

## 650 LANDSCAPING

### 650.01 CERTIFICATION

Contracts dealing with landscaping items will be awarded to a general contractor that employs, or has a sub-contractor that employs, an Ohio Certified Nursery Technician (OCNT). OCNT is offered by the Ohio Nursery and Landscape Association (ONLA). An OCNT must be on site during all aspects of landscape construction. The OCNT must have the status of either Landscape or Master Technician. This person shall have a signed statement certifying they are an Ohio Certified Nursery Technician as recognized by the Ohio Nursery and Landscape Association (ONLA). The signed statement is to include the signature and expiration date of the Ohio Certified Landscape Technician on the staff who will be supervising the Installation of the landscape contractor. Beginning January 1, 2010, the OCNT certification will be voided and landscape contracts or subcontracts will be awarded to a landscape contractor who employs a Certified Landscape Technician (CLT), offered by the Professional Landscape Network (PLANET). A CLT must be on site during all aspects of landscape construction. The CLT must have the status of CLT-Exterior with the specialty of Installation. This person shall have a signed statement certifying they are a Certified Landscape Technician-Exterior as recognized by the Professional Landscape Network (PLANET). The signed statement is to include the signature and expiration date of the Certified Landscape Technician on the staff who will be supervising the Installation of the landscape contractor.

### ITEM 651 TOPSOIL STOCKPILED

#### 651.01 Description

#### 651.02 Certification

#### 651.03 Stripping and Lifting

#### 651.04 Method of Measurement

#### 651.05 Basis of Payment

**651.01 Description.** This item shall consist of stripping topsoil from selected areas within work limits, transporting and storing in piles at locations designated by the Engineer.

**651.02 Certification.** Certification shall conform to the requirements of 650.01.

**651.03 Stripping and Lifting.** The contractor shall cut vegetation to a 1-inch height, remove cuttings from the site, and treat per the manufacturers recommendations with an approved nonselective herbicide two weeks prior to stripping. Topsoil shall be kept separate from other excavated materials and shall be completely removed to the required depth from any designated area prior to the

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beginning of regular excavation or embankment work in the area. Topsoil depth shall be determined in the field by the Engineer before topsoil is stripped. Topsoil shall not be stripped while wet or frozen. Stockpiled topsoil shall be placed in such a manner as not to pond water or cause flooding. Silt fencing or seeding of the stockpiled topsoil mound shall be performed at the discretion of the Engineer, depending on the duration of the project. If topsoil is removed to a greater depth than directed by the Engineer, payment will be made only for the amount of topsoil directed to be removed.

**651.04 Method of Measurement.** Measurement shall be the cubic yards of topsoil measured in the original place, acceptably stripped and stored in stockpiles as herein prescribed.

**651.05 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
651	Cubic Yard	Topsoil stockpiled

**ITEM 652 PLACING STOCKPILED TOPSOIL**

**652.01 Description**

**652.02 Certification**

**652.03 Preparation of Subgrade**

**652.04 Screening, Placing and Spreading Topsoil**

**652.05 Method of Measurement**

**652.06 Basis of Payment**

**652.01 Description.** This item shall consist of preparing the subgrade, and hauling and spreading topsoil from stockpiles.

**652.02 Certification.** Certification shall conform to the requirements of 650.01.

**652.03 Preparation of Subgrade.** Preparation of subgrade shall be performed in accordance with 653.05.

**652.04 Screening, Placing and Spreading Topsoil.** Topsoil shall be placed and spread in accordance with 653.06.

**652.05 Method of Measurement.** Measurement shall be the number of square yards in place.

**652.06 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
652	Square Yard	Screening/ Placing stockpiled topsoil, 4" thick

### ITEM 653 TOPSOIL FURNISHED AND PLACED

**653.01 Description**

**653.02 Certification**

**653.03 Topsoil**

**653.04 Stripping Topsoil / Stockpiled Topsoil**

**653.05 Preparation of Subgrade**

**653.06 Placing and Spreading Topsoil**

**653.07 Method of Measurement**

**653.08 Basis of Payment**

**653.01 Description.** This item shall consist of furnishing and spreading topsoil and preparing the subgrade for same.

**653.02 Certification.** Certification shall conform to the requirements of 650.01.

**653.03 Topsoil.** The material shall be natural field or farm type soil or field/farm type soil with admixtures such as sand, clay or composted organic matter and free of stones, plants, roots, sticks and other foreign materials.

Topsoil shall be a sandy loam or loam soil as defined by the Soil Conservation Service, U.S.D.A., Soil Classification System. Mechanical analysis shall be as follows:

Particle Range (Diameter)	Percent Range	Average Percent
Sand (0.05 - 2.0 mm)	35 - 75%	55%
Silt (0.002 - 0.05 mm)	15 - 50%	32%
Clay (less than 0.002 mm)	5 - 20%	13%

All topsoil shall be screened with at least 95 percent passing a 3.0 mm sieve (1/2" to 5/8" harp screen). The retained material shall be free of stones, gravel, earth clods, and debris greater than 1-inch in longest dimension.

Available phosphorous (P) shall not be less than 10 nor more than 200 pounds per acre.

Available potassium (K) shall not be less than 100 nor more than 650 pounds per acre.

#### **653.04**

The topsoil shall have an organic matter content of not less than 4%, nor more than 15% as determined by loss on ignition of samples oven dried to constant weight at 100°C.

The acceptable acidity range of the proposed topsoil shall be pH5.8 to pH7.2. The topsoil shall be corrected to a pH 6.5 to pH7.0 using lime or sulfur to achieve these results. Should lime or sulfur requirements exceed 50 lbs./1000sf (2150 lbs./acre), 50 lbs./1000sf shall be applied during the seeding/sodding operation with the balance applied immediately before final acceptance with the follow-up fertilizer.

Contractor shall submit to the Engineer, in writing, at least 30 days in advance of intended use, the location of properties from which topsoil is to be obtained, names and addresses of owners, depth to be stripped and crops grown during the past two years.

Topsoil shall be sampled and tested by the Engineer for phosphorous (P), potassium (K), pH, organic matter and analysis of soil make up, i.e.: particle range, percent range and average percent.

**653.04 Stripping Topsoil.** After approval of topsoil by the Engineer, and prior to stripping, the Contractor shall remove all grass, roots, brush, etc., from the area to be stripped. Commercial suppliers utilizing stockpiled topsoil or amendments shall use customary sanitation prior and subsequent to stripping to eliminate noxious weed seeds and plant parts from contaminating topsoil. The presence of Quack Grass, Canadian Thistle, etc., are grounds for rejection of a material.

**653.05 Preparation of Subgrade.** The Contractor shall complete all subgrading within the areas to be covered with topsoil under this item, to four inches below and parallel to typical cross-section and proposed finished grades. The Engineer shall determine the limit of the topsoil installation. The designated edge shall be cut cleanly whether sidewalk, retaining wall, curb, existing turf, etc., and excavated to four a (4) inch depth. The surface of the subgrade, immediately prior to being covered with topsoil, shall be free of all weeds, grasses, rocks, roots, concrete, and scarified to a depth of two (2) inches. All rock greater than two (2) inches in any dimension along with any foreign material, including roots uncovered during and as a result of scarification shall also be removed. The City Arborist or his/her designee shall be contacted 5 days prior to the installation of the topsoil for approval of the subgrade and cut back of the slopes.

**653.06 Placing and Spreading Topsoil.** Topsoil shall be placed and spread over the areas designated to a depth sufficiently greater than that shown on the plans so that after natural settlement the completed work will conform to elevations shown on the plans. The placement of topsoil shall be in compacted lifts to prevent settling. If settlement exceeds one half (1/2) inch against hard surfacing or causes puddling, the contractor shall correct the condition by placing topsoil to grade and re-turfing

the area. If the work schedule does not permit time for natural settlement of the placed topsoil, the use of a plate tamper or a method approved by the Engineer shall be used before lime, fertilizer, seeding or sodding operations begin. Stockpiled topsoil, depending on the end use, and at the discretion of the Engineer, shall be screened, rock hounded or by other approved methods, worked to remove rocks, gravel, roots, debris, etc., in excess of one inch.

**653.07 Method of Measurement.** Measurement shall be the number of square yards in place.

**653.08 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
653	Square Yard	Topsoil furnished and placed, 4" thick
653	Cubic Yard	Topsoil furnished and placed, variable depth

The unit price shall include full compensation for furnishing all labor, materials, tools, topsoil and equipment necessary to complete the item as specified.

## **ITEM 654 LAWN RENOVATION**

- 654.01 Description**
- 654.02 Certification**
- 654.03 Soil Testing**
- 654.04 Commercial Fertilizer**
- 654.05 Organic Material**
- 654.06 Lime**
- 654.07 Preparation, Seeding and Mulching**
- 654.08 Maintenance of Renovated Areas**
- 654.09 Method of Measurement**
- 654.10 Basis of Payment**

**654.01 Description.** This item shall consist of excavating existing lawn areas, furnishing and placing topsoil, lime and fertilizer, seeding and mulching or sodding as noted herein.

**654.02 Certification.** Certification shall conform to the requirements of 650.01.

**654.03 Soil Testing.** Soils shall be tested and approved by the Engineer for phosphorous (P), potassium (K), pH and organic content. The soil shall be corrected to a pH of 5.5 to 6.5. The organic content shall not be less than two percent nor more than twelve percent as determined by loss on ignition of samples oven dried to

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constant weight at 100°C. Contractor shall incorporate organic material into existing soil where organic content is less than two percent.

**654.04 Commercial Fertilizer.** "Starter" fertilizer, if required as a result of a soil test analysis, shall be of the type noted and applied at the rate specified. Incorporation shall be as noted in 659.14. "Follow-up" fertilizer shall be of the type and rate specified in 659.05. Time of application is as noted in 659.14.

**654.05 Organic Material.** The organic material shall be composted organic matter.

**654.06 Lime.** Lime shall be of the type noted and applied at the rate specified in the soil test analysis. Incorporation shall be as noted in 659.14.

**654.07 Preparation, Seeding and Mulching.** All soil, rock, roots and any other foreign material shall be removed to a full two inch depth below specified finish grade. Topsoil shall then be placed to finish grade, then raked, limed and fertilized as per soil test results and incorporated as noted in 659.14. On approval of the Engineer, prepared areas shall then be seeded and mulched as per 659 or sodded as per 660. Any overexcavated area shall be filled with topsoil at no cost to the City.

**654.08 Maintenance of Renovated Areas.** All renovated areas shall be maintained until acceptance (minimum of thirty days) by the City, including reseeding, aerating watering, mowing, weeding, fertilizing, and disease and pest control, etc., as noted in 659.15 or 660.11. On acceptance by the City, a "follow-up" fertilizer, as noted in 659.05, shall be applied at the rate of one pound of actual nitrogen per 1,000 square feet.

**654.09 Method of Measurement.** Measurement of lawn renovation shall be the number of square yards renovated in accordance with these Specifications.

**654.10 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
654	Square Yard	Lawn Renovation with Seeding
654	Square Yard	Lawn Renovation with Seeding and Excelsior Matting
654	Square Yard	Lawn Renovation with Sodding

**ITEM 655 RENOVATING EXISTING TURF (TOPDRESSING)**

- 655.01 Description**
- 655.02 Certification**
- 655.03 Topsoil**

- 655.04 Fertilizers**
- 655.05 Seed**
- 655.06 Mulch**
- 655.07 Mowing, Raking and Aerating**
- 655.08 Placing and Spreading Topsoil**
- 655.09 Liming and Fertilizing**
- 655.10 Seeding**
- 655.11 Maintenance of Renovated Turf**
- 655.12 Method of Measurement**
- 655.13 Basis of Payment**

**655.01 Description.** This item shall consist of renovating and seeding of existing turf by lightly scarifying, aerating, raking, topdressing, fertilizing, seeding, mulching, mowing and rolling areas indicated on the plans or as directed by the Engineer.

**655.02 Certification.** Certification shall conform to the requirements of 650.01.

**655.03 Topsoil.** The topsoil used in this item shall conform to 653.03 unless topsoil is to be furnished by the City from topsoil stockpiled under 651.

**655.04 Fertilizers.** Commercial fertilizers, "starter" and "follow-up" shall conform to 659.05.

**655.05 Seed.** Seed shall conform to 659.07.

**655.06 Mulch.** Straw mulch shall conform to 659.12 and be applied in accordance with 659.14.

**655.07 Mowing, Raking and Aerating.** Turf areas shall be mowed to a height of one inch and all clippings over two inches in length removed. Contractor shall then use a verticut to scarify the top 1/4 to 1/2 inch of soil until a proper seedbed is provided. Clippings and thatch shall be removed, then aerated to a depth of 3-1/2 inches.

**655.08 Placing and Spreading Topsoil.** Topsoil shall be spread over the entire area at an approximate depth of one half inch except in low areas where the depth of topsoil shall be as required to eliminate said low area.

**655.09 Liming and Fertilizing.** Liming and fertilizer shall be accomplished in two separate operations. Lime shall be added as determined by soil analysis results and recommendations and lightly incorporated into the top 1/4 inch by matting or raking. A "starter" type fertilizer shall, as a result of the soil test analysis, be of the type and rate specified, then lightly incorporated into the top 1/4 inch of topsoil by hand raking or dragging. A "follow-up" fertilizer shall be of the type and rate specified in 659.05. Time of application is as noted in 655.11.

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**655.10 Seeding.** Before seeding, the surface of the soil shall be raked. Grass seed shall be sown on the prepared seedbed at the rate of two pounds per 1,000 square feet. The seed shall be covered and the area mulched as specified in 659.14.

**655.11 Maintenance of Renovated Turf.** All renovated turf areas shall be maintained until acceptance (minimum of thirty days) by the City, including reseeded, aerating watering, mowing, weeding, fertilizing and disease and pest control, etc., as noted in 659.15. On acceptance by the City, a "follow-up" fertilizer, as noted in 659.05, shall be applied at the rate of one pound of actual nitrogen per 1,000 square feet.

**655.12 Method of Measurement.** Measurement of seeding and renovating existing turf shall be the number of square yards seeded and renovated in accordance with these Specifications.

**655.13 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
655	Square Yards	Renovating Existing Turf (Topdressing)

**ITEM 656 ROADSIDE CLEANUP**

- 656.01 Description**
- 656.02 Certification**
- 656.03 Intensity of Cleanup**
- 656.04 Cleaning**
- 656.05 Pruning**
- 656.06 Disposal of Refuse**
- 656.07 Method of Measurement**
- 656.08 Basis of Payment**

**656.01 Description.** This item shall consist of cleanup outside the excavated and filled areas and disposing of undesirable plants and other vegetative growth, rubbish, stumps, conspicuous stones, all down timber, dead brush, logs and timbers, the felling and destroying of all snags, and such trees as are designated by the Engineer. It shall also include the pruning of trees 6 inches or less and native shrubs and similar vegetation in areas indicated, but not inclusive of any work required to be performed under 201.

**656.02 Certification.** Certification shall conform to the requirements of 650.01.

**656.03 Intensity of Cleanup.** The intensity of cleanup shall be graduated so as to effect a natural transition in cleanup treatment from the edge of the pavement outward to the limits of the right-of-way and to avoid a sharp demarcation between the artificial and the natural.

**656.04 Cleaning.** After removal of large objects, the designated areas shall be cleaned with grubbing rakes or wide-spaced tooth rakes, unless otherwise directed, using care, however, not to disturb or injure desirable grass, vines, wild flowers, etc.

**656.05 Pruning.** Pruning methods shall be in accordance with 666. Caliper measurements shall be taken as specified in 201.05(b).

**656.06 Disposal of Refuse.** All stumps, roots, brush, timbers, logs, felled timber, limbs, branches, tops or other debris resulting from the clean up operations or occurring within the construction limits shall be removed and disposed of outside the limits of the project.

**656.07 Method of Measurement.** Measurement of roadside cleanup shall be the number of 1000 square feet units of roadside area outside the excavated and filled areas which have been cleaned up and accepted. The Engineer will determine the boundaries of the area to be cleaned up, and the number of units for which payment is to be made.

**656.08 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
656	M Square Feet	Roadside cleanup

## ITEM 657 RIPRAP FOR TREE PROTECTION

**657.01 Description**

**657.02 Certification**

**657.03 Materials**

**657.04 Tree Wells in Fill**

**657.05 Walls in Cut**

**657.06 Hand-Laid Stone Riprap**

**657.07 Earthwork**

**657.08 Method of Measurement**

**657.09 Basis of Payment**

**657.01 Description.** This item shall consist of the protection of selected trees or shrubs by tree wells, retaining walls, aeration and subdrainage as shown on the

## 657.02

plans or as directed by the Engineer. Tree wells and retaining walls shall be hand-laid stone riprap constructed as specified.

**657.02 Certification.** Certification shall conform to the requirements of 650.01.

**657.03 Materials.** Stone shall be Ohio sandstone ledge rock, buff color range, sizes of 3 to 6 inch thickness, 9 to 12 inch depth, random length and irregular sized.

Mortar shall conform to 602.02.

The aggregate for the tree root aeration, subdrainage, and protection shall be No. 4 or No. 467 washed gravel.

The perforated tubing shall be 4 inch corrugated, perforated, plastic drainage tubing (C.P.P.D. tubing) with nylon screen. Fittings shall be 4 inches and made of the same plastic material. This item shall conform to ASTM F 405.

Non-perforated tubing and fittings shall be 4 inch corrugated, plastic, drainage tubing (C.P.P.D. tubing). Fittings shall be 4 inches and made of the same plastic material. This item shall conform to ASTM F 405.

**657.04 Tree Wells in Fill.** Where a fill around a tree or shrub not marked for removal will be 12 inches or more in depth over the feeding root areas or ground surface lying within the periphery (outer branch tips) of the tree, a hand laid stone riprap tree well shall be constructed. A wall of the same height as the fill shall be constructed circling the tree or shrub and shall be 3-1/2 feet from the tree trunk or as specified. The top of the wall shall follow the contour on the finished grade in a neat line.

