



GEOLOGIE GRENOBLE UJF

D 050 035769 2

OBSERVATOIRE DE GRENOBLE
et
LABORATOIRE DE GEOPHYSIQUE INTERNE
ET TECTONOPHYSIQUE

THESE

présentée par

Mohammed Naboussi FARSI

pour obtenir le titre de DOCTEUR de

L'UNIVERSITE JOSEPH FOURIER - GRENOBLE I

(Arrêtés ministériels du 5 juillet 1984 et du 30 mars 1992)

Spécialité : Mécanique

Identification des structures de Génie Civil à partir de leurs réponses vibratoires.

ANNEXES

Date de soutenance : 20 Décembre 1996

Composition du jury :

M. M. Boulon	Président	Professeur de l'Université J. Fourier, Grenoble
M. C. Boutin	Rapporteur	Professeur à l'ENTPE de Lyon
M. C. S. Oliveira	Rapporteur	Professeur à l'ISTC, Lisbonne, Portugal
M. P-Y. Bard	Directeur de thèse	Ingénieur en chef au LCPC, Paris
M. J. Mazars	Examinateur	Professeur à l'ENS de Cachan
M. M. Belazougui	Examinateur	Directeur du CGS, Alger

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Vulnérabilité du bâti existant.

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ANNEXE A

ENREGISTREMENTS DE LA MAQUETTE "CASSBA"

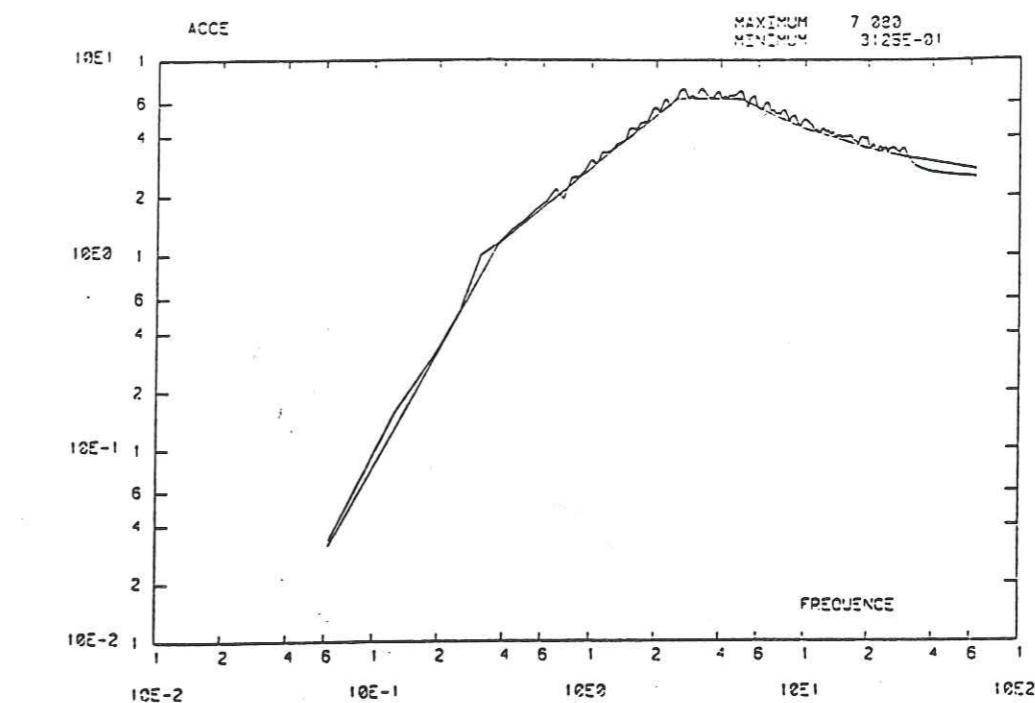
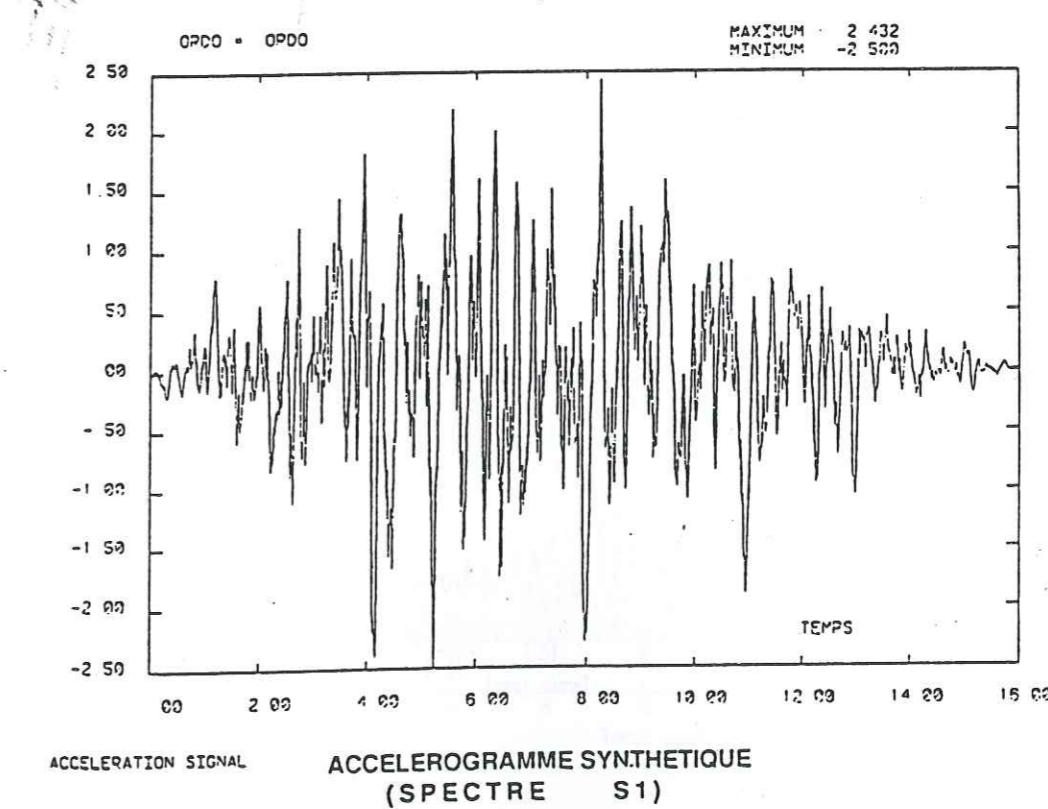
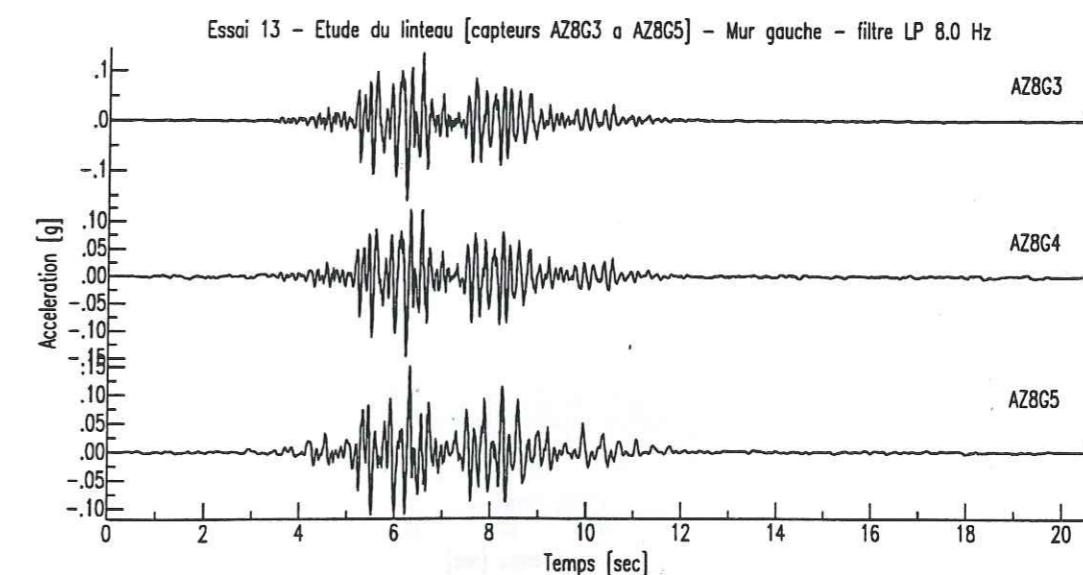
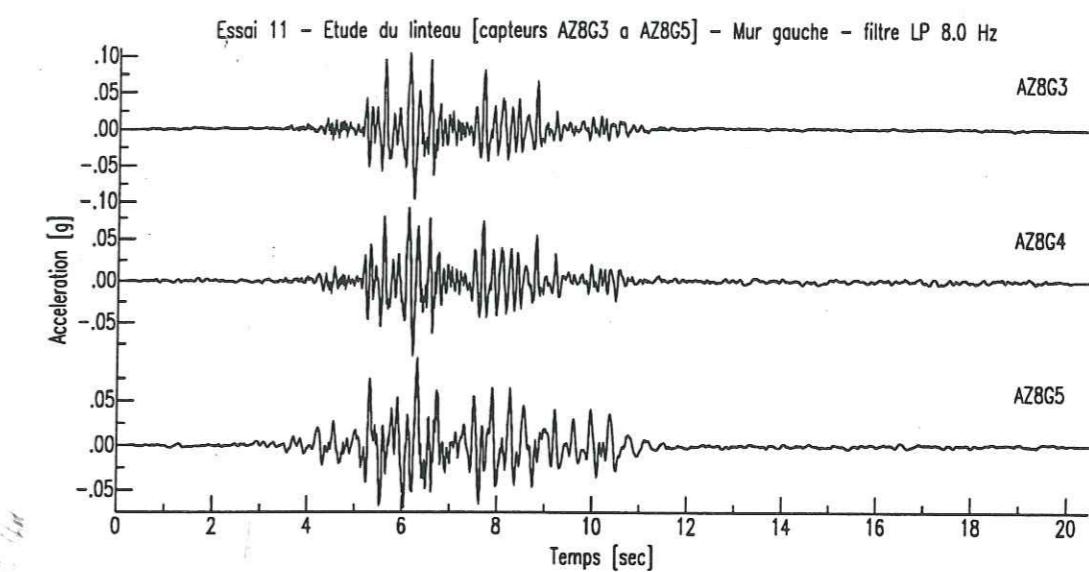
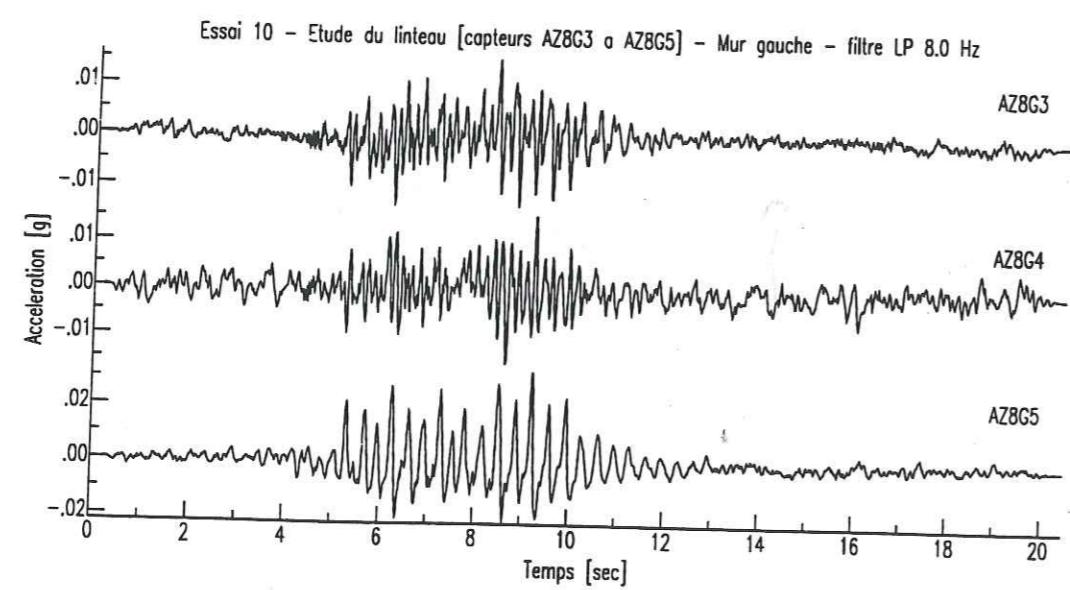
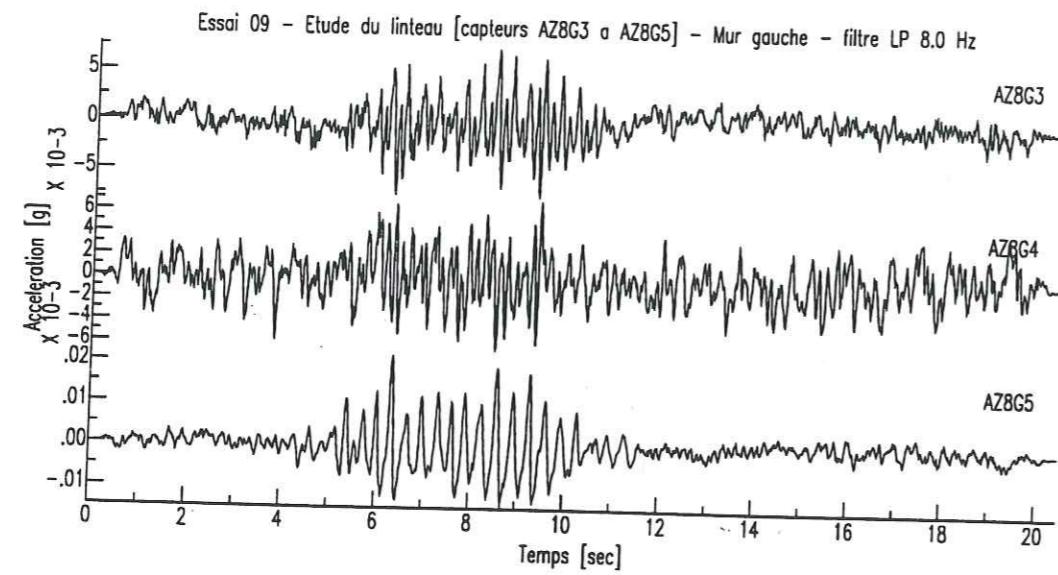
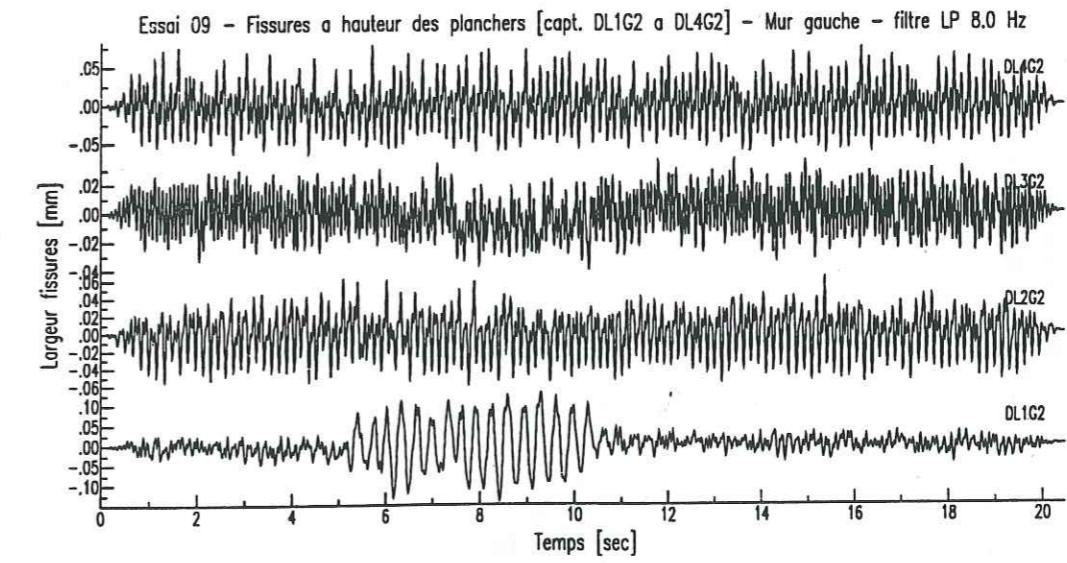
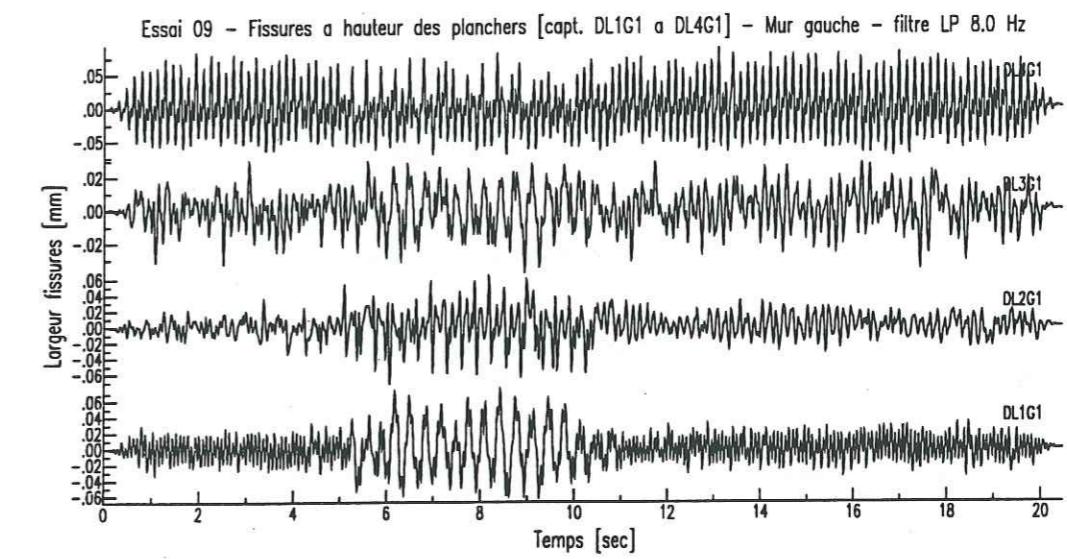
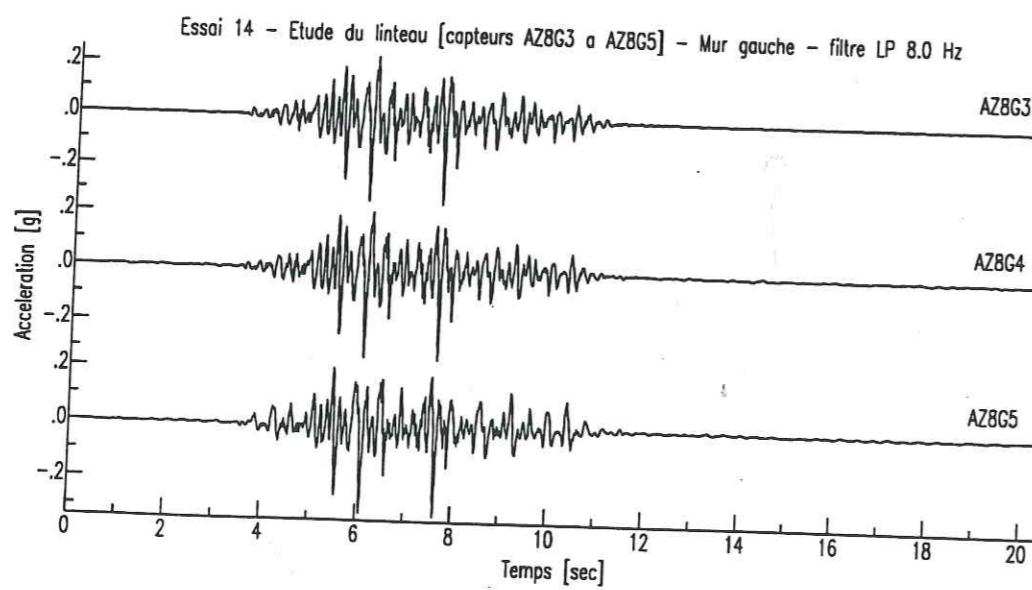
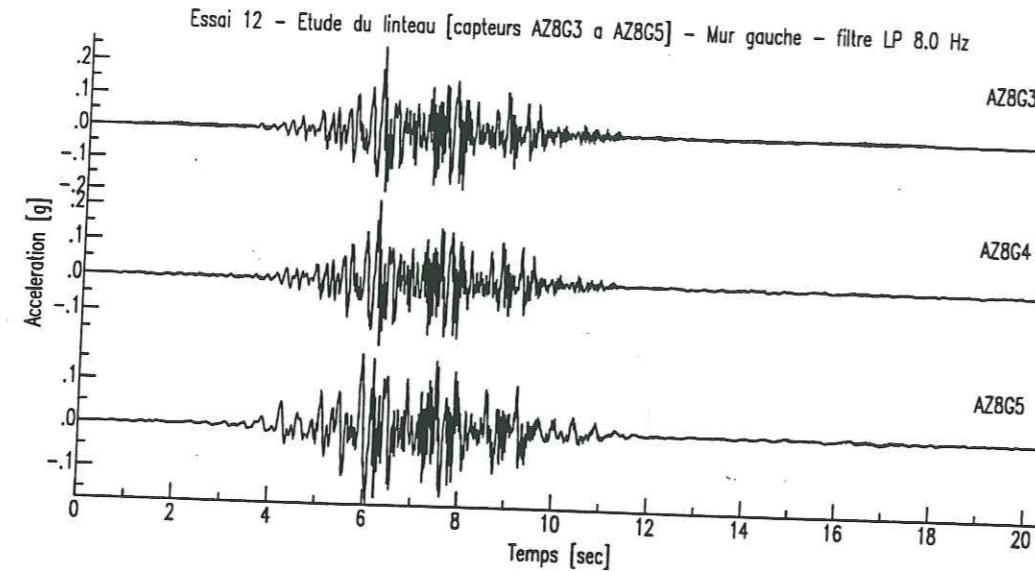


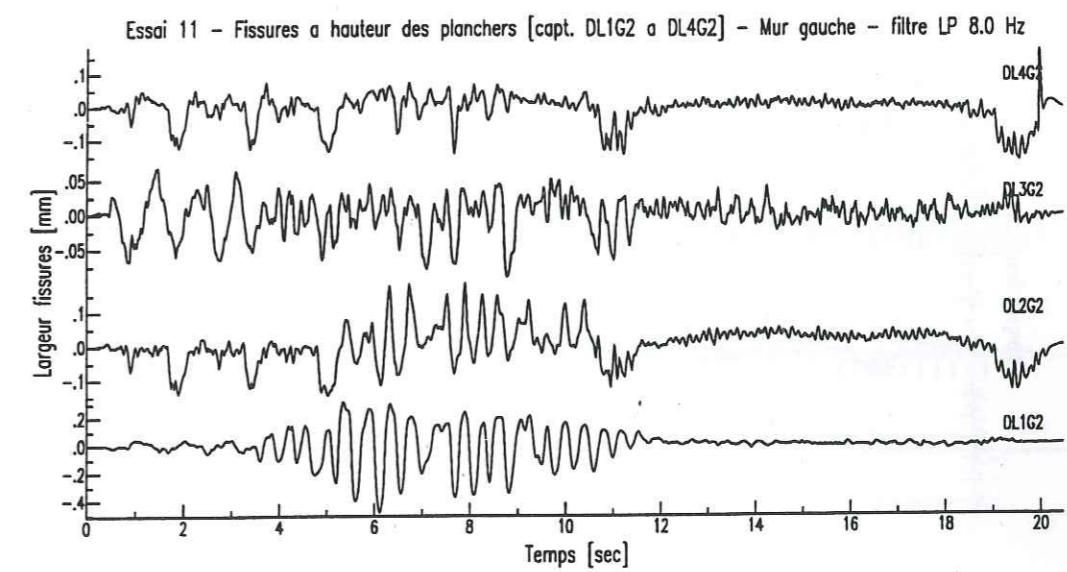
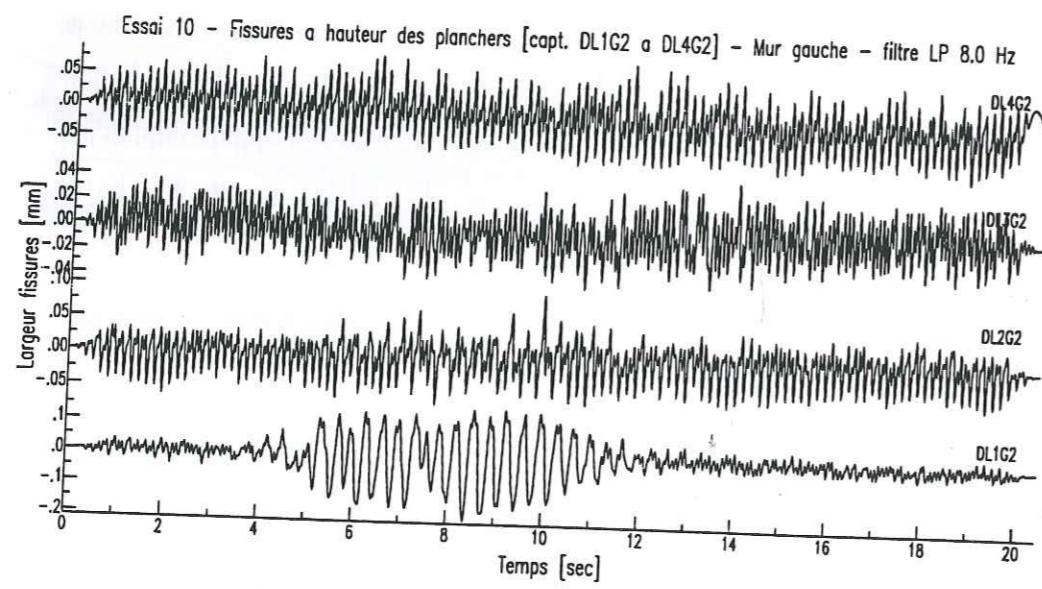
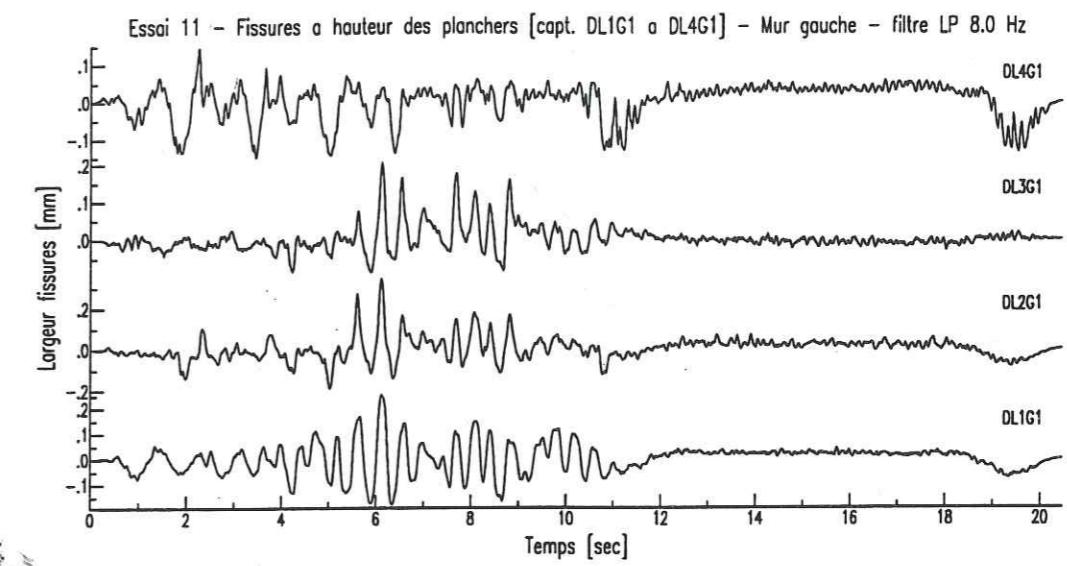
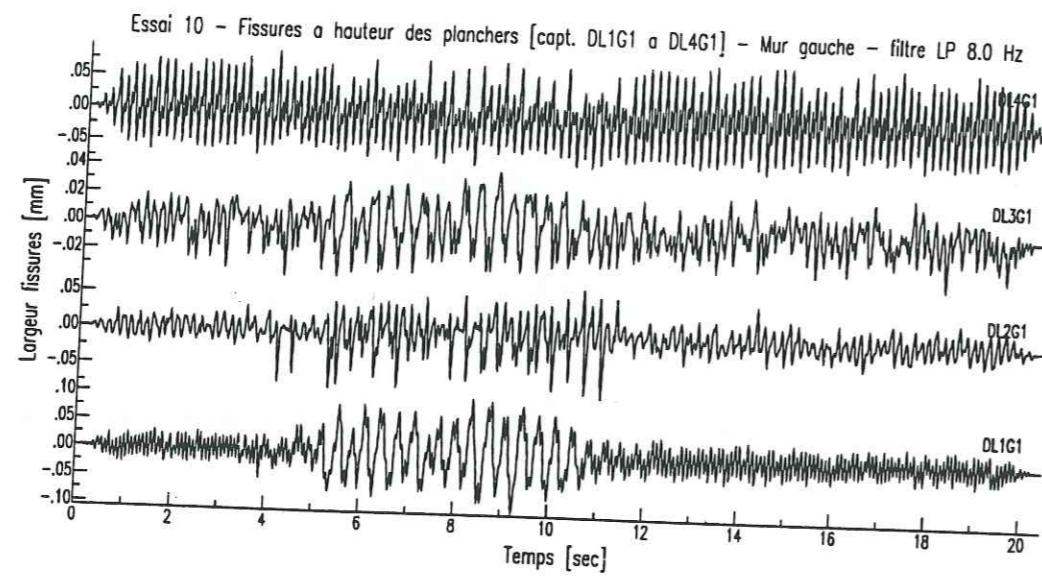
FIGURE N°4

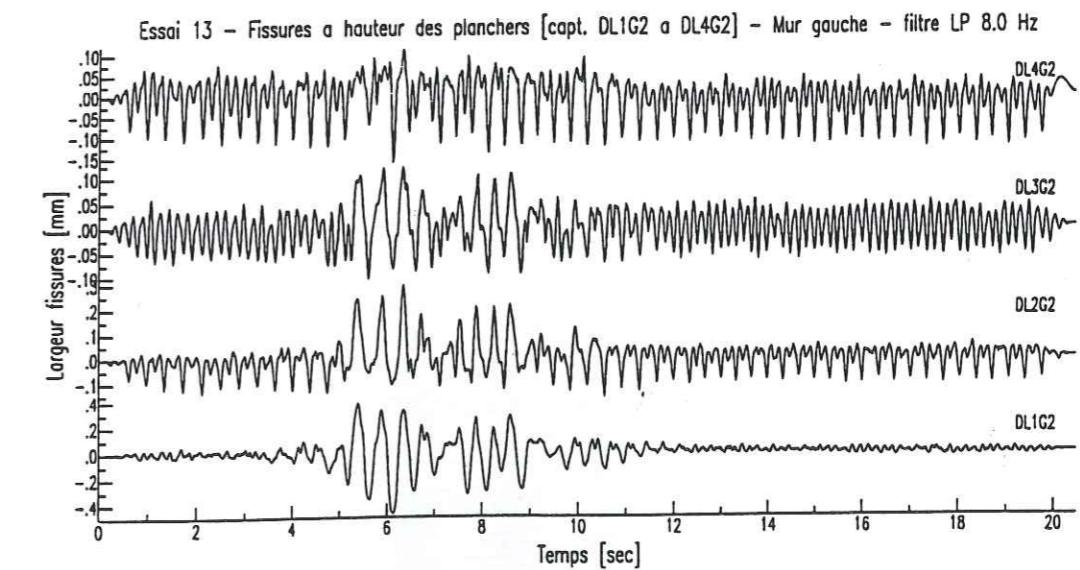
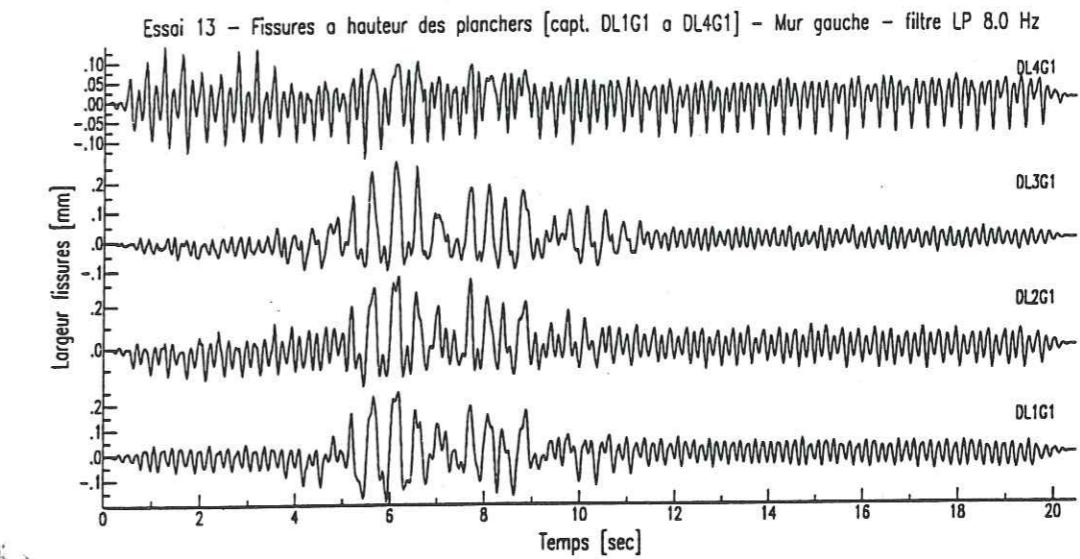
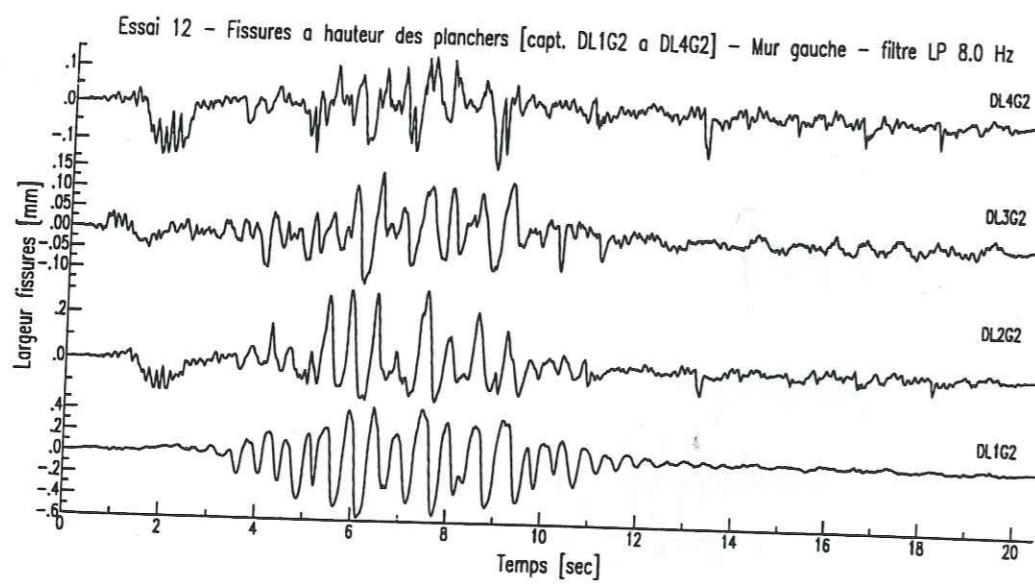
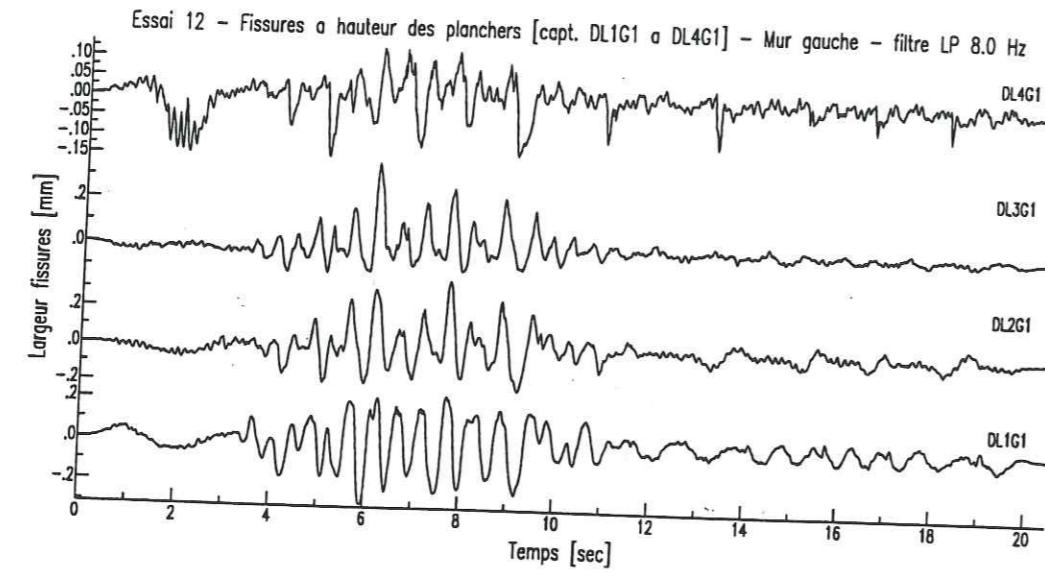


Accélérogramme injecté dans la table AZALEE

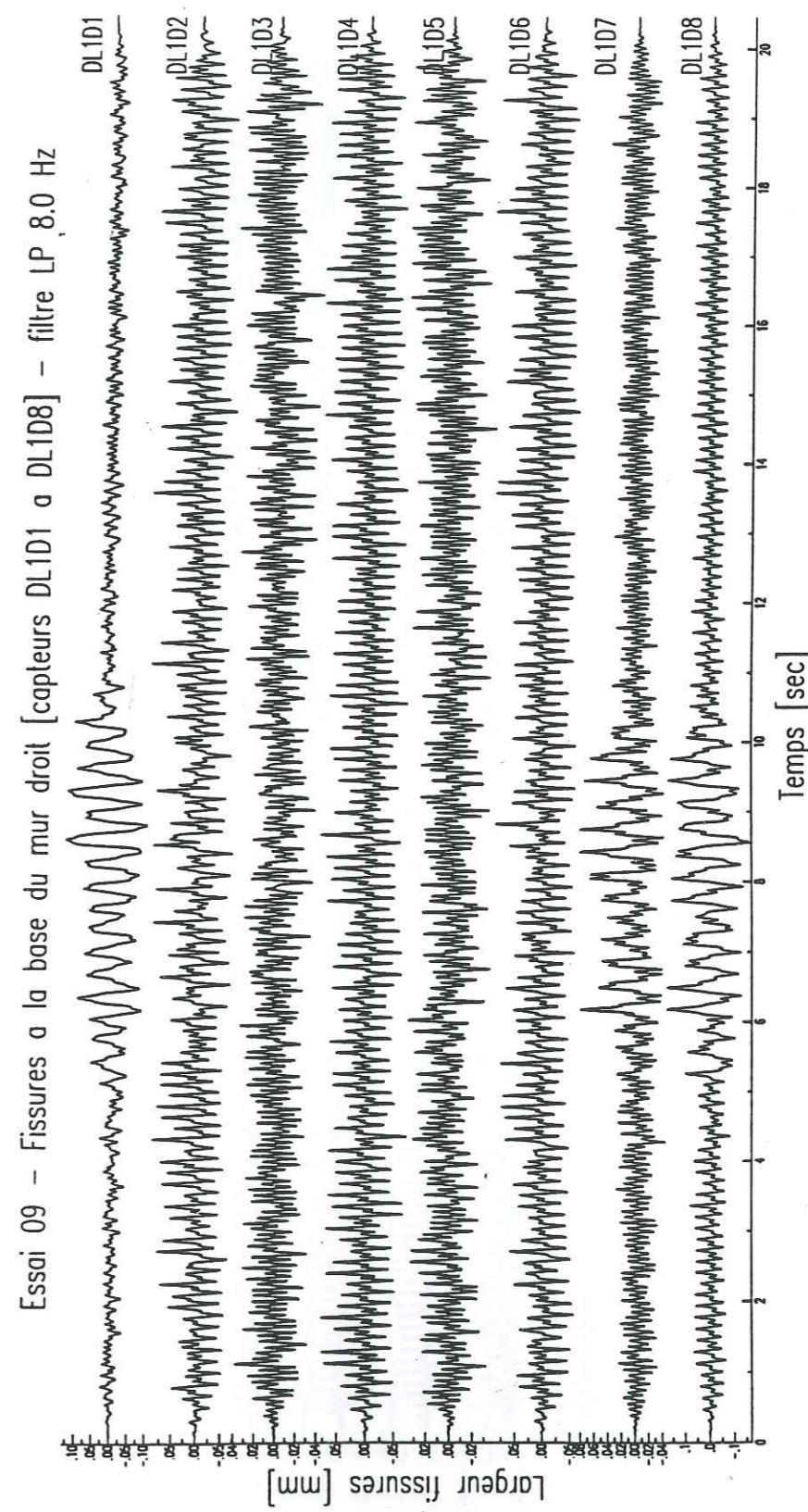
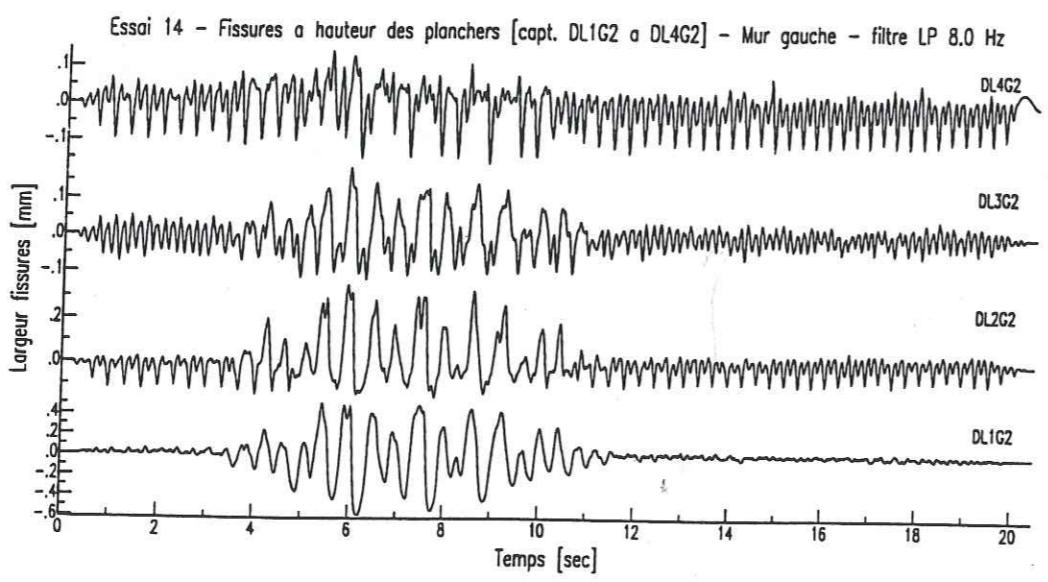
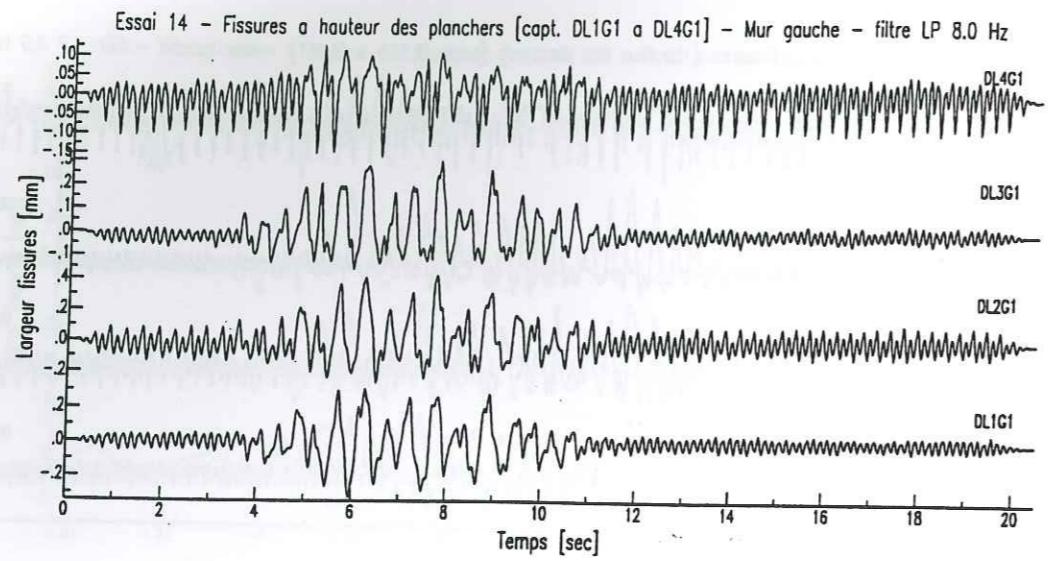




