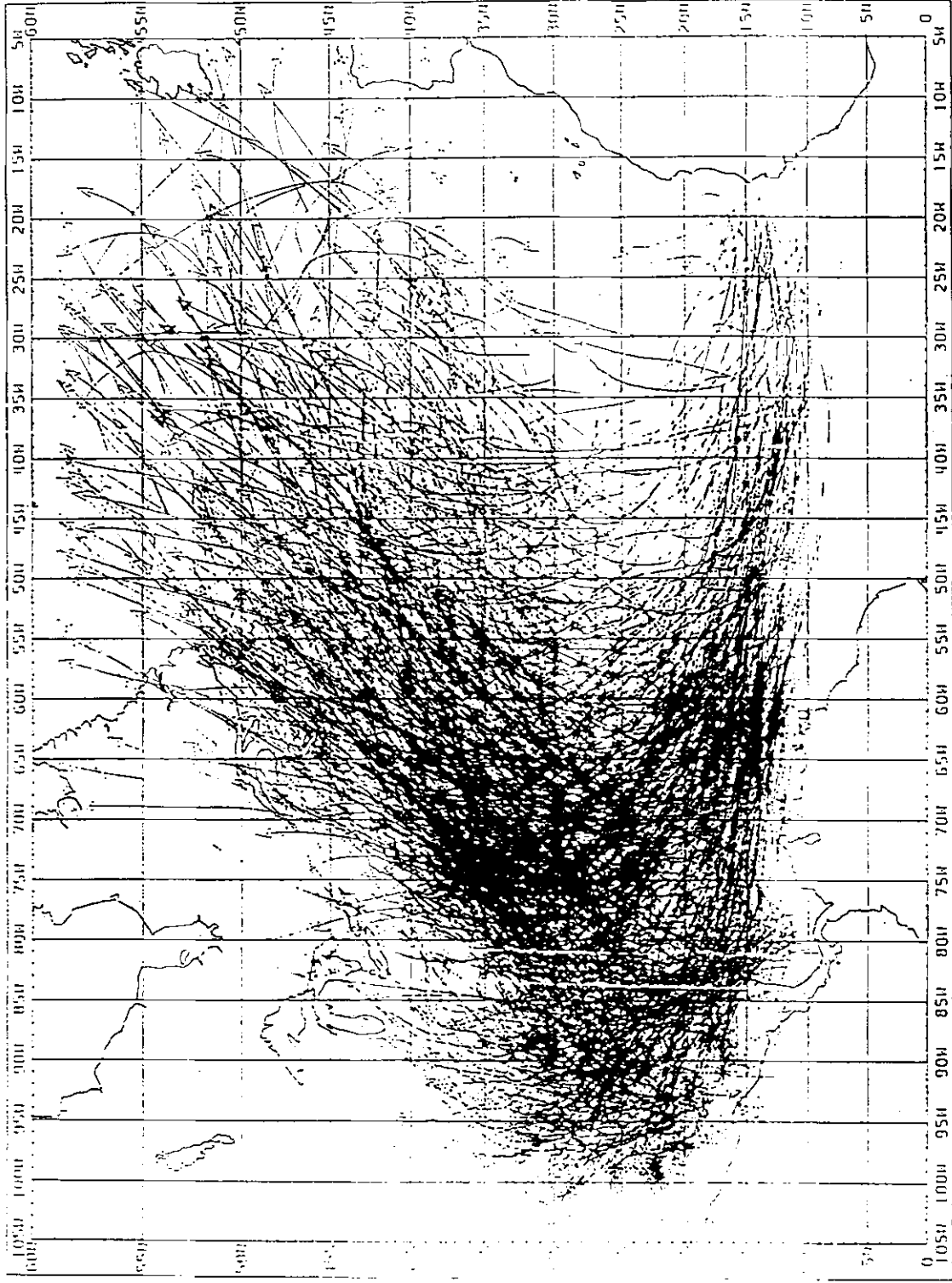
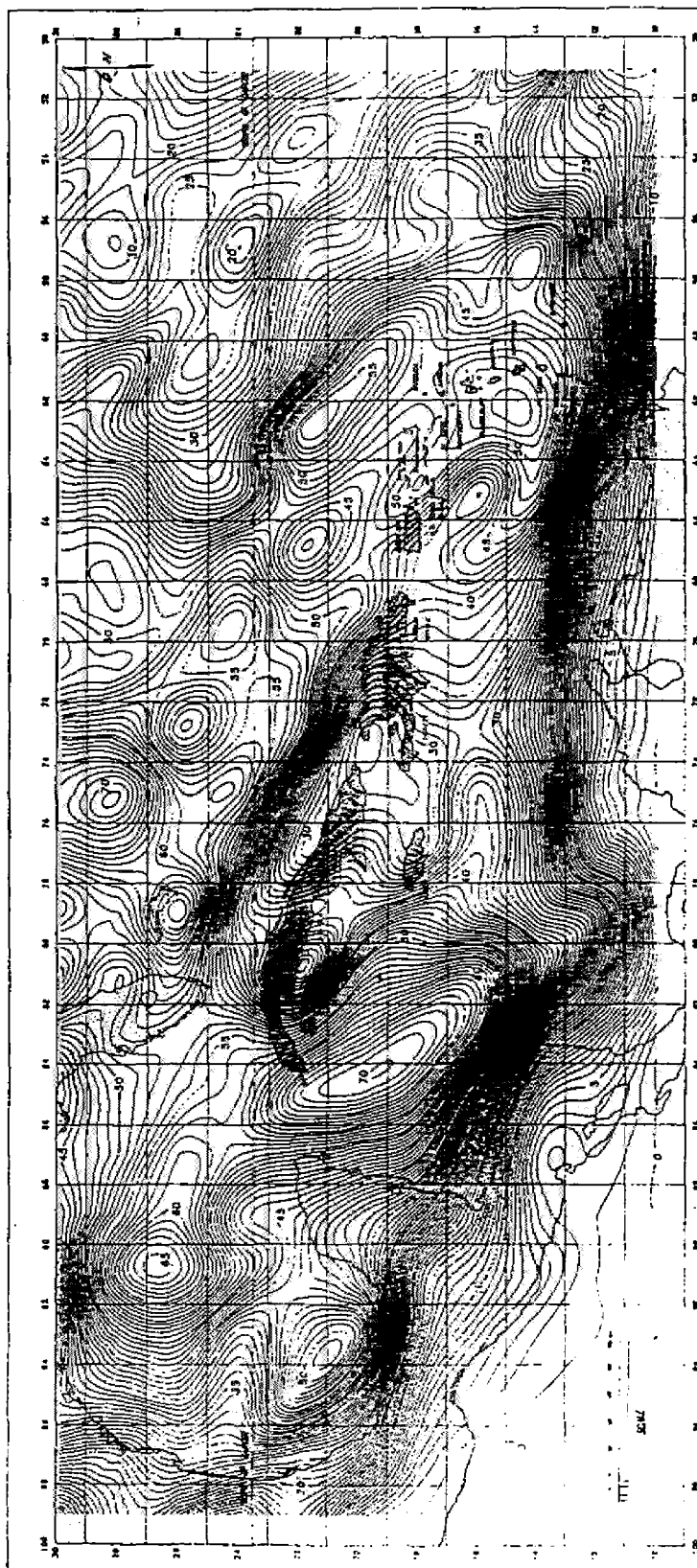


Part 3

**Visual Material
for
Wind Hazards
of the
Caribbean and the BVI**



NORTH ATLANTIC TROPICAL STORMS OR HURRICANES, 1886-1992 (904 STORMS)



CYCLONE--RESISTANT HOUSING (CARIBBEAN)

Project 3-P-89-1011-02
Funded by: The International Development Research Centre, Ottawa, Canada

The University of the West Indies

St. Augustine, Republic of Trinidad and Tobago

The University of Waterloo

Waterloo, Ontario, Canada N2L 3G1

ISOLINES DEPICTING GEOGRAPHICAL DISTRIBUTION

OF TROPICAL STORMS & HURRICANES (WINDSPEEDS GREATER THAN 34 KNOTS) DURING THE PERIOD 1866-1962

Summary

Prof. L.D.C. Imbert,
 Prof. A.M. Sharma,
 Dr. R.W.A. Oubarna,
 Mr. G.P. Chakrabarti,
 Mr. D.O. Prasad,

