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Landscape Financial and Environmental Life-Cycle Costs:

Spreadsheet and web tools for planning cost-effective, water-efficient, and resource-conserving landscapes

Nancy Hardman, MPA Central Utah Water Conservancy District

Value Engineering

The Team

Fredrick R. Liljegren, Landscape Architect
Janice Richardson, Conservation Specialist } US Bureau of Reclamation

David Rosenberg, PhD., Civil & Environmental Engineering
Kelly Kopp, PhD., Water Conservation & Turfgrass Mgmt
Heidi Kratsch, PhD., Sustainable Landscape Mgmt
Roger Kjelgren, PhD., Cost Estimation & Landscape Mgmt } Utah State University

Roy Peterman, Brigham Young University Grounds Director
Kris Ashby, owner and CEO, Elite Grounds LC

Richard King, PE, CRS Engineers
Heath Clark, PE, CUWCD Project Engineer

Nancy Hardman, Central Utah Water Conservancy District

Value

Engineering

ALTERNATE LANDSCAPE EXAMPLE COST COMPARISONS

20 YEAR LIFE CYCLE COST ANALYSIS

PREPARED BY: FREDRICK S. LILJEGREN, LANDSCAPE ARCHITECT, U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION

I. CAPITAL EXPENDITURES		ECONOMIC LIFE	20 years	COMPARISON OF LANDSCAPES (7,000 SQ. FT.)			
ITEM DESCRIPTION		UNIT PRICE	UNIT	Standard Landscape	Xeriscape Landscape	EZ Living Landscape	Commercial style Landscape
1	Excavation	\$300.00	CU YD	20	20	20	20
2	Top soil	\$0.75	SQ FT	5,600	1,000		7,000
3	Soil amendments	\$0.75	SQ FT		2,500	7,000	
4	Retaining wall	\$18.00	FACE FT	150			150
5	Concrete paving	\$3.00	SQ FT	150	150	300	200
6	Elevated Deck/platform	\$6.00	SQ FT				
7	Irrigation system	\$0.50	SQ FT	7,000	5,000	5,000	7,000
8	Lighting system	\$500.00	EA	1	1	1	1
9	Waterfall feature	\$1,000.00	EA	1	1	1	1
10	Pond feature	\$1,500.00	EA	1	1	1	1
11	Fencing	\$20.00	LN FT	280	280	280	280
12	Trees	\$50.00	EA	5	6	3	6
13	Shrubs	\$15.00	EA	15	30	25	20
14	Ground cover	\$4.00	SQ FT	200	400	200	200
15	Perennials	\$4.00	SQ FT	100	300	150	
16	Annuals	\$2.00	SQ FT	100	200	50	300
17	Turf grass	\$0.50	SQ FT	6,000	1,000	3,000	6,500
18	Mulches	\$1.00	SQ FT	500	3,000	2,000	
19	Grading	\$0.05	SQ FT	7,000	7,000	7,000	7,000
SUBTOTAL				\$ 31,175	\$ 27,975	\$ 29,125	\$ 32,250
		Mobilization	5%	1,559	1,399	1,456	1,613
		Unlisted Items	10%	3,118	2,798	2,913	3,225
COST				\$ 35,851	\$ 32,171	\$ 33,494	\$ 37,088
		Contingencies	10%	3,585	3,217	3,349	3,709
FIELD COST				\$ 39,400	\$ 35,400	\$ 36,800	\$ 40,800
		Design	6%	2,364	2,124	2,208	2,448
		Construction Oversight	4%	1,576	1,416	1,472	1,632
TOTAL INITIAL/ COLLATERAL COST				\$ 43,000	\$ 39,000	\$ 40,000	\$ 45,000

