Value Analysis Workshop
October 26 - 28, 2009

Pre-Design Phase
Pinnacle Peak Road and Channel
99th Avenue to the Agua Fria River

Flood Control District of Maricopa County
Phoenix, Arizona

Value Analysis Final Report

November 2, 2009

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SECTION A: EXECUTIVE SUMMARY

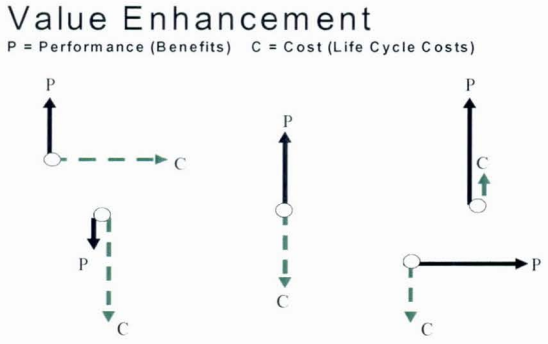
Introduction

This report includes recommendations for value enhancement of Pinnacle Peak Road and Channel project being planned for Peoria, Arizona. They stem from a value analysis (VA) workshop initiated by the Flood Control District of Maricopa County (FCDMC). The workshop was held at the FCDMC Operations Building Conference Room in Phoenix, Arizona from October 26 – October 28, 2009. The VA workshop focused on review of the Draft Pre-Design Study prepared by Wood / Patel. Bobbie Ohler, Project Manager for FCDMC coordinated the VA effort on behalf of the client.

This value analysis workshop provided a rigorous and in-depth examination of the value that will be provided by the proposed flood control improvements and amenities. The workshop found that an extraordinary amount of careful thought and planning on the part of the owner, design team and stakeholders has resulted in a project that will provide great value to the City of Peoria and western Maricopa County. Documents reviewed included:

- Draft Pre-Design Study for Pinnacle Peak Road and Channel, 99th Avenue to the Agua Fria River, dated October 2009 prepared by Wood / Patel.
- Project presentation by FCDMC and Wood / Patel.

The following diagrams illustrate the various ways value can be added to a project where P indicates project Performance and C represents Life Cycle Costs. For example the arrows in the lower right corner indicate an idea which maintains performance and reduces costs. The arrows in the center indicate an idea that raises performance and lowers cost. The VA team generated ideas in all these scenarios as illustrated to help improve the value of the project.



Value Analysis Recommendations

The value analysis team identified 52 ideas for value enhancement. Of these, 14 ideas were selected for further consider and development into recommendations for improving the performance and / or lowering the initial and life cycle cost of the project. "Big Ideas" included:

- Expand Basin C-S to the east to attenuate additional flows
- Send flows south through Ironwood Wash in lieu of new drainage improvements
- Construct channel and basin along Williams Field Road 107th Avenue west to the Agua Fria River
- Explore opportunities for mitigation bank for river bottom enhancements
- Add traffic calming on Pinnacle Peak Road

The following summary lists each proposal by number, description of the change and cost impact. Some recommendations will generate significant savings for the project while others will add costs (enhance value). The final column on this figure allows decision-makers to indicate which proposals are to be implemented. Refer to **Section B**, VA proposals for the complete description of each VA recommendation. Sketches, illustrations and cost estimates are also included in this section.

VA Results

Based on the VA proposals developed in the workshop, the team identified a total potential initial cost savings of $1,747,000 or approximately 19.2% of the estimated project cost. Although it is recognized the owner may not fully accept all recommendations, this savings would have a significant impact on the project. Another three VA recommendations were developed which would add cost and could be considered as value enhancements if they are within the County's overall project budget.

Project Description

The Pinnacle Peak Road and Channel project will develop roadway and drainage improvements near the northwestern boundary of Peoria from 99th Avenue to 107th Avenue. Currently, Pinnacle Peak Road east of Lake Pleasant Parkway is a paved two lane roadway. West of Lake Pleasant Parkway, beyond the development limits of the existing Circle K, the roadway is a graded dirt road that does not connect to 107th Avenue. The existing storm water runoff is conveyed overland from the northeast to the southwest and is ultimately collected by several washes and conveyed into the Agua Fria River. The two primary goals of the project are to provide 100 year flood protection downstream and a new roadway for City of Peoria. Other secondary objectives include:

- implementing the planned trail corridor & trail head
- avoid taking homes out
- maintain flows at 107th Ave. at existing levels in lieu of chasing them to the river

The project was first identified in the Glendale / Peoria Area Drainage Master Plan with subsequent hydrology updates and roadway scope identified in a DCR prepared by the Maricopa County Department of Transportation. FCDMC, City of Peoria and MCDOT are partners in the project with the Peoria funding the road construction and providing maintenance of the facilities.

The Draft Pre-Design Study prepared by Wood Patel identified and analyzed six hydrologic alternatives with Option 5 selected as the preferred alternative that would be the focus of the Value Analysis effort. Option 5 is primarily a closed conduit system with adjacent collector swales and several retention basins. A diagram of Option 5 is included in the Appendix of this report.

Landscape aesthetic opportunities include trail connections, trailheads, side slope forming at retention basins and mature landscaping at the road right of way. City of Peoria will be installing an irrigation system with the landscaping along Pinnacle Peak Parkway. This system will provide an opportunity for temporary or permanent irrigation for landscape materials along the corridor and in the basins.

Value Analysis Objectives

The following objectives were identified by the VA Team for this value analysis study:

- Add value
- Identify functions
- Assess worth / cost
- Optimize cost / benefit
- Explore alternatives
- Be creative
- Find mistakes
- Present findings

Cost Estimate

Wood / Patel presented the Pre-Design Cost Estimate Appendix H: Opinion of Probable Cost: Roadway and Appendix I: Opinion of Probable Cost: Segments and Options summarized as follows:
(Estimates include contingency and Right of Way costs)

Roadway	
107th Avenue to Lake Pleasant Parkway	$ 4,139, 190
Lake Pleasant Parkway to 99th Avenue	$ 420,655
102nd Avenue	$ 617,266
Sub-total Roadway	$ 5,177,111
Recommended Option 5 Drainage Improvements	
Segment A	$ 266,000
Segment B	$ 792,000
Segment C	$ 1,390,000
Segment D	$ 197,000
Segment E	$ 1,261,000
Sub-Total Drainage	$ 3,906,000
Total Estimated Project Cost:	**$ 9,083,111**

The Flood Control District of Maricopa County is currently budgeting approximately $ 10 million for the project.

VA Team

The VA team consisted of the following members:

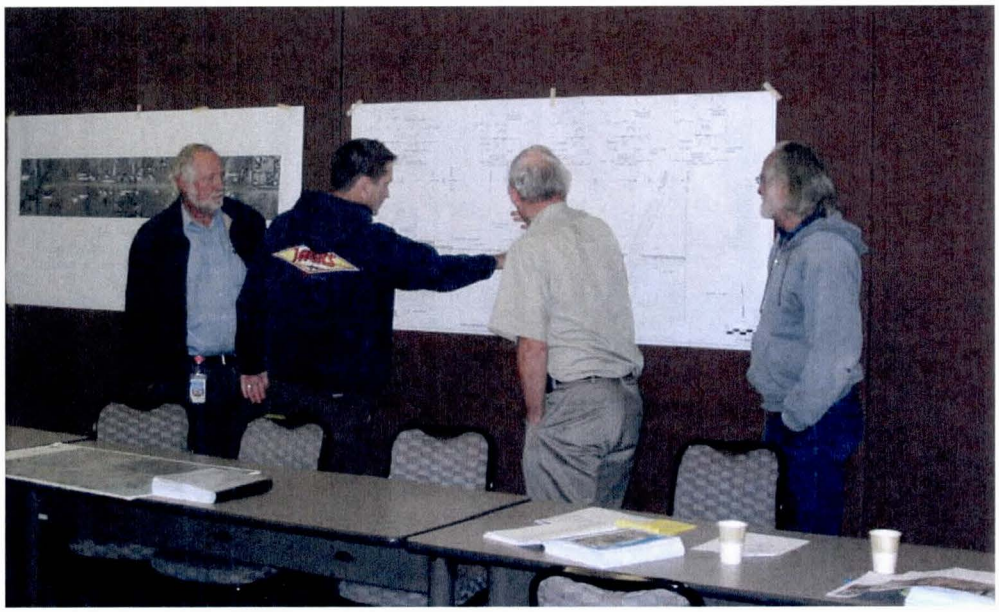
- Bobbie Ohler, Project Manager, Flood Control District of Maricopa County (part time)
- Mark Lewis, Construction Manager, Flood Control District of Maricopa County (part time)
- Burton Charron, Project Manager, City of Peoria
- Jeff Sargent, Parks & Recreation, City of Peoria
- Fritz Huber, Construction Management Branch Manager, Flood Control District of Maricopa County
- John Rodriguez, Construction Manager, Flood Control District of Maricopa County
- Bill Hahn, Maricopa County Department of Transportation
- Steven Tucker, Engineering, Flood Control District of Maricopa County
- Gary Shapiro, Engineering, Flood Control District of Maricopa County
- Jon Loxley, Landscape Planner, Flood Control District of Maricopa County
- John Pucetas, VA Team Leader, SiteTek Financial Arts, Inc.

A complete list of VA workshop participants is contained on **Section C** that follows.

The team reviewed the final design documents and created a function-logic diagram as a part of the workshop. Certain value engineering analytical tools and methods were used during the 3-day workshop to focus the VA team on the issues, concerns and opportunities presented by the pre-design stage project. The VA agenda, in conformance with the standards of SAVE International, can be found in **Section C** of this report.

Workshop Photos

(left to right, Jon Loxley, Burton Charron, John Rodriguez)



(left to right, Bill Hahn, Jon Loxley, Steven Tucker, Gary Shapiro

Function Logic Diagram (FAST)

Function Analysis is core activity to any value study. For this project, the VA team prepared a function analysis system technique (FAST) diagram to help understand the overall purposes of the project and its functional components. This diagram describes the primary functions of the project that will ***protect property, enhance connectivity, increase open space and mitigate flooding.*** The FAST diagram is included in **Section C** of this report.

Force Field Analysis

The VA Team was asked to develop two lists of project items for further consideration during the Creativity / Brainstorming Phase: Best Features and Features of Concern. These lists would then be used during the Creativity / Brainstorming phase of the workshop to generate ideas that would ***improve / correct*** the Features of Concern and further ***enhance*** the Best Features of the project. See the following list of items.