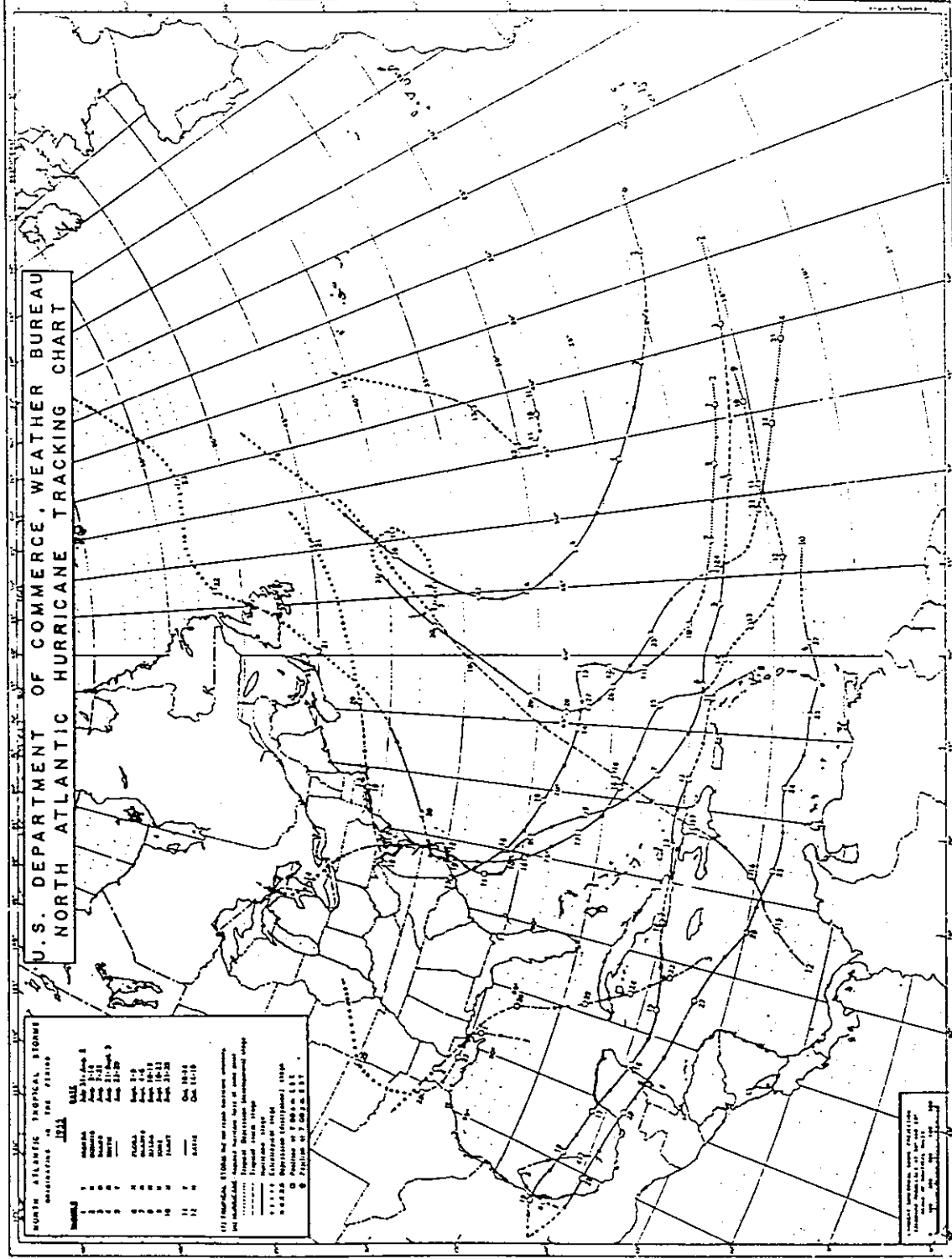
Prof. L.D.C. Imbert,
Prof. A.M. Stodima,
Dr. R.W.A. Coberna,
Mr. G.P. Oprea,
Mr. D.O. Pavesi,

Prof. L.D.C. Imbert,
Prof. A.M. Stodima,
Dr. R.W.A. Coberna,
Mr. G.P. Oprea,
Mr. D.O. Pavesi,

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Prof. A.M. Stodima,
Dr. R.W.A. Coberna,
Mr. G.P. Oprea,
Mr. D.O. Pavesi,

The Chart shown here is derived from a detailed study of the frequency of occurrence of Tropical Storms & Hurricanes during the period 1886-1952. The numbers shown above are those which control points representing a particular frequency of occurrence. These have been assigned to various lines on a logarithmic plot. The values representing the frequency of occurrence, as shown by the numbers on the Chart, are intended to be used to determine the average number of Tropical Storms and Hurricanes which have effected the location during the period. Thus, a two-degree square has approximately 1000 occurrences of such storms, and the number (5) marked in the square indicates that the average number of such storms which have effected the location during the period. For example, the island of Jamaica is located within a 15 degree square which has been marked with the number 25. This average number of Tropical Storms and Hurricanes effecting the island during the period marked from 22 to 32, giving return periods of 2 to 3 years for different parts of the island.



