



STORM DRAINAGE DESIGN MANUAL UPDATE

June 8th, 2017



KEY QUESTIONS

Receive and discuss information on outstanding policy items:

- 1. Does Mayor and Council favor requiring a retention easement? With or without access easement and/or clear zone requirement?**
- 2. Does Mayor and Council favor adding a first flush requirement as presented or modified?**
- 3. Does Mayor and Council prefer a proactive or reactive approach to maintenance of stormwater facilities?**
- 4. Does Mayor and Council prefer to leave the preservation of natural wash language or change more to an entry and exit point?**
- 5. Does Mayor and Council prefer to allow parking lot storage or not?**



RETENTION BASINS / ACCESS EASEMENTS

Issue: Notifying owners in the change of possession of real property that a retention basin exists on the property and has to remain in its location and be maintained

1. Retention Basin Easements

- **Currently not required**
- **Proposed in manual that an easement is required over retention basins to ensure the basin remains in place**

2. Access Easements to Stormwater Facilities (i.e. Basins, washes, etc)

- **Currently required for washes with a Drainage Easement**
- **Proposed in manual that access easements are required to retention basins and other stormwater facilities (i.e. culverts, drywells, etc.) in addition to washes**



RETENTION BASIN EASEMENTS

What do others do?

- Researched nationally and polled local city attorneys
- Some municipalities require retention basin easements, they include
 - Scottsdale, AZ
 - Mesa, AZ
 - Charlotte, VA
 - Sedona, AZ
 - Gilbert, AZ
 - Redmond, OR
 - Prescott Valley, AZ
- Others require a maintenance agreement – Apache Junction and Lake Havasu
- One does not allow individual lot retention – San Luis



RETENTION BASIN/CLEAR ZONES

- **Recommended in Manual, Section 8-1**
 - **Retention Basin Easement over retention basins on the property**
 - **If basin is not fenced, 5' clear area around the basin for perimeter access**
 - **If the basin is fenced, 20' clear area around the basin for perimeter access**
 - **Maintain the basin, recommend twice annual inspection by property owner and maintenance if required**

- **If not adjacent to ROW, required 16' access easement**



ACCESS EASEMENTS

- **Access to retention basins and wash corridors, Section 8-1 B:**

New Requirement

- **If the drainage easement is not contiguous to the right-of-way, a minimum 16-foot access easement, to maintain the drainage facility with mechanical equipment, shall also be dedicated, regardless of who maintains the drainage facility**
- **Currently no access easement is specifically identified, but the Drainage Easement states:**
 - **The Town shall have the right to enter the Drainage Easement area and, as needed, to access the Drainage Easement area across the Property, to inspect, clean or maintain, and to be compensated by owners for such maintenance**



RETENTION BASIN AND ACCESS EASEMENTS

- **Does Mayor and Council favor requiring a retention easement? With or without access easement and/or clear zone requirement?**
- **Alternative Option**
 - **Retention Basins**
 - **Required Retention Basin Easements**
 - **No Retention Basin Easement over retention basins on the property**
 - **Clear Space**
 - **Clear space requirement around basins only**
 - **Clear space requirement around basins and in access easements**
 - **No clear space requirements**
 - **Access Easement**
 - **Require an access easement if not adjacent to ROW @ 16' wide**
 - **Do not require an access easement**



FIRST FLUSH REQUIREMENT

- **First Flush is the first ½” of rain on a property that often collects and transports oil, grease, gas and other pollutants into the storm drainage system.**
- **The previous text stated, in Section 3-2 B.2.a:**

First flush volume shall be retained on all lots
- **The revised text states, in Section 3-2 B.2.a:**

