CONSTRUCTION STANDARDS

Note: The buildings on the UCCS campus are divided into two categories: General Fund and Auxiliaries. General Fund Buildings include academic and administrative functions. Auxiliary buildings include residence halls, athletic, and dining facilities. In some cases, construction standards differ depending on the building category. Confirm building category with Facilities Services Project Manager.

DIVISION 32 – EXTERIOR IMPROVEMENTS

- **Roads**
- **Sidewalks**
- **Pedestrian Spine**
- **Trash Enclosures**
- **Asphalt Paving**
- **Irrigation Systems**
- **Landscape**

A. ROADS

1. Campus Road should be designed with a minimum width of 24 feet for two-way traffic; 20 feet for one-way traffic and 20 feet for any fire lane access.
2. Curb and Gutter: Curb and gutter shall be 6-inch standard curb with a 12-inch gutter section for campus streets and parking lots. In public rights of way, other standards may be applicable.
3. The use of mountable curb and gutter is for roundabouts only.

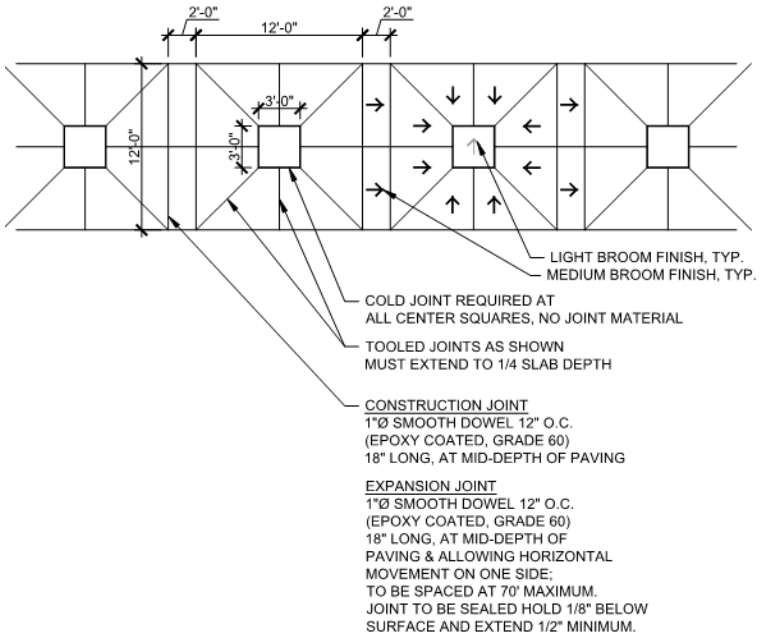
B. SIDEWALKS

1. Concrete is the campus standard for all new construction unless directed otherwise. Concrete standard thickness is 6 inches. Concrete sidewalks shall be a minimum of 5 feet wide. At locations where the sidewalk is adjacent to head in parking, the sidewalk shall be a minimum of 6’ wide.
2. Layout pattern from centerline of walk. If necessary, layout jointing from the edges to avoid panels narrower than 12 inches wide.
3. Provide broom finish perpendicular to main traffic.
4. Handicap Curb Ramps: Detectable warning strips shall be prefabricated reddish integrally colored truncated domes:
   Detectable Warning Paving Slab – TekWay Dome – Tiles, CASTinTACT®3 Truncated Dome Panels (Red). Manufacturers: StoneBilt Concepts, StrongGo, LLC and CastinTact.
5. Handicap ramps shall have a minimum width of 4 feet and shall not exceed a 1:12 slope. Handicap ramp side tapers shall not be less than 1 foot 6 inches.

C. PEDESTRIAN SPINE

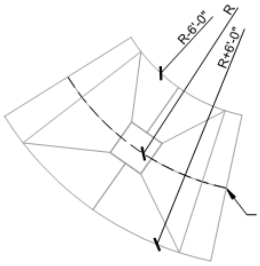
1. Pedestrian spine is 20 feet wide where it doubles as a fire lane. In other areas it is 12 feet wide.

2. The pedestrian spine shall be laid out per the Campus standard detail. Contractor will be required to prepare a 14 foot x 20 foot mock-up of the spine section for approval by the owner prior to commencing construction.
3. Center square shall be placed independently of the rest of the slab to provide a cold joint around.

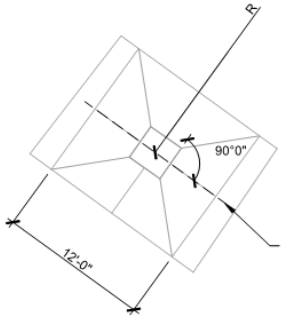


PEDESTRIAN SPINE SCORING

1/8" = 1'-0"



PATTERN LAYOUT ON CURVED POTIONS WITH CENTERLINE RADIUS LESS THAN 50': THE LONGITUDINAL DIMENSIONS SHALL BE APPLIED AT THE SPINE CENTERLINE, PERPENDICULAR JOINTS SHALL BE SET RADIAL TO THE CURVE CENTER POINT UNLESS NOTED OTHERWISE.



