



ROBERT
TRENT JONES
Golf Course Architects

THE
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SOCIETY

Conserving Our Most Precious Resource One Golf Course at a Time

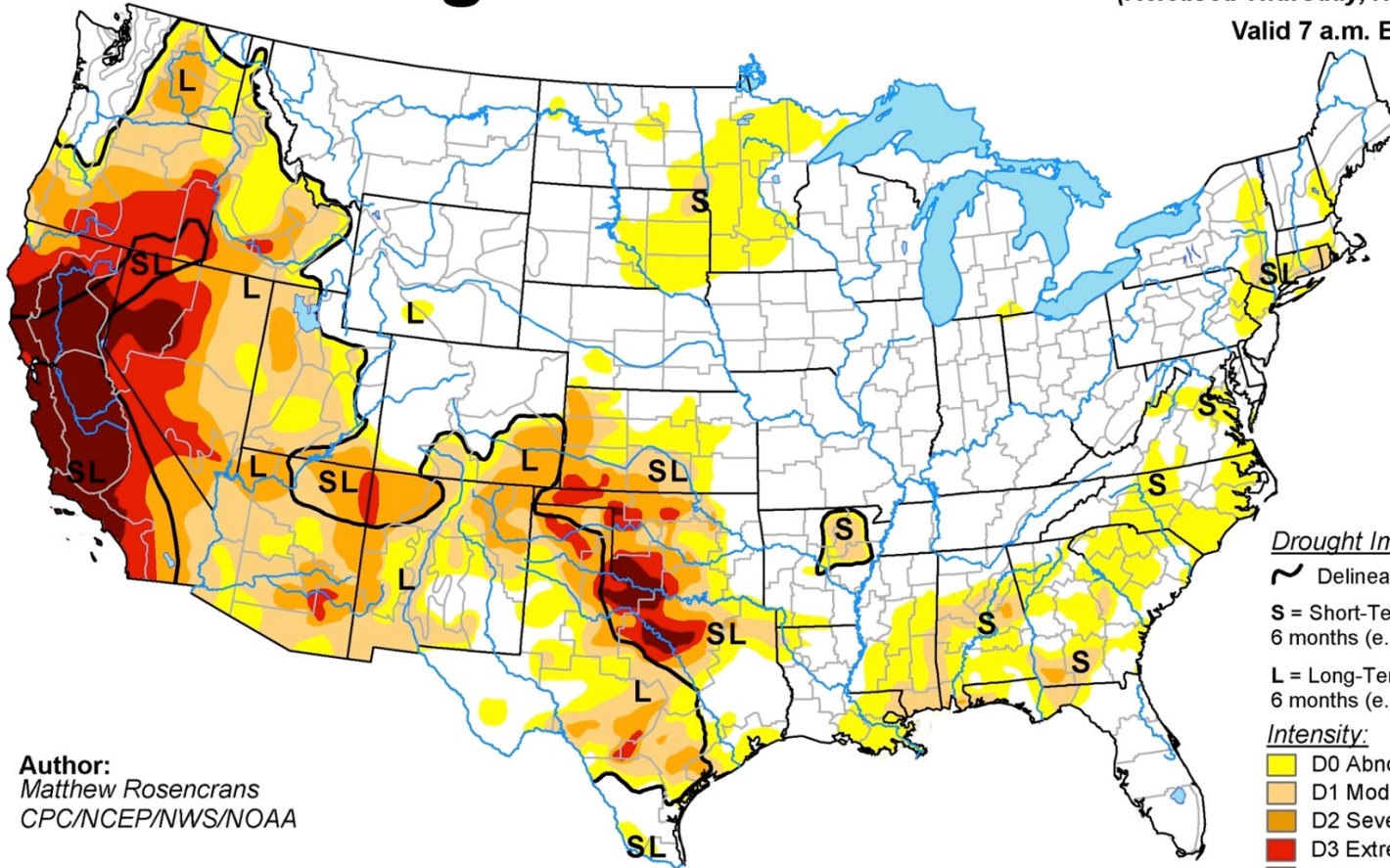
November 15, 2014



U.S. Drought Monitor

November 11, 2014
(Released Thursday, Nov. 13, 2014)

Valid 7 a.m. EST



Author:
Matthew Rosencrans
CPC/NCEP/NWS/NOAA

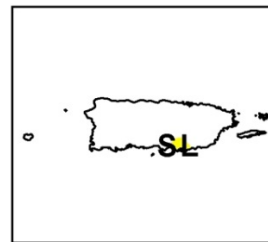
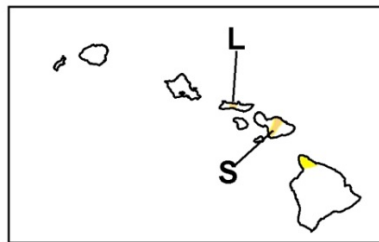
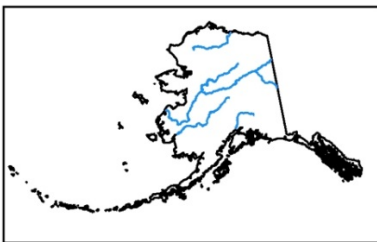
Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



<http://droughtmonitor.unl.edu/>

GREEN PROCLAMATION

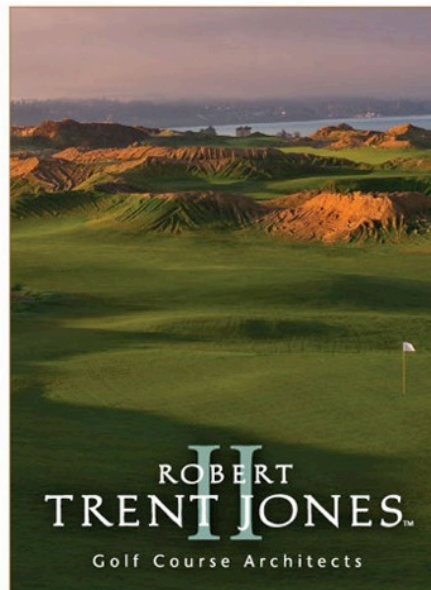
A Fresh Approach To Golf Course Design

We aspire to: 1. Create courses on sites that will sustain golf with a minimum disturbance to and maximum enhancement of natural ecosystems, and/or rehabilitate degraded landscapes and environments.

2. Move earth more efficiently to create courses that fit their sites and respect the natural characteristics of the terrain.

3. Design and construct courses with ongoing operations and future maintenance and sustainability in mind.

4. Protect native flora and fauna.



5. Protect and enhance wildlife habitat and other sensitive environmental areas while providing active corridors for species diversity.

6. Minimize clearing of trees and other native vegetation and, where possible, revegetate with indigenous plants from the site.

7. Create courses that use less water, pesticides, and fertilizers than traditional courses.

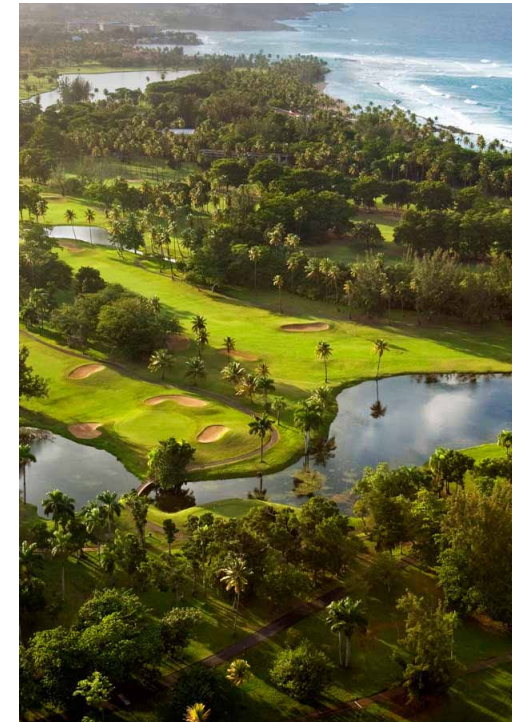
8. Protect, conserve, and improve water quality and resources by incorporating wetlands, turfgrass, and other natural site features to clean and filter water.