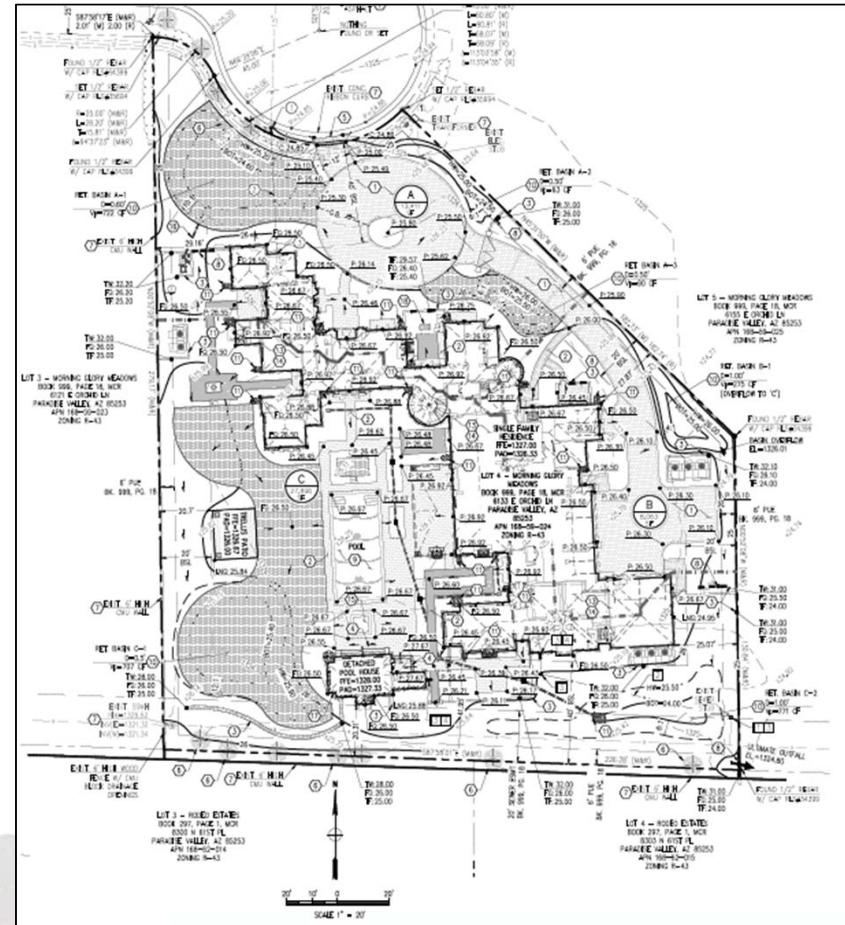
Where detention is allowed, first flush volume shall be retained on all lots or within common retention areas, and a *reasonable* attempt shall be made to route all runoff from disturbed areas to first flush basin(s) subject to grading plan approval.
- **Additionally, Section 3-4 B does allow for smaller basins and/or alternative stormwater controls, if they meet the approval of the Town Engineer, to retain/detain the first flush requirement.**



