

CHAPTER 8

INSPECTION/WORK GUIDES FOR PREVENTIVE MAINTENANCE

Section I INTRODUCTION

8-1. General This chapter describes typical defects frequently found in buildings and structures which require correction by PM units. For some of these, responsibility for maintenance or repair may be beyond the scope of PM and therefore must be assigned to an appropriate shop. Such assignment does not relieve the PM unit of the responsibility to detect and report any obvious work requirements. The list is comprehensive but does not include all defects which properly come within the purview of the PM program. Additions and deletions to the list should be made as appropriate. Corrections of hazards should be a constant objective of all personnel. Conditions contributing to or causing wasteful use of energy should also be corrected or reported.

8-2. Purpose of the Work Guides. The inspection/work guides provided in this chapter are meant to be guides only, and must be adapted to local conditions. It is intended that appropriate personnel will utilize the guides in this chapter as well

as manufacturer's instructions in developing local maintenance inspection/work requirements. The guides are also a training tool for new PM personnel who can prepare a local work guide list from the master work guide list.

8-3. Scope of the Work Guides. Actions to be taken to correct defects are not covered in this chapter. Other technical manuals in the 5-600 series provide such detailed information. A list of pertinent references is included in Appendix A. Inspection frequencies are not given for each item listed because these requirements may vary greatly from building to building and installation to installation. The frequencies selected by Facilities Engineering personnel should be based on manufacturer's recommendations, maintenance manual's recommendations, function of item, use of operation, history of service requirements, overhaul schedules, relationship of item to essential operation of the facility, etc.

Section II BUILDING COMPONENTS

8-4. General This section of the inspection/work guides contains major building components and detailed lists of elements found in each. Use of these guides will enable PM to inspect and repair the interior and exterior of buildings systematically. The coverage of the guides also assures supervisors that consistent standards of performance are being met.

8-5. Roofing Elements

- a. *State and Tile Roofs*
 - (1) missing
 - (2) flashing failures
 - (3) loose or broken
 - (4) deteriorated fasteners
- b. *Metal Roofs*
 - (1) holes, looseness, punctures, broken seams
 - (2) rust or corrosion
 - (3) inadequate side or end lap (corrugated roofing)
 - (4) inadequate expansion joints

- (5) damage resulting from contact between dissimilar metals
- (6) needs painting
- (7) inadequate or improper fastening
- c. *Asphalt Strips and Roll Roofing*
 - (1) loss of granules and coating asphalt
 - (2) bare areas with exposed and deteriorating felt
 - (3) tabs curled, clawed or missing
 - (4) shingles or roll roofing brittle
 - (5) laps of roll roofing not cemented adequately
- d. *Cement Asbestos*
 - (1) missing shingles
 - (2) loose, broken, or cracked shingles
 - (3) insufficient side or end lap of corrugated sheets
- e. *Built-Up Roofs*
 - (1) bituminous coating exposed due to loss of gravel

- (2) coating weathered, felts exposed
- (3) felts disintegrated and disbonded
- (4) blisters, splits
- (5) wet insulation
- f. *Flashings*
 - (1) deteriorated, rust, corrosion
 - (2) insecurely fastened, damaged
 - (3) open joints
- g. *Roof Decking*
 - (1) deteriorated
 - (2) improper drainage
- h. *Parapets and Copings*
 - (1) cracks, spalling, damaged, missing
 - (2) open joints
- i. *Lighting Rods and Grounds*
 - (1) broken, corroded
 - (2) insecurely fastened
 - (3) missing components
- j. *Roof Vents*
 - (1) insecurely fastened
 - (2) corrosion, deterioration, damaged
 - (3) lack of weathertightness of seams and joints
- k. *Installed Equipment on Roof*
 - (1) rust, corrosion
 - (2) loose or worn guy wires, braces, roof supports and flashings
- l. *Gutters and Downspouts*
 - (1) clogged gutters and outlets
 - (2) sections missing or damaged
 - (3) rust or corrosion
 - (4) improper slope

8-6. Structural

- a. *Foundations and Exterior Walls*
 - (1) concrete, masonry
 - (a) spalling, breaks, salt attack
 - (b) leaking, moisture penetration
 - (c) movement due to frost heaves and differential settlement
 - (d) binding of door and windows
 - (e) wall or slab separated from footing
 - (f) exposed reinforcing
 - (g) out-of-plumb
 - (2) timber
 - (a) warped, checked, split, bowed
 - (b) sagging, broken members
 - (c) rotting, fungus growth
 - (d) termite or other insect infestation
 - (e) dampness
 - (f) bolts missing, loose or faulty
 - (g) split rings, other connections
 - (3) vents
 - (a) damaged screens; missing
 - (b) wooden parts rotten, broken
 - (c) hardware damage
 - (d) vent openings obstructed

- (4) drainage
 - (a) failure to connect downspouts to available storm sewers
 - (b) failure to terminate on properly installed splash blocks
 - (c) improper surface grading around structure
 - (d) trash, debris, or other accumulations resulting in water ponding
- (5) stucco
 - (a) deterioration or disintegration
 - (b) alligator cracks
 - (c) water stains
 - (d) broken areas
- (6) cement-asbestos
 - (a) missing or broken sheets
 - (b) stains
 - (c) loose fastenings
 - (d) broken sheets or shingles
- (7) aluminum and sheet steel siding
 - (a) scars, scuffs
 - (b) rust, corrosion
 - (c) breaks in protective coating
 - (d) puncture of metal
 - (e) loose, missing or broken fastenings
- (8) exterior trim
 - (a) deterioration of protective coating
 - (b) loose, warped, cracked, checked, or broken boards
 - (c) swelling of joints
 - (d) rotting
 - (e) fungus or termite infestation
 - (f) evidence of continued dampness
- b. *Interior Walls and Ceilings*
 - (1) wood
 - (a) damaged condition
 - (b) support failure
 - (c) rot
 - (d) termite or other insect, or fungus infestation
 - (e) abrasion, scuff marks
 - (f) loose or missing fixtures
 - (g) leaks or stains
 - (2) wallboard, plasterboard, and fiberboard
 - (a) open joints
 - (b) cracked, buckling, sagging
 - (c) support failure
 - (d) abrasions, breaks, holes
 - (e) discoloration from utility leaks
 - (3) plaster
 - (a) cracking, buckling, support failure
 - (b) spalling, moisture absorption
 - (c) discoloration from leaks
 - (4) ceramic tile
 - (a) chipped, cracked, loose, missing, holes, defective joints