Tree wells shall be constructed prior to placing the fill over the root area.

Before fill material is placed over the root area, the Contractor shall:

- A. Remove all vegetation, organic matter, wood, brush and debris.
- B. Loosen the top several inches of soil without injuring the tree roots.
- C. Request and obtain a soil analysis from the Engineer.
- D. Apply lime, commercial fertilizer or organic material, if required by the soil tests.
- E. Install aeration and subdrainage tubing. Ends of C.P.P.D. tubing under the tree well shall be terminated with perforated caps. The C.P.P.D. tubing that radiates out from the tree trunk shall drain water from the tree well,

from the vertically installed tubing, into the outer ring of tubing, and then drain water through C.P.P.D. tubing down slope from the tree.

Tree well stone shall be supported by adjacent stone when bridging tubing. After construction of tree well and tubing system, and after approval by the Engineer, the Contractor shall fill the tree well with aggregate up to within 1 foot of the proposed finish grade. Other areas over the tree roots and within the outer dripline of the tree shall receive a 6 inch depth of aggregate for each 12 inches of earth fill, but with a minimum depth of 6 inches. After approval of the aggregate installation by the Engineer, the aggregate shall be covered with 1 inch of clean dry hay, straw or pine needles. The entire area shall be backfilled with topsoil except for the dry well and the capped ends of vertically placed aeration tubing which shall be terminated at the proposed finished grade of fill.

**657.05 Walls in Cut.** Unless otherwise shown on the plan, where the top of the slope in cut is within 6 feet of the trunk of a tree not marked for removal, hand laid stone riprap wall shall be constructed. The bottom of the wall shall be toed into the ground 2 inches unless otherwise shown on the plans, and the top of the wall shall be even with the original ground line at the base of the tree. The length of the wall shall extend far enough from the tree to amply cover the roots, or in accordance with the shape and size as called for on the plans. The ends of the wall shall flare back and taper or fade out into the finished grade of the slope in a neat line.

**657.06 Hand-Laid Stone Riprap.** Unless otherwise shown on the plan, the earth bed on which riprap is to be placed shall have a slope of 1 foot vertical to 2 inches horizontal and shall be dressed to a true plane. Where riprap is to rest against a fill, the embankment shall be tamped against the back of the stone. If existing 2 inch or greater viable roots are encountered, the stone work shall bridge the root.

Riprap for walls or wells shall be constructed in conformity with the lines and dimensions specified, each course of which shall be laid with the long dimensions of each stone perpendicular to the slope or batter. Each stone course shall be installed level. Individual stones shall be roughly rectangular in cross section and shall not be less than 3 inches in thickness, 9 inches in width, and the top course shall not be less than 12 inches in width.

The individual stones shall be placed by hand, one upon the other so that they will break joints with the stone in the course below. Where it is necessary to use more than one stone to provide the specified thickness or depth of the wall, thereby resulting in joints parallel to the face of the wall, such stones shall be placed so as to break joints with the adjacent stones.

The top two courses of stone shall receive full beds of mortar, and the exposed joints shall have a 2 inch rake. The space between the larger stones shall be filled with spalls rammed into place. The surface of the finished riprap shall not vary more than 3 inches from that shown on the plans, and shall present an even, tight surface, pleasing in appearance.

**657.07 Earthwork.** Excavation necessary in connection with this item shall be completed and paid for in accordance with 203. Any necessary embankment shall be performed in accordance with 203 using the material from the excavation. In the event borrow is necessary, it shall be completed and paid for in accordance with 203.

**657.08 Method of Measurement.** Measurement of riprap for tree protection shall be the number of square yards of riprap of the specified thickness, in place, completed and accepted. Measurement shall be made parallel to the face of the wells or walls.

Measurement of aeration and subdrainage tubing shall be the number of linear feet of tubing in place, completed and accepted. Measurement shall be made parallel to the centerline of the tubing.

Measurement of aggregate for use in conjunction with aeration and subdrainage tubing installation to be paid for shall be the number of cubic yards measured in the carrier, of aggregate furnished, placed, completed and accepted.

Fertilizer, if required, shall be paid for under 659.

**657.09 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
657	Square Yard	Riprap for tree protection
657	Linear Foot	Aeration and subdrainage tubing
657	Cubic Yards	Aggregate for drainage

**ITEM 658 TREE ROOT AERATION**

**658.01 Description**

**658.02 Certification**

**658.03 Materials**

**658.04 Preparation**

**658.05 Aeration**

**658.06 Earth Embankment**

**658.07 Method of Measurement**

**658.08 Basis of Payment**

**658.01 Description.** This item shall consist of furnishing and placing the necessary aggregate or performing pressurized liquid injection and fertilization on compacted soils, for the protection and aeration of the roots of trees and shrubs as specified or as directed by the Engineer.

**658.02 Certification.** Certification shall conform to the requirements of 650.01.

**658.03 Materials.** Aggregate. The aggregate for tree root aeration and protection shall be No. 4 or No. 467 washed gravel. Fertilizer. The fertilizer for the pressurized liquid injection method of aeration shall be a soluble type slow release such as Arborgreen or an equal approved by the Engineer.

**658.04 Preparation.** The feeding root area to be protected and aerated shall be the ground surface area lying within the dripline, or outer branch limits, plus one third the distance from the tree trunk to the outer branch limits of the tree or shrub to be retained. Such areas shall be first thoroughly cleared of all vegetation, wood, brush and debris. The top 2 to 4 inches of soil shall be loosened without injuring the tree roots before installation of aggregate. When using the pressurized liquid injection method the foregoing preparation is not necessary.

**658.05 Aeration.** Where the earth fill is less than 12 inches and more than 4 inches over the feeding root area, an aggregate aeration course of one-half the height of fill, but not less than 3 inches, shall be spread loosely over the area on original soil grade, except that at the tree trunk the thickness shall be increased to the height of the fill and extend outward from the tree trunk in collar form for a distance of 15 inches. A two inch layer of straw or hay shall be placed over the aggregate.

Where no earth fill is proposed the pressurized liquid injection method shall be utilized, fracturing compacted soils using pressurized water containing two-year slow release fertilizer. The pressure applied and probe depth shall be determined by soil texture, degree of soil compaction and site considerations. This work shall be performed with equipment designed and manufactured for this application and by a firm with three years experience in soil aeration.

**658.06 Earth Embankment.** Any necessary earth embankment shall be performed in accordance with 203 using the material from the excavation. In the event borrow is necessary, it shall be completed and paid for in accordance with 203.

**658.07 Method of Measurement.** The cubic yardage of aggregate for tree root aeration to be paid for shall be the number of cubic yards, measured in the carrier, of aggregate furnished, placed, completed and accepted.

The square yardage of surface area as defined by section 658.03 shall be used to quantify the pressurized liquid injection method.

**658.08 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
658	Cubic Yard	Tree root aeration

**659.01**

658 Square Yard Tree Root Aeration, Pressurized Liquid Injection Method

**ITEM 659 SEEDING AND MULCHING**

- 659.01 Description**
- 659.02 Certification**
- 659.03 Soil Testing**
- 659.04 Agricultural Liming Materials**
- 659.05 Lawn Fertilizers**
- 659.06 Crownvetch or Bird's-Foot Trefoil Fertilizers**
- 659.07 Seed**
- 659.08 Water**
- 659.09 Sticker**
- 659.10 Crownvetch or Bird's-Foot Trefoil Inoculant**
- 659.11 Sticker Cover**
- 659.12 Mulching Material**
- 659.13 Asphalt Mulch Tie-down**
- 659.14 Fertilizing, Seeding and Mulching Lawn Seed Areas**
- 659.15 Maintenance of Lawn Seed Areas**
- 659.16 Fertilizing, Seeding and Mulching Crownvetch or Bird's-Foot Trefoil Seed Areas**
- 659.17 Maintenance and Guarantee of Crownvetch or Bird's-Foot Trefoil Seed Areas**
- 659.18 Weed Control After Suf-Final Acceptance**
- 659.19 Method of Measurement**
- 659.20 Basis of Payment**

**659.01 Description.** This item shall consist of furnishing all seed, agricultural liming materials, fertilizer, inoculant, water, sticker, sticker cover, mulching materials, asphalt mulch tie-down, and placing, incorporating and maintaining as specified or directed.

The areas to be fertilized, seeded, mulched and paid for under this item shall include all areas as described on the plans. All areas outside of construction limits where the vegetative growth has been injuriously disturbed or destroyed by the Contractor, including those areas defined in 104.06, shall be restored and seeded in accordance with these specifications by the Contractor at no cost to the City.

**659.02 Certification.** Certification shall conform to the requirements of 650.01.

**659.03 Soil Testing.** The Contractor shall request a soil analysis from the Engineer when topsoil is provided under Items 651 and 653, a minimum of 30 days prior to proposed seeding. After receiving soil test results from the Engineer, the

Contractor shall make fertilizer, lime and other material applications or perform procedures in accordance with such tests and as directed by the Engineer.

**659.04 Agricultural Liming Materials.** Agricultural liming materials may only be used at the rates determined by soil analysis test results or as determined by the Engineer. In the absence of a soil test, pH shall be determined by a pH meter provided by the Engineer. pH shall be corrected to 6.5 as directed by the Engineer.

**659.05 Lawn Fertilizers.** "Starter" fertilizer for lawns shall be a dry type with a ratio as noted in the soil test analysis results and applied at the rate specified in those analyzes and incorporated as noted in 659.14.

The "follow-up" fertilizer shall be a dry type fertilizer such as an 18-5-9 or 25-5-10 or similar ratio, applied at the rate of one pound of actual nitrogen per 1,000 square feet unless otherwise directed by the Engineer. Fifty percent of the total nitrogen shall be water insoluble (W.I.N.). Other analysis requires approval of the Engineer. Contractor shall apply the "follow-up" fertilizer upon acceptance.

**659.06 Crownvetch or Bird's-Foot Trefoil fertilizers.** "Farm-grade" fertilizer shall be dry. Analysis shall be a 1-2-2 ratio, such as 10-20-20, or as otherwise approved by the Engineer. "Farm-grade" fertilizer shall be applied at the rate of 12 pounds per each 1000 square feet of surface soil area (500 pounds per acre), or equivalent to 12 pounds of 10-20-20 for that area.

**659.07 Seed.** All seed shall meet the following requirements:

98 percent purity  
85 percent germination

The Contractor shall furnish to the Engineer a letter of certification that all seed to be used comes from a source approved by the City, and meets the requirements of these specifications. Seed which is wet, moldy or otherwise damaged in transit shall not be acceptable. The seed mix shall be delivered in clean sealed bags bearing certified analysis as follows (percentages are by weight):

Lawn seed mix:

Sunny seed mix  
(Relatively Low Maintenance)

Fairlawn Brand  
35% Kentucky Bluegrass  
10% Baron Kentucky Bluegrass  
15% Pennlawn Red Fescue  
10% Brightstar II Perennial Ryegrass  
10% Pizzazz Perennial Ryegrass  
10% Seville II Perennial Ryegrass

**659.07**

Or an equal approved by the Engineer. Apply seed at the rate of 5 pounds per 1000 square feet.

Alternate Sunny Seed Mix  
(Low Maintenance)

Fescue Plus Mixture  
25% Millenium Tall Fescue  
25% Plantation Tall Fescue  
25% Crossfire II Tall Fescue  
15% Brightstar II Perennial Ryegrass  
10% Kentucky Bluegrass

Or an equal approved by the Engineer. Apply seed at the rate of 6-7 pounds per 1000 square feet.

Shady Seed Mix

Fairlawn "Shady"  
15% Shadow Chewings Fescue  
15% Pennlawn Red Fescue  
15% Intrigue Chewings Fescue  
15% Creeping Red Fescue  
10% Shademaster II Red Fescue  
20% Seville II Perennial Ryegrass  
10% Kentucky Bluegrass

Or an equal approved by the Engineer. Apply seed at the rate of 5 pounds per 1000 square feet.

Alternate Shady Seed Mix  
(Low Maintenance)

Fescue "Plus" Mixture  
25% Millenium Tall Fescue  
25% Plantation Tall Fescue  
25% Crossfire II Tall Fescue  
15% Brightstar II Perennial Ryegrass  
10% Kentucky Bluegrass

Or an equal approved by the Engineer. Apply seed at the rate of 6-7 pounds per 1000 square feet.

Athletic field seed mix  
(Relatively High Maintenance)

50% Kentucky Bluegrass  
 20% Seville II Perennial Ryegrass  
 15% Brightstar II Perennial Ryegrass  
 15% Applaud Perennial Ryegrass

Or an equal approved by the Engineer. Apply seed at the rate of 5 pounds per 1000 square feet.

(Medium Maintenance)

Akron Lawn Seed Mix  
 30% Pennlawn Creeping Red Fescue  
 17% Baron Kentucky Bluegrass  
 17% Blue Chip Kentucky Bluegrass  
 16% Nassau Kentucky Bluegrass  
 10% Brightstar II Perennial Ryegrass  
 10% Pizzazz Perennial Ryegrass

Or an equal approved by the Engineer. Apply seed at the rate of 5 pounds per 1000 square feet.

Low maintenance mixture

Utility Field Mix  
 50% Fawn or Kentucky 31 Tall Fescue  
 40% Annual Ryegrass  
 10% Kentucky Bluegrass

Or an equal approved by the Engineer. Apply seed at the rate of 6-7 pounds per 1000 square feet.

Alternate Low Maintenance Mixture:  
 (Very Slow Growth)

“No-Mow” Mixture  
 50% MX-86 Sheep Fescue  
 50% Minotaur Hard Fescue

Or an equal approved by the Engineer. Apply seed at the rate of 4 pounds per 1000 square feet.

Crownvetch Seed mix:

50 percent Crownvetch (*Coronilla varia*)  
 50 percent Annual Ryegrass (*Lolium multiflorum*)

Bird's-Foot Trefoil mix:

## 659.08

50 percent Empire Bird's-Foot Trefoil (*Lotus Corniculatos*)  
50 percent Annual Ryegrass (*Lolium Multiflorum*)

Crownvetch and Bird's-Foot Trefoil shall be applied at the rate of 1 pound (0.50 pound for each of the seed varieties) for each 1,000 square feet of area.

Where Crownvetch or Bird's-Foot Trefoil are specified in existing turf, the seed shall be applied at one (1) pound for each 1,000 sq. Ft., but without annual rye.

**659.08 Water.** Water shall be potable water metered from hydrants in accordance with standard rules and regulations of the City of Akron Public Utilities Bureau, or an approved equal. Newly seeded areas shall receive a minimum of 1 inch of water each week.

**659.09 Sticker.** Molasses (table syrup) or sweet soda pop shall be used. A mixture of 9 parts water and 1 part sticker shall be used to coat the Crownvetch or Bird's-Foot Trefoil seed for dry seeding.

**659.10 Crownvetch or Bird's-Foot Trefoil Inoculant.** The inoculant for treating Crownvetch or Bird's-Foot Trefoil seeds shall be a pure culture of nitrogen-fixing bacteria selected for maximum vitality, not more than one year old. (Temperatures above 75°-80°F weaken bacteria and make inoculant less effective). All cultures shall be subject to the approval of the Engineer. Only inoculant that has been specifically manufactured for the seed being treated shall be used. The amount of inoculant to use shall be as specified by the manufacturer. Sticker-coated seed shall be completely coated with inoculant for dry seeding. If seed is hydraulically applied, the inoculant shall be 10 times the normal rate specified by the manufacturer for dry seeding.

**659.11 Sticker Cover.** Cornstarch shall be mixed at the rate of 0.50 lb. of cornstarch to 100 pounds of inoculated Crownvetch Or Bird's-Foot Trefoil seed for dry seeding.

**659.12 Mulching Material.** All materials shall be reasonably free of weed seed and such foreign materials as may detract from their effectiveness as a mulch or injurious to desired plant growth.

**Straw:** Straw shall be new crop-cut, reasonable free of weeds or crop seed. It shall be applied at the rate of 90 pounds for each 1,000 square feet of seeding.

**Excelsior Matting:** Natural wood fiber matting, manufactured with nylon mesh netting, shall be installed as erosion control on slopes 3:1 or steeper, or as directed by the Engineer. Excelsior matting or equals approved by the Engineer shall be secured by steel staples and installed per manufacturer's recommendations, as specified in 668.

Hydro mulch: Mulch shall contain a blend of no greater than 30 percent paper and a minimum of 70 percent wood fiber. The mulch shall be applied at a minimum rate of 34 pounds (dry weight) for each 1,000 square feet of seeding if the area is 4:1 or flatter. If the area is steeper than 4:1, mulch shall be applied at a minimum rate of 46 pounds (dry weight) for each 1,000 square feet of seeding.

Hydro mulch shall be applied in the spring from the time the ground is workable to the first week of May. During the fall season, hydro mulch shall be applied from the second week of August to the second week of September, unless otherwise approved by the Engineer.

**659.13 Asphalt Mulch Tie-Down.** Rapid curing (RC-70, RC-250 and RC-800), medium curing (MC-250 and MC-800) and emulsified asphalts (SS-1, CSS-1, CMS-2) can be used to hold mulch in place. The rate of application shall be 0.25 gallons for each 1,000 square yards.

**659.14 Fertilizing, Seeding and Mulching Lawn Seed Areas.** Topsoil, if specified, whether new or removed from stockpile, shall be placed and spread in accordance with 653.

Lime, if required as a result of soil test or as required by the Engineer, shall be incorporated into the soil by disc, harrow or tiller to a depth of six inches or as otherwise directed.

