

STATE OF OHIO ONG Pam 200-xx (ARMY/AIR)
ADJUTANT GENERAL'S DEPARTMENT
2825 West Dublin Granville Road
Columbus, Ohio 43235-2789

ONG PAMPHLET
No. 200-xx (Army/Air)

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HOW TO INSPECT FOR AND ADDRESS BED BUGS

Local supplementation of this pamphlet is not permitted.

1. **PURPOSE.** This pamphlet provides information, inspection guidance, and points of contact in dealing with the identification and eradication of *Cimex Lectularius*, more commonly known as bed bugs.
2. **APPLICABILITY.** This pamphlet applies to Ohio National Guard (ONG) units, facilities, Soldiers, Airmen, federal and state employees, and contracted personnel serving or working for the ONG.
3. **REFERENCES.**
 - a. Ohio Department of Health (ODH) Bed Bug Work Group report, prepared by ODH Zoonotic Disease Program, dated January 2011.
 - b. Michigan Department of Community Health (MDCH) Manual for the Prevention and Control of Bed Bugs, produced by MDCH and the Michigan Bed Bug Working Group, dated September 2010.
 - c. *Bed Bug Basics/Fact or Fiction* informational tutorial published by The Ohio State University Department of Entomology, Dr. Susan C. Jones.
 - d. *Bed Bug Identification and Guidelines for Residents*, published by the Central Ohio Bed Bug Task Force.
 - e. *Bed Bugs: Identification, Inspection & Treatment* information Pamphlet published by the Cuyahoga County Bed Bug Task Force.
4. **OBJECTIVES.** The pamphlet objectives are to:

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- a. Serve as a primary reference to help identify bed bugs and bed bug indicators.
- b. Provide realistic, practical guidance on how to treat for and/or eradicate bed bugs from the home, work area, or work storage area(s).
- c. Increase bed bug awareness for the ONG work force through basic bed bug education.

5. **SCOPE.** Bed bug preparedness is crucial for the ONG and its work force. In the past few years, bed bugs have been making a comeback across the United States, and according to several sources, Ohio has more infestations than any other state in the Nation. Although bed bugs are wingless and do not fly, they migrate large distances in search of hosts to feed on. International travel and commerce have facilitated the spread of these insects, however the presence of bed bugs is not indicative of poor personal hygiene issues. Because of their small size and their ability to hide, it is becoming fairly commonplace to find bed bugs in public and private work places. They can be on clothing, personal belongings, and shoes and easily transported into the office. Bed bugs feed only on human or mammal blood, much like mosquitos, extracting blood from their meal source. They feed in three to fifteen minute spans, every five to seven days, when a host is present. Bed bug bites do not cause any known disease, however the bites can cause irritation that could lead to infection.

6. **INSPECTION/PREVENTION.** Eradicating bed bugs is costly, so prevention and early detection are essential. It is highly recommended that agency staff be properly trained to identify bed bugs and their common hiding places. All commonly occupied areas should be routinely inspected. Areas that are not commonly occupied should be inspected periodically as well. Attached to this document, you will find inspection checklists. They may be used at home and should routinely be used at work. It is recommended that for areas used as storage, or not routinely trafficked, the "unoccupied areas checklist" be used to check areas once every three to six months. For areas routinely utilized, the "occupied areas checklist" should be used. It is highly recommended to check routinely used areas every one to three months, or anytime an employee is staying in/occupying a new area or living space that is or has been highly trafficked. This will empower employees to take an active role in preventing bed bugs from entering the premises, as well as properly notifying facilities maintenance staff and/or the supporting base civil engineering squadrons within the agency when a suspected issue arises.

