
CONSTRUCTION SPECIFICATIONS AND DESIGN CONSIDERATIONS FOR PARKS, TRAILS, AND STREETSCAPES

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**Department of Public Works
20120 E. Mainstreet
Parker, CO 80138**





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**Department of Public Works
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INTRODUCTION

The Town of Parker Land Development Code states "The Town hereby finds that it is in the public interest for all developments to provide landscape improvements for the purposes of complementing the natural landscape; improving the general appearance of the community and enhancing its aesthetic appeal; preserving the economic base; improving the quality of life; delineating and separating use area; increasing the safety, efficiency and aesthetics of use areas and open space; screening and enhancing privacy; mitigating the adverse effects of climate, aspect and elevations; conserving energy; abating erosion and stabilizing slopes; deadening sound; and preserving air and water quality." To ensure that these goals are accomplished, the Town of Parker has developed this handbook.

These specifications are intended to be used by contractors and developers in the Town of Parker. They are meant to aid in the design and construction processes and to save time by putting forth the expectations of the Town for landscape improvements including street right-of-ways, and park and trail improvements. The Town will not accept maintenance of improvements that do not meet these minimum standards. The topics presented within this publication are only a partial list of the potential range of situations expected. Although this material should be adapted for specific conditions, these standards are to be considered minimal and general in scope. Please note the following:

- Lighting requirements set forth within these specifications may not apply to master planned communities. This will be determined during the design review process.
- Maintenance of Improvements in Public Right-Of-Way; Planting, Maintaining and Removal of Trees on Public Property; Maintenance and Installation of Landscaping; Removal of Dead or Dangerous Trees, Limbs or Shrubs; Infected or Infested Trees; Obstruction of Public Property; and Determination of Hazard/Notice to Responsible Party/Assessment of Costs shall be applicable to all right-of-way in the Town of Parker, unless otherwise approved by the Town.

Reference the Town of Parker Municipal Code for complete information on Town requirements and the review process. See also the *Land Development Code, Roadway Design and Construction Criteria Manual*, and *Storm Drainage and Environmental Criteria Manual* for required permits. Refer to the *Public Works Technical Reference Manual* for additional details.

PARK LANDSCAPES

EARTHWORK AND DRAINAGE

All earthwork operations shall be executed in a manner, which minimizes dust, noise, excessive accumulation of debris, danger to the public and interference with other construction. Only pneumatic-tired equipment shall be permitted over paved streets, walks and curb surfaces. Any damage to related site improvements shall be repaired at the expense of the Contractor prior to acceptance by the Town. Positive drainage shall be provided at all times throughout the earthwork operations.

Earthwork operations shall be executed to provide subsoil compaction to a minimum 85 to 90 percent (85 to 90%) modified Proctor density at a ± 3 percent (3%) of optimum moisture on areas to be eventually turfed or planted, and compaction to a minimum 95 percent (95%) modified Proctor density at ± 2 percent (2%) of optimum moisture under all walks, trails, structures and other site improvements. Testing to demonstrate compliance with this specification shall be performed by a registered professional engineer practicing in the field of soils mechanics, per ASTM D 1557. All costs for tests shall be paid by the Contractor. The amount of testing shall be at the sole discretion of the Designated Town Authority.

Upon completion of earthwork operations, Contractor shall guarantee that in areas that have been excavated, no rock, concrete, vegetation, construction materials or other rubble shall lie within twenty-four inches (24") of the ground surface, nor within the path of any proposed planting, irrigation lines, utilities or foundations, or other site improvements. Contractor shall also guarantee against settlement for one full year after final acceptance of the project by the Town. Any corrections required to meet this specification, including repair/replacement of seed, sod, pavements, or other site improvements shall be at the Contractor's expense.

Completed grades shall be smoothly and uniformly sloped, properly compacted, and shall provide drainage away from site improvements. All banks or slopes constructed shall be maintained in a stable condition to prevent slips, washouts or erosion, by approved methods. All maintenance shall be at Contractor's expense until Town acceptance (typical warranty period is two (2) years.) All finished grades to be within .2 feet (two tenths) of final design grade elevation.

No area to be seeded or sodded shall be steeper than a 4:1 maximum slope (4 horizontal: 1 vertical), nor flatter than a two percent (2%) minimum cross slope. Areas where water will be likely to collect may require a steeper grade in order to drain adequately.

Storm drainage ditches and detention ponds shall be designed to handle the appropriate design storm flows, and to provide ease of maintenance. Where possible, such areas shall be graded at a minimum two percent (2%) slope. Detention pond side slopes shall not exceed 4:1 and embankments shall not exceed 3:1. Nuisance water shall be confined to a narrow channel, and precautions taken to avoid erosion. The use of a constructed trickle channel designed in accordance with UDFCD and Town of Parker criteria is recommended. Refer to the Town of Parker Storm Drainage and Environmental Criteria Manual.

Allowable velocity in a vegetated channel shall be appropriate to the type and density of vegetation, but shall not exceed:

- 3 1/2 feet per second (fps) for the two-year storm on a residential development
- 3 1/2 fps for the five-year storm on a commercial development
- 5 fps for the one-hundred year storm on any type of development

Where vegetation is assumed in the storm drainage calculations, said vegetation shall be seeded or sodded and irrigated until established, prior to acceptance of the drainage improvements by the Town.

Grading, storm drainage and related drawings shall clearly describe treatment of transition areas from vertical headwalls to adjacent 4:1 maximum slopes, detailed grades at pipe inlets and outfalls and similar situations. Rip rap results in difficult maintenance - its' use shall be limited except as required by Town of Parker drainage criteria and consideration given toward ease of maintenance.

All walks and trails shall be designed to meet all current ADA standards and guidelines to include a minimum cross pitch in the appropriate direction of one quarter inch per foot (1/4" per foot) or two percent (2%), and centerline gradient shall not exceed one foot in twenty feet or five percent (5%) (per ADA recommendations). Exceptions to these guidelines may be submitted for review. Concentrated drainage shall be designed to pass under walks and trails by culvert or standard approved walk chase. Culverts or walk chases should be designed for the two- (2) year to ten- (10) year event and coordinated with surrounding drainage facilities. The minimum allowed culvert size is eighteen (18) inches and flared end sections (F.E.S.) will be required. Low water trail crossings will not be allowed unless approved by the Town.

The Town will require an as-built survey and compaction test results, certified by a professional engineer, to prove compliance with these earthwork and drainage specifications. All costs for such survey, testing and certification shall be paid by the Contractor.

SOIL PREPARATION

Soil preparation shall be provided on all areas to be seeded, sodded, or otherwise planted.

Rough mulch for soil preparation shall be a mixture of twenty-five percent (25%) ground aged manure and seventy-five percent (75%) organic compost, and shall contain a minimum of twenty-five percent (25%) organic matter. The mixture shall be free from clay subsoil, mountain peat, sand, gypsum, stones, lumps, plants or their roots, sticks, weed stolons, and seeds, high salt content and other materials harmful to plant life. The manure and organic compost shall be coarsely ground and thoroughly mixed together to ensure an even composition. The mix shall have an acidity in the range of pH 5.5 to pH 8.0, a carbon to nitrogen ratio ranging from 15:1 to 30:1, salt levels of less than 6 mmhos/cm, and shall meet the following mechanical analysis:

	<u>% Passing</u>	<u>% Retained</u>
2" screen	100	0
1" screen	90-100	0-10
1/2" screen	50-80	20-50
#100 mesh sieve	0-15	85-100

Upon the request of the Town, the following information shall be provided:

- specific locations from which the manure and organic compost were obtained
- agricultural test results showing mixture composition and analysis

Testing shall be by a qualified soil laboratory, in accordance with accepted soil amendment testing procedures, and testing shall be at the Contractor's expense.

The soil amendments shall be incorporated in the following manner:

Upon establishment of proper grades, the soil surface shall be loosened by rototilling to a minimum depth of six inches (6"), and all materials over two inches (2") in diameter shall be removed. The manure and organic compost mixture shall be evenly spread over the area at the rate of six (6) cubic yards per thousand square feet, and shall be mixed thoroughly into the soil surface to a depth of six inches (6") by means of a rototiller, soil mixer or similar apparatus. The surface shall then be finish graded to the appropriate elevations and compaction.

Prior to seeding or sodding, fertilizer with a 10-10-10 or comparable ratio shall be spread evenly over the surface at the rate of five (5) pounds per thousand square feet (1/2 pound of actual nitrogen per 1000 square feet).

TOPSOILS

Addition of topsoil is not considered a portion of the ordinary soil preparation operations as described in these specifications. However, the use of good topsoil is highly desirable, and may equal the value of soil amendments in reducing water consumption and encouraging plant growth.

When topsoil exists on the project site, the Contractor may be required to strip and stockpile the topsoil, and to redistribute the topsoil over the open space areas after overlot grading, in accordance with these specifications. The Town retains the prerogative of deleting all or a portion of the soil preparation requirements when topsoil is provided, depending on topsoil quality and quantity.

Topsoil shall be a fertile sandy loam topsoil, taken from a well-drained site, and free from clay subsoil, stones, lumps, plants or their roots, sticks, weed stolons and seeds, high salt content and other materials harmful to plant life. The topsoil shall have an acidity in the range of pH 5.5 to pH 8.0, salt levels of less than 6 mmhos/cm, and shall be screened and meet the following mechanical analysis:

	<u>% Passing</u>	<u>% Retained</u>
1" screen	100	0
1/2" screen	97 – 100	0 - 3
#100 mesh sieve	60 – 40	40 - 60

Upon the request of the Town, the following information shall be provided:

- specific location from which topsoil will be (or was) stripped
- agricultural test results showing topsoil composition and analysis

Testing shall be by a qualified soils laboratory, in accordance with "Methods of Soils Analysis - Agronomy #9" as published by the American Society of Agronomy, and testing will be done at the Contractor's expense.

When the addition of topsoil is required by the Official Development Plan and/or appropriate construction drawings, or when the Contractor opts to provide topsoil, it shall be incorporated in the following manner:

Upon establishment of the proper grade, the subsoil surface shall be loosened to a minimum depth of six inches (6") by tilling, and all objects over two inches (2") in diameter shall be removed.

The topsoil shall be spread over the area to a minimum four inch (4") compacted depth, and mixed lightly into the subsoil by means of a rototiller, soil mixer or similar. The surface layer shall then be finish graded to the appropriate elevations and compaction.

BACKFLOW PREVENTION

Only a **Reduced Pressure Backflow Preventer Assembly** is acceptable. No other devices or combinations will be accepted. All devices and installations must be in accordance with the applicable water and sanitation district specifications.

All pipe from the meter through the Reduced Pressure Backflow Preventer Assembly and down into the ground to 18" minimum depth shall be type K copper, and all fittings and nipples either copper or red brass. A union shall be installed on the downstream side of the vacuum breaker. A blow-out "tee" shall be installed on the upstream side of the vacuum breaker.

Reduced Pressure Backflow Preventer Assemblies shall consist of two separate check valves, inlet and discharge gate valves, testing cocks and a "Y"-strainer on the inlet side. A union or similar device which will allow for removal of the assembly is required on both check valves and the differential relief valve shall be so constructed that they may be serviced without removing the device from the line. The backflow preventer shall be rated to 150 psi working pressure and to water temperature of 140 degrees Fahrenheit, under continuous service.

The Reduced Pressure Backflow Preventer Assembly may be installed under continuous pressure service and where it could be subject to back pressure. This device is considered the best protection of all backflow devices. Certainly where fertilizer or other harmful chemicals may be introduced into the irrigation system, and in certain other circumstances as identified in the program meeting, the Reduced Pressure Backflow Preventer Assembly may be the only acceptable device. Parks Staff will make this decision on a case by case basis.

The Reduced Pressure Backflow Preventer Assembly does not provide protection if it is under water or other liquid, and therefore cannot be installed underground unless drainage out of the vault is certain and adequate. If installation is to be above ground, a vandal-resistant device must be installed, and major spillage shall always be allowed for in an area where spillage can be seen but would not be objectionable. The assembly shall be located so that it may be tested periodically.

Regarding manufacturer and models of these devices, which are approved, the Town follows the recommendations of the latest adopted edition of the Uniform Plumbing Code. Direct specific questions to Parks Staff.

IRRIGATION SYSTEMS

The term "IRRIGATION SYSTEM" refers to a permanently-installed automatic, underground pop-up irrigation system, which might include spray or rotor heads, bubblers, drip or trickle emitters or a variety of products. Manually operated systems and above-ground systems are not acceptable.

This section of these specifications is divided into three parts - MATERIALS, DESIGN and INSTALLATION, and is intended as a minimum specification. The Contractor (or his design consultant) is requested to meet briefly with Parks Staff to establish irrigation program requirements on a project-by-project basis prior to beginning design. Final drawings, specifications and details shall be furnished, subject to review and approval by Parks Staff, prior to construction.

MATERIALS

The Town is attempting to standardize irrigation equipment and materials. All irrigation equipment selected shall be represented by a local distributor who carries replacement parts and provides a trouble-shooting service. Products and materials are subject to approval by Parks Staff (see "Preferred Irrigation Materials List" in the *Public Works Technical Manual*).

SPRINKLER HEADS

All sprinkler heads for a particular function in a system shall be of the same manufacturer, and marked with the manufacturer's name and model in such a way that materials can be identified without removal from the system.

Rotary head sprinklers shall be of appropriate and durable construction, and shall have a drive assembly, which will operate properly on a 3:1 slope. Heads shall have a 3" minimum pop-up height and heavy spring retraction, with a feature, which securely holds the pattern as set. Part-circle heads shall be adjustable or available in enough arcs to fit any situation on the projects, and overspray and or backsplash shall be minimal. In certain circumstances, as identified in the program meeting, additional features such as rubber covers, extra vandal resistance, built-in check valves and similar may be required.

Pop-up lawn spray heads shall be of durable construction, have a minimum of 4" pop-up height, and have 1/2" female pipe thread for mounting to riser. Part-circle models shall be marked with a symbol designating the coverage pattern, and matched precipitation rate between all patterns shall be provided. Nozzles shall be interchangeable between bodies, and shall have an adjusting screw to regulate the gallonage, pressure and coverage over the full operating range of the sprinkler.

Shrub heads, bubblers, trickle emitters and other xeric irrigation equipment shall be as approved by Parks Staff on a project-by-project basis.

RISERS

All rotary heads shall be mounted on an adjustable swing joint riser which will allow the head to move in any direction without damage to head or piping. The riser detail is subject to review and approval by Parks Staff.

Lawn spray heads shall be installed on an adjustable swing joint riser or “funny pipe” of the appropriate length, unless otherwise approved. Risers for shrub sprays and trickle emitters shall be as approved by Parks Staff on a project-by-project basis.

PIPE

All pipe running from the tap and water main to the meter shall be in accordance to applicable water and sanitation district specifications and tap, meter and service line shall be the same nominal pipe size. Pipe from the meter through the backflow prevention device shall be K-soft copper where buried, and K-hard copper with copper or red brass fittings above ground at the backflow prevention device.

Mainline irrigation pipe shall be schedule 40 (under 4”) or PVC Class 200 (over 4”), and lateral lines shall be PVC Class 200 or thicker. Trickle tubing shall be of weather-resistant material and opaque to ultraviolet light.

All plastic pipe fittings shall be molded fittings manufactured of the same material as the pipe, unless approved otherwise, and shall be suitable for solvent weld, slip joint, ring-tight seal or screwed connections as specified on the drawings. Only schedule 80 pipe may be threaded. No fittings of other materials shall be used unless approved in writing by Parks Staff. When connection is plastic or metal, male adapters shall be used.

All elbows tees and plugs shall be kick blocked with an appropriate concrete kicker and rodding for 3” and larger mainlines, providing the 5 fps design rate is followed.

VALVES

Automatic remote control valves shall be of brass or approved hard plastic construction, electrically operated and normally closed type, appropriate to the use and water supply and as approved by Parks Staff. The valves shall have a slow-opening and slow-closing action for protection against surge pressure, be properly sized, and be furnished with a manual bleed device and flow control stem.

Manual control valves are not allowed, unless specifically approved by the Town of Parker for special use areas.

Manual drain valves shall be globe or gate valves of durable construction, built to withstand continuous mainline pressure without leaking, and shall have a cross-handle for operation (angle drain valves are not acceptable).

Quick-coupling valves shall be one-piece valves of durable construction, one inch (1”) size. Contractor shall furnish a minimum three (3) each matching quick-coupler keys, locking cover keys and 1” swivel hose ells. Quick-coupling valves shall be installed on a swing joint riser similar to risers

for rotary heads, though capable of withstanding continuous mainline pressure and installed in a minimum six inch (6") round valve box.

Pressure-reducing valves shall be durable valves specifically designed to reduce and/or regulate pressure without restricting flow, and as approved by Parks Staff. The flow control stem on a regular automatic control valve shall not be used to cut pressure by more than twenty percent (20%).

Gate valves for use inside the meter vault or as a curb stop shall be per the Water District specifications. Gate valves on the irrigation mainline shall be of durable construction and appropriate design, and as approved by Parks Staff.

VALVE BOXES

Valve boxes for all valve assemblies shall be of durable F. R. P. construction with locking cover, of size as required to adequately house valve assembly and leave room for maintenance. Extensions shall be furnished as necessary.

CONTROLLERS

Controllers shall be electrical solid state operated, fully automatic in operation and independent from any other system. Controller shall be furnished with a minimum 14-day program capability, shall be capable of starting a cycle on any of 23 hours each day, and shall have a minimum adjustable timing of at least 0 minutes or "OFF" to 90 minutes. Controller shall be furnished with current and lightning protection devices.

The controller shall be furnished with a vandal-resistant and weatherproof enclosure, either for wall-mounting or with an approved pedestal mount. A locking weatherproof junction box with padlock shall also be furnished, and all other wiring conduit and related work shall be per Electrical Code. Location to be determined on a site by site basis.

SLEEVES

Sleeves for irrigation piping shall be schedule 40 PVC, minimum four inch (4") diameter, larger where appropriate, and shall be provided under all paved surfaces. A separate two inch (2") diameter or larger sleeve shall be furnished where control wires pass under a paved surface - sleeve material shall be approved by the Parks Division.

PUMPS

If a pump(s) is required, all materials shall be subject to review and approval by Parks Staff.

CONTROL WIRE

Electrical control wire from controller to valves shall be 14 gauge or larger PVC-insulated copper wire U. L. approved for direct burial. Wire connectors shall be waterproof, U. L. listed and as approved by Parks Staff.

DESIGN

The Town is attempting to standardize water usage requirements, irrigation system longevity, and performance. These guidelines toward irrigation design are meant to be brief, are considered necessary, and are not intended to limit design innovation or creativity. Again, the Contractor (or his design consultant) is required to meet briefly with Parks Staff to establish irrigation program requirements on a project-by-project basis, and final, more complete drawings, specifications and details will be required prior to construction.

COVERAGES

1. All irrigation systems shall be designed to properly irrigate “bluegrass” type turf, regardless of whether “bluegrass” is originally seeded or sodded. “Native Seed” areas shall have irrigation designed in the same manner.
2. Regarding pressures required to operate heads, the appropriate equipment requires 60-70 psi at base of rotary heads and 30 psi at base of sprays. Available pressures shall be within these ranges unless otherwise approved by Parks Staff, and pumps, pressure-reducing valves and similar products shall be specified where necessary. All heads on one valve shall operate at the same pressure plus or minus seven percent (7%), and upon completion of installation, system shall be adjusted so that all heads of a type are operating at the same pressure $\pm 7\%$.
3. Regarding precipitation rate, all systems shall be capable of applying one and three-fourth inches ($1\frac{3}{4}$ ”) of water per week to the irrigated area. Watering time shall not exceed eight (8) hours per day for seven days per week (design for every third day watering or similar is encouraged). Tap size (s) required shall be determined by the Parker Water and Sanitation District.

Precipitation rates of sprinkler heads selected shall be appropriate to plant material, slope, soil, intake character and similar criteria, and the precipitation rate for sprinklers on one valve shall not vary by more than ten percent (10%) unless approved by Parks Staff.

Areas with significantly different watering needs, i.e. slopes vs. level areas, bed areas or north-facing vs. south-facing areas shall be valved separately.

4. Head spacing shall be rated, at a minimum, for 5 mile per hour winds, per manufacturers’ recommendations. In no case shall maximum spacings exceed the following:

Triangular

S = 50% catalog diameter maximum

L = 86% of head spacing ($\pm 47\%$) catalog diameter maximum

Square

S = 50% of catalog diameter maximum

(Irrigation designer shall specify exact spacings on project-by-project basis)

Rectangular

S = 45% catalog diameter maximum

L = 60% catalog diameter maximum

VELOCITY

The irrigation system shall be designed and its components selected so that the velocity in the copper service line from tap to meter does not exceed five feet per second (5 fps) and so that velocity in all other system piping does not exceed five feet per second (5 fps). Flow in gallons per minute shall not exceed 75% of the maximum safe-rated flow through the meter. Furthermore, surge pressures shall be calculated and if necessary, slower-opening and closing valves, air vent/vacuum relief valves or other components shall be specified to preclude damage from surge pressures.

DRAIN VALVES

No automatic drains will be accepted. Mainline pipe shall be graded to drain toward manual drain valves at all low points on the mainline. The drain valve shall be as specified, and installed with valve box, gravel sump and related work. Gravel sumps shall be sized to hold the total volume of water which will drain to the sump from the pipe. Where possible, pipe shall be drained into a ditch or similar channel and water carried away. Minimum size of sump is four and one-half cubic feet (4 ½ c.f.) of washed pea gravel.

Adequate isolation valves and blowout connections shall be provided so that system may be conveniently blown free of water with an air compressor.

ELECTRICAL

The Contractor (or his design consultant) shall determine the electrical demand, and shall coordinate with IREA regarding the electrical hookup. All timing and costs for electrical service shall be the responsibility of the Contractor until the project is accepted by the Town, and this portion of the work is also subject to review and approval by Parks Staff. All electric hook-ups shall be independent from any other systems.

CONTROL WIRES

Control wiring to valves shall be sized per manufacturer's directions, except that no wire shall be smaller than 14 gauge.

INSTALLATION

Again, the following is only a minimal specification – final and complete drawings, specifications and details shall be submitted prior to construction.

SPRINKLER HEADS

All heads shall be mounted on risers as specified, and shall be set perpendicular to finish grade. Sprinkler heads installed in areas where turf or ground cover has not yet been established shall be set two inches (2") above the proposed finished grade, and lowered to grade by the Contractor as part of the original contract when the cover is established.

All nozzles shall be tightened after installation, and all adjustments made to provide optimum coverage.

PIPE AND FITTINGS

All work from the tap through the meter vault is governed by Parker Water and Sanitation District and their standard specifications. All work from the meter vault through the backflow preventer is governed by the Parker Building Department. The irrigation system beyond the backflow preventer is the responsibility of the Town of Parker. All system water connections shall be independent from any other systems. Minimum depths of cover for irrigation piping beyond the backflow preventer are as follows:

- Mainline – 24” minimum depth of cover
- Laterals to Rotary Heads – 18” minimum depth of cover
- Laterals to Sprays/Bubblers – 12” minimum depth of cover

Pipe shall be installed per manufacturer’s directions. Joint compounds shall be approved by Parks Staff – all plastic threaded fittings shall be joined with Teflon tape or paste. Do not glue threaded fittings!

Trenches for irrigation piping shall be excavated to sufficient depth and width as specified to permit proper handling and installation of pipe and related equipment. Backfill shall be thoroughly compacted and to grade – compaction as specified under “EARTHWORK” in these specifications. Selected fill dirt or sand shall be used to surround pipe with minimum four inch (4”) bedding where soil conditions are rocky, as determined by Parks Staff. Unless otherwise approved, all trenches and pits that are opened during any working day shall be backfilled properly the same day.

The Contractor shall guarantee all excavation and trenching against settlement for one full year after acceptance of the project by the Town. Any necessary corrections, including repair/replacement of seed, sod or other site improvements shall be at the Contractor’s expense.

Any piping under paved surfaces shall be installed in proper sleeves. The sleeves shall be at a twenty-four inch (24”) depth, shall extend two feet (2’) beyond each pavement edge, and shall be clearly marked with nylon rope or similar.

VALVES

Automatic remote control valves shall be installed per the manufacturer’s directions, in an appropriately sized valve box with locking cover. A ball valve shall be installed upstream of the valve, and a PVC union shall be on either side of the valve, to facilitate removal and replacement (see ***Public Works Technical Manual***, “Electric Control Valve”). Extensions shall be provided to install valve box and cover at finish grade, and a pea gravel sump around and below the valve box shall be provided. Minimum depth of gravel shall be 6”, installed on top of landscape fabric.

Quick-coupling valves shall be set perpendicular to finish grade, and mounted on a swing joint riser similar to those for rotary heads, except that quick-coupler risers shall withstand continuous mainline pressure without leaks. The quick couplers shall only be installed within twelve inches (12”) of a valve box, and clearly marked on a record drawing.

All other valves shall be installed in appropriately sized valve boxes with locking covers, and extensions and sump provided.

Valve control wires shall be taped together at twenty-five feet (25') intervals and placed against and beneath the mainline pipe for protection. Wire connections and splices shall be made with approved connectors, and a minimum eighteen inch (18") loop of excess wire shall be provided at each splice and connection to allow for future maintenance.

Should pressure-reducing or regulating valves, air vacuum reliefs or other components be required, installation shall be subject to review and approval by Parks Staff.

CONTROLLERS

Controller location and installation shall be as approved by Parks Staff. A locking weatherproof junction box with padlock and keys is required on supply side of controller, and all work shall be per governing electrical codes.

BACKFLOW PREVENTERS

Backflow prevention device location and installation shall be as approved by Parks Staff.

TESTING AND ADJUSTMENTS

A mainline pressure test shall be performed early in the installation. Upon completion of installation, the entire system shall be "fine-tuned" by regulating valves, adjusting patterns and break-up arms, setting pressure reducing valves at proper pressures and similar, to provide optimum and efficient coverage. All heads of a type shall be operating at the same pressure plus or minus seven percent (7%).

The entire irrigation system shall be tested at normal working pressure for leaks in the system and retested until approved by the Town. Final inspection shall include a coverage test. If work meets these specifications, a letter of acceptance shall be given upon completion.

AS-BUILT OR RECORD DRAWINGS/MAINTENANCE MANUAL

Acceptance of the system is based upon the furnishing by the Contractor of a completed **as-built** plan which is acceptable to the Town. Contractor shall furnish to the Town a reproducible drawing of the irrigation system and two prints, product cut-sheets and operation instructions for same, and complete maintenance instructions, including system winterization and start-up procedures, all neatly assembled in plastic sheet covers in one hard-cover three-ring notebook with the project name on the cover. In addition, the contractor shall furnish these **as-built** plans on computer diskette in Auto CAD format.

