

GS² System

SHOPPING CART CONTAINMENT SYSTEM TRAINING MANUAL



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TOMORROW'S TECHNOLOGY FOR TODAY'S RETAILER

GATEKEEPER SYSTEMS, INC

2007 CART CONTAINMENT TRAINING MANUAL

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1 Introduction

Overview

The purpose of this manual is to provide the reference materials, training guidelines, step-by-step instruction, and product specifications to enable the proper installation and maintenance of the GS² System. When combined with training from Gatekeeper Field Service Supervisors, you and your company will have a thorough understanding of all techniques required to install and service the GS² System.

Proper knowledge of the installation and maintenance techniques that Gatekeeper employs offers your company a compelling opportunity to provide our mutual customers with value-added service and support.

About Gatekeeper

Gatekeeper Systems was founded in 1996 on the principles of innovation, quality, and service. Recognizing the significant impact of cart theft on retailers, Gatekeeper Systems designed and developed the industry's preeminent cart containment system. Over the years, we've gained unique insight into the needs of our customers and have engineered a range of integrated solutions that offer a blend of technological sophistication and ease-of-use.

From the first handmade prototype to today's industry-leading line of cart based technology solutions, Gatekeeper Systems remains committed to providing our customers with world-class products backed by unsurpassed service and support.

Our experienced management team provides the company with the vision and leadership essential to ensuring financial stability, unwavering focus, and continued success well into the future. In December 2004, Gatekeeper Systems, Inc successfully floated its shares on The London Stock Exchange.

Gatekeeper's Head Office is located in Irvine, California, USA. We maintain international offices in Cambridge, United Kingdom; Mundolsheim, France; and Hong Kong SAR.

Installation Philosophy

"The combination of thoughtful planning and careful execution lead to a world-class installation."

Gatekeeper Systems takes pride in providing the highest quality installations that reflect our industry-leading experience, expertise, and commitment to professionalism. The experience we've gained performing flawless installations all over the world translates into a core philosophy that serves as the foundation for every GS² System installation. This is our philosophy and the philosophy that we seek in our worldwide partners.

About This Manual

This manual will take you through the steps involved in preparing for and installing the GS² System. Our training is organized in a manner to provide you with the knowledge necessary to take a system installation from beginning (layout) to end (service and troubleshooting). A Gatekeeper Field Service Supervisor will take you step-by-step through the enclosed Training Checklist to lead you down your path to becoming a Certified Gatekeeper Installer.

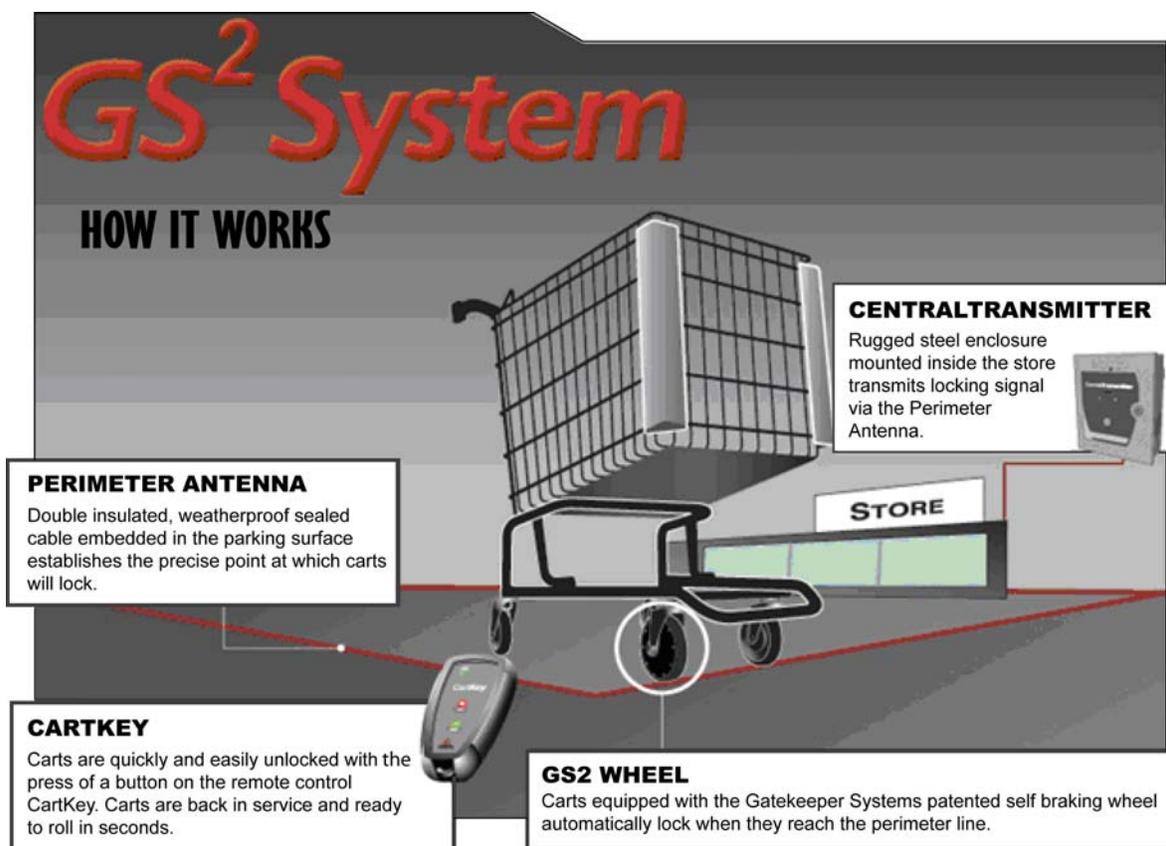
For companies with many field service technicians, our objective is to "train the trainer". You should identify one senior member of your team to be the "owner" of Gatekeeper installation techniques and knowledge. As we improve or enhance our products and capabilities, we will provide your Gatekeeper contact with technical bulletins and pertinent updates, so that your technicians stay up-to-date with the most current information. Now, let's get started.

