

Rebuilding design principles

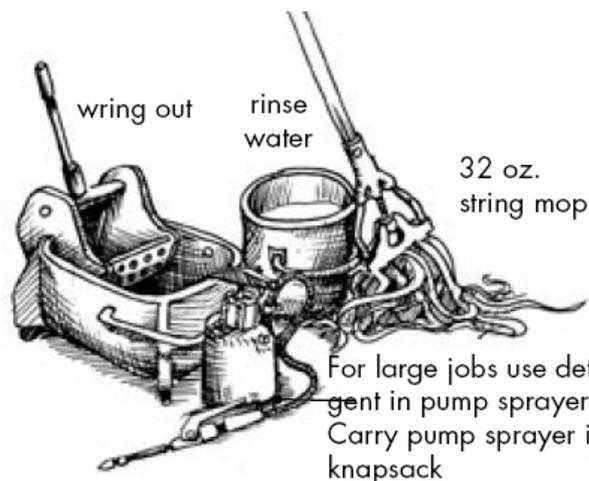
- Affordable
- Flood resistant
- Sustainable, energy efficient (green)
- Easily maintainable
- Healthy for workers, occupants, and the environment
- Preserve historic tradition and culture (design, materials, and systems)
- Make labor-intensive plans
- Build capacity of, and hire, local labor and contractors

Cleaning

1. Using a scraper that attaches to a HEPA vac (III) or stiff scrub brush, scrape or scrub all finished surfaces. Place non-phosphate detergent in a mist or pump sprayer. Change rinse water frequently. Wring out rag or mop in separate bucket or second side of a double bucket. Scrape first where there is heavy build-up of mold on structural surfaces, or old paint.



For small jobs carry a mister (spray bottle) containing detergent in tool belt or apron, and double bucket.



For large jobs use detergent in pump sprayer. Carry pump sprayer in knapsack



2. Once dry, vacuum all surfaces including electric outlet boxes and open ducts using a HEPA or high efficiency vacuum cleaner. Pro-team back-pac vacuum is ideal for working off ladders, cleaning floors and crevices, and doing integrated pest management (IPM) work.

3. Mop the floors, changing rinse water frequently. Always air-dry mops and rags in the sun.

Borate Treatment

1. Mix borate solution (Termite Pruf©) in pump or power sprayer reservoir. III
2. Soak wood, paying particular attention to the end-grain. Where necessary, pry studs away from plates, or joists from ribbon board (The boards located on the end of floor joists around the building's perimeter). Then squeeze tube into opening to soak end-grain. Allow to dry then apply second coat.



Small spray tube is supplied with case-order of Termite Pruf III



battery powered mister II

To access very tight space, use mechanic's creeper on sheets of plywood. Protect yourself with positive air hood respirator or welders face shield.

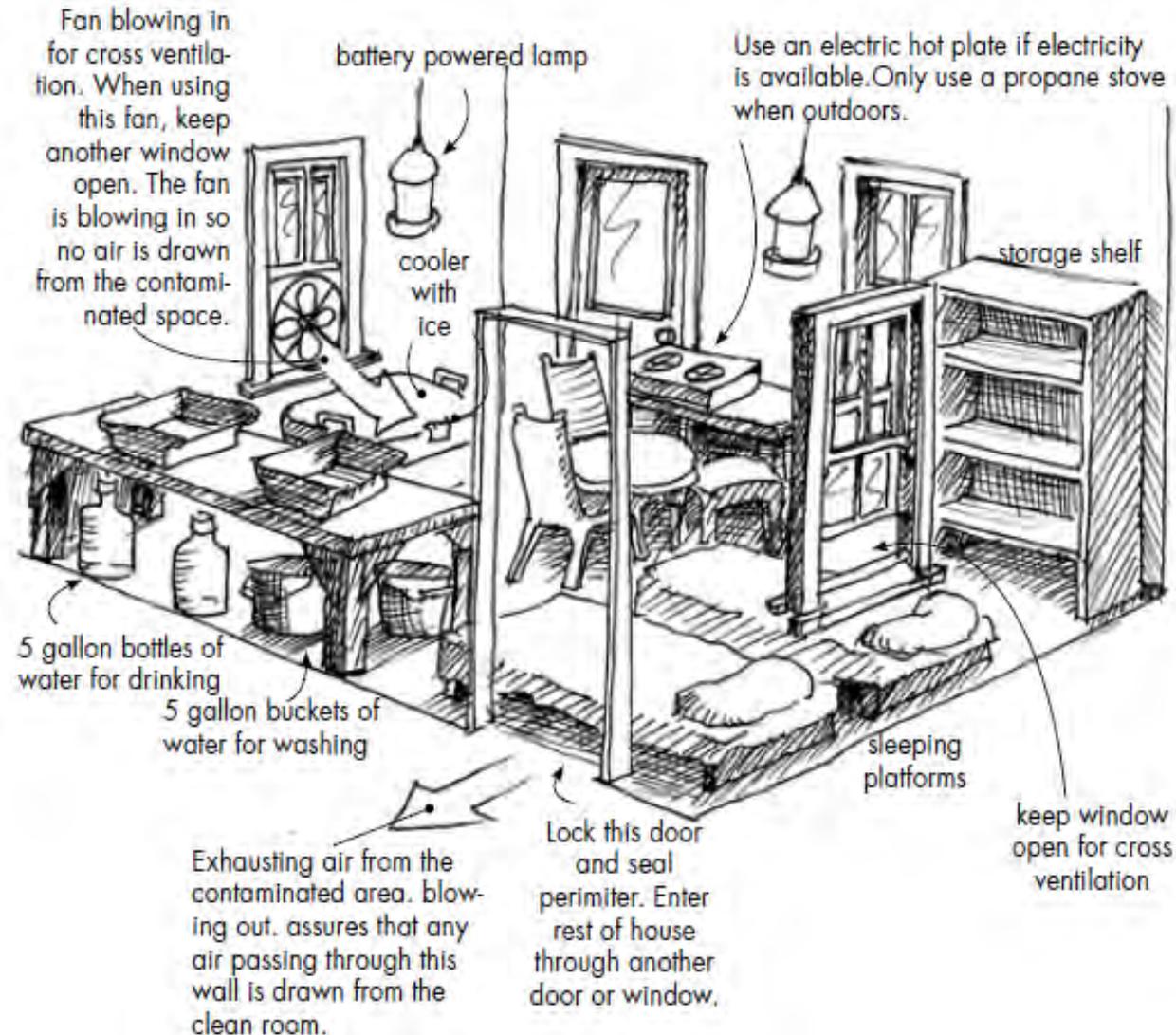
The clean room

It's preferable to complete house renovation before anyone moves in, but this may not always be practical. It may be possible to renovate one or more rooms, isolate them from the rest of the house, and stay in them safely.

