



PINE CANYON CLUB

IRRIGATION SYSTEM LONG-TERM PLAN, DRAINAGE &
WATER STRATEGY

NEW POSITION AT NEW PROPERTY = BIG IDEAS

LEFT MY LAST PROPERTY, WICKENBURG RANCH, AFTER
10 YEARS. I FELT PROPERTY INCLUDING IRRIGATION WAS
PRETTY DIALED-IN.

BEGAN AT PINE CANYON SEPTEMBER, 2017



GREAT PROPERTY, BUT
GOLF COURSE 16 YEARS
OLD

WATER SOURCE: CITY OF
FLAGSTAFF RECLAIMED
WATER

IDENTIFY WEAK AREAS OF GOLF
COURSE AND PROPERTY.

NEED TO LOOK BEYOND TURF
CONDITIONS AND DIG DEEPER INTO
INFRASTRUCTURE STATUS, PLANS,
FUNCTIONALITY.

IRRIGATION AUDIT IS AMONG THE
FIRST



OWNERSHIP, LIKE MANY,
HAVE GOAL OF BREAKING
BACK INTO TOP 5 OR BETTER
IN ARIZONA
(CURRENTLY RANKED #6)

“LET’S DO THIS...LET’S DO
THAT”

CAREFUL NOT TO BE
DISTRACTED BY ATTRACTIVE
CAPITAL IMPROVEMENTS
ONLY – IRRIGATION IS THE
LIFEBLOOD OF THE GOLF
COURSE AND COMMUNITY



REALITY SETS IN:
TO ACHIEVE GOALS,
MUST CORRECT
FOUNDATIONAL
CHALLENGES FIRST

IRRIGATION FINDINGS:

SYSTEM IS AGING, LEAKING PVC FITTINGS,
WEEPING IRRIGATION HEADS.

IRRIGATION HEADS NOT LEVEL, 2-3" BELOW
SURFACE, UNABLE TO FUNCTION PROPERLY.

MAPS INACCURATE FROM MANY YEARS OF
DEVELOPMENT, DELETES, ADDS, CHANGES

AUTOMATED CONTROLS DATED AND NOT
MAXIMIZING ABILITY TO CONTROL BOTH ON
OR OFF-SITE.



DRAINAGE FINDINGS

- 1.) DRAINAGE ON MANY HOLES VERY POOR MAINLY DUE TO FINAL GRADING OF < 2-3%.
- 2.) CART PATHS DID NOT CONTAIN BUILT-IN DRAIN BASINS AND THEREFORE OFTEN RAN DOWN HILL AND ONTO TURF.
- 3.) IMPROPER DEPTH, LOW-POINT LOCATION OR NON-LEVEL DRAIN BASINS IN FAIRWAY AND ROUGH AREAS.
- 4.) TOO LONG OF RUNS FOR WATER TO SURFACE DRAIN FOR CASUAL IRRIGATION WATER, LACKING BASINS IN TURF.
- 5.) THATCH LEVELS UNACCEPTABLE. SOIL AND THATCH SEEMED DISCONNECTED LIKE OIL AND WATER.



IRRIGATION CORRECTIONS, YEAR 1

- 1.) RAISING HUNDREDS OF DEEP SPRINKLER HEADS
- 2.) LEVELING OF SPRINKLER HEADS THAT HAVE SETTLED OR ARE UN-LEVEL
- 3.) UPping BUDGET TO UPGRADE AND REPLACE AGING SPRINKLER HEADS (CORRODED SOLENOIDS, INTERNALS FAILING, ETC.)
- 4.) GPS'ING OF ALL GOLF HOLES THAT HAVE SEEN IRRIGATION MODIFIED SINCE 2001. CREATE ALL NEW MAPPING.
- 5.) REPLACEMENT OF VARIABLE FREQUENCY DRIVE AT PUMP STATION
- 6.) IN PROCESS OF CONDUCTING STATION BY STATION AUDIT PER TROON GOLF'S STANDARDS