GUARANTEE

For a period of one year from date of installation, the Contractor shall promptly furnish and install, without cost to the Town, any and all parts which prove defective in material or workmanship. Any settling of backfilled trenches which may occur during the guarantee period shall be repaired without expense to the Owner, including the complete restoration of all damaged property.

LOOSE EQUIPMENT

Contractor shall furnish the quick-coupler keys and hose ells as previously specified, as well as manual drain valve keys, controller keys, padlock and keys for controller junction box and all related parts necessary to operate the system, as part of this work.

TEMPORARY WATER AND ELECTRICAL

Contractor shall arrange for temporary water and electrical service as necessary to his work, and shall pay all costs for both water and electricity until final acceptance of the project by the Town.

LANDSCAPING

The term "landscaping" refers to planting trees, shrubs and ground cover, placement of boulders and decorative rock, bed edger materials, mulches and related work. This specification is intended as a minimum specification. Final drawings, specifications and details shall be submitted to the Town for review and approval prior to construction.

PLANT MATERIAL

Refer to the "Town of Parker Recommended Plant List" in the ***Public Works Technical Manual***. Species not listed on the "Preferred Plants" list may be submitted for consideration, provided they are not on the Towns "Excluded Species" list.

Adequate variety (Biological Diversity) in the planting shall be provided to avoid epidemic insect or disease problems.

Minimum average plant sizes shall be as follows:

Deciduous shade trees - 2 ½" caliper - measured 6" above ground, per "American Standard for Nursery Stock" ANSI Z60.1-1996.

Ornamental trees – 2" caliper - measured 6" above ground, per "American Standard for Nursery Stock" ANSI Z60.1-1996.

Evergreen trees - 6' minimum height, measured to midpoint of most recent year's growth.

Shrubs - 5 gallon container, 2'-3' in height for deciduous, 18" - 24" spread for junipers, or as per "American Standard for Nursery Stock" ANSI Z60.1-1996.

Plants shall be hardy to this area, in a healthy and vigorous state of growth, and conform in size, shape and character to the most recent edition of the American Association of Nurserymen Standards.

All material shall be planted in accordance with the Town of Parker Planting Standards (see the ***Public Works Technical Manual***).

Where a screen or buffer is indicated on an Official Development Plan or other planting plan, the shrubs or other materials shall be planted and maintained to provide a continuous solid visual screen within 3 years from the time of planting.

Installation of accepted root barriers may be considered for approval on a case by case basis.

GROUND COVERS

Grass or other living plants shall be the primary ground cover in landscaped areas. Sodding is recommended but grass seeding is allowed under special circumstances. Vines are an acceptable ground cover in non-pedestrian areas. Ground covers used in lieu of grass shall be planted to present a finished appearance and complete coverage after three growing seasons.

Other types of ground cover, e.g. bark mulches, wood chips, boulders, cobble or river rock, and similar shall be limited to small areas. All non-living groundcover (rock, chips, etc.) shall be placed over a suitable weed barrier or ground fabric. Edging materials placed near building foundations shall allow for positive drainage away from the structures. Edging materials shall be 4 inch, 14 gauge galvanized steel only, or approved equal. Edging cap is required to be installed on all steel edging.

Native or drought-tolerant approaches to landscaping will be considered, and are encouraged, for planting certain appropriate areas. It shall be noted that adequate irrigation must be provided for establishment and maintenance, and that native grasses shall be maintained in a condition of acceptable height, free of weeds and debris, and shall not represent a fire hazard nor become a nuisance site for water or wind erosion. Native shrubs and trees, due to their drought-tolerance, are recommended in these areas. Native grasses shall have irrigation systems installed capable of providing head to head coverage.

STREETSCAPES

The following standards do not necessarily apply to residential and commercial streetscapes. They DO apply to all streetscapes that are intended to be owned and maintained by the Town of Parker. Determination as to applicability will be made during the design review process.

Streetscapes shall be defined as any areas landscaped along roadways within or beyond the Public Right-of-Way, and/or any median strips located within divided lane roadways. Streetscapes shall be designed to provide for visual relief along the Town's roadways and constructed for safety, cost effectiveness, and minimal maintenance.

DESIGN STANDARDS AND STREETSCAPE LAYOUT

- A. **Sight Distance Triangles** shall be maintained at all intersections of a private drive with a public street, and at the intersection of two public streets, their size varying by road classification, projected traffic level, and speed. These sight triangle areas are to contain no obstructions to the view of the driver of a vehicle. Any landscaping placed within these areas shall allow visibility across the area. All shrubs, boulders, ground covers, and similar features shall be maintained at or below a height of 36" above the grade of the lower of the adjacent roadways. The number and arrangement of the tree trunks shall not significantly block vision across the area. Evergreen trees may not be placed within the sight triangles at roadway intersections. All plantings within sight triangles shall be designed and installed in compliance with the latest edition of the Town of Parker's *Roadway Design and Construction Criteria* manual.
- B. **Trench Drains** are required within medians at vertical curb and gutter along arterial roadways, in accordance with the Town of Parker's *Roadway Design and Construction Criteria* manual.
- C. The first 50' to 100' of any median shall be planted with a xeric, low maintenance grass. Raised planter beds, where specified, will begin 50' to 100' from the beginning of medians, where the native grass plantings end (See *Public Works Technical Reference Manual*, Figure 1).
- D. A minimum 1' wide **Concrete Apron** shall be provided along all median edges to prevent roadway salt/sand damage in the planting area. The apron shall be sloped a minimum of 2% to allow for runoff (See *Public Works Technical Reference Manual*, Figure 1).
- E. The median planting strip shall be designed so planting areas are no less than six (6) feet wide. Non-plantable areas within medians (areas less than six (6) feet wide) shall be colored concrete (Davis Color Rustic Brown) with an exposed aggregate finish (See *Public Works Technical Reference Manual*, Figure 1).
- F. **Conduit** shall be placed underneath all new roadways at 500' increments. Place two (2) – four (4) inch PVC conduit pipes perpendicular to the roadway for connections to water, for irrigation, and power, for electric service. Conduit shall be clearly marked above proposed grade by cutting an "X" on the head of the curb with a demo saw.

PLANT MATERIALS

A. General Plant Material Guidelines are as follows:

1. Trees and shrubs shall be selected with the mature size in mind to prevent mature plants from over-crowding each other, thus minimizing pruning. A plant's mature spread will limit its location. Refer to the "Town of Parker Recommended Plant List" (*Public Works Technical Reference Manual*).
2. A **Minimum Overhead Clearance** shall be maintained throughout the life of all street and median deciduous trees (See *Public Works Technical Reference Manual*, Figure 2).
 - a. The branching height of all trees shall be maintained at no less than **sixteen (16) feet above the street**.
 - b. The branching height of all trees shall be maintained no less than **eight (8) feet above the sidewalk**.
3. **Spacing** for all vegetation shall be 90% of the mature spread stated on the included "Town of Parker Recommended Plant List" (*Public Works Technical Reference Manual*). In some instances, understory trees and shrubs shall be allowed within this 90% spacing to provide a higher density of planting, as long as the mature size (height, branching structure, etc.) of each of the plants will not hinder either plants growth. (See *Public Works Technical Reference Manual*, Figure 3).
4. Select plants that require minimal maintenance.
5. Where signs, lights, overhead or underground utilities, utility poles and fire hydrants would limit mature vegetation size, adjustments in species or location should be considered to minimize excessive pruning.
6. Create "Ornamental Pockets" where the median blocks the intersection of two roads to provide a view when traveling the intersecting road (See *Public Works Technical Reference Manual*, Figure 4). "Ornamental Pockets" shall also be located at intervals within the Street Tree Planting Strip to create interest and variety in the plant materials used along the streets in the Town of Parker.
7. Less familiar tree species, other than those listed in the "Town of Parker Recommended Plant List" (*Public Works Technical Reference Manual*), are highly encouraged for planting within the Town. Approval/disapproval of any proposed plant materials will be given during the Site Plan Review Process.
8. Xeriscape plantings are encouraged to minimize water consumption.
9. Within any given street block, a maximum of five (5), and minimum of three (3), shade tree species shall be selected to limit over-use of one species. Exceptions can be submitted for consideration, and will be approved/disapproved during the Site Plan Review Process. Select plant materials with similar characteristics such as color and form to provide

uniformity within the block, concentrating species with ornamental characteristics at vistas and intersections.

10. The use of some plant material is restricted, refer to the Allowed and Excluded Plants List (“Town of Parker Recommended Plant List”, *Public Works Technical Reference Manual*).

B. Tree placement shall adhere to the following standards:

1. **Median Planting:** (the area between the lanes of opposing traffic)
 - a. Place Shade Trees in the center of the raised planter bed to maximize the amount of area available for root growth for each tree.
 - b. Medians that are wider than standard may be able to fit more than a single Ornamental Tree within the width of the median. Size shall be the determining factor in addition to whether the location of the tree will necessitate excessive pruning to keep the tree out of the roadway.
2. **Street Tree Planting Strip:** (the area between the back of curb and the Right Of Way)
 - a. The **Design Intent** for tree placement within the Street Tree Planting Strip is to provide a continuous tree canopy over the street space as well as the pedestrian space. This canopy may be achieved by placing trees on alternate sides of the sidewalk (See *Public Works Technical Reference Manual*, Figure 4). Other design proposals may be submitted for consideration during the plan review process.
 - b. At street intersections, the tree closest to the intersecting street shall be located on the side of the sidewalk away from the street to maintain adequate visibility (See *Public Works Technical Reference Manual*, Figure 5).
3. **Evergreen Trees** shall not be placed where they will obstruct the visual line of sight on a public right-of-way, or where they will project winter shade onto a public street causing ice on the roadway.
 - a. Evergreen trees should not be placed on the south sides of east/west streets, or within 150’ of any roadway intersection.
 - b. A maximum of five (5) evergreen trees shall be allowed in one grouping to prevent snow-drifts.
 - c. Evergreen trees shall be placed at least ten (10) feet from the edge of pavement, curbs or sidewalks, or far enough to permit clearance of the tree’s mature spread.
 - d. Other design proposals may be submitted for consideration during the plan review process, with an explanation for placement noted on the plan (i.e. topography, suitability for the area due to special circumstances, etc.)

- C. **Shrubs, Ornamental Trees and/or Ground Covers** shall be used throughout the median plantings to provide under story growth, which maximize screening between the traffic corridors and helps keep mulch in place (See *Public Works Technical Reference Manual*, Figure 3). Shrubs shall be used within the “Ornamental Pockets” in the Street Tree Planting Strips (See *Public Works Technical Reference Manual*, Figure 4).
- D. **Perennials** shall be used at high visibility areas within the Median plantings and the “Ornamental Pockets” in the Street Tree Planting Strip to provide additional interest. Size and maintenance requirements shall be the determining factors for the location and use of any perennial plant material. Perennial planting areas shall be clearly labeled as such on any landscape plans submitted for Site Plan Review. When perennial plantings are used, they shall adhere to these standards:
1. Large groupings of same species plants shall be used for greater visual impact.
 2. Select plants so that visual impact is maintained through all seasons.
- E. The use of **annual bedding plants** is discouraged in planting beds to be maintained by the Town due to their high maintenance demands. Only upon direct approval through the Site Plan Review shall annual plantings be allowed. However, the Town may make direct requests for annual planting beds where they deem appropriate. Annual planting areas shall be clearly labeled as such on any plans submitted for Site Plan Review.
- F. **Optional Residential Tree Lawn Guidelines:**
The tree lawn is the area between the back of the curb and the sidewalk. In lieu of traditional turf grass, xeric landscapes can be installed within a portion of the tree lawn or in its entirety. The Town does not require review and approval of individual tree lawn areas if the species are consistent with the Town’s plant list, except for deciduous shade trees. Please check with your HOA for any additional approvals. Planting in this area should provide: species diversity, visual interest by using various colors, textures, growth habits, and plants with winter interest. When installing plant material other than traditional turf grass, water conserving xeric plants shall be used. It will take 1 to 2 growing seasons of regular deep watering to grow the kind of extensive root system these plants need to withstand dry conditions. Water deeply and infrequently once established.
1. Plant material:
 - a. A minimum coverage of 75% live xeric plant material shall be used including: ornamental grasses, perennials, deciduous and evergreen shrubs, groundcover, vines, etc. Artificial plant material shall not be allowed.
 - b. Seed mixes shall not be used in tree lawns with the exception of Buffalo Grass, Blue Grama or a blend of the two.
 - c. No more than 20% of the plant material will be over 2’ in height at maturity with the maximum height of 4’ for any plant, with the exception of trees. The total height is measured from the sidewalk level.

- d. A deciduous shade tree shall only be planted in a tree lawn (by the adjacent property owner) with the review and approval by the Town. The Town shall determine the species on a site-by-site basis. Deciduous shade trees shall be 2.5" caliper trees at planting. Evergreen trees and ornamental trees shall not be allowed.
 - e. All plant material shall be selected from the Town's plant lists. Other plants may be proposed for consideration/approval by the Town, prior to planting.
2. A maximum exposed coverage of 25% organic wood mulch, rock mulch, and/or stepping-stones shall be allowed. The mature plant size shall be considered when determining plant area coverage and exposed areas.
3. The site distance setback at intersections and driveways must not be obstructed. (All site distance requirements are referenced in the Public Works Manual.) The total height is measured from the sidewalk level.
 - a. All plants, boulders, etc. shall be less than 2' in height within 10' of any driveway.
 - b. All plants, boulders, etc. shall be less than 3' in height within 25' of a local/local or local/collector intersection, as measured from the flow line.
4. Special care shall be taken when planting around existing trees in tree lawns to protect the tree roots.
 - a. A one-foot radius per inch of trunk diameter shall be undisturbed for planting or any other site modification around the base of the tree.
 - b. New plants around the base of existing trees shall be one-gallon size or smaller to reduce the amount of damage to the tree roots.
 - c. Mulch shall be installed and maintained so as to be a minimum of 3" away from the trunk of trees.
5. Water shall be applied in a manner that allows maximum soil penetration and minimum runoff and evaporation.
 - a. Existing irrigation shall be modified to accommodate the new landscape design and promote water conservation.
 - b. Only water conserving drip or subsurface irrigation shall be used.
6. Design, installation and maintenance:
 - a. The design, installation, and maintenance shall promote: water conservation, creative designs with appropriate and diverse plant selection, and sound horticultural practices.
 - b. Successful xeriscape requires proper soil preparation. It is recommended that 5 to 6 cubic yards per 1,000 square feet of organic matter be incorporated into the soil to a depth of 6", prior to planting.
 - c. Avoid the use of landscape fabric under mulched plant material, as it will inhibit the spread of the plant.

- d. Spacing for all vegetation shall be 90% of the mature spread. All plant material shall be appropriately spaced to accommodate the natural mature plant habit.
- e. Avoid rows of larger plants.
- f. Plants shall not obstruct any sidewalk or street.
- g. A 40' separation shall be maintained between street trees and approximately the same distance for street trees and front yard trees.
- h. The adjacent property owner is responsible for maintenance including: proper pruning, weeding, plant replacement, supplemental mulching, and watering.
- i. Identify all utilities prior to digging.

LANDSCAPE PRODUCTS

A. Soils

1. An approved, imported, high quality planting mix (**Topsoil**) shall be used within raised medians (see page 6).
 - a. **Existing roadway medians** will require fourteen (14) inches of an approved imported planting mix (See *Public Works Technical Reference Manual*, Figure 6) in areas of ornamental plantings. This topsoil shall be fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than 2 inches in any dimension, and other extraneous or toxic matter harmful to plant growth.
 - i. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at the project site. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth of not less than 4 inches. Do not use soil products obtained from bogs or marshes. Mountain peat moss is not acceptable.
 - b. **Future roadway medians** shall be filled with existing topsoil, fourteen (14) inches deep, as much as is possible by equalizing cut and fill (See *Public Works Technical Reference Manual*, Figure 6). If existing topsoil is not available, follow requirements of Existing Roadway Medians above. Existing soils, when used in the medians, shall be reasonably cleaned of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than 2 inches in any dimension, and other extraneous or toxic matter harmful to plant growth. If there is not enough topsoil to fill the need, off-site topsoil shall be brought in.
2. **Soil Amendments** shall be added to planting bed areas to promote the health and vigor of the proposed plant materials.
 - a. Refer to “Park Landscapes” Section of the Town of Parker’s *Construction Specifications and Design Considerations for Parks, Trails, and Streetscapes* for soil amendment specification criteria.

3. **Structural Soil** may be required beneath sidewalks in situations where tree planting pits or vaults are utilized, or where the distance between the back of curb and sidewalk is less than six (6) feet wide. Determination as to applicability will be made during the design review process. The use of Structural Soil is to encourage deep root growth away from the pavement surface, minimizing upheaval of the sidewalk, as well as to promote root growth toward the sidewalk and away from the roadway. Refer to the article by Cornell's Urban Horticulture Institute for a description of the system and construction specifications (See *Public Works Technical Reference Manual*, "CU Structural Soil").

B. **Irrigation** shall be provided to all landscape plant material.

1. Refer to "Park Landscapes" Section of the Town of Parker's *Construction Specifications and Design Considerations for Parks, Trails, and Streetscapes* for the irrigation system's design and specification criteria. Materials used must be comparable to the Town's recommended list. Locate one (1) irrigation controller within each median.

C. **Barrier Fabric** shall be used in all planting beds to minimize weed growth.

1. Fabric is not to be used in areas with perennial or annual plantings so that their growth is not hindered.
2. The filtration/separation fabric shall be a water permeable fabric of fiberglass or polypropylene fabric (Mirafi, Typar, Trevira, or approved equal).

D. A **Shredded Red Cedar Wood Mulch**, or approved alternative, shall be used within the raised planter beds to help control weeds and conserve water. Apply at a minimum 4" thickness. All mulch shall be installed away from the trunks of all trees.

E. All trees shall be **Staked and Guyed**.

1. Provide stakes (minimum 2" x 2") and deadmen of sound new hardwood, treated softwood, or redwood, free of knot holes and other defects. Provide wire ties and guys of 2-strand, twisted, pliable galvanized iron wire, not lighter than 12 gauge with zinc-coated turnbuckles. Provide manufactured fabric tree strap with grommet to protect tree trunks from damage by wires.

LIGHTING

- A. Accent Lighting: locate one (1) "Parker Light" (Victorian Series, Model VP-103, by Niland Company) every 100-150 linear feet within the median planter beds on all arterial roadways. All other medians are subject to design review. These standards may not pertain to master-planned communities. A determination on applicability will be made during the design review process.
- B. Trees shall not be located within fifteen (15) feet of any light measured from the center of the tree (Figure 1). Trees adjacent to lights (but beyond fifteen (15) feet) shall be deciduous

shade trees only. Ornamental trees are not allowed next to lights because they block visibility of the light.

- C. All “Parker Lights” to have the outlet located on the base for use to light the median trees during the Holiday Season.

***THE FOLLOWING SECTIONS APPLY TO ALL RIGHT-OF-WAY IN THE TOWN OF PARKER,
UNLESS OTHERWISE APPROVED BY THE TOWN:***

MAINTENANCE OF IMPROVEMENTS IN PUBLIC RIGHT-OF-WAY

(a) It shall be the duty of the owner, occupant or lessee of any real property abutting a constructed right-of-way (the "Responsible Party") to provide for the continuing care, maintenance, repair and replacement of all improvements installed in any right-of-way area between their property line and the curb line adjoining their property, which includes, but is not limited to, trees, shrubs, turf, groundcover plantings, irrigation, sidewalks, driveways, planters, benches, lighting and trash receptacles (the "Improvements"). Such maintenance shall include, but is not limited to, mowing, weeding, watering, pruning of trees and shrubs, insect and disease control of plant material, repair and adjustment of irrigation systems, repair and/or replacement of concrete walkways and clearing walkways and driveways of snow and ice.

(b) Areas created prior to the enactment of the ordinance from which this section was derived may be subject to these requirements, as part of a Town approved landscape plan for the subject real property.

PLANTING, MAINTAINING AND REMOVAL OF TREES ON PUBLIC PROPERTY

The Town Forester shall establish rules and regulations for the planting and maintaining of trees on any public right-of-way or other public place in the Town and it shall be unlawful for any person to plant trees upon any public right-of-way or other public place in the Town except as prescribed in such rules and regulations. The rules and regulations shall contain:

- (1) Spacing requirements for trees on the public right-of way and other public places;
- (2) The standards that are to be followed when planting trees on the public right-of-way;
- (3) The types of trees which are prohibited on any public right-of-way or other public place;
- (4) Requirements for maintenance and removal of such trees upon the public right-of-way or other public place.

The rules and regulations are available through the office of the Town Forester.

MAINTENANCE AND INSTALLATION OF LANDSCAPING

(a) It shall be the duty of the Responsible Party that owns, leases or occupies any real property located within the Town to provide for regular weeding, pruning, mowing, watering and other maintenance required for a neat appearance and healthy condition of all plantings located on said real property. Said maintenance shall be done at the expense of the Responsible Party. Plant materials which exhibit evidence of pests, disease, or damage shall be appropriately treated, and dead plant materials shall be removed and replaced with the approval of the Town Forester.

(b) It shall be the duty of the Responsible Party that owns, leases or occupies any real property abutting a public right-of-way located within the Town to provide for landscaping of any right-of-way area between his property line and the curb line or the edge of the roadway and between the property line and the center line of any alley. Areas created prior to the enactment of the ordinance from which this section was derived may be subject to these requirements, as part of a Town approved landscape plan for the subject real property.

REMOVAL OF DEAD OR DANGEROUS TREES, LIMBS OR SHRUBS

The Responsible Party shall remove any dead, dying or structurally unsound trees, limbs or shrubs from the real property owned, occupied or leased by the Responsible Party or the public right-of-way abutting said property, when said dead, dying or structurally unsound trees or limbs are dangerous to life, limb, or property. When a dead, dying or structurally unsound tree, limb or shrub has the potential to affect adjacent property, and is dangerous to life, limb or property, the responsible party shall remove such tree or limb so as to avoid injury or damage to or on the adjacent property. The responsible party shall remove any live, dead or dying tree, limb or shrub that is blocking a sight triangle or traffic sign causing a potential traffic hazard, as determined by the Town Forester. The Town Forester or authorized representative may order the property owner to remove any such tree, limb or shrub.

INFECTED OR INFESTED TREES

(a) The Town Forester or authorized representative may inspect any tree or tree part, including logs or branches existing or growing upon any property within the Town. The Town Forester shall conduct surveys to determine if any destructive or communicable disease, or other pestilence exists which may be detrimental to or endanger the good health and well being of trees in the Town.

(b) Upon discovery of any destructive or communicable disease, breeding place of the disease, or pestilence that endangers the good health and well being of trees, or is capable of causing an epidemic spread of communicable disease or insect infestation, the Town Forester or authorized representative shall at once notify in writing the Responsible Party, of the condition thereof and order such Responsible Party to eradicate, remove, or otherwise control such condition within a specified time.

OBSTRUCTION OF PUBLIC PROPERTY

- (a) The Responsible Party shall maintain and care for the trees upon the property owned, leased or occupied by the Responsible Party and upon the public right-of-way abutting said property so that said trees do not interfere with, obstruct, or in any way endanger the safe public use of streets, alleys, sidewalks, or other public places. Stumps are not permitted on the public right-of-way or other public place.
- (b) A Minimum Overhead Clearance shall be maintained throughout the life of all street and median deciduous trees (See *Public Works Technical Reference Manual*, Figure 2). The branching height of all trees shall be maintained at no less than **sixteen (16) feet above the street**, and no less than **eight (8) feet above the sidewalk**.
- (c) When the Town Forester or authorized representative determines that a tree is in such a condition that it interferes with, obstructs, or in any way endangers the safe public use of streets, alleys, sidewalks, or other public places, the Town Forester shall issue an order directing the Responsible Party to prune, remove, or otherwise take such action as is necessary to eliminate the interference, obstruction, or dangerous condition of the tree.

DETERMINATION OF HAZARD/NOTICE TO RESPONSIBLE PARTY/ASSESSMENT OF COSTS

- (a) When the Town Forester or authorized representative determines that the Improvements described herein are in a state of disrepair, a notice to repair shall be sent to the Responsible Party described herein.
- (b) Service of the notice described above shall be made by either serving such notice on the person named in the notice, or by sending such notice by first class mail to the residence or place of business of the person named in the notice and by posting such notice in a conspicuous place on the property abutting or adjacent to the Improvements described herein. If the notice is served on one other than the owner of the property that is in disrepair or adjacent to or abutting the subject public right-of-way that is in disrepair, a copy of the notice shall also be mailed to the owner at the address contained in the Douglas County Assessor's records.
- (c) The notice described herein shall contain:
- (1) A description of the required care, maintenance, repair or replacement;
 - (2) A statement of the Improvement that requires care, maintenance, repair or replacement;
 - (3) A statement advising of the right to an administrative hearing to appeal the notice to the Public Works Director, if requested within fifteen (15) days; and
 - (4) A requirement that notification of intent to comply shall be made to the Town Foresters office within thirty (30) days from the date of issuance of the notice; and this notice shall also indicate that failure to make the repairs described in the notice within sixty (60) days shall be unlawful, and the failure to comply with the notice may result in work being done by the Town at the expense of the party to whom the notice is issued.

(d) If the person to whom the notice is directed fails to comply within the time specified in the notice, the Town Forester or authorized representative may order the care, maintenance, repair or replacement of the Improvements by or on behalf of the Town, and the procedures outlined herein for collection of costs and expenses shall apply.

(1) When work has been performed by the Town, the Town Forester shall bill any or all Responsible Parties for the costs and expenses necessary to provide care, maintenance, repair or replacement.

(2) If the Responsible Party shall fail within thirty (30) days after billing to pay the costs and expenses of work by the Town, such costs and expenses may be collected by the Town in a civil action or assessed and filed as a lien against the real property owned, leased or occupied by the Responsible Party.

(3) If the costs of care, maintenance, repair or replacement have not been otherwise collected, the Finance Director shall prepare a statement enumerating the actual costs plus fifteen percent (15%) of the costs for inspection and other additional administrative costs. The costs enumerated in this statement shall be a first and prior lien upon the property owned, leased or occupied by the Responsible Party relating back to the date upon which the care, maintenance, repair or replacement was performed. A copy of this statement shall be deposited in the United States mail or personally hand-delivered to the Responsible Party. The Responsible Party may request a hearing before the Public Works Director to contest the amount of the costs. Such request must be made in writing and be filed with the Finance Director within thirty (30) days of the date of mailing or service of the first statement to the Responsible Party. The Responsible Party shall be given at least two (2) weeks' written notice of the date, time and place of any hearing scheduled before the Public Works Director. The decision of the Public Works Director shall be final. If the statement remains unpaid, the amount shall be certified by the Finance Director to the Douglas County Treasurer. The Douglas County Treasurer, upon receipt of the certified statement, is hereby authorized to place the amount upon the tax list for the current year and to collect that amount in the same manner taxes are collected with a ten-percent penalty thereon.