PATTERN LAYOUT ON CURVED POTIONS WITH CENTERLINE RADIUS GREATER THAN 50': THE LONGITUDINAL DIMENSIONS SHALL BE APPLIED AT THE SPINE CENTERLINE ALONG A 14' CHORD ON THE CENTERLINE ARC, AND JOINTS SHALL BE PARALLEL AND PERPENDICULAR TO THE CHORD UNLESS NOTED OTHERWISE

PEDESTRIAN SPINE SCORING

1/8" = 1'0"

D. TRASH ENCLOSURE

1. Design plan shall provide an enclosure to house trash and recycling dumpsters as well as a cage for cardboard recycling. Enclosure materials to match adjacent construction.
2. Trash dumpsters shall have a 6 inch thick concrete loading pad over 95% compacted base with a maximum slope of 4 %. Concrete pad shall extend 10 feet in front of the enclosure and the width shall match that of the enclosure.
3. Trash enclosures shall have gates to coordinate with adjacent areas. Use of chain link gates is restricted to areas not visible to the public.
4. Gates shall be powdercoated finish RAL #8019 - Brun Gris

E. ASPHALT PAVING

This section covers construction with Hot Mix Asphalt pavements. Included herein are the general requirements for the construction of one or more lifts of Hot Mix Asphalt pavement on a prepared surface.

Prior to the placing of the mixture, irregularities in the underlying surface shall be brought to uniform grade and cross section. The surface shall be cleaned of all dust and debris. A tack coat shall be applied per the approved plans/contract.

The work shall consist of the preparation of the Hot Mix Asphalt (HMA) and the placement of the HMA to the lines, grades, thickness and typical cross sections shown on the plans. When more than one lift is required, each lift shall be compacted to the required density prior to the placement of the next lift.

The design engineer shall follow the recommendations of the geotechnical engineer with regard to pavement design, including but not limited to asphalt cement type, subgrade thickness, and pavement thickness. The Contractor must submit the mix design to the Project Manager for approval. The mix design(s) to be used on the project shall be approved prior to the start of any paving operation.

HMA shall only be placed on properly constructed surfaces that are dry, unfrozen surfaces and only when weather conditions allow for proper handling and compacting of the mixture.

Asphalt pavement should not be used in loading docks and high turning stress areas.

An independent testing and inspection agency to perform quality assurance testing during asphalt paving operations may be employed by the Owner. The Contractor shall pay any retesting fees required due to failed tests.

F. IRRIGATION SYSTEMS

1. As-Built Drawings

a. Indicate zoning changes.
b. Indicate non-pressure piping changes
c. Dimensions, from two permanent points of reference (building corners, sidewalk, road intersections), location of the following items:
    i. Connection to existing water lines
    ii. Routing of Sprinkler pressure lines
    iii. Sprinkler control valves
    iv. Quick coupling valves
    v. Drain valves
    vi. Control wire routing if not with pressure mainline
    vii. All gate valves
    viii. Other related equipment as desired
    ix. Indicate depth of main and laterals

2. Operation Instructions
    a. Submit one hard copy and digital copy of operating instructions including winterization procedures and start-up, with cut sheets of products, and coordinate controller/watering operation instruction with Owner maintenance personnel.
    b. Provide one controller chart for each automatic controller installed.
    c. Identify area of coverage of each remote control valve, using a distinctly different color drawing over entire area of coverage.
3. Jobsite Conditions
    a. Preserve and protect all trees, plants, monuments, structures, and paved areas from damage. The Contractor will repair all damage.
    b. All trenching or other Work under the dripline of any and all evergreens or deciduous material shall be done by hand or by other methods to prevent damage to the root system.
    c. Prune any branches of trees to be preserved which may be damaged by construction.
    d. Where it is necessary to excavate adjacent to existing trees, avoid injury to trees and tree roots. Excavation, in areas where 2 inch and larger roots occur, shall be done by hand. Roots 2 inches or larger in diameter, except directly in the path of pipe of conduit, shall be tunneled under and shall be heavily wrapped with burlap to prevent scarring or excessive drying. Where a trenching machine is operated close to trees having roots smaller than 2 inches in diameter, wall of trench adjacent to tree shall be hand trimmed, making clean cuts through roots. Trenches adjacent to trees shall be closed within 24 hours, and when this is not possible, side of trench adjacent to tree shall be kept shaded with moistened burlap or canvas.
4. Warranty/Guarantee/Maintenance
    a. Manufacturer shall warrant materials and provide labor against defects for a period of one year from date of Substantial Completion.
    b. Installer(s) shall guaranty workmanship for a period of one year from date of Substantial Completion.
    c. Settling of backfilled trenches which may occur during the warranty period, shall be repaired at no expense to the Owner, including complete restoration of damaged property.

d. Expenses due to vandalism before Substantial Completion shall be borne by the Contractor.
e. Installer(s) shall maintain the site for a period of one year following the date of Substantial Completion. "Fine-tune" entire system by regulating valves, adjusting patterns and break-up arms, and setting pressure reducing valves at proper and similar pressure to provide optimum and efficient coverage. Flush and adjust all sprinkler heads for optimum performance and to prevent overspray onto walks, roadways, and buildings as much as possible. This maintenance shall take place every two weeks during the course of the project and warranty period.
f. System shall be winterized within 3 days of notification by the Owner. System shall be voided of water using compressed air or similar method. Reopen, operate, and adjust system malfunctions accordingly during April of the following season within 3 days of notification by Owner.

