

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 00 00 EXTERIOR IMPROVEMENTS

32 12 00 – ASPHALT

ASPHALTIC CONCRETE PAVING

- A. Follow Iowa DOT standards and specifications.
 - 1. Type of mixture: Binder and surface courses shall be Type B. Mixture shall be ½ “.
 - 2. Require Constructor to submit mix design for approval.
 - 3. Require delivery tickets for each placement, with mix design noted, be given to UNI representative.

32 13 00 – CONCRETE

PORTLAND CEMENT CONCRETE PAVING

- A. Roadways - Follow Iowa DOT standards and specifications.
 - 1. Mix design: IDOT No. C-4
Coarse Aggregate: Class 3 Durability
 - 2. Require Constructor to submit mix design for approval.
 - 3. Require delivery tickets for each placement, with mix design noted, be given to UNI representative.
 - 4. Exterior Walks and Drives.
 - a) Design walks to be 5” minimum thickness and drives to be 6” minimum thickness.
 - b) Intersecting sidewalks shall have a 5’ radius connection with 2’ minimum abutment.
 - c) Medium broom finish perpendicular to the direction of the traffic.
 - d) Provide ADA embedded plates where necessary. Use Neenah Foundry quick connect plates, **epoxy coated red**.
 - 5. See end of section for details.
- B. Sidewalks
 - 1. Exterior Walks and Plazas
 - a) Avoid reinforcement of any kind, unless special circumstances are noted by UNI.

- b) 5" minimum thickness by 8' wide unless approved otherwise.
 - c) Broom finish.
 - d) Provide ADA embedded plates where necessary.
 - e) Provide green epoxy #4 rebar at 18" on center at all cold joints. This is to be done at new or replaced concrete where it is butting other sidewalks.
2. Concrete Stairs – Provide non-slip finish on treads.

32 14 00 – UNIT PAVING

A. General

1. Match existing unit pavements, as per direction of the owner's Representative.
2. References:
 - a) ASTM C 902-11 Standard Specification for Pedestrian and Light Traffic Paving Brick.
3. Submittals:
 - a) Materials Certificates: For unit pavers. Include statements of material properties indicating compliance with requirements, including compliance with standards. Provide for each type and size of unit.
 - b) Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for unit pavers, indicating compliance with requirements: to include durability testing (3 year) with exposure to same general type of environment, temperature, traffic volume as expected for project, and including freeze-thaw testing data.
4. Quality Assurance:
 - a) Provide geotechnical investigation with recommendations for depth and composition of supplemental base course (in addition to manufacturer recommended typical section) and any necessary piping.
 - b) Provide manufacturer's recommended maintenance routines for yearly post-construction maintenance.

B. Products

1. Area: Central Campus
 - a) Paver Type 1: City Line by The Belden Brick Company, Color: **Regimental Full Range Red**, Size: 2 1/4" x 4" x 8"

C. Execution

1. Refer to manufacturer's recommended installation standards.

32 14 20 - CONCRETE UNIT PAVERS

A. General

1. Match existing unit pavements, as per direction of the owner's Representative.
2. References:
 - a) ASTM C936 / C936M - 13 Standard Specification for Solid Concrete Interlocking Paving Units.
 - b) ASTM C1319 Standard Specification for Grid Paving Units.
3. Submittals:
 - a) Materials Certificates: For unit pavers. Include statements of material properties indicating compliance with requirements, including compliance with standards. Provide for each type and size of unit.
 - b) Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for unit pavers, indicating compliance with requirements: to include durability testing (3 year) with exposure to same general type of environment, temperature, traffic volume as expected for project, and including freeze-thaw testing data.
4. Quality Assurance:
 - a) Provide geotechnical investigation with recommendations for depth and composition of supplemental base course (in addition to manufacturer recommended typical section) and any necessary piping.
 - b) Provide manufacturer's recommended maintenance routines for yearly post-construction maintenance.
5. Confirm with owner prior to specifying concrete unit pavers. Brick unit pavers are preferred over concrete unit pavers.

B. Products

1. Area: Sports Facilities
 - a) Paver Type 3 (Permeable): Aqua-Roc II, by Belgard, Color: Dark Charcoal

(solid field) and Burnt Ash (blended field). Use only when matching existing. New areas of unit pavers to be brick unit pavers.

