
**SAN DIEGO GAS & ELECTRIC COMPANY
SOUTH BAY SUBSTATION RELOCATION PROJECT
RAPTOR PERCH DETERRENT PLAN**

**PREPARED
SEPTEMBER 5, 2014**



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1 – INTRODUCTION

This Raptor Perch Deterrent Plan (Plan) describes the measures that will be taken by San Diego Gas & Electric Company (SDG&E) to discourage raptors from landing on certain South Bay Substation Relocation Project (Project) components and potentially preying on special-status avian species in the area. The Project is located in Chula Vista, California, and involves the following:

- construction of a new 230/69/12 kilovolt (kV) Bay Boulevard Substation;
- construction of a 230 kV loop-in, including underground and overhead interconnections;
- relocation of six overhead 69 kV transmission lines;
- extension of a 138 kV transmission line via overhead and underground configurations;
- demolition of the existing South Bay Substation; and
- wetland restoration activities at the D Street Fill Site.

This Plan was prepared in accordance with Mitigation Measure (MM) BIO-9 of the Mitigation Monitoring, Compliance, and Reporting Program (MMCRP) for the Project and Special Condition 4 (CDP-04) of the California Coastal Commission Coastal Development Permit (CDP) for the Project.

2 – OBJECTIVE

This Plan provides a description of methods that will be implemented to discourage raptors from using Project structures as hunting perches for preying on special-status species at the San Diego Bay National Wildlife Refuge (SDBNWR), such as western snowy plover (*Charadrius alexandrinus nivosus*) and least tern (*Sternula antillarum*) (CPUC 2013). The Plan provides specific information for implementing MM BIO-9 and CDP-04, identifies structures that will be equipped with raptor deterrents, and describes the approach for inspecting and maintaining the condition of deterrent devices used for the Project. This Plan was developed to directly meet the Project mitigation requirements; it also provides Project-specific methods that may require adaptation during Project construction or operation of the facilities. Therefore, this document is adaptive and can be modified accordingly during construction or operation.

3 – MMCRP AND CDP MITIGATION REQUIREMENTS

3.0 MM BIO-9

“SDG&E shall install sufficient raptor perch deterrent devices (on the top of project components including buildings, structures, steel poles, and the lattice communication tower to discourage raptors from landing on the surface and potentially preying on special-status wildlife species in

the area. The condition of the raptor perch deterrent devices will be monitored on at least an annual basis and replaced if missing or showing signs of wear.”¹

3.1 CDP-04

“Prior to construction, SDG&E shall submit a Raptor Deterrent Plan for review and approval by the Executive Director. This plan shall include practices, substation design elements and additional methods or equipment to discourage raptors from landing on substation surfaces and potentially preying on special-status avian wildlife species in the area. These methods may include installation of raptor perch deterrent devices on the top of project components including buildings, structures, steel poles, and the proposed new lattice communication tower. The plan shall also include monitoring and maintenance protocols.”¹

4 – PLAN IMPLEMENTATION

4.0 PROJECT DESIGN REVIEW

SDG&E conducted a review of the Project design elements as well as the existing structures/facilities in the immediate area that will remain or will be removed due to the construction of the approved Project. Through this review, new and existing Project structures that may benefit from the use of perch deterrents have been identified.

Numerous existing structures and habitat in the vicinity currently provide predatory raptor perching opportunities, and are depicted in Figure 1: Existing Overhead Components in Attachment A: Figures. The eastern portion of the Project site includes an existing north-south running transmission corridor that contains 230 kV, 138 kV, and 69 kV circuits comprised of wood/steel monopoles and lattice structures. In addition, there is a 12 kV circuit located immediately east of the site, parallel to Bay Boulevard. Two stands of eucalyptus woodland occur immediately east of the South Bay Substation and hedgerows of eucalyptus and ornamental vegetation occur in the eastern portions of the Project site. The existing South Bay Substation, which is still in operation, comprises the westernmost portion of the Project. Just west of the existing South Bay Substation is the former South Bay Power Plant site.