LOCAL, REGIONAL AND MULTI-USE TRAILS

All local, regional and multi-use trails in the Town shall be designed and constructed to provide a safe and enjoyable experience for all citizens while providing for ease of maintenance. All Trails and associated facilities shall be designed and built in compliance with Urban Drainage and Flood Control District, Army Corp of Engineers and Town of Parker Regulations.

DESIGN

Material

Trails shall be designed with a minimum thickness of six (6) inches of CDOT Class B or D Portland cement concrete.

In rare cases, a soft surface (crusher fines) trail may be appropriate and must be approved by the Town. Soft surface trails are not appropriate as regional trails, where they are adjacent to roads or on slopes greater than three (3) percent.

Width

Local - Eight (8) feet

Regional – Ten (10) feet

Grade

The minimum trail cross pitch shall be two percent (2%), the cross pitch on corners and curves shall be towards the inside where drainage permits.

The centerline gradient shall not exceed five percent (5%). Trails adjacent to roads or in topographically challenged areas may exceed five percent (5%) where approved by the Town.

Stairs

On local trails, where topography prevents safe trail grades, stairs may be considered. When stairs are used an alternative ADA compliant route without stairs should be available.

When stairs are used, the minimum width shall be eight (8) feet. Stair riser heights shall be between four (4) and seven (7) inches and shall be consistent for the entire flight of stairs. The minimum tread depth shall be twelve (12) inches.

There shall be a landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum dimension measured in the direction of travel of four (4) feet.

Stairways shall have continuous handrails on both sides. Handrails shall have a circular cross section shall have an outside diameter of at least one and a quarter (1.25) inches and not greater than one and a half (1.5) inches or shall provide equivalent graspability. Clear space between a handrail and a wall or other surface shall be a minimum of one and a half (1.5) inches. Handrail height, measured above stair tread nosings, shall be uniform, not less than thirty-four (34) inches and not more than thirty-eight (38) inches.

Where handrails are not continuous between flights, the handrails shall extend horizontally at least twelve (12) inches beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser.

Drainage

Concentrated drainage shall pass under the trail by culvert or Town standard chase drain (See Drainage Crossings and Bridges) designed for the two (2) year to ten (10) year event. Culverts and chase drain shall be coordinated with surrounding drainage facilities. The minimum recommended culvert size shall be eighteen (18) inches and a flared end section will be required.

Low water trail crossings are generally discouraged. The Town may permit low water trail crossing where:

- The crossing can accommodate the ten (10) year flood.
- The design is in compliance with FEMA flood regulations.
- The crossing is designed to be resistant to flood damage

Design Speed

Trails shall have a design speed of twenty (20) miles per hour. Where slopes exceed 5%, trails shall have a design speed of thirty (30) miles per hour.

Curve Radius

The minimum curve radius shall be designed in compliance with American Association of State Highway and Transportation Officials (AASHTO) guidelines.

Sight Distance

Trails shall be designed with a minimum sight distance in compliance with American Association of State Highway and Transportation Officials (AASHTO) guidelines.

Railings

Railings shall be required where there is reasonable risk of trail users falling down an embankment with a slope of greater than 3:1 or a vertical displacement. Railings shall be a minimum of 54" in height and be constructed of a smooth metal or similar material. A 'rub' rail shall be required at 36". The railing shall flare at both ends. Railings shall be no closer than 24" from the edge of the trail.

Trail Intersections with Roads

Trails shall intersect with roads as perpendicular as possible (no less than 70 degrees). Intersections shall be signed in accordance with the MUTCD. All ramp sections at the road interface shall be constructed per Town details.

Trail Intersections

Trails intersections shall be as perpendicular as possible (no less than 70 degrees). 'T' intersections shall have a minimum radius of fifteen (15) feet.

Bridges

Bridges shall have a minimum width of ten (10) feet. Bridges shall be generally straight with approaches that meet curve radius and sight distance design standards. Bridges shall be designed to accommodate maintenance vehicles, including pickups. The vehicle load shall be 10,000 pounds plus

30% impact. Bridge decking shall be concrete and expansion joints shall be bicycle and rollerblade safe.

Utilities

Manholes, valve boxes and other utility appurtenances shall not be constructed in the pavement of the trail. Utility structures constructed at grade level shall be a minimum of two (2) feet from the edge of pavements. Structures constructed above grade shall be a minimum of four (4) feet from the edge of pavement.

CONSTRUCTION

All construction and installation specifications cited shall meet the minimum requirements of the Colorado Department of Transportation 'Standard Specifications for Road and Bridge Construction', or AASHTO, ACI, ASTM standards as noted; and the Town's Construction Criteria Manual.

Testing

Work on regional trails, trails to be maintained by the Town and/or trails located in the public right of way shall be tested by a materials testing firm. Testing shall be supervised by Colorado Registered Professional Engineer that is a full time employee of the firm.

Subgrade

The subgrade shall be thoroughly compacted to ninety-five percent (95%) modified Procter density at +/- two percent (2%) of optimum moisture for the top one (1) foot under the trail. The surface shall be the final grade on which the concrete will be placed and shall be free of humps and depressions. Testing frequency shall be a minimum of each six (6) inch lift on replacement materials with one test for every two-hundred fifty (250) feet of structure, with more taken if necessary for control.

Trail Materials

Trails shall be designed with a minimum thickness of six (6) inches of air entrained CDOT Class B or D Portland concrete cement. Finish and curing methods shall comply with CDOT Section 608 standards and specifications. Written approval from the Town is required prior to using any admixture beyond CDOT standards and specifications.

Expansion and dummy joints shall comply with CDOT section 608 requirements. In addition, expansion joints shall be sealed and contraction joints shall be saw cut.

All concrete trail cuts or connections to existing trails shall be doweled to the existing concrete with three-fourths (3/4 inch) epoxy coated tie bars on twelve (12) inch centers. All concrete trail repairs made during the probationary warranty shall be full panel (stone) replacement.

Testing and Inspection of Concrete

The slump, air content and unit weight tests shall be carried out on the first three trucks of concrete for the daily placement and thereafter one (1) set of four (4) cylinders for every five-hundred (500) lineal feet or fraction thereof trail placed. At the discretion of the Town, the contractor will provide core test results of concrete at random intervals, averaging not less than one test in five-hundred (500) feet. All testing costs shall be paid for by the developer.

Note – The testing shall include the slump (T119), air entrainment (T152), temperature of concrete placement, yield and comprehensive strength of cylinders (T22).

Final Acceptance

Final acceptance by the Town will be after a two (2) year warranty period for materials and workmanship. This warranty period shall begin after a probationary walk through of the project has been completed and when all probationary punch list items have been repaired to the satisfaction of the Town.

Refer to the *Technical Reference Manual* section of this document for illustrations pertaining to trail design.



PUBLIC WORKS TECHNICAL REFERENCE MANUAL

July 23, 2004

**Department of Public Works
9200 Motsenbocker Road
Parker, CO 80134
(303) 840-9546**

**Updated November, 2006
Updated September, 2008**

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IRRIGATION

PREFERRED IRRIGATION MATERIALS LIST FOR PROJECTS OWNED AND MAINTAINED BY THE TOWN OF PARKER

Sprinkler Heads:

1. Rotors: Hunter Gear Drive
2. Pop-up (Spray): Rainbird 1800 Series

Pipe:

1. Mainline: Sch.40 Class 200 PVC
2. Laterals: Sch. 40 Class 200 PVC
3. Dripline: Drip Poly
4. Fittings: Sch. 40 PVC
5. Risers: Swing Joint or 'Funny Pipe'; Sch. 80 PVC (rigid)
6. Copper: Type K Hard (Above or below ground) Type K Soft (Below ground)

Controller: Irritrol Dial AB Series

Backflow Preventer: Febco Reduced Pressure Assembly

Pressure Reducing Valve: Watts Regulators

Gate Valves: Matco or Hammond

Electric Valves: Rainbird

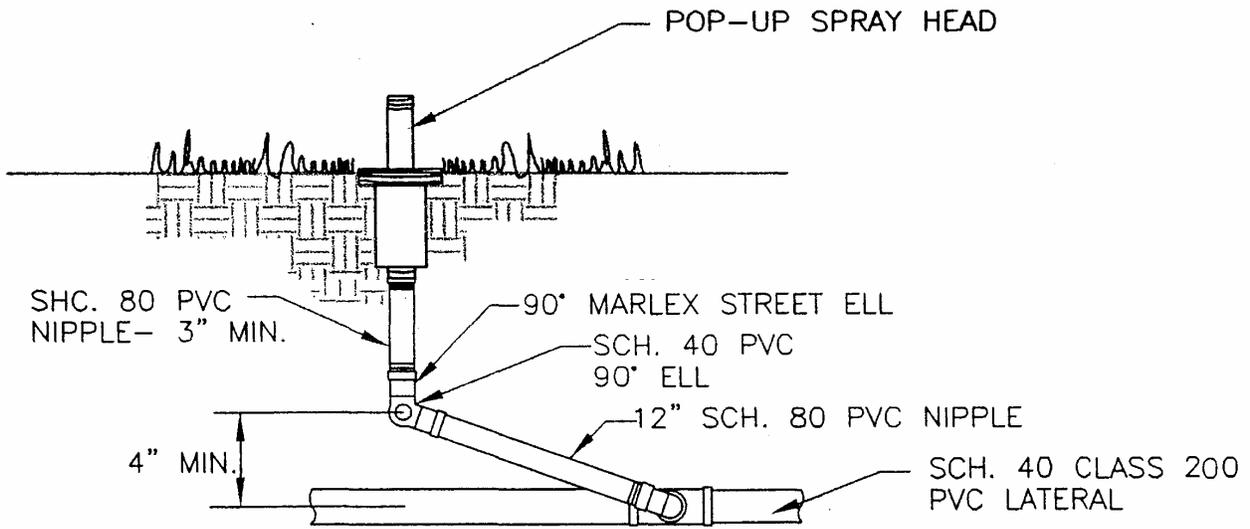
Quick Couplers: Rainbird – to be determined by job

Valve Boxes: Ametek

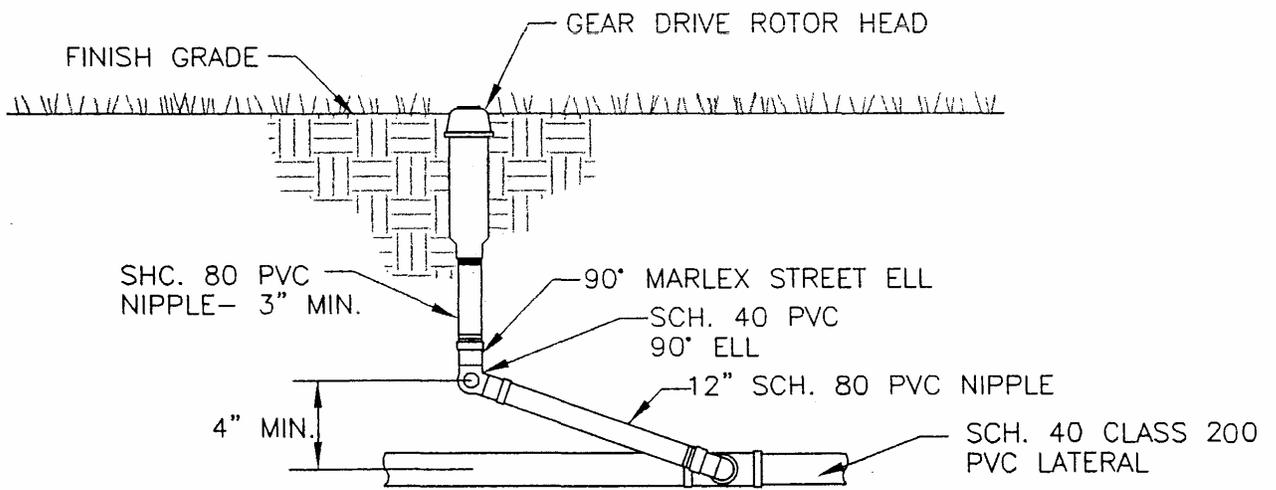
Electrical Connections: Rainbird Snap-tites

The above listing of materials, or approved equal, is to be followed on all projects to be owned or maintained by the Town of Parker. Approval on substitutions is to be made by the Public Works Director.

POP-UP SPRAY HEAD

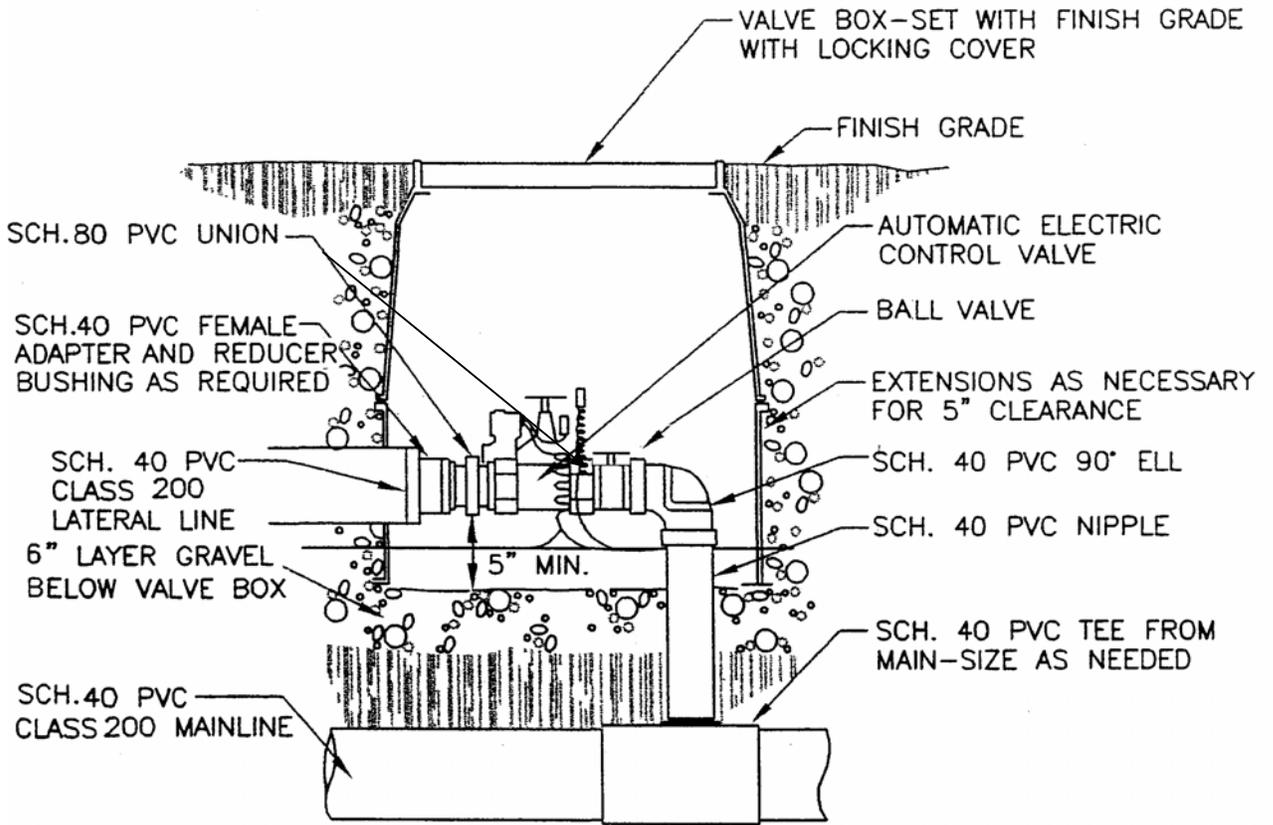


ROTOR HEAD

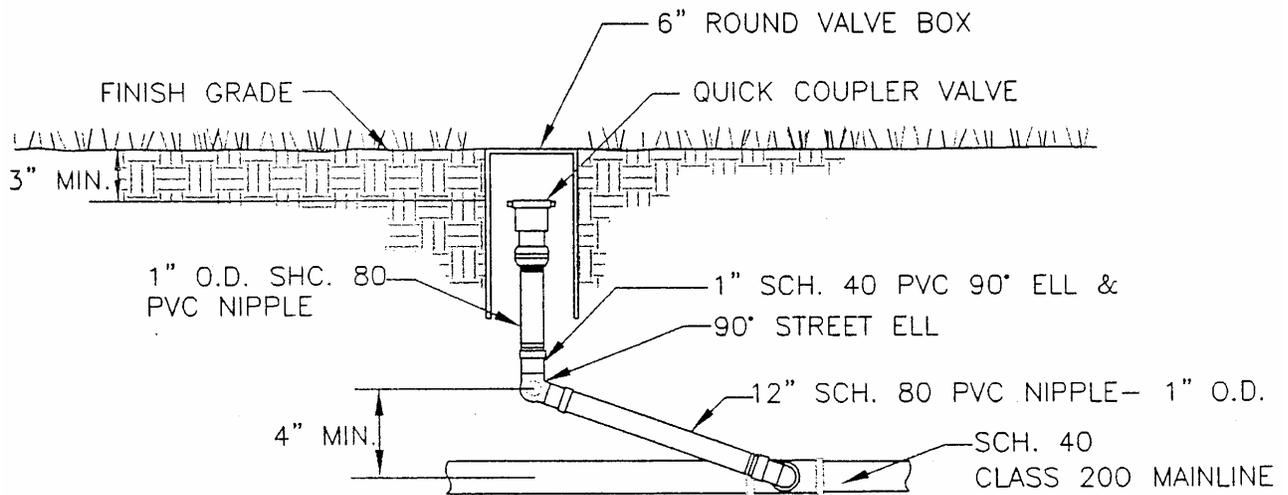


ELECTRIC CONTROL VALVE

- NOTES:
- ALL THREADED CONNECTIONS SHALL BE COATED WITH TEFLON TAPE
 - COMPACT SOIL BACKFILL TO SAME DENSITY AS ADJACENT SOIL



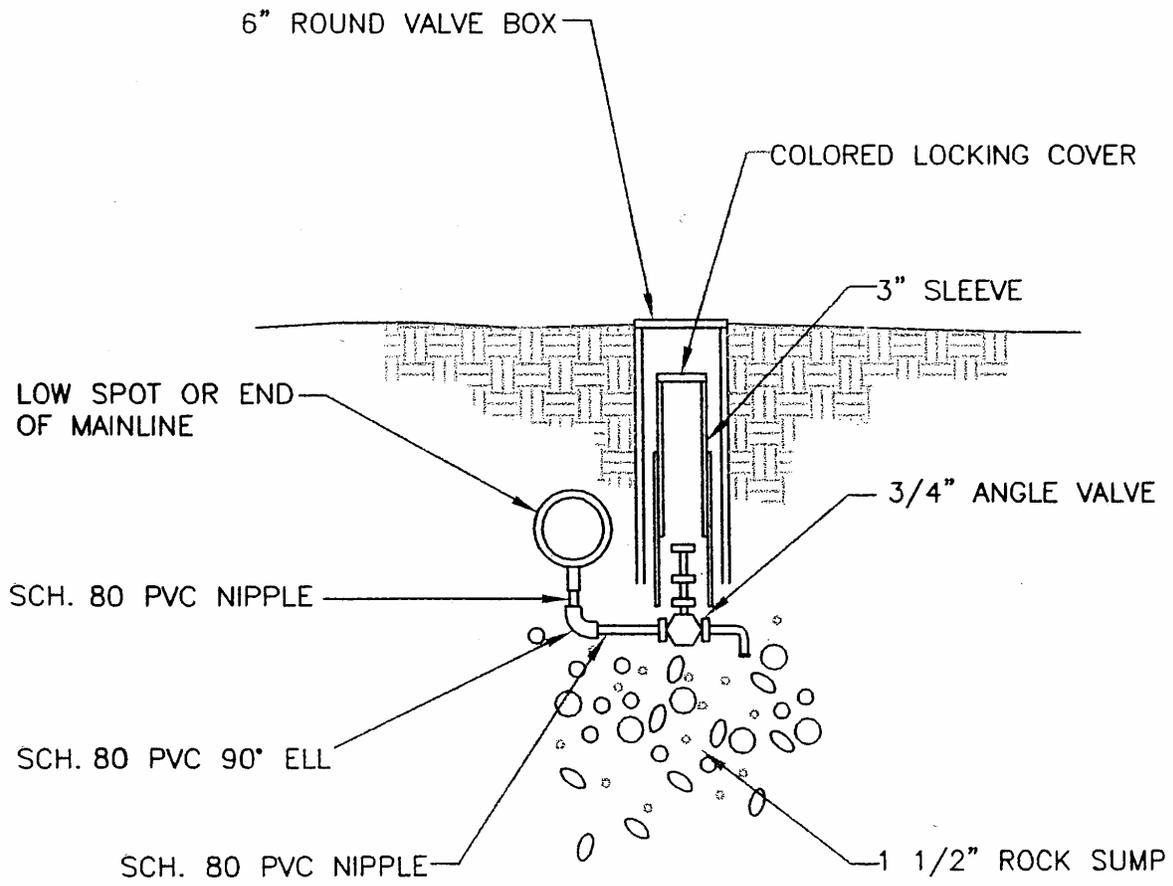
QUICK COUPLER



NOTES:

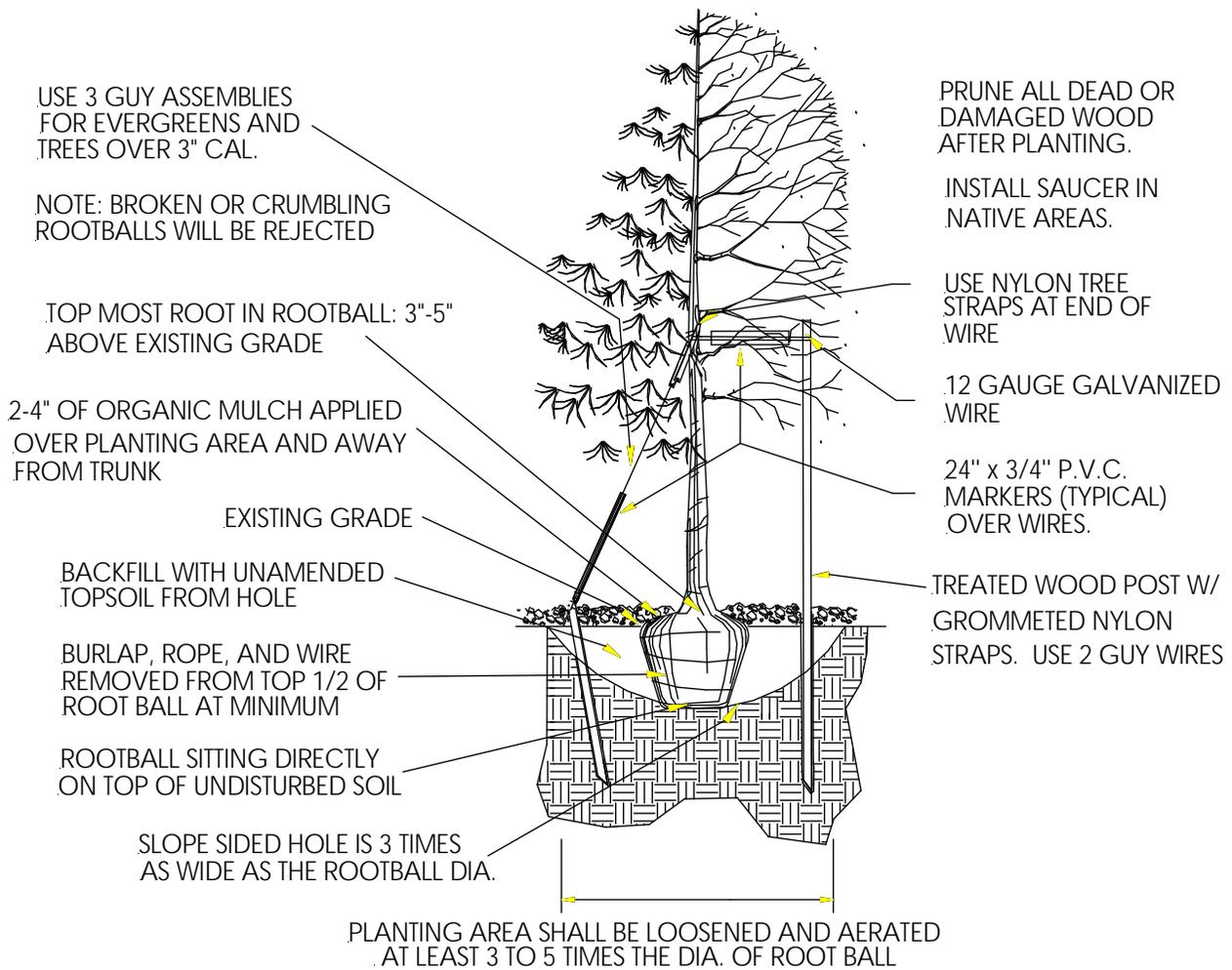
- ALL FITTINGS TO BE 1" O.D.
- ALL THREADED CONNECTIONS SHALL BE COATED WITH TEFLON TAPE
- COMPACT SOIL BACKFILL TO SAME DENSITY AS ADJACENT SOIL

