

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 00 00	Exterior Improvements
320100	Operation and Maintenance of Exterior Improvements
320111	Paving Cleaning
320111.51	Rubber and Paint Removal from Paving
320111.52	Rubber Removal from Paving
320111.53	Paint Removal from Paving
320113	Flexible Paving Surface Treatment
320113.61	Slurry Seal (Latex Modified)
320113.62	Asphalt Surface Treatment
320116	Flexible Paving Rehabilitation
320116.71	Cold Milling Asphalt Paving
320116.72	Asphalt Paving Reuse
320116.73	In Place Cold Reused Asphalt Paving
320116.74	In Place Hot Reused Asphalt Paving
320116.75	Heater Scarifying of Asphalt Paving
320117	Flexible Paving Repair
320117.61	Sealing Cracks in Asphalt Paving
320117.62	Stress-Absorbing Membrane Interlayer
320119	Rigid Paving Surface Treatment
320119.61	Sealing of Joints in Rigid Paving
320119.62	Patching of Rigid Paving
320123	Base Course Reconditioning
320126	Rigid Paving Rehabilitation
320126.71	Grooving of Concrete Paving
320126.72	Grinding of Concrete Paving
320126.73	Milling of Concrete Paving
320126.74	Concrete Overlays
320126.75	Concrete Paving Reuse
320129	Rigid Paving Repair
320129.61	Partial Depth Patching of Rigid Paving
320129.62	Concrete Paving Raising
320129.63	Subsealing and Stabilization
320130	Operation and Maintenance of Site Improvements
320130.13	Snow Removal
320180	Operation and Maintenance of Irrigation
320190	Operation and Maintenance of Planting
320190.13	Fertilizing
320190.16	Amending Soils
320190.19	Mowing
320190.23	Pruning
320190.26	Watering
320190.29	Topsoil Preservation
320190.33	Tree and Shrub Preservation
320500	Common Work Results for Exterior Improvements
320513	Soils for Exterior Improvements
320516	Aggregates for Exterior Improvements
320519	Geosynthetics for Exterior Improvements
320519.13	Geotextiles for Exterior Improvements
320519.16	Geomembranes for Exterior Improvements
320519.19	Geogrids for Exterior Improvements
320523	Cement and Concrete for Exterior Improvements

Senior Walk ConstructionChert and other absorbent aggregates can have a deleterious effect on the surface of exterior concrete, particularly flatwork. When a contractor is asked to construct a senior walk sidewalk, the university intends to engrave the concrete surface at a later date, with names or other effects. Surface blemishes must be minimized. The intent of the monumental concrete specification is to provide adequate hardness for the engraving process to provide crisp, clean engravings and to provide a surface that is very durable over time, free from “pop-outs” and other defects.

Other specialty placed concrete – There may be occasions where concrete flatwork is desired to have a durable surface, free from future defects, but where we do not intend to engrave the surface. In these cases the sample specification below may be modified to reduce the ultimate strength. However, we should not reduce below 3500 psi.

MONUMENTAL CONCRETE

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Formwork, complete with required shoring, bracing and anchorage.**
- B. Control joints and expansion joints.**
- C. Concrete joints and expansion joints.**
- D. Cast-in-place concrete.**
- E. Work associated to Senior Walks.**

1.2 RELATED WORK

- A. Section 01 45 29 – Testing Laboratory Services.**

1.3 SUBMITTALS

- A. Concrete mix design and strength test results for each specified strength.**

1.4 QUALITY ASSURANCE

- A. Perform cast-in-place concrete work in accordance with ACI 301, unless specified otherwise in this Project Manual.**
- B. Keep copy of ACI 301-99 in field office for duration of project.**

1.5 TESTING AGENCY

- A. Field testing of the concrete mix will be performed by an independent testing laboratory in accordance with Sections 01 45 29. The testing agency will be 3rd party and not the responsibility of the contractor to pay for. However, the contractor shall notify the testing agency giving adequate time for inspection and testing.**

- B. Provide free access to work and cooperate with the appointed laboratory.
- C. Tests of cement and aggregates may be performed to ensure conformance with requirements state herein.