FIRST FLUSH REQUIREMENT

Sample Lot A - Flatland

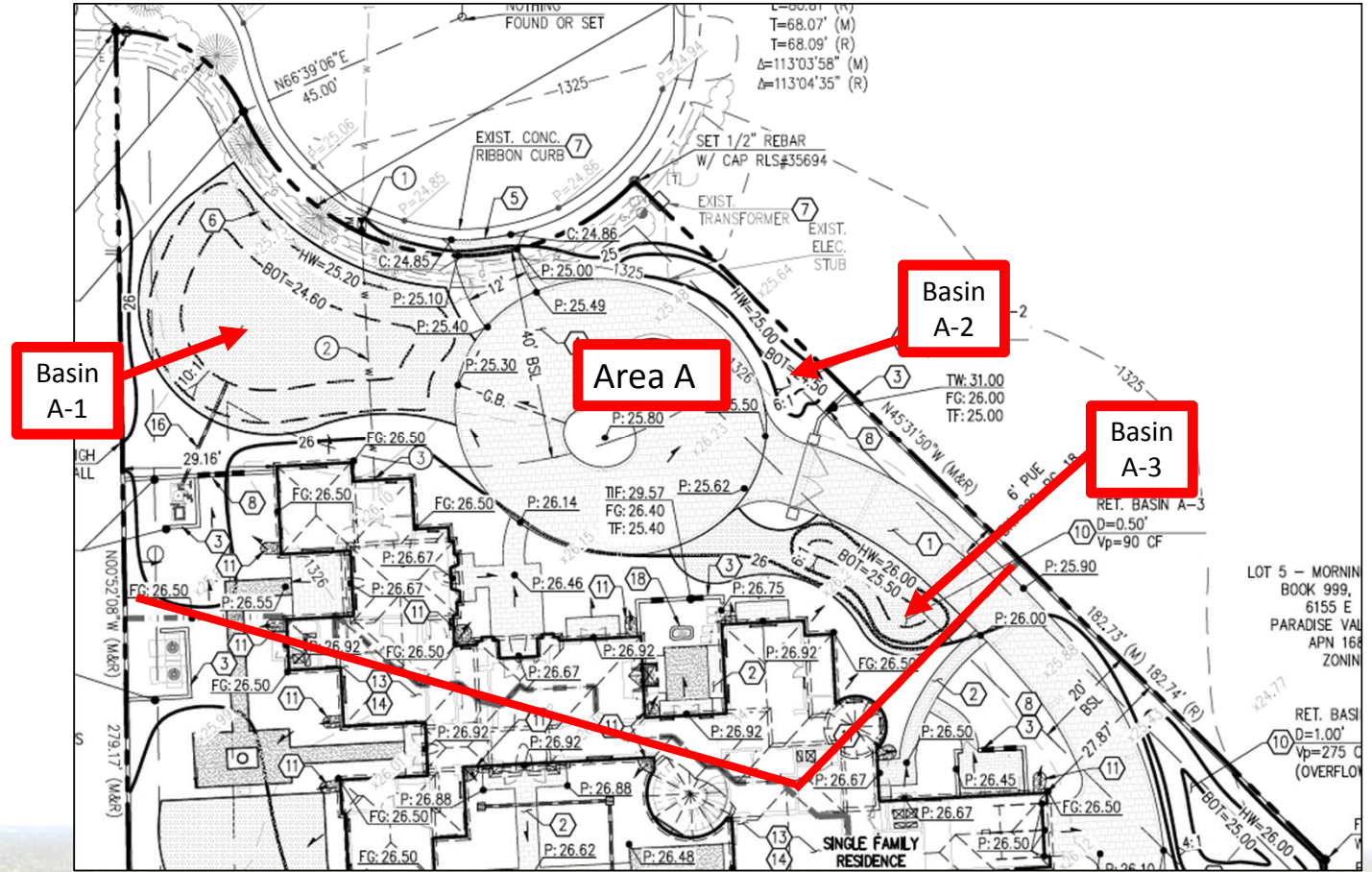
Site Data	
Lot Type	Flatland
Zoning	R-43
Lot Size	49,370 square feet
Building Area	12,323 square feet
Other Impervious Area	9,017 square feet
Retention Provided	3,012 cubic feet
First Flush Required	1,189 cubic feet



FIRST FLUSH REQUIREMENT

Sample Lot A - Flatland

Since this lot is flat land and the site provides the required retention amount, it also meets the requirement for first flush

