



Date Issued: December 15, 2009
Subject: Heat Treatment Room for Bed Bugs

Reference: Independent Living BC Non-Profit Housing Design
and Construction Standards, Revised October 2006
Provincial Homelessness Initiative Design Guidelines
& Construction Standards, October 2006

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SUBJECT:

BC Housing's provisions for construction of a designated heat treatment room to exterminate bed bugs and other insects from tenant's belongings and furnishings using high-temperature heat.

PURPOSE:

Bed bug infestation is a major problem for tenants and operators. Health and mental welfare can be seriously affected by prolonged exposure to bed bugs and other insects such as cockroaches and mites. Low barrier and hard to house facilities are more vulnerable to experience an infestation, construction of a heat treatment room should be considered by the design team in conjunction with the operator and BC Housing.

Heat treatment rooms are used to prevent and manage bed bug infestations using high-temperature heat to effectively exterminate bed bug eggs, larva/nymphs and adults from tenant's belongings and furnishings such as mattresses, couches, dressers, and electronic devices.

Managing bed bug infestations effectively is expensive and a major ongoing financial operating pressure. Use of the heat treatment room is to become part of the operators Integrate Pest Management (IPM) program.

FINANCIAL IMPLICATIONS:

Construction Costs:

Cost to construct a specialized bed bug infestation room (including heating equipment) in accordance with BCH Standards has been estimated between \$1,080 - \$1,350 m² (\$100 – 125 ft²), or \$20,000 – 25,000 for a typical bed bug room of 18.5 m² (200 ft²), see attached generic floor plan

Reducing Existing Bed Bug Management Costs:

Estimated operating cost to manage bed bug infestations could be potentially reduced by 50 %

Typical existing operating cost for 100 unit facility = \$ 15,913

Estimated operating with bed bug room 100 units = \$ 7,956

REFERENCE:

Independent Living BC Non-Profit Housing Design and Construction Standards (ILBC Standards), Revised October 2006; and

Provincial Homelessness Initiative Design Guidelines and Construction Standards, (PHI Standards), October 2006:



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- Section 5 Construction Standards – Section 04050 Basic Masonry Materials and Methods
- Section 5 Construction Standards – Section 06100 Rough Carpentry
- Section 5 Construction Standards – Section 07200 Insulation
- Section 5 Construction Standards – Section 07920 Joint Sealants
- Section 5 Construction Standards – Section 08100 Metal Doors and Frames
- Section 5 Construction Standards – Section 08710 Finished Hardware
- Section 5 Construction Standards – Section 09250 Gypsum Wallboard
- Section 5 Construction Standards – Section 09650 Resilient Flooring
- Section 5 Construction Standards – Section 16000 Electrical General Provisions

DESCRIPTION

Add: ILBC Standard, Section 13 Heat Treatment Room

Section 5, Section 13035 Heat Treatment Room, 9 pages

Add: PHI Standard, Section 13 Bed Bug Extermination Room

Section 5, Section 13035 Heat Treatment Room, 9 pages

1.0 General

- Materials and workmanship for the room construction will be specified in their related sections.
- The heat treatment room is recommended to be 3.0 m – 4.5m (10' – 15') long and 3.0 m- 3.6m (10' – 12') wide and if publicly accessible include a vestibule a min. 1.2 m x 1.2 m (4' x 4'). The heat treatment room is to have a minimum 1 hour fire-resistant rating. Locate the sauna heater controls in the vestibule or adjacent wall.
- Electrical items can be placed inside the heat treatment room but should remain in the bottom half of the heat treatment room to avoid overheating.
- Extermination Room



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1. Can be located in basement or service area and away from tenant, support or amenity areas. If possible heat treatment room should be in close proximity to the elevator and a building entrance.
 2. Should be large enough to hold a three person couch, box spring and mattress, bed side table and chest of drawers. Furniture and other items are to be placed in the room to ensure that there is adequate air circulation to allow for heat penetration.
 3. Ensure that the floor is insulated to a minimum R20, walls insulated to a minimum R22 and ceiling insulated to a minimum R28.
 4. Wall construction to consist of an insulated stud wall, aluminum heat reflective foil, cementitious board and batten finish.
 5. Ceiling construction to consist of insulated ceiling cavity, gypsum board, aluminum heat reflective foil, cementitious board and batten finish. The ceiling assembly to have gypsum board installed to provide a minimum 1 hour fire resistant rating.
 6. Avoid placing electrical, plumbing or HVAC systems in the ceiling construction.
 7. Number of sauna heaters is dependant on the room's cubic foot print. Refer to the individual sauna heater specification as to the maximum cubic space allowed.
 8. Sauna heater(s) is to be set at a temperature of 90 degrees Celsius and run continuously for two (2) hours. Sauna heater controls allow maximum 1 hour time settings, so controls will need to be manually reset for the second hour. Bed bug eggs, larva/nymph, and adults only need to be exposed to the designated temperature for twenty (20) minutes.
- Entry Vestibule (Only if Heat Treatment room is accessible to public)
1. Vestibule doors should be in direct line of each other and must open out of the rooms. Provide a standard vision light or wired glass to the heat treatment room door. Vestibule doors are to latch closed.
- Operation of the Heat treatment Room
1. Tenant's belongings are to be transported into the room prior to the saunas being activated.