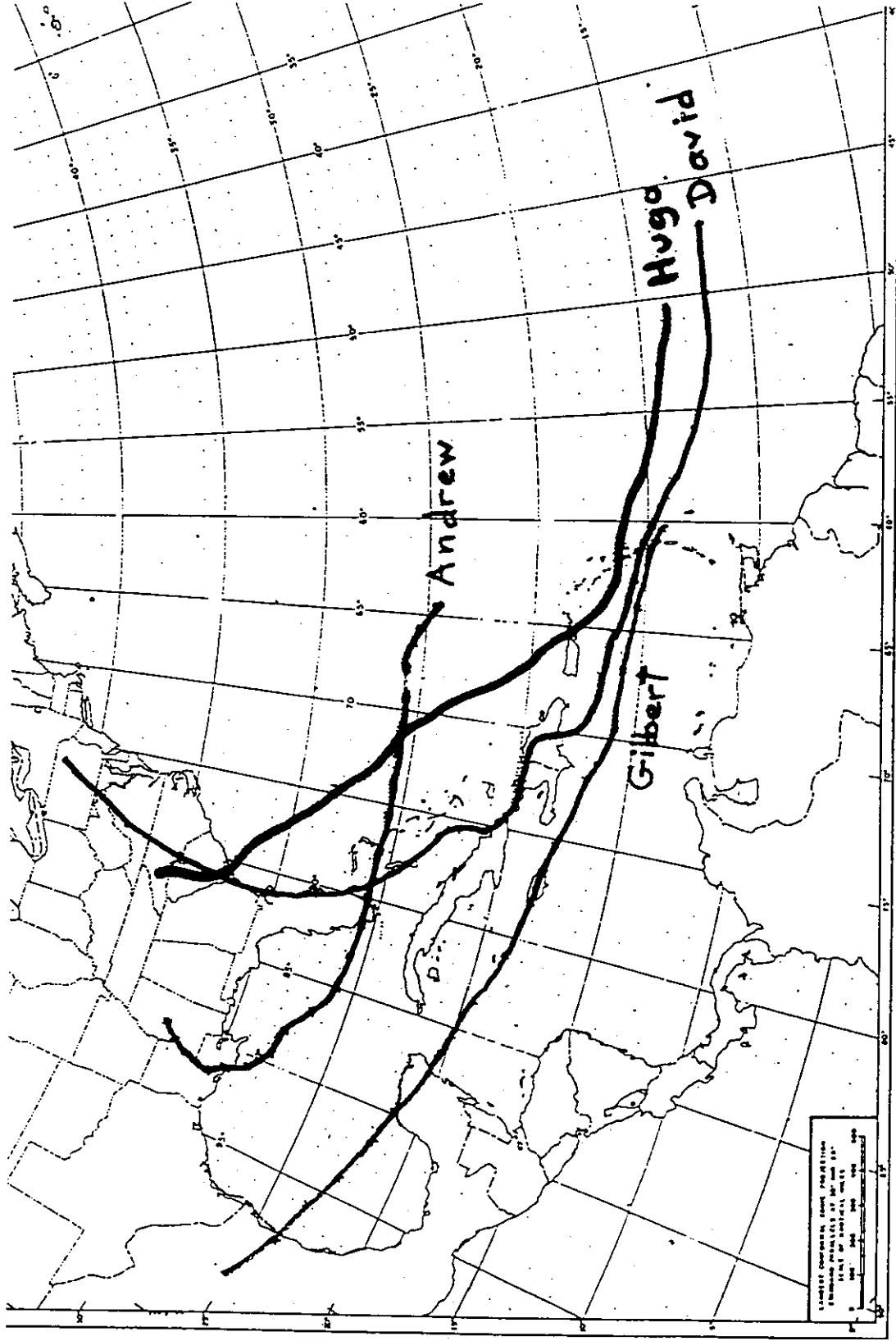
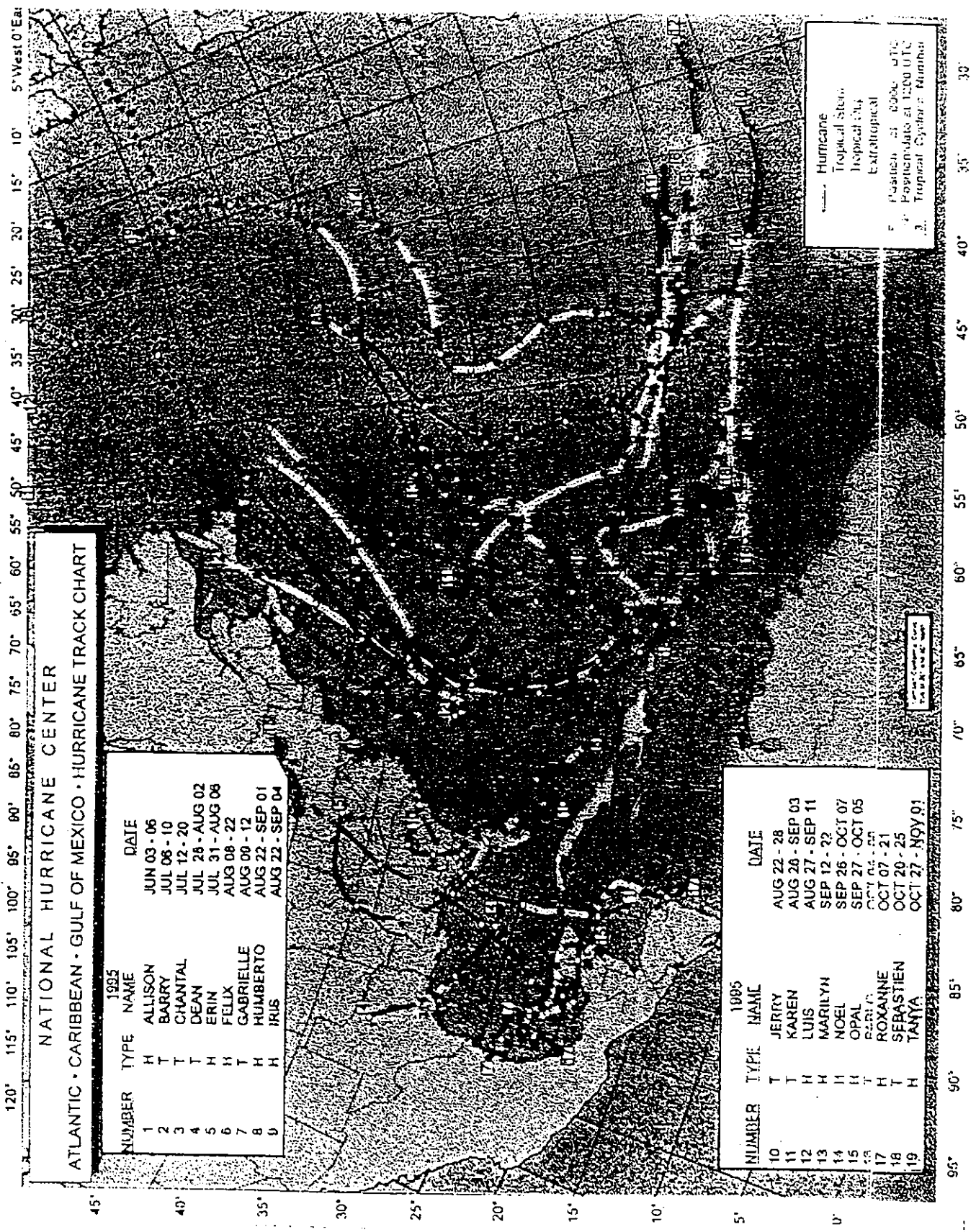
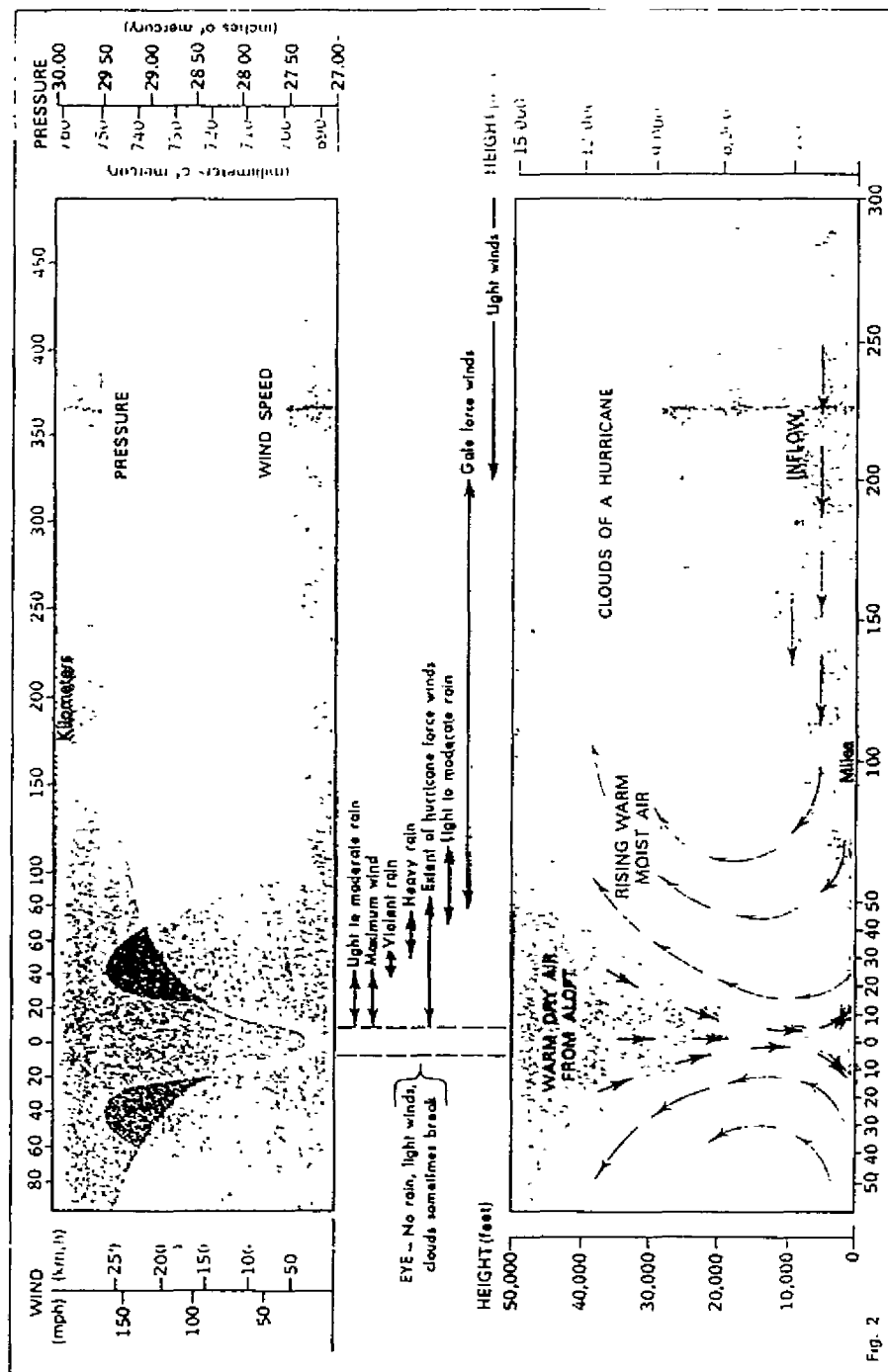
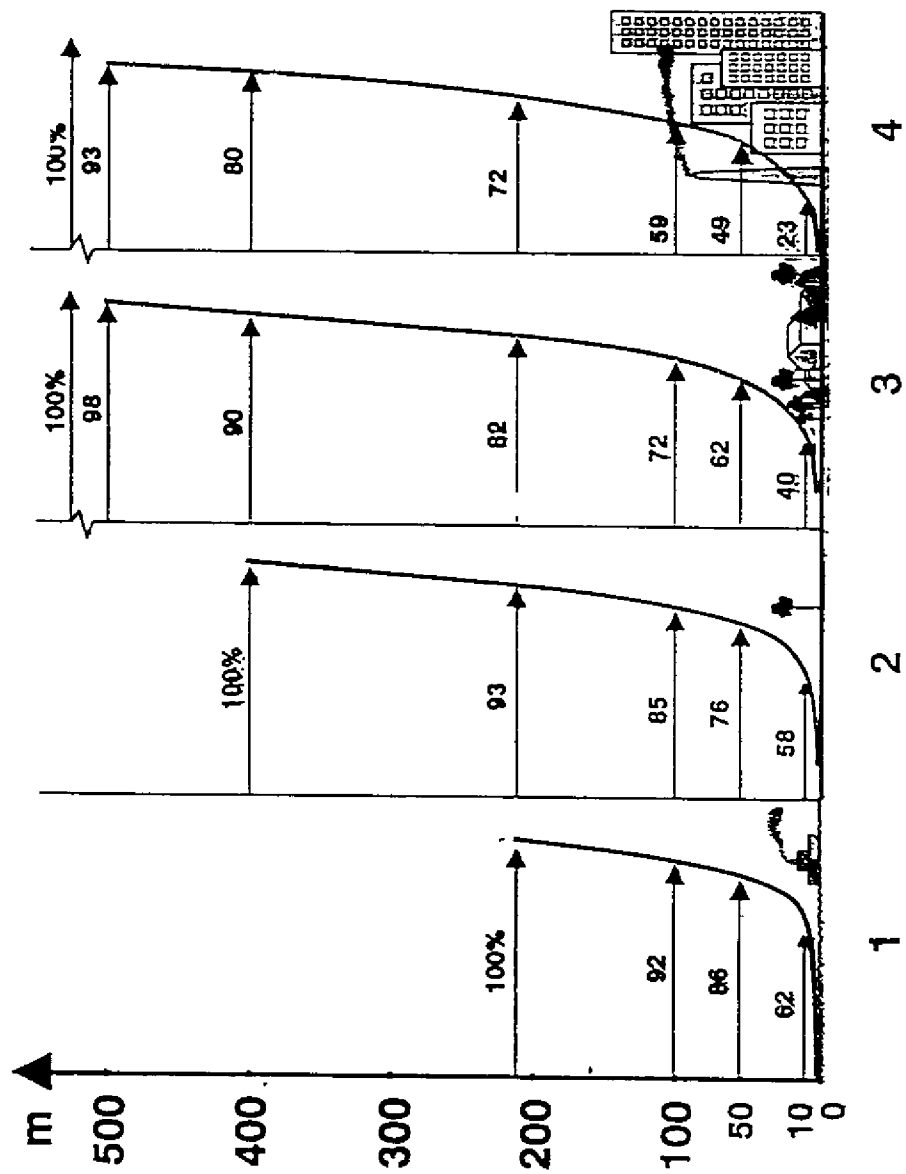


