

DIVISION 26 – ELECTRICAL

26 00 00 ELECTRICAL

26 01 00 Operation and Maintenance of Electrical Systems

26 01 10 Operation and Maintenance of Medium-Voltage Electrical Distribution

Outage Scheduling (Rev 11-15-2018)

26 01 20 Operation and Maintenance of Low-Voltage Electrical Distribution

26 01 26 Maintenance Testing of Electrical Systems

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26 01 50 Operation and Maintenance of Lighting

26 01 50.51 Luminaire Relamping

26 01 50.81 Luminaire Replacement

26 05 00 Common Work Results for Electrical

Consultant Design Guideline

Building Service Entrance (Rev 11-15-2018)

Electrical Load Calculations:

- 1.01 General: The electrical system designer shall calculate the estimated peak building demand for electricity. The calculated peak demand shall consider load diversity. The calculations shall identify the peak electrical demand associated with each energy system including air handling systems, heating water system, chilled water system, domestic hot water system, elevators, exhaust fans, interior lighting, exterior lighting, and miscellaneous equipment¹. The electrical system designer shall also determine the appropriate capacity of the building primary transformer.
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26 05 13 Medium-Voltage Cables

CONSULTANT DESIGN GUIDELINE

Rate all primary cables at 15,000 volts. Rate all distribution transformers at 15,000-volt primary with a nominal center tap voltage rating of 12,470 volts

INCLUDE IN CONSTRUCTION DOCUMENTS

Specify all cables inside tunnels to be galvanized steel interlocked armor with a ground and jacket or single conductors in rigid galvanized steel conduit.

All buried medium voltage electrical shall have PVC conduit encased in red concrete at 30", minimum, depth.

Specify high voltage caution signs to be placed on all high voltage splice and pull boxes.

All primary electrical feeder terminations in the switchgear transformer cubical, etc., shall have dead front construction.

All new building construction or renovation that involves replacement or upgrade of the medium voltage switchgear or replacement of the primary transformers shall include a means of providing the building with a looped primary feed. The switch shall have a minimum of three ways: loop in, loop out, and building feed. Coordinate the design with Facilities Management to include appropriate duct bank access to the switch for future growth.

END SECTION

26 05 13.13 Medium-Voltage Open Conductors

26 05 13.16 Medium-Voltage, Single and Multi-Conductor Cables

SECTION 26 05 19
LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
(600 VOLTS AND BELOW) (Revised 08/28/2018)

CONSULTANT DESIGN GUIDELINE

Minimum size for all conductors other than control wiring shall be #12.

Cable and wire shall be new, unspliced, annealed copper. **Aluminum conductors shall not be allowed.** Cable and wire shall be stranded for sizes #8 and larger and shall be solid for sizes #10 and smaller.

Insulation shall be THW, XHHW, or dual rated THHN-THWN, UL 44, 83 and 493.

Controls, communication, and signal wiring shall be stranded copper and shall conform to the recommendations of the manufacturers of the particular systems. Unless otherwise specified in other sections of these specifications, size control wiring as specified for power and lighting wiring, except that the minimum size shall be not less than #16. Multi-conductor cables shall have the conductors color-coded.

INCLUDE IN CONSTRUCTION DOCUMENTS

Splice and joint connectors shall comply with UL 486 A, B, D, and NEC.

Connectors for branch circuits (#10 and smaller) shall be solderless, screw-on, reasonable pressure cable type, 600 volt, 105 degree C. with integral insulation, approved for copper conductors. The integral insulator shall have a skirt that completely covers the stripped wires.

Connectors for feeder circuits shall be as follows:

Connectors shall be indent, hex screw, or bolt clamp-type of high conductivity and corrosion-resistant material.

Field installed compression connectors for cable sizes 250 MCM and larger shall have not less than two clamping elements or compression indents per wire.

Insulation materials for splices and joints shall be approved for the particular use, location, voltage, and temperature. Insulate with not less than that of the conductor level that is being joined.

Plastic electrical insulating tape shall comply with Fed Spec HH-I-595. Tape shall be flame retardant and cold weather resistant.

Wire lubricant shall be suitable for the wire insulation and conduit it is used with, and shall not harden or become adhesive. Prohibit wire lubricant on wire for isolated type electrical power systems.

EXECUTION

Install all wiring in raceway systems.

Install cable supports for all vertical feeders in accordance with the NEC. Provide split wedge type, which firmly clamps each individual cable and tightens due to cable weight.

For panelboards, cabinets, wireways, switches, and equipment assemblies, neatly form, train, and tie the cables in individual circuits.

Seal cable and wire entering a building from underground between the wire and conduit, where the cable exits the conduit, with a non-hardening approved compound.

Color-code secondary service, feeder, and branch circuit conductors as follows:

<u>PHASE</u>	<u>120/208 or 120/240</u>	<u>277/480</u>
A	Red	Brown
B	Blue	Orange
C	Black	Yellow
Neutral	White *	Gray
Ground	Green	Green

*or white with colored (other than green) tracer.

For phase conductors #8 and larger, color code using one of the following:

Solid color compound or solid color coating.

Stripes, bands, or hash marks of color specified above.

Color as specified using ¾" wide tape. Apply tape in half overlapping turns for a minimum of three inches for terminal points, and in junction boxes, pull boxes, troughs, manholes, and handholes. Apply the last two laps of tape with no tension to prevent possible unwinding. Where cable markings are covered by tape, apply tags to cable stating size and insulation type.

For modifications and additions to existing wiring systems, color-coding shall conform to the existing wiring system.

Splice cables and wires only in outlet boxes, junction boxes, pull boxes, manholes, or handholes. No splices shall be concealed within conduit. The number, size, and combination of conductors shall be in strict compliance with listed guidelines on the connector manufacturer's packaging. Splices and terminations shall be mechanically and electrically secure.

Control voltage (24 V, maximum) conductors may be installed without conduit above lay-in ceilings with permission from local authority having jurisdiction. The following conditions must be met:

Conductors shall be neatly bundled and "zip tied" to bottom chord of joists or to conduit on ten foot intervals. Conductors shall not be laid loosely on ceiling tiles.

All wiring in utility rooms and closets shall be neatly bundled and "zip tied" to nearest available strut, conduit, or pipe. Where no strut, conduit, or pipe is available, install wire in plastic raceway.

Install all wiring in walls, above gypsum board ceilings, or in occupied areas that have no ceiling in conduit.

Size wire sufficiently large that the voltage drop under in rush conditions does not adversely affect operation of the controls (maximum of 3% volt drop from source of power to end use).

Except where otherwise required, install a separate power supply circuit for each system in order that malfunctions in any system will not affect other systems.

Where power supply circuits are not shown for systems, connect them to the nearest panelboards of suitable voltages, which are intended to supply such systems and have suitable spare circuit breakers or space for installation.

Install a breaker lock on the branch circuit breaker for the power supply circuit for each system to prevent accidental de-energizing of the systems.

Install insulated crimp type forked lugs on control wiring that is to be connected to terminal strips. Size lugs properly for both the wire and the terminal strip. Use forked lugs unless the controls manufacturer specifies ring type.

Install a permanent wire marker on each wire at each termination. Identifying numbers and letters on the wire markers shall correspond to those on the wiring diagrams used for installing the systems.

In each pull box and junction box, install metal tags on each circuit cables and wires to designate clearly their circuit identification and voltage.

Feeders and branch circuits shall have their insulation tested after installation and before connection to utilization devices such as fixtures, motors, or appliances. Test shall be performed by meter and conductors and shall test free from short-circuits and grounds. Test conductors phase-to-phase and phase-to-ground. Meter motors after installation but before start-up and test free from grounds.

END SECTION

26 05 19.13 Under Carpet Electrical Power Cables

26 05 23 Control-Voltage Electrical Power Cables

26 05 26 Grounding and Bonding for Electrical Systems

26 05 29 Hangers and Supports for Electrical Systems

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS (Rev 08/28/2018)

CONSULTANT DESIGN GUIDELINE

Install all wiring in conduit.

Conduit shall be rigid, galvanized, heavy wall steel, for sizes 2½" and larger. Conduit less than 2½" in diameter shall be electrical metallic tubing (EMT), except where installed in slabs on grade, underground, building exterior, or where prohibited by Code, in which case rigid metallic conduit as described above shall be used.

At the Contractor's option, rigid aluminum conduit may be used in lieu of rigid steel conduit in sizes 2½" and larger, except aluminum conduit shall not be buried in concrete or directly in earth.

At the Contractor's option, PVC conduit may be used for underground conduit runs in the horizontal portion only. Rigid metallic conduit shall be required for elbows and vertical transitions for all underground conduit installations.

At the Contractor's option, conduit 2½" and larger may be electrical metallic tubing (EMT) only in interior applications where the conduit is installed concealed within the building ceiling space and non-masonry wall constructions.

INCLUDE IN CONSTRUCTION DOCUMENTS

Conduit size shall be in accordance with the NEC, but not less than ¼" unless otherwise shown. Where permitted by the NEC, ½" flexible conduit may be used for tap connections to recessed lighting fixtures and ¾" flexible conduit may be used for tap connections to handy boxes in existing walls. (Rev 08/28/2018)

Conduit shall not be required for control voltage conductors except fire alarm system wiring system shall have red anodized EMT conduit. (Rev 08/28/2018)

Design pipe straps specifically for use with electrical conduit; "plumbers tape" shall not be accepted. Design individual conduit hangers for the purpose, having a pre-assembled closure bolt and nut, and provisions for receiving a hanger rod. Multiple conduit (trapeze) hangers shall not be less than 1½" by 1½", 12 gauge steel, cold-formed, lipped channels; with not less than (¾)" diameter steel hanger rods. Solid masonry and concrete anchors shall be steel collet type. Wooden dowels and plastic type anchors shall not be acceptable. Design clamps to be used for attaching to beams, trusses, and joists. Clamps designed to be used for attaching to piping, lay-in ceiling grid, etc. shall not be acceptable.

Outlet, junction, and pull boxes shall comply with UL 50 and UL 514A. Boxes shall be cast metal where required by the NEC or shown, and equipped with rustproof box covers. Sheet metal boxes shall be galvanized steel except where otherwise shown.

Wireways shall be equipped with hinged covers, except where removable covers are shown. All cover assemblies shall contain captive retaining screws.

EXECUTION

Cut holes through concrete and masonry in new and existing structures with a diamond core drill or concrete saw. Pneumatic hammer, impact electric, hand or manual hammer type drills are not allowed, except where permitted by the Engineer as required by limited working space.

Where conduits, wireways, and other electrical raceways pass through fire partitions, firewalls, smoke partitions, or floors, install a fire stop that provides an effective barrier against the spread of fire, smoke and gases with approved materials. Completely fill and seal clearances between raceways and openings with the fire stop material.

At floor, exterior wall, and roof conduit penetrations, completely seal clearances around the conduit and make watertight.

Contractor shall furnish and install all sleeves and inserts for all electrical work passing through, or attaching to, walls, floors, or ceilings. Install conduits passing through designated fire/smoke rated structure with appropriately rated sleeves and inserts to maintain the integrity of the rated wall/floor/ceiling structure. Installation shall conform to NFPA, NEC, and U.L. standards.

Install essential (emergency) raceway systems independently of other raceway systems, excluding those specifically "excepted" by NEC.

Install conduit as follows:

Install conduit in complete runs before pulling in cables or wires.

Assure conduit installation does not encroach into the ceiling height headroom, walkways, or doorways.

Conduit shall be mechanically and electrically continuous.

Independently support conduit. Do not support conduit with suspended ceilings, suspended ceiling supporting members, lighting fixtures, mechanical piping, or mechanical ducts.

Support conduit within 12" of changes of direction, and within 12" of each enclosure to which connected.

Conduit installations under fume and vent hoods are prohibited.

Install conduit in concrete as follows:

Conduit shall be rigid steel or EMT; except do not install EMT in concrete slabs that are in contact with soil, gravel or vapor barriers.

Align and run conduit in direct lines parallel or perpendicular to building lines.

Prohibit installation of conduit in concrete that is less than 3" thick.

Prohibit conduit outside diameter larger than $\frac{1}{4}$ of the slab thickness.

Space between conduits in slabs shall be approximately six conduit diameters apart, except one conduit diameter at conduit crossings.

Install conduits approximately in the center of the slab so that there will be a minimum of $\frac{3}{4}$ " of concrete around the conduits.

Couplings and connections shall be watertight. Use thread compounds that are UL approved conductive type to insure low resistance ground continuity through the conduits.

Use flexible metal conduit for connections to motors and other electrical equipment subject to movement, vibration, misalignment, cramped quarters, or noise transmission. Provide liquid-tight flexible metal conduit for installation in exterior locations, moisture or humidity-laden atmosphere, corrosive atmosphere, water, or spray wash-down operations, and locations subject to seepage or dripping of oil, grease, or water. Provide a green ground wire with flexible metal conduit.

Equip conduits three inches and larger, that are rigidly secured to the building structure on opposite sides of a building expansion joint, with expansion and deflection couplings. Install the couplings in accordance with the manufacturer's recommendations. Provide conduits smaller than 3" with junction boxes on both sides of the expansion joint. Connect conduits to junction boxes with 15" of slack flexible conduit. Flexible conduit shall have a copper green ground bonding jumper installed. In lieu of this flexible conduit, expansion and deflection couplings as specified above for 3" and larger conduits are acceptable.

Use wire mold raceway, or equal, for work on existing masonry walls in finished areas. Anchor wire mold on 30" centers. Size wire mold as per manufacturer's guidelines.

In areas where Contractor is having trouble installing concealed wiring and/or conduit, consult the Architect about using wire mold.

END SECTION

26 05 36 Cable Trays for Electrical Systems

Tunnels (Rev 11-15-2018)

26 05 39 Underfloor Raceways for Electrical Systems

26 05 43 Underground Ducts and Raceways for Electrical Systems

26 05 46 Utility Poles for Electrical Systems

26 05 48 Vibration and Seismic Controls for Electrical Systems

26 05 53 Identification for Electrical Systems

Identification of equipment

Identification/tagging/tracking of equipment that requires preventive maintenance, on some periodicity, to maximize its operational lifespan is essential. If the equipment will never require any service it need not be entered into our system. Our primary concern is to identify equipment (including mechanical, electrical, and plumbing) that needs to be checked and serviced on a regular basis. An online form [link provided below] facilitates entry of all information needed to input and track equipment in the UA Facilities Management Department's Computerized Maintenance Management System (CMMS). The following process, business rules, and information requirements apply.

INFORMATION NEEDED

1. Barcode tag number
2. Equipment nomenclature
3. Manufacturer
4. Model
5. Serial number (if available)
6. Building name
7. Room number
8. Recommended preventive maintenance procedures and frequencies (i.e. monthly, quarterly, semi-annually, annually)
9. Parts requirements for procedures/frequencies stated in item eight
10. Special conditions for access, unusual tools needed, et cetera should be noted in comments
11. If project is a renovation rather than new construction, report removed equipment by its (old) barcode tag number or by completing items two through seven of a data entry form for each piece of equipment being removed

Link for the new equipment entry form for contractors to use to enter newly installed equipment on campus:

<http://facilities.uark.edu/Forms/NewEquipmentEntryForm.htm>

PROCESS

1. Consult business rules on how newly installed building components and equipment are categorized in FAMIS to determine new equipment count
2. Acquire the necessary number of barcode tags from the Facilities Management CMMS Administrator
3. Tag equipment and complete associated data entry forms

4. If project is a renovation rather than new construction, report removed equipment, by FAMIS number or by completed data entry form, to the Facilities Management CMMS Administrator
5. Supply all applicable digitized owner's manuals, user's manuals, maintenance manuals, parts lists, et cetera to the Facilities Management Construction Coordinator who will then give a copy to the Facilities Management CMMS Administrator.
6. Resolve data discrepancies identified by the Facilities Management CMMS Administrator

B U S I N E S S R U L E S

1. Components that are cheaper to replace than maintain will not be included
 - a. If in doubt, err on the side of identifying and documenting Components
2. Systems or Components with a minimum maintenance frequency of greater than one year will not be included
 - a. If in doubt, err on the side of identifying and documenting Systems and Components
3. All inventory items will receive a new metal barcode tag
4. Barcode tags will be affixed using self-adhesive unless the inventory item is located outside or there is not an appropriate surface for adhesion
5. Use plastic zip ties or wire twist ties to affix the barcode tags to items described in the previous rule
6. Major Components of Parent Systems will be labeled according to the following rules:
 - a. The Major Component has a replacement value of \geq \$500
 - b. The frequency with which the Major Component is repaired/replaced is greater than the life of the Parent System
 - c. The Pump or Motor (Major Component) is \geq 2 HP (This does not include Sump Pumps. Inventory all Sump Pumps)
 - d. The Equipment ID of the Parent System shall be recorded accordingly on the Inventory Template of the Major Component that is being barcoded
7. Barcode and record all Heat Pumps, Evaporators and Condensing Units individually if their capacity exceeds 5 tons
8. Please record the following inventory items on a per floor basis, using one barcode tag per floor. Record locations of individual units and any unusual access or tool requirements individually in comments.
 - a. Fan Coil Units
 - b. Exit Lighting & Emergency Egress Lighting
 - c. Eye Wash Stations
 - d. Emergency Showers
 - e. Electronic Handicapped Access Door Operators

9. Please record the following inventory items on a per building basis, using one barcode tag per category. Record locations of individual units and any unusual access or tool requirements individually in comments.

- a. Emergency Egress Doors
- b. Heat Pumps, Evaporators and Condensing Units with a capacity of ≤ 5 tons
- c. Bathrooms
- d. Drinking Fountains
- e. Recirculating Pumps
- f. Interior Doors
- g. Fire Doors

10. Major Systems or Components (i.e. Elevators and Sprinkler Risers) of value \geq \$1,000 shall be considered an inventory item even if the PM is outsourced

11. All Regulatory Code Reporting Items, such as backflow protection devices, expansion tanks, flash tanks, and steam converters) shall be included in the inventory
12. Individual pumps in duplexed configurations shall each be tagged as individual pieces of equipment. Note duplexed installations in comments.

End of Section

26 05 73 Overcurrent Protective Device Coordination Study

ARC FLASH STUDY (Rev 11-15-2018)

Consultant Design Guideline

It is the intent of the University of Arkansas to comply with the Arc Flash requirements as provided for in NFPA 70E, Standard for Electrical Safety in the Workplace. The responsibilities and scope of work for design professionals and contractors for major renovation and new construction projects are to deliver to the University at the time of turnover, a system that fulfills the labeling requirements under the standard (See Appendix W for this standard), and that meet the analysis criteria as specified in IEEE Standard 1584.

The consultant specifications shall require the general contractor to deliver a completed arc flash study stamped by a professional engineer, complete with both electronic and hard copy report. The deliverable shall also include the electronic computer modeling files for the fault current, coordination, and arc flash calculations. The University prefers that the analysis be performed using SKM xxx, by Company, though it is not a requirement.

The consultant specification shall be structured to require a two step analysis process. The first step shall be based on the approved electrical equipment supplier submittal documents and reasonable assumptions for the installed condition. The model shall be run for the final deliverable report based on the as built condition, using actual cable lengths and the approved coordination protective device settings prior to the generation and installation of Arc Flash labeling.

The University can assist during the design process to insure that the contract documents comply with the requirements of this section. The UofA Will provide the available fault current at the MV Service entrance based on the current version of the campus power distribution fault current & protective device coordination model. (Rev 11-15-2018)

26 06 00 Schedules for Electrical

26 06 10 Schedules for Medium-Voltage Electrical Distribution

26 06 20 Schedules for Low-Voltage Electrical Distribution

26 06 20.13 Electrical Switchboard Schedule

26 06 20.16 Electrical Panelboard Schedule

26 06 20.19 Electrical Motor-Control Center Schedule

26 06 20.23 Electrical Circuit Schedule

26 06 20.26 Wiring Device Schedule

26 06 30 Schedules for Facility Electrical Power Generating and Storing Equipment

26 06 40 Schedules for Electrical and Cathodic Protection Systems

26 06 50 Schedules for Lighting

26 06 50.13 Lighting Panelboard Schedule

26 06 50.16 Lighting Fixture Schedule

26 08 00 Commissioning of Electrical Systems

26 09 00 Instrumentation and Control for Electrical Systems

26 09 13 Electrical Power Monitoring and Control

26 09 23 Lighting Control Devices (Rev 08/28/2018) Note: this section of the A&E is a "DRAFT", check with FAMA Dept.

PART 1. GENERAL

Performance criteria and goals for sustainable and energy-efficient new and major renovation buildings to follow ASHRAE 90.1 2007, as adopted by the State of Arkansas in April 2009. Buildings must be designed, constructed, and certified to at least 10% reduction below the baseline energy consumption determined by the performance rating method of Appendix G of ASHRAE 90.1 2007.

Lighting Control Manufacturer shall be Lutron Electronics or Facilities Management approved equivalent.

Wireless lighting controls shall be considered on renovation projects for system flexibility and ease of installation. Wireless shall have a minimum communication range of 30 feet through construction material and 60 feet line of sight.

Warranty: Provide a minimum two year warranty to include 100-percent replacement parts coverage and 100-percent manufacturer labor coverage to troubleshoot and diagnosis a lighting issue. Telephone technical support to be available 24 hours per day, 7 days per week, excluding manufacturer holidays.

PART 2. INCLUDE IN CONSTRUCTION DOCUMENTS

All lighting controls shall meet ANSI/ESD S20.20, NECA 130, UL 20, UL 1472, and NFPA 70. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.

All wired occupancy sensors shall have the following features:

Capable of sensing both major motion (such as walking) and minor motion (such as small desktop level movements) according to published coverage areas, for automatic control of load indicated.

Sensor technology: Passive Infrared/Ultrasonic Dual Technology

Provide LED to visually indicate motion detection with separate color LED for each sensor type in dual technology units.

Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.

Field configurable turn-on and hold-on activation with settings for activation by either or both sensing technologies.

Turn-off Delay: Field adjustable, up to a maximum time delay setting of not less than 15 minutes and not more than 30 minutes.

Power Packs for Low Voltage Occupancy Sensors: Plenum rated, self-contained low voltage class 2 transformer and relay compatible with specified low voltage occupancy sensor for switching of line voltage loads. Input supply voltage shall be dual rated for 120/277V. Provide quantity and configuration of power and slave packs with all associated wiring and accessories as required to control the load indicated on the drawings.

Where wired sensors are indicated, wireless sensors are acceptable provided that all components and wiring modifications necessary for proper operation are included.

All wireless occupancy sensors shall have the following features:

Does not require external power packs, power wiring, or communication wiring.

Power: Battery-operated with minimum ten-year battery life.

Capable of being placed in test mode to verify correct operation from the face of the unit. Provides a clearly visible method of indication to verify that motion is being detected during testing and that the unit is communicating to compatible RF receiving devices.

Sensing Mechanism: Passive infrared (PIR) coupled with technology for sensing fine motions.

Provide temporary mounting means for drop ceilings to allow user to check proper performance and relocate as needed before permanently mounting sensor. Temporary mounting method to be designed for easy, damage-free removal.

Programmable to operate as an occupancy sensor (automatic-on and automatic-off), or a vacancy sensor (manual-on and automatic-off).

Turn-off Delay: Field adjustable, up to a maximum time delay setting of not less than 15 minutes and not more than 30 minutes.

