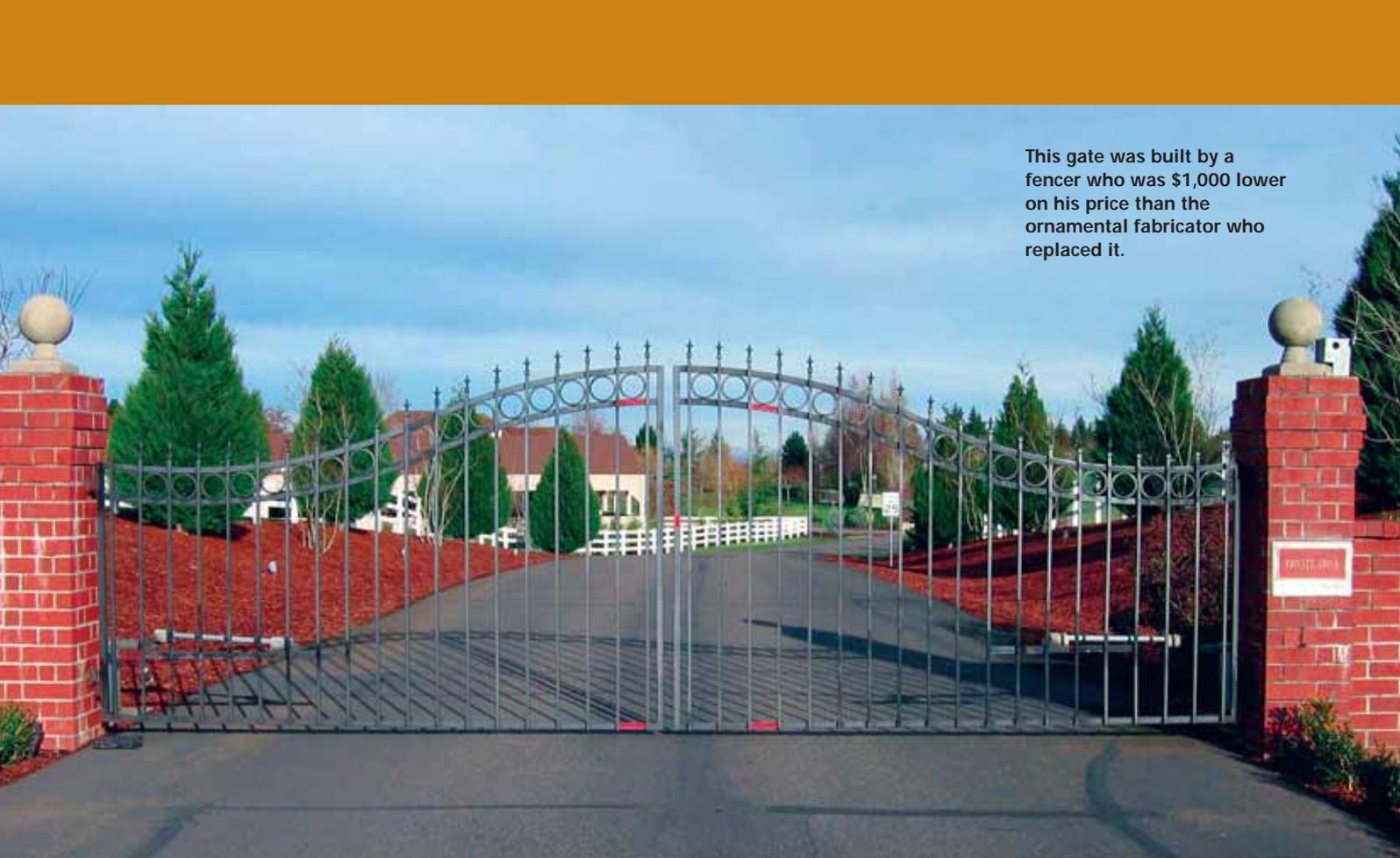


This gate was built by a fencer who was \$1,000 lower on his price than the ornamental fabricator who replaced it.



Entering the world of automated gates

■ If you're thinking about getting into gates, then you need to read this article. It's a great refresher for you experts too.

By *Lee Rodrigue*

Making the move from building handrail to gates is a significant jump for any fabricator. The complexities of providing a large assembly that can move through a wide range of motion over numerous cycles are numerous, and for most fabricators, the only way to discover them is to learn them "the hard way." Not only do you have to build a sturdy post system and hinged frame, but you also have to be an electrician and, in some cases, a landscaper as well.

When choosing whether to get into gates operators, you have to decide whether you're IN or OUT. You can't go partway, and there's a long list of things that could go wrong. Gates are unique in that their continued operation is dependent on every one of the parts of the gate system working smoothly. If any one part is deficient, then it taxes every other part of the system until it ultimately fails. If you are not willing to expand your skill set to

For your information

Tip Gates should be designed with most of the weight close to the hinge of the gate to reduce the leverage on the posts and hinges.