"Starter" fertilizer shall be incorporated into the soil to a depth of 4 inches, unless otherwise directed by the Engineer. "Starter" fertilizer shall be incorporated separately from lime incorporation.

Seedbed shall then be prepared removing all rock and foreign material greater than one inch in any dimension and fine graded by raking to a grade level consistent to and as noted in 653.06 and quality to the satisfaction of the Engineer.

The Contractor shall perform core aeration to a minimum depth of three (3) inches with a minimum of twenty (20) holes per square foot prior to the application of a "follow up" fertilizer.

A "follow-up" fertilizer shall be applied to the newly established lawn after acceptance, as noted in 659.05.

In the event a properly completed and approved seedbed has crusted due to moisture or for any reason prior to the actual seeding application, the surface shall be lightly scarified prior to broadcasting of seed.

Seed shall be evenly broadcast, drilled or as otherwise approved by the Engineer within two hours of completion and approval of seedbed preparation. Seed/soil contact, defined as at least 75% of the seed being evenly incorporated into the top ½" of topsoil, is necessary to insure seed hydration from contact with the soil

## 659.15

until germination is complete. Acceptable methods include drilling seed in with a seeder, hydraulically applying seed at a 90 degree angle from the nozzle to the ground or broadcasting and dragging the seed in the top ½" of topsoil. The application of seed will not be permitted on a hard or crusted seedbed surface.

Straw mulch shall be manually applied within two hours after seeding, or as otherwise approved by the Engineer.

Asphalt mulch tie-down, if required by the Engineer, shall be applied after mulch installation.

Water seeded/mulched areas immediately after completion. Contractor shall supply appropriate hose, couplings and/or sprinklers to reach all newly seeded areas. Natural rainfall shall be supplemented to provide a minimum of moisture necessary for proper seed/root development.

**659.15 Maintenance of Lawn Seed Areas.** All seeded and mulched areas shall be maintained until acceptance. Maintenance shall also include furnishing and installing approved barricades and signs to protect newly seeded and mulched areas. All areas damaged following seeding or mulching operations due to wind, water, fire, or other causes, shall be repaired. Such damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding. It then shall be refertilized, reseeded and remulched, as directed by the Engineer.

Contractor shall maintain seeded areas until acceptance, minimum of 30 days after a satisfactory stand of grass in vigorous and thriving condition is established. Maintenance shall include watering, mowing, weeding, aerating, reseeding, fertilizing and disease and pest control, etc. Water shall be applied, under sufficient pressure, with a nozzle that will produce a spray pattern that will adequately water but not dislodge the mulching material, every seven days during the maintenance period unless otherwise determined by the Engineer, at a rate of 120 gallons per 1,000 square feet. Mow to a height of two inches whenever grass becomes three inches high. Not more than one-third of the grass height shall be removed with each mowing. Areas which do not show a satisfactory stand of grass shall be reseeded at intervals of ten to fifteen days until a satisfactory turf is established. In turf areas that have settled, topsoil shall be added and the entire area re-seeded at the rate specified for that seed mix. In turf areas that have not settled, a slit seeder shall be used. This will salvage the existing turf and incorporate the seed into the soil. The seed shall be applied at half the rate specified for that seed mix. An acceptable lawn shall be defined as having a close stand of specified grass, 6-12 plants per square inch depending on the specified variety, in a vigorous and thriving condition. It shall be reasonably free of weeds and undesirable coarse grasses. Reasonably free of undesirable weeds and coarse grasses shall mean weeds and/or coarse grasses exist in less than five percent of the total seeded area. A weed control program will be required when weeds and/or coarse grasses surpass five percent of any given area, or five percent of total area seeded. Control may be exercised manually or through chemical control. When chemicals are used to control undesirable grasses or

broadleafed weeds insects, or diseases, the Contractor will be required to possess a commercial applicator's license with the State of Ohio and apply chemicals according to manufacturer's recommendations. Disease and pest control shall include, but not be limited to, damage by fungus, bacteria or insects, etc., as identified by the Engineer.

**659.16 Fertilizing, Seeding and Mulching Crownvetch or Bird's-Foot Trefoil Seed Areas.** Seedbed shall be rough and cloddy with stones and soil in place, where no mowing is planned. On slopes steeper than 2:1, or where the existing finish grade is too fine, the slope shall have horizontal furrows cut across the slope. Beginning at the top of the slope, 3 inch deep furrows 2 feet apart shall be made. The Engineer may vary these dimensions to meet site conditions. Seedbed must be approved by the Engineer before Crownvetch or Bird's-Foot Trefoil seed installation.

When seeding Crownvetch or Bird's-Foot Trefoil in existing turf, seedbed preparation shall include mowing existing vegetation to a height of 3", and slitseeding or loosening the top 1/4" of soil by using an aerator, flail mower or equal approved by the Engineer. Dormant season seeding shall not require loosening the soil since the soil is opened by the freeze thaw cycle.

Lime and "farm grade" fertilizer shall be incorporated into the soil by disc, harrow, rake or other method approved by the Engineer. Lime shall be incorporated to a depth of 6 inches, and fertilizers to a depth of 4 inches, unless otherwise directed by the Engineer.

Crownvetch or Bird's-Foot Trefoil shall be sown after April 1st to August 31st, or during the dormant season which shall be from November 1st to March 31st.

Crownvetch or Bird's-Foot Trefoil seed shall be thoroughly coated with the sticker, and then rolled into the inoculant. After coating the inoculated seed with the sticker cover, the seed mix should be immediately incorporated into the top 1/4 inch of soil, unless hydraulically applied, or otherwise directed by the Engineer. Hydraulic application seed shall be combined in a water slurry with agricultural liming materials (if required by soil test), fertilizers, inoculant, and mulching materials; however, mulching materials may be applied separately. Seed shall not remain more than an hour in a water slurry with lime or fertilizers. Water for hydraulically applied seeding materials shall be provided in sufficient quantity to make a flowable slurry.

Straw mulch may be applied manually or by a mechanical blower. Mulch shall be held in place by applying a light asphalt mulch tie-down, twine, soil mulch stabilizer, or by watering. Straw mulch shall be applied within 2 hours after area has been seeded.

Mulch shall not be required when seeding Crownvetch or Bird's-Foot Trefoil in existing live turf.

Water hose, couplings, and sprinklers shall be provided to reach all areas of the newly seeded areas to receive water. Natural rainfall shall be supplemented to provide a sufficient moisture for seed germination.

**659.17 Maintenance and Guarantee of Crownvetch or Bird's-Foot Trefoil Seed Areas.** Areas which do not show a satisfactory catch of Crownvetch or Bird's-Foot Trefoil shall be reseeded at intervals of 30 days until a satisfactory Crownvetch cover is established. Companion grass seed shall not be applied in the reseeded work. If dry seeded, Crownvetch shall be inoculated before seeding. If hydraulically applied, inoculant shall be added to the water slurry. All seeded and mulched areas shall be maintained by the Contractor until sub-final acceptance. Seeded areas shall not receive sub-final acceptance until each square foot of area contains at least one living plant 3" or more in height or width. Maintenance shall include watering, mowing, and weed control. Maintenance shall also include furnishing and installing approved barricades and signs to protect newly seeded and mulched areas. Any areas damaged following seeding or mulching operation due to wind, water, fire or other causes shall be repaired. Such damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding, and shall be refertilized, reseeded, and remulched, as directed by the Engineer. During the growing season after seeding, areas shall be mowed to a height of 6 inches whenever vegetation becomes 10 inches high. Mowing will not be required if slope is greater than 2:1 or exceedingly rough.

Final acceptance of Crownvetch or Bird's-Foot Trefoil seeded areas shall occur when specified legumes reach six (6) to twelve (12) inches in height or width and cover a minimum of seventy-five (75) percent of 659.01 the specified planted area. Areas not vegetated with the specified legumes which are larger than two and one quarter (2.25) square feet (an area 1.5' x 1.5') shall be reseeded as noted above, without the nurse grass.

Acceptable Crownvetch or Bird's-Foot Trefoil areas shall have a minimum of 5 living plants for each square foot of area.

**659.18 Weed control after sub-final acceptance.** When directed by the Engineer, weeds shall be eradicated in designated areas of seeded Crownvetch or Bird's-Foot Trefoil using physical, mechanical or chemical methods, or a combination thereof, as approved by the Engineer. Herbicides shall be applied in accordance with manufacturer's recommendations using care to protect desirable plants and other improvements. Restricted herbicides shall be applied by a licensed applicator.

Payment for weed control ordered by the Engineer after sub-final acceptance shall be made for the number of square yards of weeds successfully eradicated. When eradication is ordered by the Engineer more than one time, payment shall be made each time that eradication so ordered is successfully completed.

**659.19 Method of Measurement.** Measurement of seeding and mulching shall be the number of square yards seeded and mulched in accordance with these specifications. Measurement of weed control shall be in accordance with 659.18.

**659.20 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
659	Square Yards	Lawn seeding and mulching
659	Square Yards	Crownvetch Seeding and Mulching
659	Square Yards	Bird's-Foot Trefoil Seeding
659	Square Yards	Weed Control After Sub-Final Acceptance

## ITEM 660 SODDING

- 660.01 Description**
- 660.02 Certification**
- 660.03 Materials**
- 660.04 Submittal**
- 660.05 Lifting Sod**
- 660.06 Soil Testing**
- 660.07 Preparation of Areas to be Sodded**
- 660.08 Placing Sod**
- 660.09 Placing Sod in Ditches**
- 660.10 Watering**
- 660.11 Maintenance of Sodded Areas**
- 660.12 Clean up**
- 660.13 Method of Measurement**
- 660.14 Basis of Payment**

**660.01 Description.** This item shall consist of furnishing, hauling and excavating for preparing the bed and placing topsoil, fertilizer and sod. It shall also include watering, mowing and maintaining sod, all as specified herein.

**660.02 Certification.** Certification shall conform to the requirements of 650.01.

**660.03 Materials.** Topsoil shall be in accordance with 653.03.

Water shall be potable water metered from hydrants in accordance with standard rules and regulations of the City of Akron Public Utilities Bureau, or an approved equal.

Sod shall be a first grade certified mixture grown by a sod producer, exhibiting a vigorous healthy root system not less than two years old, free of weeds and

**660.03**

objectionable grasses, grubs, diseases or injurious insects and grown on mineral soil, unless otherwise accepted by the Engineer.

Provide sod composed of the following:

Sunny sod mixture  
(Medium Maintenance)

Akron Mix  
30% Pennlawn Creeping Red Fescue  
17% Merit Kentucky Bluegrass  
17% Liberty Kentucky Bluegrass  
16% Nassau Kentucky Bluegrass  
10% Manhattan II, Pizzazz or Seville II Perennial Ryegrass  
10% Brightstar Perennial Ryegrass

Or an equal approved by the Engineer.

Alternate Sunny Sod Mixture  
(Medium Maintenance)

Tall Fescue 90/10 Seed Mix  
30% Stetson Tall Fescue  
30% Lancer Tall Fescue  
30% Bravo Tall Fescue  
10% Shamrock Kentucky Bluegrass

Sunny Sod Mixture:  
(High Maintenance with Irrigation System)

Kentucky Bluegrass  
20% Merit Kentucky Bluegrass  
20% Blue Chip Kentucky Bluegrass  
20% Denim Kentucky Bluegrass  
20% Nassau Kentucky Bluegrass  
20% Midnight Kentucky Bluegrass

Alternate Sunny Sod Mixture:  
(High Maintenance with Irrigation System)

Sod Blend  
30% Abbey Kentucky Bluegrass  
30% Raven Kentucky Bluegrass  
20% Washington Kentucky Bluegrass  
20% Goldrush Kentucky Bluegrass

Alternate Sunny Sod Mixture:

## (High Maintenance with Irrigation System)

Superiors Sod Blend  
 30% Shamrock Kentucky Bluegrass  
 30% Impact Kentucky Bluegrass  
 30% Wildwood Kentucky Bluegrass  
 10% Limousine Kentucky Bluegrass

If this or an acceptable approved equal is not available, the sod grower can upon approval by the Engineer, slit seed acceptable into the sod field six weeks prior to cutting sod.

Shady sod mixture  
 (Low Maintenance)

Fescue "Plus" Mixture  
 25% Millenium Tall Fescue  
 25% Plantation Tall Fescue  
 25% Crossfire II Tall Fescue  
 15% Brightstar II Perennial Ryegrass  
 10% Kentucky Bluegrass

Or an equal approved by the Engineer.

Copies of the sod certification label clearly stating varieties or blend of grass seed used in developing the sod which is to be supplied, shall be submitted for the Engineer's approval thirty days in advance of anticipated installation, along with the grower's name, field location of sod being grown and proposed for cutting and certificate of inspection by the Ohio Department of Agriculture. No substitutions of varieties shall be permitted, except where proof is submitted in writing that sod specified is not obtainable. A proposal shall be submitted in writing to the Engineer for his consideration of the use of another variety or blend. Root systems shall be protected from wind and sun and protected against dehydration, contamination and heating during transportation and delivery. Stored sod shall be kept moist and under shade or covered with moistened burlap and piled not more than two feet in height or depth. Sod shall be placed within 24 hours after delivery to the project site.

**660.04 Submittal.** The City reserves the right to inspect sod in the grower's field prior to cutting and lifting, deliver or at any other time. The Engineer, either in lieu of or in addition to the above, may require a pad of sod of the size that is proposed for the project delivered to the project site for approval.

**660.05 Lifting Sod.** The sod shall be recently mowed uniformly at a height of 1 to 2 inches and the sod shall be machine cut at a uniform soil thickness of 3/4 inches at the time of cutting. Measurement of thickness shall exclude top growth of thatch. Individual pieces of sod shall be cut to the supplier's standard width and length. Maximum allowable

## 660.06

deviations from standard widths and lengths shall be plus or minus 1/2 inch of width and plus or minus 5% of length. Broken pads and torn or uneven ends shall not be acceptable. Sod shall not be transplanted when moisture content (excessively wet or dry as determined by the Engineer) may adversely affect its survival. Sod shall be harvested, delivered, and transplanted within a period of 36 hours unless a suitable preservation method is approved prior to delivery.

**660.06 Soil Testing.** Soil testing and material incorporation shall be performed in accordance with 659.03.

**660.07 Preparation of Areas to be Sodded.** The joint between sod and existing turf shall be a clean smooth vertical cut 4" deep made with a powered lawn edger. Areas to be sodded shall be excavated to such a depth that when the topsoil and sod are in place (after rolling), the top of the sod root system will be flush with surrounding grade and in accordance with the typical cross-section and proposed grades. The subgrade, shall be prepared in accordance with 653.05 and topsoil spread in accordance with 653.06. Grade level and quality of workmanship shall be approved by the Engineer prior to placement of sod. "Starter" fertilizer shall then be applied in accordance with 659.05 and 659.14.

During periods of higher than optimal temperature for species being specified and after all unevenness in the soil surface has been corrected and approved by the Engineer, the sod bed shall be lightly moistened immediately prior to laying the sod.

**660.08 Placing Sod.** Installation of sod may take place any time grass is in a growing stage, normally between April 15 and November 1, providing ground is in a workable condition and temperature is above 35°F. The Engineer shall determine when the ground is in workable condition. At no time will sod installation be permitted on frozen soil. During periods of drought conditions or high temperatures, soil shall be watered prior to sod installation to a soil depth of two inches. Soil surface, once approved for installation, shall be kept loose, not compacted, nor having a crust, such as normally occurs after a rain.

Sod placed on slopes shall be laid with the long edges of the strip parallel to the contour starting at the bottom of the slope. Sod shall be watered immediately after placing to prevent excessive drying during progress of work.

The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Care shall be exercised to insure that the sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots. On 3:1 or steeper slopes, sod shall be pegged after being placed using a minimum of 2 stakes per pad not more than 3 feet apart. Soft wood stakes shall be approximately 1/2 x 3/4 x 12 inches and shall be placed on "up slope" edge with the upper 2 inches of the stakes exposed.

As sodding is completely rolled out in any one section (one block), trimming shall be completed, sidewalks, aprons and curbing cleaned, and sod watered to approval. Within twenty four hours of a thorough watering, sod shall be rolled with a 200 pound roller, except in the pegged areas. Sod remaining high after rolling, specifically related to sidewalks, aprons and curbs shall be hand tamped until flush. Sodding laid on slopes shall be hand tamped to bring the sod into firm contact with the sod bed and to insure tight joints between pads of sod. After sod has rooted into the sod bed the exposed wood stakes shall be driven slightly below flush with the finished grade.

As soon as practicable following the initial water but in every case prior to the second watering the entire area shall be examined for open joints or other signs of surface imperfections. All open joints or other voids shall be carefully filled with topsoil to prevent air drying of the roots and to eliminate undulations in the surface. Topsoil shall be as specified in 653.03.

**660.09 Placing Sod in Ditches.** Sod shall be placed transversely in ditches with successive strips neatly matched, and transverse joints staggered. The sod shall be held in place securely with wooden stakes as described in 660.08.

**660.10 Watering.** The Contractor shall keep all sodded areas, including the subgrade, thoroughly moist from the time of initial installation and throughout the maintenance period.

Watering shall be done as frequently as necessary to maintain grass blades in a turgid condition, but not as to saturate the soil beneath. Saturated soil will promote sod injury and depressions if trafficked by foot or vehicle. The Contractor shall furnish potable water, watering hose and apparatus necessary for this work.

**660.11 Maintenance of Sodded Areas.** All sodded areas shall be maintained for a minimum of 30 days or until acceptance by the City, including watering, mowing, aerating, weeding, fertilizing and disease and pest control, etc. Maintenance shall also include furnishing and installing approved barricades and signs to protect newly sodded areas. All damaged areas shall be repaired to re-establish the condition and grade of the area prior to sodding and then shall be resodded as directed by the Engineer. After sodding, the areas shall be mowed to a height of two inches whenever grass becomes three inches high. Not more than 1/3 of the grass height shall be removed with each mowing.