1.6 REFERENCE STANDARDS

- A. ACI-301-99, Specifications for Structural Concrete.
- B. ACI Manual of Concrete Practice, Parts 1, 2, and 3.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Allowable Concrete Mix Temperatures: ACI 301 -99 Section 4.2.2.7.
 - 1. Cold Weather: Minimum 35 degrees F.
 - 2. Hot Weather: Maximum 95 degrees F.
- B. Do not place concrete during rain, sleet, or snow unless protection is provided.
- C. Keep accurate thermometer in area where work is proceeding.

PART 2 - PRODUCTS

2.1 CEMENT (ACI 301-99 Section 4.2).

- A. Portland Cement: ASTM C150, Type 1.
- B. Use one brand and type of cement throughout project unless otherwise specified.

2.2 ADMIXTURES (ACI 301-99 Section 4.2)

- A. Add air-entraining agent as indicated in ACI 301-99 Section 4.2.1.4.
- B. Use of accelerating admixtures such as salts, chemicals, or other foreign materials in cold weather will not be allowed. Use no other admixtures without prior approval of the Architect/Engineer.
- C. Use of set – retarding admixtures during hot weather will not be allowed.
- D. Limited use of Class F fly ash may be allowed with approval from owner.

2.3 STRENGTH (ACI 301-99 Section 1.7.4)

- A. Provide concrete of following strength: Compressive strength (28 day): 5,500 psi, except where noted otherwise in the Contract Documents

2.4 AIR ENTRAINMENT (ACI 301-99 Section 4.2.1.4)

- A. Add air-entraining agent to concrete mix for concrete work exposed to exterior.

2.5 SLUMP (ACI 301-99 Section 4.2.2.2)

- A. Contractor shall provide slump cone and test slump for each load of concrete.**
- B. Minimum, slump for all concrete work: 3 inches.**
- C. Slump for consolidation by vibration: 4 inches maximum.**
- D. Slump for slabs and consolidation other than by vibration: 5 inches maximum.**

2.6 PROPORTIONS

- A. Selection of proportions for normal weight concrete: Method 1, Method 2, or Method 3, Contractor's Option.**
- B. Fine aggregate shall conform to the requirements of ASTM Specification C-33, latest edition, and shall consist of clean, fresh water sand graded uniformly to conform to Paragraph 4 of the above referenced Specification C-33.**
- C. Coarse aggregate shall conform to the requirements of ASTM Specification C-33, latest edition, using standard grading size 1 -1/2" to No. 4 of washed gravel or crushed stone meeting requirements above and soundness requirements of ASTM C-33 modified to include item E below.**
- D. Water: Clean and free of injurious amounts of oil, acids, alkalis, organic materials, or other deleterious substances.**
- E. No aggregate that will adversely affect the surface of the concrete shall be allowed. Examples include chert or any aggregate that is water absorbent or chemically reactive may be included within the mix.**

2.7 REINFORCING STEEL (ACI 301-99 Section 3)

- A. Reinforcing Steel: 60 ksi yield grade; deformed billet steel bars, ASTM A615; plain finish.**
- B. Welded Steel Wire Fabric: plain type, ASTM A 185; in coiled rolls, plain finish, 6x6-W1.4 x W1.4 or 6x6 – W2.9 X W2.9 as shown on the Drawings.**

2.8 ACCESSORIES

- A. Premolded expansion joint fillers: ASTM D1751, ½ inch thick. Refer to ACI 301-99 Section 10.2.5.**

2.9 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94.**
- B. Mix concrete until there is a uniform distribution of the materials and the mass is homogeneous in consistency and colors. Continue mixing for at least 1 -1/2 minutes after all the ingredients are in the mixer.**

PART 3 - EXECUTION

3.1 GENERAL

- A. Notify Architect/Engineer at least 24 hours before the planned time to pour concrete.**
- B. Inspection:**
 - 1. Ensure that excavation and formwork are completed and within the allowed tolerances.**
 - 2. Ensure that ice and excess water are removed, no frost is present, and that ground is not frozen.**
 - 3. Check that reinforcement is secured in place.**
 - 4. Verify that insulation, anchors, and other embedded items are secured in position.**
- C. Install concrete work in accordance with ACI 301-99 except as amended by this section.**

