THE DOW CHEMICAL COMPANY

PLAINTIFF'S EXHIBIT
DOW-1013

TEXAS OPERATIONS ASBESTOS HANDBOOK

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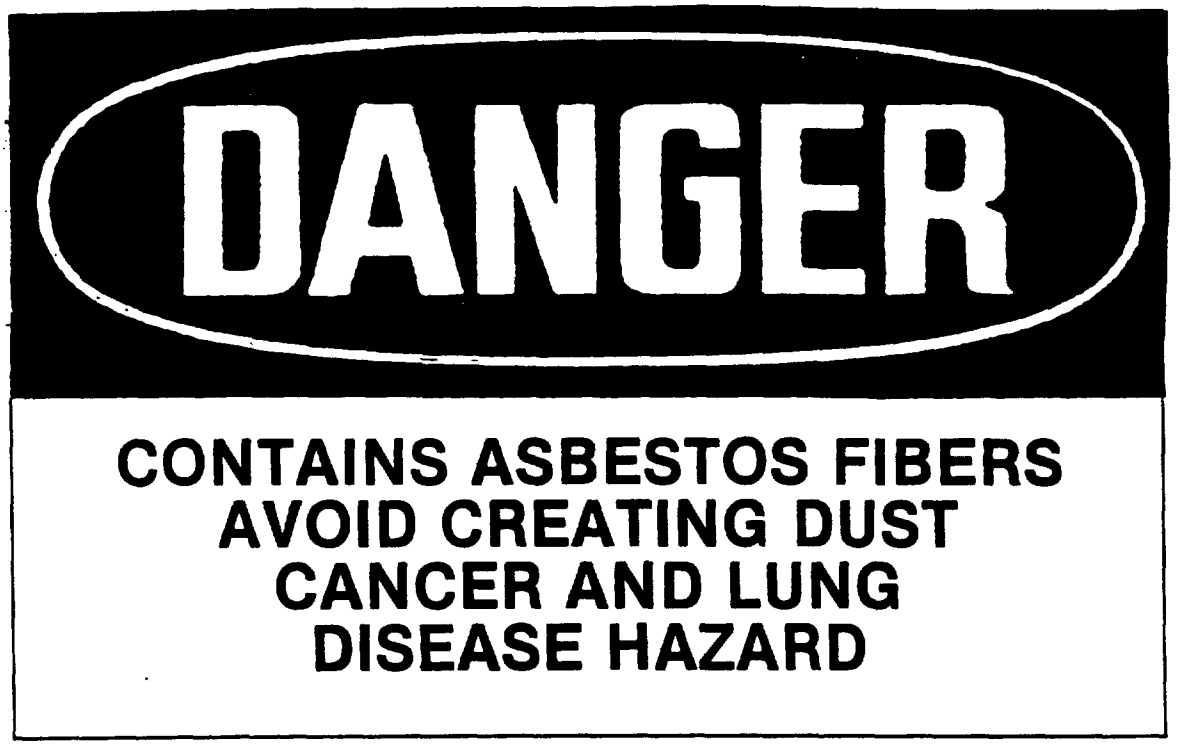

REVISED,
NOVEMBER, 1988

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THIS MANUAL IS AN UPDATED EDITION OF THE HANDBOOK PREPARED IN 1972 AND REVISED IN 1977, 1979, 1985 AND 1987. THIS EDITION WAS REVISED BY THE ASBESTOS TASK FORCE DURING THE THIRD QUARTER OF 1988.

ST0013452

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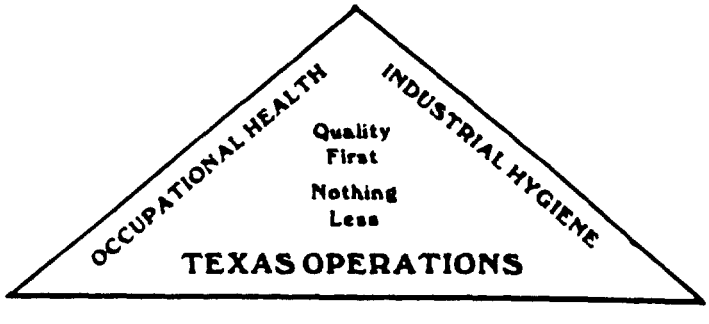

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SECTION I

PURPOSE

This handbook defines safe handling procedures for asbestos materials used in Texas Operations. The intent is to control personnel exposure to asbestos dust through training, asbestos maintenance programs, safe work procedures, proper use of protective equipment, and by the substitution of non-asbestos containing materials. It is Dow's philosophy to eliminate the use of asbestos where feasible. **MAJOR MANAGER APPROVAL IS REQUIRED WHEN USING ASBESTOS MATERIALS IF A SUITABLE ALTERNATE IS KNOWN.**

Asbestos has been widely used as insulation, structural wallboard, roofing material, etc. Asbestos fibers are currently in use as a mechanical reinforcing matrix in insulation, roofing paper, certain piping systems, gaskets, brake linings, clutch plates, etc. Dow Engineering Specifications were revised in 1970 to exclude asbestos-containing insulation before the enactment of Federal regulations controlling the use and handling of asbestos.

The revised OSHA standards (1910.1001 and 1926.58) which became effective July 21, 1986 define the precautions, procedures and controls required for asbestos handling. These standards also define the allowable exposure levels and the manner of determining exposure levels. The National Emission Standard for Hazardous Air Pollutants (NESHAP) also established specific requirements for notification, removal, packaging, transport and disposal of asbestos-containing materials. Violations of these regulations may result in a citation or fine or both. Dow is committed to meeting or exceeding government regulations, to protect the health of personnel.

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SECTION II

HEALTH & ENVIRONMENTAL SCIENCES INFORMATION CENTER
POTENTIAL HEALTH EFFECTS
ASBESTOS

DR-0027-0713 REVISED: 10/14/88

SYNONYMS
AMPHIBOLE

APPEARANCE: fibrous solid in various colors
EXPOSURE GUIDELINES: OSHA PEL is 0.2 fibers (>5 um) per cc. 8 hr. TWA
OSHA General Industry Standard 29CFR1910.1001.
OSHA Construction Standard 29CFR1926.58.
OSHA Excursion Limit is 1 fiber/cc averaged over a sampling period of 30 minutes.
ACGIH TLV is 0.5 fibers (>5 um) per cc for amosite, Ala; 0.2 fibers (>5 um) per cc for crocidolite; 2 fibers (>5 um) per cc for chrysotile and other forms of asbestos, Ala.

POTENTIAL HEALTH EFFECTS

This section includes possible adverse effects which could occur if this material is not handled in the recommended manner.

EYE
- Mechanical injury only.

SKIN
- Mechanical injury only.
- Skin absorption is unlikely due to physical properties.

INGESTION
- Single dose oral LD50 has not been determined.
- Amounts ingested incidental to industrial handling are not likely to cause injury; however ingestion of larger amounts may cause injury.

ACUTE INHALATION EFFECTS
- Excessive exposure to dust causes chronic inflammations of lung tissue and pleural membranes, as well as cancers, in both man and animals.

SUBCHRONIC EFFECTS
- Prolonged exposure to asbestos dust has been found to cause pulmonary fibrosis (asbestosis), which may be disabling and even fatal.

CHRONIC EFFECTS/CARCINOGENICITY
- Has been shown to cause cancer in humans.
- For hazard communication purposes under OSHA standard 29 CFR part 1910.1200, this chemical is listed as a carcinogen by NTP and IARC.

TERATOGENIC EFFECTS
- No relevant information found.

REPRODUCTIVE EFFECTS
- No relevant information found.

MUTAGENICITY
- Some forms of asbestos have been reported to induce chromosomal changes in tissue culture.

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SECTION III

ASBESTOS TRAINING PROGRAM MINIMUM REQUIREMENTS

All employees who handle asbestos must be trained before initial assignment and annually thereafter. The OSHA asbestos standards and all training materials are available to employees upon request. Information will be presented in a manner the employee can understand.

The following items must be included in the training program:

1. The health effects associated with asbestos,
2. The relationship between smoking and exposure to asbestos in producing lung cancer,
3. Methods of recognizing asbestos,
4. The quantity, location, manner of use, release, and storage of asbestos and the specific nature of operations which could result in exposure to asbestos,
5. The engineering controls and work practices associated with the employee's job assignment,
6. The specific procedures implemented to protect employees from exposure to asbestos, such as appropriate work practices, emergency and clean-up procedures, and personal protective equipment to be used,
7. The purpose, proper use, and limitations of respirators and protective clothing,
8. The purpose and a description of the medical surveillance program required by the OSHA Standard,
9. A review of the OSHA Standard, including appendices.

NOTE: Training Requirement Guidelines

A. Initial Training
   1. View Asbestos video tape (VT87-1129B)
   2. Complete Asbestos Training Guide (IPT)

B. Annual Retraining
   1. View video tape on OSHA standards (VT87-1129A)
   2. Complete Asbestos Training Guide (IPT)

Call 409-238-2620 to schedule videotapes and/or 409-238-2467 to obtain the Asbestos Training Guide (IPT).

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SECTION IV

DEFINITIONS

ACTION LEVEL

An airborne concentration of asbestos of 0.1 fiber per cubic centimeter (f/cc) of air calculated as an eight (8)-hour time-weighted average.

ASBESTOS

Chrysotile, amosite, crocidolite, tremolite, anthophyllite, actinolite, and any of these minerals that has been chemically treated and/or altered.

AUTHORIZED PERSONNEL

Any person authorized by the employer and required by work duties to be present in regulated areas.

CLEAN ROOM

An uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

COMPETENT PERSON

One who has been trained and retrained annually in an EPA approved course and is capable of identifying existing asbestos hazards in the workplace and has the authority to take prompt corrective measures to eliminate them. The duties of the competent person include at least the following: establishing the negative-pressure enclosure, ensuring its integrity, and controlling entry to and exit from the enclosure; supervising any employee exposure monitoring required by the standard; ensuring that all employees working within such an enclosure wear the appropriate personal protective equipment, are trained in the use of appropriate methods of exposure control, and use the hygiene facilities and decontamination procedures specified in the standard; and ensuring that engineering controls in use are in proper operating condition and are functioning properly.

DECONTAMINATION AREA

An enclosed area consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment contaminated with asbestos. The decontamination area may be adjacent and connected to the regulated area or located remotely.

DEMOLITION

The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos.

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SECTION IV

DEFINITIONS

EMPLOYEE EXPOSURE

Exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

EQUIPMENT ROOM (CHANGE ROOM)

A contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

EXCURSION LIMIT (EL)

An airborne concentration of asbestos of 1.0 fiber per cubic centimeter (f/cc) of air as averaged over a sampling period of thirty (30) minutes.

FIBER

A particulate form of asbestos 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.

FRIABLE ASBESTOS

Any material that when broken, crushed or pulverized releases asbestos fibers.

HIGH-EFFICIENCY PARTICULATE AIR (HEPA) FILTER

A filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers in diameter or larger.

MINI-ENCLOSURE

An enclosure constructed of 6-mil polyethylene sheeting to restrict access to the area where small-scale, short duration asbestos maintenance or renovation work is to be performed. The enclosure must have a contiguous change room.

NEGATIVE PRESSURE ENCLOSURE

An enclosure for large-scale long duration projects constructed of 6-mil polyethylene sheeting and equipped with a ventilation system (which discharges through a HEPA filter) capable of creating a negative pressure of 0.02 inches of water inside the enclosure. Where feasible, a decontamination area should be contiguous to the enclosure and should be the only means of egress.

PERMISSIBLE EXPOSURE LIMIT (PEL)

No employee shall be exposed to an airborne concentration of asbestos in excess of 0.2 fibers per cubic centimeter of air as an eight-hour time-weighted average (8 hr. TWA).

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SECTION IV

DEFINITIONS

REGULATED AREA

An area established by the employer to demarcate areas where airborne concentrations of asbestos exceed or can reasonably be expected to exceed the permissible exposure limit. The regulated area may take the form of a temporary enclosure, or an area demarcated to restrict access and minimize the number of employees potentially exposed to asbestos.

REMOVAL

The taking out or stripping of asbestos or materials containing asbestos.

RENOVATION

The modifying of any existing structure, or portion thereof, where exposure to airborne asbestos may result.

REPAIR

Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates where asbestos is present.