(b) etched, pitted, or dull surfaces caused by use of abrasive cleaners

(5) synthetic coverings and wallpaper

(a) elements missing

(b) insecurely fastened, adhesive failure

(c) curling, abrasions, indentations, punctures, tears

(d) etched, pitted, or dull surface caused by use of abrasive cleanser

(6) wainscots

(a) loose nails

(b) cracked or missing

(c) paint deterioration

(7) metal grills

(a) corrosion, other damage

(b) deterioration of protective coating

(c) insecurely fastened

c. *Chimneys and Stacks*

(1) masonry and concrete

(a) spalling, weathering and cracking

(b) deteriorated paint

(c) damage from gases

(d) cracks from expansion and contraction

(e) eroded or sandy mortar joints

(2) linings and baffles

(a) cracks, spalling

(b) damaged from gases

(3) ladders

(a) insecure rungs, poor anchorage

(b) rust

(c) paint scaling

d. *Porches and Decks*

(1) columns

(a) deterioration

(b) settling

(c) faulty understructures

(d) paint deterioration

(2) fire escapes

(a) settling

(b) broken railings and steps

(c) hazards

(d) paint deterioration

(3) rails-wood and metal

(a) broken

(b) missing parts

(c) deterioration

(d) insecurely fastened

(e) paint deterioration

(4) decking and steps

(a) deteriorated, termites, fungus

(b) sagging

(c) cracked

(d) paint deterioration

(e) broken

e. *Doors*

(1) wood

(a) rotting, splitting

(b) missing

(c) loose, poor fit

(d) cracking

(e) lack of weathertightness

(2) metal

(a) rust, corrosion

(b) warping, binding

(c) lack of weathertightness

(d) poor fit

(3) storm

(a) binding, jamming

(b) poor frame fit

(c) corrosion and rust of metal parts

(d) rotting and damage of wood parts

(e) lack of weathertightness

(4) frames and jambs

(a) loose fitting, broken

(b) warped, cracked

(c) paint deterioration

(5) door hardware

(a) missing, missing or loose screws and bolts

(b) broken, poorly functioning

(c) rust deterioration

(d) improper installation or adjustment

(e) lack of lubricating, misalignment

(f) loss of finish coating

(6) casings, baseboards and moldings

(a) loose

(b) water and wax damage

(c) paint deterioration

(d) scratches, indentations

(7) doorstops

(a) missing

(b) broken

f. *Structural Elements.* X-Trusses, roof framing and other structural members will be inspected by a qualified engineer to assure structural adequacy (AR 420-70, para. 2-23).

(1) timber trusses

(a) twisted and bowed members

(b) dry rot

(c) checks and splits in ends at web members

(d) sag, overloading

(e) separation or slippage at joints

(f) damaged splice plates

(2) Steel trusses

(a) twisted, bowed, deformed, broken

(b) loose bolts, rivets, defective welds

(c) rust, corrosion

(d) rupture, shearing or crushing of steel plates, members, bolts and rivets

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- (3) bar joists
 - (a) corrosion, welding defects
 - (b) bends, deflection, overloading
 - (4) timber members
 - (a) loose, warped, cracked or broken
 - (b) support failure
 - (c) rot
 - (d) termite, insect or fungus infestation
 - (e) excessive deflection
 - (5) steel members
 - (a) loose bolts, rivets
 - (b) rust, corrosion
 - (c) defective welds, connection failure
 - (d) bends, deflection
 - (6) concrete members
 - (a) exposed reinforcement
 - (b) moisture penetration
 - (c) cracks, spalling, breaks
 - (d) expansion joint deterioration
 - (7) posts
 - (a) insecure foundation
 - (b) deterioration, rotted or corroded
 - (c) paint deterioration
 - (d) out-of-plumb
 - (8) girders
 - (a) splits, cracks, rot
 - (b) insufficient bearing or fastening
 - (c) bends, deflection
 - (d) welds-failure
 - (e) rust, corrosion
 - (9) floor joists
 - (a) loose bridging
 - (b) deterioration
 - (c) excessive deflection
 - (d) insecure nailing
 - (e) insect damage
 - (10) roof rafters and purlins
 - (a) loose bolts and nails
 - (b) cracked, split and broken
 - (c) open joints
 - (d) loose boards
 - (e) insect damage
 - (f) sag of members
- g. Loading Ramps and Platforms*
- (1) warehouse platforms
 - (a) cracks, breakage (Figure 8-1)
 - (b) sunken platform slabs
 - (c) hazards

