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BUDGETING IRRIGATION SYSTEM IMPROVEMENTS

When you think about suggesting to your owner, board or other entity you report to that a new irrigation system is needed, the first thing they are going to want to know is how much will it cost?

Today's irrigation systems are much more expensive than those of the past and given the current economy, providing accurate cost estimates is imperative. You might believe it's an easy number to establish. You just ask the local distributor or contractor for a rough cost or one of your peers that just got a new system. But beware: A.) No two golf courses are alike; therefore, neither are their irrigations systems; and B.) There are many more costs to a system than just the irrigation contractors cost.

For proper budgeting, you need to make sure you have covered all of the anticipated costs and some unanticipated ones, too.

You base cost is going to be the irrigation system itself. This includes all of the materials needed: sprinklers, pipe, fittings, controls, computers and wire, as well as the cost of installing those components.

This can be established on a per sprinkler basis, such as $1,500 per sprinkler or through other techniques; 2 or 2.5 material costs or by getting a hard number by bidding. But that is just one number that reflects the basic irrigation system cost, not the project cost.

You may want more than a basic system and the costs of added features of what some might call "bells and whistles' need to be added in, too. Examples might include green and/or tee out systems, additional weather stations and bunker irrigation (all of the bunkers or just a few?).

Additionally, there are unique issues that may only apply to your golf course such as stream or road crossings. Both of these are expensive, and the more of them you have the higher your budget will need to be.

In addition, road and stream crossings most likely will need to be permitted. You need to add in the costs of the permit including specialists you might need to obtain the permit; wetland specialist, environmental consulting firm, surveyor, civil engineer and in too many cases, a lawyer.

> "Members never think you will come in on budget so they automatically add in their head to whatever number you give them."

Are you going to redo the tennis irrigation too so you get the tennis vote? What about the clubhouse grounds and entrance area? Add those costs in, too, but as a separate line item as they are not the golf course itself.

Now that you are going to have a new system, what happens to the old stuff? That needs to be budgeted too, even if your staff is going to remove all the old stuff. Not something I would advise, though.

Then there is the pump system, do you need a new one or just a refurbished one? If it's new you need the costs of the pump station, pump house, wet well, new electrical supply to the pump house, and the cost of the electrical work in the pump house plus any power company charges. You don't want to miss the mighty utility – they do nothing cheaply.

And if you are thinking about fertigation you need to include the cost of that equipment plus the building will need to be larger by about a third increasing its cost.

Do you need to add make-up water from another source to your primary irrigation supply, either municipal, groundwater or from another pond?

You need to include the costs of the piping and pumping. Don't forget those pumps will need electricity and how it will be controlled.

If it's a potable supply, it will have wet tap, meter and backflow prevention costs. If the irrigation system obtains water from an existing pond, does it need to be dredged, even just around the intake?

Include those costs and the cost of permitting the dredging work. You're probably going to have some miscellaneous electrical costs too for controller power or for your central control system so add a small number for those.

So while you're digging up the golf course what else might you like to install? Remember, most of the trenching costs are in excavating and restoring the trench. So while its open, what else might you put in it?

A few things you might want to consider: fan wire, drinking fountain

(continued on page 81)

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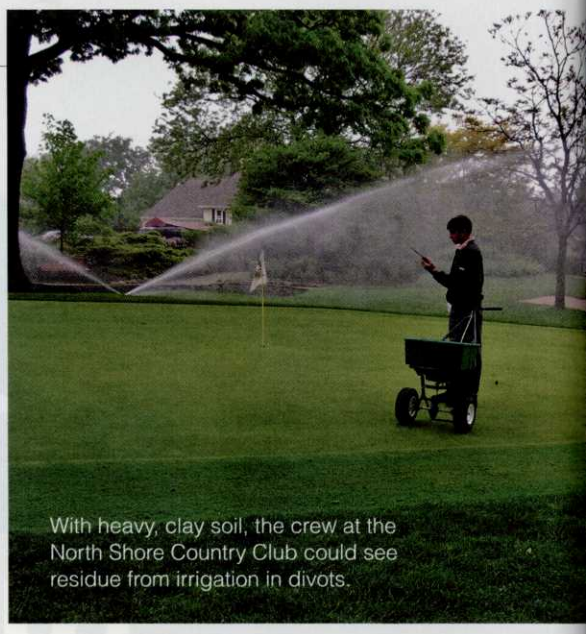
water issues



With heavy, clay soil, the crew at the North Shore Country Club could see residue from irrigation in divots.

