



**Office of Capital Planning
and Project Management**

DIVISION 32

**EXTERIOR
IMPROVEMENTS**

This Article on Codes, Regulation and Standards shall apply
to all Divisions of the Building Standards

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32 01 11 PAVING GENERAL

- All paving and hardscape materials used must have a minimum solar reflective index (SRI) of at least 29.

32 12 16 ASPHALT PAVING

- Do not locate dumpsters on asphalt.
- Asphalt will not be allowed at truck docks

32 13 13 CONCRETE PAVEMENT

- Maintain access for vehicular and pedestrian traffic as required by the University.
- Provide concrete pavement under all dumpsters.
- Concrete pavement at loading docks to extend to the drive wheels of truck.
- Sidewalks shall be minimum 5" thick with broom finish
- Provide ADA compliant 'raised cast cone pattern' at ramps per City of Chicago.
- Provide control joints at in all sidewalks at 6' on center.

32 14 00 UNIT PAVING

- Use only manufactured precast stock paver units and accessories.
- Paver Type 1 for installation as field application to be 4" x 8" x 2-3/8".
- Paver Type 2 for installation as border to the field application to be two rows of 4" x 8" x 2-3/8" with a false joint detail with the 4" x 4" look.
- The West Campus paver blend shall be a red/brown/charcoal range, also known as range 1.
- East Campus paver blend shall be a charcoal brown/buff range, also known as sierra.

32 31 19 DECORATIVE METAL FENCES AND GATES

- The University Standard fence is ornamental iron. See UIC Project Manager for details.
- The University Standard pedestrian control device is the post and chain. See UIC Project Manager for details.
- See UIC Project Manager for CAD drawings containing fence and gate detailed specifications.

32 80 00 IRRIGATION

- Actual installed conditions are to be recorded by the Irrigation Contractor in the form of an "As-Built Drawing". As-Built Drawing shall be clearly and neatly drawn on a base of the original landscape design provided by the Landscape Architect. Provide the University and Landscape Architect with a copy of the As-Built Drawing. Provide the University and the Landscape Architect with a copy of the As-Built Drawing before Work under Contract will be considered for Acceptance. All automatic and manual valves, hose bibbs or quick couplers, and wire splice locations shall be shown with actual dimensions to reference points so they may be located easily in the field. Submittals of the approved As-Built Drawing will precede any Application for Final Payment by the Contractor.
- Warranty all Work for a period of one (1) year, starting on Project Acceptance, against defects in materials, equipment, workmanship, and any repairs required resulting from leaks or other defects of workmanship, material, or equipment.

Emergency repairs may be made by the University, General Contractor, or Landscape Contractor, as appropriate, without relieving the Irrigation Contractor of any warranty obligations.

- Main line pipe to zone valves to be PVC CL-200, 200 PSI rated. Lateral pipe to sprinkler heads to be PVC CL-160, 160 PSI rated. Shall be supplied in standard twenty (20) foot lengths and shall be from one of the following preferred manufacturers:
 1. Certainteed Corporation.
 2. Crestline.
 3. Dura.

All pipe that is exposed or not below grade shall be Schedule 80 PVC. Provide sleeves below all sidewalks and embedded brass survey tack. Sleeves to extend 12" beyond walks.