Figure 2 - Tracks of hurricanes David, Gilbert, Hugo and Andrew



Country	Number of known, significant, hurricane events since 1492		Country	Number of known, significant, hurricane events since 1492
Anguilla	9		Haiti	30
Antigua	36		Jamaica	65
Bahamas	72		Martinique	41
Barbados	52		Montserrat	13
Barbuda	8		Nevis	24
Belize	27		Puerto Rico	94
Bermuda	44		St Eustatius	16
Virgin Islands	31		St Kitts	80
Cayman Islands	17		St Lucia	16
Cuba	150		Sint Maarten & Saba	14
Dominica	43		St Vincent	9
Dominican Republic	62		Tobago	8
Grenada	10		Trinidad	14
Guadeloupe	49		Turks & Caicos	13
Guyana	0			





The **Saffir/Simpson** scale is often used to categorize hurricanes based on wind speed and damage potential. The following five categories of hurricanes are recognized:

Wind Speed (one-minute sustained)			
Category	m/s	mph	Damage
HC1	33 - 42	74 - 95	Minimal
HC2	43 - 49	96 - 110	Moderate
HC3	50 - 58	111 - 130	Extensive
HC4	59 - 69	131 - 155	Extreme
HC5	> 69	> 155	Catastrophic

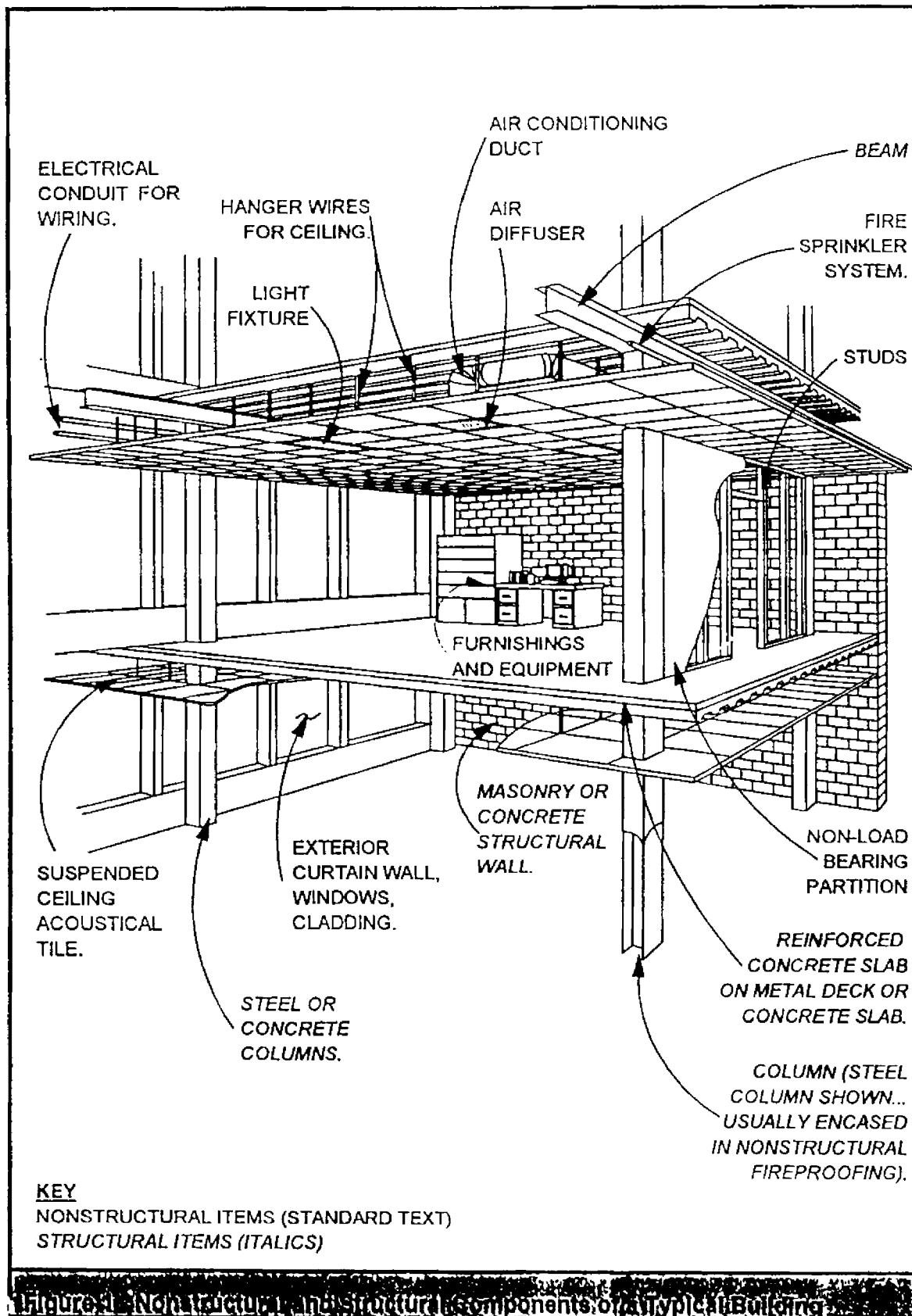
**The real environment
in a hurricane consists
of strong, turbulent,
winds (sustained for
many hours), that
change slowly in
direction as the storm
passes, and carry large
amounts of debris
while accompanied by
torrential rains**

