

## 02800 - Site Amenities

### Part 1: General

- 1.01 This section addresses site development issues including roads, streets, walks, parking, and other site amenities.

### Part 2: Design Guidelines - Roads & Streets

- 2.01 Campus Roads - Campus roads should be designed for 25mph design speed. Bus stops and transfer areas shall be designed as reinforced pavement areas.
- 2.02 Curbs & gutter - Use 6" standard curb and 24" gutter sections for campus streets and parking lots. Use rolled curb for medians and roundabouts to match the existing campus .
- 2.03 Pavement marking - All pavement marking in streets shall be thermoplastic. All crosswalks shall be block style.
- 2.04 Bus Stops - Bus Stops locations should be coordinated with NCSU Transportation Department. Bus stops should be accessible, sheltered, and have site amenities such as trashcans, benches, lighting, security phones, signage, and bike racks where appropriate. The style of bus shelters shall be approved by the University Architect. Bus shelters at Centennial Campus shall match existing. Exceptions shall be approved by the University Architect.
- 2.05 Cutting and Patching - When cutting and patching existing concrete paving, remove pavement to an existing control or expansion joint and re-pour the section to avoid small or linear patches through existing expanse of pavement.
- 2.06 All work should be performed in accordance with the NC Dept. of Transportation "Standard Specifications for Roads and Structures" July 1995 edition.

### Part 3: Design Guidelines - Parking

- 3.01 The University is committed to complying with the City of Raleigh Zoning Standards. Refer to City parking ordinances for additional information. The entire University is classified under academic space, which typically requires 1 parking space per 600 gsf of building. Parking requirements will be coordinated on a project-by-project basis with the Office of the University Architect and Facilities Planning & Design.
- 3.02 Parking - Parking spaces shall be designed according the City of Raleigh standards.
- 3.03 At locations where the sidewalk parallels a parking bay, the walk shall be a minimum width of 6 ft or a buffer strip for vehicle overhang shall be provided.
- 3.04 The University is also committed to maintaining or increasing its current parking facilities. Projects that impact existing parking will be required to implement parking remediation plans that replace the impacted spaces or other methodologies that maintain an equivalent parking service.

## Part 4: Design Guidelines – Walks

- 4.01 DESIGN CRITERIA - The designer is responsible for:
- a) Soil testing for sub-grade to determine that the sub-grade is suitable for the proposed walkway;
  - b) Identification of existing paving pattern and brick size; determination of the proposed pattern and brick size; how the brick pattern for new walkways will meet the old walkways;
  - c) Determination of soil compaction testing required for the project and including this in the estimate for the project budget;
  - d) Detailing how new walkways meet existing walkways?
  - e) Selection of the filter fabric to be used;
  - f) Recommendation to the Owner of brick paving samples submitted by the contractor. The samples shall be submitted to the designer, the designer will make a recommendation to the Owner; the Owner will approve the sample. The designer will relay the approval to the Construction Manager, who will in turn inform the Contractor.
- 4.02 The designer is responsible for specifying the size of the brick paver. Modular pavers are the campus standard for all new construction. For repair work, some existing walks are of non-modular pavers. The designer must specify the size of paver that shall be used.
- 4.03 Campus standard paving pattern is running bond in the direction of the walk.
- 4.04 Edge restraints consist of either a brick on end sailor course flush with the walk are required where lawn abuts the walkway, or a 2" height brick on end sailor course, where mulch abuts the walkway. Brick edging is to be set in a slush mortar bed.
- 4.05 2 % minimum slope required on all brick paving. Slopes less than this may require additional subsurface drainage. 2% maximum cross-slope allowed.
- 4.06 Special patterns and unit pavers other than brick may be integrated into the brick walks at building entrances, outdoor gathering places, and on the All Campus Path.
- 4.07 MATERIALS - Brick pavers - The campus standard for running bond walks is Pine Hall, 3-5/8" x 7-5/8" x 2-1/4", modular, full range, red flash pathway pavers.
- For pedestrian walkways: solid, hard-burned, red-flash, ASTM C 902, SX (durability standard, SX is used where the brick may be frozen while saturated with water), Pedestrian and Light Traffic Paving Brick. Do not use pavers with chips, cracks, voids, discolorations, or other defects, which might be visible in finished work.
- For heavy vehicular traffic: solid, hard-burned, red-flash, ASTM C 1272, Type F, Heavy Vehicular Paving Brick. Do not use pavers with chips, cracks, voids, discolorations, or other defects, which might be visible in finished work. The campus standard for vehicular paving is Pine Hall, 4" x 8", x 2-3/4" (For flexible base course applications), English Edge, heavy duty, full range, red flash pavers.
- For small repair jobs, salvage, and re-use existing brick pavers. If additional pavers are required to complete the repair, they must match in color and size, and be added to the old brick in a random distribution. If brick cannot be salvaged, new brick must match existing in size and color. Any reuse of brick pavers to be approved by the Brick Supervisor in Grounds Management.