5. Materials
   a. General Piping
      i. Pressure Supply Lines (Downstream of Backflow Prevention Units) – Schedule 40 PVC
      ii. Non-Pressure Lines and Lateral Lines – Schedule 40 PVC
   b. Copper Pipe and Fittings
      i. Copper Pipe – Type K, hard tempered
      ii. Fittings – Wrought copper, solder joint type
      iii. Joints – Soldered with solder, 45% silver, 15% copper, 16% zinc, and 24% cadmium and solidus at 1125 °F and liquids at 1145 °F.
   c. Brass Pipe and Fittings:
      i. Brass Pipe – 85% red brass, ANSI Schedule 40 screwed pipe
      ii. Fittings – Medium brass, screwed 125 pound class.
   d. Plastic Pipe and Fittings
      i. Identify all pipe with the following makings:
         Manufacturer's name
         Nominal pipe size
         Schedule of class
         Pressure rating
         NSF (National Sanitation Foundation) seal of approval
         Date of extrusion
      ii. Solvent Weld Pipe – Manufactured from virgin polyvinyl chloride (PVC) compound in accordance with ASTM D2241 and ASTM D1784; cell classification 2454-B, Type 1, Grade 1.
         Fittings – Standard wright, Schedule 40, injection molder PVC; complying with ASTM D1784 and D2466, cell classification 12454-B.
            Threads – Injection molded type.
            Tees and ells – side gated
         Threaded Nipples – ASTM D2464, Schedule 80 with molded threads
         Joint Cement and Primer – Type as recommended by manufacturer of pipe and fittings.

iii. Gasketed End Pipe – manufactured from virgin Polyvinyl Chloride compound in accordance with ASTM D2241 and ASTM D1784, cell classification 1254-B, Type 1, Grade 1.
Fittings (3" and larger) – Ductile iron, grade 70-55-05 in accordance with ASTM A-536. Fittings shall have deep bell push-on joints with gaskets meeting ASTM F-477.
Gaskets – Factory installed in pipe and fittings, having a metal or plastic support within gasket or a plastic retainer ring for gasket.
Lubricant – As recommended by manufacturer of pipe fittings

iv. Gate Valves
Gate valves for 3/4 inch through 1-1/2 inch pipe –
Brass construction; solid wedge, IPS threads, and non-rising stem with wheel operating handle.
Gate Valves for 2 inch and larger pipe –
Iron body, brass or bronze mounted AWWA gate valves with a clear waterway equal to full nominal diameter of valve

Rubber gasket, threaded, or mechanical joint types only

Valves shall be able to withstand a continuous working pressure of 200 psi and be equipped with a square operating nut and resilient wedge.

Provide pipe restraints on gate valves 3 inches or larger.

v. Quick Coupling Valves – Rainbird, Brass two-piece body designed for working pressure of 150 psi, operable with quick coupler. Equip quick coupler with locking rubber cover.

vi. Valve Boxes
Gate valves, drip line blow-out stubs, and wire stub box – Carson #910-12, Brooks #1100.

3/4 inch through 2 inch control valves – Carson #1419-13B, Brooks #1419 box.

Drip valve assemblies – Carson #1320-13B

vii. Electrical Control Wiring
Low Voltage-Electrical Control Wire – AWG UFUL approved No. 14 direct bury copper wire or larger.
Wire Colors:
Control Wires – Red
Common Wires – White
Master Valve Wires – Blue
Spare Control Wires – Black
Spare Common Wires – Yellow

If multiple controllers are utilized, and wire paths of different controllers cross each other, both common and control wires from each controller shall be different colors.

Control wire connections and splices shall be made with 3M direct bury splice. Rainbird Pentite connectors.

If the splice is too be made with a round box over it for access – Control wire connections and splices shall be made with 3M DBY direct bury splice or Rainbird Pentite connectors.

Wire splice boxes – Carson #910-12

If no round box is to be use, the joints must be twisted in an in-line fashion, soldered, and a shrink tube is to be heated around the joint to prevent any penetration from water or elements.

High Voltage – Type required by code.

Communication Cable – Paige P7162DA

viii. Ball Valves – A ball valve should be placed in each box containing a valve and is to be run in-line after the tab off the main line and before electric control valve. All ball valves used are to be Asahi Valve Treaded Ball Valves, Sch 40 and Rated at 150 psi at 70 °F, sized according to print.

ix. Electric Control Valves – All electric control valves are to be Rainbird PEB Threaded Control Valves with a manual flow adjustment and Manual Bleed out nut.

x. Unions – Each valve installed should be followed by a threaded union on the lateral side to work with threaded 90 at the top of the T off of main line for maintenance. Unions shall be made by Dura Plastic Products and be FIPI X FIPT Sch 40 and be rated at 150 psi at 73 °F.

xi. Pop-up Spray Heads – Rainbird

xii. Pop-up Spray Nozzle – Rainbird

xiii. Shrub Spray Head – Rainbird

xiv. Gear Driven Rotor – Rainbird

xv. Drip emitter indicators

6. Execution
   a. Coordination – Contractor will be held responsible for coordination between landscape and irrigation system installation. Landscape material locations shown on the Landscape Plan shall take precedence over the irrigation system equipment locations. If irrigation equipment is installed in conflict with the landscape material locations shown on the

Landscape Plan, the Contractor will be required to relocate the irrigation equipment at the Contractor's expense.

b. Static Pressure Verification – Contractor shall field verify the static pressure at the project site, prior to commencing work or ordering irrigation materials, and submit findings, in writing to the UCCS Project Manager. If the Contractor fails to verify static water pressure prior to commencing work or ordering irrigation materials, Contractor shall assume responsibility for all costs required o make system operational and the costs required to replace any damaged landscape material. Damage shall include all required material costs, design costs and plant replacement costs.

c. Preparation

   i. Install sleeving under asphalt paving and concrete walks prior to concreting and paving operations, to accommodate piping and wiring.

   ii. Trenches shall be dug straight and support pipe continuously on bottom of trench. Trench bottom shall be clean and smooth with all rock and organic debris removed.

