

## **DIVISION 32 – EXTERIOR IMPROVEMENTS**

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### **32 00 00. EXTERIOR IMPROVEMENTS**

#### **32 10 00. BASES, BALLASTS, AND PAVING**

1. GENERAL PROVISIONS: Specify that construction of roads, drives, service courts, and parking areas, including subgrade and other related work, must be performed by a contractor fully qualified and equipped to construct roads.
- .2 DESIGN DETAILS:
  - .2.1 MINIMUM TURNING RADII FOR STREETS, DRIVEWAYS, & LOADING DOCKS: 20 feet for automobile traffic; 30 feet for truck traffic, and 50 feet for bus and garbage truck traffic. When possible, or appropriate, use greater radii. Loading dock radii should be determined using the largest possible vehicle and must be approved by the University.
  - .2.2 SPECIAL DRAINS: In stairwells, areaways and similar locations where leaf clogging of conventional drains would be expected provide scupper type drains at the junction of the wall and pavement or walk. Piping size shall be 6" in diameter minimum.
  - .2.3 MANHOLES AND CATCH BASINS: Refer to City of Columbus (COC) Construction and Materials Specifications Item 604 and Standard Drawings for manhole and catch basin materials and requirements for work within Franklin County. Refer to the more stringent jurisdiction between local codes or State of Ohio Department of Transportation (ODOT) Construction and Materials Specification Item 604 and Standard Drawings for work outside Franklin County.
- .3 PROHIBITED CONSTRUCTION:
  - .3.1 Mortar joints between unit pavers. See Appendix K
  - .3.2 CHIP SEALING or shoot and chip surfacing for permanent parking lots, walks, streets or drives.
- 4 WALKS: Minimum width shall be 8 feet. See The Ohio State University walk policy in Appendix.
  - .4.1 University policy dictates concrete walkways in the absence of overriding considerations. Any deviation from concrete walks requires the approval of the University Landscape Architect. Pavers, such as 4"x8" clay brick pavers or natural stone pavers, shall be used as adjunct surfaces for appropriate areas to provide for improved drainage, to protect the viability of plant materials, or for design purposes.
    - .4.1.1 Deviations from the policy above shall be permitted in those areas where a predominant character has already been established for walkways by use of other materials.
    - .4.1.2 Deviations from the policy shall also be permitted in especially defined areas (field areas, gardens, natural areas, special feature sites, etc.) where the use of concrete walkways or masonry pavers would clearly be inappropriate or where structural considerations apply.

**32 12 00. FLEXIBLE PAVING**

32 12 16. ASPHALT PAVING

.1 GENERAL PROVISIONS: Specify asphalt paving materials by reference to City of Columbus (COC) or State of Ohio, Department of Transportation (ODOT), Construction and Materials Specifications (CMS) with the exception that limestone aggregate, only, be used in asphalt concrete.

.2 PAVEMENT DESIGN REQUIREMENTS: Associate shall employ a geotechnical engineer to conduct subsurface exploration and follow the recommendations with regards to subgrade preparation and pavement build-up. The following pavement build-up shall be considered as minimum thickness requirements by the University.

.2.1 Parking lots with no expectations of heavy loads (Total parking spaces less than 300. No bus or trailer parking)

8" Granular base – COC Item 304  
2 ½" level course – COC Item 402  
1 ¾" surface course – COC Item 404

.2.2 Parking lots with heavy loads.

10" Granular base – COC Item 304  
3" Level course – Item COC 402  
1 ¾" surface course – item COC 404

.2.3 Entrance drives and side roads with no bus traffic.

10" Granular base – Item COC 304  
3" Bituminous base course – Item COC 301  
2" Level course – Item COC 402  
1 ¾" wearing course – Item COC 416

.2.4 Main roadways with bus traffic.

6" Granular base – Item COC 304  
12" Non-reinforced concrete Class C concrete – Item COC 305  
1 ¾" Leveling course – Item COC 402  
1 ¼" Wearing course – Item COC 416

.2.5 BASE DRAINAGE: Over impervious subbases, drainage trenches filled with stone shall be provided through the earth berm, perpendicular to the edge of pavement, to provide continuous drainage of the aggregate base. These drainage trenches shall be located at low points and at intervals of 100 feet or less.