On acceptance by the City, a "follow up" fertilizer, as noted in 659.05, shall be applied at a rate of one pound of actual nitrogen per 1,000 square feet.

All sod which fails to become established 30 days after installation shall be removed and replaced with new sod as directed by the Engineer. New sod shall be installed and maintained in accordance with the requirements of these specifications.

**660.12**

Acceptable lawn areas shall be defined as 100 percent of the area having a close stand of the specified grass in a vigorous and thriving condition. It shall also be reasonably free of weeds and undesirable coarse native grasses as well as damage by insects, diseases, etc. When chemicals are used to control undesirable grasses or broadleafed weeds, insects, or diseases, the Contractor will be required to possess a commercial applicator’s license with the State of Ohio and apply chemicals according to manufacturer’s recommendations. Disease and pest control shall include, but not be limited to, damage by fungus, bacteria or insects, etc., as identified by the Engineer.

**660.12 Clean up.** All temporary barricades and signs shall be removed from sod areas. All debris from the sod bed, wood pallets, protective coverings from temporarily stored sod, equipment and excess sod shall be removed from the site. Adjacent areas disturbed by this work shall be restored at no cost to the City.

**660.13 Method of Measurement.** Quantities to be paid for shall be the number of square yards of sod installed in accordance with these specifications.

**660.14 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
660	Square Yard	Sodding

The unit price shall include full compensation for furnishing all labor, materials, tools, topsoil and equipment necessary to complete the item as specified.

**ITEM 661 PLANTING VINES AND BULBS**

- 661.01 Description**
- 661.02 Certification**
- 661.03 Topsoil**
- 661.04 Fertilizer**
- 661.05 Lime**
- 661.06 Soil Testing**
- 661.07 Organic Material**
- 661.08 Mulching Material**
- 661.09 Vines and Bulbs**
- 661.10 Nursery Stock**
- 661.11 Container**
- 661.12 Location and Source of Supply**
- 661.13 Inspection**
- 661.14 Labeling**

- 661.15 Certificates of Inspection
- 661.16 Progress Plant Inspection
- 661.17 Rejection of Plants
- 661.18 Digging and Packing of Plants
- 661.19 Water Loss Preventive Spray and Temporary Storage
- 661.20 Layout of Planting
- 661.21 Beds
- 661.22 Planting Holes
- 661.23 Surplus Excavation
- 661.24 Backfill
- 661.25 Herbicide
- 661.26 Planting
- 661.27 Planting Potted Vines
- 661.28 Pruning
- 661.29 Mulching
- 661.30 Watering
- 661.31 Weed Control After Sub-Final Acceptance
- 661.32 Maintenance and Guarantee
- 661.33 Final Inspection and Final Acceptance
- 661.34 Method of Measurement
- 661.35 Basis of Payment

**661.01 Description.** This item shall consist of furnishing and planting vines and bulbs including crown vetch on areas, and in the arrangement shown on the planting plan, and as specified or as directed by the Engineer. Included in this work is the layout of planting areas and holes; digging and preparation of vine and bulb planting holes, or planting beds if specified; furnishing and incorporating required lime, fertilizer, topsoil and peat moss; installing plants, mulch, water and topsoil; pruning, applying chemicals and water loss preventive spray; clean-up and all incidentals necessary to complete this item.

**661.02 Certification.** Certification shall conform to the requirements of 650.01.

**661.03 Topsoil.** Topsoil shall conform to 653.03

**661.04 Fertilizer.** On all vines and bulbs except crown vetch, fertilizer shall, as determined by the soil analysis recommendations, be applied both in type and rate as noted in the recommendations. In the absence of a soil analysis, a 20-6-12 or 18-6-12 (3-1-2 ratio) 100% slow release, sulfur coated urea or approved equal shall be applied at planting at the rate of 3 pounds of actual nitrogen per 1000 square feet, or 5 cups of fertilizer per cubic yard of backfill. Unless otherwise specified, this fertilizer shall be thoroughly and evenly incorporated into the soil backfill at planting. Rates of application and fertilizer ratios shall not vary unless approved by the Engineer.

## 661.05

Fertilizer for crown vetch shall be a 10-20-20 "farm grade" fertilizer applied at the rate of 500 pounds per acre, or 12 pounds per 1,000 Square feet, or equivalent as approved by the Engineer. Apply fertilizer uniformly over the entire newly planted area prior to mulching.

**661.05 Lime.** Contractor shall apply lime according to the rate and method determined by the soil analysis and recommendations.

**661.06 Soil Testing.** Soil testing and material incorporation shall be performed in accordance with 659.03

**661.07 Organic Material.** Organic material shall be composted municipal sludge as processed by the City of Akron under the Trade Name EarthPro™ or approved equal.

**661.08 Mulching Material.** Mulch for all vines except crown vetch shall be a processed shredded hardwood bark consisting of a minimum of 90 percent hardwood bark and a maximum of 10 percent wood material of which no dimension is greater than 4 inches nor smaller than 1/2 inch. Bark shall be clean, free of mold, soil, clods, debris, insects or any other noxious matter.

The Contractor will be required to submit a one cubic foot sample for approval prior to intended use. The Engineer also reserves the right to inspect the source of the shredded bark.

Mulch material for crown vetch shall be straw in accordance with 659.12, or existing vegetative material approved by the Engineer.

**661.09 Vines and Bulbs.** All vines and bulbs furnished under this item shall be true to name and shall follow standard names of vines, bulbs, shrubs, and trees as set forth in Horticultural Standards as adopted by the AAN.

**661.10 Nursery Stock.** All vines and bulbs, except crown vetch shall be nursery grown for a period of one year under the same climatic conditions as exist at the location to be planted, and shall be well developed, healthy, free from insects and diseases, and possess a normal unbroken root system. All vines shall meet the standards as set forth in ANSI Z 60.1-2004 or most current. In all cases where grades are indicated in those standards as Number 1, Number 2, etc., the Number 1 or top grade will be furnished.

Crown vetch shall be grown for a period of six months minimum and may be specified as bare root, peat pots or cell packs.

**661.11 Container.** Plants specified to be container grown shall conform to the requirements of ANSI Z 60.1-2004 or most current. Container plant material which shows evidence of being root bound, recently canned or which has girdling

roots shall be rejected. Plants shall remain in the containers until immediately before planting.

**661.12 Location and Source of Supply.** The Contractor shall supply, within 15 days after receipt of the notice of award of the contract, complete and detailed information concerning the source of supply for each of the materials included in the planting list, including mulching. Plants shall be from sources in the same or colder hardiness zone as the location of the project.

**661.13 Inspection.** All nursery stock to be purchased under this specification shall be subject to inspection and sealing by the Engineer, in the nursery, before digging and shipping. All stock must be inspected and approved before the start of the planting season, unless otherwise directed by the Engineer. Final acceptance of all plant materials will be given only after the materials are planted, and after meeting all the requirements prescribed herein. The seals shall remain on the vines until after final acceptance is made and shall then be removed. The Contractor shall bear all costs incurred by the nursery if a tagging fee is charged.

**661.14 Labeling.** Legible labels must be attached to all specimens, or boxes, bundles, bales, or other containers, indicating the necessary detailed information covering botanical genus and species name, the common name, size or age of each species or variety and the quantity contained in the individual bundles, boxes or bales.

**661.15 Certificates of Inspection.** All plants must be properly inspected before removal from the nursery by authorized Federal, State, City or other authorities as may be required in the area where the nursery involved is located. Each shipment, invoice or order of plants must be declared and certified free of diseases and insects of any kind with such necessary inspection certificates accompanying each shipment, invoice or order of plants as may be required.

**661.16 Progress Plant Inspection.** All nursery stock furnished by the Contractor shall be subject to inspection, within 48 hours after delivery of said stock, by the Engineer. The plants shall also be subject to such inspection during the entire life of the contract, and infestations occurring on the stock as a result of conditions existing prior to the receipt of the plants on the project shall be cause for rejection.

**661.17 Rejection of Plants.** Any plant not approved by the Engineer, and plants not meeting the requirements will be cause for rejection. All rejected plants shall immediately be removed and disposed of by the Contractor and approved nursery stock of like variety, size, age, etc., shall be replaced without additional compensation. Replacement stock shall meet all the requirements herein prescribed.

**661.18 Digging and Packing of Plants.** All plants shall be dug with reasonable care and skill, immediately before shipping, avoiding all possible injury to, or loss of, roots. After plants are dug, their roots shall not be permitted to dry out. The stock shall be properly packed in sphagnum moss, moist straw or other

## 661.19

suitable material that will insure the arrival of plants in acceptable condition. Stock which has heated or "sweated" by reason of tight packing or poor ventilation will be rejected. Plants shall not be exposed to artificial heat nor freezing temperatures.

### **661.19 Water Loss Preventive Spray and Temporary Storage.**

Immediately following delivery and inspection at the job, all plant material shall be sprayed in the storage areas, before being planted, heeled in or stored, with an appropriate anti-desiccant at the rate specified by the manufacturer. The spray coverage shall be complete on both the upper and lower surfaces of the branches and foliage to the point of run-off. Spray nozzles shall be the type to produce a fine mist.

Evergreens and broadleafed evergreens shall be sprayed prior to planting at all seasons; however, deciduous trees, shrubs or vines, which normally shed their leaves during the fall season, need not be sprayed if dug in the nursery during the period of September 15 to April 1. In the event planting is delayed until after April 1, and substantial growth has begun, deciduous trees, shrubs, or vines shall be sprayed as specified prior to removal from heeling beds, when directed by the Engineer.

Following spray treatment and after delivery, all bare root plants which cannot be planted promptly shall be heeled in, in a trench, spread, and the roots covered with soil and thoroughly watered. If plants are not to be stored for a period longer than 10 days, they may be placed in an approved well ventilated, but cool, moist storage shed and the roots completely covered with moist straw. All plants heeled in or stored shall be properly maintained by the Contractor until planted. In the event heeled in plant material must be held over until the next planting season, such heeled in materials shall be lifted and replanted in a satisfactory manner in nursery rows.

The balled and burlapped plants, if not immediately planted after delivery and inspection, shall be adequately protected by moist mulching material applied to amply cover the balls of earth in a manner satisfactory to the Engineer. Mulch will be placed immediately after each individual shipment is received and unloaded, unless plants are scheduled for immediate planting. Root systems (balls, containers) shall not be allowed to dry below an acceptable reading on a moisture meter approved by the Engineer. Plants allowed to dry below this level will become stressed and therefore will be rejected. Watering methods shall be adequate to soak the entire root ball (interior) and are subject to approval of the Engineer.

Crown vetch not planted within 2 hours of delivery shall be set in shade and kept watered until planted.

**661.20 Layout of Planting.** Before the digging of planting holes, the Contractor shall lay out, by suitable staking, the location of all planting holes and arrangement of all planting beds. The layout of planting shall be approved by the Engineer.

Unless otherwise noted on the plans or as directed by the Engineer, crown vetch shall be planted two (2) feet on center, in staggered rows.

**661.21 Beds.** The beds and defined bed edges shall conform to the areas specified or as directed by the Engineer, and shall be excavated uniformly to a specified depth. A defined (beveled) bed edge shall be excavated to a depth of 3 inches and a width of 6 inches by mechanical or other approved methods, to define and retain mulch.

Crown vetch areas shall be cleared and grubbed in accordance with 201.03 with all vegetation being cut to a height of 2-3 inches. All herbaceous vegetation shall be killed by applying a nonselective herbicide a minimum of seven (7) days before planting. Reapplication before planting may be necessary if vegetation is not controlled by first application.

When directed by the Engineer, an alternative method of planting crown vetch on erodible slopes may be used. This method includes application of an approved plant growth regulator to the existing vegetation rather than the nonselective herbicide. Methods and materials shall be applied in accordance with the manufacturer's recommendations and approved by the Engineer.

**661.22 Planting Holes.** When planting areas indicated on the plans are not shown in beds, holes shall have a level bottom, be excavated with a horizontal diameter of not less than 12 inches, and have a depth of not less than 12 inches measured vertically at the lower side of the pocket hole. The hole shall be of sufficient size to provide for not less than 6 inches of backfill beneath and around the root system.

Bulb planting holes shall be dug, or augured, to the specified depth for the specified varieties, see Figure 661-1. Hole width shall be adequate to place bulbs and allow for a minimum of ½ inch backfill placed around each bulb.

Crown vetch planting holes shall be vertically created with a Mattock, dibble bar, pick axe or other approved tool. The hole shall be of sufficient size to accept the entire peat cube or root system.

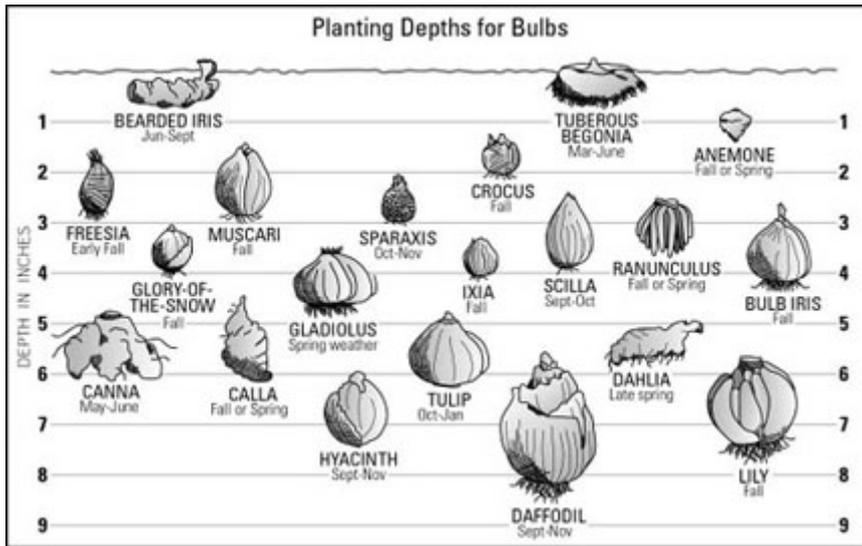


Figure 661-1

**661.23 Surplus Excavation.** Surplus and unacceptable excavation shall be disposed of in accordance with 203.

**661.24 Backfill.** Backfill for planting beds and planting holes shall consist of 80% of acceptable excavated soils and 20% of moist EarthPro™ compost. If soil taken from the planting holes or planting beds is unacceptable to the Engineer as backfill material for the plants, topsoil in accordance with 653 (without additional compensation) shall be used as backfill without the addition of compost. Acceptable excavated soils shall consist of friable sandy loam or sandy clay loam site soils, not soils with a high content of rock or gravel, heavy clay, construction debris, or unacceptable organic material.

Approved backfill shall be added in 6 inch lifts to the plant holes around the sides of the plant root system and then followed with tamping. All soils used for backfill shall be tested to determine fertilizer and lime requirements for the plant materials.

Backfill for bulbs shall consist of bonemeal in accordance with the manufacturer's recommendations, along with 20% EarthPro™ as stated above.

Compost shall not be added to the soil sample until after soil has been tested. Soils shall be corrected in accordance with soil test recommendations and shall have moist compost mixed with the corrected soil. Backfill shall be placed and tamped to a depth of 6 inches beneath the root system of all vines and small shrubs except crown vetch unless otherwise directed by the Engineer.

Backfill for crown vetch shall consist of existing soil.

**661.25 Herbicide.** An approved herbicide (pre-emergent) shall be applied to newly completed areas, prior to mulching, in accordance with manufacturer's recommendations and as directed by the Engineer. Herbicide shall be applied by a licensed applicator.

**661.26 Planting.** Spring planting shall be performed during the time the soil is in a workable condition, until May 15th. Fall planting may be performed from September 15th until the ground is no longer in a workable condition. The Engineer shall determine when the ground is in a workable condition. No vines shall be planted when the temperature is below 33°F or the ground is frozen or muddy.

Prior to planting, crown vetch shall be immersed into a dilute solution of Rapid Gro and inoculant for one hour.

Plant installation shall proceed after approval by the Engineer of the finish grading and the preparation of planting areas. After placing and tamping backfill in bottom of planting hole, plant shall be installed upright in center of planting hole, and backfill carefully placed and tamped around the root system. Sufficient backfill shall be installed around the plant crown to meet adjacent finish soil grade with the planting standing in a natural position, at the same depth as it grew in the nursery. The soil shall be thoroughly watered so that no air pockets remain around the roots. Leave a depression or rain pocket to catch water.

Spring bulbs shall be fall planted and performed from October 15<sup>th</sup> to when the soil becomes unworkable, or December 15<sup>th</sup>. The Engineer shall determine when the soil conditions are workable. Before placing bulbs in the planting holes, bonemeal shall be placed in the bottom of the hole, then the bulb placed in the hole, with the growing tip upright in each hole. Backfill can then be placed and firmed in each hole. Mulch to specified depth can then be placed over the entire bed area.

**661.27 Planting Potted Vines.** Potted vines shall be of the size and condition specified and shall conform to ANSI Z 60.1-2004 or most current. Vines shall be delivered to the project in pots which shall be removed just prior to planting unless otherwise directed by the Engineer.

**661.28 Pruning.** Plants shall have dead or broken runners removed. Hand pruners shall be used for pruning work. All tools shall be in good condition, kept sharpened and dipped or sprayed with an appropriate disinfectant to keep plants healthy.

All clippings shall be removed from the site before application of the mulch.

**661.29 Mulching.** Mulching material shall be uniformly placed between the vines and over the entire planting area within 24 hours after planting a given area and to the depth of 2 inches minimum unless otherwise shown on the plans.

## 661.30

Broadcast 2 bales of hay or straw per 1,000 Square Feet around completed crown vetch planting.