C. Execution

1. Refer to manufacturer's recommended installation standards.

32 92 00 – TURF GRASSES

A. General

1. Sod, installed with minimum 8" topsoil, is required in all areas disturbed by construction activities, unless otherwise specified by Owner.
2. Seed, installed with minimum 8" topsoil, is required in disturbed areas caused by construction activities in areas of campus generally located west of Hudson Road, unless otherwise specified by Owner.
3. Required topsoil depth may be composed of suitable, salvaged on-site topsoil plus supplemental topsoil to achieve 8" overall topsoil depth.

B. SOD SPECIFICATION

1. General

a) Description of Work

1. This section shall include preparation of the sod bed, furnishing and installing sod, watering, and maintenance for completed sodded areas as specified in contract documents.

b) References

1. Turfgrass producers International, TPI Guideline Specifications to Turfgrass Sodding, 2006.

c) Protection

1. Protect existing conditions at the site against damage including the following:
 - a] Take precautions to insure that equipment, vehicles, and seeding operations do not disturb or damage existing grades, walls, drives, pavement, utilities,

plants, lawns, irrigation systems, and other facilities.

- b] Verify locations and depths of all underground utilities prior to excavation and report conflicts with new sodding operations.
- c] Any damage to existing trees or shrubs, including branches and root systems shall be repaired and/or pruned by an experienced tree surgeon or arborist.
- d] Repair, replace, and/or return to original condition any damaged item, without additional compensation.
- e] Where not in place, provide, install and maintain adequate barricades, guards or protection around excavation, utilities, hazards and other items to remain on the site.

d) Quality Assurance

- 1) All materials described and specified herein shall be subject to inspection and approval by the Owner's Representative.
- 2) Materials may be inspected by the Owner's Representative at source of supply.
- 3) This inspection does not waive the right to reject any material after it has been delivered to the site and/or installed.

e) Submittals

- 1) Sod Growers Certification.
- 2) Certification of turf species comprising sod.
- 3) Bill of Lading and/or certification of formulation for fertilizer.

f) Delivery, Handling and Storage

- 1) Protect sod from dehydration, contamination and heating during transportation, delivery and storage.
- 2) Sod shall be harvested, delivered and transplanted within a period of twenty-four (24) hours unless a suitable preservation method is approved.
- 3) Keep stored sod moist and under shade or covered with moistened burlap.
- 4) Sod showing visible signs of heating will be rejected.
- 5) Do not tear, stretch or drop sod.

- 6) Deliver fertilizer to site in original, unopened containers, each bearing manufacturer's guaranteed analysis.
 - 7) Store packaged materials off ground and protect from moisture.
 - 8) Soil shall be firmed or healed in along the edges of the sodded areas.
- g) Warranty
- 1) Guarantee all sodded areas are a uniformly dense, live, and healthy stand of grass, free from weeds undesirable grasses, eroded areas, bare spots, diseases and insects until one year after final acceptance.
 - 2) Acceptance criteria is as defined later in this Section.
 - 3) Sodded lawn areas which do not meet the requirements of acceptance at time of inspection shall be resodded and maintained as often as required, until accepted, at no additional cost to Owner.

2. Materials

a) Sod:

- 1) Well established, nursery grown sod consisting of three (3) to four (4) improved Kentucky Bluegrass cultivars selected from the following list:
 - a] 'Elite' Bluegrass Mix, KBG, which includes 'Midnight' Kentucky Bluegrass.
- 2) Peat sod will not be accepted.
- 3) Sod shall be free from grassy and broadleaf weeds; allowable tolerance: Less than five (5) weed plants per one hundred (100) square feet of area. Sod shall be free from stones and other foreign materials.
- 4) Mow at a height of two inches (2") prior to cutting.
- 5) Machine cut at a minimum uniform soil thickness of three-quarter (3/4") inch; thickness measurement to exclude top growth and thatch.
- 6) Approved by Owner's Representative prior to placement.

b) Fertilizer

- 1) Commercial Grade

2) Formulation: 20-26-6

c) Water:

- 1) Water is available on the site from Owner. Refer to Div. 1 for metering and RPZ requirements, using Owner supplied equipment.
- 2) Constructor to provide hoses, sprinklers and the application of water from Owner supplied sources. No water trucks will be allowed unless approved by Owner. Constructor will monitor watering system to ensure sprinklers do not spray over pedestrian walkways. Constructor will provide covers over hoses where the hoses cross pedestrian walkways that meet ADA requirements. OSB or plywood covers are not acceptable. Prefer molded rubber systems manufactured for this purpose.
- 3) Constructor shall be responsible to water all newly laid sod for two (2) weeks following its installation and fertilizing.