<u>Best Features</u>

1. Maintains character of Ironwood Wash
2. Peoria annexation
3. Basin locations
4. Simple run of straight pipe
5. Avoids river
6. Avoids taking out houses
7. Utilizes undeveloped land
8. Opportunity for trail head

9. Minimizes dust
10. Gives neighborhood regional access
11. Vista opportunities
12. Addresses all drainage problems in the area
13. Improves direct property access
14. Allows infrastructure corridor for other utilities

Features of Concern

1. Pipe velocity on hill
2. Increased speed and volume of traffic
3. Connection to truck route
4. Too much pipe
5. Changes existing character of area
6. Design of splitter structure
7. Getting sheet flows into the system
8. No river enhancement west of 107th Ave.
9. Too much basin maintenance
10. Sediment / debris in pipe
11. Underutilization of Ironwood Wash
12. SRP transmission lines obstruct vista
13. Height of box culvert at Lake Pleasant Parkway
14. Drainage of retention basins
15. Quality of existing vista to support proposed amenities
16. Function of Pinnacle Peak and Lake Pleasant Parkway intersection
17. Impacts on Lutheran Church driveways with vertical curb
18. Extent of pipe east and west of Lake Pleasant Parkway.

Section B contains all VA proposals with a complete description of each VA recommendation. Sketches and cost estimates, as appropriate, are also in this section.

Section C contains a FAST Diagram, idea listing, workshop agenda and attendance list.

Implementation Plan

The Value Analysis Recommendations Summary spreadsheet is formatted to assist the District and the Wood / Patel engineering team in documenting the results of the implementation meeting. The cell on the far right side of the spreadsheet labeled "VA Idea Implemented, Yes or No" can be used to record which recommendations are accepted, rejected or accepted with conditions. This area can also be used for comments regarding the acceptance or rejection of the recommendations.

The following is the proposed schedule of events to complete the Implementation Phase of the workshop:

- VA Presentation: October 28, 2009
- Distribute Final VA report: November 2, 2009

- Implementation Meeting: November 10, 2009 (concurrent with Pre-Design Study submittal comment resolution meeting)

Implementation Notes

The following discussion is offered to assist the FCDMC, City of Peoria and Wood / Patel Engineering team in their decision making process regarding the selection of combinations of implemented recommendations. Wood Patel will ultimately be responsible for engineering the implemented recommendations into a total system that meets the performance requirements of the project.

#1 Replace pipe with channel in Segments A & B except at high cost R.O.W. areas
This recommendation can be implemented with any of the other system design alternatives but cannot be fully implemented with #30 which deletes Segment A from the project.

#7 Use existing easements at hill for possible drop structures in lieu of pipe
This recommendation can be implemented with any of the system design alternatives except for those recommendations that divert flows south or restrict flows east of the currently designed drop at the hill. #10, #11, #52

#10 Send flows south through Ironwood Wash in lieu of new drainage improvements
This recommendation cannot be implemented with the following system or basin design alternatives including #7, #13, #52

#11 Construct channel and basin along Williams Road from 107th Ave. west to the Agua Fria
This recommendation cannot be implemented with #7, #10, #13 & #52.

#13 Eliminate splitter structure and pipe (north of Basin C-S) and make low flow basin
This recommendation cannot be implemented with #10, #11& #52

#24 Use cul-de-sacs above and below bluff
This recommendation cannot be implemented with #45

#30 Consider draining Segment A to the east or south
This recommendation cannot be implemented with #32

#32 Delete improvements at Segment A (design for future improvements)
This recommendation cannot be implemented with #30

#42 Take flows to river, create natural habitat
This recommendation can only be implemented with system design alternatives that outlet to the Agua Fria River including #11 & #51.

#49 Explore opportunities for mitigation bank for river bottom enhancements
This recommendation should be implemented in conjunction with system design alternatives which include multi-use opportunities that would be enhanced by an improved river bottom including # 11 & # 42

#45 Add traffic calming on Pinnacle Peak Road (including roundabouts)
This recommendation should not be implemented with #24.

#48 Consider dip section at Pinnacle Peak at Segment C
This Design Suggestion can be implemented with any of the recommendations.

#51 Acquire drainage conveyance easement with proposed truck route
This recommendation should be implemented only in conjunction with system design alternatives that outlet to the Agua Fria River including #11 & #42

#52 Expand Basin C-S (south of Pinnacle Peak Road) to the east to attenuate additional flows
This recommendation cannot be implemented with other system design alternatives including #7, #10, #11, #13 & #42.

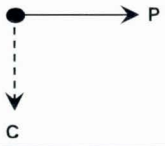
Acknowledgements

It would be a serious oversight to end this Executive Summary without acknowledging the significant contribution made by the well-informed, spirited and cooperative staff of the Wood / Patel engineering team and the VA Team from the City of Peoria and the Flood Control District of Maricopa County.

VALUE ANALYSIS RECOMMENDATIONS SUMMARY

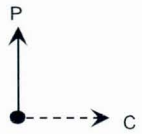
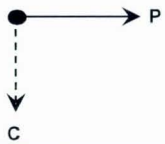
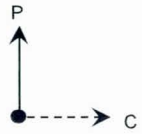
Project: **Pinnacle Peak Road and Channel**

Location: **Peoria, Arizona**

No.	Idea Description ilo = in lieu of	Value Indicator P = Performance C = Cost	Potential Savings ( ) indicates cost increase Initial ($)	 LCC ($)	VA Idea Implemented Yes or No (reason for rejection)
1	Replace pipe with channel in Segments A & B except at high cost R.O.W. areas		168,700	168,700	Implement
7	Use existing easements at hill for possible drop stuctures in lieu of pipe		(112,000)	(112,000)	NO Difficult Design
10	Send flows south through Ironwood Wash in lieu of new drainage improvements additional pipe, enlarge basin		1,355,000	1,355,000	No - 52 selected
11	Construct channel and basin along Williams Road from 107th Ave. west to Agua Fria		724,000	724,000	No - 52 selected
13	Eliminate splitter structure and pipe (north of Basin C-S) and make low flow basin		135,000	135,000	NO - 52 selected

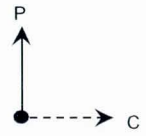
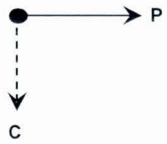
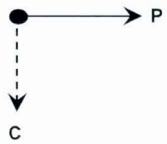
VALUE ANALYSIS RECOMMENDATIONS SUMMARY

Project: **Pinnacle Peak Road and Channel**
Location: **Peoria, Arizona**

No.	Idea Description ilo = in lieu of	Value Indicator P = Performance C = Cost	Potential Savings ( ) indicates cost increase Initial ($)	 LCC ($)	VA Idea Implemented Yes or No (reason for rejection)
24	Use cul-de-sacs above and below bluff		Design Suggestion	Design Suggestion	Peoria (NO)
30	Consider draining Segment A to the east or south		383,000	383,000	Investigate d.s. impacts
32	Delete improvements at Segment A (design for future improvements)		266,000	266,000	Peoria
42	Take flows to river, create natural habitat Same as Option 1		121,500	121,500	No - 52 selected
45	Add traffic calming on Pinnacle Peak Road (including roundabouts) OK		(200,000)	(200,000)	Peoria

VALUE ANALYSIS RECOMMENDATIONS SUMMARY

Project: **Pinnacle Peak Road and Channel**
Location: **Peoria, Arizona**

No.	Idea Description ilo = in lieu of	Value Indicator P = Performance C = Cost	Potential Savings ( ) indicates cost increase Initial ($)	 LCC ($)	VA Idea Implemented Yes or No (reason for rejection)
48	Consider dip section at Pinnacle Peak at Segment C		Design Suggestion		Investigate (D.S.)
49	Explore opportunities for mitigation bank for river bottom enhancements		(880,000)	(880,000)	No 52 selected instead
51	Acquire drainage conveyance easement with proposed truck route		578,500	578,500	No 52 selected
52	Expand Basin C-S (south of Pinnacle Peak Road) to the east to attenuate additional flows		1,364,000	1,364,000	Implement
Summary of VA Recommendations 30 & 52 (most signficant savings, not including enhancements)			1,747,000	1,747,000	
Potential Project Savings (percent)			19.2%		

Pre-Design Phase Value Analysis Workshop
FINAL REPORT

Pinnacle Peak Road and Channel
99th Avenue to the Agua Fria River
Peoria, Arizona

October 26 – 28, 2009

SECTION B: VALUE ANALYSIS RECOMMENDATIONS

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Replace pipe with channel in Segments A & B except at high cost R.O.W areas** **1**

Function (verb noun): ***convey flows***

Original Design

Segments A & B are closed conduit (concrete pipe) with 55 ft. road right of way and 24 ft. drainage easement to collect flows

Proposed Design

Within high cost right of way areas (adjacent to Lake Pleasant Parkway), design is to stay the same. Outside of the high cost of right of way areas, design is to be earthen channel (55 ft. ROW + 90 ft. ROW)

Advantages and Disadvantages

Advantages:

- More open space & opportunity for habitat
- Improved trail connectivity
- Easier to collect overland flows
- Improved operation & maintenance (sediment less of an issue)
- Access to irrigation system for landscaping

Disadvantages:

- Future crossings will be needed
- Operation & maintenance costs could be higher
- Depth of box at Lake Pleasant Parkway could require low flow

Value Indicator:

Discussion

Additional savings can be realized by downsizing upstream end of channel

Life Cycle Cost Summary

	Initial Cost
Original Design	**1,024,200**
Proposed Design	**855,500**
Potential Savings	**168,700**