Potential impacts from new raptor perching opportunities are minimized because the Project will remove several existing artificial perching surfaces during construction. The existing South Bay Substation will be decommissioned and demolished, which includes removal of all above-grade components, including both 138 kV and 69 kV transmission equipment. A total of seven new steel poles will be added. However, the Project will result in a net decrease of approximately 10 existing transmission and distribution poles that are potential raptor perches. The following structures will be removed and added, as shown in Figure 1: Existing Overhead Components, Figure 2: Proposed Overhead Components, and Figure 3: Overhead Components to be Removed and Installed in Attachment A: Figures:

¹ The Proponent’s Environmental Assessment (PEA; SDG&E 2010) and Final Environmental Impact Report (CPUC 2013) identify a lattice communication tower, which has been refined and will be a monopole structure; thus reducing perching opportunities.

- The Bay Boulevard Substation site includes installation of an approximately 65 feet tall (or less) microwave communications monopole.
- The 230 kV loop-in includes removal of a 165 feet tall steel cable pole riser, and installation of a new approximately 121 feet tall steel angle pole.
- The 138 kV extension includes removal of five steel lattice structures that measure 85 to 100 feet tall, and installation of a new approximately 165 feet tall steel cable pole riser.
- The 69 kV relocation includes removal of 23 wood transmission poles, installation of 18 new wood transmission poles, and replacement of 22 wood transmission poles. It also includes removal of six stub wood poles and one 12 kV wood distribution pole, and construction of five new 69 kV steel cable pole risers.

The Bay Boulevard Substation is located further from the San Diego Bay and natural salt marsh habitat than the existing South Bay Substation. Additionally, all new pole structures, with the exception of the communications monopole, are located in the eastern portion of the Project area. The communications monopole, located within the Bay Boulevard Substation, is the tallest structure within the substation footprint and is located approximately 440 feet east of the salt crystallizer ponds and the SDBNWR.² The closest new transmission pole (a 69 kV steel cable pole riser) is over 500 feet east of the salt crystallizer ponds and the SDBNWR. Construction of this Project will result in fewer artificial perches within the Project area overall, and raptor use of the area is not anticipated to change as a result of the Project.

4.1 STRUCTURES TARGETED FOR DETERRENTS

As described in Section 4.0 Project Design Review, the Project has been designed so that the net number of artificially provided potential perch advantages (i.e., transmission and distribution poles) will decrease, and therefore raptor predation pressure and threats to special-status prey species will not increase as a result of the Project. Additionally, all new poles, with the exception of the communications monopole, are located in the eastern portion of the Project area, away from the SDBNWR, special-status birds and their habitat. To further minimize the threat from perching raptors, SDG&E, in coordination with the SDBNWR, has identified additional methods, described in Sections 4.1, 4.2, 4.4, and 4.5, to discourage raptor use of artificial perches in the Project vicinity.

SDG&E will install deterrent devices on taller elements of the Project. In order to meet the mitigation requirements while avoiding undue grid reliability threats and outages, bird electrocution and other hazards, and worker and public safety risks, SDG&E will install deterrents on the pole top of the communications monopole, new 230 kV steel angle pole, existing 230 kV steel dead-end pole, new 138 kV steel cable pole riser, and three 69 kV steel cable pole risers. No new wooden poles will be equipped with deterrents because wooden poles on site are reduced in number overall by the Project, and are shorter and located further east (away from the SDBNWR) than the steel structures. Installation of deterrents on other substation components would be ineffective or unnecessary due to their location or architecture.

² SDG&E relocated the communications monopole further east within the substation footprint in the final Project design, based on feedback from the National Audubon Society and SDBNWR.

In some cases they would present a public/worker safety hazard and a potential hazard for raptors and other birds. Thus, deterrents will be installed on seven new and existing steel poles as shown on Table 1. Perching Deterrent Placement on Project Structures. These poles comprise the taller, westernmost Project components that offer the best SDBNWR vantage points for perching raptors. The locations of these components relative to the Project and other area features are depicted in Figure 2: Proposed Overhead Components in Attachment A: Figures. The overhead structures that will be removed or installed as part of the Project, along with all poles that are targeted for deterrents are depicted in Figure 3: Overhead Components to be Removed and Installed in Attachment A: Figures.