**661.30 Watering.** All plants shall be watered during the planting operation in accordance with 661.26 and 663.16. Crown vetch crowns shall be watered 2 days after planting to the satisfaction of the Engineer. Water shall be potable water metered from hydrants in accordance with standard rules and regulations of the City of Akron Public Utilities Bureau, or an approved equal.

**661.31 Weed control after sub-final acceptance.** When directed by the Engineer, weeds shall be eradicated in designated planting beds using physical, mechanical or chemical methods, or a combination thereof, as approved by the Engineer. Herbicides shall be applied in accordance with manufacturer's recommendations using care to protect desirable plants and other improvements. Restricted herbicides shall be applied by a licensed applicator.

Payment for weed control ordered by the Engineer after sub-final acceptance shall be made for the number of square yards of weeds successfully eradicated. When eradication is ordered by the Engineer more than one time, payment shall be made each time that eradication so ordered is successfully completed.

**661.32 Maintenance and Guarantee.** All vine plantings shall be maintained for a minimum of 30 days following satisfactory completion of planting or until sub-final acceptance by the City, including watering, weeding, litter and debris, and disease and pest control. At 30 days, the Contractor shall replace all dead and dying plants, raise or lower any improperly planted vines and eliminate any and all weeds, paper and other foreign debris.

Bulbs shall be fertilized after blooming, during new bulb development with 5-10-10 agricultural fertilizer at the rate of 3 pounds per 100 square feet.

All plant materials shall be guaranteed for one year after preliminary acceptance of the plant material. Should replacement fall due during a non-planting season, the Contractor may request the City's permission to defer planting until the proper season.

Contractor shall replace all dead crown vetch plants during the one year guarantee period, when 3 or more plants within any 100 Square Foot area have died.

**661.33 Final Inspection and Final Acceptance.** Upon completion of the one year guarantee period, the Engineer shall make a final inspection. All plants not found in a healthy viable condition, free of insects and diseases shall be replaced by the Contractor as well as pruning dead and broken branches. The Contractor on being notified in writing shall complete replacements and other noted work in a reasonable period of time as determined by the Engineer. Completion of correctional work to the satisfaction of the Engineer will constitute final acceptance.

**661.34 Method of Measurement.** Quantities to be paid for shall be the number of vines or crown vetch planted and mulched, complete in place, as measured by the Engineer. Quantities to be paid for weed control shall be in accordance with 661.31.

**661.35 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
661	Each	Planting vines
661	Each	Planting Bulbs
661	Each	Planting crown vetch
661	Sq. Yd.	Weed control after subfinal acceptance (crown vetch)
661	Sq. Yd.	Weed control after subfinal acceptance (vines)

## ITEM 662 PLANTING SHRUBS

- 662.01 Description
- 662.02 Certification
- 662.03 Material
- 662.04 Soil Testing
- 662.05 Shrubs
- 662.06 Nursery Stock
- 662.07 Specimen Stock
- 662.08 Container
- 662.09 Ball and Burlap
- 662.10 Source of Supply
- 662.11 Inspection, Labeling, Certificates and Rejection of Plants
- 662.12 Water Loss Preventive Spray and Temporary Storage
- 662.13 Layout of Planting
- 662.14 Planting Beds
- 662.15 Planting Holes
- 662.16 Surplus Excavation
- 662.17 Backfill
- 662.18 Pre-Emergence Herbicide
- 662.19 Planting
- 662.20 Pruning
- 662.21 Mulching
- 662.22 Dead, Stressed, Diseased or Injured Shrubs
- 662.23 Watering and Maintenance
- 662.24 Weed Control After Subfinal Acceptance
- 662.25 Maintenance and Guarantee
- 662.26 Method of Measurement
- 662.27 Basis of Payment

**662.01**

**662.01 Description.** This item shall consist of furnishing and planting deciduous and evergreen shrubs on the areas and in the arrangement specified or as directed by the Engineer, including the digging and preparation of planting holes, furnishing and placing the necessary topsoil, peat, mulch, water, commercial fertilizer and all other incidentals necessary to complete this item.

**662.02 Certification.** Certification shall conform to the requirements of 650.01.

**662.03 Material.** Material shall be:

Topsoil .....	653.03
Organic Material .....	661.07
Mulching .....	661.08
Fertilizer .....	661.04
Lime .....	661.05

Water shall be potable water metered from hydrants in accordance with standard rules and regulations of the City of Akron Public Utilities Bureau, or an approved equal.

**662.04 Soil Testing.** Soil testing and material incorporation shall be performed in accordance with 659.03 and 659.14 except that soils for ericaceous shrubs shall have a pH of 5.5.

**662.05 Shrubs.** All shrubs furnished under this item shall be true to name and shall follow standard names of vines, shrubs, and trees in accordance with Horticultural Standards as adopted by the AAN.

**662.06 Nursery Stock.** All plants shall be nursery grown for a period of at least one year under same climatic conditions as exist at the location to be planted. All shrubs shall meet the standards as set forth in ANSI Z 60.1-2004 or most current. In all cases where grades are indicated in those standards, as Number 1, Number 2, etc., the Number 1 or top grade will be furnished.

**662.07 Specimen Stock.** Whenever specimen stock is specified in connection with any species or variety of plants, they shall be nursery grown, but are not to be the ordinary nursery-run grade, and they shall be fully developed, bushy and better branched to the ground or at a natural height above the ground typical of the species.

Specimen plants shall have been grown individually so that they have at no time been in contact with or crowded by adjacent plants. These plants shall have been transplanted in accordance with the accepted nursery practice in Ohio for specimen plants for the various species and varieties of plants.

**662.08 Container.** Plants specified to be as container grown shall conform to the requirements of ANSI Z 60.1-2004 or most current. Damaged plants in containers will be rejected by the Engineer. Plants shall remain in the containers until immediately before planting.

**662.09 Ball and Burlap.** Whenever plants are specified B & B, they shall be balled and burlapped, with the shape and size of ball in proper proportion with the type and size of plant. The wrapping of the ball shall be performed carefully and firmly. Whenever a figure in parentheses is used following "B & B", this indicates the diameter of the minimum size ball which will be acceptable. These plants shall be handled by the ball only and not by the plant itself. The slightest indication of manufactured earth balls or handling of the plant itself will be cause for the rejection of such plants. Otherwise, the ball sizes shall be as specified for the size and type of plant in ANSI Z 60.1-2004 or most current.

**662.10 Source of Supply.** Sources of supply shall meet the requirements of 661.12.

**662.11 Inspection, Labeling, Certificates and Rejection of Plants.** All shrubs to be furnished shall conform to 661.13 through 661.17.

**662.12 Water Loss Preventive Spray and Temporary Storage.** Spraying and storage of plants shall conform to the requirements of 661.19.

**662.13 Layout of Planting.** Before the digging of planting holes or beds, the Contractor shall lay out, by suitable staking, the location of all planting holes and beds. The layout of planting shall be approved by the Engineer.

**662.14 Planting Beds.** Planting beds shall conform to the requirements of 661.21.

**662.15 Planting Holes.** Planting holes shall be dug with vertical sides to a depth such that when balled and burlapped shrubs are planted in the hole, the top of the ball shall be at the height above ground line specified in 662.19. Diameter of the hole shall be 18 inches greater than the root system or ball. If an auger is used for digging planting holes and polished sides occur in clay or heavy soils, the use of the auger shall be discontinued and the holes dug with a backhoe or other approved method.

**662.16 Surplus Excavation.** Surplus excavation from the bed and pocket holes shall be disposed of in accordance with 203.

**662.17 Backfill.** Backfill shall conform to the requirements of 661.24.

**662.18 Pre-Emergence Herbicide.** Herbicide and applications shall conform to the requirements of 661.25.

**662.19 Planting.** The plants shall be the species, variety and size specified. The operation of the spring planting shall be performed during the time the soil is in a workable condition until May 15th. Fall planting shall be performed from September 15th until the ground is not workable. The Engineer shall also approve the location of each individual plant, taking into consideration its size and shape, in order that the best possible arrangement will result. One plant shall be planted in the center of each planting hole and in the arrangement shown on the plans. The top of root ball shall be two inches above the normal ground line in average soils, three inches in heavy clay soils, and six inches where impermeable soil is encountered. The roots of bareroot stock shall be carefully spread out in their natural position.

Upright plants shall be kept in a vertical position. After placing the plant in the hole, the backfill shall be carefully made, tamping with the worker's feet and with round-end rods or other approved tamping devices to insure backfill in and about all roots. At no time shall tamping or further backfill be made while the backfill is wet or a consistency that would permit it to become over-compacted or puddled by so doing. All compaction shall be such that no plants will settle lower than the depth specified. No air pockets shall be left around the roots of any plant.

**662.20 Pruning.** Shrubs shall have dead or broken branches removed. When two branches are in contact, one of the branches shall be removed below the point of contact. Plants that are so severely pruned as to spoil their form and usefulness shall be removed and replaced at no cost to the City.

Scissor-type hand pruning shears shall be used for pruning work up to one inch in diameter and scissor-type lopper shears or a hand saw used for larger pruning work. Pruning cuts shall be made flush to the collar, with no branch stub remaining. All tools shall be in good condition, kept sharpened and dipped or sprayed with an appropriate disinfectant, both before use on City projects, and between pruning each tree, to discourage spreading disease and insects. Anvil-type shears are not acceptable.

**662.21 Mulching.** Mulching material conforming to 661.08 shall be placed to a uniform depth over the entire planting area within 24 hours after planting. The depth of application for wood chips and shredded bark shall be not less than three inches, in place and after settling. For individual plants the mulch shall be spread to cover the plant hole and an area of four inches outside the periphery of the plant hole or as detailed on the plans.

**662.22 Dead, Stressed, Diseased or Injured Shrubs.** Before completion and final acceptance of the project, all dead, stressed, diseased or injured shrubs with dieback or injury of more than 20 percent of height or width, or less than 70 percent of leaf density shall be replaced by the Contractor at no cost to the City. Replacement shrubs shall be of the specified variety, size and quality and shall be subject to sections 661.11, 661.12, 661.13 and 661.14 as were the original plants. Until the project is sub-finaled, the Contractor is responsible for theft and vandalism of plants.

**662.23 Watering and Maintenance.** All plants planted shall be watered and maintained during the life of the contract.

**662.24 Weed control after sub-final acceptance.** When directed by the Engineer, weeds shall be eradicated in designated planting beds using physical, mechanical or chemical methods, or a combination thereof, as approved by the Engineer. Herbicides shall be applied in accordance with manufacturer's recommendations using care to protect desirable plants and other improvements. Restricted herbicides shall be applied by a licensed applicator.

Payment for weed control ordered by the Engineer after sub-final acceptance shall be made for the number of square yards of weeds successfully eradicated. When eradication is ordered by the Engineer more than one time, payment shall be made each time that eradication so ordered is successfully completed.

**662.25 Maintenance and Guarantee.** All plantings shall be maintained for a minimum of 30 days following satisfactory completion of planting or until sub-final acceptance by the City, including watering, weeding and pruning of dead and broken branches, and disease and pest control. At 30 days, the contractor shall replace all dead and dying plants, remove all dead and broken branches by pruning, raise or lower any improperly planted plants and eliminate any and all weeds, paper and other foreign debris.

All plant materials shall be guaranteed for one year after subfinal acceptance of the plant material. Should replacement fall due during a non-planting season, the Contractor may request the City's permission to defer planting until the proper season.

**662.26 Method of Measurement.** The number of shrubs of each species or variety shall be those planted and mulched, complete in place and accepted. Quantities to be paid for weed control shall be in accordance with 662.24.

**662.27 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
662	Each	Planting shrubs
662	Sq. Yd.	Weed control after subfinal acceptance

## ITEM 663 PLANTING TREES

**663.01 Description**

**663.02 Certification**

663.01

- 663.03 General
- 663.04 Source of Supply
- 663.05 Schedule
- 663.06 Materials
- 663.07 Trees
- 663.08 Inspection, Labeling, Certificates, and Rejection
- 663.09 Digging Trees
- 663.10 Water Loss Preventative Spray, Temporary Storage
- 663.11 Coordination and Cleanup
- 663.12 Preparation for Planting
- 663.13 Planting Holes, Planting Trees, Backfill, Bricks, Grates
- 663.14 Watering, Herbicides, Fertilizing, Pruning, Mulching
- 663.15 Wrapping and Staking
- 663.16 Maintenance and Guarantee
- 663.17 Final Acceptance or Inspection
- 663.18 Method of Measurement
- 663.19 Basis of Payment

**663.01 Description.** This item shall consist of furnishing and planting deciduous shade and flowering trees and evergreen trees less than 6 inches in caliper, in accordance with and at locations as shown on the plans or as directed by the Engineer. In general, this work includes but is not limited to:

1. Excavating and preparing subgrade
2. Furnishing and placing tree
3. Furnishing and backfilling with topsoil
4. Furnishing and placing fertilizer
5. Watering and pruning tree
6. Cleaning up and removing excess materials and debris
7. Maintenance

For trees planted in lawn areas, the following item of work shall also be included.

1. Furnishing and spreading mulching materials.

For trees planted with grates, the following items of work shall also be included.

1. Furnishing and installing gravel base
2. Furnishing and installing concrete foundation to support tree grates
3. Furnishing and installing perforated pipe and gravel
4. Furnishing and installing tree grates
5. Furnishing and placement of gravel mulch

For trees planted with tree guards, the following item of work shall also be included.

1. Furnishing and installing tree guards and necessary hardware.

**663.02 Certification.** Certification shall conform to the requirements of 650.01.

**663.03 General.** The work included under this item shall be performed by a single firm specializing in landscape work. The firm shall have a minimum of three (3) years experience with similar landscape work and shall be able to complete the work specified under this item within the approved planting period.

It shall be the Contractor's responsibility to be fully cognizant of all construction plans, utility drawings, existing and proposed utility locations, other specifications and the work of other contractors, including construction schedules and procedures pertaining to this project.

**663.04 Source of Supply.** The Contractor shall, within 15 days after receipt of notice of award of the contract, submit to the Engineer complete and detailed information concerning the source of supply of all trees including soil type in which trees were grown. Substitutions shall not be permitted unless written proof is submitted that a specified variety is not obtainable. A written proposal shall at this time be submitted by the Contractor to the Engineer for consideration of the use of a comparable equivalent size and variety, with an equitable adjustment of the contract price to be determined by the Engineer. Oversize trees may be accepted with specific approval of the Engineer, but shall not be considered for additional payment. The Contractor shall coordinate with the nursery, prior to digging, to remove the topsoil and expose the first order root flare. Failure to do so will result in the Contractor removing the topsoil to find the root flare at the time of planting.

**663.05 Schedule.** The Contractor shall, a minimum of eight weeks prior to the beginning of the planting season, submit to the Engineer for approval a written tentative work schedule of planting, which shall include dates of shipping and planting and nursery locations. The Contractor shall not deviate from this schedule without written approval from the Engineer. Planting shall be performed during the following planting periods:

Spring - from the time the ground is workable until May 15

Fall - from September 15 until the ground is not workable

The Engineer shall determine when the ground is not workable.

**663.06 Materials.**

Backfill material shall be in accordance with 661.24.

Topsoil shall be in accordance with 653.03.

Organic material shall be in accordance with 661.07.

**663.07**

Mulch shall be in accordance with 661.08.

Fertilizer shall be in accordance with 663.14.

Lime shall be in accordance with 661.05.

Water shall be potable water metered from hydrants in accordance with standard rules and regulations of the City of Akron Public Utilities Bureau, or an approved equal.

Gravel cover shall be 1/4 inch washed silica gravel unless otherwise directed.

Gravel bedding shall be No. 4 washed gravel.

Pre-emergent herbicide shall be as approved by the Engineer and applied according to the manufacturer's label.

Stakes shall be 2 inch (inside diameter) by 8 feet long steel pipe painted with an approved exterior matte black enamel. A single strand No. 12 gauge pliable zinc coated iron wire shall be used for anchoring. Hose used to cover the anchor wire shall be new, black, 1/2 inch rubber and fabric garden hose.

Concrete shall be Class "C" conforming to 499.

Reinforcing steel shall conform to 509.

Sand bedding and filler shall conform to 703.02.

Tree grates shall be 4' x 6', cast iron, as supplied by Neenah Foundry Co. Box 729, Neenah, Wisconsin, 54956, Telephone 414-725-3041, or an approved equal or as specified on the plans.

Tree guards shall have a 5 foot installed height from top of grate to top of guard, with a 12 inch inside diameter, as supplied by Neenah (catalog Style "A") or an approved equal, or as specified on the plans.

Hex head bolts and nuts and washers shall be stainless steel or cadmium plated. Tree grates, guards and mounting hardware must be from one manufacturer.

The Contractor may be required to submit the following samples for approval: packets of fertilizer and herbicide; one cubic foot of 1/4 inch washed pea gravel; 5-foot pieces of wire and hose; a paint chart for grate and guard finishes.

**663.07 Trees.** All trees shall be of the type and size called for in the plans or specifications, fully developed, having all buds intact and free of disease, insects,

scars, bruises and breaks and shall have been grown for the preceding one year under the same climatic conditions as exist at the planting location.

Tree names, unless otherwise specified, shall conform to the latest edition of "Standardized Plant Names, as adopted by the American Joint Committee of Horticulture Nomenclature". Trees shall be individually identified by name on legible weatherproof labels securely attached to the tree.

Trees shall be nursery grown and shall meet the standards as set forth in ANSI Z 60.1-2004 or most current, and in cases where grades are indicated, the Number 1, or top, grade shall be furnished. Shade-type trees (Maples, Lindens, Oaks, etc. maturing at over 25 feet) shall be straight trunked to 8 feet and headed between 6 and 7 feet. Ornamental-type trees (Crabapples, Hawthorns, Maples, etc. maturing at less than 25 feet) shall be straight trunked to 7 feet and headed between 5 and 6 feet. Trees specified B and B (ball and burlap) shall conform to 662.09.

