BOARD OF SUPERVISORS AGENDA ITEM REPORT

Requested Board Meeting Date: 11/21/2023

*= Mandatory, information must be provided

Click or tap the boxes to enter text. If not applicable, indicate "N/A".

***Title:**

P23TA00001 LANDSCAPE DESIGN MANUAL

***Introduction/Background:**

A proposal to amend by Resolution the Pima County Landscape Design Manual, pursuant to Zoning Code section 18.73, by updating bufferyard and screening standards and permitted and prohibited plant lists, and adding stormwater harvesting requirements.

***Discussion:**

The current Landscape Design Manual was approved by the board in the mid-1980s, has ten different bufferyard types with numerous planting and screening options, three approved plant lists, and is outdated.

***Conclusion:**

The proposed amendment, Screening and Bufferyard Design Manual, streamlines and simplifies bufferyard standards, reduces planting requirements (especially canopy trees) to promote landscape viability, and requires stormwater harvesting to provide sustainable landscape irrigation.

***Recommendation:**

Staff and the Planning and Zoning Commission recommend APPROVAL of the manual amendment.

***Fiscal Impact:**

0

***Board of Supervisor District:**

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☑ All

Department: Development Services Telephone: 520-724-8800

Contact: Mark Holden, AICP, Principal Planner Telephone: 520-724-6619

Department Director Signature: for Date: 10/31/23

Deputy County Administrator Signature: Date: 10/31/2023

County Administrator Signature: Date: 11/1/2023

Melissa Whitney

From: Thomas Drzazgowski
Sent: Wednesday, November 8, 2023 11:56 AM
To: COB_mail
Subject: Landscape Design Manual

A question came up as to why the P23TA00001 references a resolution. The Landscape Design Manual is adopted outside of the Pima County Zoning Code and is a separate document and is referenced in the Zoning Code. In these cases, it is adopted by resolution and not by ordinance. The resolution begins on page 5 of the Board packet which lists exhibit A. This is different than other types of resolutions since it is not amending a rezoning and it is a manual or supplemental document. If there are any questions, please let me know.

Tom Drzazgowski
Pima County - Chief Zoning Inspector
201 N Stone Av – 1st Floor
520.724.6675

PIMA COUNTY
DEVELOPMENT SERVICES

TO: Honorable Board of Supervisors

FROM: Chris Poirier, Deputy Director
Public Works-Development Services Department-Planning Division

DATE: October 31, 2023

SUBJECT: **P23TA00001 LANDSCAPE DESIGN MANUAL**

The above referenced Comprehensive Plan amendment is scheduled for the Board of Supervisors' **TUESDAY, NOVEMBER 21, 2023** hearing.

REQUEST: A proposal to amend by Resolution, the Pima County Landscape Design Manual.

APPLICANT: Pima County Development Services Department, Planning Division

DISTRICT: All

STAFF CONTACT: Mark Holden, AICP, Principal Planner

PUBLIC COMMENT TO DATE: As of October 31, 2023, 35 written public comments have been received in addition to verbal comments received during stakeholder meetings.

PLANNING & ZONING COMMISSION RECOMMENDATION: APPROVAL 8-0 (Commissioners Hook and Truitt were absent)

STAFF RECOMMENDATION: APPROVAL

TD/MH/ds
Attachments

PIMA COUNTY
DEVELOPMENT SERVICES

BOARD OF SUPERVISORS MEMORANDUM

SUBJECT: P23TA00001

FOR NOVEMBER 21, 2023 MEETING OF THE BOARD OF SUPERVISORS

TO: HONORABLE BOARD OF SUPERVISORS

FROM: Chris Poirier, Deputy Director Tom Drzazgowski
Public Works-Development Services Department-Planning Division

DATE: October 31, 2023

ADVERTISED ITEM FOR PUBLIC HEARING

LANDSCAPE DESIGN MANUAL AMENDMENT RESOLUTION

P23TA00001 LANDSCAPE DESIGN MANUAL
A PROPOSAL TO AMEND BY RESOLUTION THE PIMA COUNTY LANDSCAPE DESIGN MANUAL, PURSUANT TO ZONING CODE SECTION 18.73, BY UPDATING BUFFERYARD AND SCREENING STANDARDS AND PERMITTED AND PROHIBITED PLANT LISTS, AND BY ADDING STORMWATER HARVESTING REQUIREMENTS. On motion, the Planning and Zoning Commission voted to recommend **APPROVAL** 8-0 (Commissioners Hook and Truitt were absent). Staff recommends **APPROVAL.**
(Districts: All)

Planning and Zoning Commission Public Hearing Summary (September 27, 2023)
The public hearing was held in person and virtually. Some commissioners and staff were present while others attended virtually and through the telephonic option. Staff attended and presented in person.

Staff introduced the case, explaining that the manual provides design standards for 'bufferyards' between two zones or uses of dissimilar intensity to protect the lesser intensity use from the impacts of the adjacent use. Staff detailed the changes made between the older (*circa* 1985) manual and the final draft manual, including: simplification of the bufferyard requirements; requiring stormwater harvesting infiltration basins; and, the new official regulatory and prohibited plant lists. Because the manual only regulates bufferyards (and not landscaping on private properties), the title of the manual was changed to *Screening and Bufferyard Design Manual.*

A commissioner asked why oleander and palo verde are on the prohibited plant list. Staff responded that oleander is an introduced species that can become invasive outside of cultivation and being highly toxic, provides limited wildlife or habitat benefit; and, the prohibited tree is the Mexican palo verde, which also has a tendency to be weedy. Staff continued that landscape architects who participated in the preparation of the manual suggested prohibiting ornamental species that have begun to escape cultivation.

Another commissioner agreed about oleander, stating he has seen it growing along a high-elevation trail in the Coronado NF, and that Mexican palo verde and yellow bird of paradise are appropriate additions to the prohibited plant list. The commissioner continued to ask if bufferyard requirements include the walls constructed around individual lots within subdivisions. Staff responded that bufferyard walls are for subdivision perimeters only. The commissioner asked how the undisturbed natural desert bufferyard is determined (versus a disturbed site). Staff responded that undisturbed desert sites are easy to identify, but that developers may be allowed to restore disturbed sites to a natural condition, though installing a bufferyard is generally easier.

The commissioner continued with questions about hybrids and cultivars in the regulated plant list. Staff responded that cultivars (i.e., phenotypes) of the same native species will be permitted, but hybrids, which could be crossed with non-native species, will not. The commissioner asked about manual revisions and exceptions being under the purview of the Planning Director (rather than the board). Staff responded that the manual update must go to the board for approval, but the manual itself is not zoning code and the director's ability to approve revisions provides greater flexibility. The commissioner asked about the difference between simple revisions and board-approved amendments. Staff responded that requested revisions must meet the Purpose and Overview of the manual.

A commissioner asked about concerns regarding screening being required outside the bufferyard. Staff responded that requirement was changed and screening may be erected within the bufferyard. The commissioner quoted from a comment letter which states that species not being considered for the regulatory plant list have been otherwise chosen for use in the region due to their ability to thrive and fit in with the native environment. The commissioner stated that the same justification was likely used for introduced non-native plants that became invasive problems (e.g., cheatgrass, buffelgrass), and that these plants have thrived and fit in too well within natural environments.

A commissioner opined that he is supportive of Chilean mesquite being included on the prohibited plant list, due to its appearance and lack of wildlife habitat qualities. Staff responded that additions could be made to the approved plant list through the revision process.

The commission opened the public hearing. No one requested to speak and the public hearing was closed.

Commissioner Gungle moved to recommend **APPROVAL** of the final draft manual amendment; Commissioner Matter gave second.

By a voice vote the commission voted to recommend **APPROVAL** of the final draft manual amendment 8-0 (Commissioners Hook and Truitt were absent).

TD/MH/ds
Attachments

RESOLUTION 2023-_____

A RESOLUTION OF THE BOARD OF SUPERVISORS OF PIMA COUNTY, ARIZONA; RELATING TO PLANNING; AMENDING THE PIMA COUNTY LANDSCAPE DESIGN MANUAL.

IT IS RESOLVED BY THE BOARD OF SUPERVISORS OF PIMA COUNTY, ARIZONA AS FOLLOWS:

Section 1. The Pima County Landscape Design Manual is hereby amended pursuant to Zoning Code chapter 18.73 by updating bufferyard and screening standards and permitted and prohibited plant lists, and by adding stormwater harvesting requirements, attached to this Resolution as Exhibit A and incorporated by this reference.

Section 2. The various County officers and employees are authorized and directed to perform all acts necessary to give effect to this Resolution.

Section 3. This Resolution shall become effective on the date of adoption.

Passed and adopted, this _____ day of _____, 2023.

_____
Chairman, Pima County Board of Supervisors

ATTEST:

_____
Clerk, Board of Supervisors

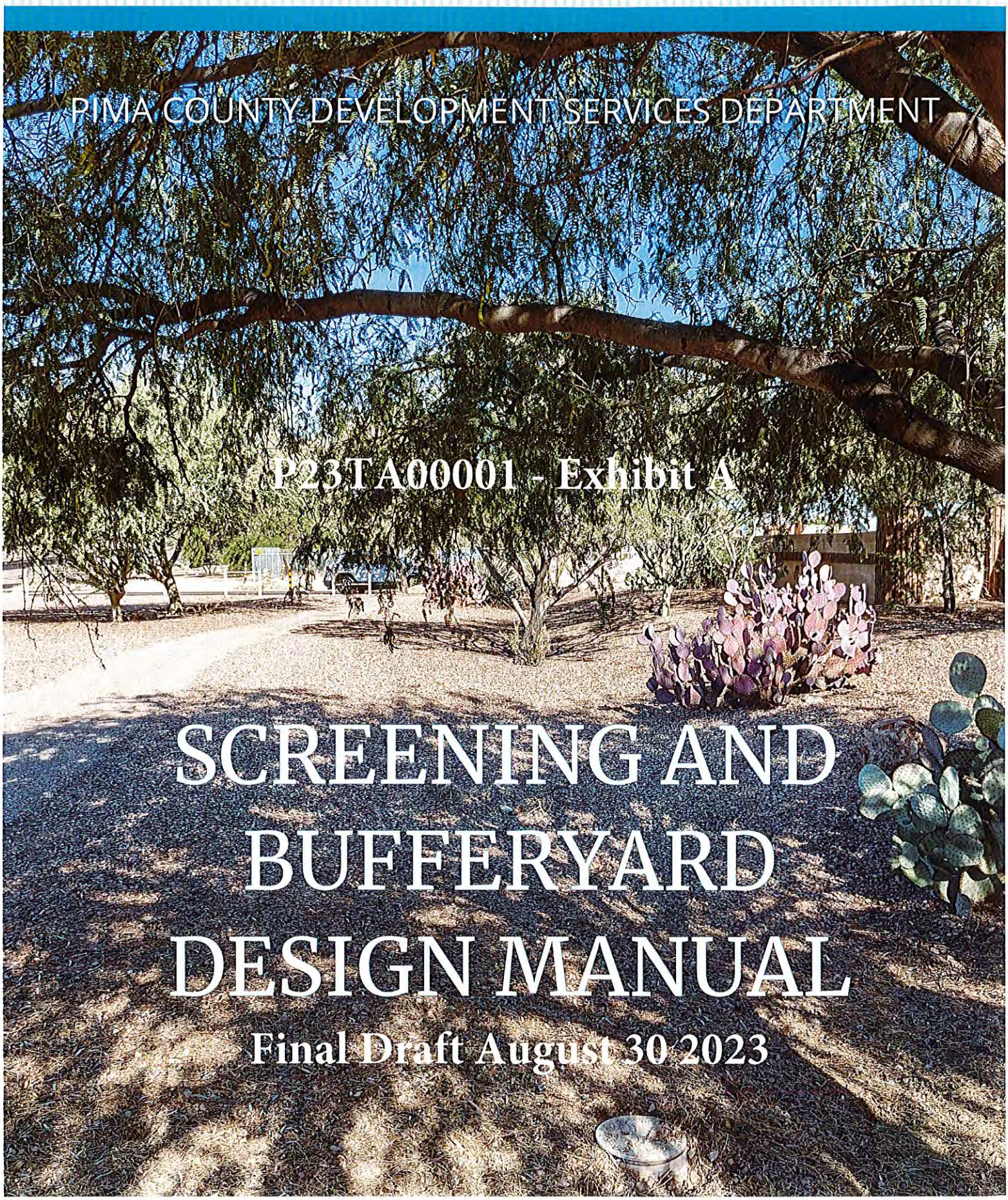
APPROVED AS TO FORM:

_____
Deputy County Attorney
Jacob Kavkewitz

APPROVED:

_____
Executive Secretary
Planning and Zoning Commission

P23TA00001



PIMA COUNTY DEVELOPMENT SERVICES DEPARTMENT

P23TA00001 - Exhibit A

SCREENING AND BUFFERYARD DESIGN MANUAL

Final Draft August 30 2023

PIMA COUNTY DEVELOPMENT SERVICES DEPARTMENT

SCREENING AND BUFFERYARD DESIGN MANUAL

Final Draft August 30 2023

This manual contains references and standards needed to implement the requirements of the Pima County, Arizona, Code of Ordinances, Chapter 18.73, Landscaping, Buffering and Screening Standards.

This document was prepared by McGann and Associates under contract to Pima County Development Services Department to update the former Landscape Design Manual, August 2023.

Cover image provided by McGann and Associates.

TABLE OF CONTENTS

INTRODUCTION

FOR BUFFERYARD REQUIREMENTS IN PIMA COUNTY, AZ (SECTION 18.73.040)

PURPOSE

This manual contains references and standards to implement the requirements of the Pima County (AZ) Zoning Code, Chapter 18.73, Landscaping, Buffering and Screening Standards. The purpose of this chapter is to 1) promote the region's unique desert environment, 2) conserve groundwater and Colorado River water resources by implementing low impact development practices, 3) require a desert-adapted regional plant palette, and 4) protect public health, safety and general welfare.

OVERVIEW

Within chapter 18.73, Section 18.73.040, Screening and Bufferyard Requirements references the use of bufferyards, defined as landscaping elements, screening devices and physical space, as depicted in this *Screening and Bufferyard Design Manual,* used for reduction of the potentially adverse impacts of adjoining, dissimilar land uses.

The land use zones in the Pima County Code (Chapter 18.05) are ranked according to their intensity, based on the type and degree of nuisance or negative impact the more intensive use is likely to impose on less intensive, adjacent land uses. In these cases, developers shall provide bufferyards, based upon the requirements of this *Screening and Bufferyard Design Manual,* between uses to minimize the negative effects of their dissimilarity.

Planning, design and installation of landscape bufferyards, including stormwater infiltration basins, should be integrated early into the design and engineering of a site. Design for drainage, detention/ retention and water harvesting on a site occurs early in the design process, working with the topography and contours of the site; bufferyards and basins should be part of that process. The water harvesting requirement for infiltration basins should be tied into drainage across the site.

The bufferyard standards in this manual specify the width to be dedicated and the density and diversity of planting required, with options for screening, to ameliorate nuisances between adjacent land uses or between a land use and public right-of-way (ROW). The standards also promote appropriate linkages (including but not limited to pedestrian and bicycling connectivity and safe routes) to compatible uses and public ROWs.

The manual also directs the use of water harvesting to increase on-site infiltration to benefit landscaping and reduce off-site drainage and erosion. Stormwater infiltration basins provide supplemental irrigation to landscape plants, which also contributes to shade and cooling, reduced flooding and improved stormwater quality, wildlife habitat and food source, and traffic calming.

The manual provides desert-adapted plant species permitted for use in bufferyards, and those that should especially be avoided or removed if found in the landscape.

DESIGN MANUAL CONTENT

The *Screening and Bufferyard Design Manual* is divided into the following sections:

- **Bufferyard Requirements** (p. 5) Steps for identifying the required bufferyard by use in **Table 1** and the requisite parameters in **Table 2.**
  - » **Table 1 Required Bufferyard by Use** (p. 6) Places each county zone and ROW type into a Use Category and designates a Bufferyard Type required (A through E) between two Use Categories.
  - » **Table 2 Bufferyard Requirements** (p. 7) Includes canopy tree and understory density planting for each Bufferyard Type option, including a natural undisturbed desert bufferyard option, as well as types of screening.
- **Planting Illustrations** (pp. 8-10) General graphic display of the required planting for all bufferyard types (A - E) and their width options.
- **Screening Requirements** (p. 11) Information on design and materials, types of screening, and optional pedestrian access.
  - » **Screening Illustrations** (p. 12) Allowed types of screening that may be used along with photographic examples.
- **Water Harvesting Requirements** (p. 13) General parameters for stormwater infiltration basins within bufferyards.
  - » **Stormwater Infiltration Basin Illustrations** (p. 14) Examples of a typical water harvesting infiltration basin with general design guidance.
- **Official Regulatory Plant List** (pp. 15-28) Plant species by category, permitted for planting in bufferyards, with basic information about mature plant size and region of origin.
- **The Prohibited Plant List** (p. 29) Plant species that are designated noxious, invasive and/or non-native, which shall not be used within bufferyards, and should be removed if found in the landscape.
- **Appendix** (p. 30) Additional resources on water harvesting, maintenance, and plant information.

REVISIONS AND EXCEPTIONS

The Planning Director or their designee may approve minor changes to this manual, which will be included in the manual by addendum. The Planning Director or designee may grant exceptions to the requirements of this manual on a project-by-project basis. Review and approval of revisions and exceptions will be based on the Purpose and Overview sections located in the Introduction of this manual.

BUFFERYARD REQUIREMENTS

The following steps are intended to help determine the type of Bufferyard and provide some additional requirements:

1 Identify the Use Category of the proposed use.

2 Identify the Use Category of the existing land use/zone on adjacent properties, and any adjacent public street, scenic or gateway route and highway. (Scenic Routes are identified in the Pima County DOT Major Street and Scenic Routes Plan. Gateway Overlay Zones are referenced in the Pima County Zoning Code, Chapter 18.78-Gateway Overlay Zone.)

3 Determine the Bufferyard Type required on each boundary (or segment thereof) of the proposed use subject site by referring to the indicated letter designation from **Table 1**.

On adjacent, vacant parcels, the first use to develop shall provide the required bufferyard; the second use shall install any additional plant material and dedicate the land necessary to provide any additional bufferyard between the two uses, if/when the second use develops.

4 Choose an option from **Table 2** for required width, plant densities and screening.

- Bufferyards shall be located on the outer perimeter of a lot or parcel, extending to the boundary line; screening shall be located within the bufferyard, near the more intensive use.
- Bufferyard width may vary or meander, provided that the average bufferyard width is not less than the required width.
- Existing trees and plants in bufferyard may be used to satisfy planting requirements if they are included in the **Official Regulatory Plant List**.

5 Information on plants within the bufferyards should demonstrate meeting requirements for plan review, such as in the following sample table.