.2.6 PROTECTION OF SURFACE COURSE: After completion of surface course, no vehicular traffic or parking shall be permitted on the pavement until the surface has cured.

2.6.1 SEALER FOR PARKING AREAS: If the budget will permit such expenditure, specify that parking areas be sealed with 2 coats of coal tar emulsion conforming to U.S. Air Force and Federal Specifications RP-00355 (GSA-FSS)), or an asphalt rejuvenating agent of a petroleum resin oil conforming to ASTM D-244, ASTM D-2006-70 and ASTM D-92.

**32 12 00. FLEXIBLE PAVING (Cont'd)**

.2.7 REPAIRS: Depressions and abutments to existing pavement shall be repaired by cutting out the surfacing to a minimum depth of one inch with vertical cuts, filling, and rolling the areas. Feathering of patches and abutments to existing pavement is prohibited.

.2.8 JOINT SEALERS: When new pavement abuts existing, the joint shall be sealed per COC Item 413. This applies to all trench repairs.

.3 WALKS: Asphalt walks, when permitted, shall be a full 2-inch compacted thickness of No. 404 on a 4-inch compacted thickness of No. 304 base. The base and the bituminous material shall each be compacted to 98 percent of their test densities.

**32 12 10. RIGID PAVING**

**32 13 13 CONCRETE PAVING**

.1 PAVING: The use of concrete for roads, drives, service courts, and parking areas is desired if the budget permits such construction. Trash dumpsters for construction debris must be parked on concrete pads. All loading docks and ramps shall be constructed with concrete.

.2 WALKS: Thickness shall be 5-1/2 inches over 4 inches of compacted No. 304 gravel base unless directed otherwise by the University Architect. Nominal 2 x 6 wood forms should be used. The concrete shall have tooled edges which are then disguised by a light/medium broom finish. Except where required for structural purposes, reinforcing bars or welded wire fabric should be omitted. For conventional concrete walks, use City of Columbus Class C or O.D.O.T. Class C concrete with clean natural sand, limestone aggregate, and 4 percent to 8 percent entrained air. Aggregate fabricated from recycled concrete material that meets COC Item 304 is acceptable. See Appendix for step detail.

.2.1 CURING COMPOUNDS: Specify only non-staining type. It has been found that clear chlorinated rubber compounds cause staining which cannot be removed.

**32 16 00. CURBS AND GUTTERS:**

.1 CURBS: All curbs shall be combination curb and gutter unless special permission is given to use straight curb to match existing. Cast-in-place concrete shall be used unless other design is required to match existing conditions. Comply with City of Columbus or O.D.O.T. Items 499 and 609. Concrete shall be Class C using No. 57 aggregate at 600 lbs. per cubic yard. Slump shall be 4 inches and minimum 28-day strength shall be 4000 psi with 4 percent to 8 percent entrained air. See Appendix.

.1.1 EXPANSION JOINTS shall be specified and shall be shown on the drawings. Color of the joint sealer shall match that of the concrete.

.1.2 FOUR INCH DRAIN CONDUCTOR in porous backfill shall be installed under all combination curbs and gutters. Conductors shall extend to drainage basins. Combination curb and gutter may be used only to match or repair existing work.

.2 CURB RAMPS FOR PERSONS WITH DISABILITIES: See the ADAAG requirements.

.2.1 COMPANION RAMPS: State laws require that when a curb ramp is built on one side of a street, a companion ramp is required on the opposite side of the street. When project limits would normally end within a street intersection, the limits must be extended to allow construction of a companion ramp on the far side of the intersection. For projects in which Federal funding is involved, this

**32 16 00. CURBS AND GUTTERS: (Cont'd)**

requirement must carefully be coordinated with Federal requirements regarding limits of Federal participation. Ramps on University property shall match COC accessible ramp design guidelines.

**32 17 00. PAVING SPECIALTIES**

**32 17 23. PAVEMENT MARKINGS:**

.1 PAVEMENT MARKINGS: All pavement markings shall conform to the City of Columbus and ODOT Item 641. Parking lot lines shall be white per COC Item 642. All roadway striping, turn arrows, cross walks, stop bars etc. shall be per COC Item 644-Thermoplastic for asphalt pavement and per ODOT Item 646 – epoxy marking for concrete pavement.