9. Maximize the effectiveness of available water through the use of drought-tolerant grass species; and specify soil amendments that lead to water conservation, and, where applicable, absorb properly-treated effluent.

10. Employ new technologies wherever and whenever feasible, that will further these goals.

Chapter 1: Trends in Golf Course Sustainability

Robert Trent Jones Sr. Design Trends

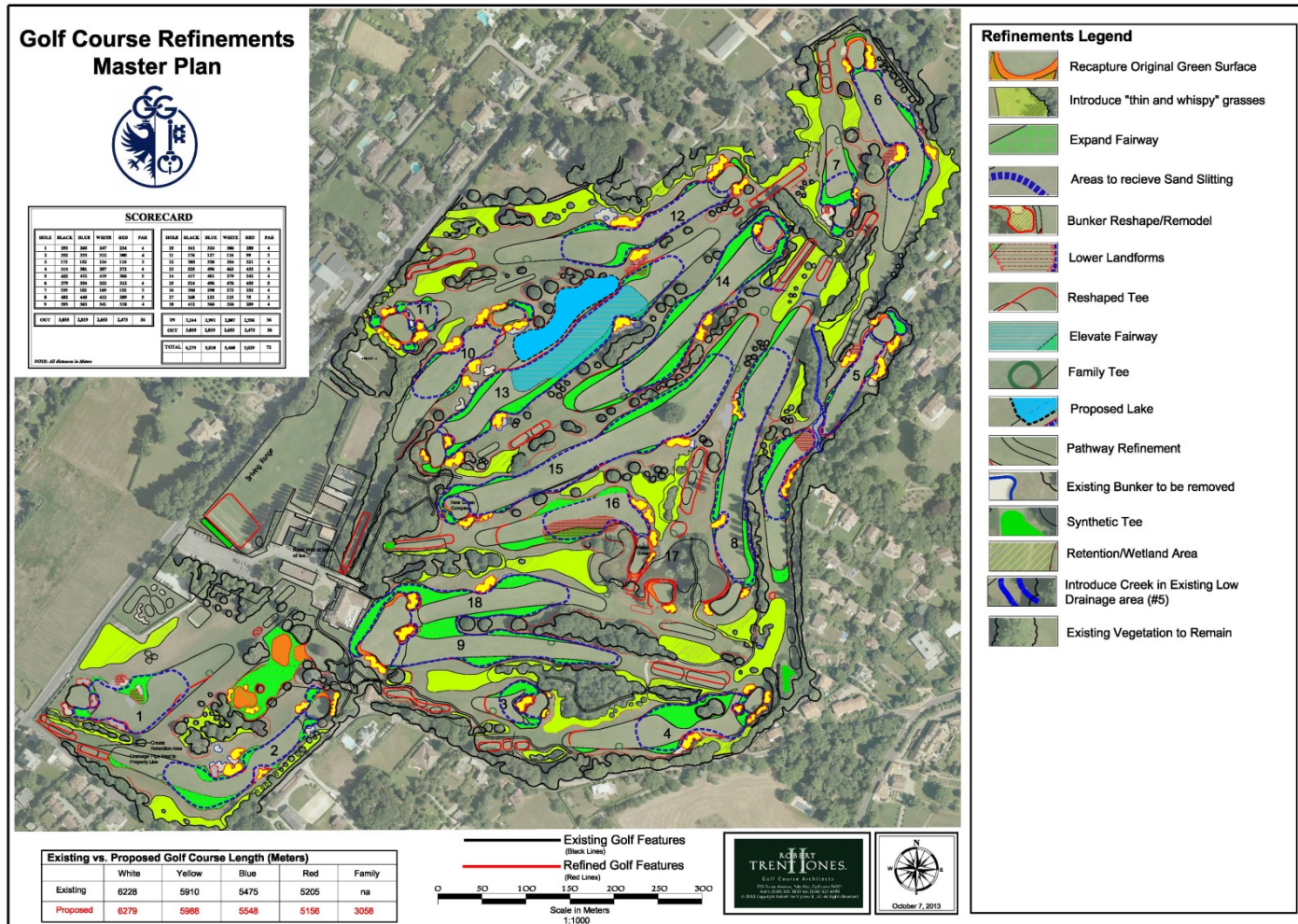


Dorado Beach, Puerto Rico

A Ritz Carlton Renaissance in the Caribbean

Chapter 1: Trends in Golf Course Sustainability

Robert Trent Jones Sr. Design Trends



Golf Club de Geneve Geneva, Switzerland

Drainage, Drainage, Drainage

Chapter 1: Trends in Golf Course Sustainability

Robert Trent Jones Sr. Design Trends

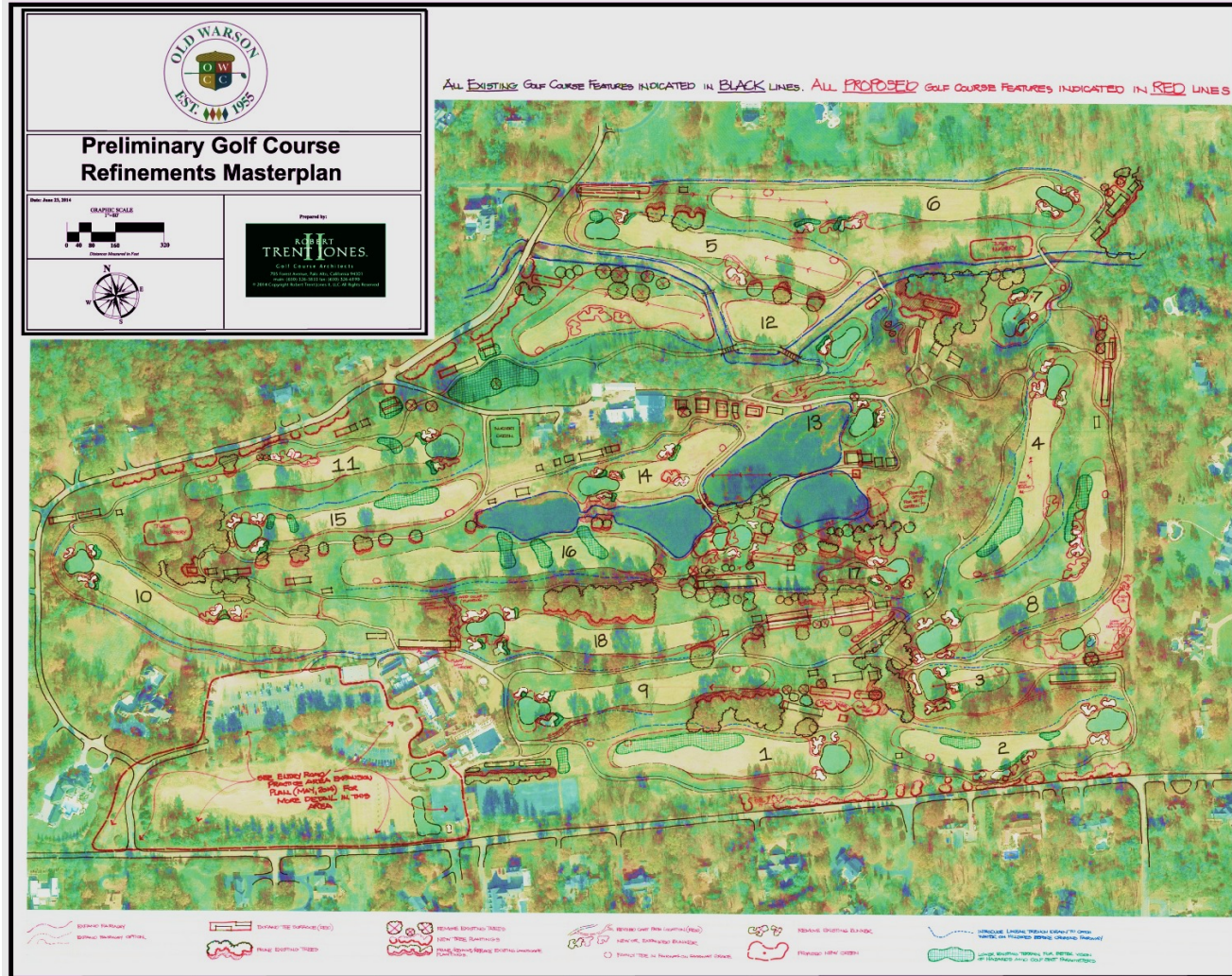


Mission Viejo Country Club

Fairway/Bunker Strategies

Chapter 1: Trends in Golf Course Sustainability

Robert Trent Jones Sr. Design Trends

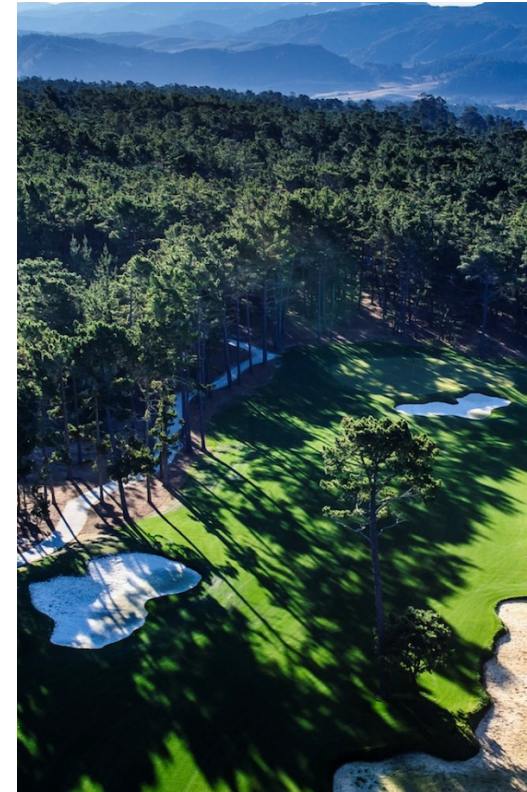


Old Warson: A revitalization of an important historic course

Chapter 1: Trends in Golf Course Sustainability: Poppy Hills

Creating an economically sustainable golf course:

- Irrigation system optimization/replacement
- Reduced Irrigation foot print
- Turfgrass replacement
- Water harvesting
- Finding solutions other than irrigated turf
- Maintenance reduction vs. golfer expectations- Communication
- Rebate Programs