**663.08 Inspection, Labeling, Certificates and Rejection.** All trees furnished under this contract shall conform to 661.13 through 661.17.

**663.09 Digging Trees.** All trees shall be carefully dug immediately before shipping, avoiding all possible injury to the roots, with particular attention given to the fibrous roots. After trees are dug their roots shall not be permitted to dry out. All trees shall be dug in a dormant state and so held until planted.

**663.10 Water Loss Preventative Spray, Temporary Storage.** All trees shall be sprayed and stored as prescribed in 661.19.

**663.11 Coordination and Cleanup.** It shall be the Contractor's responsibility to coordinate tree planting work with that work of other contractors on this project in order to insure that the tree planting proceeds expeditiously.

Throughout the planting operations, the Contractor shall keep the premises of the work clean and free of excess soils, plants, refuse, debris and other materials by removal and disposal from the project during the planting and as a final clean up.

**663.12 Preparation for Planting.** With the exception of street trees (which are located by the Engineer), the Contractor shall lay out the location of all planting (before digging the planting holes), for approval by the Engineer. The Contractor shall remove the twine and the wire basket from the root ball prior to it being placed in the planting hole. The Engineer may waive this requirement if deemed detrimental to the tree due to sandy or soft root balls. In order to establish a proper planting height, the burlap on top of the root ball shall be removed along with the topsoil on top of the root ball to expose the first order root flare.

**663.13 Planting Holes, Planting Trees, Backfill, Bricks, Grates.** Planting holes shall be dug no deeper than the height of the ball to be planted, and of sufficient width, with vertical sides, to permit at least 9 inches of backfill around the

#### 663.14

sides of the ball. The work shall be placed so the planting holes shall have the trees placed within 24 hours after being excavated. Unattended planting holes shall be properly barricaded.

- a. Trees in lawn areas shall be planted with the top of the ball one inch higher than the finished grade, unless otherwise directed by the Engineer. Backfill shall conform to 661.24. A two-inch high saucer, consisting of approved backfill material, shall be formed completely around the tree ball to the outer limits of the planting hole to facilitate watering.
- b. Trees with grates and guards.

Concrete foundations to support the tree grate shall be installed as shown on the plans, being set so that after the tree grate is placed and secured, the top of the grate shall not vary more than 1/16 inch above or below the adjacent curb, walk or brick.

Trees shall be planted with the top of the root ball four inches below the tree grate, using approved backfill material which shall be hand-tamped in six inch lifts. Two inches of washed silica gravel shall be added on top of the root ball. Tree grates shall have metal lugs cast or welded in place and drilled to receive the metal tree guard, as required and as shown on the plans. The tree guard adjustable spacer bars shall be fastened to the lugs on the tree grate in a manner that will allow the guard to be plumb.

After fabricating and welding, clean and wire brush all bare metal surfaces to remove any rust, oil, wax, grease and dirt prior to any painting. For castings that are delivered unpainted apply to all surfaces one prime coat and one finish coat (both 4 mils minimum) in the shop with only finish coat touch-up being permitted after installation. Castings that have a prime coat applied by the manufacturer shall have one coat (4 mils minimum) on all surfaces. Apply to all surfaces prime coat touch-up and one finish coat (4 mils minimum) in the shop, with only finish coat touch-up being permitted after installation. Prime coat shall be black rust inhibitive epoxy paint. Finish paint shall be Kem-Lustral Semi-Gloss Black, F65B4, as supplied by Sherwin Williams Company, or approved equal.

The tree grate, and guard when applicable, shall be installed and secured as required and as detailed on the plans, and the spaces in the grate filled with 1/4 inch silica gravel.

**663.14 Watering, Herbicide, Fertilizing, Pruning, Mulching.** Trees shall be watered within 12 hours of planting, or as directed by the Engineer. Trees in lawn areas and in tree grates shall be watered with the aid of a Treegator® Jr. Pro watering bag. The approximate 14 gallon capacity watering bag shall be used in accordance with 663.16 and shall become the property of the City of Akron upon final acceptance of the project. The cost of the Treegator® Jr. Pro watering bag

shall be included in the price bid for Item 663. Trees shall be restraightened and additional backfill used where settling occurs.

A pre-emergent herbicide, of the type approved by the Engineer, shall be applied in accordance with the manufacturer's recommendations, and as noted in 661.25.

Fertilizer shall, as determined by the soil analysis recommendations, be applied in type and rate as noted in the recommendations. In the absence of a soil analysis, a 20-6-12 or 18-6-12 (3-1-2 ratio) 100% slow release, sulfur coated urea or equal fertilizer approved by the Engineer shall be incorporated into the soil backfill at the rate of 5 cups of fertilizer per cubic yard of backfill. Rates of application and fertilizer ratios shall not vary unless approved by the Engineer.

Pruning shall be completed as noted in 666.03, or as determined by the Engineer.

Mulching material shall be an approved processed shredded hardwood bark, in accordance with 661.08. In lawn areas, the mulch shall be applied evenly 3 inches thick over the backfilled area.

**663.15 Wrapping and Staking.** Staking of trees will be performed when so specified in the contract documents or when directed by the Engineer. The Contractor, when not required to stake, shall periodically inspect and straighten trees where needed during the first four weeks after planting, at the beginning of the next planting season and at final acceptance, if necessary, or as required by the Engineer. Straightening, when deemed necessary by the Engineer, shall be completed by the Contractor within 3 days after Contractor notification.

**663.16 Maintenance and Guarantee.** Insect and disease problems occurring during the maintenance and guarantee period shall be controlled by the Contractor. Type of control, whether chemical or biological, along with type of chemical, where required, shall be determined by the Engineer. Rates and frequency of application shall be as determined by the manufacturer. The Contractor shall, during the life of the contract, perform periodic straightening, where needed or as directed by the Engineer. Trees shall be watered on at least two separate occasions during periods of drought, normally in July and August. Occasions, methods and quantity of watering shall be as determined by the Engineer. Weed growth within the mulched areas shall also be controlled by the contractor a minimum of twice within the guarantee period. Once in each of the months of July and September, or when weed growth exceeds 6 inches. This may be done by physical, mechanical, or chemical means as approved by the Engineer. Trees which have either died, display greater than 15% general branch dieback or 10% leader dieback (by length), natural breakage or vandalism, to the extent that corrective pruning would alter the natural form of the species prior to final acceptance, shall be removed and replaced at the Contractor's expense, as instructed by the Engineer. Corrective pruning shall be allowable within the following guidelines:

663.17

- leaders and scaffold branches may only be cut back to a lateral branch which is not less than one third (1/3) of the diameter of the branch being removed, to assure proper and timely wound closure,
- flush cuts, or stubs greater than one eighth (1/8) inch are unacceptable,
- sharp shears and saws, appropriate to the size of material being cut, shall be in good repair to cleanly cut, rather than tear the cambial area,
- when determined by the Engineer, a ten percent Clorox (bleach) solution shall be required as a sterilant for dipping trimming equipment between each pruning cut, to discourage the spread of disease.

Other reasons for rejection include irreversible, severe stress such as noticeably smaller leaves, abnormal foliage chlorosis, yellow or pale green color, premature fall color, excessive leaf drop (more than 25%) an irreparable girdling root(s), root damage or excessively loose ball as determined by the Engineer.

**663.17 Final Acceptance or Inspection.** Upon completion of the one year guarantee period, the Engineer shall make a Final Inspection. All trees not found in a healthy, viable condition or as noted in 663.16 shall be replaced by the Contractor, as well as receive a final pruning in accordance with 666 or as noted per Engineer. In addition, all trees shall be straight and all stakes, hose and wrapping is to be removed. The Contractor, upon being notified in writing, shall complete replacements and other noted work in a reasonable period of time as determined by the Engineer. Trees not centered in brick or grate openings shall be recentered. (up to one inch tolerance in any one direction will be allowable)

Straightening or recentering trees at final inspection shall be accomplished only by use of a proper sized tree spade or by hand. In either case the tree is to be completely dug around as in digging a tree with a ball of earth, severing all roots, quickly and cleanly with a sharp instrument to a diameter and depth noted in ANSI Z60.1-1986 - Item 1.3 Balling and Burlapping Specifications, prior to actual straightening.

**663.18 Method of Measurement.** Trees planted of each species or variety to be paid for shall be the number complete in place and accepted.

Where staking is required by the Engineer, it shall be included in the bid price for this work. Upon final acceptance, stakes shall be removed at no additional cost to the city.

**663.19 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
663	Each	Tree Planting in Lawn Area
663	Each	Tree Planting w/Grate

663      Each      Tree Planting w/Grate and Guard

The above price shall constitute full compensation for furnishing all labor, materials, equipment, tools and incidentals required to complete this item as specified herein.

## **ITEM 664 PLANTING SALVAGED PLANTS**

### **664.01 Description**

### **664.02 Certification**

### **664.03 Materials and Construction Methods**

### **664.04 Method of Measurement**

### **664.05 Basis of Payment**

**664.01 Description.** This item shall consist of digging and planting salvaged vines, shrubs, and trees up to six inches in diameter secured from within the limits of the project, including the digging and preparation of planting holes, furnishing and placing the necessary topsoil, compost, mulch, water and other incidentals necessary to complete this item.

**664.02 Certification.** Certification shall conform to the requirements of 650.01.

**664.03 Materials and Construction Methods.** The materials, except plants, to be furnished, and the performance of all operations shall be in accordance with the requirements of 661, 662 and 663 and shall include the backfilling of the hole from which the plant was dug. Plants shall be sprayed with a water loss preventative spray prior to digging and shall be planted within 36 hours after digging.

**664.04 Method of Measurement.** Salvaged vines, shrubs and trees planted of each species or variety shall be the number complete in place and accepted.

**664.05 Basis of Payment.** Payment for accepted quantities, complete in place, will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
664	Each	Planting salvaged plants

## **ITEM 665 LARGE TREES MOVED AND RESET**

665.01

- 665.01 Description
- 665.02 Certification
- 665.03 Material
- 665.04 Trees
- 665.05 Preliminary Wrapping
- 665.06 Digging Trees
- 665.07 Moving
- 665.08 Tree Holes
- 665.09 Drain Pits
- 665.10 Commercial Fertilizer or Peat Moss
- 665.11 Aggregate
- 665.12 Pipe Drains
- 665.13 Surplus Excavation
- 665.14 Backfill
- 665.15 Top and Root Pruning
- 665.16 Pre-Emergence Herbicide
- 665.17 Planting
- 665.18 Wrapping
- 665.19 Bracing
- 665.20 Mulching
- 665.21 Dead Trees
- 665.22 Watering and Maintenance
- 665.23 Method of Measurement
- 665.24 Basis of Payment

**665.01 Description.** This item shall consist of digging, moving and resetting trees 6 inches or more in diameter, including the digging of the necessary tree holes and drain pits, furnishing and placing the necessary topsoil, aggregate, peat, commercial fertilizer, mulch, water and all other incidentals necessary to complete this item.

**665.02 Certification.** Certification shall conform to the requirements of 650.01.

**665.03 Material.** Topsoil, compost, mulch and wound dressing shall conform to 662.

Commercial fertilizer shall conform to 659.

Aggregate shall be limestone, gravel or slag.

Stakes used for anchoring shall conform to 663.

Materials used in guying and anchoring shall conform to 663.

**665.04 Trees.** When the trees are required to be furnished under this item, they shall conform to 662.05, 663.07, 663.09, and 663.10, except that they shall be

measured in caliper. The caliper of the trees, six inches or more in caliper, shall be taken 12 inches above the ground line.

**665.05 Preliminary Wrapping.** The tree trunk shall be securely and properly wrapped with layers of burlap, and the branches tied in to prevent injury during digging, moving and planting.

**665.06 Digging Trees.** Each tree shall be dug in such a manner that it may be lifted with the necessary roots enclosed in an earth ball having a minimum diameter in feet equal to the caliper of the tree in inches, and in all cases the earth ball shall be of sufficient size in accordance with ANSI Z 60.1-2004 or most current. Only dormant trees shall be dug, moved and planted or reset excepting with written approval of the Engineer.

**665.07 Moving.** All trees shall be moved by the root ball with approved standard tree-moving equipment.

**665.08 Tree Holes.** Tree holes for trees under this item shall be dug to a minimum depth of three feet with a minimum diameter of eight feet, and in no case shall the tree hole be less than 1-1/2 feet deeper than the depth of the root ball, nor shall the diameter of the hole be less than the diameter of the root ball plus four times the caliper of the tree. The bottom of the tree hole shall slope toward the drain pit or as indicated on the plans.

**665.09 Drain Pits.** When called for on the plans, drain pits shall be at least 2/3 the cubic contents of the tree hole, or of the size, shape, and the location specified.

**665.10 Commercial Fertilizer or Peat Moss.** Either commercial fertilizer or peat moss, when called for on the plans, shall be spread uniformly on the bottom of the tree holes. Commercial fertilizer shall be of the analysis and applied at the rate specified. Peat moss shall be applied to a uniform depth of three inches compacted measurement. Both the commercial fertilizer and the peat moss shall be thoroughly spaded or otherwise worked into the subsoil to a depth of six inches.

**665.11 Aggregate.** Aggregate shall be spread uniformly over the bottom of the tree hole as detailed on the plans.

When drain pits are required, they shall be filled with aggregate to a height of six inches above the flow line elevation of the pipe underdrain outlet and covered with a two inch layer of straw.

**665.12 Pipe Drains.** Specified tree holes shall be drained into a drain pit by pipe laid on the bottom of the tree hole, or as directed by the Engineer. Such drainage installation, including necessary pipe, shall be completed and paid for in accordance with 551.

## 665.13

**665.13 Surplus Excavation.** Any excavated material remaining after backfilling the underdrain trench and drain pit shall be disposed of by the Contractor in accordance with 203.

**665.14 Backfill.** After the drain pipe and aggregate have been placed, a four inch layer of sandy soil shall be spread and compacted over the bottom of the hole. Approved backfill shall then be compacted to the elevation of the bottom of the root ball. The balance of the backfill shall be made as each tree is set as specified under 662.18.

**665.15 Top and Root Pruning.** The ends of all broken and damaged roots of 1/4 inch diameter or larger shall be pruned with a clean cut, removing no more than the injured portion. The tops of all trees shall be pruned and thinned as prescribed in 666.02. All cuts and wounds, except ends of small terminal and side branches, shall be painted with paint or tree wound dressing immediately after pruning.

**665.16 Pre-Emergence Herbicide.** Herbicide applications shall conform to the requirements of 661.24.

**665.17 Planting.** The trees to be planted shall be the kind specified and such trees shall be delivered and planted immediately after digging as no temporary storage will be permitted. In addition, the planting shall meet the requirements specified in 662.18 and 663.14.

**665.18 Wrapping.** Immediately after planting, removal of the burlap, and approval of the trunk, the tree shall be wrapped with eight inch wide material in a spiral motion overlapping 2 inches, beginning at the base of the tree and ending at the second lowest branch. The wrapping shall be tied securely with twine, such tyings being spaced not more than one foot apart.

**665.19 Bracing.** Immediately after wrapping, the trees shall be securely braced by the tripod method. Trees 12 inches or more in caliper shall be braced with double wires twisted together.

**665.20 Mulching.** The mulching material as described in 661.07 shall be placed according to 662.20, except that it shall cover the tree hole and an area 12 inches beyond the periphery.

**665.21 Dead Trees.** Before completion and final acceptance, all trees furnished under this item which are not alive or normally healthy, or that have died back beyond the normal pruning line shall be replaced at the Contractor's expense with trees of the specified species or variety, sizes and quality, and meeting these specifications.

**665.22 Watering and Maintenance.** All trees moved and reset, including those furnished, shall be watered and maintained during the life of the Contract as described in 661.29 and 661.31, including necessary adjustments of braces, etc.

**665.23 Method of Measurement.** Trees moved and reset, and also those furnished, shall be the number complete in place and accepted.

Aggregate for drain pits and tree holes shall be the number of cubic yards of aggregate furnished, hauled, placed, complete in place and accepted.

**665.24 Basis of Payment.** Payment for accepted quantities, complete in place, will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
665	Each	Large trees moved and reset
665	Cubic Yard	Aggregate for drain pits and tree holes

## ITEM 666 PRUNING EXISTING TREES

**666.01 Description**

**666.02 Certification**

**666.03 Pruning**

**666.04 Removal of Foreign Materials from Trees**

**666.05 Removal of Rubbish**

**666.06 Method of Measurement**

**666.07 Basis of Payment**

**666.01 Description.** This item shall consist of pruning trees specified, including the cleaning up and disposal of all branches, limbs and resulting rubbish.

**666.02 Certification.** Certification shall conform to the requirements of 650.01.

**666.03 Pruning.** All trees noted for pruning shall be pruned to make them shapely, typical of the species. In general, where roots have been cut due to construction, approximately 1/3 of the canopy should be removed by first removing all dead and/or diseased wood. Using approved pruning principles, remove duplicating branching, i.e.: those within twelve inches of each other growing in the same direction, removing interfering and/or overlapping branches to improve structural appearance and removing structural poor branching. Any branch that may be partly dead, yet having a good healthy lateral branch between the dead part and the base shall be cut off with a clean slanting cut close to and beyond the healthy lateral branch. All branches or growth interfering with pedestrian or vehicular traffic shall be removed at the direction of the Engineer. All stubs or improper cuts resulting from former pruning or limbs that have been broken shall be cut off back to the trunk collar or limb of tree to promote proper closure. All pruning tools used and methods employed shall conform to 662.19. Workers shall not be permitted to climb trees with climbing spurs; however, they shall comply with the requirements of good

**666.04**

practice and safety in the use of safety ropes. Tree branches and trunks injured as a result of construction equipment will be pruned and/or treated professionally as per 662.19 - Pruning or as directed by the Engineer at no additional cost to the City.