d) Sodding Seasons:

- 1) Sodding shall be done by August 15 of any year or at other times when weather permits, with consent of the Owner's Representative.
- 2) Sodding is prohibited when the ground is frozen.

e) Water Sprinkler System

- 1) Prior to, or during preparation of sod bed, the Constructor shall set up sprinkler system equipment needed to water the sod.
- 2) The Owner shall designate water connections for the Constructor's use. Constructor shall notify Owner 48 hours in advance to set up hydrant connections.
- 3) No sod may be placed until water system is in place.

3. Execution

a) Preparation of Sod Bed:

- 1) Complete earthwork operations to achieve uniform 8" overall topsoil depth.
- 2) Rototill and scarify topsoil to a minimum depth of 3" to a fine and mellow condition. Lightly rake to provide a smooth, uniform and fine surface texture. Remove ridges and fill depressions as required to drain.

- 3) All areas to be sodded shall be made smooth, to be checked by a four foot long, straight edge, such that the gap under the straight edge is less than one inch (1") when laid in any direction; unless shown otherwise on the plans.
 - 4) Remove gravel or stone left over from other construction operations and sticks, roots and rubbish. Remove any material greater than ¾" in dimension.
 - 5) Top of finish grade shall be below adjacent curbs, walks, and drains approximately 1-½": so that after sod is installed it will be flush or slightly below curbs, walks, drains and seeded areas. Any sod not conforming to this requirement will be removed, the sub-grade adjusted, and the sod re-laid in compliance.
- b) Fertilizing
- 1) Apply a guaranteed analysis of 20-26-6 commercial fertilizer to the soil surface before laying sod.
 - 2) Application rate: Four and one-half (4 ½) pounds of 20-26-6 or equivalent units of Nitrogen (N) Phosphate (P) and Potash (K) per one thousand (1000) square feet, thoroughly mixed into upper one and one-half (1 ½") inches of topsoil.
- c) Sod Installation:
- 1) Dampen dry soil prior to sodding.
 - 2) Lay sod uniformly, evenly and parallel to the finished contour and at right angles to the center line of ditches and swales. Begin sodding at bottom of slopes.
 - 3) Minimize traffic on newly laid sod during installation. Provide plank or wood sheets as may be required to protect sod already laid, without extra compensation during sodding operations.
 - 4) Lay each strip with tightly-fitted joints against each other without voids. Do not overlap edges. Joints at the ends of sod strips shall be staggered with adjacent strips of sod.
 - 5) Finish sod edges at walks, curbs, planting, mulch edges, and other vertical surface by cutting neatly and fitting tightly to edge and line.
 - 6) Sod mat to be approximately one inch below finished height of walks, pavement, curbs, etc. Any sod not conforming to this requirement will be removed, the subgrade adjusted, and the sod re-laid.
 - 7) Where new sod joins existing lawns, cut straight and neatly into existing lawn and level subgrade to allow height to match.

- 8) Soil shall be firmed or heeled in along the edges of the sodded areas.
- d) Sod Patching/Fitting:
 - 1) Trim existing sod at edge to allow neat fit for new sod.
 - 2) Neatly trim new sod to allow tight fit at edges.
 - 3) Remove or add soil to patch areas as necessary to permit patched area to match surrounding grades. Scarify patch area to 3" depth and smooth, ready for sod.
 - e) Staking
 - 1) On grades 3: or greater, stake each roll at a minimum of two foot intervals with flat wood stakes to prevent movement under normal rainfall conditions. Use additional stakes on steeper grades.
 - f) Initial Watering
 - 1) Not more than one (1) hour shall elapse between the laying and the initial watering of the sod.
 - 2) Initial watering shall be such that the underside of all sod and the sod bed shall be thoroughly wet.
 - g) Rolling
 - 1) After all sod is laid and thoroughly watered, roll all sodded areas (except pegged sod), either with a small mechanical or hand roller, sufficiently to set or press sod into soil.
 - h) Maintenance
 - 1) For the first two (2) weeks following the placing of the sod, all sodded areas shall be thoroughly watered daily, through the use on an on-site watering system.
 - 2) Continue maintenance until sodded areas are established with sod knitted in place. Maintenance period shall be minimum of 30 days, or to final acceptance.
 - 3) Maintenance of sodded areas shall include watering, weeding, mowing to a two to three (3") inches height after growth has exceeded four (4") inch growth, and replacement and installation of sod as originally specified for sodded areas failing to survive. Clippings from mowing which mat on the grass are to be removed.
 - 4) Water all sodded areas during maintenance period as necessary to maintain sod

and soil moisture, supplement rainfall, to promote growth, proper rooting to insure sod survival and to prevent dormancy.