7. **FACT VS. FICTION.** According to Ohio State University's Department of Entomology professor Dr. Susan C. Jones, there are several reasons for the resurgence of bed bugs in the U.S. in the past decade: an increase in international travel and

commerce, high tenant turnover, changes in pesticide use, and insecticide resistance – to name a few. Along with these facts, there are common misconceptions associated with this pest.

a. Bed bugs are only a problem in low income areas. **False!** There is an unnecessary stigma associated with bed bugs. The truth is that bed bugs prefer human blood and they will feed on anyone, regardless of their cleanliness or socio-economic status.

b. Bed bugs carry disease. **False!** There is no conclusive evidence that bed bugs transmit disease, however the bites cause irritation that could lead to infection.

c. Any insecticide will kill bed bugs. **False!** Pesticides and other treatments effective against pests, such as cockroaches, are not necessarily effective against bed bugs. For example, boric acid kills cockroaches. It is ineffective against bed bugs because it is a stomach poison that must be fed upon. (Remember bed bugs only feed on blood).

d. Household aerosol bug bombs meant for flying insects will kill bed bugs. **False!** Bug bombs will not kill the majority of bed bugs in an infested room. These insecticides cause bed bugs to scatter as the bugs attempt to avoid the irritating effect of the spray. The scattering effect from the bug bombs makes the bed bug infestation much worse! **Never use bug bombs for bed bugs!**

e. When dealing with bed bugs, it cannot be stressed enough to deal with the topic matter-of-factly. There is no correlation to poor hygiene, conventional pesticide treatment methods for other insects may not/will not work on bed bugs, etc. Only through fact and education can the issue of bed bugs be properly addressed, and continuously maintained, within our agency.

8. BED BUGS: IDENTIFICATION, PREVENTION, AND ERADICATION.

a. Identification.

(1) What are bed bugs? Bed bugs are parasitic insects. Human blood is their preferred food, but they will feed on rodents, bats, birds, and pets if humans aren't available.

(2) How do bed bugs grow and develop? During its life cycle, a bed bug hatches

from an egg into a nymph (immature) and molts (sheds its old skin) five times before becoming a full sized adult, about the size of an apple seed. Eggs are glued onto a surface by the adult female bed bug. All nymph stages and adults require blood meals.

(3) What do bed bugs look like? Adult bed bugs are small but visible to the naked eye. An adult bed bug is from 1/4 – 3/8 inches long and reddish brown. Bed bugs have an oval shape with a flattened body when unfed; their body becomes swollen after they have fed. The young nymph (immature) that has just hatched from the egg is less than 1/10 inches long, and nearly colorless, but it becomes red after taking a blood meal. See figure 1.

