APPENDIX A

FEMA - Data Collection Guideline | DO NOT USE field number | C E V

A. Contributor _____ Phone _____ Date _____

B. Building Identification (optional) _____

C. Site Location (county,state) _____ zone (if changed) _____

D. NEHRP/UBC Soil Type: S1___ S2___ S3___ S4___

E. Number of stories: above grade _____ below grade _____

F. Total Area (sq ft.) _____ (see U.)

G. Approximate Year of Original Construction _____

H. Model Building Type: (before rehabilitation)

- wood light frame ..... W1___
- wood (commercial or industrial) ..... W2___
- steel moment frame ..... S1___
- steel braced frame ..... S2___
- steel light frame ..... S3___
- steel frame with concrete shear walls ..... S4___
- steel frame with infill shear walls ..... S5___
- concrete moment frame ..... C1___
- concrete shear walls ..... C2___
- concrete frame with infill shear walls ..... C3___
- precast concrete tilt-up walls ..... PC1___
- precast concrete frame with concrete shear walls ..... PC2___
- reinforced masonry w/ metal or wood diaphragm ..... RM1___
- reinforced masonry w/ precast concrete diaphragm ..... RM2___
- unreinforced masonry ..... URM___
- other (please describe): _____

I. Historic building controls: YES___ NO___

J. BASE YEAR for cost: _____

K. TOTAL CONSTRUCTION COST: $ _____ (see U.)

L. Source of cost: actual construction(AC)___ study(S)___

N. Occupancy Classification:

- assembly ..... A___
- factory/industrial/warehouse ..... F___
- institutional/educational ..... I___
- residential ..... R___
- commercial/office ..... C___
- parking ..... P___
- retail/mall ..... M___
- other _____

O. Performance Objective:

- risk reduction ..... RR___
- life safety ..... LS___
- damage control ..... DC___
- immediate occupancy ..... IO___

P. Rehabilitation Method(s):

- added shear walls ..... SW___
- added braced frames ..... BF___
- added moment frames ..... MF___
- modified existing walls ..... EW___
- modified existing frames ..... EF___
- isolation ..... IS___
- added damping ..... AD___
- strengthened diaphragm ..... SD___
- strengthened foundations ..... SF___
- parapet bracing ..... PB___
- URM or tilt-up wall ties ..... WT___
- strengthened soft-story only ..... SS___

M. Overall scope of non-seismic work:

- minimum work required ..... MIN___
- additional improvements ..... ADD___
- complete renovation of interior ..... COM___
- added space (please give sq.ft.) _____

Q. Non-seismic work included in total construction cost:

- asbestos/hazardous material removal ..... YES__ NO___
- disabled access ..... YES__ NO___
- system improvements (arch., M.E.P.) ..... YES__ NO___
- repair of damage/deterioration ..... YES__ NO___
- other: _____

R. Condition of occupancy:

occupants-in-place(IP)___ occupants temporarily removed(TR)___ vacant(V)___

S.

Scope of seismic rehabilitation work:	Not Evaluated(NE)	Evaluated and OK(OK)	Included in Cost(I)
1 Structure			
2 Exterior falling hazards			
3 Selected interior nonstructural			
4 All interior nonstructural			

T. STRUCTURAL COST (total of items 1 & 2 in S. including contractor's overhead & profit): _____ (see U.)

U.

Estimate of uncertainty in data provided.	< 5% (G)	5-10% (F)	> 10% (P)
Area (see F.)			
Total Construction Cost (see K.)			
Structural Cost (see T.)			