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2. Once the sauna heater(s) is activated the room should be left undisturbed for the desired time frame. Operators of the heat treatment room are to be trained for proper use of the sauna heater and warned about proper precautions around the hot elements of the sauna heater and housing.
3. Once the tenant's belongings have been heat treated allow the room to cool down for a minimum 20 minutes. Opening the doors to the heat treatment room allow for the ambient temperature to cool more rapidly. Metal items may still be too hot to touch, wear appropriate gloves to protect hands.

Other - No drain or hose bib is permitted in room.

2.0 Products

Aluminum Heat Reflecting Foil: 914 mm (36") wide roll of pure aluminum foil, glue mounted to super strength Kraft paper and micro-perforated, available from local sauna suppliers.

Cementitious Tile Backer Board: Refer to Section 09250 Gypsum Wallboard for Cementitious Tile Backer Board.

Extruded Polystyrene Insulation: Refer to Section 07200 Insulation for Foundation Insulation.

Gypsum Board: Refer to Section 09250 Gypsum Wallboard for Fire-resistant Gypsum Board.

Heat Source: Commercial quality, dry sauna heater. Three-wall pressed metal construction, stainless steel heating elements, large rock capacity, direct rock contact with heating elements, free air flow; UL tested and listed. Approved Product: Model FHS# # by Homecraft.

1. Dependant on model, 3-phase electrical, 208 volt - per heater unit, 12kW or 15 kW per heater unit refer to sauna heater manufacturer's specification.

Heater Fence: S4S, kiln-dried clear vertical grain 38 mm x 89 mm (2 x4).



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- Interior Floor Sheathing:** Refer to Section 06100 Rough Carpentry for Interior Floor Sheathing.
- Joint Treatment:** Heat resistant low VOC sealant. Acceptable Product: Trimsil 600 by Tremco.
- Main Disconnect Device:** Circuit breaker, 50 or 60 amps per heater unit, refer to the sauna heater manufacturer's specification.
- Metal Door:** Insulated metal door, refer to Section 08100 Metal Doors and Frames for Exterior Service Room Exit Doors. Door width to be 900 mm (3') clear doorway opening.
- Finished Hardware:** refer to Section 08710 Finish Hardware for: Metal kick plates; door hold open device; (public door) exterior key lock free access from interior; (room door) weather stripping; (room door) multiple fin bottom sweep, metal door threshold and (room door) a standard vision light or wired glass.
- Mineral Fibre Insulation:** Semi Rigid Insulation / Mineral Wool Insulation. Conforming to CAN/ULC-S702, Type 1, Flame Spread Rating of ≤ 25 ; Smoke Developed Rating ≤ 0 with a mass of 1.22 kg/m².
- Resilient Sheet Flooring:** Refer to Section 09650 Resilient Flooring for slip resistant sheet vinyl for bathrooms for non-barefoot areas.
- Safety Labeling:** Safety Design Label form, or name plate as a permanent information sheet.
- Sauna Heater Controls:** Digital control with a programmable temperature and timer combination with a maximum time setting of 1 hour. Approved Product: TKE2 or TK24D-1 by Homecraft.
- Sprinkler heads:** high temperature resistant, fast response sprinkler head with an activation temperature above 100 degree Celsius.

3.0 Execution



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- Floors are to be insulated to a minimum R20 and covered with the interior floor sheathing. The floor sheathing is to be glued and screwed. **Do not** use concrete topping or gypsum concrete as this will affect the floors ability to reach the designated temperature within the given timeframe.
- Insulation to be installed in the wall and ceiling framing in accordance with Section 07200 Insulation.
- Start installing the aluminum heat reflective foil at the bottom of the wall and positively lap additional rows as the foil is installed up the wall. Overlap seams 75mm (3"), seal joints and punctures with foil heating duct tape.
- Install cementitious tile backer board and ceiling's gypsum board in accordance with 09250 Gypsum Wallboard. The cementitious wall board is to be installed vertically to ensure that only a continuous vertical joint is located on the walls. After the installation of the resilient flooring with cove base and finish, install the batten over the vertical wall joint to the floorings aluminum finish edge. The board joints are to be sealed and the batten is to be back caulked to both sides of the board's joint. Fasten the batten as required.
 1. If a finish is desired the cementitious board and batten should be finished with MPI 144 Institutional Low Odour/VOC. If the cementitious board is not primed use MPI 3 Alkaline resistant primer.
- Sealant is to be installed in accordance with Section 07920 Joint Sealants. Ensure proper joint design between the cementitious boards. Install sealant between the cementitious board joint prior to the installation of the resilient floor to ensure that sealant is installed behind the coving and finish bar.
- Sealant is to be applied continuously around the perimeter of the batten's backside.
- Flooring to be installed in accordance with 09650 Resilient Flooring. Cove base the perimeter of the floor to a min. 4" up the wall and finish with an aluminum edge. The