It is critical that this clean-room has a direct and separate entrance from the exterior or an isolated passage through the work-space. It's too risky for children to live in the clean-room.

Where the clean-room does not have running water, set up a portable toilet outside. Even without running water, a sink can be used putting a 5 gallon bucket under the drain.

Where there is no electric try to get an exterior pole mounted outlet installed, or pay a neighborhood to plug into their power.



Isolating clean room(s)

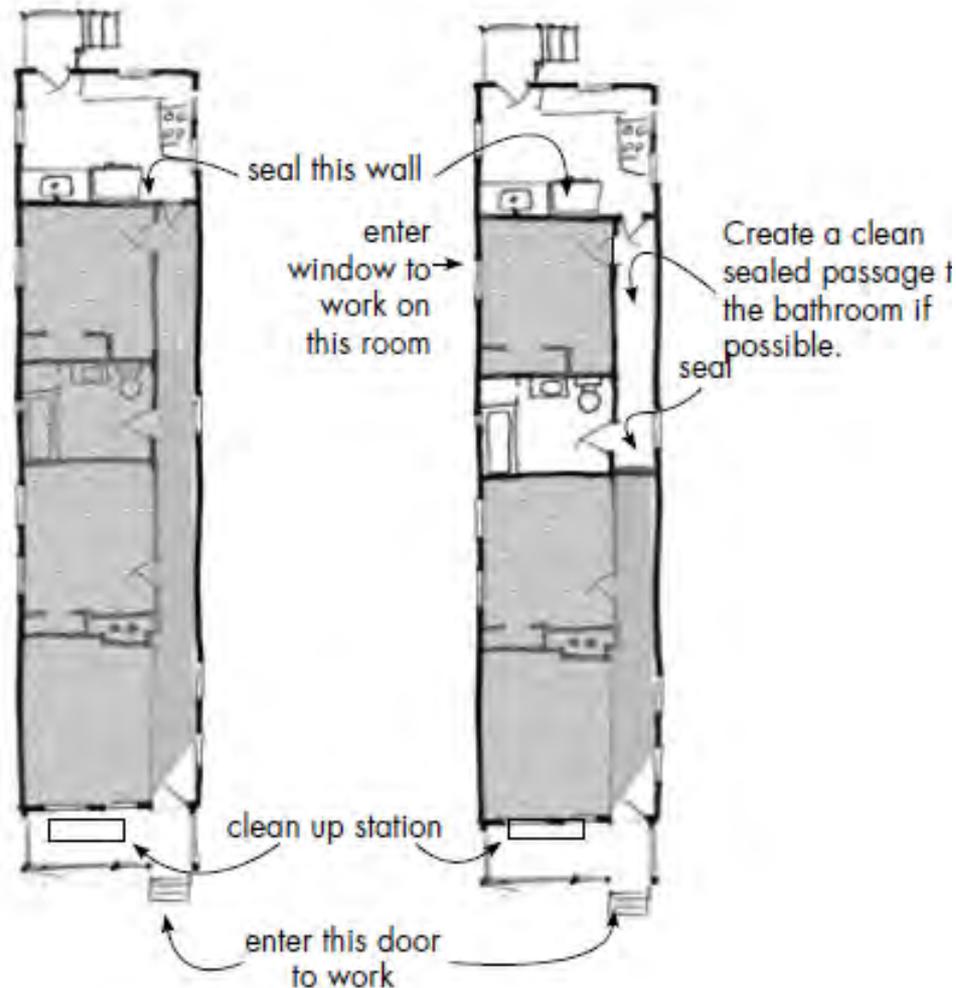


If bathroom doesn't work, install a portable toilet outside.

If there is a working bathroom..

Use front or rear rooms as clean-rooms.
Use the kitchen particularly if kitchen drain works and room is large enough.

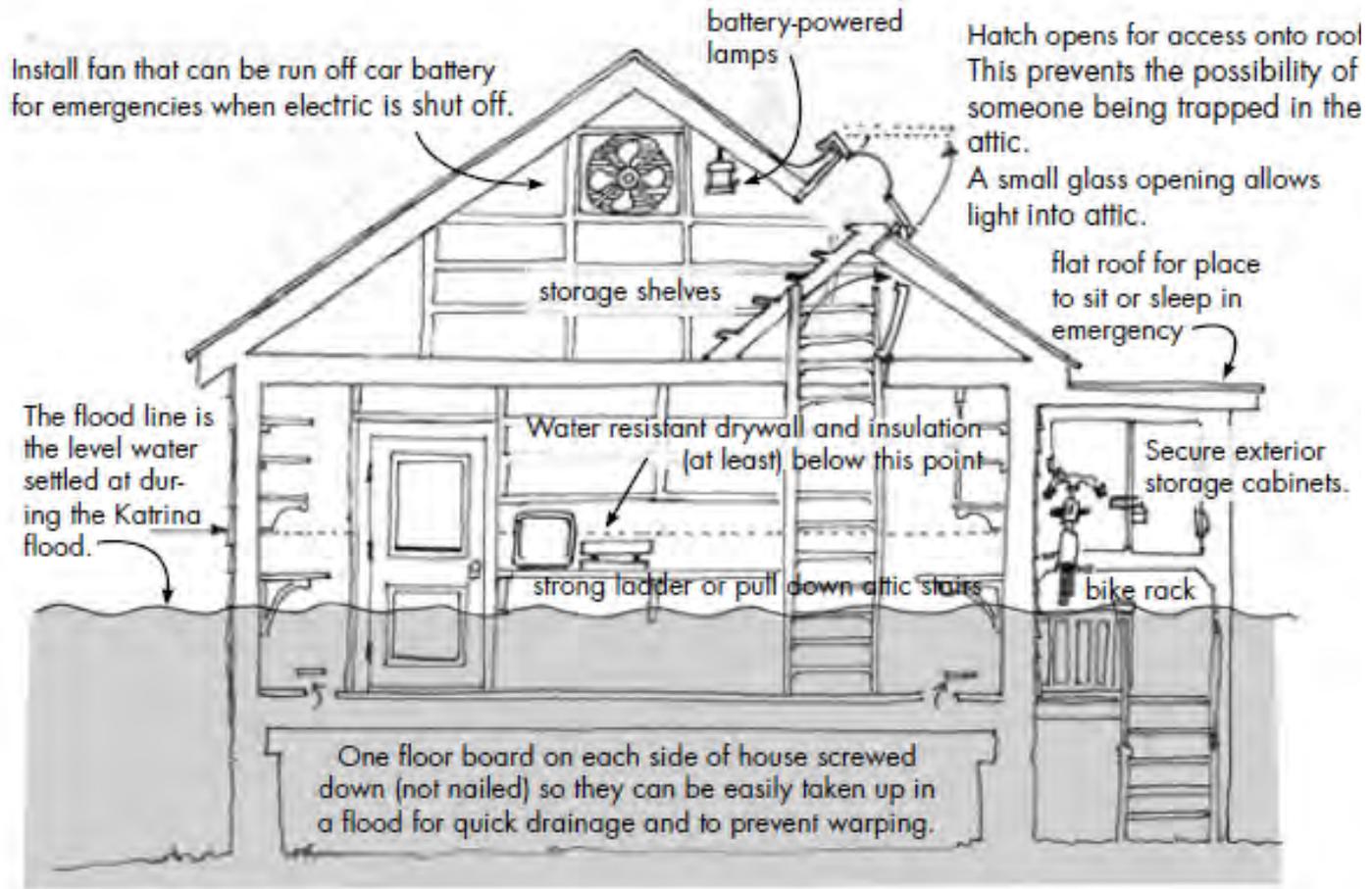
The safe room must be cleaned, treated, and completely isolated from the rest of the house. This includes caulking gaps in separating wall.