MANUAL DRAIN VALVE



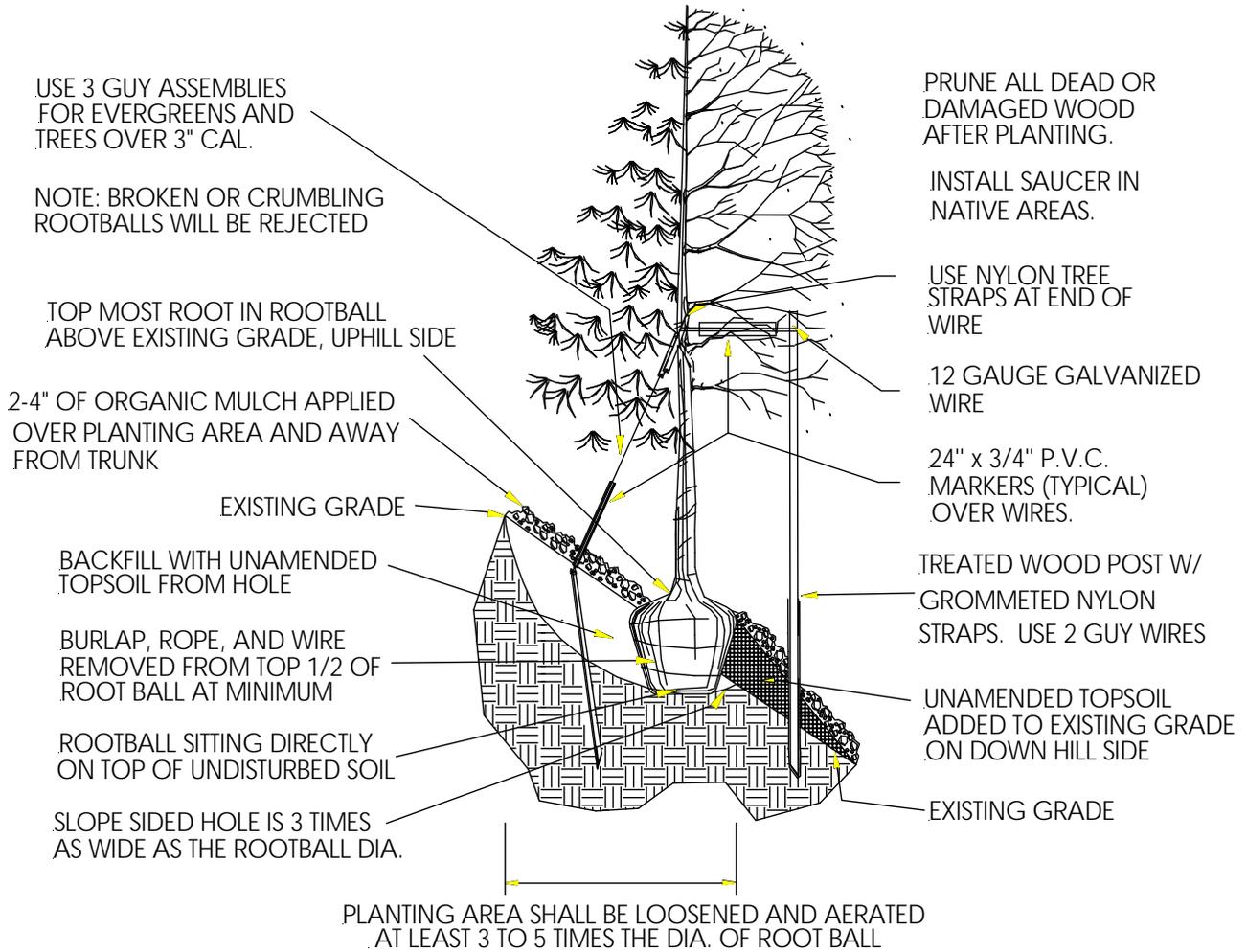
PLANTING STANDARDS

TOWN OF PARKER PLANTING STANDARDS

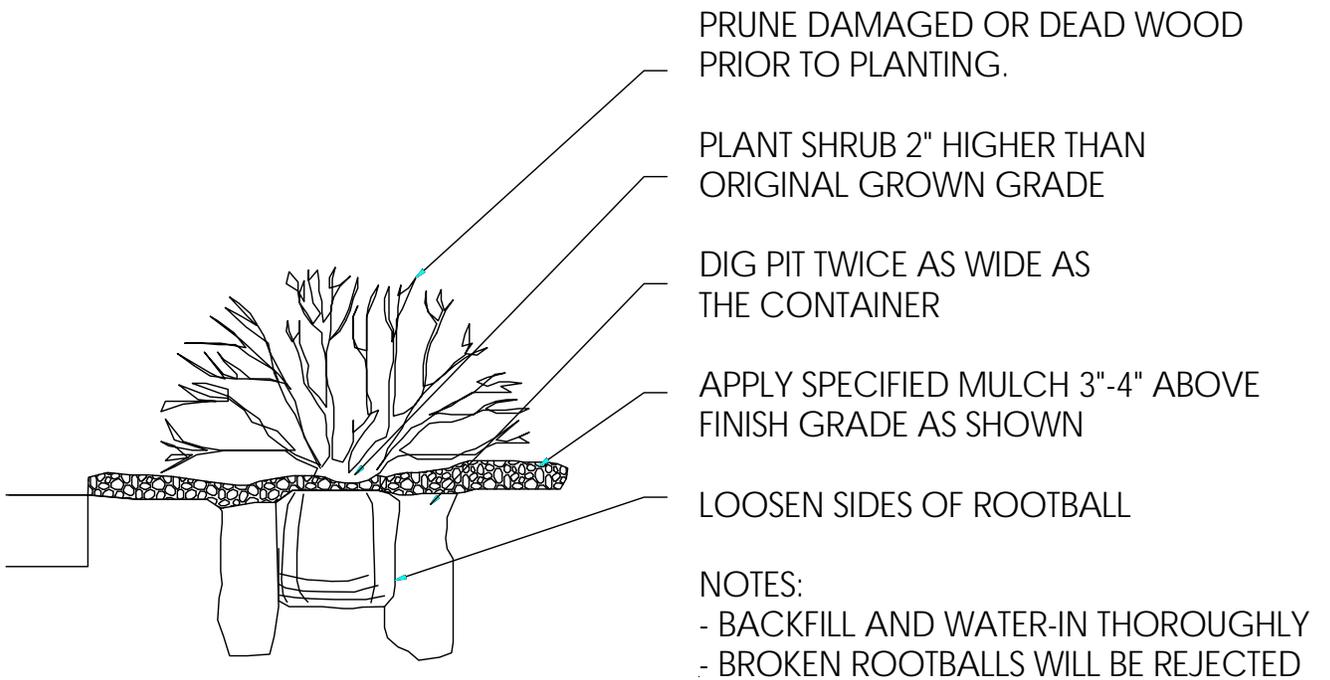


- Excavate planting holes with sloping sides. Do not disturb soil at bottom of planting holes, but do score the sides of the planting hole. Make excavations at least three times as wide as the root ball diameter and less (three to five inches) than the distance from the top most root in the root ball and the bottom of the root ball. The planting area shall be loosened and aerated at least three to five times the diameter of the root ball. Backfill shall consist of existing on site soil – no amendments shall be used unless otherwise specified.
- Trees shall be planted with the top most root in the root ball 3” to 5” higher than the finished landscape grade. This includes trees that are set on slopes (see slope planting detail). Set root ball on undisturbed soil. Trees where the trunk flare is not visible shall be rejected. Do not cover the root ball with soil.
- Cut off bottom $\frac{1}{3}$ of wire basket before placing tree in hole, cut off remainder of basket after tree is set in hole, remove basket completely where possible. At a minimum, the top $\frac{1}{2}$ of the burlap and basket shall be removed. Remove all nylon ties, twine, rope and burlap as possible. Remove unnecessary packing material.
- Form soil into a 3” to 5” tall watering ring (saucer) around planting area. This is not necessary in irrigated turf areas. Apply 3” to 4” depth of specified mulch inside watering ring.
- Staking and guying of trees is optional in most planting situations. In areas of extreme winds, or on steep slopes, staking may be necessary to stabilize trees. Staking and guying must be removed within 1 year or less of planting date.
- Tree wrap is *not* to be used on any new plantings, except in late fall planting situations, and only then after consultation with the Town Arborist.

TOWN OF PARKER TREE PLANTING DETAIL – SLOPES



TOWN OF PARKER PLANTING DETAIL – SHRUBS



CU STRUCTURAL SOIL

CU Structural Soil is a designed medium which can meet or exceed pavement design and installation requirements while remaining root penetrable and supportive for tree growth. It consists of gap-graded gravels which are made up of crushed stone, clay loam, and a hydrogel stabilizing agent. The materials can be compacted to meet all relevant pavement design requirements yet allow for sustainable root growth. This system essentially forms a rigid, load-bearing stone lattice and partially fills the lattice voids with soil. Structural soil provides a continuous base course under pavements while providing material for tree root growth, shifting design away from individual tree pits, to a designed, root penetrable, high strength, pavement system. An added advantage of using this material is its ability to allow roots to grow away from the wearing surface, thus reducing the potential for sidewalk heaving as well as providing for healthier, long-lived trees.

This system consists of a four to six inch rigid pavement surface, with a pavement opening large enough to accommodate a 40 year or older tree. The opening could be concentric rings of pavers designed for removal as the buttress roots lift them. Below that a six inch base course could be installed and compacted with the material meeting normal regional pavement specifications for the traffic they are expected to experience. The base acts as a root exclusion zone from the pavements surface. A geotextile (weed barrier) segregates the base course from the subbase and extends as an apron emerging around the edges of the concrete. A gap-graded, structural soil material demonstrated to allow root penetration when compacted would be the subbase and area for subsequent tree root growth. This material would be compacted to not less than 95% Proctor density (AASHTO T-99) and possess a California Bearing Ratio greater than 40. The subbase thickness would depend on the depth of sub grade or to a proposed target of 36 inches. This is negotiable, but a 24 inch minimum would be encouraged for the root zone. The sub grade should be excavated to parallel the final grade. Under-drainage must be provided under the structural soil material conforming to approved engineering standard for that region.

The three components of the Structural Soil are mixed in the following proportions by weight:

Crushed Stone (granite or limestone, graded ¾ to 1 ½”, highly angular, with no fines) – 100

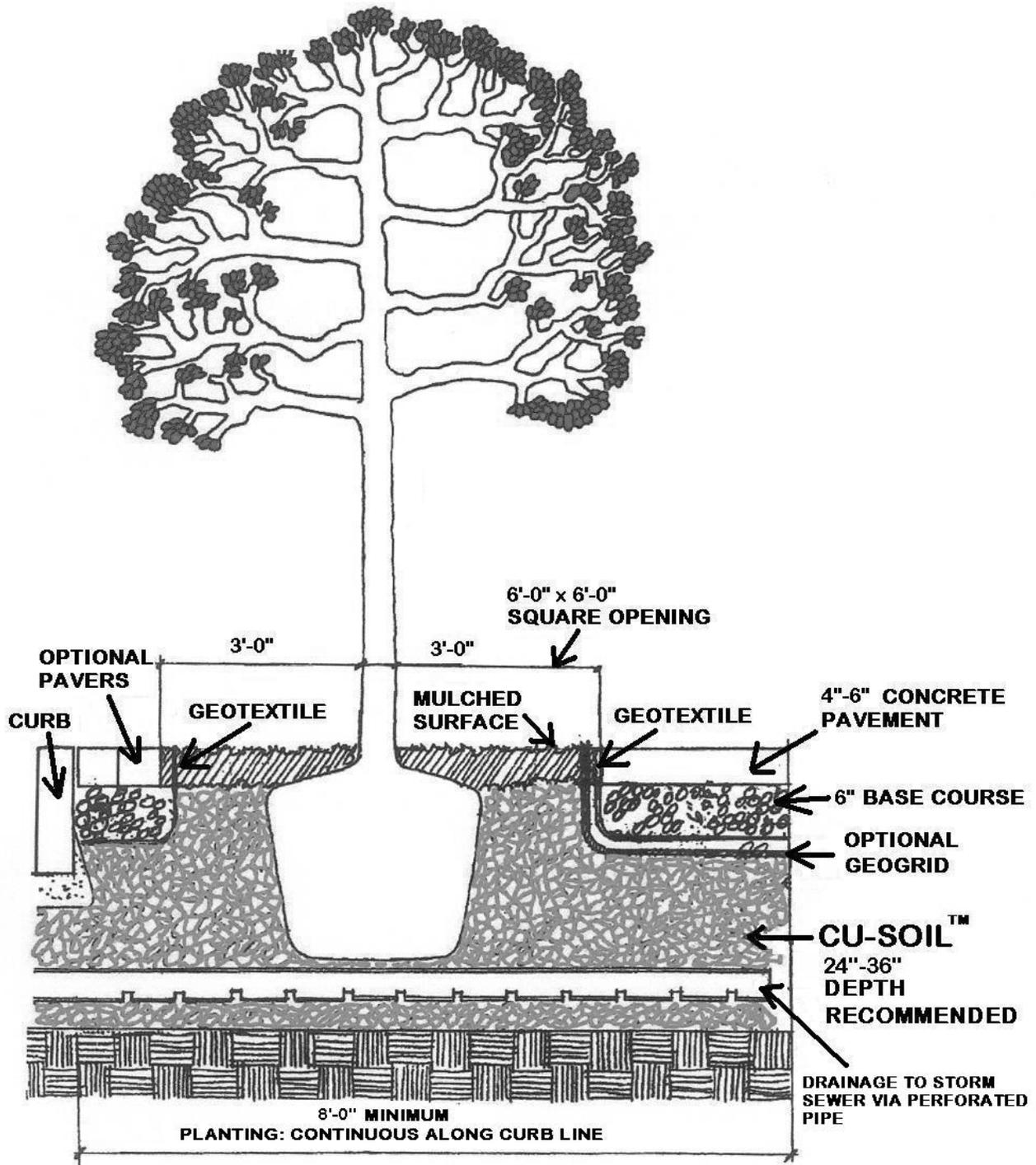
Clay Loam – 20

Hydrogel – 0.03

In a typical street tree installation of such a structural soil, the potential rooting zone could extend from the building face to curb, running the entire length of the street. This would ensure an adequate volume of soil to meet the long term needs of the tree. Where this entire excavation is not feasible, a trench, running parallel to the curb, eight feet wide and three feet deep would be minimally adequate. Since this profile has adapted the standard surface and base specifications generally in use, less hesitation for engineering approval may result.

There will be a need to ensure moisture recharge and free gas exchange throughout the root zone which is not the entire subbase. The challenge is met by the installation of a three

dimensional geo-composite (a geo-grid wrapped in textile one inch thick by eight inches wide) which could be laid above the subbase as spokes radiating from the trunk flare opening. This form of passive irrigation is currently in the testing stage. Other previous surface treatments could also provide additional moisture recharge, as could traditional irrigation.



STREETSCAPE STANDARDS

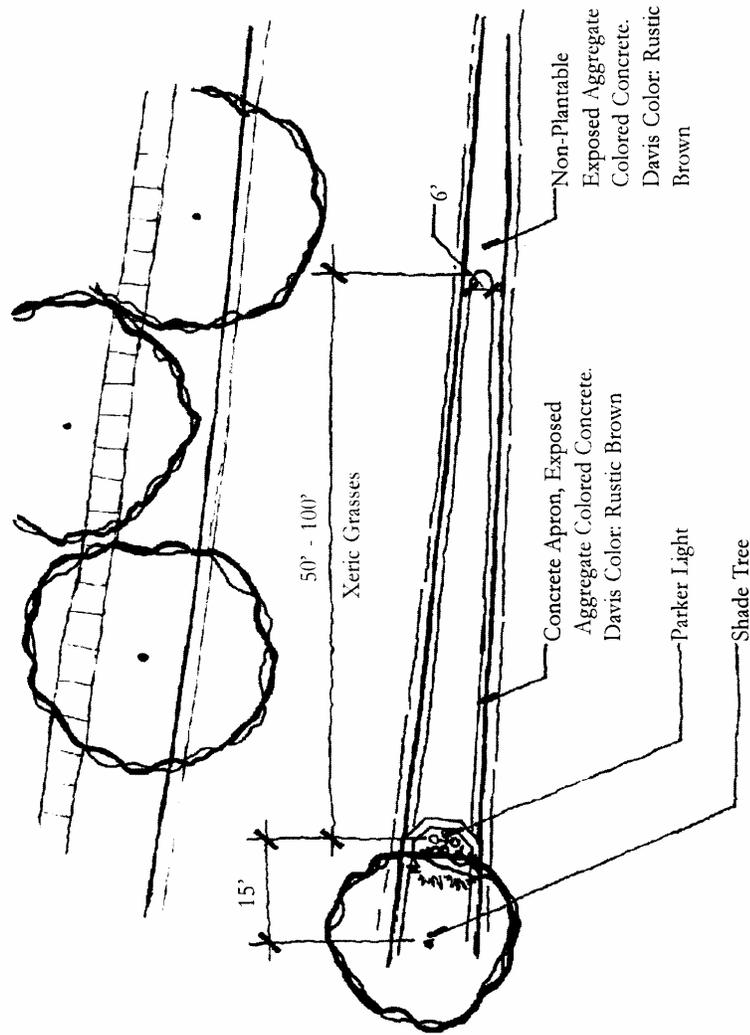


Figure 1.

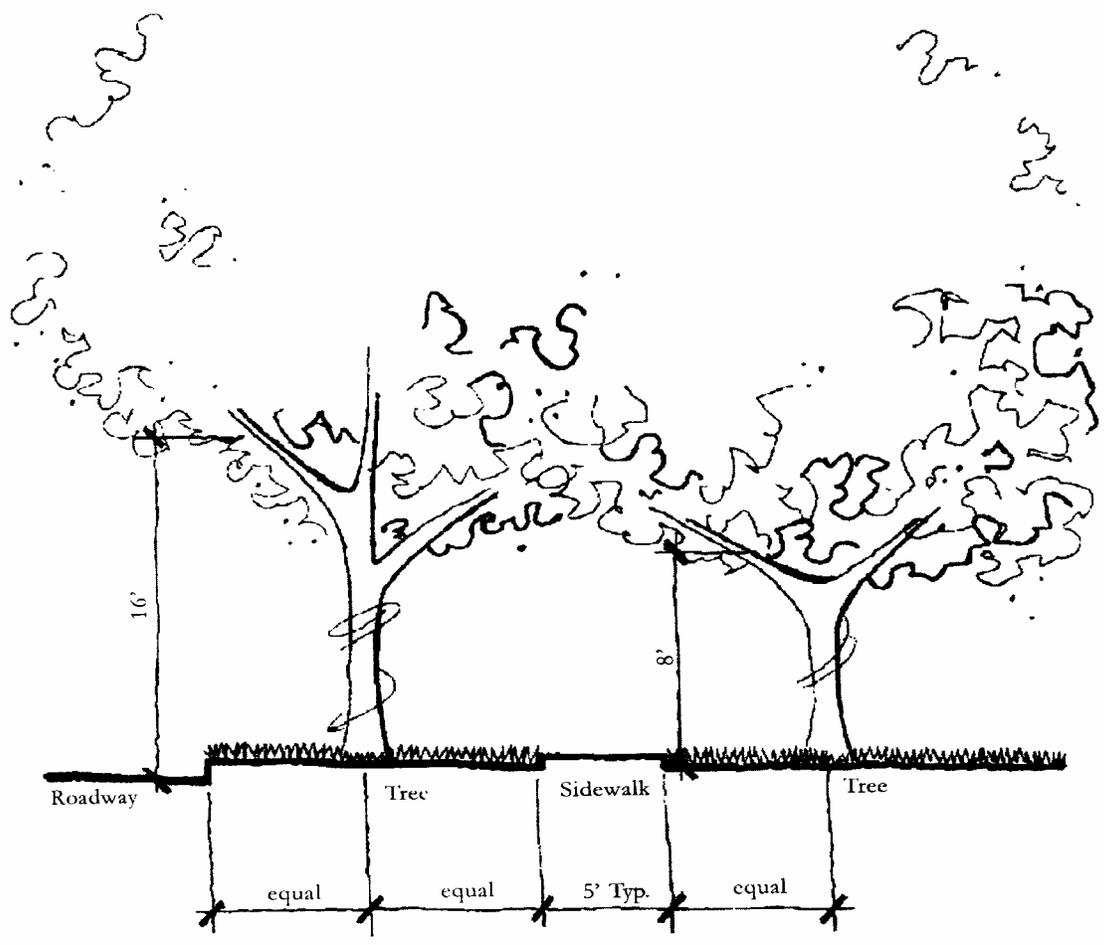
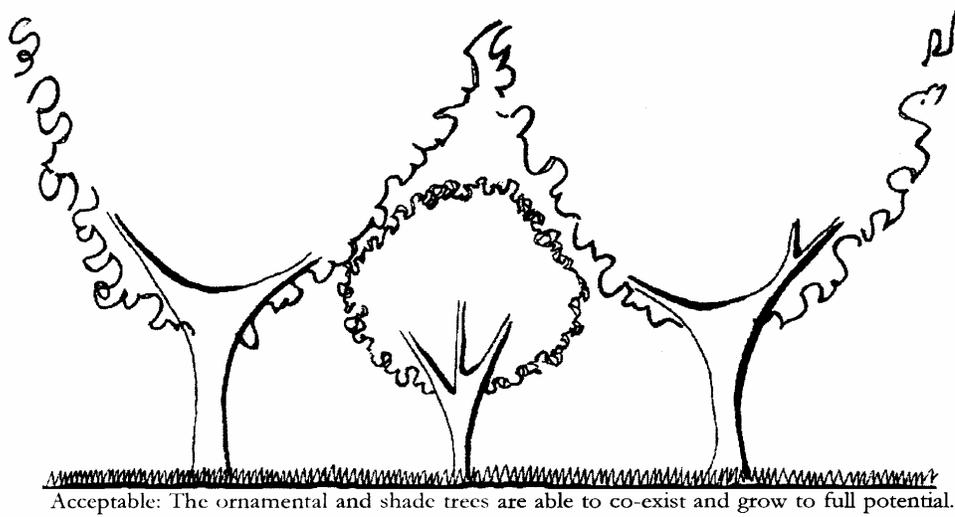
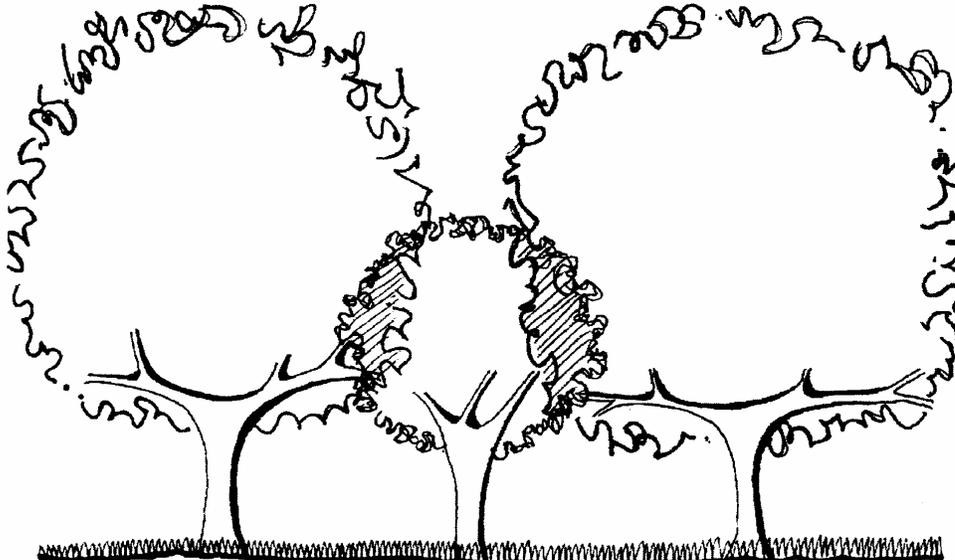


Figure 2.



Acceptable: The ornamental and shade trees are able to co-exist and grow to full potential.



Not Acceptable: The ornamental tree and shade trees are not able to co-exist and grow to full potential.

Figure 3.

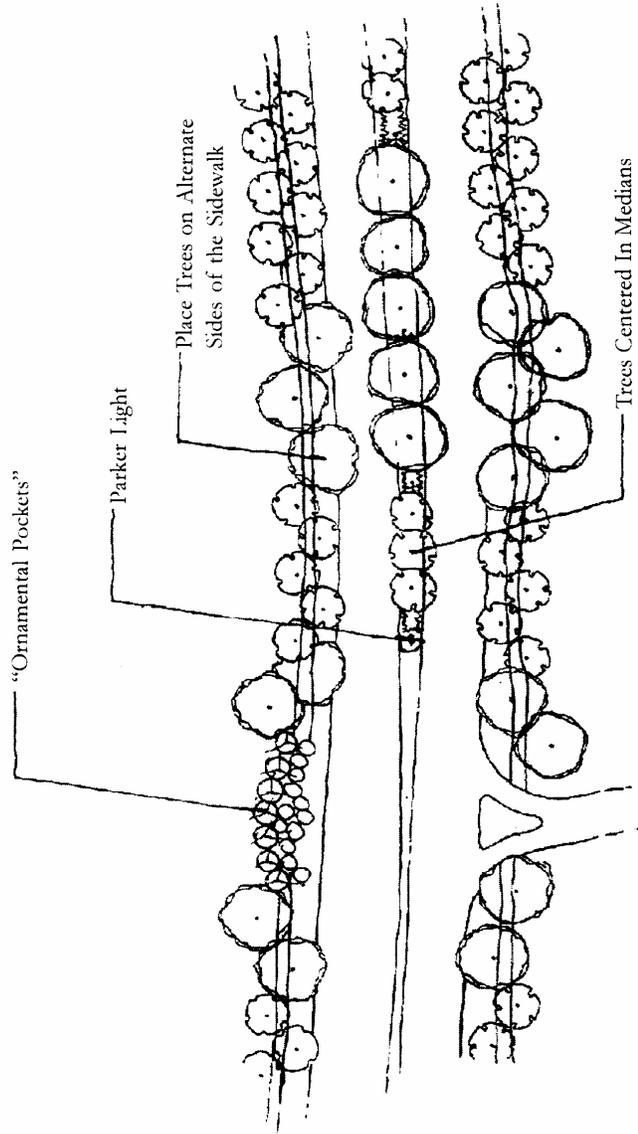


Figure 4.

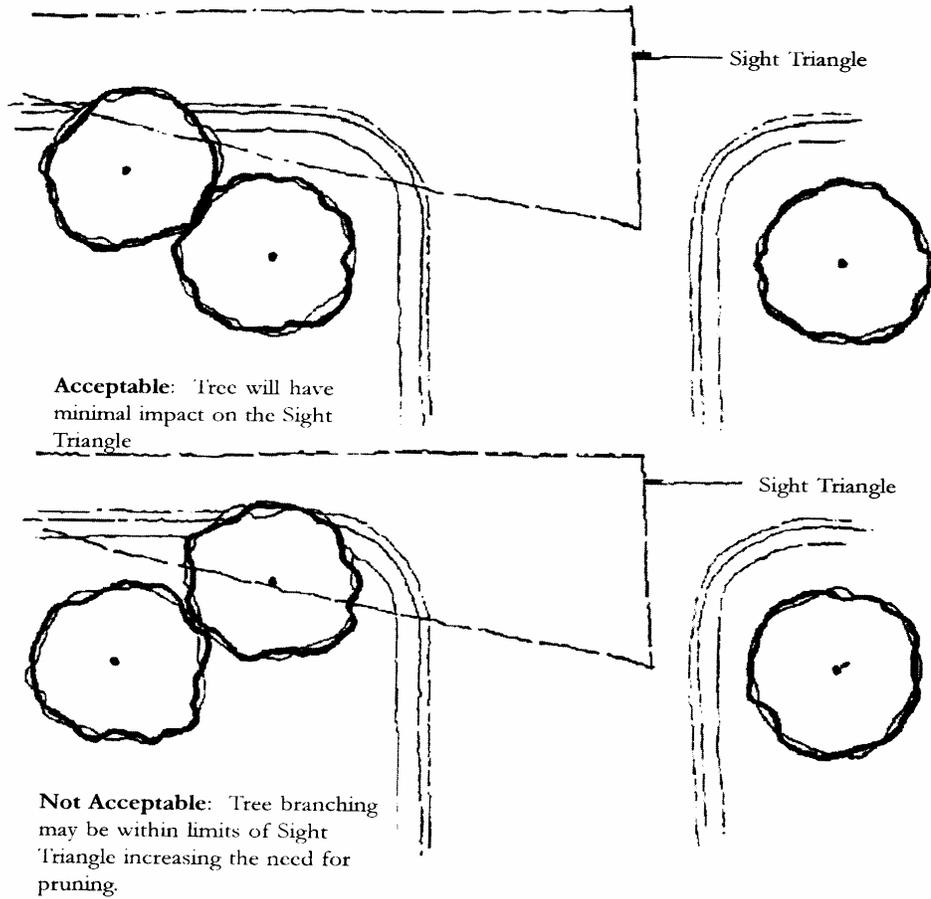


Figure 5.