Supers share their methods for clearing up their water problems and how they turn bad into good. By Richard J. Skelly

With a possible drought on the way for courses in the Midwest and East this summer, it pays for superintendents to consider just how they make use of bad water, or effluent water, on their golf courses. Golf Course Industry talked with three superintendents in three different parts of the country about their approach to using "bad water" for irrigation purposes.

All agreed on one thing: stringent, conscientious monitoring and testing of soil and water is necessary throughout the year in order for the program to be a success.

Brian Vinchesi, an irrigation consultant outside of Boston, says, "Probably the biggest problem superintendents have is salt running into their water, either from wells or effluent. The bottom line is, if you have enough money, you can effectively eliminate the problem. But it can be horrendously expensive."

Dan Dinelli, the longtime super at the private North Shore Country Club in Glenview, Ill., or north suburban Chicago, says the poor water quality situation took the club's membership and greens keeping staff by surprise, beginning in the mid-1980s.

"It was a unique situation in the Chicago area to have poor water quality," Dinelli says, noting the club, built in 1924 by Allison, Colt and McKenzie, drew water for years without incident out of the Mt. Simon aquifer. The well was 2,200 feet deep, "and we don't know why they generated the well that deep back in the 1920s when they dug it, but, they did."

"The salt migrated to the north as people used the water source, including us," he says. As population grew in Glenview, Evanston and surrounding towns, so did the area's water needs. Dinelli says the solution, which wasn't easily arrived at by him or the club's loyal membership, was to drill a new well at a cost of $250,000.

"Back in the day when the club was built there was no such thing as municipal water. The deep well they generated was used for drinking water and to irrigate the course back when they got the system installed in the early 1930s," Dinelli says.

"I can't answer to what the salt levels were like back then, but I can tell you each year we tracked it, the sodium levels increased. Because of people around here drawing off of it, the salt concentration got greater. It began to appear as a problem in the 1980s, but it wasn't until 1995 that I got a new well put in," he adds.

Well-digging engineers and irrigation specialists properly sealed off the old well "and we generated a new one that tapped into the Galesville aquifer, just above the old aquifer."

Dinelli says the soil composition at North Shore Country Club is heavily clay-based, so it packs tight, "and the golf course is pretty flat and doesn't drain terribly well."

"When we were irrigating for a period of time, you would literally see the white crusty residue develop in the divots on fairways," he says, "the best thing we could do for it was to have a natural rain event to push those salts down, but obviously you can't program those things," he says.

Dinelli and his crew made use of soil penetrants and an injection system, and they used an acid injection system to keep the porosity of the soil at North Shore as open as possible, so the salts would sink down more quickly.

"We bought two deep-tine aerifiers for greens and fairways to poke 10 to 12 inch deep holes into the soil. We also tried biologically and chemically to open up the soil by using compost, which got us on the whole compost kick we're still on today, because we found there's other values to using it," he says.

"We used compost to build the

Disease management can suffer when working with effluent water. Be sure to plan for additional stress on turf.

PHOTOS COURTESY OF NORTH SHORE COUNTRY CLUB

Dinelli and his crew used soil penetrants and an injection system to help salts move through the soil.

soil structure back up that we found the salts were destroying."

One night when he was checking irrigation in his truck, water splashed on his windshield and he could hardly see through it. He demonstrated for members with a vial of water from the old well and a vial of water from the well he wanted to switch to, using a simple glass coffee table.

Once the water from the old well dried, a milky white film was visible. Members were convinced they had to dig a new well.

Opening the new well in 1995 was the final step in North Shore conquering its salt encroachment problems, Dinelli says, but his greenskeeping crew started their composting practices back in the 1980s when they dealt with poor water quality on a daily basis.

In retrospect, what has Dinelli learned that he could share with other supers?

"Well, we survived it, but the situation also brought on some diseases like anthracnose, and take-all patch got worse, so our disease management program had to be stepped up a bit to accommodate the extra stress," he says.

"It's hard to judge," he says, when asked how he'd rate the success of having an entirely new well dug.

"We survived long enough to get the money we needed to get off that poor water source and on to a much better water source," he says, admitting not every superintendent is so fortunate.

"Keep in mind, the chemistry of this stuff is pretty straightforward and there are a lot of good labs out there to help you," Dinelli says.