Flood-resistant design

Maintain a safety station in the attic, second floor, or easily accessible place above flood line with the following equipment:

- first aid kit
- sealed glass containers of drinking water
- preserved emergency food
- flashlight on constant charge and/or extra batteries
- a battery powered lantern
- waterproof gloves and wading boots
- N95 or N100 respirators and safety glasses
- battery operated generator
- cell phone
- small generator for running fans and dehumidifiers as soon as water recedes (run generator outdoors on the roof)



Where flood water came to less than 4 feet up wall and it isn't possible to elevate the building above possible flood hazard; consider restoring it with flood resistant materials, elevated wiring, and emergency equipment, supplies, and shelter.

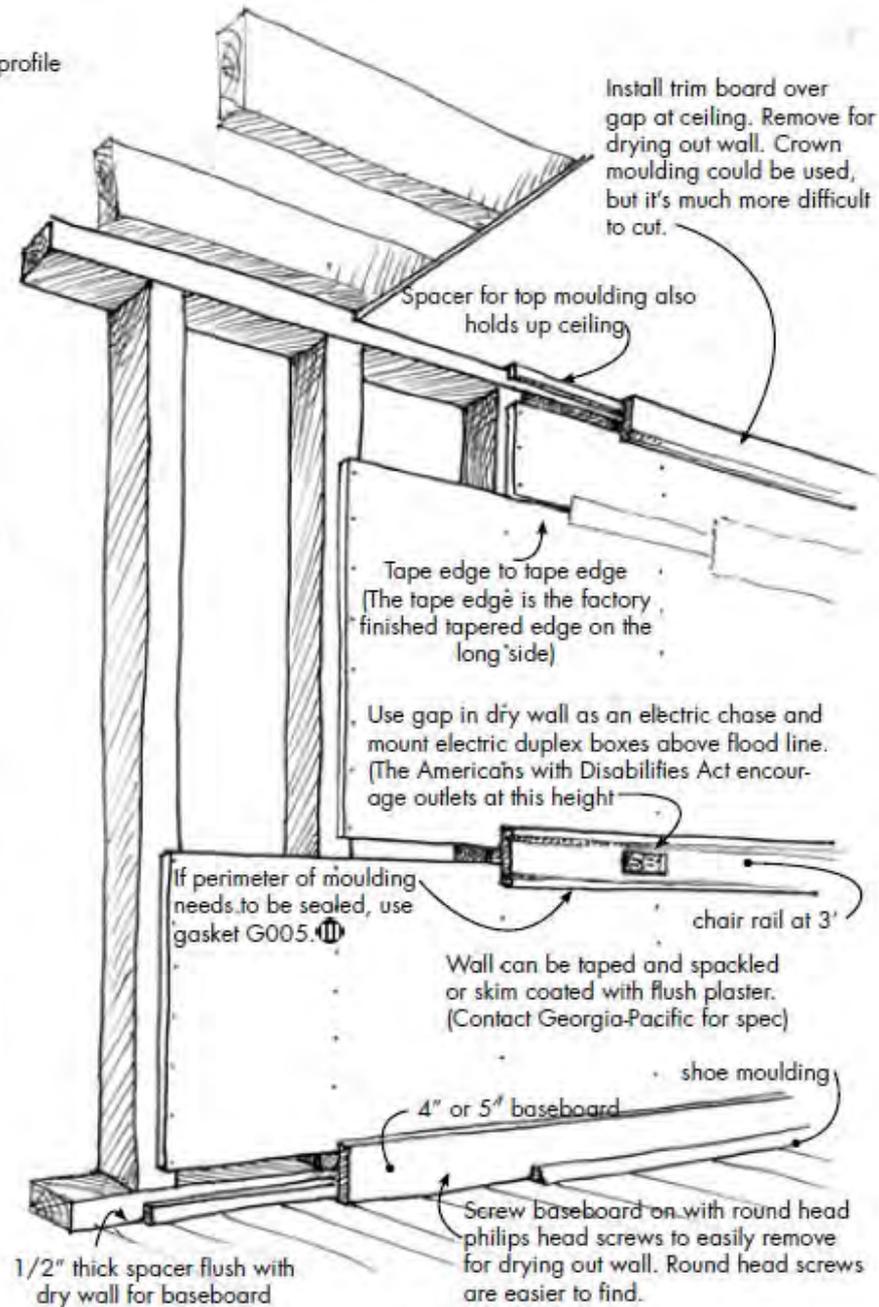
Flood-resistant drywall design

Where potential flood depth is less than three feet from floor, use paperless, moisture resistant dry wall or removable wainscot at least on bottom of wall. Rip bottom sheet to 3'. Use the remainder of this rip at top of wall.

Where possible, use same profile moulding as original.