**666.04 Removal of Foreign Materials from Trees.** All nails, spikes, bolts, wire or other foreign materials driven into or fastened to the trunk or branches of the tree shall be removed, or if directed by the Engineer, they shall be cut back to the branch collar at nearly a ninety degree angle to the branch in such a manner as to insure complete closure of the cambium and bark.

**666.05 Removal of Rubbish.** All rubbish and branches resulting from the pruning operations shall be removed and disposed of in accordance with 201.

**666.06 Method of Measurement.** Existing trees pruned and treated shall be the number, according to size, completed and accepted. Caliper measurements shall be as specified in 201.05(b).

**666.07 Basis of Payment.** Payment for accepted quantities, complete in place, will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
666	Each	Pruning existing trees, 3 to 8 inch caliper
666	Each	Pruning existing trees, 8 to 16 inch caliper
666	Each	Pruning existing trees, 16 to 24 inch caliper
666	Each	Pruning existing trees, 24 to 36 inch caliper
666	Each	Pruning existing trees, 36 inch and over

**ITEM 667 SEEDING AND JUTE MATTING**

**667.01 Description**

**667.02 Certification**

**667.03 Materials**

**667.04 Construction**

**667.05 Maintenance**

**667.06 Method of Measurement**

**667.07 Basis of Payment**

**667.01 Description.** This work shall consist of furnishing, placing, and maintaining seeding and jute matting on areas as shown on the plans and as directed by the Engineer.

**667.02 Certification.** Certification shall conform to the requirements of 650.01.

**667.03 Materials.** Matting shall be of a uniform open plain weave of undyed and unbleached single jute yarn. The yarn shall be of loosely twisted construction and shall not vary in thickness by more than one-half its normal diameter. Matting shall be furnished in rolled strips as follows:

Length - minimum, 50 yards  
 Width - 48 inches plus or minus one inch  
 Warp ends per width - 78 plus or minus two  
 Weft ends per yard - 41 plus or minus three  
 Average weight - 1.22 pounds per linear yard plus or minus ten percent

Staples used to fasten the matting shall be made from 12 inch lengths of 11 gage steel wire bent into a narrow "U" shape with the ends of the staples approximately 1 inch apart. For clay, shale and other heavy soils, a three inch steel staple, at least nine gage with points approximately one inch apart shall be used.

Seed and mulching materials shall be as specified in 659.

**667.04 Construction.** After the areas have been fertilized, and limed if required, it shall be seeded with the mixture and at the rate specified in 659.07 or on the plans.

Within 48 hours after seeding, vegetative mulching material shall be carefully and evenly placed over the specified area at the rate of 25 pounds per 1,000 square feet, or approximately 1/2 ton per acre. No asphalt emulsion tack required. Immediately thereafter, the matting strips shall be laid flat and loose, parallel to the flow of water. Where more than one strip is required to cover the given area, the strips shall overlap at least four inches. Ends shall overlap at least six inches with the upgrade section on top. The up-slope end of each strip of matting shall be buried in six inch slots with the soil firmly tamped against it. The Engineer may require that any other edge exposed to more than normal flow be buried in a similar manner.

Check slots shall be placed between the ends of strips by placing a tight fold of the matting at least six inches vertically into the soil. These shall be tamped and stapled the same as up-slope ends. Check slots shall be spaced so that one check slot or one end occurs within each 50 feet of slope. Edges of matting shall be similarly buried when the matting abuts catch basins and other structures.

Matting shall be spread evenly and smoothly. It shall be in contact with the grade at all points and shall not be stretched or drawn taut during the stapling operation.

Matting shall be held in place by means of staples driven vertically into the soil. Three rows of staples shall be provided for each strip of matting, with one row along each edge and one row alternately spaced in the middle. The staples shall be spaced not more than three feet apart in each row. All ends of the matting and all check

**667.05**

slots shall be stapled across their width, with staples spaced not more than six inches apart.

After the installation operations described have been completed, the areas disturbed through the preparation of check slots or other grade disturbances as determined by the Engineer shall be overseeded with the seed mixture specified at the rate of one pound per 1,000 square feet.

**667.05 Maintenance.** The matting areas shall be maintained until all work on the contract has been completed and accepted. Maintenance shall consist of the repair of areas damaged by erosion, wind, fire, or other causes. The soil in such areas shall be restored to the condition and grade existing just prior to application of the matting, and restored areas shall be relimed, refertilized, and reseeded. Where necessary, the jute matting shall be completely replaced.

**667.06 Method of Measurement.** The yardage of seeding and jute matting shall be the number of square yards of seeding and jute matting placed and maintained in accordance with these specifications, completed and accepted. The liming, and fertilizing required on the area covered by seeding and jute matting will be paid for under 659.

**667.07 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
667	Square Yard	Seeding and jute matting

**ITEM 668 SEEDING AND EXCELSIOR MATTING**

- 668.01 Description**
- 668.02 Certification**
- 668.03 Material**
- 668.04 Construction**
- 668.05 Maintenance**
- 668.06 Method of Measurement**
- 668.07 Basis of Payment**

**668.01 Description.** This work shall consist of furnishing, placing and maintaining seeding and excelsior matting on areas as shown on the plans and as directed by the Engineer.

**668.02 Certification.** Certification shall conform to the requirements of 650.01.

**668.03 Material.** Excelsior matting shall consist of a machine-produced mat of wood excelsior, 80 percent of which is at least eight inches in length. The wood from which the excelsior is cut shall be properly cured to achieve adequately curled and barbed fibers.

The matting shall be of consistent thickness, with the fiber evenly distributed over the entire area of the mat. The matting shall be covered on the top side with a netting having a maximum three inch by one inch weave of twisted kraft paper yarn having a high wet strength and entwined with the excelsior for maximum strength and ease of handling. Matting may be either 36 or 48 inches in width, plus or minus one inch, and in rolls of more than 100 feet in length. The weight of the material shall be not less than 0.72 pound per square yard, constant weight, air dry.

The staples used for stapling shall be as specified for jute matting in 667.03.

**668.04 Construction.** Within 48 hours after the area has been fertilized, and limed if required, it shall be seeded with the mixture and at the rate specified in 659.07.

Within 48 hours after the specified area has been seeded, excelsior matting shall be installed, held in place and overseeded as specified in 667.04, except that edge and end overlap shall be 1-1/2 inches, and no check slots shall be required. The up-slope end or top edge of each strip need not be buried unless required by the Engineer due to special conditions in the field.

**668.05 Maintenance.** The matting area shall be maintained as described for jute matting in 667.05.

**668.06 Method of Measurement.** The yardage of seeding and excelsior matting shall be the number of square yards of seeding and excelsior matting placed and maintained in accordance with these specifications, completed and accepted. The liming, fertilizing and maintenance required on the area covered by seeding and excelsior matting shall be expedited in accordance with item 659 and paid under item 668.

**668.07 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
668	Square Yard	Seeding and excelsior matting

## ITEM 669 PROTECTING TREES

### 669.01 Description

**669.01**

**669.02 Certification**

**669.03 General**

**669.04 Methods and Procedure**

**669.05 Root Cutting**

**669.06 Inspection and Final Determination**

**669.07 Damaged Trees**

**669.08 Pruning**

**669.09 Trenching Near Trees Under 5" DBH**

**669.10 Trenching Near Trees Over 5" DBH**

**669.11 Basis of Payment**

**669.01 Description.** This item shall consist of furnishing all necessary labor, materials and equipment to protect all trees within limits of the project except those marked for removal on the plans.

**669.02 Certification.** Certification shall conform to the requirements of 650.01.

**669.03 General.** The Contractor shall be required to submit to the Engineer his proposed method of protecting trees before any excavation is done on the project. No excavation work shall be started before the tree protection method has been reviewed and approved by the Engineer.

**669.04 Methods and Procedure.** The Contractor shall use due care while working around trees so as not to break any branches or damage any portion of the tree trunk or roots. Should it become necessary to trim any low hanging branches to facilitate construction, it shall be immediately brought to the Engineer's attention for prompt resolution. Branches shall not be broken off or severely skinned, but shall be cut in a manner approved by the Engineer. The trunk shall be protected by placing water-resistant cardboard or approved equal, around the entire trunk diameter.

**669.05 Root Cutting.** Roots of trees not designated to be removed, which extend into or through areas to be excavated, shall be cut prior to being dislodged by excavating equipment.

All roots, visible or buried, within the area of excavation for sidewalk, apron and curbing shall be properly severed and removed to a depth of 6" below the bottom of that respective improvement. In no instance shall the Contractor dislodge any roots without first cleanly severing those roots. Roots shall not be cut any closer to the tree trunk(s) than is actually required to place a form for the proposed improvement.

After roots are severed, they shall be removed from the area under the sidewalk, apron, curb or other proposed improvement. Chips and grindings from root cutting shall also be removed. Voids from root cutting and removal shall be backfilled and compacted in accordance with the requirements of Item 203.

When root cutting is bid as a separate pay item, specialized root cutting equipment shall be used to make a 12" deep vertical cut where directed by the Engineer, prior to excavation. The root cutting equipment shall be a Vermeer model V-430 root cutter or similar machine designed for root cutting. The extent of the pre-excavation root cutting will be generally as shown on the plan, but may be modified by the Engineer. If re-mobilization of the root cutting operation is required because of unexpected conditions or project scope changes, the additional work shall be paid for at the contract unit price with no allowance for re-mobilization.

The cutting of roots not severed by pre-excavation root cutting shall be done by hand excavating and using a chain saw or sharp hand axe. Payment for this root cutting shall be included in the lump sum payment for tree protection.

**669.06 Inspection and Final Determination.** If it is determined, by the Engineer after its roots are cut in accordance with this specification that a tree must be removed, the tree shall be removed by the Contractor in accordance with Item 201. Payment for tree removal shall be made at the unit price bid for respective tree size.

**669.07 Damaged Tree.** If the Contractor damages a tree not designated for removal because of improper procedures or negligence, replacement of damaged trees will be required of the Contractor. If deemed irreparable by the Engineer, the Contractor shall remove the tree and stump without compensation and be assessed the value of the damaged tree(s) using the International Society of Arboriculture's Guide for Plant Appraisal. If deemed repairable by the Engineer, repairs shall be made in accordance with ANSI A300 Tree, Shrub and Other Woody Plant Maintenance - Standard Practices without compensation and the assessed value of the tree(s) using the International Society of Arboriculture's Guide to Plant Appraisal Cost of Repair Method. A tree(s) shall be planted in a location designated by the Engineer, at no cost to the City. The Engineer shall determine tree quantity, size and variety.

**669.08 Pruning.** Pruning of trees, if directed by the Engineer, shall be done and paid for in accordance with Item 666 - Pruning Existing Trees.

**669.09 Trenching Near Trees Under 5" DBH.** Open trenching in the root zone of a public tree is prohibited except in cases where the trenching falls outside the dripline of the tree involved. Exceptions will be allowed if, in the opinion of the Engineer, the impact of the trenching upon the tree will be negligible.

**669.10 Trenching Near Trees Over 5" DBH.** All public trees in excess of 5 inches DBH, where there is insufficient space to bypass the dripline by trenching, must be tunneled. The beginning/ending distance of the tunnel from the face of the tree trunk in any direction is determined by the diameter of the tree as specified by the accompanying table:

**669.11**

When the tree diameter at 4.5 feet is:	Trenching will be replaced by tunneling at this minimum distance from the face of the tree trunk in any direction
6-9 inches	5 feet
10-14 inches	10 feet
15-19 inches	12 feet
Over 19 inches	15 feet

Failure to strictly adhere to this table will result in damage and compensation, in accordance with 669.07.

**669.11 Basis of Payment.** The contract lump sum payment shall be full compensation for all services, materials, labor, equipment, tools and incidentals necessary to complete this item of work except for pre-excitation root cutting which shall be paid at the contract unit price for the accepted quantity.

Payment will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
669	Lump Sum	Protecting Trees
669	Linear foot	Root cutting (pre-excitation)

**ITEM 671 PLAY EQUIPMENT AND MATERIALS**

- 671.01 Description**
- 671.02 Wood Fiber Surfacing**
- 671.03 Geotextile Fabric**
- 671.04 Resilient Wear Mats**
- 671.05 Pea Gravel**
- 671.06 Age Use Sign**
- 671.07 Play Structures**
- 671.08 Certifications**
- 671.09 Submittals**
- 671.10 Warranty**
- 671.11 Installation**
- 671.12 Method of Measurement**
- 671.13 Basis of Payment**

**671.01 Description.** This item shall consist of furnishing and installing play equipment and materials in accordance with details shown on the plans, Standard Construction Drawings, manufacturer's requirements and in reasonably close conformity with the lines, grades, and dimensions shown on the plans or established by the Engineer.

**671.02 Wood Fiber Surfacing.** Surfacing used shall be a mix of random-sized wood fibers, free draining with minimum moisture retention, comprised of wood such as white oak, red oak, maple, ash, douglas fir, lodge pole pine, poplar, etc.. Standard wood chips or bark mulch will not be acceptable.

Wood fiber shall be free of bark, twigs, leaves, debris, insects, chemical preservatives, artificial ingredients or other noxious matter.

The wood fiber shall meet ASTM F1292 and ASTM F355 Procedure C, and the Head Injury Criteria (HIC) of less than 1000. The wood fiber shall also meet or exceed the ASTM F-1951-99 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment. Wood fiber surface shall be installed per manufacturer's installation instructions.

The wood fiber shall be manufactured by The Fibar Group, 80 Business Park Dr., Suite 300, Armonk, N.Y. 10504-1705, telephone: 800-342-2721, or approved equal.

Install wood fiber surface, then spread to a uniform initial depth of 15 or 12 inches (for a minimum compacted depth of 12" or 9", respectively) above the level of gravel. Rake to a level top surface. Machinery shall not disturb or travel on the drainage medium system. Any overspill of wood fiber surfacing material beyond the edges of the defined play area shall be cleaned up.

**671.03 Geotextile Fabric.** Fabric shall be needle punched non-woven polyester, 70 mils thickness, in conformance with ASTM D 4632, 75" minimum, 150" maximum width geotextile fabric.

The geotextile fabric shall be "Fibarfelt", manufactured by The Fibar Group, 80 Business Park Dr., Suite 300, Armonk, N.Y. 10504-1705, telephone: 800-342-2721, or approved equal.

Install the geotextile fabric in accordance with manufacturer's instructions. All fabric seams shall be lapped 36" minimum, and shingled in the direction of water flow. Seal seams, tears, and punctures in fabric. Cut fabric/drainage medium system to fit around equipment; tape cuts after fitting. Lap fabric 4" vertically at interior perimeter of wood ties, fasten with galvanized roofing nails 32" O.C. (Maximum).

**671.04 Resilient Wear Mats.** The resilient wear mats shall comply with ASTM F1292, requiring a peak deceleration below 200 G's and ASTM F355 Procedure C, and the Head Impact Criteria (HIC) of less than 1000 from a fall height of 9'-6" minimum. The areas of mats indicated on the drawings are the minimum areas required to provide the specified impact attenuation exclusive of tapered edges of mats (if any). Mats with square edges are acceptable unless the system provided requires beveled perimeter pieces for anchorage.

## 671.05

The resilient wear mats shall be “Fibarmat”, manufactured by The Fibar Group, 80 Business Park Dr., Suite 300, Armonk, N.Y. 10504-1705, telephone: 800-342-2721, or approved equal.

Install resilient wear mats below swings and slides, mechanically anchored in strict accordance with manufacturer’s recommendation.

**671.05 Pea Gravel.** Granular filter materials (pea gravel) shall be made from durable aggregates, No. 8 or No. 9, per Table 703-1.

Install pea gravel drainage base over existing asphalt to a uniform thickness of 3". Over prepared earth subbase, place geotextile fabric (as noted below and detailed in the plans) followed by pea gravel drainage base to the indicated depths and/or elevations.

**671.06 Age Use Sign.** ‘Age Group Use’ sign shall be the Play Safe ‘Simple Sign’ with steel reinforced posts, 3 ½” dia. rounds. Mounting height shall be 5'-0" from top of finished grade to top of posts. Color of sign and posts shall be as designated on the plans.

Intermediate sign shall read: “Play safe! This play area is designed for children 5-12 years of age. Adult supervision is recommended.”

Tot sign shall read: “Play safe! This play area is designed for children 2-5 years of age. Adult supervision is required.”

Sign shall be manufactured by:

The Plastic Lumber Company, Inc., 540 S. Main St., Akron, Ohio 44311  
Phone: (330) 762-8989, or approved equal.

Sign posts for Age Use Signs shall be embedded in Class ‘C’ Concrete footers, and in accordance with the details shown on the plans. Furnishing and placing Concrete shall be in accordance with 511 - Concrete for Structures. The location shall be as shown on the plans.

**671.07 Play Structures.** The Contractor shall furnish play structures which are manufactured by one of the approved manufacturers listed on the plans.

Maintenance kits shall be provided for each structure and shall include the following: additional washers, nuts, bolts and fasteners of the type used to assemble the structure, any special tools or keys used to assemble the structure, touch-up paint for each color used, graffiti remover, maintenance manuals, and labeled tool box to contain all the items.

Installed play structures shall comply with the most recent standards established by the ADA and the ASTM, as well as CPSC's Handbook for Public Playground Safety.

The Contractor shall verify all play structure dimensions established by the Engineer and satisfy himself as to the correctness thereof and the mutual agreement of the parts.

Upon completion of the play structure installation, the contractor shall have the manufacturer's representative inspect the structures and note any deficiencies needing correction. After completion of the items listed on the inspection report, a signed certificate of compliance form must be completed and signed by the manufacturer's representative. This certification will verify the structure was indeed installed to manufacturer's specifications and current safety standards. Sub-final payments will not be approved before this signed certificate is received by the City.