- Electric Wiring:
 1. 120 volt service to controller shall consist of three wires: one black, one white, and one ground. Electrical service is to be provided by the General Contractor unless otherwise directed by the University.
 2. Splices in controller wiring shall be waterproof using 3M-DBY wire connectors.
 3. Control Wiring shall be 24 volt solid wire Underwriter's Laboratory (UL) approved for direct burial in ground. Minimum wire size shall be fourteen (14) gauge. All control wiring and wiring connections from the controller to the valves is included in this Contract.
- Sprinkler Heads:
 1. Fixed Spray Sprinkler Head: Sprinkler shall be of the fixed spray type designed for in - ground installation. Sprinkler shall be capable of covering a maximum of fifteen (15) foot radius at thirty (30) psi and maximum delivery of four (4.0) gpm.
 - a. Nozzle shall be comprised of one (1) or more orifices at two (2) radius ranges and shall be adjustable from fully on to fully off. Retraction shall be achieved by a heavy duty stainless steel spring. Nozzle piston shall have a smooth external surface operation in a resilient guide. Riser wiper shall be included in the sprinkler for continuous operation in the presence of sand and other foreign material.
 - b. Coverage shall be full or part circle. Part circle coverage shall be available in arcs of 90, 120, 180, 240, and 270 degrees or adjustable part circle. A centerstrip head shall also be included for coverage. Nozzle delivery shall allow circle patterns to match full circle patterns in precipitation rates.
 - c. The body of the sprinkler shall be constructed of non-corrosive heavy duty Cycloc. A filter screen shall be in the nozzle piston. All sprinkler parts shall be removable through the top of the unit by removal of a threaded cap.
 2. Preferred manufacturer:
 - a. Nelson Co.
 - b. Rainbird Sprinkler Mfg. Co.
 - c. Toro Co.
- Automatic Controller:
 1. Controller location must be easily accessible for maintenance. Provide for the possibility of making minor timing adjustments to the controller in the field.
 2. Provide electromechanical controllers capable of fully automatic as well as manual operation of the system. Controller housing is to be a wall mounted, weatherproof, lockable cabinet.
 3. Provide controller which operates on a minimum of 110 volts AC power input and is capable of operating 24 volt AC electric remote control valves, with a reset circuit breaker to protect from overload. Irrigation Contractor is responsible for connection of 120 VAC power to controller.
 4. Each station shall have a time setting knob which can be set for variable timing in increments from six (6) to sixty (60) minutes, or set to omit the station from the irrigation cycle.

5. Controller shall have a fourteen (14) day calendar dial with captive three position pins for setting the programmed start days, and a twenty - four (24) hour clock dial with twenty-three (23) captive hour pins for programming the irrigation cycle start time. A master "on - off" switch shall allow the valve power output to be interrupted without affecting the controller.
 6. Controller must be constructed so that all internal parts are accessible through the controller door without disturbing the cabinet installation.
 7. Preferred manufacturer:
 - a. Rainbird Sprinkler Mfg. Co.
 - b. Superior
 - c. Toro Co.
- Backflow Preventer
 1. To be supplied and installed by the Irrigation Contractor. Backflow preventer shall be a RPZ reduced pressure backflow assembly type, capable of having an adequate flow rate in gallons per minute (gpm) without excessive pressure loss, and shall be suitable for supply pressure up to 150 psi. Backflow preventer body shall be bronze, internal parts shall be stainless steel, and the check valve assemblies shall be tight seating rubber. Backflow preventer assembly must include two (2) gate valves for isolating unit, and two (2) ball valve test cocks for testing unit to ensure proper operation. Backflow preventer(s) shall comply with requirements of local codes, ordinances, and regulations.
 2. Preferred manufacturer:
 - a. Cla-Val Co.
 - b. Febco.
 - c. Hersey Products Inc.
 - d. Watts Regulator Co.
 - e. Wilkins Regulator.
 - Quick Coupling Valves:
 1. Quick Coupling Valves (QCVs) will be used for manual access to the pressurized main line so that a hose can be attached and used for hand watering. QCVs shall be constructed of brass with a spring loaded seal that will keep the valve in a closed position until the key is inserted into the valve. Valve shall also have a hinged aluminum cap to prevent any debris getting into the internal mechanism of the valve. QCVs shall be installed on a triple elbow swing joint.
 2. QCV keys shall be of the single lug variety. Attached to the key will be a hose swivel adapter sized to the hose commonly used on the project. Irrigation Contractor to contact the University's maintenance personnel to determine hose type. Key and swivel shall both be constructed of brass.
 3. Preferred manufacturer:
 - a. Rainbird Sprinkler Mfg. Co.
 - b. Weather-matic Sprinkler Div., Telsco Industries.
 - c. Toro Co.
 - Control Valves:
 1. Provide Electric Remote Control Valve that conform to Manufacturer's specifications concerning performance at given pressures.
 2. Preferred manufacturer:
 - a. Rainbird Sprinkler Mfg. Co.
 - b. Superior
 - c. Toro Co.
 - Flag all existing underground utilities prior to trenching and/or boring operations. Obtain locations of any new utilities from the University and/or the General Contractor. Irrigation Contractor is solely responsible for contacting the utility locating service(s) and locating on - site utilities in advance of installation.