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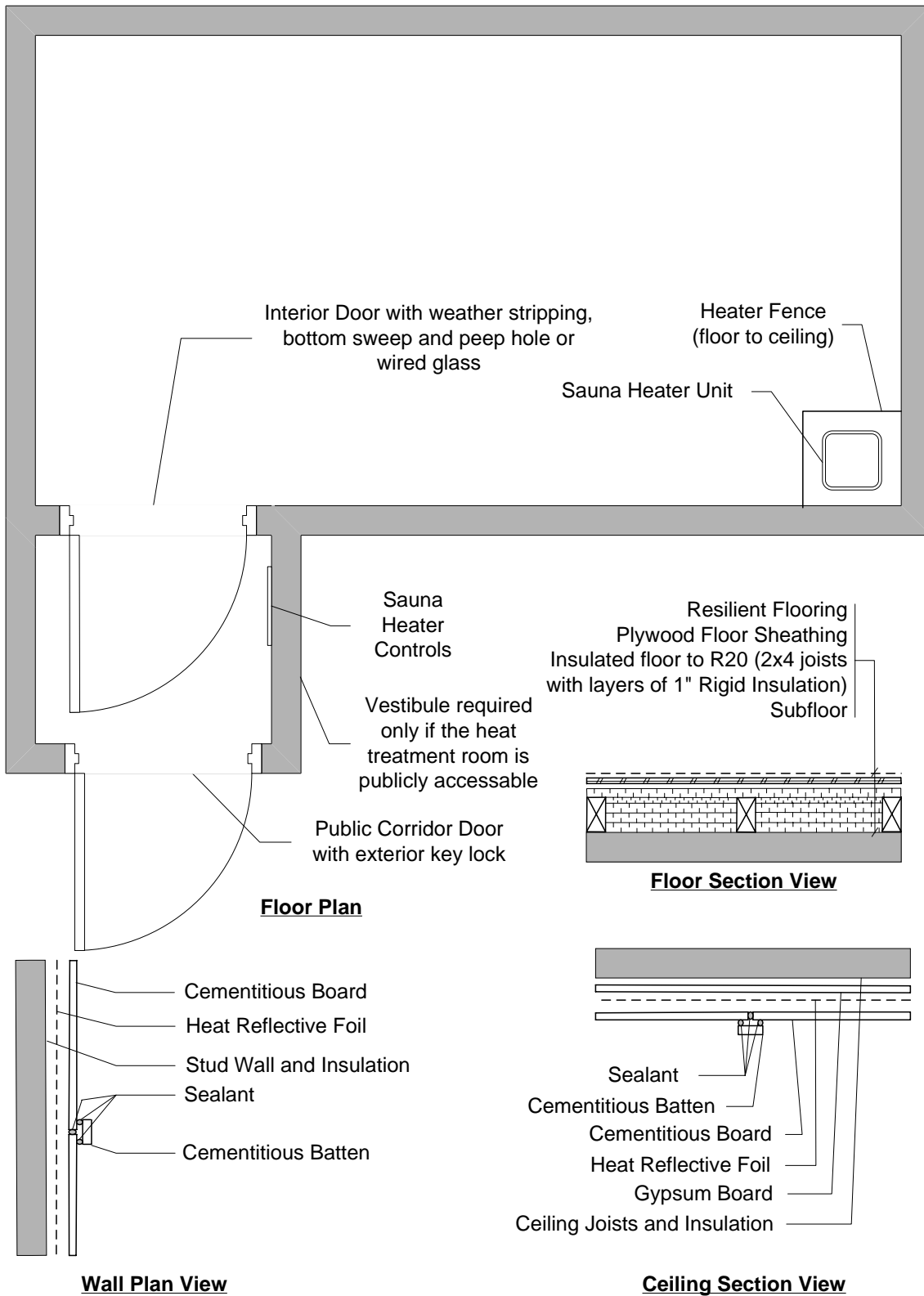
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flooring is to be 100% adhered to the substrate using a solvent free 2-part urethane adhesive.

- Install the dry sauna heater; ensure that the air circulation and unit fastening is completed as per the manufacturer's specifications. Connect the sauna heater power cable to the main disconnect device and sauna heater controls as per the manufacturer's specifications. Ensure that the temperature sensor is located above the sauna heater as stated in the manufacturer's specification.
- Fencing around the sauna heater is to be installed as per the clearance requirements from the manufacturer's specifications. The fencing is to be continuous from the floor to the ceiling to ensure materials cannot touch sauna heater. Ensure that access can be achieved to the unit for proper maintenance or replacement of parts.
- Sauna heater controls are to be installed on the wall adjacent the opening side of the door leading into the heat treatment room. Install the sauna heater controls at a height of 1219 – 2032 mm (4' – 5'). If more than one sauna heater is installed there should only be one set of controls.
- Place caution/warning signs around the sauna heaters warning the sauna heater(s) could be extremely hot and do not touch.
- Place a warning sign on the door to the heat treatment room warning that the room is not to be entered when the sauna heaters are operating and allow for a 20 minute cool down prior to entering the room.

END



Generic Heat Treatment Room