

HYDROVIEW No 1

A Water Industry VIEWPOINT from HYDROGOLD
INT'L WATER MANAGEMENT CONSULTANTS



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HYDROGOLD'S QUALITY CHAIN (The Path to a Successful Irrigation Project)

Introduction...

How does an Owner ensure that their irrigation project will be successful?

When things go wrong with a project, fingers are pointed in all directions: Was it poor planning; a flawed design; faulty product; a bad installation; a maintenance failure - or a combination?



Hydrogold breaks an irrigation project into the 5 steps (phases) above. The chain concept is symbolic of the fact that each link in this chain needs to be strong to have a successful project.

Proverb: "A chain is as strong as its weakest link".

Careful attention to each link in the chain will result in a successful project.

1 PLANNING

Good planning by the Owner is the foundation on which the rest of the project is built.

Lay a strong foundation by selecting a competent Project Team. With experience on your team, decisions are made quicker, more accurately and with greater confidence.

Quote: Byron Dorgan (US Senator):

"You can delegate the task, but you cannot delegate the responsibility."

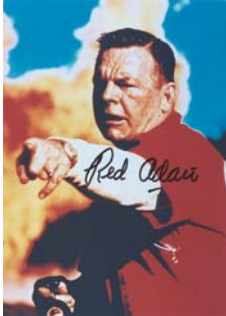
Setting clear objectives for the project gives the Project Team direction. **Putting in place appropriate and realistic budgets is critical to success.** Budget blowouts and "unforeseeable" events are often the result of inexperience and poor planning.

Project feasibility studies for any water-based project must include a "Water Balance Study" to ensure sufficient water. This may require applications for licenses and reserving land for water storage (lakes). Appoint a Water Management Consultant early.

2 DESIGN

Choose your Irrigation Consultant carefully.

The true cost of a cheap or "free" design is seen later in the project. Can you afford it?



Quote: Red Adair (Famous Texan Oil Firefighter) 1915 - 2004:

"If you think it's expensive to hire a professional to do the job, wait until you hire an amateur."

A good Irrigation Consultant will:

- ‡ Achieve Objectives within Budget - Value engineering
- ‡ Provide Comprehensive Documentation - Gives the Owner control
- ‡ Select Appropriate Products - Longer System Life
- ‡ Design for Extended Life - Better return on Capital
- ‡ Design for Efficiency - Reduced Running Costs
- ‡ Provide Support Services - Ensure Quality Control
- ‡ Minimise Total Cost of Ownership

Above all, the system must work!

The (relatively) small cost of a professional irrigation design is a worthwhile investment to sleep peacefully at night.



3 PRODUCT

Appropriate product selection is critical to meeting budgets, ensuring a long system life and minimising the Total Cost of Ownership.

Golf course irrigation systems are large, operate at (relatively) high pressure and have valves that open and close frequently. Golf specialty products are more expensive but cost-effective. Conversely, Landscape/Commercial Irrigation Systems (typically) operate at lower pressures and can use a lower class of pipe and fitting, thereby reducing costs.

Reputable manufacturers stay for the long term. When you have seen their products in service for 20 or more years (the ultimate product test), you develop a trust in them.

Quote: Aldo Gucci (from the Gucci Fashion House) - 1905-1990:

"The sweetness of a low price is soon forgotten, but the bitterness of poor quality will remain."

Case Studies: "How to minimise the TOTAL COST OF OWNERSHIP"

$$\text{Total Cost of Ownership (\$ per Year)} = \frac{\text{Capital Cost + Running Costs}}{\text{Life of System (in years)}}$$

Often, too much focus is on lowering the Capital (Up-Front) Cost.

To keep the Total Cost of Ownership in control, we also need to consider the other components: Running Costs and the Life of the System.. For example:

Case Study No 1 - Low Quality - The irrigation system lasts only 8 years.

Description	US\$
Capital Cost of Irrigation System	700,000
Maintenance Cost 8 years at US\$ 24,000 per year	192,000
Total Cost	892,000
Life of the System (Years)	8
Total Cost of Ownership (\$ per year)	US\$ 111,500

Costs do not include the flow-on effects such as loss of revenue, damages to a golf green, roads, 3rd party property, utilities or services (esp. electrical).

Case Study No 2 - Good Quality - 15% Higher Price - The irrigation system lasts 20 Years

Description	US\$
Capital Cost of Irrigation System 15% Higher (ie, +US\$ 105,000)	805,000
Maintenance Cost 20 years at US\$ 12,000 per year	240,000
Total Cost	1,045,000
Life of the System (Years)	20
Total Cost of Ownership (\$ per year)	US\$ 52,250

Benefits also result from flow-on effects such as better turf quality (increased revenue), reduced water use, reduced electricity bills and lower fertiliser costs.