2 GS² System Description and Components

GS2 System

The GS² System is a perimeter-based, electronic system that prevents the removal of carts from the store premises. The GS² System combines a digitally-encoded locking signal, embedded perimeter antenna, and our patented self-braking cart wheel to provide the most advanced, effective, and easy-to-operate cart containment solution available. The CentralTransmitter transmits a digitally encoded signal via an antenna that is embedded in the parking lot. The path of the antenna establishes a perimeter boundary, which

carts may not pass. When a cart equipped with the GS² Wheel comes within approximately one meter of the perimeter boundary, the locking mechanism engages, thus disabling the cart from use until store personnel unlock the wheel using our remote control CartKey. An effective Site Management Package, consisting of Parking Lot Signs, Cart Mounted Signs, and Perimeter Striping, indicate the presence of the GS² System for the convenience of store customers.



GS² System Components

 <p>GS2 Wheel</p>	<p>The GS² Wheel is a completely self-contained unit consisting of a circuit board, battery, receiver, electric motor, and braking band. The GS² Wheel comes fully assembled with its own caster.</p>	
	Operation	<p>The GS² Wheel contains a digital circuit board, which receives coded RF signals from in-store transmitters. The GS² Wheel translates the coded signal and, depending on the specific signal received, triggers a motor inside the wheel to either engage or disengage the internal braking band.</p>
	Form Factor	<p>Standard sized cart wheel with a replaceable, non-marring, conductive (anti-static) tread and sealed precision ball bearings.</p>
	Dimensions	<p>5" diameter x 1.23" width</p>
	Power Source	<p>One replaceable 3 volt lithium battery, part #CR123A</p>
	Electronic Components	<p>Flash programmable CMOS (low power consumption) micro-processor.</p>
	Electronics Housing (Hubs)	<p>High tensile strength reinforced plastic with glass strands for extra strength and durability. Dual o-rings provide a watertight seal.</p>
	Load Rating	<p>180 lbs</p>
	Environmental	<p>Operating Temperature Range: -10° F to 140° C</p>
 <p>GS2 Travelator</p>	<p>The GS² Travelator contains a side brake for use with moving walkways. The GS² Travelator is available in both left and right-side configurations.</p>	
	Operation	<p>The GS² Travelator utilizes the same leading edge electronics housed in the GS² Wheel.</p>
	Form Factor	<p>Standard-size wheel with replaceable non-marring anti-static rubber tread, and sealed precision ball bearings; includes a locking, polyurethane, side-disc which drops into the grooves of moving walkways</p>
	Wheel Dimensions	<p>5" diameter x 1.23" width</p>
	Side Disc Dimensions	<p>5.39" diameter x 0.66" width</p>
	Track Size	<p>Designed for use with the following moving walkways: track width: approximately 0.11 inch, groove width: approximately 0.23 inch, groove depth: >39".</p>

GS2 System Components (cont.)

<p>Central Transmitter</p> 	<p>The CentralTransmitter contains a microprocessor that generates and transmits a digitally encoded locking signal that travels through a cable embedded in the ground along the designated perimeter. The CentralTransmitter is capable of generating a locking signal through outdoor perimeter antennas up to 5,000 feet in length.</p>	
	Form Factor	High-strength steel enclosure protected by key lock.
	Dimensions	12.5" high x 10.5" wide x 4.25" deep
	Microprocessor	Digital circuitry, flash programmable and compliant with international regulations
	Power Supply	110/220 alternating current transformer; ETL/CSA/CE Certified
	Signal Output	Below 9 KHz (VLF)
	Output Current	1AMP peak-to-peak
	Alarm	Audible and visible system status. Antenna status and power supply status may be transmitted to any third party alarm system via terminal block connections.

<p>Perimeter Antenna</p> 	<p>Double-insulated cable embedded that carries the signal from the transmitter around the designated perimeter and back to the transmitter. Two types of wire are used in a perimeter antenna installation, single conductor for the locking signal and twisted pair (neutral) for a null signal. Wire is either embedded (asphalt, concrete) or routed through EMT conduit, rigid conduit or PVC pipe.</p>	
	Locking Signal	<p>14-gauge (AWG), single copper conductor, double-insulated (PVC/Nylon) wire, (IMSA 51-5). Outer diameter is 0.25". This is the wire typically used anyplace in outdoor installation where cart locking is required.</p> <p>22-gauge (AWG) is primarily used in conjunction with the ExitManager for indoor installations.</p>
	Null Signal (twisted pair)	<p>14-gauge (AWG), two copper conductors, double-insulated (PVC/Nylon) wire. Outer diameter is 0.25".</p> <p>This twisted pair wire is designed to cancel the effects of the locking signal, thus creating a "non-locking, or "neutral" signal. Twisted pair is most often used to route the neutral signal from the CentralTransmitter inside the store to the outside perimeter locking antenna.</p>

GS² System Components (cont.)

<p>CartKey</p> 	Handheld wireless device used to either unlock or lock GS ² Wheels. The CartKey sends a digital signal to the GS ² Wheel that automatically unlocks or locks the wheel	
	Form Factor	Water-tight, high-strength plastic with shock-resistant rubber boot; touch pad features two individual sealed dome switches labeled "Lock" and "Unlock"
	Dimensions	6.22" high x 3.50" wide x 1.22" deep
	Power Source	Field-serviceable CR123A, 3-volt, lithium battery identical to the one installed in the GS ² Wheel
	Signal Output	Below 9KHz (VLF)
	Signal Range	4 feet maximum range; optimal signal range: 1.5 feet – 4 feet; wireless signal range enables point-and-click unlocking
	Output Current	138 mA

<p>ExitManager</p> 	<p>The ExitManager contains a microprocessor that generates and transmits a digitally encoded signal through a closed perimeter cable loop (generally embedded in asphalt or concrete) up to 800 feet in length.</p> <p>ExitManager is capable of transmitting a single locking signal or generating a locking signal for one lock box and an unlock signal for a separate lock box.</p> <p>ExitManager is most commonly used to transmit a locking signal for an indoor or enclosed perimeter antenna, or to generate a signal for a series of two antennas in a lock/unlock configuration.</p>	
	Microprocessor	Digital circuitry, factory-programmed and compliant with FCC Part 15
	Power Supply	Utilizes 20 volt Uniform Laboratories (U.L.) approved Alternating Current (A.C.) transformer drawing less than 11 watts. Operates at 115/230V.
	Battery Backup	12V non-memory Ni-Cd battery backup array supplies 7 hours of uninterrupted backup.
	Signal Output	The signal frequency is below 9 KHZ and complies with FCC Part 15.
	Surge Protection	The system contains a built-in Surge Protector, which helps eliminate Electrostatic Discharge from power lines and lightning strikes.