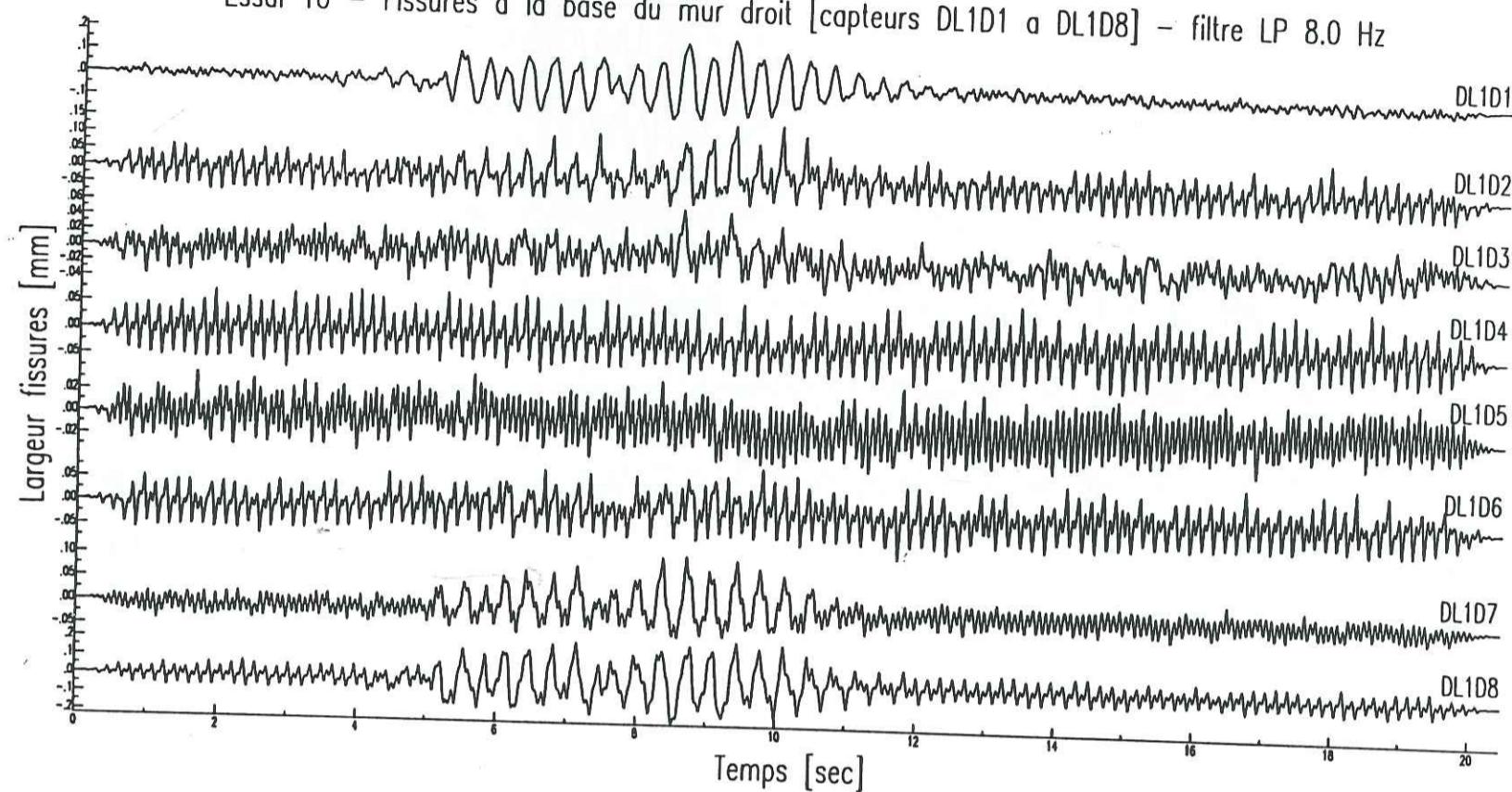




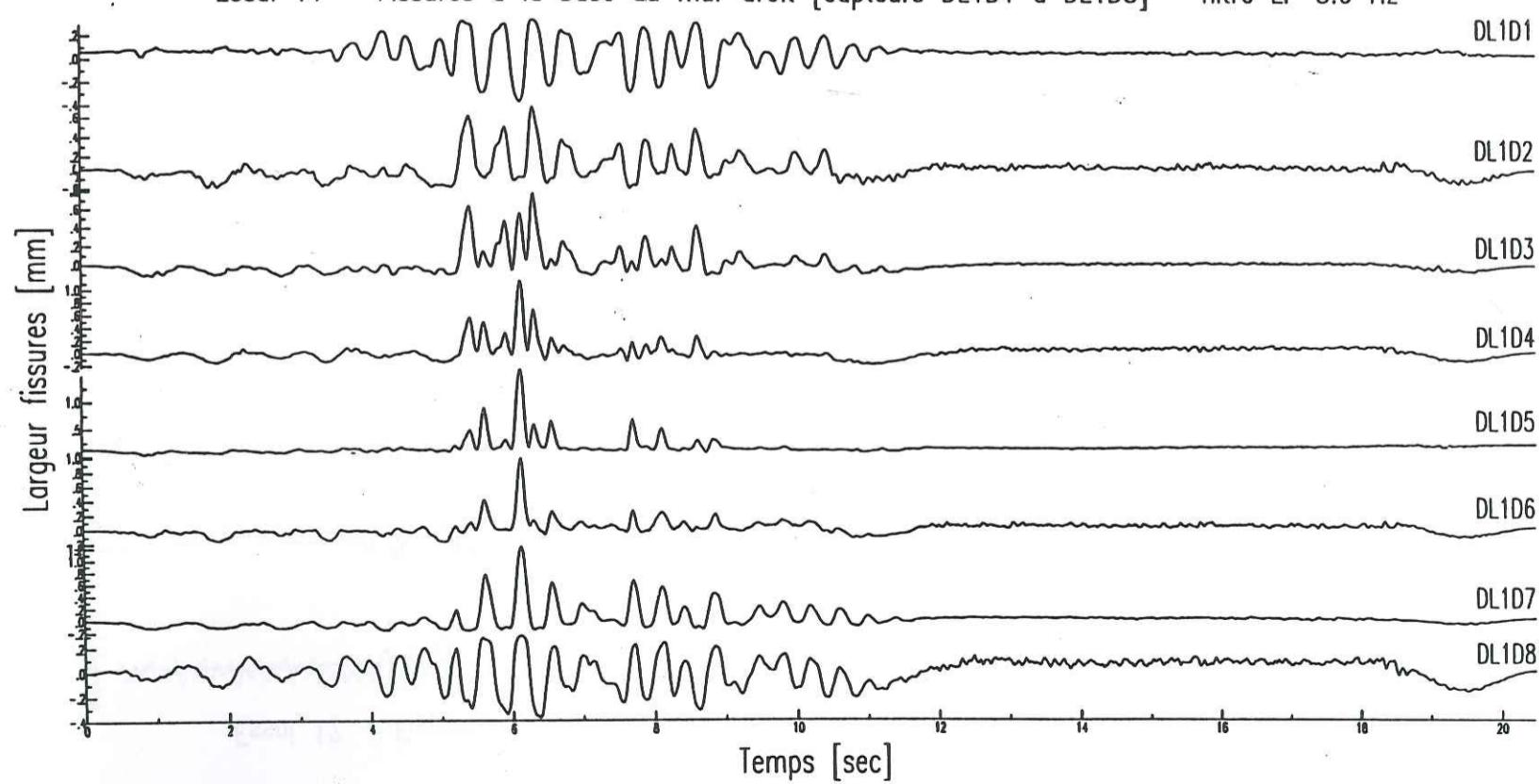
Univ. J. Fourier - O.S.U.G.
MAISON DES GEOSCIENCES
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F. 38041 GRENOBLE CEDEX
Tél. 04 76 63 54 27 - Fax 04 76 51 40 58
Mail : ptalour@ujf-grenoble.fr

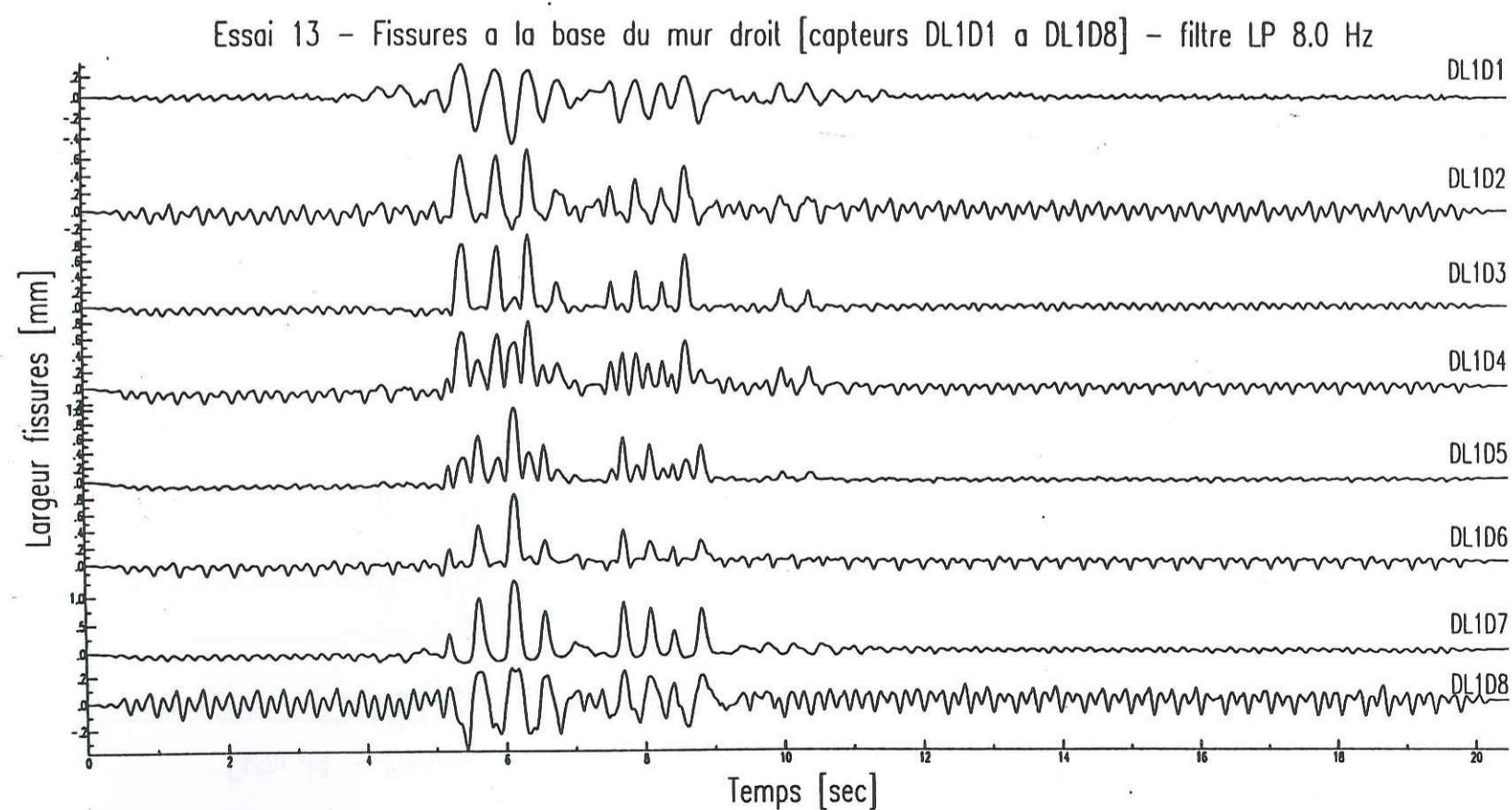
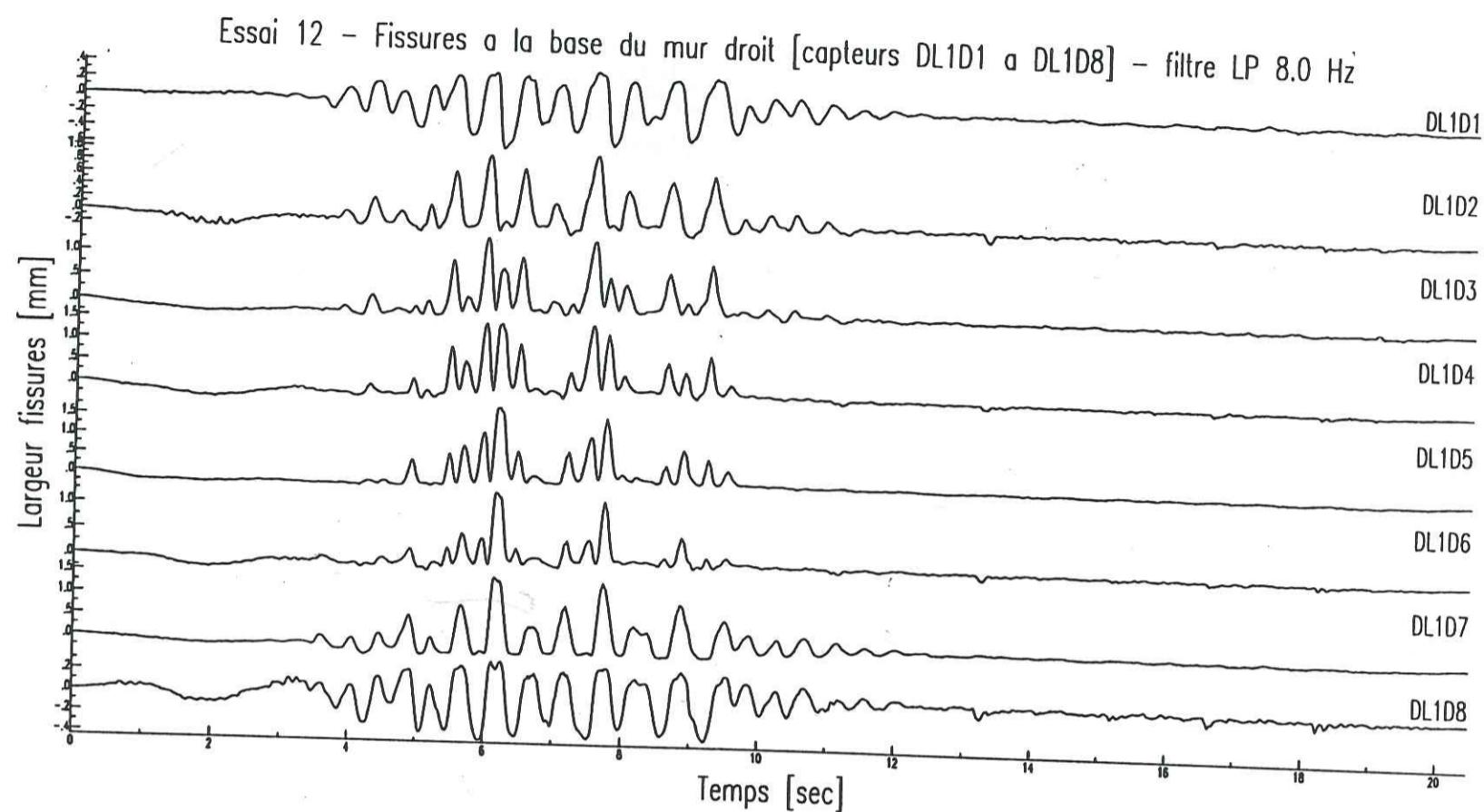


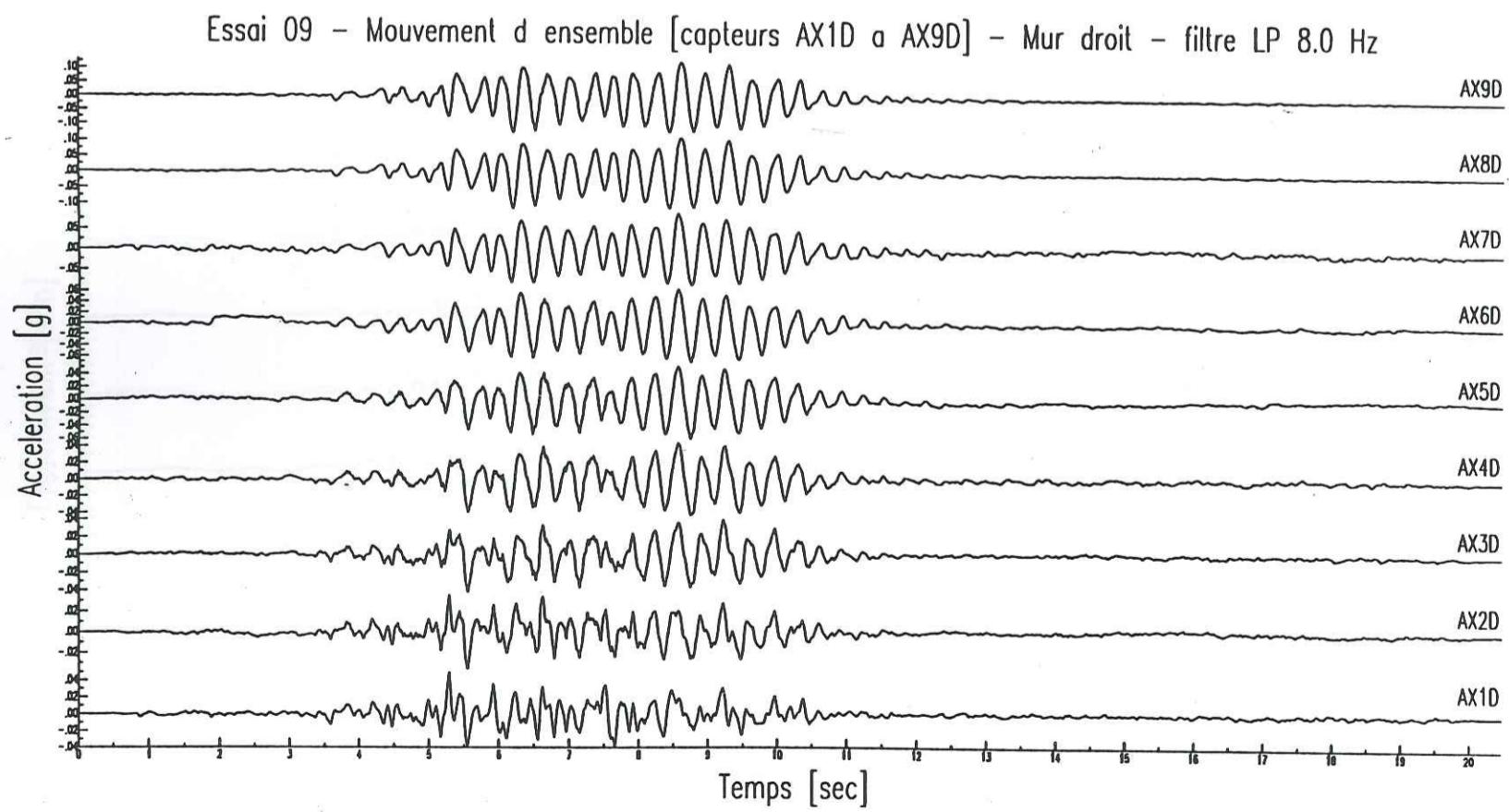
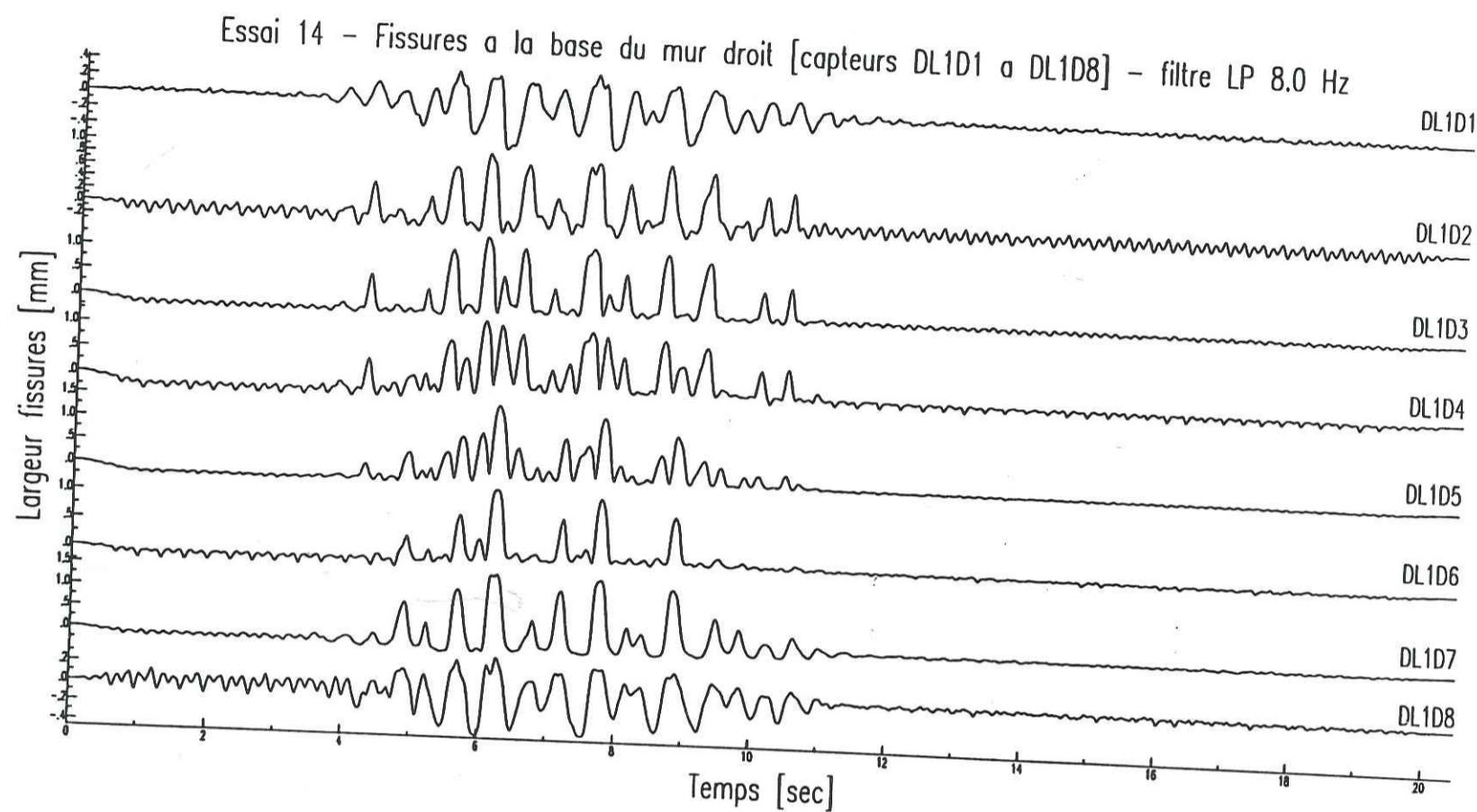
Essai 10 - Fissures à la base du mur droit [capteurs DL1D1 à DL1D8] - filtre LP 8.0 Hz

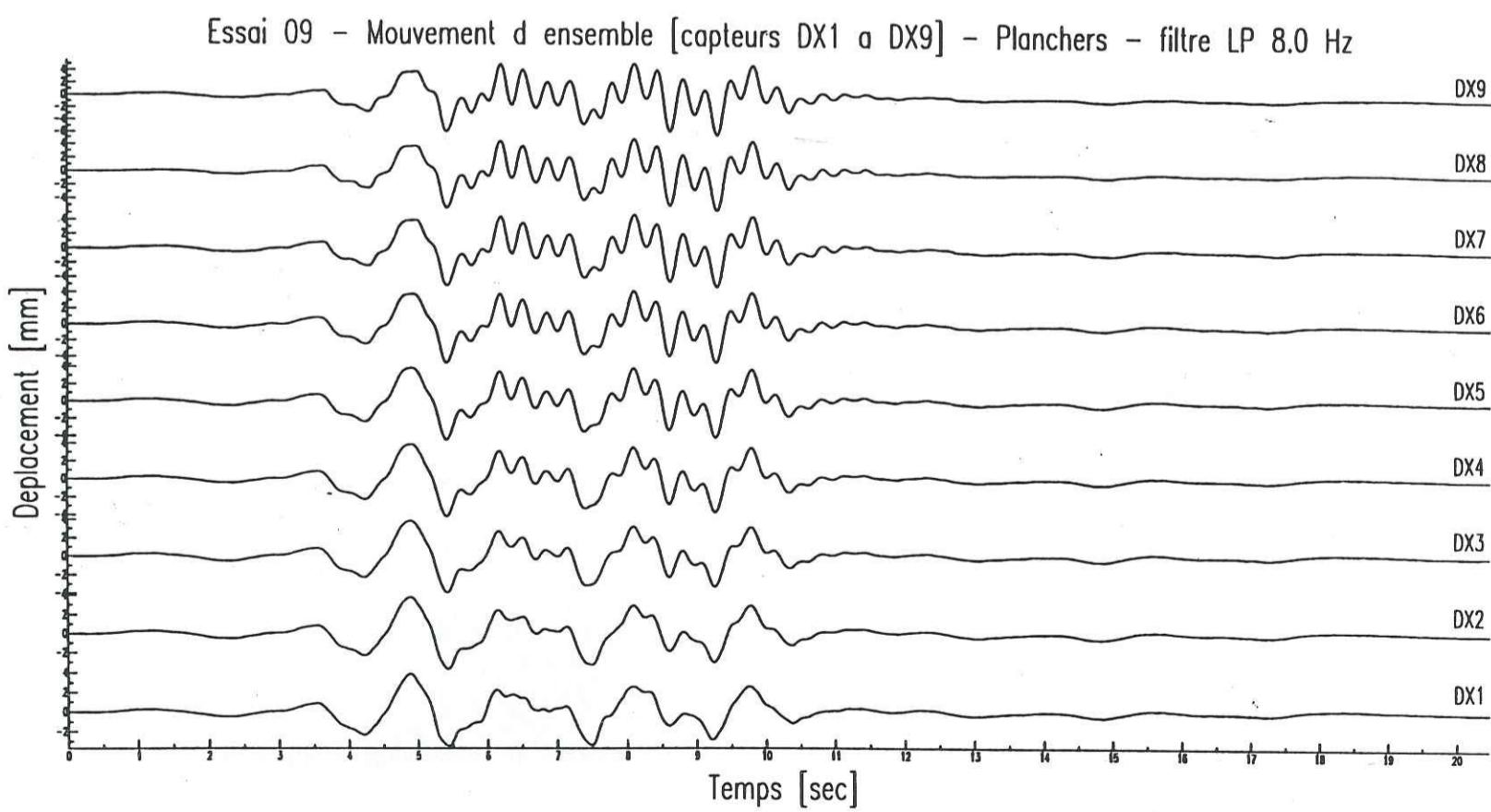
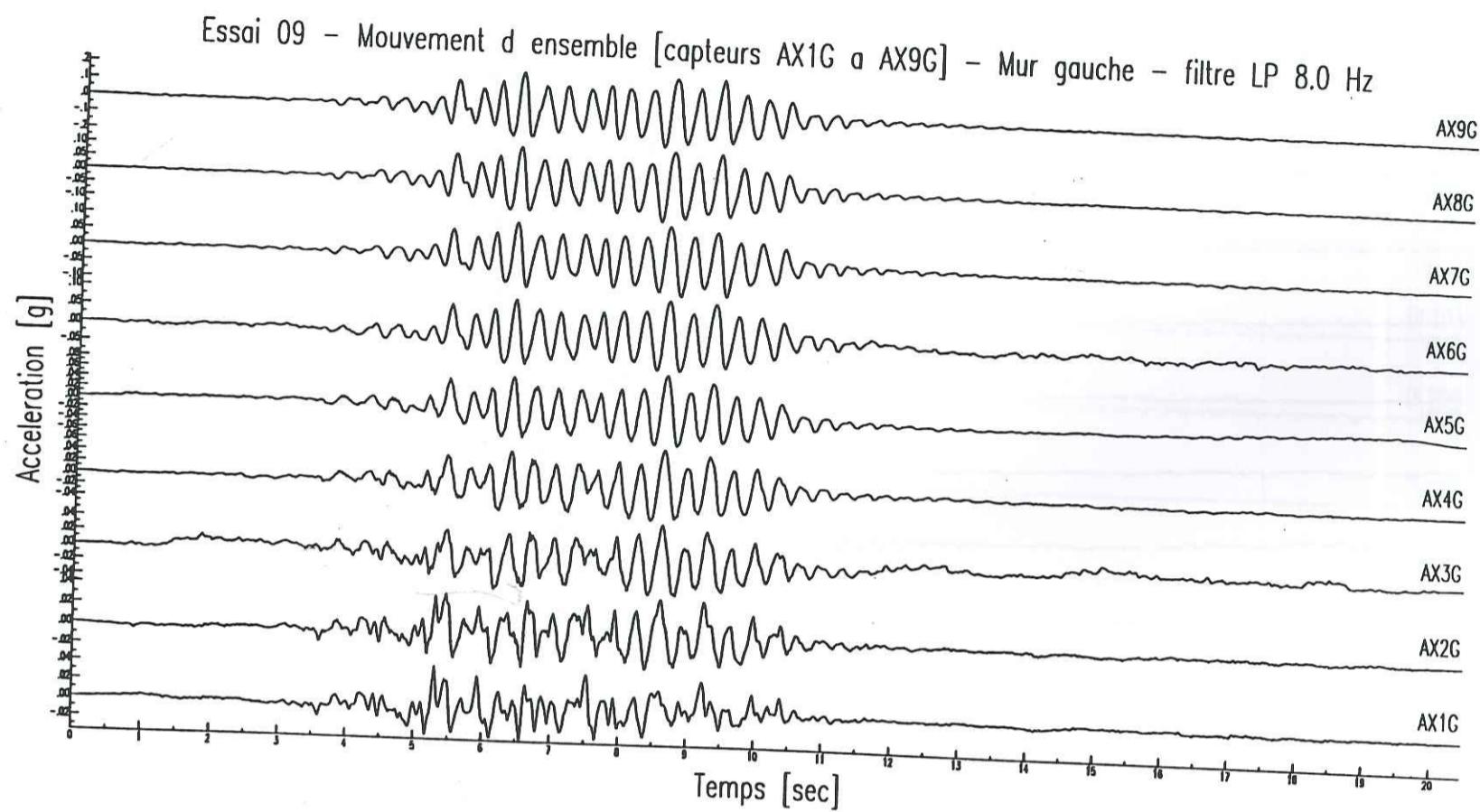


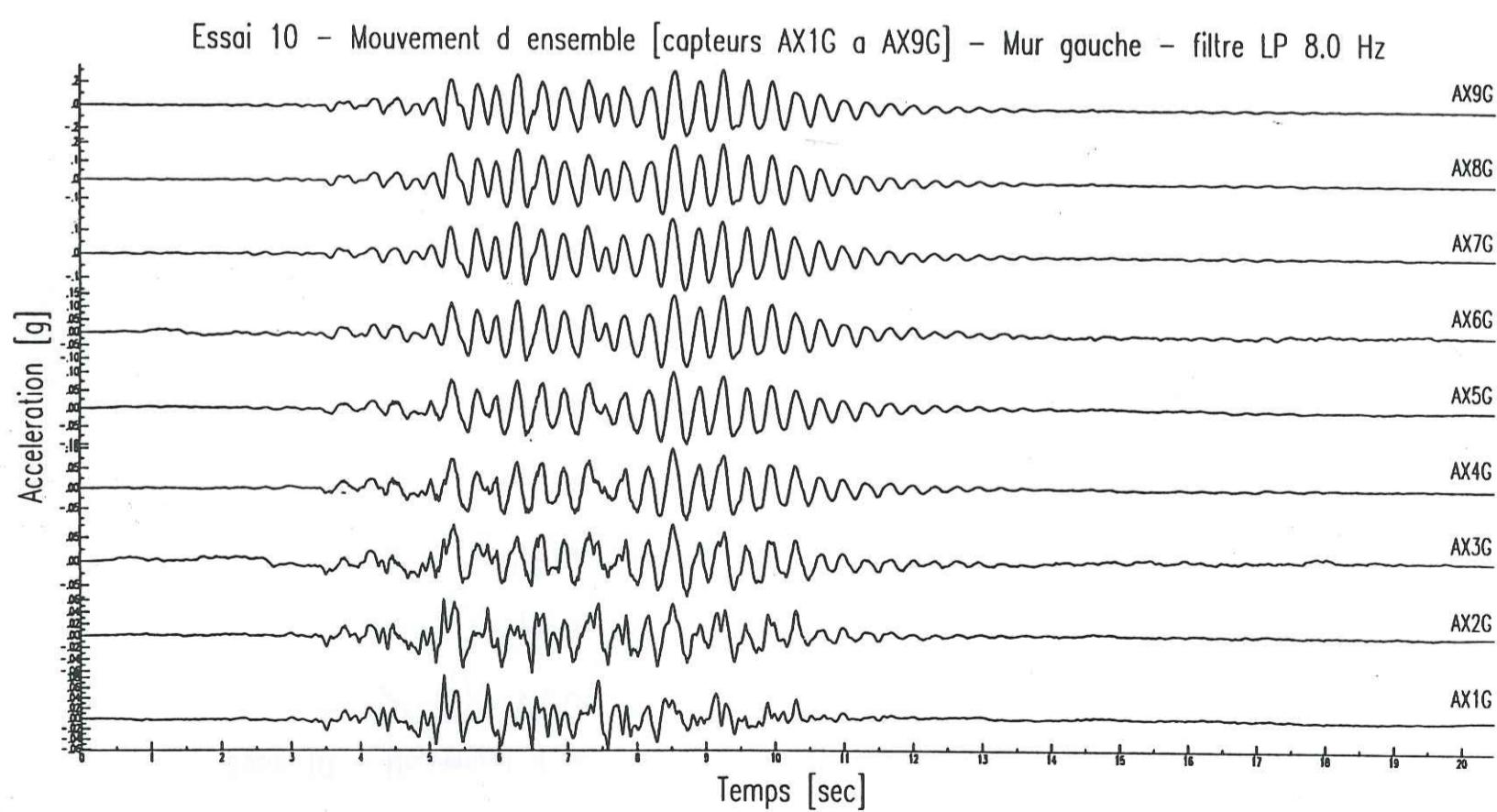
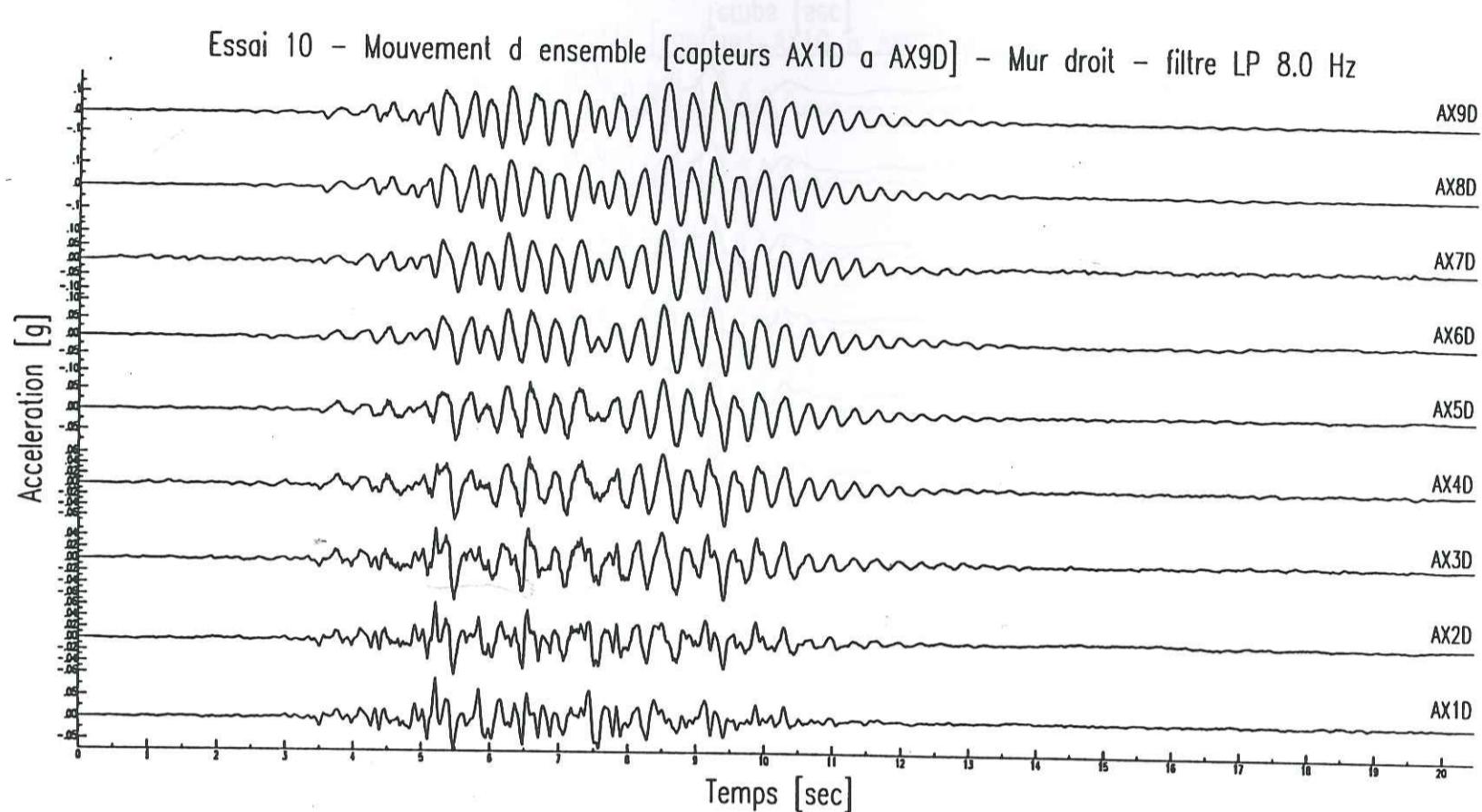
Essai 11 - Fissures à la base du mur droit [capteurs DL1D1 à DL1D8] - filtre LP 8.0 Hz

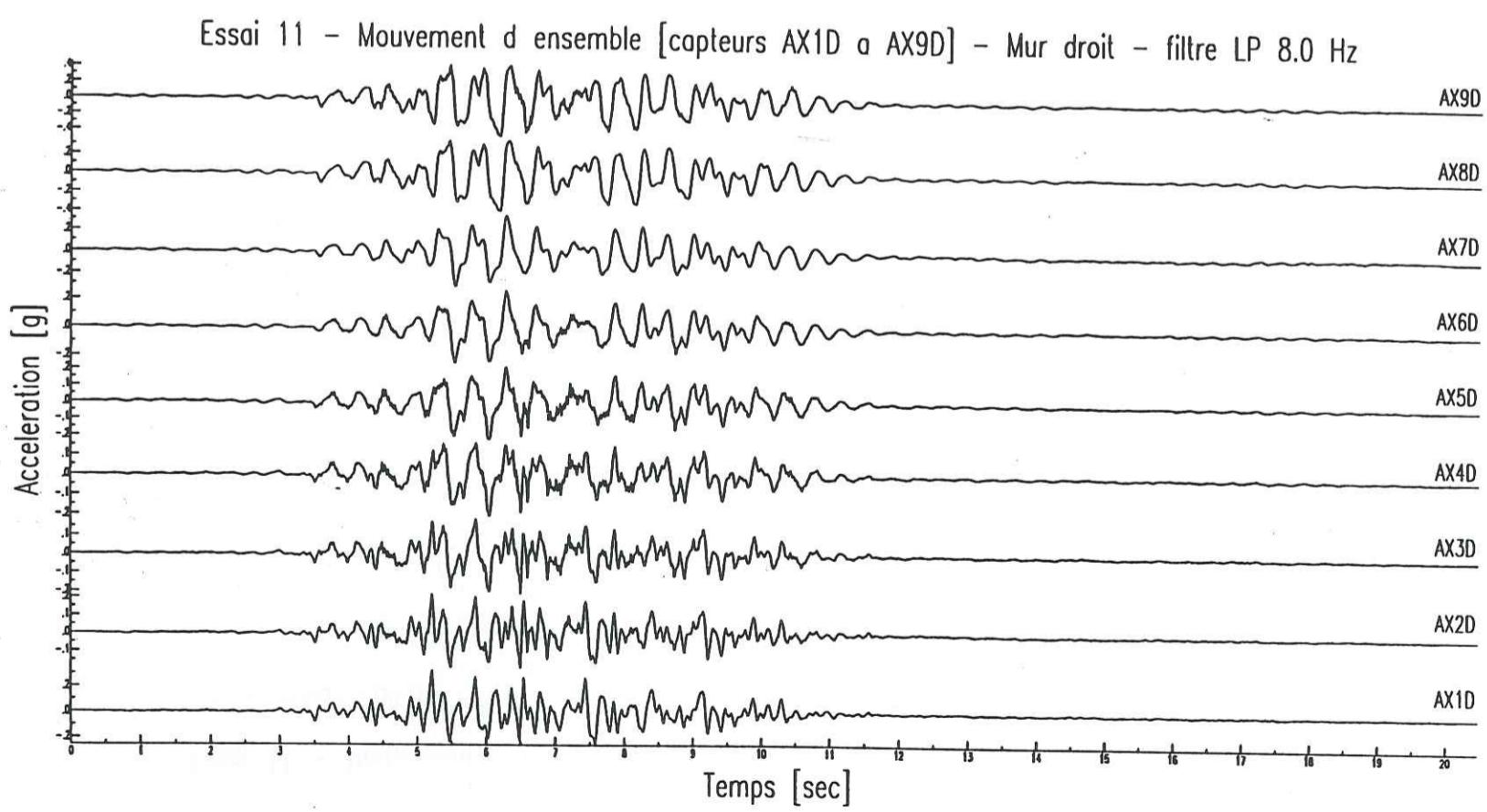
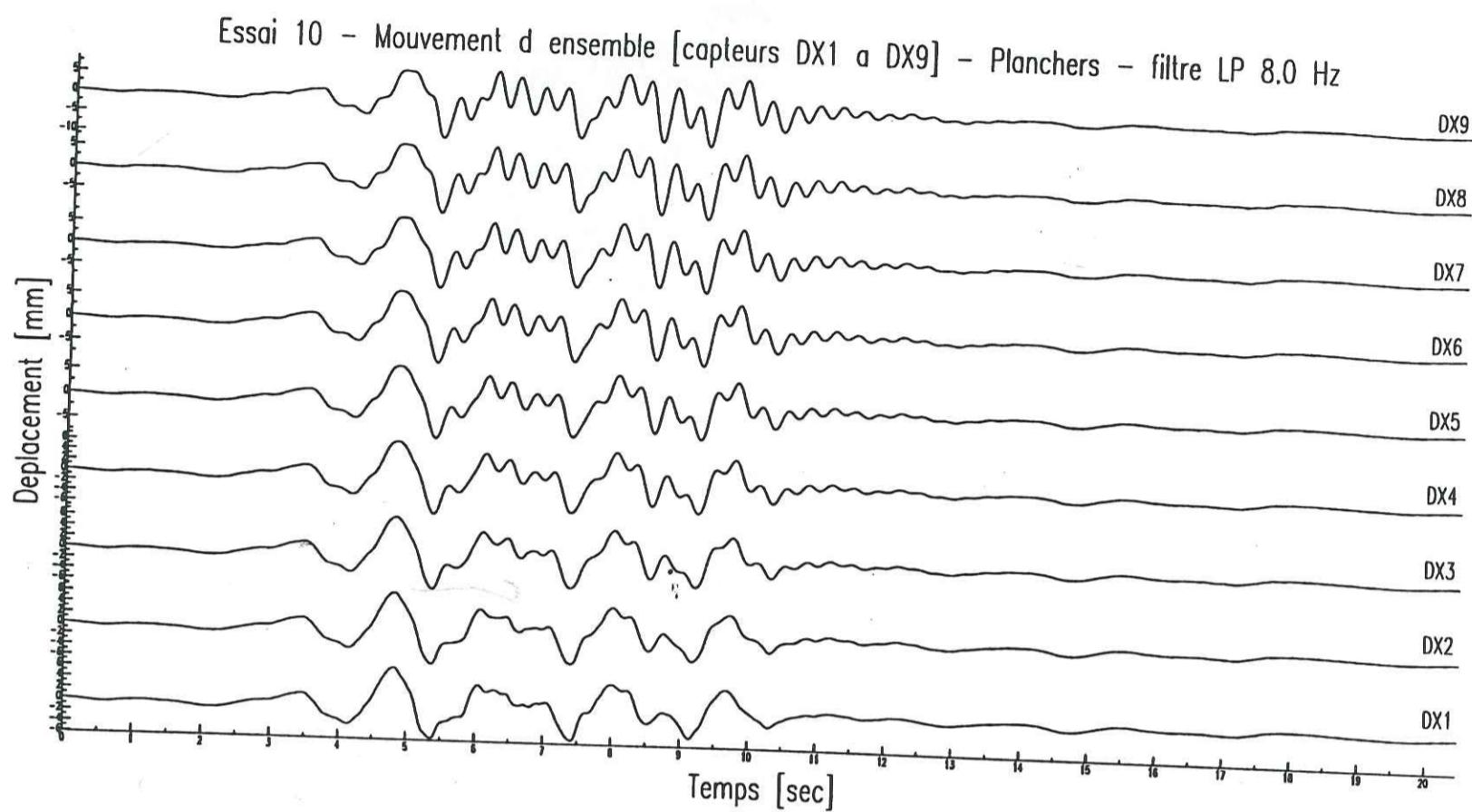


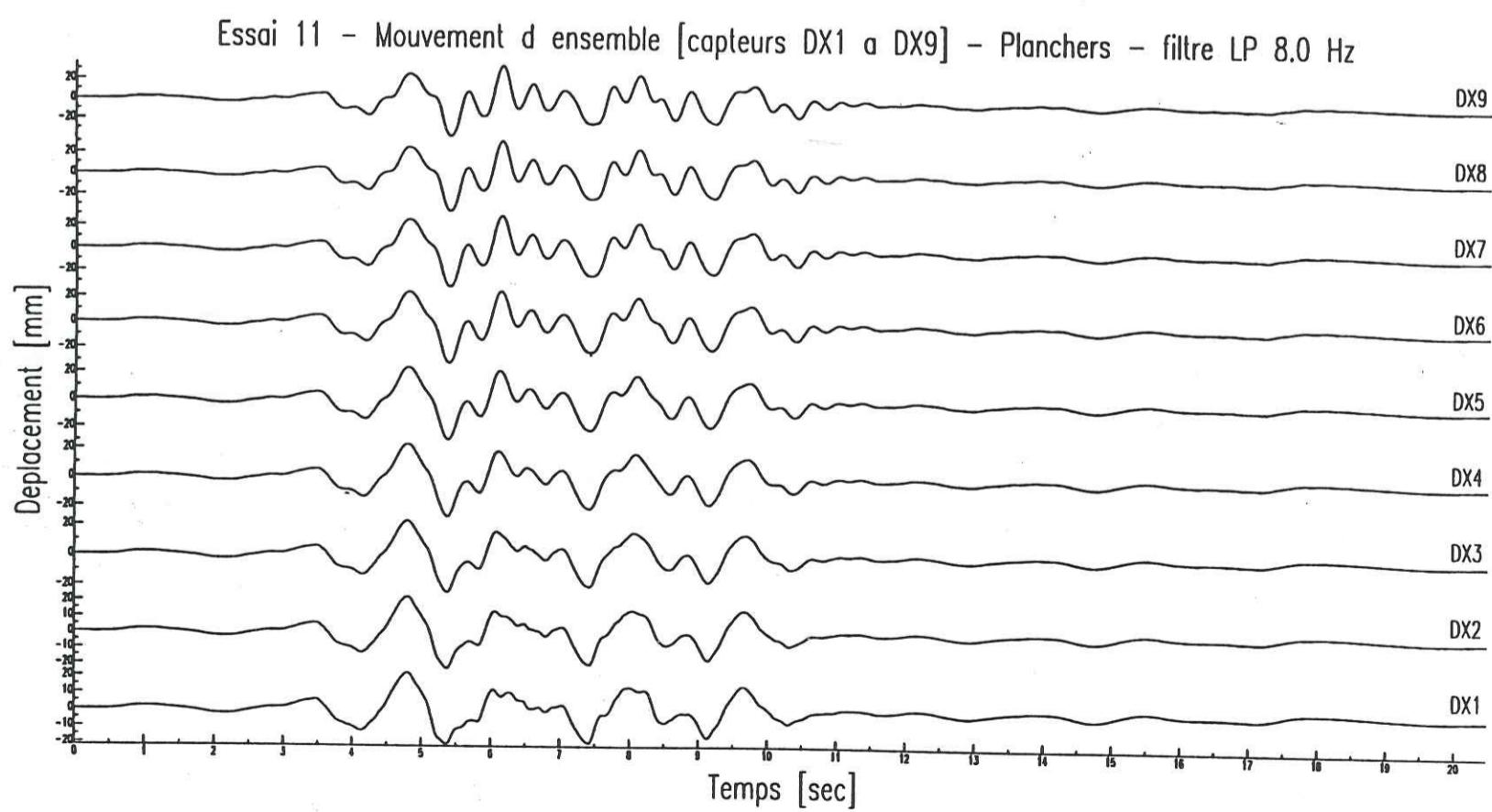
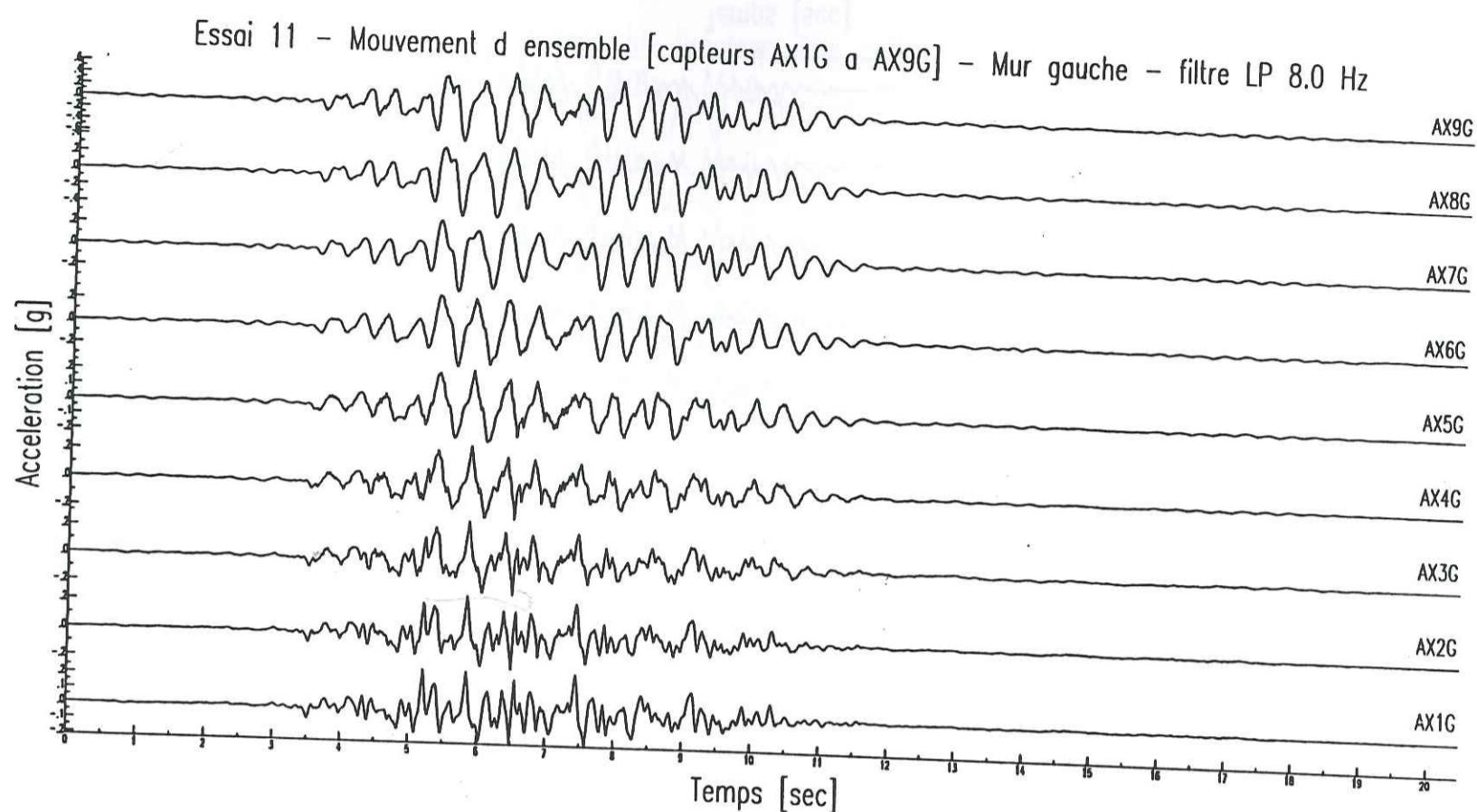