Table 1. Perching Deterrent Placement on Project Structures³

| ID Number⁴ | Construction Action | Type | Transmission Line |
|------------------------------|----------------------------|-------------------------|--------------------------|
| 0 | Install | 69 kV Steel Riser | 646/647 |
| 2 | No Action (Remain) | 230 kV Dead-End | 23042 |
| 24 | Install | 138 kV Steel Riser | 13515 |
| 200 | Install | 69 kV Steel Riser | 641 |
| 201 | Install | 69 kV Steel Riser | 642 |
| 202 | Install | 230 kV Steel Dead-end | 23042 |
| - | Install | Communications Monopole | Not Applicable |

4.2 DETERRENT METHODS

SDG&E has identified the Prommel Enterprises *Zena Pole Cap* (Zena Cone) and Bird-B-Gone *Bird Spider* and *Bird Spikes* as the preferred perching deterrent devices for the Project (see Attachment B: Perch Deterrent Information Sheets). The Bird Spider and Bird Spikes are made of stainless steel arms or spikes attached to an ultraviolet- (UV) protected polycarbonate base, and have features that make them preferred alternatives for some transmission structures. Zena products are made from UV-protected proprietary high-density long-life black polyethylene. Where perch management has been investigated with respect to predation, Slater and Smith (2008) reported that perch management tended to be more effective when pole-cap deterrents were installed on a transmission line, and raptor perch-deterrent devices similar to these have been shown to reduce raptor use when installed on new transmission structures (Oles 2007; Slater and Smith 2008). To discourage raptors from using the top of vertical poles as perches, Zena Cone, Bird Spider, Bird Spikes, or similar deterrents will be installed on the tops of the steel poles identified in Table 1. Perching Deterrent Placement on Project Structures.

Use of this perch-deterrent design on overhead utility structures is intended to reduce perching time for large-sized avian predators. SDG&E recognizes that there is ongoing research in the use of perching deterrents. The methods used may be modified accordingly during construction or

³ Pole ID numbers are provided as referenced in Attachment 3-E of the PEA (SDG&E 2010).

⁴ ID numbers are as referenced from Attachment 3-E of the PEA (SDG&E 2010).

operation. Modifications could be made based on evaluation of the current raptor threat to special status bird species, recommendations based on biological considerations, advances in technology, resource agency request, or as necessary based on other special circumstances. These adaptive measures may include retrofitting support poles with alternative deterrent methods or changing the structures targeted for deterrents.

4.3 INSPECTION AND MAINTENANCE

SDG&E will conduct monitoring and maintenance of Project components, and will identify and replace perch deterrents if missing or showing signs of wear. SDG&E has developed and implemented a Maintenance Practice, which sets forth SDG&E's procedures for the inspection and maintenance of its transmission system. During the ongoing operational and maintenance phase of the Project, SDG&E will inspect and maintain the transmission structures in accordance with operational procedures. SDG&E's inspection procedures include annual inspection of transmission structures for signs of raptor use and for facilities in need of maintenance or repair. Consistent with MM BIO-9 and CDP-04, SDG&E will identify damaged raptor deterrents during routine annual inspections and repair or replace them as necessary. SDG&E Maintenance Practice is filed with the California Public Utility Commission (CPUC) and other agencies, and the CPUC conducts an annual review of transmission inspection records with field verification.

4.4 SDBNWR PREDATOR MANAGEMENT

The U.S. Fish and Wildlife Service (USFWS) conducts predator management at the SDBNWR. Predator monitoring on the SDBNWR is conducted annually during the nesting season to provide current data regarding the presence of predators within the vicinity of nesting colonies and to document and address incidents of predation within the colony (USFWS 2006a). Avian predators in the vicinity of the Project that are identified by SDBNWR as a known and immediate threat to special status species will be controlled pursuant to the SDBNWR predator management plan. Under the predator management plan, USFWS will control raptors when they pose a threat to endangered species, as determined by the Refuge Manager, the Refuge Biologist, or a qualified predator control contractor. Specific control methods are conducted in accordance with Federal and State regulations and are discussed in detail in the predator management plan (USFWS 2006b).