- Prior to trenching and excavation remove sod, preserve, and replace after backfilling is completed. Trenching and excavation in established grass or newly seeded areas: Re-grade trenched area consistent with surrounding area and reseed with grass seed matching existing grass or seed. Mulch seed after broadcasting. Cutting, removal, and replacement of asphalt is the responsibility of the Irrigation Contractor.
- Irrigation Contractor shall spray paint on the ground all proposed trenching or excavation which occurs within the drip line or within fifty (50) feet of the trunks of existing trees, whichever is greater. Irrigation Contractor must contact the Landscape Architect for review of the proposed trenching and excavation lines prior to proceeding with the work. Landscape Architect may adjust proposed trenching and excavation lines in order to avoid damage to tree root systems and other plants. Such adjustments shall be made by the Irrigation Contractor at no additional cost to the University.
- Upon completion of the Work and final acceptance by the University and the Landscape Architect, the Irrigation Contractor shall be responsible for the orientation of maintenance personnel in the operation, maintenance, and repair of the system. Furnish copies of all available parts lists, trouble shooting lists, and specification sheets to the University prior to final payment.
- In the fall of the year of Final Acceptance, the Contractor shall be responsible for winterizing the system. Irrigation piping must be winterized by blowing the system clear of water using compressed air (eighty (80) psi maximum) admitted into the piping at a quick coupling valve or hose bib located at a higher elevation on the system piping. Activate individual zones, higher zones first, then proceed successively through the system towards lower elevations. Proceed through all zones twice. The air compressor used to winterize the system must have an engine separate from the compressor tanks to prevent high temperature air from being injected directly into the PVC piping. The University staff must be present at the time of the winterizing.
- In the spring following Final Acceptance, the Contractor shall be responsible for starting up the system. The University staff must be present at the time of the start up.

32 90 00 PLANTING

- Provide open green areas beside each building equal in area to the building footprint itself. Restore at least 50% of the undeveloped site area or 20% of the total site area (whichever is greater).

32 92 00 TURF AND GRASSES

- Contractor shall furnish all hoses, meters, backflow preventers, and any other connections necessary to carry out watering needs. Provide six (6) month maintenance agreement during growing season/cycle.
- Maintain a minimum of one foot of topsoil. Topsoil shall not be used while in a frozen or muddy condition. Surplus materials shall be disposed of by the contractor.
- Scarify compacted areas to an 18 inch depth. Scarify compacted subsoil before topsoil is added. Work the soil down to pea sized particles and form an appropriate grade that will allow the sod to be just below flush with paved areas or as required for seeded areas.
- Roll the area with an appropriate sized roller used in landscaping to firm the sod bed, then re-level to the appropriate grade.
- Sod Installation:
 1. Sod shall be properly moist at the time of cutting and shall be laid within 24 hours of cutting to prevent excessive heat buildup.
 - a. Roll sod for good soil contact making only one pass.
 - b. Water thoroughly until subsoil is wet and whenever sod shows signs of drying or wilting. Sprinklers or nozzled hoses are acceptable. Continue watering until the project is accepted.