4.08 Setting Bed Sand - Use ASTM C 33. Sand shall be free of salts and other deleterious materials to avoid efflorescence or staining.

Dry sand-cement mixes and crushed screenings from quarry operations are not acceptable.

4.09 Jointing Sand - Use ASTM C33. Sand shall be screened, with a maximum particle size of 1/16".

Sand shall be dry when used. Use white sand.

4.10 Filter Fabric - Filter fabric is non-woven drainage geo-textile, minimum 4-mil thickness.

Use Propex 4546 manufactured by Ikex Company or comparable product.

4.11 ABC Aggregate - The aggregate base course shall comply with Section 520 of the NCDOT Specifications.

Aggregate shall be a maximum diameter of 1-1/2" and conform to the graduation requirements of ASTM D-2940. See Aggregate Base Course Gradation Acceptance Ranges below:

Sieve Size	% Passing
1 1/2"	100
1"	75-97
1/2"	55-80
#4	35-55
#10	25-45
#40	14-30
#200a	4-12
#200b	4-10

4.12 Contractor must submit to NCSU Construction Manager proof that the aggregate for base is:

- a) from a NC DOT certified quarry
- b) a test certificate from the quarry indicating 100% maximum dry density
- c) a batch ticket from the quarry certifying that aggregate is ABC

4.13 METHODS - Brick Pavers - Match existing brick unless otherwise directed. Contractor shall provide brick samples to designer.

Widths of walks are nominal and do not require the cutting of brick to comply. Actual brick width of walk must be within one brick width, plus or minus.

Brick pavers shall be set 1/8" to 1/4" above finished grade.

Pavers shall be laid with a maximum 1/8" joint between pavers.

All pavers to be cut with a diamond-bladed brick saw or brick snapping tool specifically designed to produce an accurate clean straight cut. Broken edges caused by masonry hammers will not be acceptable. Do not use less than 1/2 brick in any pavement area.

The edges of adjacent pavers shall be flush.

Pavers adjacent to drainage inlets and channels shall not be lower than the top of the drain, and not more than ¼ inch above it.

Standing water in any brick area is unacceptable.

Where sidewalk abuts curb and gutter, no edge restraint is required.

Edge restraints consist of a brick sailor course, either level with adjacent sidewalk where lawn abuts sidewalk, or 2" above adjacent sidewalk where a mulched area abuts the sidewalk, set in a bed of mortar.

Edge restraints shall not restrict flow of water off the walk.

Edge restraints shall be installed before pavers are installed.

Irregular lines inconsistent with specified pattern will not be permitted.

Where existing brick pavers are to be reused, the bricks are to be carefully removed, stored on pallets, and reinstalled as needed. Bricks that are chipped, cracked, broken, or otherwise marred are not to be reused.

Where curb-cuts and accessible ramps are to be installed as a part of the project, increase size of concrete area at top of ramp as needed to avoid half or partial-brick rows of brick across top of ramp.

Refer to NC State's standard curb cut detail.

4.14 Sub-Grade - 95% compaction (of modified Proctor Density) is expected.

Compaction must be achieved by use of a self-propelled steel-wheeled vibratory compactor.

A Plate Tamper can be used if the area is less than 100 square feet.

Contractor will notify Construction Manager when sub-grade preparation is complete. The Construction Manager will approve the sub-grade preparation before the aggregate base course is applied.

The Construction Manager will verify that the sub-grade elevation is adequate to receive the specified full depth of aggregate base course required.

4.15 Filter Fabric - Filter fabric is always located between the aggregate base and sub-grade.

Filter fabric can also be placed between the aggregate base and the setting bed if so specified on plans.

Filter fabric shall overlap 12 inches at its ends.

The fabric shall be laid out smooth, and cut to match the paving area. It shall cover the base and extend up the sides of the excavation to the top of the setting bed material.

Specific membrane selection is the responsibility of the designer.