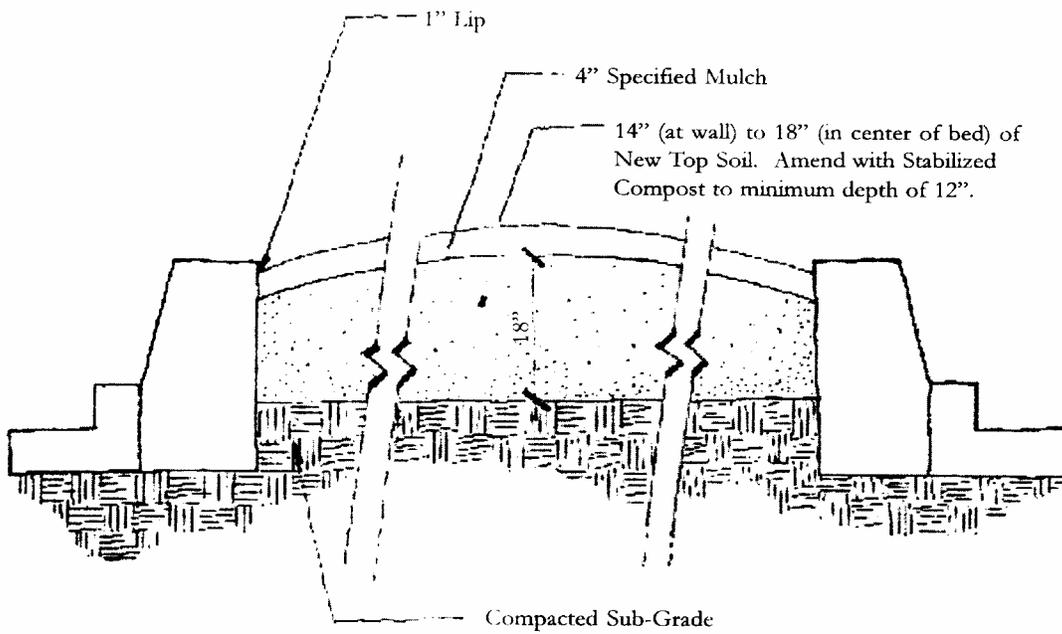
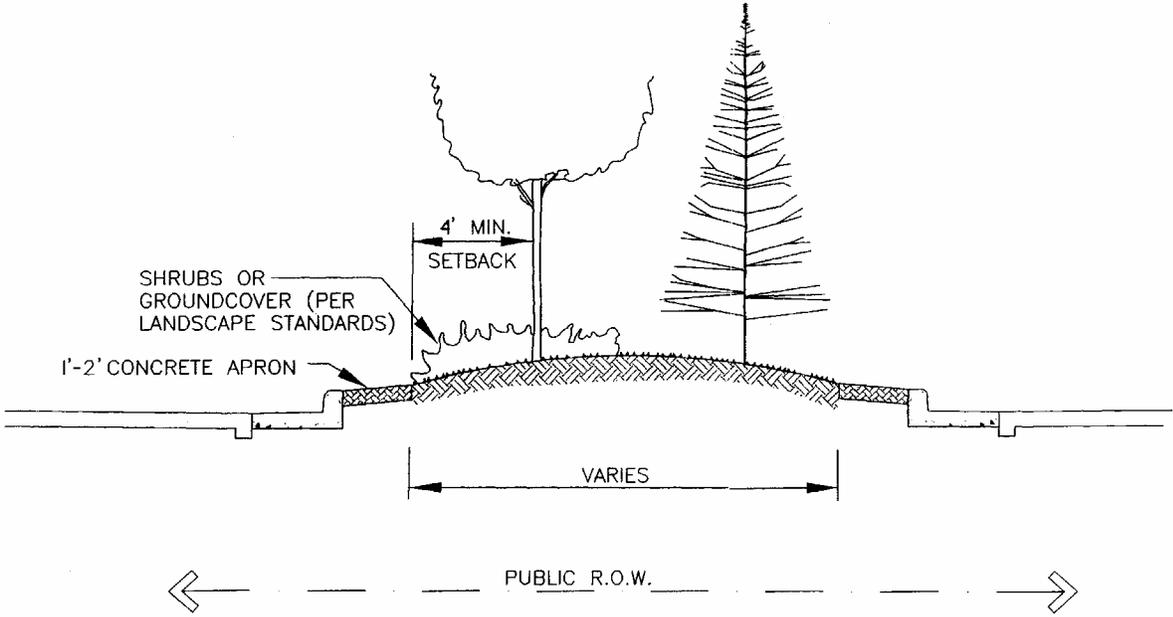


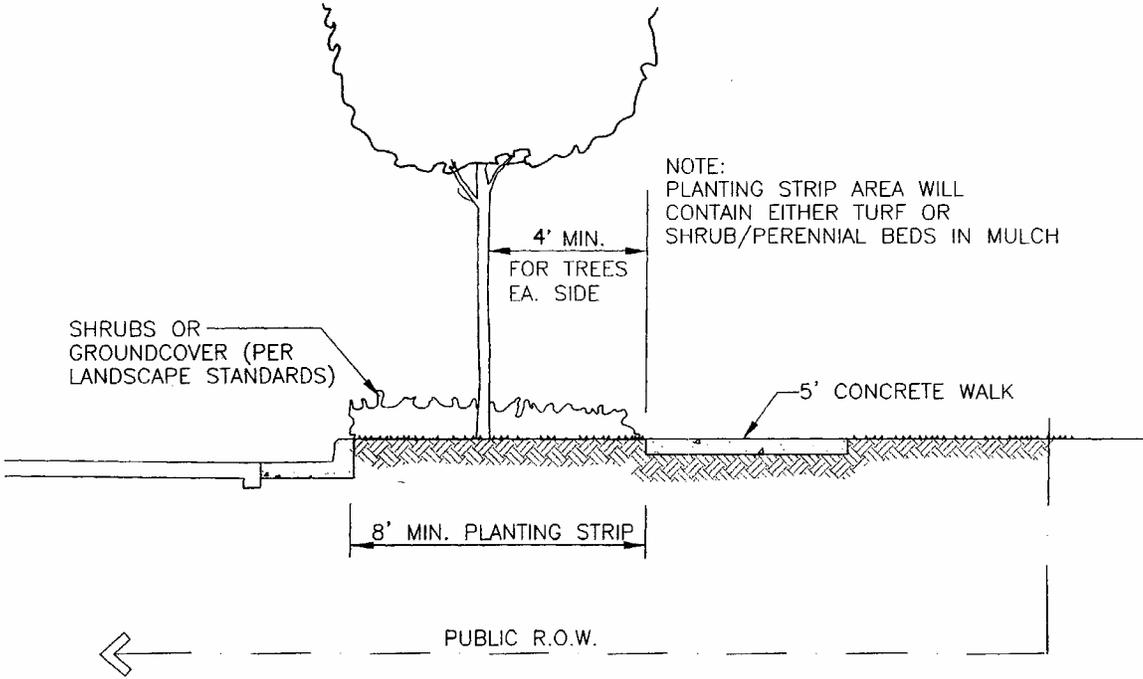
Figure 6.

TYPICAL MEDIAN OR LANDSCAPE ISLAND



* SEE ROADWAY DESIGN AND CONSTRUCTION CRITERIA MANUAL FOR TRENCH DRAIN DETAIL

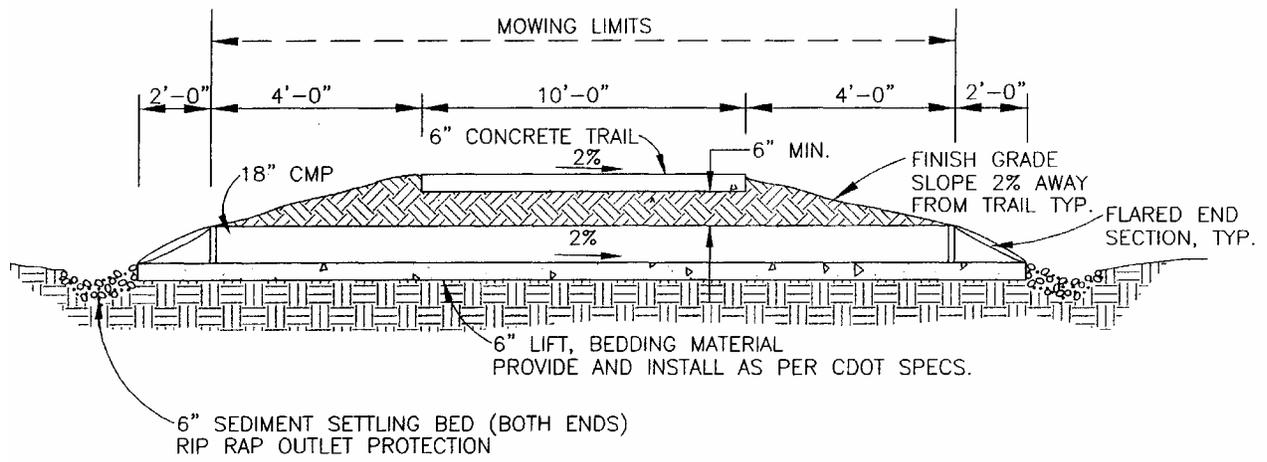
TYPICAL STREET SECTION WITH DETACHED WALK



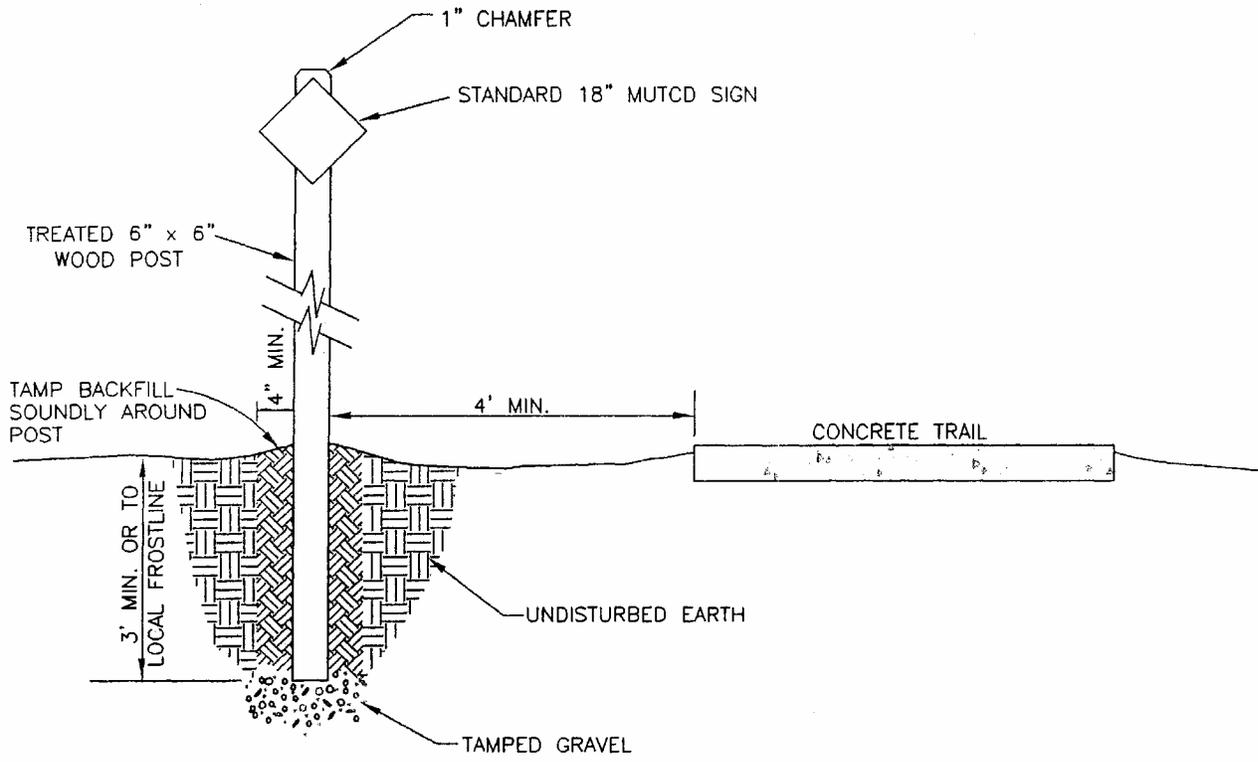
* SEE ROADWAY DESIGN AND CONSTRUCTION CRITERIA MANUAL FOR TRENCH DRAIN DETAIL (REQUIRED ON VERTICAL CURB & GUTTER ALONG ARTERIALS)