Sketch Worksheet

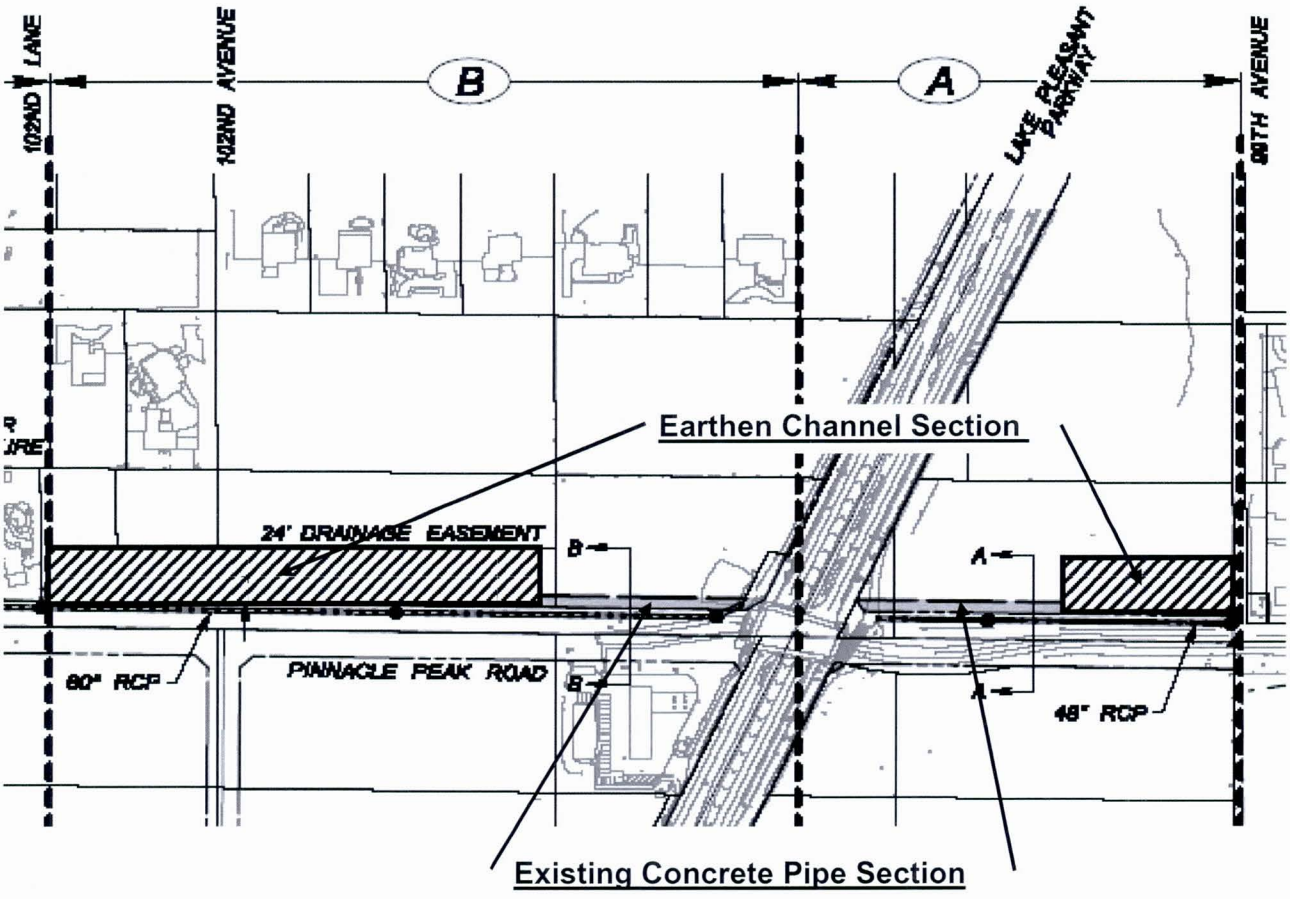
Project: Pinnacle Peak Road & Channel

Item: Replace pipe with channel in Segments A & B except at high cost R.O.W areas

VA No. 1

Function (verb noun): *convey flows*

☐ Original Design ■ Proposed Design



Cost Worksheet

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Replace pipe with channel in Segments A & B except at high cost R.O.W areas** **1**

Function (verb noun): ***convey flows***

Original Design

	Quantity	Unit	Unit Cost	Total
Segment A				
Right of way	7,200	sf	23.00	165,600
	9,192	sf	1.00	9,192
48" Conduit	683	lf	225	153,675
manholes	2	ea	3,000	6,000
grated inlet	1	ea	5,000	5,000
Landscape	1	ls	13,660	13,660
O & M Road	1,138	sy	3	3,414
Subtotal				356,541
Markup (general requirements,	0.0%			0
design contingency)			**Total Cost**	**356,500**

Proposed Design

	Quantity	Unit	Unit Cost	Total
48" Conduit	300	lf	225	67,500
Channel excavation	4,037	cy	6	24,222
Headwalls	2	ea	3,000	6,000
O & M Road	1,138	sy	3	3,414
Landscape	1	ls	27,320	27,320
Right of way (pipe)	7,200	sf	23.00	165,600
Right of way (channel)	34,470	sf	1.00	34,470
Subtotal				328,526
Markup (general requirements,	0.0%			0
design contingency)			**Total Cost**	**328,500**

Potential Savings

Potential Savings	**28,000**

Cost Worksheet

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Replace pipe with channel in Segments A & B except at high cost R.O.W areas** **1**

Function (verb noun): ***convey flows***

Original Design

	Quantity	Unit	Unit Cost	Total
Segment B				
Right of way	8,880	sf	23.00	204,240
	24,000	sf	1.00	24,000
60" Conduit	1,370	lf	275	376,750
manholes	3	ea	4,500	13,500
grated inlet	1	ea	15,000	15,000
Landscape	1	ls	27,400	27,400
O & M Road	2,283	sy	3	6,849
Subtotal				667,739
Markup (general requirements,	0.0%			0
design contingency)			**Total Cost**	**667,700**

Proposed Design

	Quantity	Unit	Unit Cost	Total
60" Conduit	370	lf	275	101,750
Channel excavation	10,555	cy	6	63,330
Headwalls	2	ea	3,000	6,000
O & M Road	2,283	sy	3	6,849
Landscape	1	ls	54,800	54,800
Right of way (pipe)	8,880	sf	23.00	204,240
Right of way (channel)	90,000	sf	1.00	90,000
Subtotal				526,969
Markup (general requirements,	0.0%			0
design contingency)			**Total Cost**	**527,000**

Potential Savings

Potential Savings	**140,700**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.** 7

Item: **Use existing easements at hill for possible drop structures in lieu of pipe**

Function (verb noun): ***dissipate flow***

Original Design

48" RCP storm drain pipe conveying flow downhill approximately 20 ft. to the open channel.

Proposed Design

Use existing property easements at the hill for a series of drop structures to convey and dissipate the flows going down the hill to the open channel.

Advantages and Disadvantages

Advantages:

- Solves problem of energy dissipation at bottom of hill
- Takes advantage of easements already in place

Value Indicator:

Disadvantages:

- Additional cost to add aesthetic treatment to drop structure

Discussion

Life Cycle Cost Summary

	Initial Cost
Original Design	
Proposed Design	
Value Enhancement	**(112,000)**

Sketch Worksheet

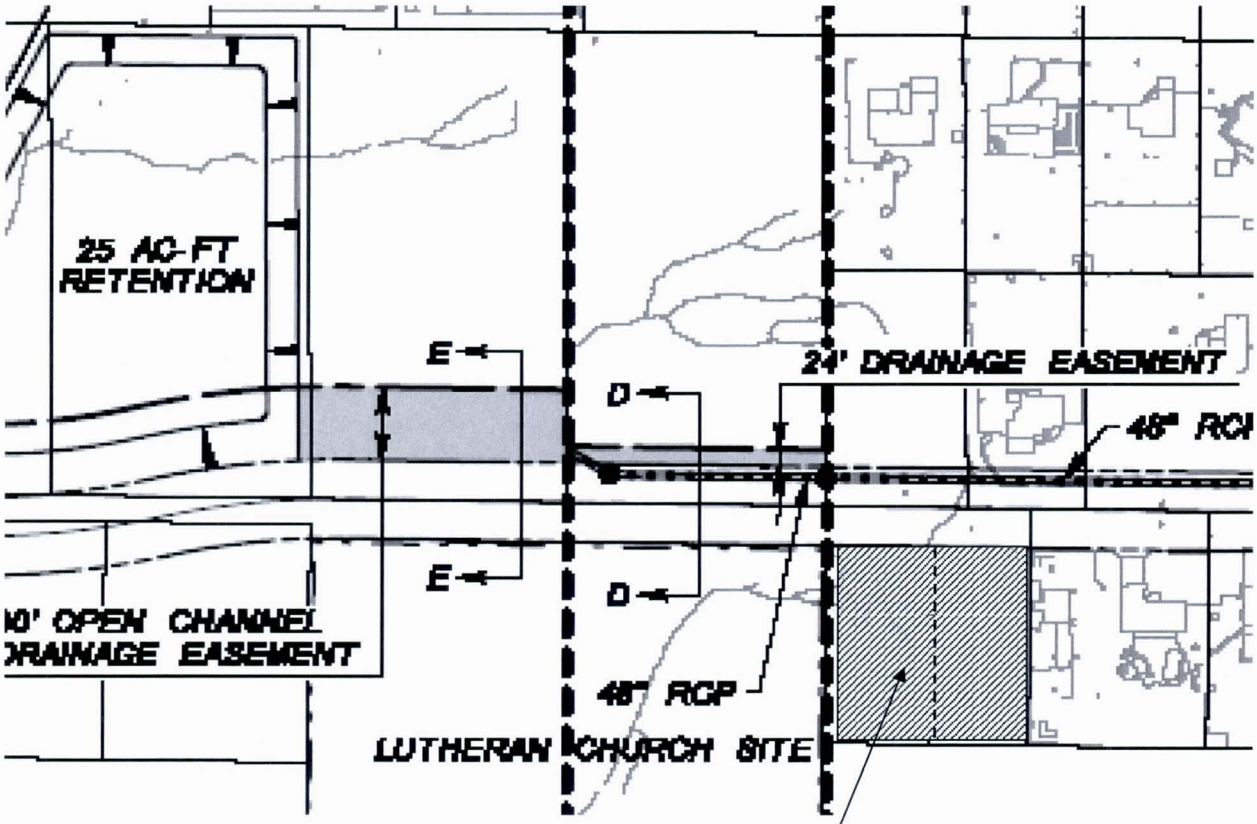
Project: Pinnacle Peak Road & Channel

VA No. 7

Item: Use existing easements at hill for possible drop structures in lieu of pipe

Function (verb noun): *dissipate flow*

☐ Original Design ■ Proposed Design



Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Send flows south through Ironwood Wash in lieu of drainage improvements** **10**

Function (verb noun): ***convey flow***

Original Design

Recommended alternative Option 5 drainage pipe, basins and channel along Pinnacle Peak Parkway from Lake Pleasant Parkway to 107th Avenue.

Proposed Design

Delete all proposed drainage improvements identified in Option 5 from 107th Ave. east to the existing Ironwood Wash. Improve conveyance capacity of existing channel along 107th Ave. and / or increase size of existing Williams Park & Rose Garden Lane basins.