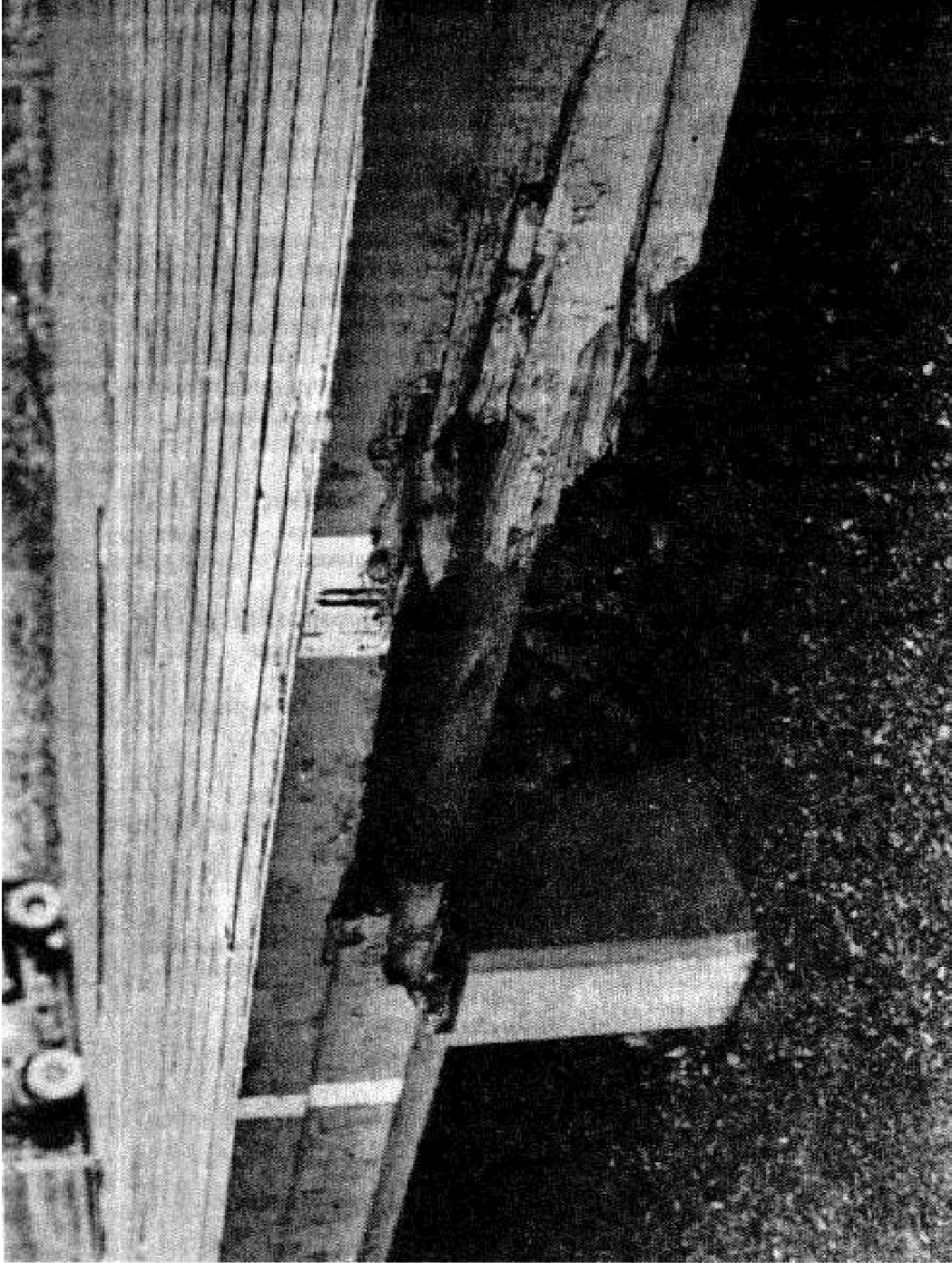


Figure 8-1. Deteriorating Loading Platform

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- (2) retaining walls
 - (a) out-of-plumb, settled
 - (b) spalling
- h. Exterior and Interior Stairs*
 - (1) no obstructions
 - (2) wood
 - (a) sagging, rotted, splintered, loose, warped
 - (b) stains, moisture
 - (3) concrete
 - (a) wear, pitting, roughness
 - (b) lack of steel nosing
 - (c) settlement, shrinkage cracks
 - (d) absence of treatment or waxing that would prevent surface dusting
 - (4) steel
 - (a) rusted, loose, bent
 - (b) support damage
 - (c) missing, loose or damaged bolts, rivets, screws, broken welds
 - (5) finish
 - (a) absence of protective coatings
 - (b) insect infestation in finish and sub-flooring
 - (c) dampness-fungus growth
 - (d) lack of nonslip finish
 - (6) railings and balustrades
 - (a) insecurely fastened
 - (b) splits, chips, broken
 - (c) paint deterioration
 - (d) rot, termite damage
- i. Sub floors*
 - (1) loadings
 - (a) deflection, warping, cracking
 - (b) lack of conformance to posted loadings
 - (2) wood
 - (a) sagging, splintered, loose, warped, rotted, moisture, insect damage
 - (c) faulty connections-nails, screws
 - (d) protruding nails
 - (3) concrete
 - (a) wear, pitting, roughness
 - (b) settlement, shrinkage cracks
 - (4) steel
 - (a) wear, rusted, loose, bent surface
 - (b) damage to structural supports
 - (c) broken welds, missing, loose or damaged bolts, nuts, rivets and screws
- j. Windows*
 - (1) woodsash
 - (a) lack of weathertightness
 - (b) loose or missing caulking
 - (c) splitting, rotting, cracking
 - (d) loose, poor fit
 - (e) binding, missing
- (2) metal sash
 - (a) rust, corrosion
 - (b) warping, binding, poor fit
 - (c) non-weathertightness
- (3) storm windows
 - (a) binding, jamming
 - (b) poor frame fit
 - (c) rust and corrosion of metal parts
 - (d) termite rotting of wood parts
- (4) shutters, awnings and canopies
 - (a) splitting, rotting, cracking
 - (b) loose, missing
 - (c) freedom of swing
 - (d) damage to supports
 - (e) misalignment damage
- (5) insect screens
 - (a) loose, broken, missing
 - (b) missing hardware
 - (c) binding, jamming
 - (d) holes in screening material
 - (e) rust, corrosion of metal parts
 - (f) rotting, stain, damage to wooden parts
- (6) louvres and venetian blinds
 - (a) loose, missing, broken
 - (b) misalignment
 - (c) improper installation
 - (d) corrosion, abrasion
 - (e) lack of lubrication
- (7) shades
 - (a) operation, improper fit
 - (b) tears, broken, missing
- (8) window hardware
 - (a) loose, missing, broken parts
 - (b) rust, corrosion, abrasion
 - (c) loss of finish coating
 - (d) binding, misalignment
 - (e) improper installation or adjustment
 - (f) lack of lubrication
- (9) glass
 - (a) broken, chipped panes, missing
 - (b) putty missing or disintegrated
- (10) weather stripping (seasonal)
 - (a) tightness of fit
 - (b) broken, missing
 - (c) moisture, rot
- k. Glazing*
 - (1) fixed single and double glazing, insulating glass
 - (a) weathertightness
 - (b) cleaning and maintenance
 - (c) cracks, breaks
 - (d) missing panes
 - (2) interior glass panels
 - (a) cleaning, maintenance

- (b) chips, breaks, cracks
- (c) fit, connections
- (3) roof lights
 - (a) leaks, weathertightness
 - (b) cleaning, maintenance