- New irrigation technologies



Chapter 1: Trends in Golf Course Sustainability: Poppy Hills



Player Experience

Firm, Fast, Fun

- Reduced severity of doglegs
- Reduced square footage of bunkers
- Introduced Sandy playable areas
- Flexible Teeing Grounds
- Elimination of perched tees
- Increased vision through the forest



Chapter 1: Trends in Golf Course Sustainability: Poppy Hills

WATER CONSERVATION

Case Study: Renovation Of Poppy Hills Golf Course

BY THE NUMBERS



- 12 } Acres of added natural areas
- 20 } Acres of irrigated turf reduction
- 50 } Approximate acres of playable fairway
- 150% } Increase of fairway landing areas
- 1,800 } Individually controlled sprinklers
- 45,000 } Square feet of new practice tees
- 75,000 } Linear feet of underground drainage
- 150,000 } Square feet of newly designed greens
- 170,000 } Total Square feet of meandering tee surfaces



Chapter 1: Trends in Golf Course Sustainability: Poppy Hills

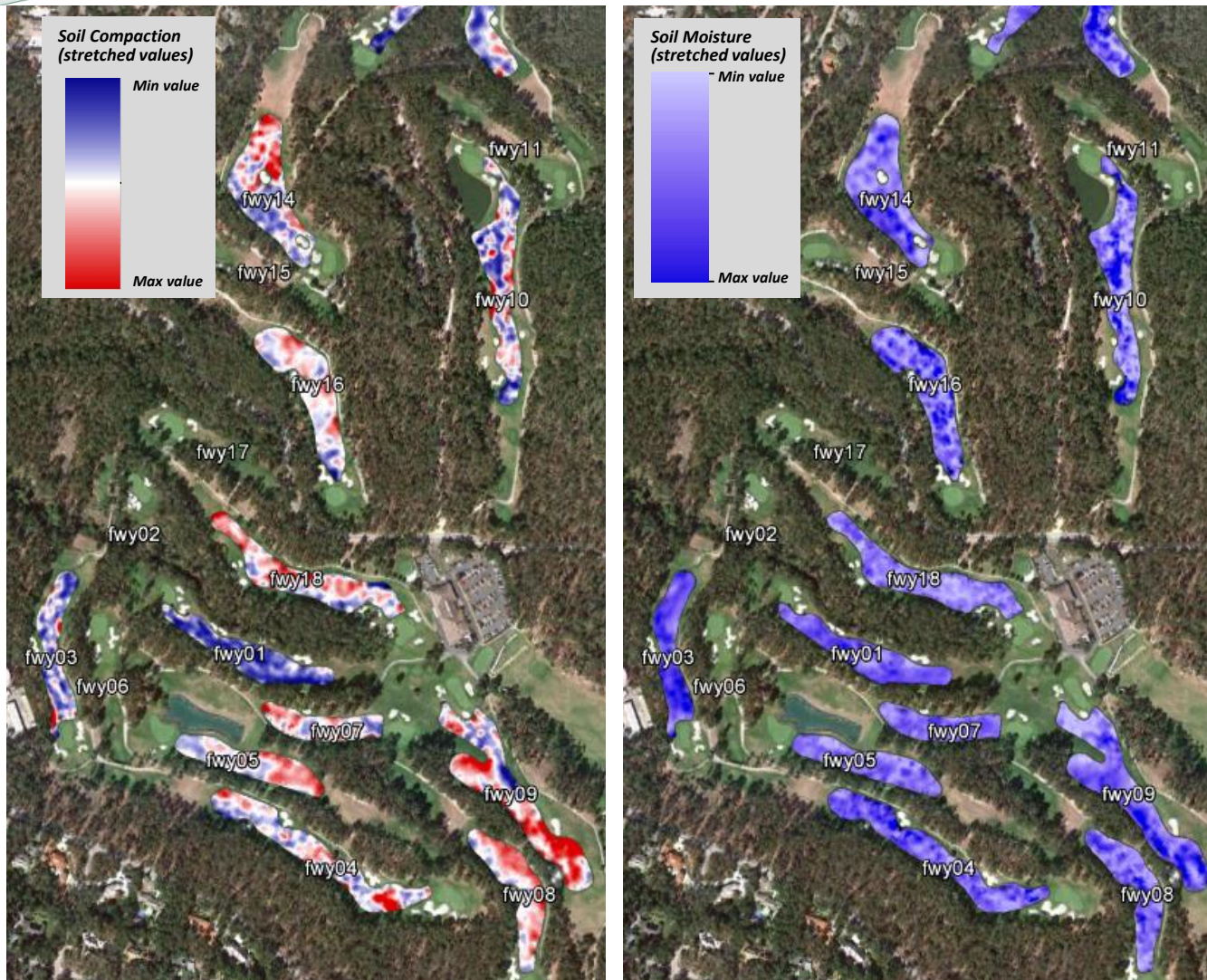


- Installation of “State of the Art” / Water Efficient Irrigation System
- Implementation of an expanded water conservation and management program
- During irrigation replacement also establish 15.5 acres of non-irrigated areas
- Develop sand cap program for improved drainage and to promote firm and fast playing conditions
- Introduce naturalized features
- Establish low maintenance areas that will also come into play strategically