Advantages and Disadvantages

Advantages:

- Eliminates flooding of 107th Ave. between Williams Drive & Deer Valley
- Utilizes existing capacity of the Ironwood Channel and Williams Park basin
- Reduces amount of flood control infrastructure

Disadvantages:

- Does not decrease the flow at Williams Park basin
- Traffic management issue at 107th Ave. during construction

Value Indicator:

Discussion

Existing Ironwood Wash has the ability to handle in excess of 400 CFS. Assumes installation of drain pipe within existing ROW.

Life Cycle Cost Summary

	Initial Cost
Original Design	**3,906,000**
Proposed Design	**2,551,000**
Potential Savings	**1,355,000**

Sketch Worksheet

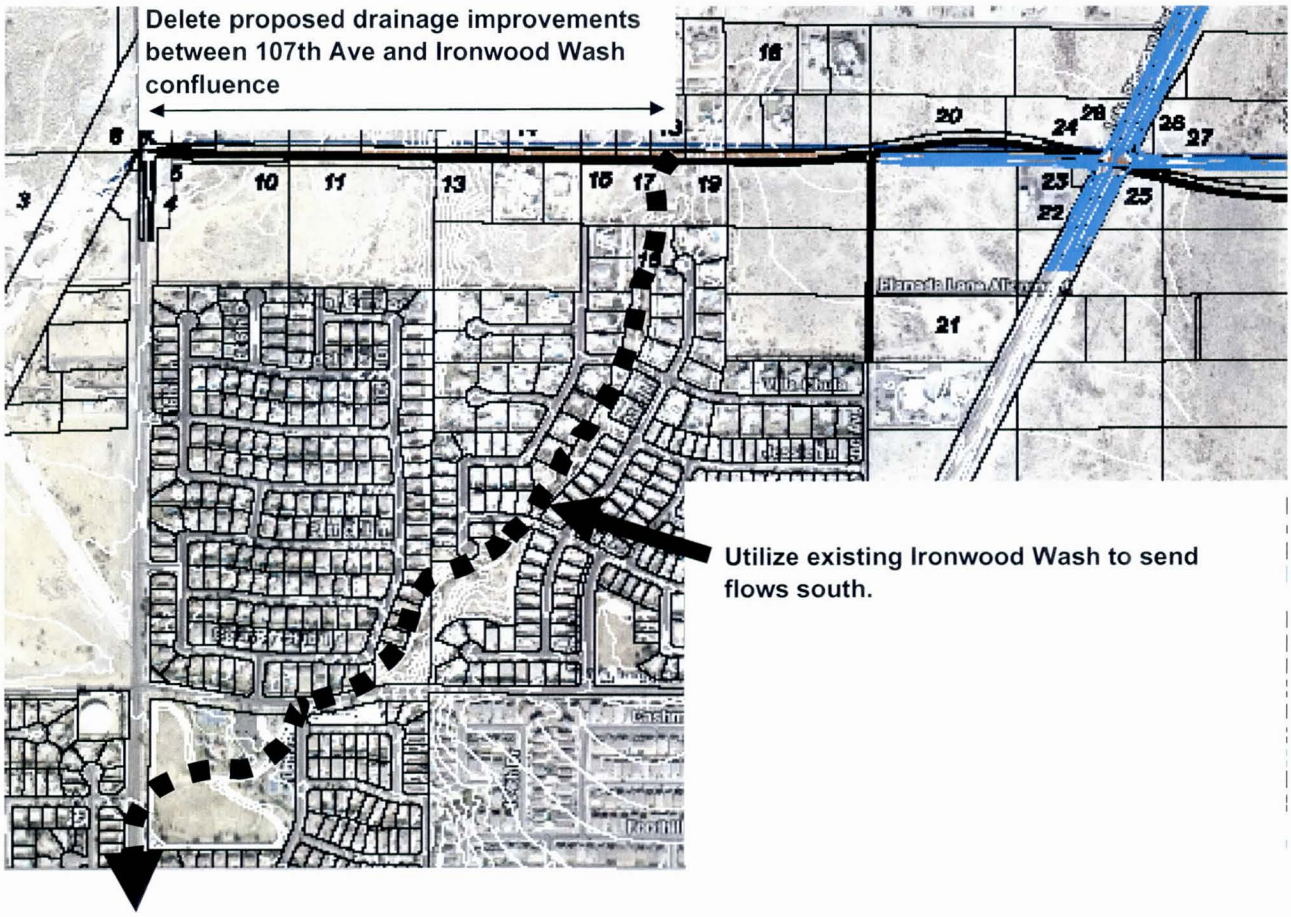
Project: Pinnacle Peak Road & Channel

Item: Send flows south through Ironwood Wash in lieu of drainage improvements

VA No. 10

Function (verb noun): *convey flow*

☐ Original Design ■ Proposed Design



Improve conveyance capacity of existing system south along 107th Ave. to alleviate existing street flooding. Possibly add a segment of storm drain and / or increase size of existing Williams Park & Rose Garden Lane basins.

Cost Worksheet

Project: Pinnacle Peak Road & Channel
Item: Send flows south through Ironwood Wash in lieu of drainage improvements

VA No. 10

Function (verb noun): *convey flow*

Original Design

	Quantity	Unit	Unit Cost	Total
Recommended Alternative Option 5	1	ls	3,906,000.00	3,906,000
Subtotal				3,906,000
Markup (general requirements, design contingency)	0.0%			0
			Total Cost	**3,906,000**

Proposed Design

	Quantity	Unit	Unit Cost	Total
Segment A	1	ls	266,000	266,000
Segment B	1	ls	792,000	792,000
Segment C	1	ls	200,000	200,000
Install 60" pipe at 107th Ave.	1,400	lf	275	385,000
Increase size of Williams Park basin	61,000	cy	4.00	244,000
Roadway reconstruction	1,400	lf	100	140,000
Modify box culvert at Desert Star Basin	400	lf	700	280,000
Increase size of Rose Garden Lane Basin	61,000	cy	4.00	244,000
Subtotal				2,551,000
Markup (general requirements, design contingency)	0.0%			0
			Total Cost	**2,551,000**

Potential Savings

Potential Savings	**1,355,000**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Construct channel and basin along Williams from 107th to Agua Fria River** **11**

Function (verb noun): ***convey flow***

Original Design

Recommended alternative Option 5 drainage pipe, basins and channel along Pinnacle Peak Parkway from Lake Pleasant Parkway to 107th Avenue.

Proposed Design

Delete all proposed drainage improvements identified in Option 5 from 107th Ave. east to the existing Ironwood Wash. Add a control to reduce flows south out of the Williams Park basin to reduce flooding on 107th Ave. Add a culvert to the northwest under the intersection of Williams Drive and 107th Ave. leading to a proposed channel and / or basin leading to the Agua Fria River. (see VA # 51)

Advantages and Disadvantages

Advantages:

- Eliminates flooding of 107th Ave. between Williams Road & Deer Valley
- Utilizes existing capacity of the Ironwood Channel and Williams Park basin
- Reduces amount of new flood control infrastructure
- Better location for potential multi-use opportunities
- Bypasses sand & gravel operations for outlet to river

Disadvantages:

- Does not decrease the flow at Williams Park basin
- Need to acquire state land north of Williams Road
- May be utility conflicts with new culvert at Williams Road & 107th Ave.

Value Indicator:

Discussion

Potential for equestrian trailhead north of Williams Road allowing access to river without equestrian crossing of 107th Ave.

Life Cycle Cost Summary

	Initial Cost
Original Design	**3,906,000**
Proposed Design	**3,182,000**
Potential Savings	**724,000**

Sketch Worksheet

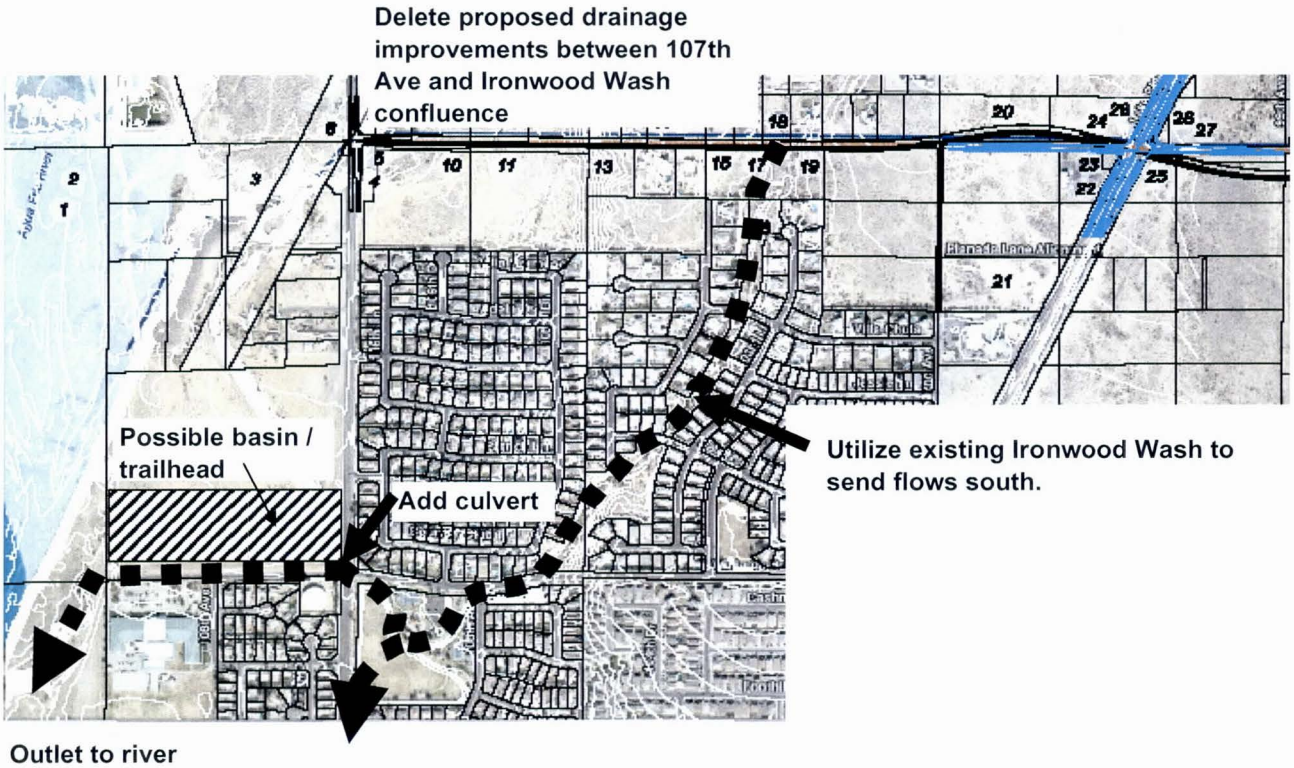
Project: Pinnacle Peak Road & Channel

VA No. 11

Item: Construct channel and basin along Williams from 107th to Agua Fria River

Function (verb noun): *convey flow*

☐ Original Design ■ Proposed Design



Cost Worksheet

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Construct channel and basin along Williams from 107th to Agua Fria River** **11**