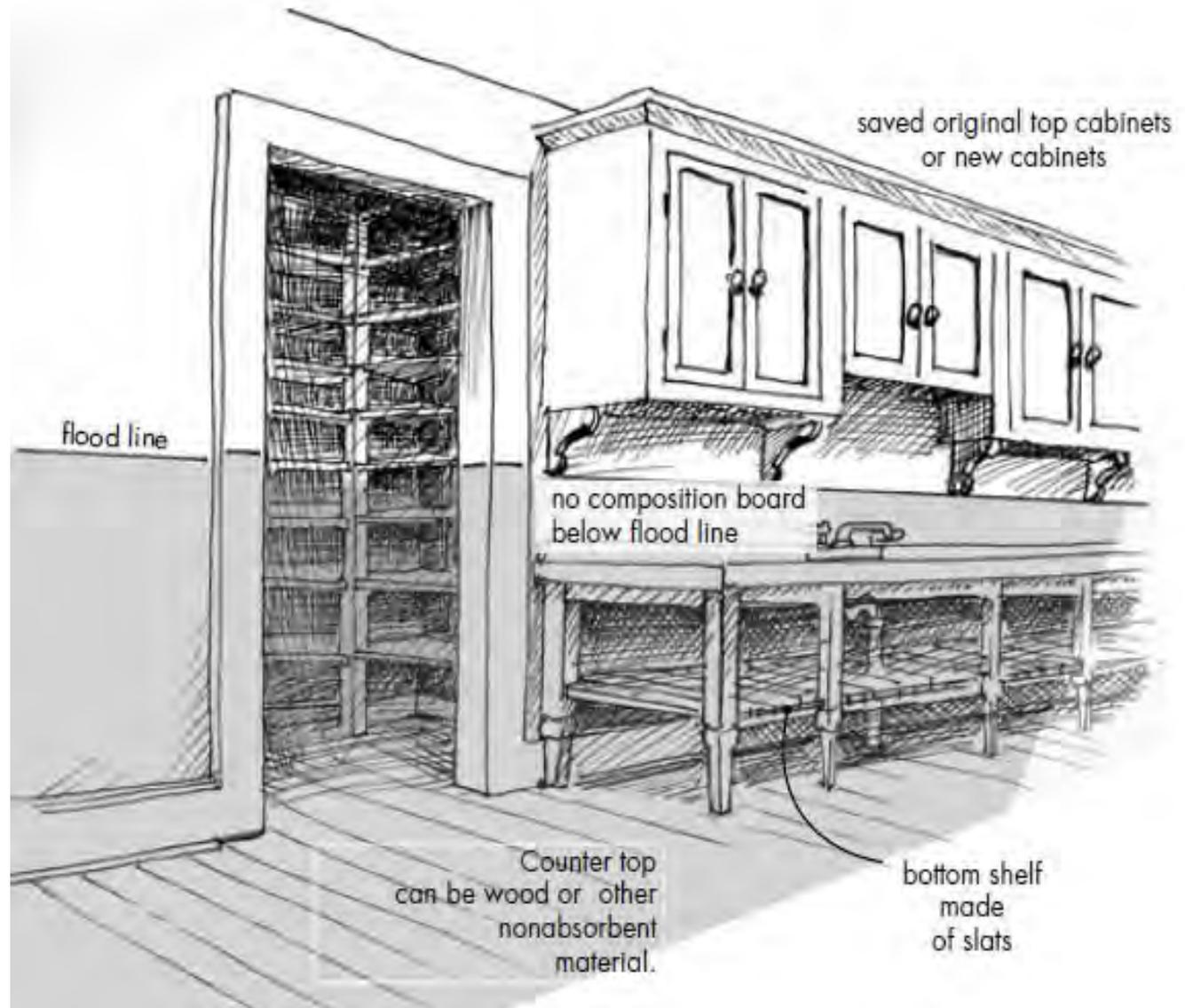


Rip bottom sheet to 3'. You may use the remainder of the rip at top of wall



Flood-resistant kitchen

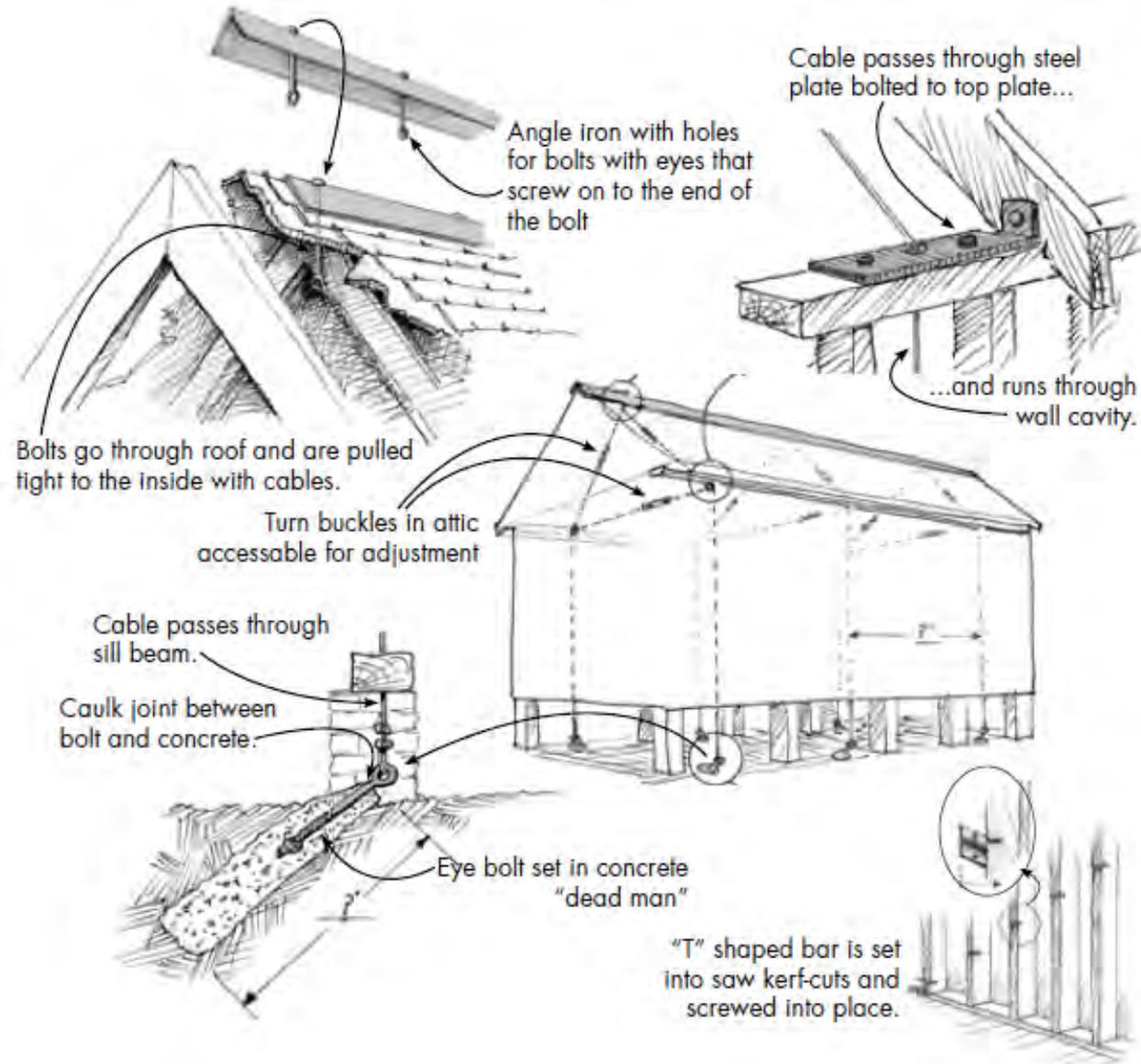
- Build open, solid-wood shelves or other water resistant material for base cabinets
- Store items that won't be damaged by flood waters on bottom shelves (bowls, pots, pails, etc.) and items like detergents that can be easily replaced.
- Open shelves make it easier to keep stored items dry, pest free, ventilated, more easily accessible, and easier to clean.
- A pantry can provide a large amount of easily accessible shelf space above the flood line.
- Locate counter-top stove, oven, and microwave units above the flood line.