All in-wall occupancy sensors shall have the following features:

Designed for installation in standard wall box at standard wall switch mounting height with a field of view of 180 degrees, integrated manual control capability, and no leakage current to load in off mode.

Manual-Off Override Control: When used to turn off load while in automatic-on mode, unit to revert back to automatic mode after no occupant presence is detected during the delayed-off time interval.

Passive Infrared (PIR): Capable of detecting motion within an area of 900 square feet.

All wired daylighting controls shall have the following features:

System Description: Control system consisting of photo sensors and compatible control modules and power packs, contactors, or relays as required for automatic control of load indicated according to available natural light; capable of integrating with occupancy sensors and manual override controls.

Daylighting Control Dimming Modules for Low Voltage Sensors: Low voltage class 2 control unit compatible with specified photo sensors and with specified dimming ballasts/drivers, for both continuous dimming of compatible dimming ballasts/drivers and switching of compatible power packs, contactors, or relays in response to changes in measured light levels according to selected settings

Operation: Unless otherwise indicated, specified load to be continuously brightened as not enough daylight becomes available and continuously dimmed as enough daylight becomes available. Load to be turned off when available daylight is sufficient to fully dim the load.

Power Packs for Low Voltage Daylighting Control Modules: Plenum rated, self-

contained low voltage class 2 transformer and relay compatible with specified low voltage daylighting control modules for switching of line voltage loads. Input supply voltage shall be dual rated for 120/277V. Provide quantity and configuration of power and slave packs with all associated wiring and accessories as required to control the load indicated on the drawings.

Where wired sensors are indicated, wireless sensors are acceptable provided that all components and wiring modifications necessary for proper operation are included.

All wireless daylighting controls shall have the following features:

Does not require external power packs, power wiring, or communication wiring.

Power: Battery-operated with minimum ten-year battery life.

Partially shielded for accurate detection of available daylight to prevent fixture lighting and horizontal light component from skewing sensor detection.

Provide linear response from 2 to 150 footcandles.

Provide temporary mounting means for drop ceilings to allow user to check proper performance and relocate as needed before permanently mounting sensor. Temporary mounting method to be design for easy, damage-free removal.

All Wall Dimmers and Switches shall have the following features:

Provide control stations of type, rating, and configuration as indicated or as required to control the loads as indicated.

Surge Tolerance: Designed and tested to withstand surges of 6,000V, 200 amps according to IEEE C62.41.2 without impairment to performance.

Dimmers: Provide full range, continuously variable control of light intensity.

For wireless controls: Communicates directly to compatible RF receiving devices through use of a radio frequency communications link. Allows for easy reprogramming without replacing the unit. Does not require external power packs, power, or communication wiring. Capable of being mounted with a table stand or directly to a wall under a faceplate. Battery-operated with a minimum ten-year battery life.

PART 3 EXECUTION

Electrical Contractor shall install products in accordance with manufacturer's instructions.

Within the design intent, reasonably minor adjustments to locations of sensors may be made in order to optimize coverage and avoid conflicts or problems affecting coverage.

Ensure that daylight sensor placement minimizes sensor view of electric light sources. Locate ceiling-mounted and luminaire-mounted daylight sensors to avoid direct view of luminaire.

Manufacturer's startup services may or may not be required. Check with manufacturer.

END OF SECTION

- 26 09 26 Lighting Control Panelboards
- 26 09 33 Central Dimming Controls
 - 26 09 33.13 Multichannel Remote-Controlled Dimmers
 - 26 09 33.16 Remote-Controlled Dimming Stations
- 26 09 36 Modular Dimming Controls
 - 26 09 36.13 Manual Modular Dimming Controls
 - 26 09 36.16 Integrated Multipreset Modular Dimming Controls
- 26 09 43 Network Lighting Controls
 - 26 09 43.13 Digital-Network Lighting Controls
 - 26 09 43.16 Addressable Fixture Lighting Control
- 26 09 61 Theatrical Lighting Controls

26 10 00 Medium-Voltage Electrical Distribution

26 11 00 Substations

- 26 11 13 Primary Unit Substations
- 26 11 16 Secondary Unit Substations

26 12 00 Medium-Voltage Transformers

- 26 12 13 Liquid-Filled, Medium-Voltage Transformers
- 26 12 16 Dry-Type, Medium-Voltage Transformers
- 26 12 19 Pad-Mounted, Liquid-Filled, Medium-Voltage Transformers

26 13 00 Medium-Voltage Switchgear

- 26 13 13 Medium-Voltage Circuit Breaker Switchgear
- 26 13 16 Medium-Voltage Fusible Interrupter Switchgear
- 26 13 19 Medium-Voltage Vacuum Interrupter Switchgear

26 18 00 Medium-Voltage Circuit Protection Devices

- 26 18 13 Medium-Voltage Cutouts
- 26 18 16 Medium-Voltage Fuses
- 26 18 19 Medium-Voltage Lightning Arresters
- 26 18 23 Medium-Voltage Surge Arresters
- 26 18 29 Medium-Voltage Reclosers
- 26 18 33 Medium-Voltage Enclosed Bus
- 26 18 36 Medium-Voltage Enclosed Fuse Cutouts
- 26 18 39 Medium-Voltage Motor Controllers

SECTION 26 20 00

LOW VOLTAGE ELECTRICAL DISTRIBUTION (Rev 11-15-2018)

CONSULTANT DESIGN GUIDELINE

Generally, the contractor will furnish and install transformer, primary cables, secondary cable connectors, C.T.'s, and metering equipment. The contractor will make secondary cable connections to the transformer. There may be cases where the new facility is being constructed outside the limits of the UofA power grid. In those cases primary voltage transformers and connections may be provided by the electric service company.

Coordinate all service and metering details:

Southwestern Electric Power Company (SWEPCO)
A unit of American Electric Power
101 W. Township Street
Fayetteville, Arkansas 72702
(479) 973-2324

The University of Arkansas has a good relationship with SWEPCO and we advise early conversation with the power provider to coordinate all aspects of the new design.

If the facility is not going to be on the UofA electric power grid, the local power company will determine metering requirements based on the electrical service entrance size. Coordinate the exact metering requirements with the local power company prior to start of construction.

Contractor shall furnish written confirmation to architect/engineer regarding available fault current prior to connection of service (amps interrupting capacity-AIC). Information shall include AIC-RMS line to line and line to neutral at service transformer secondary connections.

Contractor shall be responsible for all fees and charges incurred for the installation and/or modification of the electrical service as required by the General Contractor. Contractor shall include these fees and charges in the electrical base bid.

END OF SECTION

26 21 00 Low-Voltage Overhead Electrical Power Systems

26 22 00 Low-Voltage Transformers

26 22 13 Low-Voltage Distribution Transformers

26 22 16 Low-Voltage Buck-Boost Transformers

26 22 19 Control and Signal Transformers

26 23 00 Low-Voltage Switchgear

26 23 13 Paralleling Low-Voltage Switchgear

26 24 00 Switchboards and Panelboards

SECTION 26 24 13 SWITCHBOARDS

CONSULTANT DESIGN GUIDELINE

Acceptable manufacturers shall be Challenger, Cutler-Hammer, Siemens, Square D, or Facilities Management approved equal.

INCLUDE IN CONSTRUCTION DOCUMENTS

Provide submittal data for the following:

Manufacturer and model:

Housing, Buses, and Breakers.

Type 1 switchboard shall be front accessible with the following features:

Main breaker shall be individually mounted and compartmentalized.

Feeder breakers shall be panel mounted.

Section alignment shall be as shown on the manufacturers' data.

Main section line and load terminals shall be accessible from front and side. Distribution section line and load terminals shall be accessible from the front. Bus connections shall be accessible from the front and end.

Switchboard shall have bolted line and load connections.

Wiring gutter covers shall be full height for access to wiring terminals.

Provide a completely enclosed steel enclosure not less than the gauge required by the standards. The enclosure is to consist of the required number of vertical sections bolted together to form one metal enclosed rigid switchboard. Cover the sides, top, and rear with removable screw on sheet steel plates.

Provide ventilating louvers where required to limit the temperature rise of current carrying parts. Protect all openings against entrance of falling dirt, water, or foreign matter.

Buses shall be arranged for 3-phase, 4-wire distribution. Main phase buses (through bus), full size neutral bus, and ground bus shall be full capacity the entire length of the switchboard. Provide for future extensions by means of boltholes or other approved method. Brace the bus to withstand the available short circuit current at the particular location as shown on the drawings. No magnetic material shall be between buses to form a magnetic loop.

Buses and connections shall be hard drawn copper. Bus temperature rise shall not exceed 65^o C. Current density shall not exceed 1200 amperes per square inch for copper. Size section busing based on the sum total of breakers served to permit operation of each unit at not less than 125 percent of its trip rating or 50 percent of the frame size, whichever is greater.

Provide bare bus and mount on insulated bus supports. Provide neutral disconnect link to permit isolation of neutral bus from the common ground bus and service entrance conductors.

Provide un-insulated ¼" x 2" copper equipment ground bus bar the length of the switchboard and secure at each section.

Connect an un-insulated ¼" x 2" copper bus between the neutral and ground buses to establish the system common ground point.

Provide 20%, minimum, space for future.

Where draw out circuit breakers are provided, furnish a portable elevating carriage or switchboard-mounted device for installation and removal of the breakers.

Control wiring shall be 600-volt class B stranded SIS. Install all control wiring complete at the factory adequately bundled and protected. Wiring across hinges and between shipping units shall be class C stranded. Size wire in accordance with NEC. Provide control circuit fuses.

Main breakers shall be low voltage AC power type, dead front, stored energy with solid-state trip devices. Arcing contacts shall be renewable.

Rating shall be 3-pole, 600 volts AC, 60-cycle with frame size, trip rating, system, voltage, and interrupting rating as shown on the drawings.

Provide draw out mounting for breakers over 1600 amperes and where shown on the drawings. A racking mechanism shall position and hold the breaker in the connected, test, and disconnect positions. An interlock shall prevent movement into or out of the connected position unless the breaker is tripped open.

Provide an indicator visible from the front of the unit to indicate whether the breaker is open or closed.

Provide a mechanical trip button accessible from the front of the door to trip the breaker.

Include provisions for padlocking the breaker in the open position.

Manually operate breakers 1600-ampere frame size and less.
Electrically operate breakers larger than 1600-ampere frame size

END SECTION

26 24 16 Panelboards

26 24 19 Motor-Control Centers

26 25 00 Enclosed Bus Assemblies

26 26 00 Power Distribution Units

26 27 00 Low-Voltage Distribution Equipment

- 26 27 13 Electricity Metering
- 26 27 19 Multi-Outlet Assemblies
- 26 27 23 Indoor Service Poles
- 26 27 26 Wiring Devices
- 26 27 73 Door Chimes

26 28 00 Low-Voltage Circuit Protective Device

SECTION 26 28 00 SWITCHES AND FUSES

CONSULTANT DESIGN GUIDELINE

Switches shall be heavy duty, Type HD, and horsepower rated as required.

Manufacturer shall be Challenger, Cutler-Hammer, Siemens, Square D, or Facilities Management approved equal.

INCLUDE IN CONSTRUCTION DOCUMENTS

Switches shall be quick-make, quick-break type in accordance with UL98, National Electrical Manufacturers Association (NEMA) KS1, and NEC.

Switches shall be capable of accepting UL and NEMA standard fuses.

Switches shall have the following features:

Switch shall have copper blades, which shall be visible in the OFF position.

Switch shall have an arc chute for each pole.

External operating handle shall indicate ON and OFF position and shall have lock-open padlocking provisions.

Mechanical interlock shall permit opening of the door only when the switch is in the OFF position.

Fuse mounting shall be for the size and type of fuses shown on the drawings. Furnish switches completely fused. Furnish a complete set of spare fuses for each switch being installed. Deliver to the Owner additional sets of spare fuses to constitute not less than two complete sets for the type, size, and rating of each set installed.

Switch shall have a solid neutral for each switch being installed in a circuit that included a neutral conductor.

Switch shall have grounding Lug for connection of the grounding conductor.

Enclosures shall be the NEMA types shown on the drawings for the switches. Where the types of switch enclosures are not shown, they shall be the NEMA types that are most suitable for the environmental conditions where the switches are being installed.

End Section

26 28 13 Fuses

26 28 16 Enclosed Switches and Circuit Breakers

26 29 00 Low-Voltage Controllers

26 29 13 Enclosed Controllers

26 29 13.13 Across-the-Line Motor Controllers

26 29 13.16 Reduced-Voltage Motor Controllers

SECTION 26 29 23

VARIABLE FREQUENCY MOTOR CONTROLLERS

Checklist for Basic Requirements(Rev 11-15-2018)

- A. Need for bypass
- B. Hardware points
- C. Software points
- D. BACNet or ModBus

CONSULTANT DESIGN GUIDELINE

Variable frequency controller shall be UL listed and shall conform to latest standards of ANSI and IEEE requirements.

Variable frequency drives may be one of the commodity items available through the UofA IDIQ procurement system. The consultant should inquire with Facilities Management about the current status of procurement.

Power line noise limitations shall comply with IEEE Standard 519-1981, Guide for Harmonic Control and Reactive Compensation of Static Power Converters.

The controller shall comply with FCC Rules and Regulations, Part 15, Subpart J for emissions of conducted and radiated RFI.

Manufacturer shall be Danfoss or Facilities Management approved equal. (Rev 11-15-2018)

INCLUDE CONSTRUCTION DOCUMENTS

Contractor shall provide manual for starting and operating controllers, complete with operating limits, wiring diagram, and maintenance schedule.

Manufacturer shall furnish maintenance of controller for one year from Date of Substantial Completion.

The controller shall have capability of allowing the motor to be disconnected at the safety "disconnect" switch without damage to the controller's electronics.

Controller shall have a displacement power factor of 0.95 or greater, lagging over entire range of operating speed and load.

Minimum efficiency at full load shall be 96 percent.

Additional required features shall be as follows:

Controller shall have integral digital display to indicate voltage, output frequency, and output current.

Controller shall have status indicators for over-current, over-voltage, ground fault, over-temperature, and input power ON.

Unit shall have current limit adjustment from zero to 100 percent of rated load.

Both acceleration and deceleration rate shall be adjustable from three to 60 seconds.

Unit shall have HAND-OFF-AUTOMATIC switch and manual speed control.

Provide terminal for remote contact to allow starting under both manual and automatic modes.

Provide a manual bypass, overload motor protection, short circuit protection for full voltage, non-reversing operation of the motor. Include isolation switch to allow maintenance of inverter during bypass operation.

Include integral fused disconnect switch on the line side of each controller.

Controller shall have internal 115-volt control power with transformer and protective fuses.

Cabinet shall have door mounted speed indicator and ammeter.

Drive shall have automatic restart capability after power failures.

Unit shall have a diagnostic panel consisting of LED indicators of the following conditions: over voltage, under voltage, over current, underload timer on, run, fault, auto/manual, clipper, 6 inverter, input bus charged, input surge cycle complete, and output bus charged.

Contractor shall provide two of each type of air filter and three of each size and type of fuse.

END SECTION

26 30 00 FACILITY ELECTRICAL POWER GENERATING AND STORING EQUIPMENT

26 31 00 Photovoltaic Collectors

26 32 00 Packaged Generator Assemblies

Air Permitting(Rev 11-15-2018)

26 32 13 Engine Generators

26 32 13.13 Diesel-Engine-Driven Generator Sets

26 32 13.16 Gas-Engine-Driven Generator Sets

26 32 16 Steam-Turbine Generators

26 32 19 Hydro-Turbine Generators

26 32 23 Wind Energy Equipment

26 32 26 Frequency Changers

26 32 29 Rotary Converters

26 32 33 Rotary Uninterruptible Power Units

26 33 00 Battery Equipment

- 26 33 13 Batteries
- 26 33 16 Battery Racks
- 26 33 19 Battery Units
- 26 33 23 Central Battery Equipment
- 26 33 33 Static Power Converters
- 26 33 43 Battery Chargers
- 26 33 46 Battery Monitoring
- 26 33 53 Static Uninterruptible Power Supply

26 35 00 Power Filters and Conditioners

- 26 35 13 Capacitors
- 26 35 16 Chokes and Inductors
- 26 35 23 Electromagnetic-Interference Filters
- 26 35 26 Harmonic Filters
- 26 35 33 Power Factor Correction Equipment
- 26 35 36 Slip Controllers
- 26 35 43 Static-Frequency Converters
- 26 35 46 Radio-Frequency-Interference Filters
- 26 35 53 Voltage Regulators

26 36 00 Transfer Switches

- 26 36 13 Manual Transfer Switches
- 26 36 23 Automatic Transfer Switches

26 40 00 Electrical and Cathodic Protection**26 41 00 Facility Lightning Protection**

- 26 41 13 Lightning Protection for Structures
 - 26 41 13.13 Lightning Protection for Buildings
- 26 41 16 Lightning Prevention and Dissipation
- 26 41 19 Early Streamer Emission Lightning Protection
- 26 41 23 Lightning Protection Surge Arresters and Suppressors

26 42 00 Cathodic Protection

- 26 42 13 Passive Cathodic Protection for Underground and Submerged Piping
- 26 42 16 Passive Cathodic Protection for Underground Storage Tank

26 43 00 Transient Voltage Suppression

- 26 43 13 Transient-Voltage Suppression for Low-Voltage Electrical Power Circuits

SECTION 26 50 00 LIGHTING

CONSULTANT DESIGN GUIDELINE

1) Vault Lighting

- a. Install (2) ceiling mounted units inside the vault – Canlet Ceiling Mount 68-021FC(screw base) -01-OG-09 [ceiling mount, with incandescent screw base, with clear glass globe and cage guard]
- b. Install (1) wall mounted unit outside in the pit – Canlet Wall Mount 68-021WF-01-01-01 + 68WME02 [wall mount, with incandescent screw base, with reflector, clear glass globe and cage guard with white reflector + wall mount extension bracket]
- c. Lighting should be switched from inside the vault on the line side of the GFCI if that is allowed so that nuisance trips on the GFCI do not kill the lighting.
- d. We do want CFL lighting but not with a separate ballast. We don't really want to use fixed ballast fixtures, but rather screw base CFLs. Otherwise when a ballast fails, we have to get an electrician to fix it as opposed to just changing the bulb.

End of Section

SECTION 26 51 00 INTERIOR LIGHTING

CONSULTANT DESIGN GUIDELINE

Lighting levels should not exceed the minimum recommended by the IES guideline.

Submit fixture and dimming information in accordance with Plan Review and Submittals.

Provide fluorescent light fixtures with parabolic lenses general for building lighting. Use specification grade fluorescent fixtures with conventional lenses in storage rooms, toilets, corridors, etc. Use HID fixtures in areas that have high ceilings.

Use "Lay-in" mounted light fixtures in areas that have suspended acoustic tile ceilings.

Fluorescent fixture lenses shall be 0.156" thick, minimum.

Obtain and specify electronic ballasts in accordance with ballast specifications issued by the Office of State Purchasing, Department of Finance and Administration, PO Box 2940, Little Rock, AR 72203 (501) 324-9316.

In areas requiring a dimmer system, secondary incandescent fixtures may be used with primary general fluorescent lighting.

Exit lights shall be LED as manufactured by Hubbell.

The recommended lighting energy allowance is no greater than two watts per building gross square feet.

INCLUDE IN CONSTRUCTION DOCUMENTS

Submit all lighting for review and approval by Facilities Management.

EXECUTION

No lights shall be located over stairwells. Lights shall be over landings, or wall mounted only.

END SECTION

26 51 13 Interior Lighting Fixtures, Lamps, and Ballasts

26 52 00 Emergency Lighting

Discuss with FAMA Dept on strategy for EM Power w/ Generator VS Central Battery unit / w/ EM Secondary less ATS VS Individual battery units (Rev 11-15-2018)

26 53 00 Exit Signs

26 54 00 Classified Location Lighting

26 55 00 Special Purpose Lighting

26 55 23 Outline Lighting

26 55 29 Underwater Lighting

26 55 33 Hazard Warning lighting

26 55 36 Obstruction Lighting

26 55 53 Security Lighting

26 55 59 Display Lighting

26 55 61 Theatrical Lighting

26 55 63 Detention Lighting

26 55 70 Healthcare Lighting

SECTION 26 56 00

EXTERIOR LIGHTING

CONSULTANT DESIGN GUIDELINE

Use campus standard exterior light fixtures. Cut sheets for approved fixtures are included in folder "Campus Furnishings Standards" of this Guide.

Provide a photometric analysis for all exterior lighting layouts, and submit to Facilities Management Planning Group for approval. Photometrics should follow the campus lighting guidelines as established in Part Two: Planning Guidelines, Section 2.1 C (see Facilities

Management, Planning Group web page).

INCLUDE IN CONSTRUCTION DOCUMENTS

Pole lighting voltage shall be either 208 or 460. 120 volt pole lighting is unacceptable. Voltage drop in lighting circuits shall not exceed 7%.

EXECUTION

Exact location of exterior light fixtures shall be coordinated with Facilities Management Planning Group. No uplighting allowed.

END SECTION

26 56 13 Lighting Poles and Standards

26 56 16 Parking Lighting

26 56 19 Roadway Lighting

26 56 23 Area Lighting

26 56 26 Landscape Lighting

26 56 29 Site Lighting

26 56 33 Walkway Lighting

26 56 36 Flood Lighting

26 56 68 Exterior Athletic Lighting

B

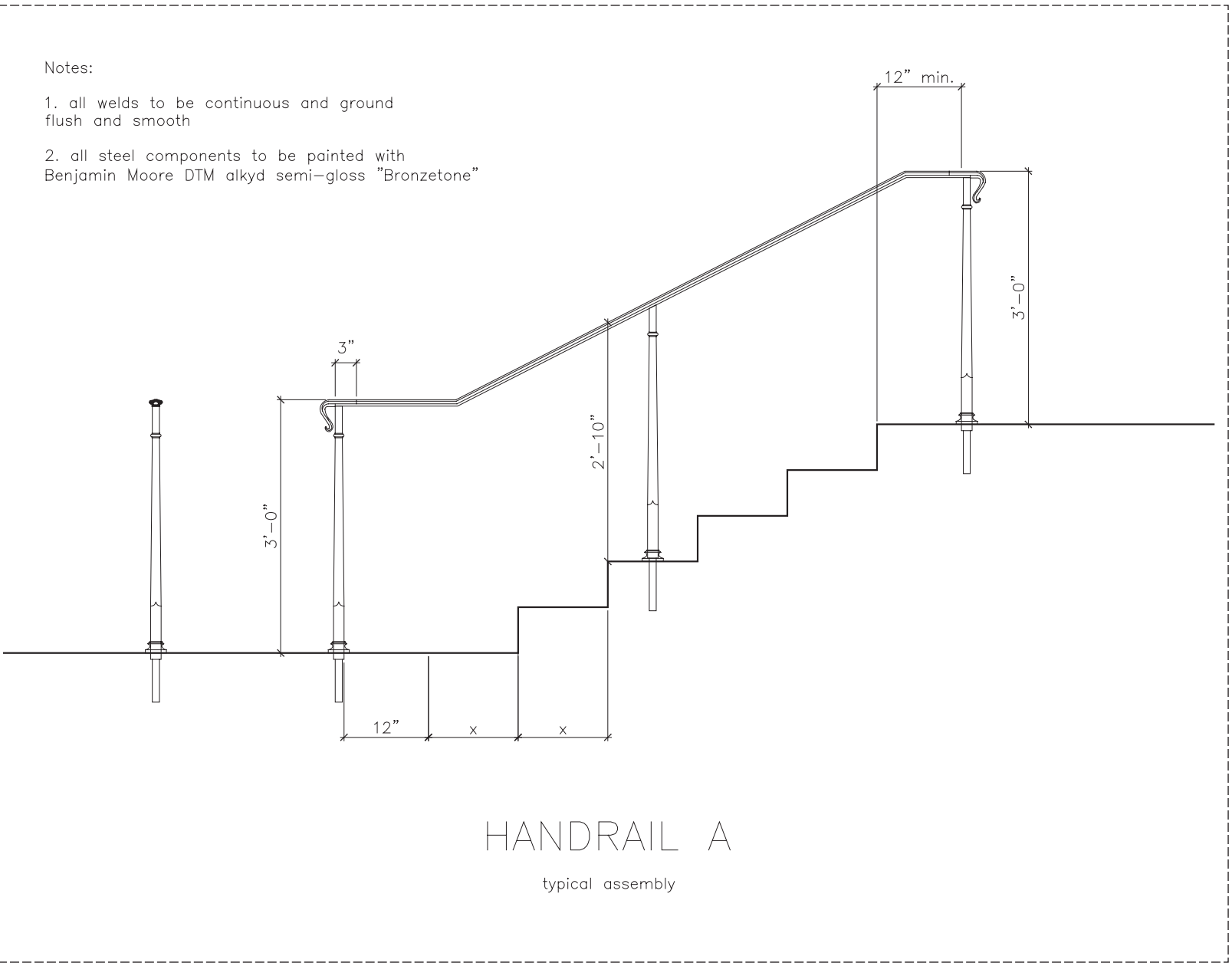
CAMPUS LANDSCAPE STANDARDS

- b1 - handrails & guardrails
- b13 - light footings
- b18 - bike rack footing & spacing
- b20 - trash can footings
- b22 - paving
- b30 - drain inlets
- b31 - plantings

(Rev 11-15-2018) Check with the FAMA Planning Group, we could be missing some details & at this time we may not have the most updated details.