> "When we were irrigating for a period of time, you would literally see the white crusty residue develop in the divots on fairways."
>
> *—Dan Dinelli, North Shore Country Club*

When dealing with salt encroachment into ground water supplies, Dinelli says keep records of your soil and water tests for yourself and to show members later.

"I think the first thing you can do as a manager is take soil samples and water samples periodically and track what's going on out in the field. You can compare differences and be tracking things and manage these things as they change over time," he says. "Most water quality is fairly stable, but not always, and water quality changes over time out of wells. It can happen."

Mike Terry, the superintendent at The Currituck Club near the Outer Banks in North Carolina, has had one series of challenges after another in growing grass at this unique resort facility, sandwiched as it is on a spit of land between the Atlantic Ocean and Currituck Sound.

This Rees Jones-designed golf course opened in 1996, but Terry

Rain events flush the course, but Terry uses products to help balance the soil.

arrived in 2005.

"We have a quality and a quantity issue here," Terry says. He waters 66 acres of Currituck with reused effluent water that's tertiary-treated on an adjacent site that was built with the irrigation system to work with the wastewater.

"Everything that goes down the toilets and sinks here at the community goes to the waste treatment plant and then it comes by way of an underground pipe to me to a pond here on the 6th hole, a par 3, where we have a large pond," he says, "and we pump out of that pond to two irrigation pump stations. We've got some holes that may be irrigated on the edges with fresh well water and some of the middles of the fairways are irrigated strictly with effluent, where it does not spray off the property," Terry says.

To call the water quality at The Currituck Club challenging is an understatement.

"We're basically on a sand dune and we're using a grass that can take a bit of salt," Terry says. When the course was built, the entire site was laid with sod.

"They sodded the entire site and it's a large site, just to get something on it immediately. It was just a big sand dune, and out here, the shape of the golf course would just blow away," he says.

"We don't buy any water here and we basically irrigate out of these ponds, and we get free effluent water from the nearby subdivision," he says, noting the effluent is treated with ultraviolet light and treated two more times before being pumped out to the ponds on the course. "It's probably some of the most complete treatment you can do to water."

What happens from season to season, Terry says, is the wells get pumped hard, the water table draws down and the level of chlorides rise.

"We'll test them in the spring and then we test them in late August, and the chlorides are higher. We find we have to constantly test the water, keep an eye on what's going on with it," he says, including injecting a product called Fairway, composed of sulfuric acid and urea, which helps adjust the pH, reduce bicarbonates and improve water penetration and infiltration into the sandy-based soil at Currituck.

"I've been here seven years and I'm still studying and educating myself about salt water encroachment. It's been a crash course for me, so I've learned a lot about water quality and effluent," he says. Terry and his crew do spot applications of granular gypsum and calcium applications, "we pile the gypsum and fertilizer on it and find we can't fertilize it enough because of the sand-based soil here. With this soil, we can't hold nutrients and we can't hold water."

Naturally, rain events help to flush the course, Terry says, but, "I don't think we've conquered the problem at all. We're always going to be dealing with extreme weather out here on the Outer Banks, and a big sand dune is just a difficult place to grow grass."

Terry is thankful for the experts he can call on for advice, since the course is managed by Club Corp. Having information and data on hand is the best way to make good water decisions.

"In dealing with bad water, you need to know what's in that water, you need to educate yourself on how best to use that water and you need to soil test to see what the water is doing out there. You've got to be paying attention, watching your heads, your water, your control system and make sure everything is applying efficiently and properly. Testing is the big thing for us, it's a huge part of what we do, so at least if you know what is happening out there with your water and your soil, you can anticipate things, because bicarbonates and pH are big issues."

Tim Cloninger, the superintendent at Shadow Creek Club in North Las Vegas, a property owned and managed by MGM Mirage Resorts, gets just one to three inches of rainfall a year in his location. Shadow Creek is a Tom Fazio-designed resort course designed to make people forget they're in the desert, as its fairways and roughs are lined with about 20,000 pine trees. Shadow Creek is situated about 15 minutes from the Strip.

"Out in the desert one thing you can definitely do is look at your variety of grasses," Cloninger says. "You need to manage your golf course for the most environmentally strong turf grasses. You need to have a good Bermudagrass base. If your water quality is that bad, you have to look into not over seeding, or look into a change in variety of your grasses." **GCI**

Richard J. Skelly is a veteran golf writer in Spotswood, N.J.