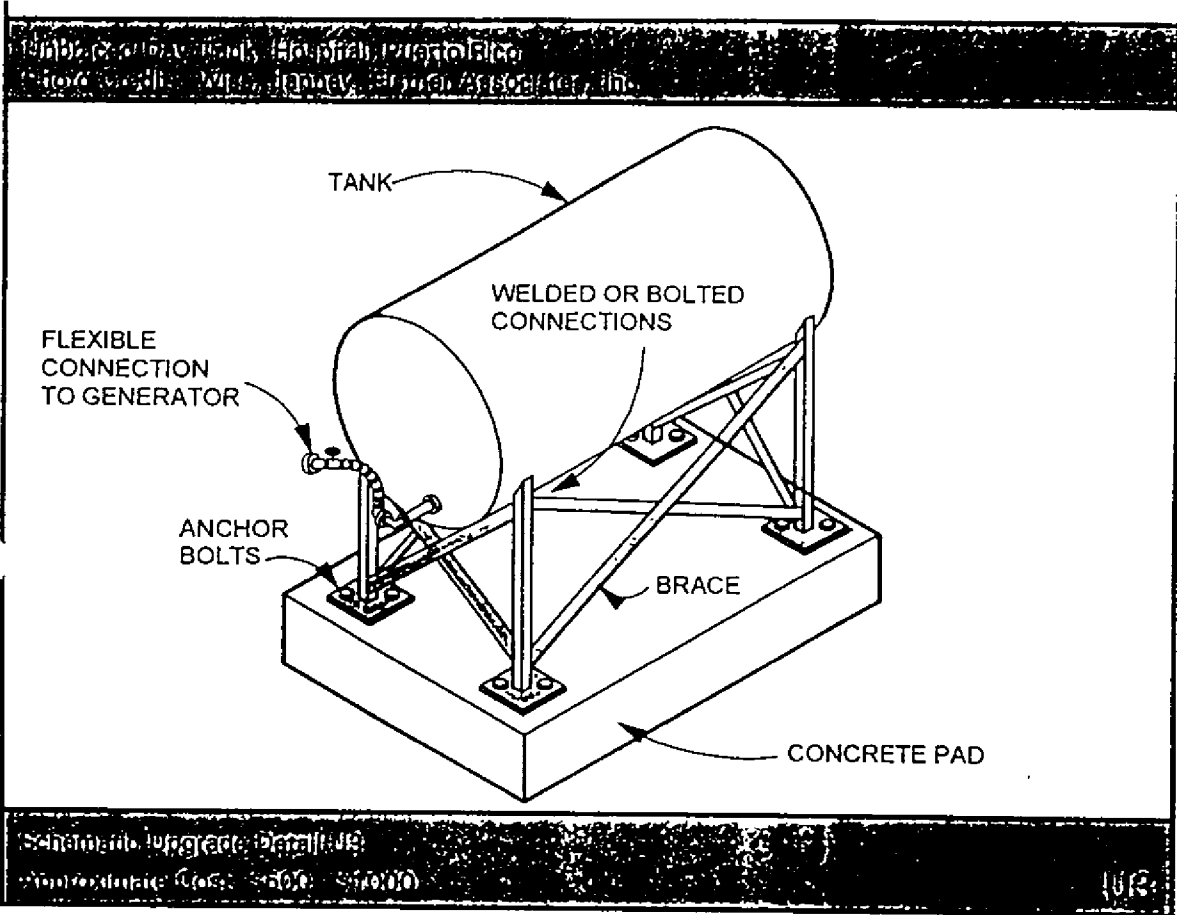
Prof Joseph Minor (modified by Tony Gibbs)

Part 4

**Visual Material
for
Prevention
of
Non-structural Damage
(Earthquakes)**

These illustrations were taken from
"Reducing the Risks of Nonstructural Earthquake Damage - a Practical Guide"
Federal Emergency Management Agency document FEMA 74 / September 1994





Unrated Extinguisher

Photo Credit: Wiss, Janney, Elstner Associates, Inc.

LATCH ON DOOR
MUST NOT LOCK
UNLESS GLASS
CAN BE EASILY
BROKEN FOR
ACCESS.