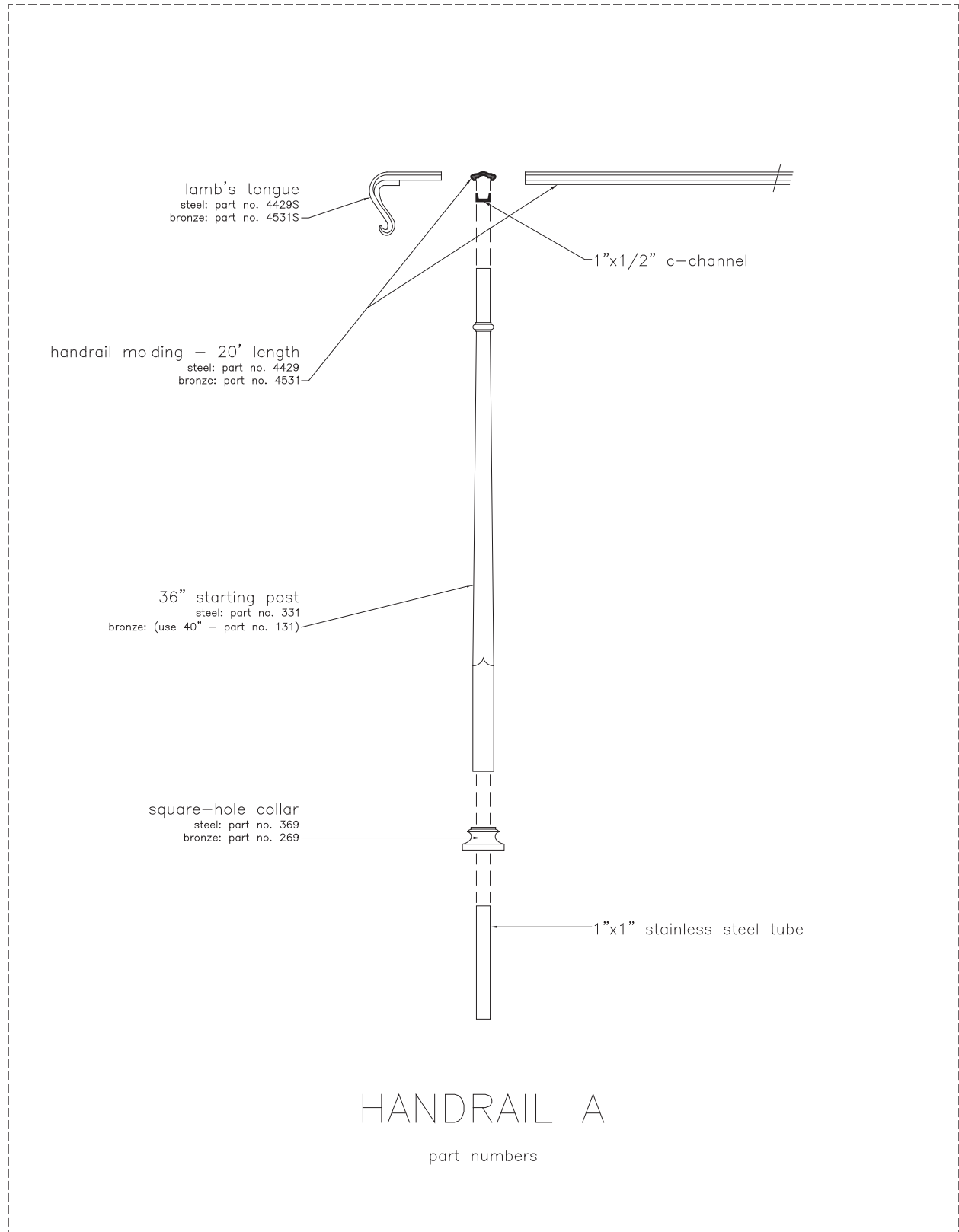
HANDRAIL A (decorative posts) - Classic

CAD file available for download at <http://planning.uark.edu>



HANDRAIL A (decorative posts) - Classic

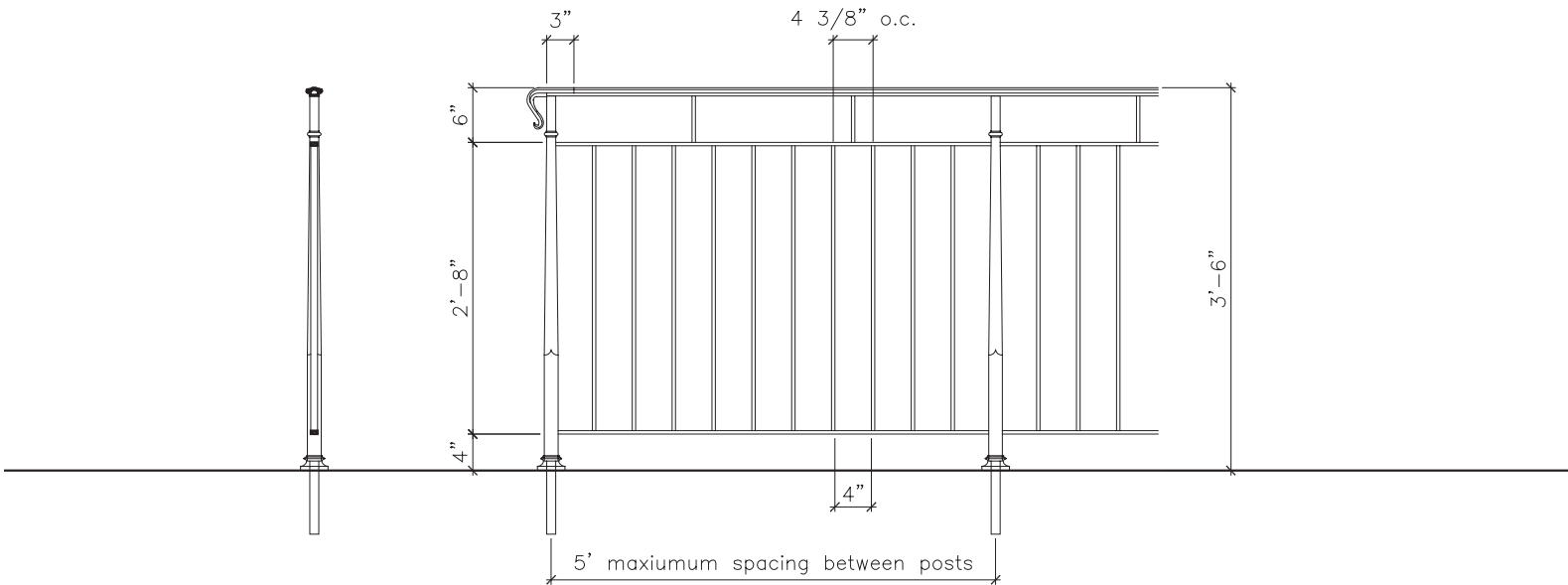
CAD file available for download at <http://planning.uark.edu>



GUARDRAIL A (decorative posts) - Classic CAD file available for download at <http://planning.uark.edu>

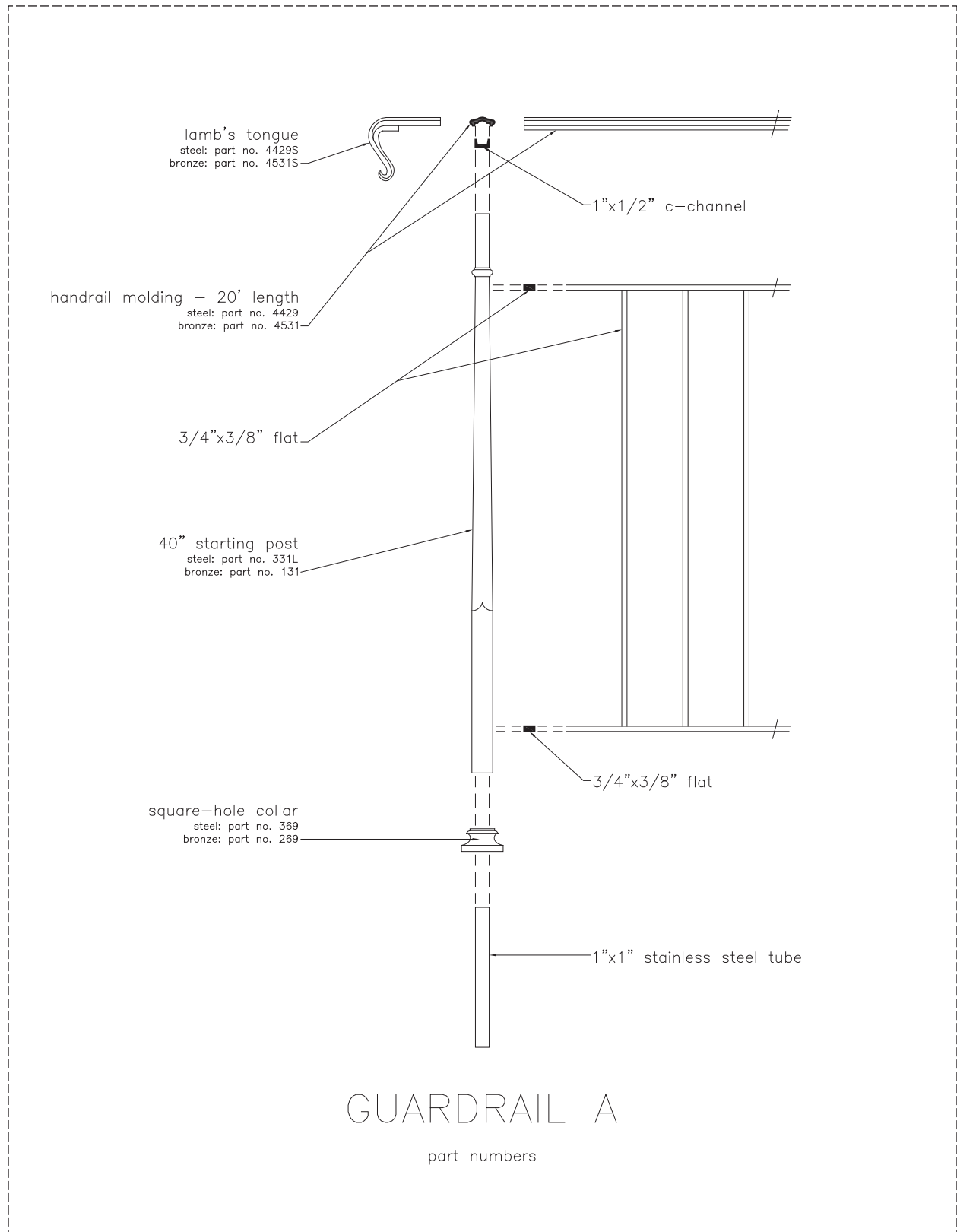
Notes:

1. all welds to be continuous and ground flush and smooth
2. all steel components to be painted with Benjamin Moore DTM alkyd semi-gloss "Bronzetone"



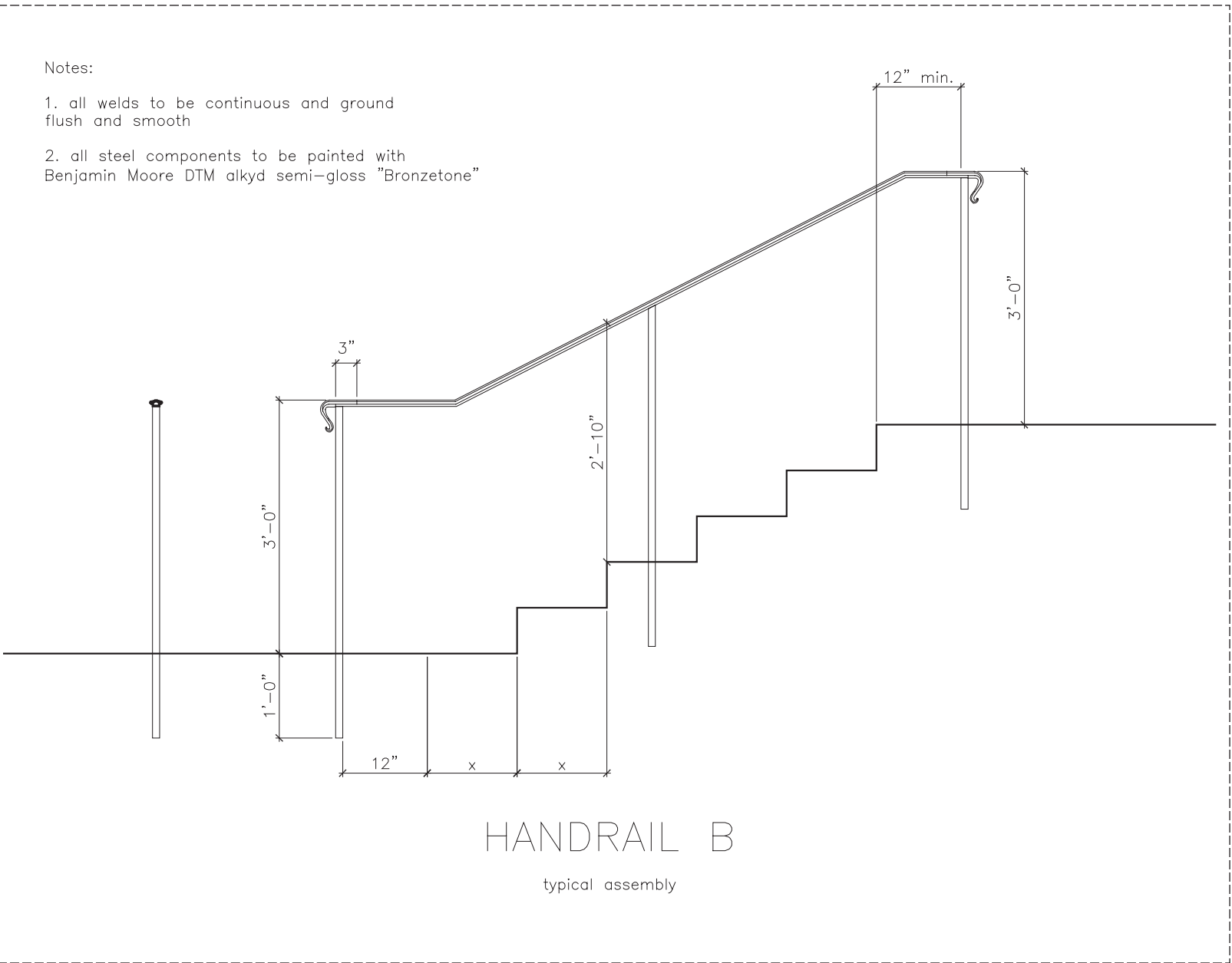
GUARDRAIL A
typical assembly

GUARDRAIL A (decorative posts) - Classic CAD file available for download at <http://planning.uark.edu>