Additional information to be provided (if available)

V. Non-Construction Project Costs

- occupant relocation _____
- A & E fees,testing, permits _____
- project management _____

W. Duration of Construction (months) _____

X. Construction Costs ($ or % of cost in K.):

- repair of damage/deterioration _____
- hazardous material removal _____
- disabled access _____
- system improvements _____
- nonstructural mitigation _____

Y. Plan Shape: ☐ (R)___ ☐ (L)___ ☐ (C)___ ☐ (O)___ Other(OT):_____ Z. Base Dimensions:_____
AA. Typical Floor Plan Dimensions:_____ BB. Story Height:_____ CC. Total Height:_____

DD. Roof/Floor Framing (2nd Floor +):

	R	F
wood joists/gluelams	W___	___
truss joists/timber trusses	TT___	___
steel beams	S___	___
concrete beams	C___	___
flat slabs	FS___	___

other (please describe):_____

EE. Diaphragms:

wood (sheathing or plywood)	W___
metal deck w/ concrete fill	MDF___
metal deck w/o concrete fill	MD___
cast-in-place concrete	C___
precast concrete	PC___
steel truss	ST___

other (please describe):_____

FF. Exterior Non-Load Bearing Cladding:

curtain wall	CW___
precast	PC___
masonry	M___

other (please describe):_____

GG. Evidence of Settling: ..... YES___NO___

HH. Condition of Bldg: ... Good___ Fair___ Poor___

II. Columns/Bearing Walls:

	C	BW
timber	W___	___
concrete	C___	___
steel	S___	___
precast concrete	PC___	___
reinforced masonry	RM___	___
unreinforced masonry	URM___	___

other (please describe):_____

JJ. Foundations:

spread footings	SF___
concrete mat	M___
piles/caissons	P___

other (please describe):_____

KK. Longitudinal Lateral System:

moment frames	MF___
braced frames	BF___
shear walls	SW___

other (please describe):_____

LL. Transverse Lateral System:

moment frames	MF___
braced frames	BF___
shear walls	SW___

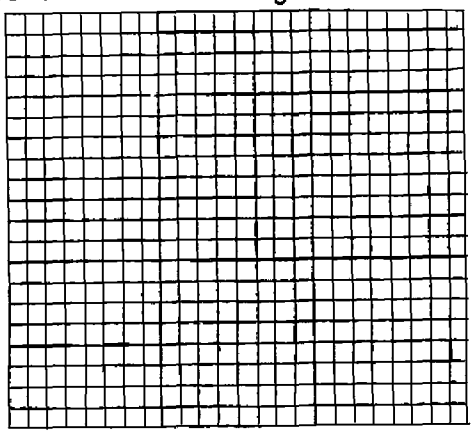
other (please describe):_____

MM. Code or Design Guideline Used for Rehabilitation:_____

NN. Special Features (irregularities, interior partitions, etc.):_____

OO. Rehabilitation Work Completed (please describe):_____

R. Schematic Sketch of Building Plan:



Existing Standards and Performance Objectives

Existing Standard	Equivalent Performance Objective	Specific Concern of Standard
ATC-22/ATC-26-1	Life Safety	①Protect occupants and general public
ATC-14	Life Safety	①
'90 BOCA National Bldg. Code	Life Safety	①
CA Title 24 - Hospitals	Immediate Occupancy	②Use of building immediately following EQ
CA Title 24 - Schools	Damage Control	③Protect occupants that are not fully able to help themselves
FEMA 178	Life Safety	①
FEMA 95 - New Buildings	Damage Control	④Minimize the hazard to life in all buildings
GSA Seismic Design Manual	Damage Control	⑤Resist a minor earthquake without damage Resist moderate earthquake without structural damage but with some nonstructural damage Resist a major earthquake with damage but without collapse
H-08-8 (VA) - Hospitals	Immediate Occupancy	②
H-08-8 (VA) - most other buildings	Damage Control	⑤
City of Long Beach - Existing Bldgs.	Life Safety	①
Massachusetts State Code	Life Safety	①
Site Specific Response	Life Safety	①
Site Specific Response	Damage Control	⑤
Site Specific Response	Immediate Occupancy	②
SBCC Southern Bldg. Code	Life Safety	①
DOD Tri-Services - Essential Buildings	Immediate Occupancy	②
1992 Tri-Services Manual	Damage Control	⑤
'88,'91 UBC (I=1.0)	Damage Control	⑤
'88,'91 UBC (I=1.25)	Immediate Occupancy	②
<'88 UBC	Life Safety	①
UCBC	Life Safety	①
DOE-STD-1020-92 Moderate & High	Immediate Occupancy	⑥Use of building immediately following EQ and containment of hazardous materials
DOE-STD-1020-92 Low & General Use	Damage Control	⑦Protect occupants and prevent release of hazardous materials