II. OPERATING COSTS ANNUALLY				Standard Landscape	Xeriscape Landscape	EZ Living Landscape	Commercial style Landscape
Mowing Turf-small equipment	\$0.11	SQ FT		6000	1000	3000	6500
Mowing Turf-intermediate equipment	\$0.09	SQ FT					
Mowing Turf-large equipment	\$0.08	SQ FT					
Edging concrete	\$0.10	LN FT		150	0	60	150
Trimming beds	\$0.10	LN FT		300	70	150	400
Pruning trees	\$5.00	EA		5	6	3	6
Biweekly weeding	\$0.08	SQ FT		2000	5000	2000	1500
Pruning shrubs	\$2.00	EA		15	30	25	20
Spring grounds preparation	\$0.04	EA		2000	5000	2000	1500
Fall grounds preparation	\$0.04	EA		5000	1000	3000	6500
Irrigation maintenance	\$0.02	SQ FT		7000	5000	5000	7000
Total Incremental Labor				\$ 1,340	\$ 947	\$ 876	\$ 1,420
Utilities water-average system	\$0.03	SQ FT		7,000			7,000
Utilities water-efficient system	\$0.02	SQ FT			5,000	5,000	
Utilities power	\$75.00	LS		1	1	1	1
Fertilizer-regular	\$0.03	SQ FT		7,000			7,000
Fertilizer-as needed	\$0.01	SQ FT			5,000	5,000	
Pesticides-regular	\$0.03	SQ FT		7,000			7,000
Pesticides-as needed	\$0.01	SQ FT			5,000	5,000	
Other Costs							
Total Incremental Misc.				\$ 705	\$ 275	\$ 275	\$ 705
Subtotal				2,045	1,222	1,151	2,125
Overhead		10.0%		205	122	115	213
Total Annual Cost				\$ 2,250	\$ 1,344	\$ 1,266	\$ 2,338
III. MAINTENANCE COSTS ANNUALLY				Standard Landscape	Xeriscape Landscape	EZ Living Landscape	Commercial style Landscape
Annual cost of replacing annuals	\$2.00	SQFT		100	200	50	300
Annual cost of replacing perennials	\$1.00	SQFT		100	300	150	
Annual cost of painting fences, etc.	\$100.00	LS		1	1	1	1
Annual Irrigation replacement cost	\$0.02	SQFT		7,000	5,000	5,000	7,000
Annual Lighting replacement cost	\$35.00	LS		1	1	1	1
Annual water pump replacement	\$30.00			1	1	1	1
Annual cost of cleaning a pond	\$50.00	LS		1	1	1	1
Annual cost of cleaning water feature	\$50.00	LS		1	1	1	1
Annual Mulch replacement	\$0.20	SQFT		500	3,000	2,000	
Total Annual Cost				\$ 805	\$ 1,665	\$ 1,015	\$ 1,005

LANDSCAPE COMPARISON

SUMMARY LIFE CYCLE ANALYSIS

I. INITIAL ASSUMPTIONS				
INTEREST RATE			2.0%	PERCENT
ECONOMIC LIFE OF LANDSCAPE			25	YEARS
OWNER SUPPLIED LABOR			100%	PERCENT
HIRED LABOR RATE			\$40.00	\$/hr
AGRICULTURAL WATER PRICE			\$1.50	\$/1000 gal
UTILITY POWER / ELECTRICITY COST			\$0.07	\$/KW-HR
FERTILIZER COST			\$0.30	\$/LBS N
HERBICIDE COST			\$901.12	\$/LBS Active Ingredient
INSECTICIDE COST			\$1,150.40	\$/LBS Active Ingredient
FUNGICIDE COST			\$0.00	\$/LBS Active Ingredient
FUEL COST			\$2.84	\$/GALON
CARBON OFFSET COST			\$5.00	\$/1000 lbs CO ₂
SUMMER HOUSEHOLD ENERGY USE			890	KW-HR/month
WINTER HOUSEHOLD ENERGY USE			700	KW-HR/month
GROWING SEASON LENGTH			135	DAYS
SENSITIVITY ANALYSIS	Typical data values		1	(1, 2, or 3)

				COMPARISON OF LANDSCAPES		
II. PLANT COVERAGE and CONFIGURATION				Cool Season Turf	Warm Season Turf	Low Water Use
				UNIT		
1	Total Landscaped Area		SQ FT	10,000	10,000	10,000
2	Hardscape					
	Paved or stone		% of TOTAL AREA	10%	10%	10%
	Decking		% of TOTAL AREA			
3	Turf					
	Cool season (percent of total landscaped area)		% of TOTAL AREA			90%
	Warm season (percent of total landscaped area)		% of TOTAL AREA			
4	Shrub beds					
	Drought tolerant		% of TOTAL AREA			
	Drought intolerant					
	Hedged		% of TOTAL AREA			
	Fast growing flowering		% of TOTAL AREA			
	Non pruned		% of TOTAL AREA			
	Plant coverage in shrub beds		% of TOT SHRUB BED			
	Rock mulching in shrub beds		% of TOT SHRUB BED			
5	Perennial beds					
	Drought tolerant		% of TOTAL AREA			
	Drought intolerant		% of TOTAL AREA			
6	Annual beds		% of TOTAL AREA			
7	Vegetable garden		% of TOTAL AREA			
8	Ground cover					
	Drought tolerant		% of TOTAL AREA	90%		
	Drought intolerant		% of TOTAL AREA		90%	
				% of TOTAL AREA	100%	100%