Function (verb noun): ***convey flow***

Original Design

		Quantity	Unit	Unit Cost	Total
Recommended Alternative Option 5		1	ls	3,906,000.00	3,906,000
Subtotal					3,906,000
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**3,906,000**

Proposed Design

		Quantity	Unit	Unit Cost	Total
Segment A		1	ls	266,000	266,000
Segment B		1	ls	792,000	792,000
Segment C		1	ls	200,000	200,000
Box culvert at 107th & Williams		1	ls	155,000	155,000
Williams Park Basin flow restrictor		1	ls	25,000	25,000
Channel excavation at Williams Road		78,000	cy	6.00	468,000
Channel ROW at Williams Road		29	ac	44,000	1,276,000
Subtotal					3,182,000
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**3,182,000**

Potential Savings

Potential Savings	**724,000**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Eliminate splitter structure & pipe (north of basin) and make an in-line basin with low flow** **13**

Function (verb noun): ***contol flow***

Original Design

Segment C design with 42" RCP, splitter structure and a 15 acre-ft surge (off line) basin

Proposed Design

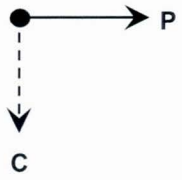
Delete splitter structure and 42" RCP adjacent to basin. Use basin as an in-line basin. Direct low flow to Ironwood Wash.

Advantages and Disadvantages

Advantages:

- Reduces amount of 42" pipe
- Improves hydraulics

Value Indicator:



Disadvantages:

- More frequent maintenance due to water in the channel

Discussion

Life Cycle Cost Summary

	Initial Cost
Original Design	**0**
Proposed Design	**135,000**
Potential Savings	**135,000**

Sketch Worksheet

Project: Pinnacle Peak Road & Channel — **VA No.** 13

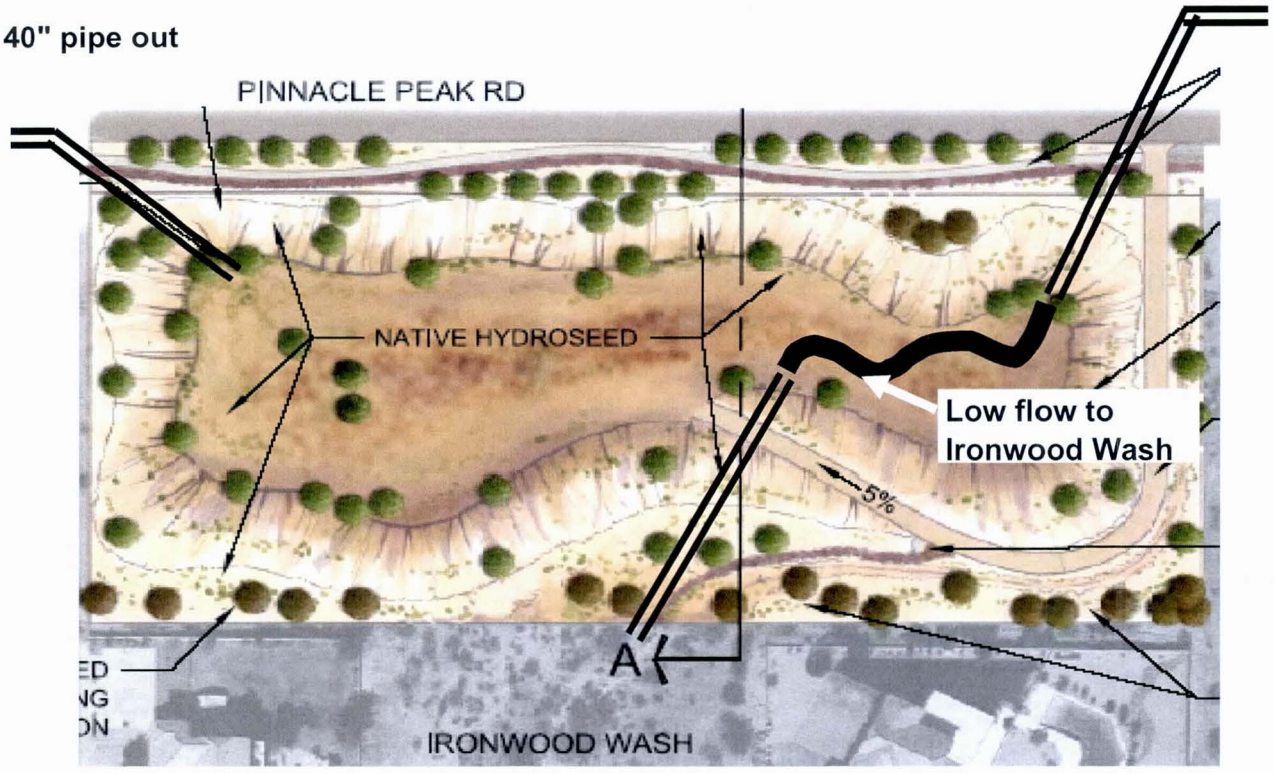
Item: Eliminate splitter structure & pipe (north of basin) and make an in-line basin with low flow

Function (verb noun): *contol flow*

☐ Original Design ■ Proposed Design

60" pipe in

40" pipe out



Cost Worksheet

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Eliminate splitter structure & pipe (north of basin) and make an in-line basin with low flow** **13**

Function (verb noun): ***contol flow***

Original Design

		Quantity	Unit	Unit Cost	Total
Subtotal					0
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**0**

Proposed Design

	Quantity	Unit	Unit Cost	Total
Delete 42" RCP	400	lf	200	80,000
Delete splitter structure	1	ls	60,000	60,000
Add concrete headwall	1	ls	-5,000	(5,000)
Subtotal				135,000
Markup (general requirements,	0.0%			0
design contingency)			**Total Cost**	**135,000**

Potential Savings

Potential Savings	**135,000**

Value Analysis Study Recommendation

Project: Pinnacle Peak Road & Channel
Item: Cul-de-sacs above and below bluff

VA No. 24

Function (verb noun): *calm traffic*

Original Design

Recommended Alternative Option 5 has continuous roadway, vertical curve down bluff

Proposed Design

Add cul-de-sac knuckles at top and toe of bluff

Advantages and Disadvantages

Advantages:

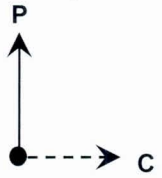
- provides overlook
- Reduction in through traffic & impact at intersection
- compliments community character
- Place water drop structure in Road ROW
- Reduce truck traffic through route
- Improves driveway access to existing properties

Disadvantages:

- Add ROW
- Disconnected
- Potential emergency egress issues

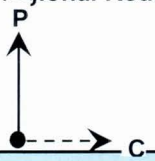
Value Indicator:

Drainage:



Collector Roadway:
P constant and C constant

Regional Roadway:



Discussion

Drainage is improved by use of road ROW for Bluff Drop, As local perspective cost and performance not changed, from regional perspective slight performance reduction, local and drainage should take precedence. Potential nominal cost savings.

Life Cycle Cost Summary

	Initial Cost
Original Design	
Proposed Design	
Potential Savings	**Design Suggestion**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Consider draining Segment A to the east or south** **30**

Function (verb noun): ***convey flow***

Original Design

Recommended Alternative Option 5 indicates 48" RCP pipe and collector swale from east of Lake Pleasant Parkway to 99th Ave.

Proposed Design

Do not allow any flows east of Lake Pleasant Parkway into the proposed drainage system. Drain flow at NE intersection of Lake Pleasant Road & Pinnacle Peak south through a culvert. Reduce storm drain size in Segment B and C from 60" to 48".

Advantages and Disadvantages

Advantages:

- Reduce the size of storm drain of Lake Pleasant Parkway in Segments B & C

Value Indicator:

Disadvantages:

- Does not address drainage problems on Lake Pleasant Road south of Pinnacle Peak

Discussion

No sacrifice in performance compared with the current condition. Interim reduction in performance

Life Cycle Cost Summary

	Initial Cost
Original Design	**1,195,500**
Proposed Design	**812,500**
Potential Savings	**383,000**

Sketch Worksheet

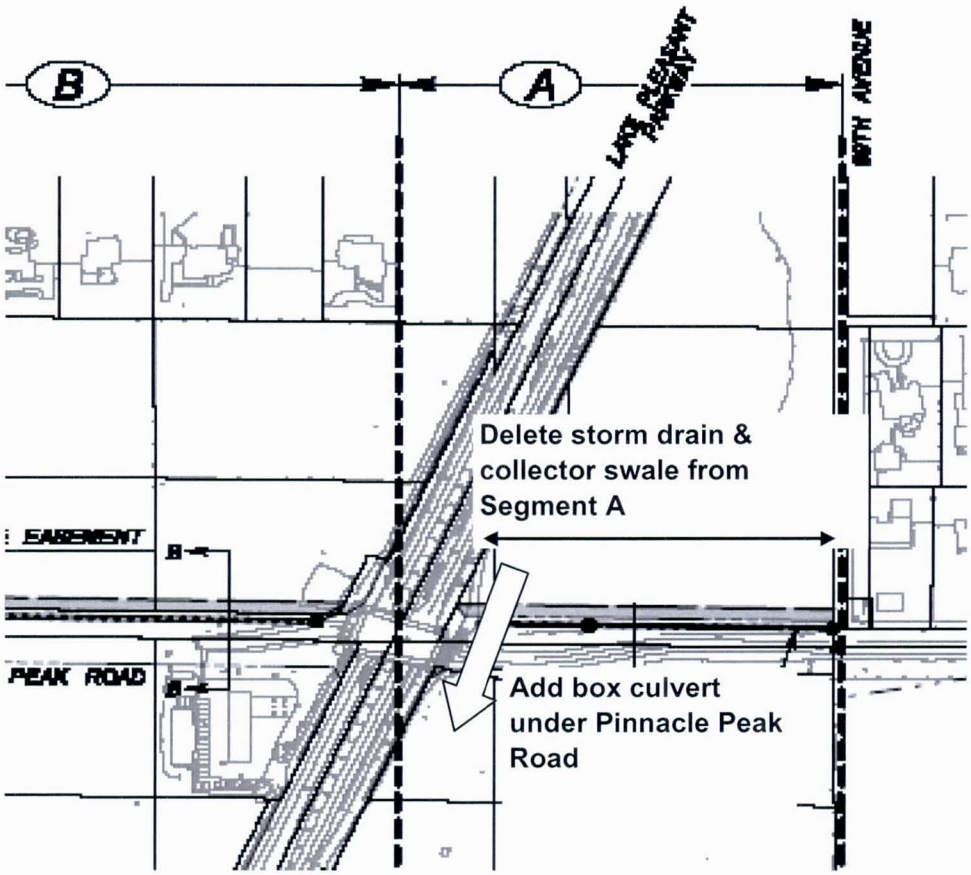
Project: Pinnacle Peak Road & Channel

Item: Consider draining Segment A to the east or south

VA No. 30

Function (verb noun): *convey flow*

☐ Original Design ■ Proposed Design



Cost Worksheet

Project: **Pinnacle Peak Road & Channel** **VA No.**
Item: **Consider draining Segment A to the east or south** **30**