SMALL-SCALE, SHORT-DURATION ACTIVITIES

The tasks such as, but not limited to: the removal of small quantities of asbestos-containing insulation on pipes prior to repair; the removal of small quantities of asbestos-containing insulation on beams or above ceilings; the replacement of an asbestos-containing gasket when mechanical removal is required; the installation or removal of a small section of drywall material containing asbestos; or the installation of electrical conduits, pipe, or cable through or proximate to asbestos-containing materials.

SURFACTANTS

Chemicals added to water to improve its wetting ability.

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ASBESTOS AWARENESS HANDLING REQUIREMENTS

OWNER RESPONSIBILITY*

INSPECT ALL AREAS

TAKE SAMPLES OF SUSPECT MATERIALS AND SEND TO ANALYTICAL SERVICES 409-238-1199

ASBESTOS CONTENT >0.1%

DOCUMENT RESULTS AND RETAIN RECORDS

TRAIN PERSONNEL ON ASBESTOS SECTION III TOAH

FURTHER INSPECT FOR MATERIAL CONDITION AND VISUAL FIBER RELEASE

MATERIAL IN POOR CONDITION OR VISUAL FIBER RELEASE

EVALUATE AND DECIDE FOR REMOVAL AND/OR REPAIR

CONTACT INSULATION SERVICES 409-238-7036 OR INDUSTRIAL HYGIENE SERVICES 409-238-1281 FOR ASSISTANCE

MAJOR REMOVAL/DEMOLITION OR RENOVATION REQUIRED

NAME PROJECT SUPERVISOR, SCOPE, JOB, AND (IF REQUIRED) PREPARE NOTIFICATION LETTER TOAH SECTION VII

PROJECT SUPERVISOR SHALL:

CONTACT ENVIRONMENTAL SERVICES 409-238-2414 25 DAYS BEFORE WORK TO BEGIN

CONTACT INSULATION SERVICES TO BID JOB OR ARRANGE FOR DOW PERSONNEL

WHEN CONTRACT AWARDED, CONTACT ENVIRONMENTAL SERVICES 409-238-2414 AND IDENTIFY SUCCESSFUL BIDDER

HAVE PRE-JOB REVIEW WITH SAFETY DIRECTOR, OWNER REPRESENTATIVE, CONTRACTOR COMPETENT PERSON, INDUSTRIAL HYGIENE, DOW OR CONTRACTOR PERSONNEL TO DO JOB

DECIDE ON JOB PROCEDURES AND ARRANGE AUDIT AND MONITORING. COMPLETE ASBESTOS SAFETY CHECKLIST.

OWNER SHALL

DOCUMENT AND RETAIN RECORD IF ALL ASBESTOS REMOVED.

DOCUMENT AND SET UP MAINTENANCE PROGRAM IF ANY ASBESTOS REMAINING

MINOR REMOVAL AND/OR REPAIR REQUIRED

REVIEW SECTION X TOAH TO SEE IF JOB FALLS INTO GLOVE BAG OR SMALL-SCALE, SHORT-DURATION ACTIVITY. IF SO USE CORRECT ASBESTOS ABATEMENT MINIMUM REQUIREMENTS

DOCUMENT REMAINING ASBESTOS & SET-UP MAINTENANCE PROGRAM

ASBESTOS CONTENT <0.1%

DOCUMENT RESULTS AND RETAIN RECORDS

NO FURTHER ACTION REQUIRED

MATERIAL IN GOOD CONDITION, NO FIBER RELEASE

DOCUMENT, LABEL AND SET UP MAINTENANCE PROGRAM TOAH SECTION VI

*REFERENCES

1. TEXAS OPERATIONS SAFETY STANDARD T12
2. TEXAS OPERATIONS ASBESTOS HANDBOOK (TOAH)
3. EPA-560 PURPLE BOOK
4. OSHA STANDARDS 29CFR 1910.1001 & 29CFR 1926.58
5. ENVIRONMENTAL STANDARD ES-314

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SECTION V

ASBESTOS AWARENESS

ASBESTOS DO'S AND DON'TS

This section is provided as general guidance when working with or near asbestos-containing materials.

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DO

1. Get positive identification. Sample and have analysis performed at Analytical Services, phone 409-238-1199.
2. Take sufficient samples. Some vessels, equipment, etc. may contain more than one type of insulation. Asbestos materials may be covered by refractory, siding, or insulation.
3. Consult the appropriate section of this handbook if asbestos is present. Materials containing more than 0.1% by weight must be handled as asbestos.
4. Put all asbestos waste (old insulation, transite, mastic, dust collector solids, disposable clothing, gaskets, packing, shingles, Haveg piping, furnace refractories, pump packing, pipe gaskets, brake shoes, etc.) in approved containers for disposal. The containers must be properly labeled to warn of the asbestos hazard and sent to the designated asbestos landfill.
5. Inform all personnel in the general area that asbestos work is in progress.

DO NOT

1. Use materials containing asbestos (i.e. insulation, fireproofing, transite siding, Haveg piping, weatherproofing, and cooling tower materials) where an adequate alternate exists. **MAJOR MANAGER APPROVAL IS REQUIRED WHEN USING ASBESTOS MATERIALS IF A SUITABLE ALTERNATE IS KNOWN.**
2. Use asbestos labeled bags for disposal of general trash because of landfill permit requirements.
3. Sandblast or hydroblast materials containing asbestos. When sandblasting or hydroblasting adjacent areas, protect the asbestos materials from overblast. Examples of items to be protected are transite walls, pipe insulation, fireproofing, etc.
4. Use compressed air to remove asbestos materials. For example, do not clean brake drums and clutch housings with compressed air. This procedure may fill the surrounding atmosphere with asbestos fibers. An acceptable method is to use an approved vacuum. Dispose of the debris in approved containers and send to the designated asbestos landfill.

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ASBESTOS DO'S AND DON'TS (Cont'd)

5. Eat, drink, smoke, chew gum/tobacco products, or apply cosmetics in a regulated area or a decontamination area.
6. Dry sweep asbestos materials.
7. Spray asbestos-containing materials.
8. Use hand-operated or power-operated tools (such as but not limited to saws, scorers, abrasive wheels and drills) without local exhaust ventilation if the use of these tools would cause asbestos exposures to personnel in excess of 0.2 fiber cc. 8 hr. TWA.
9. Hang plants or pictures on structures covered with asbestos-containing materials.
10. Sand asbestos-containing floor tiles.
11. Damage asbestos-containing materials while moving furniture or other objects.
12. Install curtains, drapes, or dividers in such a way that they damage asbestos-containing materials.
13. Dust floors, ceilings, moldings or other surfaces in asbestos-contaminated environments with a dry brush.
14. Use an ordinary vacuum to clean up asbestos-containing debris.
15. Remove ceiling tiles below asbestos-containing materials without wearing the proper respiratory protection, clearing the area of other people, and observing asbestos removal waste disposal procedures.
16. Remove contaminated ventilation system filters without wetting. Do not shake.

NOTE: Items 5 through 16 are directly from the OSHA Asbestos Regulations.

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SECTION V

SOME ASBESTOS-CONTAINING MATERIALS IN BUILDINGS

SUBDIVISION	GENERIC NAME	ASBESTOS(%)	DATES OF USE	BINDER/SIZING
Surfacing material	sprayed-or troweled-on	1-95	1935-1970	sodium silicate, portland cement, organic binders.
Preformed thermal insulating products	batts, blocks, and pipe covering			
	85% magnesia	15	1926-1949	magnesium carbonate
	calcium silicate	6-8	1949-1971	calcium silicate
Textiles	cloth			
	blankets(fire)	100	1910-present	none
	felts:	90-95	1920-present	cotton/wool
	blue stripe	80	1920-present	cotton
	red stripe	90	1920-present	cotton
	green stripe	95	1920-present	cotton
	sheets	50-95	1920-present	cotton
	cord/rope/yarn	80-100	1920-present	cotton/wool
	tubing	80-85	1920-present	cotton/wool
	tape/strip	90	1920-present	cotton/wool
	curtains:			
	theatre,welding	60-65	1945-present	cotton
Cementitious concrete-like	extrusion panels:	8	1965-1977	portland cement
	corrugated(transite)	20-45	1930-present	portland cement
	flat (transite)	40-50	1930-present	portland cement
	flexible	30-50	1930-present	portland cement
	flexible perforated	30-50	1930-present	portland cement
	laminated (outer surface)	35-50	1930-present	portland cement
	roof tiles	20-30	1930-present	portland cement
	clapboard and shingles:			
	clapboard	12-15	1944-1945	portland cement
	siding shingles	12-14	unk.-present	portland cement
	roofing shingles	20-32	unk.-present	portland cement
	pipe	20-15	1935-present	portland cement
Paper products	corrugated:			
	high temperature	90	1935-present	sodium silicate
	moderate temperature	35-70	1910-present	starch
	indented	98	1935-present	cotton and organic binder
	millboard	80-85	1925-present	starch,lime,clay

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SECTION V

SOME ASBESTOS-CONTAINING MATERIALS IN BUILDINGS

SUBDIVISION	GENERIC NAME	ASBESTOS(%)	DATES OF USE	BINDER/SIZING
Roofing felts	smooth surface	10-15	1910-present	asphalt
	mineral surface	10-15	1910-present	asphalt
	shingles	1	1971-1974	asphalt
	pipeline	10	1920-present	asphalt
Asbestos-containing compounds	caulking putties	30	1930-present	linseed oil
	adhesive(cold applied)	5-25	1945-present	asphalt
	joint compound		1945-1975	asphalt
	roofing asphalt	5	unk.-present	asphalt
	mastics	5-25	1920-present	asphalt
	asphalt tile cement	13-25	1959-present	asphalt
	roof putty	10-25	unk.-present	asphalt
	plaster/stucco	2-10	unk.-present	portland cement
	spackles	3-5	1930-1975	starch,casein, synthetic resins
	sealants fire/water	50-55	1935-present	caster oil or polyisobutylene
	cement,insulation	20-100	1900-1973	clay
	cement,finishing	55	1920-1973	clay
	cement,magnesia	15	1926-1950	magnesium carbonate
Asbestos ebony products		50	1930-present	portland cement
Flooring tile and Sheet Goods	vinyl asbestos tile	21	1950-present	polyvinyl chloride
	asphalt/asbestos tile	26-33	1920-present	asphalt
	sheet goods/resilient	30	1950-present	dry oils
Wallcovering	vinyl wallpaper	6-8	unk.-present	none
Paints and coatings	roof coating	4-7	1900-present	asphalt
	air tight	15	1940-present	asphalt

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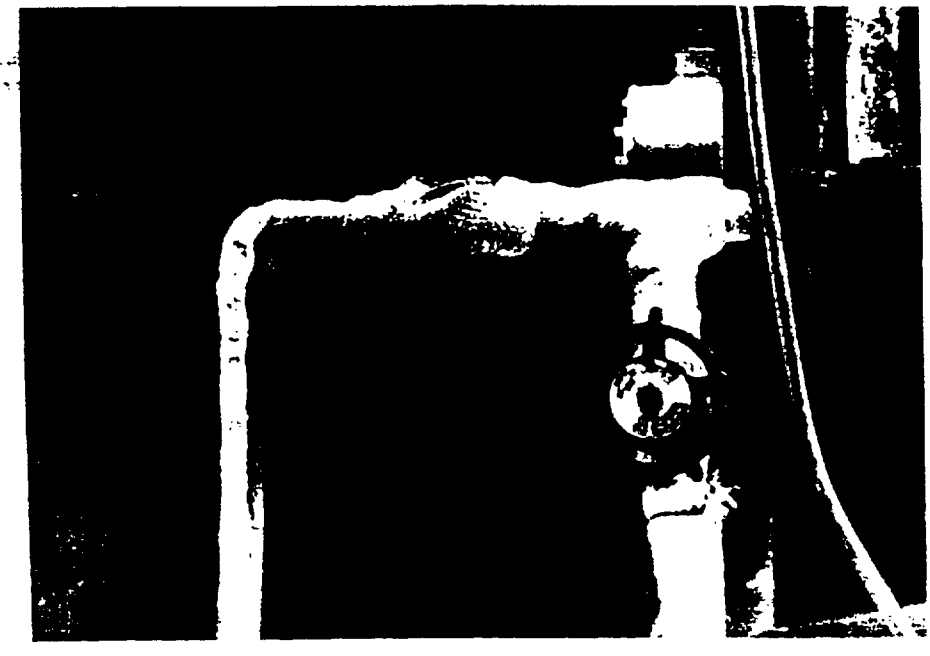
SECTION V

ASBESTOS AWARENESS

SUBJECT: Example pictures of past asbestos uses. Partial listing of examples that we must handle according to the guidance provided in this manual.