BUFFERYARD TYPE A
LENGTH = 350 LF, WIDTH = 10 LF
TOTAL AREA = 3,500 SF

	REQUIRED	PROVIDED
TREES:	11	11
SHRUBS:	21	23
OTHER UNDERSTORY	32	40

6 If irrigation systems are installed, they shall incorporate drip or other water-saving technology.

TABLE 1 | REQUIRED BUFFERYARD BY USE

SEE TABLE 2 FOR MINIMUM BUFFERYARD REQUIREMENTS

	EXISTING ADJACENT USE/ZONE							
PROPOSED USE	Low Density Residential	High Density Residential and Mixed-Use	General Commercial	Light Industrial	Heavy Industrial	Park/Other	Street 1	Street 2
Low Density Residential	None	None	None	None	None	None	A	B
High Density Residential and Mixed-Use	C	None	None	None	None	B	E	C
General Commercial	C	B	None	None	None	C	E	C
Light Industrial	D	D	D	None	None	D	B	D
Heavy Industrial	D	D	D	None	None	D	C	D
Park/Other	None	None	None	None	None	None	None	C

USE CATEGORIES

Low Density Residential

IR Institutional Reserve
SR Suburban Ranch
SR-2 Suburban Ranch Estate
RH Rural Homestead
SH Suburban Homestead
CR-1 Single Residence
CR-2 Single Residence
CR-3 Single Residence
GR-1 Rural Residential

High Density Residential and Mixed-Use

TH Trailer Homesite (RV)
CR-4 Mixed-Dwelling Type
CR-5 Multiple Residence
TR Transitional
CMH1 County Manufactured and Mobile Home
CMH2 County Manufactured and Mobile Home
MU Multiple Use

General Commercial

MR Major Resort
RVC Rural Village Center
CB-1 Local Business
CB-2 General Business

Light Industrial

CPI Campus Park Industrial
CI-1 Light Industrial/Warehousing

Heavy Industrial

CI-2 General Industrial
CI-3 Heavy Industrial
115 kV Substation

Park/Other

Golf Course
Public Park/Garden

Street 1

Public Street

Street 2

Scenic Route
Gateway Overlay
Federal and State Highways

TABLE 2 | BUFFERYARD REQUIREMENTS

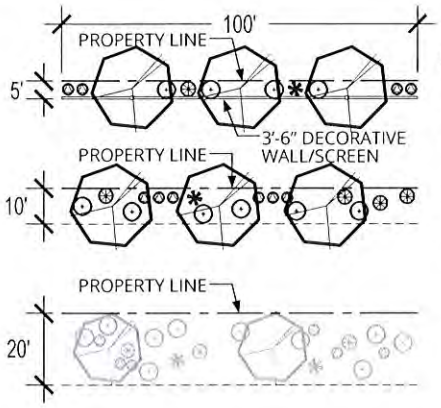
TYPE	WIDTH	TREES PER 100 FEET*	UNDERSTORY PER 100 FEET*	SCREENING
A	Five (5) feet	3 Canopy Trees	4 Shrubs 6 Cacti & Succulents/Grasses/Subshrubs	3' 6" Decorative Wall/Screen
	Ten (10) feet	3 Canopy Trees	6 Shrubs 9 Cacti & Succulents/Grasses/Subshrubs	None
	Twenty (20) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable
B	Ten (10) feet	4 Canopy Trees	8 Shrubs 10 Cacti & Succulents/Grasses/Subshrubs	6' Decorative Wall/Screen
	Twenty (20) feet	4 Canopy Trees	12 Shrubs 15 Cacti & Succulents/Grasses/Subshrubs	6' Decorative Fence
	Thirty (30) feet	4 Canopy Trees	12 Shrubs 15 Cacti & Succulents/Grasses/Subshrubs	None
	Forty (40) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable
C	Ten (10) feet	4 Canopy Trees	10 Shrubs 10 Cacti & Succulents/Grasses/Subshrubs	6' Decorative Wall/Screen
	Twenty (20) feet	4 Canopy Trees	15 Shrubs 15 Cacti & Succulents/Grasses/Subshrubs	6' Decorative Fence
	Thirty (30) feet	4 Canopy Trees	20 Shrubs 20 Cacti & Succulents/Grasses/Subshrubs	None
	Forty (40) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable
D	Twenty (20) feet	4 Canopy Trees	20 Shrubs 10 Cacti & Succulents/Grasses/Subshrubs	6' Decorative Wall/Screen
	Thirty (30) feet	4 Canopy Trees	30 Shrubs 15 Cacti & Succulents/Grasses/Subshrubs	6' Decorative Fence
	Forty (40) feet	4 Canopy Trees	30 Shrubs 25 Cacti & Succulents/Grasses/Subshrubs	Not Applicable
	Fifty (50) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable
E	Ten (10) feet	4 Canopy Trees	5 Shrubs 8 Cacti & Succulents/Grasses/Subshrubs	3' 6" Decorative Wall/Screen
	Twenty (20) feet	4 Canopy Trees	10 Shrubs 16 Cacti & Succulents/Grasses/Subshrubs	6' Decorative Fence
	Forty (40) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable

* Provides minimum required quantities of trees and understory plants from the **Official Regulatory Plant List**. Additional plants from the plant list are permitted.

PLANTING ILLUSTRATIONS

Illustrations show a 100' bufferyard segment for the widths listed in **Table 2 Bufferyard Requirements**, and provides the required quantity of trees and understory plants. Required screening is included in the illustrations, see Screening Illustrations for more information.

BUFFERYARD TYPE A



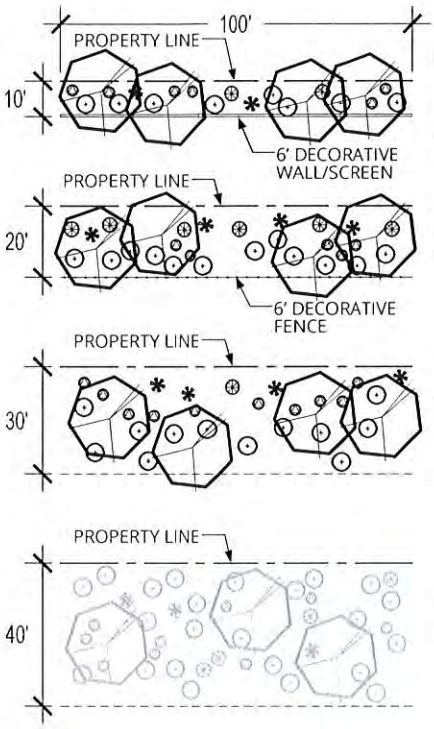
REQUIRED PLANT UNITS

3 Trees
4 Shrubs
6 Cacti & Succulents/Grasses/ Subshrubs

3 Trees
6 Shrubs
9 Cacti & Succulents/Grasses/ Subshrubs

Natural Undisturbed Desert

BUFFERYARD TYPE B



REQUIRED PLANT UNITS

4 Trees
8 Shrubs
10 Cacti & Succulents/Grasses/ Subshrubs

4 Trees
12 Shrubs
15 Cacti & Succulents/Grasses/ Subshrubs

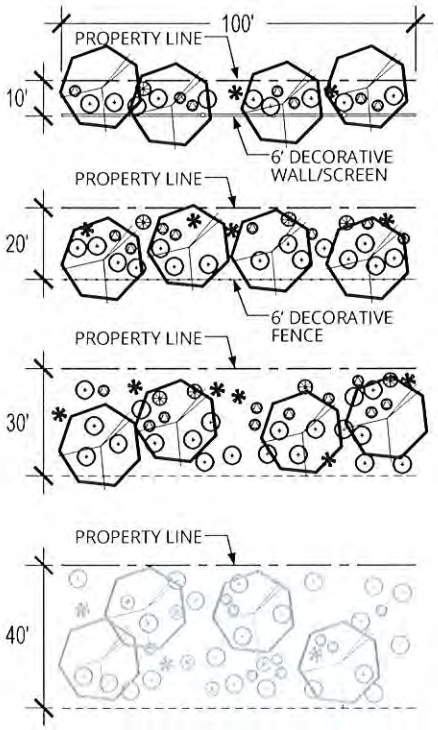
4 Trees
12 Shrubs
15 Cacti & Succulents/Grasses/ Subshrubs

Natural Undisturbed Desert

PLANTING ILLUSTRATIONS

Illustrations show a 100' bufferyard segment for the widths listed in **Table 2 Bufferyard Requirements**, and provides the required quantity of trees and understory plants. Required screening is included in the illustrations, see Screening Illustrations for more information.

BUFFERYARD TYPE C



REQUIRED PLANT UNITS

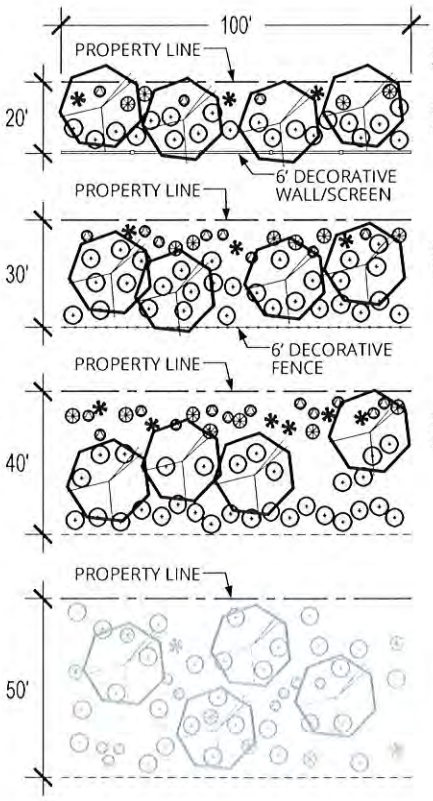
4 Trees
10 Shrubs
10 Cacti & Succulents/Grasses/ Subshrubs

4 Trees
15 Shrubs
15 Cacti & Succulents/Grasses/ Subshrubs

4 Trees
20 Shrubs
20 Cacti & Succulents/Grasses/ Subshrubs

Natural
Undisturbed
Desert

BUFFERYARD TYPE D



REQUIRED PLANT UNITS

4 Trees
20 Shrubs
10 Cacti & Succulents/Grasses/ Subshrubs

4 Trees
30 Shrubs
15 Cacti & Succulents/Grasses/ Subshrubs

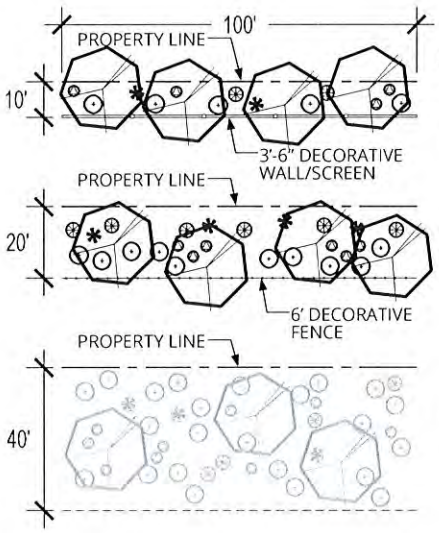
4 Trees
30 Shrubs
25 Cacti & Succulents/Grasses/ Subshrubs

Natural
Undisturbed
Desert

PLANTING ILLUSTRATIONS

Illustrations show a 100' bufferyard segment for the widths listed in **Table 2 Bufferyard Requirements**, and provides the required quantity of trees and understory plants. Required screening is included in the illustrations, see Screening Illustrations for more information.

BUFFERYARD TYPE E



REQUIRED PLANT UNITS

4 Trees
5 Shrubs
8 Cacti & Succulents/Grasses/ Subshrubs

4 Trees
10 Shrubs
16 Cacti & Succulents/Grasses/ Subshrubs

Natural
Undisturbed
Desert

SCREENING REQUIREMENTS

PURPOSE

The purpose of screening is to provide an opaque (wall/screen) or see-through (fence) barrier for boundary delineation, exclusion or confinement, security, and to shield views, noise and light trespass.

SCREENING DESIGN AND MATERIALS

- Screen may use a variety of materials, singly or in combination, but should avoid a uniform, monolithic appearance.
- Screen shall not use chain link (with or without slats), wood, vinyl or plastic, or similar materials that degrade in the desert environment.
- Standard grey CMU walls are prohibited.
- Decorative Wall/Screen is a solid screening that shall be constructed with masonry units, stone or sheet metal to be 100% opaque. Screening must be decorative, which requires the use of stucco, paint, texture, color or other elements, such as columns and caps, that improve the appearance of a block wall.
- Decorative Fences are a permeable screening that shall be constructed with metal posts, rails, and permeable panels or pickets. This does not exclude masonry or concrete columns.

LOCATION

- All screening shall be built within the bufferyard near the higher intensity use.
- Masonry walls or foundations shall be built outside of infiltration basins.

OPTIONS

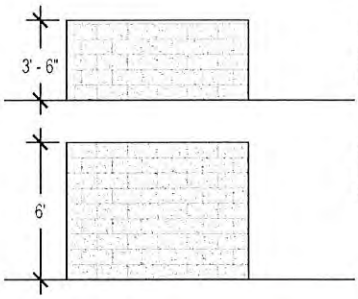
- If pedestrian or bicycle connectivity is provided through a bufferyard to an adjacent site, street or right-of-way, the required wall/screen or fence height can be reduced to 3'-6".

SCREENING ILLUSTRATIONS

Illustrations show the required screening as determined in **Table 2 Bufferyard Requirements.**

DECORATIVE WALL/SCREEN

Screen heights shown below meet the requirements for the listed bufferyards. Examples of additional solid screen styles are also shown for reference.



REQUIRED

Bufferyard A (5' Wide)
Bufferyard E (10' Wide)

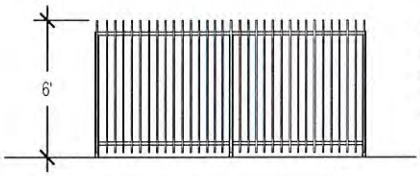
Bufferyard B (10' Wide)
Bufferyard C (10' Wide)
Bufferyard D (20' Wide)

DECORATIVE 3'-6" WALL/SCREEN EXAMPLES

DECORATIVE 6' WALL/SCREEN EXAMPLES

DECORATIVE FENCE

The illustration below meets the requirements for the listed bufferyards. Examples of additional permeable screen styles are also shown for reference.



REQUIRED

Bufferyard B (20' Wide)
Bufferyard C (20' Wide)
Bufferyard D (30' Wide)
Bufferyard E (20' Wide)

DECORATIVE 6' FENCE EXAMPLES

WATER HARVESTING REQUIREMENTS

Properly functioning stormwater basins depend on infiltration. Basins with infiltration rates greater than 1 inch per hour promote healthy vegetation, create drought resilience, and greatly improve water quality. Good infiltration depends on a good substrate and healthy soils. Application of organic mulch increases water infiltration and promotes soil moisture retention helping plants develop deeper root systems, which improves their stability. Basin bottoms also benefit from root systems of native bunch grass to promote water infiltration and improve soil stability.

Bufferyards must include stormwater infiltration basins as follows:

- Basins are required in all bufferyards, except for natural undisturbed desert bufferyards and bufferyards less than 10 feet wide.
- Organic mulch is preferred in basins to increase water quality and soil health benefits.
- To prevent loss of mulch from basins during larger storm events, consider placing mulch under riprap at least 4 inches in diameter or larger.
- Basins shall not contain fines or crushed rock mulch smaller than ½-inch in diameter.
- Basins shall be stabilized for dust control without impeding infiltration.
- Cacti, succulents, accents and other low-water use species shall be planted outside of the basin or on basin slopes.
- All water harvesting infiltration basins shall be integrated into and coordinated with the civil drainage and grading plan, and shall graphically represent the top of basin and bottom of basin on Improvement Plans, Grading Plans (Chapter 18.81 Grading Standards), and in Landscape Plans (Section 18.73.060 Landscape plan requirements).
- Basins shall be located away from irrigation valve boxes, underground utilities and the like.
- Basins shall meet the following setbacks as measured from the top of the basin slope:
  - » Minimum of 1 foot from pedestrian access path and off-street parking areas
  - » Minimum of 2 feet from back of curb or edge of pavement for streets with on-street parking
  - » Minimum of 10 feet from structures, or minimum setback specified in a geotechnical report for project
  - » Minimum of 4 feet from access space for maintenance

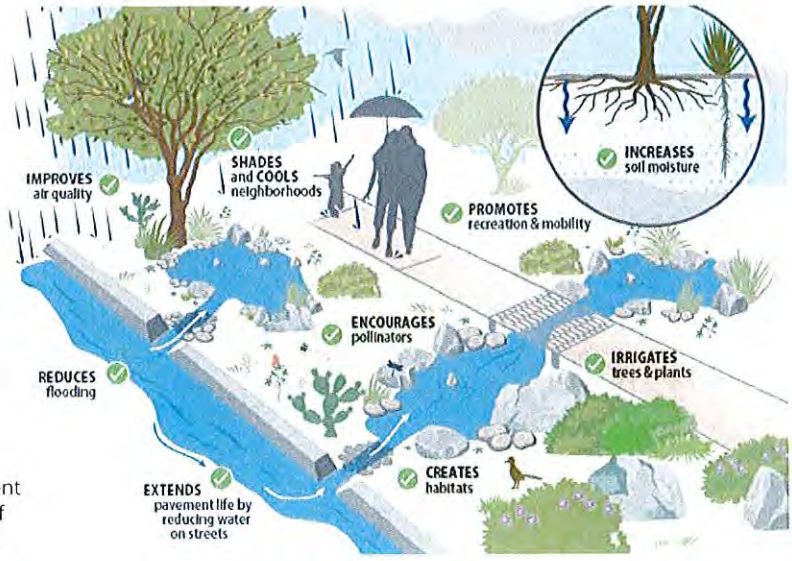


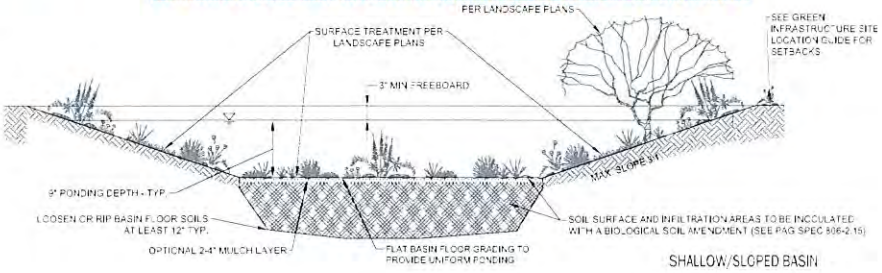
Illustration from Green Stormwater Infrastructure and Low Impact Development Standard Details and Site Guidance, City of Tucson and Pima County, November 2022

STORMWATER INFILTRATION BASIN ILLUSTRATIONS

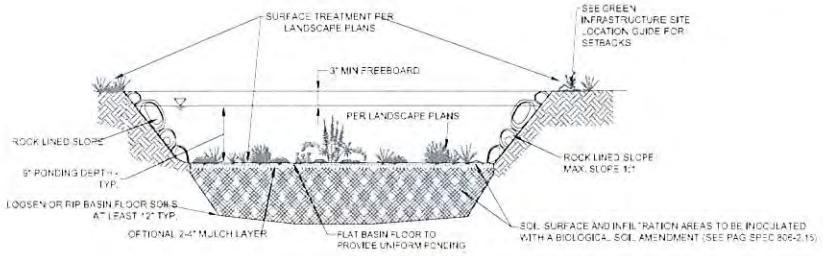
The illustrations below are typical examples of stormwater infiltration basins with general design guidance. More detailed information for water harvesting basins and similar green stormwater infrastructure is available in the county/city manual, Green Stormwater Infrastructure and Low Impact Development Standard Details and Site Guidance.