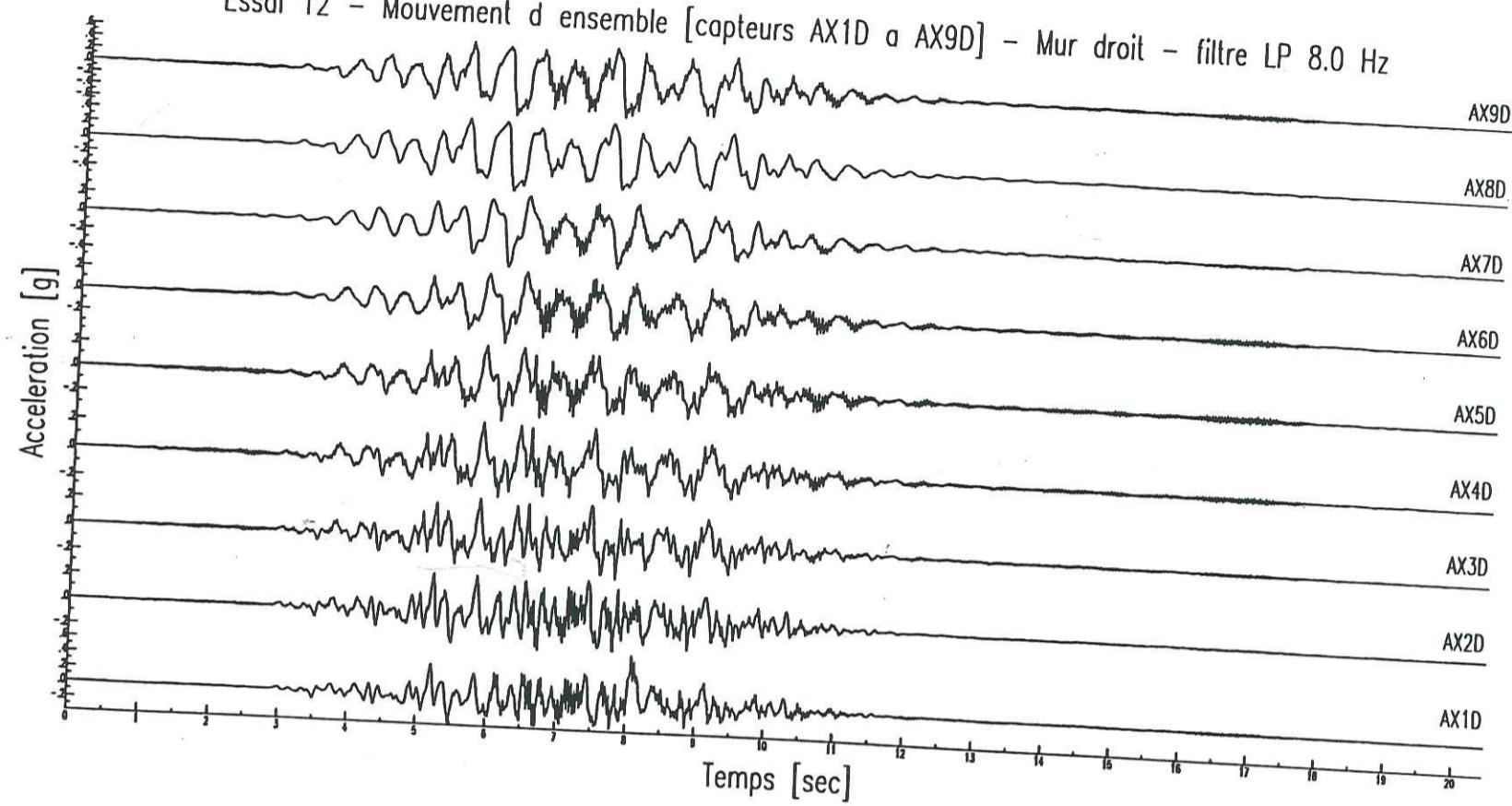




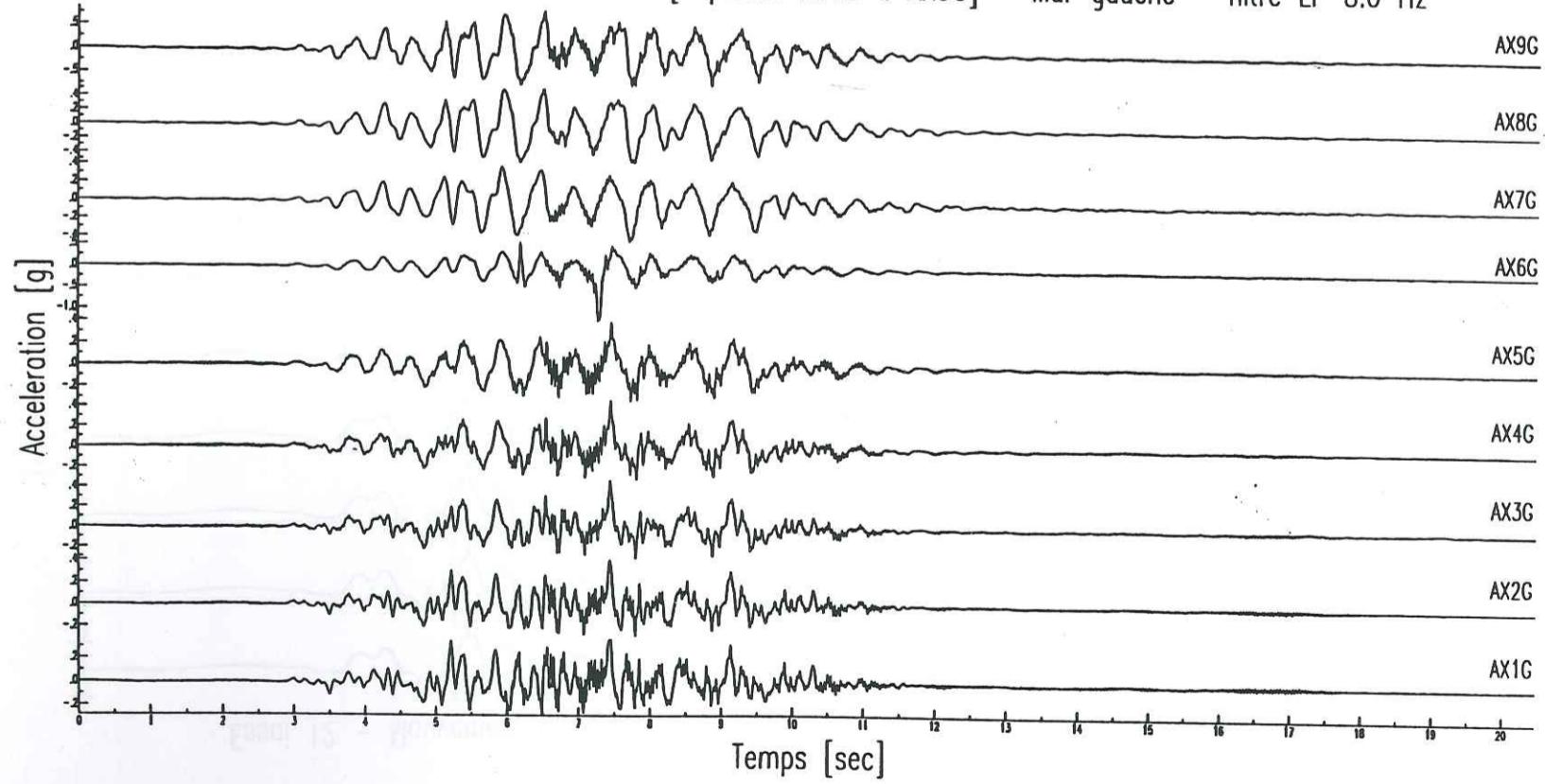


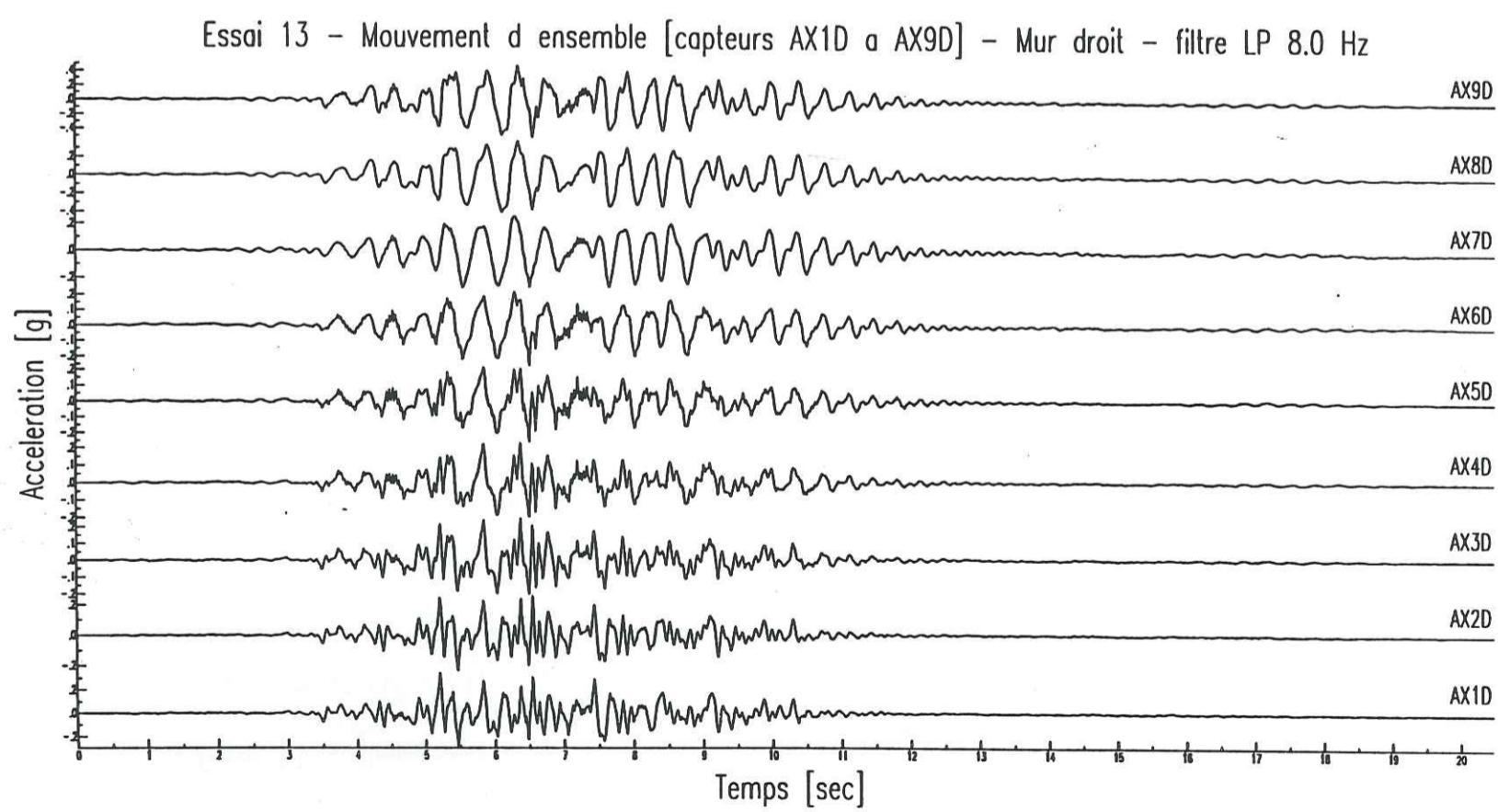
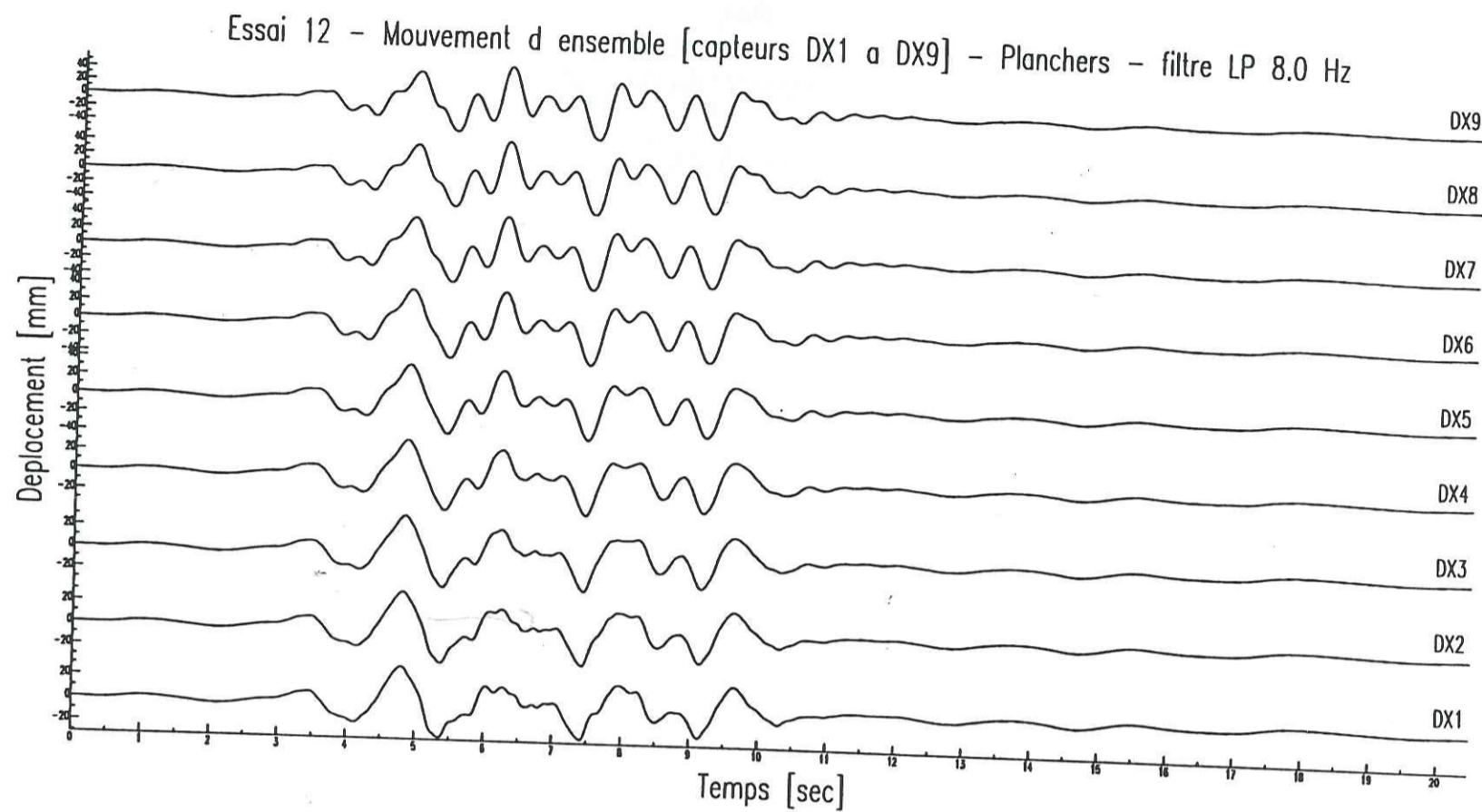


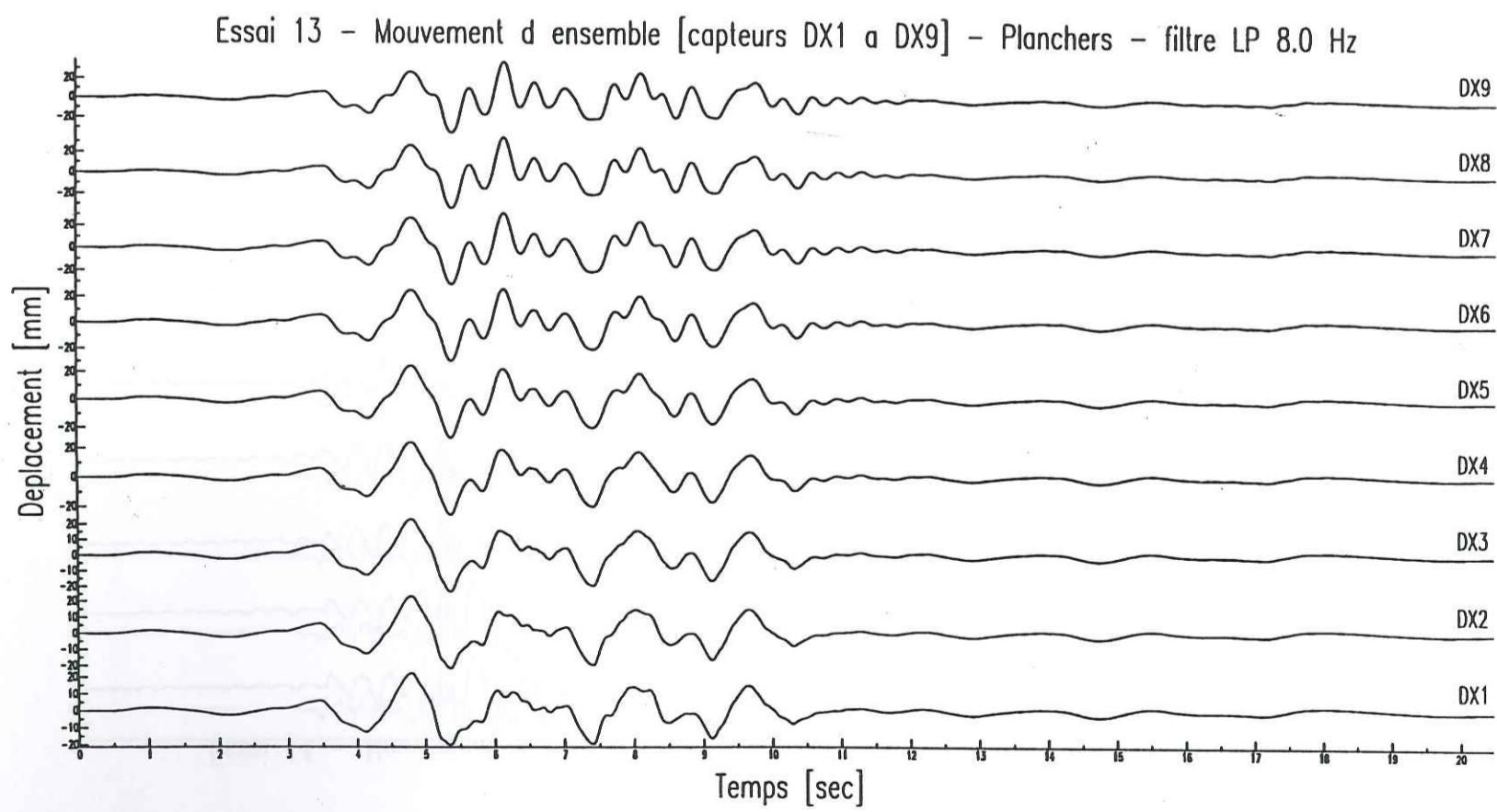
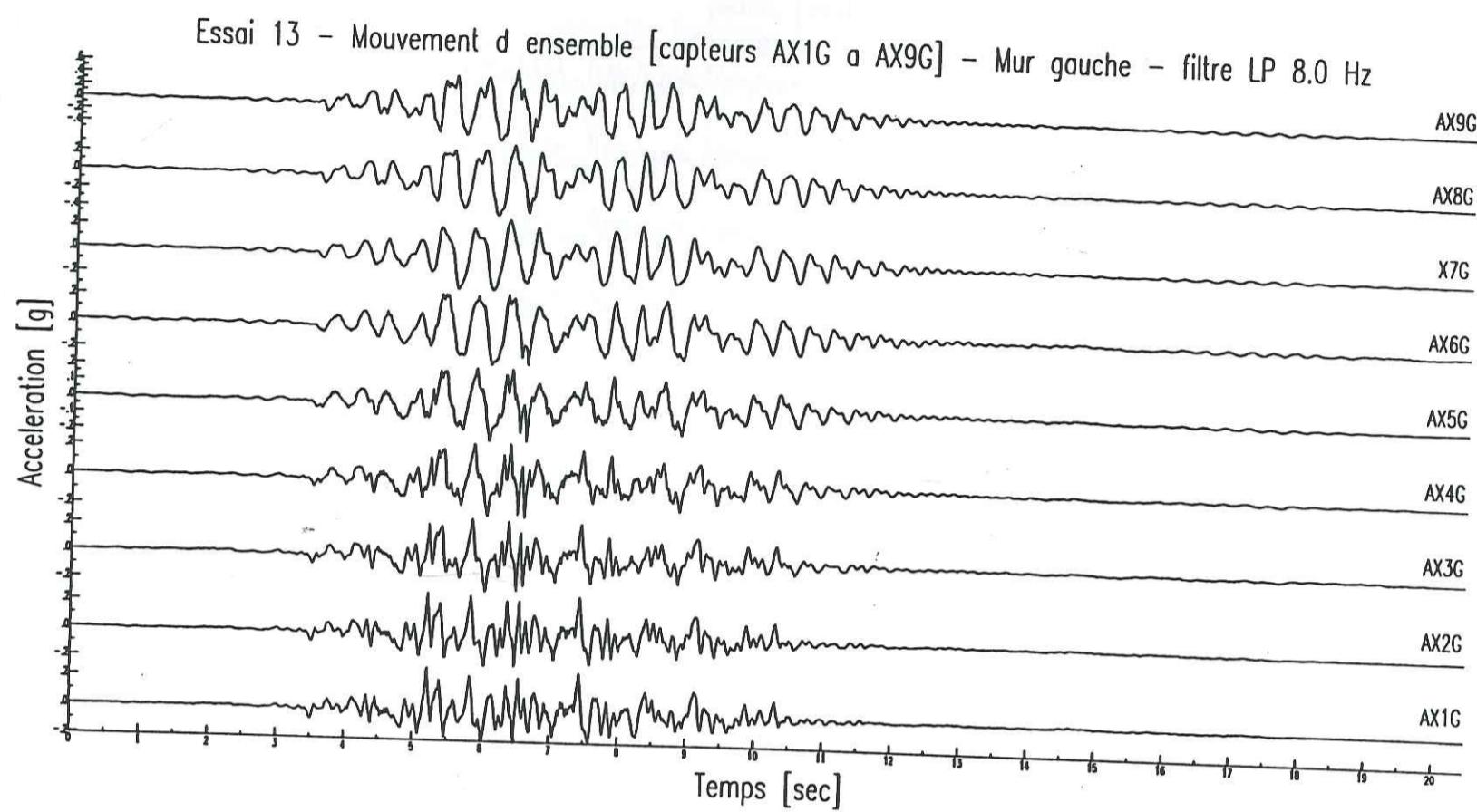
Essai 12 - Mouvement d ensemble [capteurs AX1D à AX9D] - Mur droit - filtre LP 8.0 Hz



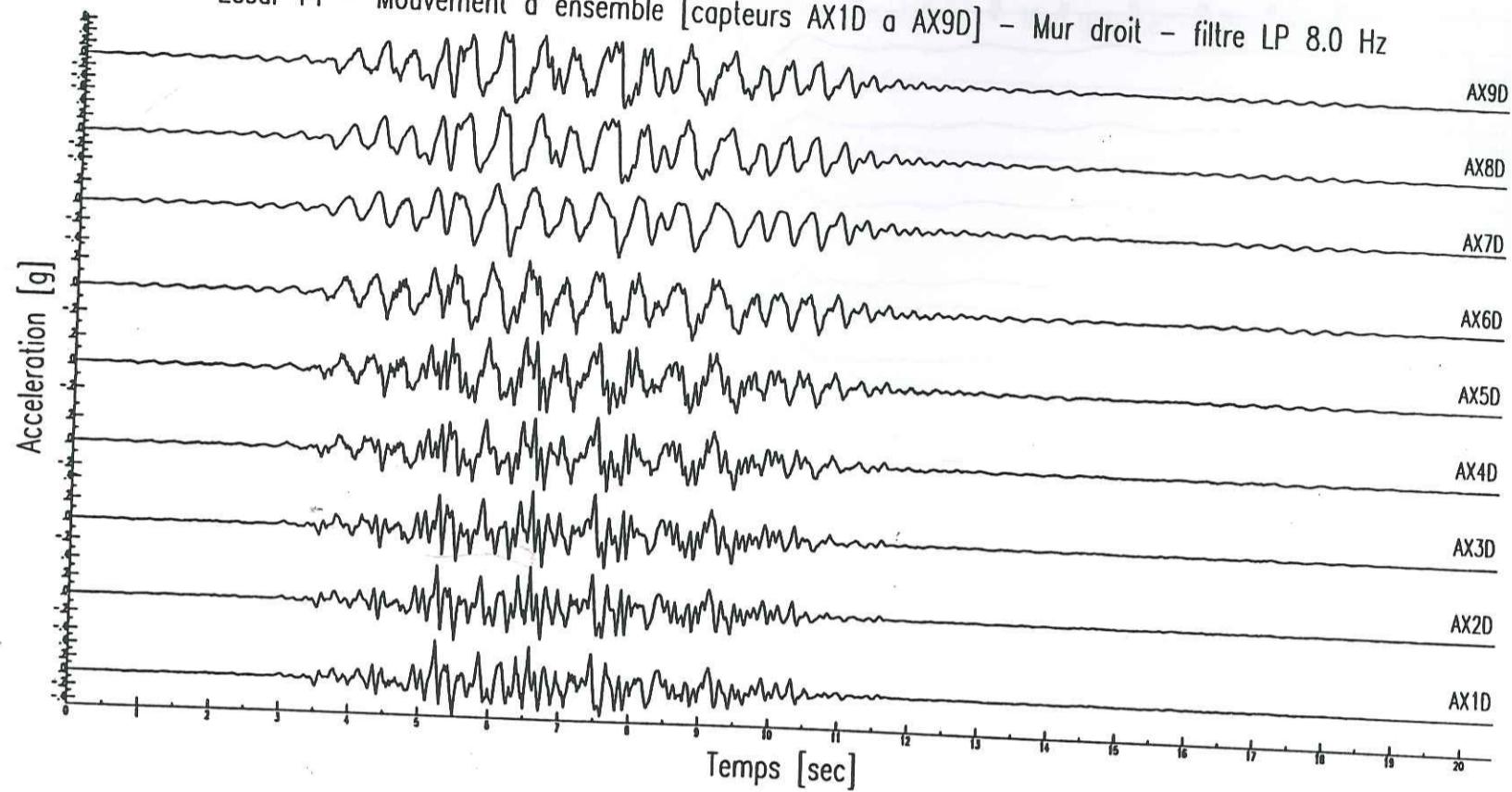
Essai 12 - Mouvement d ensemble [capteurs AX1G à AX9G] - Mur gauche - filtre LP 8.0 Hz



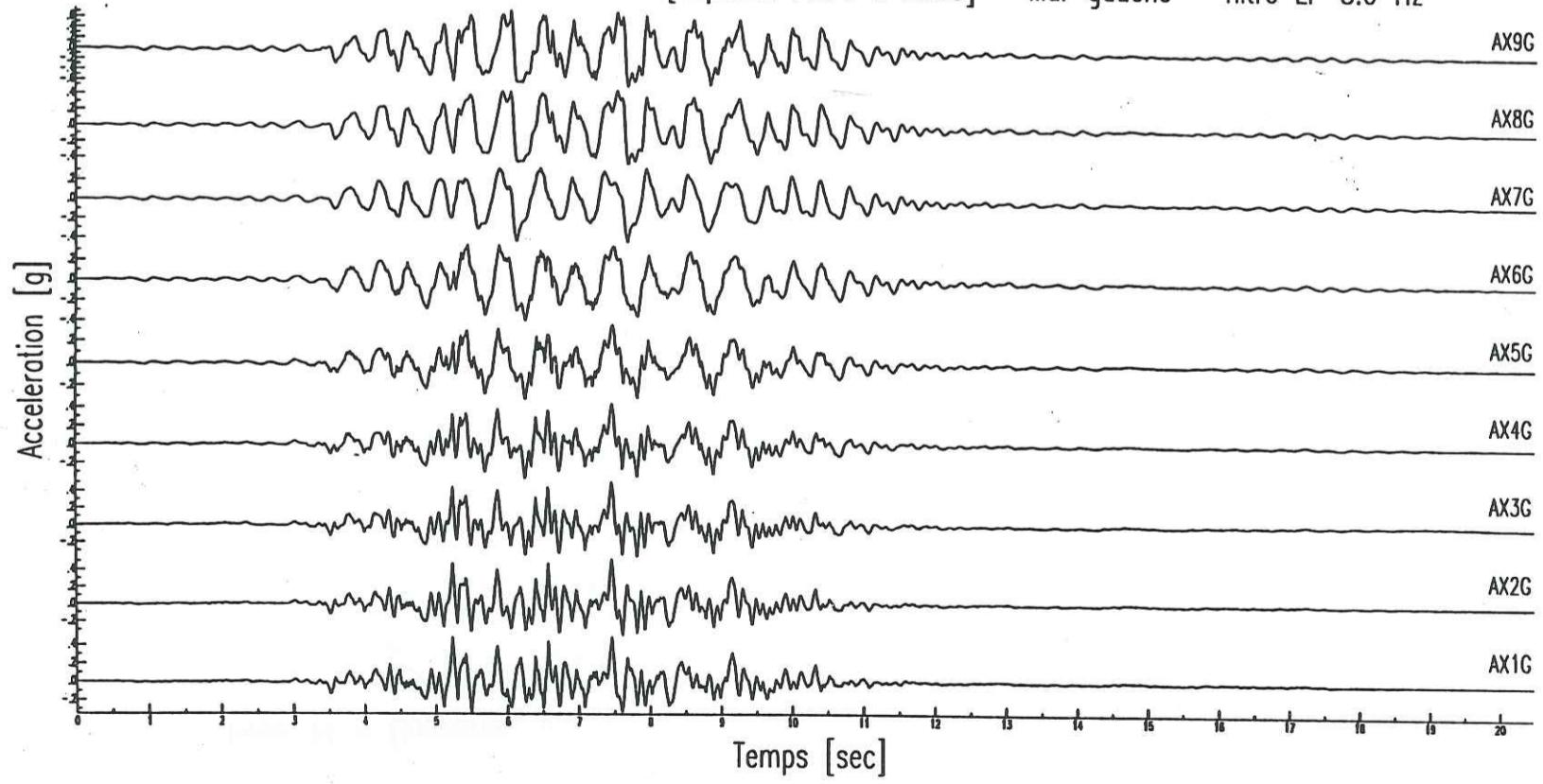




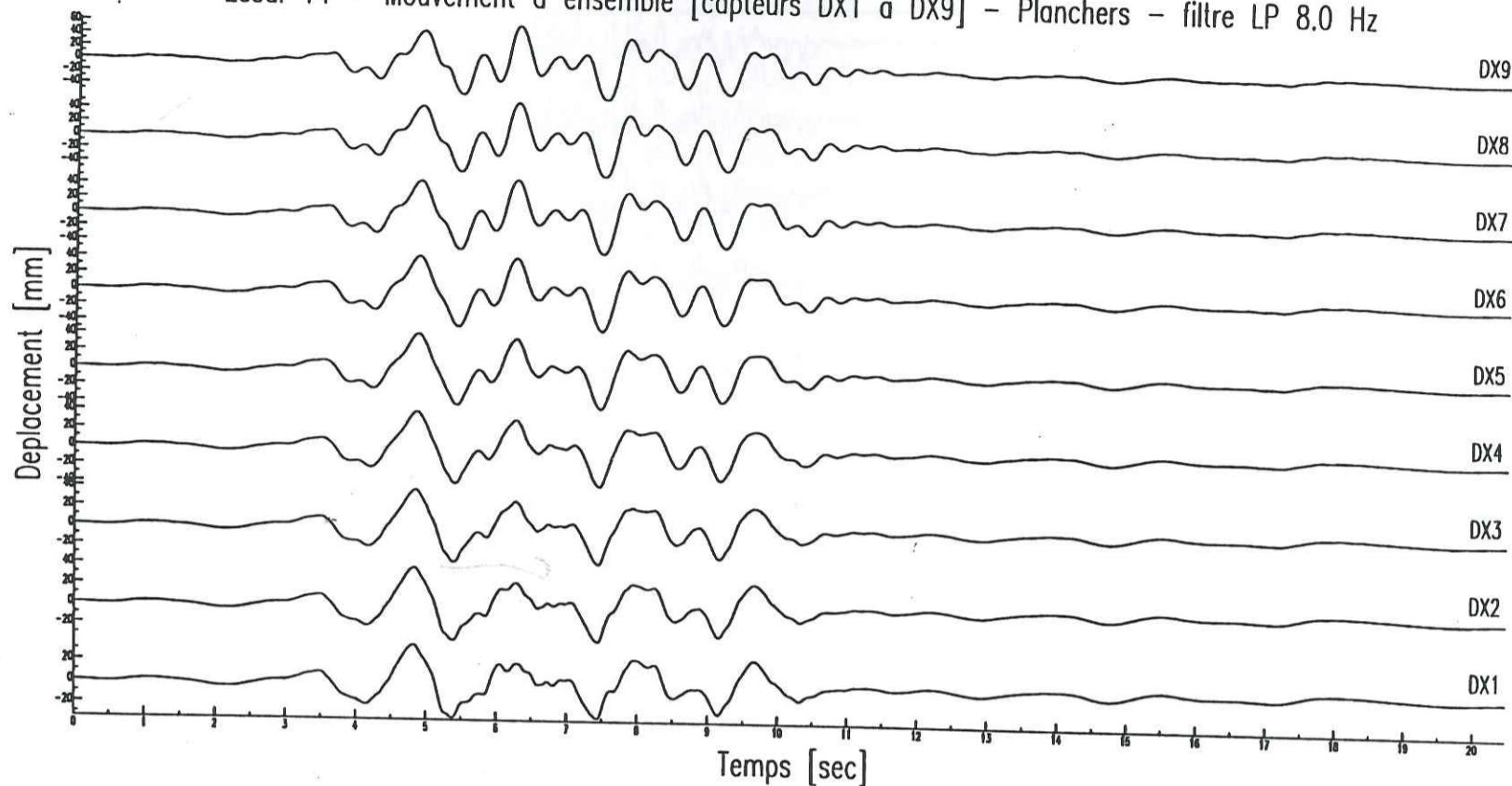
Essai 14 - Mouvement d ensemble [capteurs AX1D à AX9D] - Mur droit - filtre LP 8.0 Hz



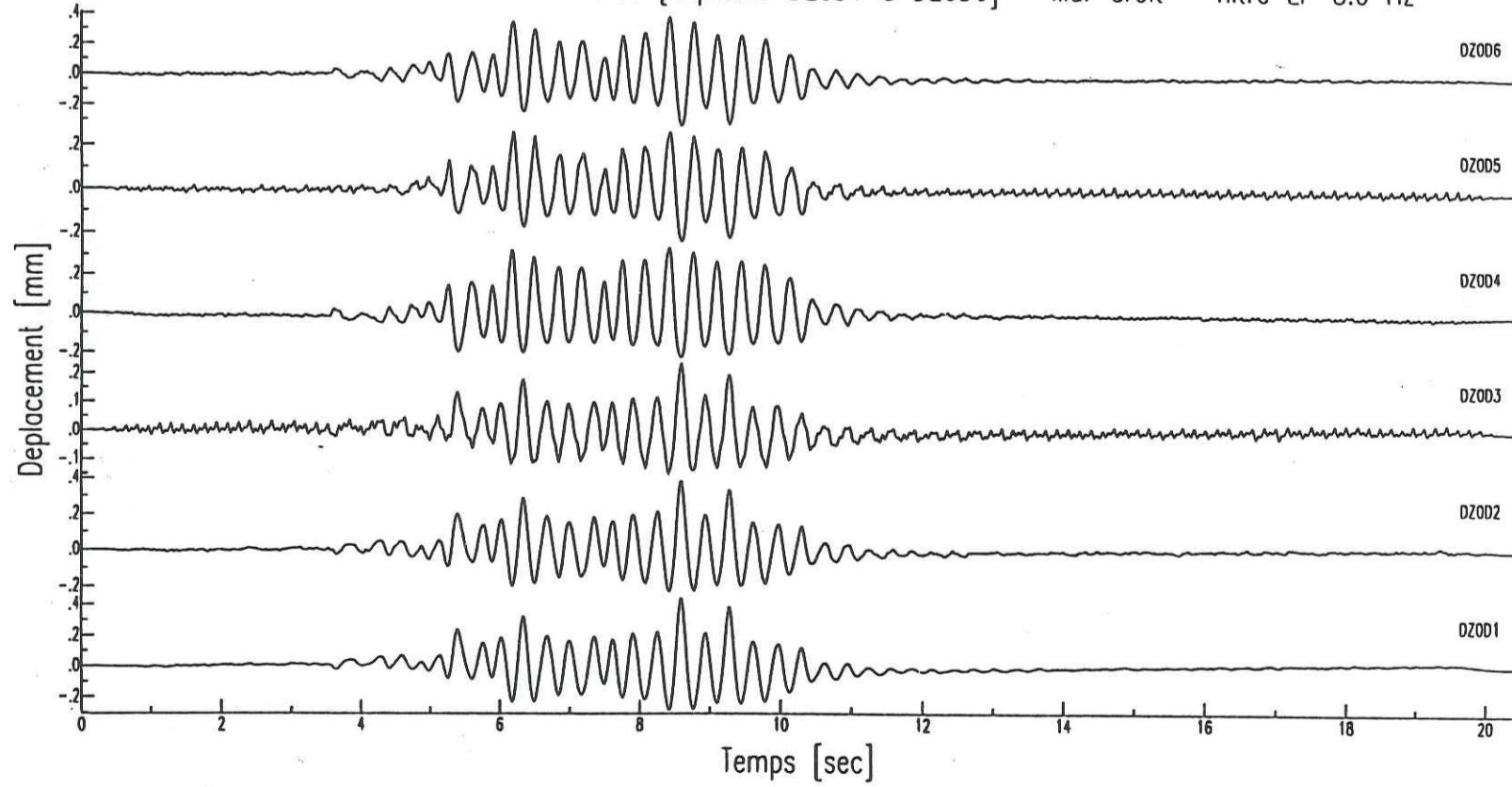
Essai 14 - Mouvement d ensemble [capteurs AX1G à AX9G] - Mur gauche - filtre LP 8.0 Hz



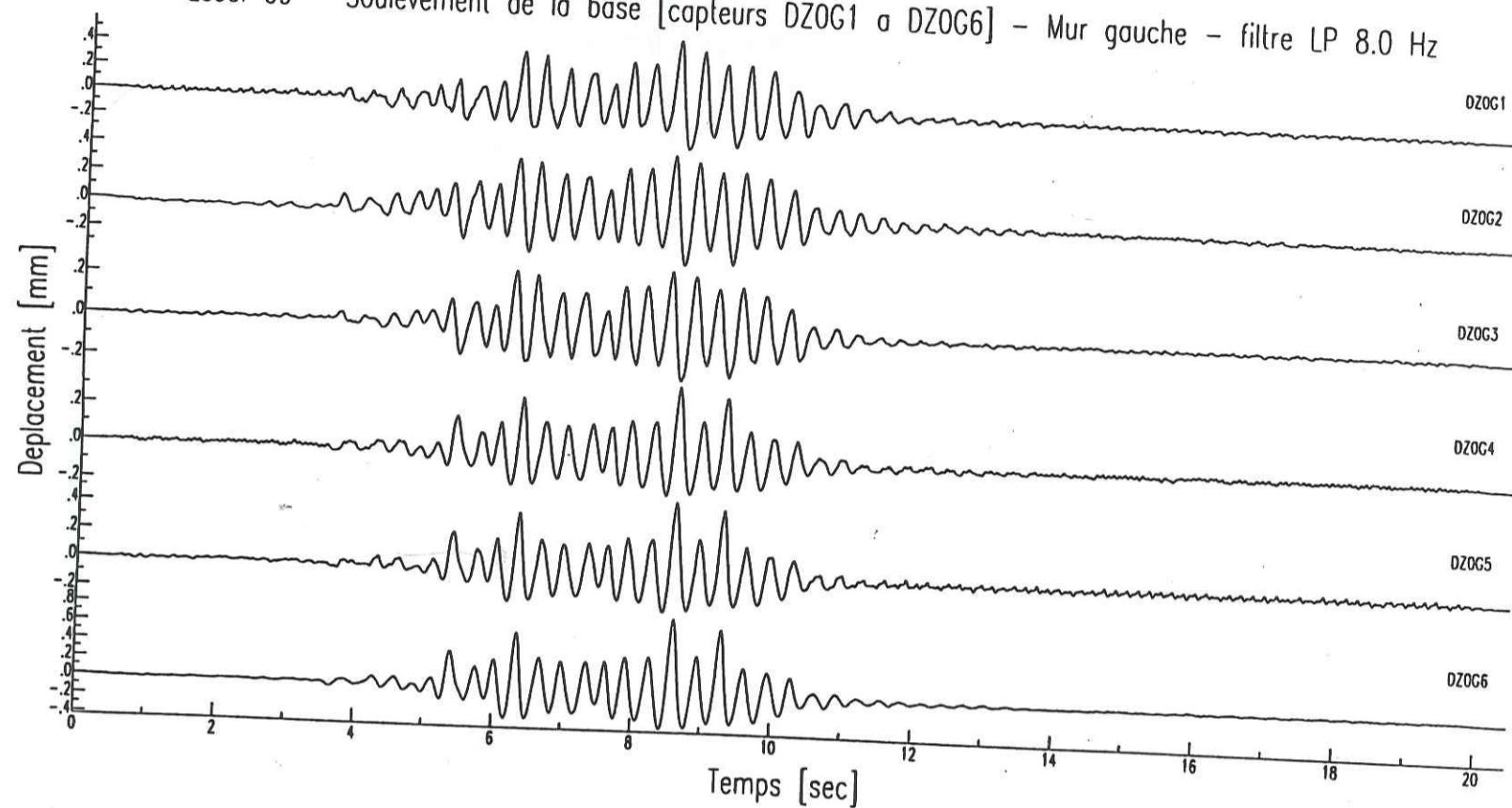
Essai 14 - Mouvement d ensemble [capteurs DX1 à DX9] - Planchers - filtre LP 8.0 Hz



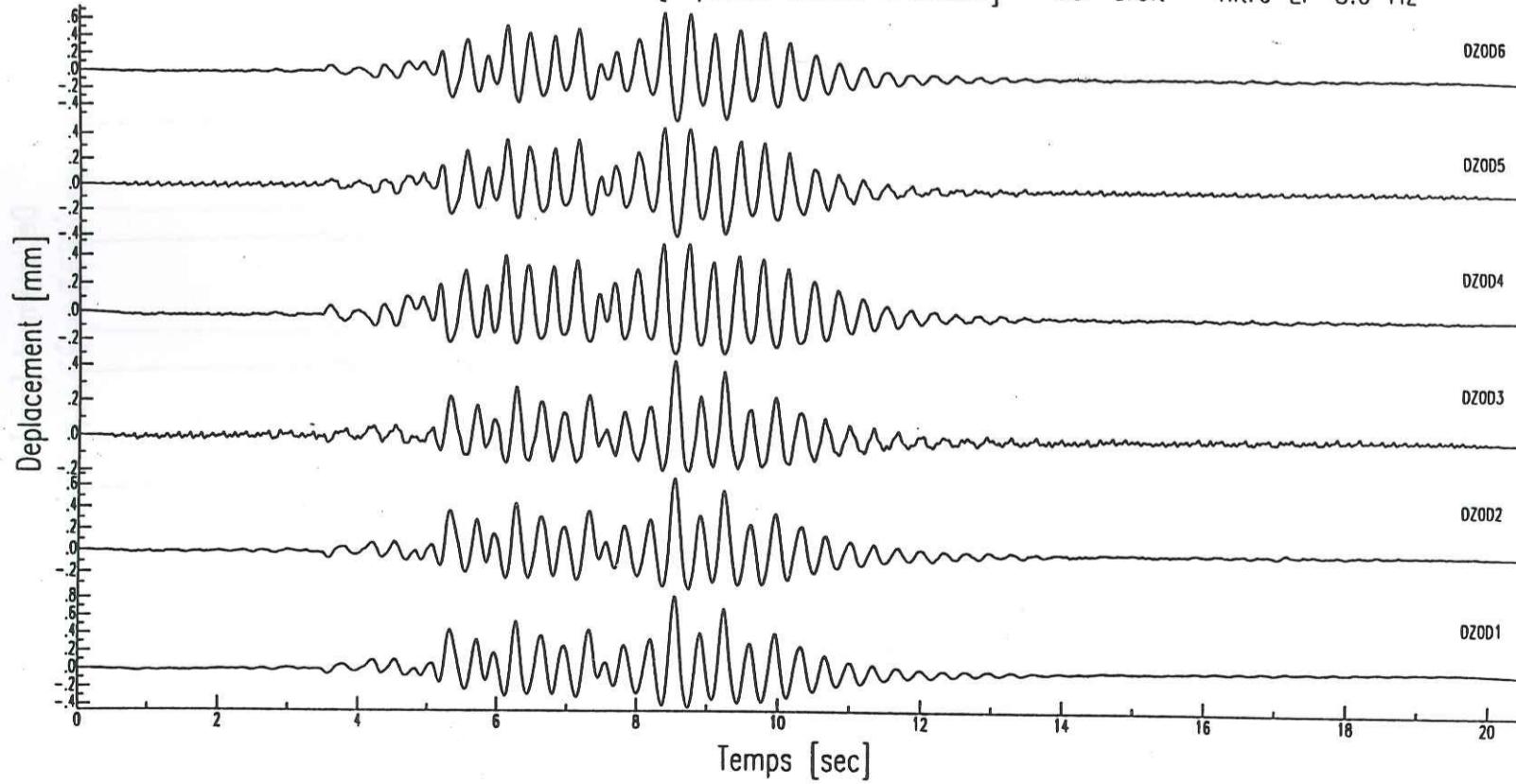
Essai 09 - Soulevement de la base [capteurs DZ0D1 à DZ0D6] - Mur droit - filtre LP 8.0 Hz



