

SiteMaster CA 102
PDS2014-MUP-005
PDS2014-ER-14-21-001

Statement Regarding Photo-Simulation Depictions

The SiteMaster CA102 project landscape plans calls for installation of four (4) Sonoran Palo Verde trees (*parkinsonia praecox*, recently reclassified from *cercidium praecox*) to screen the faux water tank and soften the view from adjacent roads and properties. Photo-simulations prepared by Artistic Engineering show how the finished site would look from seven different viewpoints with trees after 3-5 years of growth. View 6 shows the viewpoint from the adjacent dirt road in front of the project's driveway. View 6 also represents the view from the nearest neighboring residential property. The proposed Palo Verde trees will be located so that they will screen the view from the road and the neighboring property.

Several factors are taken into consideration in creating an accurate photosimulation of the depiction of trees at 3-5 years - (1) size of trees when planted, (2) rate of growth, (3) size at maturity, and (4) the geometrical calculations of the photosimulation artist and the program used to create them. Based on the research and analysis done by the project applicant and the photo-simulation artist, we believe that the simulations prepared for the SiteMaster Site CA102 in Boulevard California represent an accurate depiction of the view of the project at 3-5 years of tree growth, particularly View 6, which represents the closest viewpoint of the 7 total simulations.

Tree Size at Planting

Tree size at planting determines the starting size from the time of planting. According to Todd Power at Arid Zone Trees in a telephone conversation (480-987-9094) a 36" box Sonoran Palo Verde arrives for installation at a height of approximately 10 feet, while a 48" box arrives at a height of 10-14 feet. This represents approximately 12-18 months worth of in-ground growth. At the request of the County Landscape Architect, SiteMaster has agreed to upgrade the specified installation size from a 36" box to a 48" box. This represents a 1-1 ½ year growth period before the construction is even begun. The trees when planted are projected to be between 10-14' in height.

Rate of Growth

Several sources were consulted to determine the rate of growth. All sources agree that the Sonoran Palo Verde grows rapidly, especially when given supplemental water, as is proposed with the project. The California Polytechnic State University Urban Forest Ecosystems Institute indicates a growth rate of 36 inches per season. The University of Arizona Boyce Thompson Southwestern Arboretum indicates that "growth rate is moderate to rapid and increases with supplemental irrigation". The Baker Nursery in Arizona website shows a photo of a "6 year old specimen at mature size" that is clearly at least as large as those shown on the project photo-simulations. Todd Power of Arid Zone Trees stated that a 48" boxed Sonoran Palo Verde will grow to a mature height of 30-40 feet in 4 to 5 years. These statistics are all consistent with the photo-simulations that assume a 25-foot height in 3-5 years.

Tree Size at Maturity

Several sources listed a wide range of mature tree heights for the Sonoran Palo Verde. Cal Poly lists it at 20 feet, University of Arizona College of Agriculture at 36', Boyce Thompson Southwestern Arboretum at 15-30 feet, the Arizona Municipal Water Users Association at 25', and Arid Zone Trees lists it at 20-30' feet on their website but their Todd Power informed us that it grows to 30-40 feet. The SiteMaster photo-simulations assumed a height of 25 feet at 3-5 years. This is conservatively close to the lower end of the range of sources consulted.

Geometrical Calculation

The attached statement from Artistic Engineering on the accuracy and methodology for their photo-simulations for SiteMaster Site CA102 describes the technical approach used in incorporating all of these statistical factors into the end product. The photo viewpoint was surveyed and entered along with dimensions from the plot plans and landscape plans into a 3-D computer model, and a precise virtual photograph was generated. That virtual photograph incorporates camera azimuths and all horizontal and vertical dimensions to create a human-eye-equivalent representation of the project from each vantage point.

At the County's request View 6 is taken from a very close distance in order to represent the view from the street and nearest neighbor. From that distance the viewpoint is looking upwards at a steep angle, with the trees very close in the foreground (approximately 50' from camera) and the water tank at approximately 100' from camera. From this perspective the trees would appear much taller in respect to the tank, which was the intention of this viewpoint to show how the trees would obscure the tank from the close range view of the neighboring property.