Chapter 1: Trends in Golf Course Sustainability: Poppy Hills

Toro Precision Sense Mapping



Chapter 1: Trends in Golf Course Sustainability: Poppy Hills



20 Acre Turf Reduction

- Additional water savings of 21% gained by new irrigation system
- 12% Reduction in power requirements for pumping
- 10% Reduction in fuel consumption (mowers)

Existing Conditions



Proposed Plan



Chapter 1: Trends in Golf Course Sustainability: Poppy Hills

Reduction of out of play Turf



Before



After



Chapter 1: Trends in Golf Course Sustainability: Poppy Hills



BEFORE



AFTER



ACHIEVING MORE WITH LESS



Chapter 1: Trends in Golf Course Sustainability: Poppy Hills



Careful selection of new grasses



**New Technologies to reduce
bunker maintenance**



Chapter 1: Trends in Golf Course Sustainability: Poppy Hills



REDUCING IRRIGATED TURF



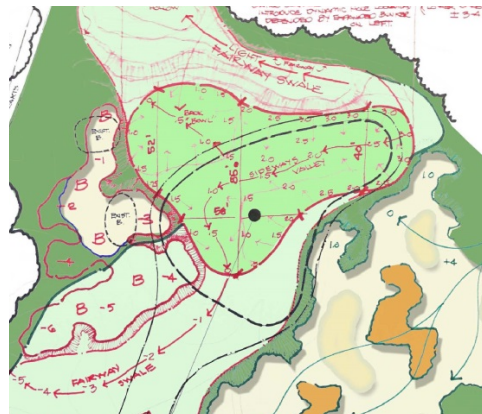
SAND CAPPING



Chapter 2: Pauma Valley Economic Sustainability Case Study

Evaluate, Collaborate, Create

Robert Trent Jones, L.L.C.									
May-08									
Hole Number	Direction of Play								Hole Nubs
	N	NE	E	SE	S	SW	W	NW	
Hole 1									Hole 1
Hole 2									Hole 2
Hole 3									Hole 3
Hole 4									Hole 4
Hole 5									Hole 5
Hole 6									Hole 6
Hole 7									Hole 7
Hole 8									Hole 8
Hole 9									Hole 9
Front Nine Total	3	0	2	1	1	0	2	0	Front Nub
Hole 10									Hole 10
Hole 11									Hole 11
Hole 12									Hole 12
Hole 13									Hole 13
Hole 14									Hole 14
Hole 15									Hole 15
Hole 16									Hole 16
Hole 17									Hole 17
Hole 18									Hole 18
Back Nine Total	2	0	0	5	1	0	1	2	
Totals	5	0	2	6	2	0	3	2	
*note wind direction is based off of prevailing on shore pattern									



Chapter 2: Evaluate, Collaborate, Create

1. **EVALUATION:** in depth research and analysis into the dynamics of the golf course:

- Existing climatic conditions
- Existing agronomic conditions
- Existing Turf Area
- Proposed Turf Area
- Low maintenance analysis
- Irrigation Improvements (e.g. Toro System at Poppy Hills)
- Design considerations
- Membership goals
- Gain as much knowledge as possible about existing conditions

Chapter 2: Evaluate, Collaborate, Create

EVALUATE CHALLENGES: TURF REDUCTION VS. FLOOD CONTROL



Pauma Valley Front Nine and Flood Control Channel

Chapter 2: Evaluate, Collaborate, Create

EVALUATE CHALLENGES: TURF REDUCTION VS. FLOOD CONTROL



Chapter 2: Evaluate, Collaborate, Create

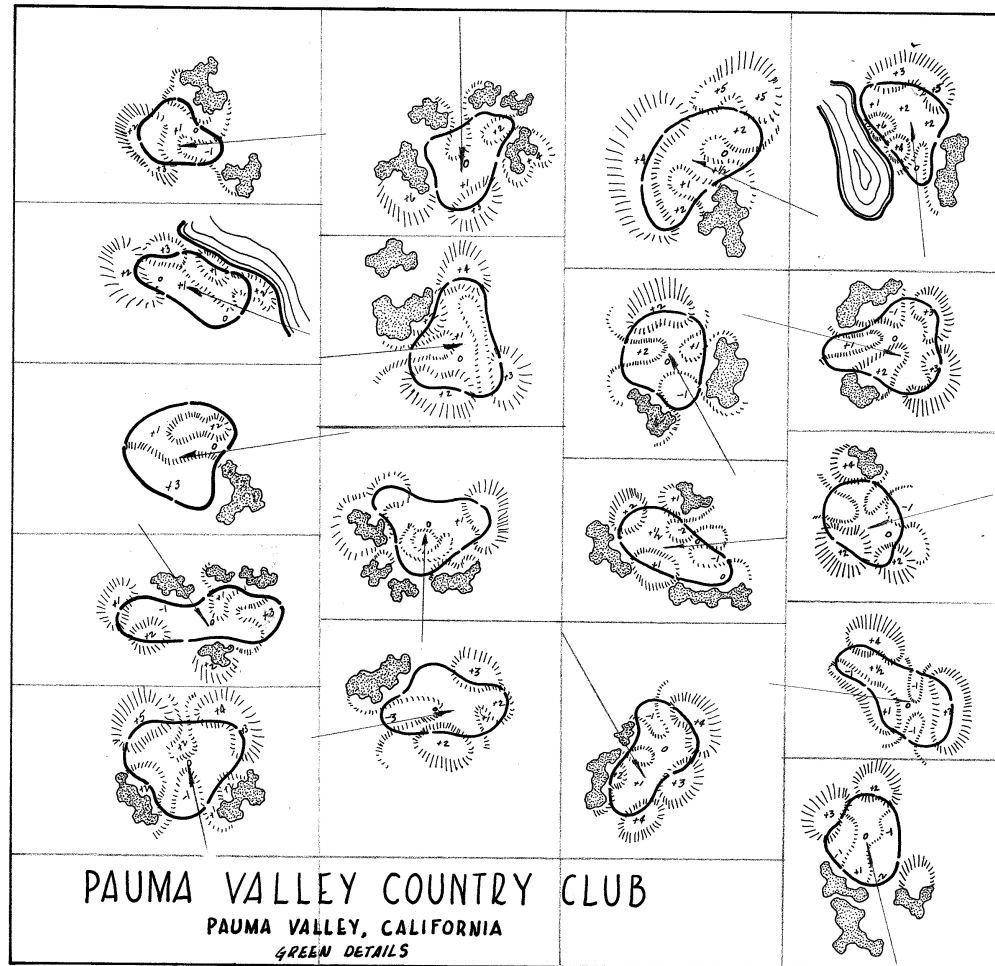
EVALUATE ORIGINAL DESIGN INTENT/STRATEGIES