Figure 1. Many of our daily jobs involve repairing flange leaks, replacing valves, etc. The old insulation that is removed in many cases will contain asbestos.



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SECTION V

ASBESTOS AWARENESS

SUBJECT: Example pictures of past asbestos uses. Partial listing of examples that we must handle according to the guidance provided in this manual.

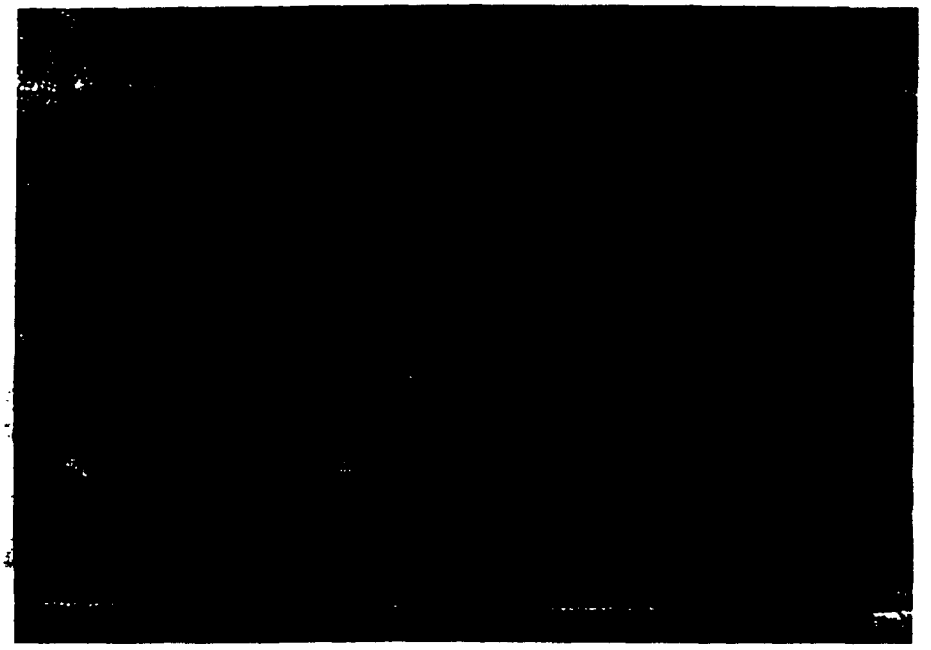

Figure 3. There still remain some asbestos blankets that need disposal.



Figure 4. Also used in past years was fiberglass insulation mixed with asbestos fibers.

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SUBJECT: Example pictures of past asbestos uses. Partial listing of examples that we must handle according to the guidance provided in this manual.

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Figure 5. Structural fireproofing often contained asbestos materials.

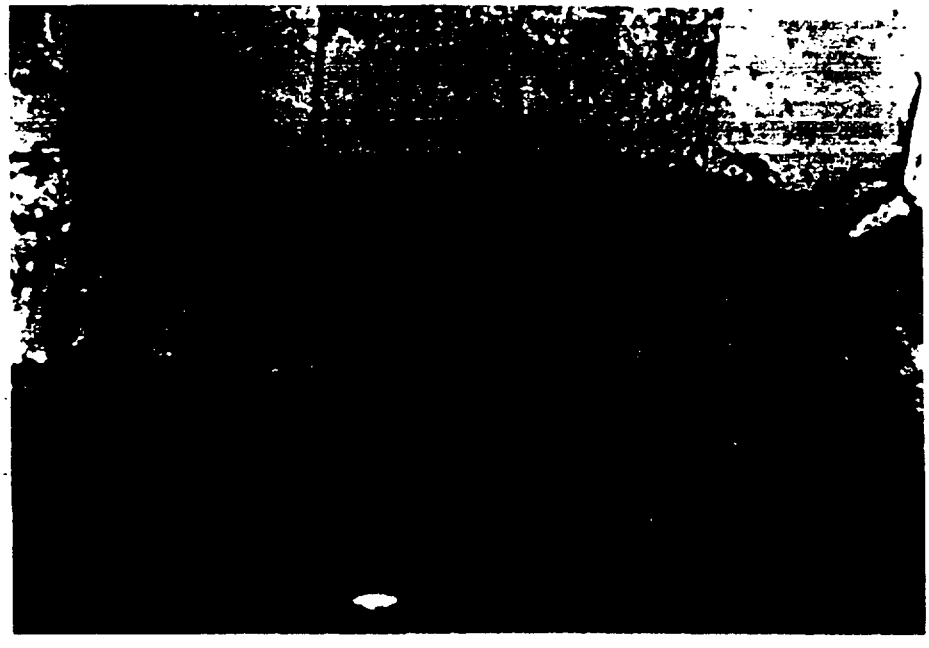

Figure 6. Asbestos insulation blocks in combinations with refractory materials exist in many of our boilers and furnaces.

SECTION V

ASBESTOS AWARENESS

SUBJECT: Example pictures of past asbestos uses. Partial listing of examples that we must handle according to the guidance provided in this manual.

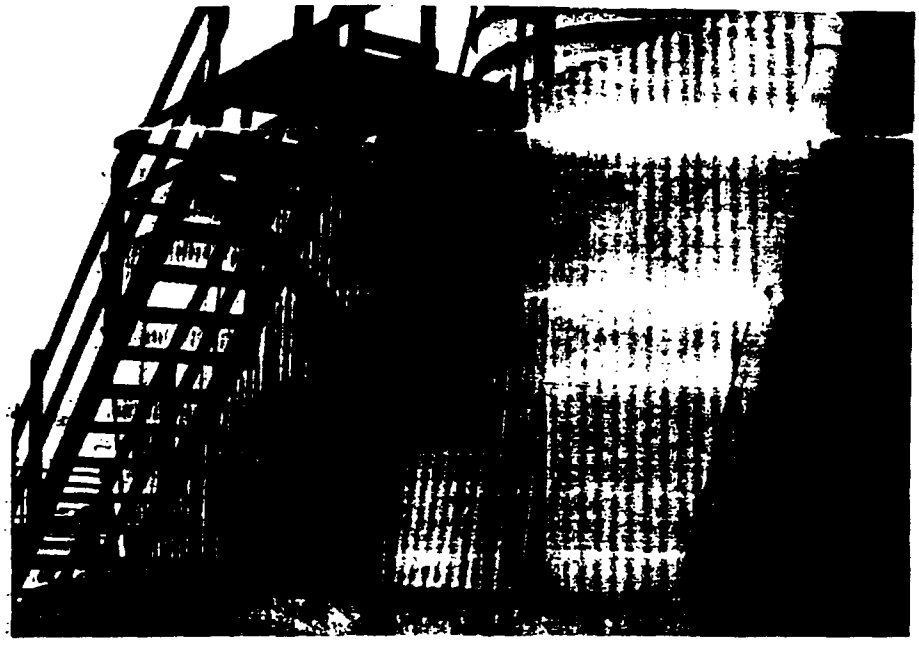

Figure 7. Transite which contains asbestos has been extensively used in the past in many applications in Texas Operations such as cooling towers, buildings, warehouses, etc. Asbestos is also present in cemesto board and asbestos siding shingles which were also used in various type buildings.

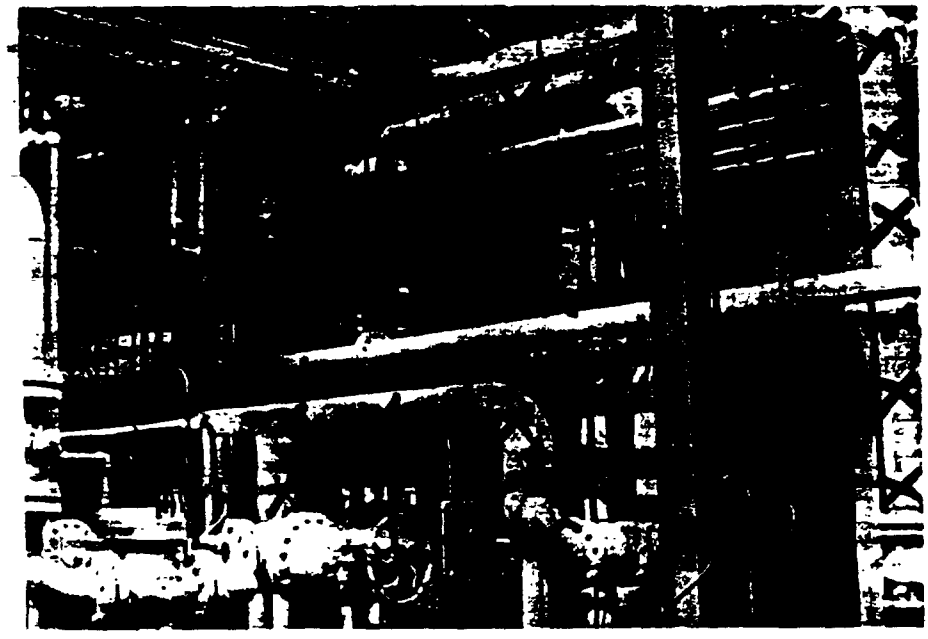

Figure 8. Our most extensive use of asbestos in the older plants was the thousands of square feet used on piping and equipment insulation.

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SUBJECT: Example pictures of asbestos uses. Partial testing of example that we must handle according to the guidance provided in this manual.

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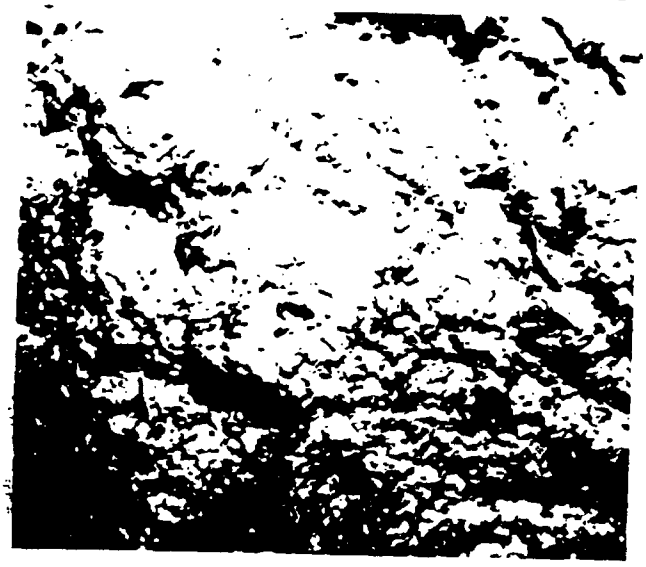
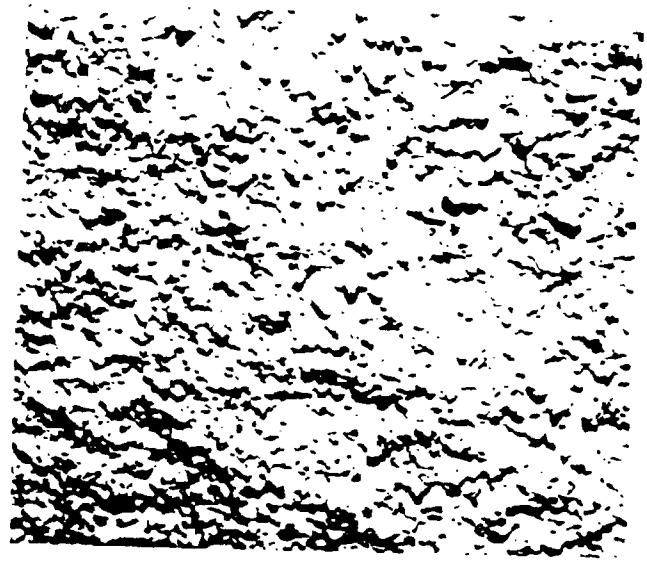
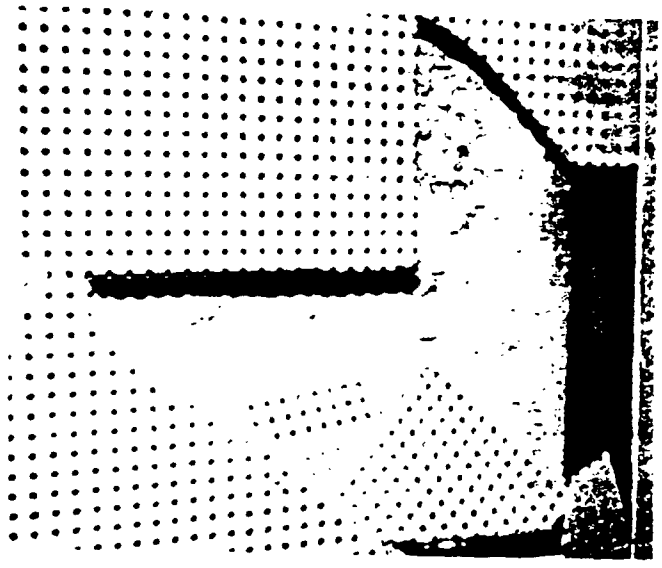


Friable, fluffy sprayed-on material



Friable, cementitious sprayed-on or troweled material (acoustical plaster)



Nonfriable wallboard with friable sprayed-on material behind



Pipe lagging

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Figure 6 Examples of asbestos-containing materials found in buildings

SECTION V

ASBESTOS AWARENESS

SUBJECT: Example pictures of asbestos uses. Partial testing of example that we must handle according to the guidance provided in this manual.