STORMWATER INFILTRATION BASIN EXAMPLES

Example Section View
Not To Scale

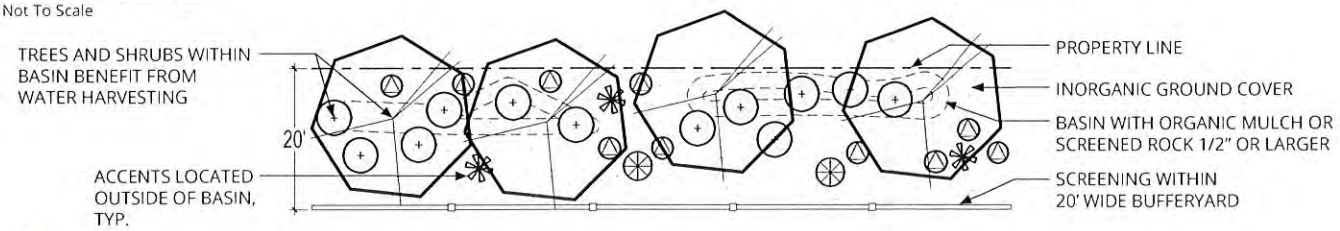


SHALLOW/SLOPED BASIN



STEEP/ROCKED BASIN

Example Plan View
Not To Scale



OFFICIAL REGULATORY PLANT LIST

OVERVIEW

This list of drought resistant, low-water use plants was compiled with the cooperation of recognized experts in the plant nursery, research and landscape design professions. It is recommended by Pima County for all regulatory and privately initiated landscaping requirements.

All plant materials on this list are approved for use in complying with the landscaping, buffering and screening requirements outlined in this ordinance. All cultivars (cultivated varieties) of plants on the list are also automatically approved for use. Hybrids are prohibited.

The materials are further recommended to individual property owners desiring locally available plant materials which offer cost-effective and aesthetically pleasing qualities, and that have been consistently used and proved successful in the eastern Pima County and Tucson area.

The plants on this list can be grown with moderate to no supplemental irrigation once they are established. Occasionally, for good appearance, supplemental irrigation may be applied during the growing season. In addition to the cacti on this list, any cacti salvaged and tagged in compliance with state agricultural and horticultural regulations may be used.

Even though all of the plants on the **Official Regulatory Plant List** meet the Arizona Department of Water Resources (ADWR) standard for low consumption, please check the regulations of the governing jurisdiction to determine whether a particular plant selection meets all locational, aesthetic, or functional requirements. For example, plants used for screening may have to be evergreen, have dense foliage, and grow to required heights. On the other hand, plants used within sight visibility triangles may have height restrictions. In some applications, there may be a requirement for native materials or a "desert or natural appearance."

The Pima County Planning Director or their designee may approve changes to the plant list, which would be included in the manual by addendum, and may grant exceptions on a project-by-project basis. Review and approval of changes and exceptions will be based on the Purpose and Overview sections located in the Introduction of this manual.

OFFICIAL REGULATORY PLANT LIST

KEY TO SYMBOLS

B Buffer Overlay Zone Use

E Evergreen

G Seed Grown or transplant on site only permitted

H Habitat — provide habitat for native birds and insects

M Male only

P Pollinators — provide food for native pollinators

S Semi-hardy — some dieback in a hard frost

T Toxic; may be harmful if eaten. For more information visit www.azpoison.com, or call the Arizona Poison Control Center at 1-800-222-1222.

NATIVE REGION DEFINITIONS

Chihuahuan Desert (CD) — broadly interpreted to include a large area of north central and northwest Mexico, southwest Texas, southern New Mexico and extreme southeast Arizona

Sonoran Desert (SD) — broadly interpreted to include the arid and semi-arid areas of northwest Mexico, southeast California and most of Arizona south of the Mogollon Rim

* — native to Pima County

Mojave Desert (MD)— broadly interpreted to include the arid areas of southeast California and southwestern Nevada with small portions extending into northwestern Arizona and southwestern Utah

PLANT CATEGORIES

The plant list organizes species by the following categories:

Cacti and Succulents

Grasses

Shrubs

Subshrubs (Groundcovers, Herbaceous Perennials, Shrubs Smaller Than 3' x 3')

Trees

Vines

CACTI AND SUCCULENTS

BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Agave americana	Century Plant	6' X 10'	CD	B/H
Agave angustifolia v. *marginata*	Narrow Leaf Agave	3' X 4'		B/H
Agave bracteosa	Squid Agave	2' X 2'	CD	B/H
Agave chrysantha	Golden Flower Agave	3' x 5'	SD*	B/H
Agave colorata	Mescal Ceniza	2' X 3'	SD	B/H
Agave desmettiana	Smooth Agave	3' X 3'		B/H/S
Agave filifera	Thread-Leaf Agave	2' X 3'	CD	B/H
Agave geminiflora	Twin-Flowered Agave	3' X 3'		B/H
Agave murpheyi	Murphey's Agave	3' X 3'	SD*	B/H
Agave ocahui	Ocahui Agave	2' X 3'	SD	B/H
Agave ovatifolia	Whale's Tongue Agave	4' X 5'		B/H
Agave palmeri	Palmer's Agave	3' X 4'	SD*	B/H/P
Agave parryi	Parry's Agave	2' X 2'	SD*	B/H
Agave parryi var. *huachucensis*	Huachuca Agave	3' X 3'	SD	B/H
Agave parviflora	Small Flowered Agave	.5' X .7'	SD*	B/H
Agave pelona	Mezcal Pelón	2' X 2.5'	SD	B/H
Agave schottii	Schott Agave	2' X 4'	SD*	B/H/P
Agave striata	Espadín	3' X 3'	MD	B/H
Agave utahensis	Utah Agave	1' X 2'	MD	B/H
Agave victoriae-reginae	Queen Victoria Agave	1' X 2'		B/H
Agave vilmoriniana	Octopus Agave	4' X 6'	SD	B/H/S
Agave weberi	Weber Agave	6' X 6'		B/H
Carnegiea gigantea	Saguaro	40' X 15'	SD*	B/H/P
Cylindropuntia arbuscula	Pencil Cholla	5' X 4'	SD*	B
Cylindropuntia bigelovii	Teddy Bear Cholla	5' X 3'	SD*/MD	B/H
Cylindropuntia versicolor	Staghorn Cholla	10' X 6'	SD*	B/H
Dasylirion acrotriche	Green Desert Spoon	4' X 5'	CD	

KEY: B = Buffer Overlay Zone Use, E = Evergreen, G = Seed Grown Only, H = Habitat, M = Male Only, P = Pollinators, S = Semi-Hardy, T = Toxic

CACTI AND SUCCULENTS (CONTINUED)

BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Dasylirion leiophyllum	Green Sotol	4' X 6'	CD	
Dasylirion quadrangulatum	Toothless Desert Spoon	4' X 5'	CD	
Dasylirion texanum	Texas Sotol	5' X 5'	CD	
Dasylirion wheeleri	Desert Spoon	4' X 5'	SD*/CD	B
Echinocactus grusonii	Golden Barrel Cactus	3' X 2'		B
Echinocereus engelmannii	Engelmann Hedgehog	1' X 2'	SD*	B
Echinocereus nicholii	Golden Spined Hedgehog	1' X 2'	SD*	
Euphorbia antisyphilitica	Candelilla	3' X 3'	CD	
Euphorbia lomelii	Lady Slipper	4' X 4'	SD	B/S
Ferocactus cylindraceus	Compass Barrel	2' X 1.5'	SD*/MD	B/H/P
Ferocactus emoryi	Coville Barrel	2' X 1.5'	SD*	
Ferocactus wislizeni	Fishhook Barrel	2' X 1.5'	SD*/CD	
Fouquieria columnaris	Boojum Tree	40' X 3'	SD	S
Fouquieria macdougalii	Mexican Tree Ocotillo	20' X 20'	SD	B/S
Fouquieria splendens	Ocotillo	16' X 13'	SD*/CD/MD	B/G
Hesperaloe campanulata	Bell Flowering Hesperaloe	3' X 3'		
Hesperaloe funifera	Giant Hesperaloe	5' X 5'	CD	
Hesperaloe nocturna	Night Flowering Hesperaloe	3' X 3'	CD	B
Hesperaloe parviflora and cultivars	Red Yucca	3' X 4'	CD	P
Lophocereus schottii	Senita Cactus	10' X 10'	SD	B
Lophocereus schottii f. monstrosus	Totem Pole Cactus	10' X 8'		
Mamillaria grahamii	Graham fishhook	0.5' X 1'	SD*/CD	B
Nolina bigelovii	Bigelow's Nolina	6' X 4'	SD/MD	B/H
Nolina matapensis	Tree Beargrass	20' X 6'	CD	B/H
Nolina microcarpa	Beargrass	3' X 6'	SD*	B/H
Nolina nelsonii	Blue Nolina	4' X 6'		H

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CACTI AND SUCCULENTS (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Nolina parryi	Parry's Beargrass	5' X 5'	SD/MD	B/H
Opuntia basilaris	Beavertail Pricklypear	2' X 3'	SD/MD	B
Opuntia engelmannii	Engelmann's Pricklypear	5' X 6'	SD*/CD/MD	B/H/P
Opuntia ficus-indica	Indian Fig	10' X 10'		H
Opuntia macrocentra	Black-Spine Prickly Pear	2' X 3'	SD*/CD	B/H
Opuntia phaeacantha	Brown-Spined Prickly Pear	3' X 5'	SD*/CD	H/P
Opuntia santa-rita and cultivars	Santa Rita Prickly Pear	4' X 4'	SD*/CD	B/H/P
Pachycereus marginatus	Mexican Fence Post	7' X 4'		S
Peniocereus greggii	Arizona Queen of the Night	6' X 3'	SD*	B/H/P
Stenocereus thurberi	Organ Pipe Cactus	8' X 5'	SD	B
Tephrocactus articulatus	Pinecone Pricklypear	3' X 1'		
Yucca baccata	Banana Yucca	3' X 5'	SD*/CD/MD	B/H
Yucca baileyi	Navajo Yucca	4' X 2'		B/H
Yucca brevifolia	Joshua Tree	15' X 8'	MD	B/H
Yucca constricta	Buckley Yucca	5' X 5'	CD	B/H
Yucca elata	Soaptree Yucca	10' X 5'	SD*/CD	B/H
Yucca faxoniana	Giant Dagger Yucca	7' X 4'	CD	B/H
Yucca glauca	Soapweed Yucca	3' X 3'	CD	B/H/S
Yucca harrimaniae	Harriman's Yucca	1' X 1.5'		B/H
Yucca pallida	Twistleaf Yucca	2' X 2'		B/H
Yucca rigida	Mexican Blue Dagger Yucca	12' X 5'	CD	B/H
Yucca rostrata	Beaked Yucca	12' X 9'	CD	B/H
Yucca schidigera	Mojave Yucca	15' X 10'	MD	B/H
Yucca schottii	Mountain Yucca	15' X 4'	SD	B/H
Yucca thompsoniana	Thompson's Yucca	10' X 5'	MD	B/H

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GRASSES				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Achnatherum hymenoides	Indian Ricegrass	2' X 2'	SD*/CD	B
Aristida purpurea	Purple Three-Awn	2' X 1'	SD*/CD	B
Bothriochloa barbinodis	Cane Beardgrass	3' X 3'	SD*/CD	B/H
Bouteloua spp.	Grama Grass	1' X 1'	SD*/CD	B/H
Cathestecum erectum	False Grama	0.5' X 1'	CD	B
Dasyochloa pulchella	Low Woollygrass, Fluffgrass	1' X 2'	SD*/MD	
Digitaria californica	Arizona Cottontop	2' X 1.5'	SD*/CD	B
Eragrostis intermedia	Plains Lovegrass	2' X 1'	SD*/CD	B
Heteropogon contortus	Tanglehead	3' X 2'	SD*/SD	B
Hilaria belangeri	Curly-Mesquite, Curly Mesquite Grass	0.5' X 1'	SD*/CD	B/P
Hilaria mutica	Tobosagrass	2' X 2'	SD*/CD	B
Hilaria rigida	Big Galleta, Big Galleta Grass	3' x 1'	SD*/CD/MD	B
Leptochloa dubia	Green Sprangletop	3' X 1'	SD*/CD	H
Muhlenbergia capillaris	Regal Mist	3' X 3'	U.S.	
Muhlenbergia dumosa	Bamboo Muhly	6' X 6'	SD*	B/H
Muhlenbergia emersleyi	Bullgrass	4' X 4'	SD*/CD	B/H
Muhlenbergia lindheimeri	Autumn Glow	5' X 5'	CD	
Muhlenbergia porteri	Bush Muhly	2' X 3'	SD*/CD/MD	B
Muhlenbergia rigens	Deergrass	4' X 4'	SD*/CD	B
Muhlenbergia rigida	Purple Muhlenbergia	5' X 3'	SD*/CD	B
Pappophorum vaginatum	Pappus Grass	3' X 2'	SD*	B
Sporobolus airoides	Alkali Sacaton	5' X 3'	SD*/CD	B
Sporobolus contractus	Spike Dropseed	3' X 1'	SD*/CD	B
Sporobolus cryptandrus	Sand Dropseed	2' X 1'	SD*/CD	B
Sporobolus flexuosus	Mesa Dropseed	3' X 1'	SD*/CD	B

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GRASSES (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Sporobolus wrightii	Big Sacaton	5' X 4'	SD*/CD	B
Trichloris crinita	Two-Feather Trichloris	3' X 1'	SD*/CD	B
Tridens muticus	Slim Tridens	1.5' X 0.5'	SD*/CD	B

SHRUBS				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Abutilon palmeri	Indian Mallow	3' X 4'	SD*	B/H
Acaciella angustissima	White Ball Acacia	5' X 5'	SD*	B/H/S
Aloysia gratissima	Bee Brush	6' X 8'	SD*/CD	B/P
Aloysia wrightii	Oreganillo	4' X 4'	SD*/CD	B/P
Amsonia grandiflora	Large-Flowered Blue Star	3' X 3'	SD*	B
Anisacanthus quadrifidus	Flame Anisacanthus	5' X 5'	CD	P
Anisacanthus thurberi	Desert Honeysuckle	6' X 4'	SD*	B/H/P
Asclepias linaria	Pine Leaf Milkweed	3' X 3'	SD*	B/H/P
Asclepias subulata	Desert Milkweed	3' X 3'	SD*/CD	B/H/P/S
Atriplex canescens	Fourwing Saltbush	5' X 5'	SD*/CD	B/E/H
Atriplex polycarpa	Desert Saltbush	4' X 4'	SD*	B/E/H
Baccharis sarothroides	Desert Broom	5' X 5'	SD*	E/M/P
Bebbia juncea	Chuckwalla Delight	3' X 3'	SD*/CD	B/P
Berberis haematocarpa	Red Barberry	5' X 5'	SD*	B/E/H/P
Berberis trifoliolata	Algerita	5' X 5'	SD*	B/E/P
Buddleja marrubiifolia	Woolly Butterfly Bush	5' X 5'	CD	B/E/P
Calliandra californica	Baja Fairy Duster	5' X 5'	SD	B/E/H/P
Calliandra eriophylla	Fairy Duster	3' X 4'	SD*	B/E/H/P
Canotia holacantha	Crucifixion Thorn	10' X 12'	SD*	B
Castela emoryi	Crucifixion Thorn	10' X 12'	SD*	B

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SHRUBS (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Celtis pallida	Desert Hackberry	16' X 10'	SD*/CD	B/E/H
Condalia globosa	Bitter Condalia	8' X 8'	SD*	B/E
Condalia warnockii var. *kearneyana*	Condalia	8' X 8'	SD*/CD	B/E/H/P
Cordia parvifolia	Little-Leaf Cordia	6' X 8'	SD/CD	B/E/P
Coursetia glandulosa	Coursetia, Baby Bonnets	8' X 12'	SD*	P/S
Dalea bicolor var. *bicolor*	Monterrey Blue Dalea	5' X 6'		E/P
Dalea bicolor var. *argyrea*	Dalea Bicolor	4' X 4'	CD	B/E/H/P
Dalea frutescens	Black Dalea	3' X 3'	CD	B/H/P
Dalea pulchra	Indigo Bush	6' X 5'	SD*	B/E/H/P
Dalea versicolor var. *sessilis*	Indigo Bush	4' X 5'	SD*	B/E/H/P
Dodonaea viscosa	Hopseed Bush	15' X 12'	SD*/CD	B/E/S
Encelia farinosa	Brittlebush	3' X 3'	SD*/MD	B/P/S
Encelia virginensis	Green Brittlebush	3' X 3'	SD*/MD	P
Ephedra aspera (E. nevadensis)	Mormon Tea	5' X 4'	SD*/MD	B/E
Ericameria laricifolia	Turpentine Bush	3' X 3'	SD*/CD/MD	B/E/P
Eriogonum fasciculatum	Flattop Buckwheat	3' X 4'	SD*/MD	B/E/H/P
Fallugia paradoxa	Apache Plume	6' X 4'	SD*/CD/MD	B/H/P
Gossypium harknessii	Wild Cotton	3' X 3'	SD*	B/S
Guaiacum coulteri	Guayacán	8' X 8'		E/H/S
Hibiscus coulteri	Yellow Hibiscus	3' X 3'	SD*/CD	B/P
Holacantha emoryi	Crucifixion Thorn	8' x 8'	SD*	P
Hyptis albida	Desert Lavender	6' X 5'	SD*	B
Jatropha cardiophylla	Limberbush	3' X 4'	SD*	B
Jatropha dioica	Jatropha	3' X 3'	CD	
Justicia californica	Chuparosa	3' X 4'	SD*	B/H
Justicia candicans	Red Justicia	4' X 3'	SD*	E/H/S