i) Final Inspection and Acceptance

- 1) Upon completion of the work and fulfillment of the requirements of the Section, notify the Owner's Representative in writing that the work is ready for final inspection. Request a definite date for final inspection.
- 2) Notify the Owner's Representative five (5) days prior to the requested final inspection date.
- 3) Sod acceptance shall be based upon following criteria:
 - a] Terms of the maintenance period, as defined in this paragraph, have been executed. Sod shall be rooted into topsoil.
 - b] Sod is weed free, healthy and in a flourishing condition.
 - c] Scattered bare spots do not exceed one (1) square foot in area.
 - d] Scattered bare spots do not exceed three percent (3%) of the total lawn area.
 - e] Grass shall not exceed 3" in height at final acceptance.
- 4) Re-sod and maintain all sodded lawn areas which do not meet the requirements of this Section at the time of final inspection.
- 5) Replacement work (resodding, maintenance, etc.) shall be as specified in this Section for original sodding; at no additional cost.
- 6) Replacement work shall be re-inspected before acceptance.

j) Clean-up

- 1) Remove from site all excess materials, debris, and equipment.
- 2) Hose down and/or broom clean all paved surfaces.

C. SEEDING SPECIFICATION

1. General

a) Description of Work

- 1) This section shall include preparation of seed bed, furnishing and placement of

seed, compaction of the seed bed including watering and maintenance of completed seeded areas as specified in contract documents.

b) Protection

1) Protect existing conditions at the site against damage including the following:

- a) Take precautions to insure that equipment, vehicles and seeding operations do not disturb or damage existing grades, walls, drives, sidewalks, pavements, utilities, plants, lawns, irrigation systems and other facilities.
- b) Verify locations and depths of all underground utilities prior to excavation and report conflicts with seeding operations.
- c) Any damage to existing trees or shrubs, including branches and root systems shall be repaired and/or pruned by an experienced tree surgeon or arborist.
- d) Repair, replace and/or return to original condition the damaged item without additional compensation.
- e) Where not in place, provide, install and maintain adequate barricades, guards or protection around excavations, utilities, hazards and other items to remain on the site.

c) Quality Assurance

- 1) All materials described and specified herein shall be subject to inspection and approval by the Owner's Representatives.
- 2) Material may be inspected by the Owner's Representative at the source of supply.
- 3) This inspection does not waive the right to reject any material after it has been delivered to the site and/or installed.

d) Submittals

- 1) Bill of Lading and/or certification of formulation for fertilizer.
- 2) Certification of Seeding mixture.

e) Seeding Season

- 1) Spring: April 30 - June 15 or as directed by the Owner's Representative.
- 2) Fall: Aug. 15 - Sept.8 or as directed by the Owner's Representative.

f) Warranty

- 1) Acceptance criteria is as defined later in this specification.
- 2) Seeded lawn areas which do not meet the requirements of acceptance at the time of inspection shall be re-seeded and maintained as often as required, until accepted, at no additional cost to Owner.

2. Materials

a) Seed

- 1) Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed as specified.

- 2) Seed Mixture, Central Campus:

- a] 'Choice Sun and Shade Mixture' as sold by LaCrosse Forage & Turf Seed, Ankeny, IA

15%	Rockstar Kentucky Bluegrass
15%	Arc Kentucky Bluegrass
10%	Diva Kentucky bluegrass
10%	Foxy Creeping Red Fescue
10%	Culumbera II Chewing Fescue
10%	Quest II Perennial Ryegrass
10%	Double Time Perennial Ryegrass
10%	Panther GLS Perennial Ryegrass

- b] Seeding Rate: 5#/1000 SF

- c] Required Minimum Test Results: 98% purity and 85% germination. Blend of varieties to be approved by Consultant. Crop and weed seed to be .01% or less. All seed to be certified.