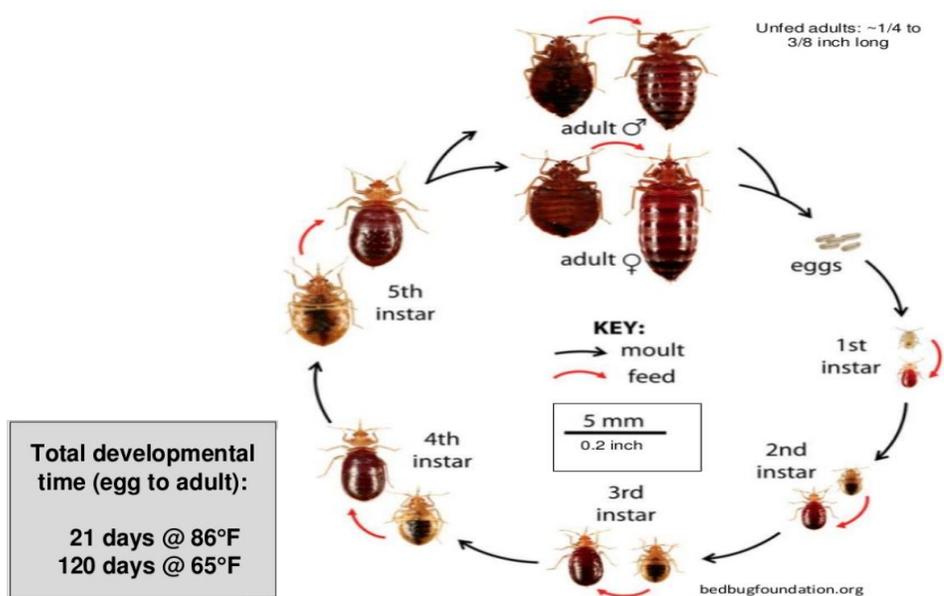


Figure 1 – Bed Bug Life Cycle

(4) How do bed bugs move about? Bed bugs cannot fly, but they can walk very fast and will hitch rides on shoes, clothing, backpacks, etc. Once the bed bugs reach a suitable location, like a bed or chair, they crawl off, hide, and wait for a host. They are able to cling tightly to most surfaces and they can maneuver in very small cracks and crevices.

(5) Where are bed bugs found? **Bed bugs can be found in places that are frequented or occupied by humans.** Bed bugs are most commonly found in dwellings with a high rate of occupant turn over, such as hotels, hostels, dormitories, apartment

complexes, movie theaters, and the like. Bed bugs can also infest private dwellings, airplanes, ships, trains, and busses.

(6) Where do bed bugs hide? Bed bugs will hide in the same small cracks and crevices they move around in. Some common examples are mattresses and box springs, bed frames, dressers, upholstered furniture and other furniture, electrical outlets, carpet tack strips, baseboards, window and door casings, drapery pleats, wall hangings, ceiling moldings, seams in wallpaper, etc. Bed bugs prefer contact with fabric, wood, and paper surfaces – all of which are common in human dwellings. See figure 2.