Instructions to the User for FCC

Each component of the GS2 system complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide a reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet or a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.

Information for Canadian Users (IC Notice)

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

3 Pre-Installation Tasks

The Site Survey

The site survey is perhaps the single most important step in the entire installation process. The purpose of the survey is to collect detailed information about the area where the GS2 System will be installed. This information includes exact measurements of the site, photographs from numerous angles, notes on possible obstacles, location of existing exits, walkways and landscaping, and a host of other data.

A meticulously executed site survey can save hours or even days of work later on during the installation process.

Pre-Planning

Prior to visiting the store, it is important to gather as much store-specific information as possible. If you are provided a site plan prior to your store visit, it is helpful to review the site plan in an effort to identify potential installation obstacles. Even for the most difficult of store layouts, with careful planning and execution, the correct antenna path will be achieved.

Some important questions to consider beforehand include:

- What is the basic store location and layout?
- What are the store's expectations as far as where they want their customers to be able to take carts?
- Is the store a freestanding structure or it is attached to other businesses? Does the store wish to allow their customers to take carts to adjacent retailers?
- Is the store located in a multi-level structure? Is there a multi-level car park attached to the store?
- Are there any issues regarding construction, such as local noise ordinances that will prohibit saw cutting during certain hours?
- Is the store currently under construction or is any construction planned for the near future?

Tools and Materials Needed for the Site Survey:

- Digital Camera,
- Distance Measuring Wheel (available at most hardware stores),
- Measuring Tape,
- 1/4" grid notepad and clipboard,
- Gatekeeper Site Survey Checklist (attached).

Arriving at the Site

Upon arrival at the site, make certain to enter the store and introduce yourself to the store manager on duty. Tell them why you are there and what you will be doing. Ask permission to enter areas of the store not normally accessible to the public. Also, notify them that you will be taking pictures of some of the store areas for purposes of planning the implementation. If you are visiting a store that is not yet open to the public, attempt to identify and notify the general contractor of your presence and purpose.

Assessing Store Operational Patterns

If possible, discuss the particulars of store operation with the store manager or other store personnel. It is also helpful to take time to observe the general customer traffic patterns (it helps to do this at a time when the store is operating at or near capacity.) Where do the customers typically take their carts? This will ensure that your antenna path is designed in a manner not to interrupt typical customer traffic patterns. Some things to note include:

- To which areas of the car park should customers be able to take carts?

- Where do most of the store customers park? Are there any spaces outside the store's parking domain where customers might reasonably be expected to take carts? Are there any associated or integrated businesses such as a gas station to which customers will need to have access?
- Location(s) of cart storage areas. Are the carts kept in cart corrals? Where are the cart corrals located? This is important because you do not want to route the system antenna within six (6) feet of any location where carts are stored permanently.

Assessing the Parking Lot Layout and Surrounding Property

While you are at the store, make sure to walk the entire site, including behind the store. Some important information to note during this process includes:

Does store practice allow the use of carts to move items about in the receiving dock area? If it does, you will want to ensure that the perimeter antenna encompasses the receiving area.

Are there any barriers on any sides of the perimeter? Are these barriers permanent and high enough that a cart cannot be lifted over it?

A low hedge (less than four feet high) or landscaping should not be considered a permanent barrier. Over time, walkways may develop through the hedge, allowing a path for carts to escape if the area is not secured by a locking perimeter antenna.

Determining the Central Transmitter Location

The location of the Central Transmitter is critical. It is important to find a secure, ventilated area protected from any possible damage or tampering. The Central Transmitter should be mounted on the interior surface of an exterior wall in the receiving or customer service areas. Power availability should also be considered when choosing a location. The Central Transmitter operates on 110 volts AC and should always be connected to a 24-hour power source. It is best to mount the transmitter in a location that will allow the antenna cable to exit the store as close as possible to the location of the Central Transmitter. It is never advisable to place the transmitter in a location that would require the antenna to travel any significant distance within the store itself. It is often necessary to route the antenna from the Central Transmitter, down to ground level within the store, and then drill through the base of the exterior wall directly into the ground.

In determining the location for the Central Transmitter, it is important to bear in mind the possibility of any other conductive surfaces that may cause coupling. Coupling is a condition in which the GS² signal generated from the Central Transmitter is carried by another conductive structure, such as rebar in concrete, metal store fronts, metal drain pipes, or electrical/data lines. Essentially, the signal carried from the transmitter by Gatekeeper's antenna "jumps" to another conductive structure. At this point, the signal is carried by the new structure. If a GS² Wheel comes within range of this structure, it is possible that it will receive the GS² signal and initiate the locking process. Proper transmitter placement combined with careful antenna routing can effectively eliminate the possibility of coupling taking place. Always avoid routing the antenna inside the front of the store or near any in-store data cable routes.

While the store manager may express a preference regarding the location of the transmitter, it is important to discourage any placement that may result in less-than-optimal system performance. Be prepared to explain why a specific transmitter location would be undesirable.

Determining System Component Requirements

Once you have acquired information regarding the store's cart containment requirements, you can go about determining what components that will be required to deliver a system that meets customer requirements. It is important to understand what system components are available and the capabilities and limitations of the different components, especially when planning a more complex layout. For a detailed description of available components, see the "**Error! Reference source not found.**" section on page 2.

Perimeter Antenna Configurations

Using the information from the Site Survey, you can now determine the optimal Perimeter Antenna configuration.

The four primary perimeter antenna configurations are described below. Use as is or tailor to your particular site needs.

