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# THE METICULOUS CONSULTANT

*Don Burns is a specialist by trade, and a perfectionist by nature. Through constant and often critical self-analysis, he has developed a modus operandi for designing irrigation systems which combines scientific thoroughness with the determination to excel.*

**WT&T: How did you get started in the business of consulting on irrigation systems? It's a very specialized field.**

BURNS: "I started as an irrigation design draftsman for King Ewing in San Francisco, in 1956. Interestingly enough, I changed majors in my sophomore year at Washington State University, from landscape architecture to Agronomy, because I was such a lousy draftsman. I still am.

"King ran one of the most successful irrigation supply houses of its time. We did a lot of business because of our free plan service. Today in the State of California, we have five irrigation consultants out of the 25 practicing members of the American Society of Irrigation Consultants, who learned their basics of design from King Ewing.

"After working in San Francisco and Sacramento for Ewing, I started my own supply house in Fresno. Eight years in Fresno and running all over the state finding golf course irrigation systems to design and sell told me I wasn't in the right place — so I sold out six years ago and moved to La Jolla as an irrigation consultant."

**WT&T: How many golf course irrigation systems have you designed?**

BURNS: "I'm sure over the past 21 years, I've designed well over 300 golf course irrigation systems — maybe more. In the supply business, we did a lot of designs that weren't installed. In the past 6 years as a professional, I have designed over 80 courses with some 50 completed and installed under our direction."

**WT&T: How do you see your role, as it relates to the golf course owner, the contractor and the superintendent, and how are these relationships defined on a given job?**

BURNS: "The owner spends \$200-300,000 and needs one person to act as a responsible party or as an authority and represent the owner in the decisions that are needed in such a large expenditure. Generally, the superintendent is not going to take that kind of responsibility. While my academic background may be strong in turf management, I would not take the responsibility of

cares for 18 greens when the loss could result to the owner in many thousands of dollars.

"I have had almost 22 years' experience in irrigation. I don't need to make the same mistakes again, nor does the owner need to get an outdated system. Too much has happened in central concepts that work. I have over 60 courses in the ground on central concept and they are very successful. Why go back to concepts we were using 10 years ago. Nobody uses a semi-automatic concept today, and yet we designed lots of them in the late 50's.

"Clearly, as a professional irrigation consultant, my function is to provide direction for the project. I am not working for the contractor, nor for the manufacturer or the supplier, but actually representing the owner in his interest. When you get a bad irrigation system, you may improve the problem, but you'll never correct it, unless you start the job over again.

"I would group the supplier and the contractor together, because the contractor, like it or not, is responsible to the owner for the equipment he installs. The relationship between the contractor and his supplier must be good for all concerned. Our specifications call for contractor responsibility and supplier responsibility. This is intended to get the service thing started right.

"Our position is to represent the owner, but you can see we sit somewhere in the middle when it comes to what's fair for all parties — owner-superintendent-contractor and manufacturer. Personally, even though my check comes from the owner, I feel a responsibility to all these parties — because it takes the help of all to get a good job. That's what it's all about."

**WT&T: What has been your experience with pulling pipe as opposed to trenching?**

BURNS: "I find it different with each contractor. Some like to pull everything they can — most will only pull on an existing golf course where a new installation is being made. On existing courses, we specify that all existing pipe, 2 inches and smaller, will be pulled. It is much less damaging to the course, and allows play to continue during the installation.

"On new golf courses, where the trench is not tearing

up anything, I find that most contractors would rather trench and backfill.

"Pulling pipe is here to stay, even on a course where rocks may be of concern. The chance of damaging the pipe during the pulling operation is worth it in comparison to the additional cost of open trenching and expensive backfill. Plus, there is a loss of revenue to clubs for closing holes when there are a lot of trenches open. This does not occur when pulling, because it's a much cleaner operation."

**WT&T: To what extent have you used effluent water and how do you see the future of this type of usage?**

BURNS: We are using effluent water on two jobs right now — the Royal Kaonapali in Maui and the New Molakai Beach course in Molakai. I feel we really should be considering using this water all over the world and not losing it by dumping it into the oceans and rivers. It has an ecological value in conservation and has added nutrition for plant life.