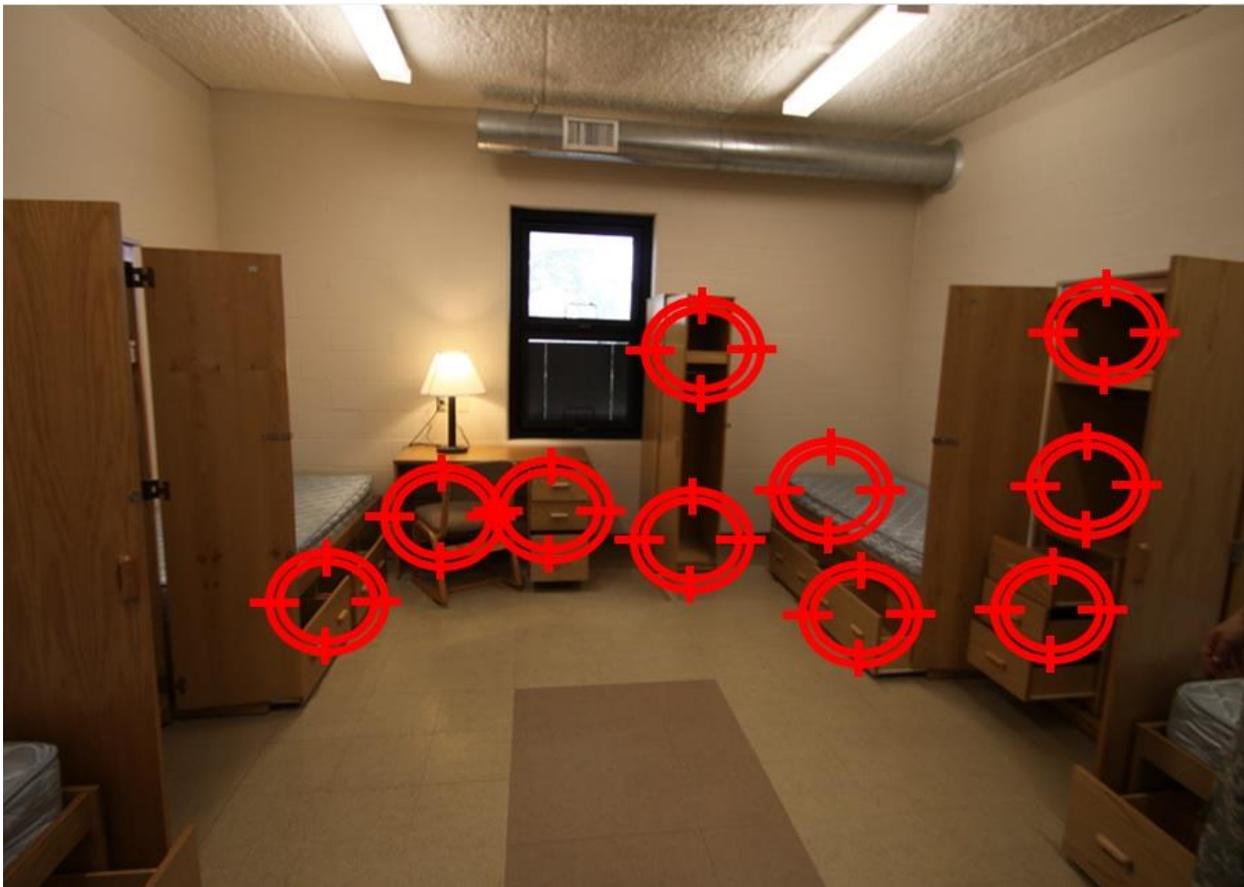


Figure 2 – Common Bed Bug Hiding Places

(7) What are the tell-tale signs of bed bugs? The most obvious sign of bed bugs is small black spots (feces) that are deposited in and near bed bug hiding places. Shed

bed bug skins, egg shells, and live bed bugs also may be found. Blood stains typically occur when a bug is squashed. Itchy red welts may be the result of bed bug bites, but other insects and arthropods and other medical conditions can produce similar bite reactions. It is important to confirm whether the bites were caused by bed bugs by conducting an inspection and finding bed bugs or their evidence. See Figure 3.



Figure 3 – Bed Bug Indicators

(8) When do bed bugs feed? Bed bugs typically bite at night, however, they also can feed during the daytime.

(9) What do bed bug bites look like? Bed bug bite reactions vary from person to person. Humans often exhibit a range of reactions to the bed bug's injected saliva. Some exhibit no reaction whatsoever and others experience a raised itchy red welt at the site of the bite. Bed bug bite reactions often appear as two or more bites in a row. They often occur on exposed areas of the body, such as the face, neck, arms, and shoulders. Bed bug bites may resemble bite reactions caused by other insects and other medical conditions. See figure 4.



Figure 4 – Bed Bug Bites

(10) How do I treat bites? Consult your physician. Anti-itching medications and antibiotic salves that are applied to the skin may be helpful.

b. Prevention.

(1) How are bed bugs spread? Bed bug nymphs and adults are adept crawlers, and they hitchhike from place to place by tucking away in clothing, shoes, backpacks, purses, briefcases, luggage, used furniture, mattresses, bedding, etc. Bed bugs can also spread by laying eggs on these items. Bed bugs can easily crawl to multiple units in a building such as in hotels, dorms, and apartments and spread beyond the site of the initial infestation.

(2) How can I protect myself and my Family from bed bugs? Knowing what to look for can keep you from carrying bed bugs into your home. Be on the lookout for the tell-tale signs of bed bugs when traveling or buying used furniture and bedding and other used items. Here are some tips:

- Leave your purse or backpack at home or in the car when you go to the theater, restaurant, library, or other crowded public places
- If you have to take your purse or backpack with you into a public place avoid putting it down on carpeted or upholstered surfaces if possible
- Don't throw your coat over the backs of upholstered seats, benches, etc. in public places – keep it on, leave it in the car, or put it in your lap if you can
- If you can't avoid putting your personal belongings on upholstered surfaces or carpeted floors, use a high powered light (preferably white) to inspect your things before you get in the car to come home
- Check your luggage thoroughly for hitchhikers before you leave the airport terminal
- Visually inspect the seats in public places, taxis, planes, etc. before you take a seat or put down your purse, laptop case, etc., especially if they are cloth covered seats