4.5 ADAPTIVE MANAGEMENT

Although some perch deterrents appear to be effective, the best available science is inconclusive overall, with no data available comparing the relative effectiveness of various recently developed perch deterrents (Dwyer and Doloughan 2014). It is expected that technology and innovation will provide improved methods to minimize raptor perching on artificial structures. Design standards and utility infrastructure also change over time. It is important that changing technology and utility needs, as well as changes in the existing and surrounding environment, be addressed and accounted for in adaptive management of the site and the commitment for minimization of raptor perching opportunities. SDG&E will use this adaptive management approach to make critical decisions during operation and maintenance of the new Bay Boulevard Substation. SDG&E will confer with resource agencies and their specialists, as needed, when/if changes or upgrades in electric components or structures become necessary, or if the primary

objective of minimizing raptor perching opportunities can be accomplished with other more advanced or efficient methods as they become available.

REFERENCES

- CPUC (California Public Utilities Commission). 2013. Final Environmental Impact Report for the South Bay Substation Relocation Project. Prepared by Dudek. April.
- Dwyer, J. F. and K. W. Doloughan. 2014. Testing systems of avian perch deterrents on electric power distribution poles in sage-brush habitat. *Human–Wildlife Interactions* 8(1):39–55, Spring.
- Oles. 2007. “Effectiveness of Raptor Perch-Deterrent Devices on Power Poles for Reducing Secondary Effects on Prey Species.” Resource Note No. 84: 1–2. March 23.
- Slater, S. J., and J. P. Smith. 2008. Effectiveness of raptor perch deterrents on an electrical transmission line of southwestern Wyoming. Final report prepared for U. S. Department of Interior, Bureau of Land Management, Kemmerer Field Office. Hawkwatch International, Inc., Salt Lake City, Utah.
- SDG&E (San Diego Gas & Electric). 2010. Proponent’s Environmental Assessment for the South Bay Substation Relocation Project. Prepared by Insignia Environmental. June.
- USFWS (U.S. Fish and Wildlife Service). 2006a. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, Comprehensive Conservation Plan and Environmental Impact Statement, Volumes I and II. August.
- USFWS. 2006b. Final Predator Management Plan, San Diego Bay National Wildlife Refuge (Sweetwater Marsh and South San Diego Bay Units). Appendix M in Comprehensive Conservation Plan and Environmental Impact Statement, Volume II. August.