3.2 FORMWORK (ACI 301-99 Section 2)

- A. Obtain Architect/Engineer's review for use of earth forms. When using earth forms, hand-trim sides and bottoms, and remove loose dirt prior to placing concrete.**
- B. Tolerances for Formed Services: (Comply with ACI 301-99 Section 2)**

3.3 FORM SURFACES PREPARATION (ACI 301-99 Section 2)

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations. Apply prior to placing reinforcing steel, anchoring devices and embedded parts. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent.**

3.4 FINISHING FORMED SURFACES

- A. Formed Surfaces Finishes: Provide rough form finish (ACI 301-99 Section 2) at all surfaces not exposed to view. Provide smooth rubbed finished (ACI 301-99 Section 2) at all surfaces exposed to view.**

3.5 REMOVAL OF FORMS (ACI 301-99 Section 2)

- A. Do not remove forms, shores, and bracing until concrete has gained sufficient strength to carry its own weight, construction loads, and design loads which are liable to be imposed upon it. Verify strength of concrete by compressive test results.**

3.6 PLACING REINFORCING

- A. Reinforcing shall be unpainted and uncoated, free from rust or scale and shall be cleaned and straightened before being shaped and in position.**
- B. Position reinforcing accurately and tie securely.**

- C. Support foot reinforcing on support chairs or concrete grout at maximum 3 feet on center each way to insure proper depth from bottom.
- D. Wire dowels to longitudinal bars and place top bars in perfect alignment by the use of wood templates placed 2 inches from the top of the form.
- E. Support wire mesh on support chairs, or other approved means, at no greater than three feet on center way to hold reinforcing in the center of the slab or as shown on the drawings.
 - 1. Do not depend on lifting mesh as concrete is being poured.
 - 2. Lap sides and ends not less than one wire spacing in slabs on grade and not less than 12 inches in structural slabs.
- F. Provide 3 inches of concrete between reinforcing and the ground, unless detailed otherwise, where concrete is poured against the ground.
- G. If, after the removal of forms, concrete surfaces are to be in contact with the ground or exposed to the weather:
 - 1. Bars larger than No.5: Protect with 2 inches of concrete.
 - 2. No. 5 bars and smaller: Protect with 1 1/2 inches of concrete.
- H. Concrete covering for any reinforcing at surfaces not exposed directly to the ground or weather: Protect with 1 -1/2 inches of concrete.

3.7 PLACING CONCRETE

- A. Convey concrete from mixer to final position by method which will prevent separation or loss of material.
- B. Maximum height of concrete free fall; 60 inches.
- C. Regulate rate of placement so concrete remains plastic and flows into position.
- D. Deposit concrete in continuous operation until panel or section is completed.
- E. Do not use concrete that has set and do not re-temper or use concrete that has been mixed for more than 1½ hours.

3.8 CONSOLIDATING CONCRETE:

- A. Use mechanical vibrating equipment for consolidation.
- B. Vertically insert and remove hand-held vibrators at points 18 inches to 30 inches apart, inserting to within 6 inches of bottom of freshly poured concrete.
- C. Do not use vibrators to transport concrete forms.
- D. Minimum vibrators frequencies: 6000 impulses per minute.
- E. Vibrate concrete minimum amount required for consolidation.
- F. Keep spare vibrator on hand during concrete placing operation.

- G. Make sure the concrete is thoroughly worked around the reinforcing, the embedded items, and into corners of forms.

3.9 SLABS (ACI 301-99 Section 5)

- A. Finish concrete slab surfaces in accordance with ACI 301-99 Section 5:
 - 1. Uniformly spread, screed, and float slabs. Do not use grate tampers or mesh rollers. Do not spread concrete by vibration.
 - 2. Senior Sidewalks that are intended to have engravings or other treatments shall be finished totally smooth. No brooming or other surface finishes are desired.
- B. Sidewalks: Finish other than senior sidewalks in accordance with Section 32 13 76.