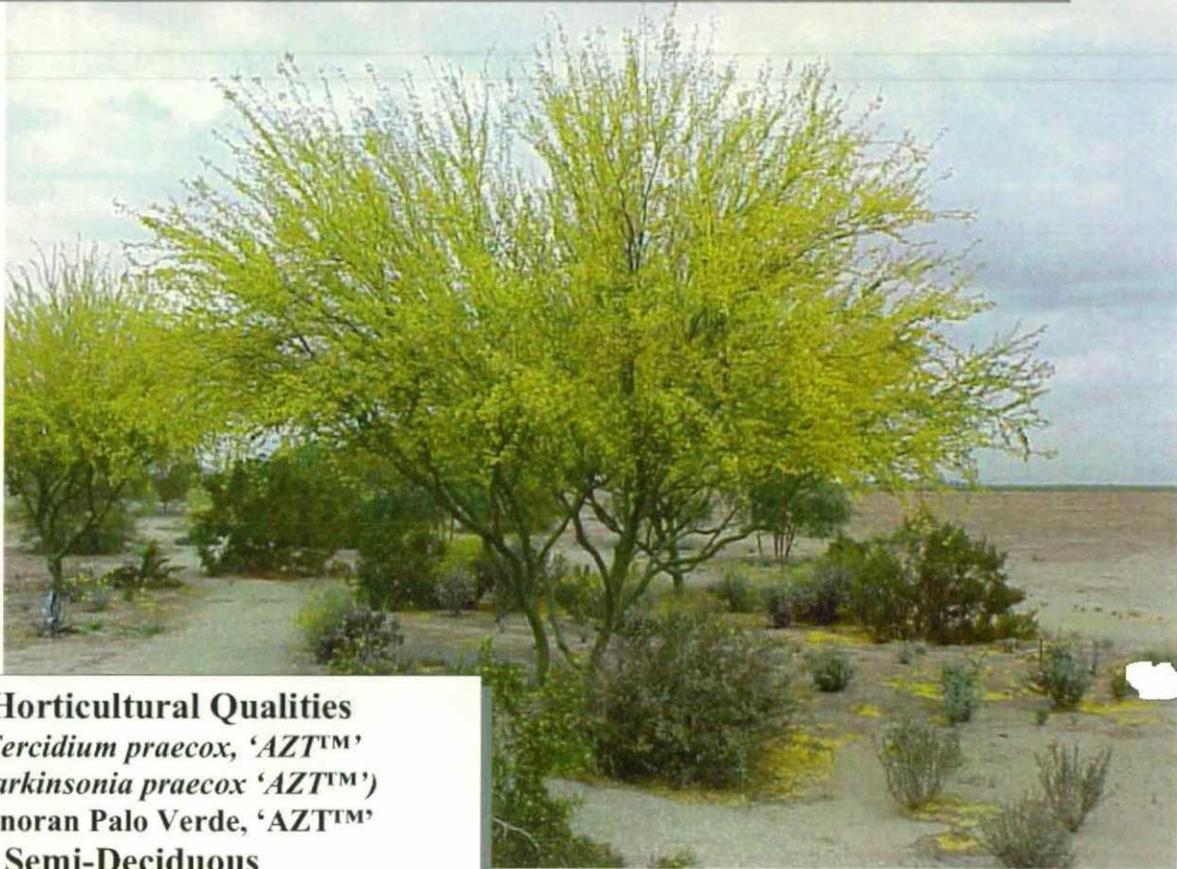
Summary

The seven photo-simulations show a highly accurate representation of the project at 3-5 years after construction. The proposed Sonoran Palo Verde trees will be planted as large specimen sizes (48" boxes, between 12-14' height), have a rapid rate of growth (36" per season), and will reach a mature height (conservatively projected in the simulations at 25') in 3-5 years, as shown.