For questions concerning the Data Collection Guideline, please call H.J. Degenkolb Associates, (415) 392-6952 (Jeff Soulages)

Please return the completed Guidelines to:

Jeff Soulages
H.J. Degenkolb Associates
350 Sansome St. #900
San Francisco, CA 94104

FAX # (415) 981-3157

Guideline Notes:

C. Location of building Indicate seismic zone used for rehabilitation if it has been changed since the date of the rehabilitation project.

D. Soil profile type based on either NEHRP Handbook for the Seismic Evaluation of Existing Buildings (FEMA 178) or the Uniform Building Code.

E. Include new stories that were added.

F. Total area is the total square footage of the building including basements and added space.

H. Model building type is based upon the fifteen building types described in the NEHRP Handbook (FEMA 178). This applies to the original building, not the structural system used for rehabilitation.

I. Historic building controls refers to whether or not special consideration was taken for preserving the historic character of the building.

J. Base year for costs is the bid date for construction or the year used for the cost estimate in the study

K. The total construction cost is the bid amount or the cost estimate from a detailed seismic study including the contractor's overhead, profit, and contingency costs. Also include change orders if known to add significant cost. If the cost due to change orders is unknown, indicate this in item U. Not included in this cost are the costs shown in item V.

L. Source of total construction cost is either an actual rehabilitation project which has been completed or an estimate from the study of the projected rehabilitation of a particular building A study is a schematic design of a specific building. A study does not include a "cost per square foot" study as in FEMA 156/157 or a cost estimation based on the rapid screening process described in FEMA 154.

M. Overall scope of non-seismic work is divided into three categories 1) minimum work is doing "just enough" to satisfy local code requirements; 2) moderate improvements are those done voluntarily without doing a 3) complete renovation of the interior, which implies that the seismic rehabilitation work does not increase the level of architectural work which is already a major portion of the project. Added space refers to additional stories or expansions of the bldg space.

N. Occupancy classifications are as follows:
- assembly - theatres, churches, or other assembly buildings
- industrial/factory/warehouse - factories, assembling plants, industrial laboratories, storage, etc.
- institutional/educational - schools, hospitals, prisons, etc.
- residential - houses, hotels, and apartments.
- commercial/office - all buildings used for the transaction of business, for the rendering of professional services, or for other services that involve limited stocks of goods or merchandise.
- parking - parking garages or structures
- retail/mall - retail stores or shopping malls.

O. The performance objectives are.
- risk reduction - rehabilitating parts or portions of a structure without considering the entire structure for life-safety or greater performance.
- life-safety - allows for unrepairable damage as long as life is not jeopardized and ingress or egress routes are not blocked.
- damage control - protect some feature or function of the building beyond life-safety, such as protecting building contents or preventing the release of toxic materials.
- immediate occupancy - minimal post-earthquake damage and disruption with some nonstructural repairs and cleanup

P. Rehabilitation method used for building

Q. Non-seismic work included in total construction cost are those items which do not improve the seismic performance of the building. These may have been "triggered" by the seismic work or done voluntarily. The third item refers to architectural improvements, as well as mechanical, electrical, or plumbing (M.E.P.) improvements

R. Condition of occupancy is the location of the occupants during the construction.
- occupants-in-place - work is scheduled around normal hours of occupancy
- occupants temporarily removed - occupants are moved to another room in the building during construction
- vacant - the building is completely vacated during construction

S. Scope of seismic rehabilitation work refers to any items which were rehabilitated: the main structure, exterior falling hazards such as precast panels and parapets, or interior elements such as equipment and light fixtures.