   - Piping 3 inches and larger – make trenches of sufficient width (14 inches minimum) to properly assemble and position pipe in trench. Minimum clearance of piping 3 inches or larger shall be 5 inches horizontally on both sides of the trench.
   - Piping smaller than 3 inches – trenches shall have a minimum width of 7 inches.
   - Line Clearance – Provide not less than 6 inches of clearance between each line, and not less than 12 inches of clearance between lines of other trades.

   iii. Pipe and Wire Depth:

   - Pressure Supply Piping – 24 inches from top of pipe.
   - PVC Sleeving – 18 inches from top of pipe.
   - Non-pressure Piping (rotor) – 18 inches from top of pipe.
   - Non-pressure Piping (pop-up) – 12 inches from top of pipe.
   - Control Wiring – Side of Pressure main.
   - Drip Tubing – 12 inches from top of pipe.
   - Drip Emitter Indicators must be installed on all drip lines.
   - Emitter Tubing (Micro-tubing) – 8 inches from top of pipe.

   iv. Boring will be permitted only where pipe must pass under obstruction(s), which cannot be removed. In backfilling bore, final density of backfill shall match that of surrounding soil. It is acceptable to use sleeves of suitable diameter installed first by jacking or boring, and pipe laid through sleeves. Observe same precautions as though pipe were installed in open trench.

7. Field Quality Control

a. Flushing – after piping, risers, and valves are in place and connected, but prior to installation of sprinkler heads, quick coupler assemblies, and hose valves, thoroughly flush piping

systems under full head of water pressure from dead end fittings. Maintain flushing for 5 minutes through furthermost valves. Cap risers after flushing.

b. Testing – Conduct tests in presence of Consultant and Owner. Arrange for presence of Consultant and Owner 48 hours in advance of testing. Supply force pump and all other test equipment. Pressurize to 40 psi over the designated static pressure or 120 psi, whichever is greater, for a period of 2 hours.

c. Walk-Through for Substantial Completion – Entire system shall be completely installed and operation prior to scheduling. Operate each zone in its entirety and open all valve boxes.

d. Walk-Through for Final Completion – Provide Owner with all accessories, charts, record drawings, and equipment as required before Final Walk. Operate each zone in its entirety and open all valve boxes (as requested).

G. LANDSCAPE

Landscape General Standards

1. Submittals:
   a. Materials List:
      - Plant material including source and location;
      - Mulches, organic rocks;
      - Amendments;
      - Accessories including edging, stake-guy system.
   b. Plant and Material Certificates:
      - Certificates of inspection;
      - Manufacturer's or Vendor's certified analysis for soil amendments and fertilizer materials;
      - Label data substantiating that plans, trees, shrubs and planting materials comply with specified requirements.
      - Seed Vendor's certified statement for each grass seed mixture required. Stating botanical and common name, percentages by weight, and percentages of purity, germination, and weed seed for each grass seed species.
   c. Proposed planting schedule, indicating dates for each type of landscape work during normal seasons for such work in area of site. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reason for delays.
   d. Maintenance Instructions: Typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work for one full year.
2. Quality Assurance:
   a. Pre-Planting Inspection:
      - The Owner and Landscape Consultant will inspect all trees at nursery before planting commences.
      - All plant fertilizers, backfill mixes, mulches and soil amendments will be accepted by the Owner prior to planting operations.

b. Planting Inspections:
   - The Owner and Landscape Consultant will inspect the staked location of all trees prior to planting.
   - The Owner and Landscape Consultant will inspect the staked locations of container stock prior to planting.

c. Pre-Maintenance Inspection:
   - The Owner and Landscape Consultant will inspect the site at the completion of all planting operations.

d. Final Acceptance:
   - Final acceptance by the Owner will not be given until all deficiencies and punchlist items are corrected.

3. Materials

a. Topsoil
   - Topsoil for landscape work may not be available at site and must be furnished and as specified.
   - Provide new topsoil that is fertile, friable, natural loam, surface soil; reasonably free of subsoil, clay lumps, brush, weeds, roots, stumps, stones larger than 2 inches in any direction, liter, and other extraneous or toxic matter harmful to plant growth. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at project site. Obtain topsoil only from naturally well-drained sites where topsoil occurs in depth of no less than 4 inches.

b. Soil Amendments and Fertilizers
   - Type, analysis and application shall be determined by the Landscape Consultant based upon type of planting and the results of specific project soil analysis.
   - Organic Compost: Composted cow manure at 4 cubic yards per 1000 square feet.
   - Compost: A-1 Premium 3 Organic Compost
   - Mulch: Organic mulch free from deleterious materials and suitable for top dressing of trees, shrubs, or plants.