Tip Prevent sag by using diagonal elements that help support the extended weight of the frame.

Tip Any two-dimensional element in the face of the gate can act as a structural element to help transfer the weight of the gate to the post.

This gate, built by NOMMA member Stratford Gates, replaced the gate shown on the opposite page.



include all the talents required to do all of those things at the expert level, then you may not want to get into them. In gate operation, customer satisfaction ends up being transferable, and guarantees aren't measured in

years, but decades. Robert Rayson, owner of Stratford Gate Systems, says jokingly, "It's really not that difficult... but most people can't do it."

One of the biggest problems with gates has nothing to do with design.

The main issue is the fact that they require a great deal of time and expertise, and the average customer needs your help as an expert to be shown that the product you are providing is worth the price you are asking.

A special thank you to Robert Rayson of Stratford Gate Systems and Richard Sedivy, Director of Marketing at DKS DoorKing and President of DASMA, for their help in preparing this article.

All photos courtesy of Robert Rayson, Stratford Gate Systems, Clackamas, OR.



Artist Raymond Hunter teamed up with Robert Rayson of Stratford Gates to create this gate fabricated from stainless steel and copper. Rayson designed the framing and operator systems, and Hunter made the dragons.



ABOVE: Cutouts at the bottom of this gate allow adequate clearance when the gate opens to the uphill side.

RIGHT: Use of plates and weaves can add structural integrity to a frame without use of diagonals.



“As fabricators, we tend to believe the customers when they say, ‘I can’t afford that price,’” Rayson says. “What we should hear is, ‘You didn’t show me enough value to support doing the job right’ or, ‘You did not convince me your price was worth it.’ You have to remember that a gate, unlike a handrail required by code, has a psychological attachment to it, due mainly to the prestige associated with it. The goal is to show your customer that what you are going to provide him will be worth more to him than the relatively small fee he pays to you.”

The world is full of people getting in over their heads with gates, and a large proportion of them tend to come from the fencing industry, which emphasizes pre-fabrication. Most fence companies are installation companies, and when they come up to a gate, they become “gate companies.” Unfortunately, if they do not possess the level of craftsmanship and precision required to build a gate well, the result is that the customer

ends up with an inferior product with a shorter lifespan than they might get from a company that specializes in gate fabrication.

Rayson offers some simple rules for ensuring gate-building success: “It’s not rocket science. You have to put a big enough footing in the ground. You have to use a post system that’s sturdy enough that doesn’t have flex. You have to use good, tight hinges. You have to build a gate and frame that doesn’t sag or flex, and can resist torsion created by sudden changes in direction. You then have to choose and install the right operator.”

Be prepared to acquire an entire subset of electrical skills to avoid operator malfunction. If you use the wrong wire size or an unshielded

wire, use the wrong voltage, nick a wire, if you’re sloppy and allow wiring to follow a path that will ultimately compromise the system, then your operator will fail. It’s much more precise than putting in a static item, like bolting a handrail to the ground. Allowing time to learn the tricks prior to installing your first gate will make all your gate jobs less stressful. Virtually every operator manufacturer offers courses for installers, and the new gate fabricator would be wise to take one.

Each of these tasks uses lessons learned through repetition. If a fabricator only builds one or two monumental staircases a year, then no one in the organization has the opportunity to retain the tricks learned from

the last one to the extent that they become true experts. As a result, they must use additional time each time they build a staircase. Whereas someone who does nothing but monumental stairs would not to reinvent the wheel each time. This is where the inexperienced lose their competitive edge, and as a result lose profitability.

You can't just build a rail and slap some hinges on it. According to Rayson, "If you put a wheel on a swing gate, it's the same thing as putting a big sign on it that says 'I do not know how to make gates.'"

Tips on gate fabrication

Ideally, gates should be designed with most of the weight close to the hinge of the gate, which reduces the leverage on the posts and hinges. To prevent sag, use diagonal elements to help support the extended weight of the frame.

How can one avoid using diagonal elements? Consider adding structural elements like larger members for the frame, kickplates, and weaves. Any two-dimensional element in the face of the gate can act as a structural element to help transfer the weight of the gate to the post.

The factor that most fabricators ignore is "whip", or the flexion that can occur out of the plane of the gate when it changes direction suddenly. Usually, this occurs because they make the gate too long (over 10 feet). Whether you use a mechanical or hydraulic operator, most gates slow down at the start and the stop points. It's when there's a secondary input in mid-swing, where the gate is moving at its fastest speed and it suddenly must stop, that the "whip" effect can cause material to deform, welds to break, cracks to form, rust to begin, and ultimately the gate to fail. Also, that torque can transfer into the operator, decreasing its life.