DRAINAGE CORRECTIONS, YEAR 1

- 1.) PERCOLATING DRAINAGE: ADDITION OF 7000' OF DRAIN LINES (PEA GRAVEL, PIPE, SAND) IN LOW AREAS, MOST GOLF HOLES FOR IMPROVED PLAYABILITY & WATER MANAGEMENT.
- 2.) CASUAL, SURFACE WATER: "SPEEDY DRAINS" WITHIN THESE DRAIN LINES EVERY 6 – 10'
- 3.) 35 DRAIN BASINS WITHIN TURF AREAS LEVELLED, RAISED, MOVED FOR MAINTAINABILITY, PLAYABILITY
- 4.) 22 CART PATH BASIN ADDS PLUS EXTENSION OF CURBING TO DIRECT WATER UNDERGROUND TO DRAINAGE NETWORK, IMPROVE AESTHETICS AND CONDITIONS ALONG CART PATHS.



OTHER ACTIONS TAKEN FOR BEST WATER MANAGEMENT PRACTICES SPECIFIC TO PINE CANYON



- 1.) THATCH MANAGEMENT: INCREASE AERIFICATION MIXING SOIL AND THATCH CREATING BETTER WATER HOLDING ABILITIES IN OUR HIGH CLAY SOILS.
- 2.) USE OF SOIL SURFACTANTS TO HELP BALANCE BOTH WET AND DRY AREAS DECREASING IRRIGATION DEMANDS.
- 3.) FERTILITY & GROWTH REGULATORS: USE OF GRANULAR FERTILIZERS EARLY SEASON, SWITCH TO FOLIAR APPLICATIONS AT LOW RATES WITH INCREASED IRON FOR COLOR AND GROWTH REGULATORS FOR DENSE, GREEN TURF. BROUGHT SUCCESSFUL DESERT PROGRAM TO HIGH COUNTRY GOLF PROPERTY. IT'S WORKING!
- 4.) INCREASE HAND WATERING, DECREASE FLIPPING ON SPRINKLER HEADS IN PROBLEMATIC DRY AREAS.

NEW DRAINAGE TRENCHING, HOLES #1 & #7



DRAINAGE PROGRESS: PIPE, PEA GRAVEL, COARSE SAND, "SPEEDY" DRAINS

HOLE #5, PERFORATED PIPE TRANSITIONS TO SOLID DISCHARGE PIPE



HOLE #5, PERFORATED PIPE SECTION WITH "SPEEDY DRAINS" HELPS TO DRAIN APPROACH ON PAR 3



CONTINUING THE DRAIN LINE PROCESS

FINISH TOP OF GRADE WITH SAND LEVEL WITH "SPEEDY DRAINS"



FOLLOW WITH HYDRO-SEEDER WITH WOOD FIBER MULCH, FERTILIZER & BLUEGRASS/ RYEGRASS SEED



LEFT: HAND SPIKE & SEED
RIGHT: NEW TURF GROWN ON WELL-DRAINING
SAND AND PEA GRAVEL



DRAIN BASIN RE-GRADING, RE-POSITIONING OF
DRAIN GRATES, WORKING THE SURROUNDING
AREA



IN THE END

- GET BACK TO BASICS: WHAT WE HAVE IN FIELD MUST MATCH CENTRAL COMPUTER
- BUILD BETTER RELATIONSHIPS WITH CITY OF FLAGSTAFF, RECLAIMED WATER TEAM
- OVERWHELMING AMOUNT OF NEEDED WORK. (3 YEAR PLAN)
- PROPOSED IRRIGATION UPGRADES HAVE AND WILL INCLUDE:
 1. SPRINKLER HEAD REPLACEMENT
 2. CONTROL CLOCK REPLACEMENT
 3. CENTRAL COMPUTER REPLACEMENT
 4. GETTING BACK ON RAINBIRD GSP PLAN
 5. REGULARLY SCHEDULED WEATHER STATION CALIBRATION
 6. 2018 GPS WORK WILL HELP GENERATE UPDATED MAPPING THROUGHOUT

THANK YOU