1. Single Locking Loop

A single locking loop is the most effective method of containing carts in a free-standing store environment. This configuration is utilized when it is possible to run the antenna out from the transmitter (in combination with using twisted pair to get out of the building), all the way around the intended perimeter, and back to the transmitter. When laying out a system using a single loop, it is important to confirm that there is room behind the store or other buildings to saw cut the antenna path. If the store abuts another property or building, it may not be possible to work behind the building (see sample Site Plans).

2. Double Saw Cut Locking Loop

Often in sites where the store is attached to other buildings, it is not possible to route the antenna around or over the attached buildings and back to the CentralTransmitter. Remember, a single locking line needs to complete a loop back to the CentralTransmitter. In these instances, you may choose to route the antenna in a double saw cut configuration. In this layout, twisted pair leaves the CentralTransmitter and is then connected to a long single loop that runs around the perimeter locking area and then back along in a parallel path, with at least two (2) feet of separation. By routing it back along the same path, you have enabled a closed loop configuration (see "Sample Site Plans").

3. Single Locking Loop Over Building

An alternative to the double saw cut for instances where the store is connected to other buildings, is to route the antenna around the store in a single loop, and up and over the roofline of the connecting buildings. This installation type allows for a single saw cut in the parking lot area and is often the most efficient way to design the system. It is important to note a few things when considering this layout: Is there an easy way to route the antenna up the side or front of the connected building in conduit? Are there any awnings on the connected buildings that will make this task difficult? Keep in mind at all times that you should NEVER penetrate any roof or permanently attach anything to the roof.

4. Twisted Pair and Lockbox Combination

If a site's perimeter contains many existing barriers, it is often best to configure the system using a twisted pair and lockbox combination. This will minimize the total size of the installation and provide an effective cart containment perimeter. This is generally designed with twisted pair leading from the CentralTransmitter out to the areas that do not have an existing perimeter boundary, such as a fence or wall. When the antenna reaches this area, the twisted pair is then spliced to a lock box of single conductor locking line. A lock box is a rectangular box created by embedding 14g locking loop in a rectangular, box formation, with at least 24 inches separation between the long sides of the rectangle (see "Sample Site Plans").

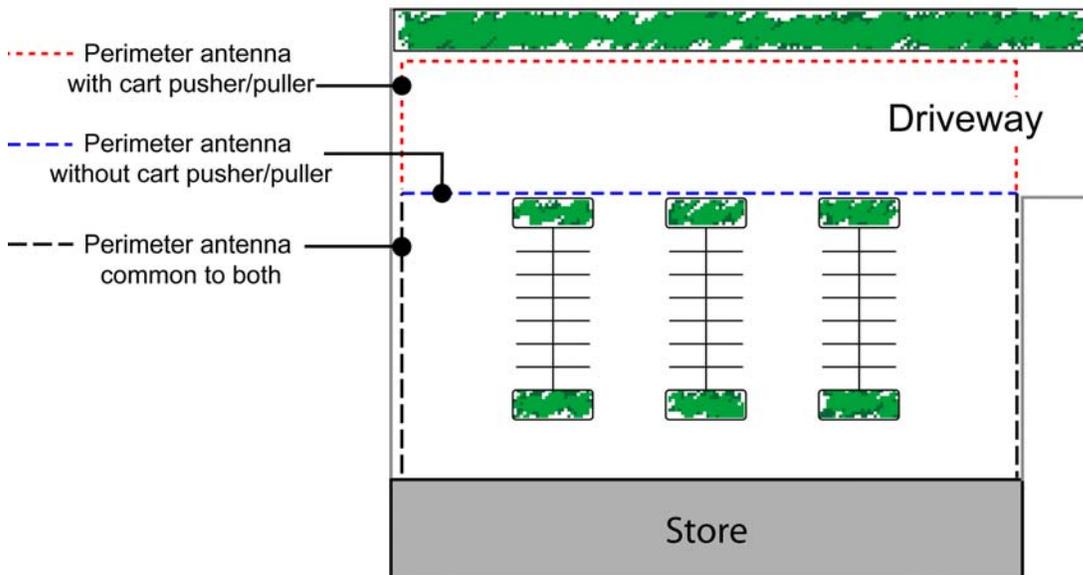
Other Perimeter Antenna Considerations

Antenna on Slopes

Similar caution should be exercised when routing the antenna across any area that slopes downhill. If the antenna path is routed across a sloped area, it should always be routed along the top portion of the slope. When routing the antenna across rows of parking spaces, it is important to always place the antenna at the end of the parking space (where the nose of the car would be located). As the GS² locking signal will be transmitted approximately three feet from the antenna path, the cart will actually begin locking at the middle portion of a parked car, if the antenna is placed at the nose end of the parking space. Were the antenna to be routed across the entry to the parking space, a shopper would not be able to push the cart to their car, as it would begin to lock. This is both an inconvenience to the shopper, as well as to the store.

Antenna Across Driveways

The placement of the perimeter antenna when crossing driveways will vary depending on whether or not the store is using a cart collection system. The two options are shown in the diagram below.



Documenting the Site Survey

When you visit the site, it is important to take notes for future reference. The “Site Survey Checklist” on page 17, contains most of the information that is needed to prepare a final Scope of Work and should be completed in its entirety with every site survey.

In addition to the checklist, you will need to either mark-up an existing store site plan (provided by Gatekeeper) or create one from scratch using your grid paper and measuring wheel. It is important to include measurements of the entire perimeter on your drawing, including the segmented measurements on each side of the perimeter. If the installation requires conduit on a wall or over a roof, indicate the approximate height of the structures on your drawing.