(3) You can take steps to greatly reduce your chances of bringing bed bugs home when you travel. When you're getting ready to go:

- Pack very lightly
- Pack your things in tightly sealed plastic bags inside your suitcase
- Pack extra plastic bags for any items you might purchase or pick up on the trip
- If you can, take along a bed bug travel kit that consists of:
 - A flashlight for inspections - the brighter the better, white LEDs are best
 - Trash bags to store your luggage - large lawn leaf bags are best
 - Sealable plastic bags to store your clothing, shoes, and toiletries – extra-large or gallon Ziploc® bags are best
 - A plastic tub with a tightly fitting lid to quarantine items – the larger the better
 - Tape to capture any bugs for later ID (optional) – any brand will do
 - A camera to take photos of any bugs – you'll need proof if you want any refunds
 - An extra set of clothes in a sealed bag to prevent cross contamination – if you run into any bedbugs you'll want to change into clean clothes before you get into your vehicle

(4) **See something, say something!** Make it a habit to visually check yourself for bed bugs crawling on your person before entering and exiting your work area or home, especially if you have travelled to an area identified in this section (i.e. movie theater, hotel/motel, plane, etc).

(a) Army/Joint Forces Headquarters: If you suspect you have bed bugs in your work area, contact the DIMR, Facilities Maintenance, and/or Environmental office immediately! For advisement on home treatment, please contact the Environmental office.

(b) Air Force: If you suspect you have bed bugs in your work area, contact your supporting civil engineer squadron immediately! For advisement on home treatment, you may contact the DIMR (Army) Environmental office.

(c) State of Ohio Employees: In the event of a bed bug infestation that impacts a state of Ohio employee, supervisors cannot force an employee to leave the work area and go home. If a state employee desires to leave the work area and go home due to the bed bug infestation, they must use their leave. In the event "where the health or safety of an employee or of any person or property entrusted to the employee's care could be adversely affected," the State Human Capital Management Manager should be consulted to determine if Administrative Leave with Pay under Ohio Revised Code section 124.388 could be applicable.

(d) ONG Points of Contact.

Facilities Maintenance Branch

1LT Robert L. Weber, Facilities Maintenance Branch Chief
robert.l.weber98.mil@mail.mil and (614) 336-7414

Mr. James Penn, State Facilities Maintenance Supervisor
james.h.penn2.nfg@mail.mil and (614) 336-7307

Environmental and Energy Branch

CPT Steven M. Vicario, Environmental & Energy Branch Chief
steven.m.vicario.mil@mail.mil and (614) 336-7095

Mr. Thomas Daugherty, State Environmental Supervisor
thomas.d.daugherty.nfg@mail.mil and (614) 336-7395

Mr. Timothy Morgan, State Environmental Supervisor
timothy.m.morgan.nfg@mail.mil and (614) 336-6568

Mr. Jason Remich, ES II, Pest Management Program

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jason.d.remich.nfg@mail.mil and (614) 336-7079

c. Eradication.

(1) An integrated pest management (IPM) approach of sanitation and non-chemical and chemical measures is required to combat a bed bug infestation.

(a) Use a variety of sanitation and non-chemical measures including:

- Minimize clutter.
- Launder all bedding, clothing, etc. in hot water (at least 122F) and dry on a hot setting for at least 15 minutes.
- Encase mattresses and box springs in special encasements that have a sealed zipper.
- Caulk or seal cracks and crevices.
- Vacuum rigorously. Use crevice tool/attachment for seams.

(b) Chemical treatment requires a licensed pesticide applicator who should:

- Apply insecticides to targeted sites.
- Use a variety of insecticides.
- Rotate insecticide.
- Conduct at least one follow-up inspection with insecticide treatment as necessary.

(2) Do not consider an infested area or unit within a building isolated. Bed bugs move quickly and can easily spread beyond the site of the initial infestation. Be sure to inspect, and treat if necessary, all areas or units that share a common wall (above, below, and on both sides) with the infested area or unit.