That is, **a 15% higher price for the Capital Cost** of the Irrigation System **leads to a 53% (US\$ 59,250 each year) saving on the Total Cost of Ownership** for the Irrigation System.

The "Trick" is the "Life of the System". No trick really. Attention to each link in Hydrogold's Quality Chain lengthens the System Life and reduces annual Maintenance Costs.

4 INSTALLATION

Great planning, design and product. Now we need to focus on the installation to ensure a successful project.

Irrigation Contractors are like Doctors; they both bury their mistakes. Unlike the doctors, the Irrigation Contractor's mistakes sometimes come back to the surface to haunt the Owner (the Contractor is normally gone)...



I remember one Contractor complaining after he had lost a project to an inexperienced Contractor: ***"My 20 years contracting and my reputation were not worth \$ 4,000."*** On the \$ 1,500,000 contract that was only a quarter of a percent! The Owner had made a bad choice that was to cost him many times over later in the project.

Do not pick your Contractor based on the lowest bid. Compile a weighted assessment table to make a balanced choice.

**Dalit Bay Golf Course
Kota Kinabalu, Malaysia**



"If you pay peanuts, you get monkeys." And I have worked on sites with some real monkeys...

Quality is Assured by Inspections:

Daily inspections (before trenches are backfilled) need to be made by on-site Staff representing the Owner.

As the Irrigation Designer, Hydrogold also makes periodic site inspections to:

- ‡ Train on-site staff for daily inspections
- ‡ Independently review the installation
- ‡ Ensure a higher standard of installation
- ‡ Check Contractor's As Built Drawings
- ‡ Verify that everything is installed
- ‡ Prepare a Defects List
- ‡ Provide on-going advice

Remember: The Contractor will be gone from the project after a year but the Owner has to look after it for the next 20 years! Choose your Contractor carefully.

5 MAINTENANCE

This last link is the one most Owners overlook - themselves.

Some Owners fall down at the handover of the irrigation system. Often they do not get the system signed off by the Irrigation Consultant; they may fail to get As-Built Drawings (or check their accuracy); sometimes they accept a system that is not fully complete and occasionally some fail to get spare parts; and other such mistakes.

"Automatic" does not mean "No Maintenance". Everybody knows to service their car regularly. The irrigation system is a large electro-mechanical system operating in harsh conditions. It is in the open, subject to elements (rain, sun, lightning...) and people digging holes. Mechanical parts wear (and tear). Just like the car, a regular maintenance schedule needs to be set up and followed.

Proverbs: *"A Stitch in Time Saves Nine" - "Prevention is better than Cure"*

You will need *specialist support from your suppliers, particularly for the Irrigation Control System and the Irrigation Pump Station.* Select your Supplier(s) carefully, preferably before you award the contract (back to the Planning - another Owner responsibility). Talk to other Owners in the area to see how each Supplier performs.

In any electro-mechanical system, there are practical limits made at the design stage. Eg, Typically the design would not allow all sprinklers on a Par 5 hole to operate simultaneously. The basis of Hydrogold's irrigation design is included in our comprehensive Irrigation Design Report. Not many Irrigation Consultants produce such a document.

Perhaps you may like to check out Hydrogold's documentation on-line at:
<http://www.hydrogold.com/documentation.html>

IN SUMMARY...

The Quality Chain identifies the links that are critical to a successful irrigation project:

Planning + Design + Product + Installation + Maintenance = SUCCESS

Finding the fault is not always simple. Just because a sprinkler fails does not make it a faulty sprinkler. Perhaps the designer undersized the pipes and the water velocity is too high - perhaps the installer did not install the air valves (or the isolation valves are closed) - perhaps too many sprinklers were operated simultaneously on a lateral by manually opening valves.

Experience is your best friend when troubleshooting an irrigation system. Use Hydrogold's experience rather than experimenting.

Hydrogold are there to help you at each stage of the project to prevent problems:

Planning Water Balance Study to ensure viability of the project - Financial Budgets

Design Ensure long system life and high efficiency - Quality Documentation

Product Appropriate product selections and specifications

Installation Proven installation specification - Overseeing of Installation

Maintenance Audits to optimise system efficiency - Save Water, Electricity & Fertiliser

We are not just focused on Design; Hydrogold provides you the lowest Total Cost of Ownership by doing more than "just the irrigation design".