PHOTOS COURTESY OF THE CURRITUCK CLUB

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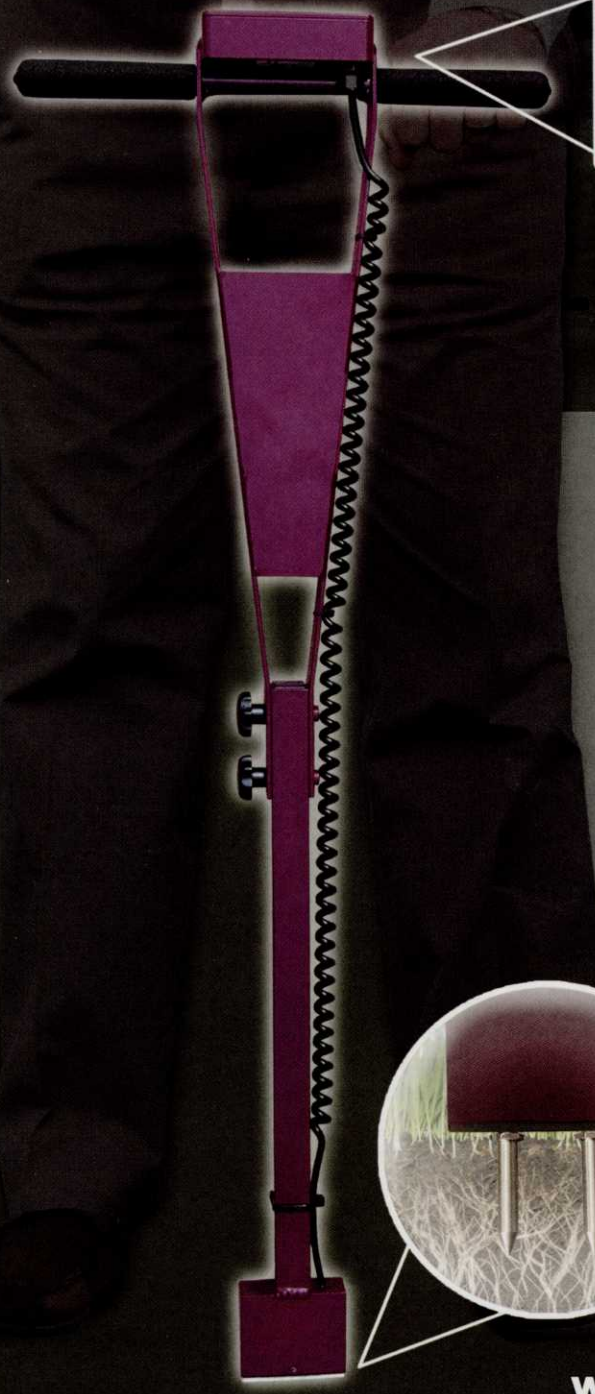

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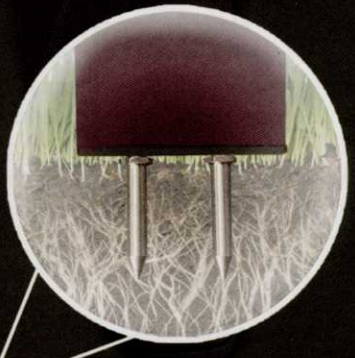

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Ron Dodson and **Bill Love** are the founders of Love & Dodson, LLC a firm that specializes in sustainable planning, design, construction and management of golf courses, recreational facilities and sanctuaries. www.loveanddodson.com

LINKS TO SUSTAINABILITY

The golf industry is at a crossroads.

Much has been accomplished during the last two decades concerning golf course planning, design and management, especially as they relate to ensuring and maintaining environmental quality. However, our industry, like everyone else, has been and continues to be gripped by economic uncertainty.

As we make your way the best we can through this economically uncertain time, there are opportunities for the golf course industry to build upon its previous environmental improvements and become prominent leaders in the more recent movement connected with sustainability.