8-7. Floor Covering

- a. *Wood Flooring*
 - (1) abrasion, indentations, scuffmarks
 - (2) absence of protective coatings
 - (3) insect infestations
 - (4) overloading
 - (5) dampness, fungus growth
 - (6) knots, sagging, stains, discolorations, scratches, warped
- b. *Concrete*
 - (1) stains, discolorations
 - (2) shrinkage cracks, settlement
 - (3) absence of treatment or waxing that would prevent surface dusting
 - (4) wear, pitting, roughness
- c. *Oxychloride/Cementitious*
 - (1) moisture
 - (2) abrasion resistance
 - (3) protection against chemical damage
 - (4) chips, cracks, pitting, roughness
- d. *Terrazzo*
 - (1) pitting, roughness
 - (2) discolorations
 - (3) settlement cracks, loose or broken segment
- e. *Clay and Masonry Tile*
 - (1) broken, chipped or loose resulting in uneven surfaces
 - (2) stains, discolorations
 - (3) sandy and eroded joints
- f. *Vinyl-asbestos Tile*
 - (1) loose at seams
 - (2) tears, indentations
 - (3) chipping, breaking, cracking
 - (4) furniture supports to prevent indentations
 - (5) damage from solvents or excessive water in cleaning
 - (6) metal protection strips
- g. *Asphalt Tile*
 - (1) missing, loose or broken tiles
 - (2) indentations, furniture supports to prevent indentations
 - (3) loose edged
 - (4) damaged from solvents or excessive water in cleaning
 - (5) improper wax
- h. *Resilient Floor Covering*
 - (1) wear, cracking, chipping, breaking
 - (2) scratches, tears, indentations
 - (3) lack of bonding and unevenness of underlayment

- (4) damage from solvents or excessive water in cleaning
- (5) absence of protective wax coatings
- i. *Mastic*
 - (1) depressions, indentations
 - (2) absence of protective wax coatings
- j. *Carpets and Rugs*
 - (1) wear, tear, cuts, raveling
 - (2) discolorations, fading
 - (3) beetle or moth damage
 - (4) wear, damage, failure of binding or anchoring strips
 - (5) wear or missing tractive substance on backing of small rugs or carpet on polished floors

8-8. Exterior Painting

- a. peeling, efflorescence
- b. Rust, Corrosion, Absence of Paint
- c. Weather Damage
- d. Deterioration
- e. Excessive Chalking or mildew

8-9. Interior Painting

- a. Scuffs, Abrasions
- b. Deterioration
- c. Absence of Paint

8-10. Heating

- a. *Hot Air Furnaces*
 - (1) operation
 - (a) complaints of operators
 - (b) improper cleaning
 - (c) poor flue connections
 - (2) filters
 - (a) dust, grease deposits
 - (b) missing, improper fit
 - (c) replacement of throwaway types
 - (d) washing of permanent types
 - (3) electrical controls
 - (a) loose connections
 - (b) charred, frayed, broken or wet insulation
 - (c) low voltage
 - (4) combustion chambers and smoke pipes
 - (a) deposits, dirt
 - (b) abrasions, wear, misalignment
 - (c) breaks in thermal insulation casings
 - (d) leakage of gases
 - (e) lack of weathertightness of seams and joints
 - (5) adjustments and connections
 - (a) missing or damaged connections
 - (b) clogged jets, valves, fuel supply lines
 - (c) insufficient oil or gas pressures
 - (d) misalignment, nonuniform flame or heat spread
 - (e) wrong fuel-air mixture
 - (f) incorrect position of pilot light

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(g) improper baffle adjustment causing impingement

(h) defects in multiple-step heating device

b. Steam and Hot Water Furnaces

(1) complaints of operators

(2) improper cleaning

(3) dust, scaling, corrosion, other deposits, clogging

(4) leaks, air-binding or water hammer

(5) misalignment and improper slope of units resulting in inadequate drainage and heating efficiency

c. Hot Water Tanks

(1) corroded surfaces

(2) leaks

(3) open seams

(4) insufficient, improper or damaged insulation

(5) improperly set aquastat

d. Air Handlers, Pumps, and Hot Air Blowers

(1) dust, dirt, other accumulations

(2) defective operation, indicated from observation through operating cycle

(3) loose, missing or damaged connections and connectors

(4) bent blades, worn or loose belts

(5) misalignment, imbalance

(6) excessive noise and vibration

(7) excessive end play of shaft

(8) ineffective sound isolators

e. Space Heaters

(1) lack of wall and floor protection (2) incorrect firing

f. Air Ducts

(1) soot, dust and other deposits, clogging

(2) deformations, broken, loose or missing

parts

(3) loose seams and joints

(4) breaks in vapor barriers

(5) improper air distribution at branch ducts

(6) improper seasonal damper or register settings

tings

g. Radiators

(1) broken parts

(2) leaking valves and connections, condensations, clogging

(3) vibrations, excessive noise

(4) corrosion, metal defects

h. Piping

(1) defective operation

(2) leaks, clogging

(3) moisture

(4) vibration

i. Thermostats and Controls (Figure 8-2)