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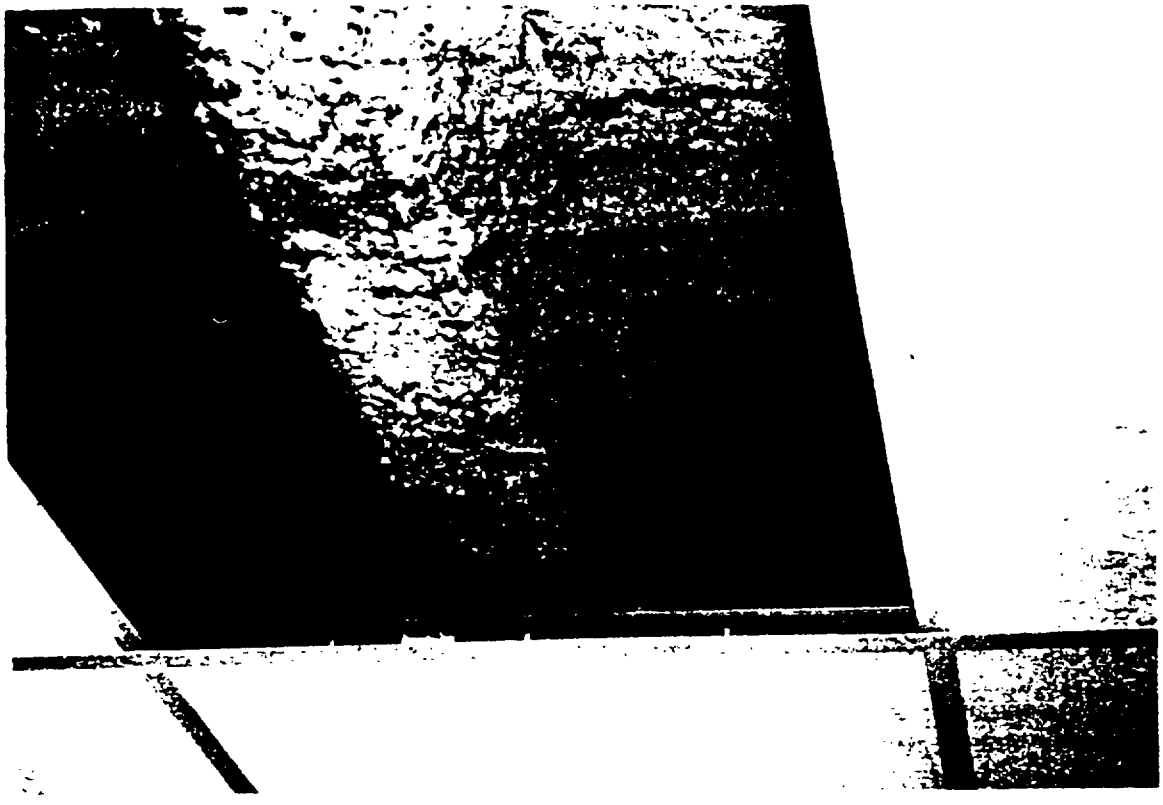

Figure 7 Asbestos-containing material located above a suspended ceiling.

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SECTION VI

ASBESTOS MAINTENANCE PROGRAM MINIMUM REQUIREMENT

An asbestos maintenance program must be initiated in all facilities that have asbestos-containing materials. Such a program shall include:

1. Inspection of buildings and process areas to determine the presence or absence of asbestos containing materials.
2. Development of an inventory of all asbestos-containing materials in the facility. The inventory may be a blueprint, diagram or written description which identifies the location and approximate amount of asbestos. Records must be maintained until the asbestos-containing materials are removed.
3. Maintenance of all labeling of asbestos-containing materials or block signs in the facility.
4. Prompt clean up of any asbestos contamination.
5. Examination of all asbestos-containing materials semi-annually to detect deterioration. If deterioration is found, the material must be repaired or removed. Call Insulation Services (409-238-7036) if assistance is needed.
6. Written procedures for handling asbestos materials during the performance of maintenance, demolition and renovation activities.
7. Training for personnel who may be required to handle asbestos-containing materials as outlined in the Training Section of this Handbook. (See page 3)
8. Documentation of compliance with this program.

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SECTION VII

ASBESTOS WORK IN PUBLIC BUILDINGS

The Texas Department of Health adopted new rules which became effective on October 1, 1988. These rules apply for all asbestos work in "public buildings". "Public buildings" are defined as all buildings "capable of public occupancy" except for "those buildings or portions of buildings to which all access is strictly and entirely controlled or prohibited because of process or functions dangerous to human health or safety.."

The procedures outlined below must be followed for all jobs involving asbestos in public buildings:

1. Notify Environmental Services, (409-238-2414)

2. Contact Insulation Services for assistance in assessing the job and in locating a licensed contractor to do the work. (409-238-7036)

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SECTION VIII

NOTIFICATION OF DEMOLITION OR RENOVATION WORK

It is the responsibility of the superintendent/owner to contact Environmental Services (409-238-2414) 25 days prior to the start of any reportable asbestos project. Jobs to be reported are:

(1) Demolition which involves the removal of friable asbestos material.

(2) Renovation in which the cumulative amount of friable asbestos removed in a calendar year exceeds 260 linear feet on pipe or 160 square feet on other facility components.

(3) Any asbestos work in "public buildings"

Reference: Texas Operations Environmental Standard ES314

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SECTION IX

HAZARD COMMUNICATION

1. Labels: Labels may be affixed individually to items or a warning sign may be placed at the entrance to the block or area.

   All products that contain asbestos in concentrations that exceed 0.1% by weight must be labeled. Labeling must be done in accordance with the requirements of 29 CFR 1910.1200 (f) of OSHA's Hazard Communication standard.

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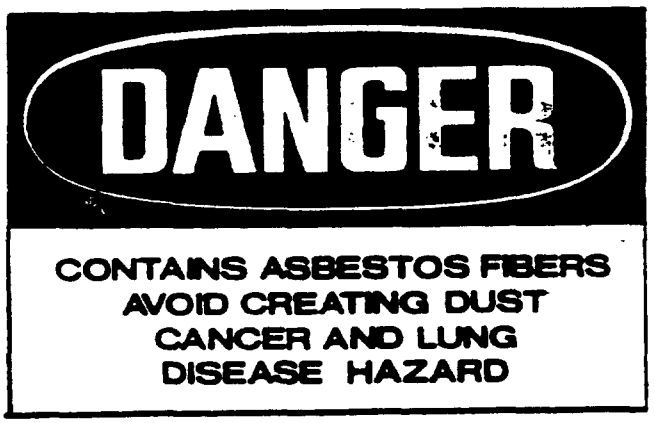


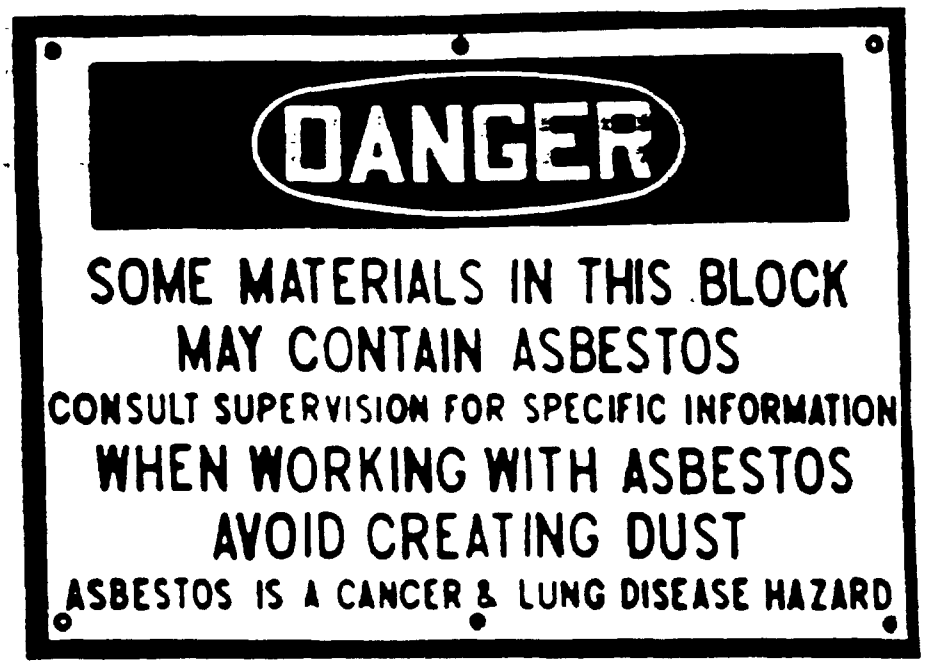
14" x 20" Asbestos Hazard Signs

Dow Stock #01-03374-020

3" x 5" Asbestos Hazard Labels

Dow Stock #01-03372

White "Danger" on red oval on a black field - - Black block lettering



14" x 20" Asbestos Hazard Labeling - Area Sign

Dow Stock #01-03374-010

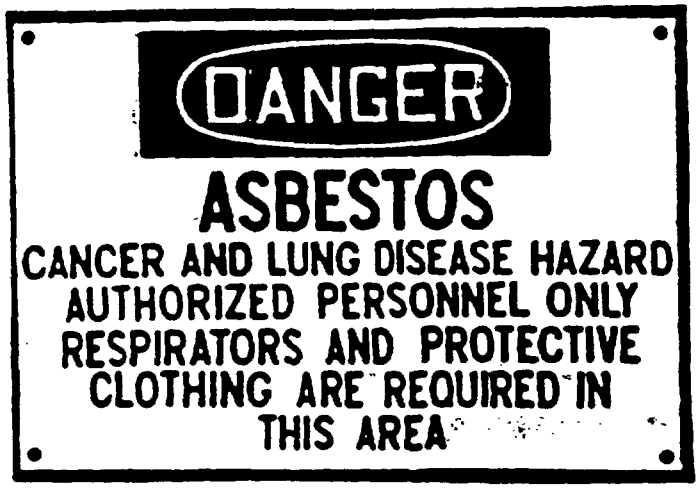
White "Danger" on a red oval on a black field - Black block lettering

SECTION IX

HAZARD COMMUNICATION

2. Regulated Area Sign:

Warning signs must be posted to demarcate a regulated area and must be posted at such a distance that an employee can read the signs and take necessary protective steps before entering the regulated area.



14" x 20" Asbesto
Hazard Sign

Dow Stock #01-03

White "Danger"
a red oval on
field - Black
lettering

3. Asbestos Disposal Containers:

All containers used for disposal of asbestos waste must have an appro
label. Special purpose, 6 mil, polyethylene bags with the appropriate
label are available through Dow Stock #17-30522.