.2 PARKING LOT MARKINGS:

.2.1 Standard Parking Stall: 8.5' x 18'

.2.2 Standard Parking driveway: 24'

.2.3 Accessible Parking Stall: 8' x 18' with either an adjacent 5' loading space or 8' van loading space.

**32 30 00. SITE IMPROVEMENTS**

.1 SITE AND STREET FURNISHINGS: The Ohio State University has standards for a variety of site and street furnishings. Consult the University Landscape Architect (614-292-3673) for a list of acceptable products and the required installation methods.

.1.1 Refer to Division 12 FURNISHINGS, Section 12 93 00 Site Furnishings

**32 80 00. IRRIGATION**

.1 LAWN AND PLANT IRRIGATION: Provide a permanent irrigation system if determined necessary by the University Landscape Architect for all new or renovated lawn areas and planting beds designed and constructed by the project. All site irrigation system controls shall be Rain Bird Corporation, "Maxicom Central Control System" compatible.

**32 90 00. PLANTING**

.1 CONSULTING SERVICES: Refer to PART ONE, paragraph 00033 for possibility of the services of a professional Landscape Architect being required.

.2 PLANT MATERIALS: Selection of plant materials on the Campus is extremely important. Since this is a teaching laboratory, the varieties selected must be made from a broad range of stock indigenous to the specific locations. Persons selecting materials must not only be knowledgeable about the plants that will survive in the specific area of Ohio but also be able to select those appropriate for the northwest part of Columbus, for example. Be similarly selective for regional campus and OARDC plant materials. A pre-installation meeting shall be conducted with representatives from the University Landscape Architect's office and/or the office of Roads and Grounds regarding site and landscape work to address the University's site development and landscape requirements. Refer to the University Landscape Architect for approvals and assistance. See the unacceptable plant list in Appendix Q.

.3 PLANT LISTS should contain both common and technical names, quantities, and notation of planting delivery method (B & B, bare roots, etc.).

**32 90 00. PLANTING (Cont'd)**

- .4 KEYS: Indexes or keys identifying plants on drawings are prohibited. All planting must be individually identified without the use of code letters, numbers, etc.
- .5 MULCH: Premium grade shredded pine bark mulch.
- .6 PROHIBITED MATERIALS: Landscape steel, plastic, or aluminum edging and weed-control plastic mats or film under mulch beds may not be used without specific approval of the University Landscape Architect or the Director of Roads and Grounds.
- .7 TOPSOIL: Areas to receive sod, seeding or planting shall be provided with topsoil in amounts indicated in paragraph 32 91 00.2. Topsoil shall be subject to inspection and approval by the University Landscape Architect and Director of Roads and Grounds.
- .8 STRUCTURAL SOIL: Any tree planted in a tree pit situation and/or surrounded by pavement shall use structural soil in a minimum 8'x8'x3' depth planting area.

**32 91 00. PLANTING PREPARATION**

- .1 SOIL PREPARATION: Specify that areas to be seeded or sodded will be properly prepared with a rototiller to the depth of 6 inches. If the area has been compacted during construction, rototill 4 to 6 inches depth to break up the pan, grade level, and apply topsoil (see 32 91 00.2 for acceptable topsoil). ALL ROCKS, GRAVEL, DIRT AND TURF CLOUDS are to be removed prior to seeding. Grade area 1 to 1-1/2" above grade of existing lawn; blend edges to existing turf and sidewalks. Over seed areas with seed the rate indicated in 32 92 00.2 and for proper seed selection. The Director of Roads and Grounds must approve any alternate method.
- .2 TOPSOIL PLACEMENT AND GRADING: Specify a 6-inch depth of acceptable topsoil for seeded areas and 12-inch depth for planting areas. Acceptable topsoil is defined as a blended soil mix consisting of ASTM D5268-92(96) soil component, ASTM C33 course sand and "Com-Til" – or a University approved organic amendment, tested to determine fertilizer and lime recommendations. Specify a 4-inch depth of acceptable topsoil with an additional 2-inch depth of "Com-Til" for seeded areas or a 10-inch depth of acceptable topsoil with an additional 2-inch depth of "Com-Til" for planting areas.
  - .2.1 Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depression to meet finish grades.
  - .2.2 Moisten prepared lawn areas before planting soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
  - .2.3 Restore areas if eroded or otherwise disturbed after finish grading and before planting.