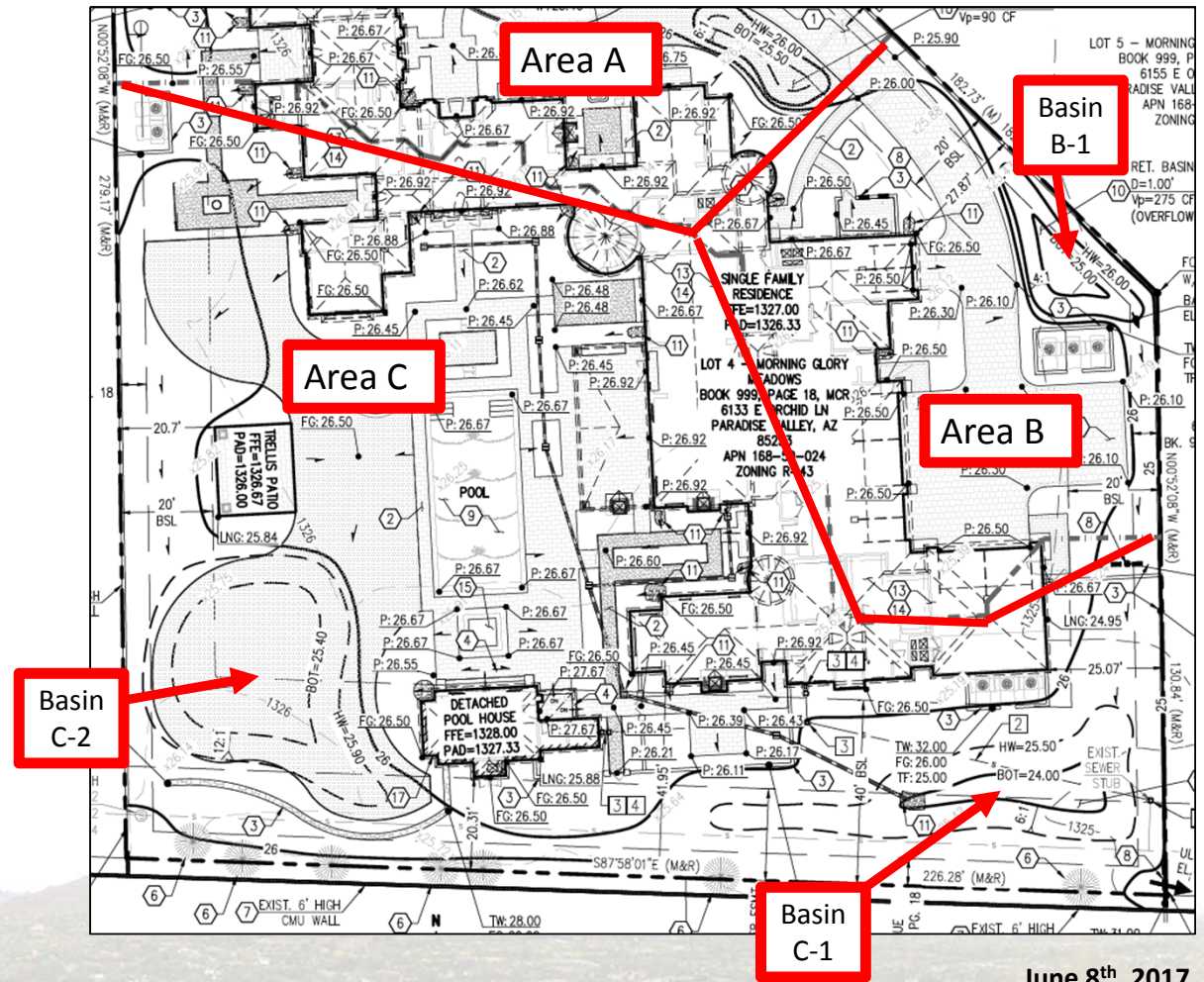


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FIRST FLUSH REQUIREMENT

Sample Lot A - Flatland



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FIRST FLUSH REQUIREMENT

Sample Lot B - Hillside

Site Data	
Lot Type	Hillside
Slope	13.5%
Zoning	R-43
Lot Size	214,020 square feet
Building Area	26,320 square feet
Other Impervious Area	37,330 square feet
Retention Provided	251 cubic feet
First Flush Required	2,419 cubic feet