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SECTION X

PACKAGING OF ASBESTOS WASTE FOR DISPOSAL

1. The recommended container is a 6-mil thick polyethylene bag. These bags are available through Dow Stock #17-30522. Other acceptable containers are polyethylene lined cardboard containers or polyethylene lined metal containers (drums, dempster boxes, or dino boxes).
2. Polyethylene bags labeled with an approved asbestos label must be used only for bagging asbestos waste.
3. When using bags, minimize the amount of void space or air in the bags to minimize their bursting during stacking and disposal.
4. All containers used for asbestos waste must be sealed to make them leak-tight.
5. Torn bags must be rebagged (double bagged) rather than repaired by taping.
6. Disposable clothing worn during asbestos removal, packaging, and disposal must be placed into properly labeled polyethylene bags and disposed of as asbestos waste.
7. An open-top fiber or steel drum containing a polyethylene liner may be used to accumulate small quantities of bagged and sealed asbestos waste (brake shoes, brake dust, garlock gaskets, etc.). The drum must have an approved warning label, be labeled for asbestos waste use only, and the top must be kept on except during deposit of waste.
8. All dempsters used for unbagged asbestos waste must contain a disposable polyethylene liner obtained from, or approved by, Environmental Operations.
9. Dempster boxes must not be filled higher than the top of the walls.
10. Dempster liners must be lapped over and secured for temporary closure whenever the job is discontinued for a prolonged period (overnight, holiday, weekend).
11. Dempster liners must be securely closed before transport of the dempsters; the sides and ends are to be lapped over and then secured. Proper lapping and sealing procedures are provided in instructions by Environmental Operations.
12. Tie-downs for dempster liners must not be attached to the dempster boxes.
13. All dempster boxes used for asbestos waste packaging and transport, and all packages of asbestos waste (including dempster liners) must be labeled with an OSHA-approved label.

Note: Call 409-238-1176 for information.

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SECTION XI

ASBESTOS GASKET AND PACKING HANDLING MINIMUM REQUIREMENTS

STORAGE FACILITY

Preformed gaskets, packing and gasket fabrication materials will be stored in a clean storage area. The storage area will be cleaned regularly with a HEPA filter vacuum to prevent accumulation of debris.

REMOVAL

Spiral-wound gasket removal shall comply with the glove bag or small-scale short-duration minimum requirements if wet methods cannot be used.

If other gaskets or packing to be removed are not adhered to the sealing surfaces and can be removed by hand without breaking apart, remove and package for disposal according to Section IX of this manual. If the gasket or packing is adhered to the sealing surfaces so that mechanical means are used and this operation creates particles in the air or surrounding area, then as a minimum, the asbestos abatement minimum requirements for glove bags or small-scale short-duration jobs shall be used.

All asbestos residue must be removed from gasket sealing surfaces on valve and pipe before transporting from gasket removal site.

CUTTING

GENERAL:

1. Employees who work with asbestos must receive training in asbestos hazards before the initial assignment and annually thereafter.
2. Personnel in the general area must be notified that asbestos work is in progress.
3. A specific job procedure must exist and be followed.

SAFETY:

1. Safety equipment required by the job location must be worn.
2. An approved respirator must be worn during cutting and cleanup. Employee must have completed the mandatory fit test. Contact 409-238-3536 for information.
3. Disposable coveralls with attached boots and hoods must be worn for cutting and cleanup operations. Coverall boots may be worn over shoes or inside rubber boots. If monitoring shows the potential asbestos exposure levels are consistently below 0.1 fiber/cc on an 8 hour TWA or short-term exposures below 1 f/cc averaged over a sampling period of 30 minutes, disposable coveralls need not be worn.
4. Vacuum and local exhaust ventilation systems must be equipped with HEPA filters.

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SECTION XI

ASBESTOS GASKET AND PACKING HANDLING MINIMUM REQUIREMENTS

SAFETY:

5. Personnel monitoring must be done at the beginning of each job unless personnel wear supplied air respirators, or previous personnel monitoring of similar jobs shows short-term exposures below 1 fiber/cc averaged over a sampling period of 30 minutes or 8 hour TWA exposure potentials less than 0.1 fiber/cc. Contact Industrial Hygiene Services 409-238-1281 for information.
6. Local exhaust ventilation must be provided for hand operated or power operated tools (such as but not limited to saws, scorers, abrasive wheels, and drills). The efficiency of local exhaust ventilation systems must be verified by Industrial Hygiene Services.

WORK AREA:

1. Gasket fabrication area must be identified as an asbestos handling area.
2. Gasket cutting table will be fabricated such that asbestos material or dust cannot collect or contaminate the table.
3. Work area must be cleaned after each job. Vacuum to remove any loose material or dust. Dispose of any scrap material in a sealed plastic bag with the proper asbestos label and clean unused fabrication material for storage. A job procedure must be followed when changing HEPA filters.
4. Dispose of coveralls and other contaminated clothing using labeled plastic bags.
5. After area is clean, vacuum work clothes and remove and clean respirators for storage.

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SECTION XI

TRANSITE AND ASBESTOS SHINGLES HANDLING MINIMUM REQUIREMENTS

Transite sheeting or asbestos shingles should not be modified (cut or drilled). An alternate material should replace the transite sheeting or shingles needing modification and any cutting or drilling should be made on the alternate material.

MAJOR MANAGER APPROVAL IS REQUIRED WHEN USING ASBESTOS MATERIALS AS REPLACEMENT FOR TRANSITE SHEETING OR ASBESTOS SHINGLES.

Requirements:

1. A competent person must supervise all large-scale jobs to assure proper procedures are followed.
2. Employees who work with asbestos must receive training in asbestos hazards before the initial assignment and annually thereafter.
3. Personnel in the general area must be notified that asbestos work is in progress.
4. A specific job procedure must be written and followed. An asbestos safety check list must be completed for each large scale job.
5. Safety equipment required by the job location must be worn.
6. An approved respirator must be worn. Employees must have completed the mandatory fit test. Contact 409-238-3536.
7. Disposable coveralls with attached boots and hoods must be worn during removal and cleanup operations. If the removal is being done with the use of heavy equipment such as a crane or front-end loader, the necessary protective clothing should be specified in the job procedure.
8. Personnel monitoring must be done at the beginning of each job unless personnel wear supplied air respirators, or previous personnel monitoring of similar jobs shows short-term exposure potentials below 1 f/cc averaged over a sampling period of 30 minutes or 8-hour TWA exposure potentials less than 0.1 fiber/cc. Contact Industrial Hygiene Services 409-238-1281 for information.
9. Transite and asbestos shingles must be wetted before removal.
10. A regulated area must be established and asbestos warning signs posted to restrict access to authorized personnel only.
11. Drinking water must be kept outside regulated area.
12. Disposable clothing and respirator must be removed each time before exiting the regulated area. A change area must be designated just inside the regulated area.
13. Broken pieces of transite and/or shingles must not be crushed by the movement of the heavy equipment.
14. Broken transite and shingles must be wetted before being picked up. Material must be placed into labeled polyethylene bags or containers approved by Environmental Operations. Bags or containers must be lowered to the ground, not dropped.
15. Before leaving the regulated area at the end of the day or job, broken transite and shingles must be placed in an approved container.
16. All equipment removed from the regulated area must be decontaminated.

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SECTION XI

TRANSITE AND ASBESTOS SHINGLES HANDLING MINIMUM REQUIREMENTS (CONT'D)

17. Disposable coveralls and gloves must be placed in an approved container at the end of the day or job.
18. After work is completed a thorough inspection and cleanup of the area must be conducted.
19. All materials used to establish the regulated area must be removed.
20. Bags or containers must be transported to the dempster or collection area.

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SECTION XI

TRANSITE AND ASBESTOS SHINGLES CUTTING, DRILLING, OR ABRADING MINIMUM REQUIREMENTS

Transite sheeting or asbestos shingles should not be modified (cut or drilled). An alternate material should replace the transite sheeting or shingles needing modification and any cutting or drilling should be made on the alternate material.

MAJOR MANAGER APPROVAL IS REQUIRED WHEN USING ASBESTOS MATERIALS AS REPLACEMENT FOR TRANSITE SHEETING OR ASBESTOS SHINGLES.

REQUIREMENTS:

1. Employees who work with asbestos must receive training in asbestos hazards before the initial assignment and annually thereafter.
2. Personnel in the general area must be notified that asbestos work is in progress.
3. A specific job procedure must be written and followed.
4. Safety equipment required by the job location must be worn.
5. An approved respirator must be worn. Employees must have completed the mandatory fit test. Contact 409-238-3536.
6. Disposable coveralls with attached boots and hoods must be worn during removal, cutting, drilling, abrading and the resulting cleanup. Coverall boots may be worn over work shoes or inside rubber boots.
7. Vacuum and local exhaust ventilation systems must be equipped with HEPA filters.
8. Personnel monitoring must be done at the beginning of each job unless personnel wear supplied air respirators, or previous personnel monitoring of similar jobs shows short-term exposures below 1 f/cc averaged over a sampling period of 30 minutes or 8 hour TWA exposure potentials less than 0.1 fiber/cc. Contact Industrial Hygiene Services 409-238-1281 for information.
9. Water for wetting must contain a surfactant.
10. Local exhaust ventilation must be provided for hand operated or power operated tools (such as but not limited to, saws, scorers, abrasive wheels, and drills). The efficiency of the local exhaust ventilation system must be verified by Industrial Hygiene Services.
11. A regulated area must be established and asbestos warning signs posted to restrict access to authorized personnel only.
12. Area must be cleaned of existing asbestos contamination and other debris.
13. Portable objects must be removed to prevent contamination.
14. Coverings must be placed over remaining objects and underneath the work area. Scaffold landings must be covered.
15. Mini-enclosures or negative pressure enclosures must be used for jobs whenever feasible if the potential exposure level may equal or exceed 1 fiber/cc averaged over a sampling period of 30 minutes or 0.2 fibers/cc 8 hour TWA (local exhaust ventilation or other engineering control methods may eliminate the need for enclosures.)

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SECTION XI

TRANSITE AND ASBESTOS SHINGLES HANDLING MINIMUM REQUIREMENTS (CONT'D)

16. Material that is being cut, drilled, etc. must be wetted down and/or local exhaust ventilation used. If wetting is not compatible with the process, or materials/equipment may be damaged, or local exhaust ventilation reduces the potential exposure below 1 fiber/cc averaged over a sampling period of 30 minutes or 0.2 fibers/cc as an 8 hour TWA, wetting may be eliminated.
17. Material removed must be placed into labeled polyethylene bags or containers approved by Environmental Operations. Bags or containers must be lowered to the ground, not dropped.
18. After work is completed a thorough inspection and cleanup of the area must be conducted. Vacuum the work area as required.
19. All tools removed from the regulated area must be decontaminated. The specific job procedure for the job must address the decontamination of HEPA vacuum cleaners and changing of the HEPA filter in vacuum cleaners if a vacuum cleaner is used during the job.
20. Disposable coveralls, exposed area of skin and respirator must be vacuumed and boots must be decontaminated each time before exiting the regulated area.
21. Disposable coveralls, must be disposed of in a sealed asbestos waste bag.
22. Work clothes must be vacuum off.
23. All materials used to establish the regulated area must be removed.
24. Bags or containers must be transported to the dempster or collection area.

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SECTION XI

ASBESTOS ABATEMENT MINIMUM REQUIREMENTS

GLOVE BAGS.

GENERAL:

1. Employees who work with asbestos must receive training in asbestos hazards before the initial assignment and annually thereafter.
2. A specific job procedure must be written before beginning the job.

SAFETY:

1. Safety equipment required by the job location must be worn.
2. An approved respirator must be worn during material removal and cleanup. Employee must have completed the mandatory fit test. Contact 409-238-3536 for information.
3. Vacuum equipment must be equipped with a HEPA filter.
4. Water for wetting must contain a surfactant.

REMOVAL:

1. The glove bag must be fitted to the pipe or structure where asbestos work is to be done. Insert the necessary tools into the bag. Attach bag to the pipe or structure and seal all openings with tape. The bottom seam of the bag must also be reinforced with tape to prevent leakage from the bag that may result from a defect in the bottom seam.
2. An opening must be made in the bag away from the work area. A spray nozzle must be inserted through this opening and the area to be worked sprayed until it is thoroughly wetted. Continue wetting dry material as it is exposed. Dry material in the bottom of the bag must be wetted. Wetting of materials may be eliminated if water is not compatible with the process or materials or equipment may be seriously damaged.
3. After removal of the layer of asbestos containing materials, the pipe or surface must be cleaned with a wire brush and wet wiped until no traces of asbestos containing material can be seen.
4. Exposed asbestos must be encapsulated at terminations.
5. Tools must be wetted and cleaned. Place the tools such that they may be removed after the bag is twisted and sealed.
6. A vacuum hose must be inserted through the opening used for wetting and used to remove any air from the bag that may contain asbestos fibers. The bag must be squeezed as close to the top as possible, twisted and sealed with tape to keep the asbestos materials safely in the bottom of the bag.
7. Remove the bag from the work area and remove tools.
8. The top portion of the bag and the opening used for wetting must be resealed with tape.
9. Disposal of the glove bag must be in an approved container.

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SECTION XI

ASBESTOS ABATEMENT MINIMUM REQUIREMENTS

SMALL-SCALE SHORT-DURATION PROJECTS WHEN GLOVE BAGS ARE NOT USED.