Arid Zone Trees



Cercidium praecox 'AZT™', Sonoran Palo Verde



Horticultural Qualities

Cercidium praecox, 'AZT™'
(*Parkinsonia praecox* 'AZT™')
Sonoran Palo Verde, 'AZT™'

Foliage: Semi-Deciduous

Mature Height: 20' - 30'

Mature Width: 20' - 40'

Growth Rate: Moderate to Fast

Hardiness: Below 18 F

Exposure: Full Sun

Leaf Color: Green

Shade: Filtered

Flower Color: Yellow

Flower Shape: Funnel Shaped Petals

Flower Season: Spring

Thorns: Yes

Box Sizes Produced: 24", 36" & 48"

Propagation Method: Cloning



www.aridzonetrees.com

Arid Zone Trees, P. O. Box 167, Queen Creek, AZ 85142, Phone 480-987-9094 e-mail: info@aridzonetrees.com



SONORAN PALO VERDE - *Parkinsonia praecox*



General Notes

Utility friendly tree.

- Native To: Sonoran Desert
- Habit: Erect or Spreading. Has Deciduous foliage.
- Shape: Rounded or Umbrella
- Sunset Zones: 12, 13 and 18 - 20
- Exposure: Full Sun
- Water Needs: Moist to Dry Soil. Drought tolerant.
- Soil Type: Loam or Sand
- Soil pH: Neutral to Highly Alkaline
- Height: 20 feet
- Growth Rate: 36 Inches per Season
- Landscape Use: Screen
- Longevity: 50 to 150 years
- Leaves: Pinnately Compound Odd Blue Green or Medium Green. Deciduous.
- Flowers: Yellow. Flowers in Spring.
- Fruit: Brown or Mostly Green Pod (1.50 - 3.00 inches), fruits in Winter or Summer.
- Bark: Green, Smooth
- Shading Capacity: Rated as Moderately Low in Leaf and Low out of Leaf.
- Branch Strength: Rated as Medium
- Litter Issue: Dry Fruit
- Root Damage Potential: Rated as Low
- Health Hazard: None Known

Release Date: April 19, 2007

Our State Tree puts on a show in April

By Laura Murphy

If months were associated with color, April would be yellow. Many of our native desert blooming plants have yellow blossoms. One of the most spectacular and easy to see examples is the Palo Verde tree. It is found throughout the washes and open areas all over town as well as in many landscapes.

The name Palo Verde literally translated means “green stick” in Spanish and is a very appropriate name. All parts of the tree from the leaves to the branches, limbs and trunk are green. **These trees are superbly adapted to the desert. They are among the most drought tolerant trees available.** When in bloom, the Palo Verde is also one of the most beautiful.



Native to the southwest desert and Mexico, the Palo Verde is the state tree of Arizona. Once established these trees truly need no supplemental water to live. One look around in our washes and open lots will prove that. However, in a landscape setting, some supplemental water will accelerate growth, prevent limb die-back and produce a more lush and attractive tree.

To survive the harsh desert climate, the Palo Verde can do some amazing things. The bark of the tree is green and can photosynthesize something that in most plants only leaves do. This allows the leaves to be very small which decreases water loss through evaporation and transpiration. The leaves can also be shed if extreme drought occurs. During periods of extended drought, small branches will also die back. When water again becomes available, new branches will sprout out.

There are four species and one hybrid tree that are commonly found and go by the name Palo Verde. While all of them have the typical green bark, spines, pods and yellow spring time flowers, there are differences which should be considered when choosing a tree for your landscape.

The Blue Palo Verde has a more upright growth habit and a wide spreading crown. It will grow about 30 feet tall and as wide at maturity making it a large shade tree. It will be the first of the Palo Verdes to bloom. It has become a favorite tree for street side plantings and public areas in Phoenix and Tucson.