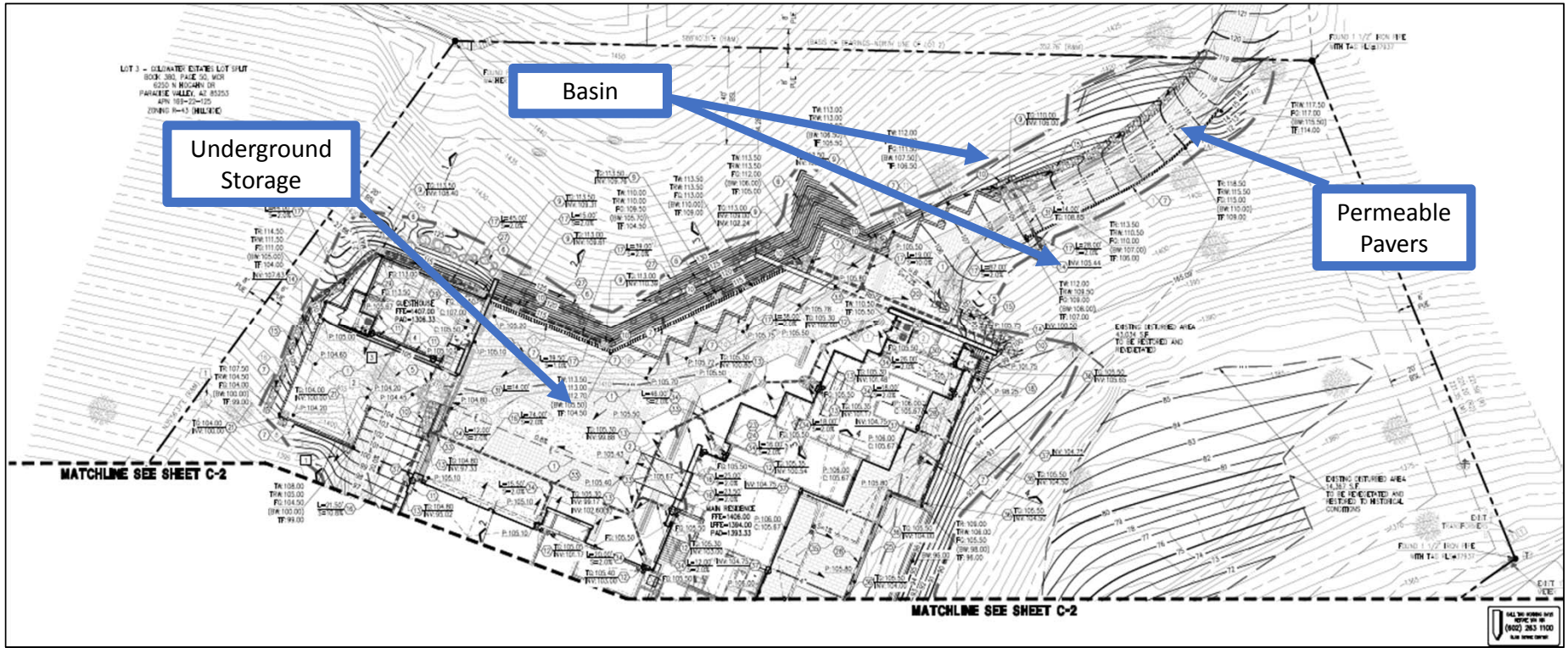
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FIRST FLUSH REQUIREMENT