"Not all effluent water is usable, but if we can generalize, I would answer as above. If you are going to use effluent water, you must consider two points — (1) the quality of the original water sources; and (2) the renovation treatment. The dissolved salt content, the sodium absorption ratio which reduces soil permeability, the trace elements which are potentially toxic, the chlorine content, and, if course, the biological composition for health reasons.

I would recommend an analysis be made on any water from a soil and water testing laboratory."

**WT&T: How about drip irrigation?**

BURNS: "Our only use of drip irrigation has been as additional water for trees. It is very important in the desert that trees get more water than just that offered by the irrigation system. We run a manual system off the main with tubing supplying an emitter at each side of the tree. It has been very effective and inexpensive to install. The tubing can be pulled shallow after the trees are planted."

**WT&T: You seem to be a perfectionist in your design. It must be difficult to work with a contractor who feels the urgency of getting a job done more poignantly than the need for farsighted design.**

BURNS: "I don't feel many contractors will try to cheat, if the contract is reasonable. It must be fair for both the owner and the contractor. If the contractor is losing money, he will try to make it up.

"A contractor who specializes in golf course irrigation usually is pretty set in his thoughts of what is a good

irrigation system. He's usually pretty proud of his job record. I don't always agree with his concepts but we do find that in the end an agreement is made to the benefit of the owner. I try to help the contractor so he will help me — it gives the owner more for his money."

**WT&T: Can you explain why your approach to irrigation design is different from the other 25 consultants in California?**

BURNS: "In the first place, 95 percent of our work is golf course irrigation, which separates most of us. Of those who do do golf course irrigation, very few will do their own staking. After the normal preliminary and final design with complete sets of specifications and details, as performed by all irrigation consultants, our scope of work differs in that it extends to total responsibility of staking of all sprinkler heads, valves, and controllers. This personal staking allows changes in head location and programming of heads due to: construction changes, site conditions or contours, wind and soil conditions, and existing trees, sand traps, or cart paths.

"Following this staking, we must do another plan because of the changes. This plan becomes an 'As Staked Drawing' and is the guideline for the contractor during installation. When the contractor completes this phase of the installation, we do another drawing showing all corrections and changes in pipe and valve locations for a final 'As Built Drawing.'

"In the end, this means we made three drawings of each area and walked the same fairway four different times:

- (1) during staking
- (2) doing the 'As Staked Drawing'
- (3) while checking the 'As Staked' for corrections
- (4) a final walk-through with the 'As Built' drawing with the superintendent and contractor for check list to sell job.

"This involves over 30 days, or parts of days, on a site, over a period of 4 to 6 months. This is a lot of time on-site, but I know of no other way to assure the owner he is getting the best possible job."

**WT&T: Is business competitive among irrigation consultants?**

BURNS: "Generally I am competing with two or three other consultants and price doesn't necessarily determine how the owner makes his selection. Rather, the scope of work of a consultant and his past experience are the major factors. The selection of a consultant should be made independent of manufacturer or supplier presentations. There are two things you must get across to the owner and superintendent, when making your presentation: (1) you don't really care what brand of equipment they use, as long as two brands are

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listed (I think it important that competition be involved in the equipment); and (2) you are open to their concepts of design as long as they will let you express your experience on your own concepts of design, and together come to a mutual acceptance.

"There are things I won't do and if I feel they are really wrong, I politely say I don't think they need me. If they have made a decision on a direction and it is not in agreement with what I know to be good practice, sometimes I have to allow them to go ahead and make their mistakes because they are paying the bills."

### **WT&T: Your design concepts are rather technical. Have you encountered any difficulties in presenting your ideas to owners and superintendents?**

BURNS: "I try to cover this in making the client understand what C.U. means. C.U. means the Co-efficient of Uniformity, which is a percentage figure, derived from the precipitation rates at various points of one sprinkler to another, totaled together and averaged out giving the efficiency of coverage.

"One thing I work on the hardest is a high C.U., and this comes only with the use of the right head at the right spacing. We use two size heads to accomplish this; to make the two areas fit together, one to the other, takes two size sprinklers. It is not possible to hold to a total equilateral triangular spacing like many plans are drawn. Drawing circles on a flat piece of paper is not the same as staking to site conditions. Our 'as staked' drawings relate to a custom design to the site conditions.

"One thing we will not tolerate is, if we are on a basically 70 foot spacing, and we jam heads in to make it cover where some heads are on 40 feet and some on 70 feet and some on 75 feet. We have destroyed the C.U. in this area obviously creating a wet spot or dry area. This must be corrected during staking. By using two sizes of sprinkler heads, it is possible. It is important that you understand the need to make the spacing correct all the way through.