GOOD LOCATION
FOR FLASHLIGHT

CABINET
BOLTED
TO WALL
STUD

QUICK-
RELEASE
STRAP

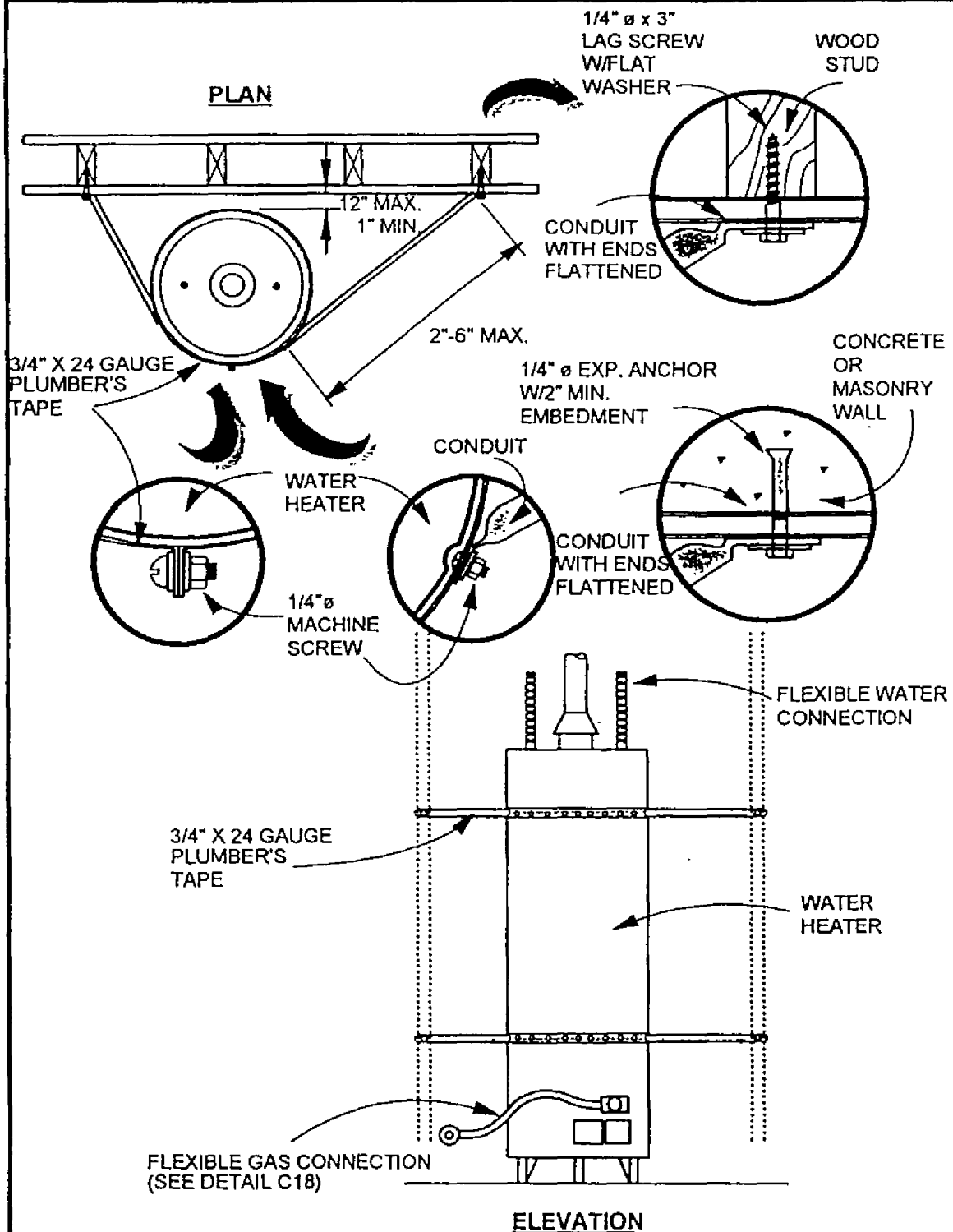
Approved Detail U10

Approximate Cost: \$600

U10

WATER HEATER WALL INSTALLATION

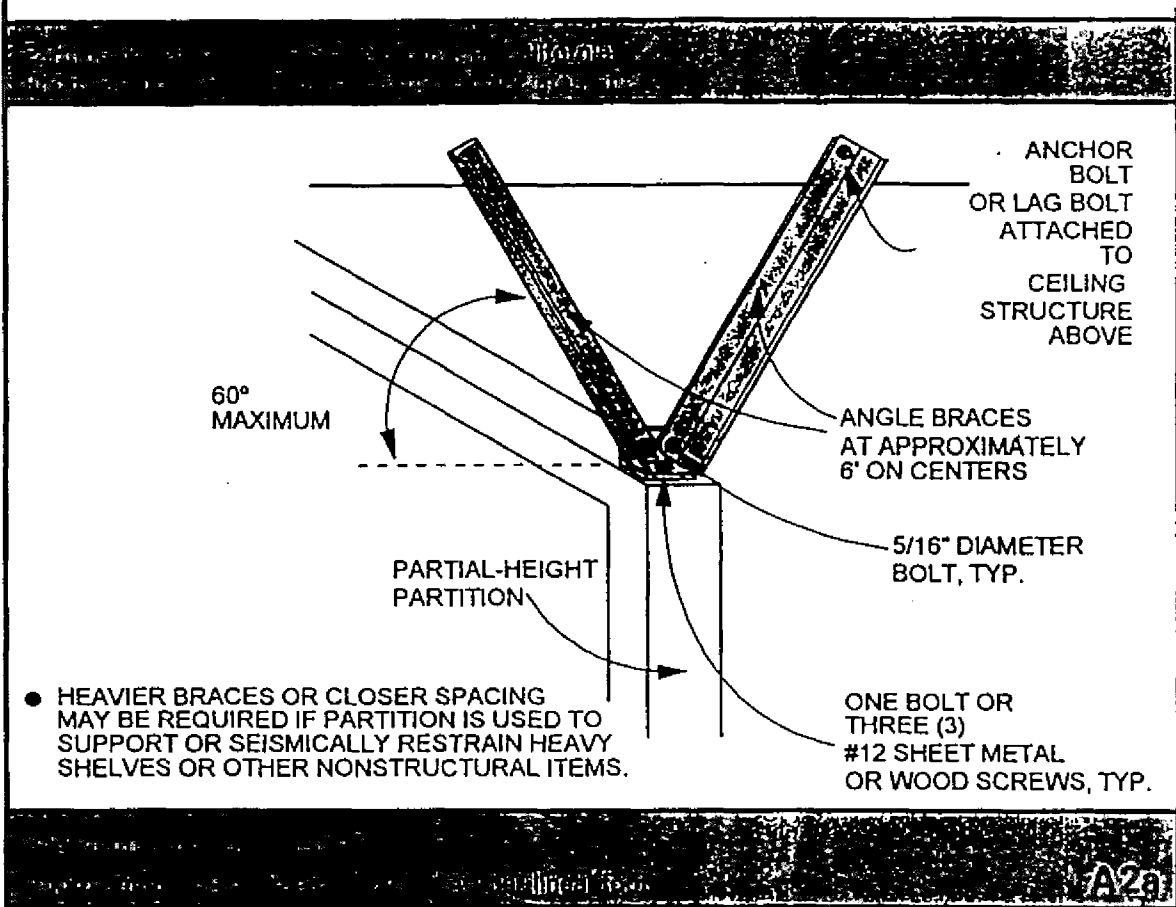
DO-IT-YOURSELF



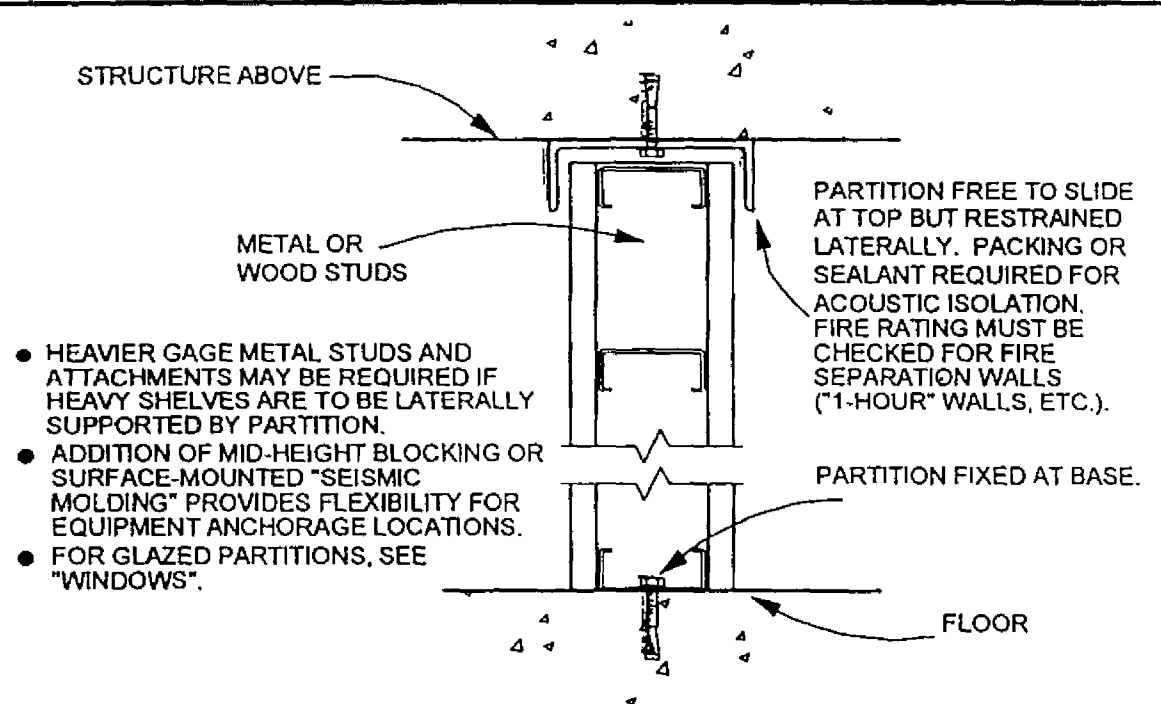
Upgrade Detail U19b

Approximate Cost: \$200

U19b



Earthquake Damage, 1994, Northridge, California
 Photo Credit: Wiss, Janney, Elstner Associates, Inc.

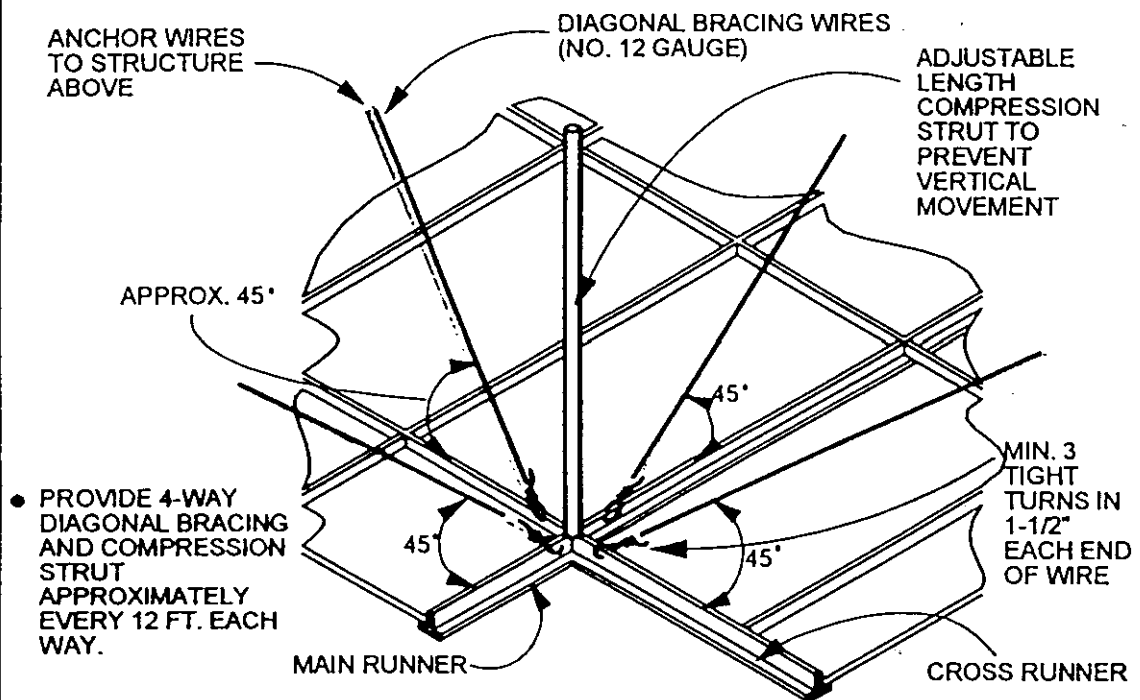


Schematic Upgrade Detail A2b

Approximate Cost: Varies, depending on design

A2b

Earthquake Damage 1994 Northridge, California
Photo Credit: W. J. Janney, Elstner Associates, Inc.