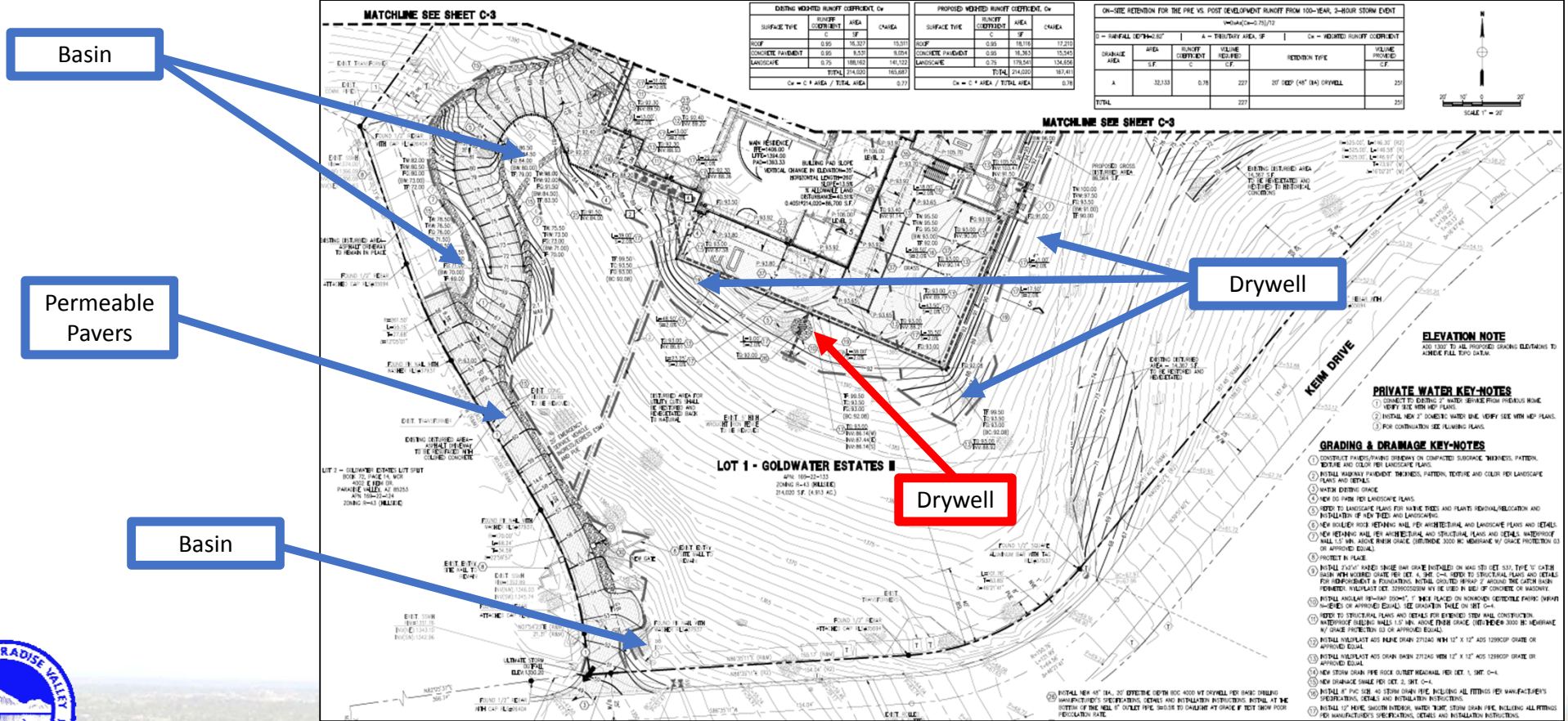
Sample Lot B - Hillside

Text



FIRST FLUSH REQUIREMENT

Sample Lot B - Hillside



FIRST FLUSH REQUIREMENT

Sample Lot B - Hillside

Solution	Design Cost	Construction Cost	Sample
Retention Basins	\$	\$\$	 <p>Figure 6.4 - Vegetated Retention Basin</p>
Underground Storage	\$\$	\$\$\$+	
Permeable Pavers	\$\$	\$\$\$+	



FIRST FLUSH REQUIREMENT

- Does Mayor and Council favor adding a first flush requirement as presented or modified?

- The revised text states, in Section 3-2 B.2.a:

Where detention is allowed, first flush volume shall be retained on all lots or within common retention areas, and a *reasonable* attempt shall be made to route all runoff from disturbed areas to first flush basin(s) subject to grading plan approval.

- Additionally, Section 3-4 B does allow for smaller basins and/or alternative stormwater controls, if they meet the approval of the Town Engineer, to retain/detain the first flush requirement.



MAINTENANCE OF STORMWATER FACILITIES

On-going maintenance issues:

- **Property owners don't know its their responsibility to maintain washes, basins, culverts, etc. that are on their property**
 - **More recently, staff has been proactively providing this information**
- **Town has been approving more drywells and underground retention facilities**
- **In certain situations this lack of maintenance can become a flooding hazard to the property owner or a neighboring property owner**
 - **Wash full of debris can divert stormwater, culvert that is clogged can back up stormwater, underground retention basin can fill with sediment, etc.**
- **Town has historically been reactive to stormwater facility maintenance complaints**



MAINTENANCE OF STORMWATER FACILITIES

Two approaches:

1. Reactive approach (current and recommended policy)

- **Inventory both public and private stormwater improvements (ADEQ MS4 req.)**
- **Require owners to provide a Drainage Easement and Maintenance Agreement**
- **Respond to complaints received**

2. Proactive approach (tasks above plus)

- **Town provide annual notification of inspection and maintenance requirement**
- **Require residents to provide annual affidavits of inspection and maintenance**
- **Complete periodic inspections, issue notices if necessary, etc.**

This approach requires a stormwater facilities database and significant staff time

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MAINTENANCE OF STORMWATER FACILITIES

Does Mayor and Council prefer a proactive or reactive approach to maintenance of stormwater facilities?