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SHRUBS (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Justicia spicigera	Mexican Honeysuckle	3' X 3'		E/H/S
Koeberlinia spinosa	Crown of Thorns	8' X 6'	SD*	B/H
Larrea tridentata	Creosote Bush	8' X 8'	SD*/CD	B/E/P
Leucophyllum spp.	Texas Ranger	Varies	CD	E/H/P
Lycium andersonii	Desert Wolfberry	5' X 5'	SD*	B/H/P
Lycium berlandieri	Narrowleaf Wolfberry	5' X 5'	SD*/CD	B/H/P
Lycium exsertum	Thornbush	5' X 5'	SD*	B/H/P
Lycium fremontii	Fremont's Wolfberry	5' X 5'	SD*	B/H/P
Lycium pallidum	Desert Thorn	4' X 6'	SD*/MD	B/H/P
Maytenus phyllanthoides	Mangle Dulce	12' X 12'		B
Mimosa biuncifera	Catclaw Mimosa	6' X 6'	SD*	B/H/P
Mimosa dysocarpa	Velvetpod	4' X 5'	SD*	B/H
Poliomintha maderensis	Lavender Spice	3' X 3'		P
Plumbago scandens	White Plumbago	3' X 4'	SD*	H/P
Rhus microphylla	Littleleaf Sumac	8' X 8'	SD/CD	B/H/P
Rhus ovata	Sugar Sumac	10' X 10'	SD	B/E/P
Rhus trilobata	Three Leaf Sumac	5' X 8'	SD/CD	B/P
Rhus virens	Evergreen Sumac	12' X 12'	SD*/CD	B/E/P
Ruellia californica	Sonoran Desert Ruellia	4' X 4'	SD	B/H/P/S
Ruellia peninsularis	Baja Ruellia	4' X 4'	SD	B/H/P/S
Salvia clevelandii	Cleveland Sage	5' X 5'		P/S
Salvia greggii	Autumn Sage	3' X 3'	CD	B/P/E
Salvia mohavensis	Mojave Sage	3' X 3'	SD/MD	B/P
Senna lindheimeriana	Lindheimer Senna	3' X 2'	CD	B/H/P/S
Senna purpusii	Baja Senna	6' X 5'	SD	B/H/P/S
Senna wislizeni	Shrubby Senna	8' X 8'	SD/CD	B/H/P

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SHRUBS (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Simmondsia chinensis	Jojoba	8' X 8'	SD*	B/E
Sphaeralcea ambigua	Desert Globemallow	3' X 3'	SD*/MD	B/H/P
Tecoma stans	Arizona Yellow Bells	10' X 8'	SD*/CD	B/S
Trixis californica	Trixis	3.5' X 3.5'	SD*/CD/MD	E/P
Vachellia rigidula	Blackbrush Acacia	15' X 15'	CD	E/H/P
Vauquelinia californica	Arizona Rosewood	15' X 15'	SD*	B/E/H
Vauquelinia corymbosa	Slimleaf Rosewood	15' X 15'	CD	E/H
Viguiera stenoloba	Skeleton-Leaf Goldeneye	4' X 3'	SD*/CD	P
Ziziphus obtusifolia	Greythorn	10' X 8'	SD*/CD	B/H

SUBSHRUBS (GROUNDCOVERS, HERBACEOUS PERENNIALS, SHRUBS SMALLER THAN 3' X 3')				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Acmispon rigidus	Shrubby Deervetch	2' X 2'	SD*/MD	B
Ambrosia deltoidea	Triangle-Leaf Bursage	2' X 2'	SD*	B
Ambrosia dumosa	White Bursage	2' X 2'	SD*	B
Artemisia ludoviciana	Prairie Sagebursh	1' X 3'	SD*/CD	B/H
Bahia absinthifolia	Desert Daisy	1' X 0.5'	SD*/CD	B/P
Bahiopsis parishii	Parish's Goldeneye	2' X 2'	SD/MD	B/H/P
Baileya multiradiata	Desert Marigold	1' X 1'	SD*/CD	B
Berlandiera lyrata	Chocolate Flower	2' X 2'	SD*/CD	P
Calylophus berlandieri	Berlandier's Sundrops	1' X 3'	CD	
Calylophus hartwegii	Hartweg's Sundrops	1' X 2'	SD*/CD	H/P
Chrysactinia mexicana	Damianita	2' X 2'	CD	E/P
Dalea capitata	Yellow Dalea	3' X 1'	CD	B/E/H/P
Dalea formosa	Feather Dalea	2' X 2'	SD*/CD	P
Dalea greggii	Trailing Dalea	2' X 4'	CD	B/E/H/P

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SUBSHRUBS (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Datura wrightii	Sacred Datura	2' X 3'	SD*/CD/MD	B/P/S/T
Dicliptera resupinata	Arizona Foldwing	2' X 2'	SD*/CD	B/H/P
Eriogonum wrightii	Wright Buckwheat	2' X 2'	SD*/CD	B/E/H/P
Glandularia gooddingii	Goodding's Verbena	1' X 3'	SD*	B/P
Gutierrezia sarothrae	Snakeweed	2' X 2'	SD*/CD	P
Lupinus arizonicus	Arizona Lupine	1' x 1'	SD/MD	B
Melampodium leucanthum	Blackfoot Daisy	1.5' X 1'	SD*/CD	P
Menodora scabra	Rough Menodora	1' X 1'	SD*/CD/MD	B
Oenothera berlandieri	Mexican Evening Primrose	1' X 3'	CD	S
Oenothera caespitosa	Tufted Evening Primrose	1' X 3'	SD*	B/P
Oenothera stubbei	Chihuahuan Primrose	1' X 2'	CD	
Penstemon barbatus	Beardtongue Penstemon	1' X 1'	SD*/CD/MD	B/P
Penstemon eatonii	Firecracker Penstemon	1' X 1'	SD*	B/P
Penstemon palmeri	Palmer Penstemon	2' X 2'	SD*/MD	P
Penstemon parryi	Parry Penstemon	1' X 1'	SD*	B/P
Penstemon pseudospectabilis	Canyon Penstemon	1' X 1'	SD*/MD	B/P
Penstemon subulatus	Little Beardtongue	1' X 1'	SD*	B/P
Penstemon superbus	Superb Penstemon	2' X 2'	SD*/CD	B/P
Psilostrophe cooperi	Paper Flower	2' X 2'	SD*/CD/MD	B
Psilostrophe tagetina	Woolly Paper Flower	2' X 2'	SD*/CD	B
Salvia dorrii	Mojave Sage	2' X 2'	MD	B/P
Senna covesii	Desert Senna	1' X 1'	SD*	B/P
Tetraneuris acaulis	Angelita Daisy	1' X 2'		E
Thymophylla acerosa	Dyssodia	0.5' X 0.5'	SD*/CD	B/P
Thymophylla pentachaeta	Dogweed	0.5' X 0.5'	SD*/CD	B/H/P
Zauschneria californica subsp. *latifolia*	Hummingbird Trumpet	2' x 2'	SD*	B/P
Zinnia acerosa	Desert Zinnia	1' X 1'	SD*/CD	B/P

KEY: B = Buffer Overlay Zone Use, E = Evergreen, G = Seed Grown Only, H = Habitat, M = Male Only, P = Pollinators, S = Semi-Hardy, T = Toxic

TREES				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Acacia greggii	Catclaw Acacia	45' X 20'	SD*/SD	E/H/P
Acca sellowiana	Pineapple Guava	15' X 15'		E/H
Bauhinia lunarioides	Chihuahuan Orchid Tree	10' X 10'	CD	H/P
Brahea armata	Mexican Blue Palm	30' X 10'	SD	B/E/H
Caesalpinia cacalaco	Cascalote	15' X 15'		H/P
Celtis reticulata	Netleaf Hackberry	30' X 30'	SD*/CD	B/H
Cercis canadensis var. *mexicana*	Mexican Redbud	15' X 15'	CD	H/P
Chilopsis linearis	Desert Willow	30' X 30'	SD*/CD	B/P
Chitalpa 'Morning Cloud'	Morning Cloud Chitalpa	25' X 25'		
Condalia globosa	Bitter Condalia	15' X 20'	SD*/SD	B
Cordia boissieri	Texas Olive	15' X 15'	CD	E/P/S
Cupressus arizonica var. *glabra*	Smooth Bark Cypress	40' X 20'	SD*	B/E
Dermatophyllum secundiflorum	Texas Mountain Laurel	15' X 10'	CD	E/H/P/T
Ebenopsis ebano	Texas Ebony	30' X 20'	CD	E/H/P
Eysenhardtia orthocarpa	Kidneywood	15' X 10'	SD*/CD	B/H/P
Eysenhardtia texana	Texas Kidneywood	10' X 8'	CD	H/P
Fraxinus greggii	Littleleaf Ash	15' X 15'	CD	E/H/P
Havardia mexicana	Mexican Ebony	30' X 20'	SD	B/H/P
Havardia pallens	Tenaza	30' X 20'	CD	H/P
Leucaena retusa	Golden Ball Lead Tree	20' X 15'	CD	H/P
Lysiloma watsonii var. *thornberi*	Feather Tree	20' X 20'	SD*	B/H/P/S
Mariosousa heterophylla	Palo Blanco	15' X 15'	SD	B/P/S
Myrospermum sousanum	Arroyo Sweetwood	20' X 20'	SD/CD	B
Olneya tesota	Desert Ironwood	30' X 25'	SD*	B/E/H
Parkinsonia florida	Blue Palo Verde	30' X 30'	SD*	B/H/P
Parkinsonia microphylla	Foothill Palo Verde	20' X 20'	SD*	B/H/P

KEY: B = Buffer Overlay Zone Use, E = Evergreen, G = Seed Grown Only, H = Habitat, M = Male Only, P = Pollinators, S = Semi-Hardy, T = Toxic

TREES (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Parkinsonia praecox	Palo Brea	30' X 25'	SD	B/H/P/S
Prosopis glandulosa var. *torreyana*	Western Honey Mesquite	30' X 30'	SD/CD	B
Prosopis pubescens	Screwbean Mesquite	20' X 20'	SD*/CD	B/H/P
Prosopis velutina	Velvet Mesquite	30' X 30'	SD*	H/P
Quercus emoryi	Emory Oak	30' X 20'	SD*/CD	H
Quercus fusiformis	Texas Live Oak	30' X 30'		E/H
Quercus muehlenbergii	Chinquapin Oak	30' X 30'	CD	H
Quercus oblongifolia	Mexican Blue Oak	30' X 30'	SD/CD	E/H
Sambucus nigra subsp. *cerulea*	Mexican Elderberry	30' X 20'	SD*/CD	B/S
Sapindus saponaria var. *drummondii*	Western Soapberry	30' X 30'	SD*/CD	B/H/P
Senegalia berlandieri	Guajillo	15' X 15'	CD	E/H/P
Senegalia occidentalis	Sonoran Cat Claw	20' X 15'		H
Ungnadia speciosa	Mexican Buckeye	12' X 12'	CD	B/H/P
Vachellia constricta	Whitethorn Acacia	10' X 10'	SD*	H/P
Vachellia farnesiana	Sweet Acacia	20' X 20'	SD*/CD	B/H/P

VINES				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Antigonon leptopus	Queen's Wreath	30' X 15'		P/S
Callaeum macropterum	Yellow Orchid Vine	20' X 15'	SD	E
Cissus trifoliata	Desert Grape Ivy	20' X 20'	SD	P/T
Dolichandra unguis-cati	Cat's Claw Vine	30' X 15'		
Janusia gracilis	Slender Janusia	3 X 5'	SD*/CD	B/H
Lonicera arizonica	Coral Honeysuckle	10' x 10'	SD*	
Mascagnia lilacina	Purple Orchid Vine	15' X 15'	CD	E
Merremia aurea	Yellow Morning Glory Vine	10' X 10'		

KEY: B = Buffer Overlay Zone Use, E = Evergreen, G = Seed Grown Only, H = Habitat, M = Male Only, P = Pollinators, S = Semi-Hardy, T = Toxic

VINES (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Parthenocissus spp.	Hacienda Creeper	15' X 15'		H
Passiflora foetida	Passion Flower	20' X 1'		H/P
Vitis arizonica	Canyon Grape	20' X 5'	SD*/CD	B

KEY: B = Buffer Overlay Zone Use, E = Evergreen, G = Seed Grown Only, H = Habitat, M = Male Only, P = Pollinators, S = Semi-Hardy, T = Toxic

PROHIBITED PLANT LIST

Pima County prohibits the use of the following plant species due to invasive characteristics, noxious pollen or other quality that creates a nuisance in the landscape.

BOTANICAL NAME	COMMON NAME
Ailanthus altissima	Tree of Heaven
Alhagi pseudalhagi	Camelthorn
Arundo donax	Giant Reed
Brassica tournefortii	Sahara Mustard
Bromus rubens	Red Brome
Bromus tectorum	Cheatgrass
Caesalpinia gilliesii	Yellow Bird of Paradise
Centaurea melitensis	Malta Starthistle
Centaurea solstitalis	Yellow Starthistle
Cortaderia spp.	Pampas Grass
Cynodon dactylon	Bermuda Grass (excluding sod hybrid)
Digitaria spp.	Crabgrass
Elaeagnus angustifolia	Russian Olive
Eragrostis spp.	Lovegrass (excluding E. intermedia, Plains Lovegrass)
Melinis repens	Natal Grass
Mesembryanthemum spp.	Iceplant
Morus rubra	Mulberry Tree
Nerium oleander	Oleander
Olea europaea	Olive Tree (excluding fruitless varieties, such as 'Wilsonii')
Oncosiphon piluliferum	Stinknet
Parkinsonia aculeata	Mexican Palo Verde
Peganum harmala	African Rue
Pennisetum ciliare	Buffelgrass
Pennisetum setaceum	Fountain Grass (including purple "sterile" variety)
Prosopis chilensis	Chilean Mesquite
Salsola spp.	Russian Thistle
Searsia lancea	African Sumac
Senna artemisioides	Feathery Senna
Senna nemophila	Desert Senna
Senna phyllodinea	Silvery Senna
Schinus spp.	Pepper Tree
Schismus arabicus	Arabian Grass
Schismus barbatus	Mediterranean Grass
Sorghum halepense	Johnson Grass
Tamarix spp.	Tamarisk

APPENDIX

GENERAL MANUALS

- Green Stormwater Infrastructure and Low Impact Development Standard Details and Site Guidance, City of Tucson & Pima County Regional Flood Control District, Tucson, AZ, November 2022
- Low Impact Development and Green Infrastructure Guidance Manual, City of Tucson, Tucson AZ, March 2015
- Design Standards for Stormwater Detention and Retention, Pima County Regional Flood Control District, Tucson, AZ, November 2015

MAINTENANCE

- Guidelines for the Maintenance of Regulated Riparian Habitat (RRH) for Commercial Property Owners and Homeowners' Associations, Pima County Regional Flood Control District, Tucson, AZ, January 2021
- Drainage Maintenance Guidelines for Homeowners' Associations, Pima County Regional Flood Control District, Tucson, AZ
- Detention Basin Inspection and Maintenance Checklist, Pima County Regional Flood Control District, Tucson, AZ

INVASIVE / NON-NATIVE / NOXIOUS SPECIES

- Buffelgrass (Pennisetum ciliare) information
- Buffelgrass and Fountain Grass Identification Pocket Guide, 2017
- Grow Native! Don't Plant a Pest-Southeastern Arizona, Arizona Native Plant Society
- Wipe Out Weeds, Pima County Regional Flood Control District, Tucson, AZ
- Taking Action Against Mosquitoes, Pima County Regional Flood Control District, Tucson, AZ

NATIVE SEED LIST

- Standard Specifications and Details for Public Improvements Section 805 Seeding, Pima Association of Governments

Manual ends at previous page.

Following pages include Staff Report and Public Comments.

PIMA COUNTY DEVELOPMENT SERVICES DEPARTMENT
PLANNING DIVISION
STAFF REPORT TO THE PLANNING AND ZONING COMMISSION

PUBLIC HEARING
SEPTEMBER 27, 2023

P23TA00001	**LANDSCAPE DESIGN MANUAL AMENDMENT**
STATUS / AGENDA ITEMS	**Planning and Zoning Commission Public Hearing** Landscape Manual Amendments
REQUEST	A Resolution of the Board of Supervisors of Pima County, Arizona, Relating to Zoning (Title 18); Chapter 18.73 (Landscaping, Buffering and Screening Standards); Amending the Landscape Design Manual by Updating Bufferyard, Screening, Stormwater Harvesting, and Permitted Plant Requirements. (Districts: All)
INITIATION	Planning and Zoning Commission Hearing, August 30, 2023

Staff Recommendation
Staff recommends **APPROVAL** of the proposed Resolution to amend the Screening and Bufferyard (formerly 'Landscape') Design Manual.

This proposed amendment will simplify design standards for landscape bufferyards, include stormwater harvesting to supplement irrigation, and support a native desert plant palette adapted to the regional Sonoran Desert environment.

The Planning and Zoning Commission authorized staff to amend the Pima County Zoning Code Chapter 18.73 and Landscape Design Manual at its August 30, 2023, hearing. Staff is presenting the amended manual at this meeting and is working on changes to the Zoning Code in coordination with similar changes being made by City of Tucson. The Zoning Code amendment will be brought forward at a future hearing.

Background

The Landscape Design Manual was approved by the Board of Supervisors in the mid-1980s, with addenda for permitted and prohibited plant lists and other sections included at later dates. Pima County Zoning Code Section 18.73.030.A states that the manual may be amended by Resolution of the Board after a noticed public hearing.

The proposed manual amendment is supported by Zoning Code ordinances, Pima County Comprehensive Plan goals and policies, and other county plans:

Pima County Zoning Code

Chapter 18.72 - Native Plant Protection, lists findings for the preservation of plant species and communities native to Pima County, to:

- Promote a sense of place and enhance community appearance
- Maintain regional identity, which contributes to economic development by attracting tourism and new business
- Protect property values, improve and maintain quality of life, support community values and lifestyle
- Stabilize desert soils, decrease erosion, maintain original features of habitats important to native fauna
- Promote water conservation with drought-tolerant vegetation that requires minimal supplemental irrigation and maintenance, and helps moderate climate that reduces energy costs
- Reduce non-native plant allergens and improve air quality

Pima Prospers, the 2015 update of the Pima County Comprehensive Plan, identifies goals and policies that support the proposed amendment:

3.4 Environmental Element

Goal 2: Minimize climate change impacts in Pima County and increase human, economic and natural environmental resiliency

- Policy 1 - Support climate adaptation strategies that benefit the public health, economy and environment by: improving stormwater management strategies to minimize runoff in urban areas, making beneficial use of stormwater and retaining natural open space
- Policy 2 - Pursue preparedness strategies such as diversification of water supplies, water conservation, improved demand management and increased reliance on water harvesting
- Policy 6 - Support and strengthen policies and programs to control and eradicate non-native invasive species to reduce the threat of wildfire and loss of native species

3.5 Housing and Community Design Element

Goal 14: Encourage cost-effective green building and site design methods and materials

- Policy 2 - Increase use of reclaimed water and rainwater harvesting

4.2 Water Resources Element

Goal 3: Support efficient water demand management practices and strategies that protect local and basin-wide water supplies

- Policy 4 - Encourage the use of renewable water sources including reclaimed water, CAP water and water harvesting
- Policy 6 - Promote drought tolerant landscapes, use of reclaimed water and rainwater harvesting, and Low Impact Development (LID) principles that treats stormwater as a resource

4.9 Flood Control and Drainage Element

Goal 3: Integrate watercourses, riparian and upland habitat, land use, recreation and drainage to achieve healthy development patterns

- Policy 3 - Encourage green street standards that integrate watercourse, riparian and upland habitat, recreation, alternate modes of transportation, shade and landscape

amenities, drought tolerant plants and drainage as a form of water harvesting in new development and allow for the natural filtration of precipitation

Sonoran Desert Conservation Plan

- Ensure the long-term survival of the full spectrum of plants and animals that are indigenous to Pima County through maintaining or improving the habitat conditions and ecosystem functions necessary for their survival

The Landscape Design Manual amendment is an implementation item in the Environmental Element of Pima Prospers (2015) and was identified as a "low-hanging fruit" project during Development Services Department (DSD) and Regional Flood Control District participation in the *Growing Water Smart* (GWS) workshop with the Babbitt Center for Land and Water Policy and the Sonoran Institute (March 2022). Following the workshop DSD successfully competed for a GWS Technical Assistance Grant to update the manual and contracted with McGann and Associates, a local planning and landscape architecture firm, to work on the update.