III. CAPITAL EXPENDITURES

			PURCHASE PRICE (\$/UNIT)	UNIT	EC ON	REQUIRED UNITS		
Landscaping								
1	Trees							
	Drought tolerant	<input type="text"/>	\$10.00	EA	60	0	0	0
	Drought intolerant							
	Slow growing	<input type="text"/>	\$10.00	EA	60	1	0	0
	Fast growing	<input type="text"/>	\$80.00	EA	60	0	0	0
	Fruit	<input type="text"/>	\$200.00	EA	60	0	0	0
	Conifers	<input type="text"/>	\$80.00	EA	60	0	0	0
2	Shrubs							
	Drought tolerant		\$30.00	EA	60	0	0	0
	Drought intolerant							
	Hedged		\$25.00	EA	60	0	0	0
	Fast growing flowering		\$25.00	EA	60	0	0	0
	Non pruned		\$25.00	EA	60	0	0	0
3	Ground cover							
	Drought tolerant		\$5.85	SQ FT	8	9,000	0	0
	Drought intolerant		\$5.85	SQ FT	8	0	9,000	0
4	Perennials							
	Drought tolerant		\$2.75	SQ FT	8	0	0	0
	Drought intolerant		\$2.75	SQ FT	8	0	0	0
5	Annuals		\$2.50	SQ FT	1	0	0	0
6	Vegetable garden		\$9.08	SQ FT	1	0	0	0
7	Turf grass							
	Cool season	<input type="text"/>	\$0.06	SQ FT	30	0	0	9,000
	Warm season	<input type="text"/>	\$0.15	SQ FT	30	0	0	0
8	Mulches							
	Organic		\$0.56	SQ FT	3	0	0	0
	Inorganic, rocks (around sparse shrubs)		\$0.74	SQ FT	60	0	0	0
9	Paving		\$5.00	SQ FT	60	1,000	1,000	1,000

V. ANNUAL OPERATING and MAINTENANCE COSTS

ITEM	\$/UNIT	UNITS			
Labor		HRS/YEAR	322	319	113
Owner-supplied labor	0	HRS/YEAR	321.7	319.1	113.3
Hired labor	40	HRS/YEAR	0.0	0.0	0.0
Water Use	1.5	1000 GALLONS/YR	60	208	213
Net utilities power	\$0.07	KW-HR/YEAR	0	0	0
Fertilizer	\$0.30	LBS N/YEAR	10	9	54
Pesticides		LBS AI/YEAR	0	0	2
Herbicides	\$901.12	LBS AI/YEAR	0	0	2
Insecticides	\$1,150.40	LBS AI/YEAR	0	0	0
Fungicides	\$0.00	LBS AI/YEAR	0	0	0
Fuel	\$2.84	GAL/YEAR	0	0	34
Carbon offsets	\$5.00	1000 LBS CO2/YEAR	(0)	(0)	1
Total Annual Cost			\$92	\$313	\$2,053

VI. REPLACEMENT COSTS

Total Replacement Costs			\$164,430	\$164,430	\$5,160
Present Value of Replacement Costs			\$122,875	\$122,875	\$3,686

VII. INVESTMENT ANALYSIS

Year 1 Capital, Material, Purchase, Contingencies, Site Preparation, and Installation Costs			\$94,286	\$94,271	\$15,729
Present Value of Future Costs			\$124,703	\$129,116	\$44,569
Total Present Value of All Costs			218,989	223,387	60,298