Ground anchor hurricane-resistant tie down

NOTE: This design is a suggestion, not a recommendation. It needs engineer's review and specifications before being installed as a prototype.

It's designed for existing buildings where it is difficult to access all of the structural joints to install hurricane ties. It may be advisable to install diagonal bracing on the end walls to prevent the building framing from being distorted by wind. This could be achieved by installing diagonal cables on turnbuckles, inside the front and rear wall cavities. If the wall is open, a kerf-cut brace would work.

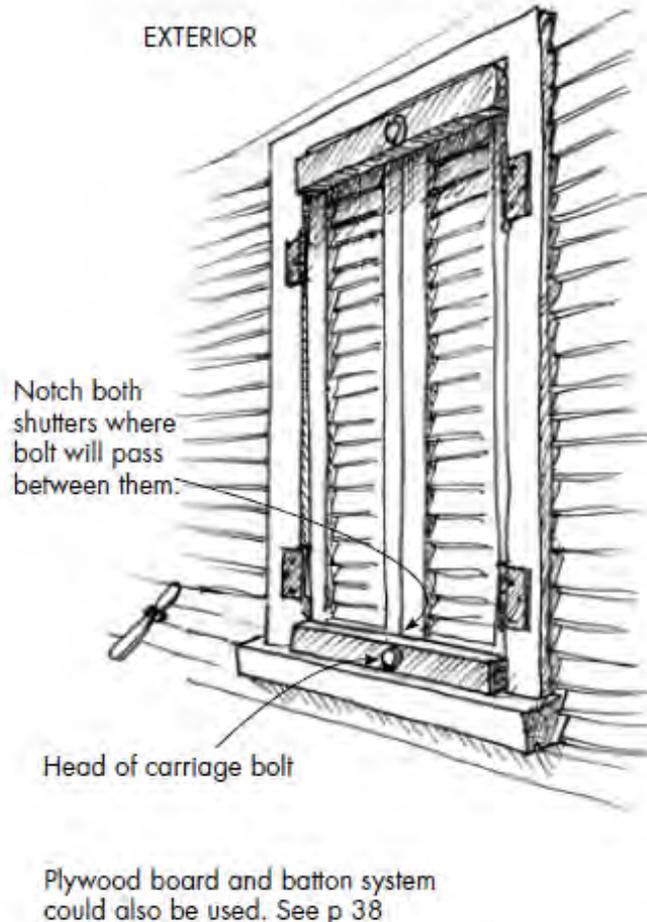


Storm shutters

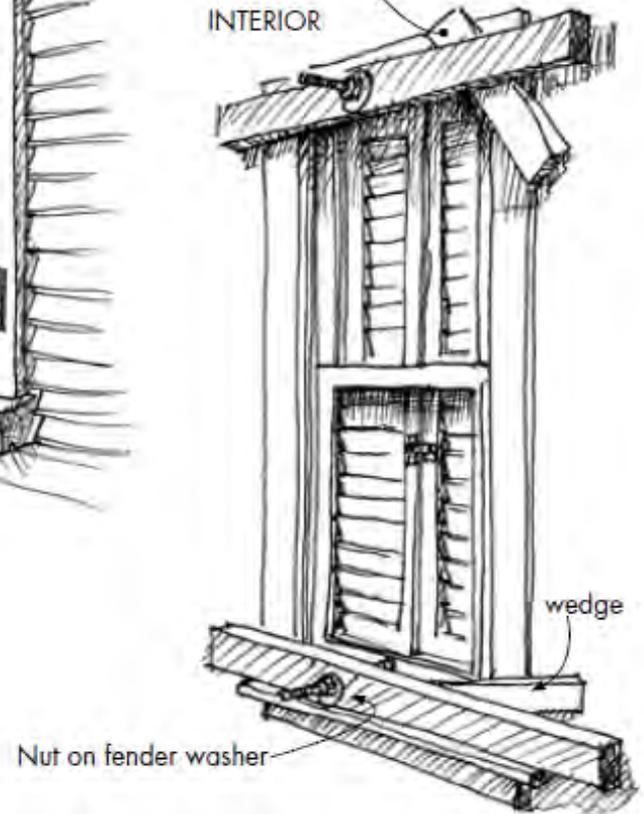
Converting window shutters into storm shutters

Four reasons to install and maintain louvered shutters:

- They keep the sun out during the day and still allow cross ventilation.
- They can be used to secure the house from breaks-ins when the house is vacant.
- Combined with a bolt and batten system, they can be used as hurricane shutters.
- They are part of the region's historic fabric.