Manual Amendment

Goals
DSD identified the following goals for the manual amendment:

- Update, simplify and streamline the manual
- Incorporate on-site water harvesting to support landscape
- Promote the use of regionally adapted native desert plant species

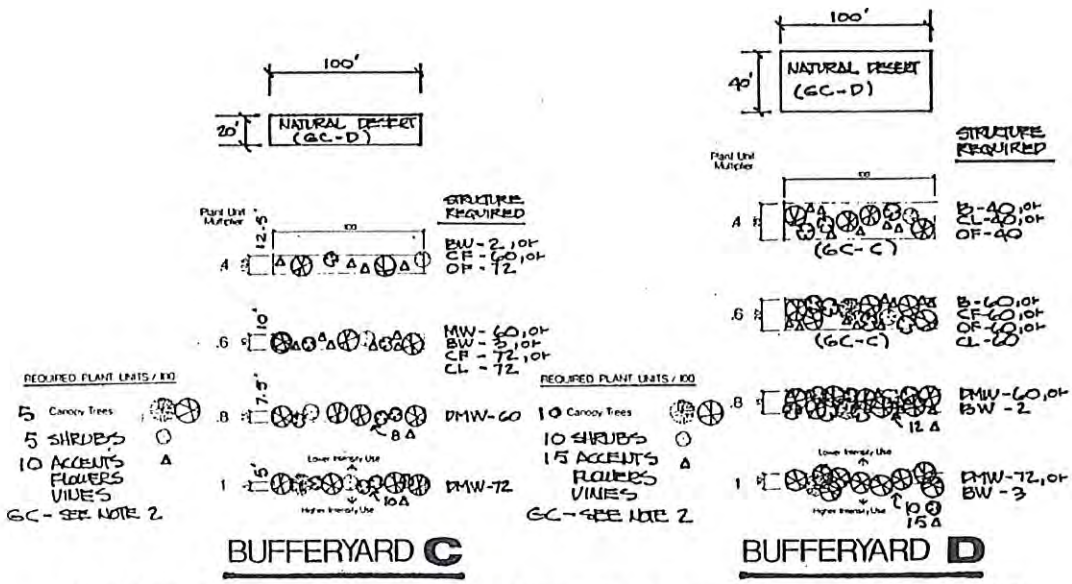
Changes and additions to the existing (1980s) manual are detailed in the staff report, below:

Title
The title of the draft manual was changed to *Screening and Bufferyard Design Manual* to reflect Section 18.73.040-Screening and Bufferyard Requirements of the Zoning Code. The Zoning Code defines *bufferyards* as landscaping elements and screening devices to reduce potentially adverse impacts of adjoining dissimilar land uses (18.73.020). The manual provides bufferyard standards specifically between residential subdivisions, commercial and industrial developments, and public rights-of-way (ROWs), but does not prescribe landscaping or plant species requirements on private residential or commercial properties, common areas or similar situations. Therefore, the title *landscape manual* was somewhat inaccurate.

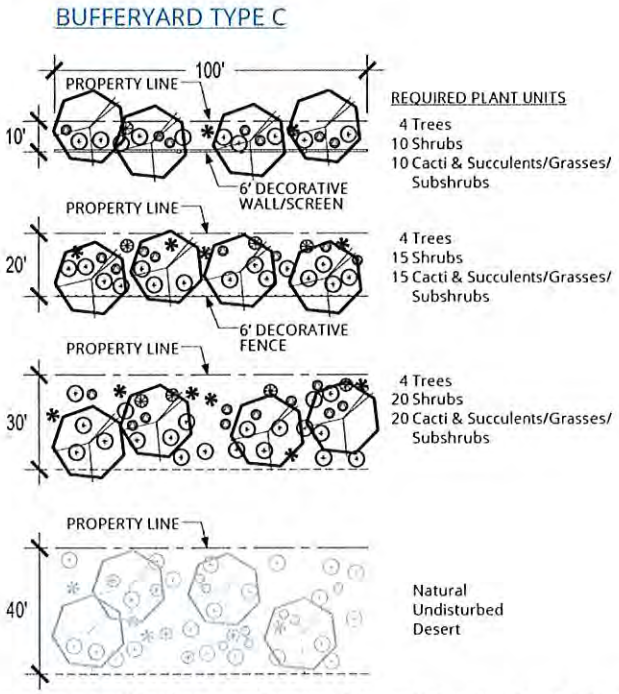
Bufferyard Types and Requirements
The existing manual has 10 bufferyard types (A-J), with 5-6 different options for each type, including a natural undisturbed desert option. The draft manual has reduced the number of bufferyards to 5 total, with 3-4 options under each, including the undisturbed desert option.

Functionally, new bufferyard requirements are proposed to increase survivability of plants in the bufferyard. The existing manual requirements have been described by landscape professionals as 'overplanting' bufferyards – some options currently require 10 canopy trees to be planted within a 100-foot length of bufferyard (10-foot-wide Bufferyard D, below), as well as additional shrubs, accent plants and ground cover. The draft manual will require 3-4 canopy trees for the same length of bufferyard, which takes the mature size of these canopy trees into account.

Examples of Bufferyards C and D in the existing manual and proposed equivalent Bufferyard C are shown below:



Pima County Landscape Design Manual (circa 1985) – Mixed Residential Bufferyards C & D



Pima County Screening and Bufferyard Design Manual (2023) – Mixed Residential Bufferyard C

Screening Requirements

The existing manual lists structures and earthworks to provide additional screening, such as decorative masonry walls, closed wood, split-rail or chain link fences, and berms or berm walls. The draft manual has reduced required screening to decorative wall or screen (either 3½ or 6 feet high) and decorative metal fence (6 feet high). Materials that do not hold up well in the desert (wood and vinyl) or are strictly utilitarian (chain link) are prohibited.

Water Harvesting Requirements
The draft manual requires stormwater infiltration basins in bufferyards. Subdivisions and commercial developments are required to provide flood retention and detention, and "first flush" to collect the first one-half inch of rainfall. Similarly, stormwater infiltration basins will collect and concentrate on-site precipitation to irrigate landscaping. The manual provides basic guidelines for basins and links to county and city reference manuals for additional instruction. The existing manual requirement for water-efficient irrigation systems is now proposed as optional.

Official Regulatory Plant List
The existing manual has three plant lists: the Arizona Department of Water Resources (ADWR) Tucson Active Management Area (TAMA) *Low Water Use/Drought Tolerant Plant List* (1996), a *General Resource Plants List*, and the *Buffer Overlay Zone Approved Plant List* (1988), of native plants for landscaping on projects subject to Chapter 18.67-Buffer Overlay Zone (BOZ).

DSD and McGann staff selected native species from the Sonoran, Mojave and Chihuahuan Deserts from the 2022 ADWR TAMA *Low Water Use & Drought Tolerant Plant List* for the proposed regulatory plant list. Bufferyards in the county will be at elevations between about 2000 to 4000 feet ASL (Mt. Lemmon is exempt from bufferyard requirements), so local higher-elevation plant species that would require additional irrigation were excluded. The BOZ permitted plants, species native to Pima County, evergreen (i.e., non-deciduous for year-round screening), habitat and pollinator plants and other characteristics are identified in notes in the table.

Staff excluded introduced ornamental species from the 2022 ADWR TAMA list. These were originally introduced because of their appearance and ability to grow in the desert; however, some have escaped cultivation and become established on their own (e.g., tamarisk, tree of heaven, fountain grass, African sumac) with impacts on natural ecosystem structure and function. For example, a relatively new plant from South Africa, stinknet (*Oncosiphon piluliferum*), first identified in Tucson in 2015, colonizes disturbed lands, spreads rapidly, causes skin rash and asthma in sensitive individuals, and "burns like gasoline" producing an irritating acrid smoke (*Weed Warriors Take Aim at Tucson's Largest Stinknet Outbreak So Far*, Tucson.com, May 19, 2023). Stinknet is thought to have been introduced as a cultured desert habitat specimen in Phoenix (SouthwestDesertFlora.com, 2020) and is the fastest spreading invasive weed to ever have occurred in Arizona (The Plant Press, Arizona Native Plant Society, Winter 2020).

The manual only covers landscape bufferyards as identified in Zoning Code Title 18, and introduced ornamental plant species may still be used in other landscape designs and locations. However, the manual amendment is an opportunity to promote the use of regional native plants in the local community, and for Pima County to continue to set an example for preserving and restoring native habitats.

Prohibited Plant List
The existing Prohibited Plant List is three plants identified by the Health and Environmental Quality departments as producers of large amounts of allergenic wind-borne pollen: Bermuda grass, mulberry and olive trees (Pima County Code, Title 7-Environmental Quality, Chapter 7.41-Pollen Control). There was discussion about the olive and mulberry tree prohibition with local native plant nursery and Mission Garden staff, who are promoting heritage food trees in the region. However, staff feels it is outside of DSD's purview to amend Title 7 of Pima County Code.

The draft manual Prohibited Plant List is comprised of species known to be noxious and invasive in the Sonoran Desert, which are frequently included in county rezoning conditions – species are not to be planted and should be removed if found on-site.

Departmental and Stakeholder Review and Comment
Staff sent the draft manual to county departments which have responsibilities with landscaping, native plants or stormwater harvesting, and local development, landscape architecture and plant nursery stakeholders for review and comment. DSD and McGann staff held a virtual group meeting over Microsoft Teams with interested stakeholders on May 18, 2023, with about 30 people in attendance. Staff recorded comments from the meeting and accepted email comments which were used to make changes to the manual.

A second Teams meeting was offered on July 19, 2023, about 20 people attended virtually and additional comments were accepted through email and additional edits were made.

Staff also met virtually with individual stakeholders who requested to discuss the manual – this included Southern Arizona Home Builders Assn., Metro Pima Alliance, Diamond Ventures and the Arizona Nursery Association.

Public Comment
Published and mailed notice of the amendment along with the website posting of staff's report will occur a minimum of fifteen days prior to public hearing. The website will be updated to include public comment throughout the process to the Planning and Zoning Commission and the Board of Supervisors.

Respectfully Submitted,

Anita McNamara

Anita McNamara, AICP
Senior Planner

Mark Holden

Mark Holden, AICP
Principal Planner

P23TA00001 LANDSCAPE DESIGN MANUAL AMENDMENT – Stakeholder Outreach

Pima County Departments
Environmental Quality
Native Plant Nursery
Natural Resources, Parks and Recreation
Regional Flood Control District
Transportation

Outside Contacts
Arc Studios Landscape Architecture
Arizona Nursery Assn.
Bowman Landscape Architecture
Caryl Clement Design
City of Tucson
Civano Nursery
Coalition for Sonoran Desert Protection
Desert Survivors Nursery
Diamond Ventures
GRS Landscape Architects
Larsen-Baker Real Estate
Metro Pima Alliance
Novak Environmental
The Planning Center
Rick Engineering
Southern Arizona Home Builders Assn.
Spadefoot Nursery
Tucson Chamber of Commerce
Tucson Historic Mission Garden
Wilder Landscape Architects

From: David Godlewski <David@sahba.org>
Sent: Tuesday, September 26, 2023 9:51 AM
To: Mark Holden; Chris Poirier
Cc: Carla Blackwell; Ginger Kneup
Subject: SAHBA Comments on Revised Screening & Bufferyard Manual

Mark and Chris,

As we approach Wednesday's P&Z meeting, I wanted to reach out regarding the Screening & Bufferyard Manual. We have been fielding comments from members on the most recent draft and wanted to share with you a few of the remaining points we'd ask you to consider.

Please note, we support the update of the manual and value the opportunity to work collaboratively. It's a better document. From our perspective, addressing these items would improve the final product.

Happy to have a quick call to discuss.

- Need to reduce the potential misapplication of requirements adjacent to a "public street." For instance, subdivisions are platted with streets that will be dedicated at some point as public streets, however the intention is not to require bufferyards on those streets. Is the same bufferyard appropriate against a minor street and a major street? Is it possible to further refine the term "public streets" to provide more clarity?
- We would request that clarity be given as to the administrative relief for the potentially unintended consequences that occur when the requirements are applicable against existing, developed properties. Would the applicant apply for a zoning variance, design modification request, private agreement between adjacent owners or some other applicable process? Similarly, could the Planning Administrator approve the suitability of existing walls to fulfill some of the requirements.
- The 6' decorative fence requirement may not be the appropriate choice for bufferyards that are in front of a property as it could effectively block desired visibility to consumers visiting that property. We would ask for a 3'6" Decorative Wall be permitted for front-facing bufferyards and the addition of an option for vegetative screening (similar to what is permitted in COT) at the discretion of the Planning Administrator.
- Soil conditions could impact the ability of an applicant to comply with the water harvesting requirements in totality. We would request additional language that the water harvesting requirements may be waived or adjusted at the discretion of the Planning Administrator if applicant provides sufficient soils reports to document soil unsuitability.
- The Stormwater Infiltration Basin Illustrations include references to "Accents located outside of Basin." It would be helpful if the term "accents" was given greater clarity or reference to the existing plant list in order to avoid confusion or potential misunderstandings of the expectation. Given the complexity of water harvesting from one site to another, we would ask that specific language be added to allow the Planning Administrator some flexibility in determining what is appropriate and meets the underlying goals of the requirement.
- While we understand the need to reference a plant list and appreciate the built-in flexibility given to the Planning Administrator, industry experience has been that the local, commercial nurseries simply do not have

the capacity to provide the required plant materials at the scale needed to supply the construction industry. A more comprehensive list would support better supply from local growers.

Regards,
David

DAVID GODLEWSKI, President & CEO

Southern Arizona Home Builders Association
2840 N. Country Club Road | Tucson, AZ 85716
d: 520.918.2364 m: 520.548.7267 e: david@sahba.org w: sahba.org

The Community Builder

From: Nick Shipley <nick@civanogrowers.com>
Sent: Wednesday, September 13, 2023 10:57 AM
To: Mark Holden; Anita McNamara; Chris Poirier; Carla Blackwell
Subject: Civano Growers Bufferyard Comments

Hello,

I want to start by saying that I am a big fan of Southwest native plants and have supported Pima County's promotion of the Southwest native plant palette over the years. With the ever-increasing water and climate pressures we are experiencing it is important that we use plants that will thrive in our built environment. The plants we use should not only thrive but be pollinator-friendly, beautify our environment, reduce our water impact, and conform to the constraints that our urban environment puts on them.

The only change that I would like to see added to the bufferyard manual is clarification that cultivated native plants are allowed. I've talked to many landscape architects about the changes and they feel that they are not allowed to specify cultivars unless it is expressly listed on the plant list. For example, there are many varieties of Chilopsis linearis. Are landscape architects and designers allowed to specify a particular cultivar? Currently on the plant list, there are some cultivars such as Chiltalpa 'Morning Cloud' and "Hesperloe parviflora and cultivars" listed. As you probably know Chiltalpa is a hybrid cross of our native Chilopsis linearis and the non Southwest native Catalpa speciosa.

In conclusion, my concern lies with making a clarification that cultivars of the plants listed in the updated bufferyard manual are allowed to be specified.

Please feel free to email me back with any follow-up questions you may have.

Thanks

Nick Shipley
Chief Operations and Grow Officer
ISA Certified Arborist WE-4094a

Office: (520) 746-9205
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Physical Address:
12190 S Old Nogales Hwy
Tucson, AZ 85756

Mailing Address:
PO Box 1100
Sahuarita, AZ 85629

CIVANO GROWERS

Arizona Nursery Association
Where Growing Businesses Can Thrive

August 1, 2023

VIA Email
Mark S. Holden AICP
Principal Planner, Planning Division
Pima County Development Services Dept.

Dear Mark:

My name is Jeff Grass, I am the production manager at Treeland Nurseries in Gilbert, AZ and I am the president-elect for the Arizona Nursery Association. I have been working in the nursery and landscape industry for almost 30 years, and I have a special passion for native and desert plants, and seeing how they integrate into our built and natural environments. One of our members brought the revisions of the buffer yard document to our attention, and we shared an hour-long conference call with them and a few others in the industry to speak about the scope of how these revisions will impact landscapes and the Green Industry as a whole. I feel that the exclusion of all plants outside of the Sonoran, Chihuahuan, and Mojave Desert regions would not be the best course of action for these landscapes moving forward.

I can understand the interest in protecting the pollinators and insects that are a vital part of our environment, but there are plenty of non-native plants that are low water use and will provide sustenance for the pollinators that we are trying to preserve. Many of the species that you are looking to eliminate from your accepted planting lists have been chosen for our area due to their ability to thrive and fit in with the native environment.

Citing a few examples:

Acacia aneura comes from Australia, but has been proven to thrive in our low desert after decades of study starting with the Boyce Thompson Arboretum and continuing with desert plant pioneers like Ron Gass of Mountain States Wholesale Nursery. This tree can survive in Tucson on rainfall once established, is non-invasive, and provides numerous sources of nutrition for bees (flowers) and other insects (seeds, pods, dropped leaves). I feel that this would be a misstep to remove such a dependable workhorse plant from the landscape palette.

Rosemary has long been a stalwart in Southwestern landscapes and is an excellent provider for native pollinators. This plant also provides blooms during times of year that our native plants are not in flower, helping to further support our pollinator populations.

Prosopis chilensis (and hybrids) are another great plant for our environment in the right situations. Buffer yards seem ideal for this tree as they can be grown with minimal pruning in a more natural setting which will keep these trees strong and buffering against any problems with wind damage. This is not a tree that is invasive, and in fact is quite beneficial to the landscape by providing forage for pollinators and adding nitrogen back into the soil.

A further concern with this plant list involves the inclusion of cultivars and hybrids. Horticultural improvement of species has been going on in the Southwest for nearly 50 years, with the intent of providing plants that are more disease resistant, have better flowers, longer bloom seasons, and an improved growth habit. These new hybrids and cultivars are trialed for years to determine viability and characteristics before introduction into the nursery trade and are often marked improvements on what is strictly native. I feel it wise to include some language with the list to ensure that new varieties can be accepted if the parent plants are already on the list as is.