c. Landscape Materials
   - Bark Mulch: Washington Cedar Mulch “Gorilla Hair”.
   - Gravel Mulch: No pink or grey hues. Submit sample for acceptance (color, depth (3”)). Soil separator fabric required.
   - Soil Separator Fabric: 4 oz per square yard polypropylene fabric, water permeable, and unaffected by UV light, freezing and thawing.
   - Pre-Emergent Herbicide: Apply beneath all mulch layers and soil separator fabric.
   - Landscape Edging: Pro-Steel 14 Gauge Roll-Top Edging – Green.
   - Crusher Fines: 1/4 inch minus, Pioneer Sunrise (or approved equal), Applied to 3 inch depth, Apply over filtration fabric.
   - Anti-Desiccant: Emulsion type, film-forming agent designed to permit transpiration, but retard excessive loss of moisture from plants.

- Wrapping: Tree-wrap tape not less than 4 inches wide, designed to prevent borer damage and winter freezing.
- Stakes and Guys: Provide standard wood stakes. Provide wire ties and guys of 2 strand, twisted, pliable galvanized iron wire, not lighter than 12 gal. with zinc-coated turnbuckles. Provide manufactured fabric tree strap with grommet to protect tree trunks form damage by wires.

4. Execution
   a. Preparation
      - Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations and outline areas and secure Architect's acceptance before start of work.

Soil Preparation

1. Soil Materials
   a. Topsoil: Remove weeds by removing the existing top 12" of soil from site. Do not remove soil within tree/plant protection zones. Replace soil with 12" of new approved topsoil in all proposed landscape areas including landscape beds.
   b. Soil Conditioner: A-1 Organics Pro Gro II Organic Compost or approved equal to be used for all areas requiring soil amendment.
   c. First Application of Fertilizer to all Landscape Areas: Apply Richlawn 5-3-2 or approved equal at a rate of 1 lb of Nitrogen/1000 sq. ft. tilled to a depth of 6 inches.
2. Execution
   a. Do not perform work when climate and existing site conditions will not provide satisfactory results.
   b. Inspect to verify rough grading is within +0.1 foot of grades indicated and specified.
   c. Inspect to verify that earth is free of unfit material and has been replaced with clean earth from a source approved by the UCCS Project Manager.
   d. Runoff: Take measures and furnish equipment and labor necessary to control the flow, drainage, and accumulation of water.
   e. Erosion Control: Take measures and furnish equipment and labor necessary to control and prevent soil erosion, blowing soil and accumulation of wind-deposited material on the site throughout duration of work.
   f. Do fine grading for areas prior to planting.
   g. For ground surface areas surrounding buildings to be landscaped, maintain required positive drainage away from buildings.

Fescue Seeding

1. Project Conditions
   a. Perform seeding work only after planting and other work affecting ground surface has been completed.

b. Restrict traffic from lawn areas until grass is established.
c. Provide hose and lawn watering equipment as required.
d. The irrigation system will be installed prior to seeding.

2. Warranty
   a. Provide a uniform stand of grass by watering, mowing, and maintaining seeded areas until final acceptance. Reseed areas, with specified materials, which fail to provide a uniform stand of grass until all affected areas are accepted by the Owner.
3. Products
   a. Green Resistor Blend Seed Mix:
      100% Turf-Type Tall Fescue

      An excellent blend of high endophyte, rhizome-rich turf-type tall fescues. Deep rooted and winter hardy, tall fescues have the ability to access water from deeper soil depths, exhibits good disease and pest resistance that survives on many soil types in full sun or light shade. It is highly stress tolerant and requires minimal care. High quality tall fescue with unsurpassed rhizome capability. Forms a tough, durable turf that easily tolerates constant use, heat and drought.

      Characteristics: Endophyte-enhanced; Dark green color; medium coarse texture.

      Light/Soil Requirements: Gro2ws equally well in sun and shade, performs well on many soil types.
   b. Application rate:
      New Seeding: Broadcast: 8-10 lbs/1,000 sq ft
      Overseeding: Broadcast: 4-5 lbs/1,000 sq ft
   c. Establishment Rate:
      Germinates in 10 to 14 days with proper moisture, forms a dense turf in 8 to 10 weeks.
4. Installation
   a. Seed immediately after preparation of bed. Seed irrigated seed areas between April 1 – August 15 and dryland areas between October 1 – April 15 or at such other times acceptable to the UCCS Project Manager.
   b. Seed indicated areas within contract limits and areas adjoining contract limits disturbed as a result of construction operations.
   c. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.
   d. Seeding shall be done by means of broadcast seeding. Seeds shall be uniformly sown and raked to a depth of approximately 1/4”.