GENERAL:

1. Employees who work with asbestos must receive training in asbestos hazards before the initial assignment and annually thereafter.
2. Personnel in the general area must be notified that asbestos work is in progress.
3. A specific job procedure must be written before beginning the job.

SAFETY:

1. Safety equipment required by the job location must be worn.
2. An approved respirator must be worn during material removal and cleanup. Employee must have completed the mandatory fit test. Contact 409-238-3536 for information.
3. Disposable coveralls with attached boots and hoods must be worn during cleanup and removal operations. Coverall boots may be worn over work shoes or inside rubber boots.
4. Vacuum and local exhaust ventilation systems must be equipped with HEPA filters.
5. Personnel monitoring must be done at the beginning of each job unless personnel wear supplied air respirators, or previous personnel monitoring of similar jobs shows short-term exposures below 1 f/cc averaged over a sampling period of 30 minutes or 8 hour TWA exposure potentials less than 0.1 fiber/cc. Contact Industrial Hygiene Services 409-238-1281 for information.
6. Water for wetting must contain a surfactant.
7. Local exhaust ventilation must be provided for hand operated or power operated tools (such as but not limited to, saws, scorers, abrasive wheels, and drills). The efficiency of local exhaust ventilation systems must be verified by Industrial Hygiene Services.

REGULATED AREA:

1. A regulated area must be established and asbestos warning signs posted to restrict access to authorized personnel only.
2. Area must be cleaned of existing asbestos contamination and other debris.
3. Portable objects must be removed to prevent contamination.
4. Coverings must be placed over remaining objects and underneath the work area. Scaffold landings must be covered. Materials must not be dropped to the ground. Pre-job planning must include provisions for keeping deteriorated material in place after jacketing is removed.
5. Mini-enclosures or negative pressure enclosures must be used for jobs whenever feasible if the potential exposure level may equal or exceed 1 f/cc averaged over a sampling period of 30 minutes or 0.2 fibers/cc 8 hour TWA (local exhaust ventilation or other engineering controls methods may eliminate the need for enclosures.)

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SECTION XI

ASBESTOS ABATEMENT MINIMUM REQUIREMENTS

SMALL-SCALE SHORT-DURATION PROJECTS WHEN GLOVE BAGS ARE NOT USED (Cont'd)

REMOVAL:

1. The materials must be wet down before, during, and after removal to prevent airborne emissions. Materials must be thoroughly wetted, but not to the point that they crumble and turn to mush. Wetting of material may be eliminated if water is not compatible with the process, or materials/equipment may be seriously damaged, or local exhaust ventilation reduces the potential exposure limit below 1 fiber/cc averaged over a sampling period of 30 minutes or 0.2 fibers/cc as an 8 hour TWA.
2. Material must be removed and placed into labeled polyethylene bags or containers approved by Environmental Operations. Bags or containers must be lowered to the ground, not dropped.
3. The surface from which asbestos has been removed must be wetted and cleaned.
4. Exposed asbestos must be encapsulated at terminations.
5. After asbestos removal, a thorough inspection and cleanup of the area must be conducted. Pick up and dispose of coverings and odouble bag contaminated or broken bags. Vacuum the work area as required.
6. All items removed from the regulated area must be decontaminated. A job procedure must be followed when changing HEPA filters.
7. Disposable coveralls, exposed area of skin and respirator must be vacuumed and boots must be decontaminated each time before exiting the regulated area.
8. Disposable coveralls must be disposed of in a sealed asbestos waste bag.
9. Work clothes must be vacuumed off.
10. All materials used to establish the regulated area must be removed.
11. Bags or containers must be transported to the dempster or collection area.

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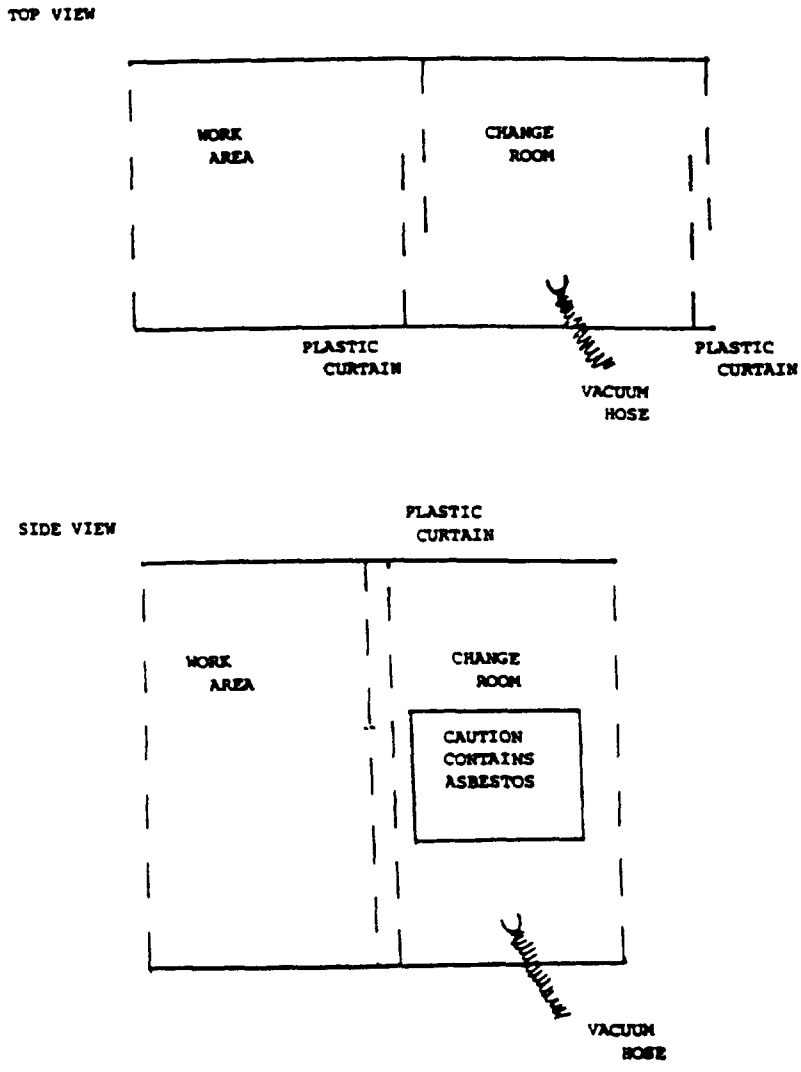
SECTION XI

CONSTRUCTION OF MINI-ENCLOSURES (SMALL-SCALE, SHORT-DURATION JOB)

1. AFFIX 6-MIL THICK POLYETHYLENE SHEETING TO WALLS WITH SPRAY ADHESIVE AND TAPE.
2. COVER THE FLOOR WITH PLASTIC AND SEAL TO THE PLASTIC ON THE WALLS.
3. SEAL ALL PENETRATIONS SUCH AS PIPES OR ELECTRICAL CONDUIT WITH TAPE.
4. CONSTRUCTION A SMALL CHANGE ROOM OF 6 MIL THICK POLYETHYLENE PLASTIC CONTIGUOUS TO THE MINI-ENCLOSURE. THE WORKER USES THE CHANGE ROOM TO VACUUM OFF HIS PROTECTIVE COVERALLS AND REMOVE THEM BEFORE LEAVING THE WORK AREA.

SCHEMATIC OF MINI-ENCLOSURE



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SECTION XI

ASBESTOS ABATEMENT MINIMUM REQUIREMENTS

LARGE SCALE, LONG DURATION PROJECTS.

GENERAL:

1. The Superintendent/owner must contact Environmental Services (2414) a minimum of 25 days prior to starting asbestos removal work and specify a project supervisor.
2. The project supervisor must provide a written Safe Work procedure specific for each job which includes as a minimum the requirements listed below.
3. The project supervisor must meet with the industrial hygienist, safety director for the area, and personnel performing the job to discuss the Safe Work procedure and arrange for audit and monitoring.
4. The project supervisor must arrange to have a "Competent Person" for the job if the work is performed by Dow employees. If work is contracted, the contractor must provide a "Competent Person" to supervise the job.
5. Employees who work with asbestos must receive training in asbestos hazards before the initial assignment and annually thereafter.
6. Personnel in the general area must be notified that asbestos work is in progress.

SAFETY:

1. Safety equipment required by the job location must be worn.
2. An approved respirator must be worn during material removal and cleanup. Employee must have completed the mandatory fit test. Contact 409-238-3536 for information.
3. Disposable coveralls with attached boots and hoods must be worn during cleanup and removal operations. Coverall boots may be worn over work shoes or inside rubber boots.
4. "Street clothes" must not be worn underneath disposable coveralls.
5. If work clothing is worn underneath, it must be left in the "dirty room" of the decontamination facilities. Contaminated clothing for laundering must be contained in a sealed asbestos waste bag and laundered in a manner which will minimize the release of asbestos fibers. Personnel laundering asbestos contaminated clothing must be informed of this requirement.
6. Vacuum and local exhaust ventilation systems must be equipped with HEPA filters.
7. Personnel monitoring must be done at the beginning of each job unless glove bags are used or personnel wear supplied air respirators or previous personnel monitoring of similar jobs shows short-term exposures below 1 f/cc averaged over a sampling period of 30 minutes or 8 hour TWA exposure potentials less than 0.1 fibers/cc. Contact Industrial Hygiene Services 409-238-1281 for information.
8. A decontamination area must be provided. It must be contiguous to the regulated area if feasible. Egress to the regulated area must be through the decontamination area.
9. Water for wetting must contain a surfactant.

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SECTION XI

ASBESTOS ABATEMENT MINIMUM REQUIREMENTS

LARGE SCALE, LONG DURATION PROJECTS (Cont'd)

SAFETY (CONT'D)

10. Local exhaust ventilation must be provided for hand operated or power operated tools, such as but not limited to, saws, scorers, abrasive wheels, and drills. The efficiency of local exhaust ventilation systems must be verified by Industrial Hygiene Services.
11. An Asbestos Safety Checklist must be completed for each job.

REGULATED AREA:

1. A regulated area must be established and asbestos warning signs posted to restrict access to authorized personnel only.
2. Area must be cleaned of existing asbestos contamination and other debris.
3. Portable objects must be removed to prevent contamination.
4. Coverings must be placed over remaining objects and underneath the work area. Scaffold landings must be covered. Materials must not be dropped to the ground. Pre-job planning must include provisions for keeping deteriorated material in place after jacketing is removed.
5. Glove bags, mini-enclosures or negative pressure enclosures must be used for jobs whenever feasible if the potential exposure level may equal or exceed 1 f/cc averaged over a sampling period of 30 minutes or 0.2 fibers/cc as an 8 hour TWA. (Local exhaust ventilation or other engineering control methods may eliminate the need for enclosures.)

REMOVAL:

1. The materials must be wet down before, during, and after removal to prevent airborne emissions. Materials must be thoroughly wetted, but not to the point that they crumble and turn to mush. Wetting of materials may be eliminated if water is not compatible with the process, or materials/equipment may be seriously damaged, or local exhaust ventilation reduces the potential exposure limit below 1 f/cc averaged over a sampling period of 30 minutes or 0.2 fibers/cc as an 8 hour TWA.
2. Material must be removed and placed into labeled polyethylene bags or containers approved by Environmental Operations. Bags or containers must be lowered to the ground, not dropped.
3. The surface from which asbestos has been removed must be wetted and cleaned.
4. Exposed asbestos must be encapsulated at terminations.
5. After asbestos removal, a thorough inspection and cleanup of the area must be conducted. Pick up and dispose of coverings and double bag contaminated or broken bags. Vacuum work area as required.
6. All items removed from the regulated area must be decontaminated. A job procedure must be followed when changing HEPA filters.
7. All materials used to establish the regulated area must be removed.
8. Bags or containers must be transported to the dempster or collection area.