Thank you for taking the time to review my concerns, I view this as an important discussion for the Green Industry as a whole. Reducing the diversity of the accepted plant list can have a dramatic effect on the economic viability of some long-time designers and developers, as well as making plant availability difficult to meet a more stringent list.

Please feel free to reach out to me so we can discuss this further. The Arizona Nursery Association requests the opportunity to be involved in the process as we represent the growers and retailers of plants in this state.

Sincerely,

Jeff Grass
Arizona Nursery Association President Elect
jeff@treeland.com
623-764-0149

From: Jennifer Barroso <Jennifer@sahba.org>
Sent: Friday, July 21, 2023 3:54 PM
To: Mark Holden
Subject: SAHBA's Comments Screening & Bufferyard Design Manual

Hi Mark,

Thank you for the opportunity to comment again on the new draft of the Screening & Bufferyard Design Manual. SAHBA believes the new manual is well thought out, organized, and easy to understand. We appreciate your incorporating many of the recommendations made during the first round of comments on the previous draft. A few questions and concerns were left unanswered which we believe would be advantageous to mention.

- The clarity of guidelines surrounding stormwater infiltration basins improved greatly. We appreciate the County listening to our recommendations on implementing clearly defined guidelines and visuals indicating placement and purpose. Our only concern is that there still seems to be no exceptions for opting out of a stormwater infiltration basin if the soil is not conducive to it or if the property is on a slope.
- The addition of a screening requirement exception for pedestrian or bicycle connectivity purposes was a step in the right direction. We feel there are several other instances where there may be the need for an exception to requiring a screening element such as for automalls, dealerships, outdoor storage, or loading areas.
    - As alluded to in the previous comments, there are instances where exceptions may need to be made. We believe establishing a general administrative process within the manual for requesting exceptions based on site conditions (whether it be for screening, stormwater infiltration basins, or plant approval) would be equally beneficial to the County and individuals utilizing the Screening & Bufferyard Design Manual as guidance.
- Stormwater infiltration basins with irrigation will need sensors so irrigation shuts off when it rains which can be complicated, tedious, and expensive. Has the County considered looking into a cost analysis of requiring and maintaining these stormwater infiltration basins with irrigation systems?
- In the original Landscape Design Manual's illustrations, the screening component is shown as contained within the bufferyard. In the new Screening & Bufferyard Design Manual's illustrations, the screening component seems to be shown as a separate part placed *outside* of the bufferyard, thus reducing developable land. We recommend all elements be contained within the bufferyard's dimensions, including the screening element.
- From the industry's perspective, there are still concerns related to the plant list that we'd urge the County to consider. If an exception is given via administrative approval, we recommend the County allow it to be used in future projects, as well. This would streamline the process on both sides.

SAHBA would love to have the opportunity of gathering a small group to meet with the County on these concerns. We believe a follow-up meeting would be valuable, particularly to hear the reasoning behind making certain changes to the manual. We look forward to hearing back and continuing to collaborate on this.

Best,

JENNIFER BARROSO, Government Affairs

Southern Arizona Home Builders Association
2840 N. Country Club Road | Tucson, AZ 85716
d: 520.918.2367 **m:** 602.461.0140 **e:** jennifer@sahba.org **w:** sahba.org

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From: Fernanda Quintanilla <fquintanilla@diamondven.com>
Sent: Friday, July 21, 2023 9:55 AM
To: Mark Holden
Cc: Storm, Priscilla
Subject: Comments: Screening and Bufferyard Design Manual Summary

Good morning,

Thank you for the opportunity to work together with Pima County and provide input on the Screening and Bufferyard Design Manual. We appreciate the incorporation of many of our initial comments into the updated draft of the Manual. After working with additional industry stakeholders, there are further outstanding items we would like to point out for consideration:

- There should be an overarching statement implementing an administrative process for variances based upon merit and site conditions including either demonstrated hardship or ability to meet the screening and bufferyard requirements through alternative innovative design.
- There are still concerns with this plant list. Please clarify that alternative plants when submitted may be administratively approved. And when exceptions are granted, will the list be amended, or where will the record be available for future reference.
- If adjacency to type of roadway is a determinant for a bufferyard requirement, scenic routes, gateway routes, and federal and state highways should be specifically defined in a way that correlates directly to existing transportation related plans.
- The original Landscape Design Manual illustrations show all components of the bufferyard contained within the dimensions of the bufferyard designation. However, the new plan states that all screening be built outside of the bufferyard. This change further reduces the quantity of developable land. We request this requirement be eliminated and all landscape and hardscape elements be contained within the defined dimensions of the bufferyard.
- As the public and private sector continue to work together, it is beneficial to be transparent and include a cost benefit analysis with a proposed ordinance. There are aspects of this that represent cost savings, are cost neutral and may increase installation costs. It would be good to understand these up front and the reasons for those trade-offs.

Thank you,

Fernanda

Fernanda Quintanilla, MPA
Director of Special Projects
Diamond Ventures, Inc.
2200 E. River Road, Suite 115
Tucson, AZ 85718
fquintanilla@diamondven.com
O: 520-577-0200 ext 108

From: Spadefoot Nursery <sales@spadefootnursery.com>
Sent: Saturday, July 15, 2023 4:34 PM
To: Mark Holden
Subject: Re: Draft Design Manual edits - May > July versions

Omg thank you for the removal of olive and mulberry on the list. Just a note—it is Morus alba that was traditionally planted and what they probably wanted banned. I haven't seen Morus rubra in the trade in AZ. There are several other species too but anyway, maybe that was the original name they used back in the 80s when they banned mulberry?

On Fri, Jul 14, 2023 at 9:46 AM Mark Holden <Mark.Holden@pima.gov> wrote:

> We have had requests (for this and earlier draft manual update versions) for "red-lined" copies that display what edits, additions and deletions have been made. Given the wholesale changes that have been made to the manual, it's difficult to provide red-lined documents between versions.
>
> However, we have created a list of the edits made between the May 2023 version and the most recent July 2023 version, including changes made to permitted and prohibited plants (attached PDF). We hope that this helps with review of the most current version prior to the planned July 19 Teams meeting.
>
> As always, please contact us if you have questions or comments,
>
> Mark Holden

Mark S. Holden, AICP

Principal Planner,

Planning Division

Pima County Development Services Dept.

(520) 724-6619

--
Katy Gierlach and Jared McKinley
Spadefoot Nursery
2831 East Broadway Boulevard
Tucson, AZ 85716
(520)909-3619
www.SpadefootNursery.com
Open Wednesday through Sunday
8am-5pm

From: Stephanie Spencer <sspencer@tucsonchamber.org>
Sent: Wednesday, July 19, 2023 8:58 AM
To: Mark Holden
Subject: DRAFT: Screening and Bufferyard Design Manual Comments

Dear Mark,

The Chamber would like to extend its sincere thanks for the work that has been done by you and your staff in keeping stakeholder groups updated as the Screening and Bufferyard Design Manual has moved forward. Overall, the manual thus far is reasonable and clearly written. However, after consulting with other stakeholders, the Chamber offers the following items for your consideration.

- The Chamber supports the flexibility provided in the manual that allows for exceptions upon approval from the Pima County Planning Director. However, consider providing the administrative process for submitting such exception requests and subsequently the scenarios in which these requests may be permitted. In the past, our members have struggled with lengthy turnaround times in processes like this that could have been remedied with a better explanation of procedures.
    - Additionally, when processing exceptions, will these exceptions be documented by staff & readily accessible? This would be beneficial for setting a precedent for what does and does not qualify for exceptions.
- To ensure consistency with existing transportation plans, consider defining scenic routes, gateway routes, and federal and state highways in a manner that directly corresponds to the buffer yard requirements.
- The ordinance as proposed provides requirements that may represent a cost savings, cost neutrality, or a cost increase. Buy-in from the business community can be increased if these aspects of the ordinance are made transparent upfront. Consider providing an analysis and explanation relating to potential cost differences.

Thank you,

TUCSON METRO CHAMBER

Stephanie Spencer • Business Advocacy Specialist
P: 520 207 1395 • C: 520 909 2048
sspencer@tucsonchamber.org • TucsonChamber.org
Tucson Metro Chamber • 212 E. Broadway Blvd. • Tucson, AZ 85701

Mission: Champion an environment where your business thrives and our community prospers

From: Mark Fellinger <mfellinger@rickengineering.com>
Sent: Monday, July 31, 2023 3:54 PM
To: Mark Holden
Subject: RE: draft Landscape Design Manual comments

Hi, Mark-

Sorry for the delayed response on this. My only remaining comment concerns the bufferyard water harvesting requirement. I think that it would be helpful to better clarify what will constitute compliance with the water harvesting requirement. In my opinion, something that is quantifiable would be of benefit to both designers and plan reviewers.

Per my previous comments:
Recommend clarifying and quantifying the minimum bufferyard water harvesting requirement in a way that provides flexibility on sites where providing water harvesting basins is not practical due to grading design limitations or other constraints. One suggestion would be that a minimum percentage of total bufferyard area on site would be required to include water harvesting basins.

Thank you.

-Mark

Mark Fellinger, PLA
LANDSCAPE ARCHITECT | **RICK ENGINEERING COMPANY**

RICK ENGINEERING COMPANY
3945 E. FORT LOWELL ROAD, SUITE 111, TUCSON, AZ 85712

t 520.795.1000 d 520.320.4121
mfellinger@rickengineering.com **www.rickengineering.com**

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From: mjplagens arizonensis.org <mjplagens@arizonensis.org>
Sent: Monday, July 10, 2023 6:19 PM
To: Mark Holden
Subject: RE: DRAFT Pima Co Screening & Bufferyard Design Manual - comments JULY 21, 2023

Hello Mark,

These are a few corrections I would recommend:

1. *Pappophorum mucronulatum* is not an Arizona grass. The native species of Pappus Grass is *Pappophorum vaginatum*.
2. *Ferocactus acanthodes* corrected spelling *Ferocactus cylindraceus* and California Barrel
3. *Hesperaloe nocturna* no *Hesperaloe* are native to the Sonoran Desert and so should be CD
4. *Nolina matapensis* is native to CD
5. *Acacia angustissima* corrected spelling is *Acaciella angustissima*
6. *Viguiera parishii* corrected spelling is *Bahiopsis parishii*
7. *Vitis arizonica* the widely accepted common name is Canyon Grape
8. *Quercus oblongifolia* Mexican Blue Oak is native to the Sonoran Desert SD
9. *Acacia angustissima* is now called *Acaciella angustissima*
10. *Acacia constricta* is now called *Vachellia constricta*
11. *Rhus lancea* is now called *Searsia lancea*

Sincerely,
Michael Plagens
https://www.researchgate.net/profile/Michael-Plagens

From: Jacob Prietto
Sent: Friday, July 21, 2023 4:15 PM
To: Mark Holden
Subject: Screening/Buffer Yard Requirements

Comments:

1. Arrange document based on content (stormwater, plant pallet, etc.), not information type (requirements, tables, lists, illustrations)
2. Remove duplicative information

Thanks,
Jacob

Jacob Prietto, CFM
Chief Hydrologist
Pima County Regional Flood Control District
201 N Stone Avenue – 9th Floor
Tucson, Arizona 85701
520.724.4627 office
Jacob.Prietto@pima.gov

From: Caryl Clement <caryl@cjclementdesign.com>
Sent: Friday, July 7, 2023 9:37 AM
To: Mark Holden; Anita McNamara; Elva Pedrego
Cc: Carla Blackwell; Chris Poirier
Subject: RE: DRAFT Pima Co Screening & Bufferyard Design Manual - comments JULY 21, 2023
Attachments: 1 DRAFT PimaCo ScreenBufferManual 30June2023 CLEMENT COMMENTS.pdf

Mark, Anita and Elva,

Good Morning. Thank you for your continued efforts on the Bufferyard Manual. Attached is the DRAFT Manual with my comments/suggestions - in RED. Just a few....

This most recent DRAFT Manual is really good. I would like to take this opportunity commend you all on a great job! You guys juggled multiple comments, multiple interests into a comprehensive, succinct and very 'workable' manual. Please take a moment and be proud of yourselves 😊

Sincerely,
Caryl Clement

CARYL CLEMENT PLA

LANDSCAPE ARCHITECTURE • HORTICULTURE • PUBLIC ART
520 • 861 • 3731 caryl@cjclementdesign.com Tucson, Arizona USA

http://www.cjclementdesign.com

BUFFERYARD STORMWATER INFILTRATION BASIN ILLUSTRATIONS

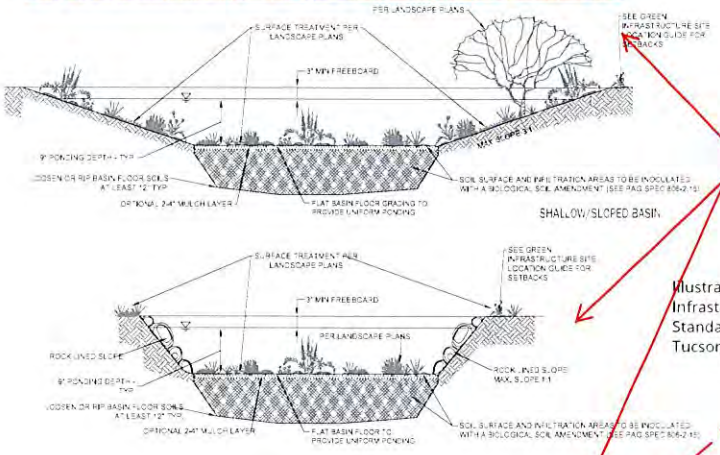
When stormwater infiltration basins are required in a bufferyard, they shall be located away from underground utilities, irrigation valve boxes and the like. Cacti, succulents and other very low water use plants shall be located on basin slopes or on top of the basin edge to prevent over watering during large storm events. Stormwater infiltration basins should be designed in coordination with and reflect the information in the correlating project site drainage report. All basins shall be included in hardscape, landscape, and grading and drainage plans.

For more guidelines on stormwater infiltration basins, refer to the Green Stormwater Infrastructure and Low Impact Development Standard Details and Site Guidance for Pima County and the City of Tucson.

STORMWATER INFILTRATION BASIN EXAMPLES

Example Cross-Section

NTS

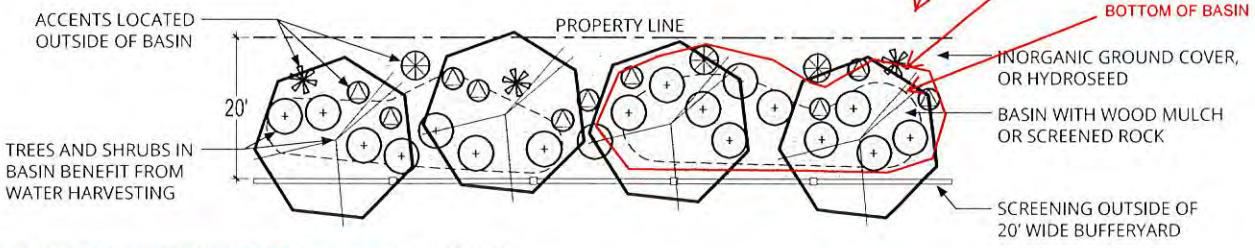


Thank you for including these additional illustrations. I would like to suggest that 'Top of Basin' and 'Bottom of Basin be indicated and labeled in the 'Example Plan View'. Thank you for your consideration.

Illustration from: Green Stormwater Infrastructure and Low Impact Development Standard Details and Site Guidance, City of Tucson and Pima County, November 2022

Example Plan View

NTS



OFFICIAL REGULATORY PLANT LIST

KEY TO SYMBOLS

B Buffer Overlay Zone Use

E Evergreen

G Seed Grown or transplant on site only permitted

H Habitat — provide habitat for native birds and insects

M Male only

P Pollinators — provide food for native pollinators

S Semi-hardy — some dieback in a hard frost

T Toxic; may be harmful if eaten. For more information visit www.azpoison.com, or call the Arizona Poison Control Center at 1-800-222-1222.

NATIVE REGION DEFINITIONS

Chihuahuan Desert (CD) — broadly interpreted to include a large area of north central and northwest Mexico, southwest Texas, southern New Mexico and extreme southeast Arizona

Sonoran Desert (SD) — broadly interpreted to include the arid and semi-arid areas of northwest Mexico, southeast California and most of Arizona south of the Mogollon Rim.

* — native to Pima County. LOVE THAT THIS SUB CATEGORY HAS BEEN ADDED! THANK YOU!

Mojave Desert (MD)— broadly interpreted to include the arid areas of southeast California and southwestern Nevada with small portions extending into northwestern Arizona and southwestern Utah.

PLANT CATEGORIES

The plant list organizes species by the following categories:

Cacti and Succulents

Grasses

Herbaceous Perennials

Shrubs

Trees

Vines

SHRUBS (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Zauschneria californica subsp. *latifolia*	Hummingbird Trumpet	2' x 2'	SD*	B/P
Ziziphus obtusifolia	Greythorn	10' X 8'	SD*/CD	B/H

TREES				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Acacia constricta	Whitethorn Acacia	10' X 10'	SD*	H/P
Acacia greggii	Catclaw Acacia	45' X 20'	SD*/SD	H/P/E
Acca sellowiana	Pineapple Guava	15' X 15'		H
Bauhinia lunarioides	Chihuahuan Orchid Tree	10' X 10'	CD	H/P
Brahea armata	Mexican Blue Palm	30' X 10'	SD	B/H
Caesalpinia cacalaco	Cascalote	15' X 15'		H/P
Caesalpinia mexicana	~~Mexican Bird of Paradise~~	~~15' X 6'~~		~~H/P~~
Celtis reticulata	Netleaf Hackberry	30' X 30'	SD*/CD	B/H
Cercis canadensis var. *mexicana*	Mexican Redbud	15' X 15'	CD	H/P
Chilopsis linearis	Desert Willow	30' X 30'	SD*/CD	B/P
Chitalpa 'Morning Cloud'	Morning Cloud Chitalpa	25' X 25'		
Condalia globosa	Bitter Condalia	15' X 20'	SD*/SD	B
Cordia boissieri	Texas Olive	15' X 15'	CD	P/S
Cupressus arizonica var. *glabra*	Smooth Bark Cypress	40' X 20'	SD*	B/E
Dermatophyllum secundiflorum	Texas Mountain Laurel	15' X 10'	CD	E/H/P/T
Ebenopsis ebano	Texas Ebony	30' X 20'	CD	H/P/E
Eysenhardtia orthocarpa	Kidneywood	15' X 10'	SD*/CD	B/H/P
Eysenhardtia texana	Texas Kidneywood	10' X 8'	CD	H/P
Fraxinus greggii	Littleleaf Ash	15' X 15'	CD	H/P/E
Havardia mexicana	Mexican Ebony	30' X 20'	SD	B/H/P
Havardia pallens	Tenaza	30' X 20'	CD	H/P

There are rummblings amoungts botanists that this plant is starting to exhibit signs of being invasive.