The Foothills Palo Verde is also known as Little Leaf Palo Verde. It is a shrubbier, slower growing tree. It will reach about 20 feet tall. The blossoms are a paler yellow with a delicate fragrance. Each branch ends in a thorn, making it undesirable for planting close to walkways.

The Sonoran Palo Verde is also called Palo Brea. This tree has smooth, blue-green bark that looks like a leotard clinging to the branches. This tree is more sculptural looking. It has fewer lower branches and at 35 feet, is a taller tree. It is an ideal tree for a focal point in a larger yard.

The Mexican Palo Verde has a rapid growth rate and unlike its cousins, has a midrib that looks like a long pine needle. The leaves attach to this but are only seen for a short period of time. This tree will be up to 30 feet tall. It can reseed itself easily and seedlings can become a problem. It has been suggested that this Palo Verde should not be planted close to natural preserves and waterways do to its rampant ability to proliferate.

The new kid on the block is a naturally occurring three-way hybrid between the Blue Palo Verde, the Foothills Palo Verde and the Mexican Palo Verde. Because it was found and worked on by researchers at the Arizona Sonoran Desert Museum, it is called the Desert Museum Palo Verde. This tree has all the good characteristics of each of its parents. These include rapid growth, strong upright branching structure, large showy yellow flowers that bloom over a long period of time and disease and pest resistance. In addition, it has no spines, few pods and very little litter.



Palo Verde Blossoms

This is the tree that has been planted along downtown McCullough Boulevard. Other named hybrids are also becoming available from other growers. Look to the nursery for growth characteristics and availability.

The Palo Verde can be used in many settings in the landscape. It is perfectly at home in any kind of naturalistic setting. However the beauty of the tree and its magnificent spring time bloom display make it attractive for any setting. While it will survive on no water it can also be planted near areas that get a lot of water such as a lawn or planting bed. Like all trees, be careful about planting too close to your septic system, power lines or foundations.

As a native tree the Palo Verde will provide food and homes for our native wildlife. Hummingbirds love to nest in the tree and raise their young. I have a Palo Verde in the front and backyards of my home and for many years each has provided a home for a local hummingbird family. Mourning doves and White wing doves will also nest in Palo Verdes, as well as many other species of birds. The pods are devoured by small animals, rabbits munch on fallen litter and quail will roost in them at night. Every living thing including people will appreciate the shade provided in the summer.

When considering a new tree for your landscape, think about the non-fussy, water-thrifty, Palo Verde.

Laura Murphy is a Lake Havasu City Master Gardener. For more information, contact the Lake Havasu City Master Gardeners by calling their Hot Line at 505-4105. Master Gardeners are also available to answer you question on the first Tuesday of every month at the Library from 11 a.m. to 1 p.m.



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Palo Verde Trees for the Urban Landscape

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Palo Verde Species and Cultivars

Palo verdes are popular, drought tolerant landscape trees in the genus *Parkinsonia* (formerly *Cercidium*) and the family *Fabaceae*. The cultivated palo verdes range from large shrubs to medium sized trees and are native in the Sonoran Desert with *P. praecox* extending from Mexico to South America. Along with saguaro cactus, they are a staple of the Sonoran Desert and are used in many xeriscape plantings. *Parkinsonia florida*, blue palo verde, and *P. microphylla*, the Foothill palo verde, share the title of Arizona's official state tree.

Palo verde trees prefer full sun and well drained soil in cultivated landscapes. Growth rates vary depending on supplemental irrigation and species. Conspicuous green, smooth bark dominates the plant's appearance during periods of drought and cold when trees are leafless and gives them their common name 'palo verde' which in Spanish means 'green stick'. Shoots are armed with small thorns at the nodes or the end and leaves are small, bipinnate. The green bark allows photosynthesis and with age turns from smooth with yellowish green color to rough with gray color. Besides the striking green bark, a profuse show of yellow flowers in spring makes palo verdes popular landscape trees. Line drawings of leaves, flowers and seed pods are presented with each species to aid in identification.