The International Sustainability Council (ISC) supports golf course facilities that are run as well-rounded, well-though-out businesses. For example, the ISC publicly states:

"A sustainable golf facility is an economically sound business that provides safe, healthy and enjoyable environments for all employees, members, visitors, and guests. A sustainable golf facility is sited, designed, and constructed in ways that enhance the local community, and reduce or eliminate its impact on natural resources. It is managed in ways that provide balance between optimum playing conditions for golfers, and good stewardship of the natural environment. Management strategies are based upon scientifically sound site specific best practices that improve the quality of all life on the site, regionally, and beyond. Through outreach and education, a sustainable golf facility is a champion and advocate of sustainability."

The issues faced by the golf course industry are wide and varied. Economic conditions are the driving force for the future of the industry.

While many factors that drive economic conditions are beyond the scope of an individual course manager, those economic factors nevertheless go hand-in-hand with environmental management opportunities that are available and accessible to course management. The relationship between economic, environmental and social concerns is not always obvious, but the three issues are nevertheless intimately connected.

Sustainability is a characteristic of a process or state that can be maintained at a certain level indefinitely, according to the ISC. The term, in its environmental usage, refers to the potential longevity of vital human ecological support systems, such as the planet's climatic system, systems of agriculture, industry, forestry and fisheries, and human communities in general and the various systems on which they depend.

In recent years, an academic and public debate has led to the use of the word "sustainability" in reference to how long human ecological systems can be expected to be usefully productive. Observers point out that in the past, complex human societies have died out, sometimes as a result of their own growth and associated impacts on ecological support systems.

You see, the important implication to note here is that a modern industrial society, which continues to grow in scale and complexity, might also collapse.

Therefore, the implied preference would be for systems to be productive indefinitely, or be sustainable.

In many regards, past unsustainable business practices are responsible for the present state of the global economy.

> "Many courses are, in fact, part of their community's 'green infrastructure' and are important segments of a community's water management system."

Sustainability is focused on the "triple-bottom line" of profit, planet and, of course, people. Plainly spoken, this means it is vital that we focus on monetary issues, environmental issues and social issues, both locally and globally.

Many golf course superintendents and managers recognize that they are managing their facilities as part of a watershed and community resource. Many courses are, in fact, part of their home towns' green infrastructures and are important components of those communities' water-management systems.

However, most people don't value natural systems and ecological processes. And they most certainly don't value the human-managed systems created and managed by professional golf course turf managers and stewards.

Even with all of the improvements made with regard to environmental management in the golf course industry over the past 20-plus years, there is still much to be accomplished.

Now is the time for those of use in the golf course industry to fully embrace the leadership opportunities associated with insuring a sustainable future not only for the game of golf, but also a sustainable future for our planet. **GCI**

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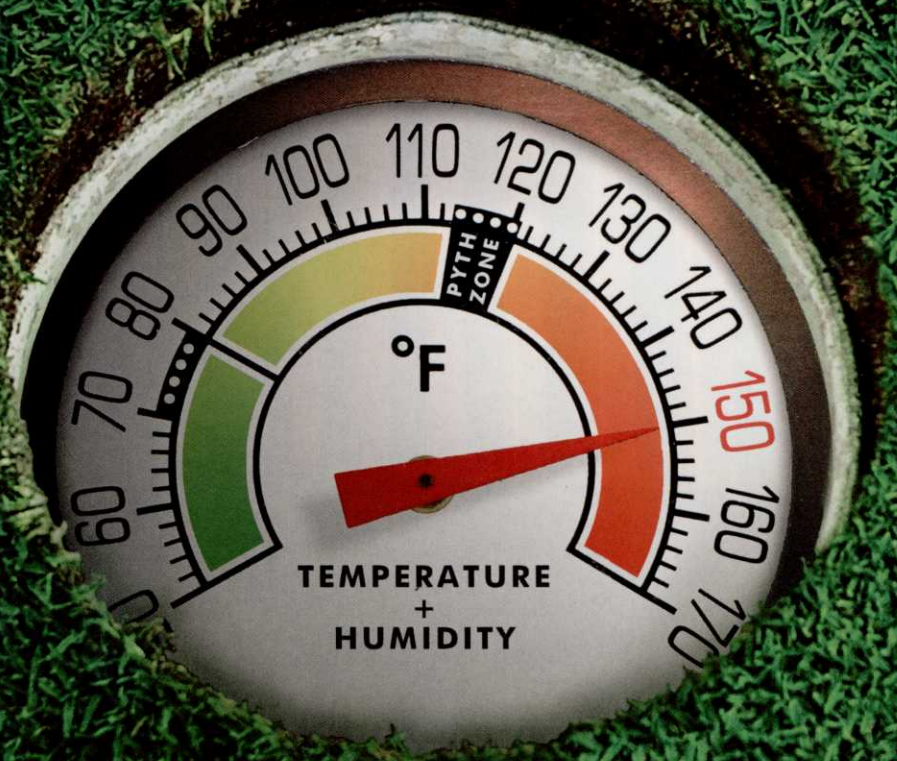