VISIBLE SIGNS OF INFESTATION CHECKLIST - UNOCCUPIED AREAS

Completed By: _____ **Date:** _____

Area: _____ **Address/Location:** _____

The purpose of this checklist is to determine whether or not there are any visible signs of infestation in the above described area as of the date the area was inspected. Please consult with Directorate of Information Management and Resources (DIMR), Environmental and Energy Branch, for further details about treatment options.

A bed bug infestation can be recognized by:

- Dark (sometimes rusty) spots of excrement on sheets and mattresses and walls.
- Fecal spots, egg shells, and shed skin may be found near their hiding places.
- Blood stains from crushed bugs.
- An offensive, sweet, musty odor from the bed bug scent glands may be detected when infestations are severe.

Additional information and photographs can be found at the Central Ohio Bed Bug Task Force website (www.centralohiobedbugs.org) or The Ohio State University Department of Entomology Fact Sheet (http://ohioline.osu.edu/hyg-fact/2000/21_OS.html).

In occupied areas, a minimal amount of clutter is necessary in order to inspect properly. If the area is too cluttered, the time spent will not be beneficial. To do a thorough inspection, all areas adjacent to the inspected area should be inspected.

The following is a list of places that you are required to check for visible signs of a bed bug infestation. Check NVSI (No Visible Signs of Infestation) if you do not see visible signs. Check VSI (Visible Signs of Infestation) if you see visible signs.

BEDROOMS:

VSI ___ NVSI ___ Drapery pleats or other window coverings

VSI ___ NVSI ___ Loosened wallpaper

VSI ___ NVSI ___ Ceiling/wall junctions/ceiling moldings

LIVING & DINING AREAS:

VSI ___ NVSI ___ Carpeting in all rooms that can be pulled away from wall & tack strip visually checked

VSI ___ NVSI ___ Cracks in wooden molding (bed bugs like wood surfaces); check cracks in walls or behind any peeling or chipped paint.

VISIBLE SIGNS OF INFESTATION CHECKLIST - UNOCCUPIED AREAS (CON'T)
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GENERAL AREAS AND WORK SPACES:

VSI ___ NVSI ___ Remove all outlet and switch plate covers-check back and front of covers. (Facilities Maintenance Personnel)

VSI ___ NVSI ___ Removing baseboards (selectively) may reveal bed bugs. Bed bugs tend to congregate in certain areas but you may find an isolated one or two. (Facilities Maintenance Personnel)

VSI ___ NVSI ___ Check electronic items; inspect smoke detectors, thermostats, phones, clocks, computers, etc.

VSI ___ NVSI ___ Check ceiling/wall junctions for visual evidence of bed bugs.

VSI ___ NVSI ___ Loose wallpaper should be examined

VSI ___ NVSI ___ Window and door frames

VSI ___ NVSI ___ Cracks and crevices

VSI ___ NVSI ___ Carpet tack strips at the wall

VSI ___ NVSI ___ Check inside, around, and behind all appliances, in all closets and utility rooms, and in and around any exterior areas.

IN THE EVENT THAT YOU CHECK ANY OF THE VSI SECTIONS ABOVE, CONTACT DIMR, FACILITIES MAINTENANCE OR SUPPORTING CIVIL ENGINEERING SQUADRON IMMEDIATELY!!! IF CHECKLIST IS USED IN THE HOME AND VSI SECTIONS HAVE BEEN CHECKED, CONSULT PROFESSIONAL EXTERMINATOR IMMEDIATELY!!!!

VISIBLE SIGNS OF INFESTATION CHECKLIST - OCCUPIED AREAS

Completed By: _____ Date: _____

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Area: _____ **Address/Location:** _____

The purpose of this checklist is to determine whether or not there are any visible signs of infestation in the above described area as of the date the area was inspected. Please consult with Directorate of Information Management and Resources (DIMR), Environmental and Energy Branch, for further details about treatment options.