Function (verb noun): ***convey flow***

Original Design

	Quantity	Unit	Unit Cost	Total
Segment A Drainage Improvements	1	ls	266,000.00	266,000
Segment B 60" RCP	1	ls	792,000	792,000
Segment C 60" RCP	500	ft	275.00	137,500
Subtotal				1,195,500
Markup (general requirements, design contingency)	0.0%		**Total Cost**	0 **1,195,500**

Proposed Design

	Quantity	Unit	Unit Cost	Total
Box Culvert under Pinnacle Peak Road	1	ea	52,000	52,000
Segment B 48" RCP	1	ea	648,000	648,000
Segment C 48" RCP	500	ft	225.00	112,500
Subtotal				812,500
Markup (general requirements, design contingency)	0.0%		**Total Cost**	0 **812,500**

Potential Savings

Potential Savings	**383,000**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Delete improvements at Segment A (design for future construction)** **32**

Function (verb noun): ***convey flow***

Original Design

Recommended Alternative Option 5 indicates 48" RCP pipe and collector swale from east of Lake Pleasant Parkway to 99th Ave.

Proposed Design

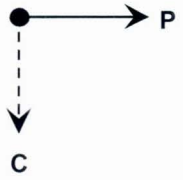
Delete the drainage improvements proposed for Segment A from the construction contract. Open the existing box culvert under Lake Pleasant Parkway. Maintain existing drainage conditions until future development at the NE corner of Pinnacle Peak Road and Lake Pleasant Parkway pays for the drainage improvements.

Advantages and Disadvantages

Advantages:

- Reduces scope of construction project

Value Indicator:



Disadvantages:

- Increased flows on undeveloped land south of Pinnacle Peak Road

Discussion

Complete design and engineering for Segment A.

Life Cycle Cost Summary

	Initial Cost
Original Design	**266,000**
Proposed Design	**0**
Potential Savings	**266,000**

Cost Worksheet

Project: **Pinnacle Peak Road & Channel** **VA No.**
Item: **Delete improvements at Segment A (design for future construction)** **32**

Function (verb noun): ***convey flow***

Original Design

		Quantity	Unit	Unit Cost	Total
Segment A Drainage Improvements		1	ls	266,000.00	266,000
Subtotal					266,000
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**266,000**

Proposed Design

		Quantity	Unit	Unit Cost	Total
Defer Segment A Drainage Improvement				0	
Subtotal					0
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**0**

Potential Savings

Potential Savings	**266,000**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Take flows to river, create natural habitat** **42**

Function (verb noun):

Original Design

Recommended Alternative, Option 5, utilizes detention basins and storm drain to collect, store and release water in the study area, and avoids discharge West, toward the river

Proposed Design

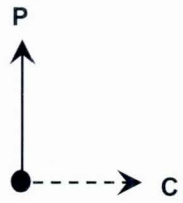
Discharge to the river, land value plus improvement value taxed at a rate of 3%, 50% utilization of the tax revenues over 50 year lifecycle

Advantages and Disadvantages

Advantages:

- Discharge to river
- Eliminate need for basins in project area
- Can be combined with option 49
- Original basin location have higher best use
- Puts river basin property to its higher best use (riparian ecosystem)
- Can be combined with option 51

Value Indicator:



Disadvantages:

- Discharge to river affects downstream landowners
- Drainage ROW required
- Complexity of design and implementation

Discussion

Flowage easement along proposed truck route is complimentary to this proposal

Life Cycle Cost Summary

	Initial Cost
Original Design	**3,900,000**
Proposed Design	**3,778,500**
Potential Savings	**121,500**

Cost Worksheet

Project: Pinnacle Peak Road & Channel
Item: Take flows to river, create natural habitat

VA No. 42

Function (verb noun): *0*

Original Design

		Quantity	Unit	Unit Cost	Total
Option 5 Project		1	EA	3,900,000.00	3,900,000
Subtotal					3,900,000
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**3,900,000**

Proposed Design

		Quantity	Unit	Unit Cost	Total
Option 1 Project		1	EA	5,186,000	5,091,000
Lifetime tax revenue		-1		1,312,500	(1,312,500)
Subtotal					3,778,500
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**3,778,500**

Potential Savings

Potential Savings	**121,500**

Value Analysis Study Recommendation

Project: Pinnacle Peak Road & Channel — **VA No.** 45

Item: Add traffic calming on Pinnacle Peak Road (including roundabouts)

Function (verb noun): *calm traffic*

Original Design

Full Road Section (collector) with Tee and Cross Intersections, and straight CL

Proposed Design

Collector with roundabouts at intersections at 104th and meandering CL starting at bluff Top Slope area

Advantages and Disadvantages

Advantages:

- Discourages through traffic, truck movements
- Discourage speeding
- Safer movements at intersections
- Traffic calming better fits neighborhood characteristics
- CL curve improves DW approaches
-

Value Indicator:

Disadvantages:

- motorist confusion
- slight increase construction costs
- requires attentive driving

Discussion

Drainage is improved by use of road ROW for Bluff Drop, As local perspective cost and performance not changed, from regional perspective slight performance reduction, local and drainage should take precedence

Life Cycle Cost Summary

	Initial Cost
Original Design	**0**
Proposed Design	**200,000**
Value Enhancement	**(200,000)**

Cost Worksheet

Project: Pinnacle Peak Road & Channel **VA No.** 45

Item: Add traffic calming on Pinnacle Peak Road (including roundabouts)

Function (verb noun): *calm traffic*

Original Design

		Quantity	Unit	Unit Cost	Total
Subtotal					0
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**0**

Proposed Design

		Quantity	Unit	Unit Cost	Total
Additional Curb, Pavement etc.		2	Ea	100,000	200,000
Subtotal					200,000
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**200,000**

Potential Savings

Value Enhancement **(200,000)**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Consider dip section at Pinnacle Peak at Segment C** **48**

Function (verb noun): ***convey flow***

Original Design

Low point of Pinnacle Peak Parkway between 103rd & 104th Avenues approx. 1296.1. Channel depth approx. 1294.5

Proposed Design

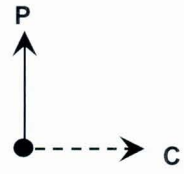
Lower Pinnacle Peak Parkway roadway profile to approximatley 1294.5 between 103rd & 104th Avenues.

Advantages and Disadvantages

Advantages:

- Does not back up flows onto properties
- Provides traffic calming

Value Indicator:



Disadvantages:

- May not meet traffic standards

Discussion

Life Cycle Cost Summary

	Initial Cost
Original Design	
Proposed Design	
Potential Savings	**Design Suggestion**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Explore opportunities for mitigation bank for river bottom improvements** **49**

Function (verb noun): ***enhance environment***

Original Design

Recommended Alternative, Option 5, utilizes detention basins and storm drain to collect, store and release water in the study area, and avoids discharge West, toward the river

Proposed Design

Explore partnering opportunities for mitigation bank, environmental enhancements in drainage course West of the project, towards the river

Advantages and Disadvantages

Advantages:

- Discharge to river
- Reduce or eliminate need for basins in project area
- Generates mitigation benefit for interested partner
- Restore valuable xeric riparian ecosystem
- Reduce erosion potential, restore natural and benficial floodplain functions
- Can be combined with option 42
- State Land possible eager for property enhancement opportinity
- Preferred location of a Peoria equestrian trailhead

Disadvantages:

- Discharge to river affects downstream landowners
- Drainage ROW required
- Complexity of design and implementation

Value Indicator:

Discussion

Note valulable recreational opportunities, partnership with sand and gravel, orderly re-establishment of xeri-riparian, explore potential for joint partner such as State Game & Fish

Life Cycle Cost Summary

	Initial Cost
Original Design	**0**
Proposed Design	**880,000**
Value Enhancement	**(880,000)**

Cost Worksheet

Project: Pinnacle Peak Road & Channel

VA No. 49

Item: Explore opportunities for mitigation bank for river bottom improvements

Function (verb noun): *enhance environment*

Original Design

		Quantity	Unit	Unit Cost	Total
Subtotal					0
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**0**

Proposed Design

		Quantity	Unit	Unit Cost	Total
Mitigation Area		40	AC	44,000	1,760,000
Mitigation Sales		20	AC	-44,000	(880,000)
Subtotal					880,000
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**880,000**

Potential Savings

Value Enhancement **(880,000)**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Acquire drainage conveyance easement with proposed truck route.** **51**

Function (verb noun): ***convey flow***

Original Design

Recommended Alternative Option 5 does not address the advantages of coordinating with the adjacent truck route project

Proposed Design

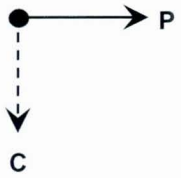
Utilize a joint drainage easement along proposed truck route

Advantages and Disadvantages

Advantages:

- No additional basin properties needed
- Cost share on truck route conveyance channel
- Can be combined with option 49, 42
- Eliminates basin maintenance on Option 5 basin

Value Indicator:



Disadvantages:

- Implementation complexity
- Moderate increased volume required at Rose Garden Basin

Discussion

Flowage easement along proposed truck route is complimentary to this proposal, lifecycle costs are less, reach F basin eliminated

Life Cycle Cost Summary

	Initial Cost
Original Design	**3,900,000**
Proposed Design	**3,321,500**
Potential Savings	**578,500**

Cost Worksheet

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Acquire drainage conveyance easement with proposed truck route.** **51**

Function (verb noun): ***convey flow***

Original Design

		Quantity	Unit	Unit Cost	Total
Option 5 Project		1	EA	3,900,000.00	3,900,000
Subtotal					3,900,000
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**3,900,000**

Proposed Design

		Quantity	Unit	Unit Cost	Total
Option 1 Project		1	EA	5,186,000	5,091,000
Lifetime tax revenue		-1		1,312,500	(1,312,500)
Reach 4 Ba		-1		457,000	(457,000)
Subtotal					3,321,500
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**3,321,500**

Potential Savings

Potential Savings	**578,500**

Value Analysis Study Recommendation

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Expand Basin C-S (south of Pinnacle Peak Road) to the east to attenuate additional flows** **52**

Function (verb noun): ***control flows***

Original Design

Recommended Alternative Option 5 with 15 acre ft. retention basin at the south side of Pinnacle Peak Road between 103rd & 104th Avenues.