Drawing the Site Diagram

When drawing your site diagram, attempt to include relevant detail about the property, including:

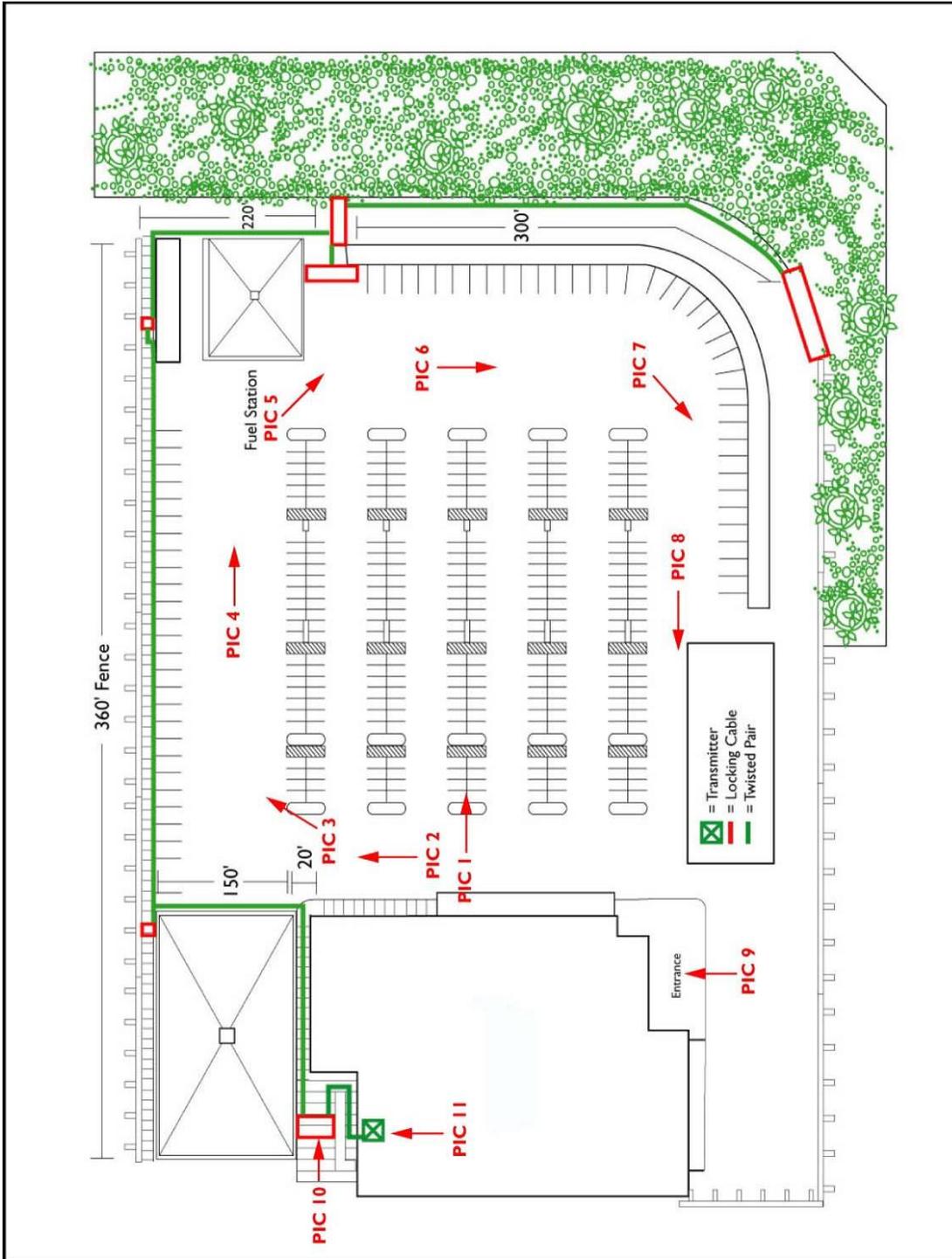
- Basic overview of parking lot and structures
- Store dimensions
- Sidewalks, walkways, etc.
- Store entry and exit points
- Cart corrals
- Indicate parking lot surfaces, e.g. asphalt, concrete etc.
- Condition of the parking lot surface
- Permanent fencing or walls that create boundaries. Low (4 feet or less) hedges are NOT considered permanent barriers.
- Additional businesses in the parking lot area (attached or unattached)
- Landscaped areas within the proposed antenna path (including trees)
- Main points of ingress/egress from the parking lot
- Vehicle traffic lanes within the parking lot
- Use different color pens to indicate the different types of antenna, for example: red = locking line; green = twisted pair; blue = conduit; orange = landscaping
- When attaching digital photos, label the image files in sequential order beginning with one and use those numbers to indicate specific locations on your site diagram

Before marking up an official architectural print (or copy thereof), be certain to make a duplicate of the original print.

Finally, it is important to take as many photographs as possible. The photographs are a vital means of communicating the final site plan and antenna path layout to our mutual customer. Photographs should be taken at multiple locations throughout the site. Each photograph should be numbered. Always indicate on the site plan the exact spot where the photograph was taken and the direction the photographer was facing, as shown on page 12.