TRAILS

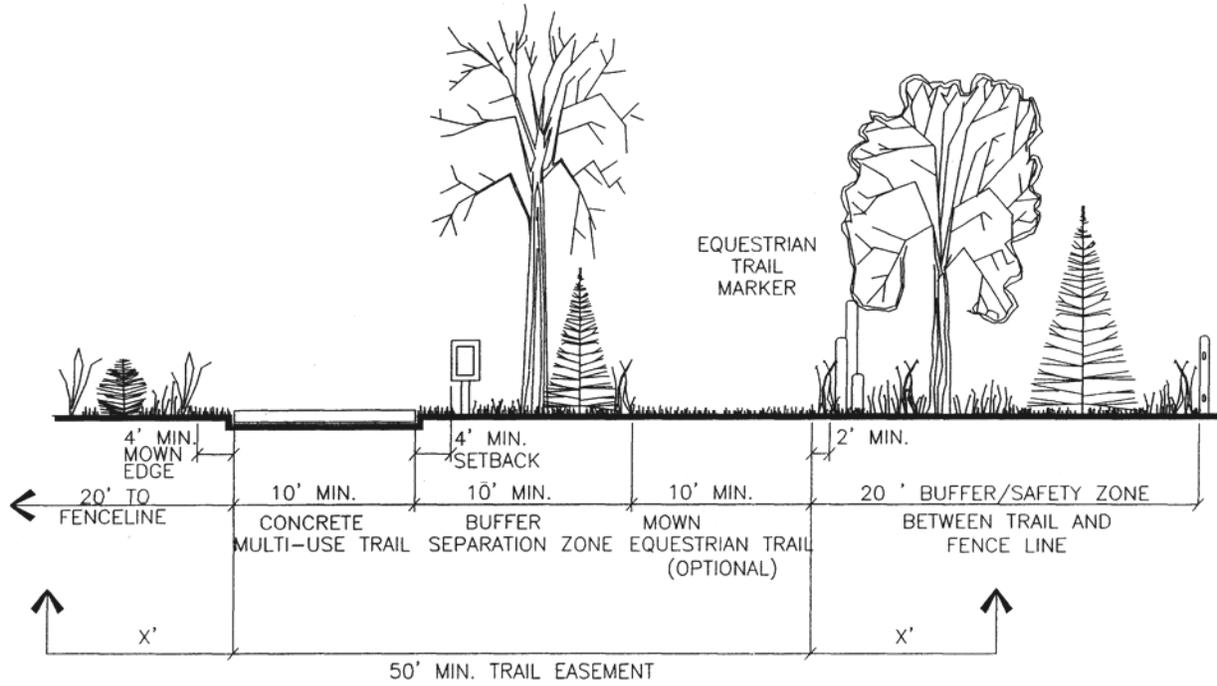
CULVERT



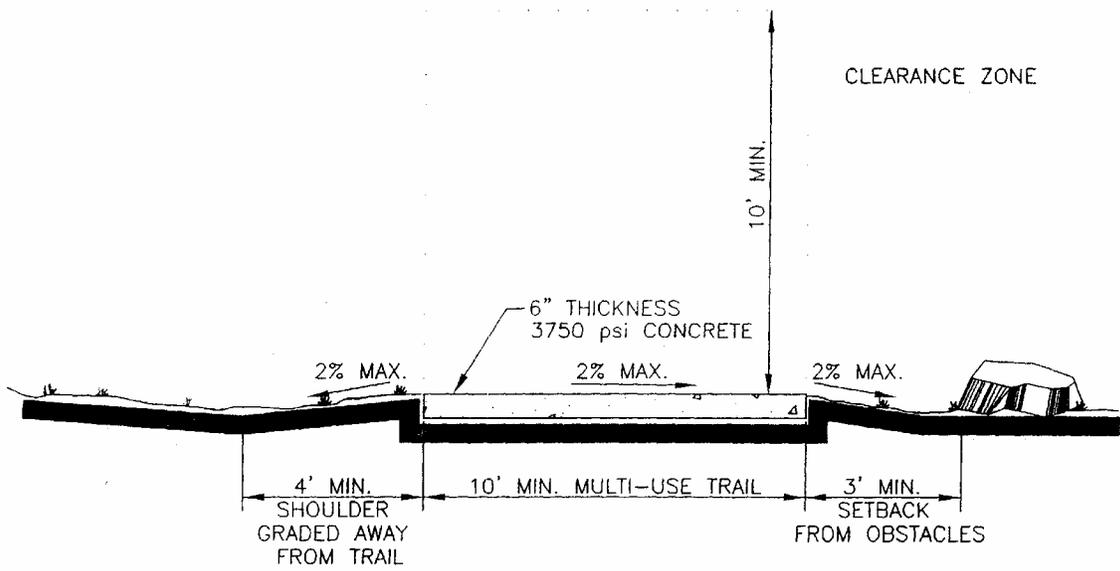
POST DETAIL



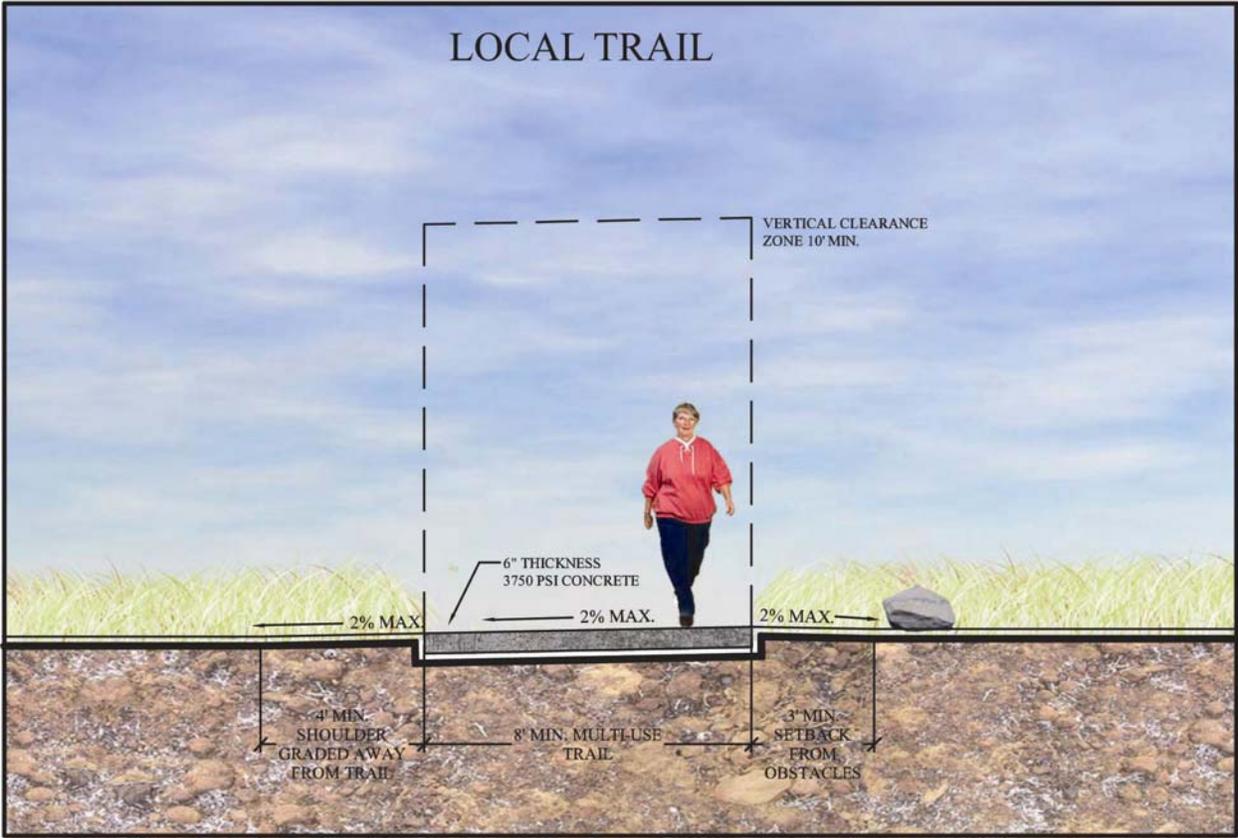
RECREATION TRAIL CORRIDOR



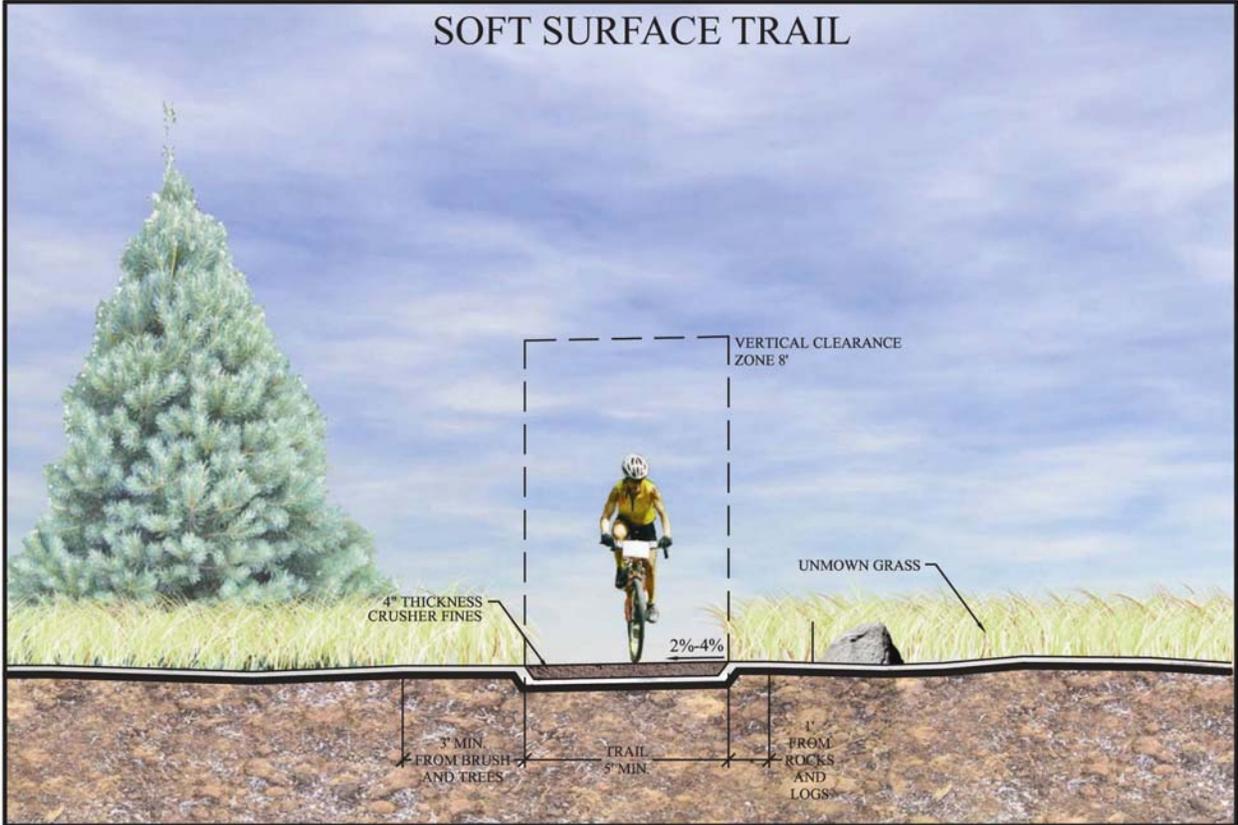
REGIONAL TRAIL



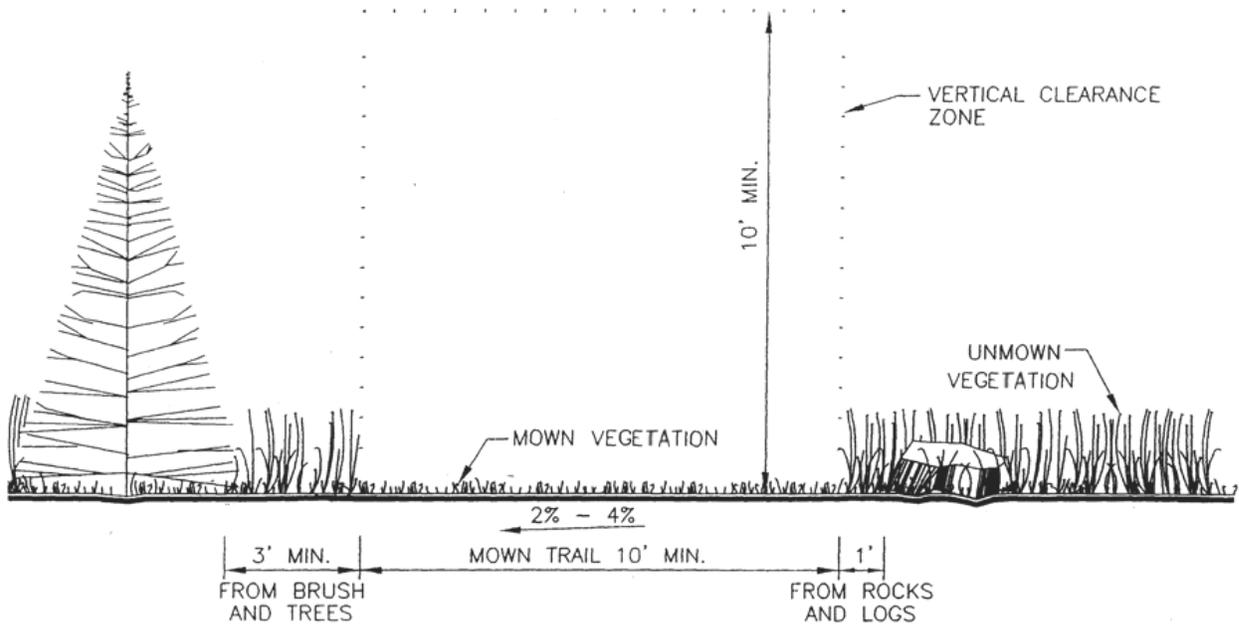
LOCAL TRAIL



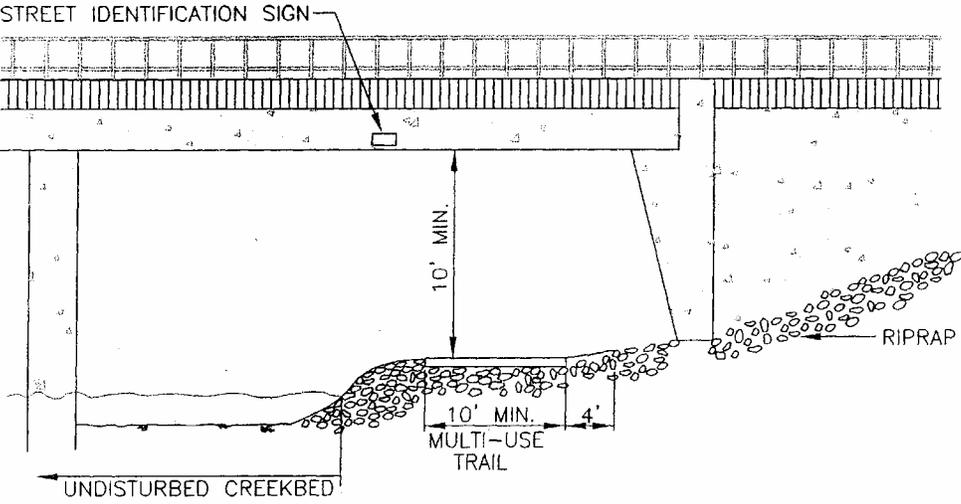
SOFT SURFACE TRAIL



MOWN EQUESTRIAN TRAIL



BRIDGE UNDERPASS



PLANT LISTS

TOWN OF PARKER RECOMMENDED PLANT LIST

PREFERRED PLANTS

<u>NAME</u>	<u>COMMON NAME</u>	<u>SIZE</u>	<u>CHARACTERISTICS</u>
DECIDUOUS SHADE TREES			
<i>Acer platanoides</i> 'Columnare'	Columnar Norway Maple	35' ht. X 15' spr.	Dark green leaves. Yellow fall color. Tolerates air pollution.
<i>Acer platanoides</i> 'Emerald Queen'	Emerald Queen Norway Maple	50' ht. X 40' spr.	Ascending branches. Dark green leaves. Bright yellow fall color.
<i>Acer platanoides</i> 'Fairview'	Fairview Maple	45' ht. X 35' spr.	Upright growth habit. Reddish leaves in spring, green in summer.
<i>Acer platanoides</i> 'Pond'	Emerald Lustre Maple	50' ht. X 40' spr.	Red tinged new leaves mature to glossy deep green w/wavy margins.
<i>Acer platanoides</i> 'Schwedleri'	Schwedler Maple	45' ht. X 40' spr.	Purplish-red leaves in spring, green in summer, yellow in fall.
<i>Aesculus glabra</i>	Ohio Buckeye	35' ht. X 30' spr.	Five dark green leaflets. White flowers in early spring.
<i>Aesculus</i> × <i>carnea</i> 'Briotii'	Red Horsechestnut	45' ht. X 30' spr.	Ruby-red blooms in late spring. Usually fruitless.
<i>Aesculus</i> × <i>carnea</i> 'Ft McNair'	Ft. McNair Horsechestnut	45' ht. X 30' spr.	Clusters of pink flowers with a yellow throat. Five leaflet leaves.
<i>Betula nigra</i>	River Birch	45' ht. X 35' spr.	Cinnamon colored exfoliating bark. Borer resistant. Yellow fall color.
<i>Carpinus betulus</i> 'Fastigiata'	Pyramidal European Hornbeam	35' ht. X 25' spr.	Dense pyramidal to oval shape. Steel-gray 'muscled' trunk. Yellow fall color.
<i>Catalpa speciosa</i>	Western Catalpa*	50' ht. X 30' spr.	Large heart-shaped leaves. White flowers in late June. Long seed pods.
<i>Celtis occidentalis</i>	Western Hackberry*	60' ht. X 40' spr.	Bright green leaves. Corky bark. Yellow fall color. Pollution tolerant.
<i>Cladrastis kentuckea</i> (lutea)	American Yellowwood	35' ht. X 35' spr.	Smooth gray bark. Fragrant white flowers. Flat seedpods. Yellow fall color.
<i>Corylus colurna</i>	Turkish Filbert*	40' ht. X 25' spr.	Broad pyramidal shape. Ornamental catkins in early spring. Yellow fall color.
<i>Ginkgo biloba</i>	Ginkgo	50' ht. X 25' spr.	Unusual, fan shaped leaves. Slow growing. Yellow fall color.
<i>Gleditsia triacanthos inermis</i> 'Impcole'	Imperial Honeylocust*	35' ht. X 25' spr.	Thornless. Small leaves. Rounded crown. Yellow fall color.
<i>Gleditsia triacanthos inermis</i> 'Shademaster'	Shademaster Honeylocust*	50' ht. X 35' spr.	Thornless. Small leaves. Upright branches. Yellow fall color.
<i>Gleditsia triacanthos inermis</i> 'Skycole'	Skyline Honeylocust*	50' ht. X 35' spr.	Thornless. Small leaves. Pyramidal form. Yellow fall color.
<i>Gymnocladus dioicus</i>	Kentucky Coffeetree*	60' ht. X 50' spr.	Compound leaves. Picturesque in winter. White flowers. Yellow in fall.
<i>Liquidambar styraciflua</i>	Sweetgum	65' ht. X 50' spr.	Star shaped leaves. Pyramidal form. Red-orange fall color.
<i>Liriodendron tulipifera</i>	Tuliptree	70' ht. X 40' spr.	Unusual leaves. Greenish-yellow tulip-shaped flowers in spring.
<i>Ostrya virginiana</i>	American Hophornbeam	40' ht. X 25' spr.	Hop-like fruit adds interest in late summer. Golden-yellow fall color.
<i>Platanus</i> × <i>acerifolia</i> 'Bloodgood'	London Planetree	60' ht. X 40' spr.	Tolerant of city conditions. Bark is mottled and flaking. Yellow fall color.
<i>Platanus occidentalis</i>	Sycamore	70' ht. X 50' spr.	Tolerant of city conditions. Bark is mottled and flaking. Yellow fall color.
<i>Quercus alba</i> × <i>robur</i> 'Crimschmidt'	Crimson Spire Oak	45' ht. X 15' spr.	Columnar growth habit. Dark green leaves turn red in the fall.
<i>Quercus bicolor</i>	Swamp White Oak*	50' ht. X 40' spr.	Broad rounded form. Lobed leaves turn russet-red in fall. Small acorns

<i>Quercus buckleyi</i>	Texas Red Oak	55' ht. X 35' spr.	Large, deeply lobed bright green leaves turn red in the fall.
<i>Quercus macrocarpa</i>	Bur Oak*	65' ht. X 45' spr.	Corky twigs. Fringe-capped acorn. Yellow-russet in fall. Air pollution tolerant
<i>Quercus muehlenbergii</i>	Chinkapin Oak*	45' ht. X 45' spr.	Broad rounded crown. Sharply lobed leaves. Yellow to russet fall color.
<i>Quercus robur</i>	English Oak*	50' ht. X 40' spr.	Yellow-brown fall color. Dry leaves persist through winter. Small acorns.
<i>Quercus robur</i> 'Fastigiata'	Columnar English Oak	50' ht. X 20' spr.	Medium green leaves. Dry leaves and acorns persist into winter.
<i>Quercus rubra</i>	Northern Red Oak	50' ht. X 40' spr.	Sharply lobed leaves. Red to bronze fall color. Fast growing.
<i>Quercus x macdanielli</i> 'Clemons'	Heritage Oak*	60' ht. X 40' spr.	A cross between Bur Oak and English Oak. Glossy dark green leaves.
<i>Tilia americana</i>	American Linden	75' ht. X 50' spr.	Large green leaves. Fragrant flowers in early summer. Yellow fall color.
<i>Tilia americana</i> 'Redmond'	Redmond Linden	45' ht. X 30' spr.	Pyramidal form. Large glossy heart-shaped leaves. Fragrant summer flowers.
<i>Tilia cordata</i> 'Glenleven'	Glenleven Linden	45' ht. X 30' spr.	Open, fast growing tree. Small leaves, fragrant summer flowers.
<i>Tilia cordata</i> 'Greenspire'	Greenspire Linden	40' ht. X 30' spr.	Dense, conical crown. Small leaves, fragrant summer flowers.
<i>Tilia tomentosa</i> 'Sterling Silver'	Sterling Silver Linden	45' ht. X 30' spr.	Dark green leaves with silver undersides. Fragrant summer flowers.
<i>Ulmus japonica x wilsoniana</i> 'Morton'	Accolade Elm	60' ht. X 40' spr.	Vase shaped. Glossy green foliage. Yellow fall color. Fast growing.
<i>Ulmus</i> 'Morton Glossy'	Triumph Elm	55' ht. X 45' spr.	Upright oval-vase shaped. Glossy green foliage. Yellow fall color. Fast grower
<i>Ulmus parvifolia</i> 'Emer II'	Allee Elm	65' ht. X 45' spr.	Dark green leaves. Exfoliating bark. Yellow fall color. Moderately fast grower

ORNAMENTAL TREES

<i>Acer campstre</i>	Hedge Maple	25' ht. X 25' spr.	Densely rounded form. Glossy green foliage. Yellow fall color. Slow growing
<i>Acer ginnala</i>	Amur Maple/Ginnala Maple*	20' ht. X 15' spr.	Deeply lobed leaves. Fragrant white flowers. Orange-red in fall. Irregular form
<i>Acer ginnala</i> 'Flame'	Flame Amur Maple*	20' ht. X 15' spr.	Bright green leaves turn fiery red in fall. Red winged seeds late in summer.
Acer glabrum	Rocky Mountain Maple	15' ht. X 10' spr.	Light gray bark. Red winged seeds, leaf stems, winter buds. Yellow fall color.
<i>Acer grandidentatum</i>	Bigtooth Maple*	30' ht. X 25' spr.	Rose-colored winged seeds. 5-lobed dark green leaves turn yellow-red in fall.
<i>Acer platanoides</i> 'Crimson Sentury'	Crimson Sentury Maple	25' ht. X 15' spr.	Leaves emerge red and change to a rich maroon color. Reddish fall color
<i>Acer tataricum</i>	Tatarian Maple*	20' ht. X 20' spr.	Rosy-red winged seeds. Dark green leaves turn yellow to red in the fall.
<i>Acer tataricum</i> 'GarAnn'	Hotwings™ Tatarian Maple	20' ht. X 18' spr.	Red winged seeds in summer. Red-orange fall color. Broad irregular form.
<i>Acer triflorum</i>	Three Flowered Maple	25' ht. X 25' spr.	Cinnamon-red exfoliating bark. Red to gold fall color. Well-drained soils.
<i>Alnus tenuifolia</i>	Thinleaf Alder	20' ht. X 15' spr.	Red-brown bark. Yellow fall color. Cone-like fruits in winter.
<i>Amelanchier canadensis</i>	Shadblow Serviceberry	18' ht. X 15' spr.	White fragrant flowers before leaves. Purple-black fruit. Yellow-red fall color
<i>Amelanchier x grandiflora</i> 'Autumn Brilliance'	Autumn Brilliance Serviceberry	18' ht. X 15' spr.	White fragrant flowers in April. Purple-black fruit. Orange-red fall color.
<i>Amelanchier x grandiflora</i> 'Robin Hill'	Robin Hill Serviceberry	20' ht. X 15' spr.	Pink flower buds. White blooms. Small fruit. Yellow to red fall color.
<i>Betula occidentalis</i>	Rocky Mountain Birch	20' ht. X 20' spr.	Cherry-brown bark with white lenticels. Yellow fall color. Broadly pyramidal

<i>Carpinus caroliniana</i>	American Hornbeam	25' ht. X 25' spr.	Slate gray 'muscle' bark. Slow growing. Yellow to scarlet fall color.
<i>Chionanthus virginicus</i>	White Fringe Tree	15' ht. X 15' spr.	Fragrant, white, fringed blooms. Blue grape-like fruit in summer.
<i>Crataegus ambigua</i>	Russian Hawthorn*	20' ht. X 20' spr.	White blooms. Red fruit persist into winter. Thorns. Yellow-red fall color.
<i>Crataegus crus-galli</i> var. <i>inermis</i>	Thornless Cockspur Hawthorn*	20' ht. X 20' spr.	White flowers. Small red fruit persist into winter. Red-orange fall color.
<i>Crataegus laevigata</i> 'Crimson Cloud'	Crimson Cloud Hawthorn	20' ht. X 15' spr.	Crimson flowers. Small red fruit persist into winter. Few thorns.
<i>Crataegus phaenopyrum</i>	Washington Hawthorn*	20' ht. X 15' spr.	White flowers. Red fruit persist into winter. Red fall color. Thorns.
<i>Crataegus viridis</i> 'Winter King'	Winter King Hawthorn	25' ht. X 20' spr.	White flowers. Small red persistent fruit. Purple-red fall color. Few thorns.
<i>Crataegus</i> × <i>lavalleyi</i>	Lavalle Hawthorn	25' ht. X 10' spr.	Upright, open branched. White flowers. Orange-red fruit. Reddish fall color.
<i>Crataegus</i> × <i>mordenensis</i> 'Toba'	Toba Hawthorn	15' ht. X 15' spr.	Fragrant double white blooms. Red persistent fruit. Yellowish bark. Thornless
<i>Koeleria paniculata</i>	Goldenrain Tree*	30' ht. X 25' spr.	Yellow flowers in summer. Lantern-like papery capsules. Yellow fall color.
<i>Maackia amurensis</i>	Amur Maackia	25' ht. X 30' spr.	Fragrant white summer flowers. Glossy amber-brown bark peels w/maturity
<i>Malus</i> 'Cardinal'	Cardinal Crabapple	20' ht. X 25' spr.	Bright red flowers. Purple-red tinged foliage. Small dark red fruit.
<i>Malus</i> 'Centurion'	Centurion Crabapple	25' ht. X 15' spr.	Rose-red blooms. 5/8" cherry-red fruit. Leaves emerge reddish turn bronze.
<i>Malus</i> 'Coralburst'	Coralburst Crabapple	12' ht. X 12' spr.	Rose-pink semi-double blooms. 1/2" bronze fruit. Dense, rounded form.
<i>Malus</i> 'David'	David Crabapple	14' ht. X 14' spr.	Pinkish-white flowers. 3/8" bright red fruit. Compact, rounded form.
<i>Malus</i> 'Donald Wyman'	Donald Wyman Crabapple	15' ht. X 20' spr.	Masses of white flowers in spring. Small persistent red fruit. Green foliage.
<i>Malus</i> 'Harvest Gold'	Harvest Gold Crabapple	30' ht. X 15' spr.	White flowers one week later than most. Golden-yellow persistent fruit.
<i>Malus</i> 'Indian Magic'	Indian Magic Crabapple	18' ht. X 18' spr.	Deep pink blooms. 1/2" red-orange persistent fruit. Orange-red fall color.
<i>Malus</i> 'Indian Summer'	Indian Summer Crabapple	18' ht. X 20' spr.	Rose-red flowers in spring. 3/4" bright red fruit. Orange fall color.
<i>Malus</i> 'Lancelot'	Lancelot	10' ht. X 8' spr.	Dark pink buds. White blooms. 3/8" gold persistent fruit. Yellow in fall.
<i>Malus</i> 'Louisa'	Louisa Crabapple	15' ht. X 15' spr.	Umbrella shaped weeper. Pink blooms. 3/8" golden persistent fruit.
<i>Malus</i> 'Molten Lava'	Molten Lava Crabapple	15' ht. X 12' spr.	Semi-weeping habit. White flowers. 1/2" red-orange persistent fruit.
<i>Malus</i> 'Prairifire'	Prairifire Crabapple	20' ht. X 20' spr.	Red-pink blooms. Red-green foliage orange in fall. Red-purple persistent fruit
<i>Malus</i> 'Profusion'	Profusion Crabapple	18' ht. X 18' spr.	Purple-pink flowers. 1/2" maroon persistent fruit. Bronze-green leaves.
<i>Malus</i> 'Radiant'	Radiant Crabapple	20' ht. X 20' spr.	Red-purple foliage turns dark green. Deep pink blooms. 1/2" bright red fruit.
<i>Malus</i> 'Robinson'	Robinson Crabapple	25' ht. X 25' spr.	Deep pink blooms. 1/2" dark red persistent fruit. Bronze-green leaves.
<i>Malus</i> 'Sentinel'	Sentinel Crabapple	20' ht. X 12' spr.	Large clusters of white flowers. Persistent deep red fruit.
<i>Malus</i> 'Thunderchild'	Thunderchild Crabapple	18' ht. X 18' spr.	Rose-pink blooms. 1/2" purple-red persistent fruit. Deep purple leaves.
<i>Prunus cerasus</i> 'Montmorency'	Montmorency Cherry	18' ht. X 15' spr.	White flowers in spring. Bright red edible fruit. Yellow-red fall color.
<i>Prunus maackii</i>	Amur Chokecherry	30' ht. X 25' spr.	Fragrant white flowers. Small black fruit. Slightly exfoliating red-brown bark.
<i>Prunus nigra</i> 'Princess Kay'	Princess Kay Plum	18' ht. X 13' spr.	Dark bark w/lenticels. Fragrant double white flowers. Red-orange fall color
<i>Pyrus ussuriensis</i> 'Prairie Gem'	Prairie Gem Pear	25' ht. X 20' spr.	Oval to rounded form. White flowers before or w/leaves. Yellow fall color.

<i>Ptelea trifoliata</i>	Wafer Ash*	15' ht. X 15' spr.	Fragrant greenish June flowers. Persistent elm-like wafers. Yellow fall color
<i>Quercus gambelii</i>	Gambel Oak*	20' ht. X 15' spr.	Glossy dark green leaves turn yellow-orange in fall. Tan acorns. Slow grower
<i>Quercus undulata</i>	Wavyleaf Oak*	15' ht. X 13' spr.	Thick leathery blue-green leaves typically with wavy margins.
<i>Sorbus intermedia</i>	Swedish Whitebeam	30' ht. X 25' spr.	Oak-like leaves. White flowers in spring. Orange berries. Russet fall color
<i>Syringa reticulata</i>	Japanese Tree Lilac*	20' ht. X 18' spr.	Fragrant, large creamy white flower clusters. Red-brown bark. Yellow in fall .
<i>Syringa reticulata</i> 'Ivory Silk'	Ivory Silk Japanese Lilac	20' ht. X 18' spr.	Fragrant, creamy white flowers in June. Dark reddish-brown exfoliating bark

EVERGREEN TREES

<i>Abies concolor</i>	White Fir	50' ht. X 30' spr.	Pyramidal evergreen with soft blue-green needles.
<i>Juniperus monosperma</i>	One Seed Juniper*	25' ht. X 12' spr.	Blue-green foliage.Fibrous red-brown bark.Small dark blue fruit.Slow grower
<i>Juniperus scopulorum</i>	Rocky Mountain Juniper*	25' ht. X 10' spr.	Scaly green-gray foliage. Fibrous red-brown bark. Dark blue fruit.
<i>Juniperus virginiana</i>	Eastern Red Cedar*	35' ht. X 15' spr.	Medium green in summer turns dusty-green to russet in winter.
<i>Larix decidua</i>	European Larch	50' ht. X 30' spr.	Unusual deciduous conifer. Yellow fall color.
<i>Picea engelmannii</i>	Engelmann Spruce	60' ht. X 25' spr.	Bluish-green sharp-pointed needles. Large, narrow, densely pyramidal form.
<i>Picea glauca</i> 'Densata'	Black Hills Spruce	30' ht. X 15' spr.	Dense, slow growing, pyramidal form. Short dark green needles. Very hardy
<i>Picea pungens</i>	Colorado Spruce	60' ht. X 25' spr.	Pyramidal form. Blue, green & silver-blue available. Sharp-pointed needles
<i>Picea pungens</i> 'Baby Blue Eyes'	Baby Blue Eyes Spruce	20' ht. X 10' spr.	Compact pyramidal form. Silver-blue foliage on open layered branches.
<i>Picea pungens</i> 'Bakeri'	Bakeri Spruce	35' ht. X 15' spr.	Compact Colorado Spruce. Bright silver-blue needles. Sharp-pointed needles
<i>Picea pungens</i> 'Fastigiata'	Fastigiata Blue Spruce	20' ht. X 10' spr.	Upright, compact, columnar form. Striking steel-blue sharp-pointed needles.
<i>Picea pungens</i> 'Fat Albert'	Fat Albert Spruce	45' ht. X 30' spr.	Dense, pyramidal form. Silver-blue sharp-pointed needles. Grafted trees.
<i>Picea pungens</i> 'Hoopsii'	Hoopsii Blue Spruce	40' ht. X 18' spr.	Upright, often irregular form. One of the bluest Spruce thick needles
<i>Pinus aristata</i>	Bristlecone Pine/Foxtail Pine*	30' ht. X 15' spr.	Irregular bushy, habit. Short, dark green needles w/specks of resin
<i>Pinus bungeana</i>	Lacebark Pine*	40' ht. X 25' spr.	Dark green needles. Exfoliating bark shows white, green, brown patches.
<i>Pinus edulis</i>	Pinyon Pine*	25' ht. X 15' spr.	Dark green needles. Bushy, slow grower. Edible nuts. Do not over water.
<i>Pinus flexilis</i> 'Cesarini Blue'	Cesarini Blue Limber Pine	25' ht. X 13' spr.	Powdery blue color. Soft textural appearance.
<i>Pinus flexilis</i> 'Vanderwolf's Pyramid'	Vanderwolf's Limber Pine	25' ht. X 15' spr.	Soft, flexible bluish green needles. Densely branched pyramidal form.
<i>Pinus heldreichii</i> var. <i>leucodermis</i>	Bosnian Pine*	30' ht. X 15' spr.	Dark green needles hold on for 5-6 years. Slow-growing. Salt tolerant.
<i>Pinus leucodermis</i> 'Emerald Arrow'	Emerald Arrow Bosnian Pine	25' ht. X 12' spr.	Narrower form. Dark green needles and silver bark. Salt tolerant.
<i>Pinus nigra</i>	Austrian Pine*	50' ht. X 25' spr.	Long dark green needles. Fast grower. Withstands some over watering
<i>Pinus nigra</i> 'Oregon Green'	Oregon Green Austrian Pine	20' ht. X 15' spr.	Dark green needles. Pearly white candles that form in clusters. Slow grower
<i>Pinus strobiformis</i>	Southwestern White Pine	50' ht. X 30' spr.	Soft textured, blue-green needles. Silver-gray bark. Broad conical form.
<i>Pinus sylvestris</i>	Scotch Pine	50' ht. X 30' spr.	Reddish-orange bark. Short, twisted, blue-green needles. Gray-brown cones

<i>Pseudotsuga menziesii</i>	Douglas Fir	60' ht. X 25' spr.	Soft textured needles. Pyramidal form. Medium-fast grower. Distinct cones.
<i>Taxodium distichum</i>	Bald Cypress	50' ht. X 20' spr.	Deciduous conifer. Yellow fall color. Soft textured foliage. Unusual cones.

DECIDUOUS SHRUBS

<i>Amelanchier alnifolia</i>	Saskatoon Serviceberry*	12' ht. X 8' spr.	Clusters of white flowers in spring. Yellow to soft red fall color.
<i>Amorpha canescens</i>	Leadplant*	3' ht. X 4' spr.	Violet flowers mid to late summer. Small oval gray-green leaflets.
<i>Atriplex canescens</i>	Four Wing Saltbush*	5' ht. X 4' spr.	Tiny fellow flowers at branch tips. Four-winged fruit on female plants.
<i>Berberis thunbergii</i> spp.	Barberry	Varies	Dense thorny shrub. Available in various sizes & colors: red, green, & yellow
<i>Buddleia davidii</i> spp.	Butterfly Bush	Varies	Arching stems with sprays of colorful flowers.
<i>Caragana arborescens</i> 'Sutherland'	Sutherland Peashrub*	15' ht. X 6' spr.	Columnar form. Sienna-brown bark adds winter interest.
<i>Caryopteris</i> × <i>clandonensis</i>	Blue Mist Spirea*	3' ht. X 3' spr.	Blue flowers June-September. Silvery foliage. Rounded form. Attract bees
<i>Caryopteris</i> × <i>clandonensis</i> 'Dark Knight'	Dark Knight Blue Mist Spirea*	3' ht. X 3' spr.	Darker silvery-green foliage. Dark blue flowers. Attracts bees.
<i>Cercocarpus intricatus</i>	Littleleaf Mountain Mahogany*	4' ht. X 4' spr.	Dense rounded form. Stiff intertwining branches. Tiny leaves.
<i>Cercocarpus montanus</i>	Mountain Mahogany*	8' ht. X 6' spr.	Open, spreading shrub w/gray-green leaves. Fuzzy twisted seed 'tails'.
<i>Chamaebatiara millefolium</i>	Fernbush*	5' ht. X 5' spr.	Fern-like leaves. Semi-evergreen. White flowers. Delicately aromatic.
<i>Chrysothamnus nauseosus</i>	Rabbitbrush*	4' ht. X 4' spr.	Silver-green leaves. Yellow flower clusters in late summer.
<i>Chrysothamnus nauseosus</i> <i>nauseosus</i>	Dwarf Blue Rabbitbrush*	3' ht. X 3' spr.	Smaller, compact form. Bluish-gray leaves. Yellow flower clusters.
<i>Cornus sericea</i> 'Bailey'	Red Twig Dogwood	8' ht. X 8' spr.	White flowers in spring. Bright red stems in winter. Burgundy-red fall color.
<i>Cornus sericea</i> 'Cardinal'	Cardinal Dogwood	8' ht. X 8' spr.	Cherry red twigs in winter. White spring flowers. Scarlet fall color.
<i>Cornus sericea</i> 'Kelsey'	Kelsey Dogwood	2.5' ht. X 2.5' spr	Compact mounded shape. Dark green foliage turns reddish-purple in fall.
<i>Cotoneaster apiculatus</i> 'Tom Thumb'	Tom Thumb Cotoneaster	1' ht. X 4' spr.	Low, spreading form. Small, rounded, glossy green leaves. Red fall color.
<i>Cotoneaster divaricatus</i>	Shrub Cotoneaster*	6' ht. X 6' spr.	Glossy dark green leaves. Arching stems. Small bright red fruit in fall.
<i>Cotoneaster horizontalis</i>	Rock Cotoneaster	2' ht. X 4' spr.	Low spreading semi-evergreen shrub. Small round leaves. Red berries in fall.
<i>Cotoneaster horizontalis</i> <i>perpusillus</i>	Ground Cotoneaster	1' ht. X 3' spr.	Low spreading form. Dark green leaves turn orange-red in fall. Red berries.
<i>Euonymus alatus</i>	Burning Bush	10' ht. X 10' spr.	Dark green leaves turn bright red in fall. Corky winged ridges on stems.
<i>Euonymus alatus</i> 'Compacta'	Dwarf Burning Bush	6' ht. X 6' spr.	Dwarf variety of Burning Bush. Needs protection.
<i>Euonymus fortunei</i> 'Coloratus'	Purpleleaf Wintercreeper	2' ht. X 4' spr.	Broadleaf evergreen. Dark green foliage turns purple-red in winter.
<i>Forestiera neomexicana</i>	New Mexico Privet*	12' ht. X 8' spr.	Dense rounded form. Yellow fall color. Tiny bluish-black summer fruit.
<i>Ligustrum vulgare</i> 'Cheyenne'	Cheyenne Privet*	8' ht. X 6' spr.	Fragrant white flowers in early summer. Poisonous fruit. Shears well.
<i>Perovskia artemisiifolia</i>	Russian Sage*	4' ht. X 4' spr.	Gray-green fragrant foliage. Bright blue-violet flowers in late summer. Bees
<i>Potentilla fruticosa</i> spp.	Potentilla	Varies	Upright to rounded forms. Various sizes and flower colors available.
<i>Prunus besseyi</i> 'Pawnee Buttes'	Pawnee Buttes Sand Cherry*	1.5' ht. X 6' spr.	Low spreading form. Fragrant white flowers. Reddish-purple fall color.
<i>Rhus aromatica</i> 'Grow-Low'	Dwarf Fragrant Sumac*	3' ht. X 8' spr.	Broad spreading form. Small fuzzy red fruit. Scarlet-orange fall color.