- c. Fertilize immediately prior to sodding or immediately after the sodding operation at a rate of .5 pounds of nitrogen per 1000 square feet.
 - d. Work is to be done at typically accepted sodding times in spring or fall when temperatures are mild and establishment can be completed.
 - e. Maintain lawn until project is accepted or a minimum of thirty (30) days after installation, including watering, weeding, re-seeding or re-sodding, mowing, trimming, and edging. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.
 - f. Sodding operations shall be repeated until a satisfactory uniform stand of grass is obtained as determined by the A/E. Damage resulting from erosion, washouts, drought, diseases, or other causes shall be repaired by filling with topsoil, tamping, fertilizing, and sodding by the contractor at no additional compensation.
- Seeding Operation:
 1. Rake seed for good soil contact.
 2. Water with sprinklers whenever soil surface is dry and until small puddles just begin to form. Open-ended or nozzled hoses will not be accepted. Continue proper watering schedule until the project is accepted.
 3. Fertilize immediately prior to seeding or immediately after seeding at a rate of .5 pounds of nitrogen per 1000 square feet.
 4. Work is to be done between April 15 and May 31 or August 15 and October 15 when temperatures are mild and establishment can be completed.
 5. Maintain lawn for a minimum of ninety (90) days or until project is accepted after installation, including watering, weeding, re-seeding or re-sodding, mowing, trimming, and edging. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.
 6. Seeding operations shall be repeated until a satisfactory uniform stand of grass is obtained as determined by the A/E. Damage resulting from erosion, washouts, or other causes shall be repaired by filling with topsoil, tamping, fertilizing, and seeding by the contractor at no additional compensation.

32 93 00 EXTERIOR PLANTS

- Plant selection and tagging:
 1. Plants shall be subject to inspection and approval at their place of growth and upon delivery for conformity to specifications. Such approval shall not impair the right of inspection and rejection during progress of the work. A contractor's representative shall be present at all inspections.
 2. Written requests for inspection of plant material at their place of growth shall be submitted to the University's Representative at least 10 calendar days prior to digging. Written requests shall state the place of growth and quantity of plants to be inspected. The University's Representative may refuse inspection at this time if, in his judgment, a sufficient quantity of plants are not available for inspection.
 3. Plants identified as "selected specimen" shall be approved and tagged at their place of growth. For distant material, submit photographs for pre-inspection review.
 4. Trees are to be a minimum three-inch (3") caliper.
 5. Plant native species, with an emphasis on plants that require less irrigation water.
 6. Plant native trees to increase shade and decrease heat island effect.
- Digging and handling of plant material:

1. Ball and burlap (B&B) plants shall have natural balls of earth, of size not less than that recommended in the "American Standard for Nursery Stock". Plants moved with a ball will not be accepted if the ball is dry, cracked, or broken before or during planting operations.
 2. All plants shall be freshly dug. Heeled-in plants or plants from cold storage will not be accepted. All nursery grown plants shall have been transplanted or root pruned at least once in the last three years.
 3. All plants shall be handled so that the roots, trunk, and branches are adequately protected at all times. During shipment all plants shall be properly protected by a shade tarpaulin of approximately 90% shade material. No plant shall be so bound with rope or wire at any time as to damage the bark, break branches, or destroy its natural shape.
- Plants:
 1. Plants shall be true to species and variety specified and nursery grown in accordance with good horticultural practice under climatic conditions similar to those in the locality of the project for at least two years. Plants shall be freshly dug, unless specified as container stock, and shall not be in leaf at time of digging.
 2. Unless specifically noted otherwise, all plants shall be of specimen quality, exceptionally heavy, symmetrical, so trained or favored in development and appearance as to be unquestionably and outstandingly superior in form, compactness, and symmetry. They shall be sound, healthy, vigorous, well branched and densely foliated when in leaf, free of disease, insects, eggs, or larvae and shall have healthy, well developed root systems.
 3. Plants shall not be pruned before delivery. Trees with multiple leaders, unless specified, will be rejected. Trees with a damaged or crooked leader, abrasion of bark, sun scald, disfiguring knots, insect damage, or cuts of limbs over 3/4 inch in diameter rot completely callused will be rejected.
 4. All plants shall conform to the measurements specified in the plant list and shall conform to the "American Standards for Nursery Stock". Plants larger than specified may be used if approved by the University's Representative. Use of such plants shall not increase the contract price. If larger plants are approved, the root ball shall be increased in proportion to the size of the plant.
 5. All plants and all tree trunks shall be measured when the branches are in their normal position. Dimensions for height and spread refer to the main body of the plant and not from branch tip to branch tip. Measurements specified are minimum size acceptable after pruning where pruning is required. Plants that meet requirements but do not possess a normal balance between height and spread shall be rejected.
 6. All plants shall be labeled with correct plant name and size. Labels shall be securely attached to all plants, bundles, and containers of plant materials delivered.
 7. Substitutions of plant materials will not be permitted unless authorized in writing. If proof is submitted, substantiated in writing, that any plant specified is not obtainable, a proposal will be considered for the use of the nearest available size or similar variety with a corresponding adjustment of the contract price.
 8. When the plant list is completed, it will include what was removed and/or damaged beyond reasonable repair during the project, their correct spacing, and type (ball and burlap, container, etc.). Any damage will be evaluated by the University's Representative as to whether replacement is necessary. Such replacement shall be the sole responsibility of the contractor.
 - Mulch:
 1. Mulch will be shredded hardwood bark, chemically inert, nontoxic, free of weeds or any other substance injurious to plant growth. Shredded bark will have a uniform fibrous texture free from cakes and lumps. It will be free of foreign material and of a uniform color. No individual piece will be larger than 2 square inches.
 - Excavating of planted areas:
 1. Where required for planting operation, the contractor shall perform all necessary excavations as part of the contract price. Stake out plant locations and obtain approval of the University's Representative before excavation is begun. Excavations shall include all rock, old concrete, earth excavations. The contractor shall be responsible for locating all underground utilities, and take all necessary precautions not to disturb or damage these utilities.