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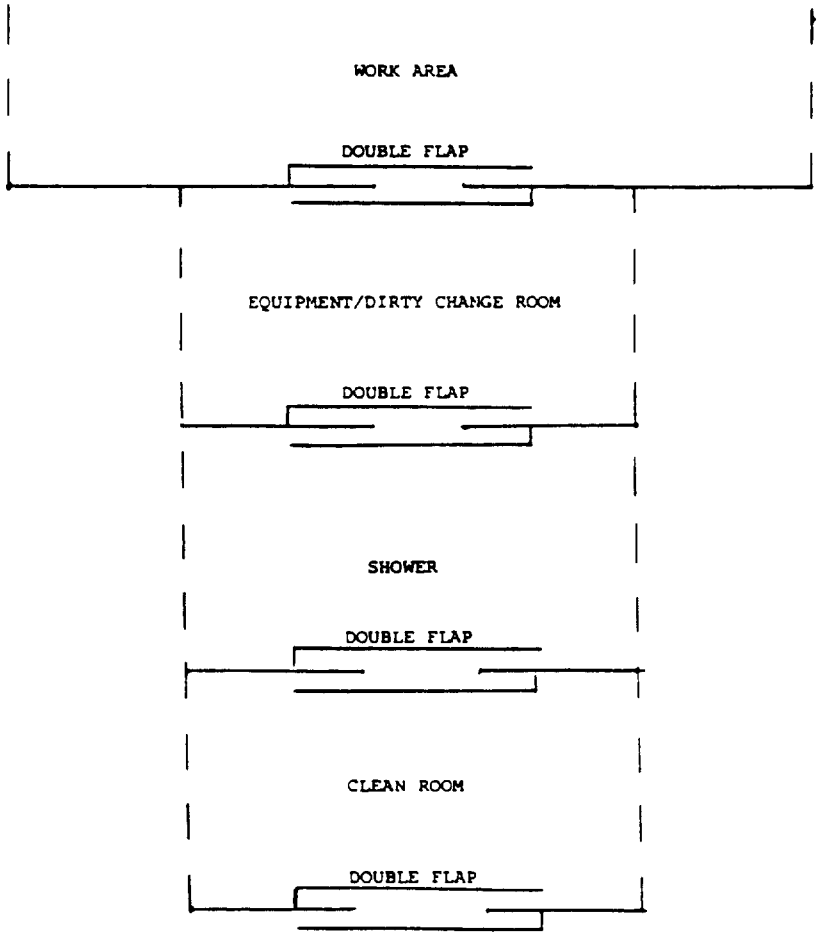
SECTION XI

TYPICAL DECONTAMINATION AREA

LAYOUT



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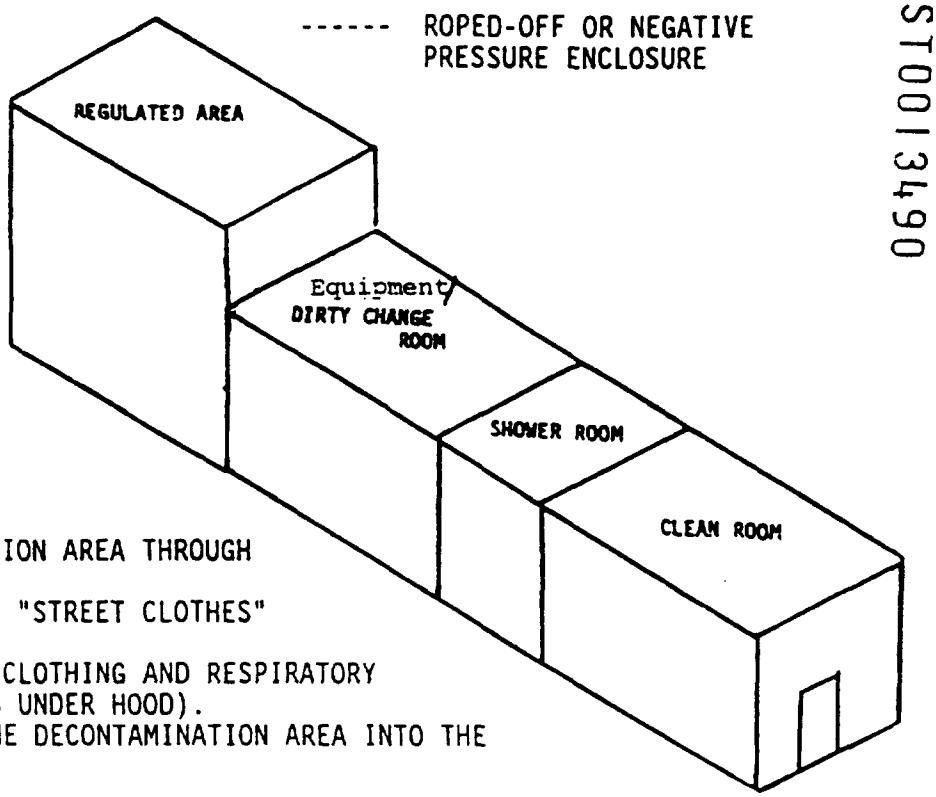
SECTION XI

DECONTAMINATION AREA
(CONTIGUOUS TO WORK AREA)



ENTRY

1. ENTER DECONTAMINATION AREA THROUGH CLEAN ROOM.
2. REMOVE AND DEPOSIT "STREET CLOTHES" IN LOCKER.
3. PUT ON PROTECTIVE CLOTHING AND RESPIRATORY PROTECTION (STRAPS UNDER HOOD).
4. PROCEED THROUGH THE DECONTAMINATION AREA INTO THE REGULATED AREA.

EXIT

1. REMOVE GROSS CONTAMINATION FROM SUIT.
2. REMOVE PROTECTIVE CLOTHING IN EQUIPMENT/DIRTY CHANGE ROOM AND DEPOSIT IN LABELED IMPERMEABLE BAGS.
3. WEAR RESPIRATOR INTO SHOWER AREA.
4. SHOWER BEFORE ENTERING CLEAN ROOM.
5. PUT ON STREET CLOTHES.
6. EXIT DECONTAMINATION AREA.

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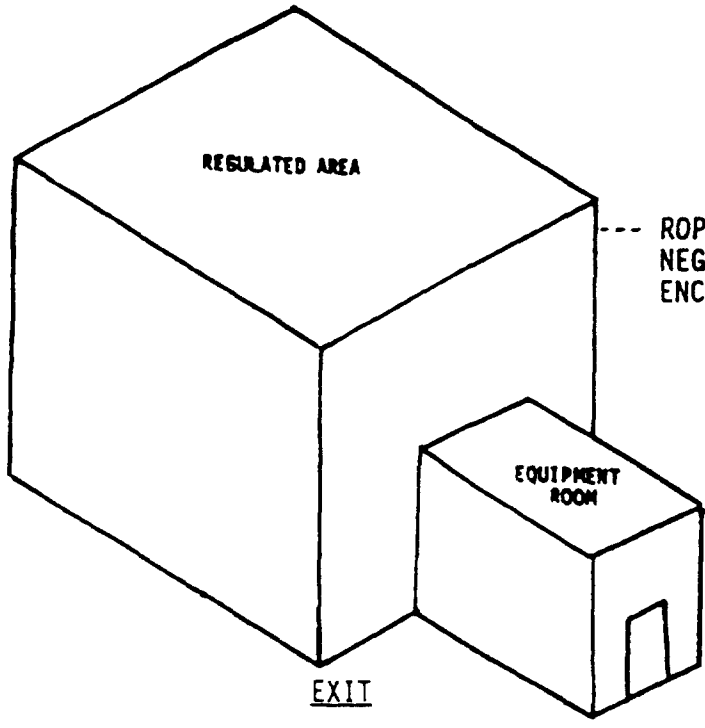
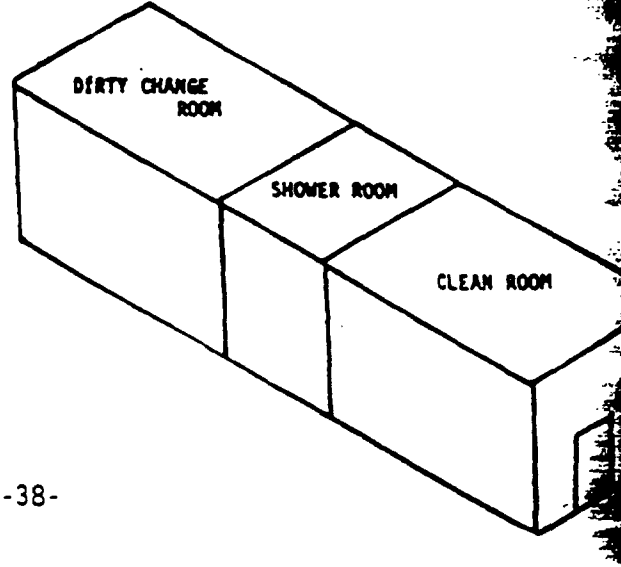
SECTION XI

DECONTAMINATION AREA
(At a Remote Location)



1. VACUUM PROTECTIVE --- CLOTHING AND EQUIPMENT.
2. REMOVE CONTAMINATED CLOTHING.
3. PUT ON CLEAN SUIT AND PROCEED TO DECONTAMINATION AREA WEARING RESPIRATOR.
4. DEPOSIT CLOTHING IN DIRTY CHANGE ROOM.
5. WEAR RESPIRATOR INTO SHOWER AREA.
6. SHOWER BEFORE ENTERING CLEAN ROOM.
7. EXIT DECONTAMINATION AREA.



ENTRY

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1. ENTER DECONTAMINATION AREA THROUGH CLEAN ROOM.
2. REMOVE AND DEPOSIT "STREET CLOTHES" IN LOCKER
3. PUT ON PROTECTIVE CLOTHING AND RESPIRATORY PROTECTION (STRAPS UNDER HOOD).
4. PROCEED TO WORK SITE AND ENTER ENCLOSURE/REGULATED AREA THROUGH EQUIPMENT ROOM.

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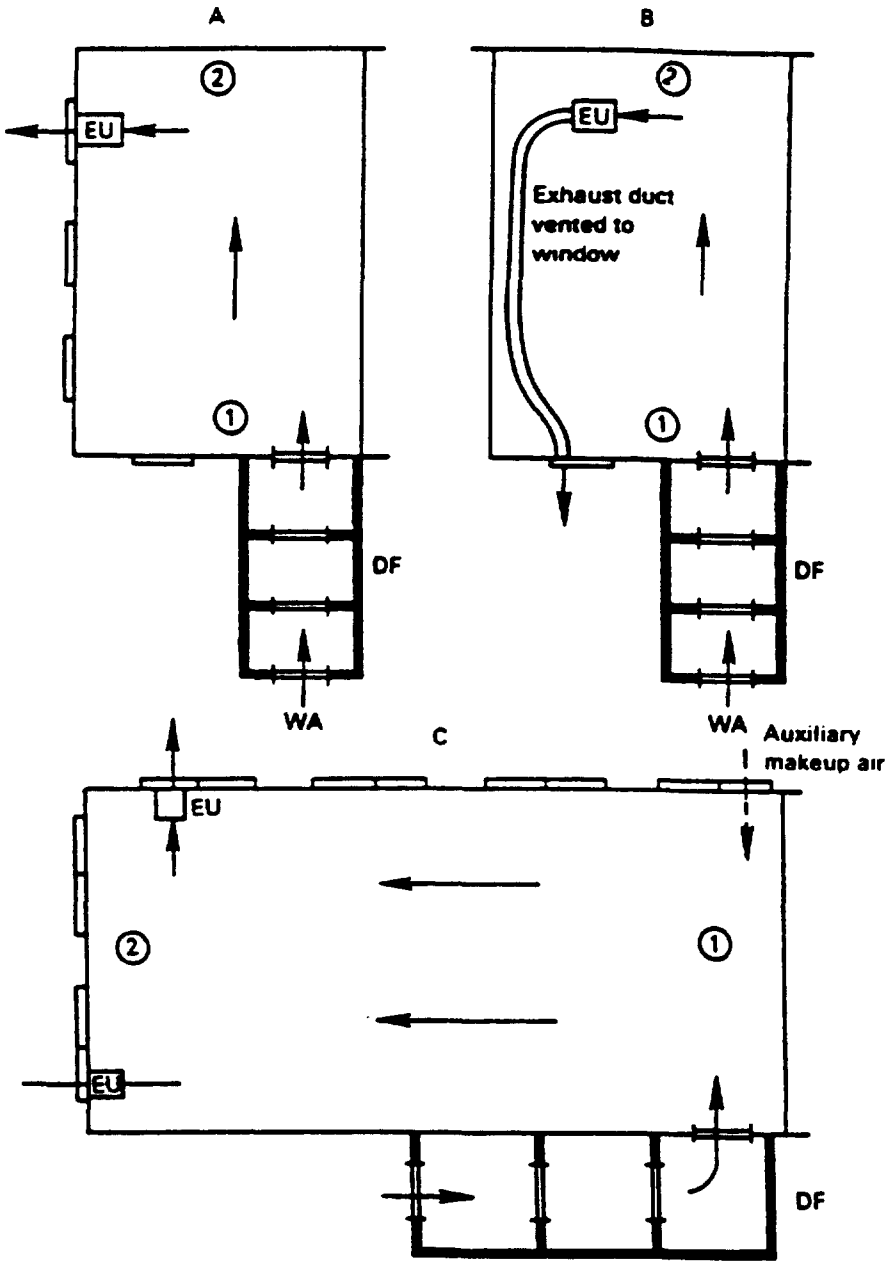
SECTION XI

EXAMPLES OF NEGATIVE PRESSURE SYSTEMS



DF, Decontamination Facility; EU, Exhaust Unit; WA, Worker Access; A, Single-room work area with multiple windows; B, Single-room work area with single window near entrance; C, Large single-room work area with windows and auxiliary makeup air source (dotted arrow). Arrows denote direction of air flow. Circled numbers indicate progression of removal sequence.