ATTACHMENT A: FIGURES

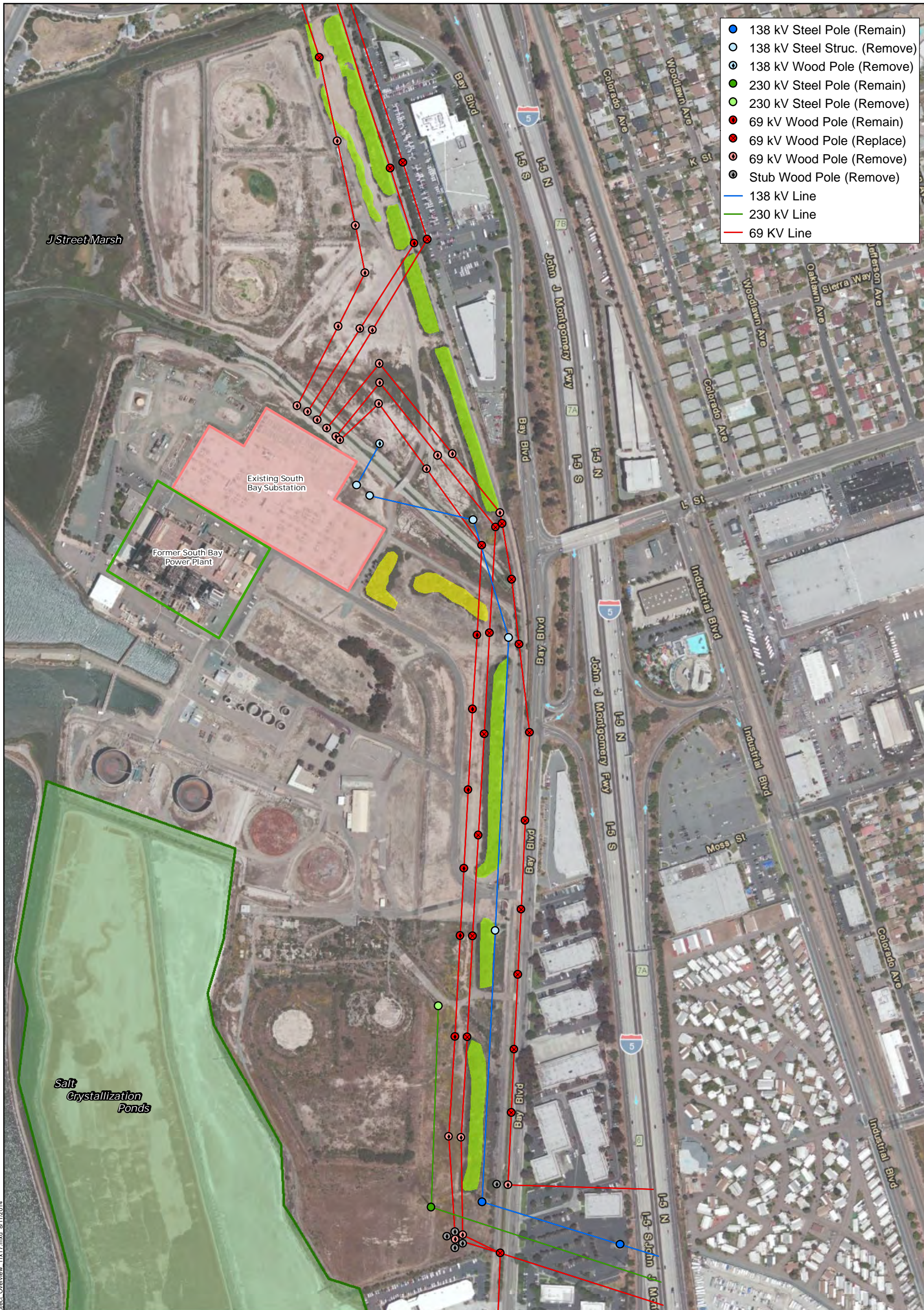
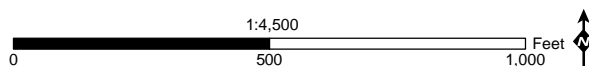


Figure 1: Existing Overhead Components

South Bay Substation Relocation Project

- Existing South Bay Substation
- Former South Bay Power Plant
- San Diego Bay National Wildlife Refuge
- Ornamental vegetation
- Eucalyptus Woodland





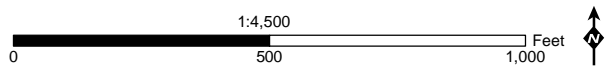
- 138 kV Steel Pole (Existing)
- 138 kV Steel Pole (New)
- 230 kV Steel Pole (Existing)
- 230 kV Steel Pole (New)
- 69 kV Wood Pole (Existing)
- 69 kV Wood Pole (Replace)
- 69 kV Wood Pole (New)
- 69 kV Steel Pole (New)
- 230 kV Line
- 138 kV Line
- 69 kV Line

Figure 2: Proposed Overhead Components

South Bay Substation Relocation Project

- ▭ Proposed Bay Boulevard Substation Site
- ▭ San Diego Bay National Wildlife Refuge
- ▭ SDGE&E Parcel Boundary
- ▭ Ornamental vegetation
- ▭ Eucalyptus Woodland

*Approximate location.



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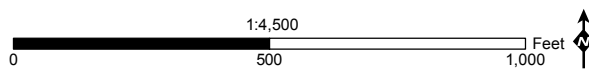
- 230 kV Steel Pole (New)*
- 138 kV Steel Pole (New)
- 69 kV Steel/Wood Pole (New)
- ⊗ 138 kV Pole (Remove)
- ⊗ 230 kV Steel Pole (Remove)
- ⊗ 69 kV Wood Pole (Remove)
- ⊗ Stub Wood Pole (Remove)
- ▶ Deterrent Installation

Figure 3: Overhead Components to be Removed and Installed

South Bay Substation Relocation Project

- ▭ Existing South Bay Substation
- ▭ Former South Bay Power Plant
- ▭ San Diego Bay National Wildlife Refuge
- ▭ Ornamental vegetation
- ▭ Eucalyptus Woodland

*Pole #2 is an existing structure
 †Approximate location.