- 3) Seed Mixture, Sports Fields

- a] 'Sport Mix 1', by Pace Supply, North Liberty, IA, 1-800-396-7917

20%	Bewitched Kentucky bluegrass
20%	Brooklawn Kentucky bluegrass
20%	Langara Kentucky bluegrass
20%	Boutique Kentucky bluegrass
20%	Midnight Kentucky bluegrass

- b] Seeding Rate: 5#/1000 SF

b) Fertilizer

- 1) Fertilizer shall be used in granular form and shall be delivered to the site in the original bag in good condition for proper distribution, chemical analysis and weight. The fertilizer supplier shall deliver such fertilizer with proper scale weight records and a statement of guaranteed analysis. All fertilizer shall comply with the rules of the Iowa Department of Agriculture.
- 2) Fertilizer shall be a complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, not less than 30% of the nitrogen from a slow release source. Fifty percent of the nitrogen shall be derived from natural organic sources. The percentages by weight shall be determined per recommendations of the soil testing reports for lawns.
 - a] Apply a guaranteed analysis of 1-1-1 ratio of N-P-K with the application rate of 1#N/1000 SF applied prior to seed, and worked into the top 2" of the seedbed.

3) Calcium

- a] Pellet calcium, such as Super Call 98 J (quick release) shall be applied in addition to the fertilizer specified. Application rate shall be 1,300 lbs/acre.

c) Mulches

- 1) Mulch may be specified on newly seeded areas as follows:
 - a] Straw Mulch: Provide air-dry, clean, mildew and seed free hay or threshed straw of wheat, rye, oats or barley.
 - b] Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic, free of plant growth or germination inhibitors, with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

d) Erosion Control Materials

- 1) Erosion control materials may be specified within newly seeded areas if needed as follows, generally when slopes exceed 4H:1V or in swale flow lines when slopes >3%.:
 - a] Erosion Control Blankets: Biodegradable wood excelsior, straw, or coconut fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches (150mm) long.
 - b] Erosion Control Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, a minimum of 0.92 lb/sq. yd. (0.5 kg/sq. m), with 50 to 65 percent open area. Included manufacturer's recommended steel wire staples, 6 inches

(150mm) long.

e) Hydroseeding

1) Hydroseeding may be specified as follows:

- a) Mix specified seed, fertilizer, fiber and mulch in water using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
- b) Mix slurry with nonasphaltic tackifier.
- c) Apply slurry uniformly to all areas to be seeded in a one-step process. Apply mulch at a minimum rate of 1500 – lb/acre dry weight but not less than the rate required to obtain specified seed sowing rate.

3. Execution

a) Surface Preparation

- 1) Complete earthwork operations to achieve uniform 8" overall topsoil depth.
- 2) Limit surface preparation to disturbed areas to be planted.
- 3) The area to be seeded shall be relatively smooth, and all washes and gullies shall be filled to conform to the desired cross section.
- 4) Loosen subgrade to a minimum depth of 4 inches. Areas inaccessible to field machinery shall be prepared by hand to a depth not less than 2 inches. Remove stones larger than 1 inch in any dimension and sticks, vegetation, roots, rubbish and other extraneous matter and dispose legally off campus.
- 5) Finish grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2" of finish elevation. Roll, rake, remove ridges and fill depressions to meet finish grades.
- 6) Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

b) Application of Fertilizer

- 1) Specified fertilizer and calcium shall be applied and incorporated into the surface grade using field machinery and/or hand spread as needed prior to application of seed.

c) Application of Seed

- 1) Sow specified seed with an approved type seeder which is capable of being calibrated to distribute seed into the soil at not less than specified rates of application spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.
 - 2) Rake or drag seed lightly into top 1/8 inch (3 mm) of topsoil and roll lightly to obtain maximum soil-seed contact.
 - 3) Seeding application shall take place between the time period of August 15 and September 15 unless otherwise approved by the Architect/Engineer or Owner's Representative.
- d) Maintenance
- 1) Begin maintenance immediately after each area is planted and continue until acceptable lawn is established. Maintenance period shall be a minimum of 90 days or to final acceptance.
 - 2) When full maintenance period has not elapsed before the end of the planting season, or if lawn is not fully established, continue maintenance during next planting season.
 - 3) Maintain and establish lawns by watering, fertilizing, weeding, mowing to height of 3 " when lawns have reached 4" height, trimming, replanting and other operations. Roll, regrade and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.
 - 4) In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.
 - 5) Provide and maintain temporary piping, hoses and lawn watering equipment to convey water from sources. Keep lawn uniformly moist to a depth of 4 inches.
 - 6) Schedule watering to prevent wilting, puddling, erosion and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas. Water lawn daily for the first two weeks.
- e) Final Inspection And Acceptance
- 1) Upon completion of the work and fulfillment of the requirements of the Section, notify the Owner's Representative in writing that the work is ready for final inspection. Request a definite date for final inspection.
 - 2) Notify the Owner's Representative five (5) days prior to the requested final inspection date.