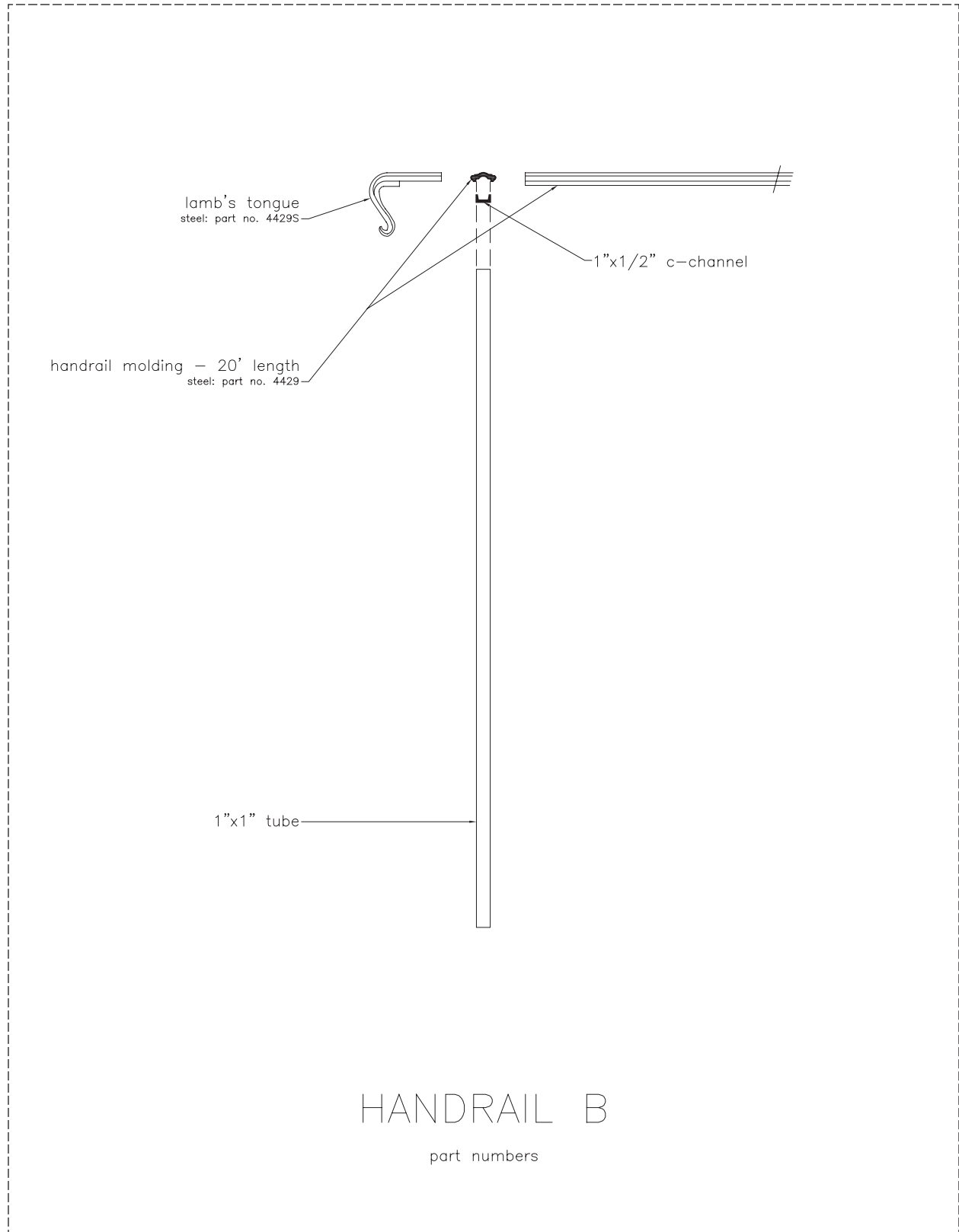
HANDRAIL B (plain posts) - Classic

CAD file available for download at <http://planning.uark.edu>



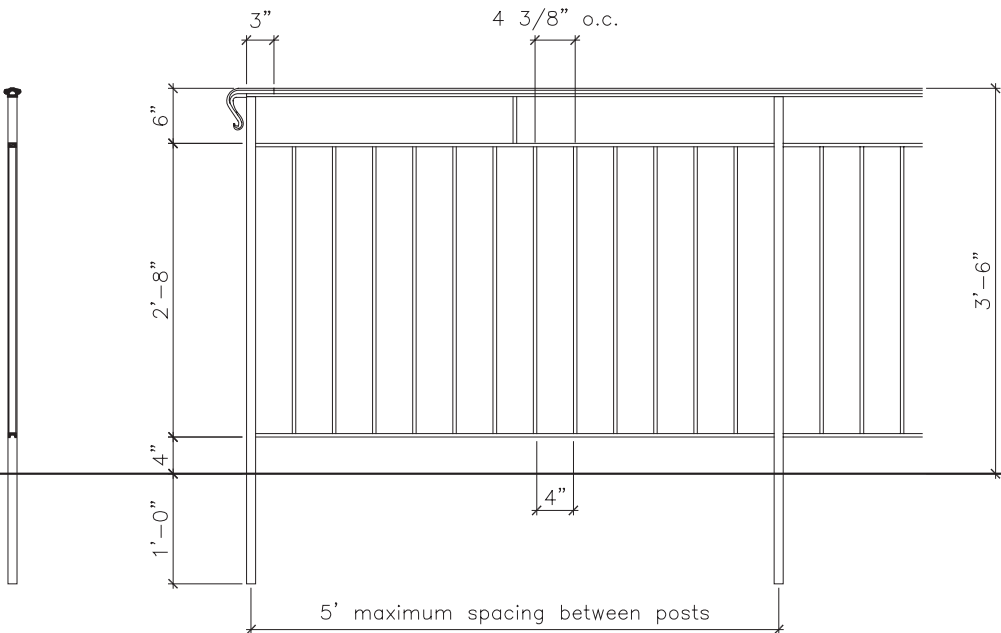
HANDRAIL B (plain posts) - Classic

CAD file available for download at <http://planning.uark.edu>



GUARDRAIL B (plain posts) - Classic

CAD file available for download at <http://planning.uark.edu>



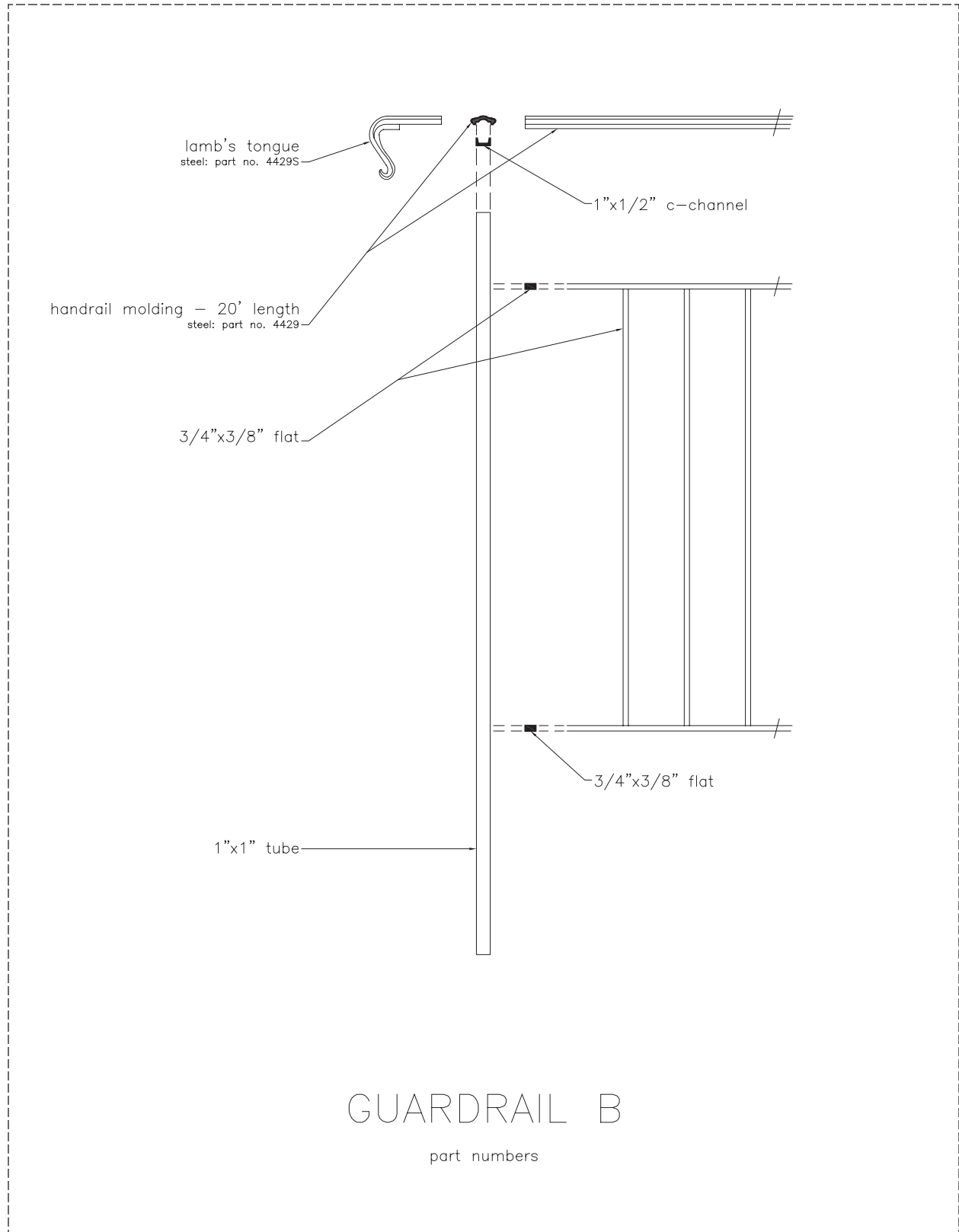
GUARDRAIL B
typical assembly

Notes:

1. all welds to be continuous and ground flush and smooth
2. all steel components to be painted with Benjamin Moore DTM alkyd semi-gloss "Bronzetone"

GUARDRAIL B (plain posts) - Classic

CAD file available for download at <http://planning.uark.edu>

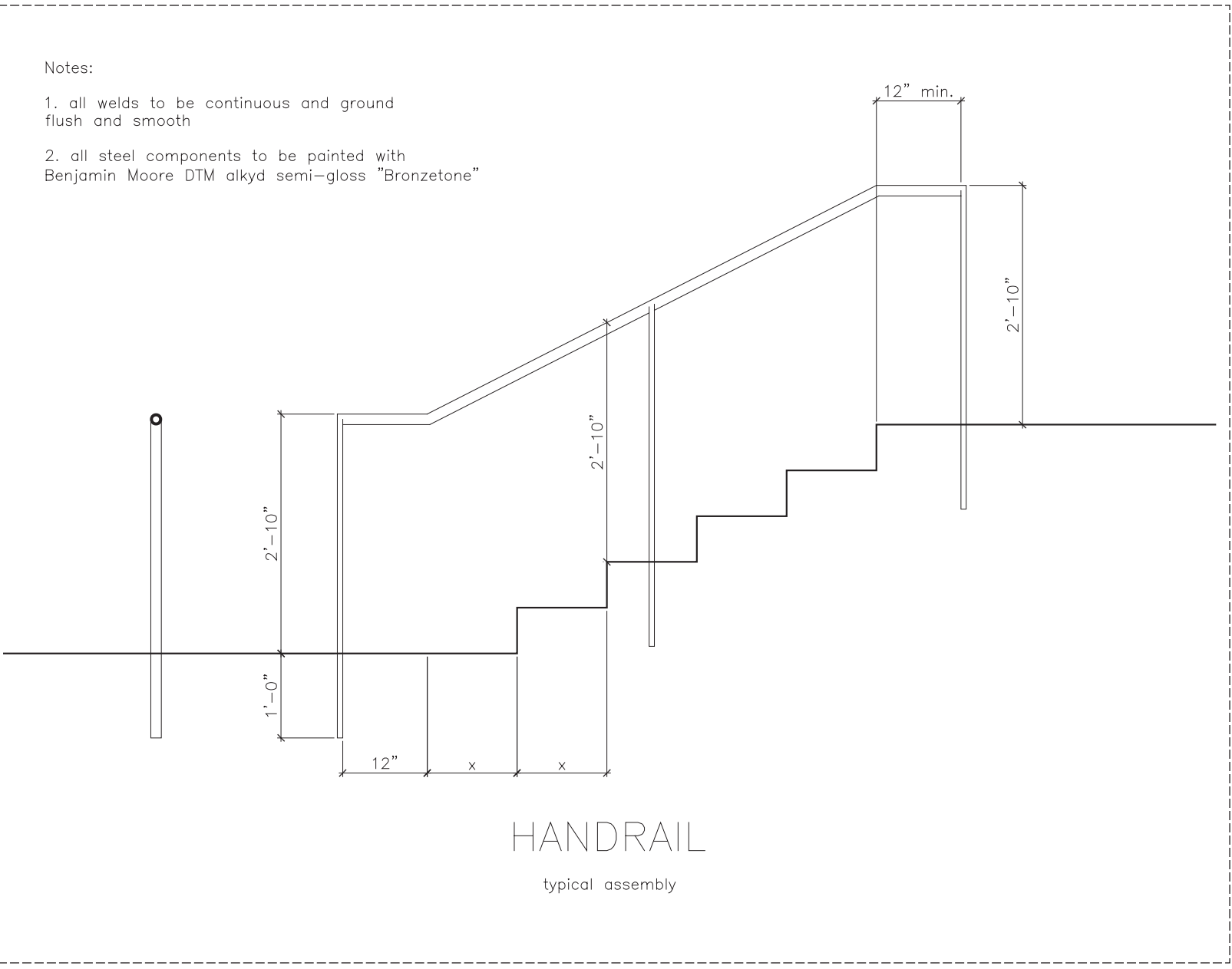


GUARDRAIL B

part numbers

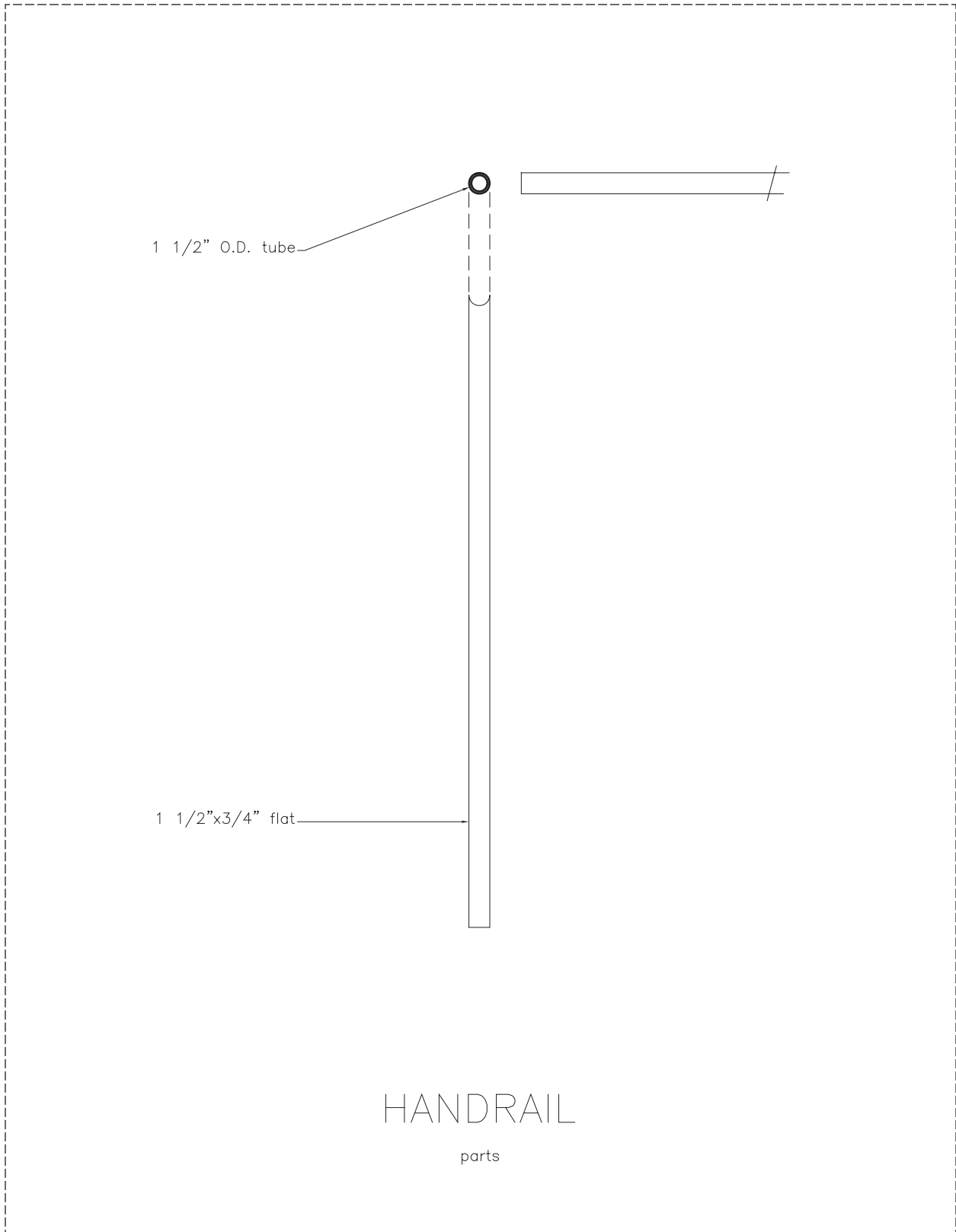
HANDRAIL - Contemporary

CAD file available for download at <http://planning.uark.edu>



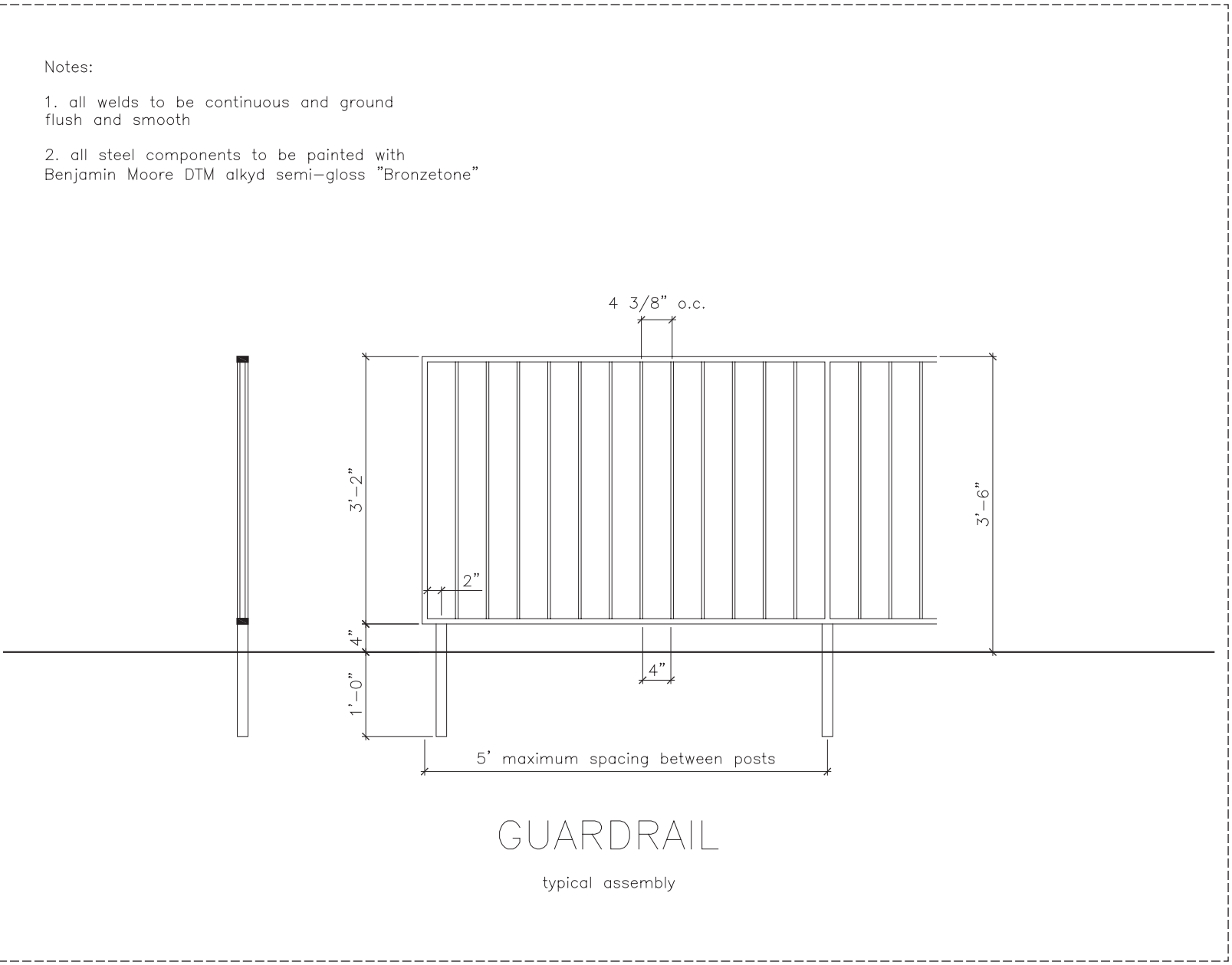
HANDRAIL - Contemporary

CAD file available for download at <http://planning.uark.edu>



GUARDRAIL - Contemporary

CAD file available for download at <http://planning.uark.edu>



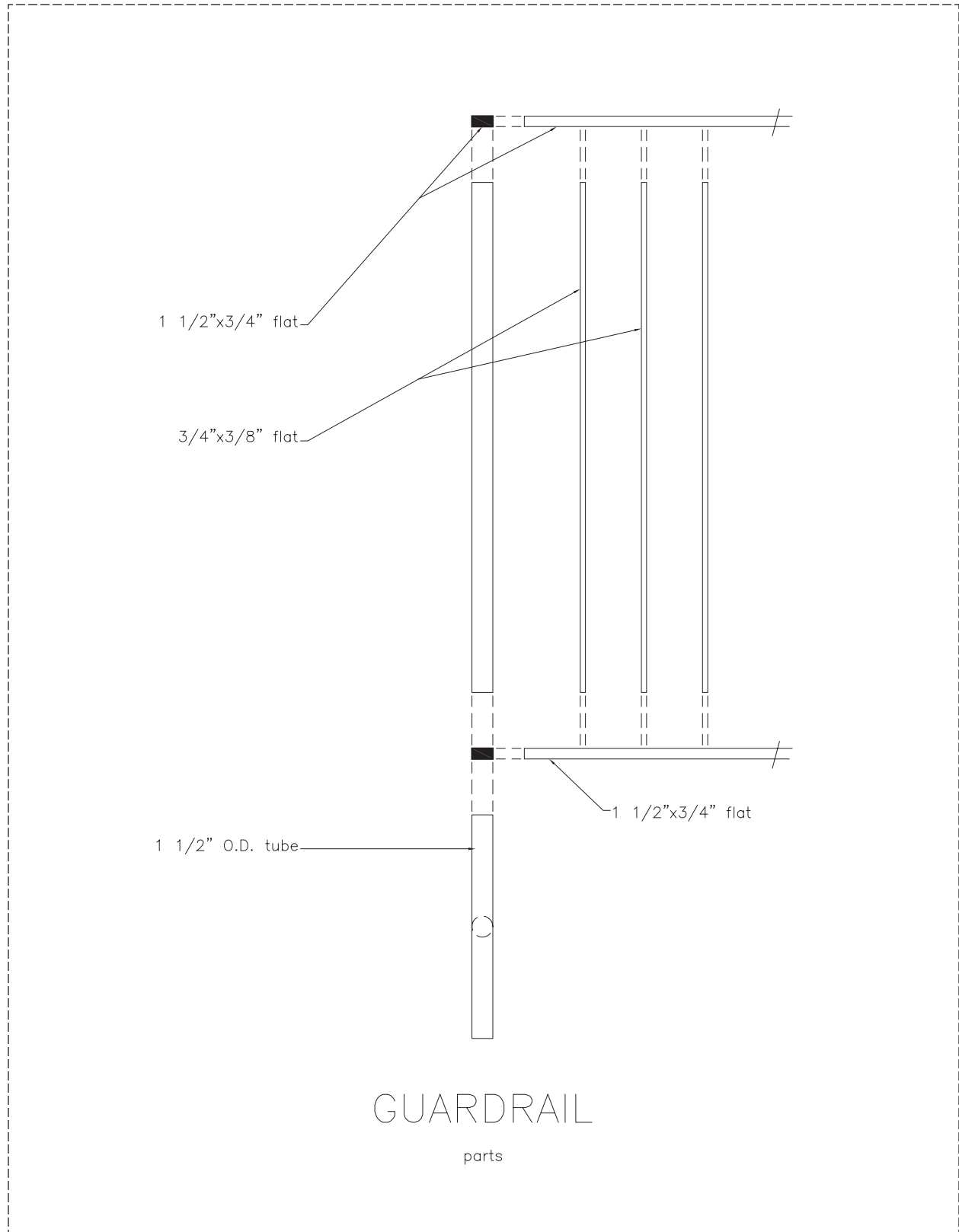
Notes:

1. all welds to be continuous and ground flush and smooth
2. all steel components to be painted with Benjamin Moore DTM alkyd semi-gloss "Bronzestone"