Sample Photograph Map

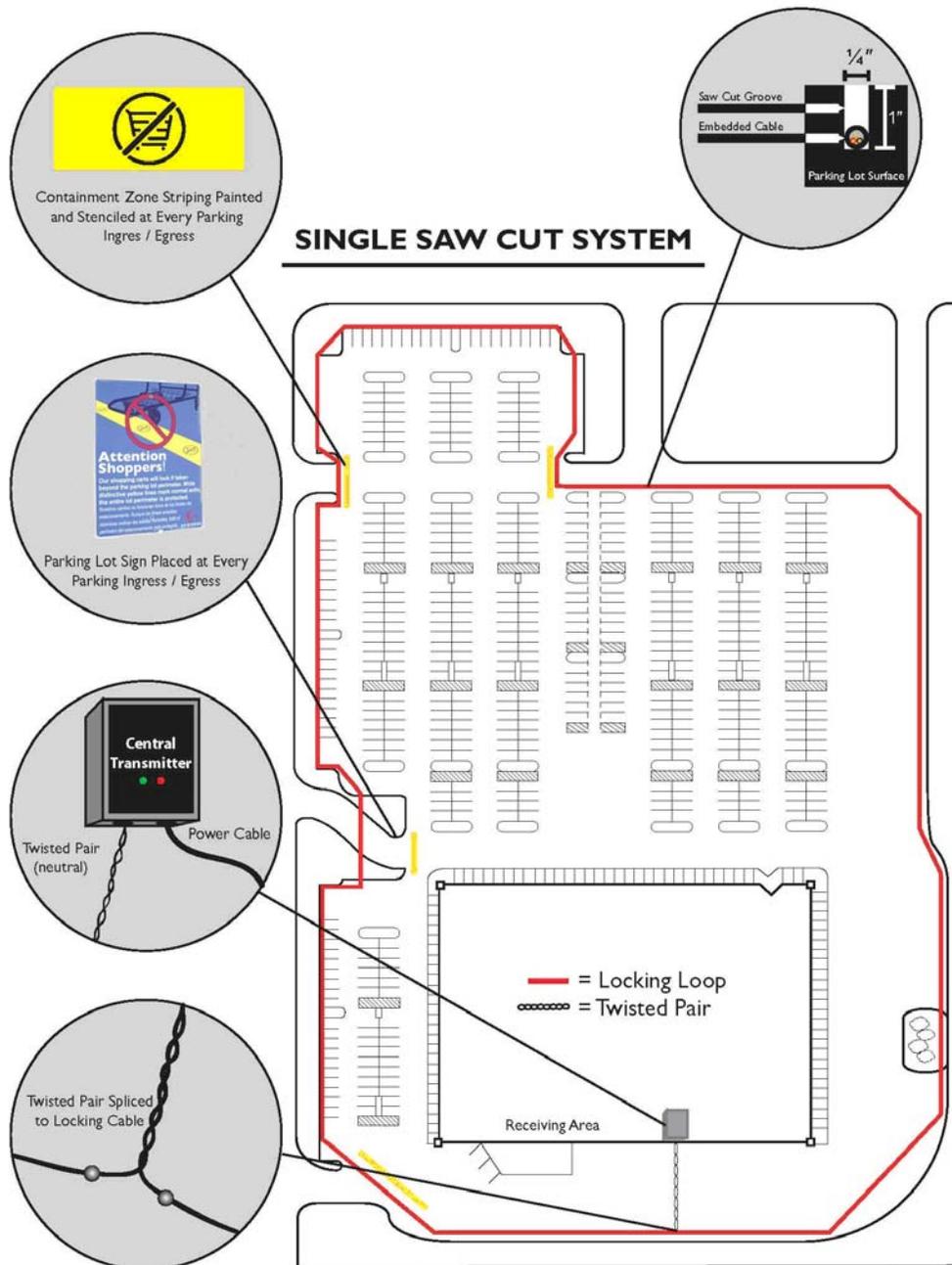
The entries on this map (PIC1, PIC2...) indicate the locations where pictures were taken. Arrows show the direction the photographer was facing. Numbers on the site plan should match the number on the back of the corresponding photo.



Sample Site Plans

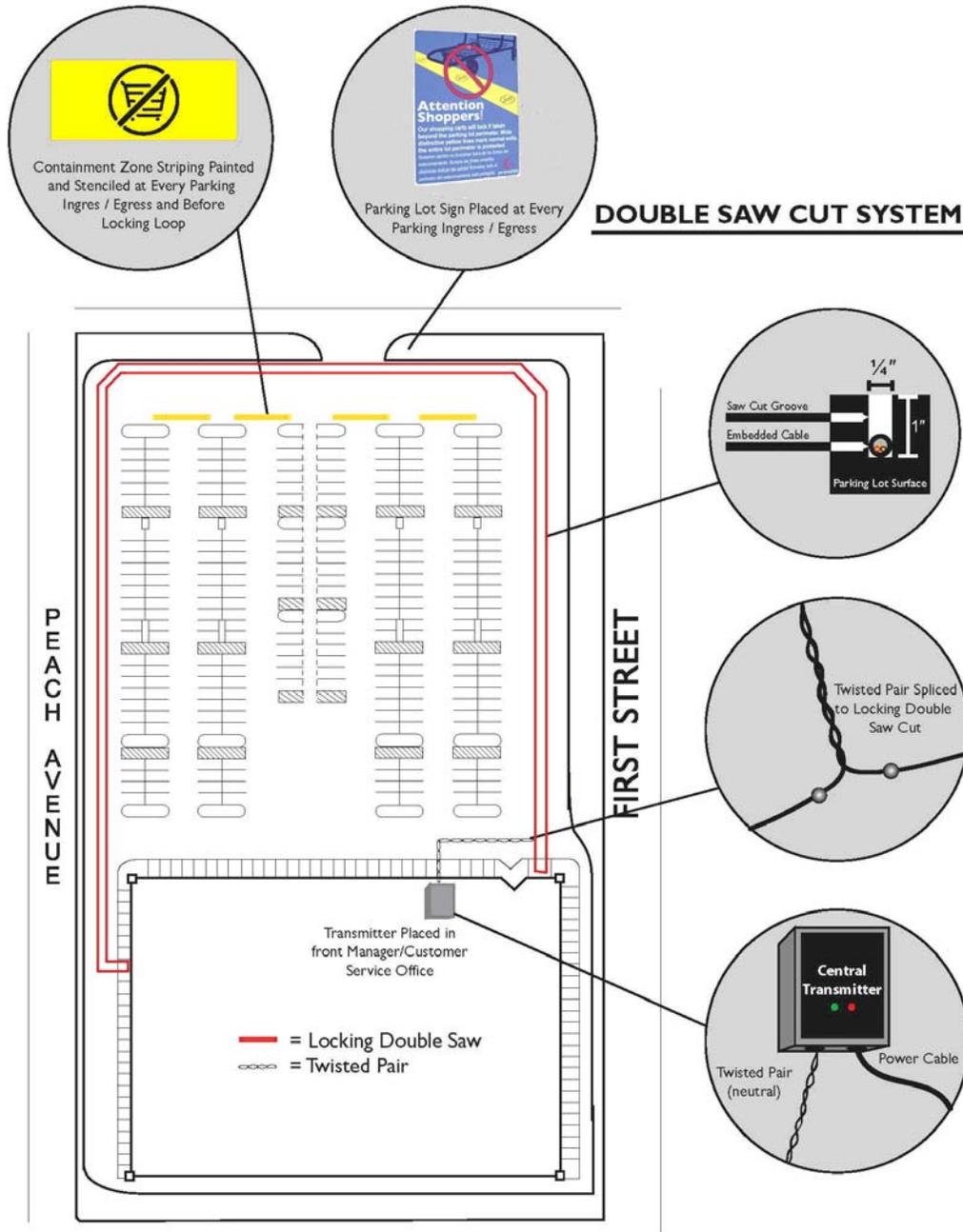
Single Locking Loop

This plan shows a single perimeter antenna leaving the Central Transmitter via a short run of twisted pair, circling the containment area and returning to the CT. This is usually the simplest, most efficient setup.