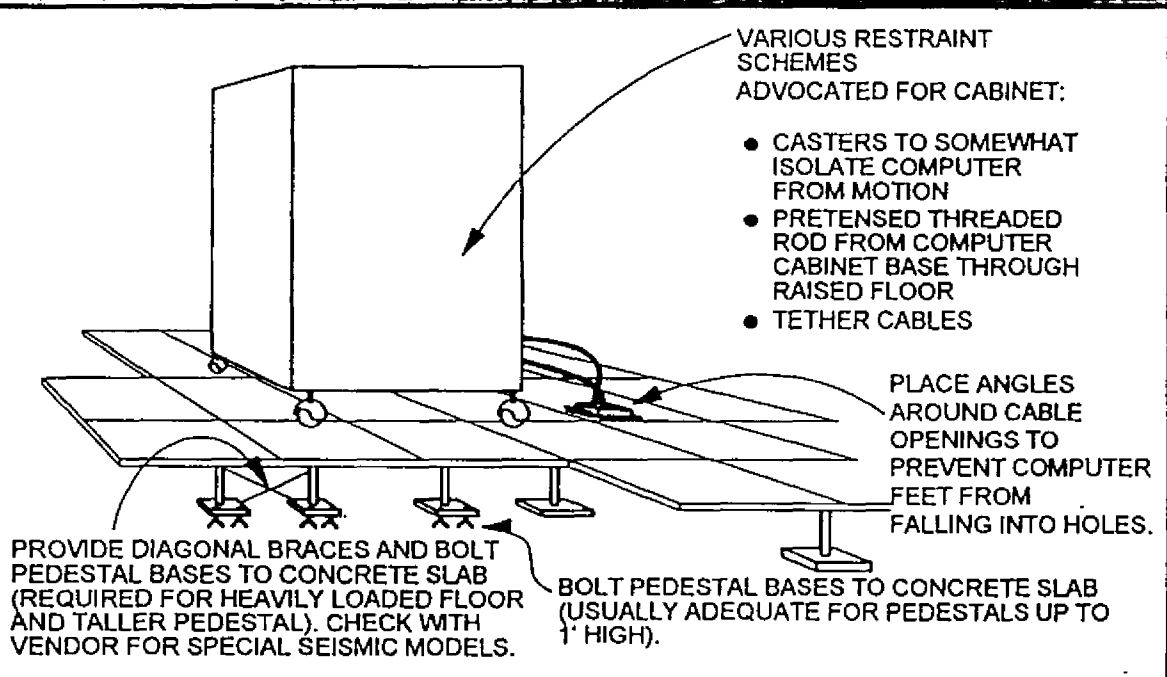


Schematic Upgrade Detail A3

Approximate Cost: \$50 per brace

A3

Temporary bracing for collapsed ceiling
 Earthquake Damage - 1994, Northridge
 Photo Credit: Wiss, Janney, Elstner Assoc.



Schematic Upgrade Detail C8

Approximate Cost:

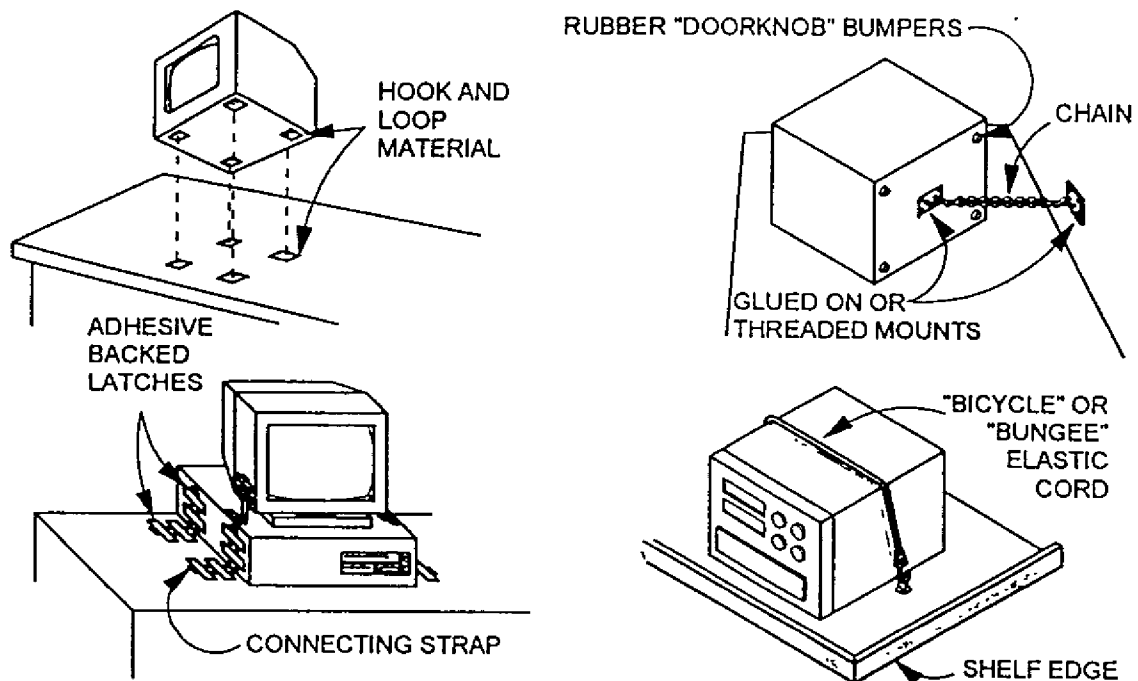
Access floor alone

Cabinet restraint

1/2" x 1/2" x 1/2" x 1/2"

1/2" x 1/2" x 1/2" x 1/2"

Unsecured computers may fall and suffer damage.
Photo Credit: Wiss, Janney, Elstner Associates, Inc.