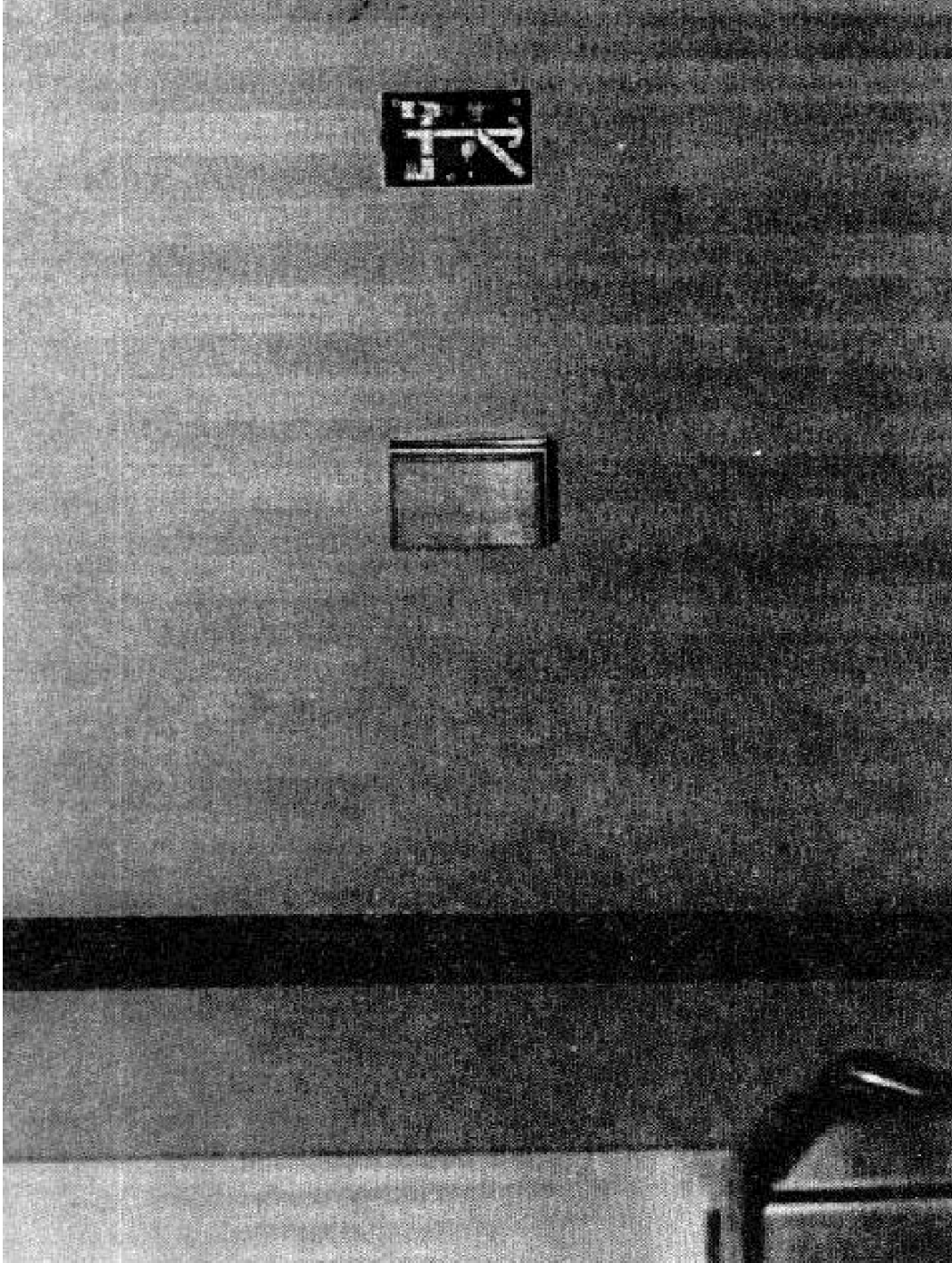


Figure 8-2. Missing Thermostat Cover

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- (1) complaints of operators
- (2) partially or fully inoperable
- (3) improper "on" and "off" operation

j. Ventilating Fans

- (1) dirty
- (2) lack of lubrication
- (3) noisy, excessive vibration
- (4) defective
- (5) bent blades
- (6) imbalance

8-11. Air Conditioning

a. Wiring and Electrical Controls

- (1) loose connections
- (2) charred, broken or wet insulation
- (3) short circuits

b. Temperature and Humidity Controls

- (1) improper setting
- (2) loose connections
- (3) defective operation noted in observing operation through complete cycle

c. Air Ducts, Dampers, Registers, Grills, Louvres and Bird and Insect Screens

- (1) soot, dirt, dust and other deposit
- (2) leaks, broken, loose or missing connections and parts
- (3) excessive vibration
- (4) material defects
- (5) defective operation of moveable parts
- (6) improper seasonal or operating settings of dampers

d. Thermal Insulation and Vapor Barriers

- (1) wet, damaged or missing
- (2) broken tie wires
- (3) loose bands
- (4) torn canvas jackets

e. Air Filters

- (1) dust, grease, other deposits
- (2) missing

- (3) improper fit

f. Piping

- (1) leaks, corrosion
- (2) material defects of fittings, copper tubing, steel piping

8-12. Plumbing

a. Lavatory Services

- (1) bowl
 - (a) unsanitary
 - (b) broken, leaks, material defects
 - (c) insecurely fastened
- (2) seat
 - (a) unsanitary
 - (b) broken, missing, insecurely fastened
 - (c) splintered (if applicable)
 - (d) paint or protective coating
- (3) fixtures, flush valves and parts
 - (a) improper functioning
 - (b) leaks, broken or insecurely fastened
 - (c) missing

b. Sinks and Basins

- (1) bowl
 - (a) unsanitary, odors
 - (b) broken, insecurely fastened
 - (c) leaks, material defects
- (2) faucet
 - (a) worn washers
 - (b) loose, leaking, broken
- (3) traps and drains
 - (a) dirty, clogged
 - (b) corrosion
 - (c) grease
 - (d) leaks
- (4) stopper
 - (a) missing or deteriorated
 - (b) inoperative

c. Bathtubs and Showers (Figure 8-3)