KEY: B = Buffer Overlay Zone Use, E = Evergreen, G = Seed Grown Only, H = Habitat, M = Male Only, P = Pollinators, S = Semi-Hardy, T = Toxic

From: Carolyn Campbell <carolyn.campbell@sonorandesert.org>
Sent: Wednesday, August 30, 2023 10:42 AM
To: Mark Holden
Subject: Fwd: bufferyard comments

On Wed, Jul 12, 2023 at 9:36 AM Christina Mc Vie <christina.mcvie@gmail.com> wrote:
Hi Mark and all,

Some comments and observations for your consideration:

Evergreen category should include desert hackberry and ironwood trees - in the case of ironwoods, they only drop leaves just before blooming and are otherwise evergreen; hackberrys are also a great visual screen, shade and security device and habitat enhance and require little to no maintenance if spaced properly.

No new turf - if turf is deemed desirable by a developer, they can utilize artificial turf; otherwise, use other appropriate vegetative groundcover.

Prohibit the use of DG - it is a heat retainer and contributes to the heat island effect. Larger rock treatments, such as for erosion control, do not create that same effect.

Require instead the use of biotic mulch, chipped landscaping detritus, etc along with other vegetative ground cover to abate dust, stabilize and build soils, reduce erosion, increase moisture retention and infiltration and promote habitat establishment and enhancement. Leaf litter and brush are essential for herps especially, such as lizards, and other beneficial creatures that may help control disease vectors such as mosquitos.

Encourage the enhancement or restoration of native vegetation, where appropriate.

Encourage watering, if any, at night or off peak hours.

Lastly, I appreciated the conversation of the plant experts at the first virtual meeting, especially regarding their focus on true Sonoran Desert vegetation, and look forward to the next. You all are doing good work and we thank you!

c
--

Best wishes, Christina
she / her / ella

Born on ancestral Gabrielino-Tongva lands
Gratefully living on traditional O'odham, Tohono O'adham and Pascua Yaqui lands

--

Carolyn Campbell
Executive Director
Coalition for Sonoran Desert Protection
738 N. 5th Ave, Suite 205

please note new Suite number
Tucson, AZ 85705

520-388-9925 (office); 520-629-0525 (cell)
CURRENTLY WORKING REMOTELY

PIMA COUNTY DEVELOPMENT SERVICES DEPARTMENT

COMMENTS BY: THE PLANNING CENTER
07/19/23
FOREST WEIER

SCREENING AND BUFFERYARD DESIGN MANUAL

CHAIN LINK SHOULD BE PROHIBITED GENERALLY, BUT THERE ARE CASES WHERE CHAIN LINK IS APPROPRIATE.

CHAIN LINK PROVIDES SECURITY AND BOUNDARY DELINEATION CONSISTENT WITH TYPE II SCREEN DEFINED BELOW.

WHAT ABOUT BUFFER YARDS ADJACENT TO EXISTING ADOT CHAIN LINK FENCE ALONG HIGHWAYS?

Screening Types

- The purpose of Decorative Screen Type I is to provide an opaque barrier for boundary delineation, security, and to shield views and light trespass
- The purpose of Decorative Screen Type II is to provide a see-through barrier for boundary delineation and security

Screening Materials

- Screen may use a variety of materials, singly or in combination, but should avoid a uniform, monolithic appearance

THIS NEEDS ADDITIONAL DEFINING.

- Screen shall not use chain link (with or without slats), wood, v that degrade in the desert environment

IF I HAVE A SIDEWALK CONNECTION ADJACENT TO MY DRIVEWAY LEADING TO THE STREET SIDEWALK, THEN I CAN HAVE A 42" WALL?

Exceptions

THIS WILL BE NEARLY EVERY PROJECT.

If pedestrian or bicycle connectivity is provided through a bufferyard to an adjacent site, street or right-of-way, the required fence/screen height can be reduced to forty-two (42) inches

BUFFERYARD W/

WHAT IF THERE IS A BUILDING ADJACENT TO THE BUFFERYARD? BASIN CAN'T BE INSTALLED BECAUSE IT WOULD BE WITHIN 10' OF A FOUNDATION.

A minimum volume of installation of stormwa

OR CASES WHERE OTHER OBSTRUCTION/FOUNDATION/FOOTING PREVENTS INSTALLING A BASIN?

WHAT ABOUT BUFFER YARDS ON SLOPES? BASINS ARE NOT POSSIBLE ON STEEP SLOPES.

- Water harvesting infiltration basins are required in all bufferyards, except for natural undisturbed desert bufferyards and the 5-foot-wide Bufferyard A
- Basins shall be located at least 10 feet from foundations of structures
- Irrigation valve boxes, underground utilities and fences/wal

ORGANIC MULCH FLOATS AWAY.
ORGANIC MULCH DECOMPOSES TO QUICKLY.

- Organic mulch is preferred in basins to increase water quality and soil health benefits
- To prevent loss of mulch from basins during larger storm events, consider placing mulch under riprap at least 4 inches in diameter or larger; however, basins should not contain fine or crushed inorganic rock mulch of less than ½-inch in diameter

NO LESS THAN 1/2" IN BASIN BOTTOMS.

- Basins shall be stabilized for dust control without impe

BUT LESS THAN 1/2" SHOULD BE OKAY ON BASIN SIDES.

- Basin side and top of slopes shall be covered with inorganic mulch, to a minimum 2-inch depth
- Cacti, succulents, accents and other low-water use species shall be planted outside of the basin or on basin slopes
- All water harvesting infiltration basins shall be integrated into and coordinated with the civil drainage and grading plan.

MULCH SIZE?

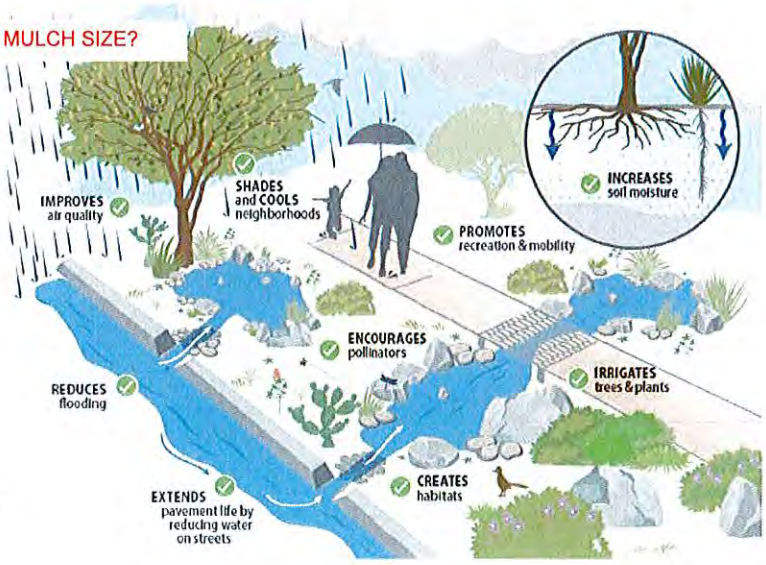


Illustration from: Green Stormwater Infrastructure and Low Impact Development Standard Details and Site Guidance, City of Tucson and Pima County, November 2022

TABLE 1 | REQUIRED BUFFER

SEE TABLE 2 FOR MINIMUM BUFFERYARD REQUIR

YOU PROBABLY WANT A BUFFER BETWEEN SUBDIVISIONS AND PARKS.

A 6' WALL IS APPROPRIATE FOR MORE DEVELOPED/URBAN PARKS.

VIEW FENCE (PARTIAL MASONRY/PARTIAL OPEN METAL FENCE) IS APPROPRIATE FOR RIVERPARKS/GOLF COURSES/NATURAL AREAS.

	EXISTING ADJACENT USE/ZONE							
PROPOSED USE	Low Density Residential	High Density Residential and Mixed-Use	General Commercial	Light Industrial	Heavy Industrial	Park/Other	Street 1	Street 2
Low Density Residential	None	None	None	None	None	None	A	B
High Density Residential and Mixed-Use						B	E	C
General Commercial						C	E	C
Light Industrial	D	D	[					
Heavy Industrial	D	D	D	None	None	D	C	D
Park/Other	None	None	None	None				C

TYPE B IS A PROBLEM FOR HIGH DENSITY RESIDENTIAL AND MIXED USE ADJACENT TO PARKS.

EXAMPLE: MIXED-USE NEXT TO THE LOOP/RIVERPARK. A 6' WALL IS REQUIRED FOR A 10' BUFFER. A 6' WALL DOESN'T MAKE SENSE FOR RESAURANTS OR OTHER BUSINESSES THAT WANT CUSTOMERS FROM THE LOOP/RIVERPARK.

ALSO, HIGH DENSITY RESIDENTIAL AND MIXED-USE WILL WANT A VIEW FENCE ALONG A RIVER PARK OR NATURAL AREA OR GOLF COURSE.

VIEW FENCE (PARTIAL MASONRY/PARTIAL OPEN METAL FENCE) SHOULD BE AN OPTION FOR SCREENS.

TYPE C IS A PROBLEM FOR COMMERCIAL ADJACENT TO PARKS.

EXAMPLE: RESTAURANT NEXT TO THE LOOP/RIVERPARK. A 6' WALL IS REQUIRED FOR A 10' BUFFER. A 6' WALL DOESN'T MAKE ANY SENSE FOR RESAURANTS OR OTHER BUSINESSES THAT WANT CUSTOMERS FROM THE LOOP/RIVERPARK.

BUFFER IS NOT NEEDED FOR A PARK ALONG A SCENIC GATEWAY.

NATURAL AREAS OR GOLF COURSES DON'T NEED A BUFFER OR WALL ALONG HIGHWAS OR MAJOR ROUTES.

USE CATEGORIES

Low Density Residential

IR Institutional Rese[illegible]
SR Suburban Ranch
SR-2 Suburban Ranch
RH Rural Homestead
SH Suburban Homes
CR-1 Single Residence
CR-2 Single Residence
CR-3 Single Residence
GR-1 Rural Residential

High Density Residential and Mixed-Use

TH Trailer Homesite (RV)

PARKING AREAS:

SCREENS FOR PARKING AREAS?

ISN'T THERE A MINIMUM SCREEN REQUIRED FOR PARKING AREAS?

THERE SHOULD BE A SINGLE STANDARD FOR ALL PARKING WITH A 42" WALL.

WHAT ABOUT SELF STORAGE USE?
WHAT ABOUT RV STORAGE, CONTRACTOR YARDS, ETC?
NEED MORE USES DEFINED.

General Commercial

MR Major Resort
RVC Rural Village Center
CB-1 Local Business
CB-2 General Business

Light Industrial

CPI Campus Park Industrial
CI-1 Light Industrial/Warehousing

Heavy Industrial

CI-2 General Industrial
CI-3 Heavy Industrial
115 kV Substation

Park/Other

Golf Course
Public Park/Garden

OTHER NATURAL AREAS TO INCLUDE?
-WILDLIFE REFUGE, NATURE PRESERVES, OPEN SPACE ETC.???

Street 1

Public Street

Street 2

Scenic Route
Gateway Route
Federal and State Highways

SCREENING AND

TABLE 2 | BUFFERYARD REQUIREMENTS

TYPE	WIDTH	TREES PER 100 FEET*	UNDERSTORY PER 100 FEET*	SCREENING**
A	Five (5) feet	3 Canopy Trees	4 Shrubs 6 Cacti & Succulents/Grasses/Herbaceous Perennials	3' 6" Decorative Screen Type I
	Ten (10) feet	3 Canopy Trees	6 Shrubs 9 Cacti & Succulents/Grasses/Herbaceous Perennials	None
	Twenty (20) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable
B	Ten (10) feet	4 Canopy Trees	8 Shrubs 10 Cacti & Succulents/Grasses/Herbaceous Perennials	6' Decorative Screen Type I
	Twenty (20) feet	4 Canopy Trees	12 Shrubs 15 Cacti & Succulents/Grasses/Herbaceous Perennials	6' Decorative Screen Type II
	Thirty (30) feet	4 Canopy Trees	12 Shrubs 15 Cacti & Succulents/Grasses/Herbaceous Perennials	None
	Forty (40) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable
C	Ten (10) feet	4 Canopy Trees	10 Shrubs 10 Cacti & Succulents/Grasses/Herbaceous Perennials	6' Decorative Screen Type I
	Twenty (20) feet	4 Canopy Trees	15 Shrubs 15 Cacti & Succulents/Grasses/Herbaceous Perennials	6' Decorative Screen Type II
	Thirty (30) feet	5 Canopy Trees	20 Shrubs 20 Cacti & Succulents/Grasses/Herbaceous Perennials	None
	Forty (40) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable
D	Twenty (20) feet	4 Canopy Trees	20 Shrubs 10 Cacti & Succulents/Grasses/Herbaceous Perennials	6' Decorative Screen Type I
	Thirty (30) feet	5 Canopy Trees	30 Shrubs 15 Cacti & Succulents/Grasses/Herbaceous Perennials	6' Decorative Screen Type II
	Forty (40) feet	5 Canopy Trees	30 Shrubs 25 Cacti & Succulents/Grasses/Herbaceous Perennials	Not Applicable
	Fifty (50) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable
E	Ten (10) feet	4 Canopy Trees	5 Shrubs 8 Cacti & Succulents/Grasses/Herbaceous Perennials	3' 6" Decorative Screen Type I
	Twenty (20) feet	4 Canopy Trees	10 Shrubs 16 Cacti & Succulents/Grasses/Herbaceous Perennials	6' Decorative Screen Type II
	Forty (40) feet Natural Undisturbed Desert	Not Applicable	Not Applicable	Not Applicable

~~* Provides minimum required quantities of trees and understory from the **Official Regulatory Plant List**. Additional plants from the plant list are permitted.~~

** Screen height may be reduced to 3'-6" when pedestrian connectivity is provided through bufferyard to an adjacent site, street or right of way.

SC THIS NEEDS ADDITIONAL DEFINING.

IF I HAVE A SIDEWALK CONNECTION ADJACENT TO MY DRIVEWAY LEADING TO THE STREET SIDEWALK, THEN I CAN HAVE A 42" WALL?

THIS WILL BE NEARLY EVERY PROJECT.

BUFFERYARD SCREENI

VIEW FENCE:

HIGH DENSITY RESIDENTIAL WILL WANT A VIEW FENCE ALONG A RIVER PARK OR NATURAL AREA OR GOLF COURSE.

VIEW FENCE (PARTIAL MASONRY/PARTIAL OPEN METAL FENCE) SHOULD BE AN OPTION FOR SCREEN TYPE 1 IN THE CASE OF RESIDENTIAL ADJACENT TO A RIVER PARK OR GOLF COURSE OR NATURAL AREA..

Illustrations show the required screening as determin eryard. No masonry walls shall be built within infiltration basi ough bufferyard to an adjacent site, street or right of way.

DECORATIVE SCREEN TYPE I

Solid screening shall be constructed with masonry units, stone and sheet metal to provide 100% opacity. The use of wood and vinyl is prohibited. Screening must be decorative, which requires the use of stucco, paint, texture, color or other elements, such as columns and caps, that improve the appearance of a block wall. Standard grey CMU walls are prohibited. Screen heights shown below meet the requirements for the listed bufferyards. Examples of additional solid screen styles are also shown for reference.

PARKING AREAS:

SCREENS FOR PARKING AREAS?

ISN'T THERE A MINIMUM SCREEN REQUIRED FOR PARKING AREAS?

REQUIRED

Bufferyard A (5' Wide)
Bufferyard E (10' Wide)

ide)
de)
ide)

DECORATIVE 3'-6"

DECORATIVE 6' SC

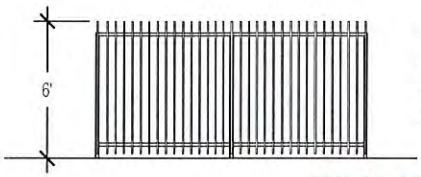
TYPE I: WOULD CORRUGATED SHEET METAL PANELS BE ALLOWED? MAYBE CORRUGATED SHEET METAL SHOULD BE PROHIBITED? OR HAVE SOME ADDITIONAL DECORATIVE DESIGN FEATURES REQUIRED?

YOU CAN MAKE A CHEAP VERY UGLY FENCE WITH CORRUGATED SHEET METAL (CSM). THIS EXAMPLE IS PRETTY UGLY.

OR WITH ADDITIONAL MATERIALS AND DESIGN, CSM CAN BE USED IN VERY ATTRACTIVE FENCES.

DECORATIVE SCREEN TYPE II

Permeable screening shall be constructed with metal posts, rails, and permeable panels or pickets. This does not exclude masonry or concrete columns. The use of vinyl, wood and chain link is prohibited. The illustration below meets the requirements for the listed bufferyards. Examples of additional permeable screen styles are also shown for reference.



REQUIRED

Bufferyard B (20' Wide)
Bufferyard C (20' Wide)
Bufferyard D (30' Wide)
Bufferyard E (20' Wide)

GENERAL QUESTION:
WHAT IF THERE IS AN EXISTING FENCE OR WALL ON THE PROPERTY LINE? (NEIGHBORS FENCE OR ADOT HIGHWAY FENCE)

YOU DON'T WANT TO CREATE A 'NO MAN'S LAND' BUFFER THAT HAS PARALLEL FENCE ON BOTH SIDES.

YPE II EXAMPLES

BUFFERYARD STORMWATER INFILTRATION BASIN ILLUSTRATIONS

When stormwater infiltration basins are required in a bufferyard and the like. Cacti, succulents and other very low water use plant watering during large storm events. Stormwater infiltration basir correlating project site drainage report. All basins shall be includ

WHAT IF THERE IS A BUILDING ADJACENT TO THE BUFFERYARD? BASIN CAN'T BE INSTALLED BECAUSE IT WOULD BE WITHIN 10' OF A FOUNDATION.

OR CASES WHERE OTHER OBSTRUCTION/FOUNDATION/FOOTING PREVENTS INSTALLING A BASIN?

WHAT ABOUT BUFFER YARDS ON SLOPES? BASINS ARE NOT POSSIBLE ON STEEP SLOPES.

For more guidelines on stormwater infiltration basins, refer to the Green Stormwater Infrastructure and Low Impact Development Standard Details and Site Guidance for Pima County and the City of Tucson.

STORMWATER INFILTRATION BASIN EXAMPLES

Example Cross-Section

NTS

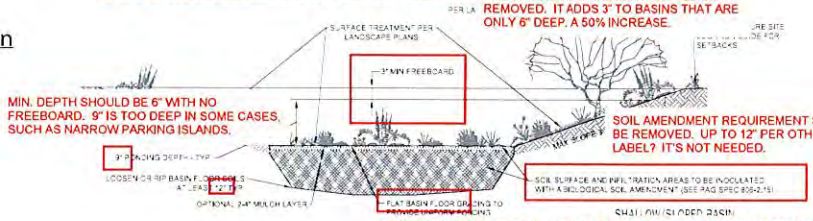
NEW CROSS SECTIONS SHOULD BE CREATED FOR THIS MANUAL.