- 3) Acceptance of seed lawn areas shall be based upon the following criteria:
 - a) Terms of the maintenance period, as defined in this paragraph have been executed. Seeded lawn areas shall be healthy, uniform and a close stand of grass shall be established.
 - b) The seeded lawn areas shall be free of weeds and surface irregularities.
 - c) In any 10 square foot area within the seeded lawn, coverage shall exceed 95%.
 - d) Scattered bare spots shall not exceed an area 4 inches by 4 inches.
 - e) Grass shall not exceed 3" in height at time of acceptance.
- f) Clean Up
 - 1) Remove from site all excess materials, debris and equipment.
 - 2) Hose down and/or broom clean all paved surfaces.
 - 3) Remove erosion control measures after seed lawn has been established.

32 93 00 – PLANTING

A. General

1. References

- a) American Association of nurserymen, Inc. (AAN) Standard: American Standard for Nursery Stock (ANSI Z60.1 - current edition).
- b) Hortus Third, current edition.

2. Source Quality Control

- a) Well matched and of consistent form throughout species.
- b) Exhibiting no root sprouts at grafts.
- c) Certification: All landscape materials shall be from stock inspected and certified by authorized governmental agencies. Certificates of inspection shall accompany invoices for each shipment.

3. Samples

a) Plant Material: Samples or photos may be requested in lieu of inspection.

b) Mulch: 1 pound sample

4. Substitutions

a) Not allowed without formal substitution request and review by the Owner's Representative. Constructor shall supply list of suppliers contacted as validation that material is not available prior to initiating a substitution request.

5. Planting Season

a) Restrictions:

Spring Dig Only:

Beech (Fagus)

Coffeetree (Gymnocladus)

Pear (Pyrus)

Oak (Quercus), except Swamp White Oak (Quercus bicolor)

Musclewood (Carpinus)

Redbud (Cercis)

Magnolia sp. (Magnolia)

Broadleaf Evergreens (Buxus, Rhododendron)

Plant Before Aug 15:

Evergreen, any, including tree and shrub forms

Broadleaf Evergreen (Buxus, Rhododendron)

Grasses (any including native and ornamental)

Plant Between May 1 and Sept. 1:

All Perennials, excluding grasses

6. Schedule

a) Upon authorization to proceed with the work, submit schedule including dates of each:

Tagging of plants at nurseries

Staking plants on site

Digging and preparation of planting pits and beds

Delivery of material to the site

Planting

Substantial completion

B. Materials

1. Canopy Trees

a) Minimum Size: 3" caliper.

- b) Quality: Straight leader, symmetrical crown, limbed up minimum 6', well-matched form within species, no graft suckers, grown in clay-based soils, dug and burlapped maintaining production top of ball, wrapped with biodegradable twine and burlap and low profile basket, and with firm rootball.

2. Ornamental Trees

- a) Minimum Size: 7' height clump or 2.5" caliper

3. Evergreen Trees

- a) Minimum Size: 7' height clump or 2.5" caliper

4. Mulch

- a) Shredded Hardwood Bark mulch- Double milled shredded hardwood bark, chemically inert, non-toxic, free of weeds or any other substance injurious to plant growth. Shredded bark shall have a uniform fibrous texture, free from cakes and lumps. It shall be free of foreign material and be of a uniform color. No individual piece shall be larger than 2 square inches.
- b) Colored mulch is not permitted.

5. Staking Materials

- a) Generally not permitted unless directed by the Owner's Representative.

6. Tree Wrap

- a) Waterproofed crepe paper 2-1/2" wide, made up of two layers of crepe kraft paper cemented together with asphalt.
- b) Twine used to secure tree shall be composed of a minimum of two-ply jute material.