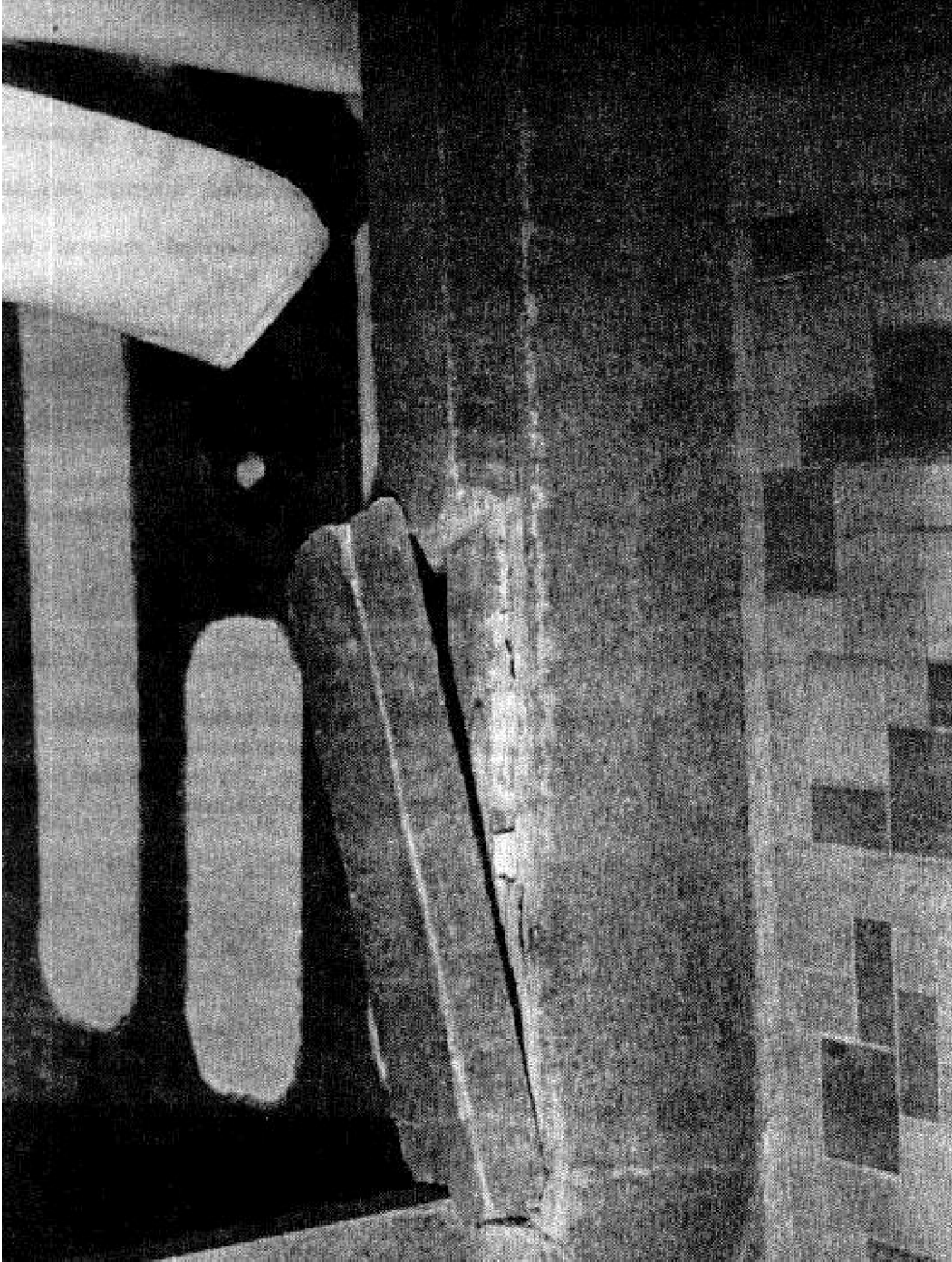


Figure 8-3. Broken Shower Threshold

- (1) general
 - (a) hazards
 - (b) unsanitary conditions
- (2) showerhead
 - (a) insecurely fastened
 - (b) leaking
- d. *Urinals*
 - (1) bowl
 - (a) unsanitary
 - (b) broken, insecurely fastened
 - (c) leaks
 - (d) missing strainer
 - (2) fixtures, flush valves and parts
 - (a) improper functioning
 - (b) broken, damaged
- e. *Piping*
 - (1) water piping
 - (a) external rust
 - (b) leakage, clogging, loose connections
 - (c) insufficient water flow
 - (d) water hammer
 - (2) sanitary and drain
 - (a) solid accumulation in strainers
 - (b) slow drainage
 - (c) odors and sewer gas from loss of water seal in traps
 - (d) back pressure caused by clogging
 - (e) ground water through leaky joint or broken pipe
- f. *Drinking Fountains*
 - (1) bowl
 - (a) cracked
 - (b) clogged
 - (2) valve
 - (a) worn washer
 - (b) leaking

8-13. Electrical

- a. *Conservation of Energy*
 - (1) unnecessary lights, excessively high lighting levels
 - (2) unnecessarily high-wattage bulbs
 - (3) unoccupied areas lighted
 - (4) signs posted to remind occupants to turn off lights
- b. *Lighting, Including Sockets*
 - (1) improper lamps installed in hazardous locations
 - (2) inadequately supported, insecure and improperly located
 - (3) evidence of unauthorized removal and relocation
 - (4) cracked or broken luminaries and fixture parts
 - (5) missing pullcords, metal pullchains not provided with insulating links
 - (6) indications of objects being supported from, hung on or stored in fixtures
 - (7) evidence of overheating, under-sized or other damage to socket, exposed or damaged connecting wiring
- c. *Wiring and Cable*
 - (1) dirty, poor ventilation
 - (2) broken conduit
 - (3) presence of moisture, grease, oil, chemical fumes
 - (4) improper or unauthorized connection and dangerous temporary connections
 - (5) damaged wiring devices, defective insulators, damaged support (Figure 8-4)