T. Structural cost is the cost of the construction of the structural elements necessary to rehabilitate the building and reduce exterior falling hazards. This cost includes the contractor's overhead and profit. It does not include items such as demolition and replacement costs for architectural finishes or M.E.P. systems. If the exact figure is not known, please approximate.

U. The estimate of uncertainty relates to the data collection process (not the uncertainty inherent in a cost estimate or study). If the area and/or costs provided are guesses, indicate >10% uncertainty. If the data is documented or recollection is very accurate, indicate <5%

V. Non-construction project costs should be provided as an amount or percentage of the total construction cost for each of the items presented

W. Please estimate duration of rehabilitation project.

X. Additional components of the construction cost. Please provide an amount or percentage of the total construction cost for each of the items presented.

APPENDIX B

REFERENCES

1. *Americans with Disabilities Act Handbook*, ADA 1991., Equal Employment Opportunity Commission and the U.S. Department of Justice, Washington, D.C. , October 1991.

2. *Establishing Programs and Priorities for the Seismic Rehabilitation of Buildings*, Building Systems Development, Inc., A Handbook and Supporting Report, FEMA 174 & 173. Washington D.C., FEMA, 1989.

3. *Seismic Costs and Policy Implications*, Comerio, Mary C., George Miers & Associates, San Francisco, CA, 1989.

4. *Typical Costs for Seismic Rehabilitation of Existing Buildings*, Englekirk & Hart Consulting Engineers, Vol I & II, FEMA 156 & 157, Washington D.C., FEMA, 1988.

5. *Socioeconomic and Engineering Study of Seismic Retrofitting Alternatives for Oakland's Unreinforced Masonry Buildings*, Recht Hausrath & Associates, Oakland, CA, March 1993.

6. *A Benefit-Cost Model for the Seismic Rehabilitation of Buildings*, VSP Associates, Vol. I & II, FEMA 227 & 228, Washington D.C., FEMA, 1991.

APPENDIX C

ADVISORY PANEL

PANEL MEMBER	FIRM
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APPENDIX D

COMPUTERIZED DATABASE

The data file that was created as part of this project is available on one 3-1/4" double sided high density disk (1 44 Mb) formatted for DOS systems. The file is in compressed format The instructions for decompressing it are given on the floppy disk and are also described below A DOS based computer system is needed to decompress the file.

The data that is available is the raw, uncorrected data, the collection of which is described in detail in Chapter 3 of this volume. The raw cost data file is presented in a spreadsheet file (data.wk1) with one row per cost data point. Each column represents one item in the cost data collection form In addition to the raw cost data, the data file also includes separately, for each cost data point, the time correction index (to index the data point to March 1993 dollars) , the location adjustment factor, and the data quality rating.

The data file was developed using Lotus 1-2-3 Version 1 software. The decompressed file can be read using Lotus 1-2-3 Version 1or any newer edition of Lotus 1-2-3 either for DOS or Windows. In addition, several other spreadsheet programs on both DOS and Macintosh systems have the capability to read and manipulate the decompressed data file

The compressed data file is in the file data exe The disk also contains an ASCII text file called readme which repeats the following instructions for data file retrieval. The readme file can be read either using any screen editor available on the computer.

In these instructions, the name of the user's directory is assumed to be c.\work\fema. If the directory used is different, its name should be substituted for c \work\fema in the following commands. To retrieve the data file, copy the compressed file (data.exe) to your directory (c:\work\fema) from the floppy:

a:> copy data.exe c:\work\fema

To decompress the file, type

c.\work\fema> data.exe > data

The data file will then uncompress itself into two files:

DATA.WK1 - the actual cost data file
DATA.FMT - a formatting file

The data file can then be examined for any desired analysis.

Copies of the data file on disk are available from Birch & Davis Associates, Inc. at (301) 589-6760 or by fax at (301) 650-0398.