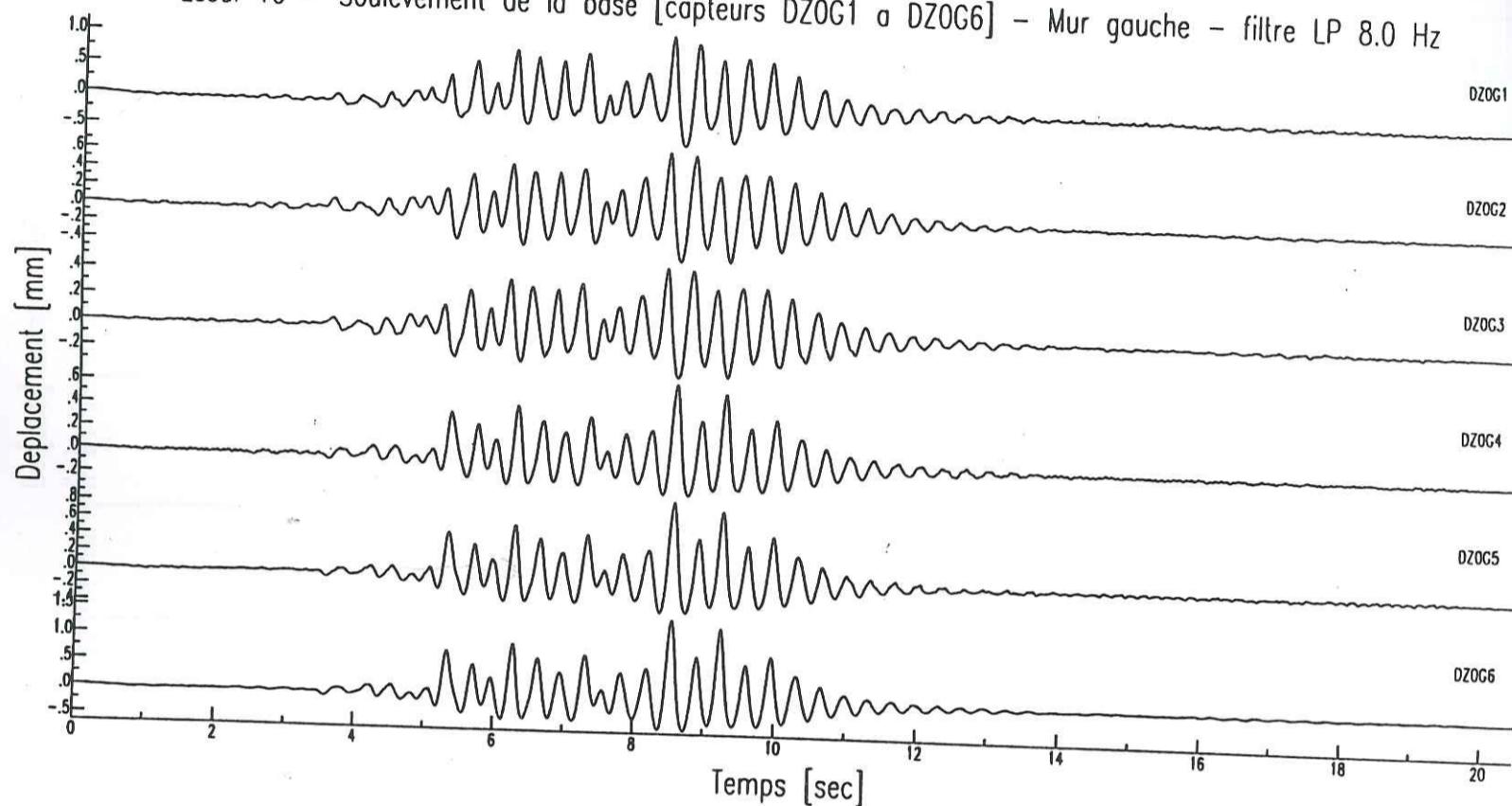
Essai 09 - Soulevement de la base [capteurs DZ0G1 à DZ0G6] - Mur gauche - filtre LP 8.0 Hz



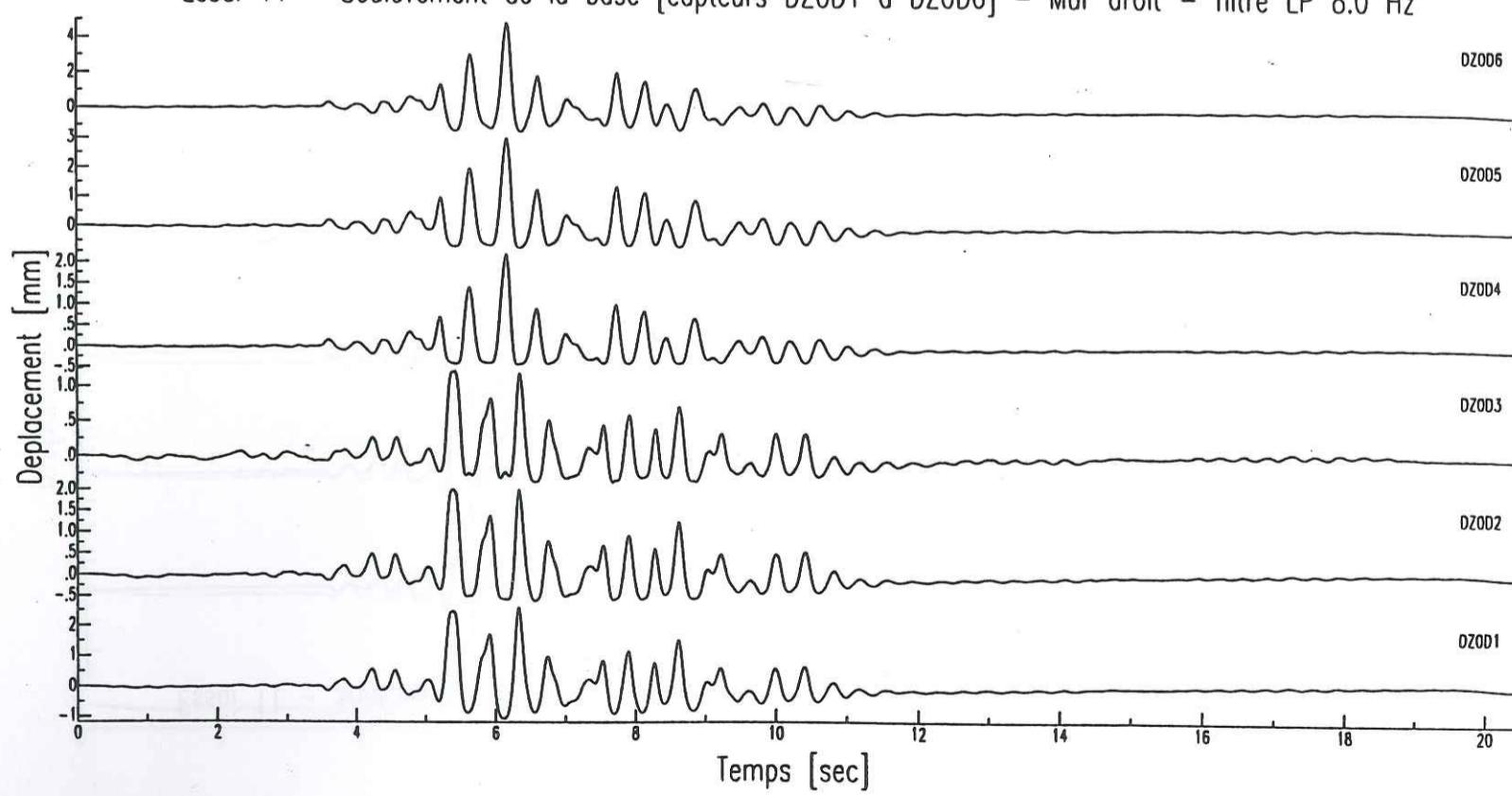
Essai 10 - Soulevement de la base [capteurs DZ0D1 à DZ0D6] - Mur droit - filtre LP 8.0 Hz



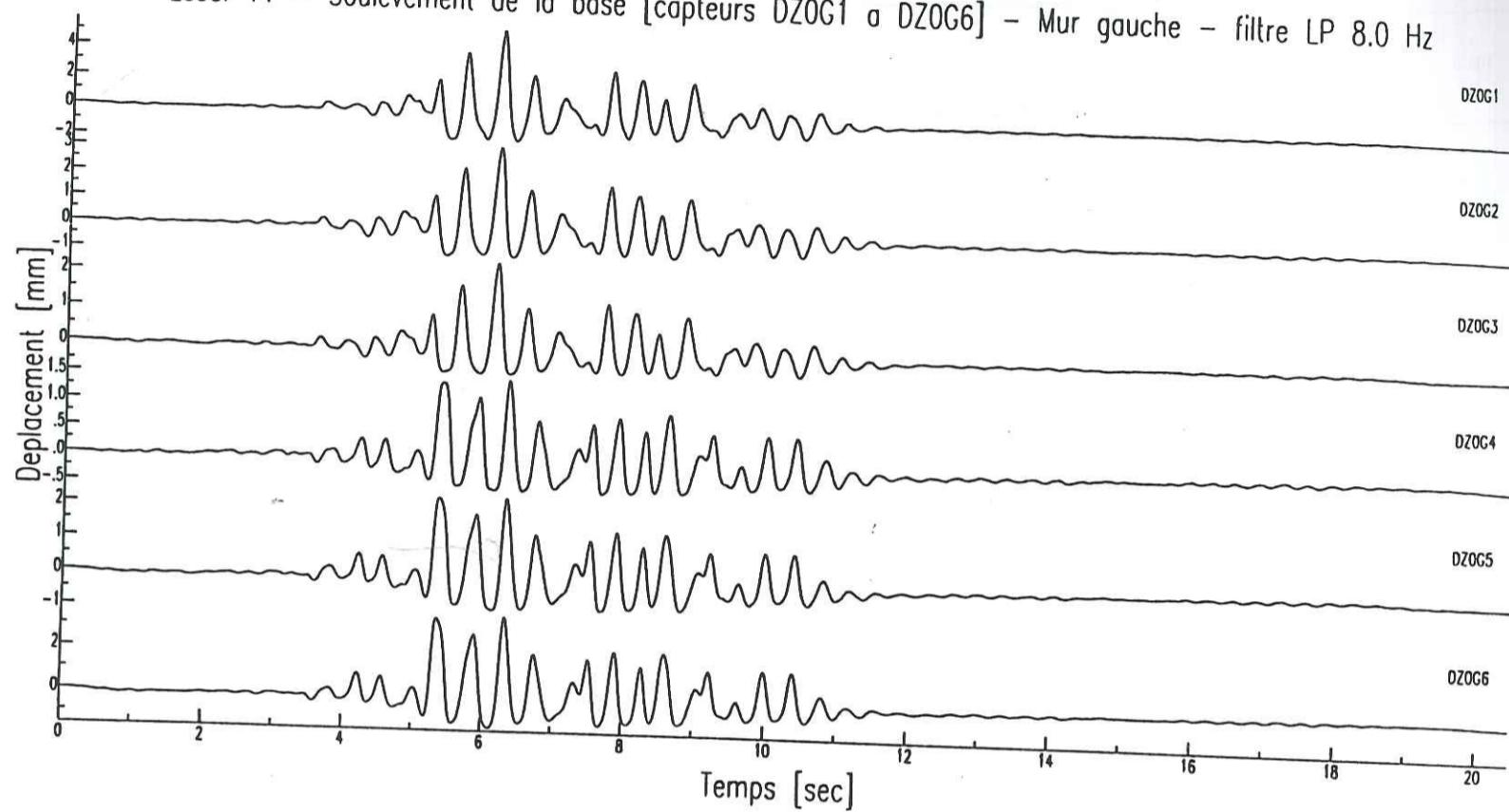
Essai 10 - Soulevement de la base [capteurs DZ0G1 à DZ0G6] - Mur gauche - filtre LP 8.0 Hz



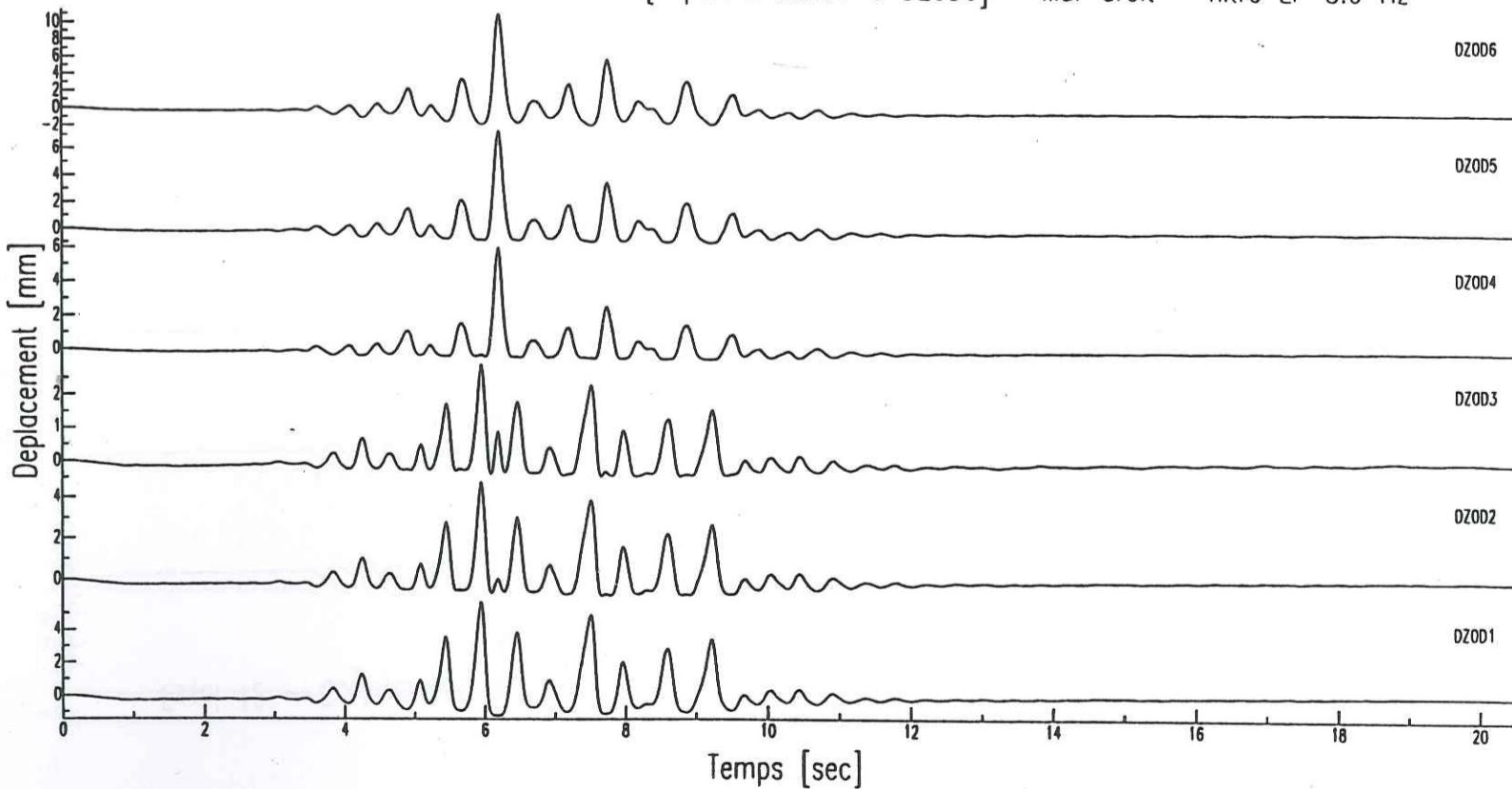
Essai 11 - Soulevement de la base [capteurs DZ0D1 à DZ0D6] - Mur droit - filtre LP 8.0 Hz



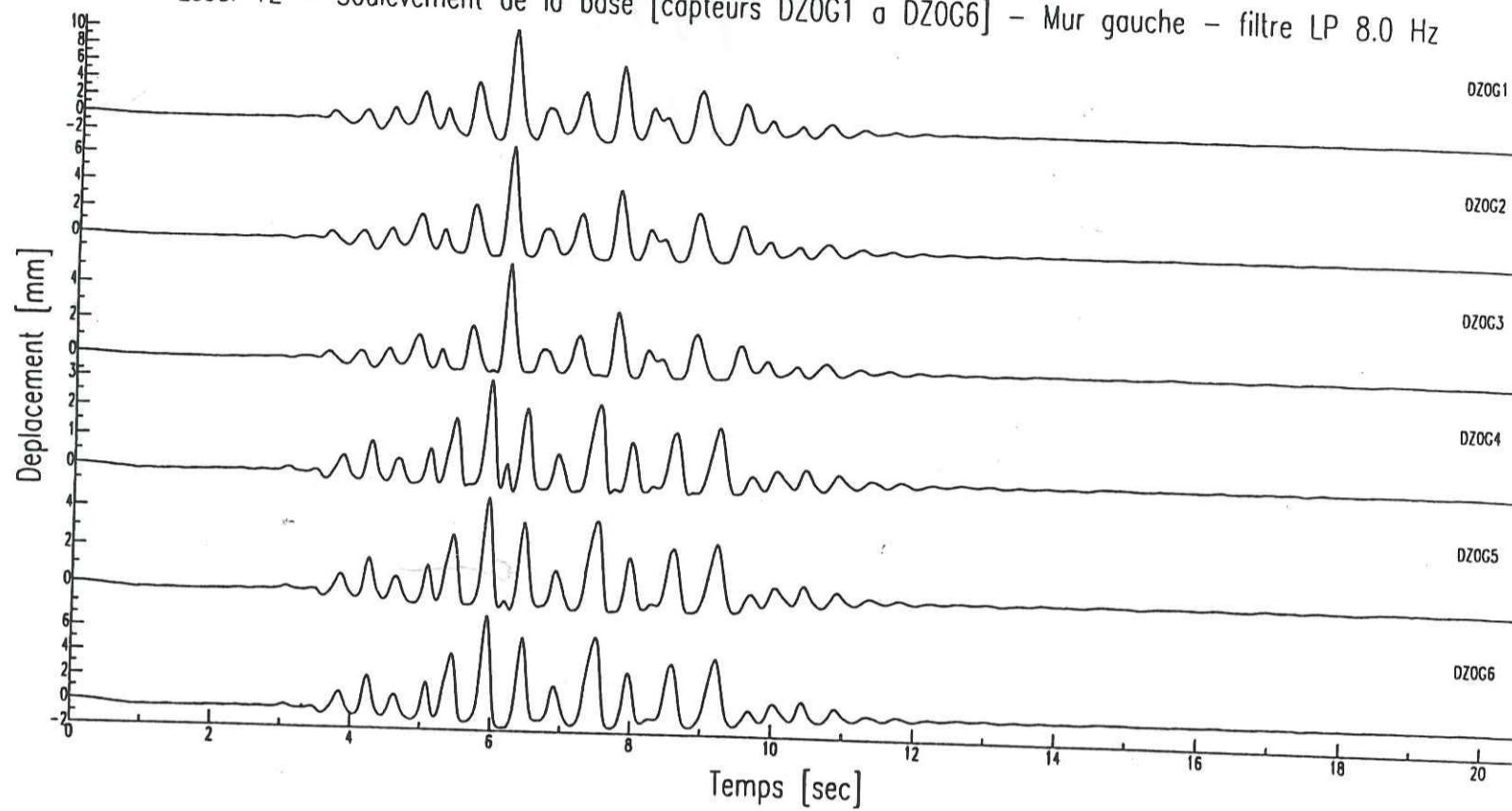
Essai 11 - Soulevement de la base [capteurs DZ0G1 à DZ0G6] - Mur gauche - filtre LP 8.0 Hz



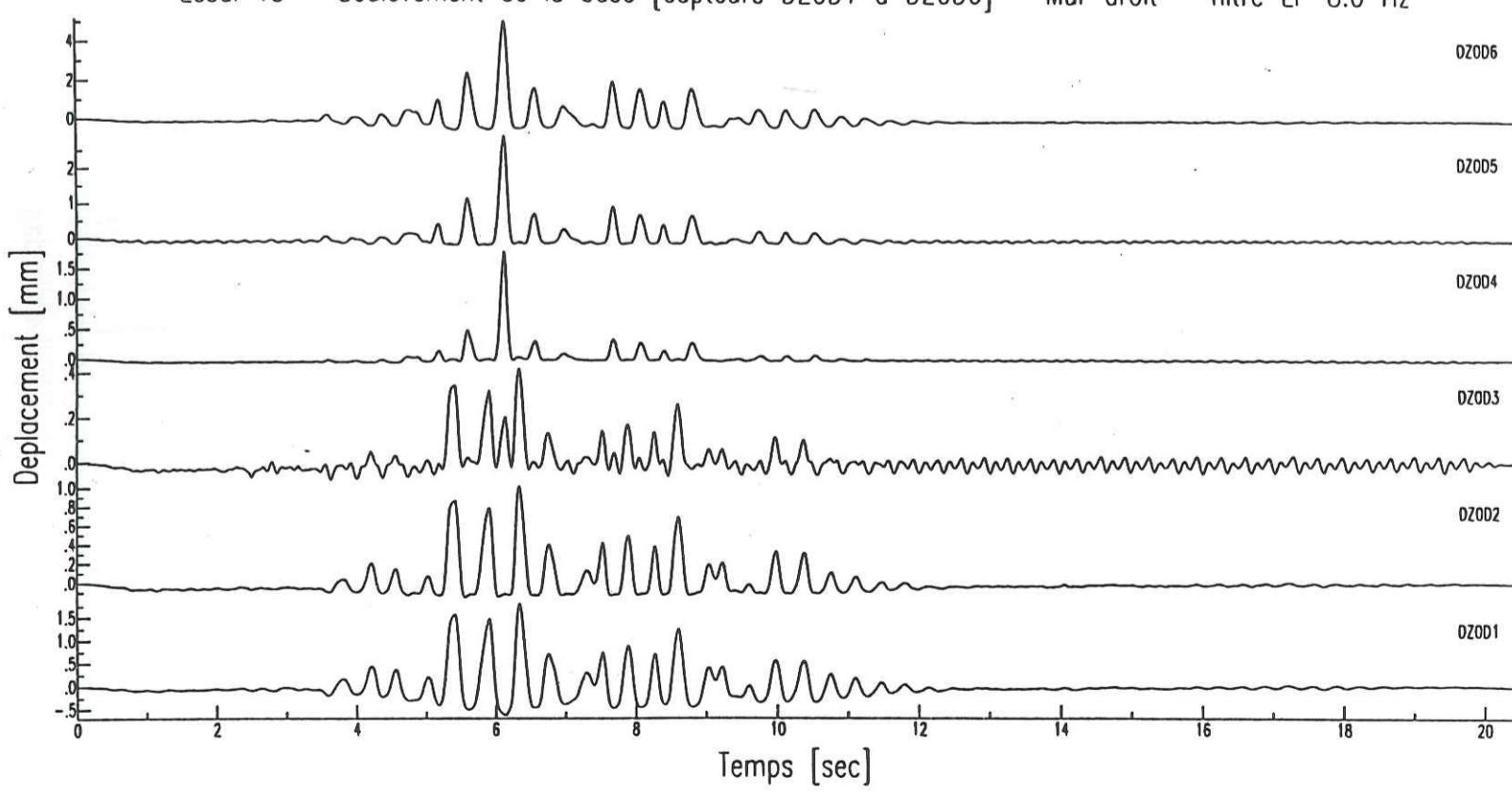
Essai 12 - Soulevement de la base [capteurs DZ0D1 à DZ0D6] - Mur droit - filtre LP 8.0 Hz



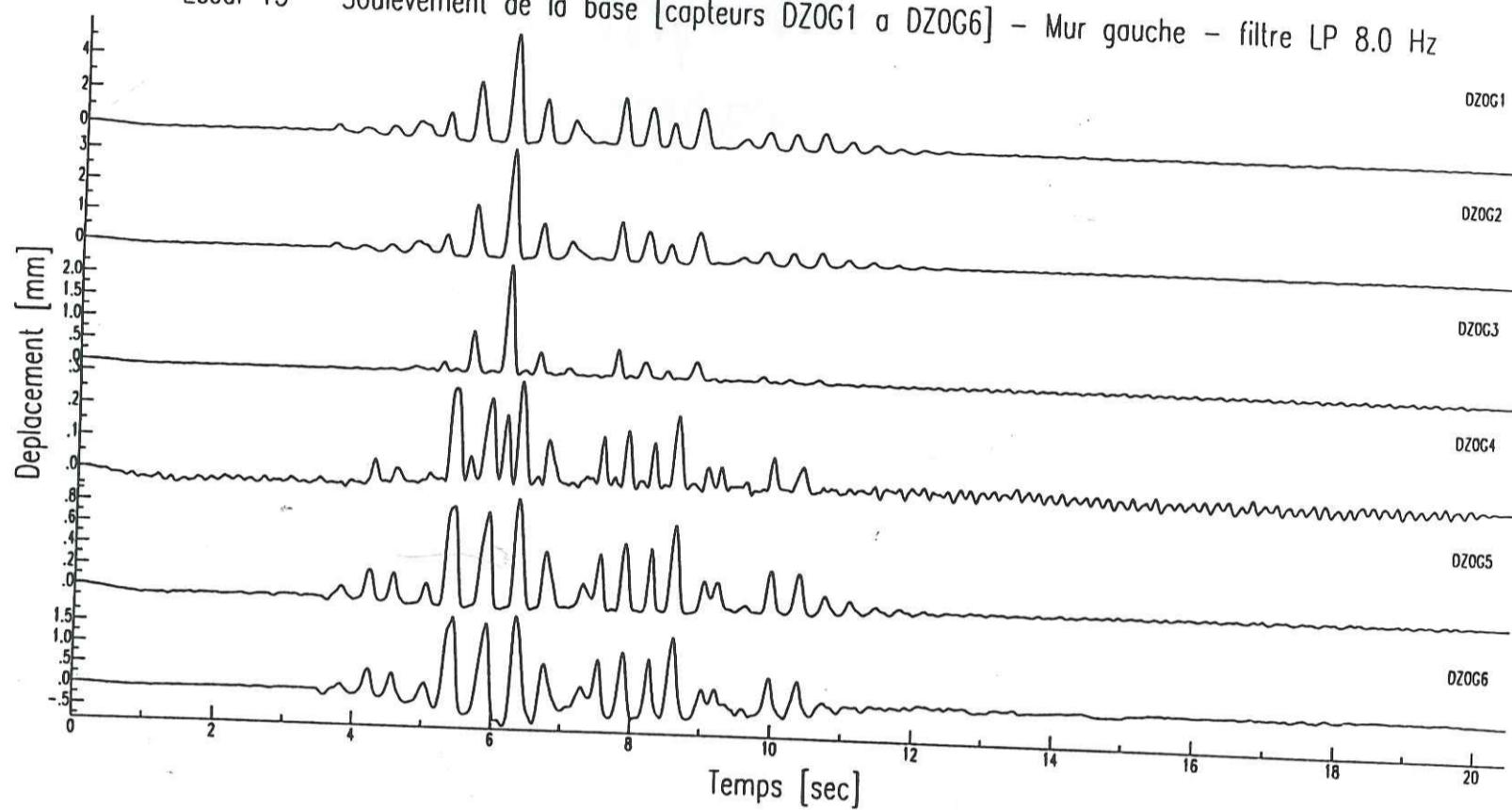
Essai 12 – Soulevement de la base [capteurs DZOG1 à DZOG6] – Mur gauche – filtre LP 8.0 Hz



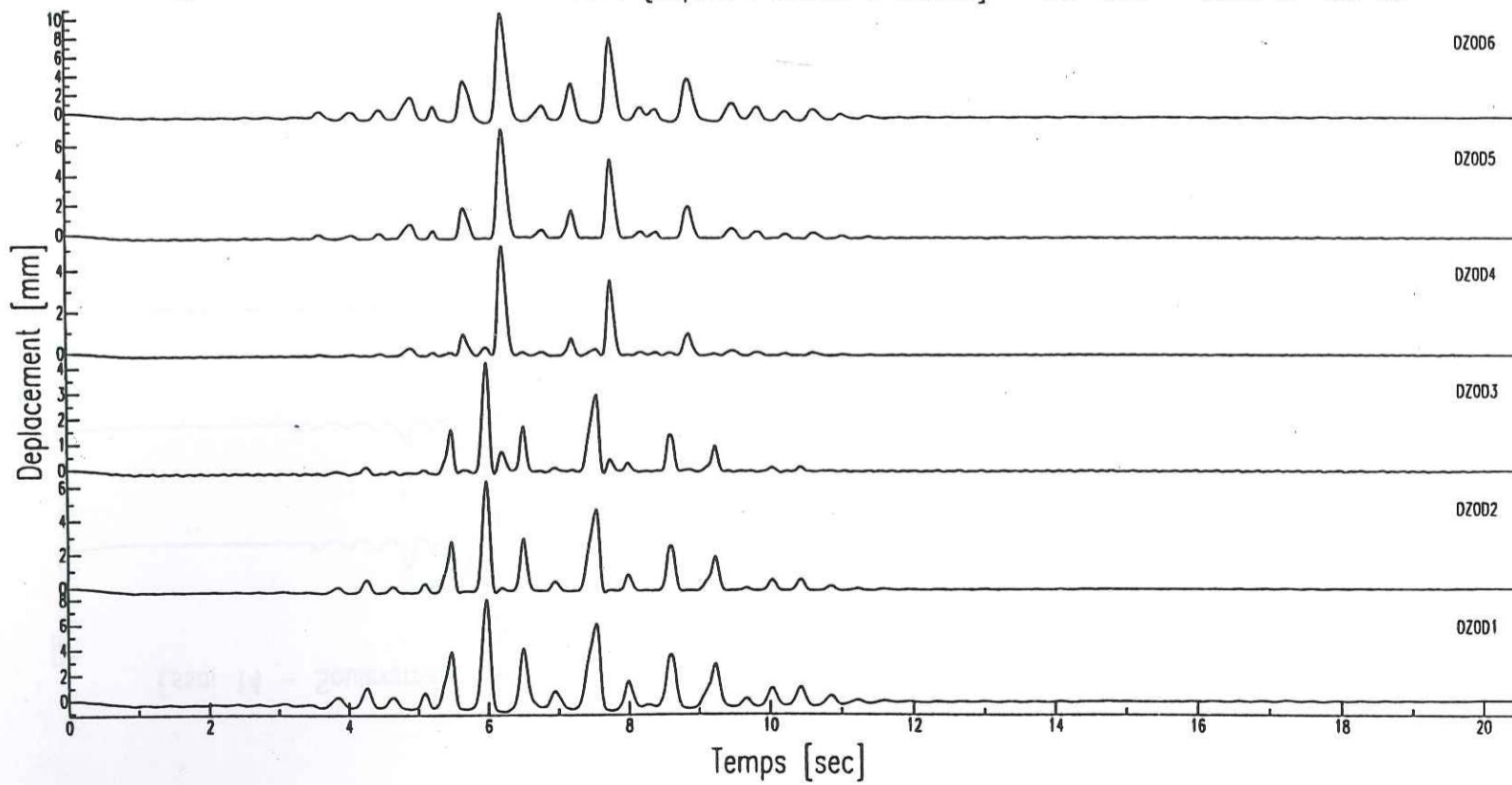
Essai 13 – Soulevement de la base [capteurs DZOD1 à DZOD6] – Mur droit – filtre LP 8.0 Hz

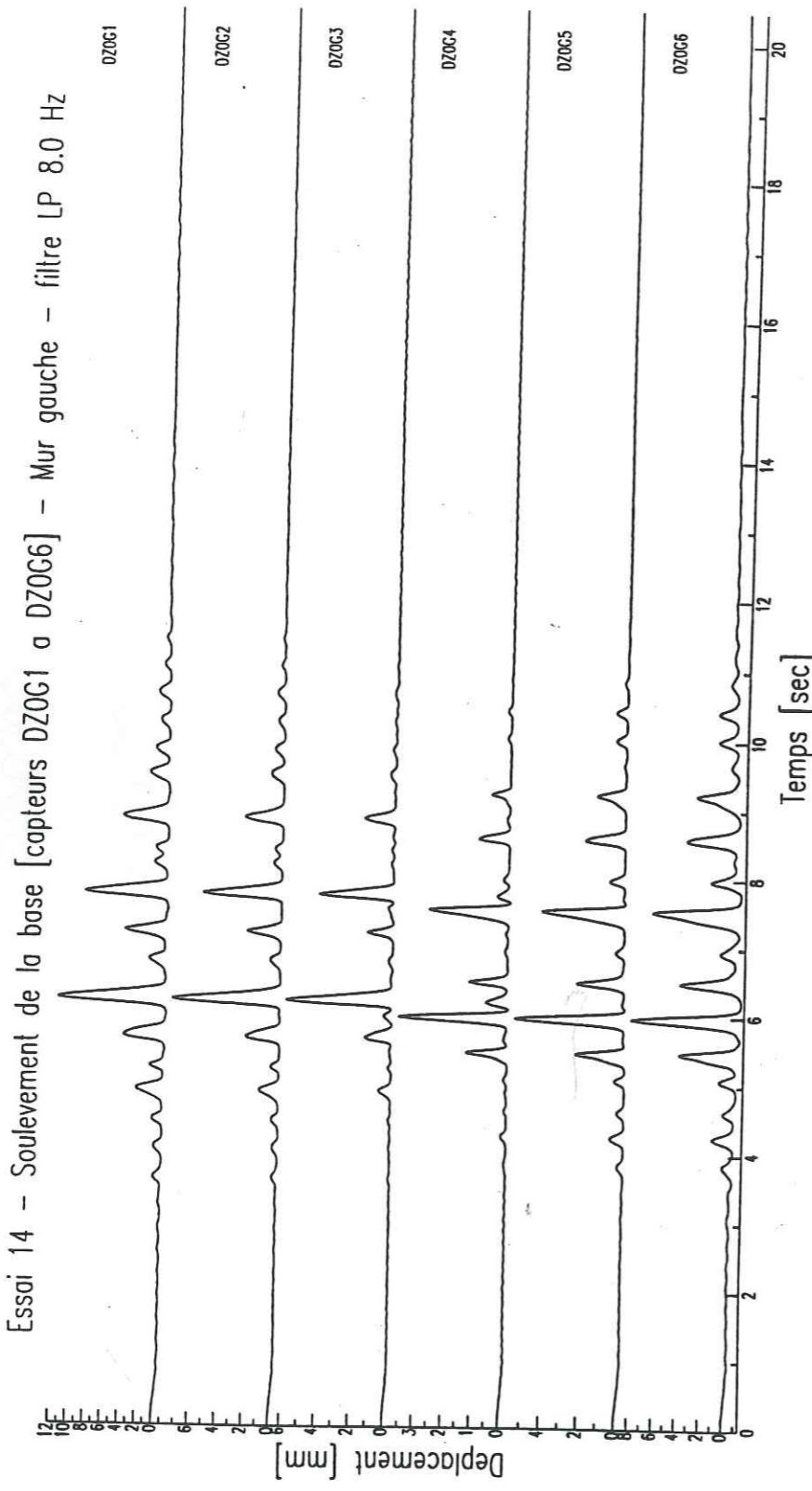


Essai 13 – Soulevement de la base [capteurs DZ0G1 à DZ0G6] – Mur gauche – filtre LP 8.0 Hz



Essai 14 – Soulevement de la base [capteurs DZ0D1 à DZ0D6] – Mur droit – filtre LP 8.0 Hz





ANNEXE B

PLANS DES BATIMENTS CALIFORNIENS

Hayward - 13-story School Office Bldg.



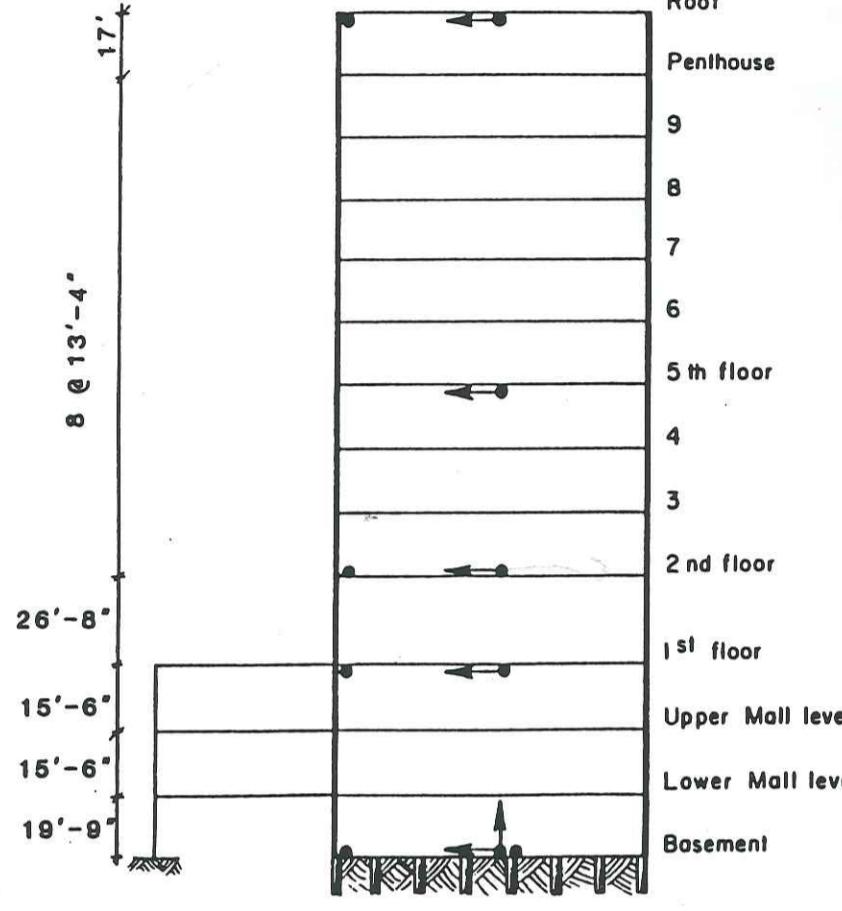
No. of Stories above/below
ground: 13/0
Plan Shape: Rectangular
Base Dimensions: 122' x 125'
Typical Floor Dimensions: 113' x 113'
Design Date: 1969
Construction Date: 1969-71

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B.P. 53
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DOCUMENTATION
B.P. 53
GRENOBLE CEDEX
F. 38041 GRENOBLE CEDEX
F. 38041 GRENOBLE CEDEX
Tel. 04 76 63 54 21 - Fax 04 76 51 40 58
Mail: pialour@ujf.grenoble.fr

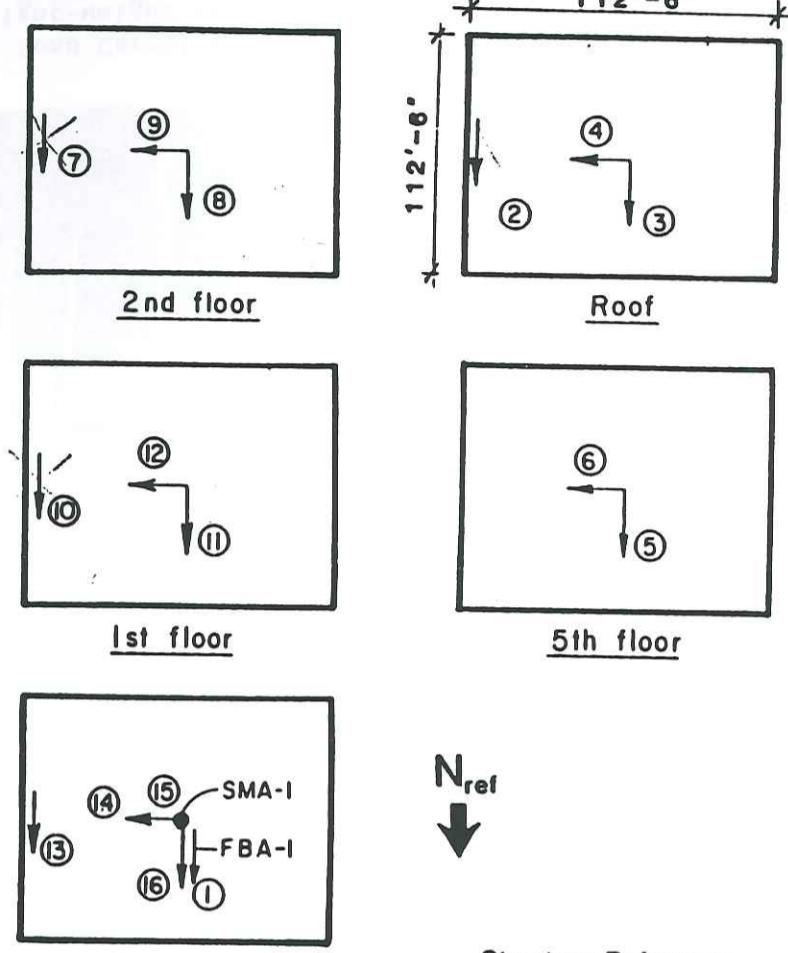
Vertical Load Carrying System:
2.5" light-weight concrete slab over metal
deck supported by steel beams and columns.
Lateral Force Resisting System:
Interior core moment steel frame and exterior
perimeter concrete moment frame; concrete
shear walls around elevator to 2nd floor.
Foundation Type:
Bearing piles with 18" concrete slab on grade.

Hayward - 13-story School Office Bldg.

(CSMIP Station No. 58354)

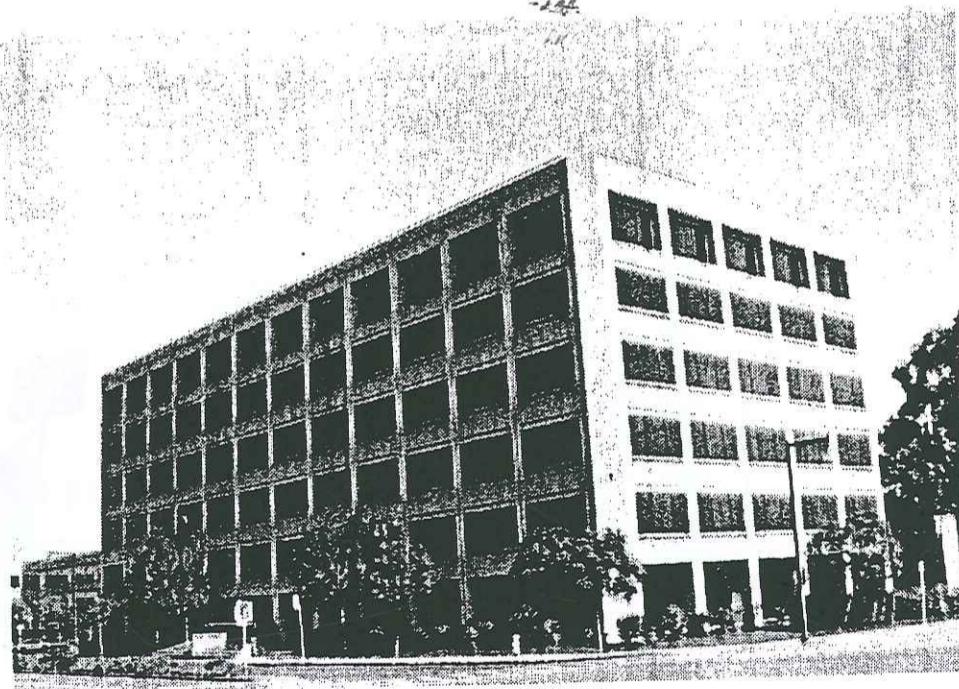


SENSOR LOCATIONS



Structure Reference
Orientation: N = 320°

San Bruno - 6-story Office Bldg.



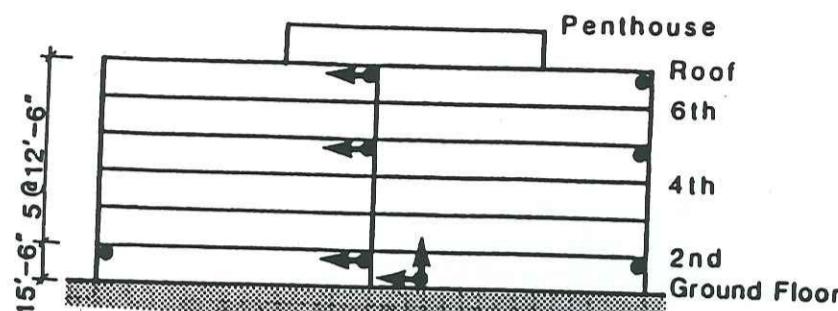
No. of Stories above/below
ground: 6/0
Plan Shape: Rectangular
Base Dimensions: 90' x 200'
Typical Floor Dimensions: Same as base
Design Date: 1977
Construction Date: 1978

Vertical Load Carrying System:
Concrete slabs supported by concrete beams
and columns.
Lateral Force Resisting System:
Moment-resistant concrete frame (exterior and
one interior frame); concrete roof and floor
diaphragms.
Foundation Type:
Spread footings.

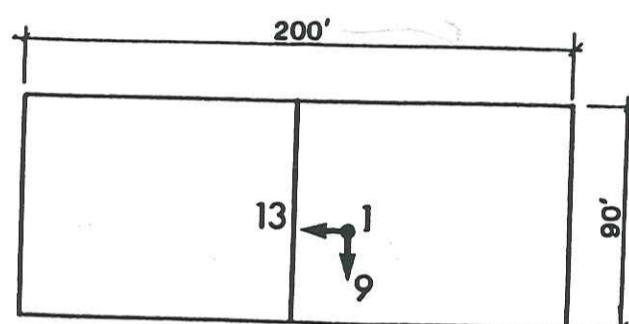
San Bruno - 6-story Office Bldg.