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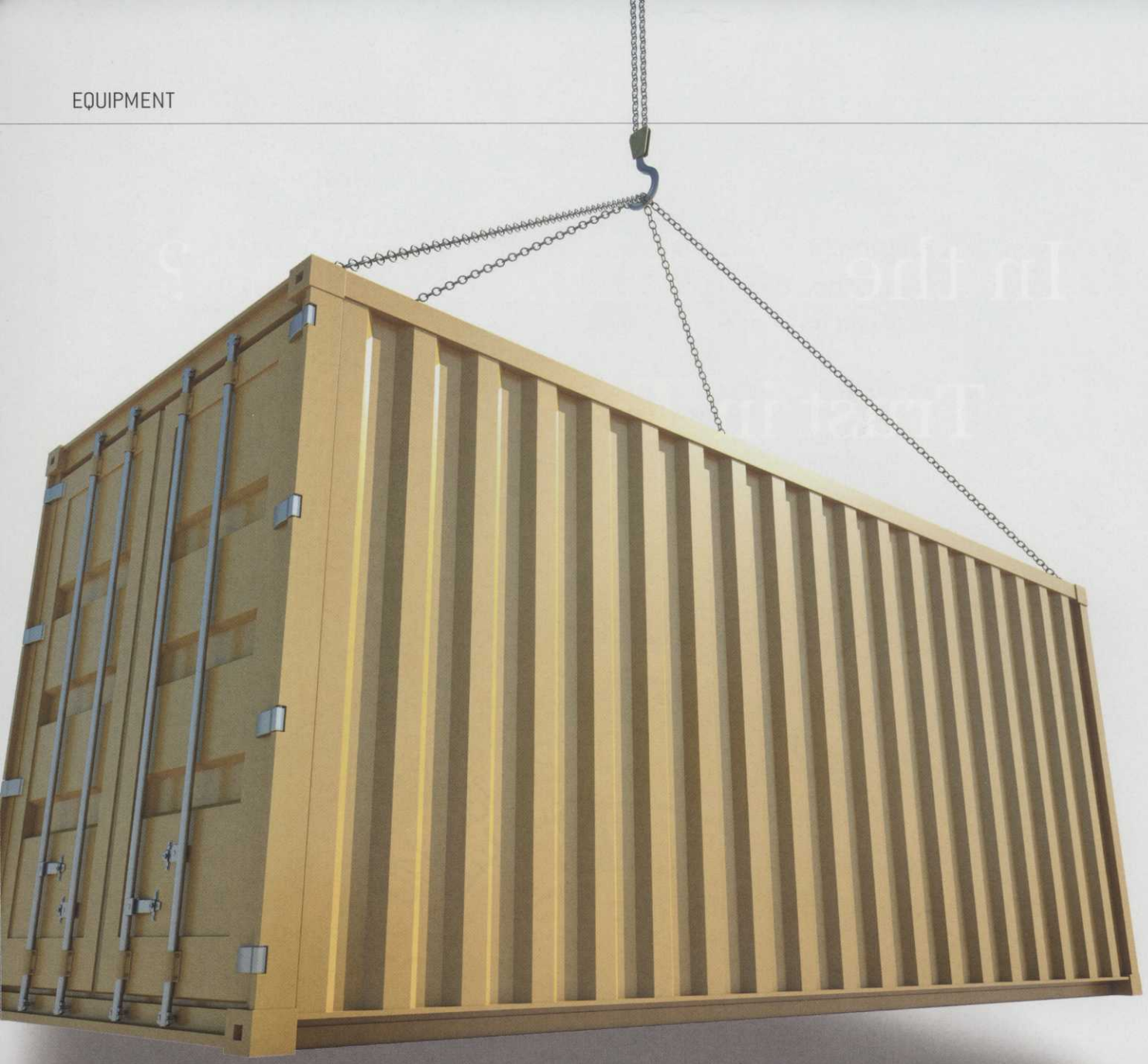

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