**32 92 00. TURF AND GRASSES**

- .1 LAWNS: Specify that all unpaved areas not indicated to receive planting be considered as lawn areas and shall be seeded or sodded. No sod or Hydro-mulch seeding is acceptable on the University grounds without the approval of the Director of Roads and Grounds or the University Landscape Architect. Hydro-mulch seeding will only be considered for large areas or sloping terrain. All debris (rocks, bricks, concrete, clods stumps etc.) will be removed and the area graded before area will be approved for Hydro- mulch seeding.

## 32 90 00. PLANTING (Cont'd)

.2 TURF GRASS SEED SELECTION: Seed selection is dependent on the site. Timing of the seeding is determined by the date; see 32 92 19.1 for details. If seeding is to be split because of the time of planting, multiply each of the following percentage by 2 for the proper mix at each seeding.

.2.1 TURF SEED shall be a clean, weed-free mix (a combination of 2 or more different species of turf grass) or blend (combination of 2 or more cultivars of a single turfgrass species); delivered in sealed containers with labels bearing the producer's name and formula of the mix at each seeding.

.2.1.1 FOR THE OVAL: use a mix that has been combined specifically for the Oval by the Seed Center, 1-800-660-8789, in Delaware, Ohio. Product can be purchased from the Seed Center or any other vendor, provided the seed mix matches the requirements listed below.

Special mix: 80/20 Bluegrass / Rye:

20% Rugby bluegrass

20% New Glade bluegrass

20% Aspen or Liberator or Odyssey bluegrass

20% Blue Moon bluegrass

20% Accent perennial rye

Rate: 3.5 lbs/1000 sq ft

.2.1.2 GENERAL TURF - If in an existing bluegrass / rye lawn in parks and around buildings:

Overseeder II: Purchased from the Seed Center: 70/30 Mix:

70% Bluegrass: Rugby II (25%), NuGlade (25%), Blue Moon (20%)

30% Perennial Rye: Accent, Goldkeeper

Rate: 3.5 lbs/1000 sq ft

If in an existing tall turf-type fescue lawn along roadways; Gridiron a blend of 90% tall turf-type fescue and 10% bluegrass, or Triple-A Tall fescue blend from the Seed Center.

Rate: 6-7 lbs/1000 sq ft.

## 32 92 19. SEEDING

.1 SEEDING shall be done either between August 15 and October 15, or between March 15 and May 20. The early fall period is preferred. If seeding must take place after May or October and the lawn requires a perennial rye and bluegrass mix, the seeding will be split. The perennial rye seed will be sown at the time scheduled and the bluegrass seed will be split, seeded over the same area in September.

.1.1 Seed: Seed with approved seed mix and rate (see 32 92 00.2 for seed selection); water if necessary for proper rate of germination. Areas that do not germinate must be reseeded and watered for establishment.

.1.2 Fertilizer: Fertilize at the time of seeding with 18-24-12 at a rate of 4 lbs. of fertilizer (by weight) per 1,000 sq. ft. or a similar analysis with one pound of phosphorus per 1,000 sq. ft. and low nitrogen. The fertilizer must be coded for slow release. Hand rake seed and fertilizer lightly into 1/2" of soil.

**32 90 00. PLANTING (Cont'd)**

- .1.3 Mulch: Straw must be clean, free from seedbearing stalks or roots of noxious weeds, evenly distributed at an approximate thickness of two straws with no piles of straw. Any area that has had too much straw must be redone with the removal of the straw, touch up grading, if necessary, and the proper depth of straw applied.
- .1.4 Cleanup: Clean off sidewalks of soil; sweep walks clean of straw, seed and fertilizer.
- .2 LAWN MULCH: Specify clean straw, free from seedbearing stalks or roots of noxious weeds, evenly distributed at an approximate thickness of two straws with no piles of straw. Hydro-mulch seeding and erosion control is usually preferred for large areas or sloping sites, subject to approval by the Director of Grounds Maintenance.
- .3 MAINTENANCE: Seeded, sodded and planted areas shall be contractor maintained (including watering, mowing and weed control) until acceptance by the University. Total cover of planted areas shall be guaranteed by the contractor.