(CSMIP Station No. 58490)

SENSOR LOCATIONS

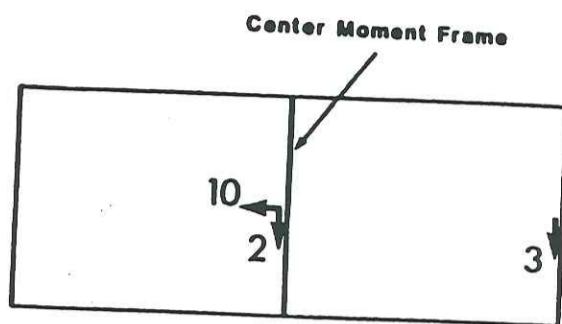


S/N Elevation

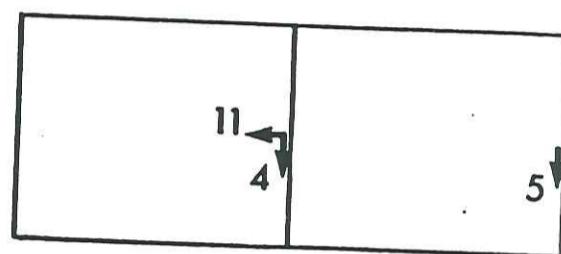


Ground Level Plan

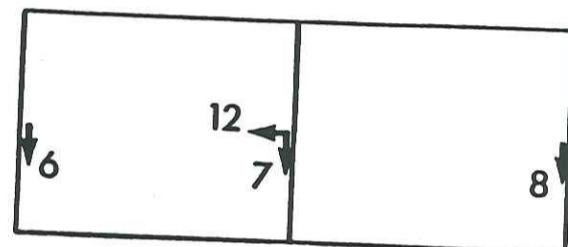
N_{ref} →



Roof Plan



5th Floor Plan



2nd Floor Plan

Structure Reference
Orientation: N = 335°

Los Angeles - Hollywood Storage Bldg.

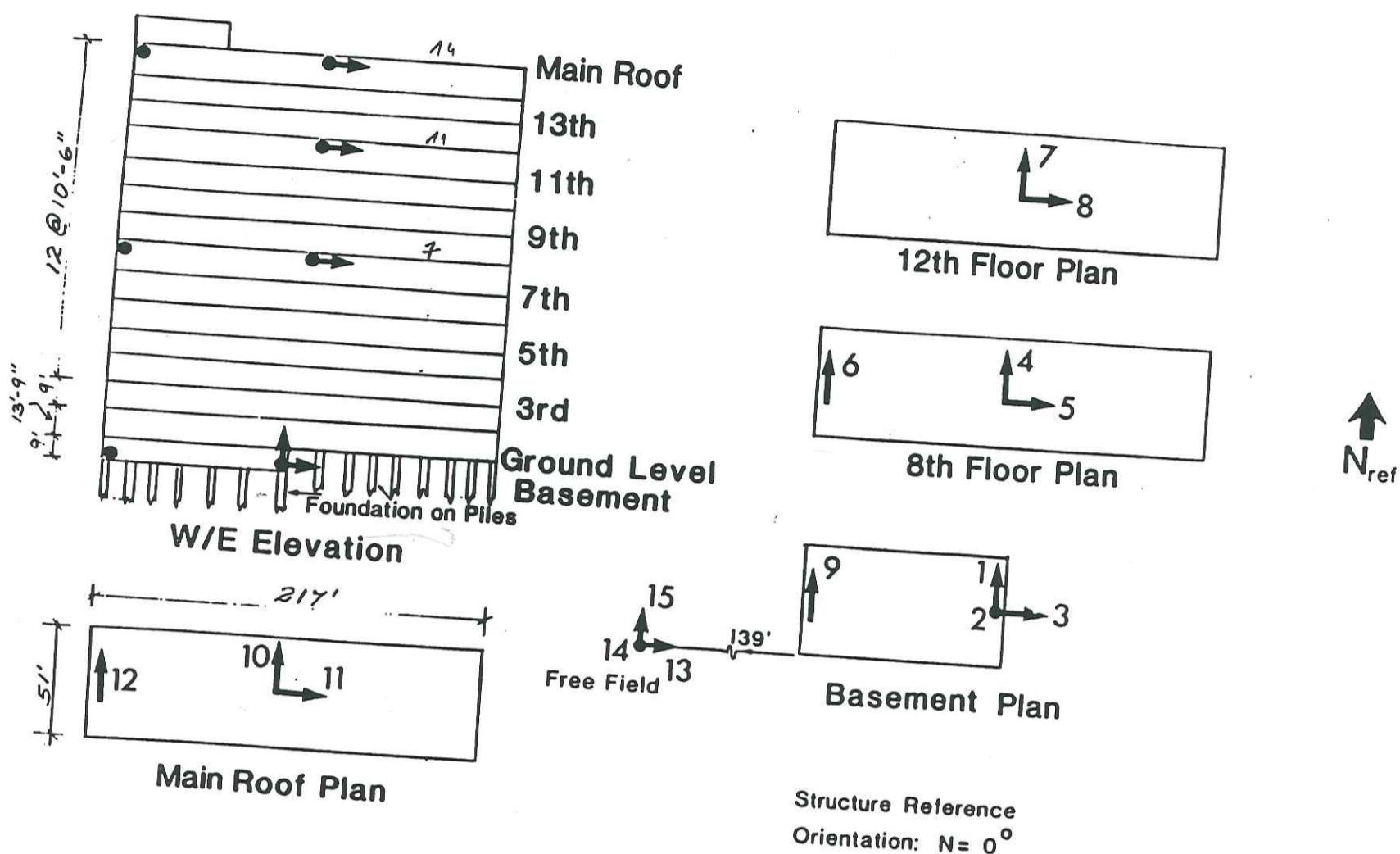


Address: 1025 N. Highland Ave.
Los Angeles, CA
No. of Stories above/below
ground: 1 1/4/partial basement
Plan Shape: Rectangular
Base Dimensions: 217' x 51'
Typical Floor Dimensions: Same
Design Date: 1925

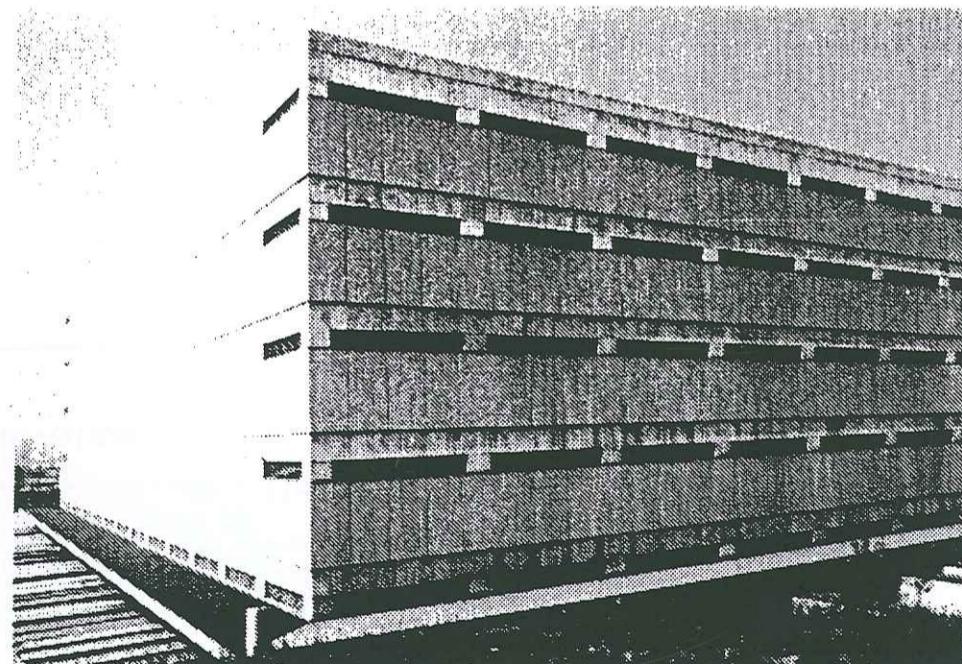
Vertical Load Carrying System:
8" thick concrete slabs supported by concrete frame.
Lateral Force resisting System:
Reinforced concrete frame in both directions.
Foundation Type:
Concrete piles.

Los Angeles - Hollywood Storage Bldg.
 (CSMIP Station No. 24236)

SENSOR LAYOUT



Los Angeles - Sears Warehouse



Address: 2555 East Olympic Blvd.
 Los Angeles, CA
 No. of Stories above/below
 ground: 5/1
 Plan Shape: Rectangular
 Base Dimensions: 360' x 280'
 Typical Floor Dimensions: Same
 Design Date: 1970

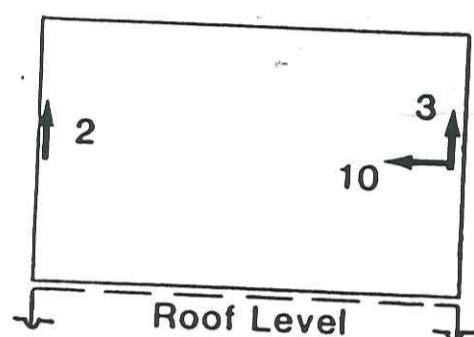
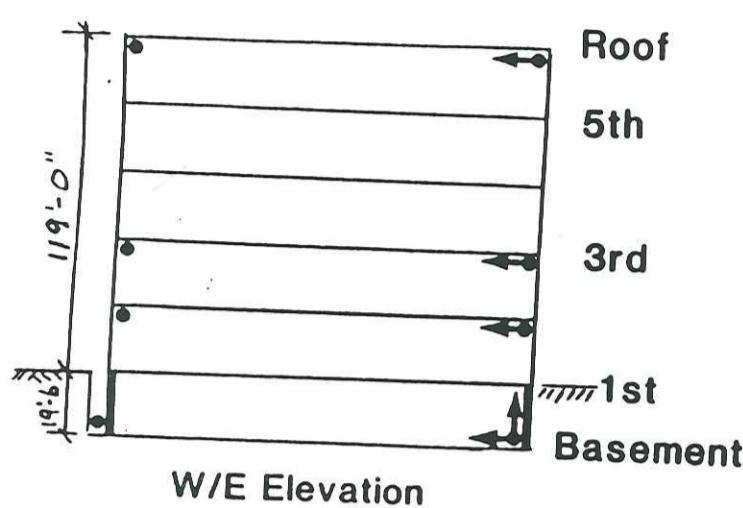
Note: This building is adjacent to a similar building; the buildings are separated by a seismic joint.

Vertical Load Carrying System:
 Concrete slabs, beams and columns.
Lateral Force Resisting System:
 Ductile reinforced concrete perimeter frame;
 basement shear walls; designed according
 to the 1970 Los Angeles Building Code.
Foundation Type:
 Spread footings.

Los Angeles - Sears Warehouse

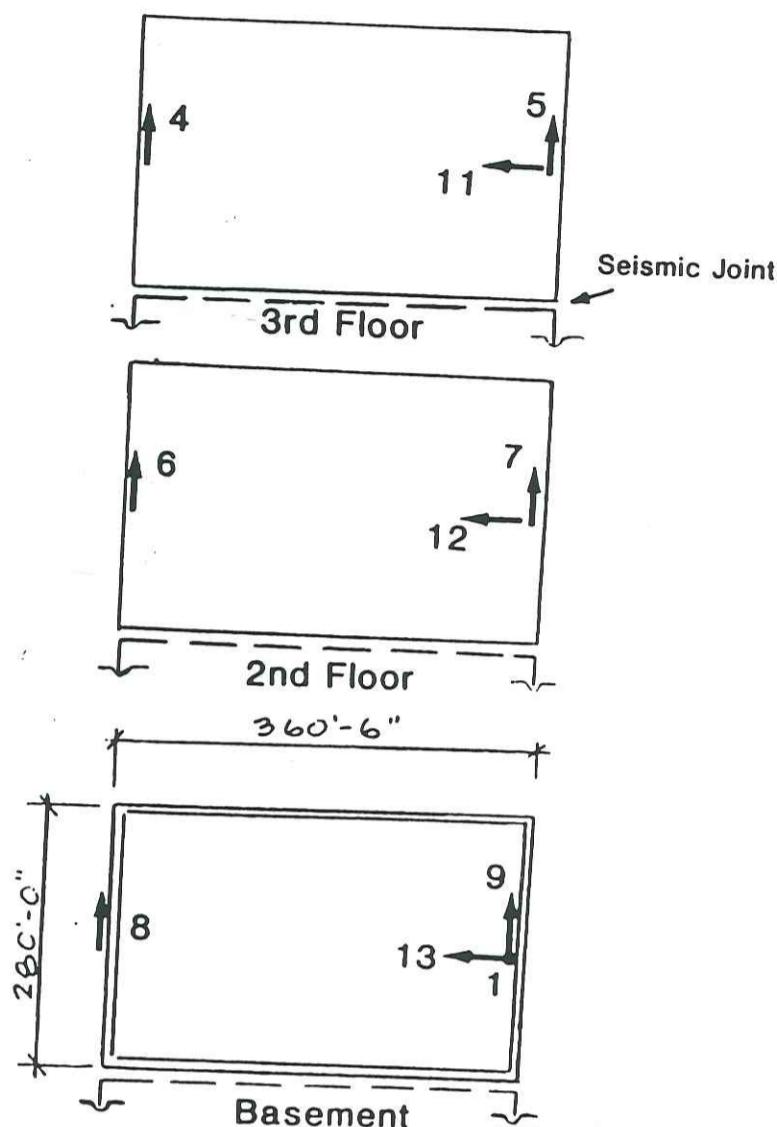
(CSMIP Station No. 24463)

SENSOR LAYOUT



N_{ref}

Structure Reference
Orientation: $N = 350^\circ$



North Hollywood - Sheraton-Universal Hotel



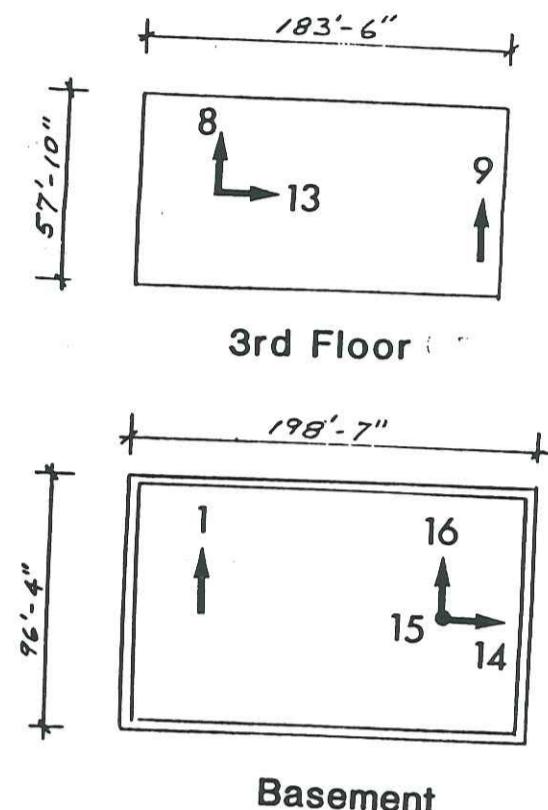
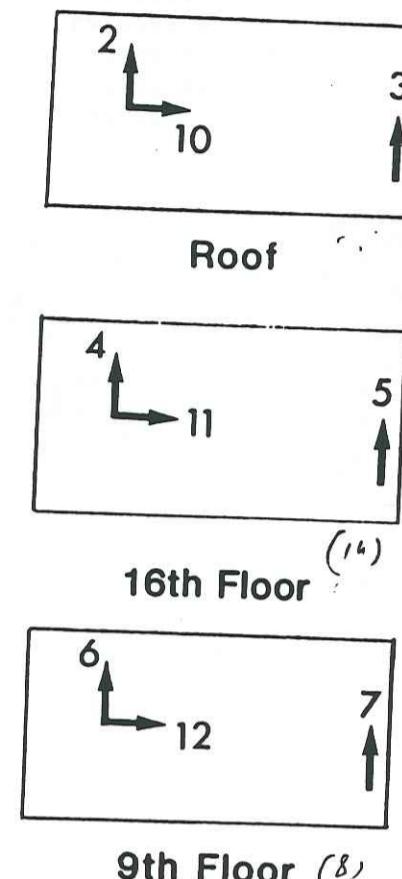
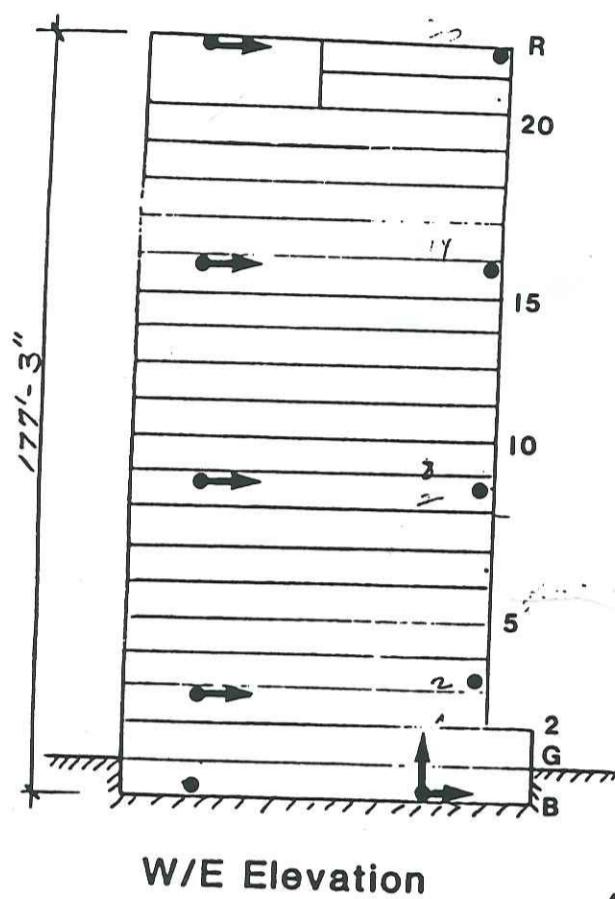
Address: 30 Universal City Plaza
North Hollywood, CA
No. of Stories above/below
ground: 20/1
Plan Shape: Rectangular
Base Dimensions: 199' x 96'
Typical Floor Dimensions: 184' x 58'
Design Date: 1967
Construction Date: 1968

Vertical Load Carrying System:
4-6" thick concrete slabs supported by
concrete beams and columns.
Lateral Force resisting System:
Ductile moment resisting concrete frame;
designed according to the 1966 Los Angeles
Building Code.
Foundation Type:
Spread footings.

North Hollywood - Sheraton Universal Hotel

(CSMIP Station No. 24464)

SENSOR LAYOUT



9th Floor (8)

Structure Reference
Orientation: N = 0°

16th Floor (14)

Sherman Oaks - Union Bank Building



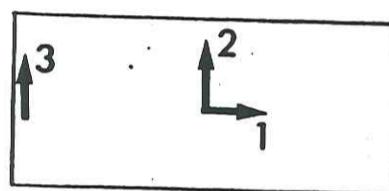
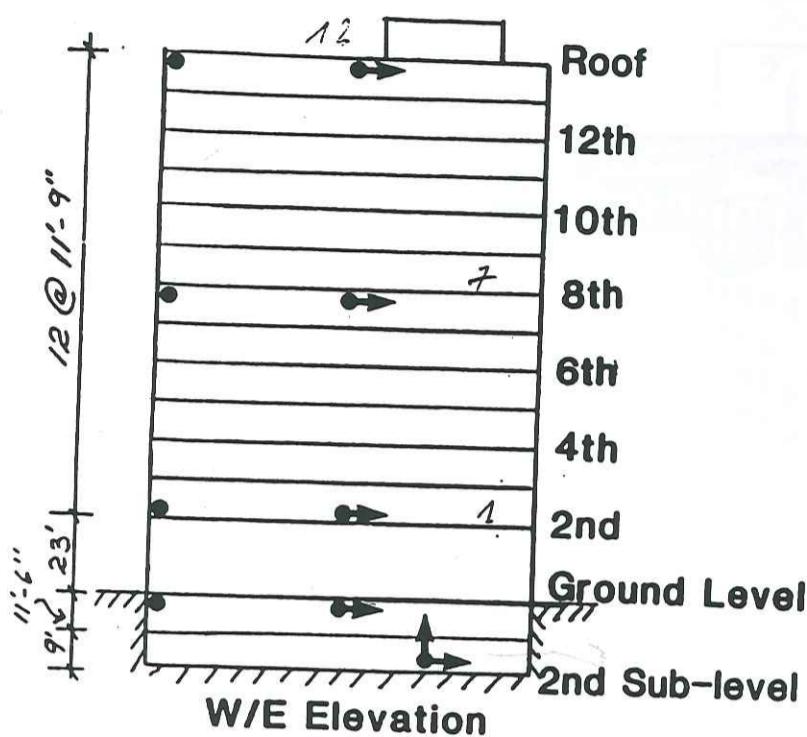
Address: 15233 Ventura Blvd
Sherman Oaks, CA
No. of Stories above/below
ground: 13/2
Plan Shape: Rectangular
Base Dimensions: 209' x 125'
Typical Floor Dimensions: 193' x 75'
Design Date: 1964

Vertical Load Carrying System:
4" thick one-way concrete slabs supported
by concrete beams, girders and columns.
Lateral Force Resisting System:
Moment resisting concrete frame in both
directions; shear walls below first floor.
Foundation Type:
Concrete piles.

Sherman Oaks - Union Bank Bldg.

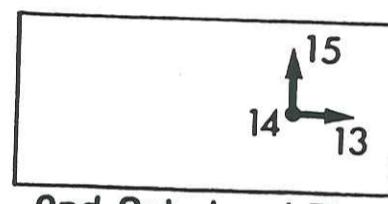
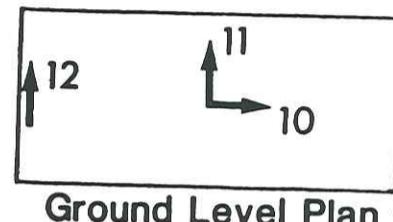
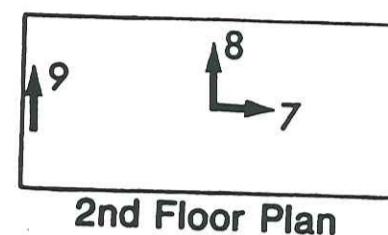
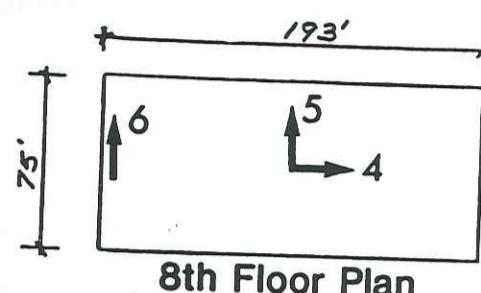
(CSMIP Station No. 24322)

SENSOR LAYOUT



Structure Reference
Orientation: N = 0°

↑
 N_{ref}



Van Nuys - Holiday Inn



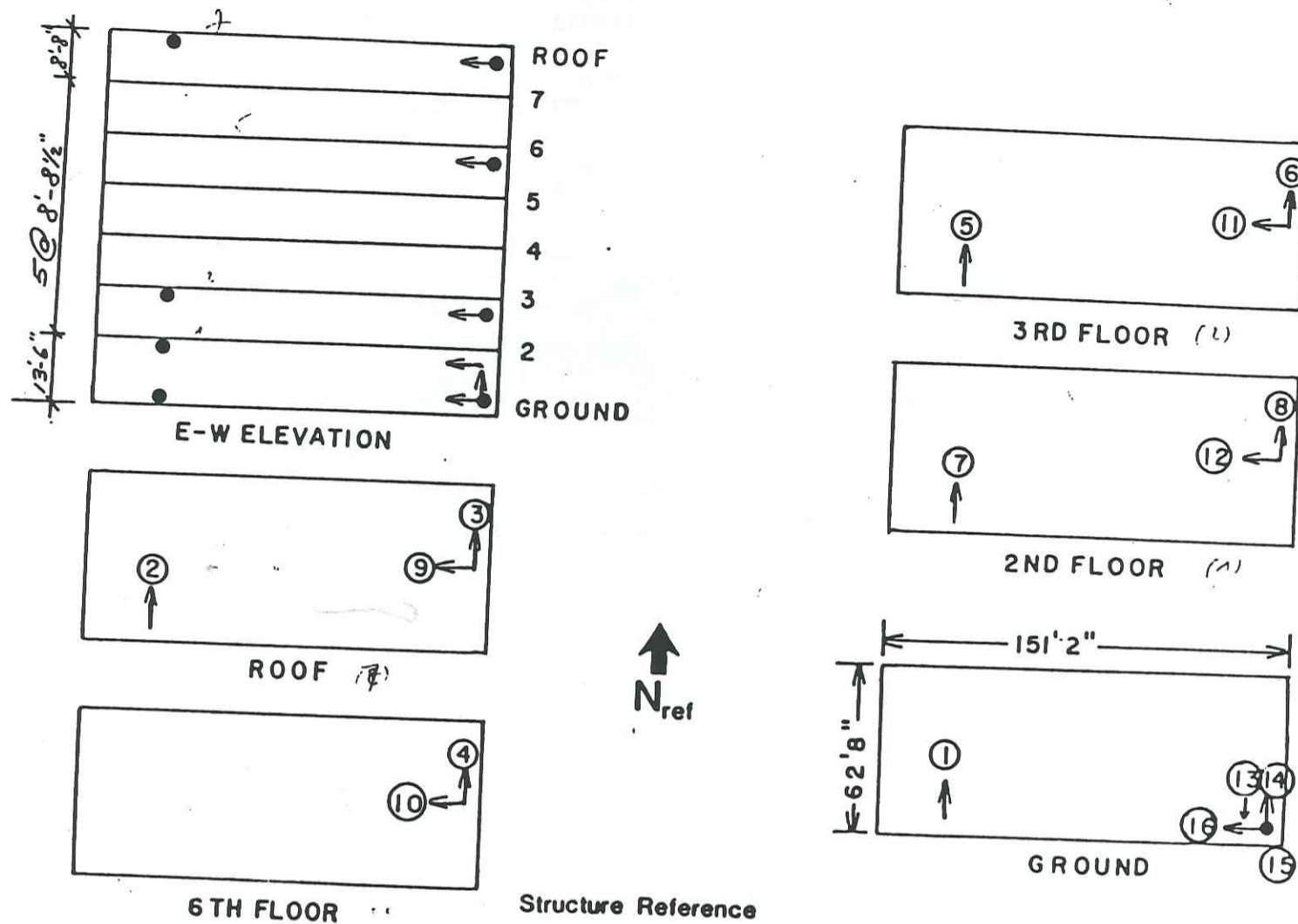
Address: 8244 Orion Ave.
Van Nuys, CA
No. of Stories above/below
ground: 7/0
Plan Shape: Rectangular
Base Dimensions: 151' x 63'
Typical Floor Dimensions: Same
Design Date: 1965
Construction Date: 1966

Vertical Load Carrying System:
8 - 10" thick concrete slabs supported by
concrete beams and columns.
Lateral Force Resisting System:
Moment resisting concrete frame in both
directions.
Foundation Type:
Concrete friction piles.

Van Nuys - Holiday Inn

(CSMIP Station No. 24386)

SENSOR LAYOUT



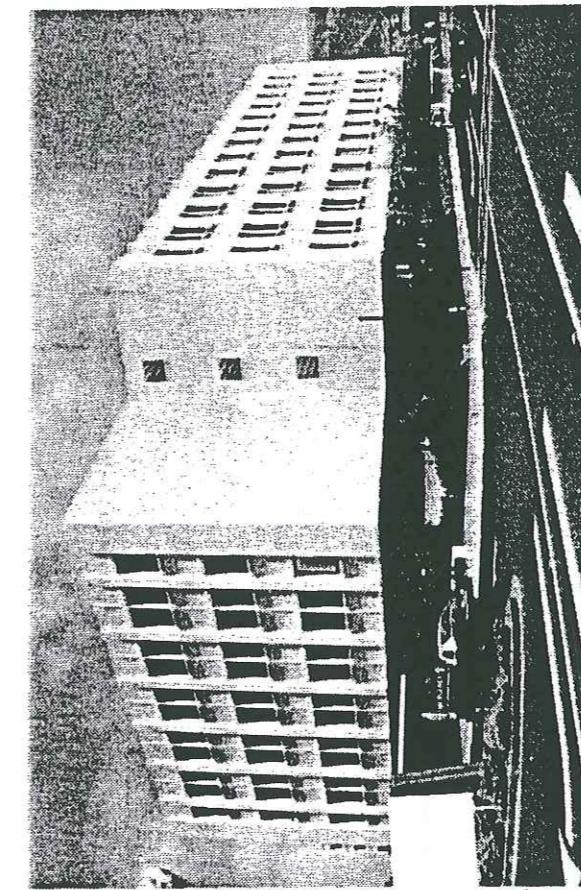
Pomona - First Federal Savings Bldg.



Address: 350 S. Garey Ave.
 Pomona, CA
No. of Stories above/below
 ground: 2/1
Plan Shape: Rectangular
Base Dimensions: 120' x 100'
Typical Floor Dimensions: Same
Design Date: 1971
Construction Date: 1971

Vertical Load Carrying System:
 Concrete slabs supported on concrete beams
 and columns.
Lateral Force Resisting System:
 Perimeter moment resisting ductile
 concrete frame.
Foundation Type:
 Cast-in-place concrete piles.

Structural Response - Area 2



South San Francisco - 4-story Hospital

No. of Stories above/below ground: 4/0
 Plan Shape: Rectangular
 Base Dimensions: 219' x 144'
 Typical Floor Dimensions: 219' x 117'
 Design Date: 1972
 Construction Date: 1973-75

Vertical Load Carrying System:
 3.5" light-weight concrete fill over metal deck supported by steel frame.

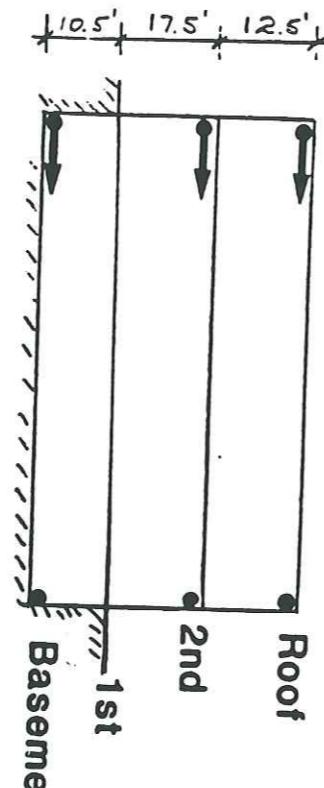
Lateral Force Resisting System:
 Concrete shear walls at first floor;
 moment-resistant steel frame.

Pile Foundation Type:
 Piles (50-70' deep); 8" concrete slab on grade.

Pomona - First Federal Savings Bldg.

(CSMIP Station No. 23511)

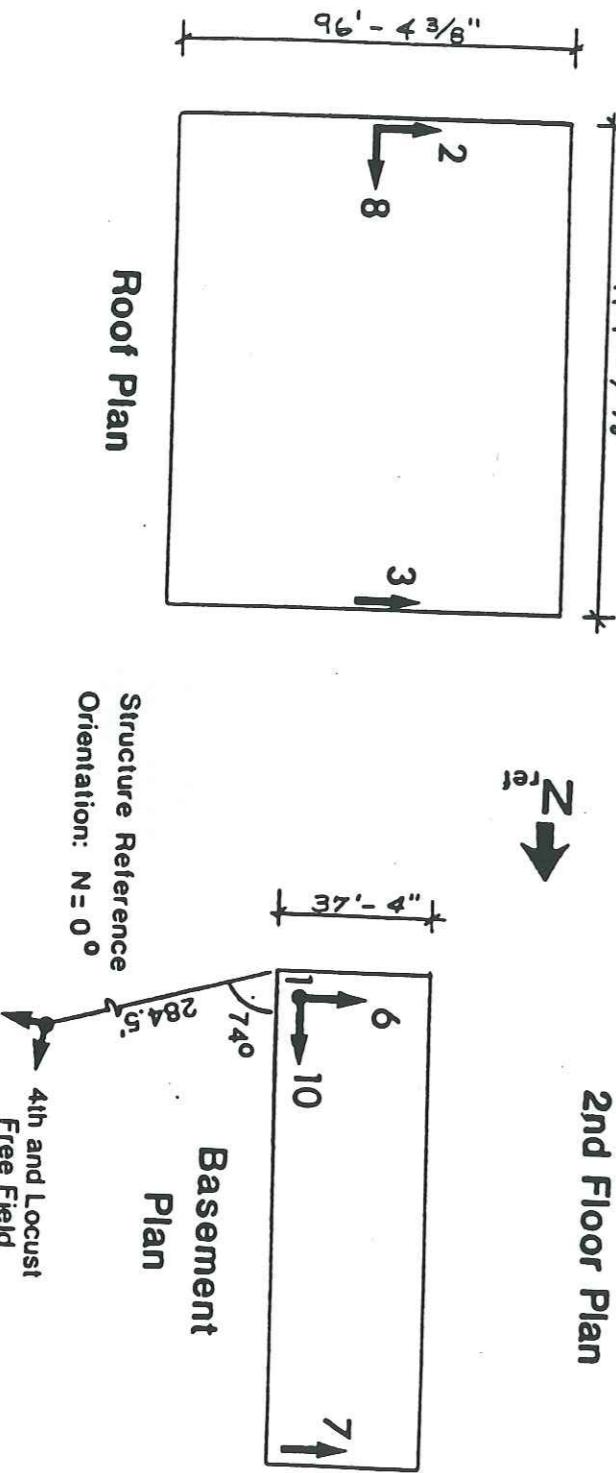
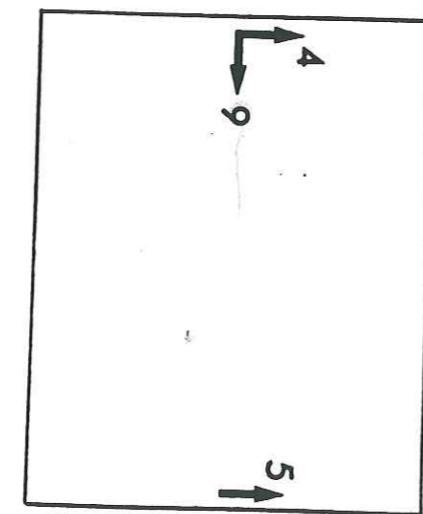
SENSOR LAYOUT



Elevation

Z_{re}

2nd Floor Plan



Roof Plan

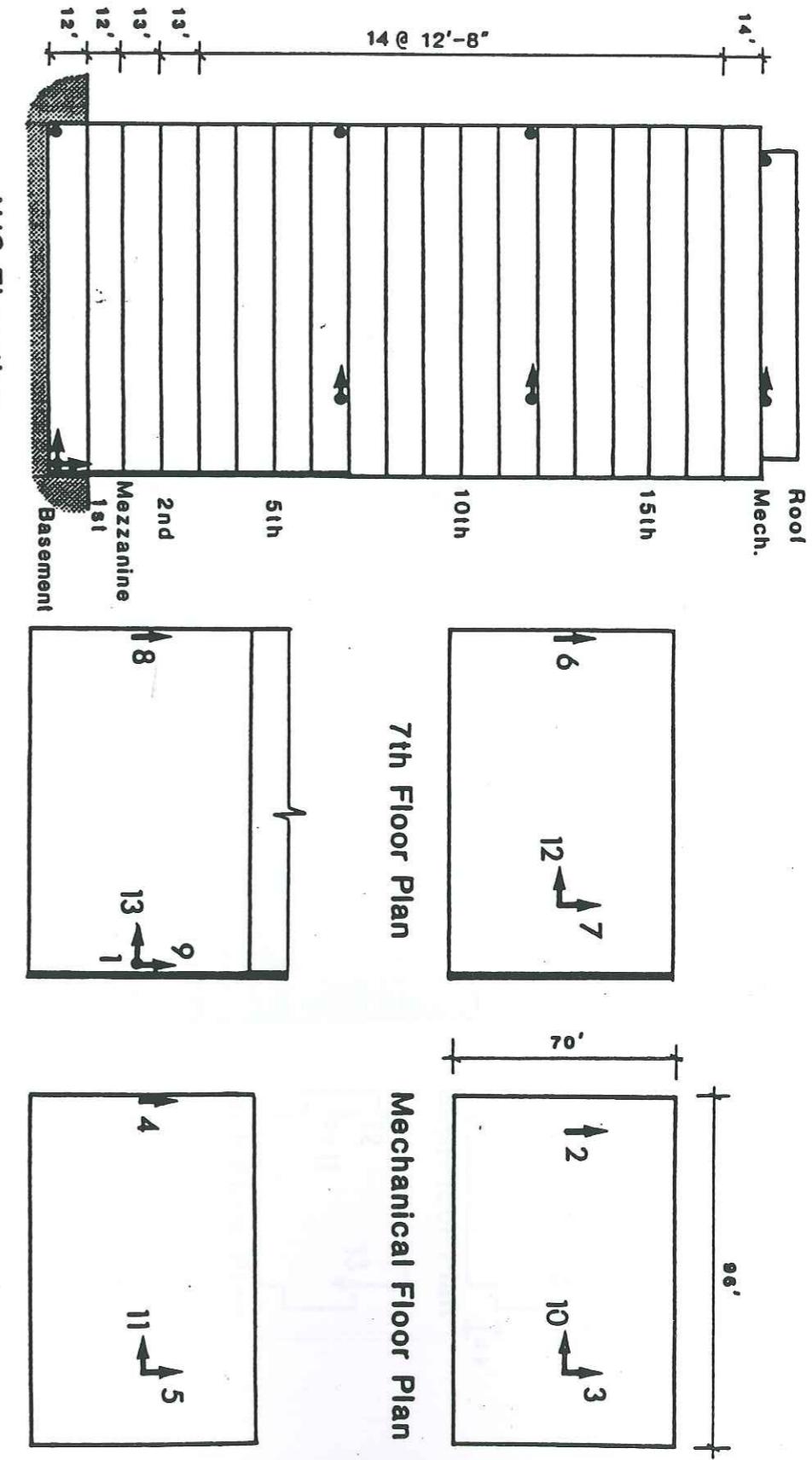
Structure Reference
Orientation: N = 0°

4th and Locust
Free Field

San Francisco - 18-story Commercial Bldg.

(CSMIP Station No. 58480)

SENSOR LOCATIONS



N/S Elevation

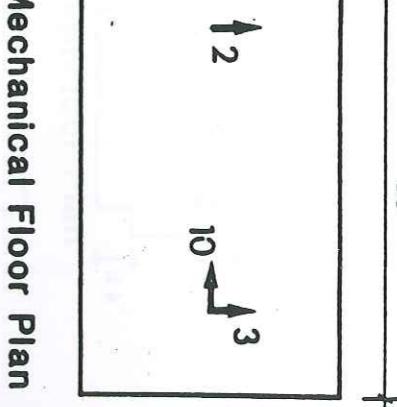
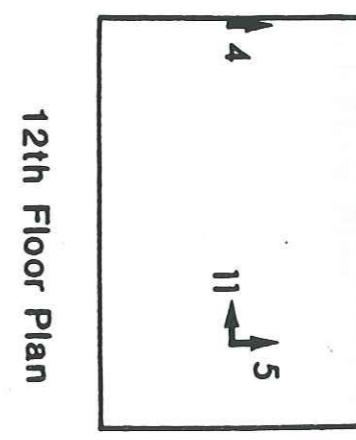
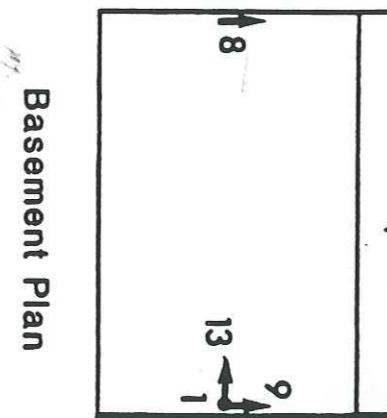
Basement Plan

$\leftarrow N_{ref}$

Floors 4-18: steel moment-resisting frame
Floors 1-3: concrete shear walls
Design Date: 1964

12th Floor Plan

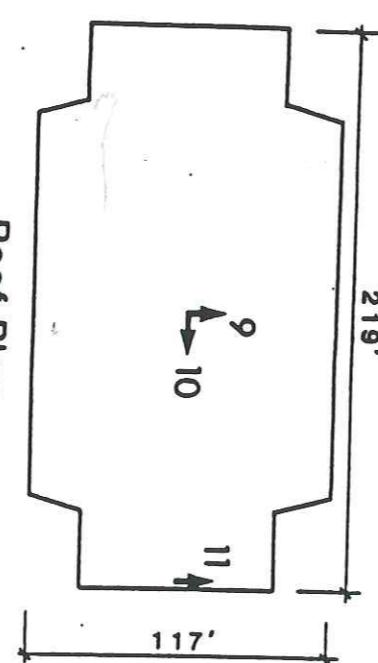
Structure Reference
Orientation: N = 350°



So. San Francisco - 4-story Hospital

(CSMIP Station No. 58261)

SENSOR LOCATIONS



S/N Elevation

$N_{ref} \rightarrow$

2nd Floor Plan

Concrete Walls

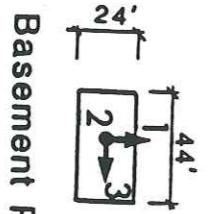


Roof Plan

9

10

11



1
2
3
4

13'-6"

3 @ 13'

24'

44'

1

13'

13'

12'

12'

14'

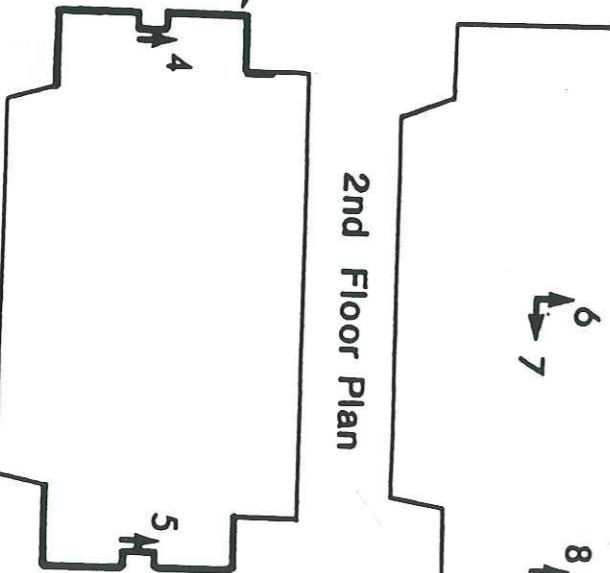
14'

Roof
Mech.

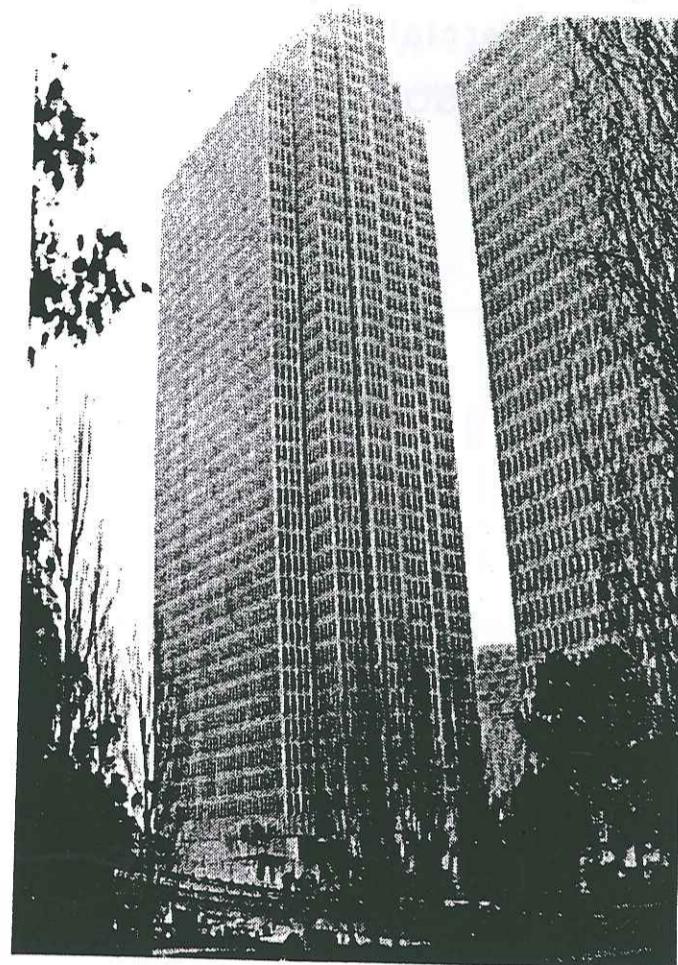
1st Floor Plan

Structure Reference
Orientation: N = 41°

Basement Plan



San Francisco - 47-story Office Bldg.



No. of Stories above/below

ground: 47/2

Plan Shape: Rectangular

Base Dimensions: 300' x 210'

Typical Floor Dimensions: 180' x 122'

Design Date: 1978

Construction Date: 1978-79

Note: There is a 3-story concrete building adjacent to the high-rise tower and both are separated by a 2" seismic joint.

Vertical Load Carrying System:

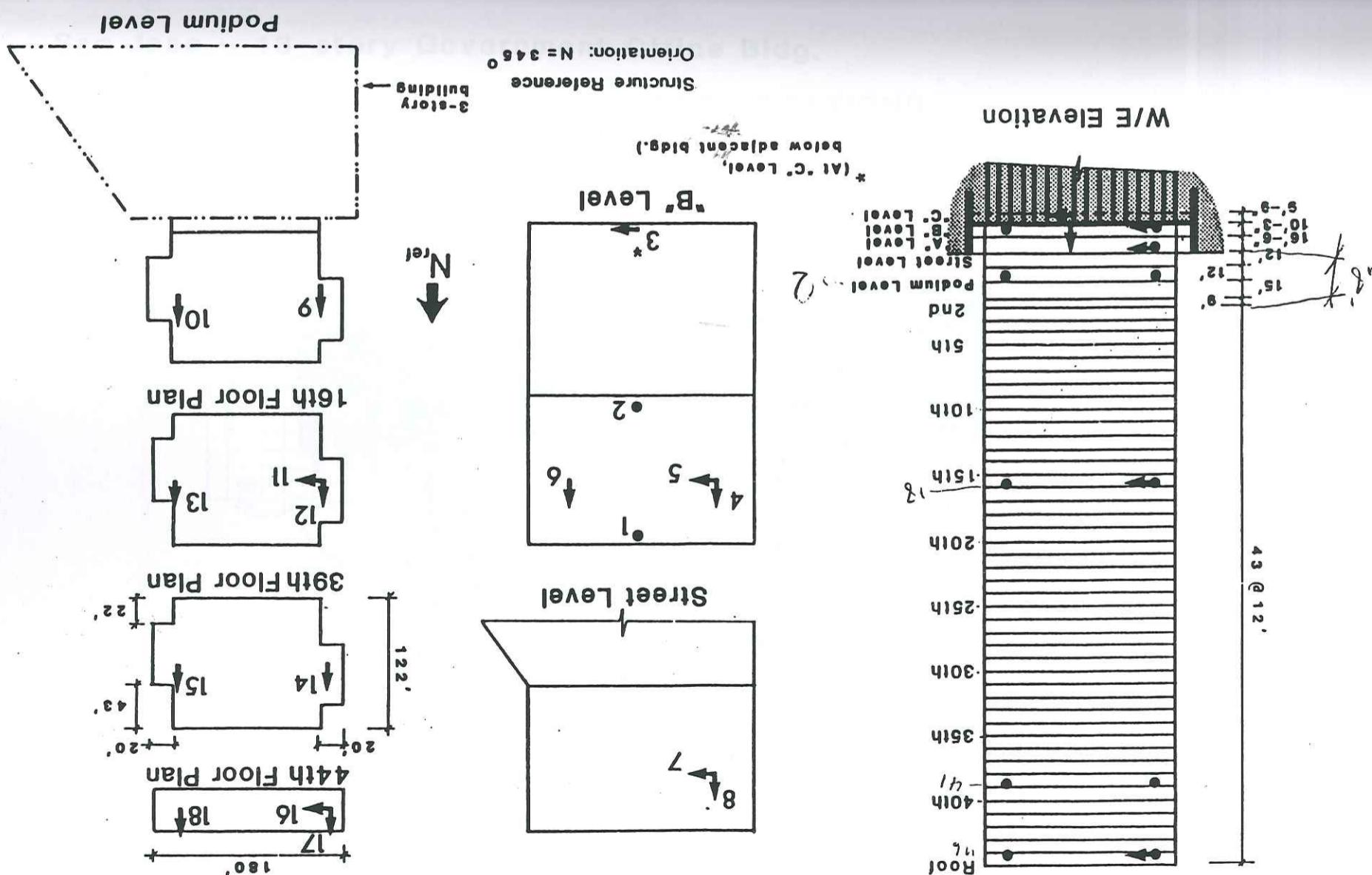
2.5" concrete over 3" metal decking supported by steel frames.