2. When an obstruction of rock, tree roots, utilities or any other object of substantial size and extent is encountered, an alternate location for the plant may be selected by the University's Representative. Where locations cannot be changed as determined by Facilities Management representatives, submit cost required to move or remove the obstruction. Proceed with such revisions only after approval by University's Representative.
 3. Excavations shall be scheduled so that it will be followed immediately by the placement of plant materials and during the specified planting season.
 4. Excavate tree pits to the depth of the tree ball and at least twice the width of the tree ball. Excavate shrub pits to depth of shrub ball or container and one foot wider than the ball or container. Excavate groundcover pits to depth of container or sufficient to plant bare root groundcover to appropriate depth. Depth of all plant pits specified will be measured from the finish grade.
 5. Detrimental soil conditions affecting plant growth shall be reported in writing to University's Representative. State condition and submit proposal of correcting the condition to University's Representative. Proper drainage must be assured.
 6. All excess excavated materials shall be disposed off site by the contractor. The contractor shall be responsible for removing all rubbish, waste materials, or other debris from the site at the completion of each working day.
- Planting operations:
 1. Protect plants at all times from conditions detrimental to the health of the plants. Plants that cannot be planted immediately on delivery shall be kept in shade or sun, according to their specific requirements, with B&B material well protected with soil, wood chips, shredded bark or other acceptable material, and shall be kept watered. Plants shall not remain unplanted for longer than three (3) days after delivery.
 2. Set plants in planting pits at same relationship to finished grade as they were to the ground from which they were dug. Set plant plumb and brace rigidly into position until prepared topsoil has been tamped solidly around ball and roots so that the plant will be of the same depth one year later. See "Tree and Shrub Transplanting Manual".
 3. Cut and remove ropes, strings and wrapping from the top one-half of the ball after plant has been set. Leave balance of wrapping intact around the ball. All waterproof, water repellant, or rot resistant wrappings shall be removed from the ball. Wire baskets shall be removed if the ball will hold together once it is removed.
 4. Backfill plant pits with excavated material. When plant pits have been backfilled about one-half full, water thoroughly, eliminating all air pockets.
 5. After watering, install soil to top of pit and repeat watering. Avoid puddled soil conditions.
 6. Form saucer around tree and shrub pits as indicated in the "Tree and Shrub Transplanting Manual".
 7. Firm soil around groundcover plants and water thoroughly.
 8. Finish grade the planting area to conform to appropriate grade after full settlement of the soil has occurred.
 9. Mulch all pits with shredded bark to a depth of 3 inches immediately after planting.
 10. Water all plants thoroughly. Water will be furnished to the contractor by the owner from existing facilities. Contractor shall furnish all hose, meters, backflow preventers and other connections necessary for watering plants.
 - Guying, staking, wrapping and pruning:
 1. Flag guys with 18 inch sections of 1 inch diameter white PVC pipe, if guys extend outside planting area or pose a tripping hazard, shall be completed immediately after planting. Drive anchors into the ground outside of the planting pit to a depth that will securely hold the tree. Attach cables with hose around the trunk. Leave cables with just enough slack that they will go tight in a wind.
 2. Use three stakes on trees.
 3. Wrap trunks of deciduous trees 1.5 inches or more in caliper with a spiral overlapping tree wrap to a minimum height of the first branch. Wrap from the bottom and tie wrapping securely in place. Consult University's Representative for acceptance trunk wrap material.