**32 93 00. PLANTS**

- .1 GROUND COVERS: must be weeded during the establishment period by the contractor to prevent perennial weeds from becoming established the University takes over the maintenance of the beds.
  - .1.1 A pre-emergence can be applied at the time of planting to prevent the seeding in of new weeds.
  - .1.2 Perennial weeds must be sprayed with an herbicide to completely eradicate them from the bed.
  - .1.3. Spacing of the plant should be 3" - 6" o.c. to achieve coverage of the area during the first growing period. Planting should be watered regularly to promote establishment before the end of the warranty period.
- .2 SHRUBS: must be planted on appropriate spacing.
  - .2.1 All twine must be removed from the stems.
  - .2.2 Burlap must be pulled away from the stems and down 1/2 the ball.
  - .2.3 Nylon burlap must be totally removed.
  - .2.4 Backfill amendments (see trees .3.6)
  - .2.5 All shrubs must be evaluated and approved by the Director of Roads and Grounds or the University Landscape Architect prior to planting.
- .3 TREES: will be planted according to the planting detail in the appendix. No tree wrap is to be used. All mulch must be 2" away from the trunk of the tree. Mulch should be no thicker than 2". See 32 90 00.5 for type of mulch. The lip of the mound around the tree is to be no higher than 3". Forked trunks on trees are not acceptable; each tree must have one strong leader. Street trees must be limbed to 8 feet minimum.
  - .3.1 All trees that come in wire baskets must have the basket removed. All twine must be removed from the trunk of the tree.

**32 90 00. PLANTING (Cont'd)**

- .3.2 All trees that have burlap and are bound with twine, must have twine cut and the burlap pulled away from the trunk down to half of the ball.
- .3.3 All trees and shrubs that are bound in nylon burlap must have the burlap totally removed.
- .3.4 The stakes of all trees will be removed at the end of the guarantee period by the contractor.
- .3.5 No tree will be planted within 10' of a building or overhead structure unless approved by the University Landscape Architect.
- .3.6 Backfill amendments: Mix a starter fertilizer (high phosphorus, low nitrogen ratio) and terra-sorb (or equivalent) acrylamide copolymer for water retention; use product's rate of application per tree size.
- .3.7 All trees must be watered in thoroughly (using a root feeder to dispense the water) immediately after planting, and at 1 week intervals during the first 6 months of planting, Large caliper (3.5 - 6") need to be watered every week for the entire year.
- .3.8 All trees must be evaluated and approved by the Director of Roads and Grounds or the University Landscape Architect prior to planting.

**32 98 00. EXISTING TURF AND PLANT RESTORATION**

- .1 EXISTING LAWNS: Existing lawns must be restored when compacted during construction. Repair any ruts or depressions left by equipment or storage of material. Remove topsoil containing foreign materials resulting from contractors operations including oil drippings, fuel spills, stone, gravel and other construction materials, and replace with new topsoil. Mow, dethatch, core aerate at a rate of 9 holes per square foot and rake existing lawn. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides. Till stripped, bare and compacted areas to a soil depth of 6". Apply 1" Comtil over entire surface to be repaired. Slit seed using seed mix and rate appropriate to area (see section 32 92 00, Turf Grass Seed). Apply straw (see section 32 92 19, Seeding).
- .2 EXISTING SHRUBS: Existing shrubs within the construction area or staging area: replace or correctively prune if damaged during construction; prune to the height at the beginning of construction; weed/spray if weeds have grown up within the construction area and /or shrubbery.
- .3 EXISTING TREES: Existing trees: original grade maintained, no top fill greater than 2" from the original grade out of the drip line; minimal to no grading under the drip line.
- .4 RELEASE: Release of the restored area will be approved by the Superintendent of Grounds-Plant Material Section and the University Landscape Architect. The contractor will be recalled to provide a proper growing environment for the plant material.

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END OF DIVISION 32 - EXTERIOR IMPROVEMENTS