Lateral Force Resisting System:

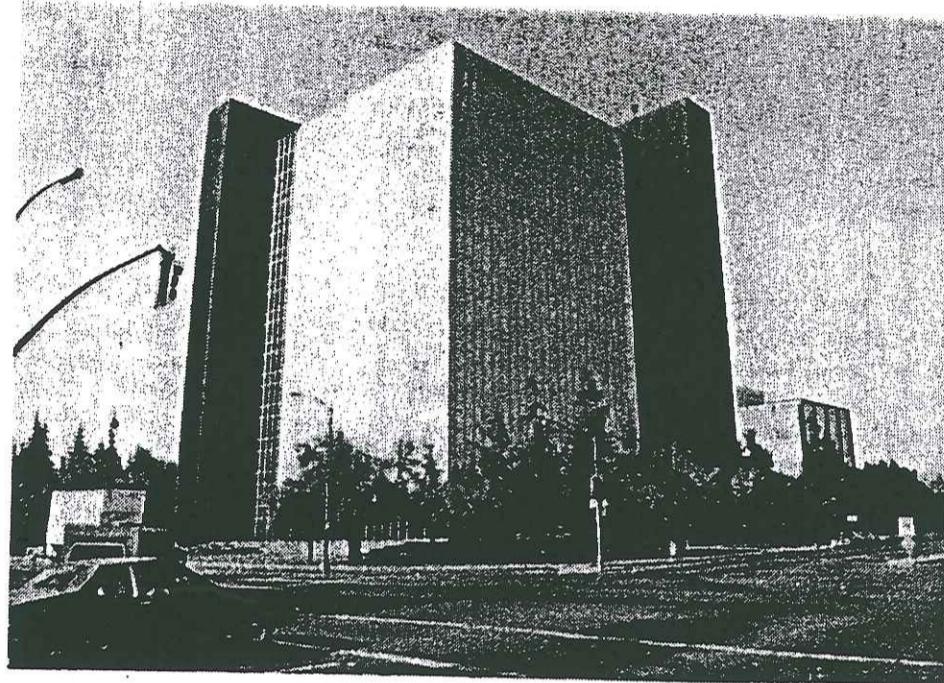
Moment-resisting steel frames in both directions; the frame is eccentrically braced at two center bays in the transverse direction.

Foundation Type:

5' reinforced concrete mat supported by composite concrete and steel piles (150 - 200' long)



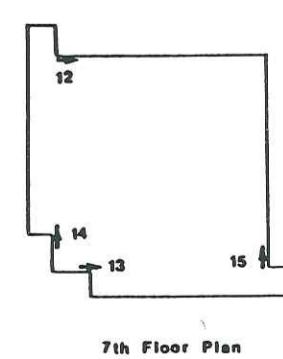
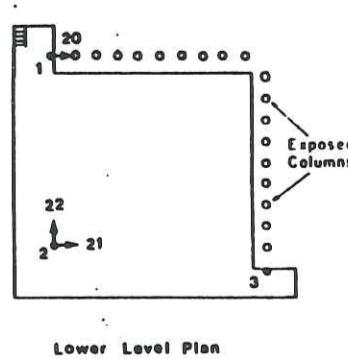
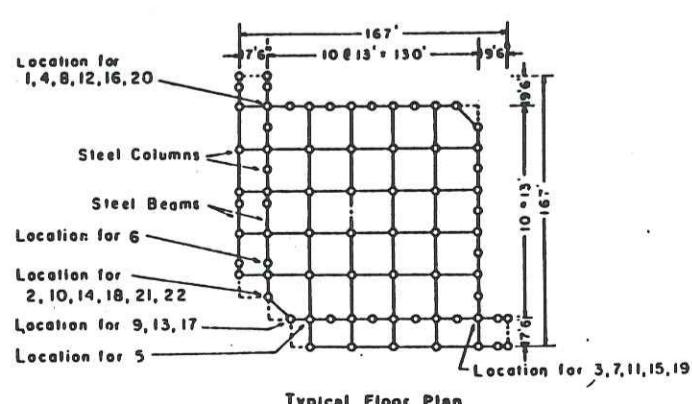
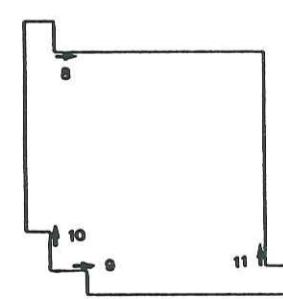
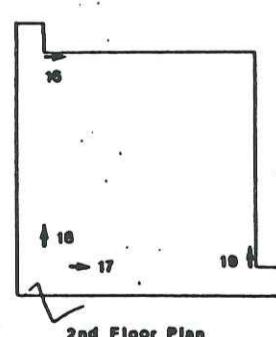
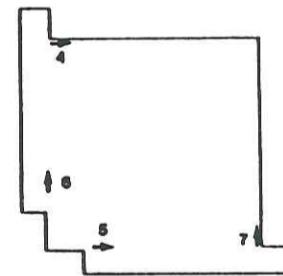
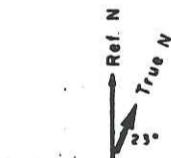
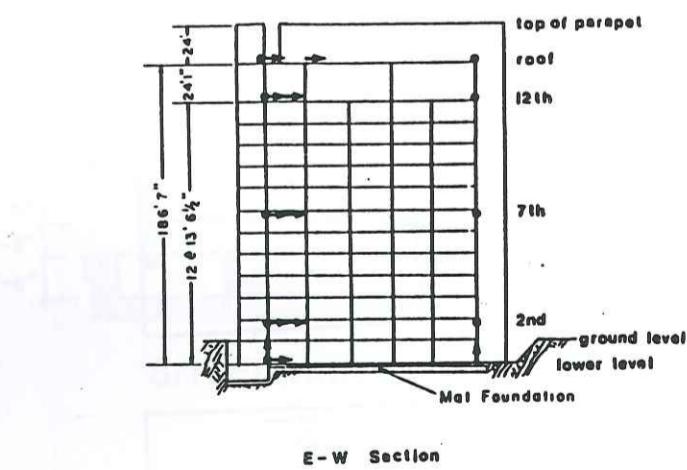
San Jose - 13-story Government Office Bldg.



San Jose - 13-story Government Office Bldg.

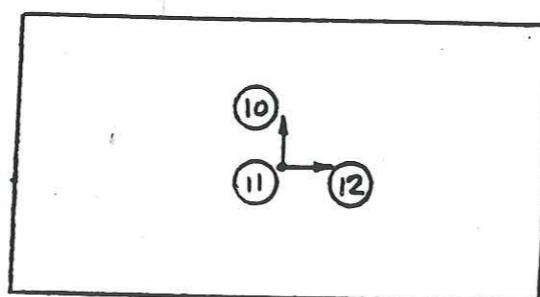
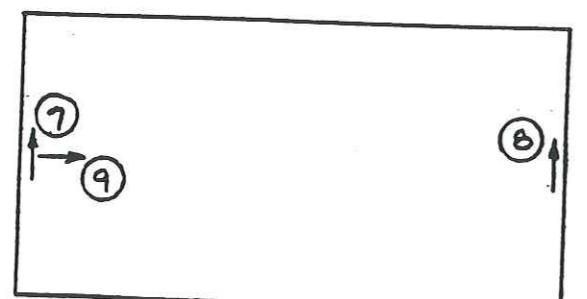
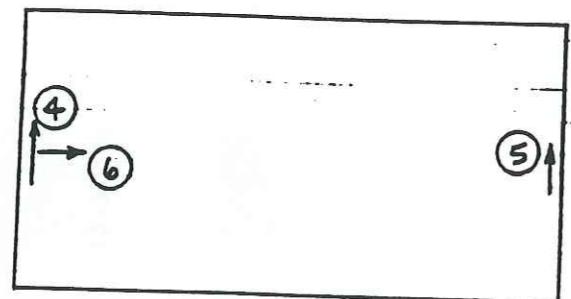
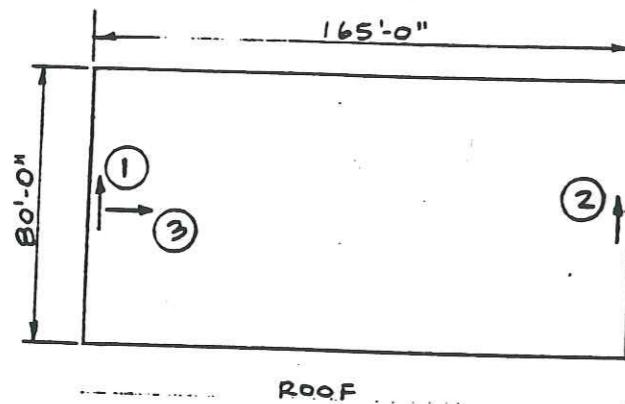
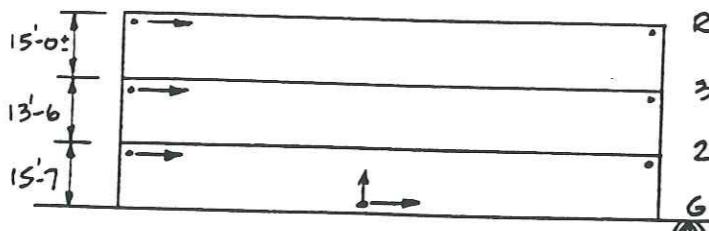
(CSMIP Station No. 57357)

SENSOR LOCATIONS



RICHMOND, CA
MEDICAL CENTER AT HILLTOP

2/26/85
RAGSDALE



TRACE- DIR	LOCATION		
1 E	STEEL BEAM BELOW ROOF		
2 E	" "	" "	"
3 S	" "	" "	"
4 E	STEEL BEAM BELOW 3RD		
5 E	" "	" "	"
6 S	" "	" "	"
7 E	STEEL BEAM BELOW 2ND		
8 E	" "	" "	"
9 S	" "	" "	"
10 E	GROUND FLOOR SLAB		
11 UP	" "	" "	"
12 S	" "	" "	"

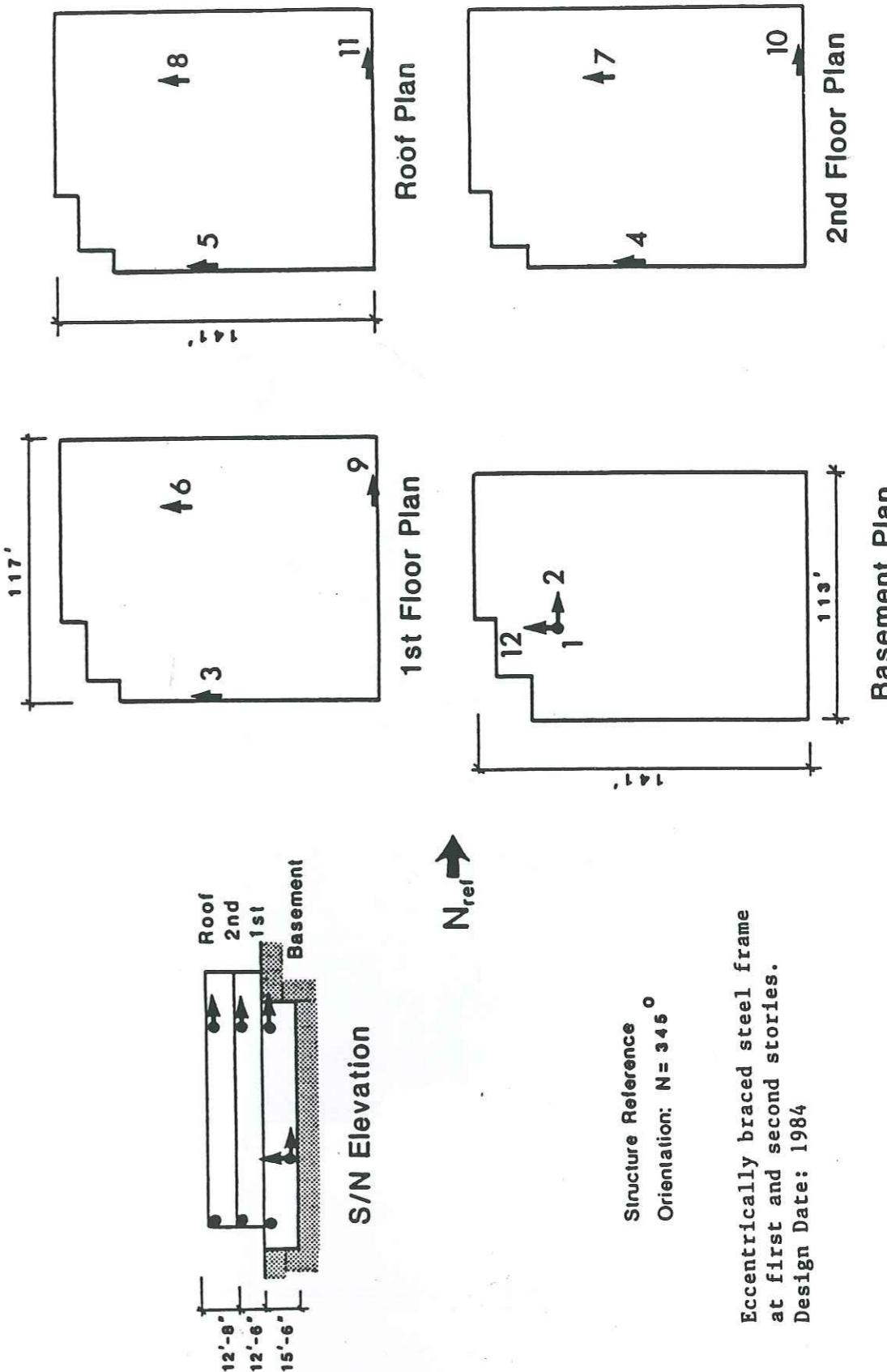
VERT. STARTER ON GROUND FLOOR SLAB, HORIZ. STARTER AT ROOF



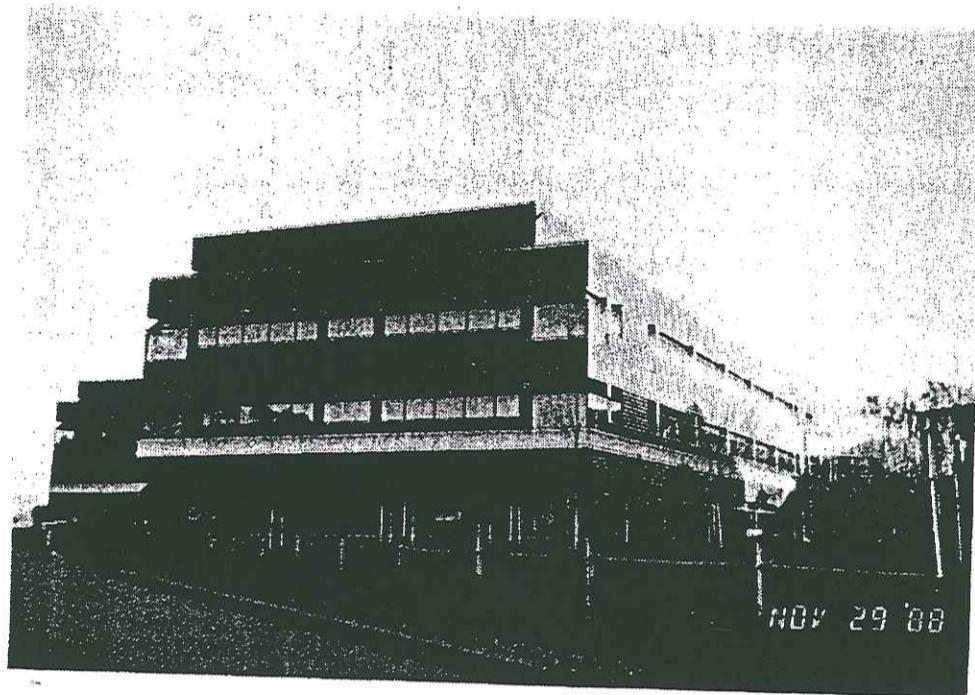
Berkeley - 2-story Hospital

(CSMIP Station No. 58496)

SENSOR LOCATIONS



San Jose - 3-story Office Bldg.



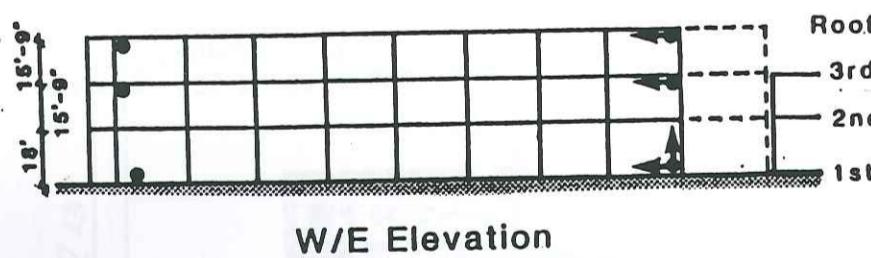
No. of Stories above/below ground: 3/0
 Plan Shape: Rectangular
 Base Dimensions: 250' x 93'
 Typical Floor Dimensions: Same as base
 Design Date: 1983
 Construction Date: 1984

Vertical Load Carrying System:
 Concrete slab on steel deck supported by steel frame.
 Lateral Force Resisting System:
 Moment-resistant steel frame with exterior cladding.
 Foundation Type:
 Spread footings.

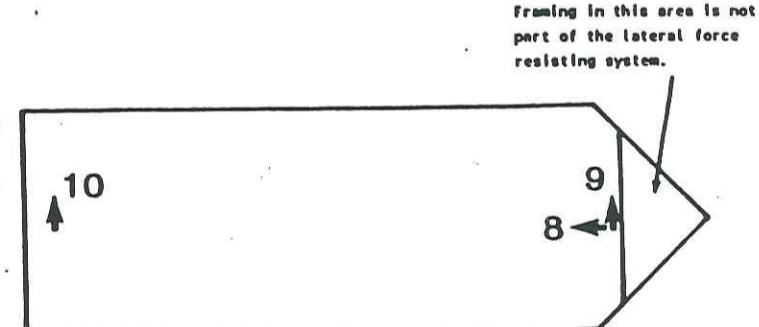
San Jose - 3-story Office Bldg.

(CSMIP Station No. 57562)

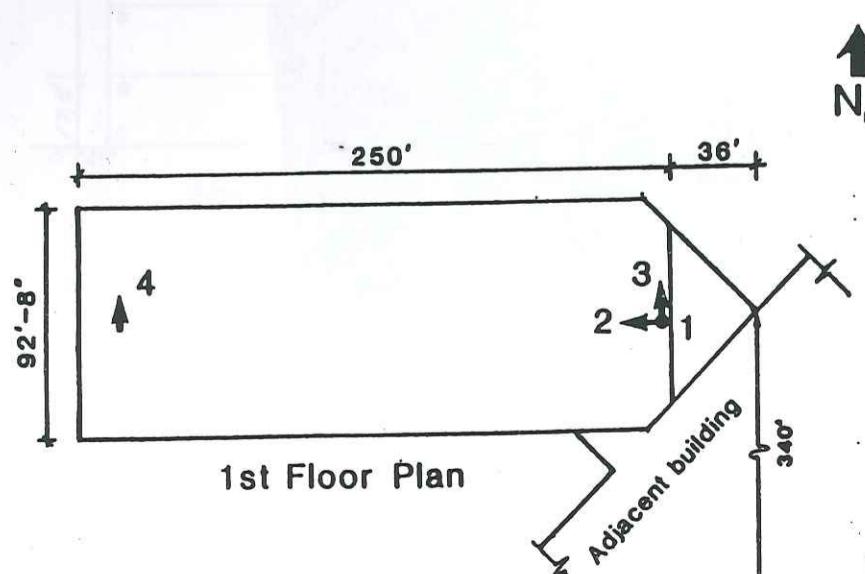
SENSOR LOCATIONS



W/E Elevation

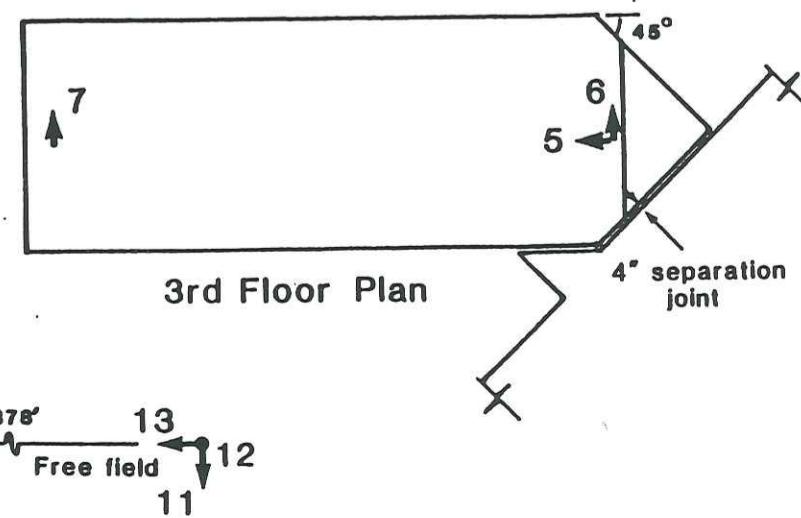


Roof Level Plan



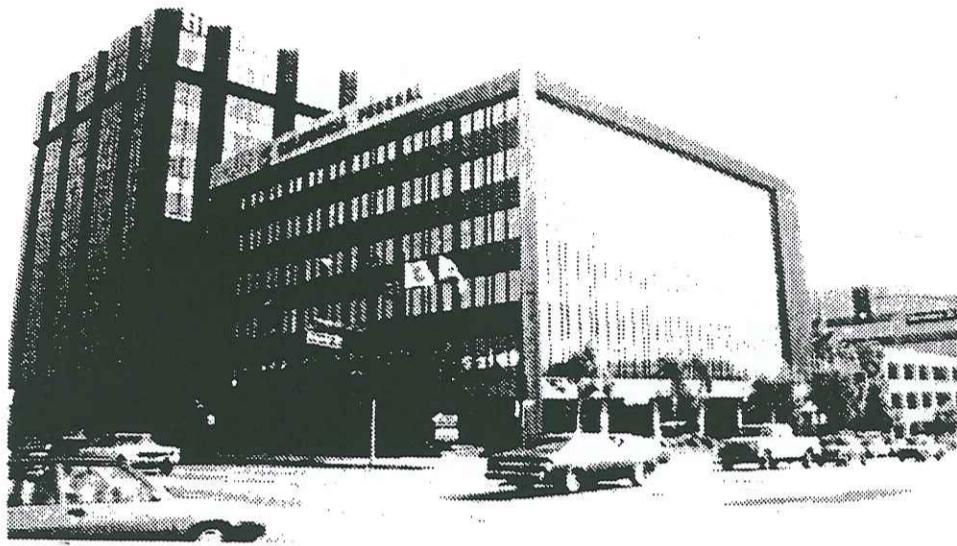
1st Floor Plan

Structure Reference
 Orientation: N = 45°



3rd Floor Plan

Burbank - California Federal Savings Bldg.



Structural Response - Area 1

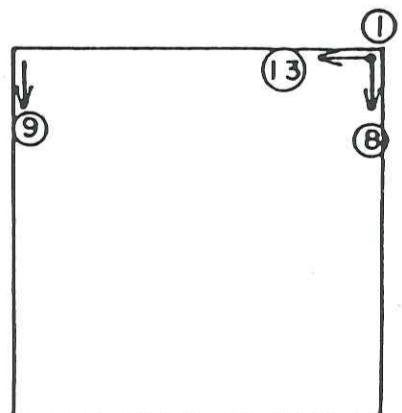
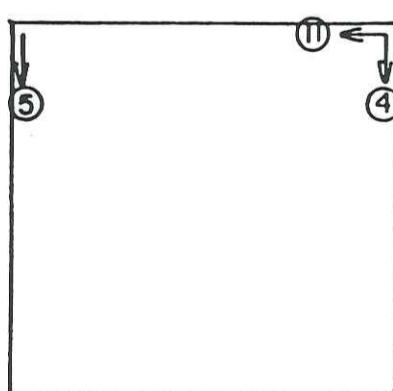
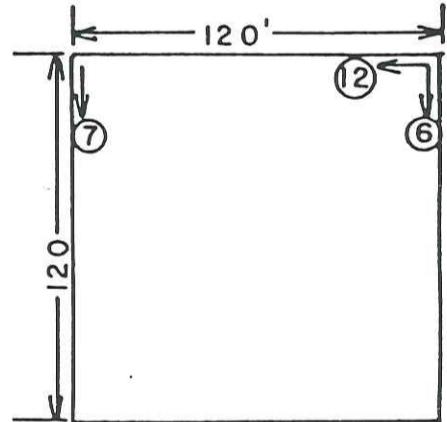
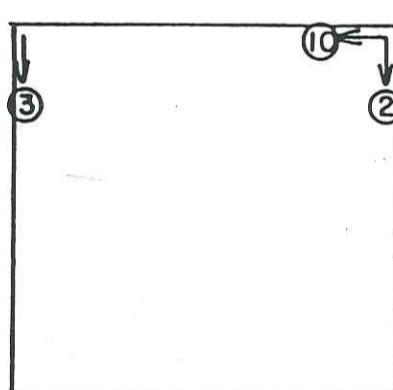
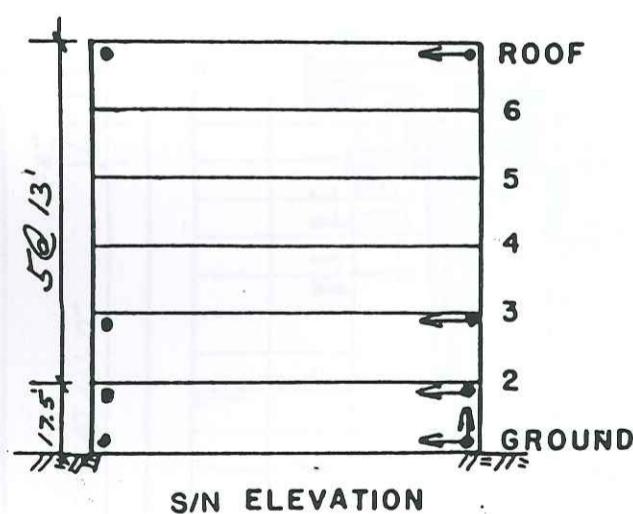
Address: 323 N. Glenoaks Blvd.
Burbank, CA
No. of Stories above/below
ground: 6/0
Plan Shape: Rectangular
Base Dimensions: 120' x 120'
Typical Floor Dimensions: Same
Design Date: 1976
Construction Date: 1977

- Vertical Load Carrying System:
 - 3" thick concrete slab over metal deck supported by steel frame.
- Lateral Force Resisting System:
 - Perimeter moment resisting steel frame.
- Foundation Type:
 - Concrete caissons (approx. 32' long).

Burbank – California Federal Savings Bldg.

(CSMIP Station No. 24370)

~~SENSOR LAYOUT~~



**Structure Reference
Orientation: N = 310°**

Long Beach - City Hall



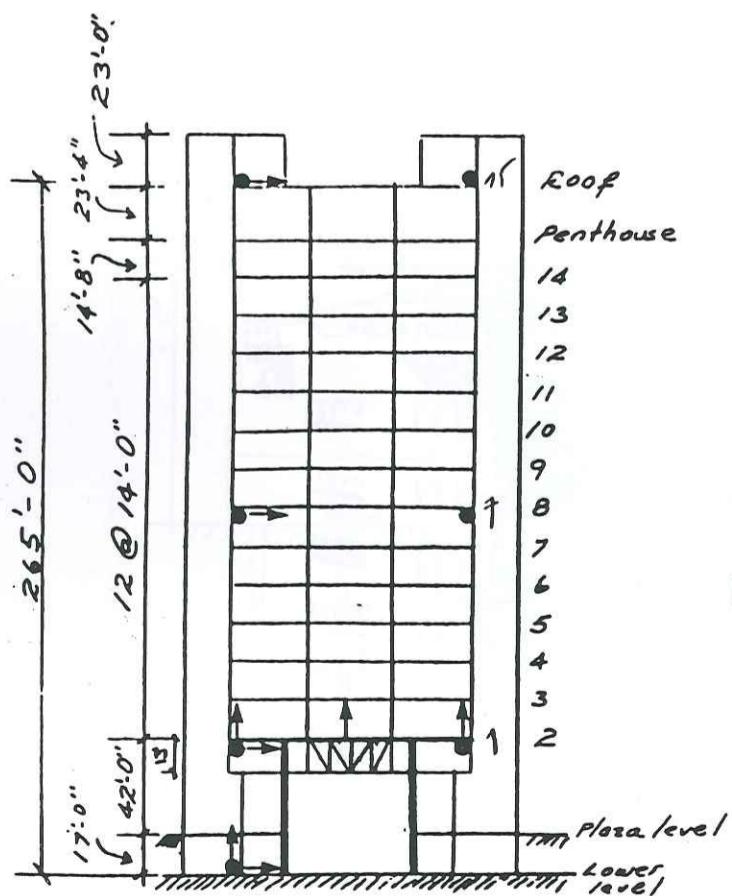
Address: 333 West Ocean Blvd.
Long Beach, CA
No. of Stories above/below
ground: 15/1
Plan Shape: Square
Base Dimensions: 106' x 106'
Typical Floor Dimensions: Same
Design Date: 1973
Construction Date: 1975-76

Vertical Load Carrying System:
Concrete slab on steel deck supported by steel
frame; steel frame towers on four corners of the
square with precast concrete exterior panels.
Lateral Force Resisting System:
Moment resisting steel frame.
Foundation Type:
Spread footings and drilled bell caissons.

Long Beach - City Hall

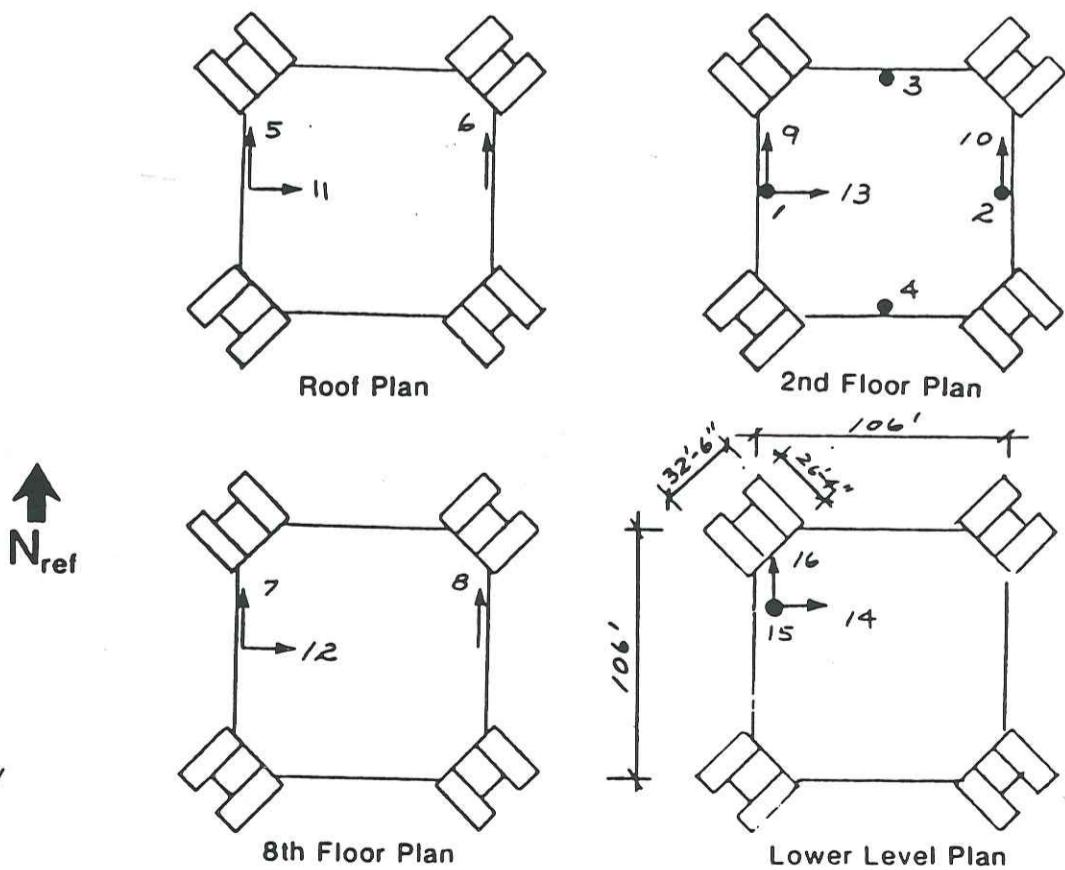
(CSMIP Station No. 14533)

SENSOR LAYOUT



W/E Elevation

Structure Reference
Orientation: N = 45°



Long Beach - Harbor Administration Building



Structural Response - Area 1

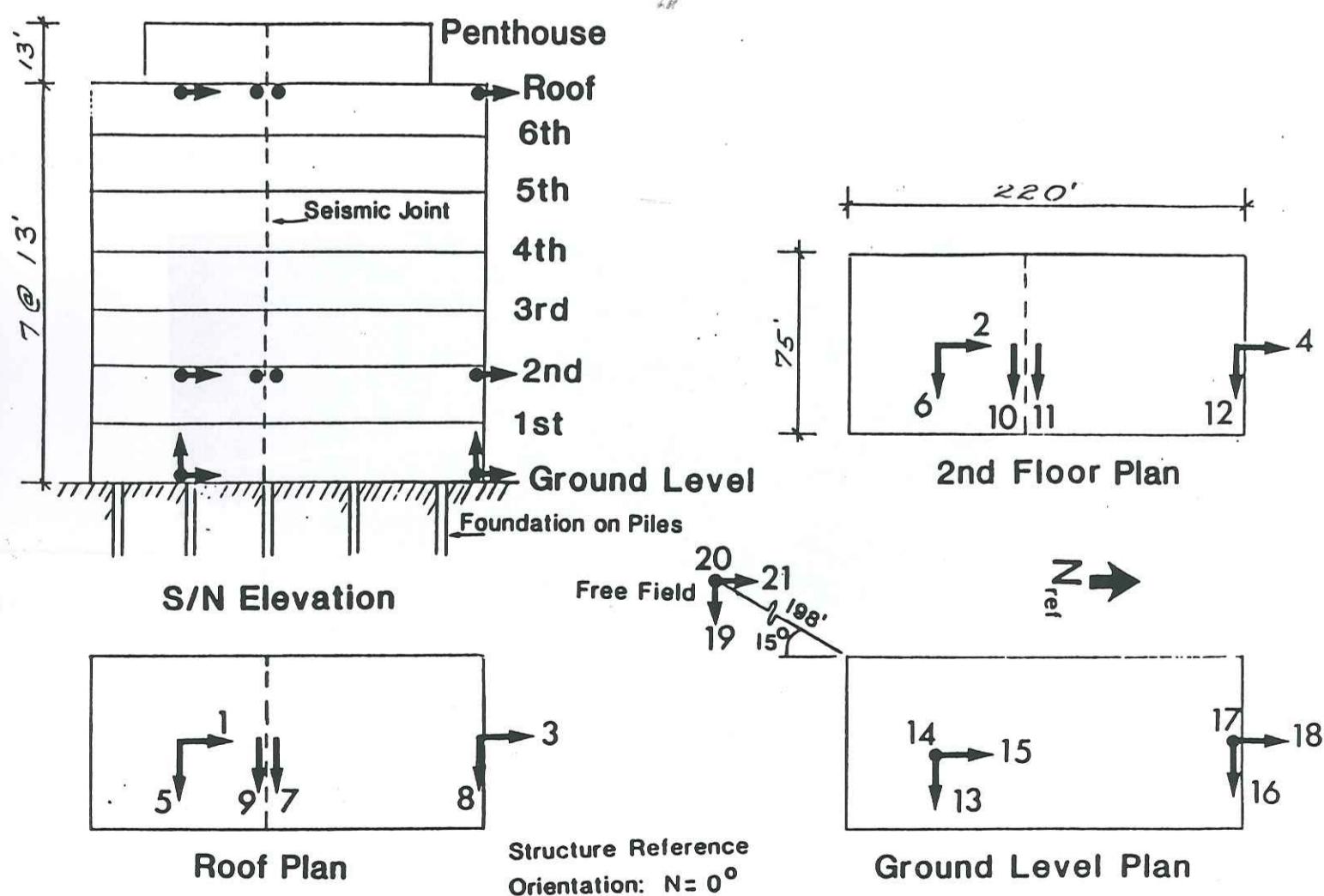
Address: 925 Harbor Plaza
Long Beach, CA
No. of Stories above/below ground: 7/0
Plan Shape: Rectangular
Base Dimensions: 220' x 75'
Typical Floor Dimensions: Same
Design Date: 1967
Construction Date: 1970

Vertical Load Carrying System:
7" thick concrete slabs supported by steel frame.
Lateral Force Resisting System:
Steel frame.
Foundation Type:
Concrete piles.

Long Beach - Harbor Admin. Bldg.

(CSMIP Station No. 14323)

SENSOR LAYOUT



Rancho Cucamonga - San Bernardino County Law and Justice Center

Structural Response - Area 2



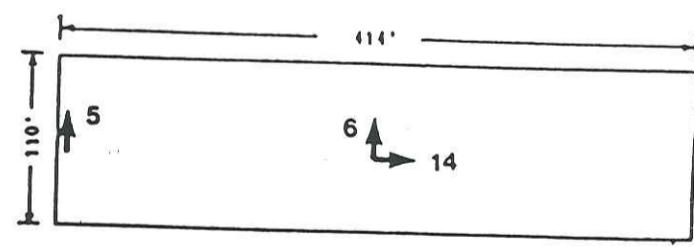
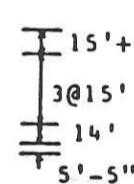
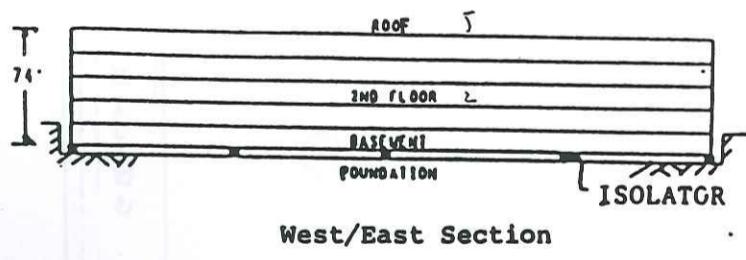
Address: 8202 Aspen Street
Rancho Cucamonga, CA
No. of Stories above/below
ground: 4/1
Plane Shape: Rectangular
Base Dimensions: 414' x 110'
Typical Floor Dimensions: Same
Design Date: 1983
Construction Date: 1985

Vertical Load Carrying System:
Concrete slabs over steel deck supported
by steel beams and columns on elastomeric
bearings.
Lateral Force resisting System:
Braced steel frame in upper four stories;
concrete shear walls at basement;
base isolated on elastomeric bearings.
Foundation Type:
Spread footings.

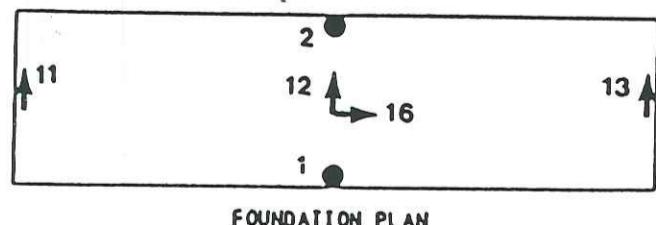
Rancho Cucamonga - Law and Justice Center

(CSMIP Station No. 23497)

SENSOR LAYOUT



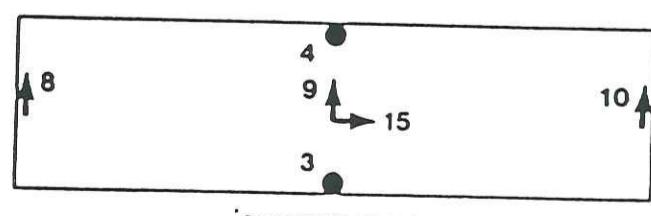
Structure Reference
Orientation: N=0°



N_{ref}

7

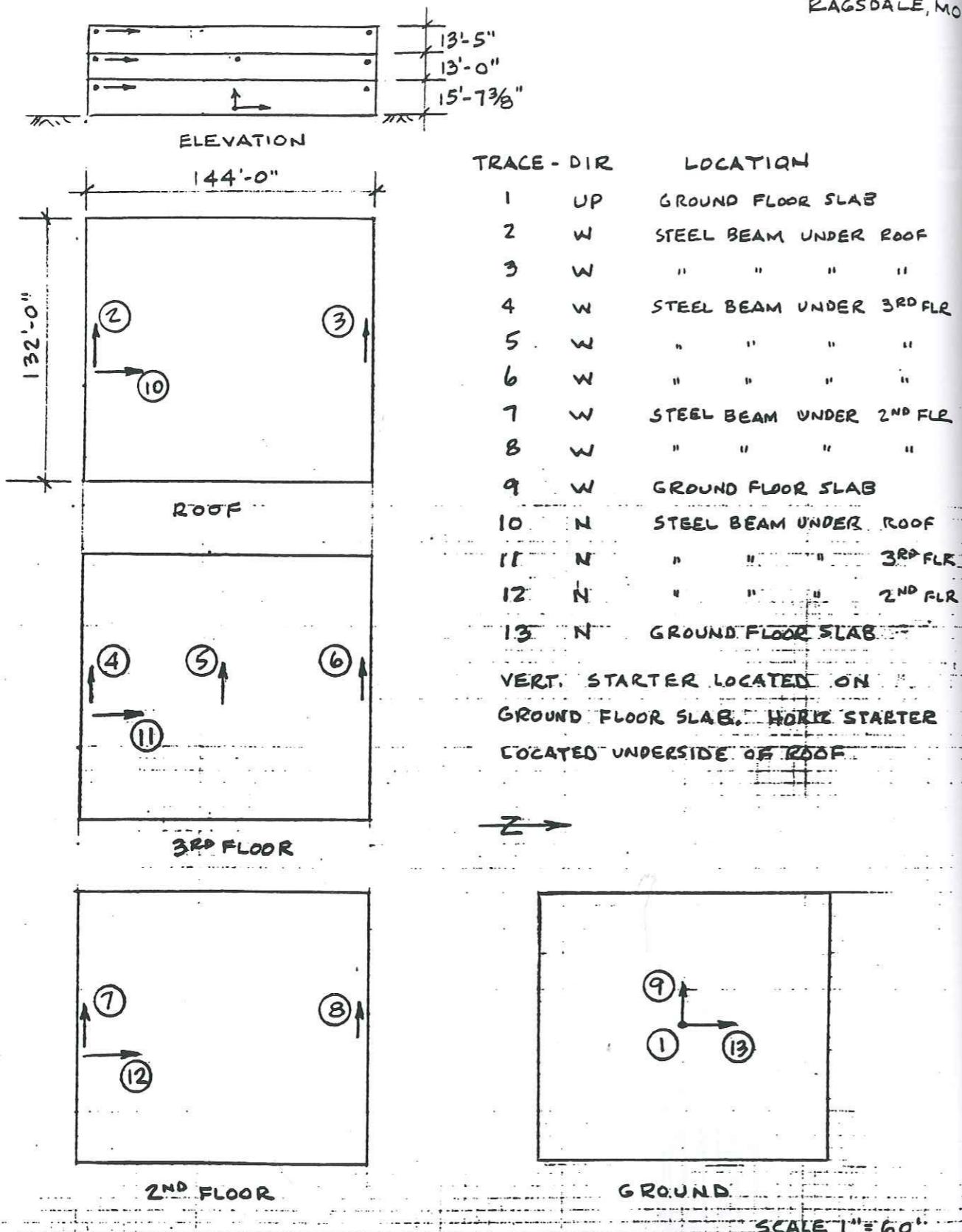
2ND FLOOR PLAN



330°
48°
FREE FIELD
19
18
17

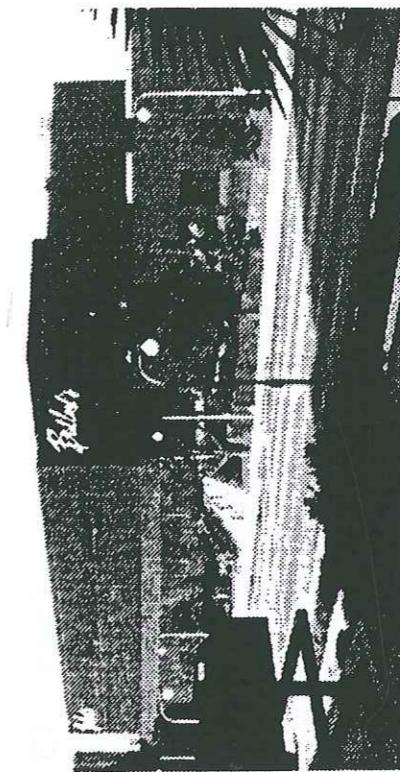
SAN BERNARDINO, SUN WEST OFFICE BLDG #1

5/9/86
RAGSDALE, MO



Los Angeles - Century City Bullock Department Store

Structural Response - Area 1



Address: 10250 Santa Monica Blvd.