Pauma Valley Early Aerial Photography-Learning from the past

Chapter 2: Evaluate, Collaborate, Create

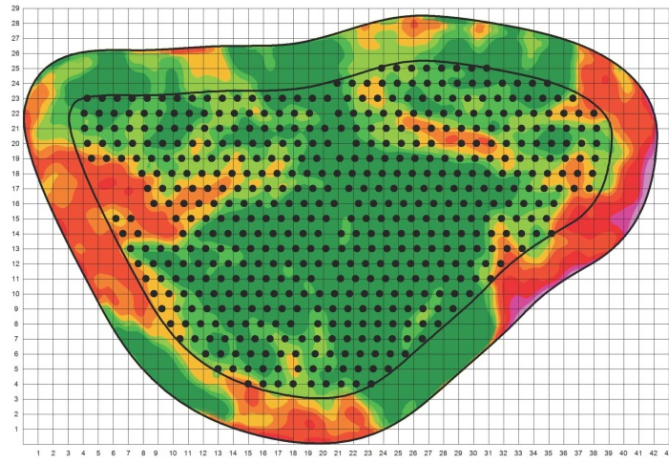
EVALUATE ORIGINAL GREEN SURFACES



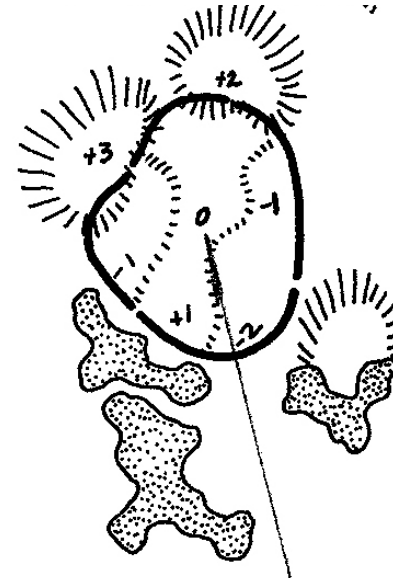
RTJ Sr. Archival Drawings

Chapter 2: Evaluate, Collaborate, Create

GREEN SURFACES EVALUATION



Percent Slope	Green Area ft ² (%)	Putting Area ft ² (%)
0-2	3186.4 (41.2)	2408.3 (48.5)
2-2.5	1205.6 (15.6)	961.6 (19.4)
2.5-3	1095.1 (14.1)	760.7 (15.3)
3-3.5	729.8 (9.4)	417.7 (8.4)
3.5-4	561.1 (7.2)	241.7 (4.9)
4-5	653.7 (8.4)	149.8 (3.0)
5-6	202.2 (2.6)	20.6 (0.4)
6-7	61.9 (0.8)	0.0 (0.0)
7-10	43.0 (0.6)	0.0 (0.0)
10-100	7.9 (0.1)	0.0 (0.0)






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Find New Hole Locations and Green Limits

Chapter 2: Evaluate, Collaborate, Create


Existing Mowing Pattern Evaluation



WATER CONSERVATION AND MAINTENANCE REDUCTION
Mowing Pattern and Maintenance Reduction
Hole #1 Green Complex

Existing Conditions


Wall to Wall Turf



- Irrigated turf extending to out of play areas
- Green limits encroachment
- Bunker detached from green
- Rough Surrounding green
- Rough preventing shots from entering bunkers

Proposed Conditions




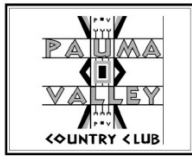
Strategic Enhancements with maintenance reductions



- Low Maintenance Area
- Revised Irrigated Turf boundary
- Increase Fairway mowing patterns around green surface
- Bring greenside bunker more into play by expanding fairway mowing patterns
- Regain original size of green surface
- Create a "roll in" bunker edge

Mowing Pattern Strategy Results:

- Reduced Irrigated Turf
- More Strategic Options around green surface
- More hole locations
- Hazards more into play



November 1, 2014

Fairway mowing patterns become detached over time


Chapter 2: Evaluate, Collaborate, Create

Existing Bunker Evaluation

WATER CONSERVATION AND MAINTENANCE REDUCTION

**Mowing Pattern and Maintenance Reduction
Hole #2 Bunker Complex Improvements**

Existing Conditions
Fairway Bunkers Detached from Play



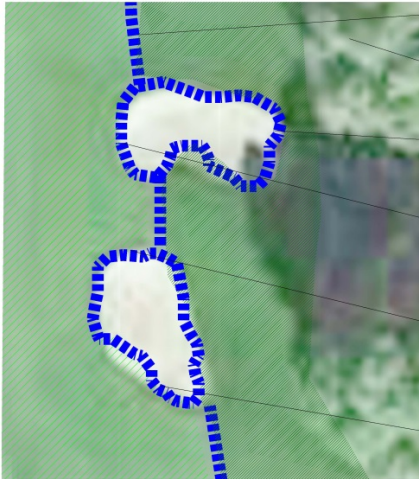
Fairway limits detached from bunkers

Bunkers have lost shape over time

Bunkers surrounded by rough

Sand built up around edges bunkers-(over time)

Proposed Conditions
Strategic Enhancements with maintenance reductions



Fairway perimeter closer to bunkers

Revised Irrigated Turf boundary

Re-Edge bunkers to regain original shape


Fairway mown closer to bunker edge

Create a "roll in" bunker edge

Create a strategic carry edge to set up better approach into green

Bunker Improvement Results:

- Regain bunker strategy
- Bunkers become more aesthetically pleasing
- More hole locations
- Hazards more into play



PAULMA VALLEY COUNTRY CLUB

ROBERT TRENT JONES
GOLF COURSE ARCHITECTS

100 FEET

NOVEMBER 1, 2014

Bunkers lose shape and become “perched over time”

Chapter 2: Evaluate, Collaborate, Create



BUNKER RESTORATION Photosimulation Character



Existing Bunker Conditions

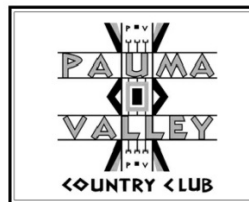


- Bunker shapes have lost character over time
- Minimal vision into bunker
- Bunker detached from fairway

Proposed Bunker Strategy



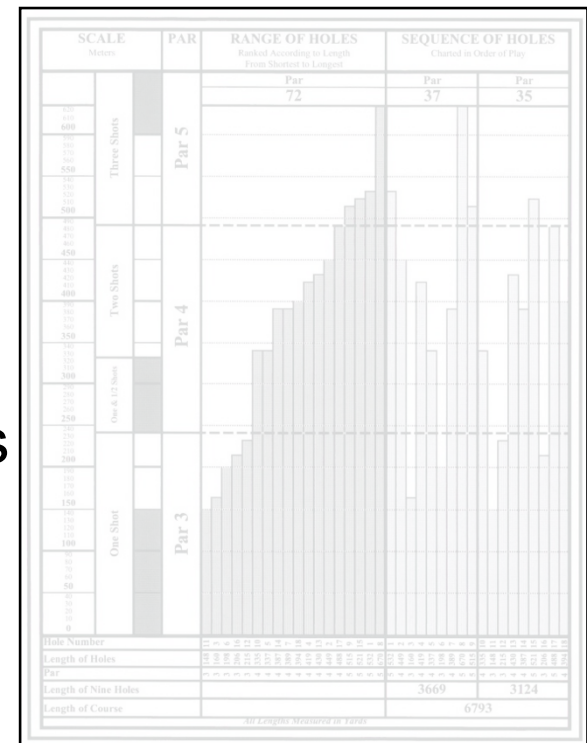
- Restore Bunker Shapes
- Improve Bunker Visibility
- Less bunkers with more strategic options



Chapter 2: Evaluate, Collaborate, Create


2. Collaborate- Review concepts and findings during audit process with committee members:

- Cost analysis
- Water savings analysis
- Maintenance reduction analysis
- Return on investment
- Timeline
- Deficiencies in golf course conditions
- Shows areas of existing conditions
- Shows what can be improved
- Detailed irrigated turf analysis