3.10 CURING

- A. Cure Slabs: Use damp method as per ACI 301-99 Section 5.
- B. Cure Walls above Grade: Use moisture-retaining covering as approved by Architect/Engineer in accordance with ACI 308.

3.11 WELDING (ACI 301-99 Section 3)

- A. Welding Reinforcing Steel: Not allowed.

3.12 CONSTRUCTION JOINTS

- A. Install construction joints in accordance with ACI 301-99 Section 5
- B. Place expansion at 30 feet intervals and contraction joints at 15 feet (maximum) intervals. Where possible, make joints coincide with joints in adjacent concrete.
- C. Fit joints with filler of required profiles. Recess $\frac{1}{4}$ inch below finished concrete surface.

3.13 INSERTS, EMBEDDED PARTS AND OPENINGS

- A. Provide formed openings where required for pipes, conduits, sleeves and other work to be embedded in and passing through concrete members.
- B. Coordinate work of other sections and cooperate with trade involved in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts. Any sleeve or object that extends above the horizontal surface of the concrete shall have the concrete shaped around the object in such a way as to not hold any water. Surface finishing, fillers, covers, etc. shall be installed with a slight conical shape as to avoid any water collection or water holding.

3.14 REPAIR OF SURFACE DEFECTS (ACI 301-99 Section 5.3.7)

- A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Modify or replace concrete not conforming to required lines, detail, and elevation.

- C. Repair or replace concrete not properly placed resulting in excessive honeycombing and other defects. Do not patch, repair, or replace exposed architectural concrete except upon express direction of Architect/Engineer.

3.15 FIELD QUALITY CONTROL

- A. Four (4) concrete test cylinders will be taken by the testing laboratory for every 40 cu. yds., or fraction thereof, of concrete placed. Not less than one (1) set of test cylinders shall be taken for each day's pour.
- B. One (1) additional test cylinder will be taken during cold weather concreting and be cured on job site under same conditions as concrete it represents.
- C. One (1) slump test will be taken by the testing laboratory for each set of test cylinders taken and for each separate batch of concrete placed.
- D. Compression test cylinders: Test cylinders shall be cast on the project site by a representative of the testing laboratory.
 - 1. Make cylinders according to ASTM C31.
 - 2. Make additional sets of test cylinders for curing under job conditions:
 - a. When it is needed to determine when to remove forms.
 - b. When to put a structure into service.
 - c. When temperature extremes are expected during the curing test period.
 - 3. Make test cylinders in the presence of Architect/Engineer.
 - 4. Properly marked prepared test cylinders and fill out the card supplied by the testing laboratory with instructions on when to make test breaks and where to send the test results.
 - 5. Transport in a protected condition, each set of prepared and marked test cylinders to the designated testing laboratory for curing and testing as soon as the cylinders can be transported without damage.
- E. Compression Testing concrete Cylinders ASTM C-39: by commercial testing laboratory.
 - 1. Cure cylinders in laboratory until time for testing.
 - 2. Test each set of cylinders at 7 days and 28 days after pouring.
 - 3. Tabulation of breakage schedule and action:

Specified strength of 5,500 psi at 28 days

	Test Break	Action
7 day	Less than 4200 psi	Contractor notify A/E
	4200-6000 psi	Break 28 day cylinder
	Over 6000 psi	Stop Testing
28 day	Less than 6000 psi	Contractor notify Architect, investigate reason for low break and report in writing to AE.

4. For testing cylinders for specified compressive strength other than 6,000 psi, see the Architect/Engineer.

F. In Case of Low Compression Test Results:

1. Architect/Engineer will have right to order change in the mix design, costs to be borne by the contractor.
2. Architect/Engineer will have right to order core tests of the concrete in accordance with SCI C42, or load tests of the structure, the cost to be borne by the Contractor for either test.