Drill hole through top-sash top-rail, and bottom-sash, bottom-rail for carriage bolt. Holes can be filled with removable plug. Once nut is snug against fender washer, drive long wedges between casing and battens to tighten up bolt.



Affordability issues

- Up front costs
- Life cycle costing
- Durability
- Minimize energy and maintenance costs
- Use labor-intensive strategies that employ local workers vs. capital-intensive solutions



Building community & contractor capacity



- Build community residents' restoration skills, leadership skills, and professional career opportunities
- Increase the capacity of local contractors and/or train new contractors able to deliver affordable, high quality, healthy restoration.

The program...

- Trains local trades people and introduces young people to the trades
- Builds capacity of small local contractors (HUD section 3 compliance)
- Builds a consortium of small contractors to share overhead, administrative support, equipment, update training, marketing and bulk purchasing
- Sets up neighborhood maintenance companies to preserve vacant houses, continue to maintain rehabbed houses, and respond to emergencies

Program goals

- Community based, energy efficient, healthy housing maintenance company
- Jobs and income
- Reversal of dollar drain
- Maintenance / renovation
- Humanize
- Educate
- Maximize local labor and material



Deliverables

- Control of:
 - Water and water vapor
 - Air: temperature, ventilation, circulation, quality
 - Particles and creatures: IPM, lead hazard remediation, exclusion, clean-up
- Customer education, and resource availability
- Historic restoration and maintenance
- Green principles

Strategies

- **Survey**
- **Establish funding and work backlog**
- **Recruit (HUD section 3), mobile street seminars**
- **Evaluate**
- **Certify & train stipended crew**
- **Administrative collective**
- **Program qualification**
- **Insurance**
- **Municipal agency/program link**
- **Bulk purchase**
- **Shared facilities, vehicles, and equipment**
- **Market diversification, marketing**



BUILDING A FRAMEWORK FOR HEALTHY HOUSING

Lessons from Katrina: *Developing Local Capacity to Restore and Maintain Healthy, Green, Flood-Resistant and Affordable Housing*

**Dennis Livingston, Community Resources
Ralph Scott, Alliance for Healthy Homes**

Overview



- What we did the past 3 years (and why)
- Rebuilding design strategies we developed/learned
- Building community and contractor capacity
- Policy shortcomings and recommendations



Three years ago...

Hurricanes
Katrina and
Rita devastated
Gulf Coast
housing

- **Flooding & Wind Damage**
- **Mold Damage**
- **Other Health Threats**



Disaster created need and opportunity



- Dire need to support healthy, safe and affordable rebuilding
- Chance of a lifetime to explore the health-housing connection



Health and housing issues

- Mold & moisture
- Structural
- Lead paint
- Pests
- Carbon monoxide
- Toxic sludge contamination
- Worker health & safety



What we did

SAFE & HEALTHY RESTORATION FLOOD DAMAGED HOMES

Re-use vs. REFUSE MATERIALS

One Day
Train-the-Trainer Workshop

Intensive workshop day will develop participant skills for defining a 1-hour training to sell, lease or renovate materials (Include Training Manual)

The workshop is designed for trades people who restore, finish and design work including:

- Veneer & Tinting Offsets
- Construction Considerations
- Public Housing Authorities
- Property Maintenance Offices
- Residential Trade Professionals
- Non-Profit, Agencies, Architects
- Community Development Specialists

Key Subjects Covered

- Coopering, Planing and Chiseling
- Insulation Techniques
- Drying a "Wet" Floor
- Mold, Radon, and Diesel Treatment
- Roof Lifting Strategies
- Buildable Restoration
- HVAC and Electrical Systems
- Floor Decked Design
- Greenhouse Health & Safety
- Garage Remold Design

Tuesday—April 24, 2007—9:00 am to 4:00 pm
Tulane University—Holtz Campus—Rogewater Mall
Registration: www.mhaff.org (Select Event Registration from Menu)

For more information or to register contact: Bill Smith at 504-726-0818 - reports@mhaff.org

Tulane Green LivingSpace has over 20 years of experience designing and delivering world-class and state-of-the-art sustainable design programs in education, residential and commercial, of all scales, and other healthy living projects.

Sponsored by the Alliance for Healthy Homes, Washington, DC

- Alliance sponsored 6 day-long trainings
- 3 train-the-trainer sessions in N.O. and 3 in Mississippi
- Plus other meetings, seminars, homeowner trainings, workshops and presentations
- Dennis Livingston was the trainer

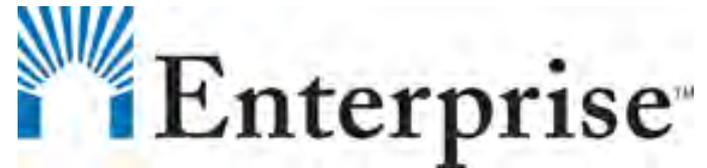


Thanks to our funders

Chase Bank



Enterprise Community
Partners



Home Depot Foundation



Fannie Mae Foundation



Key local partners



- New Orleans – Preservation Resource Center of N.O.
- Mississippi – MS Interfaith Disaster Task Force
- Audrey Evans, LSU Extension
- Colette Pichon Battle, Moving Forward Gulf Coast



Who participated

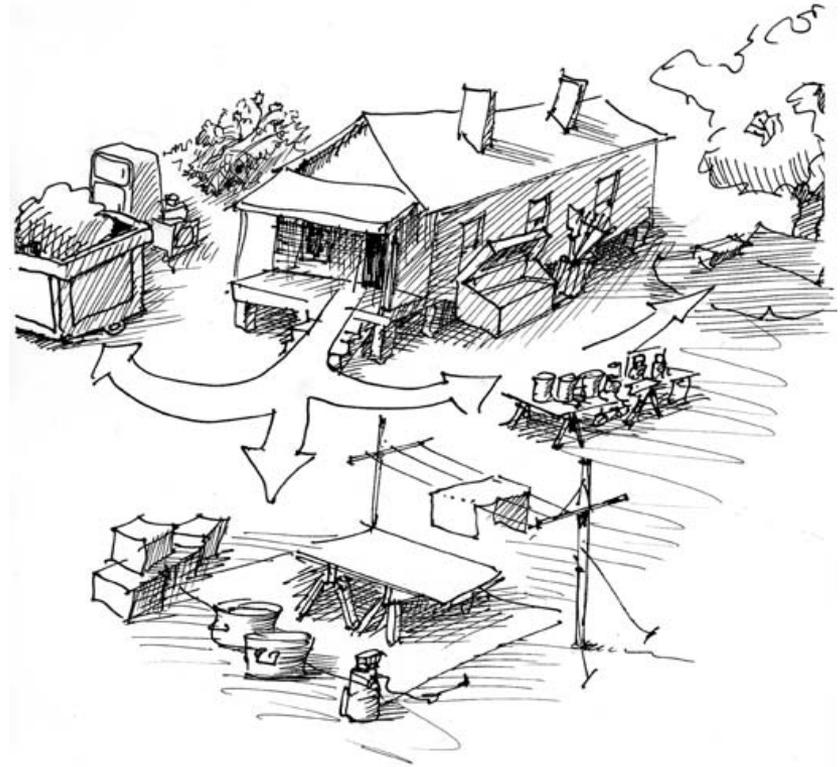


- Disaster recovery groups
- Community orgs
- Churches
- Government agencies
- Contractors