ATTACHMENT B: PERCH DETERRENT INFORMATION SHEETS



The Zena Cone

Data Sheet

Application

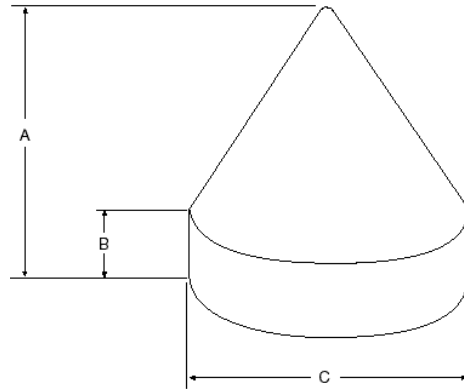
The Zena Cone mounts on wooden, steel or composite poles in minutes, using stainless steel straps or bolts. Molded from proprietary high-density long-life black polyethylene, the cone delivers economical and effective protection from birds and the weather.

Description

The Zena Cone prevents birds from perching on top of round tubular and solid poles.

Benefits

- > Transmission & Distribution operators reduce outages from flashovers and electrocutions,
- > Telecommunication operators reduce bird-related maintenance on communication towers,
- > Airport operators reduce strike risk and improve lighting and navigation equipment reliability.



Features

Designed specifically for raptors and larger birds, the Zena Cone:

- > Discourages perching and nesting,
- > Is bird safe and environmentally friendly,
- > Installs quickly, reducing downtime,
- > Has excellent self-washing characteristics,
- > Protects poles of different diameters.

For More Information

To learn more about how our products could help your organization, please contact us.

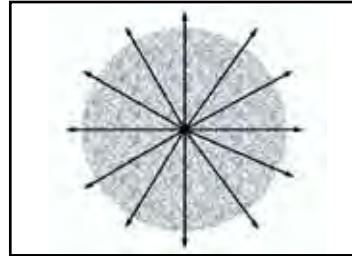
Call: (970) 663-3980 **Fax:** (970) 663-3972
Email: info@zenadesign.com
Visit: www.zenadesign.com

| Catalog Number | Nominal Dimension (inches) | | |
|----------------|----------------------------|---|--------------|
| | A | B | C (inside Ø) |
| ZRP 3011 | 9 | 4 | 6 ¾ |
| ZRP 3012 | 9 ½ | 4 | 7 ¼ |
| ZRP 3025 | 9 5/8 | 4 | 8 |
| ZRP 3013 | 9 5/8 | 4 | 8 3/8 |
| ZRP 3014 | 10 3/8 | 4 | 9 1/2 |
| ZRP 3026 | 11 | 4 | 10 |
| ZRP 3015 | 11 | 4 | 10 1/4 |
| ZRP 3016 | 12 3/8 | 4 | 11 3/4 |
| ZRP 3017 | 12 1/8 | 4 | 12 |
| ZRP 3024 | 13 1/4 | 4 | 13 |
| ZRP 3018 | 14 | 4 | 14 |
| ZRP 3019 | 15 1/4 | 4 | 15 7/8 |
| ZRP 3020 | 17 | 4 | 18 3/8 |
| ZRP 3021 | 18 1/2 | 4 | 20 3/8 |
| ZRP 3022 | 20 | 4 | 22 3/8 |
| ZRP 3023 | 21 1/2 | 4 | 24 1/2 |

Nominal wall thickness 0.125 inches

INSTALLATION INSTRUCTIONS FOR BIRD•B•GONE BIRD SPIDER

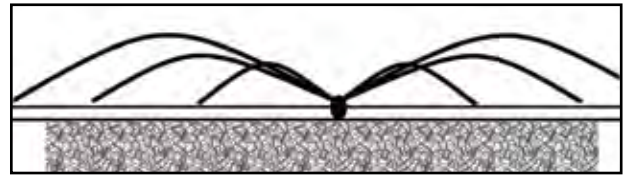
- 1.** Ensure mounting surface is clean of bird feces and debris before installing any bird deterrent, including the Bird Spider.
- Use Bird-B-Gone Disinfectant or appropriate disinfectant to prepare the surface.