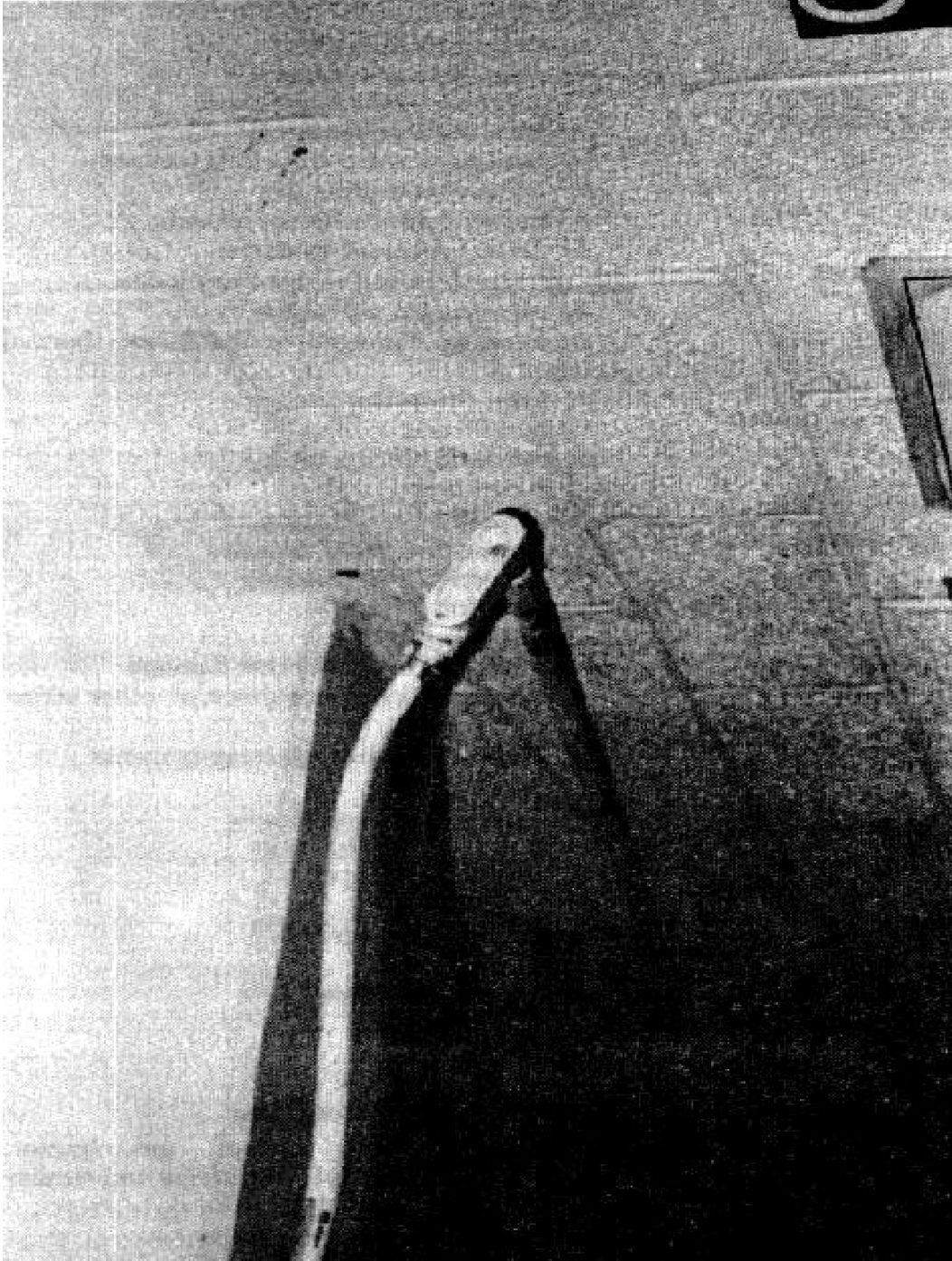


Figure 8-4. Poorly Connected Conduit

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- (6) broken or missing parts or exposed live parts
- (7) excessive cable sag and vibration
- (8) crowded cable spacing
- (9) evidence of overheating, ground and short circuits
- (10) overheated splices, damaged or defective insulation
- d. *Electric Heaters*
 - (1) unauthorized location
 - (2) evidence of overheating
 - (3) exposed or damaged connecting wiring
- e. *Motors and Fans*
 - (1) excessive vibration and noise
 - (2) lack of or excessive lubrication
 - (3) evidence of overheating
 - (4) exposed or damaged connecting wiring
- f. *Fuseboxes*
 - (1) dirty, corroded
 - (2) evidence of overheating
 - (3) unposted or illegible instructions, identification charts, circuit diagrams, and feeder schedules
 - (4) loose or inadequate connections
 - (5) lack of lubrication for switches
 - (6) knife switches and fuse clips improperly aligned
 - (7) dangerous temporary connections
- g. *Distribution Ducting*
 - (1) torn, insecure, hazardous
 - (2) insulation damage
- h. *Switches*
 - (1) defective operation
 - (2) broken or missing parts
 - (3) loose wires
- i. *Convenience Outlets*
 - (1) dirty, defective contacts
 - (2) missing or damaged cover plates
 - (3) difficult plugging
 - (4) overheating
 - (5) evidence of overloading on multiple sockets servicing lamps or appliances
 - (6) lack of grounding terminal
- j. *Cords, Cord Extensions, and Plugs*
 - (1) inadequate
 - (2) unsafe
 - (3) incorrect types being used
 - (4) lengths excessive
 - (5) poor insulation
 - (6) twisted, spliced
 - (7) exposed to damage underfoot
 - (8) laying on floor or across heated surfaces or lamps
 - (9) cracks, breaks, loose connection wires improperly attached and in danger of pulling away from plug when removing from outlet
 - (10) missing protective cover on male ends

- (11) no grounding terminal or ground wire with clamp
- (12) cable clamps missing or loose on power plugs

8-14. Equipment

a. *Food Service Systems*

- (1) ranges
 - (a) dirty or loose canopy
 - (b) poor flue connections
 - (c) improper operation of doors
 - (d) loose units or bolts
 - (e) slanting or warped cooking surfaces
 - (f) evidence of leaking gas
 - (g) burner grills broken or missing
 - (h) defects reported by users
 - (2) refrigerators and cold storage lockers
 - (a) excess noise, vibration
 - (b) missing, damaged or inefficient thermal insulation
 - (c) paint chipped or peeling
 - (d) insufficient cooling
 - (e) complaints of operator
 - (3) exhaust fans
 - (a) excess noise, vibration
 - (b) grease, dirt, other deposits
 - (c) protective grille missing
 - (d) loose connections
 - (4) counter tops
 - (a) scratched, stained, other damage
 - (b) pulling away from cabinet or other structure
 - (5) cupboards and storage compartments
 - (a) sagging doors
 - (b) broken or missing hinges
 - (c) broken or missing locks
 - (d) insufficient supports
 - (e) broken glass
 - (f) combustible materials
 - (6) sinks
 - (a) insecurely fastened
 - (b) slow drainage
 - (c) leaking faucets
 - (d) chipped enamel
 - (7) steam and hot water tables
 - (a) defective water valves, gas burner, heating units, switches and pilot lamps and similar equipment
 - (b) dented, scratched surfaces
- ### b. *Laundry Facilities*
- (1) washing machines
 - (a) leaking door
 - (b) malfunctioning hinges
 - (c) loose or faulty electrical and plumbing connections

- (d) evidence of imbalance
- (e) excess noise, vibration
- (2) dryers
 - (a) loose, damaged or missing vent ductwork
 - (b) insufficient clearance between dryer and wall
 - (c) faulty electrical connection
- (3) ducting
 - (a) loose, damaged or missing
 - (b) located in areas prone to damage
- (4) exhaust fans
 - (a) inoperable, disfunctioning
 - (b) dirt, grease, other deposits'
 - (c) excessive noise, vibration
 - (d) operation hazards, i.e. opportunity for electric shock, injuries from rotating blade
- (5) tubs, trays
 - (a) damaged, missing, leaking
 - (b) insecurely fastened
 - (c) cabinetry
- (1) cupboards and cabinets
 - (a) sagging doors
 - (b) missing hinges or locks
 - (c) insufficient supports
- (2) chalkboards, bulletin boards
 - (a) cracked, broken, other damage
 - (b) insecurely attached
- (3) shelving
 - (a) hazards
 - (b) insufficient supports
 - (c) sagging
- (4) counters
 - (a) insecurely fastened
 - (b) slivers
 - (c) loose nails
 - (d) warped surface covering
- (5) butcher block surfaces
 - (a) chipped, slivers
 - (b) wood in need of oiling or other refinishing
 - (c) laminated pieces pulling apart
 - (d) insecurely fastened
- d. Smoke alarms—test operation

Section III. STRUCTURES COMPONENTS

8-15. General This section of the inspection/work guides contains special components of structures. PM, personnel will find that use of these guides will enable them to cover most structures not addressed in Section II.