"Back to the question, it's very hard to present these concepts, but it's a lot easier and a lot more understandable when you visit an existing job and see the heads in operation. In addition to the correct spacing, I feel our most important job is in establishing proper programming, often referred to as the heart beat of the system. Custom programming to conditions as found on site means programming to the drainage or contours as they are found on site.

"I am a total believer in the Master Central Controller concept. I have been responsible for over 75 installations of this type, and when properly used, they save labor, money in the waste of fertilizer and water, and improve the conditions of play by preventing wet spots and over-watering."

### **WT&T: I realize that this may be academic, but can you explain how you evaluate the irrigation needs of a particular site.**

BURNS: "Prior to design, we make a site visit for survey of (1) terrain; (2) soil; (3) water availability and requirements; (4) wind and how constant it is; then we follow this all up with input from the superintendent. We ask him to give us: programming time; number of hours we can water at night; and the spacing that he would like. Next I ask very pointed questions as to the supplier in the area who offers the best service. Then I ask what they expect the cost of the system to be. From this data, we do a preliminary design.

"A meeting is again held on site with the owner and the superintendent to go over these concepts and expected costs. From the feedback of this meeting, a final design is made with a complete set of specifications and details of the pumping plants.

"Variables that distinguish one design from another are: (1) owners' requirements — type of system, budget, how many hours we can operate per night, and how much water is required (1 inch a week, 1½ inches a week, etc.); (2) wind conditions — the head location must be in relation to the normal wind current; (3) soil conditions — heavy soil must have more control because wet spots will result if you aren't controlling the area (sandy soil has little or no lateral water movement so that consistent spacing is critical); (4) water supply — pump control, clean or dirty water, and whether we have to put up some sort of sand separation or purifying plant. Obviously all these things are going to make for extreme cost differences.

"We worked on contracts last year with a low of \$180,000 for 18 holes, and a high of \$520,000 on 18 holes.

"We are working on our eighth golf course in Hawaii and the high cost still amazes me. Next year we will be bidding on a job in 100 percent total lava. I'm still unsure of its cost or exactly how we're going to do it. This year we worked on Honolulu International Country Club. The total cost of the golf course, alone, is going to exceed \$12 million. They actually filled a lake to create the land.

"We are completing two other projects at this time — one is Oahu Country Club, which has a rainfall of 180 inches, and the other is Molakai Beach, with an average rainfall of less than 12 inches."

Every job is difficult in some way. Our concepts are always changing. We hope with improvements in equipment, they will continue to change.

### **WT&T: Where do you think the decision-making input should come from when specifying for designing an irrigation system?**

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BURNS: "The superintendent should have the most to say. If he is qualified, he should get what he wants, within reason.

"I would prefer to interview for a job on a design basis, meaning, if an owner would give some nominal cost, have two or three consultants present a design on the same fairway and explain concepts and why."

**WT&T: Is your system dependent upon any particular line of products, or are you personally committed to any one manufacturer?**

BURNS: "No and I always ask for more than one brand be listed for competitive bidding. If the owner is satisfied he wants only one brand because of past relationship, I ask that the equipment price be negotiated as the contractor price is negotiated.

"Being in the supply business in past years myself, obviously I have a lot of understanding of pricing as to what is fair, and where a negotiated figure should be.

"I honestly don't feel any one manufacturer has an advantage over another. I do feel one supplier over

another is important. The service of the supply house is what we leave with the owner after the job is completed.

"Every manufacturer would like the designer to give him an advantage, but I think most manufacturers would rather see an equal shot for his products than be left out. This past year, I was commissioned for several designs by the manufacturers directly, (as a service for that manufacturer), by three of the four major irrigation equipment manufacturers. I feel this speaks highly for our independence."

**WT&T: Does every golf course need an irrigation system which is as elaborate as the systems which you design?**

BURNS: "No, but I disagree strongly on some of the jobs I see go in, especially in areas where irrigation becomes somewhat supplemental. The Midwest and Eastern States can get away with more inadequacies because rain covers up mistakes. Most of my work has been in the Southwestern United States and the State of Hawaii, but I continually run across work or re-do work that would not have cost any more if it had been done right the first time." □

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