GUARDRAIL
typical assembly

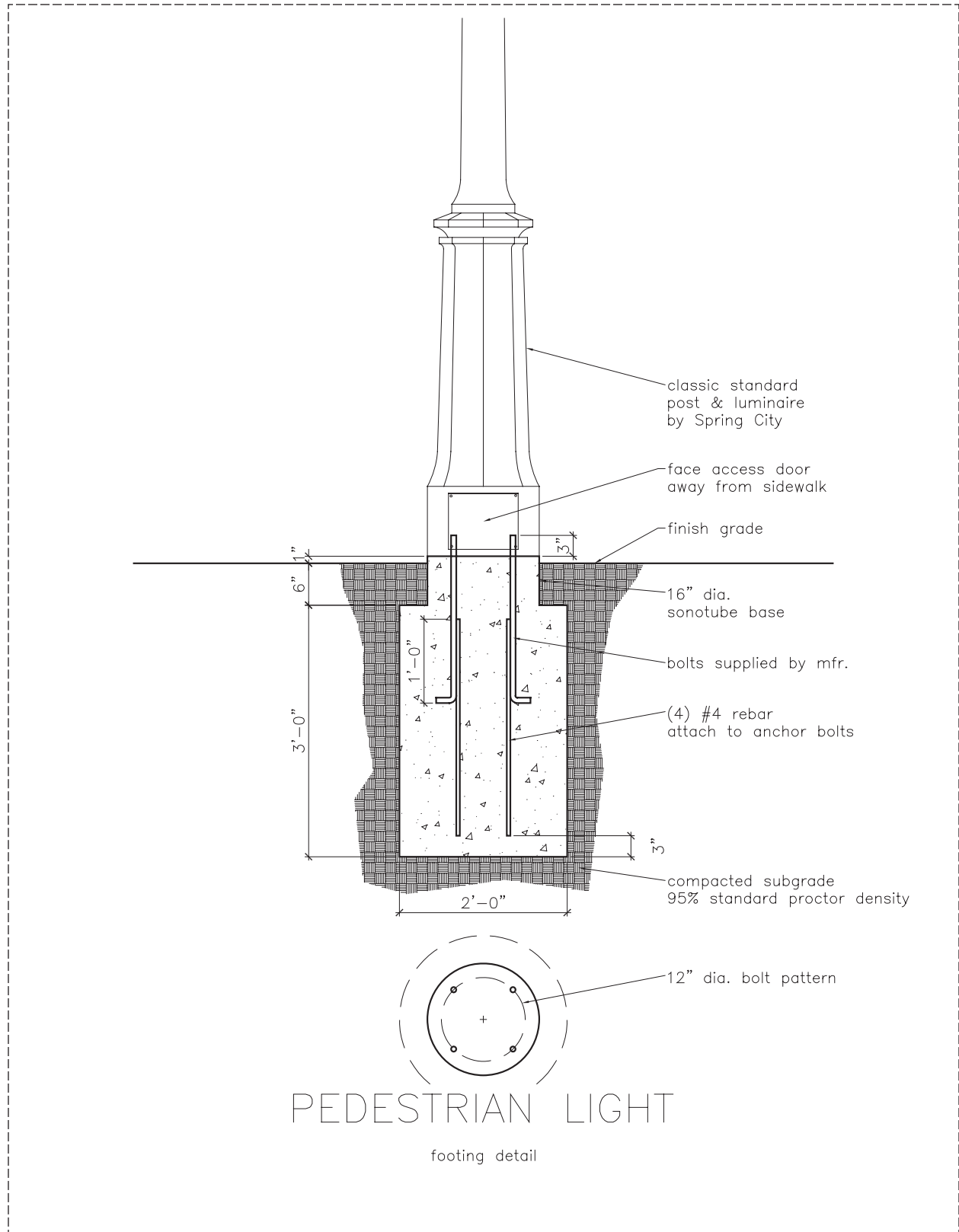
GUARDRAIL - Contemporary

CAD file available for download at <http://planning.uark.edu>



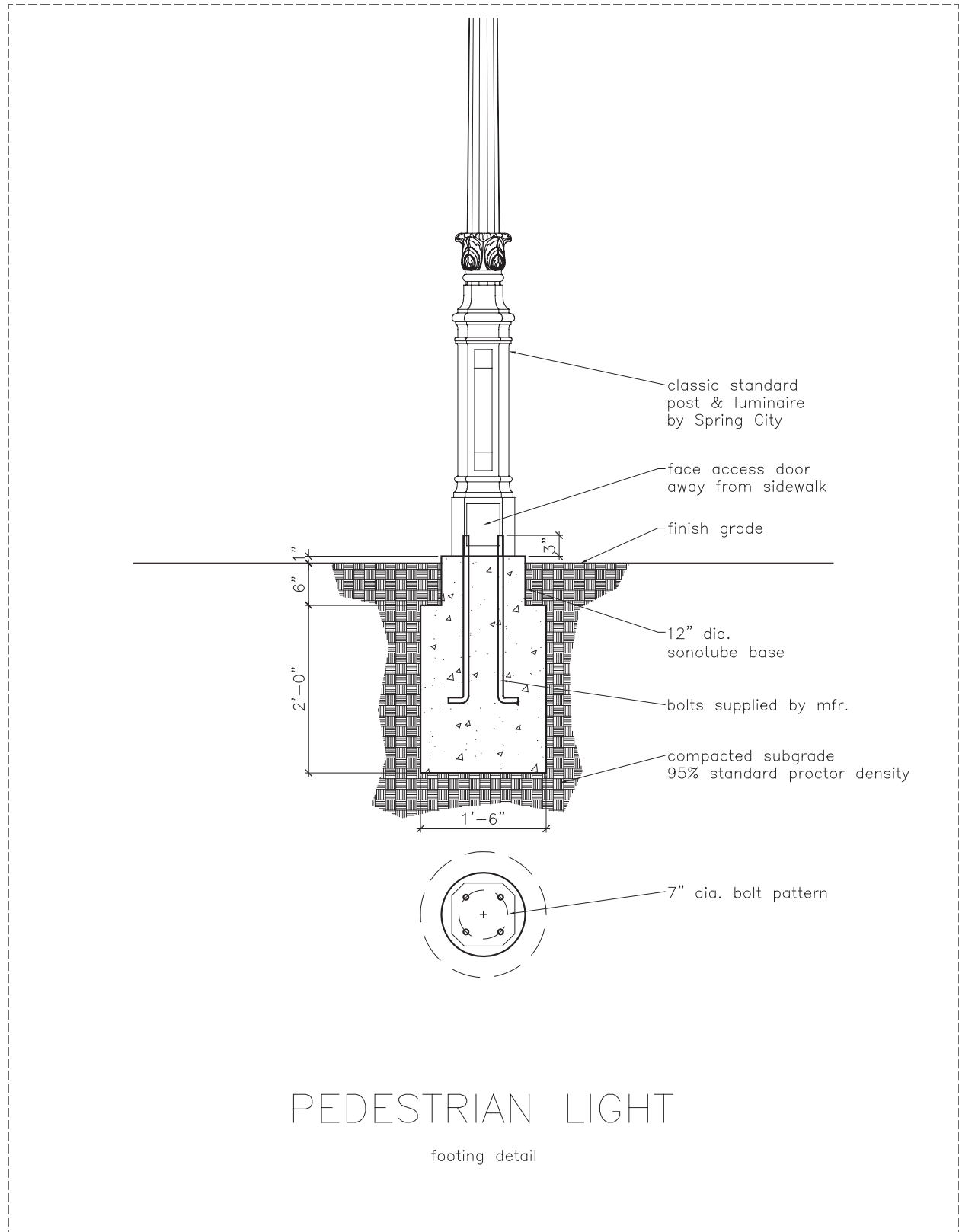
PEDESTRIAN LIGHT - Classic

CAD file available for download at <http://planning.uark.edu>



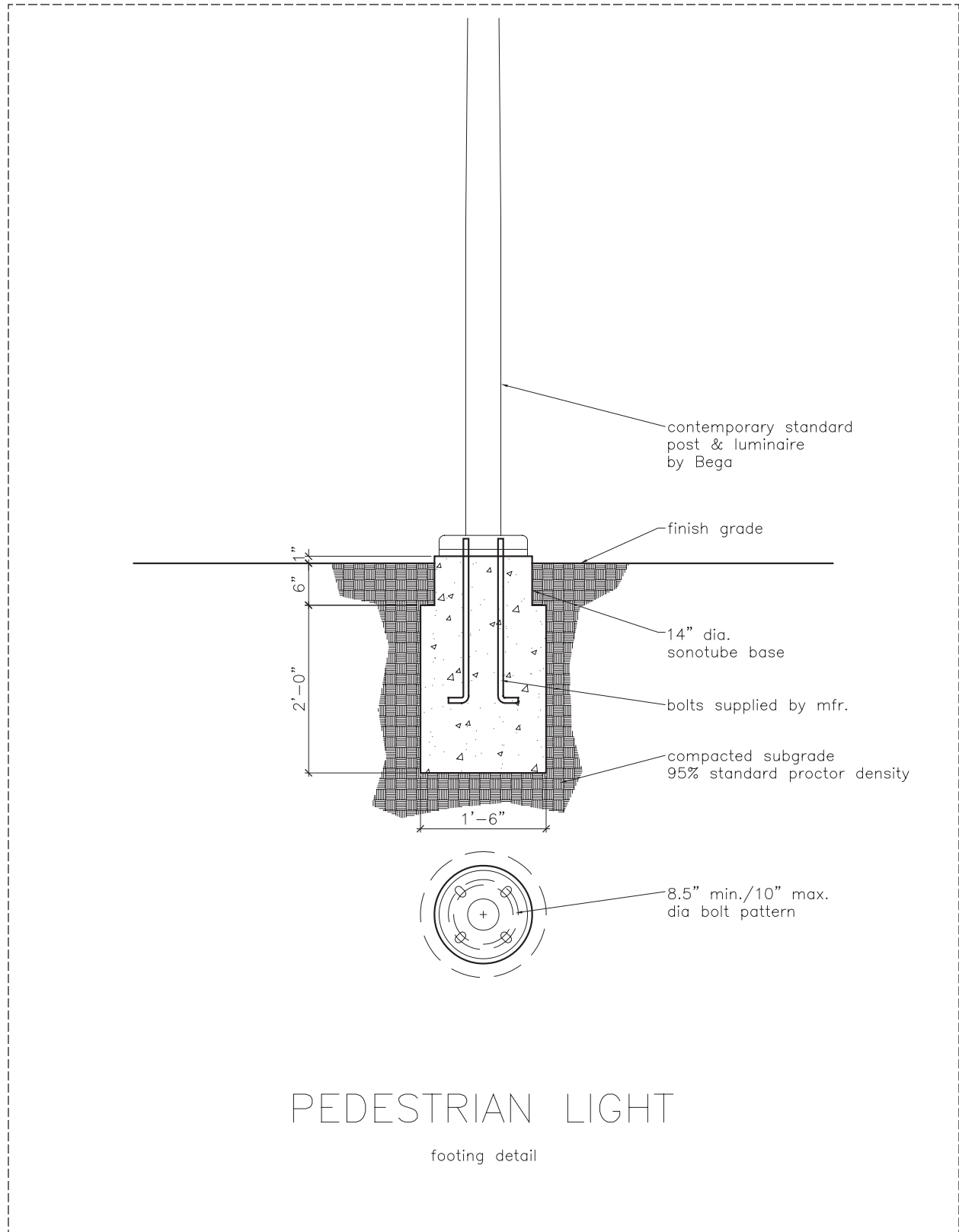
PEDESTRIAN LIGHT - Classic alternate*

CAD file available for download at <http://planning.uark.edu>



PEDESTRIAN LIGHT - Contemporary

CAD file available for download at <http://planning.uark.edu>

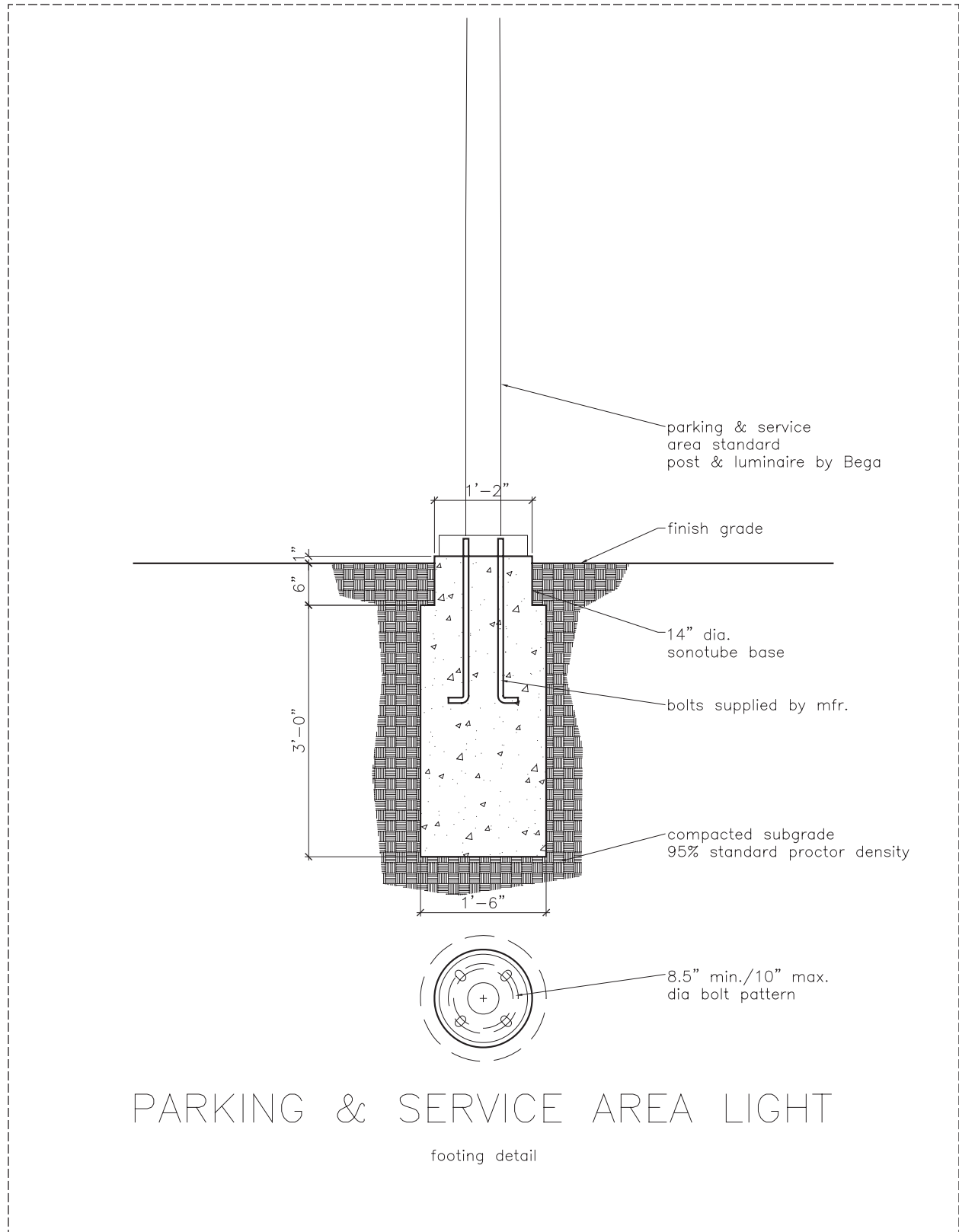


PEDESTRIAN LIGHT

footing detail

PARKING & SERVICE AREA LIGHT

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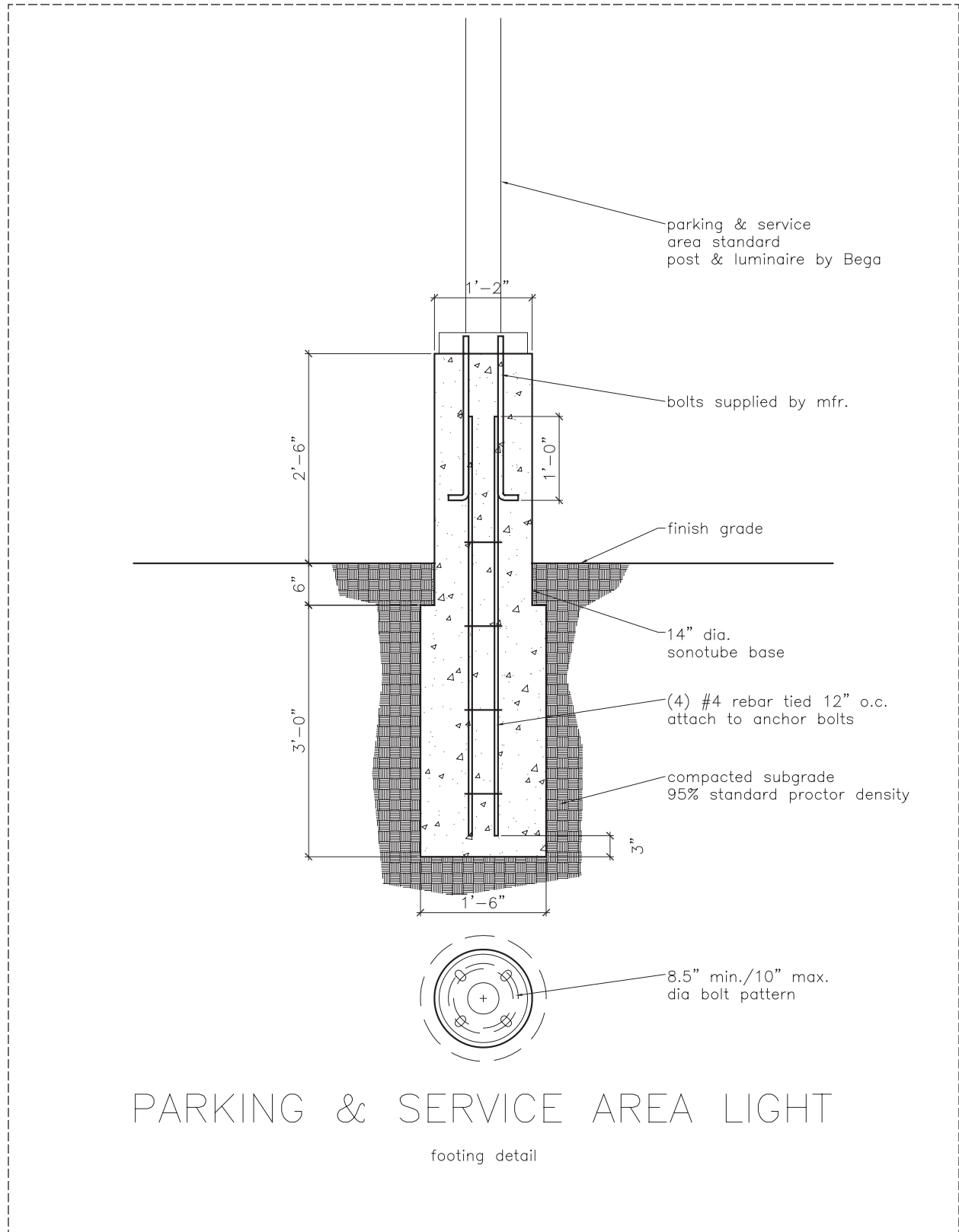


PARKING & SERVICE AREA LIGHT

footing detail

PARKING & SERVICE AREA LIGHT

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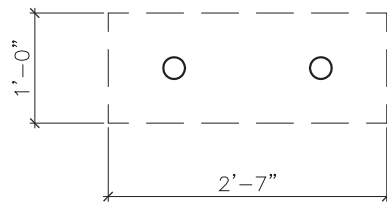
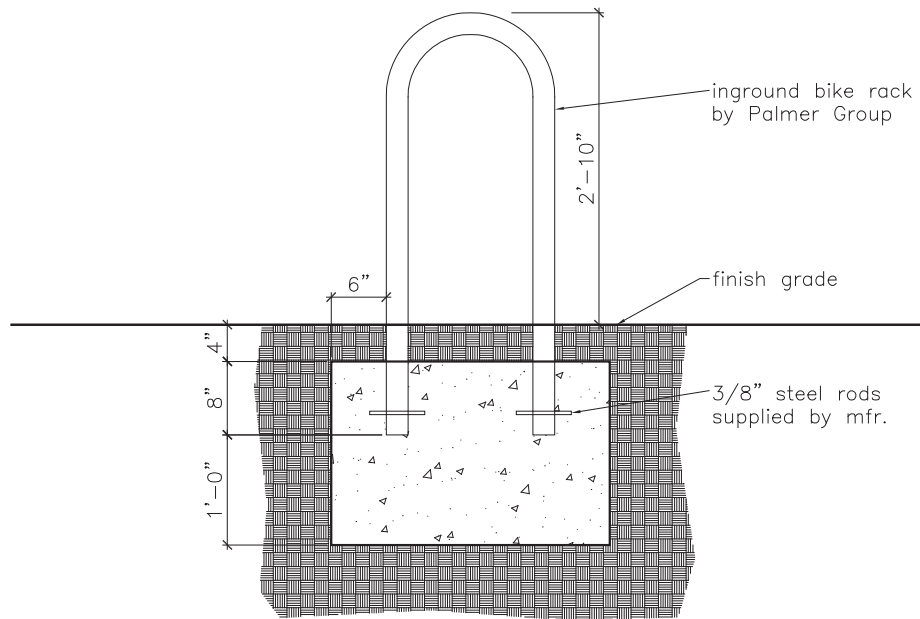


PARKING & SERVICE AREA LIGHT

footing detail

IN-GROUND MOUNT BIKE RACK

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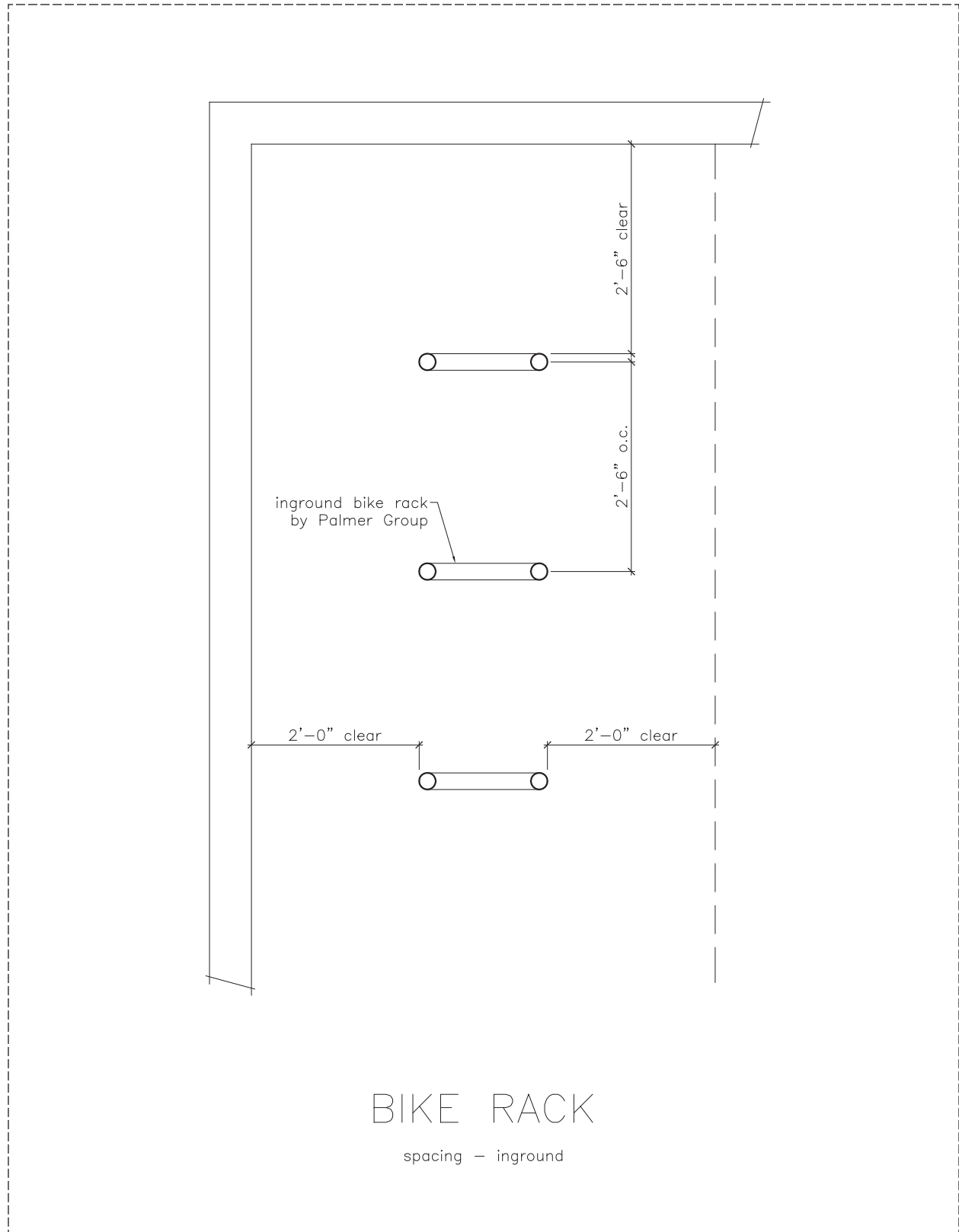


BIKE RACK

footing detail - inground

IN-GROUND MOUNT BIKE RACK

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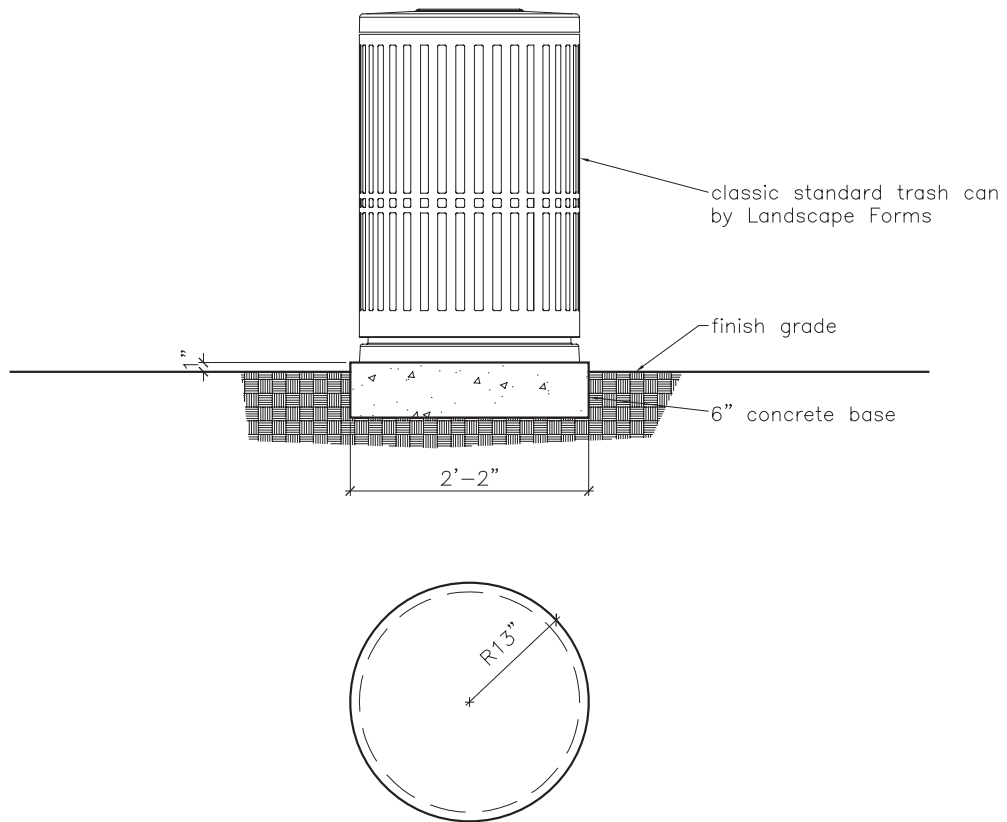