A bed bug infestation can be recognized by:

- Dark (sometimes rusty) spots of excrement on sheets and mattresses and walls.
- Fecal spots, egg shells, and shed skin may be found near their hiding places.
- Blood stains from crushed bugs.
- An offensive, sweet, musty odor from the bed bug scent glands may be detected when infestations are severe.

Additional information and photographs can be found at the Central Ohio Bed Bug Task Force website (www.centralohiobedbugs.org) or The Ohio State University Department of Entomology Fact Sheet (http://ohioline.osu.edu/hyg-fact/2000/21_OS.html).

In occupied areas, a minimal amount of clutter is necessary in order to inspect properly. If the area is too cluttered, the time spent will not be beneficial. To do a thorough inspection, all areas adjacent to the inspected area should be inspected.

The following is a list of places that you are required to check for visible signs of a bed bug infestation. Check NVSI (No Visible Signs of Infestation) if you do not see visible signs. Check VSI (Visible Signs of Infestation) if you see visible signs.

BEDROOMS:

- VSI ___ NVSI ___ Check tuft lines around top and bottom of mattress. If the mattress has holes, rips or tears in the covering, bed bugs may be inside.
- VSI ___ NVSI ___ Remove muslin wrap on bottom of box spring and thoroughly check underneath of box spring. (as applicable)
- VSI ___ NVSI ___ Remove all contents of dresser and chest of drawers: take drawers out of their affixed position and inspect thoroughly inside and out-top and bottom.
- VSI ___ NVSI ___ Dismantle (if possible) and check all parts of bed frames particularly if frame is wood-bed bugs have an affinity for wood and fabric more than metal or plastic.

VISIBLE SIGNS OF INFESTATION CHECKLIST - OCCUPIED AREAS (CON'T)

VSI ___ NVSI ___ Headboards need to be checked: if fastened to wall, remove and inspect behind. (Facilities Maintenance)

VSI ___ NVSI ___ Bedding, including sheets, comforter, and blanket can show evidence.

VSI ___ NVSI ___ Drapery pleats or other window coverings

VSI ___ NVSI ___ Loosened wallpaper

VSI ___ NVSI ___ Check ceiling/wall junctions/ceiling moldings

LIVING & DINING AREAS:

VSI ___ NVSI ___ Check top, sides, and underneath of all furniture pieces to include seams, tufts, skirts, and crevices. This should include couches, recliners, easy chairs, end tables, coffee tables.

VSI ___ NVSI ___ Carpeting in all rooms can be pulled away from wall & tack strip visually checked. (Facilities Maintenance)

VSI ___ NVSI ___ Check any cracks in wooden molding (bed bugs like wood). Check cracks in walls or behind any peeling or chipped paint.

GENERAL:

VSI ___ NVSI ___ Remove all outlet and switch plate covers--check back and front of covers. (Facilities Maintenance)

VSI ___ NVSI ___ Removing baseboards (selectively) may reveal bed bugs. Bed bugs tend to congregate in certain areas but you may find an isolated one and two.

VSI ___ NVSI ___ Check electronic items; inspect smoke detectors, thermostats, phones, clocks, computers, etc.

VSI ___ NVSI ___ Check ceiling/wall junctions for visual evidence of bed bugs.

VSI ___ NVSI ___ Picture frames and loose wallpaper should be examined

VSI ___ NVSI ___ Window and door frames

VSI ___ NVSI ___ Cracks and crevices

VSI ___ NVSI ___ Carpet tack strips at the wall

IN THE EVENT THAT YOU CHECK ANY OF THE VSI SECTIONS ABOVE, CONTACT DIMR, FACILITIES MAINTENANCE OR SUPPORTING CIVIL ENGINEERING SQUADRON IMMEDIATELY!!! IF CHECKLIST IS USED IN THE HOME AND VSI SECTIONS HAVE BEEN CHECKED, CONSULT PROFESSIONAL EXTERMINATOR IMMEDIATELY!!!!