5. Maintenance, Warranty and Acceptance
   a. The maintenance and warranty period shall begin immediately after each area is seeded until final acceptance of the project. During this time, the Contractor shall be responsible for watering, if needed, mowing, spraying, weeding, and all related work and costs as

necessary to insure that seeded areas are in a vigorous growing condition until final acceptance.

b. The Contractor shall, for a period of one (1) year, monitor his work once every month to verify that major settlement has not taken place and that no seeded area has become waterlogged in settled swales or other areas. Should settlement occur, the contractor shall repair all damage.

c. The Contractor shall maintain the seeded areas until all work on the contract has been completed and accepted. Maintenance shall consist of, in addition to watering, mowing, weed control, and protection from vandalism, the repair of areas damaged by erosion and wind. Such areas shall be repaired during the maintenance period at no expense to the Owner to re-establish the condition and grade of the soil prior to application of the mulch and shall be re-fertilized, reseeded, and re-mulched as directed. Major repair of areas due to the work or failure of other Contractor's systems or work shall be by the Contractor who damaged the work, provided that during this maintenance period the lawn Contractor within ten (10) days of the occurrence. Major damage due to vandalism (<$5,000 in time and materials) in any one incident shall be borne by the Owner, again provided that notification was made within ten (10) days as specified herein. After receiving final acceptance, maintenance shall become the responsibility of the Owner.

d. The seeded areas shall be accepted on the basis of having a uniform plant growth over the entire seeded area. Two (2) months after seeding, the Landscape Architect, UCCS Project Manager and Contractor shall review the areas seeded. Any areas where the seed has failed to germinate shall be reseeded and raked to cover the seed. Any area where the seed has failed to grow, reseeding shall be at the Contractor's expense until grass is established and accepted. Acceptable uniform plant growth shall be defined as when the scattered bare spots, not greater than 4 sq in, do not exceed 5% of the seeded area.

Native Grasses Seeding

1. Project Conditions
   a. Perform seeding work only after planting and other work affecting ground surface has been completed.
   b. Restrict traffic from lawn areas until grass is established.
   c. Provide hose and lawn watering equipment as required.
   d. The irrigation system will be installed prior to seeding.
2. Warranty
   a. Provide a uniform stand of grass by watering, mowing, and maintaining seeded areas until final acceptance. Reseed areas, with specified materials, which fail to provide a uniform stand of grass until all affected areas are accepted by the Owner.

3. Products
   a. Foothills Seed Mix:
      A mixture developed for elevations of 3,000 to 8,000 feet to provide natural cover under dryland conditions. Contains both cool and warm season grasses adapted to the Western

Great Plains and Southwest region. Has excellent cold and drought tolerance. Good for soil stabilization on poor soils.

Characteristics: Grows 36-60 inches with average rainfall. Excellent natural cover for dryland areas.

Mix Contains:
20% Annual Ryegrass – Cool Season bunchgrass with germination in 5-10 days. Noted for quick germination. Provides fast green up and root structure to stabilize soil.
15% Slender Wheatgrass - Cool Season bunchgrass with germination in 21-28 days. A native species to the mountain and intermountain areas of the western United States and the northern Great Plains.
12% Crested Wheatgrass- Cool Season bunchgrass with germination in 14-21 days. Drought tolerant, and winter hardy grass with deep rooted system making an excellent soil binder.
10% mountain Brome - Cool Season bunchgrass with germination in 10-14 days. Survives on thin, dry or coarse soils, and displays strong winter hardiness. Will produce best in moist deep fertile soils.
10% Hard Fescue - Cool Season bunchgrass with germination in 7-10 days. Well adapted to many soil types and often used for erosion control.
10% Canada Bluegrass - Cool Season bunchgrass with germination in 14-21 days. Often used for soil stabilization.
6% Sideoats Grama – Warm season bunch/sod-forming grass with germination in 14-21 days. A medium-sized perennial 15-30" tall, it is adapted to most soil conditions.
6% Big Bluestem – Warm season sod-former with germination in 14-21 days. It is tall grass, reaching a height of 6 to 8 feet on most sites when left un-grazed.
5% Blue Grama (Coated) – Warm season bunchgrass with germination in 7-10 days. This grass demonstrates good drought, fair salinity, and moderate alkalinity tolerances.
5% Switchgrass – Warm season bunchgrass with germination in 21-28 days. Very tolerant of poor soils, flooding and drought. Often used in reclamation of sand dunes and dikes.
1% Sand Dropseed – Warm season bunchgrass with germination in 14-21 days. Commonly grown on sandy soils but is adapted to medium textured soils also.

Arkansas Valley Seed, Inc., 4300 Monaco Street, Denver, Co 80216 (303) 320.7500
www.avseeds.com

b. Application rate:

New Seeding:	Broadcast:	20-25 lbs/acre
	Drilled:	15-20 lbs/acre
	Overseeding	
	Broadcast:	10-15 lbs/acre
	Drilled:	5-10 lbs/acre

4. Preparation

a. Limit preparation to areas which are ready to be seeded immediately.
b. The Contractor shall prepare the subgrade to all areas to be seeded by disking or rototilling the soil to a depth of six (6) inches. No organic amendments will be applied to dryland seed grass area.
c. Prior to the second tillage, the fertilizer shall be applied to the surface of the rough subgrade of the areas to be seeded and tilled during the second operation. When completed, the soil shall be firmed by rolling and float drag, followed by steel raking, to provide for the proper seeded surface. The seed bed shall be totally free from rock or clay clods over one (1) inch in diameter.