Training manual

- Worker-friendly (emphasizes illustrations over text)
- Includes info on tools, materials, costs - and where to get them



Available at - www.afhh.org/res/res_pubs/shrfdh.pdf



Mold cleanup & prevention



This part of our training based on techniques developed by:

- National Center for Healthy Housing
- Little Sisters of the Assumption Family Health Services (East Harlem)



Manual & strategies used beyond our trainings

- Consolidated Safety Services (HUD contractor) used our drawings and exercises in dozens of homeowner trainings in the Gulf
- Steven Winter Associates (HUD contractor) recently published “Rebuilding Flood-Damaged Homes” using much of our manual
- Manual and training put to use again after recent Mississippi River flooding



Policy failures & recommendations



Disaster preparedness

- Restore & preserve, don't degrade, wetlands
- Build adequate levees and maintain them
- Evacuate people without cars early enough
- Tell people that they should have insurance
- Support community development org. roles



Disaster response

- The things we all saw on TV
- Little government help for cleanout, safety supplies
- Promotion of bleach as a disinfectant for cleaning up mold
- Major delays in federal funding for home restoration
- Very little training for homeowners and workers in safety and effective techniques for cleaning and restoring homes.
- Virtually no training or support for day laborers
- Failure to comply with Section 3.
- Failure to organize bulk purchasing and sharing of costly tools
- Inadequate support or guidance for residents restoring homes
- Contradictory messages on contamination levels
- City health dept. practically didn't function for months



Other policy issues



- Green vs. saving homes
- Owner-occupied vs. rental
- Planning re. future of hardest-hit neighborhoods