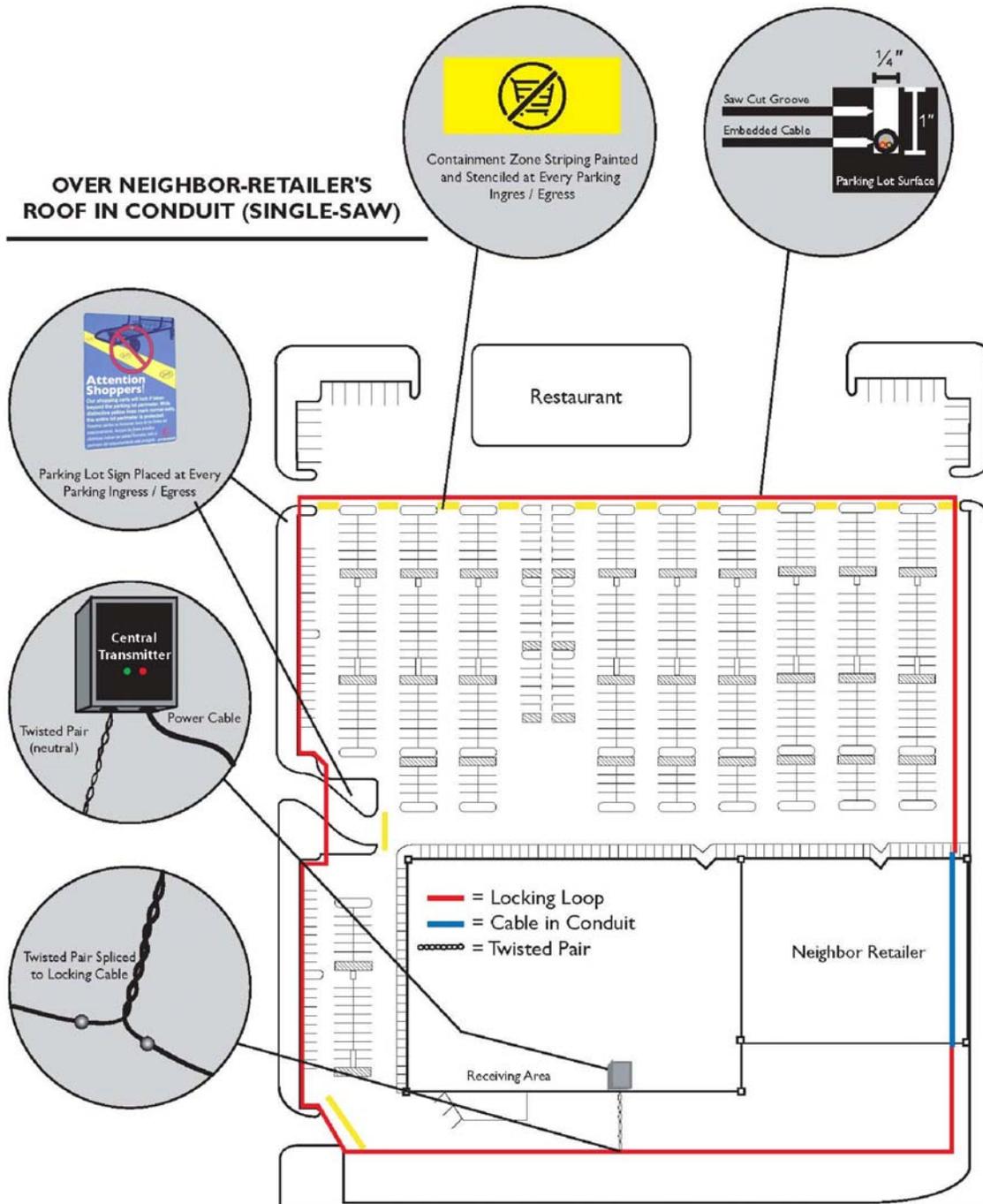
Double Saw Cut

A double saw cut system is used when a single continuous loop is not possible, usually because the area at the back of the building is not accessible for antenna installation. This method is more work intensive, but avoids conduit running over the top of the building.



Single Locking Loop - Over Roof

Installation of antenna in conduit over a roof can be used when an otherwise simple single perimeter line is interrupted by an attached or neighboring building.



Site Survey Checklist

SITE INFORMATION

Store Name / No:		Survey Date:	
Street Address:		Survey Taker:	
City / State / Zip Code :		New Construction:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Store Phone:		Parking Lot:	<input type="checkbox"/> Paved <input type="checkbox"/> Dirt
Store Director:		Est. Completion Date of Construction:	

SYSTEM CONFIGURATION

Antenna Layout:	<input type="checkbox"/> Loop <input type="checkbox"/> Double <input type="checkbox"/> Lock Box <input type="checkbox"/> Over Roof		Asphalt Footage:	
Transmitter:	<input type="checkbox"/> Receiving <input type="checkbox"/> Office <input type="checkbox"/> Front of Store		Concrete Footage:	
# of Signs:		# of Sign Posts:	Landscape Footage:	
Locking Line:		Twisted Pair:	Conduit: Footage	
# of Stripes:		Avg. Stripe LF:	Total Antenna LF:	

SITE COMMENTS

A site plan indicating the antenna layout, with locking line and twisted pair clearly identified, transmitter location, key site measurements, sign locations, sign posts required, and striping locations must accompany this site survey.

4 Installation

Overview

Installation of the GS² System will require two to three field service technicians and may take up to four days, depending on the size of the installation, site availability and weather.