Proposed Design

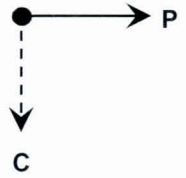
Expand the size of the basin to the east to accommodate the total upstream flow of the system thereby eliminating all the proposed improvements west of 104th Avenue. Existing rising grades between 102nd & 103rd Avenues may necessitate multiple basins at different elevations.

Advantages and Disadvantages

Advantages:

- Cheaper land acquisition for basin
- Concentrates open space

Value Indicator:



Disadvantages:

- Difficult to configure such that all the storage volume can be utilized

Discussion

Life Cycle Cost Summary

	Initial Cost
Original Design	**0**
Proposed Design	**1,363,500**
Potential Savings	**1,363,500**

Sketch Worksheet

Project: Pinnacle Peak Road & Channel

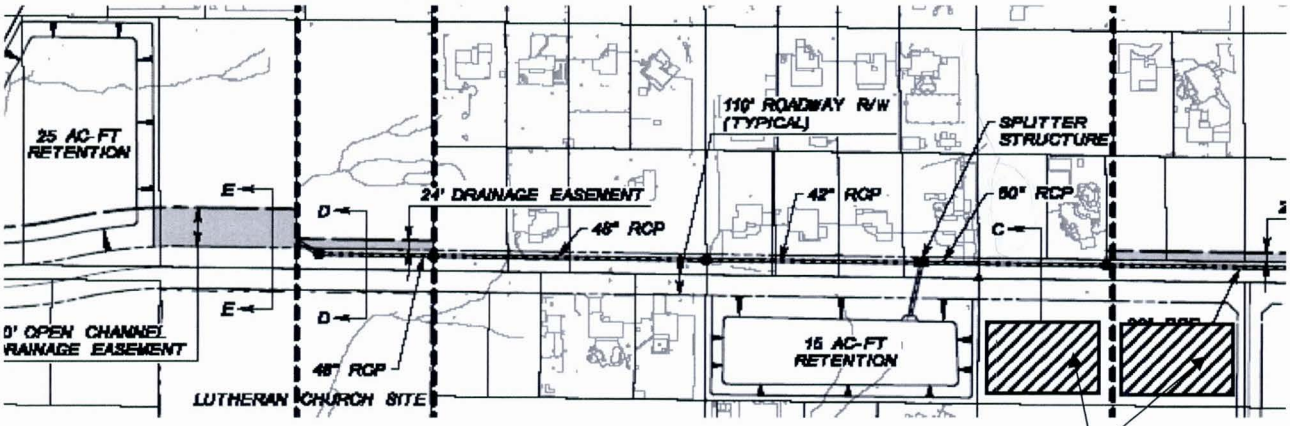
VA No. 52

Item: Expand Basin C-S (south of Pinnacle Peak Road) to the east to attenuate additional flows

Function (verb noun): *control flows*

☐ Original Design ■ Proposed Design

Delete proposed improvements in Segments C, D & E



Expand size of basin

Cost Worksheet

Project: **Pinnacle Peak Road & Channel** **VA No.**

Item: **Expand Basin C-S (south of Pinnacle Peak Road) to the east to attenuate additional flows** **52**

Function (verb noun): ***control flows***

Original Design

		Quantity	Unit	Unit Cost	Total
Subtotal					0
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**0**

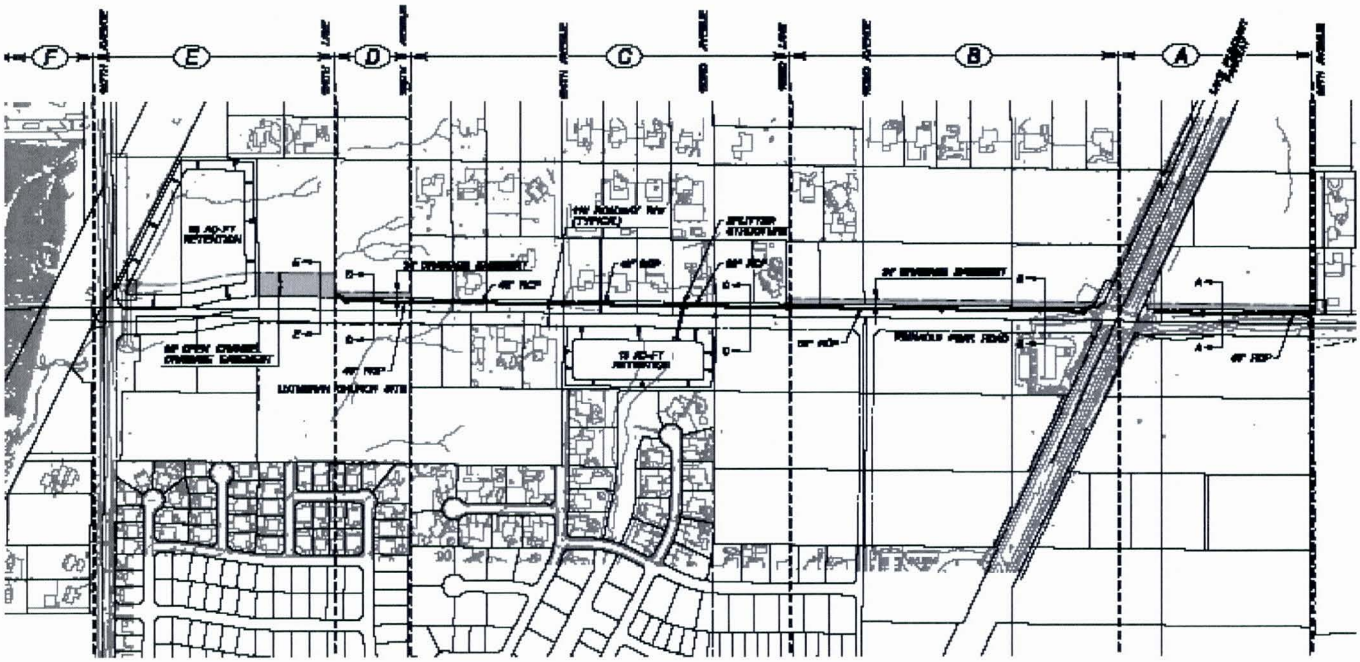
Proposed Design

		Quantity	Unit	Unit Cost	Total
New Half Basin (add)		-5	ac	44,000	(220,000)
Basin excavation (add)		-1	ls	120,000	(120,000)
Basin landscaping (add)		-1	ls	160,000	(160,000)
Deduct:					
Segment D					197,000
Segment E					1,261,000
Pipe in Segment C: 60"					132,000
Pipe in Segment C: 48"					135,000
Pipe in Segment C: 42"					125,000
Manholes		3			13,500
Subtotal					1,363,500
Markup	(general requirements,	0.0%			0
	design contingency)			**Total Cost**	**1,363,500**

Potential Savings

Potential Savings	**1,363,500**

Option 5, Recommended Alternative

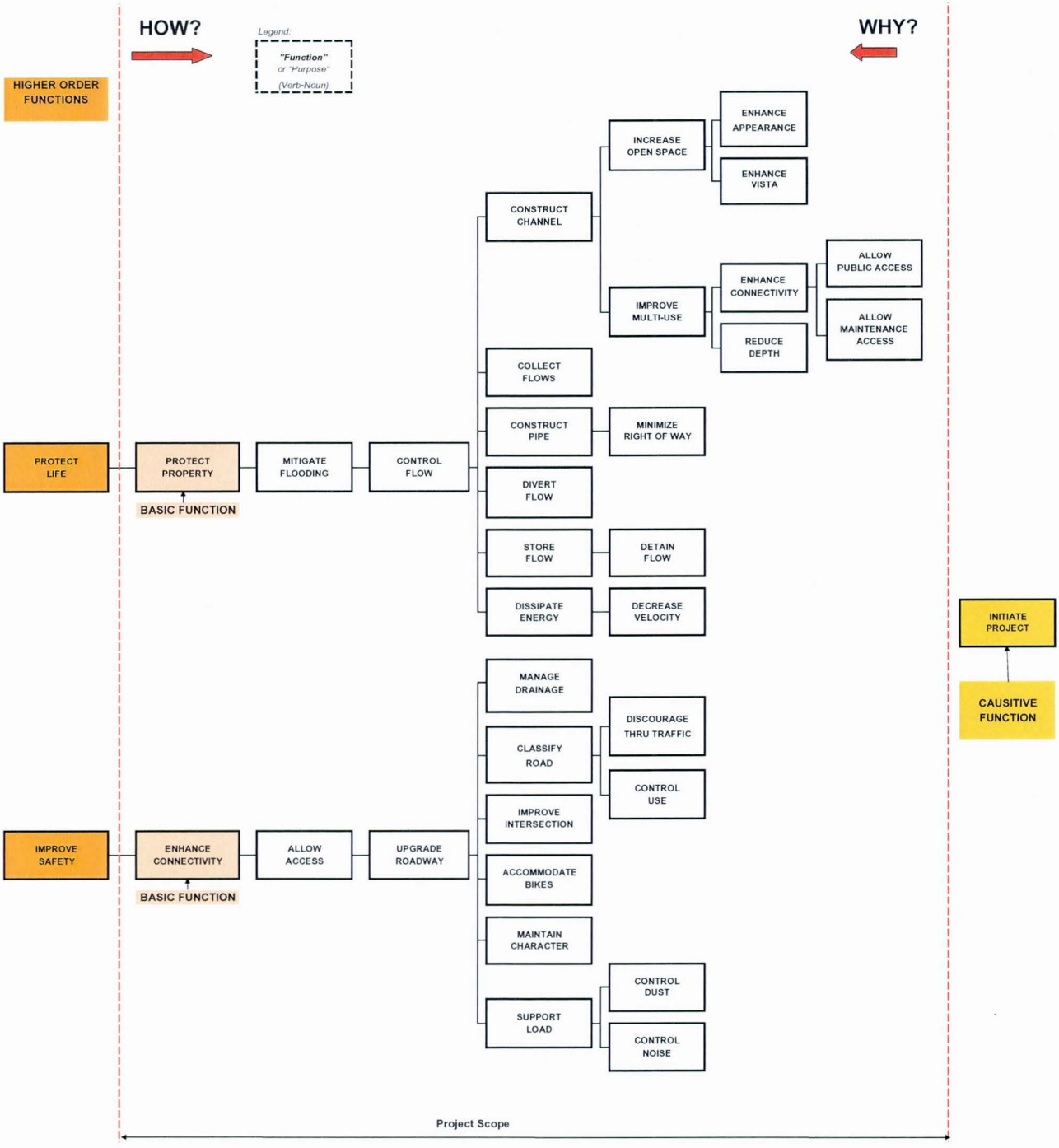


WOOD/PATEL
10/22/2008

PINNACLE PEAK ROAD AND CHANNEL PROJECT
99TH AVENUE TO AGUA FRIA RIVER
RECOMMENDED ALTERNATIVE - OPTION 5 - DRAINAGE CONVEYANCE SYSTEMS
EXHIBIT 19