3.16 PROTECTION OF COMPLETED WORK

- A. During curing period, protect the concrete from damaging mechanical disturbances, water flow, loading, shock, and vibration.**

END OF SECTION

320600	Schedules for Exterior Improvements
320610	Schedules for Bases, Ballasts, and Paving
320610.13	Pedestrian Walkway Schedule
320630	Schedules for Site Improvements
320630.13	Retaining Wall Schedule
320680	Schedules for Irrigation
320680.13	Irrigation Piping Schedule
320690	Schedules for Planting
320690.13	Planting Schedule
320800	Commissioning of Exterior Improvements
32 1000	Bases, Ballasts, and Paving
321100	Base Courses
321113	Subgrade Modifications
321113.13	Lime-Treated Subgrades
321113.16	Bituminous-Treated Subgrades
321116	Subbase Courses
321116.13	Sand-Clay Subbase Courses
321116.16	Aggregate Subbase Courses
321123	Aggregate Base Courses
321123.13	Sand-Clay Base Courses
321123.23	Base Course Drainage Layers
321126	Asphaltic Base Courses
321126.13	Plant Mix Asphaltic Base Courses
321126.16	Road Mix Asphaltic Base Courses
321126.19	Bituminous-Stabilized Base Courses
321129	Lime Treated Base Courses
321129.13	Lime-Fly Ash-Treated Base Courses
321133	Cement-Treated Base Courses
321133.13	Portland Cement-Stabilized Base Courses
321136	Concrete Base Courses
321136.13	Lean Concrete Base Courses
321136.16	Plain Cement Concrete Base Courses
321136.19	Hydraulic Cement Concrete Base Courses
321200	Flexible Paving
321213	Preparatory Coats
321213.13	Tack Coats
321213.16	Asphaltic Tack Coats
321213.19	Prime Coats
321213.23	Asphaltic Prime Coats
321216	Asphalt Paving
321216.13	Plant-Mix Asphalt Paving
321216.16	Road-Mix Asphalt Paving
321216.19	Cold-Mix Asphalt Paving
321216.23	Reinforced Asphalt Paving
321216.26	Fiber-Modified Asphalt Paving
321216.29	Polymer-Modified Asphalt Paving
321216.33	Granulated Rubber-Modified Asphalt Paving
321216.36	Athletic Asphalt Paving
321219	Asphalt Paving Wearing Courses
321219.13	Road-Mix Asphalt Paving Wearing Courses
321219.16	Resin-Modified Asphalt Paving Wearing Courses
321219.19	Porous Friction Asphalt Paving Wearing Courses

321233 FlexiblePavingSurfaceTreatments
321236 Seal Coats
321236.13 AsphalticSealandFogCoats
321236.16 CoalTarSealCoats
321236.19 CoalTarSealCoats withUnvulcanizedRubber
321236.23 Fuel-ResistantSealers
321243 PorousFlexiblePaving
321273 AsphaltPavingJoint Sealants

321300 Rigid Paving

321313 Concrete Paving
321313.13 ExposedAggregateConcretePaving
321313.16 Power-CompactedConcretePaving
321313.19 PrestressedConcretePaving
321313.23 ConcretePavingSurfaceTreatment
321313.33 PlainConcretePaving
321316 DecorativeConcretePaving
321316.13 PatternedConcretePaving
321316.16 Roller-CompactedConcretePaving
321316.19 ImprintedConcretePaving
321316.23 StampedConcretePaving
321343 PerviousConcretePaving
321373 Concrete PavingJoint Sealants
321373.13 Fuel-ResistantConcretePavingJointSealants
321373.16 Field-MoldedConcretePavingJointSealants
321373.19 CompressionConcretePavingJointSealants

321400 UnitPaving

321413 Precast ConcreteUnit Paving
321413.13 InterlockingPrecastConcreteUnitPaving
321413.16 PrecastConcreteUnitPavingSlabs
321413.19 PorousPrecastConcreteUnitPaving
321416 BrickUnitPaving
321423 AsphaltUnitPaving
321426 WoodPaving
321429 Recycled-RubberPaving
321440 StonePaving
321443 PorousUnit Paving

321500 AggregateSurfacing

321513 CinderSurfacing
321540 CrushedStone Surfacing

321600 Curbs,Gutters, Sidewalks,and Driveways

321613 CurbsandGutters
321613.13 Cast-In-PlaceConcreteCurbsandGutters
321613.16 SteelFacedCurbs
321613.23 PrecastConcreteCurbsandGutters
321613.33 AsphaltCurbs
321613.43 StoneCurbs
321623 Sidewalks
321633 Driveways