BIKE RACK

spacing - inground

TRASH CAN - Classic

CAD file available for download at <http://planning.uark.edu>

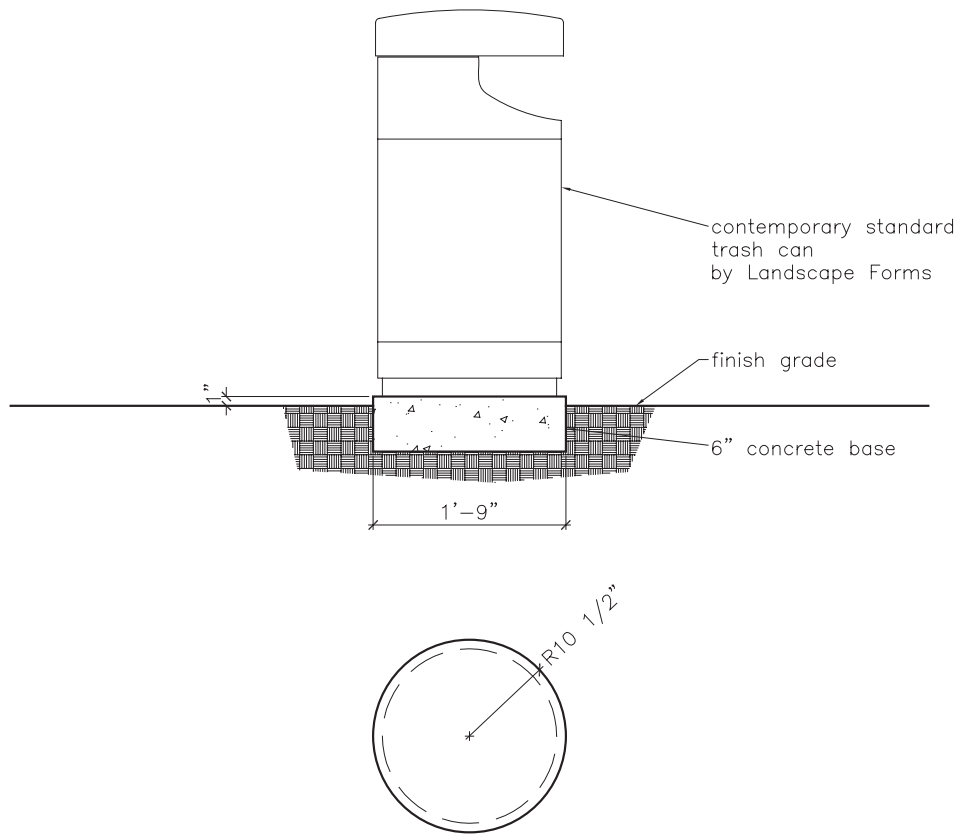


TRASH CAN

footing detail

TRASH CAN - Contemporary

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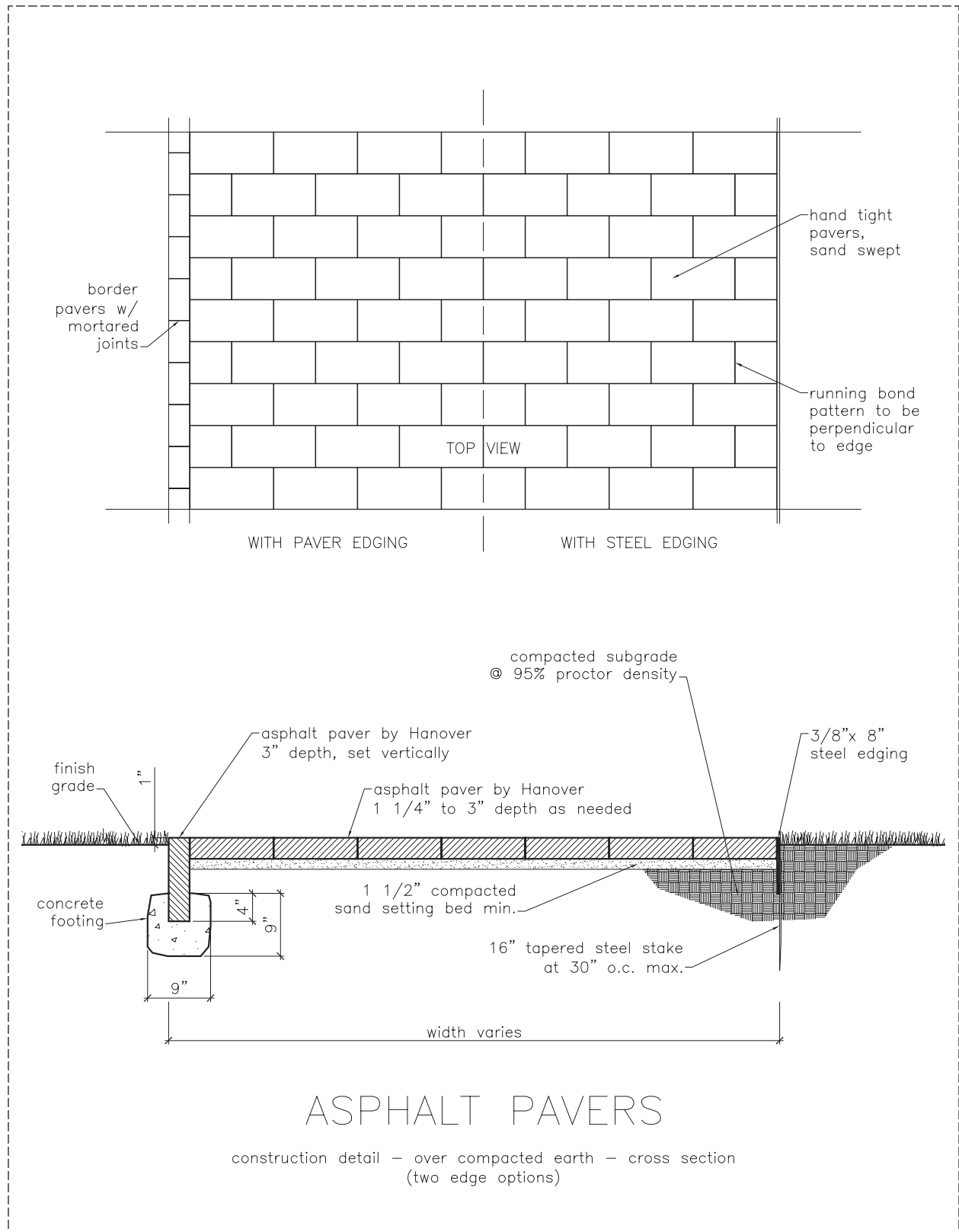


TRASH CAN

footing detail

ASPHALT PAVER WALK

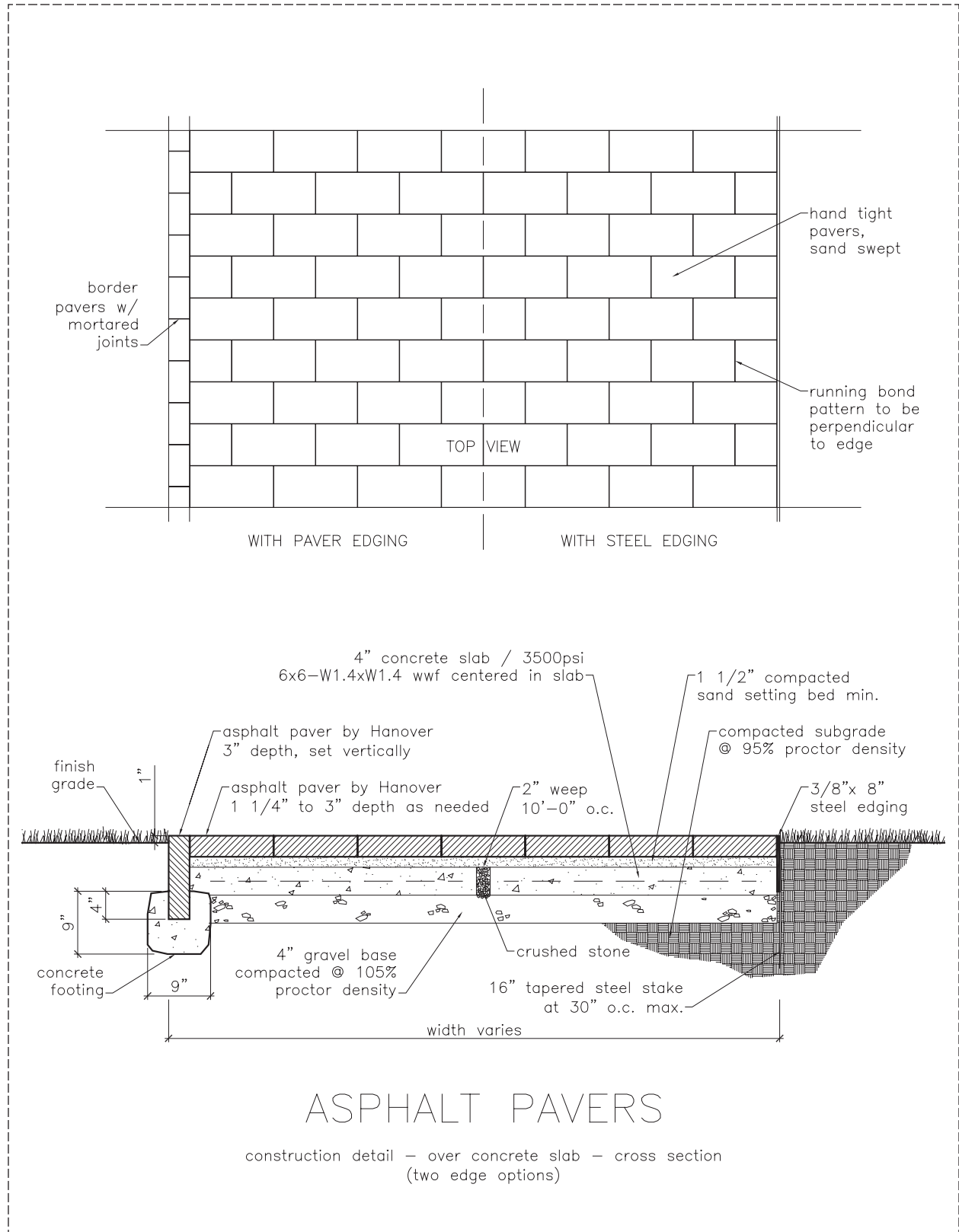
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LANDSCAPE STANDARDS

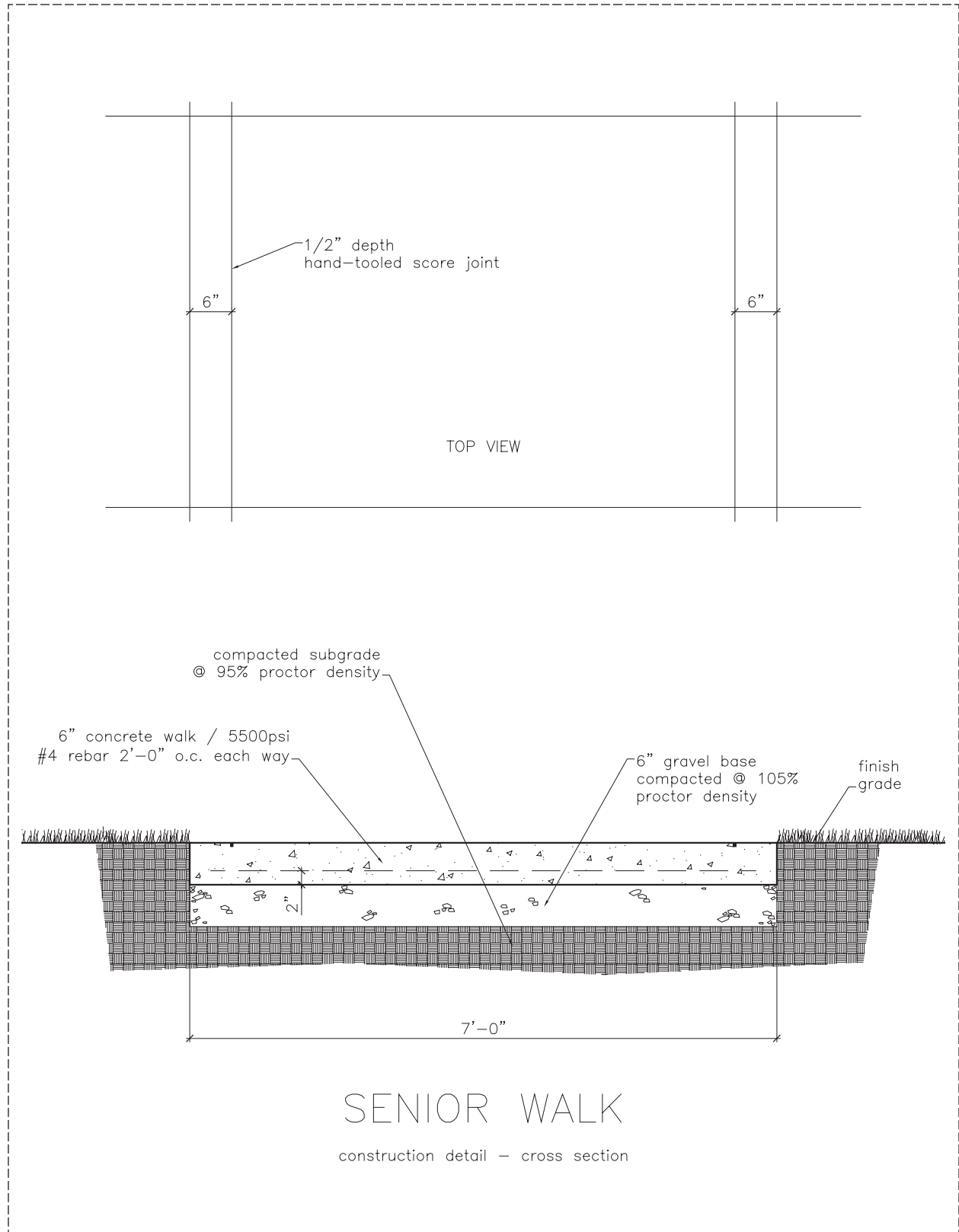
ASPHALT PAVER WALK

CAD file available for download at <http://planning.uark.edu>



SENIOR WALK

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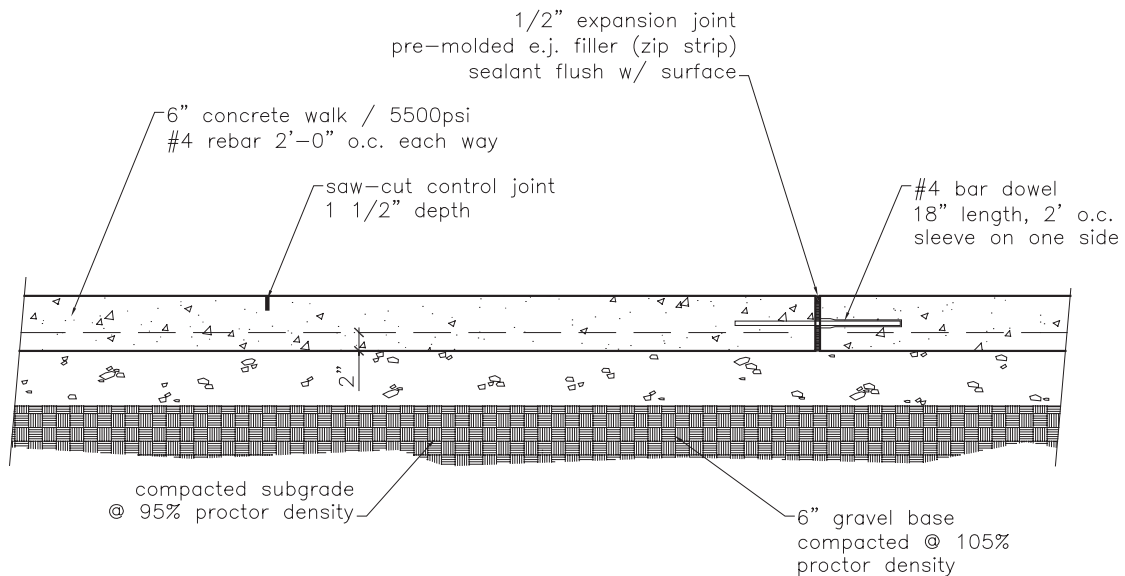


SENIOR WALK

CAD file available for download at <http://planning.uark.edu>

Notes:

1. concrete to be 5500psi
2. reinforcing to consist of #4 bar at 2'-0" o.c. each way, 2" from bottom of slab
3. concrete mix to have maximum 3/4" aggregate
4. compressive strength of concrete test cylinders to be taken by contractor at his expense on day of pour
5. walk to have a minimum curing time of 90 days prior to sandblasting
6. 4" dia. PVC schedule 40 sleeve at 30'-0" o.c.
7. saw-cut control joints at 15'-0" o.c. to be cut within 24 hrs. of pour
8. expansion joints at 30'-0" o.c.
9. walk surface to have slick trowel finish
10. contractor to "press" top 1/2" of wet concrete so that aggregate material is 1/2" below top of walk
11. "S" stamp to be embossed by contractor at all sleeve locations, each side



SENIOR WALK

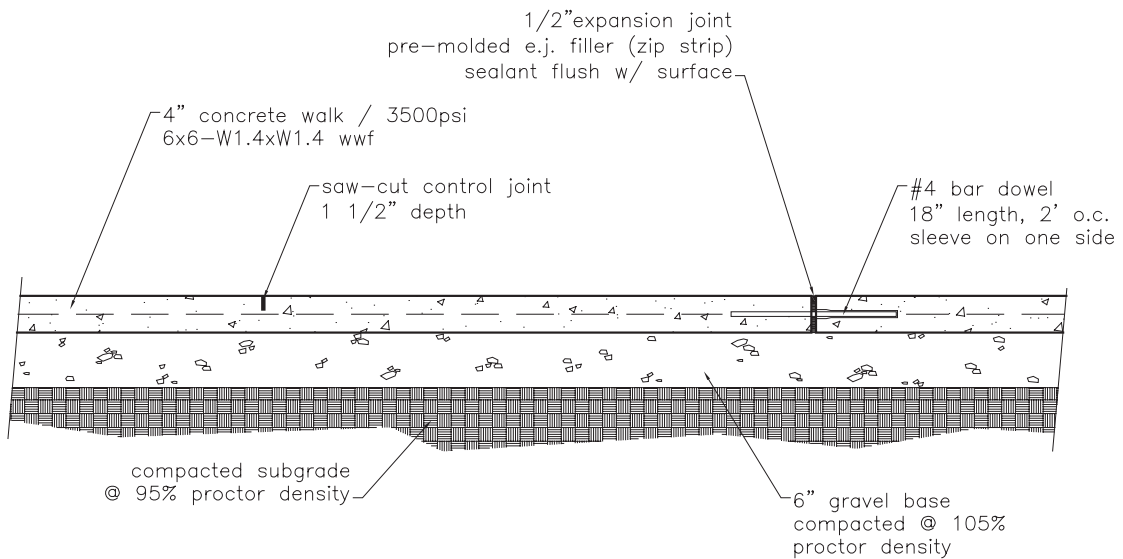
construction detail – longitudinal section

4-inch CONCRETE WALK

CAD file available for download at <http://planning.uark.edu>

Notes:

1. 4" dia. PVC schedule 40 sleeve at 30'-0" o.c. (as required by owner)
2. saw-cut control joints at 15'-0" o.c.
3. expansion joint at 30'-0" o.c.
4. walk surface to have light broom finish
5. "S" stamp to be embossed by contractor at all sleeve locations, each side



4" CONCRETE WALK

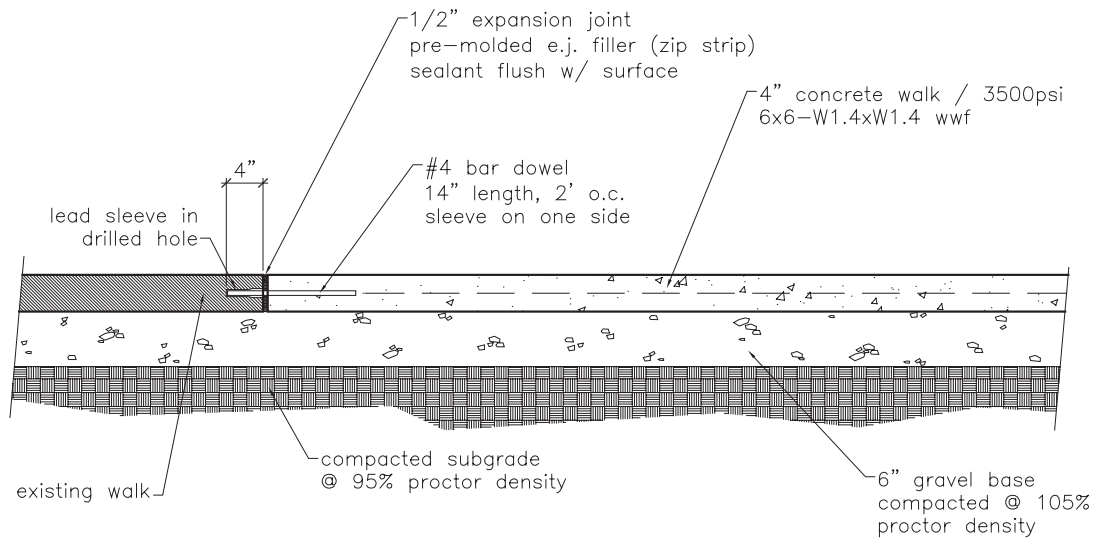
construction detail – longitudinal section

4-inch CONCRETE WALK

CAD file available for download at <http://planning.uark.edu>

Notes:

1. 4" dia. PVC schedule 40 sleeve at 30'-0" o.c. (as required by owner)
2. saw-cut control joints at 15'-0" o.c.
3. expansion joint at 30'-0" o.c.
4. walk surface to have light broom finish
5. "S" stamp to be embossed by contractor at all sleeve locations, each side