Los Angeles, CA

No. of Stories above/below

ground: 3/2

Plan Shape: Rectangular

Base Dimensions:

520'x227' (2-story parking garage)

Typical Floor Dimensions:

241'x219' (3-story department store)

Design Date: 1974

Construction Date: 1975-76

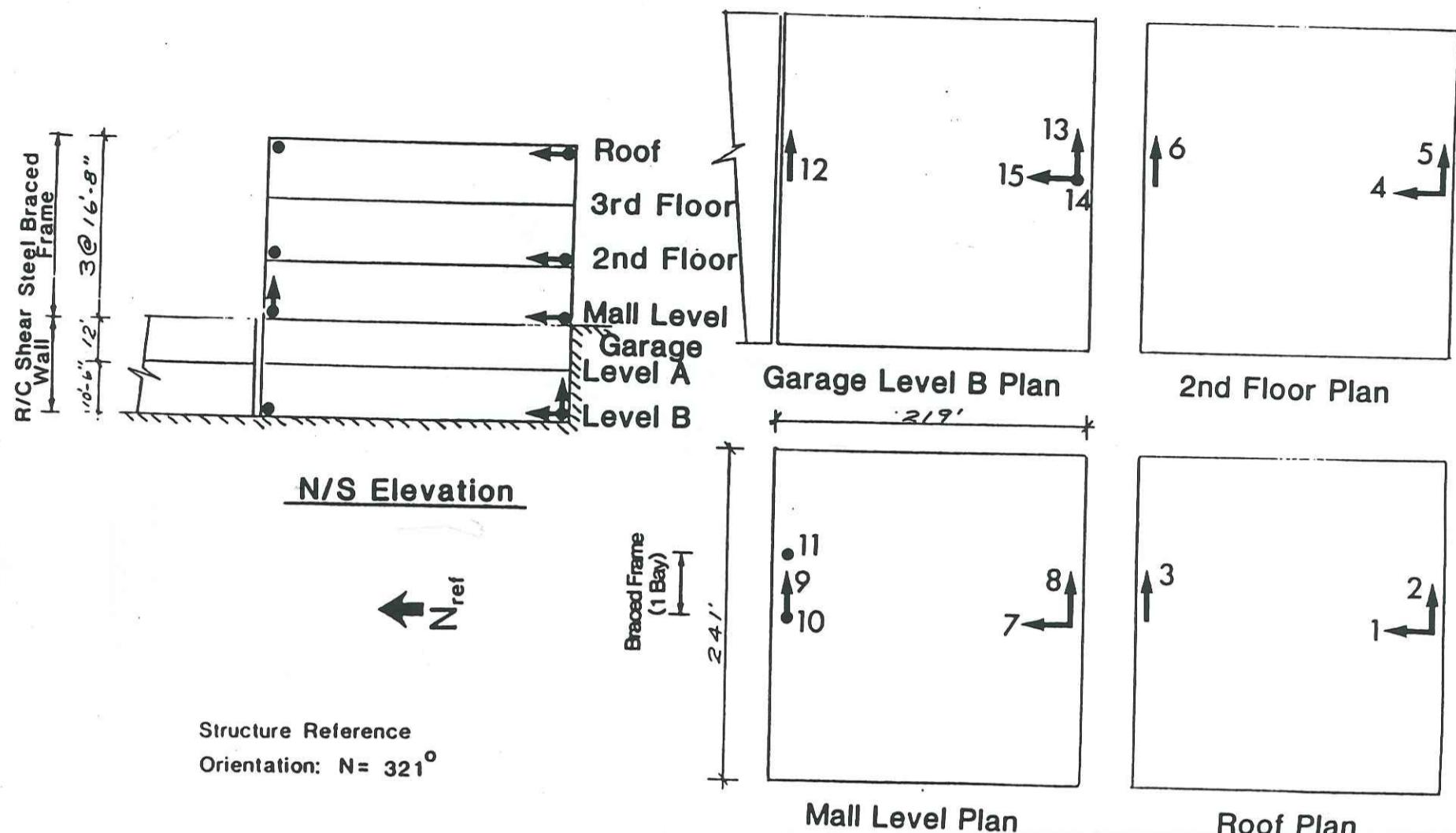
Vertical Load Carrying System:
Upper 3 stories: steel deck with 3 1/4" lightweight concrete slab supported by steel frame.
Lower 2 stories: 18" thick waffle slabs.

Lateral Force Resisting System:
Upper 3 stories: steel braced frame (perimeter only). Lower 2 stories: concrete shear walls.

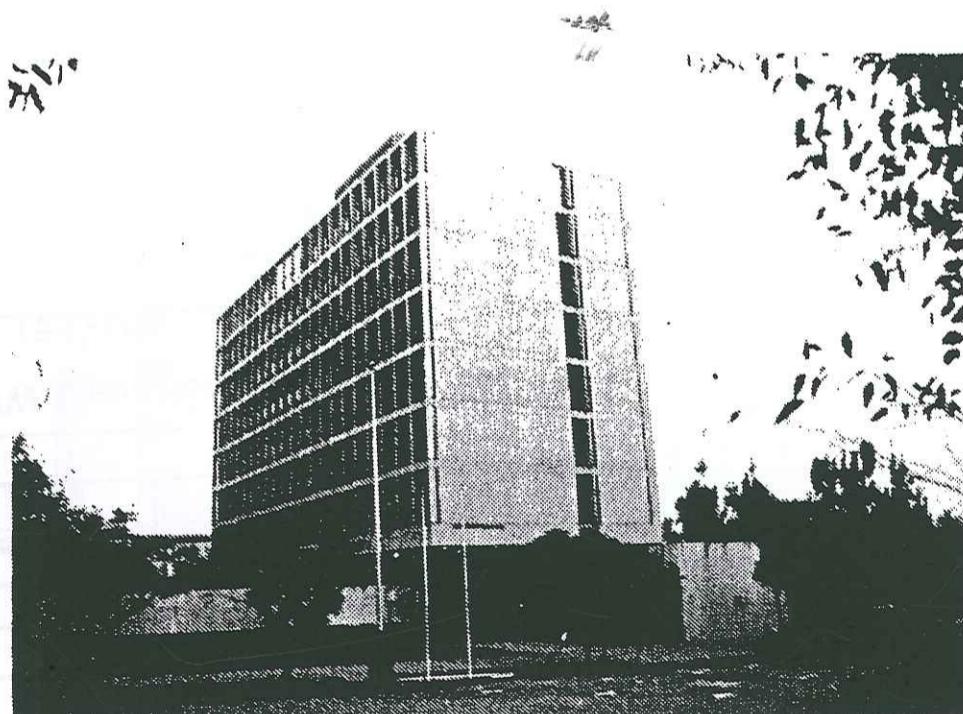
Foundation Type:
Spread footings and drilled bell caissons.

Los Angeles - Century City Bullock Dept. Store
 (CSMIP Station No. 24332)

SENSOR LAYOUT



Los Angeles - CSULA Administration Bldg.



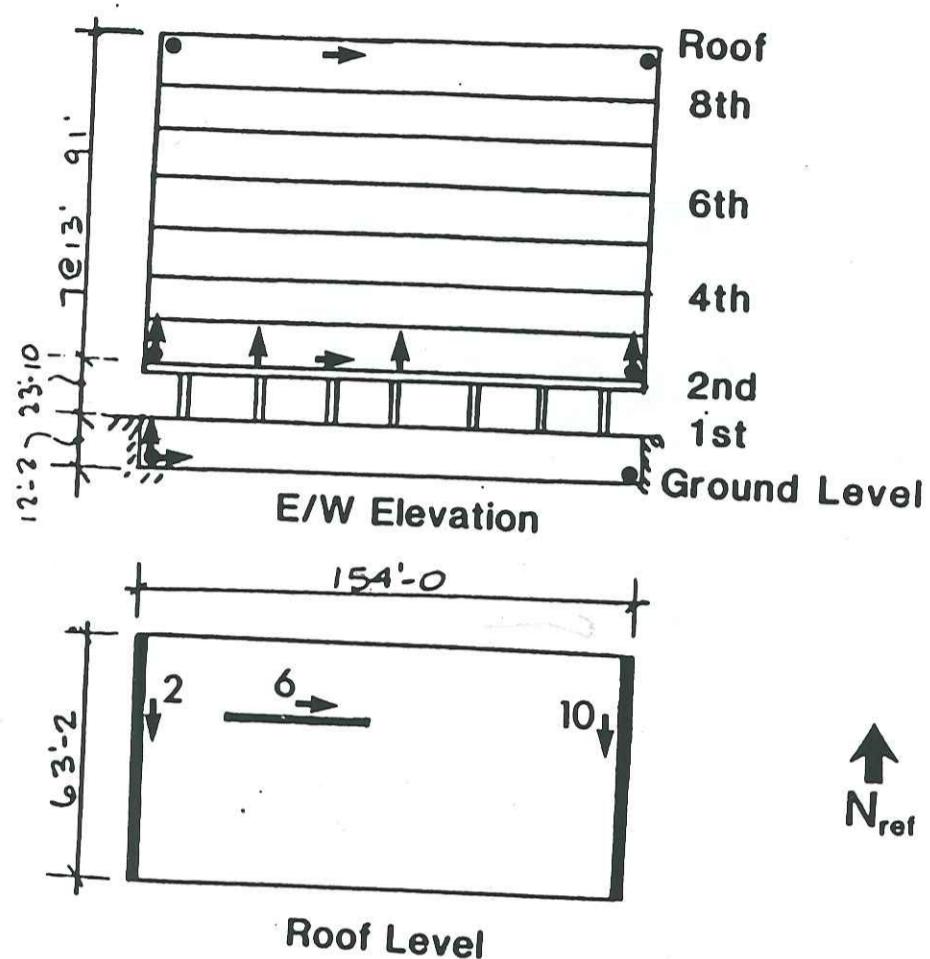
Address: Calif. State University at LA
 Los Angeles, CA
 No. of Stories above/below
 ground: 8/1
 Plan Shape: Rectangular
 Base Dimensions: Irregular base shape
 Typical Floor Dimensions: 154' x 63'
 Design Date: 1967
 Construction Date: 1969

Vertical Load Carrying System:
 Concrete slabs supported by concrete beams
 and columns.
 Lateral Force Resisting System:
 Concrete shear walls except between levels
 1 and 2 where composite concrete/steel
 columns resist lateral forces.
 Foundation Type:
 Spread footings and concrete caissons.

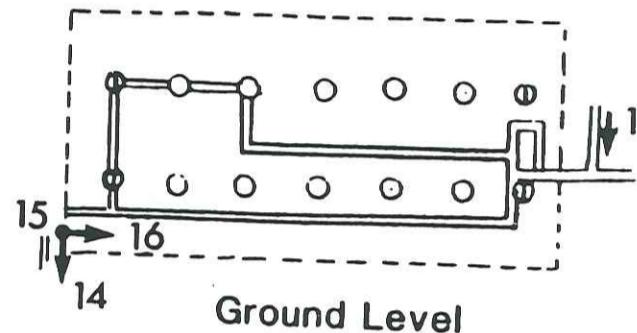
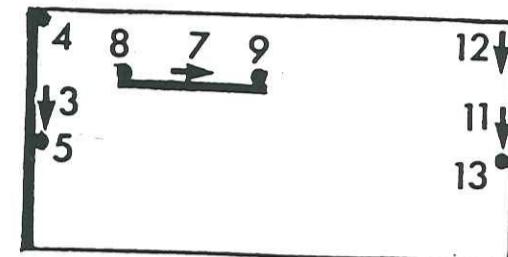
Los Angeles - CSULA Admin. Bldg.

(CSMIP Station No. 24468)

SENSOR LAYOUT



Structure Reference
Orientation: N = 0°



San Jose - 10-story Residential Bldg.



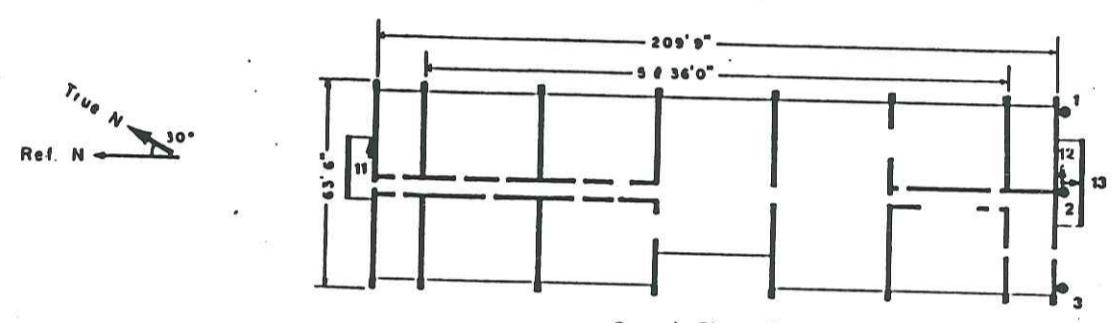
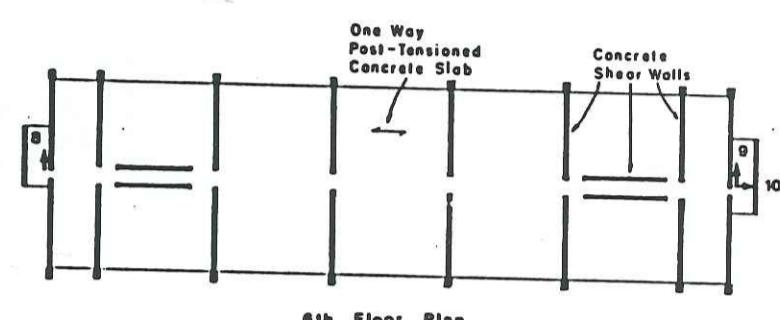
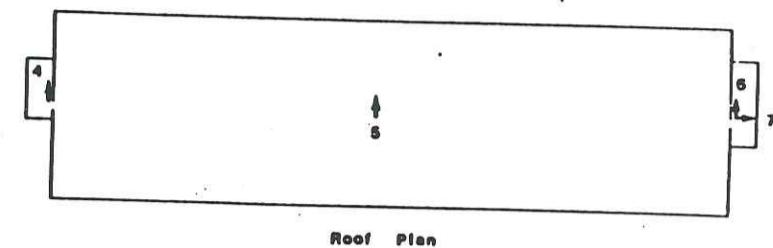
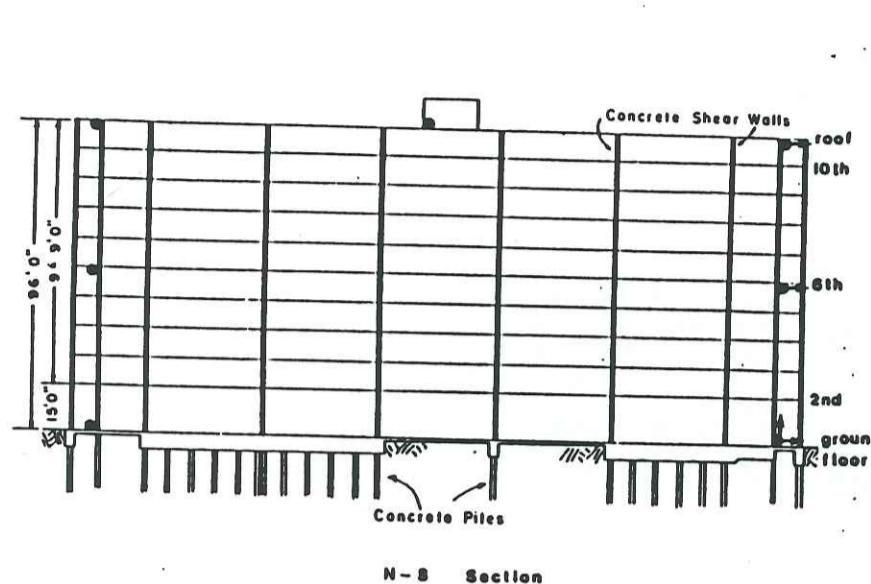
No. of Stories above/below ground: 10/0
Plan Shape: Rectangular
Base Dimensions: 210' x 64'
Typical Floor Dimensions: Same as base
Design Date: 1971
Construction Date: 1971-72

Vertical Load Carrying System:
One-way post-tensioned flat slabs on reinforced concrete bearing walls.
Lateral Force Resisting System:
Concrete shear walls at regular intervals in transverse direction, and along interior corridors in longitudinal direction.
Foundation Type:
Precast-prestressed concrete piles under all walls.

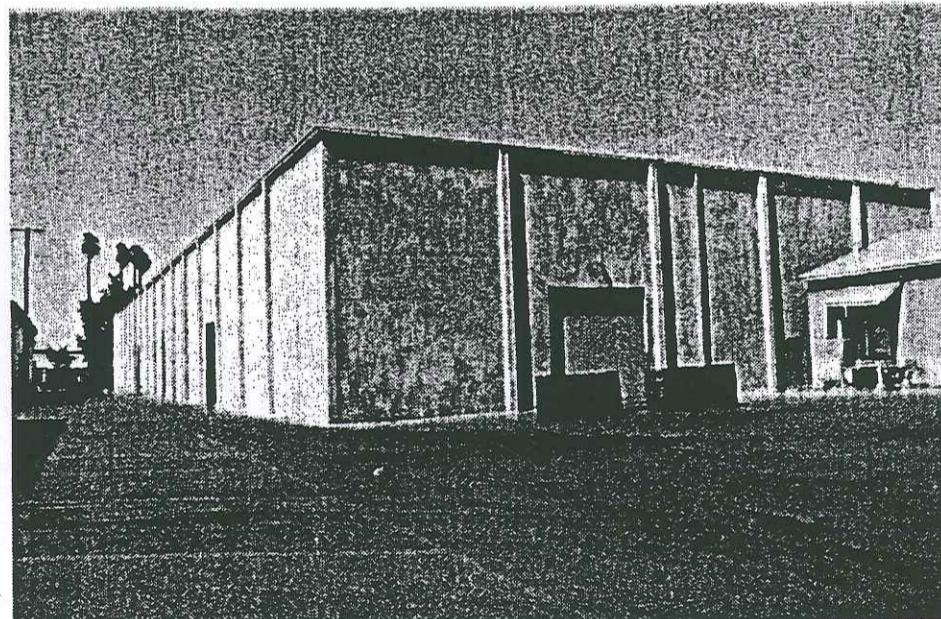
San Jose - 10-story Residential Bldg.

(CSMIP Station No. 57356)

SENSOR LOCATIONS



Hollister - 1-story Warehouse



No. of Stories above/below
ground: 1/0

Plan Shape: Rectangular

Base Dimensions: 300' x 100'

Typical Floor Dimensions: Same as base

Design Date: 1979

Construction Date: 1979

Vertical Load Carrying System:

Glulam Beams, wood joists, interior steel columns, and perimeter tilt-up concrete walls.

Lateral Force Resisting System:

Concrete tilt-up shear walls on perimeter; plywood roof diaphragm.

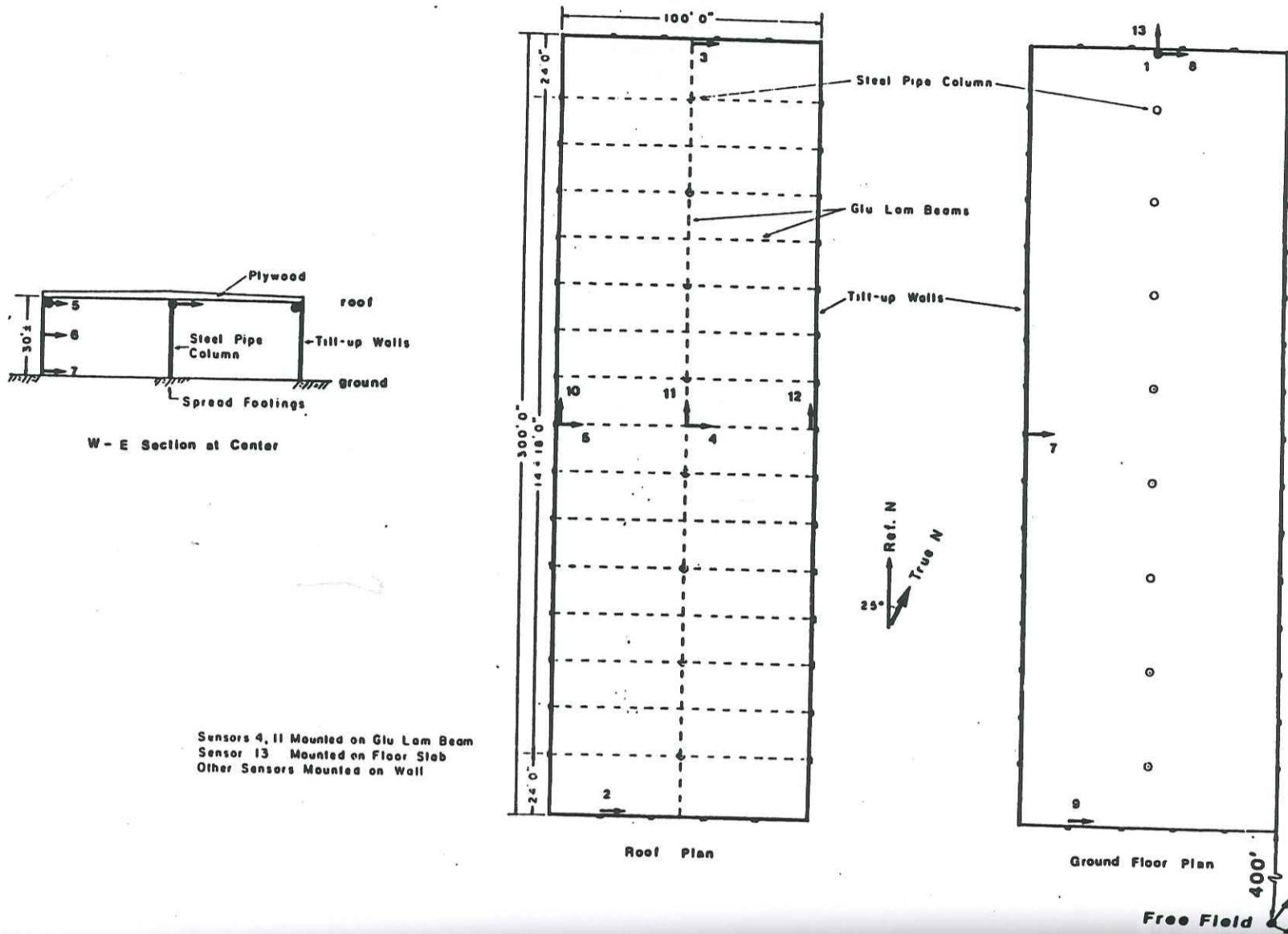
Foundation Type:

Spread footings.

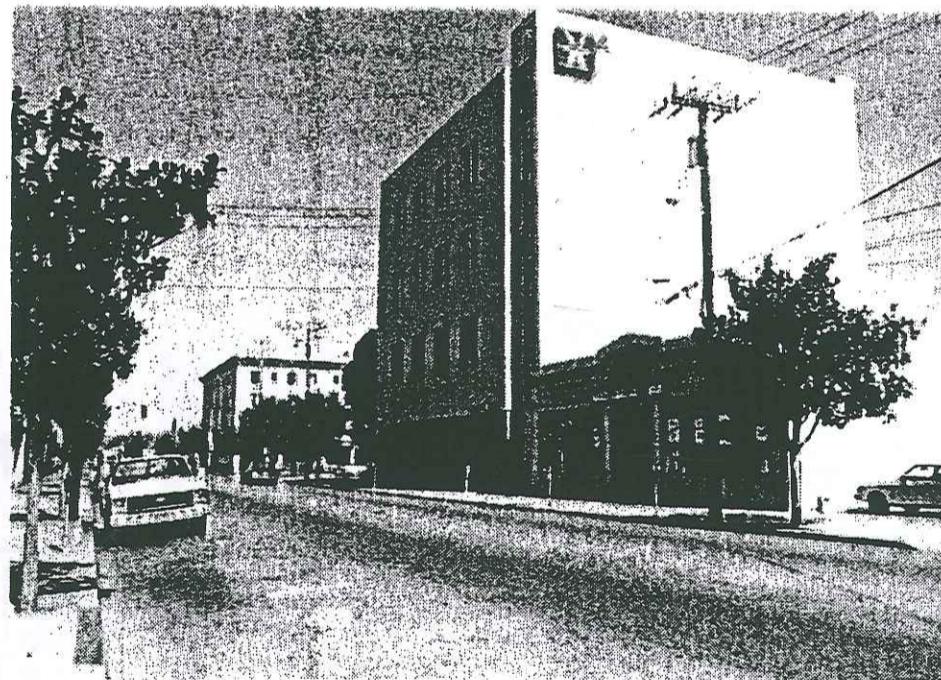
Hollister - 1-story Warehouse

(CSMIP Station No. 47391)

SENSOR LOCATIONS



Watsonville - 4-story Commercial Bldg.



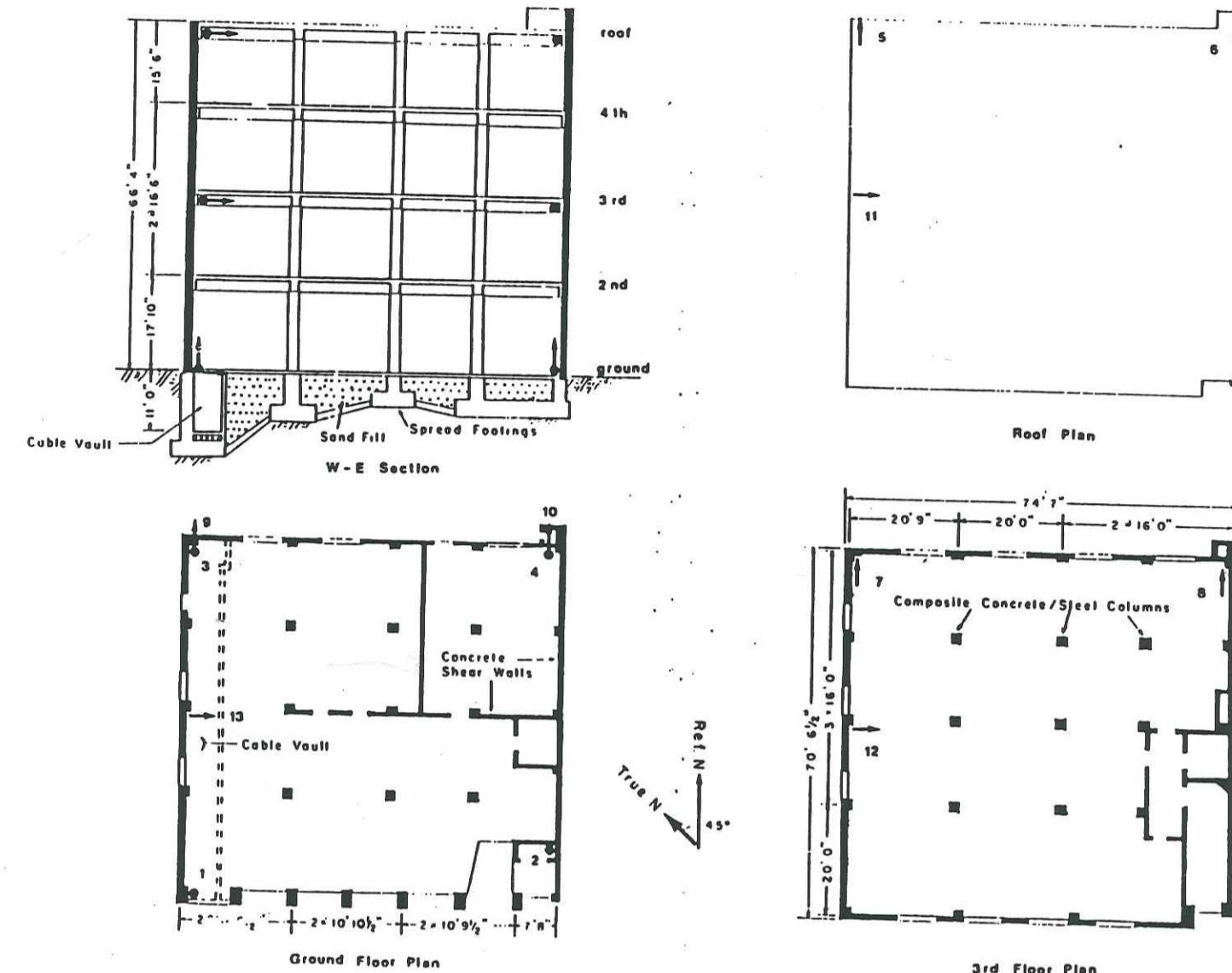
No. of Stories above/below ground: 4/0
 Plan Shape: Rectangular
 Base Dimensions: 75' x 71'
 Typical Floor Dimensions: Same as base
 Design Date: 1948 & 1955
 Construction Date: 1948 & 1955
 Note: 4th story was added in 1955

Vertical Load Carrying System:
 Composite concrete/steel beams,
 girders and columns; concrete slabs.
 Lateral Force Resisting System:
 Concrete shear walls.
 Foundation Type:
 Spread footings.

Watsonville - 4-story Commercial Bldg.

(CSMIP Station No. 47459)

SENSOR LOCATIONS



San Bruno - 9-story Government Office Bldg.



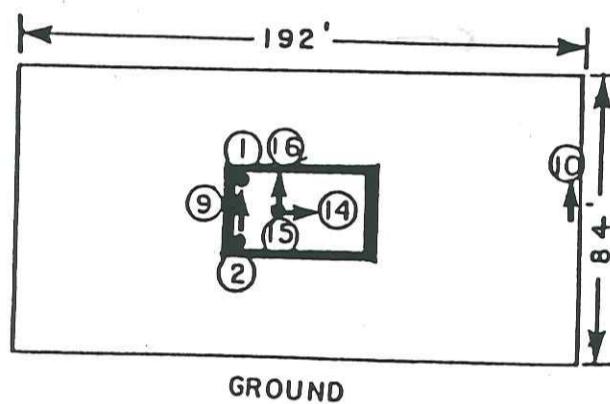
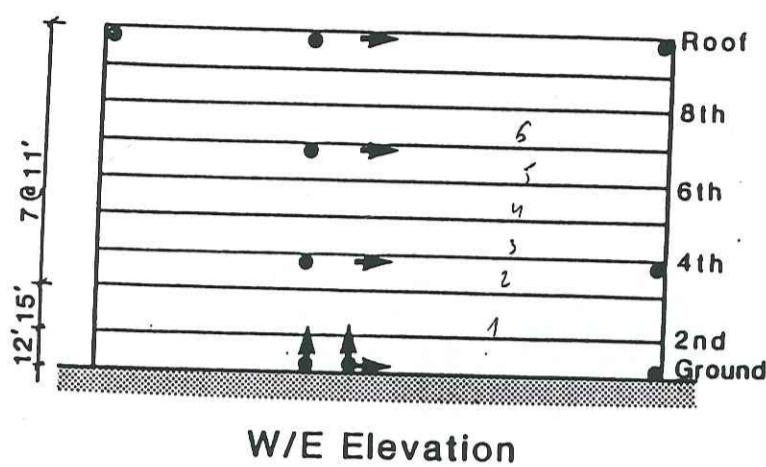
No. of Stories above/below
ground: 9/0
Plan Shape: Rectangular
Base Dimensions: 192' x 84'
Typical Floor Dimensions: Same as base
Design Date: 1972
Construction Date: 1972

Vertical Load Carrying System:
8" and 9" post-tensioned light-weight
concrete flat slabs; concrete columns.
Lateral Force Resisting System:
Center core concrete shear walls.
Foundation Type:
Mat foundation.

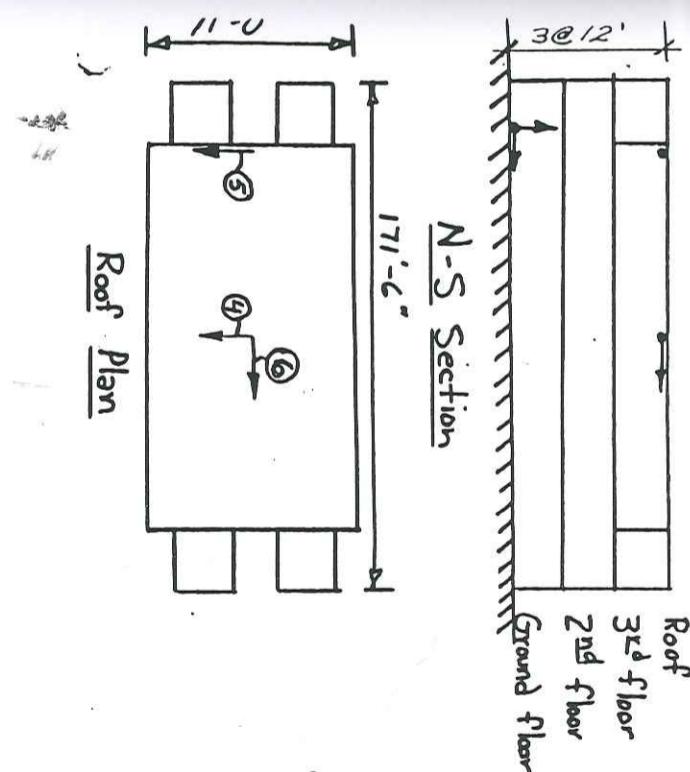
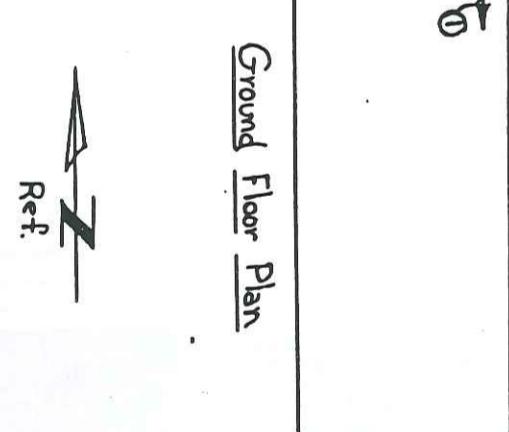
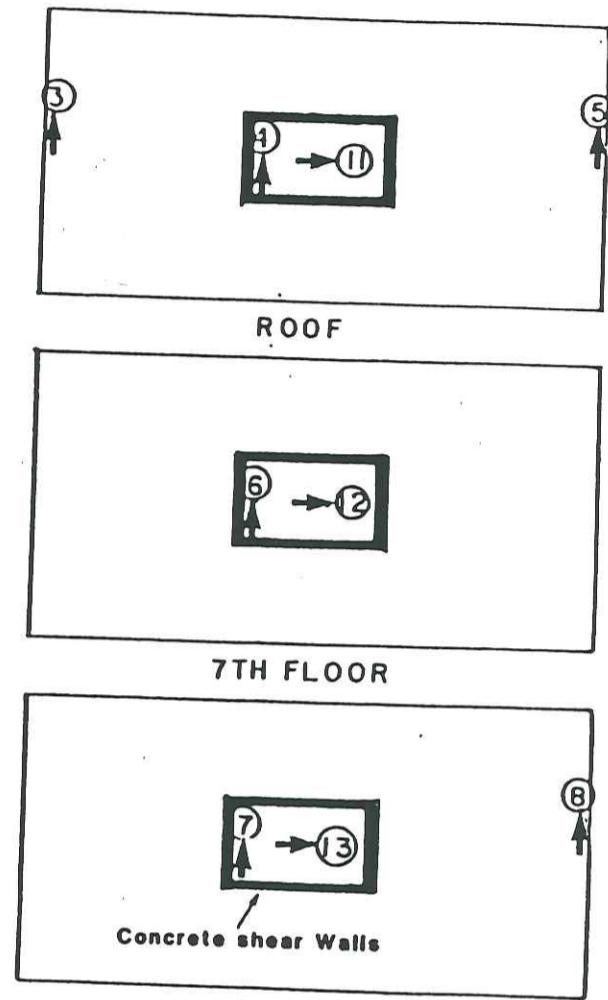
San Bruno - 9-story Government Office Bldg.

(CSMIP Station No. 58394)

SENSOR LOCATIONS



Structure Reference
Orientation: N = 335°



Recorder trace order:
Accelerometer 1
Fixed trace 1
Accelerometer 2
Fixed trace 2
Accelerometer 3
Fixed trace 3
Accelerometer 4
Fixed trace 4
Accelerometer 5
Fixed trace 5
Accelerometer 6

Note: Accelerometers 1, 2 & 3 located on ground floor slab. Accelerometers 4, 5 & 6 attached to underside of roof slab.
Horizontal starter adjacent to accelerometers 4 and 6. Vertical starter & recorder adjacent to triaxial package on ground floor

Strong-Motion Instrumentation Scheme

Building 13 (K)
Canada College
Redwood City/Woodside, CA

Hayward - 6-story Office Bldg.



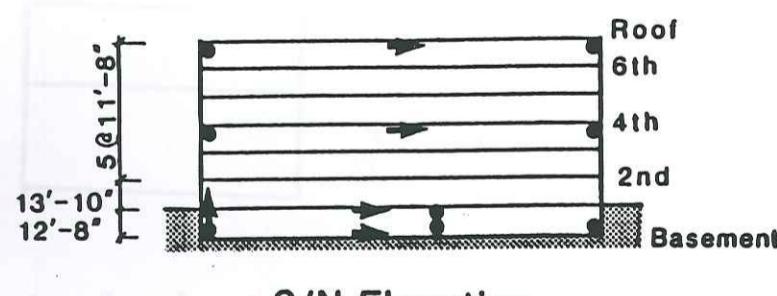
No. of Stories above/below ground: 6/1
 Plan Shape: Rectangular
 Base Dimensions: 218' x 92'
 Typical Floor Dimensions: 218' x 92'
 Design Date: 1966
 Construction Date: 1967

Vertical Load Carrying System:
 Concrete waffle floors with 4" slabs and 10" deep two way joists; concrete columns.
 Lateral Force Resisting System:
 Concrete shear walls.
 Foundation Type:
 Spread footings under columns; combined footings under shear walls.

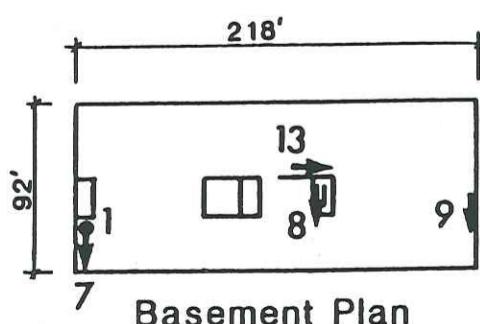
Hayward - 6-story Office Bldg.

(CSMIP Station No. 58462)

SENSOR LOCATIONS

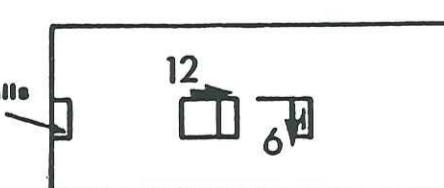
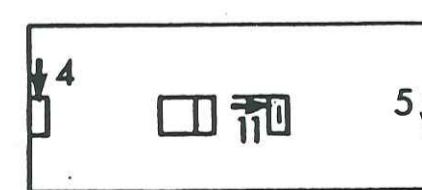
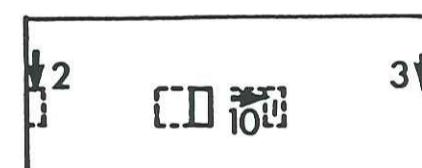


S/N Elevation

 $N_{ref} \rightarrow$

Concrete Shear Walls

Structure Reference
 Orientation: N = 335°



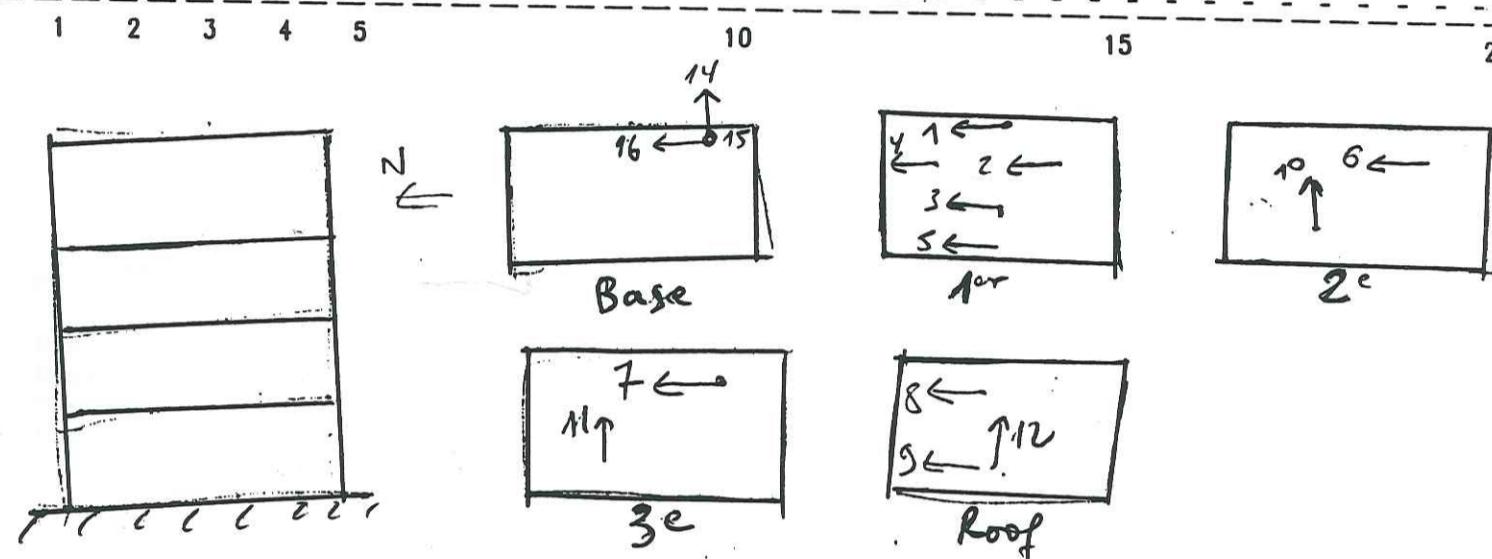
Hayward - 4-story School Bldg.
(CSMIP Station 58488)

Record 58488-S3508-89292.01

00:04:33 GMT

14	Ground Floor: East End - E Max. Accel. = 0.04 g		
15	"	"	- Up 0.03 g
16	"	"	- N 0.05 g

Structure Reference Orientation: N=335°



Oakland - 24-story Residential Bldg.

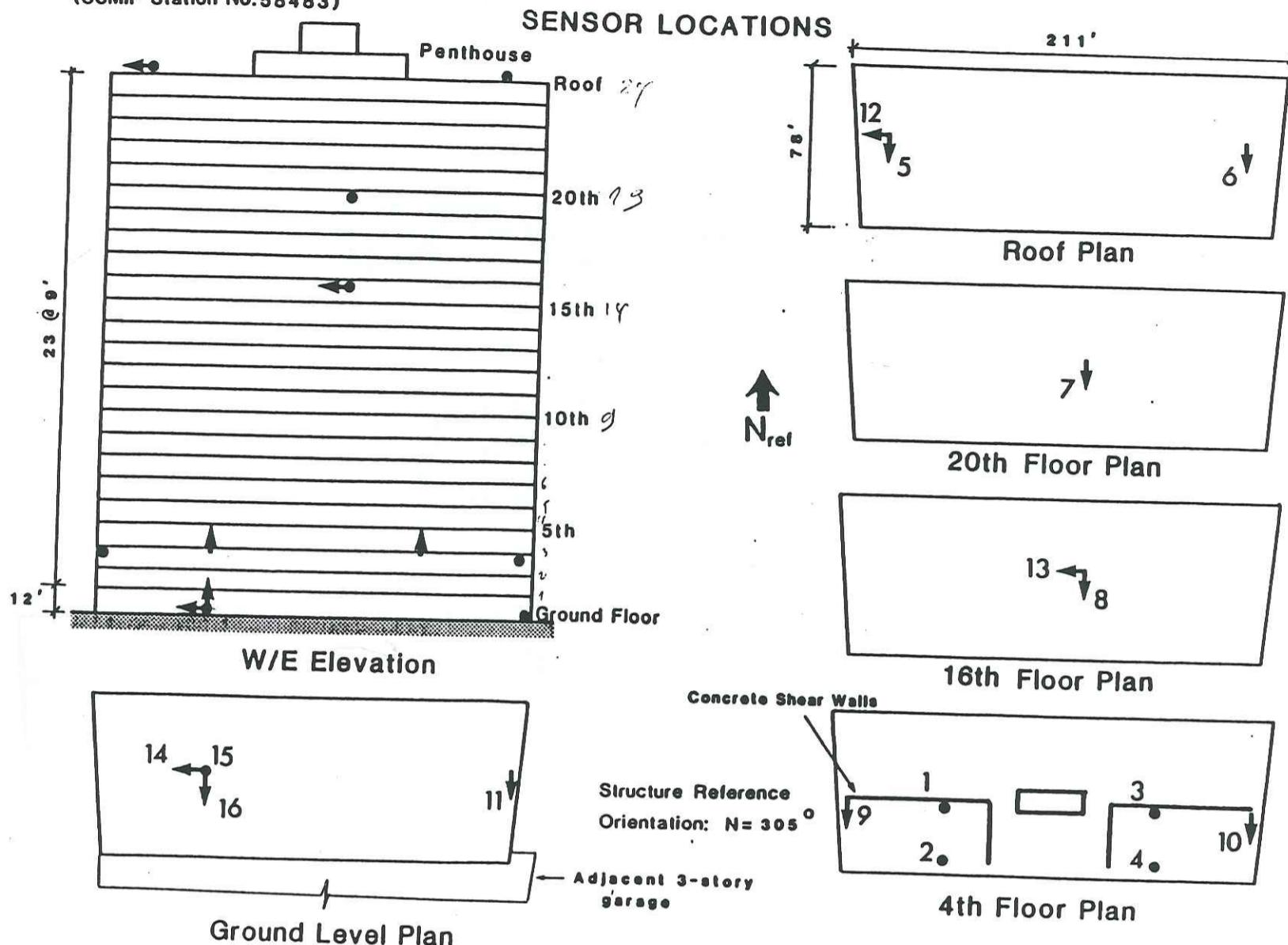


No. of Stories above/below
ground: 24/0
Plan Shape: Trapezoidal
Base Dimensions: 211' x 197' (Flrs 1-3)
Typical Floor Dimensions: 211' x 78'
Design Date: 1964

Vertical Load Carrying System:
Concrete floor and roof slabs supported by
concrete columns.
Lateral Force Resisting System:
Multiple concrete shear walls in both
directions.
Foundation Type:
Mat foundation.

Oakland - 24-story Residential Bldg.

(CSMIP Station No. 58483)



Oakland - 2-story Office Bldg.

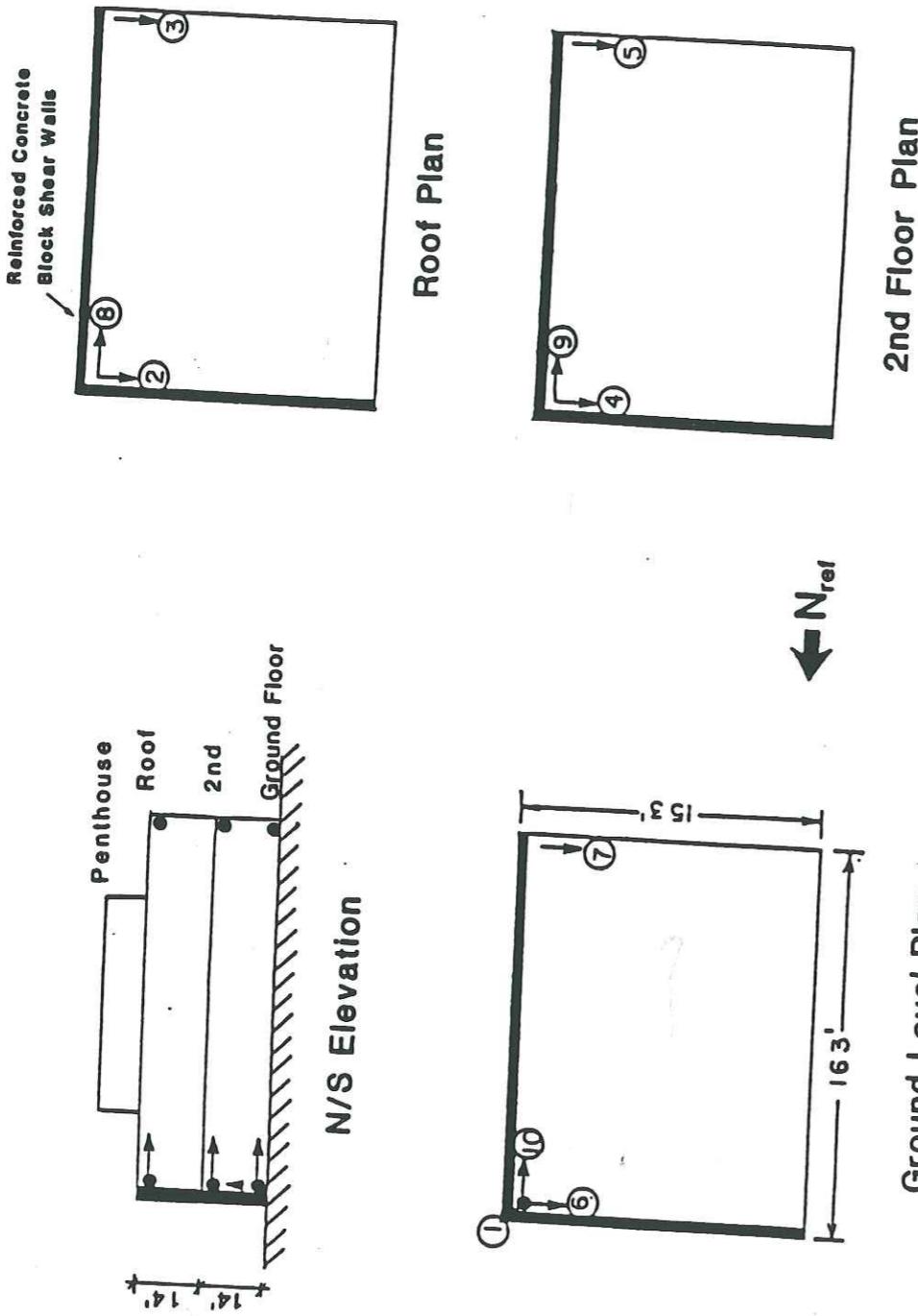


No. of Stories above/below
ground: 2/0
Plan Shape: Rectangular
Base Dimensions: 163' x 153'
Typical Floor Dimensions: Same as base
Design Date: 1964
Construction Date: 1965

Vertical Load Carrying System:
2.5" concrete fill on 3" metal decks supported
by rigid steel frame.
Lateral Force Resisting System:
Reinforced concrete block shear walls on
two adjacent exterior faces; welded rigid
steel frame.
Foundation Type:
Spread footings.

