Drainage Maintenance Guidelines

For Homeowner's Associations

This booklet provides information on how to care for the private drainage infrastructure that was designed to eliminate or reduce damage from stormwater runoff in neighborhoods in unincorporated Pima County.

Guidelines may differ for Pima County's incorporated jurisdictions: Tucson, South Tucson, Sahuarita, Marana, and Oro Valley.

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Neighborhood Drainage Channel designed to carry stormwater safely around home sites.

This drainage area needs cleanup and work to prevent further channel erosion.

Caring for Your Neighborhood

Neighborhood infrastructure, such as roads, sidewalks, landscaping and drainage, benefits property owners and creates a safe and enjoyable environment. The proper maintenance of such infrastructure results in an improved quality of life for neighborhood residents.

The Pima County Flood Control District (District) offers this booklet as a guide on caring for the private drainage infrastructure that was designed to make your development safer by reducing erosion and safely conveying stormwater runoff through the neighborhood. Proper drainage can reduce damage to properties within and adjacent to your neighborhood. In some cases, this infrastructure mimics natural conditions and can support landscaping, preserve habitat, and/or provide recreational and aesthetically pleasing areas.

HOA Responsibility for Drainage Infrastructure

When residential subdivisions are created, a Homeowners' Association (HOA) is often formed to take responsibility for common areas in the subdivision. Most residents are aware of community swimming pools and clubhouses, but many are less aware of common areas, natural open space areas and private easements. These features, which belong to the HOA, are often essential for safe conveyance of stormwater through a neighborhood. When private drainage easements and other stormwater facilities such as detention basins and channels have been granted to the HOA, the HOA must provide the maintenance and repair required for the stormwater facilities. Check the Dedication section of the subdivision plat to determine maintenance responsibilities.

HOA responsibilities for stormwater facilities include:

- Regular inspections of easements and common area drainage facilities. It is important to conduct inspections annually and after significant storm events.
- Removal of debris and other obstructions that could divert flow out of the areas designated for drainage or cause overtopping of facilities.
- Removal of debris, obstructions and invasive plants such as buffelgrass in natural open space.
- Correction of drainage slopes that result in extended ponding.
- Restoration of soils and removal of residues that can result in extended ponding.
- Repair of concrete and grouted riprap that exhibits cracks, damage or stress due to settling.
- Restoration of riprap or other non-grouted rock erosion protection that has developed gaps or lost subsurface soil over time.
- Addition of fill to correct undermined or exposed ends or edges of erosion protection.

- Removal of sediment that reduces water volume in basins or reduces conveyance capacity of infrastructure such as pipes and channels
- Removal of obstructions such as sediment, plants and trash from culverts under private roads.

Since 2014, developers in unincorporated Pima County have been required to provide an Inspection and Maintenance Protocol for detention and retention basins and for Low Impact Development features such as stormwater harvesting basins. The link to the *Design Standards for Stormwater Detention and Retention Basins* which includes an example inspection and maintenance checklist is: **http://webcms.pima.gov/cms/one.aspx?portalId=169&pageId=65527.**

For older subdivisions, this checklist could be useful in establishing inspection and maintenance guidelines for drainage infrastructure. As part of this process, the District also recommends establishing benchmarks within or adjacent to drainage infrastructure to help in the determination of when maintenance is necessary and to help maintenance crews re-establish the infrastructure to design specifications.

The Conditions, Covenants and Restrictions (CCRs) is a useful place to include maintenance responsibility because every homeowner receives a copy of the CCRs. Consider adding a maintenance section to your CCRs with an exhibit showing what areas the community is responsible for so property owners understand the importance of areas designated to handle drainage safely.

To locate the CCRs for your subdivision, check the Final Plat for the recording information. If the recording information is not provided, the Pima County Recorder's Office can search the Public Records for you. Some neighborhoods may not have CCRs. You can obtain a copy of the plat for your subdivision at: **http://webcms.pima.gov/cms/One.aspx?portalId=169&pageId=216199**.

If original design specifications are available, regular inspections can ensure that the original features dictated in the specifications remain in place. If the facilities no longer meet the original design requirements, the HOA must return the infrastructure to original design specifications through maintenance and repair.

There may be times when it makes sense to improve upon the existing infrastructure instead of simply repairing a design that may have proven to be inadequate. District staff is available to provide technical assistance to aid in determining the best course of action. Any changes to an approved drainage design in unincorporated Pima County must be submitted to the District to determine whether a Floodplain Use Permit or revised site construction plan is required. Changes to detention basins, such as adding recreational features, usually require a Floodplain Use Permit.

Any private streets owned by the HOA are the responsibility of the HOA and must convey stormwater flows safely through and under those streets. Public streets and all associated drainage features are maintained by the Pima County Department of Transportation.