321700 Paving Specialties

321713 ParkingBumpers
321713.13 MetalParkingBumpers
321713.16 PlasticParkingBumpers

321713.19 PrecastConcreteParkingBumpers
321713.23 RubberParkingBumpers
321713.26 WoodParkingBumpers
321716 SpeedBumps
321723 PavementMarkings
321723.13 PaintedPavementMarkings
321723.23 RaisedPavementMarkings
321723.33 PlasticPavementMarkings
321726 TactileWarningSurfacing
321743 PavementSnowMeltingSystems

321800 Athletic and Recreational Surfacing

321813 SyntheticGrassSurfacing
321816 SyntheticResilientSurfacing
321816.13 PlaygroundProtectiveSurfacing
321823 AthleticSurfacing
321823.13 BaseballFieldSurfacing
321823.16 NaturalBaseballFieldSurfacing
321823.19 SyntheticBaseballFieldSurfacing
321823.23 FieldSportSurfacing
321823.26 NaturalFieldSportSurfacing
321823.29 SyntheticFieldSportSurfacing
321823.33 RunningTrackSurfacing
321823.36 NaturalRunningTrackSurfacing
321823.39 SyntheticRunningTrackSurfacing
321823.43 RecreationalCourtSurfacing
321823.53 TennisCourtSurfacing
321823.56 NaturalTennisCourtSurfacing
321823.59 SyntheticTennisCourtSurfacing

32 3000 Site Improvements

323100 Fences and Gates

323111 GateOperators
323113 ChainLinkFencesandGates
323113.23 RecreationalCourtFencesandGates
323113.26 TennisCourtFencesandGates
323113.29 TennisCourtWindBreaker
323113.33 ChainLink Backstops
323113.53 High-SecurityChainLink FencesandGates
323116 WeldedWireFencesand Gates
323117 ExpandedMetal Fencesand Gates
323119 DecorativeMetal FencesandGates
323123 PlasticFencesandGates
323126 WireFencesandGates
323129 WoodFencesandGates
323132 CompositeFencesandGates
323153 CattleGuards

323200 Retaining Walls

323213 Cast-in-PlaceConcreteRetainingWalls
323216 Precast ConcreteRetainingWalls
323219 UnitMasonry RetainingWalls
323223 Segmental RetainingWalls
323223.13 SegmentalConcreteUnitMasonryRetainingWalls
323223.16 ManufacturedModularWalls

323226	Metal Crib Retaining Walls
323229	Timber Retaining Walls
323234	Reinforced Soil Retaining Walls
323236	Gabion Retaining Walls
323243	Soldier-Beam Retaining Walls
323253	Stone Retaining Walls
323400	Fabricated Bridges
323413	Fabricated Pedestrian Bridges
323423	Fabricated Roadway Bridges
323433	Fabricated Railway Bridges
323500	Screening Devices
323513	Screens and Louvers
323516	Sound Barriers
323900	Manufactured Site Specialties
323913	Manufactured Metal Bollards
32 7000	Wetlands
327100	Constructed Wetlands
327200	Wetlands Restoration
32 8000	Irrigation

SECTION 32 80 00
IRRIGATION

CONSULTANT DESIGN GUIDELINE

Prior to preparation of design development drawings, Facilities Management will review irrigation system. Review will allow the cost of an irrigation system to become a part of the preliminary cost estimate.

INCLUDE IN CONTRACT DOCUMENTS

Design irrigation systems to be fully operational. Install control wiring in PVC schedule 40 conduit. The sprinkler system considered shall be equal to Rainbird series shrub head and Hunter rotary heads. All water lines shall be PVC schedule 40. Sized main and lateral lines, all quick couplers, automatic drain valves, shrub risers, manual drain valves, back flow preventers, water meters and other equipment necessary to provide a complete system shall be included. Indicate all required items, location and size on the drawings.

A separate meter and backflow prevention is required for irrigation system.