Gates should be built to swing level. For issues with slopes, Rayson avoids using offset hinges. He tries to blend form with function, and feels that offset hinges look more like an afterthought. "Anything will work for a year or two. It's three years, five

"Anytime you start doing things that are outside of the gate operator manufacturer's specs, you're opening yourself up to trouble."

years, eight years out that you really find out if you did a good job. Very few operators are designed to lift a gate... they're designed to swing a level gate. So anytime you start doing things that are outside of the manufacturer's specs, you're opening yourself up to trouble."

Providing regular service to the operators is a necessary part of the business. Service contracts tend to be with multi-family jobs, like apartments, condos, and gated communities. For single-family units, service is generally done on an as-needed basis.

Rayson adds, "If you are going to do gates, it is virtually a requirement that you attend FENCETECH, the annual convention for the fencing industry (www.americanfenceassociation.com). Every operator company is there, and you can learn more about what lies ahead for you in your three days there than in your first few years of installing gates and operators."

Codes and standards

UL 325 is a standard that addresses the design and operation of the gate operator. This does not include the access control system, but simply the mechanism responsible for starting and stopping the movement of the gate at the appropriate time. When the manufacturer of a gate operator makes a product, it is submitted for independent testing. If it meets all the requirements of the UL325 standard, then it can be sold with a sticker indicating that it is in compliance with UL325 and is said to be listed.

ASTM F2200 is a standard that addresses the design and operation of the gate itself. It is this standard that the fabricator should consider when designing the gate. Although it does not describe standards related to the

operators, it was written with UL 325 in mind, so that the standards are in harmony with each other. This was made easier because of the timeframe with which each standard was written. UL 325 was written and revised from 1993 to 1998, and made effective March 1, 2000. ASTM F2200-02 was written from 1998 to 2002 and was made effective in 2002.

In these standards, there are four basic classes of gate operators, and each has a different level of safety incorporated (see Table 2 on page 30). The safety features of a gate and its operator primarily focus on preventing body parts from becoming injured by a moving part on a gate. This is not limited to the gate itself, but any other moving part associated with its operation. In the industry, this is called "entrapment protection," and there are many different types available (see Table 1 on page 30).

According to Richard Sedivy, President of the Door and Access Systems Manufacturers Association and Director of Marketing at DKS DoorKing, "Most of the gates built by NOMMA members will fall into the Class I and Class II category, which require the highest level of entrapment protection."

Most of the time, one or both of these standards will be mentioned in the specs for a job. Sometimes, these standards are not specifically required by a job, like in the case of a single-home residential customer who just wants a gate for his or her driveway. This does not relieve the fabricator or installer from using them. The primary reason to use and follow the appropriate standards is to allow you to use the creativity and expertise that sets you apart from your competitors while keeping a watchful eye on your liability.

"Even if UL 325 and ASTM F2200 are not specifically required by a job, like in the case of a single-home residential customer, this does not relieve the fabricator or installer from using them."

Consider the following scenario: You build a gate, install an operator, and leave a satisfied customer very pleased with your work. The residence is sold, and the new owner's son becomes injured while playing near the gate. When called onto the stand, the plaintiff's attorney asks you if you're familiar with UL 325 or ASTM F2200. If you are not, you can take out your checkbook because it is the

industry standard for the product that you provided. Even if you are familiar with the standard, the plaintiff's attorney will ask you about every variation you might have made from that standard, and why you did so. If you cannot explain why you did not adhere to the standard, then you should again take out your checkbook.

This is not to say that you should design gates or do business strictly to

avoid litigation. However, when the potential risk to people, pets, and vehicles is higher, the responsibility of the fabricator increases as well. Given the complexity of fabricating large, heavy, movable items like gates, fabricators should carefully consider their commitment to their products and customers for years to come before punching in their "access code" to enter the world of gates. ❁

Types of Entrapment Protection		Table 1
Type A Inherent entrapment sensing system.	Type C Inherent adjustable clutch or pressure relief device.	
Type B1 Provision for connection of, or supplied with, a non-contact sensor (photoelectric sensor or the equivalent).	Type D Provision for connection of, or supplied with, an actuating device requiring continuous pressure to maintain opening or closing motion of the gate.	
Type B2 Provision for connection of, or supplied with, a contact sensor (edge device or the equivalent).	Type E An inherent audio alarm.	

Types of safety measures required for various gates and locations

Vehicular Usage Class	Gate Operator Category				Table 2
	Horizontal Slide Vertical Lift Vertical Pivot		Swing Gate Vertical Barrier (Arm)		
	Primary Type	Secondary Type	Primary Type	Secondary Type	
Class: I & II - 1-4 Single Family Residential & Commercial	A	B1, B2, or D	A or C	A, B1, B2, C, or D	
Class: III - Industrial	A, B1, or B2	A, B1, B2, D, or E	A, B1, B2, or C	A, B1, B2, C, D or E	
Class: IV - Restricted Access	A, B1, B2, or D	A, B1, B2, D or E	A, B1, B2, C, or D	A, B1, B2, C, D or E	