VIII. LIFECYCLE IMPACT ANALYSIS

Total lifecycle financial cost	(\$)	218,989	223,387	60,298
Total lifecycle water use	(1000 gallons)	1,681	5,792	5,108
Total lifecycle energy	(kW-hr)	0	0	0
Total lifecycle fertilizer use	(lbs N)	238	225	1,350
Total lifecycle pesticide use	(lbs)	0	0	45
Total lifecycle owner labor	(hrs)	13,445	13,379	2,968
Total lifecycle hired labor	(hrs)	0	0	0
Total lifecycle fuel	(gallons)	0	0	838
Total lifecycle particulate matter	(lbs)	0	0	6
Total lifecycle hydrocarbon output	(tons CO2)	-2.2	-1.6	6.6

II. Applied Water to Meet Plant Needs

8 Irrigation system zone	Irrigation component	Application Efficiency (%)	Lifecycle Applied Irrigation Water (gallons)		
Turf areas	In-ground sprinkler		0	0	0
Rotor	In-ground rotor	75%	0	0	5,107,500
Spray	In-ground spray	50%	0	0	0
Shrub beds	In-ground spray	50%	0	0	0
Perennial beds	Drip	85%	0	0	0
Annual beds	Drip	85%	0	0	0
Vegetable gardens	Drip	85%	0	0	0
Ground cover	In-ground spray	50%	1,680,750	5,791,500	0
Total Lifecycle Required Water (gallons)			1,680,750	5,791,500	5,107,500
Year 1 Establishment Required Water (gallons)			243,162	810,000	0
Average Post Establishment Year 1 Required Water (gallons/year)			59,900	207,563	212,813

Cost summary
 Water
 Labor
 Fuel
 CO₂
 Energy
 Dust
 Replacement Costs

Fertilizer
 Pesticide
 Data-Explanation
 Data-Irrigation
 Data-Tree Growth
 Data-Equipment
 Data-Labor Equipment
 References

Welcome to our site:

<http://VLE.CUWCD.COM>



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Evaluating Landscapes for Financial and Environmental Sustainability



Landscape Area

In this step, we will determine the size of the area that is to be landscaped.

I know the area and will enter it below:

square feet

I need help calculating the area:

Lot size: ▼

House Dimensions

Length: ft.

Width: ft.

Non-Landscaped Areas

1) Length: ft. Width:

2) Length: ft. Width:

3) Length: ft. Width:

Landscape Area

Trees & Shrubs

Ground covers etc.

Turf Grass

TOTALS

Summary

Value Landscaping

Evaluating Landscapes for Financial and Environmental Sustainability



Trees and Shrubs

In this step, we will indicate the types and quantities of trees and shrubs desired in

To see examples of drought-tolerant trees, visit our plant database:
www.centralutahgardens.org

Trees	Drought Tolerant	Drought Intolerant	Conifers
Bare Root	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>
5 Gallon	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="12"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="8"/> <input type="button" value="▲"/> <input type="button" value="▼"/>
20 Gallon	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>
Ball & Burlap	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>
Shrubs	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>	<input type="text" value="0"/> <input type="button" value="▲"/> <input type="button" value="▼"/>



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Groundcover, Annuals, Perennials, & Vegetable Garden

In this step, we will determine the sizes of areas that will have a variety of plants other than turf (lawn).

To see examples of drought-tolerant groundcovers, annuals, and perennials, visit our plant database:

www.centralutahgardens.org

Groundcover

Drought Tolerant

Drought Intolerant

on Method

Annuals

Perennials

Drought Tolerant

Drought Intolerant

Vegetable Garden

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Turf /
In this step

“Cool Season” grasses that typically “green-up” in spring and fall. They go dormant during hot weather. Examples include Kentucky Bluegrass, Ryegrass, and Fescue.

“Warm Season” grasses are those that do best in hot weather. They “green-up” later than the cool season grasses and will go brown earlier in the fall. Warm season grasses usually require less water than cool season grasses. Buffalo grass, Zoysia grass, and some of the fescues are warm season grasses.

ass.

Planting Method	Cool Season	Warm Season	Method
Seed	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value=""/>
HydroSeed	<input type="text" value="0"/> <input checked="" type="checkbox"/>	<input type="text" value="0"/> <input checked="" type="checkbox"/>	<input type="text" value=""/>
Sod / Plugs / Sprigs	<input type="text" value="7145"/> <input checked="" type="checkbox"/>	<input type="text" value="0"/> <input checked="" type="checkbox"/>	<input type="text" value="in-ground"/>

Landscape Area

Trees & Shrubs

Ground covers etc.