<i>Rhus trilobata</i>	Three Leaf Sumac*	6' ht. X 6' spr.	Three lobed dark green leaflets. Red-orange fall color. Red berries.
<i>Rhus trilobata</i> 'Autumn Amber'	Autumn Amber Sumac*	1.5' ht. X 7' spr.	Low spreading dense form. Amber to brick-red fall color.
<i>Ribes aureum</i>	Yellow Flowering Currant*	6' ht. X 6' spr.	Fragrant small yellow flowers. Pea-sized black fruit. Red fall color
<i>Rosa</i> 'Meicoublan'	White Meidiland Rose	2' ht. X 5' spr.	Mounding groundcover. Large white flowers June-frost. Mass plantings.
<i>Rosa</i> 'Meipsidue'	Fire Meidiland Rose	2' ht. X 4' spr.	Mounding groundcover. Bright red flowers May-October. Mass plantings.
<i>Rosa</i> × 'Meipitac'	Carefree Wonder Shrub Rose	3' ht. X 4' spr.	Large rich pink flowers from spring to fall. Good for mass plantings.
<i>Rubus deliciosus</i>	Boulder Raspberry*	5' ht. X 5' spr.	Vase-shaped. Exfoliating cinnamon colored branches. Yellow fall color.
<i>Salix exigua</i>	Coyote/Sand Bar Willow	10' ht. X 6' spr.	Gray-green foliage. Yellow branches. Yellow fall color. Prefers moisture.
<i>Salix purpurea</i> 'Nana'	Dwarf Artic Willow	8' ht. X 8' spr.	Blue-green foliage. Purplish twigs in winter. Prefers moisture.
<i>Spiraea japonica</i> 'Alpina'	Daphne Spiraea	2' ht. X 3' spr.	Small blue-green leaves. Clusters of light pink flowers all summer.
<i>Spiraea japonica</i> 'Anthony Waterer'	Anthony Waterer Spiraea	3' ht. X 4' spr.	Dense, compact rounded form. Small rose-red flowers in early summer.
<i>Spiraea japonica</i> 'Little Princess'	Little Princess Spiraea	2' ht. X 3' spr.	Small dense form. Pink flowers in summer. Purplish red fall color
<i>Spiraea japonica</i> 'Neon Flash'	Neon Flash Spiraea	3' ht. X 3' spr.	Neon-red flowers in summer. Purple tinted new growth. Reddish fall color.
<i>Spiraea nipponica</i> var. <i>tosaensis</i>	Cheyenne Snowmound Spiraea	4' ht. X 4' spr.	White flowers in late spring. Dark green foliage. Rounded form.
<i>Spiraea trilobata</i> 'Fairy Queen'	Fairy Queen Spiraea	3' ht. X 3' spr.	Profuse white flowers May and June. Small, three-lobed dark green leaves.
<i>Spiraea</i> × <i>vanhouttei</i> 'Renaissance'	Renaissance Spiraea	6' ht. X 6' spr.	Fragrant white flowers covering arching branches in spring.
<i>Symphoricarpos</i> × <i>chenault</i> 'Hancock'	Hancock Coralberry	3' ht. X 7' spr.	Spreading habit. Erosion control on slopes. Pink flowers. Red berries.
<i>Syringa patula</i> 'Miss Kim'	Miss Kim Lilac*	7' ht. X 6' spr.	Fragrant single lilac-purple flower clusters late spring. Burgundy-red fall color
<i>Syringa vulgaris</i>	Common Purple Lilac*	14' ht. X 10' spr.	Fragrant, single, purple flower clusters in May. Heart-shaped leaves.
<i>Syringa vulgaris</i> <i>alba</i>	Common White Lilac*	14' ht. X 10' spr.	Fragrant single, white flower clusters in May. Heart-shaped leaves.
<i>Syringa vulgaris</i> 'Charles Joly'	Charles Joly Lilac*	12' ht. X 10' spr.	Fragrant, double, dark reddish-purple flower clusters in May.
<i>Syringa vulgaris</i> 'Katherine Havemeyer'	Katherine Havemeyer Lilac*	12' ht. X 10' spr.	Fragrant, double, lavender-pink flower clusters in May.
<i>Syringa vulgaris</i> 'Sensation'	Sensation Lilac*	10' ht. X 10' spr.	Fragrant, single, purple flowers with white margins in May.
<i>Syringa</i> × <i>hyacinthiflora</i> 'Mount Baker'	Mount Baker Lilac*	12' ht. X 10' spr.	Fragrant, single, white flower clusters in late April.
<i>Syringa</i> × <i>hyacinthiflora</i> 'Pocahontas'	Pocahontas Lilac*	10' ht. X 10' spr.	Fragrant, single, deep violet flower clusters in early May.
<i>Syringa</i> × <i>prestoniae</i> 'Donald Wyman'	Donald Wyman Lilac*	10' ht. X 8' spr.	Fragrant, single, reddish-purple flower clusters early-mid June.
<i>Syringa</i> × <i>prestoniae</i> 'James MacFarlane'	James MacFarlane Lilac*	10' ht. X 8' spr.	Fragrant, single, pink flower clusters in late May-June. Blooms at a young age
<i>Syringa</i> × <i>prestoniae</i> 'Minuet'	Minuet Lilac*	8' ht. X 6' spr.	Fragrant, single, light purple flower clusters in May.
<i>Syringa</i> × <i>prestoniae</i> 'Miss Canada'	Miss Canada Lilac*	9' ht. X 8' spr.	Fragrant, single, deep pink flower clusters in May. Non-suckering.
<i>Syringa</i> × <i>prestoniae</i> 'Royalty'	Royalty Lilac*	10' ht. X 6' spr.	Fragrant, single, reddish-purple flower clusters in late May-June.
<i>Viburnum carlesii</i>	Koreanspice Viburnum	6' ht. X 6' spr.	Intensely fragrant pink buds open to white flower clusters. Reddish fall color
<i>Viburnum dentatum</i>	Arrowwood Viburnum	10' ht. X 10' spr.	White flowers in June. Blue-black berries. Orange-red-purple fall color

<i>Viburnum dentatum</i> 'Christom'	Blue Muffin Viburnum	6' ht. X 6' spr.	Covered w/white flowers. Blue berries persist into winter. Yellow fall color
<i>Viburnum dentatum</i> 'Ralph Senior'	Autumn Jazz Viburnum	10' ht. X 10' spr.	White flowers in June. Blue-black berries. Orange-red-purple fall color.
<i>Viburnum lantana</i>	Wayfaring Tree Viburnum*	12' ht. X 8' spr.	Flat white flower clusters. Bright red fruit. Deep green leaves
<i>Viburnum lantana</i> 'Mohican'	Mohican Viburnum*	6' ht. X 6' spr.	Compact Wayfaring Tree Viburnum. White flowers. Orange-red fruit.
<i>Viburnum opulus</i> 'Compactum'	European Compact Cranberry	5' ht. X 5' spr.	Single white flowers in spring. Persistent scarlet fruit. Red fall color.
<i>Viburnum opulus</i> 'Nanum'	Dwarf European Cranberry	3' ht. X 3' spr.	Dense mounded form. Dark green leaves turn wine-red in fall.
<i>Viburnum trilobum</i> 'Compactum'	Dwarf American Cranberry	5' ht. X 5' spr.	Rounded form. Shiny, dark green leaves turn vibrant red in fall.
<i>Viburnum</i> × <i>burkwoodii</i>	Burkwood Viburnum	8' ht. X 8' spr.	Dark green leathery leaves. Semi-evergreen. Fragrant white flowers in spring

EVERGREEN SHRUBS AND SPECIALTY EVERGREENS

<i>Arctostaphylos</i> 'Panchito'	Panchito Manzanita*	2' ht. X 4' spr.	Same characteristics as the Colorado Manzanita, except grows taller.
<i>Arctostaphylos</i> × <i>coloradensis</i>	Colorado Manzanita*	8" ht. X 4' spr.	Shell-pink flowers. Cinnamon-red to purple exfoliating bark.
<i>Arctostaphylos</i> × <i>coloradensis</i> 'Chieftain'	Chieftain Manzanita*	4' ht. X 9' spr.	Same characteristics as the Colorado Manzanita, except grows taller.
Cytisus dallimorei 'Lena'	Scotch Lena Broom*	3' ht. X 4' spr.	Rusty red and yellow blooms in late spring.
<i>Cytisus purgan</i> 'Spanish Gold'	Spanish Gold Broom*	4' ht. X 6' spr.	Slender green stems with gold flowers in late spring.
<i>Cytisus scoparius</i> 'Burkwoodii'	Burkwoodii Red Broom*	3' ht. X 4' spr.	Red flowers with a tinge of yellow in late spring.
<i>Cytisus scoparius</i> 'Moonlight'	Moonlight Broom*	5' ht. X 6' spr.	Glowing 'moonlight' yellow flowers all along the stems.
<i>Cytisus</i> × 'Lilac Time'	Lilac Time Broom*	3' ht. X 4' spr.	Lilac-pink flowers in late spring. Green branches year round.
<i>Cytisus</i> × 'Minstead'	Minstead Broom*	4' ht. X 5' spr.	White flowers with purple wings in late spring.
<i>Cytisus</i> × <i>praecox</i> 'Allgold'	Warminster Broom*	6' ht. X 6' spr.	Slender green stems. Small, bright yellow fragrant blooms.
<i>Euonymus fortunei</i> 'Emerald Gaiety'	Emerald Gaiety Euonymus	4' ht. X 4' spr.	Broadleaf evergreen. Dark green rounded leaves w/white margins.
<i>Euonymus fortunei</i> 'Emerald 'n Gold'	Emerald 'n Gold Euonymus	2' ht. X 4' spr.	Similar to Emerald Gaiety, but w/gold margins. Slow growing.
<i>Juniperus chinensis</i> 'Armstrongii'	Armstrong Juniper*	4' ht. X 4' spr.	Light green finely textured foliage. Symmetrical branching habit.
<i>Juniperus chinensis</i> 'Holbert'	Holbert Juniper*	3' ht. X 8' spr.	Silver-blue foliage holds its color through the winter. Low spreading.
<i>Juniperus communis</i> 'Effusa'	Effusa Juniper*	2' ht. X 6' spr.	Bright green foliage with whitish streaks.
<i>Juniperus communis</i> 'Green Carpet'	Green Carpet Juniper*	10" ht. X 6' spr.	Medium green foliage turns dark green in winter. Low spreading.
<i>Juniperus communis</i> 'Mondap'	Alpine Carpet*	8" ht. X 4' spr.	Deep blue, soft textured foliage. Low spreading.
<i>Juniperus horizontalis</i> 'Bar Harbor'	Bar Harbor Juniper*	8" ht. X 6' spr.	Gray-blue foliage turns a silver plum color in winter. Low spreading.
<i>Juniperus horizontalis</i> 'Blue Chip'	Blue Chip Juniper*	10" ht. X 7' spr.	Silver-blue foliage turns plum colored in winter. Low spreading.
<i>Juniperus horizontalis</i> 'Hughes'	Hughes Juniper*	18" ht. X 6' spr.	Silver-blue foliage turns a light purple color in winter. Low spreading.

<i>Juniperus horizontalis</i> 'Monber'	Icee Blue Juniper*	4" ht. X 8' spr.	Silver-blue foliage with distinctive purplish tips. Low spreading.
<i>Juniperus horizontalis</i> 'Mother Lode'	Mother Lode Juniper*	6" ht. X 5' spr.	New growth bright gold. Low spreading.
<i>Juniperus horizontalis</i> 'Prince of Wales'	Prince of Wales Juniper*	8" ht. X 9' spr.	Bright green foliage turns purple color in winter. Low wide spreading.
<i>Juniperus horizontalis</i> 'Taylors Blue'	Dry Ice Juniper*	3" ht. X 8' spr.	Steel blue foliage turns maroon in winter. Low spreading.
<i>Juniperus horizontalis</i> 'Wiltonii'	Wiltoni/Blue Rug Juniper*	6" ht. X 6' spr.	Blue foliage takes on a purple cast in winter. Low spreading.
<i>Juniperus horizontalis</i> 'Youngstown'	Andorra/Youngstown Juniper*	18" ht. X 6' spr.	Feathery light green foliage turns plum colored in winter.
<i>Juniperus procumbens</i> 'Green Mound'	Green Mound Juniper*	1' ht. X 7' spr.	Cushion-like low spreading form. Dense blue-green foliage.
<i>Juniperus sabina</i> 'Arcadia'	Arcadia Juniper*	2' ht. X 4' spr.	Bright green lacy foliage.
<i>Juniperus sabina</i> 'Broadmoor'	Broadmoor Juniper*	1' ht. X 5' spr.	Dense low mounding form. Graceful soft green foliage.
<i>Juniperus sabina</i> 'Buffalo'	Buffalo Juniper*	1' ht. X 6' spr.	Bright green foliage. Low spreading form.
<i>Juniperus sabina</i> 'Monna'	Calgary Carpet Juniper*	9" ht. X 9' spr.	Feathery soft green foliage. Low wide spreading form.
<i>Juniperus sabina</i> 'Scandia'	Scandia Juniper*	18" ht. X 6' spr.	Feathery bright green foliage. Low spreading form.
<i>Juniperus sabina</i> 'Sierra Spreader'	Sierra Spreader*	1' ht. X 8' spr.	Soft green foliage. Wide spreading form.
<i>Juniperus sabina</i> 'Tamariscifolia'	Tammy Juniper*	4' ht. X 7' spr.	Feathery, mounding growth habit. Light green or blue-green all year.
<i>Juniperus scopulorum</i> 'Table Top Blue'	Table Top Blue Juniper*	6' ht. X 8' spr.	Silver-blue foliage. Flat-top, wide spreading habit. Waxy dark blue fruit.
<i>Juniperus squamata</i> 'Blue Star'	Blue Star Juniper*	2' ht. X 5' spr.	Silver-blue foliage. Dense form. Prefers shade.
<i>Juniperus virginiana</i> 'Grey Owl'	Grey Owl Juniper*	18" ht. X 6' spr.	Finely textured silver-blue foliage turns purple in winter. Low spreading.
<i>Juniperus</i> × <i>media</i> 'Old Gold'	Old Gold/Gold Coast Juniper*	3' ht. X 4' spr.	Compact form. Golden foliage.
<i>Juniperus</i> × <i>media</i> 'Sea Green'	Sea Green Juniper*	8' ht. X 7' spr.	Rich green foliage. Branches flare outward. Somewhat vase shaped.
<i>Mahonia aquifolium</i>	Oregon Grape Holly*	6' ht. X 6' spr.	Green holly-like foliage. Yellow spring flowers. Blue colored berries.
<i>Mahonia aquifolium</i> 'Compacta'	Compact Oregon Grape Holly*	3' ht. X 5' spr.	Dwarf variety of Oregon Grape Holly.
<i>Mahonia aquifolium</i> 'Kings Ransom'	Kings Ransom Grape Holly*	6' ht. X 6' spr.	Yellow spring flowers. Blue-green leaves turn maroon in fall.
<i>Mahonia repens</i>	Creeping Oregon Grape Holly*	18" ht. X 2' spr.	Yellow flowers. Blue colored berries. Foliage turns red in winter.
<i>Picea abies</i> 'Pumila'	Dwarf Norway Spruce	4' ht. X 6' spr.	Short blue-green needles, dense branching, mound shaped, slow grower.
<i>Picea pungens</i> 'Globosa'	Dwarf Globe Blue Spruce	4' ht. X 5' spr.	Bright blue needles. Densely branched, compact, globe-shape. Slow grower.
<i>Picea pungens</i> 'Mesa Verde'	Mesa Verde Spruce	3' ht. X 6' spr.	Spreading, low-growing, uniform habit. Bright green needles.
<i>Picea pungens</i> 'Montgomery'	Montgomery Spruce	8' ht. X 8' spr.	Broadly pyramidal form. Bright blue needles. Slow growing.
<i>Picea pungens</i> 'St. Mary's Broom'	St. Mary's Blue Spruce	3' ht. X 4' spr.	Bright blue needles. Mounding form. Slow growing.
<i>Pinus mugo</i> 'Mops'	Mops Mugo Pine	4' ht. X 4' spr.	Densely compact, globe form of Mugo Pine. Tight green needles.
<i>Pinus mugo</i> 'Slowmound'	Slowmound Mugo Pine	4' ht. X 5' spr.	Another, dense compact form of Mugo Pine. Dark green needles.
<i>Pinus mugo</i> 'Whitebud'	Whitebud Mugo Pine	4' ht. X 5' spr.	Another, mounding selection. Waxy winter buds contrast to green needles.
<i>Thuja occidentalis</i> 'Little Giant'	Little Giant Arborvitae	6' ht. X 6' spr.	Globe shaped with rich green fan-shaped branches. Slow grower

<i>Thuja orientalis</i> 'Aurea Nana'	Golden Arborvitae	4' ht. X 4' spr.	Dense, oval shaped upright. Soft green foliage with yellow ends.
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UPRIGHT EVERGREENS

<i>Juniperus chinensis</i> 'Blue Point'	Blue Point Juniper*	10' ht. X 6' spr.	Keeps natural pyramidal upright form without shearing.
<i>Juniperus chinensis</i> 'Spartan'	Spartan*	18' ht. X 5' spr.	Rich green foliage. Pyramidal form. Fast growing.
<i>Juniperus chinensis</i> 'Spearmint'	Spearmint Juniper*	15' ht. X 5' spr.	Rich green foliage. Pyramidal form. Fast growing.
<i>Juniperus scopulorum</i> 'Cologreen'	Cologreen Upright Juniper*	18' ht. X 6' spr.	Rich green foliage. Small fleshy blue fruit.
<i>Juniperus scopulorum</i> 'Gray Gleam'	Gray Gleam Juniper*	15' ht. X 6' spr.	Fine blue-gray foliage, upright pyramidal form, no fruit, slow growing
<i>Juniperus scopulorum</i> 'Medora'	Medora Juniper*	12' ht. X 4' spr.	Dense blue-green foliage. Narrow upright form. Slow growing.
<i>Juniperus scopulorum</i> 'Moonglow'	Moonglow Juniper*	16' ht. X 6' spr.	Showy bright silver-blue foliage. Pyramidal form.
<i>Juniperus scopulorum</i> 'Skyrocket'	Skyrocket Juniper*	18' ht. X 5' spr.	Silver-blue foliage. Narrow upright form. Fast growing.
<i>Juniperus scopulorum</i> 'Wichita Blue'	Wichita Blue Juniper*	18' ht. X 6' spr.	Bright silver-blue foliage. Pyramidal form.
<i>Juniperus virginiana</i> 'Cupressifolia'	Hillspire Juniper*	18' ht. X 6' spr.	Bright green foliage. Small waxy fruit are a coppery-blue color.
<i>Picea abies</i> 'Cupressina'	Columnar Norway Spruce	20' ht. X 6' spr.	Narrow form. Short dark green needles. Withstands moderate snow loads.
<i>Picea abies</i> 'Sherwood Compact'	Sherwood Compact Spruce	12' ht. X 6' spr.	Narrow, pyramidal form w/upright branching. Short, medium green needles
<i>Picea glauca</i> 'North Star'	North Star Spruce	12' ht. X 6' spr.	Short rich green needles. Compact, upright form of Black Hills Spruce.
<i>Pinus leucodermis</i> 'Mint Truffle'	Mint Truffle Bosnian Pine	15' ht. X 8' spr.	Dense compact mint-green color. Broad teardrop shape. Well drained soils
<i>Thuja occidentalis</i> 'Emerald'	Emerald Arborvitae	15' ht. X 4' spr.	Dense feathery foliage, narrow upright growth habit.

PERENNIALS

<i>Achillea</i> 'Moonshine'	Moonshine Yarrow*	2' ht. X 2' spr.	Sulfur-yellow flowers in summer. Grey-green foliage.
<i>Agastache</i> spp.	Hyssop*	Varies	Various colors and sizes available.
<i>Ajuga reptans</i> var.	Ajuga	Varies	Various colors and sizes available.
<i>Antennaria dioica</i> var.	Pussytoes*	3" ht. X 12" spr.	Woolly, gray-green spoon-like leaves. Small pink flowers. Butterflies
<i>Aster</i> 'Professor Kippenburg'	Kippenburg Fall Aster	15" ht. X 2' spr.	Dark green leaves. Blanketed w/blue daisy-like flowers Aug.-Sept.
<i>Aurinia saxatilis</i> (<i>Alyssum saxatile</i>)	Basket of Gold*	1' ht. X 1' spr.	Gray-green foliage. Yellow flowers over entire plant April-May.
<i>Campanula persicifolia</i>	Peachleaf Bellflower	3' ht. X 18" spr.	Bright green leaves. Clusters of blue bell-shaped flowers July-August.
<i>Centaurea dealbata</i>	Pink Bachelor Button*	2' ht. X 2.5' spr.	Bright pink, feathery flowers May-June. Fern like gray-green foliage.
<i>Centranthus ruber</i>	Jupiter's Beard/Red Valerian*	3' ht. X 2' spr.	Heart-shaped fleshy leaves. Fragrant reddish-pink flowers June-September
<i>Cerastium tomentosum</i>	Snow-in-Summer*	8" ht. X 2' spr.	Downy silver-gray foliage. Snowy white flowers May-June.
<i>Cerastostigma plumbaginoides</i>	Leadwort/Plumbago	1' ht. X 2' spr.	Blue flowers June-Oct. Shiny green leaves turn burgundy-red in fall
<i>Coreopsis verticillata</i> 'Moonbeam'	Moonbeam Coreopsis*	2' ht. X 2' spr.	Creamy yellow flowers June-September. Thread-leaf foliage.
<i>Delosperma</i> spp.	Ice Plant*	Varies	Thick mat of succulent leaves. Various sizes and flower colors available.

<i>Echinacea purpurea</i>	Purple Coneflower*	30" ht. X 2' spr.	Broad clumps of dark leaves. Large lavender-purple flowers.
<i>Gaillardia aristata</i>	Native Blanket Flower*	2' ht. X 2' spr.	Large daisy-shaped lavender-red blooms with purple centers July-Sept.
<i>Gaura lindheimeri</i>	Whirling Butterflies*	30" ht. X 30" spr.	Willow-like leaves on wiry stems. White flowers resembling butterflies.
<i>Gazania linearis</i> 'Colorado Gold'	Hardy Colorado Gold Gazania*	3" ht. X 10" spr.	Large bright yellow flowers May to September. Deep green linear foliage.
<i>Hemerocallis</i> spp.	Daylily*	Varies	Grass-like foliage. Various flower colors available. Blooms all summer.
<i>Iberis sempervirens</i>	Candytuft*	1' ht. X 18" spr.	Narrow dark evergreen foliage. Tiny white flowers May-June.
<i>Iris</i> × <i>germanica</i> var.	Bearded Iris*	30" ht. X 18" spr.	Blade-like green foliage. Late spring blooms. Various colors available.
<i>Lavandula angustifolia</i> 'Munstead'	English Lavender*	18" ht. X 18" spr.	Aromatic gray-green foliage. Tiny lavender-blue flowers in spring.
<i>Leontopodium alpinum</i>	Edelweiss*	1' ht. X 1' spr.	Woolly gray foliage. Tiny silvery-white button-like flowers in spring.
<i>Liatris</i> spp.	Gayfeather*	Varies	Lavender-purple flowers on slender stalks in summer.
<i>Nepeta</i> × <i>faassenii</i>	Faassen's Catmint*	2' ht. X 2' spr.	Fragrant rippled soft gray leaves. Lavender flowers in summer.
<i>Penstemon</i> spp.	Penstemon*	Varies	Various sizes and colors available.
<i>Persicaria affinis</i>	Himalayan Border Jewel*	6" ht. X 2' spr.	Small light pink flowers June-July. Bronze foliage in winter..
<i>Phlox subulata</i> var.	Creeping Phlox*	6" ht. X 20" spr.	Assorted colors available. Showy masses of flowers April-May.
<i>Rudbeckia fulgida</i> 'Goldsturm'	Black-Eyed Susan*	2' ht. X 2' spr.	Golden-yellow flowers with dark brown/black centers summer-fall.
<i>Salvia sylvestris</i> × 'Mainacht'	May Night Salvia*	2' ht. X 18" spr.	Gray-green leaves. Violet-blue flowers all summer. Attracts butterflies.
<i>Santolina chamaecyparissus</i>	Lavender Cotton*	18" ht. X 2' spr.	Fragrant silver-gray foliage. Button-like yellow flowers mid summer.
<i>Saponaria ocymoides</i>	Soapwort*	6" ht. X 18" spr.	Low spreading form. Bright pink flowers May-June.
<i>Scabiosa columbaria</i> 'Butterfly Blue'/'Pink Mist'	Pincushion Flower	2' ht. X 2' spr.	Lavender-blue or pink flowers June-August. Attracts butterflies.
<i>Sedum</i> spp.	Sedum/Stonecrop*	Varies	Fleshy succulent leaves. Various sizes and flower colors available.
<i>Sempervivum</i> spp.	Hens and Chicks*	Varies	Fleshy succulent leaves. Various sizes and flower colors available.
<i>Tanacetum densum amani</i>	Partridge Feather*	1' ht. X 1' spr.	Silvery-white foliage. Button-like yellow flowers in early summer.
<i>Thymus praecox</i> var.	Thyme*	2" ht. X 18" spr.	Low creeping stems. Various flower colors available.
<i>Veronica</i> 'Crystal River'	Crystal River Speedwell	3" ht. X 30" spr.	Evergreen groundcover. Tiny blue flowers in spring & scattered till fall.
<i>Veronica livanensis</i>	Turkish Speedwell*	2" ht. X 18" spr.	Dense mat of small glossy dark green leaves. Deep blue flowers.
<i>Veronica repens</i>	Creeping Speedwell	3" ht. X 18" spr.	Low trailing stems w/ bright green leaves. Bell-shaped sky-blue flowers.
<i>Veronica spicata</i> 'Goodness Grows'	Goodness grows Speedwell	14" ht. X 14" spr.	Deep blue flower June-August. Mounded form w/lance-shaped leaves.
<i>Veronica spicata</i> 'Red Fox'	Red Fox Speedwell	16" ht. X 16" spr.	Rich green foliage. Vibrant rosy-red flowers mid-summer.