Chapter 2: Evaluate, Collaborate, Create

Golf Course Masterplan Audit



Pauma Valley








Audit Considerations

REFINEMENTS LEGEND

- 1 RESHAPE / REDEFINE / EXPAND BUNKER SHAPES FOR: BETTER VISION / HIGHER STRATEGIC VALUE / IMPROVED DRAINAGE & PLAYABILITY CHARACTERISTICS
- 2 INTRODUCE EXPANDED GREEN PUTTING SURFACE FOR: MORE VARIETY IN HOLE LOCATIONS AND ENHANCED GOLF SHOT STRATEGY
- 3 RESHAPE / REDEFINE / EXPAND OR REDUCE EXISTING WATER HAZARD FOR: INCREASED PLAYABILITY / BETTER GOLF SHOT DEFINITION / ADDITIONAL DRAMA IN PLAY
- 4 INTRODUCE NEW WATER HAZARD FOR: POSSIBLE STORM WATER RETENTION / ENHANCED GOLF SHOT STRATEGY / ADDITIONAL DRAMA IN PLAY
- 5 REMOVE EXISTING TREES / VEGETATION FOR: BETTER VISION OF GOLF HOLE / BETTER TURF CONDITIONS
- 6 PRUNE EXISTING TREES / VEGETATION FOR: BETTER VISION OF GOLF HOLE / BETTER TURF CONDITIONS
- 7 INTRODUCE / NEW NATIVE TREE PLANTINGS FOR: ADDITIONAL GOLF HOLE DEFINITION / SAFETY / AESTHETIC VARIETY
- 8 REDEFINE / INTRODUCE NEW FAIRWAY MOVING PATTERNS FOR: ENHANCED PLAYABILITY / MORE VARIETY IN SHOT OPTIONS (NEAR GREENS)
- 9 REDEFINE / EXPAND NON-TURF VEGETATION AREAS FOR: BETTER GOLF HOLE DEFINITION / ADDED VEGETATION TEXTURES / AESTHETICS / REDUCED MAINTENANCE
- 10 RECAPTURE ORIGINAL GREEN SIZE / REBUILD GREEN FOR: ACCENTUATED PLAYABILITY OF PUTTING SURFACE / PROMOTE RUNOFF / CREATE CORRECT SOIL PROFILE FOR SUPERIOR PUTTING GREEN TURF CONDITIONS
- 11 IMPROVE EXISTING FLOOD CHANNEL.

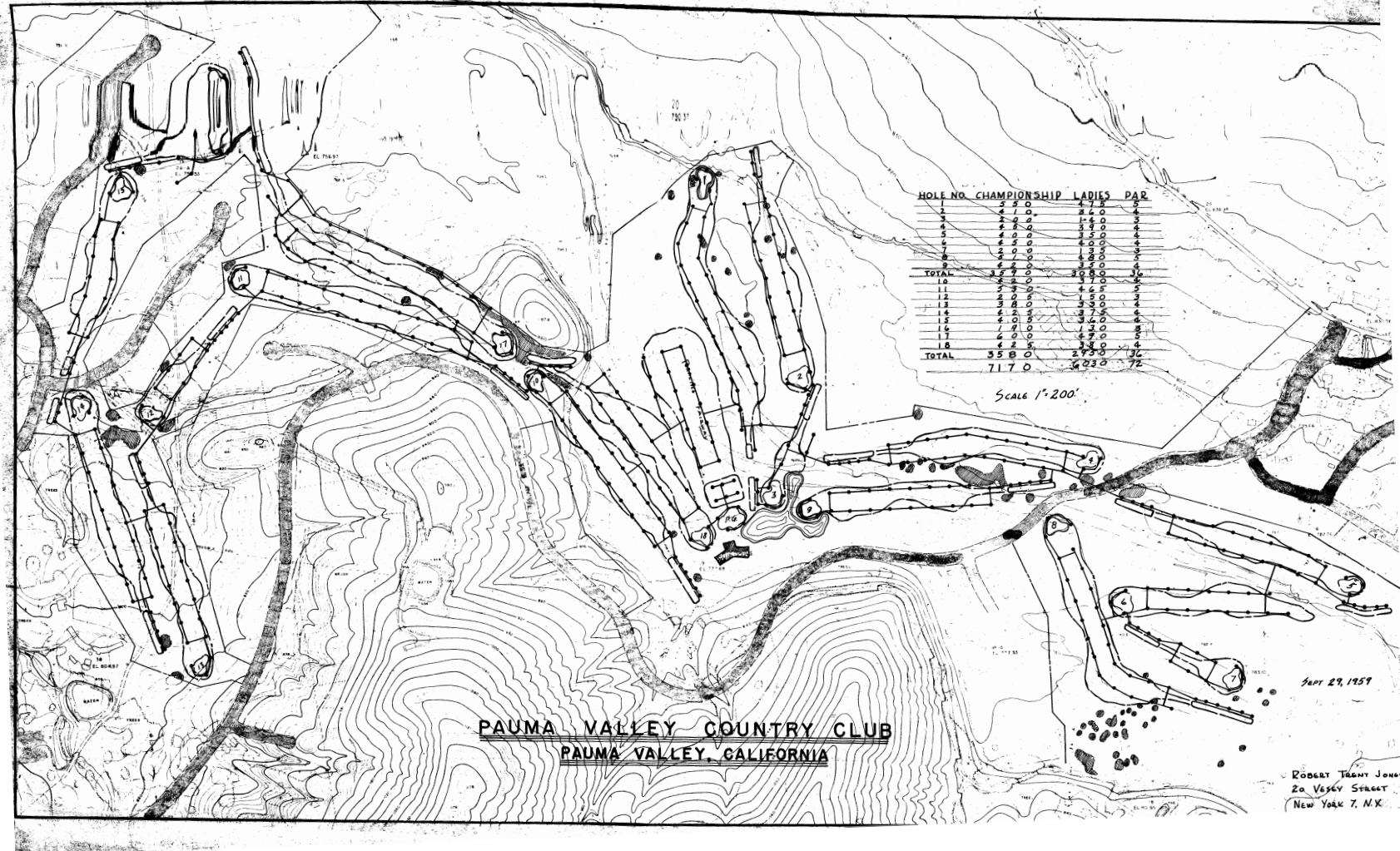
Provide owners with a menu of masterplan options.