4.16 Aggregate base course - Minimum standard is an 8" depth. (Sub-base testing to **determine bearing strength** is required to alter the minimum standard depth).

NCDOT quarry certified ABC gravel is required. 98% compaction is required.

Install in 2, 4" maximum lifts. Wet and roll each 4" lift.

Contractor will notify Construction Manager when stone base course is applied and compacted and is ready for inspection. Do not apply filter fabric until directed by the Construction Manager. Construction Manager will coordinate compaction testing.

4.17 Sand Setting Bed - Sand setting bed shall be no more than 1” deep.

Do not prepare more than one day’s worth of sand setting bed. If any screeded bed is not paved by the end of the day, it should be removed and re-screeded the following day.

The sand shall be screeded approximately 1/8 inch to ¼ inch above the desired bed elevation to allow for compaction and settlement after the brick are installed.

Contractor will notify Construction Manager when sand setting bed is screeded, leveled, and ready for inspection, and will not apply brick pavers until directed by the Construction Manager.

Sweep sand over surface to fill all joints, and then work into place with a plate vibrator, continuing until joints are full. Tamp brick surface smooth. Refill joints with sand after tamping and tamp again. Repeat process until joints are filled.

4.18 Warranty - The contractor warrants brick pavement for one year dating from acceptance by the Owner. During the warranty period the contractor is required to sweep jointing sand over the new paving at the end of 30 days and 60 days from the acceptance date.

## Part 5: Design Guidelines - Miscellaneous Site Amenities

5.01 Flag Pole Site Criteria for Centennial Campus:

- One American Flag per open space (Courtyard, Green, pedestrian mall/street, etc).
- Accessible (meaning ADA and accessible in the sense that all using the open space feel “ownership” in the central open space, not in any one building’s “personal” space).
- Pole not to exceed 35’ height.
- Color and materials: clear satin finish aluminum pole, gold ball on top.
- Cleat lock box with halyard cover satin finish.
- Flag pole base on pavement, preferably contiguous with a walk or plaza surface.
- Any Dedication plaque commemorating a campus gift must be approved by Institutional History and Commemorations Committee.
- Ensure proper flag display etiquette is accomplished with the pole siting and flag display.
- For 24-hour flag display, the flag must have lighting.
- A request for a flagpole must be made by completing a Facilities Modification Request and including a site map with flagpole location and plans for pad and lighting as required.
- Complete specification sheet for poles and accessories must be provided.

5.02 Banner Location and Installation Guidelines:

- Encourage use of banners on light poles along street corridors such as Cates and Stinson or along the All Campus Path pedestrian ways with approval from Facilities Operations. (Locations on public ROW’s are under the City of Raleigh’s jurisdiction and must follow the city zoning requirements.)
- No penetration of exterior building facades, roof, columns, or poles with banner hardware is allowed.

- Banners attached to light poles must have a stationary bar at the top and bottom of the banner to avoid flapping and tangling in the wind. Banners must have wind slits to reduce wind loads on supporting poles. Banners may not be appropriate on poles that are not strong enough to handle the additional wind load. (This will be evaluated by FAC OPS). Banners may not block light from the light fixture.
  - Submit the design, wording, attachment method, proposed locations and duration to the Office of the University Architect (OUA) and FAC OPS for approval.
  - Banner Sponsor is responsible for expense of hanging the banners, removing them (by Facilities Operations only) at the agreed time and any damage to poles or facilities.
  - Banners must be removed immediately if torn, damaged, improperly installed, faded, or agreed duration is passed. (If not removed within 1 week of notification to remove FAC OPS will remove them at the Sponsor's expense.)
  - Banner request must follow the Facilities Modification Process.
- 5.03 Fountains, Pools, and Water Displays - The water containment areas of all water features shall be finished black. Avoid placing pool equipment in confined spaces as defined by OSHA.
- 5.04 Fences, Gates, & Hardware - All permanent chain link fencing and accessories shall be black vinyl coated.
- 5.05 Site, Street, & Mall Furnishings
- a) Benches - Benches other than the standard NC State redwood bench (see detail) shall be approved by the University Landscape Architect.
  - b) Outdoor Dining and Game Tables - Where practical; use dark color, vinyl coated small metal tables with integral benches/seats, single pedestal, permanently mounted. Size, color, and layout of tables must be approved by the University Landscape Architect.
  - c) Trash Cans - Howard H9 pierced metal, dark architectural bronze, trash containers. Mount to a dark architectural bronze metal post. In food service courts, outdoor fields, or other gathering areas, larger containers may be used (Howard H-55E). Trash cans shall not be mounted directly to building surfaces.
  - d) Ash Urns - Use Wausau #TF2040 -pre-cast brown weather stone, 14x12x24h, permanent colored, acrylic sealer, brass drain screen, washed sand, weight 230# for typical freestanding ashtrays. Alternate: "Smoker's Oasis" pots may also be used. Place on paved level surface, preferably undercover.
  - e) Bicycle racks - Bicycle racks shall be black vinyl-coated Sunshine Wave-Lok Bicycle Rack by U-Lok Corporation, or equal. Locate on paved pads and under cover where possible.
- 5.06 Exterior Paint - All utility boxes and covers shall be painted to match Dark Architectural Bronze. Handrails should not be painted. Handrails should be aluminum pipe with brushed natural finish.
- 5.07 Use of Color - The color NC STATE Red shall be used for way-finding signage and University image graphics only. Other exterior colors shall be approved by the Office of the University Architect.
- 5.08 Exterior Signage - All exterior signage shall conform to the University's exterior signage manual, North Carolina State University Campus Exterior Signage Program, dated December 30, 1996 (See Appendix XXX). Building and landscape renovations as well as new facilities should be evaluated for way-finding and ADA signage.