Pinnacle Peak Road & Channel

Peoria, Arizona



Function Analysis System Technique (FAST) Diagram

CREATIVE IDEAS

Brainstorming

SiteTek
Financial Arts

Project: **Pinncale Peak Road and Channel**
Location: **Peoria, Arizona**
Date: **October 26 - 28, 2009**

Bold = Ideas developed into proposals
DS = Design Suggestion for further consideration by the Engineering Team

No.	Description:	VOTES
1	**Replace pipe with channel in Segments A & B except at high cost R.O.W. areas**	**3**
2	Enlarge downstream basins on 107th Ave. and divert flows south	
3	Use excavations for truck route	DS
4	Add pipe downstream at 107th Ave. to accommodate increased flows	1
5	Design, acquire R.O.W. and construct as soon as possible	DS
6	Drainage and roadway in one construction contract	
7	**Use existing easements at hill for possible drop stuctures in lieu of pipe**	**DS**
8	Move intersection at 107th Ave. south to avoid crossing channel	
9	Use pipe in lieu of channel at Segment E	
10	**Send flows south through Ironwood Wash in lieu of new drainage improvements**	**4**
11	**Construct channel and basin along Williams Road from 107th Ave. west to Agua Fria**	**3**
12	Have City of Peoria administer roadway contract	
13	**Eliminate splitter structure and pipe (north of Basin C-S) and make low flow basin**	**1**
14	Use tall pots with drip irrigation system to accelerate tree growth	DS
15	Use Peoria nursery stock from APS for mature landscape varieties	DS
16	Create vista node (use existing open space easements)	DS
17	At minimum, construct roadway subgrade with drainage contract to use project dirt	
18	Use series of decorative steps for drop structure in lieu of pipe	1
19	Use existing easement properties to address potential ADA access issues	DS
20	Maintain 104th Ave. right of way	DS
21	Consider different cross section for channel	1
22	Use free flow acceleration lanes for right turn at Pinnacle Peak & Lake Pleasant Pkwy. Intersection	1
23	Use roundabouts at 104th Ave. & 107th Ave.	1
24	**Use cul-de-sacs above and below bluff**	**DS**
25	Utilize Lutheran Church site for excess fill	DS
26	Look at opportunity for CMP / CIP in lieu of RGRCP	DS
27	Maintain existing Pinnacle Peak and Lake Pleasant Pkwy. Intersection alignment	
28	Consider roundabout at Pinnacle Peak and Lake Pleasant Pkwy. Intersection	
29	Investigate plunge pool for energy dissipation	DS
30	**Consider draining Segment A to the east or south**	**2**
31	No basin design	
32	**Delete improvements at Segment A (design for future improvements)**	**3**

CREATIVE IDEAS

Brainstorming

SiteTek
Financial Arts

Project: **Pinncale Peak Road and Channel**
Location: **Peoria, Arizona**
Date: **October 26 - 28, 2009**

Bold = Ideas developed into proposals
DS = Design Suggestion for further consideration by the Engineering Team

No.	Description:	VOTES
33	Consider frontage driveway to accommodate driveway access issues	
34	Move church driveway to accommodate road slope	
35	Use easement parcels for access to church site	
36	Modify road alignment (zig zag) to accommodate driveway grades	1
37	Design driveways with with road from 102nd to 107th	
38	Build 104th Ave. half street	
39	Underground power line at 104th Ave.	
40	Make truck route free flow at 107th Ave.	
41	Move E-NE basin to the east (eliminate channel section)	
42	**Take flows to river, create natural habitat**	**3**
43	Change pipe slope to reduce velocity	
44	Add interior collars to reduce velocity	
45	**Add traffic calming on Pinnacle Peak Road (including roundabouts)**	**3**
46	Sheet flow capture by individual developments with connection to pipe	1
47	Investigate distressed parcels along alignment	DS
48	**Consider dip section at Pinnacle Peak at Segment C**	**2**
49	**Explore opportunities for mitigation bank for river bottom enhancements**	**6**
50	Combine R.O.W. landscaping / irrigation with drainage landscaping - pending schedule	DS
51	**Acquire drainage conveyance easement with proposed truck route**	**6**
52	**Expand Basin C-S (south of Pinnacle Peak Road) to the east to attenuate additional flows**	

3-DAY VALUE ANALYSIS CONFERENCE AGENDA
PINNACLE PEAK ROAD & CHANNEL
99TH AVENUE TO AGUA FRIA RIVER

October 26 - 28, 2009

Workshop Location:
Flood Control District of Maricopa County (FCDMC)
Operations Building Dreamy Draw & Sunny Cove Conference Room
2801 West Durango Street
Phoenix, AZ 85009

Workshop Invitees:

Jeff Minch	Wood Patel
Bill Hahn	MCDOT
Burton Charron	City of Peoria
Scott Vogel	FCDMC
Jon Loxley	FCDMC
Fritz Huber	FCDMC
Mark Lewis	FCDMC (part time)
Gary Shapiro	FCDMC
Steven Tucker	FCDMC
Bobbie Ohler	FCDMC
John Rodriquez	FCDMC
John Pucetas	SiteTek Financial Arts, Inc.

DAY 1 – October 26, 2009

8:30 a.m. **INFORMATION PHASE - INTRODUCTION TO WORKSHOP**
(by VA Team Leader, John Pucetas, SiteTek)

Welcome & Opening Remarks
Team Member Introductions
Value Analysis Briefing
Objectives of Workshop
Questions & Comments

9:30 **BREAK**

9:45 **INFORMATION PHASE - PROJECT BRIEFING**
(by Jeff Minch & Bobbie Ohler)

Project Goals
Project Design: Project history & evolution
Presentation of design including: hydrology, structures, environmental, landscape aesthetics, multi-use, constructability
Project Budget Review: Cost estimate vs. FCDMC budget

Project Schedule Review: Design & Construction

12:00 **LUNCH BREAK (lunch not provided)**

1:00 p.m. **DOCUMENT REVIEW**
(VA Team)

2:00 **FUNCTION ANALYSIS PHASE**

Function - Cost - Worth Relationship
Identify high cost to worth relationships for further consideration
Function Analysis System Technique Diagrams

3:00 **FORCE FIELD ANALYSIS**

Best Project Features
Features of Concern

3:30 **CREATIVE (SPECULATION) PHASE**

Brainstorm ideas to meet required functions at lower cost
Identify opportunities to achieve best balance of life-cycle cost, performance & durability, while meeting required functions
No Judgment!

5:00 **ADJOURN**

DAY 2 – October 27, 2009

8:30 a.m. **CREATIVE (SPECULATION) PHASE - continued**

10:00 **EVALUATION PHASE**

Define Ranking Evaluation Criteria
Evaluate Ideas By Comparison
Identify VA Performance Criteria
Select most promising alternatives for development

11:00 **DEVELOPMENT/COSTING PHASE**

Review of Proposal Forms and Final Products
Team Member Proposal Development Assignments
Cost Estimates of Alternatives
Sketches of Alternatives
Life Cycle Cost Calculations (as appropriate)
Written Proposals

12:00 **LUNCH BREAK (lunch not provided)**

1:00 p.m. **DEVELOPMENT/COSTING PHASE - continued**

5:00 **ADJOURN**

DAY 3 – October 28, 2009

8:30 a.m **REVIEW STATUS AND PROGRESS**

DEVELOPMENT/COSTING PHASE - Continued

12:00 **LUNCH BREAK (lunch not provided)**

1:00 p.m. **PRESENTATION PHASE**

Presentation preparation
Summarize & Check Proposals
Print & Copy Summary Sheets

2:00 – 3:30 **VA PRESENTATION**

Purpose of Presentation: "Sell Ideas"

Summary of VA Process
VA Proposals, Benefits & Cost Savings (by VA Team Members)
Summary of Value Enhancements and Potential Cost Savings
Comments & Discussion

3:30 **IMPLEMENTATION PHASE**

Process for Accepting/Rejecting Recommendations
Implementation Tracking Log
Develop Implementation Schedule of Events

4:00 **CLOSING REMARKS**
ADJOURN/CELEBRATION!!!

ATTENDANCE LIST

Value Analysis Workshop

SiteTek
Financial Arts

Project: **Pinnacle Peak Road & Channel**
Location: **Peoria, Arizona**
Date: **October 26 - 28, 2009**

PARTICIPANTS:

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ATTENDANCE LIST

Value Analysis Workshop

SiteTek
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Location: **Peoria, Arizona**
Date: **October 26 - 28, 2009**

PARTICIPANTS:

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ATTENDANCE LIST

Value Analysis Presentation

SiteTek Financial Arts

Project: **Pinnacle Peak Road & Channel**
Location: **Peoria, Arizona**
Date: **October 28, 2009**

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ATTENDANCE LIST

Value Analysis Presentation

SiteTek
Financial Arts

Project: **Pinnacle Peak Road & Channel**
Location: **Peoria, Arizona**
Date: **October 28, 2009**

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	Branch Manager		