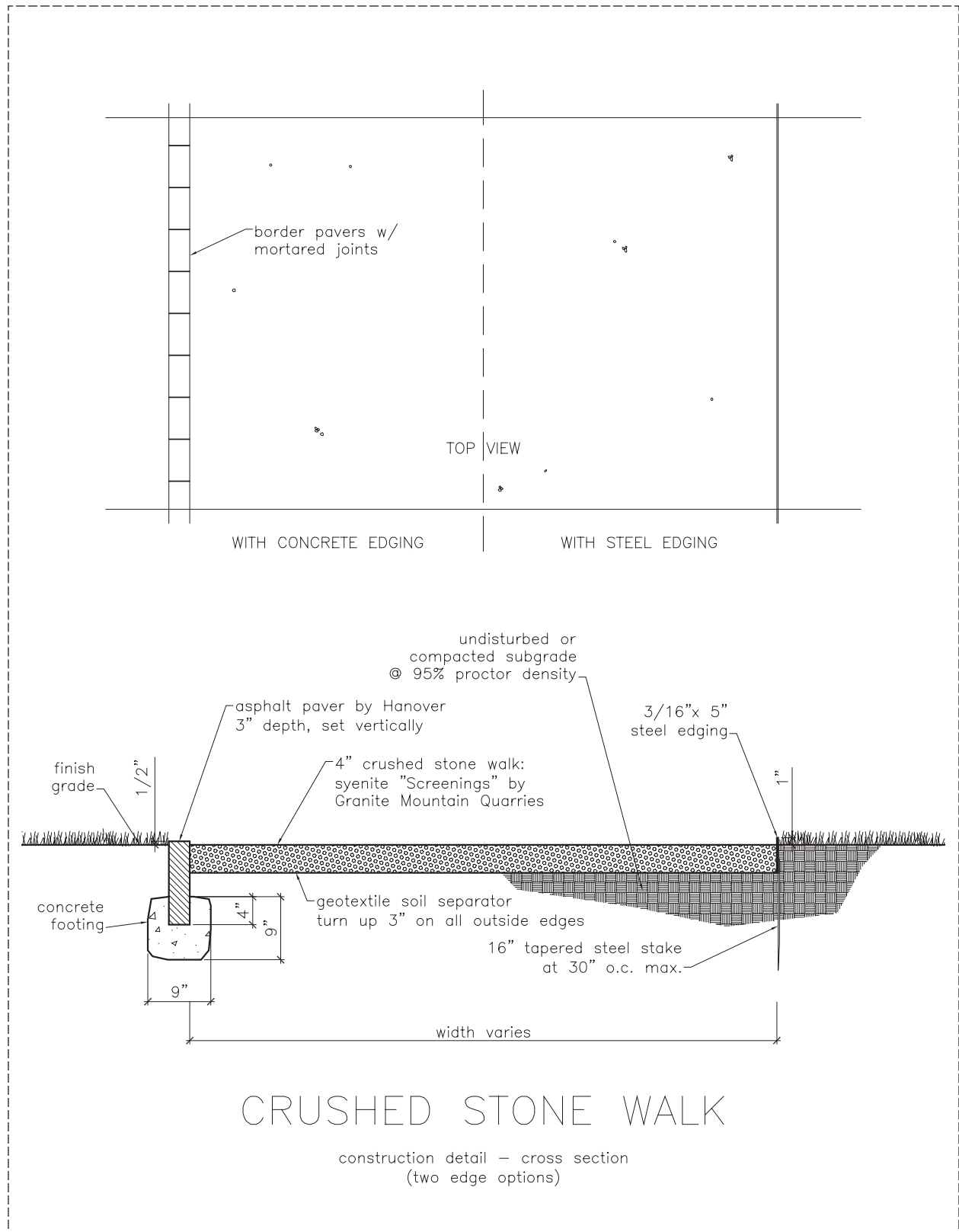
4" CONCRETE WALK at EXISTING WALK

construction detail – longitudinal section

LANDSCAPE STANDARDS

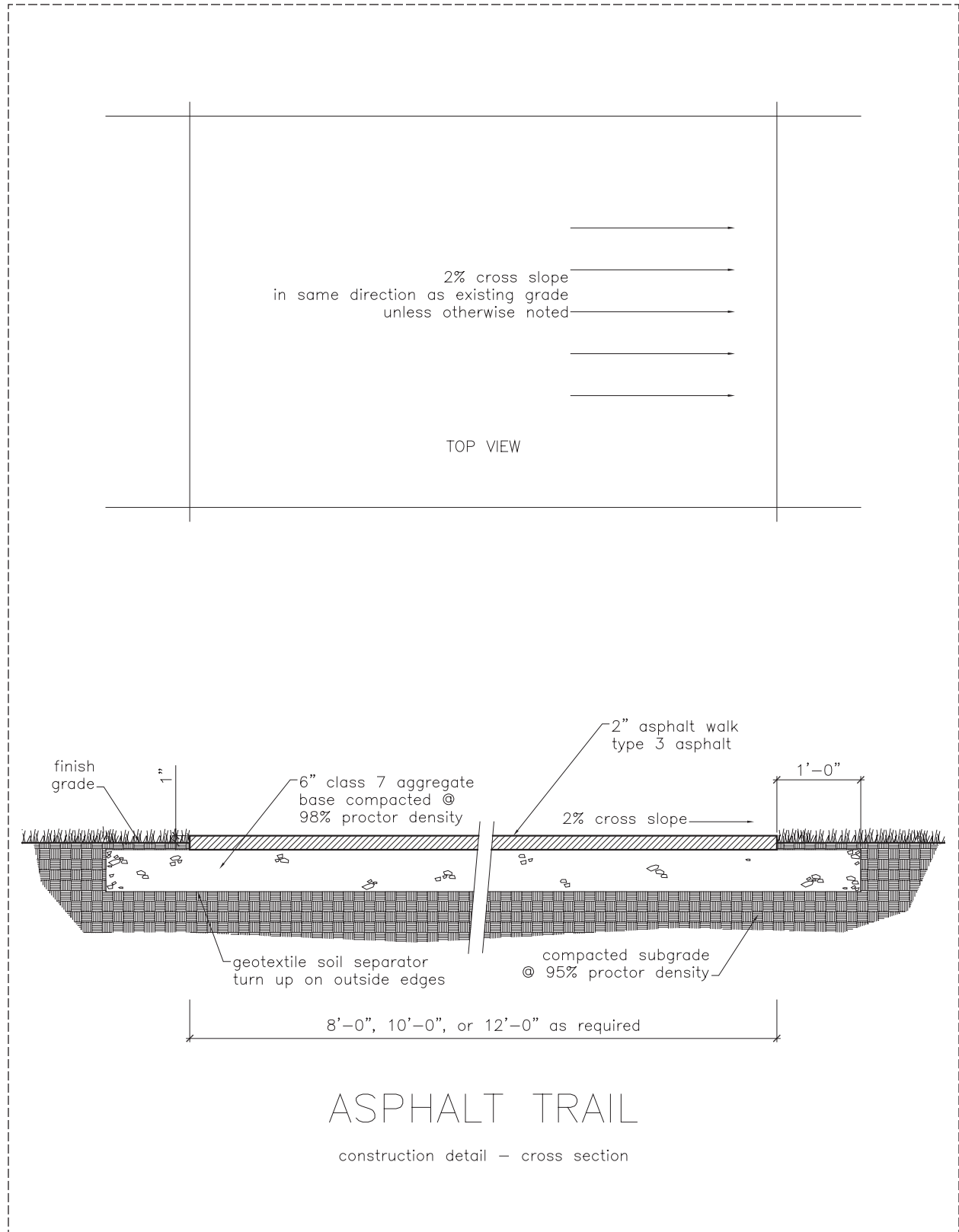
CRUSHED STONE WALK

CAD file available for download at <http://planning.uark.edu>



ASPHALT TRAIL

CAD file available for download at <http://planning.uark.edu>

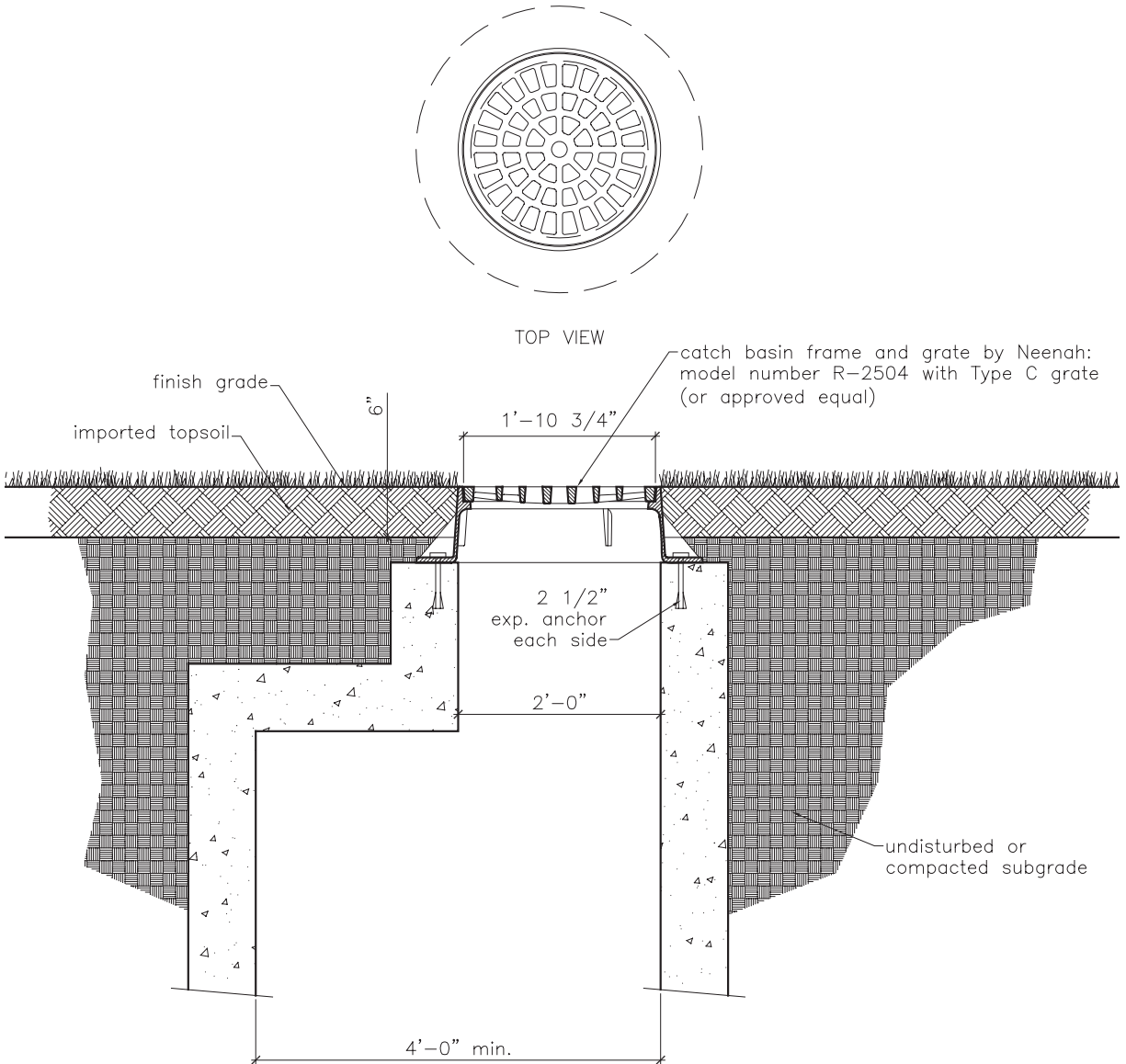


DRAIN INLET

CAD file available for download at <http://planning.uark.edu>

Notes:

1. consult engineer for structural details

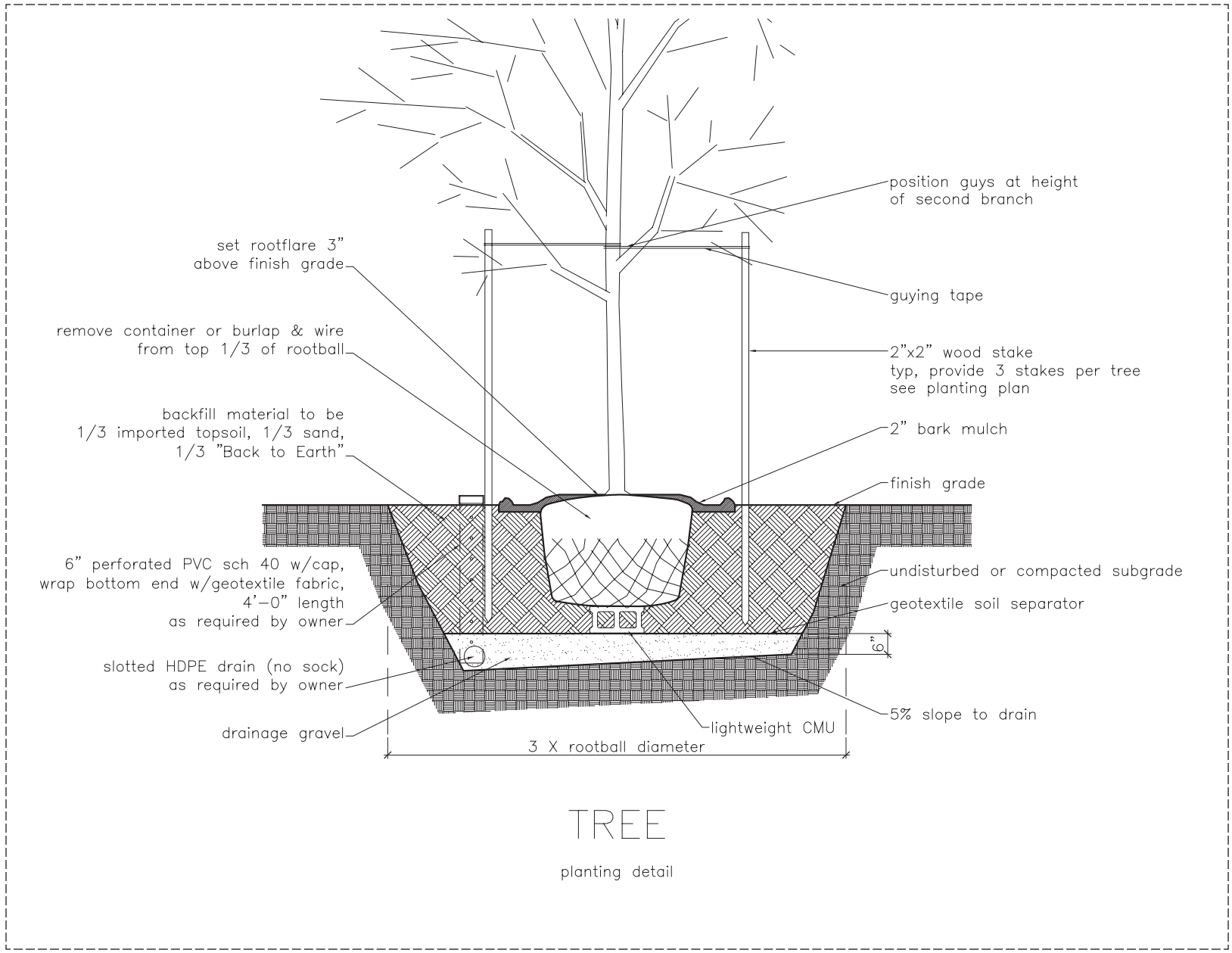


DRAIN INLET IN LAWN

construction detail – cross section

TREE

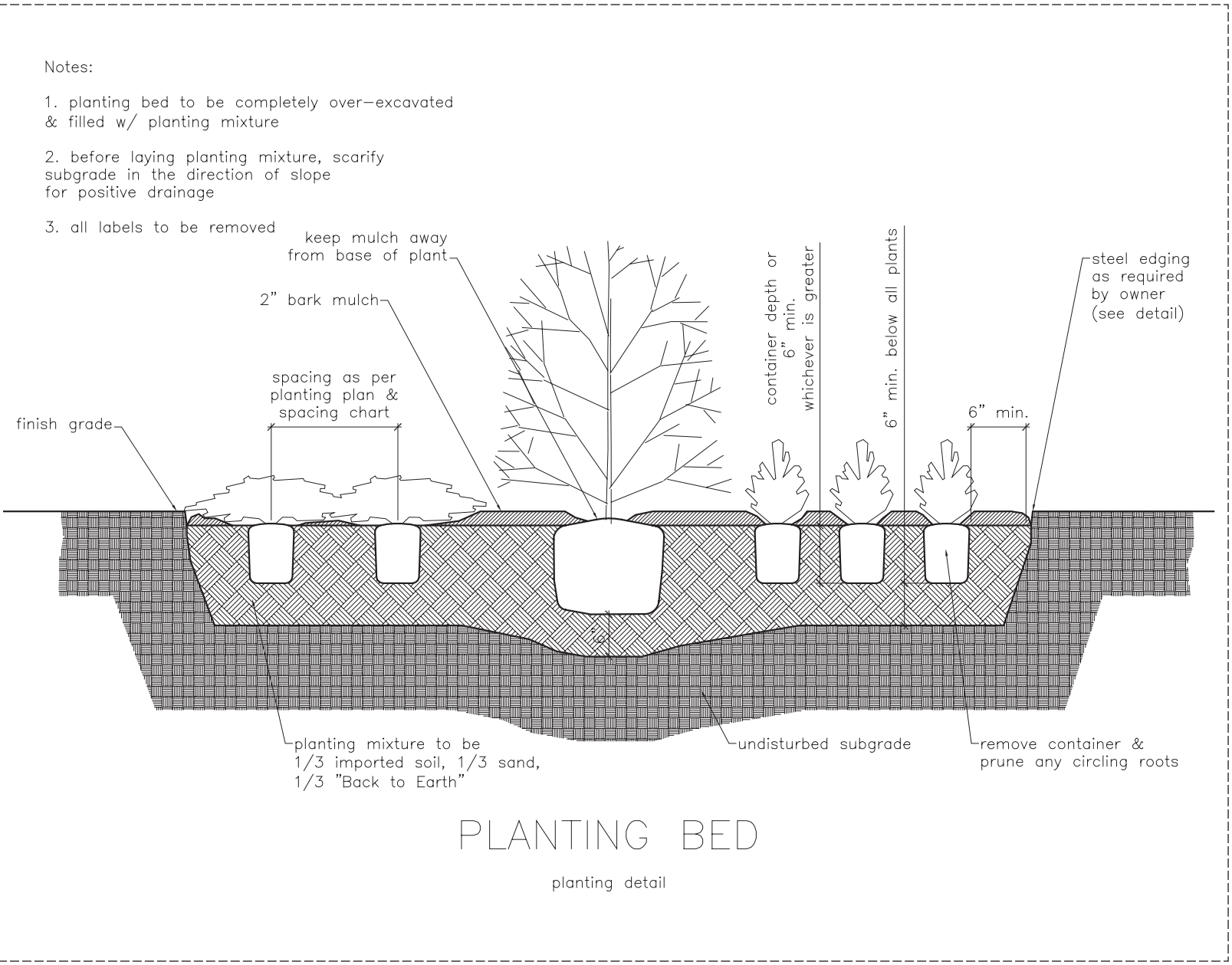
CAD file available for download at <http://planning.uark.edu>



TREE
planting detail

PLANTING BED

CAD file available for download at <http://planning.uark.edu>



PLANTING BED

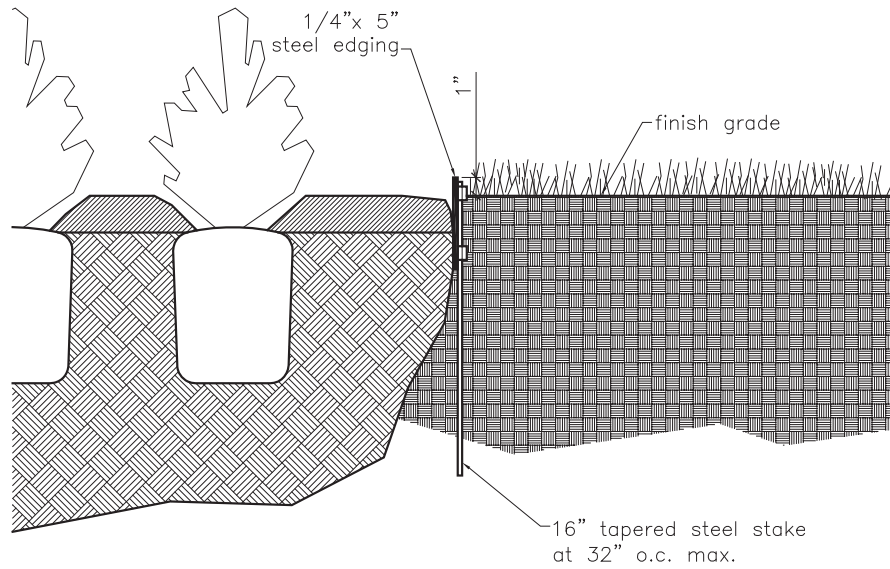
planting detail

Notes:

1. planting bed to be completely over-excavated & filled w/ planting mixture
2. before laying planting mixture, scarify subgrade in the direction of slope for positive drainage
3. all labels to be removed

STEEL EDGING

CAD file available for download at <http://planning.uark.edu>



STEEL EDGING

detail

A

CAMPUS FURNISHINGS STANDARDS

- a1 - benches & tables
- a5 - bike racks
- a7 - bollards
- a10 - cafe furniture
- a13 - handrails & guardrails
- a14 - lights
- a21 - trash & recycling cans
- a25 - emergency phones
- a27 - pavers
- a29 - crushed stone

(Rev 11-15-2018) Check with the FAMA Planning Group, we could be missing some details & at this time we may not have the most updated details.