5. Seeding
   a. Seed immediately after preparation of bed. Seed irrigated seed areas between April 1 – August 15 and dryland areas between October 1 - April 15 or at such other times acceptable to the UCCS Project Manager.
   b. Seed indicted areas within contract limits and areas adjoining contract limits disturbed as a result of construction operations.
   e. Native Seed: Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.
   f. Seeding shall be done by means of broadcast seeding. Seeds shall be uniformly sown and raked to a depth of approximately 1/4".
6. Maintenance, Warranty and Acceptance
   a. The maintenance and warranty period shall begin immediately after each area is seeded until final acceptance of the project. During this time, the Contractor shall be responsible for watering, if needed, mowing, spraying, weeding, and all related work and costs as necessary to insure that seeded areas are in a vigorous growing condition until final acceptance.
   b. The Contractor shall, for a period of one (1) year, monitor his work once every month to verify that major settlement has not taken place and that no seeded area has become waterlogged in settled swales or other areas. Should settlement occur, the contractor shall repair all damage.
   c. The Contractor shall maintain the seeded areas until all work on the contract has been completed and accepted. Maintenance shall consist of, in addition to watering, mowing, weed control, and protection from vandalism, the repair of areas damaged by erosion and wind. Such areas shall be repaired during the maintenance period at no expense to the Owner to re-establish the condition and grade of the soil prior to application of the mulch and shall be re-fertilized, reseeded, and re-mulched as directed. Major repair of areas due to the work or failure of other Contractor's systems or work shall be by the Contractor who damaged the work, provided that during this maintenance period the lawn Contractor within ten (10) days of the occurrence. Major damage due to vandalism (<$5,000 in time and materials) in any one incident shall be borne by the Owner, again provided that notification was made within ten (10) days as specified herein. After receiving final acceptance, maintenance shall become the responsibility of the Owner.

d. The seeded areas shall be accepted on the basis of having a uniform plant growth over the entire seeded area. Two (2) months after seeding, the Landscape Architect, UCCS Project Manager and Contractor shall review the areas seeded. Any areas where the seed has failed to germinate shall be reseeded and raked to cover the seed. Any area where the seed has failed to grow, reseeding shall be at the Contractor's expense until grass is established and accepted. Acceptable uniform plant growth shall be defined as when the scattered bare spots, not greater than 4 sq in, do not exceed 5% of the seeded area.

Tall Fescue Sodding

1. Quality Assurance
   a. Source Quality Control: Supplier must be a member of Rocky Mountain Sod Growers Association. Sod will be subject to inspection and acceptance. UCCS Project Manager reserves the right to reject at any time or place prior to acceptance, any work and sod which in their opinion fails to meet these standards.
   b. Inspection: Primarily for quality; however, other requirements are not waived even though visual inspection results in acceptance. Notify UCCS Project Manager of intended sod farm prior to cutting for inspection. Inspection at growth site shall not preclude the right of rejection at the project site.
   c. Promptly remove rejected sod from the site.
   d. Inspections will be made periodically during sodding, at completion and at the end of the warranty period.
2. Survivalist Tall Fescue Turf Mix:
   Mixture of actively rhizomatous tall fescue cultivars mixed with a Texas bluegrass hybrid. Drought tolerant, wear tolerant turf that not only has an extremely deep root system to garner deeper soil moisture but also has the ability to form new plants from rhizomes that can repair damage caused to the plant.

   Characteristics: Good rich, green color; drought tolerance, medium texture, heat tolerant, wear tolerant, rhizome activity to help repair damage caused by drought or traffic; tolerant to varied soil pH; improved shade tolerance compared to bluegrass; deep rooting.

   Survivalist Tall Fescue Mix Contains:
   47% Grande II - Actively rhizomatous Tall Fescue
   47% SR8650 - Actively rhizomatous Tall Fescue
   6% Spitfire – Texas hybrid Kentucky Bluegrass
3. Sod Standards:
   a. Healthy, thick turf having undergone a program of regular fertilization, mowing and weed control; free of objectionable weeds; uniform in green color, leaf texture and density; healthy, vigorous root system; inspected and found free of disease, nematodes, pests and pest larvae by the entomologist of the State Department of Agriculture.
   b. Each piece of sod: Sandy-loam soil base that will not break, crumble or tear during sod installation.

c. Thickness: 1.25 Inches thick, excluding top growth and thatch.
d. Thatch: Not to exceed 1/4" uncompressed.
e. Size: Cut in strips 18 inches wide no more than 24 hours prior to delivery.
f. All sod supplied will be comprised of the same turf cultivars. Product must be cut continuously from the same turf field or from a separate field that was seeded with the same cultivars and same percentages of cultivars as original product. During all phases of grow in, establishment phase and warranty phases, color should be even after proper fertilization. Turf must be of even color without addition of specialized nutrient products. If discoloration is evident and it is believed different cultivars of sod were used, contractor bares all responsibility for providing proof that turf is of the same cultivar, including but not limited to: genetic testing done at a location of the UCCS Project Managers choosing. All costs associated with material testing will be the responsibility of the Contractor. If it is determined that turf is of different cultivars, Contractor is solely responsible for all removal and replacement costs.