Private maintenance activity within a public area is prohibited without prior authorization. If maintenance or repair is needed to any *public* infrastructure or drainage area within unincorporated Pima County, an HOA representative should submit a Drainage Complaint form to the District. The form is available on our website: **http://webcms.pima.gov/cms/one.aspx?portalId=169&pageId=60151.**

Identifying Drainage Facilities and Design Specifications

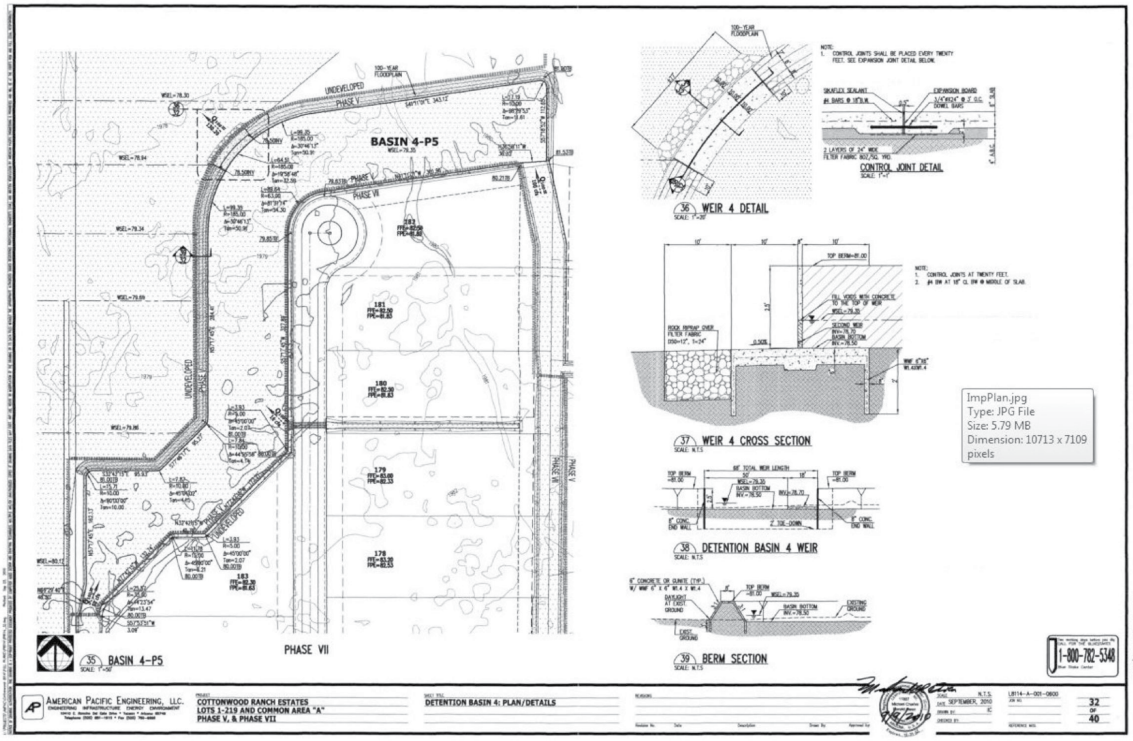
In most subdivisions, the areas where stormwater is collected and conveyed are obvious, but you should still check the subdivision plat for areas such as Common Areas, Private Drainage Easements, Natural Open Space, Public Drainageways or Easements or other designated areas for drainage.

The Final Plat should show surveyable floodplain limits for one-percent-chance storm flows of 100 cubic feet per second or greater, erosion hazard setback limits, common areas, and easements (Please see the example on the following page.)

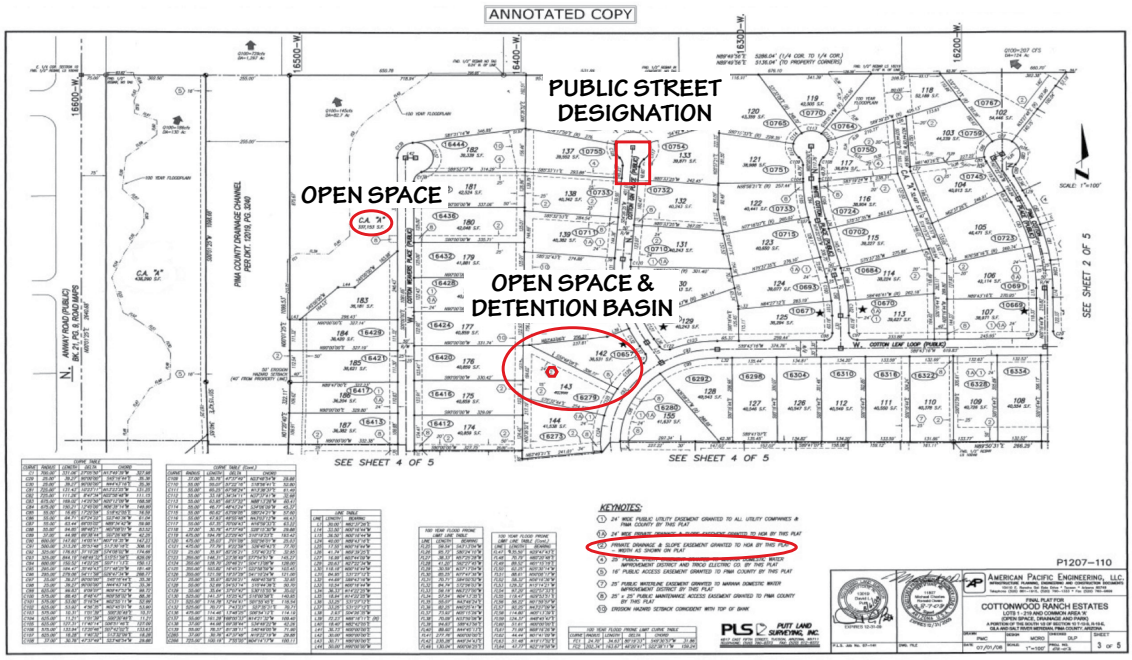
Recent subdivisions may also have a Tentative Plat. The Tentative Plat shows proposed grading, drainage swales, bank protection, detention basins and other drainage infrastructure, providing helpful information about how flows get into and out of the Common Areas.