8-16 Special Structures

- a. *Storage Bins and Tanks*
 - (1) foundations
 - (a) settling, movement, upheaving
 - (b) inadequate soil coverage
 - (c) cracking
 - (2) exterior concrete surfaces
 - (a) spalling, cracking and leakage
 - (b) exposed reinforcing
 - (3) exterior steel surfaces
 - (a) rust, corrosion
 - (b) distortion or other structural failure
 - (c) leakage
 - (d) deteriorated paint
 - (4) roofs
 - (a) defects in weatherproofing, heat-reflecting coatings, coverings
 - (b) rust, corrosion
 - (c) deteriorated paint
 - (d) structural or mechanical damage caused by freezing weather conditions
 - (5) structural supports
 - (a) rust, corrosion, rot
 - (b) broken, cracked, distorted
 - (c) loose, missing
 - (d) deteriorated paint
 - (6) vents
 - (a) rust, corrosion
 - (b) dirty, damaged or missing screens
 - (7) relief valves
 - (a) defective operation
 - (b) leakage
 - (c) improper adjustment
 - (8) ladders and stairs
 - (a) rust, corrosion, rot
 - (b) broken, cracked, loose, missing members or connections
 - (c) deteriorated paint
 - (9) leakage
 - (a) evidence of fuel loss
 - (b) water infiltration
- b. *Storage Sheds*
 - (1) metal
 - (a) rust, corrosion
 - (b) dents, punctures
 - (c) loose connections
 - (d) improperly functioning doors and hinges
 - (2) wood
 - (a) rot, deterioration
 - (b) insect infestation
 - (c) leaks

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- c. *Towers*
 - (1) general defects
 - (a) out of plumb
 - (b) paint deterioration
 - (c) deficient support or guys
 - (d) rust, corrosion, loose, missing, twisted, bowed, bent or broken members
 - (e) termite or other insect infestation
 - (f) corroded, loose or missing conduits, terminals, cables
 - d. *Grandstands, Bleachers*
 - (1) structural supports
 - (a) corrosion, rot
 - (b) damaged, loose or missing members
 - (2) seats
 - (a) splintered, chipped
 - (b) insecurely fastened
 - (c) peeling, cracking paint
 - (3) steps
 - (a) sagging, bowed
 - (b) insecurely fastened, missing
 - (c) improperly or illegibly identified
 - (4) wooden
 - (a) termite or other insect infestation
 - (b) splinters, splinters, chipped, rotten
 - (c) damaged, loose or missing members
 - (d) peeling, cracked paint
 - (5) steel
 - (a) corrosion, rust
 - (b) damaged, loose or missing members
 - (c) peeling, cracked paint
 - (6) concrete
 - (a) cracking, spalling, settling
 - (b) exposed reinforcing rods
 - (c) paint deterioration
 - e. *Playground Structures*
 - (1) structural supports
 - (a) corrosion, rot
 - (b) damaged, loose or missing members
 - (c) abrasive edges
 - (d) instability
 - (2) climbing apparatuses
 - (a) splinters
 - (b) rust or abrasive surfaces
 - (c) sharp edges
 - (d) missing rungs or supports
 - (3) seats and benches
 - (a) splinters, chipped
 - (b) chain supports damaged or fouled
 - (c) cloth seats frayed or torn
 - (d) sharp edges
 - (e) insecurely fastened
 - (4) paint
 - (a) cracked, peeling, chipped
 - (b) weathered

- (c) vandalized
- (d) blistered
- (5) hazards
 - (a) loose members
 - (b) dangerous edges
 - (c) rough surfaces
 - (d) damaged retaining fences

8-17. Swimming Pools

- a. *Walls and Floor.*
 - (1) Cracked
 - (2) Leaks
 - (3) Dirt and Stains
- b. *Scum Gutters and Drains*
 - (1) Broken
 - (2) Sluggish and Clogged
 - (3) Corrosion
- c. *Gratings*
 - (1) Cracked
 - (2) Broken
 - (3) Paint Deterioration
- d. *Spring Boards, Diving Towers and Platforms*
 - (1) Insecurely fastened
 - (2) Metal-Rust or Corrosion
 - (3) Wood-Cracked, Broken or other Damage
 - (4) Absence of Non-Slip Coverings
- e. *Concrete*
 - (1) Settling
 - (2) Cracks, Breaks and Spalling
 - (3) Exposed Reinforcing Steel
- f. *Tile*
 - (1) Chipped and Cracked
 - (2) Loose and Missing Pieces
 - (3) Defective mortar joints
- g. *Expansion Joints*
 - (1) Leakage
- h. *Depth Markers and Lane Stripes*
 - (1) Illegible
 - (2) Deteriorating

8-18. Docks, Piers and Wharves

- a. *Concrete Members*
 - (1) cracks, breaks, spalling, settling
 - (2) exposure of reinforcing steel
- b. *Timber Members*
 - (1) infestation
 - (2) loose, missing, broken, split, warped
 - (3) rotted bolt holes
- c. *Pilings*
 - (1) holes, abrasions
 - (2) infestation
 - (3) mechanical damage
 - (4) loose or missing wedges
- d. *Bracings*
 - (1) loose, missing, broken, split
 - (2) warped, decay

(3) termite and other pest infestation

e. Steel Members

- (1) rust, corrosion
- (2) loose, missing, bent, broken
- (3) defective connections

f. Bollards, cleats

- (1) broken or loose hardware
- (2) paint deterioration

g. Stringers

- (1) loose, cracked or broken
- (2) loose hardware
- (3) deterioration
- (4) infestation

h. Decking

- (1) cracked or broken
- (2) deterioration

(3) infestation

8-19. Mechanical Movers

a. Elevators

- (1) paint deterioration
- (2) loose or broken hardware
- (3) excessive wear of floor covering
- (4) broken, insufficient or missing lighting

b. Escalators

- (1) paint deterioration
- (2) loose or broken hardware
- (3) excessive wear of treated material
- (4) broken, insufficient or missing lightning
- (5) deteriorated hand rail
- (6) hazards