Palo verde plays an important role in the desert ecosystem providing habitat for wildlife and serving as a nurse plant for small cacti. Flowers produce much nectar for honey. Pods are sought by wildlife and

livestock and provided a staple for indigenous people in the Southwest. Pods can create heavy litter.

Parkinsonia aculeata (Mexican palo verde) is found in older landscapes, but is no longer considered a desirable landscape tree. Although a showy blooming tree, it is well armed, short-lived, produces heavy leaf litter, and reseeds freely on road sides, vacant lots, and in washes.

Parkinsonia florida (Blue palo verde)

The blue-green color of stems, branches, and densely growing twigs and the prolific bright yellow flowers in spring have made it one of the most popular palo verde species (Fig. 1). Foliage is fine textured and consists of one pair of pinnae with 2 - 4 leaflets (Fig. 2). Blue palo verde flowers in mid-spring, about three weeks earlier than *P. microphylla* (Foothill palo verde). Blue palo verde has a moderate growth rate. It is adapted to desert soils, but can also tolerate lawn conditions. Native to washes and plains with deep soil, trees benefit from additional irrigation once or twice during the hot, dry season. This plant is native to the Sonoran Desert, northern Sinaloa and Baja California, Mexico, and can be found at elevations from sea level to 4,000 feet (1,220 meters). Cold hardiness is reported to 10 °F (-12 °C).

The profuse amount of flowers and seed pods can create heavy litter under the tree canopy. Short thorns on twigs can be a problem near walkways. Blue palo verde generally require more pruning than other cultivated palo verdes, because they tend to spread more and have more secondary branches. Blue palo verde is susceptible to the palo verde borer, mistletoe, and witches' broom (see under problems).



Figure 4: *Parkinsonia microphylla* in full bloom

Parkinsonia praecox* subsp. *glauca (Argentine palo brea)

This tree grows up to 20 feet (6 meters) tall and originated in Argentina. It has the characteristic green bark, yellow flowers, and tan pods of the genus. It looks very similar to the Sonoran palo brea (*P. praecox* subsp. *praecox*) but has smaller leaflets. The subspecies *glauca* is considered to have greater drought tolerance than the Sonoran palo brea, because it is native in areas that receive as little as 4 inches (80 - 100 mm) of annual rainfall. Supplemental irrigation will increase growth. Argentine palo brea is also thought to have greater cold hardiness to 10 °F (-12 °C) based on observations where the Sonoran palo brea suffered greater cold damage after frost than the Argentine palo brea. This open shrub is often trained to a small tree by removing lower limbs and can be used in areas such as medians and patios where space may be limited. No problems have been observed on trees in the landscape.

'Brea' is the Spanish word for tar or pitch and refers to the waxy coating of the bark that can be scraped off and used as glue. The exudates from the bark are sweet and edible and have been used to make soap. Medicinal use of bark has been reported.



Figure 5: Leaf, flower and seed pod of *Parkinsonia praecox* subsp. *praecox*

Parkinsonia praecox* subsp. *praecox (Sonoran palo brea, Brea)

This small tree grows 15 to 30 feet (4.5 - 9 meters) tall with almost equal spread. This subspecies has the largest leaflets of the genus (Fig. 5). Flowers are golden yellow, the bark is bright green to lime green with foliage of blue green color. Seed pods are tan colored, oblong and 1.2 - 2.5 inches (3-6) cm in length and can create heavy litter. Growth rate is moderate to rapid and increases with supplemental irrigation. Plants tolerate a wide range of soil conditions.

Subspecies *praecox* is native to the widest range of the genus and occurs from northwest Mexico in disjunct populations as far south as Argentina, and from near sea level to 6,560 feet (2000 meters) elevation. This subspecies is considered less tolerant to drought and cold temperatures than the subspecies *glauca*. Hardiness of plants from Sonora has been reported at 20 °F (-6.5 °C). Hybrids of *P. praecox* with *P. microphylla* or *P. florida* have been observed.