4. Prune plants only at time of planting and according to horticultural standards to preserve the natural character of the plant, and only to remove broken, crossing, or damaged branches. Pruning is to be done only with approval of University's Representative. Use only clean, sharp tools.
- Maintenance of trees, shrubs and groundcovers.
 1. Maintenance shall begin immediately after each plant is planted and shall continue until acceptance.
 2. Maintenance shall consist of pruning, watering, cultivating, weeding, mulching, tightening, repairing of guys and stakes, wrapping repair, resetting plants to proper grades or upright condition, restoration of planting saucer, and furnishing and applying such sprays or other items as are necessary to keep the plantings free of insects and disease and in thriving condition.
 3. Sidewalks and other paved areas shall be kept clean of debris and material resulting from planting and maintenance work.
 - Pruning:
 1. Pruning of existing plant material shall be done only with approval of University's Representative. Each plant shall be pruned to preserve its natural character and according to accepted standards. Prune with sharp tools only. Make cuts flush and clean.
 - Fertilizing:
 1. Commercial fertilizer for trees and shrubs shall be Nutri-Pak controlled release plant food as manufactured by JRP International, Inc. of Fon du Lac, Wisconsin or Owner's Representative approved equal.
 - a. Standard formulation: Guaranteed analysis of 16% total Nitrogen, 8% available Phosphoric Acid and 8% soluble Potash (16/8/8) packaged in a patented controlled release packet.
 2. Commercial fertilizer for groundcover and perennials shall be a general purpose complete plant food (10-10-10), furnished in a uniform granular or pelletized form as approved by Owner's Representative.
 - a. Standard formulation: Guaranteed Analysis of 10% total Nitrogen, 10% available Phosphoric Acid and 10% soluble Potash
 - Guarantee
 1. The guarantee period for trees, shrubs and groundcovers shall begin at the date of the Substantial Completion.
 2. All plant material shall be guaranteed by the contractor for a period of one year from the date of Substantial Completion to be in good, healthy, and flourishing condition.
 3. The contractor shall further guarantee that during the period of the guarantee he will make good any defects to the work and all damage caused to property of the owner by such defects or by the work required to remedy such defects.
 4. At any time within the period of the guarantee, the contractor shall be responsible for any plant which is dead, dying, in a declining condition, or which has failed to flourish in such a manner or in such a degree that its usefulness or appearance has been impaired due to inferior or defective materials or workmanship or inadequate protection. The decision of University's Representative for making replacements shall be conclusive and binding upon the contractor. The contractor shall also make good all damage to persons or property caused by defective workmanship or materials.
 5. Any trees or shrubs found to be unacceptable as described above shall be removed from the site and replaced during the next planting season.
 6. Plant replacements shall be of the same kind and size as specified in the plant list. All plant replacements shall be inspected, furnished, planted, mulched, and otherwise installed as specified at the contractor's expense.
 7. Where plants are replaced, the contractor shall be responsible for repairing any damage caused by this replacement to lawns, pavements, or other areas involved with the replacement.
 8. During the guarantee period, the contractor shall, from time to time, inspect the watering, cultivation, and other maintenance operations carried on by the owner or its agents with respect to such work and promptly report to the owner any methods, practices, or operations which he considers unsatisfactory, and not in accord with his interests or good horticultural practices. The failure of the contractor to so inspect or report shall be

construed as an acceptance by him of the owner's maintenance operations; and he shall not thereafter claim or assert that any defects which may later develop are the results of such methods, practices, or operations. The contractor shall have the opportunity, together with the owner, to establish the maintenance program to be followed.

**This section of the Building Standards establishes minimum requirements only.
It should not be used as a complete specification**