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SECTION XI

ASBESTOS ABATEMENT MINIMUM REQUIREMENTS

AUTOMOTIVE CLUTCH AND BRAKE REPAIR

GENERAL:

1. Employees who work with asbestos must receive training in asbestos hazards before the initial assignment and annually thereafter.
2. Do NOT use compressed air to remove asbestos materials or dust from brake drums or clutch housings.
3. Place polyethylene sheeting underneath the work area.

SAFETY REQUIREMENTS:

1. Safety equipment required by the job location must be worn.
2. An approved respirator must be worn during material removal and clean up. Employees must have completed the mandatory fit test. Call 409-238-3536 for information.
3. Barricade area with yellow tape or rope to limit access.

REMOVAL

1. Two methods can be used to reduce exposure to asbestos fibers. The Enclosed Cylinder/HEPA Vacuum System Method and a wetting method.

   A. The Enclosed Cylinder/HEPA Filter Vacuum System Method consists of three components.

      * A wheel-shaped cylinder designed to cover and enclose the wheel assembly

      * A compressed-air hose and nozzle that fits into a port in the cylinder, and

      * A HEPA-filter vacuum used to evacuate airborne dust generated within the cylinder by the compressed air.

   B. The wetting method consists of spraying water containing a surfactant to loosen the asbestos containing residue and to capture the resulting airborne particles in the water mist.

      * Begin spraying the asbestos-containing parts at a sufficient distance to ensure that the asbestos particles are not dislodged by the velocity of the water spray.

      * When the asbestos particles are thoroughly wetted, the spray will be brought closer to the parts and the parts will be sprayed as necessary to remove grease and other material.

      * The parts must then be wiped with disposal rags or towels which must be placed in a labelled plastic bag and sealed while they are still wet.

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AUTOMOTIVE CLUTCH AND BRAKE REPAIR (Cont'd)

2. Replaced brake shoes or pads, clutch plates, disposable rags or towels, polyethylene sheeting and other contaminated materials for disposal must be handled as asbestos waste.

3. When the job is completed, a thorough inspection must be made to ensure all asbestos contaminated materials have been picked up. Vacuum work area as required. A job procedure must be followed when changing HEPA filters.

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SECTION XII

ASBESTOS SAFETY CHECKLIST

JOB DESCRIPTION_____ DATE_____
LOCATION _____

PRE-JOB REQUIREMENTS:

1. Environmental Services contacted (ph 409 238-2414)? Yes__ No__
   Name:_____ Date: _____
   Dow Project Supervisor: _____
2. Safe Work Procedure Written? Yes_____ No_____ Date:_____
3. Project Review Held?
   Industrial Hygienist: _____ Date:_____
   Safety Director:_____ Date:_____
   Competent Person:_____ Date:_____
   Craftsmen:_____ Date:_____
   Safe Work Procedure Approved: Yes____ No____
   Hygiene Monitoring Required: Yes____ No____
   Audit Required: Yes____ No____
   Auditor Assigned_____ Phone:_____

JOB REQUIREMENTS:

1. Safe Work Procedure Reviewed: Yes____ No____
2. Regulated Area Established and Signs Posted: Yes____ No____
   Negative pressure enclosure established: Yes____ No____
   Decontamination Area Established: Yes____ No____
3. Personnel Trained: Yes____ No____
4. Block Personnel Informed: Yes____ No____
5. Auditor Notified: Yes____ No____
6. Amended Water Available To Control Dust: Yes____ No____
7. Has packaging of asbestos debris been decided upon? Yes____ No____
8. Has Disposal Of Asbestos Debris Been Arranged: Yes____ No____
9. Arrangements For Clean-up Made: Yes____ No____
10. Safety Equipment Required:
    __ Safety equipment required by the location
    __ Approved respirator __current fit test __clean shaven
    __ Disposable coveralls with hood and boots __ gloves
11. Arrangements for laundering work clothes Yes____ No____
12. Vacuum cleaners and local exhaust ventilation systems equipped with HEPA filters Yes____ No____
    Note: Work may commence when Safe Work Permit issued.
13. Final cleanup complete Yes____ No____
14. Job complete: Dow Project Supervisor:_____ Date:_____
15. Send completed checklist to Industrial Hygiene Services B-101.

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SECTION XIII

ASBESTOS ABATEMENT AUDIT CHECKLIST

Job Description_____ Date:_____

Location:_____Removal by:_____
Company Name

1.	Regulated Area Established and Signs Posted:	YES___ NO___
	Polyethylene or other coverings over floor & objects:	YES___ NO___
2.	Decontamination Area Established:	YES___ NO___
	Contiguous_____ Remote:_____ Location:_____	
	Entry to work area only through decontamination area	YES___ NO___
3.	Negative Pressure Enclosure Established:	YES___ NO___
	Floor Covered	YES___ NO___
	Walls Covered	YES___ NO___
	Area Ventilation OFF	YES___ NO___
	All Edges Sealed	YES___ NO___
	Penetrations Around Pipes and Conduit Sealed	YES___ NO___
	Entry Curtains	YES___ NO___
	Negative Pressure Achieved (-0.02" water)	YES___ NO___
4.	Protective Equipment:	
	Disposable Coveralls with Hood and Boots	YES___ NO___
	Coveralls Unzipped, Torn, or Cut	YES___ NO___
	Coveralls Used One Time	YES___ NO___
	Approved Respirator	YES___ NO___
	Type Used	_____
	Clean Shaven	YES___ NO___
	Straps Under Hood	YES___ NO___
	Safety Equipment Required by Location:	
	Hard Hat	YES___ NO___
	Safety Glasses	YES___ NO___
	Goggles	YES___ NO___

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SECTION XIII

ASBESTOS ABATEMENT
AUDIT CHECKLIST

5. Work Practices:

Material Worked Wet	YES___	NO___
Material Kept Wet Until Bagged & Sealed	YES___	NO___
Material Too Wet, Mushy	YES___	NO___
Insulation Broken Intentionally	YES___	NO___
Material Dropped to Ground	YES___	NO___
Removed Material Promptly Bagged	YES___	NO___
Bags Torn or Left Open	YES___	NO___
Visible Emissions	YES___	NO___
HEPA Filtered Vacuum Used	YES___	NO___
Smoking, Eating, Drinking, Chewing, Cosmetics	YES___	NO___
Personnel Decontaminated Each Departure	YES___	NO___
Shower Used by All Personnel	YES___	NO___
Exposed Asbestos at Terminations Sealed with Encapsulant	YES___	NO___
Work Area Cleaned After Completion	YES___	NO___

6. Personnel Monitoring

Initial Monitoring	YES___	NO___
Contractor_____ Dow_____		
Daily Monitoring	YES___	NO___
Area Monitoring	YES___	NO___

COMMENTS: _____

_____

_____

_____

_____

SIGNATURE: _____
Industrial Hygienist/Safety Director

cc: Project Supervisor
Area Owner
Safety Director
Industrial Hygienist
Manager, Industrial Hygiene Services

Revised 10/20/88
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APPENDIX A

RECOMMENDED PROTECTIVE EQUIPMENT

The equipment listed below has been judged to be the best for asbestos protection but is not necessarily the only equipment available. Other types of respirators are identified in Appendix C of the Texas Operations Respiratory Protection Manual (2/88). **The equipment listed below represents the preferred equipment based on current technology and knowledge at the time of publication of this Asbestos Manual.** Equipment which is not listed below or in Appendix C of the Respiratory Protection Manual should not be purchased or used unless the Texas Operations Protective Equipment Committee (1281) has evaluated the equipment.

Respirator users must be trained, fit tested and medically certified prior to using a respirator. Training & fit testing can be scheduled by contacting Industrial Hygiene Services (3536). Medical certification is conducted by the Occupational Health Department (3598).

All respirators can be ordered through the Dow Stores (3401), or via Purchase Order.

RESPIRATORY PROTECTION FOR ASBESTOS

Airborne Asbestos	Manufacturer	VSP Number	
		Respirator	Cartridge
≤ 2 fibers/cc	Half-Mask Air Purifying		
	AO 5 STAR - Silicone	-	01-040680-500
	small	01-04175-000	
	medium	01-04175-010	
	large	01-04175-020	
	AO 5 STAR - Rubber	-	01-040680-500
	small	01-04173-000	
	medium	01-04173-010	
	large	01-04173-020	
	Wilson 6100 - Silicone	-	01-04285
	small	01-04280	
	medium	01-04282	
	large	01-04284	
	MSA Comfo II - Rubber	-	01-04252
	small	01-04122	
	medium	01-04124	
	large	01-04126	

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I. RESPIRATORY PROTECTION FOR ASBESTOS (Cont'd)

Airborne Asbestos	Manufacturer	VSP Number Respirator	VSP Number Cartridge
≤ 10 f/cc	**Full Face Air Purifying**		
	Scott-O-Vista[1]	01-04335	01-04193
	Scott-O-Vista[2]	01-04335	01-04196
	Scottoramic	01-04420	01-04193
	AO 7 STAR	01-04190	01-040680-500
≤ 20 f/cc	**Powered Air Purifying Respirators**		
	Racal BE7/P3	01-04805	01-04810
≤ 200 f/cc	**Supplied Air Pressure Demand (Full Face)**		
	Scottoramic	01-04625	NA
	Scott-O-Vista	01-04630	NA
	SCBA Pressure Demand (Full Face)		
	Scott IIA Scottoramic (30 minute)	01-04520	NA
	Scott 2.2, Scott-O-Vista (30 minute)	01-04510	NA
	Scott 4.5, Scott-O-Vista (60 minute)	01-04512	NA
	Scott Case	01-04666	

II. RESPIRATOR CARTRIDGES FOR A COMBINATION OF ASBESTOS & CHEMICALS

Respirator Manufacturer	Cartridge Protects Against:	Part Number	Supply Source
American Optical 5 & 7 STARs	Organic vapors & asbestos	R51HE	Safety Shoe 233-0605
	Acid gases & asbestos	R52HE	
	Organic vapors, acid gases & asbestos	R53HE	
	Ammonia, amines & asbestos	R54HE	
MSA Comfo II	Organic vapors & asbestos	464029	Safety Shoe 233-0605
	Acid gases & asbestos	464028	
	Organic vapors, acid gases & asbestos	464027	
	Ammonia, amines & asbestos	464026	

[1]This Scott-O-Vista facepiece uses a twin cartridge adapter (Scott Part No. 802451-01) which is purchased separately from the facepiece (VSP Number 01-04342)

[2]This Scott-O-Vista facepiece uses a single canister adapter (Scott Part No. 802472-01 which is purchased separately from the facepiece (VSP Number 01-04340)

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II. RESPIRATOR FOR A COMBINATION OF ASBESTOS & CHEMICALS (Cont'd)

Respirator Manufacturer	Cartridge Protects Against:	Part Number	Supply Source
Scott-O-Vista[1]	Organic vapor & asbestos	642-OV-H	Vallen
	Acid gases & asbestos	642-AG-H	265-8176
	Organic vapors, acid gases & asbestos	642-OA-H	
	Ammonia, amines & asbestos	642-AM-H	
Willson 6100	Organic vapors & asbestos	T41	Briggs-Weaver
	Acid gases & asbestos	T46	233-5451
	Organic vapors, acid gases & asbestos	T45	VSP 01-04286
	Ammonia, amines & asbestos	T44	

[1]This Scott-O-Vista facepiece uses a twin cartridge adapter Scott (Part 802451-01) which is purchased separately from the facepiece itself. (VSP number: 01-04342)

III. CLOTHING

Tyvek disposable Paper Coveralls with attached Hood and Boots

Small	01-03551-001
Medium	01-03552-001
Large	01-03553-001
Extra Large	01-03554-001

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