Questions, Answers & Comments





BUILDING A FRAMEWORK FOR HEALTHY HOUSING

2008 National Healthy Homes Conference

Lessons Learned from Hurricane Katrina

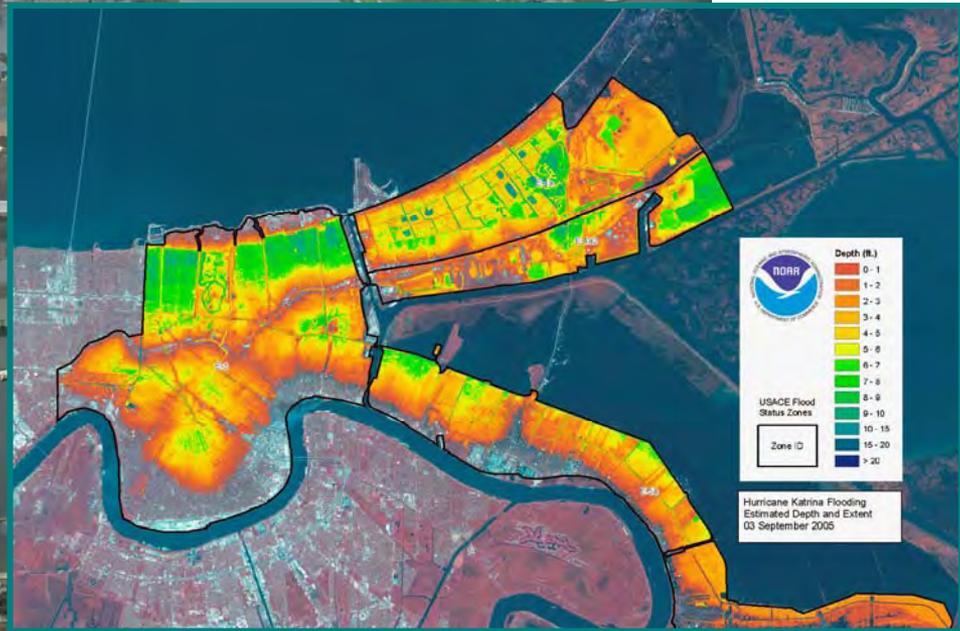
Building Contractor Capacity

Ralph Scott, Alliance for Healthy Homes

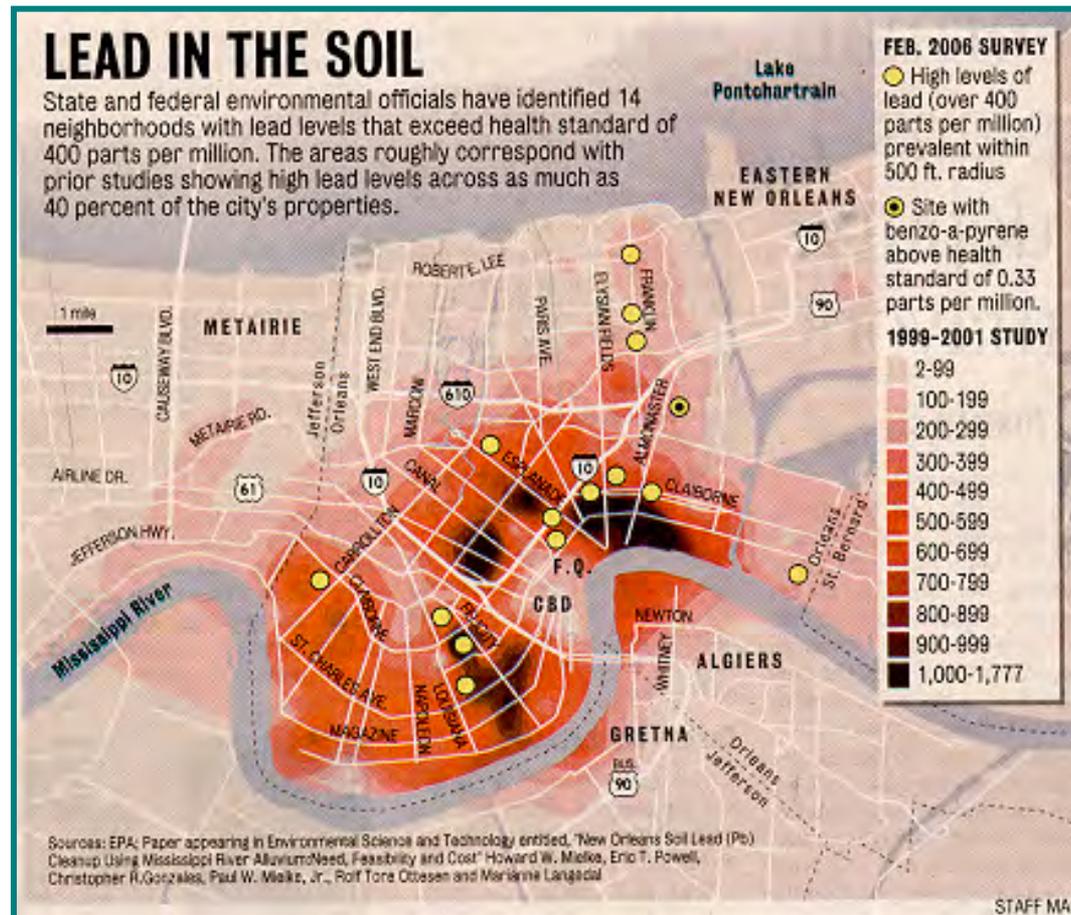
Dennis Livingston, Community Resources

Howard Mielke, Moderator

Impact of “catastrophic structural failure” by Katrina on exterior lead sources



EPA, USGS & DEQ results after Hurricane Katrina: “historic soil Pb”

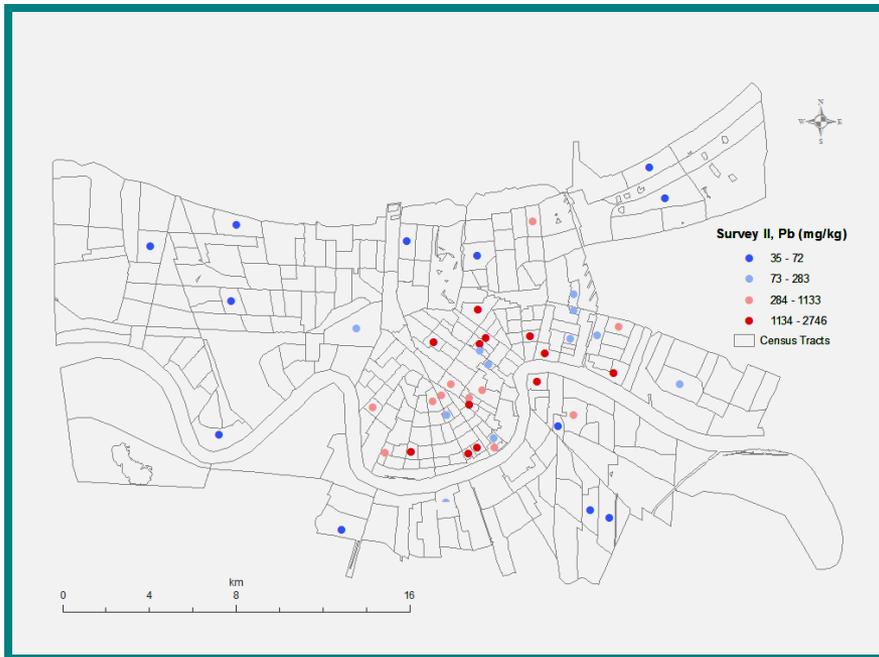


Soil Pb Survey III & H₂O depth (m) 46 Census Tracts (874 soil samples) Collected during the summer of 2006

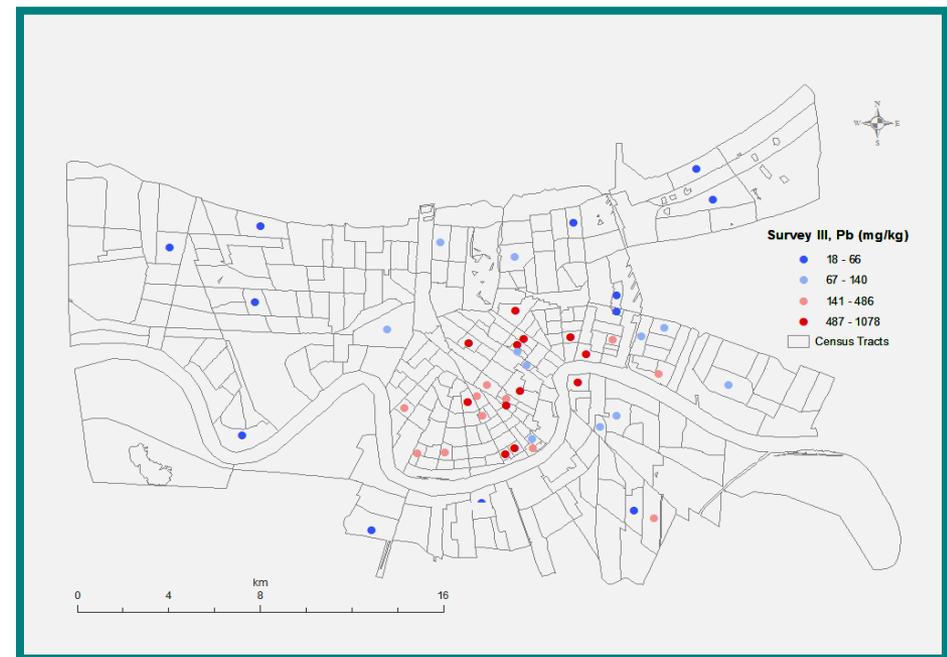


Pre and Post Katrina N = 46 CTs (n = 874): Results of Survey II versus III Chance of difference: P-value = 1.7×10^{-7}

Survey II Exterior Pb



Survey III Exterior Pb



Survey of New Orleans paint coating samples (N = 40) & “Home Renovation”

%-tile	Pb Ext	Pb Int
	4% < 5,000 ppm	
Min	464	24
25%	36,408	164
50%	76,603	416
75%	117,046	12,326
Max	317,151	63,313
N	25	15