- 1. Reactive approach**
- 2. Proactive approach**
- 3. Different approach depending upon facility**
 - Drywells and underground retention basins – proactive**
 - Washes, culverts, above ground retention basins - reactive**



PRESERVATION OF NATURAL WASHES

Possible views:

- 1. Washes that cross private property are important pieces of the natural environment that should be preserved in their natural state unless requiring so makes the lot unbuildable.**
- 2. So long as property owners preserve the entry and exit points of washes on their property and convey the same volume, what happens on the property is less important.**
- 3. Land is so valuable in town that the idea of substantial portions of private property being left in natural condition is getting harder because there is so much pressure to maximize the usage of the lot.**



PRESERVATION OF NATURAL WASHES

Town code Section 5-10-5 Grading and Dust Control States:

“The Town Council has adopted a General Plan which encourages preservation of natural features. The Town Council also desires to reduce air pollution by limiting fugitive dust, and further seeks to minimize the possible impact of property flooding due to storm water drainage.

These goals have in common that they are all furthered by maintaining the surface of the earth in an undisturbed natural state. Disturbance of the earth’s surface should occur only when necessary, and should be done in a manner which reflects an understanding of the unique local environment.”



PRESERVATION OF NATURAL WASHES

Town code Section 5-10-5 Grading and Dust Control Continues:

Any grading requires "A drainage plan showing washes in an undisturbed state except for modifications approved by the Town Engineer that are required to accommodate storm water. Washes shall not be realigned except as approved by the Town Engineer and Community Development Director when necessary to accommodate storm water or restore a disturbed wash to a more natural state."

- **Practice has been, washes have to remain in their natural state unless requiring the property owner to do so makes the lot undevelopable, in which case installing culverts in the washes original alignment is acceptable**

Is this still the goal of Mayor and Town Council?

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PRESERVATION OF NATURAL WASHES

Storm Drainage Design Manual reflects these practices in multiple locations:

3-7 Culverts and Storm Drains

- E. Stormwater runoff shall not be conveyed in a culvert or pipe under structures, except to drain a fully enclosed courtyard, where redundancy is required. Exceptions may be made where a lot is considered unbuildable, as approved by the Town Community Development Director and Town Engineer**

10-2 Natural Areas

- A. Preservation: Grading and design of landscape improvements will preserve and restore natural wash corridors that provide stormwater conveyance**

10-5 Improvements to Natural Washes



PRESERVATION OF NATURAL WASHES

- Does Mayor and Council prefer to leave the preservation of natural wash language or change more to an entry and exit point?



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STORMWATER STORAGE ON PARKING LOTS

Stormwater Management, Section 3-2 Stormwater Storage, Subsection C

16. Stormwater storage may occur in a private road, driveway or parking lot if the following conditions are met:

- a. At least the first 50% of the required storage volume is provided in a stormwater storage basin or underground storage tank, if approved;**
- b. No more than 50% of the required storage volume is provided;**
- c. The depth of the water does not exceed six inches; and**
- d. Interference with pedestrian traffic is minimized.**



STORMWATER STORAGE ON PARKING LOTS



Common practice amongst other municipalities, new practice to the Town. Engineer still has to prove water will evaporate or drain within 36 hours



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STORMWATER STORAGE ON PARKING LOTS

- Does Mayor and Council prefer to allow parking lot storage or not?



NEXT STEPS

- Review and revise Manual consistent with policy direction given;
- Address non-policy edits from Council;
- Clean up text;
- Eliminate redundancies and consolidate where possible;
- Improve formatting.

Present in Fall 2017