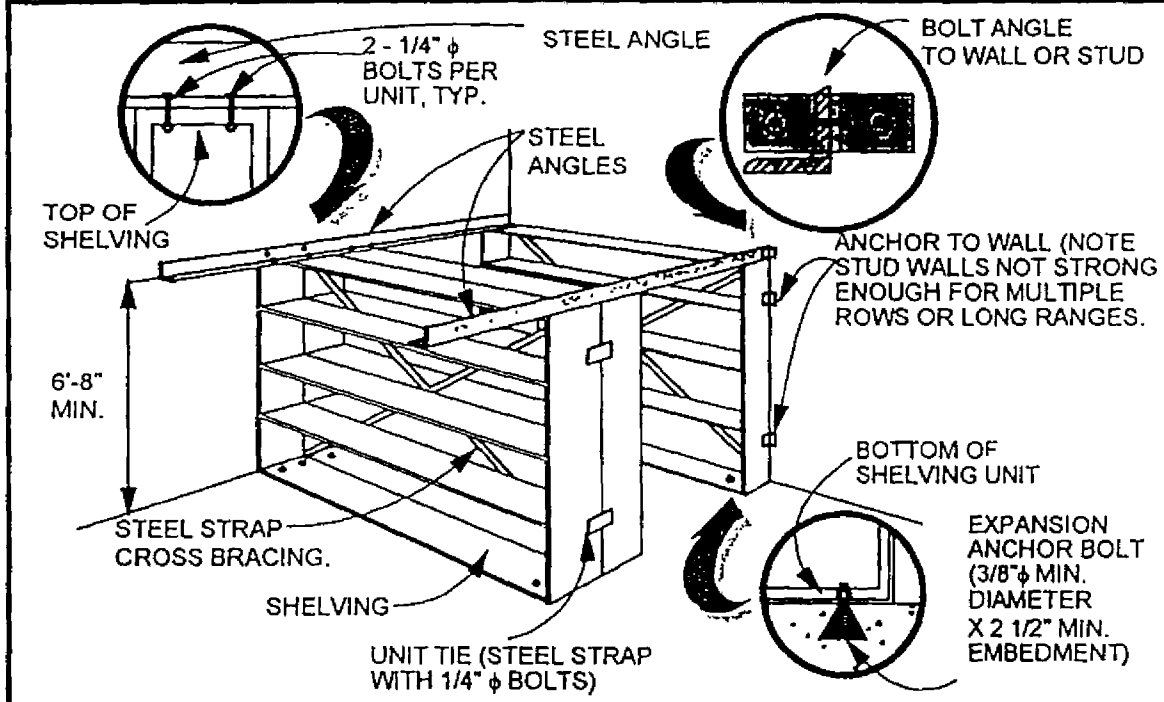


Upgrade Detail C10

Approximate Cost: \$60 per Computer

C10

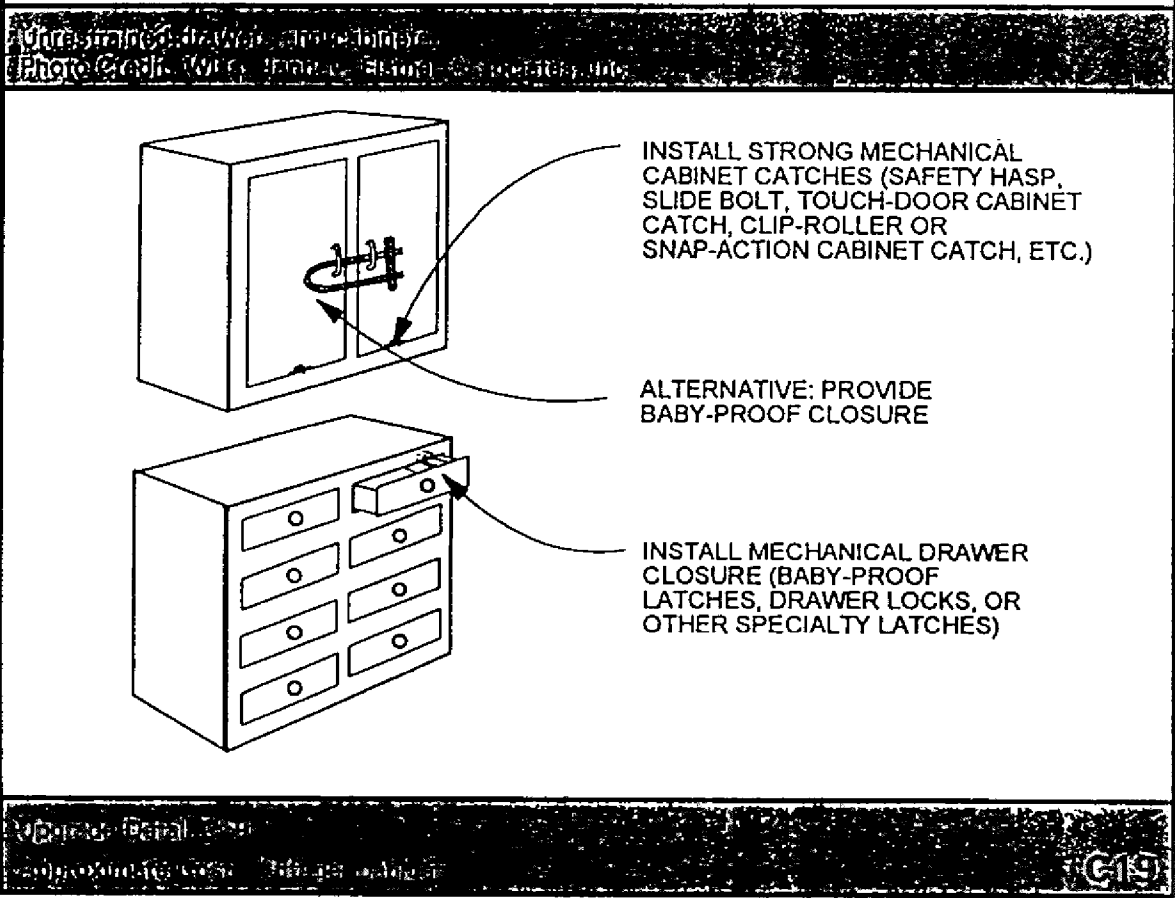
Earthquake Damage 1972, Managua, Nicaragua
 Photo Credit: John J. Meahan



Schematic Upgrade Detail G12a

Approximate Cost: \$20 per lineal foot of shelving

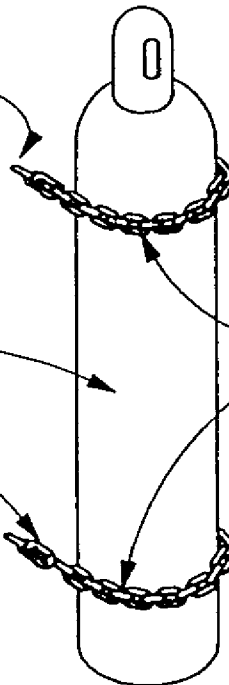
G12a



1/4" DIAMETER
SCREW EYE (OR
EXPANSION
ANCHOR TO
CONCRETE)

GAS
CYLINDER

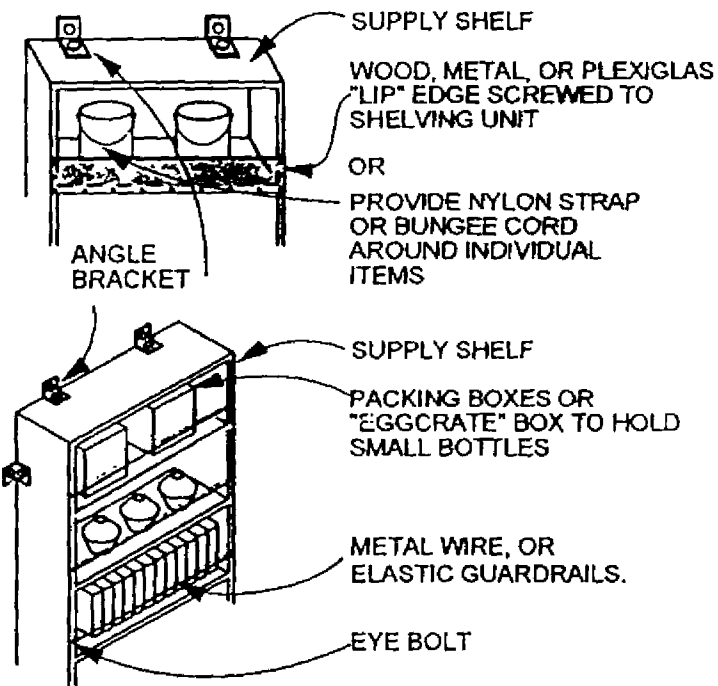
1/4" ϕ MIN.
THREADED
CONNECTOR
(SAFE WORKING
LOAD 500 LB.)



CHAIN RESTRAINT
3/16" ϕ MIN. WELDED
CLOSED-LINK STEEL CHAIN
(SAFE WORKING LOAD 500 LB.)

STRONGER HARDWARE AND
WALL SUPPORT REQUIRED
FOR MULTIPLE CYLINDERS.
ENGINEERING RECOMMENDED.

Photo Credit: Robert McManis/Red



- ANCHOR STORAGE SHELVES
- PROVIDE SAFETY LIP OR SHELF EDGE
- PROVIDE MECHANICAL LATCHES FOR CABINETS AND DRAWERS
- STORE SMALL OR BREAKABLE ITEMS IN ORIGINAL PACKING OR EGGRATE BOXES, NOT LOOSE ON SHELF OR IN DRAWER
- STORE INCOMPATIBLE MATERIALS AT A SAFE DISTANCE TO AVOID MIXING IF THE CONTAINERS FALL
- ORDER HAZARDOUS LAB CHEMICALS IN UNBREAKABLE PLASTIC BOTTLES OR IN GLASS BOTTLES WITH AN EXTERIOR PLASTIC SAFETY COATING

Abstract