Turf Grass

TOTALS

Summary

Value Landscaping

Evaluating Landscapes for Financial and Environmental Sustainability



Totals

Assumptions

Economic Life of Landscape (years) = 20
 Growing Season Length (days) = 189
 Labor Rate (%) = 10
 Total Landscaped Area (sq. ft.) = 8,320

Fertilizer Cost (lbs. nitrogen) - \$.30
 Pesticide Cost (lb. active ingredient) = \$12.00
 Cost of Water (per 1000 gallons) = \$1.50

Impact of Each Landscape Activity

Landscape Activity	Quantity	Unit	Unit Price	Capital Cost	Lifetime of Item (years)	Avg Annual Water (gallons)	Annual Fertilizer (lbs. nitro)	Annual Pesticides (lbs. active ingredient)
Drought Intolerant Trees	12	Each	\$25.00	\$300.00	60	13,126	0.0240	0.0000
Conifers - 5 gal.	8	Each	\$25.00	\$200.00	60	8,751	0.0080	0.0000
Drought Tolerant Shrub	18	Each	\$30.00	\$540.00	60	2,303	0.0360	0.0223
Drought Intolerant Shrub	8	Each	\$25.00	\$200.00	60	2,444	0.0160	0.0099
Drought Intolerant Groundcover	1000	sq. ft.	\$5.85	\$5,850.00	8	34,965	1.0000	0.0000
Drought Tolerant Perennial	495	sq. ft.	\$2.75	\$1,361.25	8	4,426	0.4950	0.1126
Drought Intolerant Perennial	1815	sq. ft.	\$2.75	\$4,991.25	8	55,995	2.7225	0.4129
Vegetable Garden	900	sq. ft.	\$9.08	\$8,172.00	1	68,040	1.3500	0.0810
Cool Season Sod	7145	sq. ft.	\$0.26	\$1,857.70	30	340,602	42.8700	0.0000

Landscape Area

Trees & Shrubs

Ground covers etc.

Turf Grass

TOTALS

Summary



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Summary of Impacts

Year 1 Cost	Total Cost (materials only):	\$23,472.20
	Total Year 1 Cost with Labor:	\$25,819.42
Replacement Cost	Total Annual Average Replacement Costs (materials only):	\$9,456.47
	Total Annual Average Replacement Costs with labor:	\$10,402.12
Water	Total Annual Average Water Required (gallons):	530,752
	Total Annual Average Water cost:	\$795.98
Fertilizer	Total Annual Fertilizer Required (lbs. nitrogen):	48.5215
	Total Annual Fertilizer Cost:	\$14.56
Pesticide	Total Annual Pesticide Required (lbs. active ingredient):	0.6387
	Total Annual Pesticide Cost:	\$7.66
TOTAL	Total Average Annual Cost of Landscape:	\$11,220.32