THE GREEN STORMWATER DETAILS REQUIRE TOO MUCH. AND DEPTHS ARE WRONG.

FREEBOARD REQUIREMENT SHOULD BE REMOVED. IT ADDS 3" TO BASINS THAT ARE ONLY 6" DEEP. A 50% INCREASE.

MIN. DEPTH SHOULD BE 6" WITH NO FREEBOARD. 9" IS TOO DEEP IN SOME CASES, SUCH AS NARROW PARKING ISLANDS.

SOIL AMENDMENT REQUIREMENT SHOULD BE REMOVED. UP TO 12" PER OTHER LABEL? IT'S NOT NEEDED.



FLAT BASIN REQUIREMENT SHOULD BE REMOVED. THERE ARE CASES WHERE NARROW BASINS ARE USEFUL AND THE SLOPES WILL MEET AT THE BOTTOM OF THE BASIN LEAVING LITTLE OR NO FLAT BOTTOM.

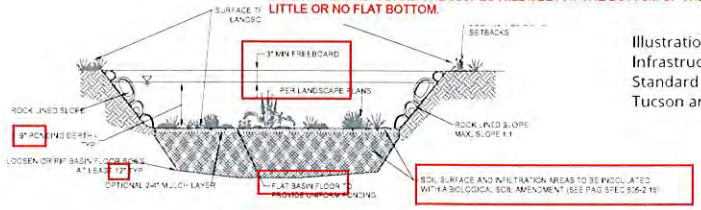
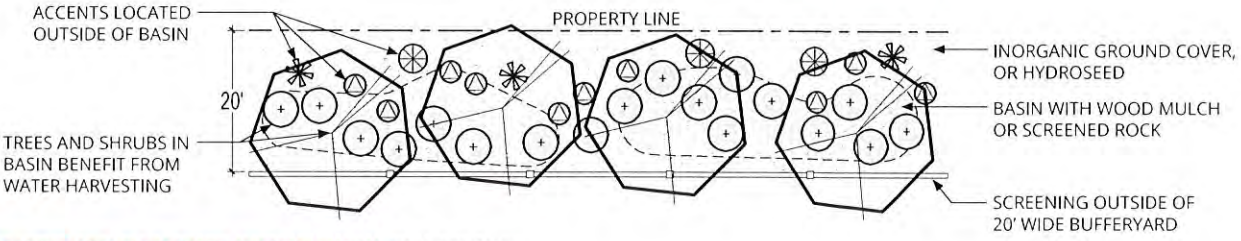


Illustration from: Green Stormwater Infrastructure and Low Impact Development Standard Details and Site Guidance, City of Tucson and Pima County, November 2022

Example Plan View

NTS



CACTI AND SUCCULENTS

BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Agave angustifolia v. *marginata*	Narrow Leaf Agave	3' X 4'		B/H
Agave bracteosa	Squid Agave	2' X 2'	CD	B/H
Agave chrysantha		3' x 5'	SD*	B/H
Agave colorata	Mescal Ceniza	2' X 3'	SD	B/H
Agave desmettiana	Smooth Agave	3' X 3'		B/H/S
Agave filifera	Thread-Leaf Agave	2' X 3'	CD	B/H
Agave geminiflora	Twin-Flowered Agave	3' X 3'		B/H
Agave murpheyi	Murphey's Agave	3' X 3'	SD*	B/H
Agave ocahui	Ocahui Agave	2' X 3'	SD	B/H
Agave ovatifolia	Whale's Tongue Agave	4' X 5'		B/H
Agave palmeri	Palmer's Agave	3' X 4'	SD*	B/H/P
Agave parryi	Parry's Agave	2' X 2'	SD*	B/H
Agave parryi var. *huachucensis*	Huachuca Agave	3' X 3'	SD	B/H
Agave parviflora	Small Flowered Agave	.5' X .7'	SD*	B/H
Agave pelona	Mezcal Pelón	2' X 2.5'	SD	B/H
Agave schottii	Schott Agave	2' X 4'	SD*	B/H/P
Agave striata	Espadín	3' X 3'	MD	B/H
Agave utahensis	Utah Agave	1' X 2'	MD	B/H
Agave victoriae-reginae	Queen Victoria Agave	1' X 2'		B/H
Agave vilmoriniana	Octopus Agave	4' X 6'	SD	B/H/S
Agave weberi	Weber Agave	6' X 6'		B/H
Carnegiea gigantea	Saguaro	40' X 15'	SD*	B/H/P
Cylindropuntia arbuscula	Pencil Cholla	5' X 4'	SD*	B
Cylindropuntia bigelovii	Teddy Bear Cholla	5' X 3'	SD*/MD	B/H
Cylindropuntia versicolor	Staghorn Cholla	10' X 6'	SD*	B/H
Dasylirion acrotriche	Green Desert Spoon	4' X 5'	CD	
Dasylirion leiophyllum	Green Sotol	4' X 6'	CD	

SHOULD ADD 'AGAVE AMERICANA'

KEY: B = Buffer Overlay Zone Use, E = Evergreen, G = Seed Grown Only, H = Habitat, M = Male Only, P = Pollinators, S = Semi-Hardy, T = Toxic

CACTI AND SUCCULENTS (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Dasylirion quadrangulatum	Toothless Desert Spoon	4' X 5'	CD	
Dasylirion texanum	SHOULD ADD 'DASYLIRION LONGISSIMA'	5' X 5'	CD	
Dasylirion wheeleri	Desert Spoon	4' X 5'	SD*/CD	B
Echinocactus grusonii	Golden Barrel Cactus	3' X 2'		B
Echinocereus engelmannii	Engelmann Hedgehog	1' X 2'	SD*	B
Echinocereus nicholii	Golden Spined Hedgehog	1' X 2'	SD*	
Euphorbia antisyphilitica	Candelilla	3' X 3'	CD	
Euphorbia lomelii	Lady Slipper	4' X 4'	SD	B/S
Ferocactus acanthodes	Compass Barrel	2' X 1.5'	SD*/MD	B/H/P
Ferocactus emoryi	Coville Barrel	2' X 1.5'	SD*	
Ferocactus wislizeni	Fishhook Barrel	2' X 1.5'	SD*/CD	
Fouquieria columnaris	Boojum Tree	40' X 3'	SD	S
Fouquieria macdougalii	Mexican Tree Ocotillo	20' X 20'	SD	B/S
Fouquieria splendens	Ocotillo	16' X 13'	SD*/CD/MD	B/G
Hesperaloe campanulata	Bell Flowering Hesperaloe	3' X 3'		
Hesperaloe funifera	Giant Hesperaloe	5' X 5'	CD	
Hesperaloe nocturna	Night Flowering Hesperaloe	3' X 3'	SD	B
Hesperaloe parviflora and cultivars	Red Yucca	3' X 4'	CD	P
Lophocereus schottii	Senita Cactus	10' X 10'	SD	B
Lophocereus schottii f. monstrosus	Totem Pole Cactus	10' X 8'		
Mamillaria grahamii	Graham fishhook	0.5' X 1'	SD*/CD	B
Nolina bigelovii	Bigelow's Nolina	6' X 4'	SD/MD	B/H
Nolina matapensis	Tree Beargrass	20' X 6'	SD	B/H
Nolina microcarpa	Beargrass	3' X 6'	SD*	B/H
Nolina nelsonii	Blue Nolina	4' X 6'		H
Nolina parryi	Parry's Beargrass	5' X 5'	SD/MD	B/H

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CACTI AND SUCCULENTS (CONTINUED)

BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Opuntia basilaris	Beavertail Pricklypear	2' X 3'	SD/MD	B
Opuntia engelmannii	Engelmann's Pricklypear	5' X 6'	SD*/CD/MD	B/H/P
Opuntia ficus-indica	Indian Fig	10' X 10'		H
Opuntia macrocentra	Black-Spine Prickly Pear	2' X 3'	SD*/CD	B/H
Opuntia phaeacantha	Brown-Spined Prickly Pear	3' X 5'	SD*/CD	H/P
Opuntia santa-rita and cultivars	SHOULD ADD 'PEDILANTHUS MACROCARPUS'	'	SD*/CD	B/H/P
Pachycereus marginatus	Mexican Fence Post	7' X 4'		S
Peniocereus greggii	Arizona Queen of the Night	6' X 3'	SD*	B/H/P
Stenocereus thurberi	Organ Pipe Cactus	8' X 5'	SD	B
Tephrocactus articulatus	Pinecone Pricklypear	3' X 1'		
Yucca baccata	Banana Yucca	3' X 5'	SD*/CD/MD	B/H
Yucca baileyi	Navajo Yucca	4' X 2'		B/H
Yucca brevifolia	Joshua Tree	15' X 8'	MD	B/H
Yucca constricta	Buckley Yucca	5' X 5'	CD	B/H
Yucca elata	Soaptree Yucca	10' X 5'	SD*/CD	B/H
Yucca faxoniana	Giant Dagger Yucca	7' X 4'	CD	B/H
Yucca glauca	Soapweed Yucca	3' X 3'	CD	B/H/S
Yucca harrimaniae	Harriman's Yucca	1' X 1.5'		B/H
Yucca pallida	Twistleaf Yucca	2' X 2'		B/H
Yucca rigida	SHOULD ADD 'YUCCA RECURVIFOLIA'	12' X 5'	CD	B/H
Yucca rostrata	Beaked Yucca	12' X 9'	CD	B/H
Yucca schottii	Mountain Yucca	15' X 4'	SD	B/H
Yucca thompsoniana	Thompson's Yucca	10' X 5'	MD	B/H

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GRASSES (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Trichloris crinita	Two-Feather Trichloris	3' X 1'	SD*/CD	B
Tridens muticus	Slim Tridens	1.5' X 0.5'	SD*/CD	B

HERBACEOUS PERENNIALS				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Acmispon rigidus	Shrubby Deervetch	2' X 2'	SD*/MD	B
Amsonia grandiflora		3' X 3'	SD*	B
Bahia absinthifolia		1' X 0.5'	SD*/CD	B/P
Baileya multiradiata		1' X 1'	SD*/CD	B
Berlandiera lyrata		2' X 2'	SD*/CD	P
Calylophus berlandieri		1' X 3'	CD	
Calylophus hartwegii		1' X 2'	SD*/CD	H/P
Datura wrightii	Sacred Datura	3' X 3'	SD*/CD/MD	B/P/S/T
Dicliptera resupinata	Arizona Foldwing	2' X 2'	SD*/CD	B/H/P
Glandularia gooddingii	Goodding's Verbena	1' X 3'	SD*	B/P
Lupinus arizonicus	Arizona Lupine	1' x 1'	SD/MD	B
Melampodium leucanthum	Blackfoot Daisy	1.5' X 1'	SD*/CD	P
Menodora scabra	Rough Menodora	1' X 1'	SD*/CD/MD	B
Oenothera berlandieri	Mexican Evening Primrose	1' X 3'	CD	S
Oenothera caespitosa	Tufted Evening Primrose	1' X 3'	SD*	B/P
Oenothera stubbei	Chihuahuan Primrose	1' X 2'	CD	
Penstemon barbatus	Beardtongue Penstemon	1' X 1'	SD*/CD/MD	B/P
Penstemon eatonii	Firecracker Penstemon	1' X 1'	SD*	B/P
Penstemon palmeri	Palmer Penstemon	2' X 2'	SD*/MD	P
Penstemon parryi	Parry Penstemon	1' X 1'	SD*	B/P
Penstemon pseudospectabilis	Canyon Penstemon	1' X 1'	SD*/MD	B/P

MUST ADD GROUNDCOVERS !!!!

-LANTANAS, DYSSODIAS, MYOPORUMS, SETCREASA, ETC....

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SHRUBS (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Atriplex polycarpa	Desert Saltbush	4' X 4'	SD*	B/H/E
Baccharis sarothroides	Desert Broom	5' X 5'	SD*	M/P/E
Bahiopsis parishii	Parish's Goldeneye	2' X 2'	SD/MD	P
Bebbia juncea	Chuckwalla Delight	3' X 3'	SD*/CD	B/P
Berberis haematocarpa	Red Barberry	5' X 5'	SD*	B/H/P/E
Berberis trifoliolata	Algerita	5' X 5'	SD*	B/P/E
Buddleja marrubiifolia	MUST ADD 'CAESALALPINIA PULCHERRIMA'		CD	B/P/E
Calliandra californica	Baja Fairy Duster	5' X 5'	SD	B/H/P/E
Calliandra eriophylla	Fairy Duster	3' X 4'	SD*	B/H/P/E
Canotia holacantha	Crucifixion Thorn	10' X 12'	SD*	B
Castela emoryi	SHOULD ADD 'CELTIS RETICULATA'	10' X 12'	SD*	B
Celtis pallida	Desert Hackberry	16' X 10'	SD*/CD	B/H
Chrysactinia mexicana	Damianita	2' X 2'	CD	P/E
Condalia globosa	Bitter Condalia	8' X 8'	SD*	B/E
Condalia warnockii var. *kearneyana*	Condalia	8' X 8'	SD*/CD	B/H/P/E
Cordia parvifolia	Little-Leaf Cordia	6' X 8'	SD/CD	B/P/E
Coursetia glandulosa	Coursetia, Baby Bonnets	8' X 12'	SD*	P/S
Dalea bicolor var. *bicolor*	Monterrey Blue Dalea	5' X 6'		P/E
Dalea bicolor var. *argyrea*	Dalea Bicolor	4' X 4'	CD	B/H/P/E
Dalea capitata	Yellow Dalea	3' X 1'	CD	B/H/P/E
Dalea formosa	Feather Dalea	2' X 2'	SD*/CD	P
Dalea frutescens	Black Dalea	3' X 3'	CD	B/H/P
Dalea greggii	Trailing Dalea	2' X 4'	CD	B/H/P/E
Dalea pulchra	Indigo Bush	6' X 5'	SD*	B/H/P/E
Dalea versicolor var. *sessilis*	Indigo Bush	4' X 5'	SD*	B/H/P/E
Dodonaea viscosa	Hopseed Bush	15' X 12'	SD*/CD	B/S/E

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SHRUBS (CONTINUED)				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Zauschneria californica subsp. *latifolia*	Hummingbird Trumpet	2' x 2'	SD*	B/P
Ziziphus obtusifolia	Greythorn	10' X 8'	SD*/CD	B/H

TREES				
BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Acacia constricta	Whitethorn Acacia	10' X 10'	SD*	H/P
Acacia greggii	Catclaw Acacia	45' X 20'	SD*/SD	H/P/E
Acca sellowiana	Pineapple Guava	15' X 15'		H
Bauhinia lunarioides	Chihuahuan Orchid Tree	10' X 10'	CD	H/P
Brahea armata	Mexican Blue Palm	30' X 10'	SD	B/H
Caesalpinia cacalaco	Cascalote	15' X 15'		H/P
Caesalpinia mexicana	Mexican Bird of Paradise	15' X 6'		H/P
Celtis reticulata	Netleaf Hackberry	30' X 30'	SD*/CD	B/H
Cercis canadensis var. *mexicana*	Mexican Redbud	15' X 15'	CD	H/P
Chilopsis linearis	Desert Willow	30' X 30'	SD*/CD	B/P
Chitalpa 'Morning Cloud'	Morning Cloud Chitalpa	25' X 25'		
Condalia globosa	Bitter Condalia	15' X 20'	SD*/SD	B
Cordia boissieri	Texas Olive	15' X 15'	CD	P/S
Cupressus arizonica var. *glabra*	Smooth Bark Cypress	40' X 20'	SD*	B/E
Dermatophyllum secundiflorum	Texas Mountain Laurel	15' X 10'	CD	E/H/P/T
Ebenopsis ebano	Texas Ebony	30' X 20'	CD	H/P/E
Eysenhardtia orthocarpa	Kidneywood	15' X 10'	SD*/CD	B/H/P
Eysenhardtia texana	Texas Kidneywood	10' X 8'	CD	H/P
Fraxinus greggii	Littleleaf Ash	15' X 15'	CD	H/P/E
Havardia mexicana	Mexican Ebony		SD	B/H/P
Havardia pallens	Tenaza	30' X 20'	CD	H/P

SHOULD ADD "FRAXINUS VELUTINA'

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TREES (CONTINUED)

BOTANICAL NAME	COMMON NAME	TYPICAL SIZE (H X W)	NATIVE REGION	NOTES
Leucaena retusa	Golden Ball Lead Tree	20' X 15'	CD	H/P
Lysiloma watsonii var. *thornberi*	Feather Tree	20' X 20'	SD*	B/H/P/S
Mariosousa heterophylla	Palo Blanco	15' X 15'	SD	B/P/S
Morus microphylla	Texas Mulberry	15' X 15'	SD*/CD	H/P
Myrospermum sousanum	Arroyo Sweetwood	20' X 20'	SD/CD	B
Olneya tesota	Desert Ironwood	30' X 25'	SD*	B/H
Parkinsonia florida	Blue Palo Verde	30' X 30'	SD*	B/H/P
Parkinsonia microphylla	Foothill Palo Verde	20' X 20'	SD*	B/H/P
Parkinsonia praecox	Palo Brea	30' X 25'	SD	B/H/P/S
Parkinsonia x sonorae	Sonoran Palo Verde	20' X 20'	SD	H/P
Pinus edulis	Pinyon Pine	25' X 15'	CD/MD	H/E
Pinus monophylla	Single-Leaf Pinyon Pine	25' X 15'	MD	B
Prosopis glandulosa var. *torreyana*	We	30'	SD/CD	B
Prosopis pubescens	Screwbean Mesquite	20' X 20'	SD*/CD	B/H/P
Prosopis velutina	Velvet Me			H/P
Punica granatum	Pomegranate	20' X 15'		
Quercus emoryi	Emory Oak	30' X 20'	SD*/CD	H
Quercus fusiformis	Texas Live Oak	30' X 30'		H/E
Quercus muehlenbergii	Chinquapin Oak	30' X 30'	CD	H
Quercus oblongifolia	Mexican Blue Oak	30' X 30'	CD	H/E
Sambucus nigra subsp. *cerulea*	Mexican Elderberry	30' X 20'	SD*/CD	B/S
Sapindus saponaria var. *drummondii*	Western Soapberry	30' X 30'	SD*/CD	B/H/P
Senegalia berlandieri	Guajillo		CD	H/P
Senegalia occidentalis	Sonoran Cat Claw			H
Ungnadia speciosa	Mexican Buckeye	12' X 12'	CD	B/H/P
Vachellia farnesiana	Sweet Acacia	20' X 20'	SD*/CD	B/H/P

SHOULD ADD 'PISTACIA CHINENSIS'

SHOULD ADD 'PROSOPIS X PHOENIX', THORNLESS HYBRID MESQUITE

SHOULD ADD 'SOPHORA SECUNDIFLORA'

KEY: B = Buffer Overlay Zone Use, E = Evergreen, G = Seed Grown Only, H = Habitat, M = Male Only, P = Pollinators, S = Semi-Hardy, T = Toxic