It is recommended that work begin as early in the day as possible, while customer activity is light and the parking lot is fairly empty. Prior to the day of installation, you will need to verify with your site contact when you can begin your work.

This chapter contains the following sections:

- Required tools and materials
- Arriving on site
- Confirming the CentralTransmitter location
- Marking the antenna path
- Saw cutting the marked area
- Removing saw cut residue
- Installing the perimeter antenna
- Splicing the antenna
- Sealing the saw cut
- Mounting the CentralTransmitter
- CentralTransmitter front panel
- CentralTransmitter main circuit board
- Connecting electrical power to the CentralTransmitter
- Calibrating the CentralTransmitter
- Selecting the transmitter mode
- Connecting the alarm relays
- Information tracker
- Perimeter striping
- Installing the parking lot signs
- Installing the tilt bars
- Installing the GS² wheel
- Installing the cart mounted signs

Required Tools and Materials

The following table lists the tools and materials that are required for a standard GS² installation. You may need additional items, depending on the specific needs of your installation.

Item	Task / Purpose
Truck or van capable of transporting a self propelled concrete saw.	Moving material and equipment to installation site.
Measuring wheel	Measure the total footage of the Perimeter Antenna
Caution tape	Blocking off the work area
Traffic cones	Blocking off the work area
Chalk line/string and paint	Indicating antenna path for saw cutter
Self propelled concrete saw	Installing antenna
¼" saw blade	Cutting asphalt and/or concrete
Concrete/asphalt hand saw	Cutting asphalt and/or concrete
Hilti saw w/ roller plate attachment	Cutting indoor loops
4 ½" angle grinder	Fine saw cuts at corners or bends
Electric or cordless impact wrench	Installing GS ² Wheel
Wet/Dry vacuum	Cleaning out a wet saw cut
Power sweeper	Cleaning up debris from a dry saw cut
Wire caddy or dispenser	Rolling out Perimeter Antenna wire
Gatekeeper cleaning hook	Cleaning out the saw cut
Gatekeeper antenna roller	Rolling the antenna into the saw cut
Drill with roto-hammer option	Curb and wall penetrations
Assorted drill bits	Standard and mason bits
Conduit bender	½" EMT conduit
Fish tape	Pulling antenna through conduit
Pour pot (Type 1 or 2)	Applying asphalt sealer
V-squeegee	Removing excess sealer
1 large and 1 small caulking gun	Sealing concrete areas
6' step ladder	Installing Central Transmitter and Parking Lot Signs
Extension ladder	Conduit risers and roof work
Electrical generator (1850 watt minimum)	Supply A/C to hand tools
Portable propane soldering torch	Performing antenna splices
Scotchkote Electrical Coating	Coat the antenna splices before the shrink tube
Shrink tubing	Performing antenna splices
Electrical multi-meter	Measuring resistance within the Perimeter Antenna
Wire cutters/strippers	Antenna splices and terminations
Shovels, different sizes	Installing antenna into garden areas
Pick	Installing antenna into garden areas

Item	Task / Purpose
9" paint roller with ¾" NAP	Painting Perimeter Striping
Respirator (2 pair)	Safety equipment for saw cutting
Safety glasses (2 pair)	Safety equipment for saw-cutting and drilling
Ear protection (2 pair)	Safety equipment for saw cutting
Kleen Sweep 27	Push sweeper for cleaning up saw cut residue Approved providers: Minuteman International
Leaf blower	Cleaning fine dust from saw-cut after a dry cut
14 AWG single conductor antenna	Locking loop antenna Approved providers: Beldin, Coleman
14 AWG two conductor antenna	Twisted pair antenna (null signal) Approved providers: Beldin
½" rigid conduit	Antenna runs up buildings
½" EMT conduit	Antenna runs up buildings
Conduit straps	Antenna runs up buildings
Conduit LBs	Antenna runs up buildings
Concrete sealer	Self leveling concrete sealant Approved providers: Quikrete, SikaFlex
Asphalt sealer	Cold pour asphalt sealant Approved providers: Craftco (Tri-American), SealMaster
Traffic Paint	Perimeter striping Approved providers: Gliden Ultra-Hide Durus Acrylic Traffic Paint (Lot# GL-0087)

Arriving On Site

Telephone the store management (if the store is operational) or construction site supervisor (for a store still under construction) several days before the installation and inform them of your planned installation dates, start time, and scope of work. If possible, get the name of a specific person to contact when you get to the site. On arrival, check in with your contact person. Introduce yourself and be sure that they understand the scope of the planned work, when you want to begin, and about how long you expect to be on site. Be open to suggestions on how to minimize impact to store operations or construction schedules.

Confirming the CentralTransmitter Location

Confirm the location of the CentralTransmitter as indicated on your site plan. Verify that you have access to a 110 volt AC power supply (outlet or hardwired) and determine the location and accessibility of the circuit breaker that energizes the line.

Determine how you will route the perimeter antenna from the CT to the outside of the building. Ideally, the antenna should be enclosed in rigid conduit from the CentralTransmitter, down the inner wall of the store to the floor. A hole is drilled in the wall and the conduit is routed through to the base of the exterior wall.

If ground level penetration from the inside of the store is not possible, than you should penetrate the building wall from the interior, at the height of the CentralTransmitter, and route the antenna down the exterior wall in rigid conduit. For more information on running antenna through conduit, see page 23.

Marking the Antenna Path

Use a chalk line or spray paint to mark the path of the saw cut prior to cutting. Mark your lines exactly as you want the cut to be performed. This will help the saw cutter in making a straight saw cut. Make 45° angles through any 90° turns. You should NEVER make a 90° bend with the antenna, as it may cause the locking signal to be transmitted in a sporadic pattern at the 90° bend. It is helpful to mark off all areas requiring saw cutting with yellow caution tape or traffic cones. If you are beginning early in the morning, you might consider instructing one member of the installation team to begin striping the parking lot at this time. The most convenient time to stripe the lot is at the beginning of the day, before cars have begun to enter the parking lot. This will require a minimum crew of two technicians: one saw cutter and one to begin the perimeter striping.