ORNAMENTAL GRASSES

<i>Andropogon gerardii</i>	Big Bluestem Grass*	6' ht. X 3' spr.	Blue-green leaves turn to bronze-red in the fall.
<i>Andropogon (Bothriochloa) saccharoides</i>	Silver Bluestem Grass*	3' ht. X 2' spr.	Puffy, silver-white seedheads. Red/purple/orange fall color.
<i>Bouteloua curtipendula</i>	Sideoats Grama Grass*	3' ht. X 2' spr.	Narrow blue-green leaf blades. Flowers & seeds on one-side of stem.

<i>Bouteloua gracilis</i>	Blue Grama Grass*	2' ht. X 2' spr.	One-sided flowers/seedheads that curl down like eyelashes.
<i>Calamagrostis acutiflora</i> 'Karl Foerster'	Feather Reed Grass	5' ht. X 2' spr.	Upright clump. Slender rich green blades. Pinkish plumes fade to buff.
<i>Calamagrostis acutiflora</i> 'Overdam'	Variegated Feather Reed Grass	3' ht. X 2' spr.	Creamy-white and medium green variegated leaves. Sand colored plumes
<i>Chasmanthium latifolium</i>	Northern Sea Oats	3' ht. X 2' spr.	Wide deep green blades. Clusters of drooping oat-like seeds summer-fall.
<i>Deschampsia cespitosa</i>	Hair Grass*	3' ht. X 2' spr.	Very fine hair-like texture. Dark green foliage. Forms neat tufted clump.
<i>Festuca glauca</i>	Blue Fescue Grass*	10" ht. X 10" spr.	Blue tufts of wiry hair-like foliage. Tan seed heads.
<i>Festuca glauca</i> 'Boulder Blue'	Boulder Blue Fescue Grass*	10" ht. X 10" spr.	Blue tufts of wiry hair-like foliage. 15" tan seed heads in summer.
<i>Festuca glauca</i> 'Elijah Blue'	Elijah Blue Fescue*	10" ht. X 10" spr.	Round mounded form. Powdery blue foliage. Tan seed heads in summer.
<i>Helictotrichon sempervirens</i>	Blue Avena Grass/Oat Grass*	3' ht. X 2' spr.	Powder blue foliage. Oat-like seed heads into winter.
<i>Imperata cylindrica</i> 'Red Baron'	Japanese Blood Grass	18" ht. X 2' spr.	Green blades at base w/blood red tips. Color intensifies in fall.
<i>Miscanthus sinensis</i> 'Gracillimus'	Maiden Grass	7' ht. X 4' spr.	Broad clump of thin rich green blades. Creamy-white feather seed plumes
<i>Miscanthus sinensis</i> 'Graziella'	Graziella Maiden Grass	5' ht. X 3' spr.	Similar to 'Gracillimus' but flowers several weeks earlier.
<i>Miscanthus sinensis</i> 'Purpurescens'	Purple/Flame Maiden Grass	4' ht. X 2' spr.	Green blades turn reddish-purple in late summer. Fan-like seed plumes.
<i>Miscanthus sinensis</i> 'Yaku Jima'	Dwarf Maiden Grass	4' ht. X 3' spr.	Compact clump. Rich green leaves. Creamy white, silky seed plumes.
<i>Miscanthus sinensis</i> 'Zebrinus'	Zebra Grass	7 ht. X 5' spr.	Banded variegation of golden bars. Silvery-white plumes fade to buff.
<i>Muhlenbergia capillaries</i> 'Regal Mist'	Regal Mist Muhly Grass*	4' ht. X 3' spr.	Fine textured leaves. Rosy-red flower spikes in late summer.
<i>Nessella (Stipa) tenuissima</i>	Mexican Feather Grass*	3' ht. X 2' spr.	Very fine thread-like green leaves. Narrow seed heads. Annual but reseeds
<i>Oryzopsis (Achnatherum) hymenoides</i>	Indian Rice Grass*	2' ht. X 2' spr.	Narrow arching leaves. Light airy flower heads.
<i>Panicum virgatum</i> 'Heavy Metal'	Heavy Metal Blue Switch Grass	5' ht. X 2' spr.	Upright metallic-blue foliage. Delicate seed heads.
<i>Panicum virgatum</i> 'Shenandoah'	Shenandoah Red Switch Grass	4' ht. X 2' spr.	Leaves display tones of dark red all summer, becomes wine-colored in fall
<i>Pennisetum alopecuroides</i> 'Hameln'	Dwarf/Hardy Fountain Grass*	2' ht. X 2' spr.	Long arching bright green leaves. Cream colored seed heads.
<i>Pennisetum alopecuroides</i> 'Little Bunny'	Little Bunny Fountain Grass*	1' ht. X 1' spr.	Compact variety of Dwarf Fountain Grass.
<i>Pennisetum orientale</i> 'Karley Rose'	Karley Rose Fountain Grass	3' ht. X 2' spr.	Smokey-rose colored foxtail-like plumes.
<i>Schizachyrium scoparium</i>	Little Bluestem*	4' ht. X 2' spr.	Upright clumps of blue-gray foliage turn red to orange in the fall.
<i>Sorghastrum nutans</i>	Indian Grass*	6' ht. X 3' spr.	Upright arching blue-green foliage. Tan flowers. Purple fall color.
<i>Sorghastrum nutans</i> 'Indian Steel'	Indian Steel Indian Grass*	6' ht. X 3' spr.	Steel-blue upright foliage. Tan flowers. Yellow to bronze fall color.
<i>Sporobolus heterolepis</i>	Prairie Dropseed Grass*	3' ht. X 3' spr.	Upright, emerald green fine-textured foliage. Pumpkin-orange fall color.
<i>Sporobolus wrightii</i>	Giant Sacaton Grass*	6' ht. X 3' spr.	Blue-green foliage. Blooms late summer-fall. Pumpkin-orange fall color.

VINES

<i>Clematis terniflora</i>	Sweet Autumn Clematis*	20-30 foot height	Aromatic, single, white flowers late summer-fall. Bright green leaves.
<i>Lonicera</i> 'Mandarin'	Mandarin Honeysuckle	10-20 foot height	Clusters of orange-pink tubular flowers late spring through summer.
<i>Lonicera japonica</i> 'Halliana'	Hall's Honeysuckle*	10-20 foot height	Fragrant white & yellow flowers June-Sept. Purplish fall color.

<i>Lonicera periclymenum</i> 'Harlequin'	Harlequin Honeysuckle	10-20 foot height	Fragrant rose-purple flowers. Variegated irregular serrated leaves.
<i>Lonicera prolifera</i> 'Kintzley's Ghost'	Kintzley's Ghost Honeysuckle	10-20 foot height	Blue-green leaves. Pale yellow flowers. Distinct ghostly white bracts.
<i>Lonicera</i> × <i>brownii</i> 'Dropmore Scarlet'	Dropmore Honeysuckle	20 foot height	Orange-scarlet flowers all summer. Attract hummingbirds.
<i>Parthenocissus quinquefolia engelmannii</i>	Virginia Creeper/Engleman Ivy*	30-40 foot height	Very hardy. Brilliant red fall color. Small blue-black fruit. Fast growing.
<i>Polygonum (Fallopia) aubertii</i>	Silver Lace Vine*	10-15 foot height	Small white flowers in summer. Green heart-shaped foliage. Fast growing.

PROHIBITED SPECIES

<i>Acer negundo</i>	Boxelder (weak wood; insect issues)
<i>Acer rubrum</i>	Red maple (chlorosis problems)
<i>Acer saccharinum</i>	Silver Maple (weak wood; susceptible to storm damage)
<i>Acer</i> × <i>freemanii</i> 'Jeffersred' Autumn Blaze	Autumn Blaze Maple (weak wood; chlorosis problems; susceptible to storm damage)
<i>Ailanthus altissima</i>	Tree of Heaven (weak wood; susceptible to storm damage)
<i>Elaeagnus angustifolia</i>	Russian Olive (on the Colorado noxious weed list)
<i>Fraxinus</i> spp.	All species in the genus <i>Fraxinus</i> (numerous insect problems; susceptible to storm damage), including but not limited to Autumn Purple Ash (<i>Fraxinus americana</i> 'Junginger' Autumn Purple®), Marshall Green Ash (<i>Fraxinus pennsylvanica</i> 'Marshall'), Patmore Green Ash, (<i>Fraxinus pennsylvanica</i> 'Patmore'), Summit Green Ash, (<i>Fraxinus pennsylvanica</i> 'Summit') and Black Ash (<i>Fraxinus nigra</i>)
<i>Gleditsia triacanthos inermis</i> 'Sunburst'	Sunburst Honeylocust (sunscald; disease and canker problems)
<i>Populus</i> spp.	Cottonwood (weak wood; susceptible to storm damage)
<i>Prunus cerasifera</i> 'Newport'	Newport Plum (insect problems, chlorosis)
<i>Prunus virginiana</i>	Chokecherry, all varieties (suckers excessively)
<i>Robinia pseudoacacia</i> 'Purple Robe'	Purple Robe Locust (weak wood; susceptible to storm damage)
<i>Salix</i> spp.	Willow - tree forms (weak wood; susceptible to storm damage)
<i>Sorbus aucuparia</i>	Mountain Ash (sunscald, fireblight)
<i>Ulmus pumila</i>	Siberian Elm (insect problems, branch litter)

* XERIC SPECIES (An exclusively xeric plant list is also available: Town of Parker Xeric Plant List)

PLANT SELECT® SPECIES MAY ALSO BE UTILIZED. <http://plantselect.org/>

EVERY LANDSCAPE PLAN MUST INCORPORATE SPECIES DIVERSITY.

ALWAYS VERIFY PLANT AVAILABILITY WITH SEVERAL NURSERIES.

Xeric Plants

DECIDUOUS SHADE TREES

Catalpa
Common Hackberry
Imperial[®] Locust
Shademaster[®] Locust
Skyline[®] Locust
Kentucky Coffeetree
Swamp White Oak
Bur Oak
English Oak

Catalpa speciosa
Celtis occidentalis
Gleditsia triacanthos inermis ‘Impcole’
Gleditsia triacanthos inermis ‘Shademaster’
Gleditsia triacanthos inermis ‘Skycole’
Gymnocladus dioicus
Quercus bicolor
Quercus macrocarpa
Quercus robur

ORNAMENTAL TREES

Amur Maple
Bigtooth Maple
Tatarian Maple
Russian Hawthorn
Cockspur Thornless Hawthorn
Washington Hawthorn
Goldenrain Tree
Wafer Ash
Gambel Oak
Japanese Tree Lilac

Acer ginnala
Acer grandidentatum
Acer tataricum
Crataegus ambigua
Crataegus crus-galli var. *inermis*
Crataegus phaenopyrum
Koelreuteria paniculata
Ptelea trifoliata
Quercus gambelii
Syringa reticulata

EVERGREEN TREES

One Seed Juniper
Rocky Mountain Juniper
Bristlecone Pine
Pinyon Pine
Limber Pine
Austrian Pine
Ponderosa Pine

Juniperus monosperma
Juniperus scopulorum
Pinus aristata
Pinus edulis
Pinus flexilis
Pinus nigra
Pinus ponderosa

DECIDUOUS SHRUBS

Saskatoon Serviceberry
Leadplant
Indigobush
Sand Sagebrush
Tall Western Sage
Four Wing Saltbush
Silver Fountain Butterfly Bush
Siberian Peashrub
Pygmy Peashrub
Blue Mist Spirea
Dark Knight Spirea
Curl Leaf Mountain Mahogany
Mountain Mahogany
Fernbush
Rabbitbrush
Cliffrose
Morman Tea

Amelanchier alnifolia
Amorpha canescens
Amorpha fruticosa
Artemisia filifolia
Artemisia tridentata
Artiplex canescens
Buddleia alternifolia ‘Argentea’
Caragana arborescens
Caragana pygmaea
Caryopteris × *clandonensis*
Caryopteris × *clandonensis* ‘Dark Knight’
Cercocarpus ledifolius
Cercocarpus montanus
Chamaebatiara millefolium
Chrysothamnus nauseosus
Cowania mexicana
Ephedra viridis

Apache Plume
 New Mexico Privet
 Royal Gold Woodwaxen
 Rock Spirea
 Hidcote St. Johnswort
 Waxflower
 Beautybush
 Cheyenne Privet
 Lodense Privet
 Blue Velvet Honeysuckle
 Arnold Red Honeysuckle
 Clavey's Dwarf Honeysuckle
 Squaw Apple
 Russian Sage
 Cheyenne Mockorange
 Littleleaf Mockorange
 Pawnee Buttes Sand Cherry
 Gro-Low Sumac
 Rocky Mountain Sumac
 Smooth Cutleaf Sumac
 Three leaf Sumac
 Staghorn Cutleaf Sumac
 Boulder Raspberry
 Silver Buffaloberry
 Common Purple Lilac
 Common White Lilac
 Charles Joly Lilac
 Donald Wyman Lilac
 James MacFarlane Lilac
 Royalty Lilac
 Wayfaring Viburnum
 Mohican Viburnum

Fallugia paradoxa
Forestiera neomexicana
Genista tinctoria 'Royal Gold'
Holodiscus dumosus
Hypericum 'Hidcote'
Jamesia americana
Kolkwitzia amabilis
Ligustrum vulgare 'Cheyenne'
Ligustrum vulgare 'Lodense'
Lonicera korolkowii 'Floribunda'
Lonicera tatarica 'Arnold Red'
Lonicera × *xylosteooides* 'Clavey's Dwarf'
Peraphyllum ramosissimum
Perovskia artiplicifolia
Philadelphus lewisii 'Cheyenne'
Philadelphus microphyllus
Prunus besseyi 'Pawnee Buttes'
Rhus aromatica 'Grow-Low'
Rhus glabra 'Cismontana'
Rhus glabra 'Laciniata'
Rhus trilobata
Rhus typhina 'Laciniata'
Rubus deliciosus
Shepherdia argentea
Syringa vulgaris
Syringa vulgaris alba
Syringa vulgaris 'Charles Joly'
Syringa × *prestoniae* 'Donald Wyman'
Syringa × *prestoniae* 'James MacFarlane'
Syringa × *prestoniae* 'Royalty'
Viburnum lantana
Viburnum lantana 'Mohican'

EVERGREEN SHRUBS & SPECIALTY EVERGREENS

Spanish Gold Broom
 Moonlight Broom
 Lilac Time Broom
 Minstead Broom
 Allgold Warminster Broom
 Armstrong Juniper
 Holbert Juniper
 Effusa Juniper
 Bar Harbor Juniper
 Blue Chip Juniper
 Hughes Juniper
 Icee Blue™ Juniper
 Prince of Wales Juniper
 Wiltoni/Blue Rug Juniper
 Andorra Juniper
 Green Mound Juniper
 Arcadia Juniper
 Broadmoor Juniper
 Buffalo Juniper
 Calgary Carpet Juniper
 Scandia Juniper
 Sierra Spreader Juniper
 Tammy Juniper
 Table Top Blue Juniper
 Blue Star Juniper
 Grey Owl Juniper
 Old Gold/Gold Coast™ Juniper

Cytisus purgan 'Spanish Gold'
Cytisus scoparius 'Moonlight'
Cytisus × 'Lilac Time'
Cytisus × 'Minstead'
Cytisus × *praecox* 'Allgold'
Juniperus chinensis 'Armstrongii'
Juniperus chinensis 'Holbert'
Juniperus communis depressa 'Effusa'
Juniperus horizontalis 'Bar Harbor'
Juniperus horizontalis 'Blue Chip'
Juniperus horizontalis 'Hughes'
Juniperus horizontalis 'Monber'
Juniperus horizontalis 'Prince of Wales'
Juniperus horizontalis 'Wiltonii'
Juniperus horizontalis 'Youngstown'
Juniperus procumbens 'Green Mound'
Juniperus sabina 'Arcadia'
Juniperus sabina 'Broadmoor'
Juniperus sabina 'Buffalo'
Juniperus sabina 'Monna'
Juniperus sabina 'Scandia'
Juniperus sabina 'Sierra Spreader'
Juniperus sabina 'Tamariscifolia'
Juniperus scopulorum 'Table Top Blue'
Juniperus squamata 'Blue Star'
Juniperus virginiana 'Grey Owl'
Juniperus × *media* 'Old Gold'

Sea Green/Mint Julep™ Juniper
Oregon Grape Holly
Compact Oregon Grape Holly
Creeping Oregon Grape Holly
Mugo Pine

Juniperus × *media* ‘Sea Green’
Mahonia aquifolium
Mahonia aquifolium ‘Compacta’
Mahonia repens
Pinus mugo mughus

UPRIGHT EVERGREENS

Blue Point Juniper
Spartan/Spearmint Juniper
Cologreen Juniper
Gray Gleam Juniper
Moonglow Juniper
Wichita Blue Juniper
Skyrocket Juniper

Juniperus chinensis ‘Blue Point’
Juniperus chinensis ‘Spartan’
Juniperus scopulorum ‘Cologreen’
Juniperus scopulorum ‘Gray Gleam’
Juniperus scopulorum ‘Moonglow’
Juniperus scopulorum ‘Wichita Blue’
Juniperus scopulorum ‘Skyrocket’

PERENNIALS

Moonshine Yarrow
Pink Yarrow
Sunset Hyssop
Pussytoes
Kinnikinnick
Silver Mound Sage
Basket of Gold
Prairie Winecup
Cupids Dart
Pink Cornflower
Jupiter’s Beard
Snow-in-Summer
Moonbeam Coreopsis
Zagreb Coreopsis
Purple Ice Plant
Yellow Ice Plant
Purple Coneflower
White Coneflower
California Poppy
Japanese Fleece Flower
Blanket Flower
Whirling Butterflies
Hardy Colorado Gold Gazania
Sunrose
Daylily
Candytuft
German Bearded Iris
Red Hot Poker
English Lavender
Gayfeather
Blue Flax
Catmint
Sundrops Primrose
Missouri Evening Primrose
Elfin Pink Penstemon
Mexicale Penstemon
Red Beardstongue
Mersea Yellow Penstemon
Rocky Mountain Penstemon
Himalayan Border Jewel
Creeping Phlox
Prairie Coneflower/Mexican Hat
Silver Sage Salvia
Purple Flowering Sage
May Night Salvia

Achillea ‘Moonshine’
Achillea millefolium ‘Rosea’
Agastache rupestris
Antennaria dioica
Arctostaphylos uva-ursi
Artemisia schmidtiana
Aurinia saxatilis (*Alyssum saxatile*)
Callirhoe involucrata
Catananche caerulea
Centaurea dealbata
Centranthus ruber
Cerastium tomentosum
Coreopsis verticillata ‘Moonbeam’
Coreopsis verticillata ‘Zagreb’
Delosperma cooperi
Delosperma nubigenum
Echinacea purpurea
Echinacea purpurea ‘Alba’
Eschscholzia californica
Fallopia japonica
Gaillardia aristata
Gaura lindheimeri
Gazania linearis ‘Colorado Gold’
Helianthemum nummularium
Hemerocallis hybrids
Iberis sempervirens
Iris germanica var.
Kniphofia uvaria
Lavandula angustifolia ‘Munstead’
Liatris spicata
Linum perenne
Nepeta faassenii
Oenothera fruiticosa
Oenothera macrocarpa
Penstemon barbatus ‘Elfin Pink’
Penstemon mexicale
Penstemon pinifolius
Penstemon pinifolius ‘Mersea Yellow’
Penstemon strictus
Persicaria affinis
Phlox subulata
Ratibida columnifera ‘Red’
Salvia argentea
Salvia nemorosa
Salvia sylvestris × ‘Mainacht’

Lavender Cotton
Gold Moss Sedum
Hybridum Sedum
Blue Spruce Sedum
Autumn Joy Sedum
Dragon's Blood Sedum
Hens and Chicks
Lamb's Ear
Germander
Wooly Thyme
Turkish Veronica
Sunny Border Blue Veronica
Periwinkle
Hummingbird Flower

Santolina chamaecyparissus
Sedum floriferum
Sedum hybridum
Sedum pinifolium 'Blue Spruce'
Sedum spectabile 'Autumn Joy'
Sedum spurium 'Dragon's Blood'
Sempervivum hybrids
Stachys lanata
Teucrium chamaedrys
Thymus praecox pseudolanuginosus
Veronica liwanensis
Veronica 'Sunny Border Blue'
Vinca minor 'Bowles'
Zauschneria garrettii

ORNAMENTAL GRASSES

Blue Fescue
Blue Avena/Oat Grass
Hardy Fountain Grass
Little Bluestem

VINES

Goldflame Honeysuckle
Hall's Honeysuckle
Virginia Creeper
Silver Lace Vine

Festuca glauca 'Elijah Blue'
Helictotrichon sempervirens
Pennisetum alopecuroides 'Hameln'
Schizachyrium scoparium

Lonicera heckrottii
Lonicera japonica 'Halliana'
Parthenocissus quinquefolia engelmannii
Polygonum aubertii

NATIVE SEED MIXES

(SEEDING RATES: DRILLED: 25 LBS/ACRE or BROADCAST: 50 LBS/ACRE)

TOWN OF PARKER, SEED MIX 1

20% CANADA WILDRYE
15% CRESTED WHEATGRASS
15% SLENDER WHEATGRASS
10% ANNUAL RYEGRASS
10% SHEEP FESCUE
10% BIG BLUESTEM
10% SIDEOATS GRAMA
5% CANADA BLUEGRASS
5% BLUE GRAMA

TOWN OF PARKER, SEED MIX 2

22% SLENDER WHEATGRASS
18% SODAR STREAMBANK WHEATGRASS
13% ARIZONA FESCUE
13% BLUE GRAMA
12% BUFFALOGRASS
12% BARLEY OR OATS
5% SPIKE MUHLY
5% INDIAN RICEGRASS

TOWN OF PARKER, SEED MIX 3 (LOW-GROWTH MIX)

25% EPHRAIM CRESTED WHEATGRASS
23% SHEEP FESCUE
18% PERENNIAL RYEGRASS
13% CANADA BLUEGRASS
12% BARLEY OR OATS
9% BLUE FESCUE

DOUGLAS COUNTY PERMANENT DRILL SEEDING MIX

10% BIG BLUESTEM
10% YELLOW INDIANGRASS
10% SWITCHGRASS
10% SIDEOATS GRAMA
10% WESTERN WHEATGRASS
10% BLUE GRAMA
10% THICKSPIKE WHEATGRASS
10% PRAIRIE SANDREED
10% GREEN NEEDLEGRASS
5% SLENDER WHEATGRASS
5% STREAMBANK WHEATGRASS
Himalayan Border Jewel
Creeping Phlox
Prairie Coneflower/Mexican Hat
Silver Sage Salvia
Purple Flowering Sage
May Night Salvia
Lavender Cotton
Gold Moss Sedum
Hybridum Sedum
Blue Spruce Sedum
Autumn Joy Sedum
Dragon’s Blood Sedum
Hens and Chicks
Lamb’s Ear
Germander
Wooly Thyme
Turkish Veronica
Sunny Border Blue Veronica
Periwinkle
Hummingbird Flower

Persicaria affinis
Phlox subulata
Ratibida columnifera ‘Red’
Salvia argentea
Salvia nemorosa
Salvia sylvestris × ‘Mainacht’
Santolina chamaecyparissus
Sedum floriferum
Sedum hybridum
Sedum pinifolium ‘Blue Spruce’
Sedum spectabile ‘Autumn Joy’
Sedum spurium ‘Dragon’s Blood’
Sempervivum hybrids
Stachys lanata
Teucrium chamaedrys
Thymus praecox pseudolanuginosus
Veronica liwanensis
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(SEEDING RATES: DRILLED: 25 LBS/ACRE or BROADCAST: 50 LBS/ACRE)

TOWN OF PARKER, SEED MIX 1

20% CANADA WILD RYE
15% CRESTED WHEATGRASS
15% SLENDER WHEATGRASS
10% ANNUAL RYEGRASS
10% SHEEP FESCUE
10% BIG BLUESTEM
10% SIDEOATS GRAMA
5% CANADA BLUEGRASS
5% BLUE GRAMA

TOWN OF PARKER, SEED MIX 2

22% SLENDER WHEATGRASS
18% SODAR STREAMBANK WHEATGRASS
13% ARIZONA FESCUE
13% BLUE GRAMA
12% BUFFALOGRASS
12% BARLEY OR OATS
5% SPIKE MUHLY
5% INDIAN RICEGRASS

TOWN OF PARKER, SEED MIX 3 (LOW-GROWTH MIX)

25% EPHRAIM CRESTED WHEATGRASS
23% SHEEP FESCUE
18% PERENNIAL RYEGRASS
13% CANADA BLUEGRASS
12% BARLEY OR OATS
9% BLUE FESCUE

DOUGLAS COUNTY PERMANENT DRILL SEEDING MIX

10% BIG BLUESTEM
10% YELLOW INDIANGRASS
10% SWITCHGRASS
10% SIDEOATS GRAMA
10% WESTERN WHEATGRASS
10% BLUE GRAMA
10% THICKSPIKE WHEATGRASS
10% PRAIRIE SANDREED
10% GREEN NEEDLEGRASS
5% SLENDER WHEATGRASS
5% STREAMBANK WHEATGRASS