Bird Spider Arm "tips" should overhang mounting surface by at least 2".

- 2.** Select the appropriate Bird Spider (4' or 8') depending on the surface of coverage.
- It is important that the "tips" of the arms extend several inches over the outside surface(s).

- 4.** Bird Spider Arm Tips Should be no more than 2-3" above mounting surface.



- 3.** Stainless Steel arms must have room to move with the air.
- Do not mount Bird Spider in an area where the arms will be suppressed from movement or blocked by walls.

- 5.** If the Bird Spider requires gluing for the installation, the PVC adapter must be used.

- **DO NOT GLUE THE BOTTOM OF THE BASE UNIT WITHOUT INSTALLING THE PVC BASE.**
- Use Bird-B-Gone Adhesives, available direct from Bird-B-Gone

BOAT ADAPTATION:

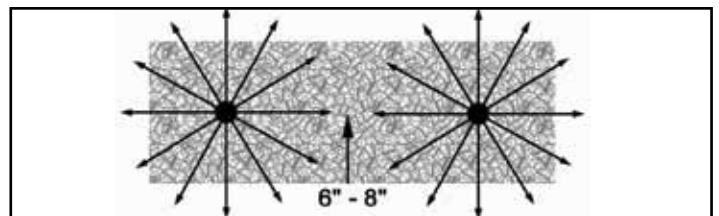
Bird Spider Boat Base:

- Attach the Bird Spider Base directly to the Boat Base with the screws supplied.
 - **Do not mount onto the PVC supplied attachment first.**
- Each of the four "corners" of the Bird Spider Boat Base has holes.
- This makes it easy to "bungee" or tie down the base to the canopy top, cover, etc. ... and also allows for easy removal of this ideal boat protective device!

Bird Spider Sandbag Base:

- Use the Sandbag Base on Boats where the Bird Spider Boat Base is not appropriate (i.e. Bimini Tops and larger areas).
- Attach the Bird Spider Base directly to the Sandbag Base with the screws supplied with Sandbag Base. Follow instructions supplied with screws. **(Screws used for the PVC attachment will not work with the Sandbag Base.)**
 - Do not mount onto the PVC supplied attachment first
- Although the Bird Spider Sandbag Base is weighted, it should always be secured to the boat.
- High winds or extreme shifts in weather could remove the Sand Bag Base and cause damage if it is not properly secured.

- 6.** If installing more than one Bird Spider in a row, be sure that they are installed 6-8" from arm tip-to-arm tip (not base-to-base).



Any Questions Regarding
Bird Spider Installation:
Call **1-800-392-6915**

Bird•B•Gone, Inc.

Ph. 949-472-3122

FAX: 949-472-3116

Email: nobirds@birdbgone.com

www.birdbgone.com





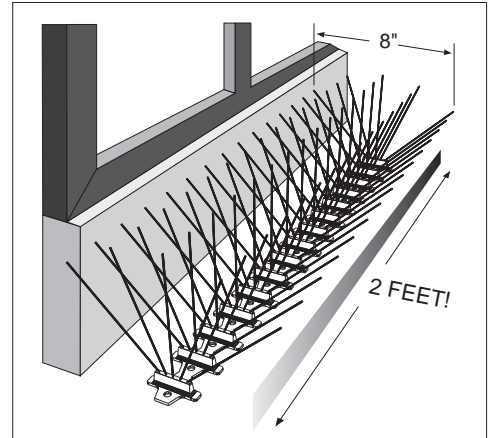
BIRD•B•GONE INC.

