

Special Specification 5127

Bat Exclusion System



1. DESCRIPTION

Furnish, install, maintain, and replace Bat Exclusion Systems (BES) onto structures including bridges and culverts to prevent the roosting or return of roosting bats. BES also provides an efficient and humane method of evicting bats from existing roosts. The BES will be installed in accordance with the Engineer's specifications and perform work in a manner to prevent impacts to bats to facilitate project construction and to comply with additional applicable federal, state, and local regulations. This Item will govern the furnishing of all labor, equipment, and materials necessary to complete this work at the locations as shown on the plans or as approved.

2. MATERIALS

- 2.1. **Polypropylene Plastic Netting.** Mesh size of 1/10 in. (2.4 mm) minimum to 1/6 in. (4 mm) maximum.
- 2.2. **PVC or PE Pipe.** 2 in. (54 mm) diameter, smooth, unperforated piping.
- 2.3. **Flat Pipe Flange.**
- 2.4. **Caulk.** Non-toxic concrete and masonry silicone caulking.
- 2.5. **Duct Tape.** 2 in.

3. QUALIFICATIONS, TRAINING, AND EMPLOYEE REQUIREMENTS

All work should be performed under the supervision of a qualified scientist permitted to handle bats. Bats observed onsite should not be handled or harassed, except by a permitted scientist.

4. CONSTRUCTION

- 4.1. **Contractor Responsibility.** Take reasonable action to protect any bats or birds that may be present on the structure at the time of installation by following all the Department's requirements as outlined in this Item and the Engineer's specifications on the plan set.
- 4.2. **Implementation.** The Contractor Responsible Person for environmental compliance (CRPE) or alternate CRPE must be accessible by phone and able to respond to project-related environmental emergencies.
- 4.3. **Commencement.** BES should be installed outside the bat maternity season as specified on the plans. BES should be installed as soon as practicable during structure construction. Any adjustments to BES to meet field conditions must be approved and incorporated into the plans before implementation.
- 4.4. **Installation.** BES should be installed on the open, longitudinal joint under the median barrier running the full length of the structure or as shown on the plans.
 - 4.4.1. Thoroughly fasten edges of exclusion netting with caulk, ensuring that there are no gaps that will permit the passage of the bats.

- 4.4.2. When making a continuous run of netting, butt net ends together and “sandwich” between two strips of 2 in. duct tape running the complete width of net joint and centered on the joint. Thoroughly press the tape to ensure that no gaps are present.
- 4.4.3. Attach flat pipe flange fitting to the pipe according to the pipe supplier's recommendations. Cut an opening in the netting that snugly fits around the pipe flange. Insert the flanged pipe into the opening so that the flat end of the flange rests on the netting.
- 4.4.4. Thoroughly caulk the net to flange overlap to ensure that no gaps are present. The flanged pipe should hang from the net and not be directly attached to the host structure.
- 4.4.5. Thoroughly caulk the net to the host structure to ensure that no gaps are present that could permit the passage of bats and that the bond is adequate to support the weight of the installation and bats that are attempting to leave or re-enter roosts.
- 4.4.6. Place a bat escape pipe adjacent to and inboard of each corner of the drop inlet.
- 4.4.7. Protect other locations adjacent to the joint where BES is installed such as transverse gaps at the abutments, between ends of beams, etc., and other locations as identified by the Engineer that will permit either access to the joint or that will provide an alternate roost as follows: insert compressible material (such as backer rod or foam rubber) into such openings so as to completely block bat access and place caulk along the exposed edges of the installed compressible material to prevent dislodgement. This item is subsidiary to payment for the BES bid item.
- 4.5. **Limitations.** Do not install a bat exclusion system that directly causes harm to bats. Do not install a bat exclusion system during the bat maternity season, from March 15 to August 31. Do not perform work during dusk, the period of waning light from the time of sunset to full dark, during the first seven days after installation is completed.
- 4.6. **Maintenance.** Any damage to the BES, including small holes and large holes in the netting must be repaired the day the damage is observed. When corrections are not made in the established timeframe, all work will cease on the project and time charges will continue while the BES is brought into compliance.
- 4.6.1. **Small Holes.** Holes less than 1 in. in diameter will be repaired using a tape, such as duct tape, with the Engineer's discretion.
- 4.6.2. **Large Holes.** Sections of BES netting or piping with holes 1 in. in diameter or larger must be replaced.
- 4.6.3. **Tape and Caulking.** Any tape or caulking that has been damaged or no longer functions in sealing the netting should be replaced immediately.
- 4.7. **Phasing.** BES must be installed in accordance with phasing requirements as shown on the plans and within the specific timeframe (e.g. outside of bat maternity season).
- 4.8. **Removal.** BES does not need to be removed before demolition of host structure. BES used in culvert applications can be removed after all other culvertwork is completed. Use a wire brush to clean any caulk remnants from the concrete.

5. INSPECTION

BES inspections will occur as directed by the Department based on species-specific criteria at a minimum weekly. Inspections will be documented as directed by the Department.

Inspections must occur regardless of holidays or “too wet to work” conditions. The only acceptable reason for not completing an inspection is due to weather-related emergency situations (e.g. lightning or flooding).

Inspection personnel must meet the qualifications outlined in Article 5127.3., "Qualifications, Training, and Employee Requirements." A primary and alternate Inspector must be designated for the project.

6. MEASUREMENT

Installation or removal of BES will be measured by the square foot in place and includes the covered openings and required construction overlaps to seal edges.

7. PAYMENT

7.1 **Furnish and Install.** The work performed and materials furnished, in accordance with furnishing and installation of this Item and measured as provided under "Measurement," will be paid for at the unit bid price for "BES (Install)." This price is full compensation for furnishing and operating all materials, tools, equipment, labor, and all incidentals necessary to complete the work, including installation, adjustments as needed during operation, and proper disposal.

7.2 **Remove.** The work performed and materials furnished, in accordance with removal of this Item and measured as provided under "Measurement," will be paid for at the unit price bid for "BES (Remove)." This price is full compensation for all materials, tools, equipment, labor, and all incidentals necessary to complete the work including removal and disposal.

7.3 **Maintenance, Repair, and Replacement.** The work performed and materials furnished, in accordance with maintenance, repair, and replacement of this Item and measured as provided under "Measurement," will be paid for under a Contractor Force Account item from invoice provided to the Engineer.

This price is full compensation for the repair or replacement of damaged BES.