November 1, 2014

Chapter 2: Evaluate, Collaborate, Create

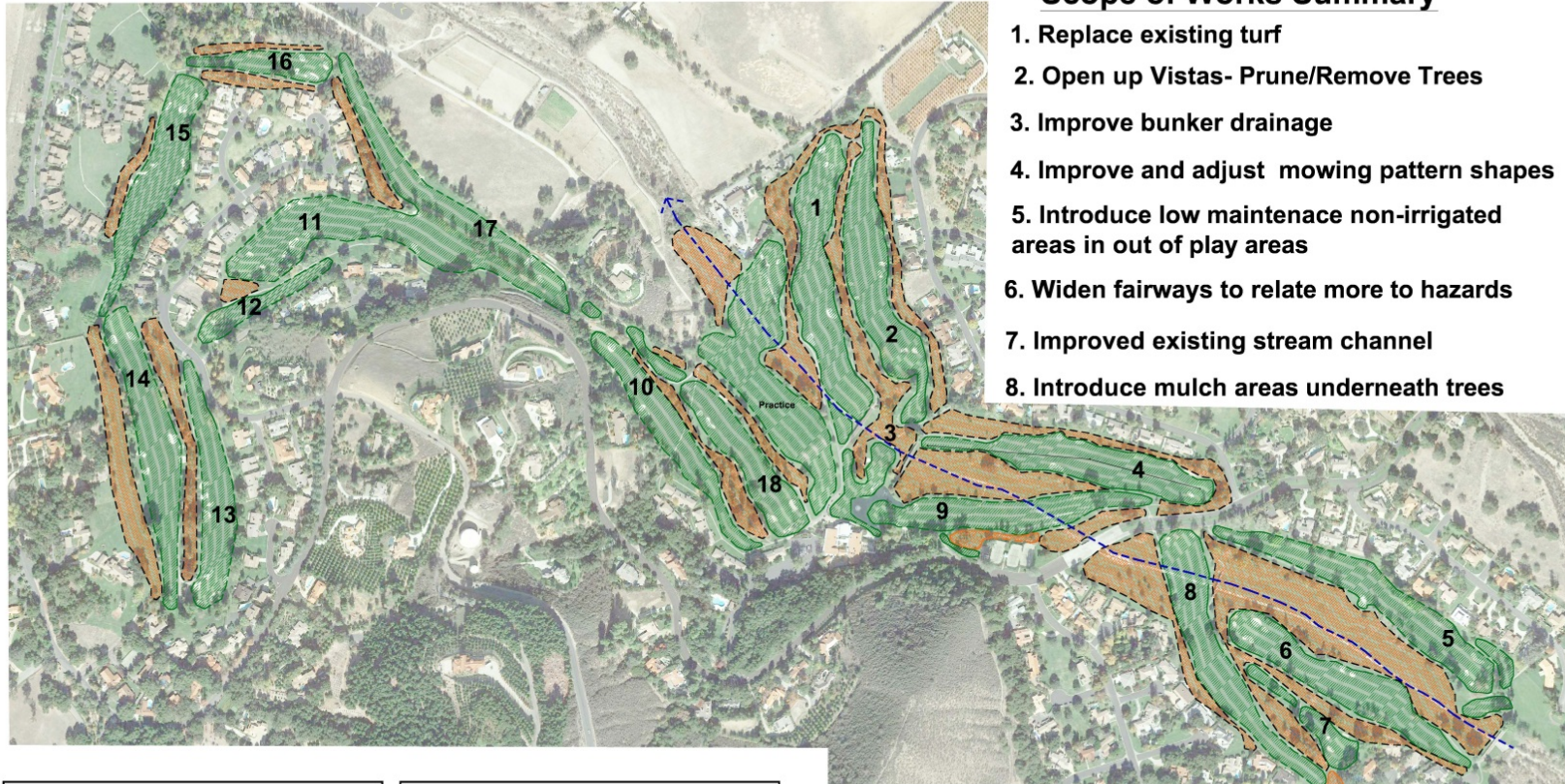
Irrigation Audit



Chapter 2: Evaluate, Collaborate, Create



WATER CONSERVATION AND MAINTENANCE REDUCTION MASTER PLAN

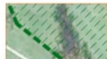



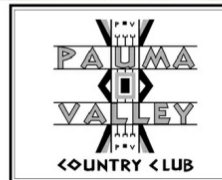
Scope of Works Summary

1. Replace existing turf
2. Open up Vistas- Prune/Remove Trees
3. Improve bunker drainage
4. Improve and adjust mowing pattern shapes
5. Introduce low maintenance non-irrigated areas in out of play areas
6. Widen fairways to relate more to hazards
7. Improved existing stream channel
8. Introduce mulch areas underneath trees

Turf Reduction Totals
Existing Total Irrigated Turf Area 150.4 Acres
Proposed Total Irrigated Turf Area 99.2 Acres
Total Turf Reduction 51.2 Acres

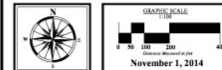
Legend

	Proposed Area of Irrigated Turf
	Proposed Non Irrigated Area

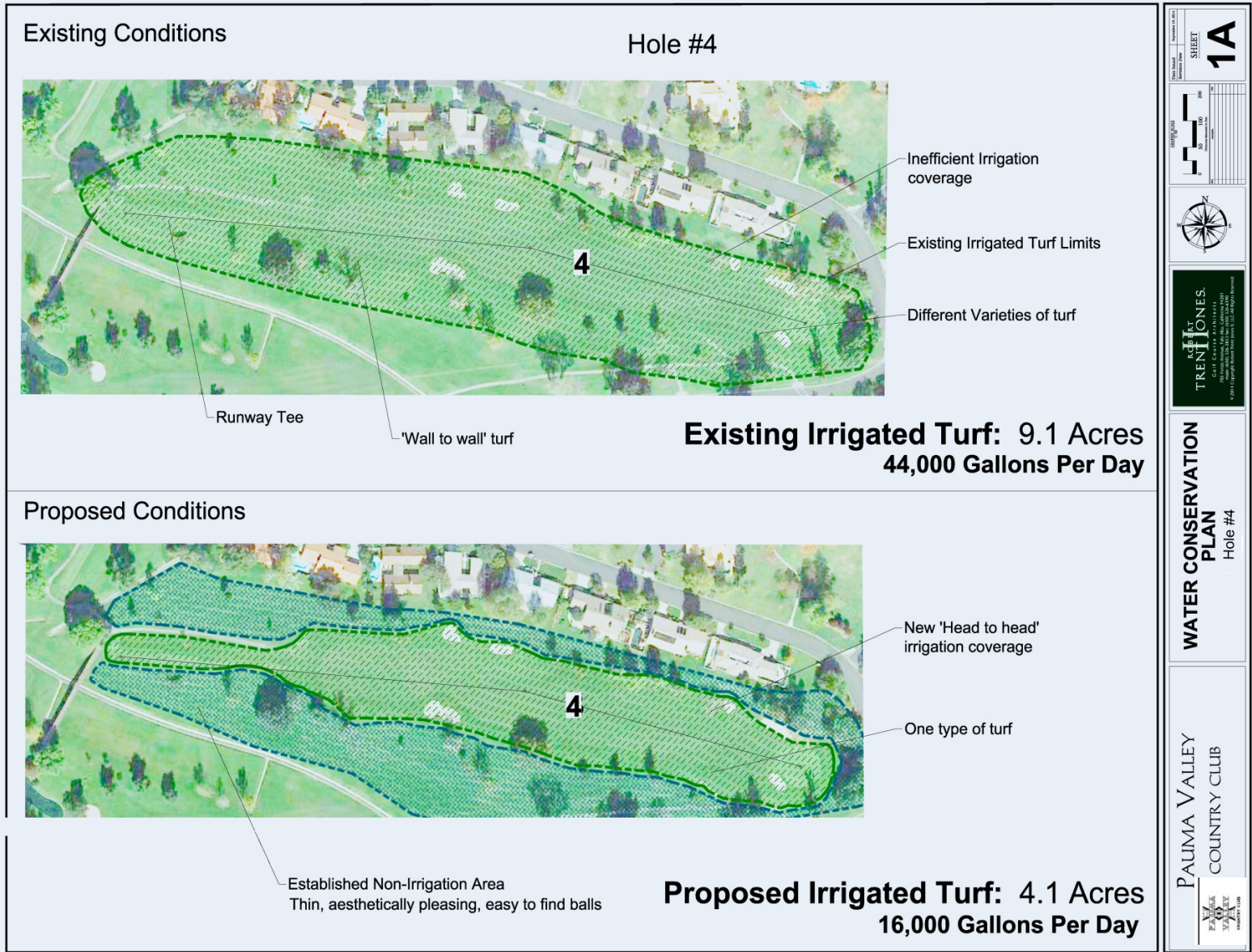


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NOVEMBER 1, 2014

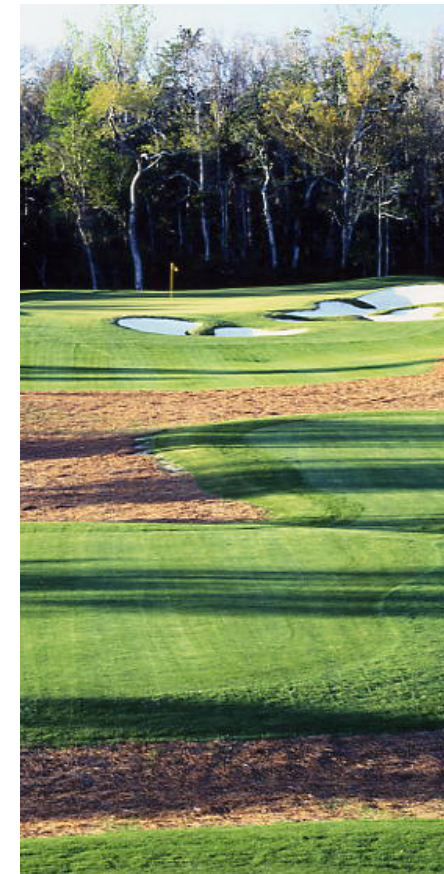


Chapter 2: Evaluate, Collaborate, Create



Chapter 2: Evaluate, Collaborate, Create

Non-Irrigated treatment options in non irrigated-turf areas:



Chapter 2: Evaluate, Collaborate, Create

Non-Irrigated treatment options in non irrigated-turf areas:



Chapter 2: Evaluate, Collaborate, Create

Non-Irrigated treatment options in non irrigated-turf areas:



Chapter 2: Evaluate, Collaborate, Create

Non-Irrigated treatment options in non irrigated-turf areas:

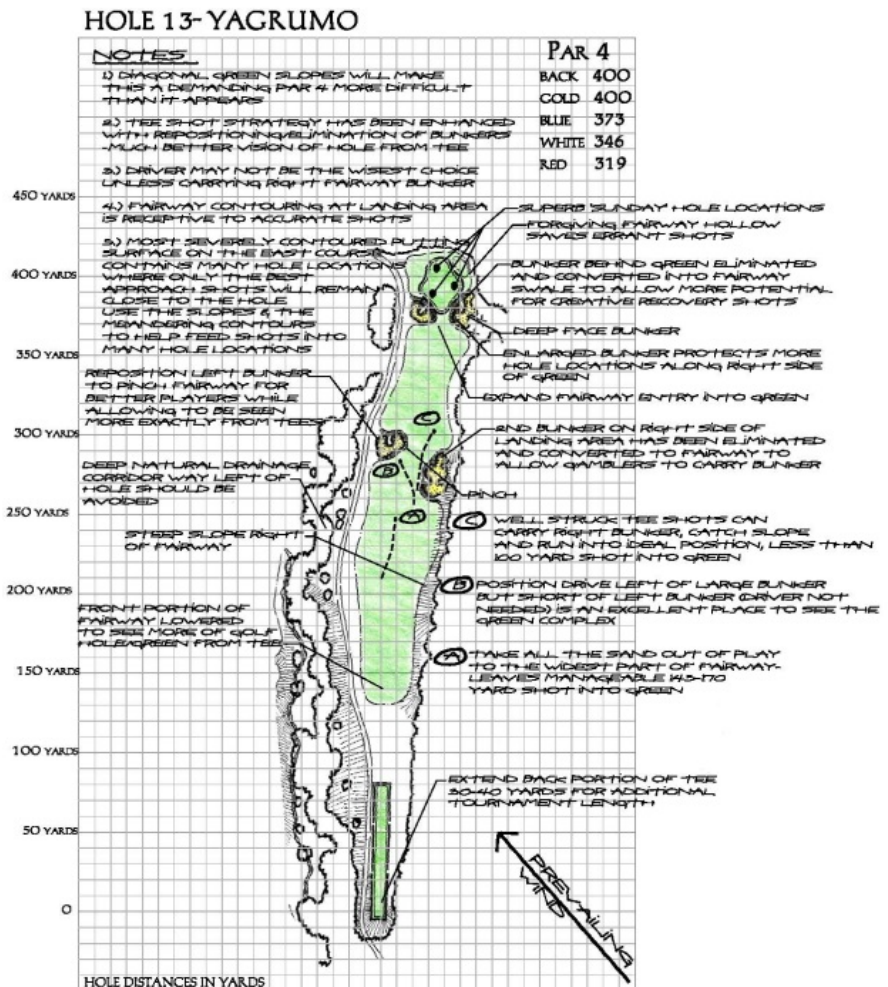


Chapter 2: Evaluate, Collaborate, Create

3. Create-Final Recommendations and Bid Documents

Execute & implement a final plan:

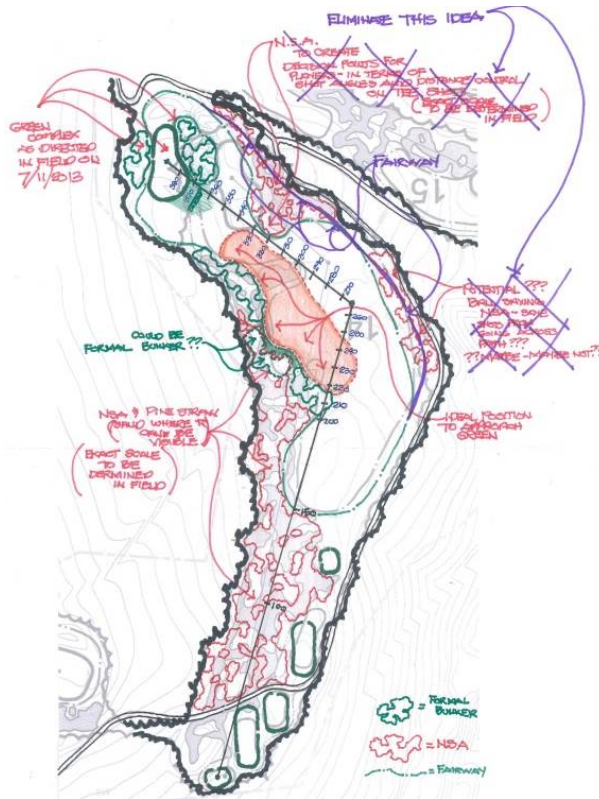
- Contractor selection
- Specifications
- Bid Supervision
- Bid Recommendations
- On Site review
- Construction oversight
- Weekly Budget tracking
- Membership Communication



Sample Hole Master-plan Recommendations
Dorado Beach (East Course)

Chapter 2: Evaluate, Collaborate, Create

3. Create- Design Supervision during construction:



Holes renovated from the green backward.

Process:

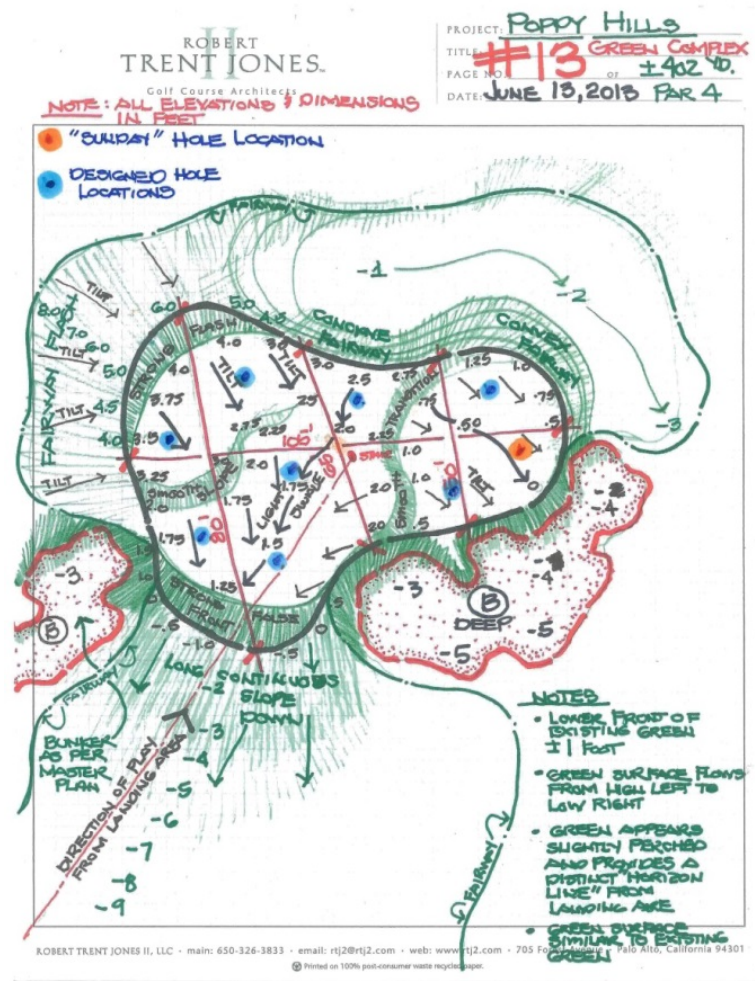
1. Strip turf
2. Shape features
3. Architectural Review and Approve
4. Plant new turf
5. Move on to next area

Sample Field Sketch
Poppy Hills

Chapter 2: Evaluate, Collaborate, Create

3. Create-

Design Supervision
during construction:



Sample Field Green Sketch
Poppy Hills

Chapter 2: Evaluate, Collaborate, Create

3. Create- Renovation Reopens for member play:



Chapter 3: Questions and Answers

Are these sustainability issues relevant to the East and Midwest?

Is there a financial benefit even when drought is not an issue?

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Thank You!