BIRD SPIKE 2001™ stainless steel spike system

Features

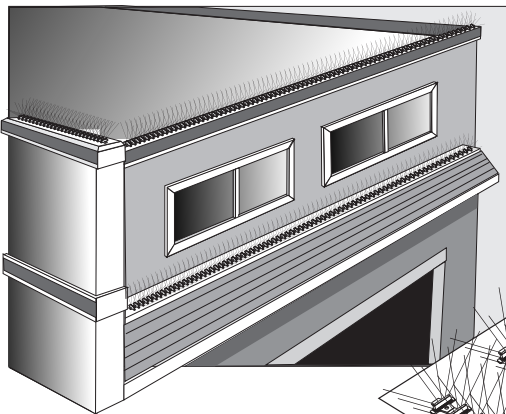
Bird Spike 2001™ is the most effective, permanent protection against bird landings. It is constructed of 316 Stainless Steel spikes, manufactured into a U.V. protected polycarbonate base. Bird Spike 2001's patent pending design provides extra strength and stability, and unlike other spike products, it will not rust or deteriorate under extreme conditions. Bird Spike 2001 has an industry leading 10 YEAR GUARANTEE, and is available in 3", 5" and 8" widths - the widest coverage on ANY spike product available.

- Bird Pressure:** Light, Medium, and Heavy.
- Bird Type:** Repels all birds, including pigeons, seagulls and larger species.
- Packaging:** Bird Spike 2001 is packaged 50 ft. per carton (25 - 2ft. sections/box). Each carton is 25" x 15" x 10".



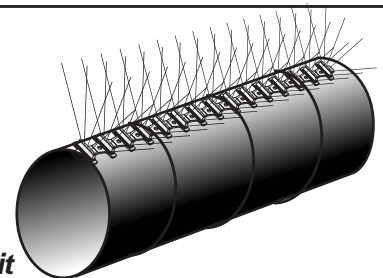
Applications

Bird-B-Gone Spike 2001 is a versatile system that can be easily installed where any bird can roost.



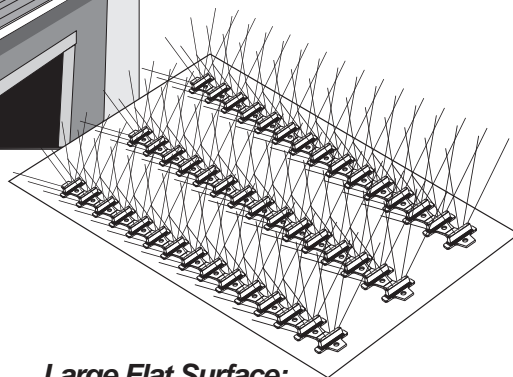
Ledges:

To prevent pest birds from congregating and nesting on ledges, sills, roof tops, etc. Installing Bird Spike 2001 will stop birds from creating unsightly messes and health problems.



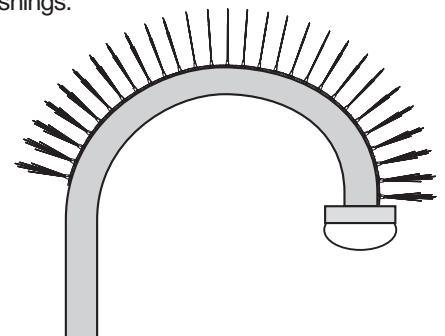
Conduit

Spike 2001 can be attached to wires, conduit, gutters, and pipes by using common hose clamps, Nylon ties or wire lashings.



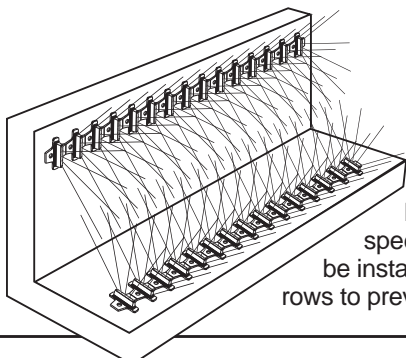
Large Flat Surface:

Bird Spike 2001 can be installed in multiple rows for a wide area of coverage.



Curved Surfaces:

Spike 2001 is so flexible that it can bend **360 degrees** without breaking. Install Bird Spike 2001 on all curved surfaces such as lampposts, signs, letters, etc. by using adhesive with nylon ties, hose clamps, etc.



Nesting Areas:

Because pigeons and other birds will nest in a specific area for generations, Bird Spike 2001 can be installed using interwoven vertical and horizontal rows to prevent nesting or roosting.

IMPORTANT! Observe all Cautions and Warnings listed in instructions prior to installation. See reverse side.