Before final acceptance of the play structure, all special tools, extra hardware, maintenance kits, parts lists, and maintenance manuals shall be delivered to the Engineer. The Engineer shall deliver all such materials to the City Facilities Maintenance Division.

All new play structures shall be installed in accordance with the manufacturer's recommendations, the manufacturer's Play Equipment Installation Manual, and as designated on the plans and approved shop drawings unless otherwise directed by the Engineer. New play structure footings shall be anchored by setting in Class 'C' Concrete. Furnishing and placing Concrete shall be in accordance with 511 - Concrete for Structures. The contractor and manufacturer shall design and install footers of sufficient size to support the structure based on the existing soil conditions and that are a minimum of 42" deep. New play structures shall be installed in the locations shown on the plans and verified in the field by the Engineer prior to pouring footers.

Support posts shall be of sufficient length to provide depth of footer as shown on the drawings, shop drawings and height of play structure as recommended by the manufacturer. The top of the post shall be a minimum of 6" above the top of the clamp (not including cap).

All mounting hardware for stairs, slides, and climbers shall be extended by the manufacturer to accommodate the 16-inch soft surface.

#### **671.08 Certifications.**

Resilient Surface and Geotextile Fabric: The Contractor shall submit certification that the compacted surface depth of the resilient surface and the installation of resilient wear mats shall be in accordance with ASTM F1292, ASTM F355 Procedure C with HIC values of less than 1000 and ASTM PS83 for surfacing as follows:

The peak deceleration of the head shall not exceed 200 G's, and a Head Injury Criteria shall not exceed a value of 1000 for the following critical heights:

## 671.09

10' Fall Height (9" of compacted wood fibers)  
10' Fall Height (resilient wear mat)

The Contractor shall certify that no chemicals or additives are present in the wood surface material and that surface material is non-toxic.

The Contractor shall provide certification from the manufacturer or installer that the final installed play system meets or exceeds all current safety requirements.

**671.09 Submittals.** The Contractor shall submit copies of testing procedures and results performed by independent testing source, which demonstrate compliance with and in accordance with ASTM F1292, ASTM F355 Procedure C with HIC values of less than 1000 and ASTM PS83.

The Contractor shall submit manufacturer's technical product data substantiating that products comply with all requirements. Submit a listing of the species of wood used in the wood fiber.

Samples: Three (3) cubic feet of fiber surfacing material.  
1'-0" square of geotextile fabric.  
1'-0" square of resilient wear mat and one anchor (if applicable).

The Contractor shall also submit a copy of detailed manufacturer's installation instructions of the above mentioned items to the Engineer.

For Play Structures, the Contractor shall submit to the Engineer, for review and approval, six (6) copies of shop drawings and installation manuals, unless additional copies are requested. Fabrication and/or assembly shall not begin until the submitted drawings and colors have been approved by the Engineer.

**671.10 Warranty.** The Contractor shall provide a written guarantee for three (3) years from the date of installation against decay and biochemical degradation calling for replacement of defective materials during the guarantee period.

**671.11 Installation.** The Contractor shall strictly follow the detailed manufacturer's installation instructions for the wood fiber, geotextile fabric, and the resilient wear mat.

Inspect timber enclosure curbs at play surface perimeter. Clean existing drainage holes in existing wood timbers of all obstacles and debris for free passage of water. Verify that proper drainage will be maintained through drainage holes of timber curbs.

Subsurface to receive resilient playground surface shall be clean, dry, free of accumulated dirt, rubbish and other construction debris and free of any oils, gasoline, or other chemical deposits.

**671.12 Method of Measurement.** Quantities to be paid for under these items shall be the number of cubic yards of wood fiber installed, the number of square feet of geotextile fabric, the number of cubic yards of pea gravel, the number of each resilient wear mats, and the number of Age Use Signs complete, measured in place, and accepted. For play structures, the quantity to be paid shall be for each completed, certified, and accepted play structure inclusive of all individual component parts and maintenance kits.

**671.13 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
671	Cubic Yard	Resilient Surface
671	Square Feet	Geotextile Fabric
671	Each	Resilient Wear Mat
671	Cubic Yard	Pea Gravel
671	Each	Age Use Sign, Intermediate
671	Each	Age Use Sign, Tot
671	Each	Play Structure, Intermediate
671	Each	Play Structure, Tot

The above price shall constitute full compensation for furnishing all labor, material, tools, equipment and incidentals necessary to complete the work as specified herein.

The price bid for the play structure item of work shall constitute full compensation for furnishing all labor, materials, tools, extra hardware, maintenance kits, and maintenance manuals required to assemble and construct the associated play structure including any item not expressly shown on the plan or listed herein, but necessary to provide a complete play structure.

## **ITEM 672 PARK EQUIPMENT AND MATERIALS**

- 672.01 Description**
- 672.02 Park Bench**
- 672.03 Picnic Table**
- 672.04 Trash Receptacle**
- 672.05 Wood Bollards**
- 672.06 Verification of Dimensions**
- 672.07 Shop Drawings**
- 672.08 Guarantee**
- 672.09 Method of Measurement**
- 672.10 Basis of Payment**

**672.01 Description.** This work shall consist of the furnishing and installing new park equipment and materials as indicated on the plans, Standard Construction

## 672.02

Drawings, and in accordance with the specifications for the various items which constitute the completed structure, and in reasonably close conformity with the lines, grades, and dimensions shown on the plans or established by the Engineer.

**672.02 Park Bench.** Park benches shall be “Survivor” Series, Model FP2055, as manufactured by The Plastic Lumber Company, Inc., 540 South Main Street, Building #7, Akron, Ohio 44311-1010 (telephone: 330-762-8989).

All park benches shall be installed in accordance with the manufacturer’s recommendations, and as designated on the plans and approved shop drawings unless otherwise directed by the Engineer. New park benches shall be anchored by setting in Class ‘C’ Concrete. Furnishing and placing concrete shall be in accordance with 511 - Concrete for Structures. The cost of the concrete shall be included in the price bid for park benches. New park benches shall be installed in the locations shown on the plans and verified in the field by the Engineer prior to pouring concrete for bench footers.

Support posts for benches shall be of sufficient length to provide depth of footer as shown on the drawings, shop drawings and height of equipment as recommended by the manufacturer.

**672.03 Picnic Table.** Picnic tables shall be Model FP1030, as manufactured by The Plastic Lumber Company, Inc., 540 South Main Street, Building #7, Akron, Ohio 44311-1010 (telephone: 330-762-8989).

All picnic tables shall be installed in accordance with the manufacturer’s recommendations, and as designated on the plans and approved shop drawings unless otherwise directed by the Engineer. New picnic tables shall be anchored by setting in Class ‘C’ Concrete. Furnishing and placing concrete shall be in accordance with 511 - Concrete for Structures. The cost of the concrete shall be included in the price bid for picnic tables. New park equipment shall be installed in the locations shown on the plans and verified in the field by the Engineer prior to pouring concrete for bench footers and table anchors.

Table anchors shall be of sufficient length to provide depth of anchor as shown on the drawings, shop drawings and height of equipment as recommended by the manufacturer.

**672.03 Trash Receptacle.** Trash receptacles shall be precast concrete, as manufactured by Lindsay Concrete Products (telephone 1-800-837-7788). Trash receptacle shall have a sandblast finish, plastic lid, and be capable of holding a 30 gallon galvanized trash container. A heavy duty 30 gallon galvanized steel trash container shall be supplied with each unit.

A 3’x3’x4” thick concrete pad shall be provided for each unit if it is to be located in a lawn area. Concrete for the pad shall be Class ‘C’ Concrete, finished per 456.

**672.04 Park Sign.** Signs identified on the plan or in the proposal as Type A indicates that the lettering shall be on one side only of the panel boards. Signs identified as Type B indicates that the lettering shall be on both sides of the panel boards. Wood shall be pressure treated timbers, rails and panels of the sizes and type indicated on the standard drawing or as shown on the plan.

Concrete used for the foundation shall be Class "C". Reinforcing steel shall be according to 509. The wooden park signage shall be assembled, lettered, stained, painted and installed as indicated on the standard drawing or as shown on the plan.

Signs furnished must be of quality workmanship. The Engineer reserves the right to reject any sign, or part thereof, that is poor in appearance or otherwise defective.

A list of qualified sign makers is included in the proposal.

Posts shall be set plumb in holes and encased in concrete as indicated on the standard drawing.

Grass areas disturbed by this work shall be seeded and mulched in accordance with 659.13, unless the plan calls for a mulched planting area near the base of the sign.

**672.05 Wood Bollards.** Timbers for wood bollards shall be as specified in ODOT Section 711.26. Dimensional lumber and timbers shall be treated #1 Southern Pine, dressed S4S according to SFPA or WWPA standards.

Timbers shall be pressure preservative treated with ACQ or approved equal in accordance with AWP A C2 and AWP LP-22, rev. 1980 and AASHTO M133. Minimum retention shall be 0.037 pounds/cubic foot.

Kiln dry all material after treatment to less than 19% moisture content. All fabrication including beveling, notching, easing, hole boring and cutting shall be accomplished prior to treatment. This does not refer to field cutting and boring. Field fabrication shall be treated according to AWP Standard M4. Bollards shall be stained with two coats of solid color stain of the color indicated on the plans.

Hardware required for the collapsible bollard shall be manufactured from medium carbon steel meeting the appropriate ASTM standard for its type and be sized to suit the application. Spikes and nails shall be galvanized common wire type and shall meet AISI specification 1010 or 1020 for steel. All hardware shall be hot-dip galvanized in accordance with ASTM A153 and ODOT Section 711.02. The zinc coating shall be Class A in accordance with ASTM B695 Class 55.

The Contractor shall supply eight (8) sets of keys for collapsible bollards to the City of Akron. All locks to be keyed the same.

**672.06**

**672.06 Verification of Dimensions.** The Contractor shall verify all dimensions and satisfy himself as to the correctness thereof and the mutual agreement of the parts.

**672.07 Shop Drawings.** The Contractor shall submit to the Engineer for review and approval, six (6) copies of shop drawings and installation manuals for each piece of park equipment, unless additional copies are requested. Fabrication and/or assembly shall not begin until the submitted drawings have been approved by the Engineer.

**672.08 Guarantee.** All park benches, picnic tables and trash receptacles furnished and installed must be warranted by the Contractor for a period of at least one (1) year. The Contractor is responsible for the maintenance, repairs, and any adjustments necessary during the guarantee period.

**672.09 Method of Measurement.** The quantity to be paid shall be for each completed and accepted park bench, picnic table, trash receptacle, or park sign inclusive of all individual component parts, including excavation and concrete.

**672.10 Basis of Payment.** Park equipment will be paid for at the contract unit price bid for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
672	Each	Park Bench, "Survivor"
672	Each	Picnic Table
672	Each	Trash Receptacle
672	Each	Trash Receptacle w/Pad
672	Each	Park Sign, Type ____ (Name: " ____")
672	Each	Park Sign, Directional, Type ____ (____)
672	Each	Wood Bollard
672	Each	Wood Bollard, Collapsible

The price bid for these items shall constitute full compensation for furnishing all labor, materials, tools, and hardware required to assemble and construct each piece of park equipment, including any item not expressly shown on the plans or listed in the specifications but necessary to provide a complete installation.

**ITEM 673 SPORTS EQUIPMENT AND MATERIALS**

- 673.01 Description**
- 673.02 Basketball Goal Assembly**
- 673.03 Tennis Court Items**
- 673.04 Baseball Field Items**
- 673.05 Verification of Dimensions**
- 673.06 Permits**

**673.07 Shop Drawings****673.08 Guarantee****673.09 Method of Measurement****673.10 Basis of Payment**

**673.01 Description.** The Contractor shall provide all labor, equipment, tools and materials required to furnish and install new sports equipment as indicated on the plans, and in accordance with the specifications for the various items which constitute the completed installation, and in reasonably close conformity with the lines, grades, and dimensions shown on the plans or established by the Engineer.

**673.02 Basketball Goal Assembly.** Equipment and installation for each Basketball Goal Assembly, including but not limited to one basketball goal post, one basketball backboard, and one basketball rim and net shall be per Standard Construction Drawing No. LA-9.

**673.03 Tennis Court Items.** Equipment and installation for each Tennis Net Post and Cap shall be per Standard Construction Drawing No. LA-7.

**673.04 Baseball Field Items.** The Contractor shall furnish and install the following items:

Home Plate: Home Plate shall be item HPS #12908160, as manufactured by Hollywood Bases, Inc., or approved equal. Installation shall be per manufacturer's recommendations, and as designated on the plans. Concrete used for installation of the home plate shall be Class "C" Concrete.

Pitching Rubber: Pitching rubber shall be 6" x 24" four-way with polyvinyl surface and aluminum inner support tube, as manufactured by Hollywood Bases, Inc., catalog number BBPB #12909180, or approved equal. Installation shall be per manufacturer's recommendations, and as designated on the plans.

Bases: Bases shall be strapless 15" x 15" x 3" high vinyl covered, as manufactured by McGregor "Collegiate Series Strapless Bases" catalog number #BBBASEBO or approved equal. Installation shall be per manufacturer's recommendations, and as designated on the plans. Bases shall be installed complete with anchors.

Bleachers: Each Bleacher shall be Model #NB-0530A/GDLX, as manufactured by National Research Systems, Inc., 5120 Investment Drive, Fort Wayne, Indiana, 46808 (Phone (219)482-6023, Web address: www.bleachers.com), or approved equal. Each Bleacher shall be heavy duty aluminum, 5 row, 30 feet long, with semi-closed deck, fully enclosed deck aisle rails, meeting or exceeding current Ohio Building Code OBBC 1013 and NFA 102-4. Installation shall be per manufacturer's recommendations, and as designated on the plans.

**673.05**

Foul Poles: Equipment and installation for each Foul Pole shall be per Standard Construction Drawing No. LA-10.3. Concrete used for installation of the foul pole shall be Class "C" Concrete.

Dirt Storage Box: Material for each dirt storage box shall be plastic lumber, as detailed on the plans and manufactured by the Plastic Lumber Co., Inc., or approved equal. The plastic lumber color shall be Brown. Foundations for dirt storage boxes shall be Class "C" Concrete per 511. Installation shall be per manufacturer's recommendations, and as designated on the plans.

Fence Protection: Equipment for the fence protection shall be Poly-Cap Protective Fence Guard, Model BSN-BBPC250-F, and Poly-Cap Protective Guard Ties, Model BSN-BBPCTIES, as manufactured by BSN Sports, P.O. Box 7726, Dallas, Texas 75209 (Telephone: 1-800-527-7510, fax: 1-800-899-0149), or approved equal. All fence protection shall be installed per manufacturer's recommendations and as designated on the plans.

Sand/Clay Mix: Furnishing and placing infield mix, 6" thick, shall consist of 60% to 75% clay and 40% to 25% sharp sand screened through a 3/8" mesh. Material shall be free of organic debris and less than 2% organic matter by weight. Provide test results for preliminary approval to the Engineer. After preliminary approval, the delivered infield mix shall be stockpiled prior to placement. The Engineer shall then have a sample of the mix tested by an independent soils testing laboratory for final approval. Mix shall be manufactured by: Kurtz Bros. Inc., 4700 East 49th Street, Cuyahoga Heights, Ohio 44125, phone: (216) 641-7000, FAX (216) 341-9331 or approved equal.

After completion of excavation and embankment as required, the existing subgrade soil shall be compacted with a power tamper to reflect a grade lower than the existing finish grade as shown on the plans. The various materials shall be installed to the appropriate depths as shown on the plans.

Density of compaction for subgrade soil shall not be less than 90 percent of the maximum density at optimum moisture. The moisture content shall be as determined by the Engineer to obtain the desired compaction.

Compact each layer of infield mix to a density of not less than 95 percent of the maximum density, as determined by AASHTO T180-74, Method D. The Engineer will test density in-place, in accordance with AASHTO T 191-61, T205-64, or other recognized method. Random tests for compacted depth will be made during the progress of the work.

**673.05 Verification of Dimensions.** The Contractor shall verify all dimensions and satisfy himself as to the correctness thereof and the mutual agreement of the parts.

**673.06 Permits.** Prior to installation of bleachers, Contractor shall submit to the Plans and Permits Center, for review and approval, all required information under a separate 'Miscellaneous Structures' permit for the bleachers. All costs associated with the permitting process shall be considered incidental to this item.

**673.07 Shop Drawings.** The Contractor shall submit to the Engineer for review and approval, six (6) copies of shop drawings and installation manuals, unless additional copies are requested. Fabrication and/or assembly shall not begin until the submitted drawings have been approved by the Engineer.

**673.08 Guarantee.** All sports equipment furnished and installed must be warranted by the Contractor for a period of at least one (1) year. The Contractor is responsible for the maintenance, repairs, and any adjustments necessary during the guarantee period.

**673.09 Method of Measurement.** The accepted quantities of specific items will be paid for at the contract prices designated for each pay item listed.

**673.10 Basis of Payment.** Sports equipment and materials will be paid for at the contract unit price bid for:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
673	Each	Basketball Goal Assembly
673	Each	Tennis Post and Cap
673	Each	Tennis Strap and Anchor
673	Each	Tennis Net
673	Each	Tennis Practice Boards
673	Each	Home Plate
673	Each	Pitching Rubber
673	Each	Bases
673	Each	Foul Pole
673	Each	Bleachers
673	Each	Dirt Storage Box
673	Linear Feet	Fence Protection
673	Square Yard	Infield Baseball Diamond Sand / Clay Mix, 6" Thick

The price bid for this item shall constitute full compensation for furnishing all labor, materials, tools, and hardware required to assemble and install sports equipment or install sports materials including any item not expressly shown on the print or listed in the specifications but necessary to provide a complete installation.