Landscape Area

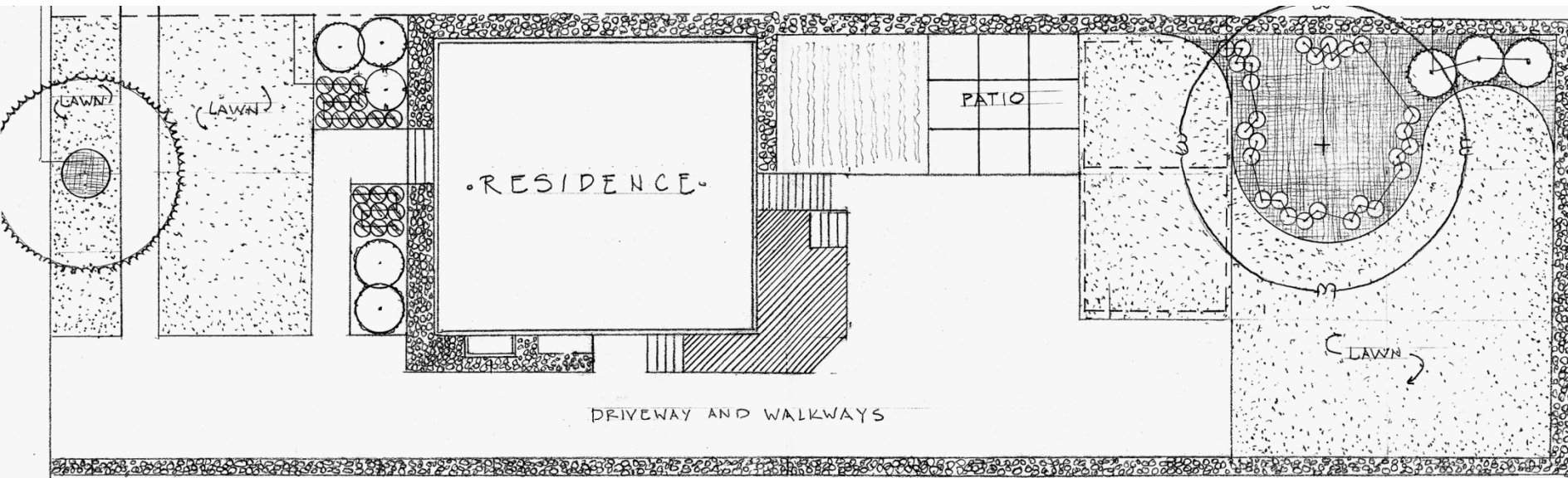
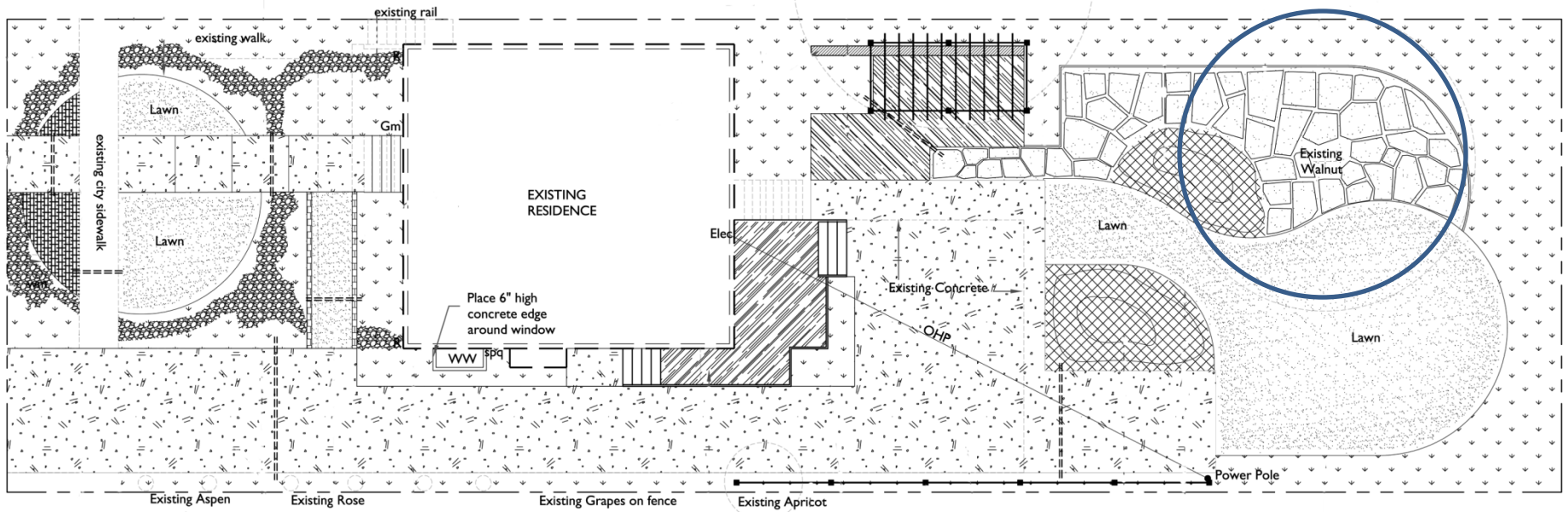
Trees & Shrubs

Ground covers etc.

Turf Grass

TOTALS

Summary



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Our Website is currently receiving finishing touches and will be available for your use shortly.

In the meantime, please contact us at nancy@cuwcd.com for more information about this important project!

<http://VLE.CUWCD.COM>

Contact Information:

Nancy Hardman, CUWCDnancy@cuwcd.com 801-226-7187

Fred Liljegren, USBORFLiljegren@usbr.gov 801-524-3765

David Rosenberg, USU David.rosenberg@usu.edu 435-797-8689

Kelly Kopp, USUkelly.kopp@usu.edu 435-797-1523

Thanks!

Questions?