If available, the site construction plans and as-built drawings will have the most detail about how subdivision improvements have been constructed. Site improvement plans provide final design information, while the Tentative Plat shows what was proposed in planning the site. The District has required an as-built certification for all basins since 2014. Below is an excerpt from the improvement plans for this example subdivision which shows construction detail for one of the detention basins.

There may be limited drainage information for older subdivisions. HOAs for older subdivisions without design information must rely on site observations. If there is no design information for problem areas, an HOA should consult a drainage engineer.



An Example Final Plat with Common Areas and Easements for Drainage



Excerpt from Improvement Plans

Typical issues for HOAs

Designers sometimes do not consider all possible conditions, and on occasion, neighborhood activities can alter flows. In these instances, ponding water and erosion can occur. In such cases, a drainage engineer should evaluate the situation for possible design revisions. *Examples of common problems appear below:*

A neighborhood detention basin with extended ponding.
Over time, maintenance activities can lower basin floors causing the drainage outlet to become ineffective.

A neighborhood basin with accumulated trash and debris.
Vegetation and debris can be swept into basins during rain events; in addition, basins also become convenient locations for illegal dumping.

A basin inlet with some obstruction from accumulated sediment.
Soil has been deposited at this basin inlet and needs to be removed to allow full flow conveyance into the basin. After sediment removal, the outlet rock erosion protection should be replaced at the finished grade of the basin pipe bottom to reduce future obstruction.

A wall opening into a basin that has created erosion on the basin slope.

This eroded rill should be filled, and the slope should be protected with rock or hydroseed.

A drainage easement with concrete apron for street flow.

This apron was designed to be elevated at the curve to better capture flow. It appears that flow is overtopping the curve and/or side flows have undermined the apron. The erosion should be corrected to protect the designed structure.

Riprap erosion protection that has shifted over time, exposing the underlying filter fabric.

Rocks should be restored to original locations. The underlying grade may need to be returned to a more uniform slope.

A basin inlet and concrete drainage channel that are in design condition.

This channel is free of debris and damage. The rock erosion apron is not obstructed or filled with sediment.

GLOSSARY

As-built plans/drawings: As-Built plans are drawings that show the way any feature in a construction project was actually built, instead of how it was originally designed.

Conditions, Covenants and Restrictions (CCRs): CCRs are rules that are implemented and enforced in planned neighborhoods/developments. CCRs specify certain requirements for properties in the neighborhood. The requirements are meant to enhance property values and are agreed to by home purchasers/owners.

Detention Basin: A detention basin is an area within a development where stormwater is temporarily held and released through an engineered outlet at a flow rate that approximates the pre-development flow rate at the outlet location.

Easement: An easement is private property that must be made available for utility or other infrastructure. The property owner cannot do anything on the easement that could impede its use. Easements are typically on the periphery of a property.

Erosion Hazard Setback Limits: Areas where buildings cannot be placed due the potential of erosion of the banks of an adjacent river or wash in a flood event.

Floodplain Use Permit: An authorization to perform improvements within a floodplain. A Floodplain Use Permit is required before construction, development or placement of improvements within any regulatory floodplain, including those designated on plats.

Overtopping: Overtopping occurs when water flows over manmade features designed to hold water back.

Plat: A plat is a legal map that is drawn to scale and has been approved by a governmental entity. Plats typically show subdivisions, blocks, streets and alleys.

Retention Basin: A retention basin is an area within a development where stormwater is retained to reduce stormwater volume leaving the development and to benefit vegetation by infiltration.

Rill: A rill is a narrow and shallow channel that is caused by flowing water.

Riprap: Riprap is rock used to protect waterways or infrastructure against scour and erosion.

Swale: A swale is a low area of land that collects water. A swale can be a naturally-occurring landscape feature or a human-created feature. Artificial swales are designed to manage water runoff, filter pollutants and increase rainwater infiltration.

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