4. Delivery, Storage and Handling
   a. Deliver on pallets properly loaded on vehicles and with root system protected from exposure to sun, wind, and heat in accordance with standard practice. Protect from dehydration, contamination and heating at all times.
   b. Do not deliver more sod than can be installed in 24 hours.
   c. Do not stack sod more than 2 feet deep.
5. Project/Site Conditions
   a. Perform work only after planting and other work affecting ground surface has been completed.
   b. Restrict traffic from lawn areas until grass is established.
   c. Provide hose and lawn watering equipment as required.
   d. The irrigation system will be installed prior to seeding.
   a. Do not install sod on saturated or frozen soil.
6. Maintenance, Warranty and Acceptance
   a. The maintenance and warranty period shall begin immediately after each area is sodded and continue until final acceptance of the project. During this time, the Contractor shall be responsible for watering, if needed, mowing, spraying, weeding, and all related work and costs as necessary to insure that seeded areas are in a vigorous growing condition until final acceptance.
   b. Water sod sufficiently to moisten subsoil in a manner not to cause erosion, damage, or overwater to a point which firmness of subsoil is compromised. Prevent excessive water usage during initial watering to prevent any changes to the grade of the install. Water shall be free of substances harmful to plant growth. Be responsible for furnishing water from underground sprinkler system, quick couplers or other source.
   c. If work has not received final acceptance within 45 days after initial fertilizer application to sodded areas, repeat fertilizer application to maintain optimal sod vigor.

   d. Mow and trim around trees, walls, fences, etc., maintaining turf at 2 1/2 – 2 3/4 inches in height. Do not remove more than 33% of grass leaf in single mowing. Remove grass clippings from pavement areas.
   e. Resod spots larger than1 sq ft not having health, uniform stand of grass.
7. Sodding
   a. Soil on which sod is laid shall be slightly moist.
   b. Lay with longest dimension parallel to contours and in continuous rows.
   c. Tightly butt ends and sides of sod together. Stagger and compact vertical joints between sod strips by rolling so sod will be incorporated with the ground surface, insuring tight joints between adjacent pieces.

Trees, Plants and Ground Covers

1. Plants shall be first-class representatives of the specified species or variety, in healthy condition with normal well-developed branch and root systems, free of objectionable features, and shall conform to requirements as follows:
   a. USDA Standards for Nursery Stock
   b. AAN Standardized Specifications
   c. American Joint Committee on Horticulture (AJCH)(Plant names shall meet AJCH Standards)
   d. American national Standard Institute (ANSI)(Nursery stock shall meet ANSI Standards)
   e. Colorado State Nursery Act of 1965 Title 35, Article 26, CRS 1973.
2. Submittals
   a. State, Federal, or other inspection certificates shall accompany invoice for materials showing source or origin.
   b. Submit list of plants. Indicate which plants have special watering requirements.
   c. Submit a digital and three copies of written maintenance instructions to Owner for maintenance and care of installed plants through a full growing season.
3. Quality Assurance
   a. The Owner reserves the right to reject, at any time or place prior to final acceptance, of the installation, any materials and plants which in the Owner's opinion fails to meet specified standard requirements.
   b. Inspection of plants is primarily for quality, size and variety; however, other requirements are not waived.
   c. Plants may be inspected where growing, but inspection at place of growth shall not preclude the right of rejection at site.
   d. Rejected plants and materials will be promptly removed from the site.
4. Delivery, Storage and Handling
   a. Plants shall be containerized with limbs bound, properly pruned and prepared for shipping.
   b. Root system shall be kept moist and plants shall be protected from adverse conditions.
   c. Each plant shall be identified by means of grower's label affixed to plant. Grower's label will give data necessary to indicate conformance to specifications. Use durable waterproof labels with water resistant ink which will remain legible for at least 90 days.
5. Warranty:

For a period of one (1) full growing season after Final Acceptance of Landscape work and at no additional cost to the Owner, the Contractor shall replace any trees, shrubs or ground cover that are dead, or that are, in the opinion of the Owner, in unhealthy, or unsightly condition, or that have lost their natural shape due to dead branches or excessive pruning of dead branches.

6. Materials
    a. Backfill Material
        h. Planting mix shall be existing topsoil blended 50/50 with A1 Premium 3 Organic Compost.
        ii. Topsoils shall be those stockpiled on site, free from toxic substances, sticks, debris, vegetation and stones over 1 inch in dimension.
    b. Tree Wrapping Materials will be first quality 4 inches wide bituminous impregnated tape, corrugated or crepe paper, brown in color, specifically manufactured for tree wrapping and having qualities to resist inset infestation.
    c. Staking and Guying Material
        i. Stakes will be standard wood 8 foot high stakes.
        ii. Protective loops will be nylon, of a composition durable enough to last two years.
7. Installation
    a. Shrubs and trees will be placed in position prior to planting, for final acceptance to location by the Owner.
    b. Planting will be done in accord with good horticultural practice or region. Trees should be planted so the top of the root ball is at least one (1) inch above surrounding grade.
    c. After preparation of soil, the plant pit, centered on the location stake, shall be excavated in a cylindrical shape with vertical sides and flat or saucer-shaped bottom. Sides of the plant pit shall be scarified. Diameter of plant pit will be at least twice the spread of ball or container.
    d. Do not remove protective wrapping of root ball or bare roots until plant is positioned accurately in planting pit. When positioned, remove wire mesh and burlap prior to backfilling.
    e. Score root balls of containerized shrubs just prior to planting.
    f. Plant material will be pruned only to remove dead, injured or lower branches.
    g. Provide an 8 foot diameter much ring around each newly planted tree.
    h. Organic mulch planting saucers, beds, tree mulch ring and areas within two days after planting.
8. Maintenance and Acceptance
    a. Maintenance period will begin immediately after plant material is installed until final acceptance of landscape work.
    b. Maintenance shall include watering, weeding, cultivating, mulching removal of dead branches, restoring plants to proper grade or upright position and other necessary operations.