Sonoran Emerald Hybrid Palo Verde



6 year old specimen, mature size in full bloom, late spring.
COVER: 2 year old specimen planted from 24" box

Like a sparkling jewel among the dusty hues of the desert, Arizona Wholesale Growers' Sonoran Emerald™ shines as nearly the perfect desert tree. Deep green in color, the Sonoran Emerald™ is lush and nearly evergreen with a spectacular flower display late May through June with sporadic flowering the rest of summer. Extremely wind tolerant, the initial crop of trees gracefully withstood the windy monsoons of 1999.

Mature size 25'x25'

Semi-evergreen

Thornless

Non-fruiting

Yellow flowers late spring

Rapid growth

Xeriscape once established

Extreme Wind Tolerance

Cold Hardy to 18°F

<http://www.bakernursery.com/httpdocs/locally%20grown.html>

Search

Botanical Name: *Cercidium praecox*
Common Name: Palo Brea

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Like

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Combination

Basics:

Hardiness: 25°F

Sun: full sun

Water: very low

Growth:

Growth Rate: fast

Mature Size: 25' height X 25' width

Foliage:

Mature Form: umbrellalike

Evergreen: semievergreen

Foliage Color: blue-green

Foliage Texture: medium

Flowers:

Flower Color: Bright yellow

Flower Season: late spring

Comments:

Litter: low

Thorns: small

Allergenic: no

Special Features:

Wildlife:

Features: Distinctive sculptural form. Lime-green bark.

Native to: Mexico into S. America

Recently reclassified as *Parkinsonia praecox*.

Photo Gallery

click a photo for a larger view



Photo: Scott Millard



Photo: Mountain States Wholesale Nursery



Photo: Mountain States Wholesale Nursery



Photo: Mountain States Wholesale Nursery



Photo: Mountain States Wholesale Nursery



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Regarding Photo-Simulations for:

Site Number: CA102
Site Name: Pine Valley

March 12th, 2015

Dear County Members and Others To Whom This May Concern:

The photo-simulations, provided by Artistic Engineering Inc., entitled CA102/Pine Valley are a digital representation of the proposed-site-conditions* for site CA102 and intended to illustrate the possible aesthetic impact(s) brought about by the possible future site. The photo-simulations are based on the 100% Zoning Plans/Landscape Plans dated 10/23/14 and any other information provided to Artistic Engineering by project applicant at time of requested work.

• **Methodology**

- The submitted photo-simulations were produced employing proprietary systems and software utilized by Artistic Engineering, for the purpose of creating an accurate, photorealistic depiction of the proposed design: Various onsite conditions were recorded with a laser distance meter and/or tape measure. Recommended vantage points were marked using a laser range finder. From each vantage point one or more photo(s) were taken and related photo data was recorded. This data includes: the camera azimuths/altitudes, focal length, and exposure settings; as well as the time of day and relevant lighting conditions.
- The site analysis was then used along with the proposed-site-conditions to generate a CAD model (3D digital mockup) of the existing/proposed site. Virtual cameras were placed into the site mockup at the various respective vantage points and adjusted according to the conditions present for each respective vantage point photo.
- With all relevant data assed, the CAD software was then used to render a composite existing/proposed image from each camera location.
- Each composite provides a human-eye-equivalent** representation (photo-simulation) of the proposed site from each vantage point.

In no event will Artistic Engineering Inc. be held liable for any loss of profit or any other commercial and public damage including but not limited to special, incidental, consequential or other damages resulting from the use of the provided information or data.

Sincerely,

A handwritten signature in black ink, appearing to read 'Brandon Hurley'.

Brandon Hurley
Project Manager-Artistic Engineering
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*Conditions are as provided by project applicant per zoning drawing, sketches, and other verbal or written notes.

** Please note that the actual perspective nature of any viewpoint can cause various discrepancies when compared to the orthographic representation in architectural drawings. This includes but is not limited to: line-of-site blocking by existing or proposed objects and variations of scale due to distance.