END SECTION

328200	Irrigation Pumps
328400	PlantingIrrigation
328413	Drip Irrigation
328423	UndergroundSprinklers
328600	Agricultural Irrigation
32 9000	Planting

SECTION 32 90 00
PLANTING

CONSULTANT DESIGN GUIDELINE

Submit schematic landscaping, planting, and irrigation plans for review and approval by Facilities Management. Landscape plans shall bear the seal of a Landscape Architect registered in the State of Arkansas according to Arkansas State Board of Landscape Architects.

EXECUTION

REMOVAL OF EXISTING TREES

Removal. Dig trees, as noted on construction plans, with firm natural balls of diameter not less than 10 inches wide for each caliper inch (24 inch minimum), and of sufficient depth to include the fibrous and feeding roots. Wrap trees with burlap according to American National Nursery Standards and place each tree in a Star Basket. Trees will not be accepted if ball is cracked or broken during transportation. The contractor shall replace the damaged tree at their expense. See the following site for detail instructions: http://planning.uark.edu/campus_planning/content/guide%20-%20appendix%20b.pdf.

Delivery. The contractor is responsible for delivering the trees to the Agriculture Experimental Farm and coordinating delivery time with Facilities Management Grounds Shop at 575-6161.

END SECTION

329100	PlantingPreparation
329113	Soil Preparation
329113.13	Hydro-Punching
329113.16	Mulching
329113.19	PlantingSoilMixing
329113.23	StructuralSoilMixing
329113.26	PlantingBeds
329116	PlantingSoil Stabilization
329116.13	BlanketPlantingSoilStabilization
329116.16	Mat PlantingSoilStabilization
329116.19	NettingPlantingSoilStabilization
329119	LandscapeGrading
329119.13	TopsoilPlacementandGrading

32 91 19.13 Topsoil Placement and Grading

CONSULTANT DESIGN GUIDELINE

Coordinate earthwork design with Facilities Management Planning Group.

INCLUDE IN THE CONSTRUCTION DOCUMENTS

Top soil shall be fertile, well drained of uniform quality, free of foreign materials, oil or chemicals, rocks, sticks, noxious weeds or grasses (Bermuda grass, Nut grass, Bind weed, Johnson grass, and Kudzu), and must be approved by Facilities Management and/or consulting landscape architect before being placed.

Top soil must be approved by Facilities Management and/or consulting landscape architect.

EXECUTION

Remove all construction debris and construction materials from the site before final grading is started.

Backfill all areas for planting of shrubs and/or ground cover with a grass-free top soil to a depth of 12".

Till lawn areas to a depth of 6", hand rake, and leave in friable condition. Dig a ditch 1'0" wide by 1'0" deep by 30'0" long to determine the conditions of the soil prior to finish grading.

Submit soil test of proposed topsoil verifying amounts of nitrogen, potassium and phosphorus to Facilities Management. Sections of the grounds shall be sampled before soil is placed; location of this sampling to be determined by the landscape architect. Dig a ditch of 1'0" wide by 1'6" deep by 20'0" long to determine the condition of the soil.

Bring all areas to a finished grade (hand-raked surface) not to exceed 1" below all walks and/or doorways of buildings. The finished grade shall be in physical condition for landscape planting.

END SECTION

329200 Turfand Grasses

It is the desire of the University to install sod wherever practical.

- 329213 Hydro-Mulching
- 329216 Plugging
- 329219 Seeding
- 329219.13 MechanicalSeeding
- 329219.16 HydraulicSeeding
- 329223 Sodding
- 329226 Sprigging
- 329226.13 Stolonizing

329300 Plants

- 329313 Ground Covers
- 329323 PlantsandBulbs
- 329333 Shrubs
- 329343 Trees

329400 PlantingAccessories

- 329413 LandscapeEdging

329416	LandscapeTimbers
329419	LandscapeSurfacing
329433	Planters
329443	TreeGrates
329446	TreeGrids

329600 Transplanting

329613	Ground Cover Transplanting
329623	PlantandBulbTransplanting
329633	ShrubTransplanting
329643	TreeTransplanting