BENCH - Classic



Monarch Teak Bench

5ft Bench

Item No. 4612
Weight 65 lbs
Dimensions 59.5L x 28W x 37.5H
Color natural teak

6ft Bench

Item No. 4613
Weight 70 lbs
Dimensions 71.5L x 28W x 37.5H
Color natural teak

8ft Bench

Item No. 4614
Weight 94 lbs
Dimensions 95.5L x 28W x 37.5H
Color natural teak

Anchoring Brackets

Item No. 1001 - 6in Below-grade Steel
1005 - 3in On-grade Brass

MANUFACTURER/SUPPLIER

Country Casual
7601 Rickenbacker Drive
Gaithersburg, MD 20879

Phone 301.926.9195 / 800.289.8325
Fax 301.926.9198

sales@countrycasual.com
www.countrycasual.com



BENCH - Contemporary

Wellspring Teak Bench

4ft Teak Bench

Item	48in Wellspring bench, without center arm
Weight	x lbs
Dimensions	48L x 25W x 34H
Seat Height	17.5
Color	natural teak

6ft Teak Bench

Item	72in Wellspring bench, without intermediate arms
Weight	x lbs
Dimensions	72L x 28W x 34H
Seat Height	17.5
Color	natural teak

Anchoring Brackets

Item	stainless steel surface mounting kit
------	--------------------------------------

MANUFACTURER/SUPPLIER

Landscape Forms, Inc.
431 Lawndale Avenue
Kalamazoo, MI 49048

Regional Sales Office, Dallas, TX
Phone 214.343.1145 / 888.667.1145
Fax 214.340.6769

specify@landscapeforms.com
www.landscapeforms.com

COFFEE TABLE - Classic

Avignon™ Teak Coffee Table

Item No. 789875
Weight 27 lbs
Dimensions 47L x 24W x 17H
Color natural teak

MANUFACTURER/SUPPLIER

Smith and Hawken Trade
4 Hamilton Landing, Suite 100
Novato, CA 94949

Phone 800.423.0117
Fax 800.630.7161

trade@smithandhawken.com
www.smithandhawken.com

PICNIC TABLE - Classic/Contemporary

Larchmont Picnic Table

Item No.	#4859
Weight	115 lbs
Dimensions	71L x 63.5W x 28H
Color	natural teak

MANUFACTURER/SUPPLIER

Country Casual
7601 Rickenbacker Drive
Gaithersburg, MD 20879

Phone 301.926.9195 / 800.289.8325
Fax 301.926.9198

sales@countrycasual.com
www.countrycasual.com

BIKE BOLLARD - Classic/Contemporary



Bollard CycLoops - embedment mount

Item No. 2172-E-C
Material Steel
Dimensions 4.5dia x 36H
Color RAL 7037 “dusty grey” powder coat

MANUFACTURER/SUPPLIER

Columbia Cascade Company
TimberForm Site Furnishings Division
1975 SW Fifth Avenue
Portland, OR 97201-5293

Phone 503.223.1157
Fax 503.223.4530

hq@timberform.com
www.timberform.com



BIKE RACK - Classic/Contemporary

Welle Series U Rack - inground - 1 loop

Item No. WSH3602-IG-P
Material Steel
Dimensions 2.375dia x 18.25W x 46H
Color RAL 7037 “dusty grey” powder coat

Welle Series U Rack - surface mount - 3 loops

Item No. WSH3606-SF-P
Material Steel
Dimensions 54L x 18W x 36H
Color RAL 7037 “dusty grey” powder coat

Welle Series U Rack - surface mount - 4 loops

Item No. WSH3608-SF-P
Material Steel
Dimensions 78L x 18W x 36H
Color RAL 7037 “dusty grey” powder coat

Welle Series U Rack - surface mount - 5 loops

Item No. WSH3610-SF-P
Material Steel
Dimensions 102L x 18W x 36H
Color RAL 7037 “dusty grey” powder coat

MANUFACTURER/SUPPLIER

Palmer Group
1072 Folsom Street #328
San Francisco, CA 94103

Phone 415.333.6428 / 888.764.2453
Fax 415.333.2032

www.bikeparking.com

BOLLARD - Classic

Brunel

Item No.	BRU 523
Material	Cast Iron
Dimensions	100cm dia x 1160cm H
Color	Primed

Brunel - removable

Item No.	BRU 523 + SOCK LC hinged removable socket (included)
Material	Cast Iron
Dimensions	100cm dia x 885cm H
Color	Primed

MANUFACTURER

Furnitubes International
Meridian House
Royal Hill
Greenwich
London, SE 10 8RT

Phone 011 44.020.8378.3200
Fax 011 44.020.8378.3250

www.furnitubes.com

BOLLARD - Classic

Gunner

Item No. GUN 503
Material Cast Iron
Dimensions 165cm dia x 1050cm H
Color Primed

Gunner Security*

Item No. GUN 503 SC
Material Cast Iron bollard / Steel insert
Dimensions 165cm dia x 1370cm H
Color Primed

*anti-ram raid version

MANUFACTURER

Furnitubes International
Meridian House
Royal Hill
Greenwich
London, SE 10 8RT

Phone 011 44.020.8378.3200
Fax 011 44.020.8378.3250

www.furnitubes.com

TRAFFIC BOLLARD - Contemporary



TrafficGuard® Round Post Lock

Item No.	RPL 3
Material	Steel
Dimensions	3.5dia x 36H (above ground)
Color	RAL 7037 “dusty grey” powder coat

TrafficGuard® Accessories

High Shear Security Lock Pins

2.6 times the shear capacity of stock pins
Recommended if a higher level of security is needed

Reflective End Marker Labels

Increases the visibility of bollards in low light situations

Removable Bollard Storage Rack

Size	2, 4, or 6 units
Material	Hot dipped, galvanized finish

MANUFACTURER

TrafficGuard® Direct LLC
PO Box 201
Geneva, IL 60134-9946

Phone 877.727.7347
Fax 800.814.7194

<http://trafficguard.net>

CAFE FURNITURE - Classic

Bistro Collection Chairs & Tables



Metal Folding Chairs - steel frame & painted Beechwood slats

Item No. 5001 "Classique" chair
Color 02 Cedar Green

Metal Folding Chairs - steel frame & steel slats

Item No. 0101 "Square" chair
Color 02 Cedar Green



Metal Folding Tables - steel frame & top

Item Nos. 0245 24in Round Solid Top table
0257 30in Round Solid Top table / without parasol hole
0233 30in Round Solid Top table / with parasol hole
0230 24in Round Perforated Top "Floreal" table
0234 30in Round Perforated Top "Floreal" table
6041 46Lx30W Rectangular Solid Top table
Color 02 Cedar Green

MANUFACTURER

Fermob Outdoor Lounge
Parc Actival
01140 Thoissy, FRANCE

info@fermob.com
www.fermob.com

DISTRIBUTOR

UpCountry
1389 Weber Industrial Drive
Cumming, GA 30041

Phone 770.888.9606
Fax 770.205.0182

gardens@upcountry.biz
www.upcountry.biz

CAFE FURNITURE - Contemporary

Parc Centre Chairs & Tables

Metal Chairs - steel frame with powdercoat finish

Item Parc Centre Chair, without arms
Color Titanium (Panguard II[®] polyester powdercoat)



Metal Tables - steel frame & top with powdercoat finish

Item 24in Round table, freestanding
30in Round table, freestanding
Color Titanium (Panguard II[®] polyester powdercoat)

MANUFACTURER

Landscape Forms, Inc.
431 Lawndale Avenue
Kalamazoo, MI 49048

Regional Sales Office, Dallas, TX
Phone 214.343.1145 / 888.667.1145
Fax 214.340.6769

specify@landscapeforms.com
www.landscapeforms.com

CAFE UMBRELLA - Classic



Umbrella & Base

Royal Cafe & Bistro Wood Umbrella

Item	6ft Octagonal Asian Hardwood
Material	Hardwood pole / Suncrylic Solution-Dyed Acrylic fabric
Dimensions	72dia x 92H
Wood Finish	Dark Wood Premium Finish
Fabric Color	White

Tuscany Umbrella Base

Item No.	MB35X
Weight	50 lbs
Material	Cast Iron
Dimensions	23dia
Color	Hammered Bronze powder coat
Neck Size	TT (Thru-Table) - fits 1.5dia poles

DISTRIBUTOR

Patio Experts, LLC
14252 Culver Drive, # 641
Irvine, CA 92604

Phone 714.842.4759 / 800.593.6612
Fax 714.842.0939

info@patioexperts.com
www.outdoorpatioumbrellas.com / www.patioexperts.com

HANDRAIL/GUARDRAIL - Classic

Traditional Railing Components*



Steel components

Part Nos.	4429	handrail moulding - 20ft length
	4429S	straight lamb's tongue
	4429B	bevel lamb's tongue
	331	36in starting post
	331L	40in starting post
	329	36in spindle
	330	36in spindle
	329L	42in spindle
	330L	42in spindle
	369	square hole base
	---	others as needed (finials, corners, etc.)

Bronze components

Part Nos.	4531	handrail moulding - 20ft length
	4537	handrail moulding for bending
	4531S	straight lamb's tongue
	4531B	bevel lamb's tongue
	131	40in starting post
	129	36in spindle
	130	36in spindle
	129L	42in spindle
	130L	42in spindle
	269	square hole base
	---	others as needed (finials, corners, etc.)

MANUFACTURER/SUPPLIER

Julius Blum & Co. Inc.
PO Box 816
Carlstadt, NJ 07072

Phone 201.438.4600
Fax 201.438.6003

www.juliusblum.com

*see *Campus Landscape Standards* for fabrication information

PEDESTRIAN LIGHT - Classic

Spring City post & luminaire

“Newburyport” Lamp Post

Item No. IPSNBP-16-12-TN3.5/3-323/1NW-LR-BG
 Material Cast Iron
 Dimensions 16dia x 144H
 Color Bottle Green

“Savannah Genie” Luminaire

Item No. ALMSVH-YSDP-BG
 Material Cast Aluminum
 Dimensions 19.125oct x 39.125H
 Color Bottle Green

Globe Seeded Acrylic

Optical System (by Clear Energy Services)

IN PROGRESS

Lamp CF 70W quad GX24q-6 / 841 (GE item no. 48868)
 Ballast 120V - 277V Universal Voltage Electronic Ballast (GE item no. 47506)

MANUFACTURER

Spring City Electrical Mfg. Co.
 Hall & Main Streets
 PO Drawer 19
 Spring City, PA 19475

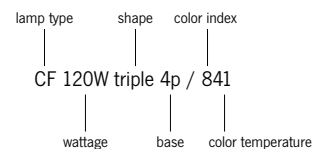
Phone 610.948.4000
 Fax 610.948.5577

www.springcity.com

OPTICAL SYSTEM

Clear Energy Services
 438 E Millsap Road
 Suite 203
 Fayetteville, AR 72703

Phone 479.695.1976
 Fax 479.527.8831



*see *Campus Landscape Standards* for footing detail

PEDESTRIAN LIGHT - Classic alternate*



Spring City post & luminaire

“Pasadena” Lamp Post

Item No. IPSPAS-9-9.5-TN2.875/3-323/1NW-BG
 Material Cast Iron
 Dimensions 9L x 9W x 114H
 Color Bottle Green

“William and Mary” Luminaire

Item No. ALMWMS-YSDP-BG
 Material Cast Aluminum
 Dimensions 16.625oct x 34H
 Color Bottle Green

Globe Seeded Acrylic

Optical System (by Clear Energy Services)

IN PROGRESS

Lamp CF 70W quad GX24q-6 / 841 (GE item no. 48868)
 Ballast 120V - 277V Universal Voltage Electronic Ballast (GE item no. 47506)

MANUFACTURER

Spring City Electrical Mfg. Co.
 Hall & Main Streets
 PO Drawer 19
 Spring City, PA 19475

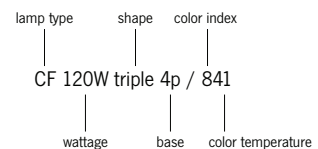
Phone 610.948.4000
 Fax 610.948.5577

www.springcity.com

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 438 E Millsap Road
 Suite 203
 Fayetteville, AR 72703

Phone 479.695.1976
 Fax 479.527.8831



*see *Campus Landscape Standards* for footing detail

PEDESTRIAN LIGHT - Contemporary



BEGA pole & luminaire

Pole 1308HR

Item No. 1308HR
Material Aluminum
Dimensions 5dia x 164H
Color BEGA Black

Luminaire 8223P Modified

Item No. 8223P modified
Material Aluminum
Dimensions 31.5dia x 29.25H
Color BEGA Black

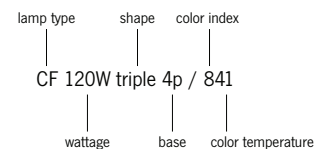
Globe White Plastic Diffuser
Lamp CF 120W triple 4p / 841
Ballast 120V - 277V Universal Voltage Electronic Ballast

MANUFACTURER

BEGA/US
1000 Bega Way
Carpinteria, CA 93013

Phone 805.664.0533
Fax 805.566.9474

www.bega-us.com



*see *Campus Landscape Standards* for footing detail

PARKING & SERVICE AREA LIGHT - Classic/Contemporary

BEGA pole & luminaire

Pole 1908HR

Item No. 1908HR
Material Aluminum
Dimensions 5dia x 323.25H
Color BEGA Black

Luminaire 8145MH - single

Item No. 8145MH
Material Aluminum
Dimensions 20L x 9W x 4H
Color BEGA Black

Globe Tempered Clear Glass
Lamp MH 150W T6 G12
Ballast 120V/277V Dual Voltage Metal Halide Ballast

Luminaire 8146MH - double

Item No. 8146MH
Material Aluminum
Dimensions 38.5L x 9W x 4H
Color BEGA Black

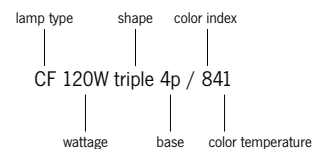
Globe Tempered Clear Glass
Lamp MH 150W T6 G12
Ballast 120V/277V Dual Voltage Metal Halide Ballast (2)

MANUFACTURER

BEGA/US
1000 Bega Way
Carpinteria, CA 93013

Phone 805.664.0533
Fax 805.566.9474

www.bega-us.com



*see *Campus Landscape Standards* for footing detail

WALL-MOUNTED LIGHT - Contemporary

BEGA wall-mounted luminaire

Luminaire 7475MH

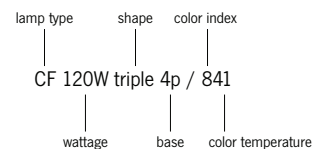
Item No.	7475MH
Material	Cast Aluminum
Dimensions	18.75L x 9W x 4.5H
Color	BEGA Black
Globe	Tempered Clear Glass
Lamp	MH 70W T6 G12
Ballast	120V/277V Dual Voltage Metal Halide Ballast

MANUFACTURER

BEGA/US
1000 Bega Way
Carpinteria, CA 93013

Phone 805.664.0533
Fax 805.566.9474

www.bega-us.com



WALL-PACK LIGHT - Classic/Contemporary

GeoMatrixx™ Series

GXMW Series Medium Architectural WallPack

Item No.	GX M W 57 HFL L GA 8
Material	Cast Aluminum
Dimensions	13L x 12W x 6.5H
Color	Galvanite
Globe	Tempered Clear Glass
Lamp	CF 57W
Ballast	120V - 277V Universal Voltage Electronic Ballast
Mounting	12ft max height

Mounting Box

Item No.	GMSBOX
----------	--------

Photo Control

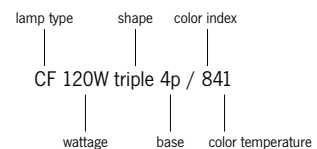
Item No.	P105A (button)
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MANUFACTURER

ExceLine
2345 Vauxhall Road
Union, NJ 07083

Phone 800.334.2212
Fax 908.964.0968

www.exceline.com



LIGHTED BOLLARD - Classic/Contemporary

Horizontal louver bollard

Horizontal louver bollard - 180° light distribution

Item No. 8136P-BLK bollard + 895A anchorage for 8136 (included)
Material Extruded Aluminum
Dimensions 5.5dia x 39.375H
Color BEGA Black

Globe hand-blown 3-ply opal diffuser
Lamp CF 13W quad 4p
Ballast 120V - 277V Universal Voltage Electronic Ballast

Horizontal louver bollard - 360° light distribution

Item No. 8429P-BLK bollard + 895A anchorage for 8429 (included)
Material Extruded Aluminum
Dimensions 5.5dia x 39.375H
Color BEGA Black

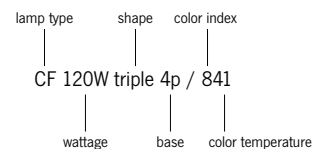
Globe hand-blown 3-ply opal diffuser
Lamp CF 13W quad 4p
Ballast 120V - 277V Universal Voltage Electronic Ballast

MANUFACTURER

BEGA/US
1000 Bega Way
Carpinteria, CA 93013

Phone 805.664.0533
Fax 805.566.9474

www.bega-us.com



TRASH CAN - Classic



Chase Park™ Litter Receptacle with polyethylene liner - top opening

Item	Chase Park Litter Receptacle
Material	Cast Iron base / Cast Aluminum body / Spun Aluminum lid
Dimensions	24dia x 39H
Capacity	40 gallons
Color	Stone (Panguard II® polyester powdercoat)

MANUFACTURER

Landscape Forms, Inc.
431 Lawndale Avenue
Kalamazoo, MI 49048

Regional Sales Office, Dallas, TX
Phone 214.343.1145 / 888.667.1145
Fax 214.340.6769

specify@landscapeforms.com
www.landscapeforms.com

*see *Campus Landscape Standards* for footing detail

RECYCLING CAN - Classic

Chase Park™ Recycling Receptacle with polyethylene liner - top opening

Item	Chase Park Recycling Receptacle with 5" diameter opening in top (for aluminum cans or plastic bottles)
Material	Cast Iron base / Cast Aluminum body / Spun Aluminum lid
Dimensions	24dia x 39H
Capacity	40 gallons
Color	Ivy (Panguard II® polyester powdercoat)

MANUFACTURER

Landscape Forms, Inc.
431 Lawndale Avenue
Kalamazoo, MI 49048

Regional Sales Office, Dallas, TX
Phone 214.343.1145 / 888.667.1145
Fax 214.340.6769

specify@landscapeforms.com
www.landscapeforms.com

*see *Campus Landscape Standards* for footing detail

TRASH CAN - Contemporary



Petoskey Litter Receptacle with polyethylene liner

Item	Petoskey Litter Receptacle
Material	Cold-rolled Steel body / Spun Steel lid
Dimensions	20dia x 42H
Capacity	30 gallons
Color	Stone (Panguard II [®] polyester powdercoat)

MANUFACTURER

Landscape Forms, Inc.
431 Lawndale Avenue
Kalamazoo, MI 49048

Regional Sales Office, Dallas, TX
Phone 214.343.1145 / 888.667.1145
Fax 214.340.6769

specify@landscapeforms.com
www.landscapeforms.com

**see Campus Landscape Standards for footing detail*

RECYCLING CAN - Contemporary

Petoskey Recycling Receptacle with polyethylene liner

Item	Petoskey Recycling Receptacle with 5" diameter opening (for aluminum cans or plastic bottles); or newspaper slit
Material	Cold-rolled Steel body / Spun Steel lid
Dimensions	20dia x 42H
Capacity	30 gallons
Color	Ivy (Panguard II [®] polyester powdercoat)

MANUFACTURER

Landscape Forms, Inc.
431 Lawndale Avenue
Kalamazoo, MI 49048

Regional Sales Office, Dallas, TX
Phone 214.343.1145 / 888.667.1145
Fax 214.340.6769

specify@landscapeforms.com
www.landscapeforms.com

*see *Campus Landscape Standards* for footing detail

EMERGENCY PHONE - Classic/Contemporary



CB 1-s Pedestal Interactive Voice Communication Unit

Item No.	CB 1-s pedestal + FP 1 faceplate (included)
Material	Steel body / Stainless Steel faceplate
Dimensions	12.75dia x 108H
Color	Safety Blue

Text	“Emergency”
Text color	Reflective White

Lamp	MH 70W
Ballast	120V

Optional Features to include:

- Cellular communication
- 70W MH area light
- Photocell for area light
- Step-down power transformer (as needed)

MANUFACTURER

Code Blue Corp.
92 E 64th Street
Holland, MI 49423

Phone 800.205.7186
Fax 616.392.8391

infocb@codeblue.com
www.codeblue.com

EMERGENCY PHONE - Classic/Contemporary



CB 8 Wall-Mounted Interactive Voice Communication Unit

Item No.	CB 8 wall-mounted unit + FP 1 faceplate (included)
Material	Steel body / Stainless Steel faceplate
Dimensions	14L x 12.75W x 25.75H
Color	Safety Blue
Text	“Emergency”
Text color	Reflective White

Optional Features to include:

Cellular communication
Beacon/strobe kit
Step-down power transformer (as needed)



Remote Mount Combination Blue Beacon/Strobe Kit

Item	Remote Mount Combination Blue Beacon/Strobe Kit
Material	Steel body / Polycarbonate refractor

MANUFACTURER

Code Blue Corp.
92 E 64th Street
Holland, MI 49423

Phone 800.205.7186
Fax 616.392.8391

info**cb**@codeblue.com
www.codeblue.com

ASPHALT PAVERS - Classic/Contemporary

Commercial Asphalt Block

6" x 12" Commercial Asphalt Block

Item	6" x 12" commercial asphalt block
Material	Type 3 Asphalt cement, ASTM D-312
Dimensions	12L x 6W x (1 1/4" to 3")H, thickness dependent upon application
Finish	Ground Finish or Tudor Finish, dependent upon application
Color	Matrix #10

5" x 12" Commercial Asphalt Block

Item	5" x 12" commercial asphalt block
Material	Type 3 Asphalt cement, ASTM D-312
Dimensions	12L x 6W x (1 1/4" to 3")H
Finish	Ground Finish or Tudor Finish, dependent upon application
Color	Matrix #10

MANUFACTURER

Hanover Architectural Products
240 Bender Road
Hanover, PA 17331

Phone 717.637.0500
Fax 717.637.7145

www.hanoverpavers.com

**see Campus Landscape Standards for installation details*

TRUNCATED DOME PAVERS - Classic/Contemporary

Detectable Warning Paver

12" x 12" Detectable Warning Paver

Item	12" x 12" detectable warning paver
Material	concrete, ASTM C936, ASTM C67
Dimensions	11.75L x 11.75W x (1 1/4" to 4")H, thickness dependent upon application
Finish	Tudor Finish
Color	Charcoal

24" x 24" Detectable Warning Paver

Item	24" x 24" detectable warning paver
Material	concrete, ASTM C936, ASTM C67
Dimensions	23.5L x 23.5W x (1 1/4" to 4")H
Finish	Tudor Finish
Color	Charcoal

MANUFACTURER

Hanover Architectural Products
240 Bender Road
Hanover, PA 17331

Phone 717.637.0500
Fax 717.637.7145

www.hanoverpavers.com

CRUSHED STONE - Classic/Contemporary



Crushed Stone Gravel

Item	Syenite "Screenings"
Material	Syenite
Size	Screenings

MANUFACTURER

Granite Mountain Quarries, Inc.
1010 Shamburger Lane
Little Rock, AR 72201

Phone 501.490.1535
Fax 501.490.1852

**see Campus Landscape Standards for installation detail*



DANGER

Arc Flash & Shock Hazard Appropriate PPE Required

Arc Flash Boundary _____

Hazard Risk Category _____

Minimum Arc Rating of Clothing _____

_____ VAC Shock Hazard When:

Incident Energy (cal/cm²) _____

Corresponding Work Distance _____

Nominal System Voltage _____

Limited Approach Boundary _____

Restricted Approach Boundary _____

Prohibited Approach Boundary _____

FLASH PPE

- | | | | |
|---|---|---|--------------------------|
| <input type="checkbox"/> Arc-rated balaclava | <input type="checkbox"/> Arc-rated shirt | <input type="checkbox"/> Face shield | <input type="checkbox"/> |
| <input type="checkbox"/> Arc-rated hard hat liner | <input type="checkbox"/> Arc-rated pants | <input type="checkbox"/> Hearing protection | <input type="checkbox"/> |
| <input type="checkbox"/> Arc-rated gloves | <input type="checkbox"/> Arc-rated coverall | <input type="checkbox"/> Safety glasses | <input type="checkbox"/> |
| <input type="checkbox"/> Long-sleeve shirt | <input type="checkbox"/> Flash suit | <input type="checkbox"/> Safety goggles | <input type="checkbox"/> |
| <input type="checkbox"/> Long pants | <input type="checkbox"/> Flash hood | <input type="checkbox"/> Leather gloves | <input type="checkbox"/> |
| | <input type="checkbox"/> Hard hat | <input type="checkbox"/> Leather shoes | <input type="checkbox"/> |

SHOCK PPE

- | | |
|-----------------------------------|-------|
| <input type="checkbox"/> Class | _____ |
| <input type="checkbox"/> V-rating | _____ |
| <input type="checkbox"/> | |
| <input type="checkbox"/> | |

Equipment ID: _____

BRADY #121078 BRADYID.COM Y1894667