- 5.09 Outdoor sculpture - Outdoor sculpture selection and site selection shall be coordinated with the Director of the Gallery of Art and Design and the University Architect.

## Part 6 – Design Guideline – Bus Shelters

- 6.01 Shelter Type: Peak roof with approximate pitch of 1' rise to 2' run. Aluminum construction, Dark Architectural Bronze all surfaces. Glass panel walls. Nominal dimensions - 8' deep x 16' wide
- 6.02 Frame: Aluminum construction, adjustable, galvanized steel, mounting feet for easy on-site leveling. Mounting method to accommodate brick paving. Long lasting 3-mil powder coated finish, dark architectural bronze. Minimum wind load - 75mph. Minimum live load - 40 lbs./square foot. Structural and framing members - extruded aluminum, not less than 1/8" thick
- 6.03 Metal Roof: All aluminum, one piece construction, standing seam gable roof with fascia and integral gutter across opening. Powder coated finish to match shelter.
- 6.04 Walls: End walls - (2) panels 44" x 82", 3/8" tempered glass with white visibility safety dots. Rear walls -(4) panels as above with center post. Provide ventilation space at top and bottom of all panels. Adjustable glass clips. Open front.
- 6.05 Support Posts: Minimum post size - 3" X 3". Detail the posts, footings and adjustable supports for use with brick paving.
- 6.06 Map Frame: Ground mounted frame with integral tamperproof hardware. Provide visible copy area of 30" x 48". Stainless steel hinges with security screw locks. Map frame and supports to be powder coated to match shelter finish.
- 6.07 Lighting: Three (3) fluorescent fixtures shall be provided, including one (1) fixture for rear wall and one (1) fixture for each end wall. Internal conduit and wiring shall be installed at the factory to meet the requirements of the National Electrical Code. Shelter electrical system shall be designed to accept single point of external power connection.
- All electrical work shall meet the requirements of the latest edition of the National Electrical Code (NEC). Light fixtures shall be listed for **damp location** use by Underwriters Laboratory (UL), or approved testing agency. Fluorescent ballasts shall be cold weather rated electronic type to accept multi-tap input of 120 volts, 240 volts, or 277 volts. Lamps shall be 4' length, 32 watt, T8 fluorescent. Each fixture shall contain two (2) lamps. Lights shall have photocell control with approved main power disconnect switch. Minimum wiring size shall be #12 THHN/THWN solid copper. Separate copper ground wire shall be provided for all conduit. All conduit, junction boxes, wiring, fittings, and connections shall be installed to meet NEC requirements.
- 6.08 Trash Receptacle: (2) 10 galleon perforated steel containers (Howard H-9 or equal). Color to match shelter. Include hardware to attach to shelter posts.
- 6.09 Warranty: Shelters shall be guaranteed against any defects in material and/or workmanship for one full year from time of delivery.
- 6.10 Shop drawings: Upon award of the contract, the vendor shall submit shop drawings, complete with footing detail and electrical drawings, and sealed by a Registered Professional Engineer, licensed in the State of North Carolina.

END OF SECTION 02800 – SITE AMENITIES