Oakland - 2-story Office Bldg.
(CSMIP Station No. 58224)

SENSOR LOCATIONS

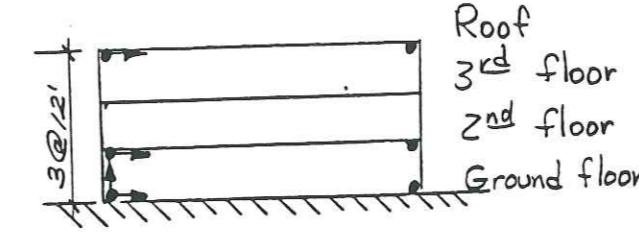


Structure Reference
Orientation: N = 20°

Piedmont Junior High School
Classroom Building
740 Magnolia Avenue
Piedmont, CA

)

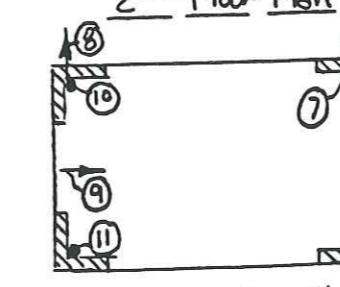
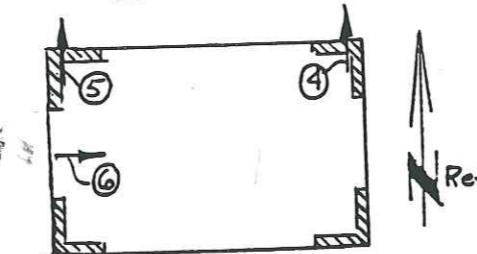
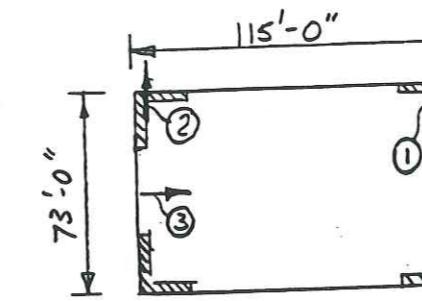
Strong-Motion Instrumentation Scheme



Note: Accelerometers 1 to 6 attached to underside of floor slab.
Accelerometers 7 to 12 attached to topside of floor slab.
Recorder and vertical starter to be adjacent to accelerometer 10.

Recorder trace order:

Accelerometer	1
Fixed trace	2
Accelerometer	3
"	4
Fixed trace	5
Accelerometer	6
"	7
Fixed trace	8
Accelerometer	9
"	10
Fixed trace	11

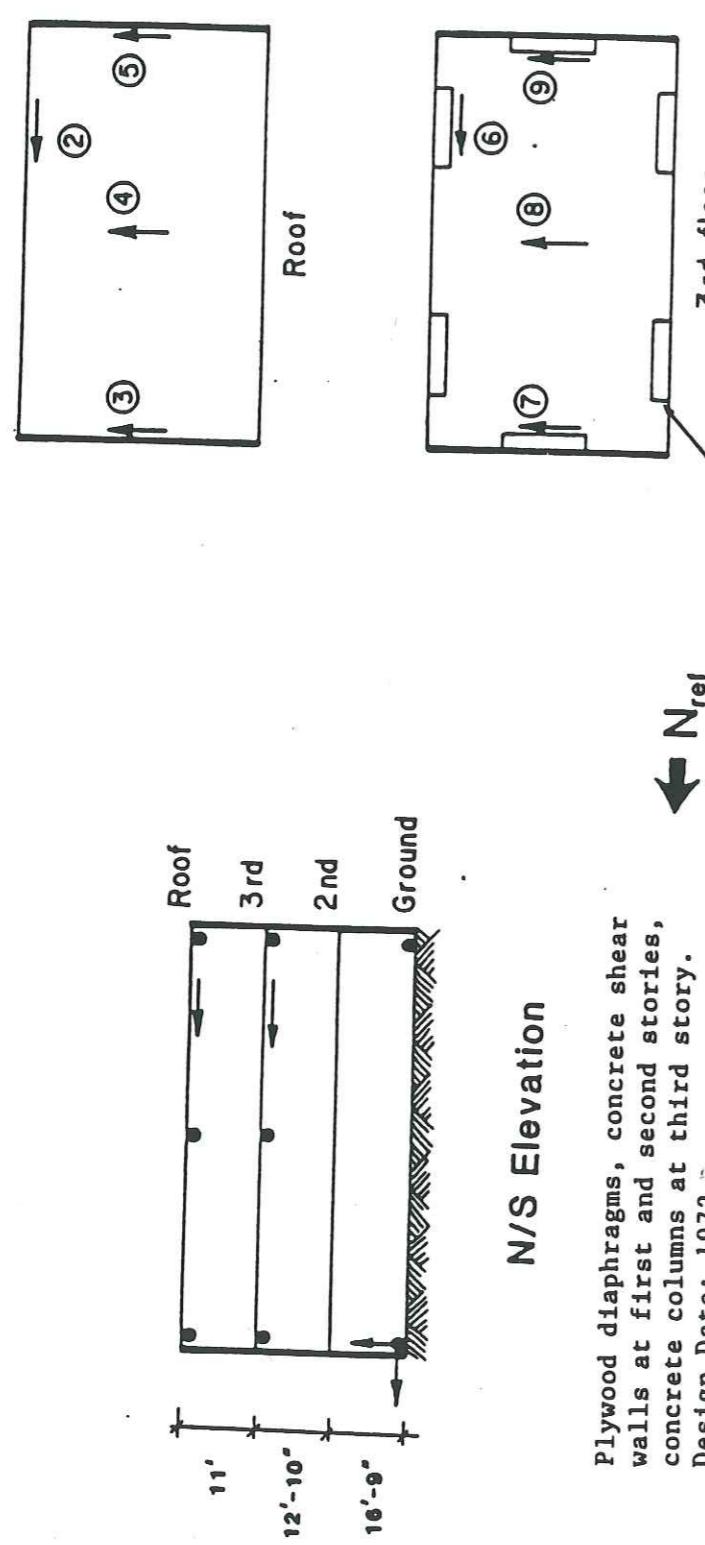


Free-field Triaxial package to be located approximately 120' west of NW corner of building.

Pleasant Hill - 3-story Commercial Bldg.

(CSMIP Station No. 58348)

SENSOR LOCATIONS

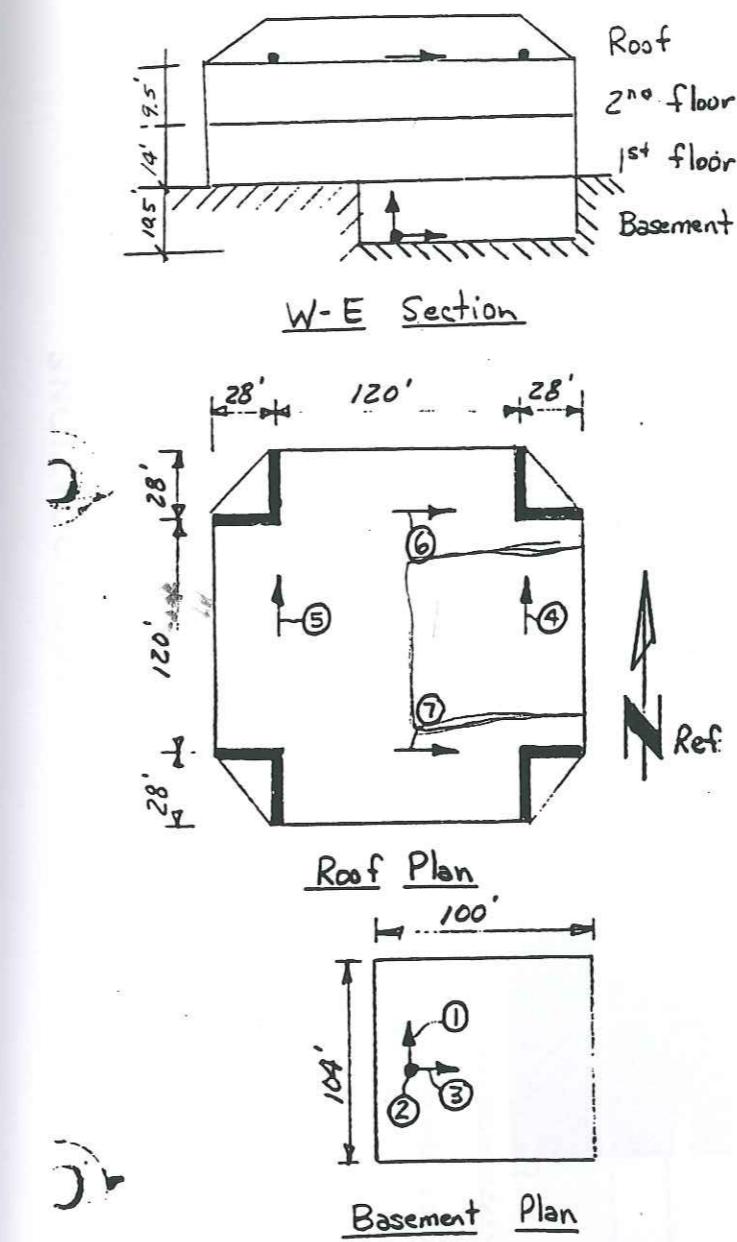


Structure Reference
Orientation: N = 0°

Envirotech Systems Building
1 Davis Drive
Belmont, Calif.

5/76
Rev. 520 11/80
by W.W.

Strong-Motion Instrumentation Scheme



Note: Accelerometers 1, 2 & 3 to be installed on f floor slab in storage room in half basement. Recorder of vertical starter to be adjacent.
Accelerometers 4 and 5 to be attached to bottom of 48" truss at mid-span
Accelerometers 6 and 7 to be attached to 30" joist at mid-span

Recorder trace order:
Accelerometer 1
Fixed trace
Accelerometer
" Fixed trace
Accelerometer
" Fixed trace
Accelerometer
" Fixed trace
Fixed trace

1 2 3 4 5 6 7

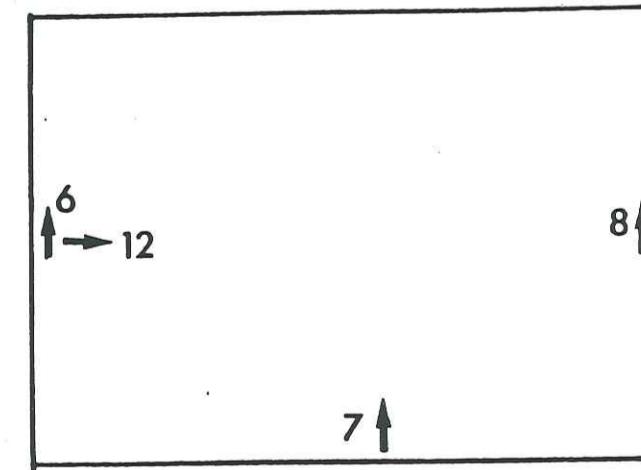
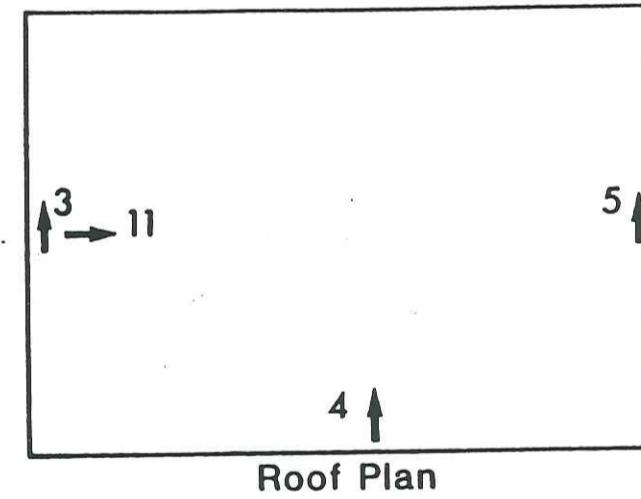
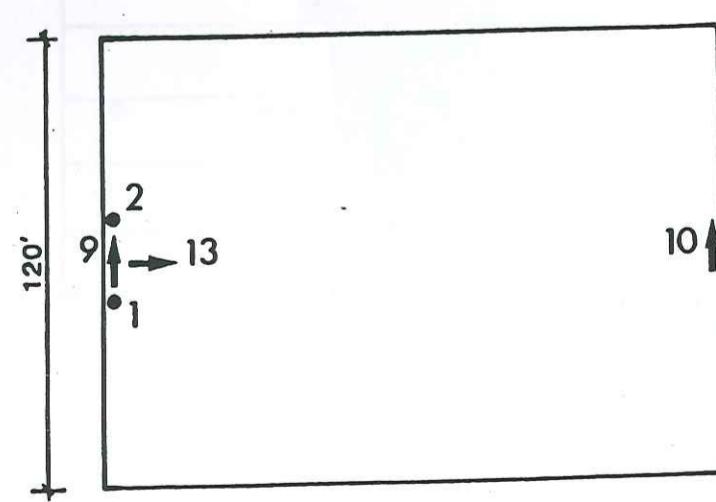
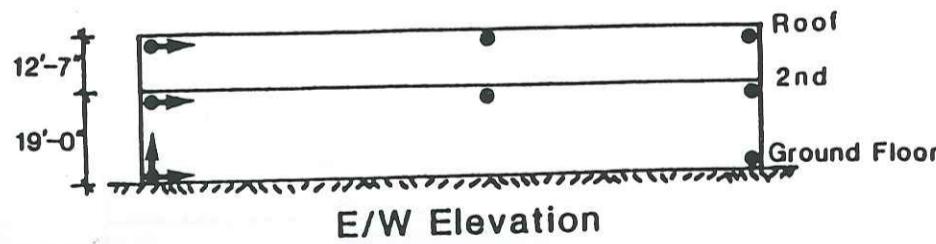
Milpitas - 2-story Industrial Bldg.



No. of Stories above/below
ground: 2/0
Plan Shape: Rectangular
Base Dimensions: 168' x 120'
Typical Floor Dimensions: Same as base
Design Date: 1984
Construction Date: 1985

Vertical Load Carrying System:
Glulam Beams (roof); steel beams and joists
(2nd); interior steel tube columns, and
perimeter tilt-up concrete walls.
Lateral Force Resisting System:
Concrete tilt-up shear walls on perimeter;
concrete floor on metal deck (2nd); plywood
roof diaphragms.
Foundation Type:
Spread footings.

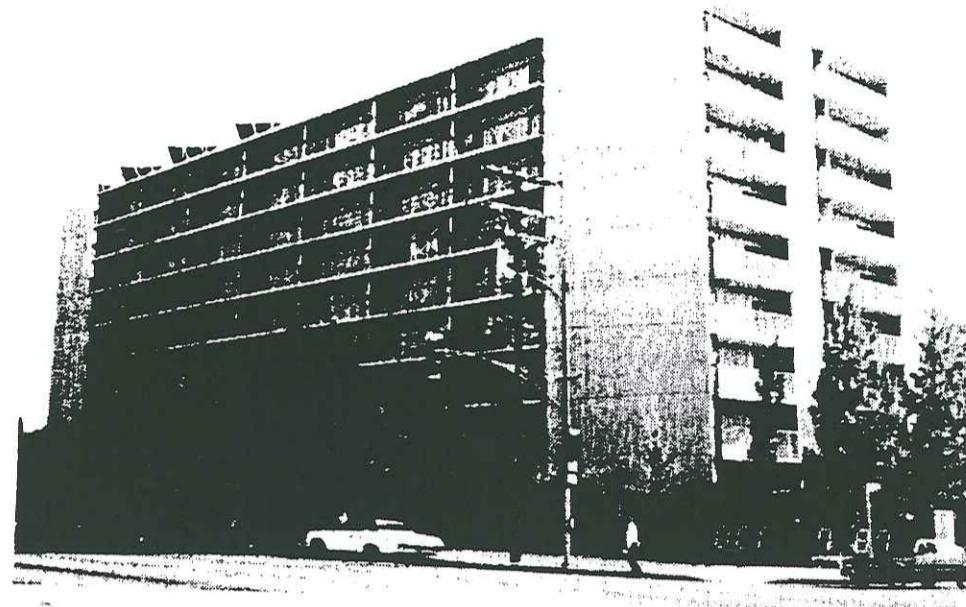
SENSOR LOCATIONS

Milpitas - 2-story Industrial Bldg.
(CSMIP Station No. 57502)

N_{ref}

Structure Reference
Orientation: N = 335°

Burbank - Pacific Manor



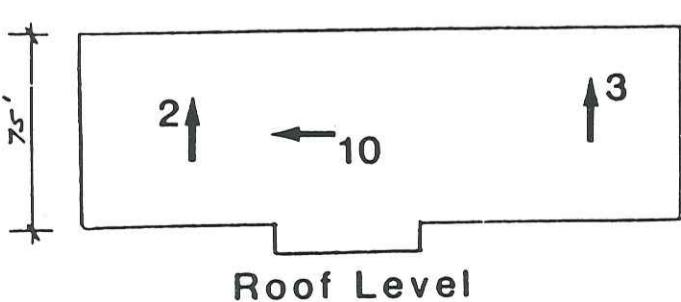
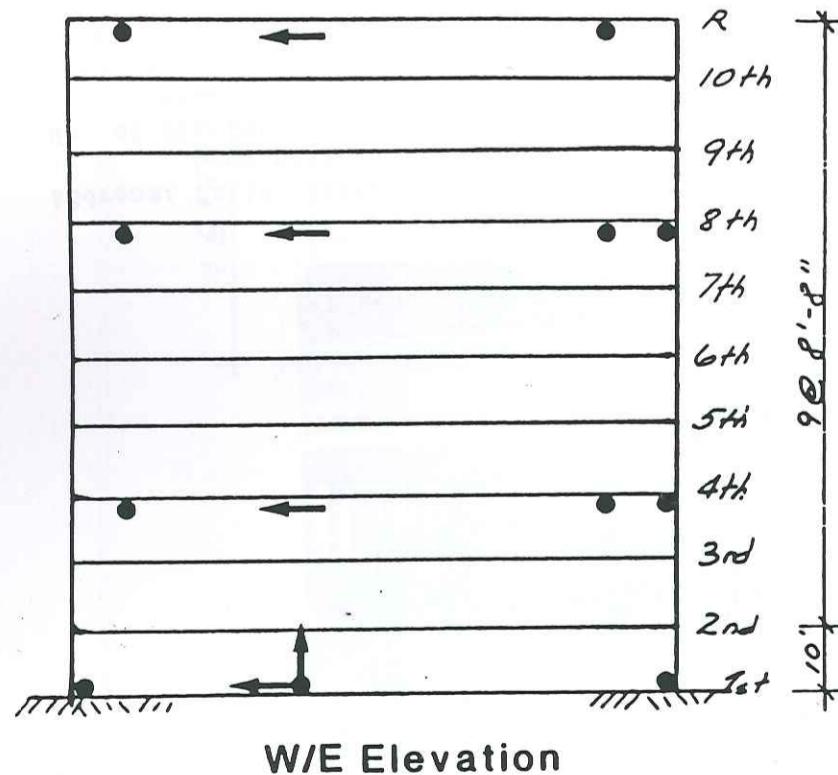
Address: 609 N. Glenoaks Blvd.
Burbank, CA
No. of Stories above/below
ground: 10/0
Plan Shape: Rectangular
Base Dimensions: 215' x 75'
Typical Floor Dimensions: Same
Design Date: 1974
Construction Date: 1974

Vertical Load Carrying System:
Precast and poured-in-place concrete floor slabs
supported by precast concrete bearing walls.
Lateral Force Resisting System:
Precast concrete shear walls in both directions.
Foundation Type:
Concrete caissons (25' to 35' deep) under
all bearing walls.

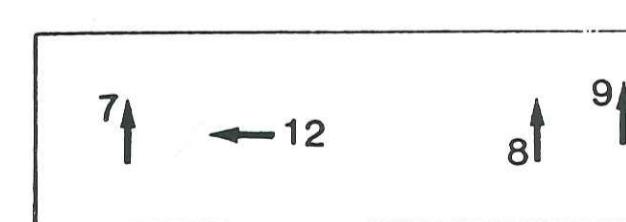
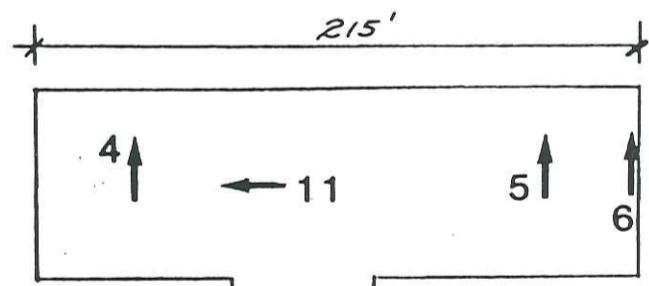
Burbank - Pacific Manor

(CSMIP Station No. 24385)

SENSOR LAYOUT

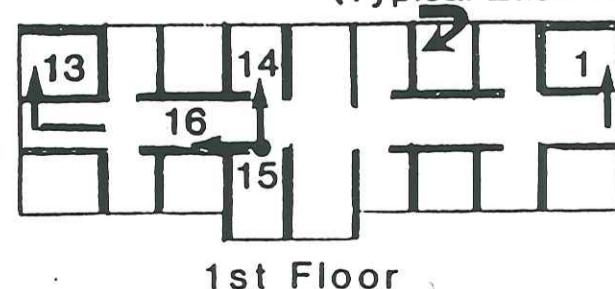


Structure Reference
Orientation: N = 40°



4th Floor

Shear Walls Shown
(Typical Each Floor)



1st Floor

Long Beach - CSULB Engineering Building 1



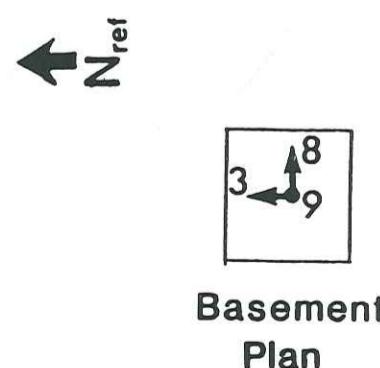
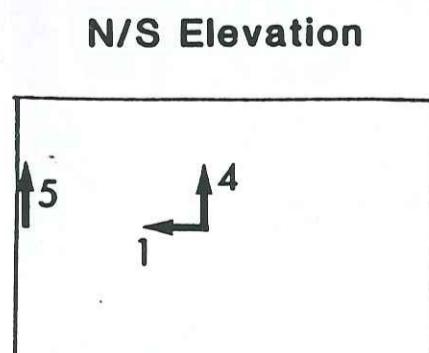
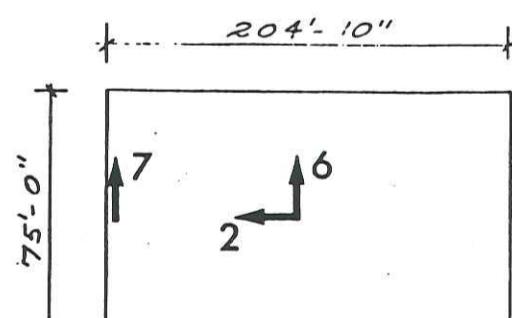
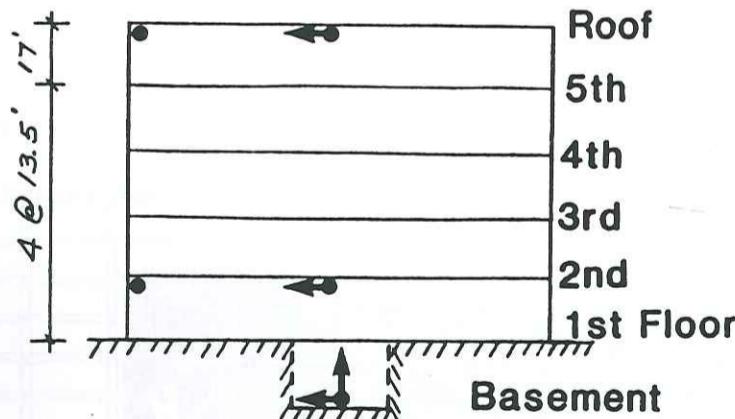
Address: Calif. State University
 Long Beach, CA
 No. of Stories above/below
 ground: 5/partial basement
 Plan Shape: Rectangular
 Base Dimensions: 205' x 81'
 Typical Floor Dimensions: Same
 Design Date: 1968
 Construction Date: 1970

Vertical Load Carrying System:
 6" thick concrete slabs supported by concrete beams,
 columns and 12" thick concrete bearing walls.
 Lateral Force Resisting System:
 Concrete shear walls in both directions.
 Foundation Type:
 Concrete piles.

Long Beach - CSULB Engineering Bldg. 1

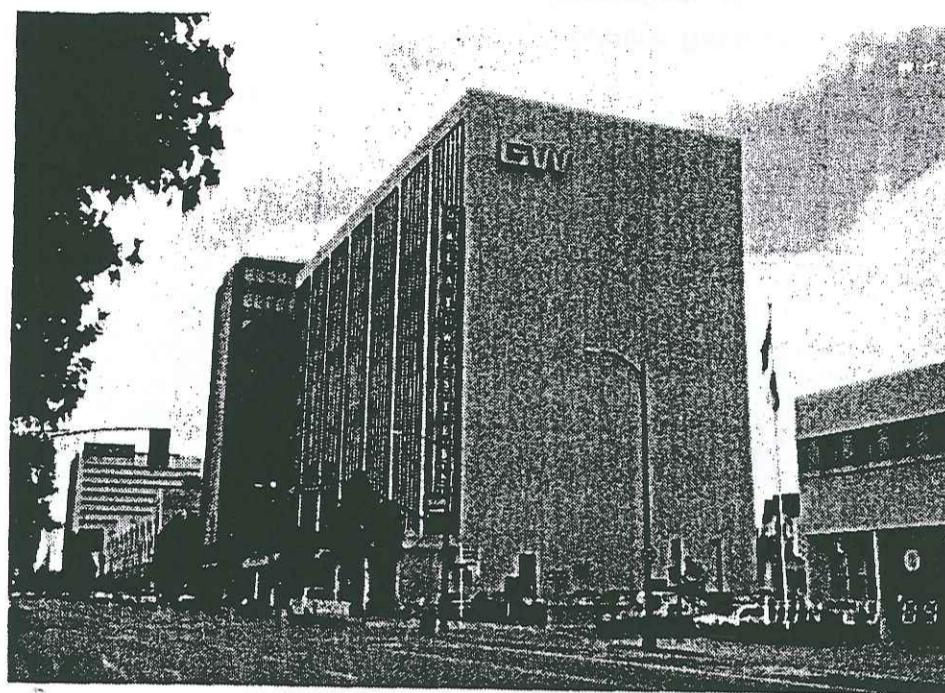
(CSMIP Station No. 14311)

SENSOR LAYOUT



Structure Reference
Orientation: N = 0°

San Jose - 10-story Commercial Bldg.



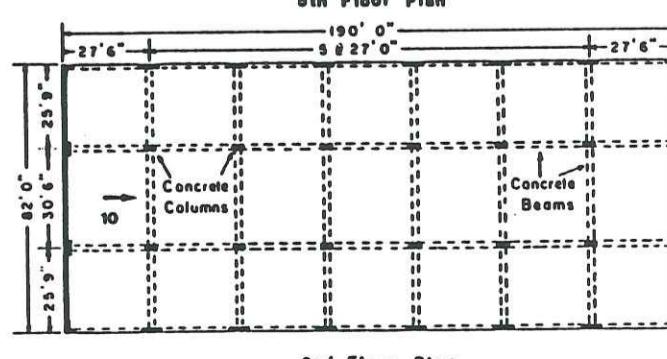
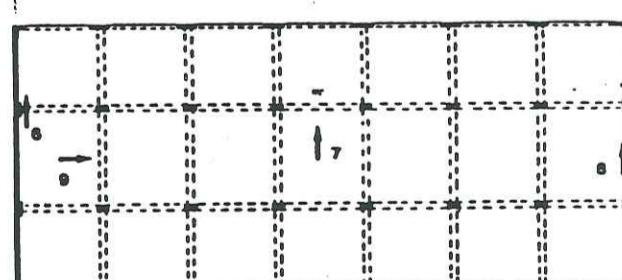
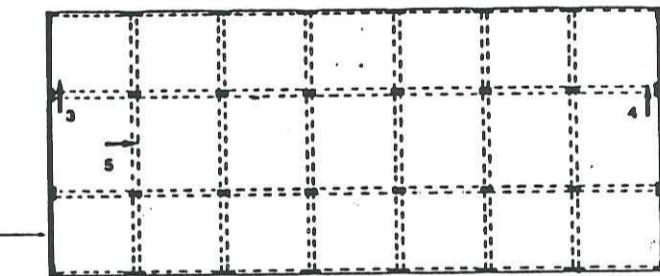
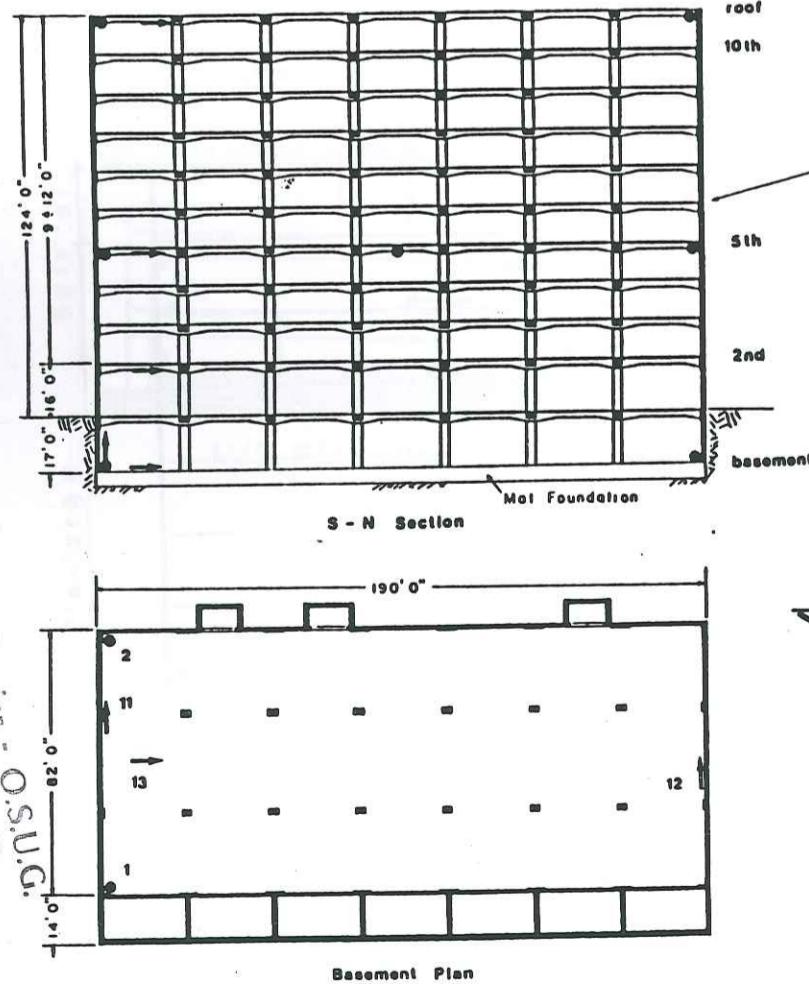
No. of Stories above/below ground: 10/1
 Plan Shape: Rectangular
 Base Dimensions: 190' x 96'
 Typical Floor Dimensions: 190' x 82'
 Design Date: 1964
 Construction Date: 1967

Vertical Load Carrying System:
 Concrete floor slabs supported by concrete pan joists and concrete frames.
Lateral Force Resisting System:
 End concrete shear walls in transverse direction; moment-resistant concrete frame in longitudinal direction.
Foundation Type:
 Mat foundation.

San Jose - 10-story Commercial Bldg.

(CSMIP Station No. 57355)

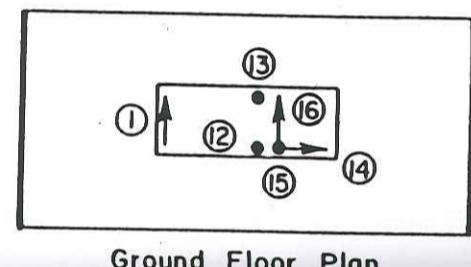
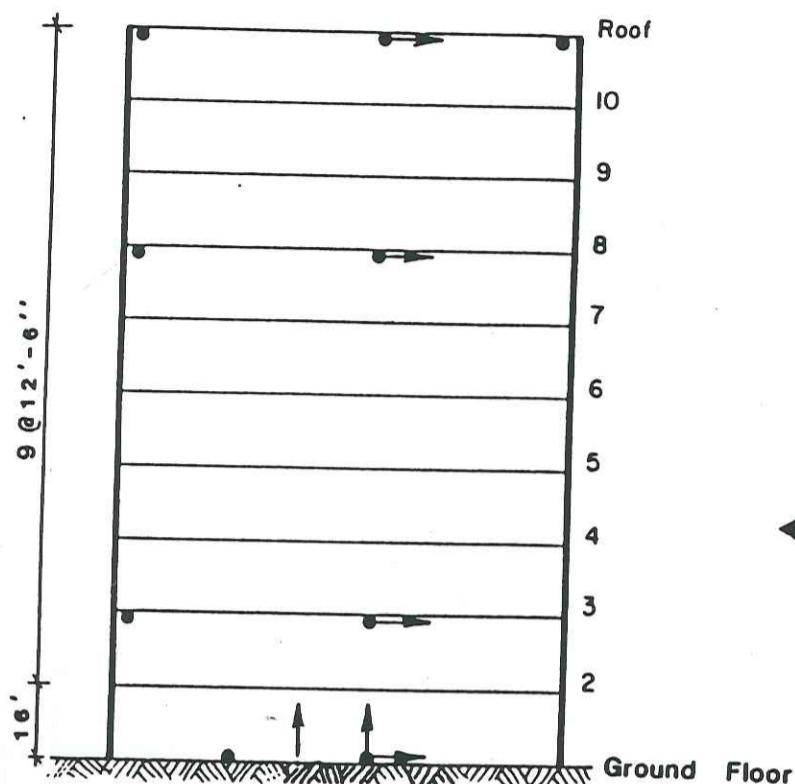
SENSOR LOCATIONS



Walnut Creek - 10-story Commercial Bldg.

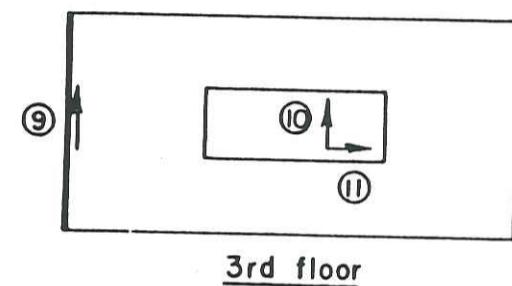
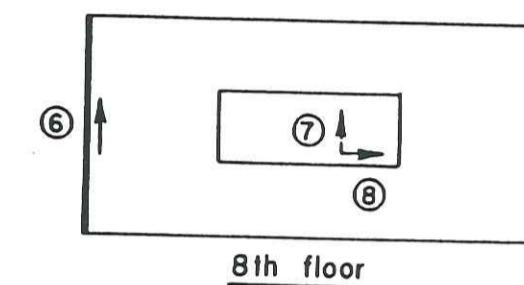
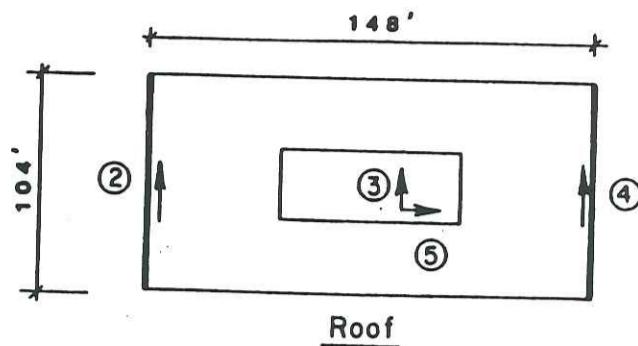
(CSMIP Station No. 58364)

SENSOR LOCATIONS



Interior core concrete shear walls and exterior concrete frame.
Design Date: 1970

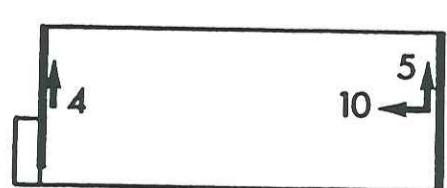
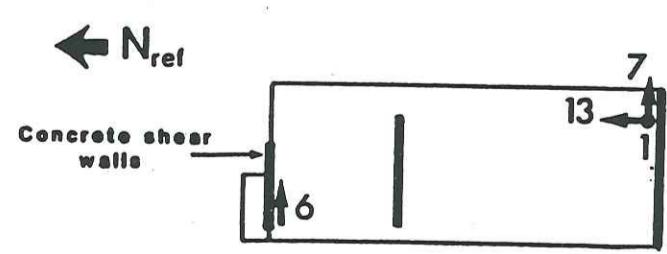
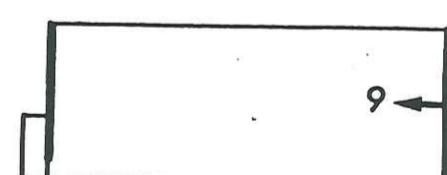
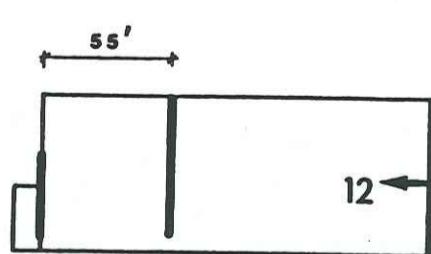
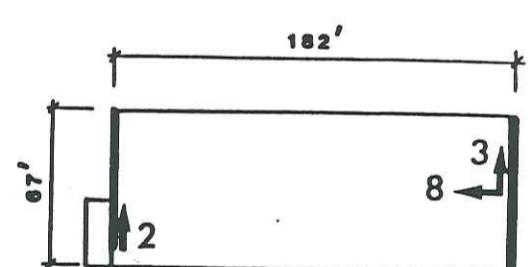
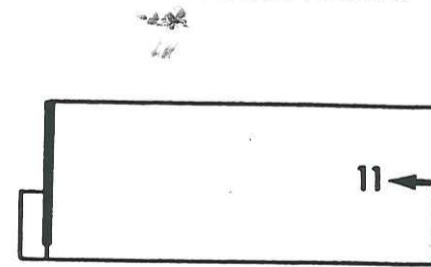
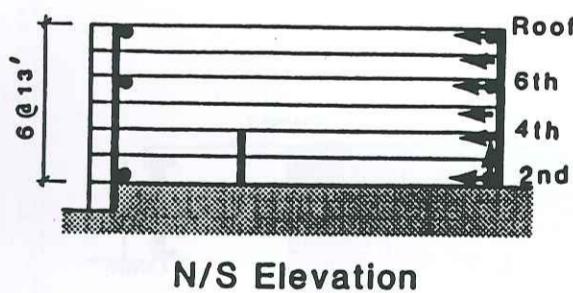
Structure Reference
Orientation: N = 350°



San Francisco - 6-story School Bldg.

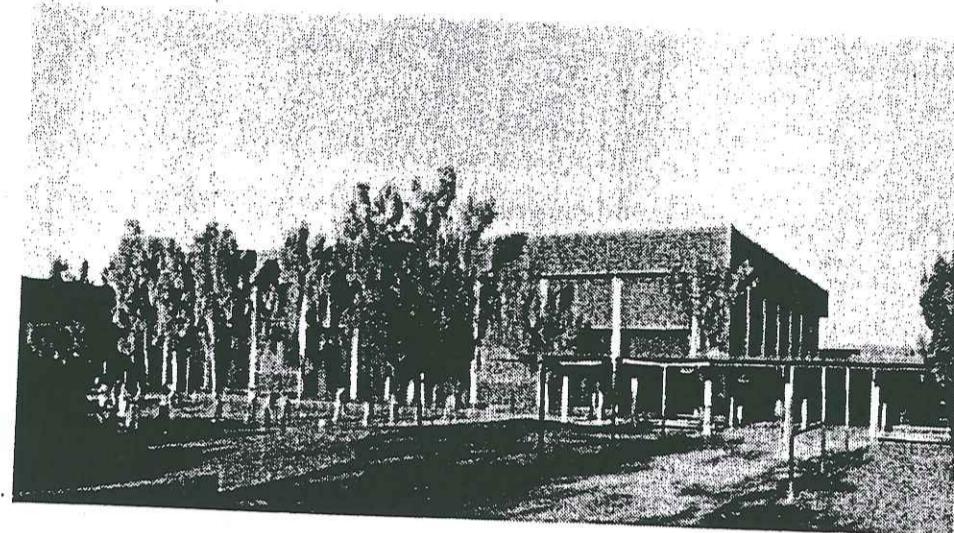
(CSMIP Station No. 58479)

SENSOR LOCATIONS



Structure Reference
Orientation: N = 345°

Saratoga - 1-story School Gym



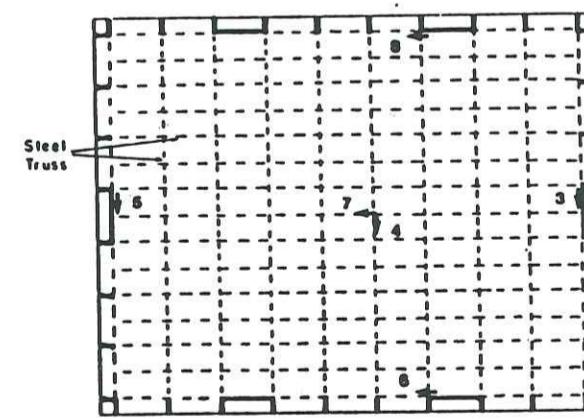
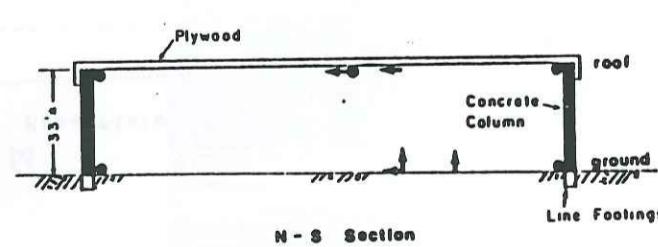
No. of Stories above/below
ground: 1/0
Plan Shape: Rectangular
Base Dimensions: 154' x 122'
Typical Floor Dimensions: Same as base
Design Date: 1971

Vertical Load Carrying System:
3/8" plywood over tongue & groove sheathing;
steel trusses on concrete columns.
Lateral Force Resisting System:
Isolated perimeter concrete shear walls and
columns.
Foundation Type:
Spread footings.

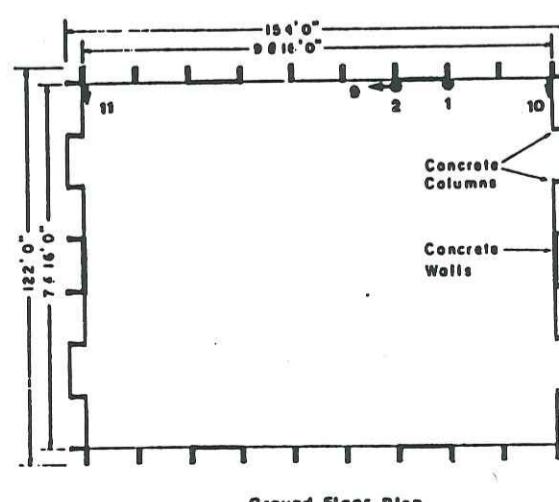
Saratoga - 1-story School Gym

(CSMIP Station No. 58235)

SENSOR LOCATIONS



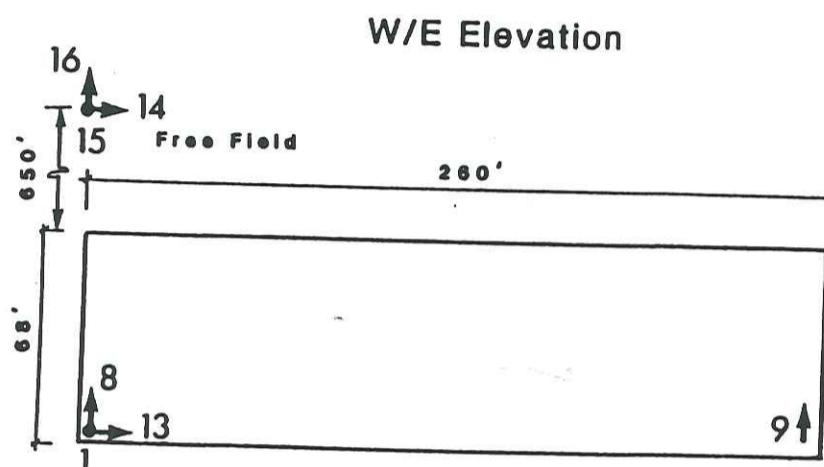
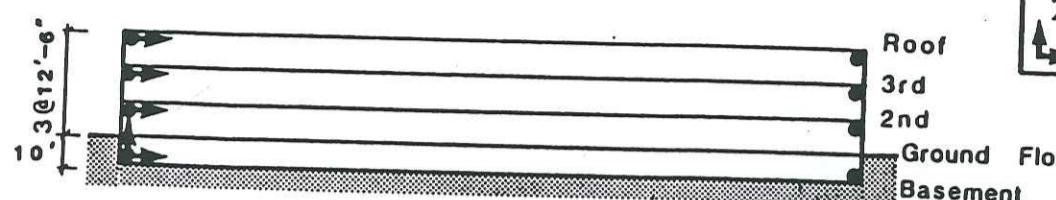
Sensors 4,7 Mounted on Steel Truss
Sensors 10,11 Mounted on Concrete Column
Other Sensors Mounted on Concrete Wall



Richmond - 3-story Government Office Bldg.

(CSMIP Station No. 58503)

SENSOR LOCATIONS



Concrete moment-resisting frame and concrete shear walls.
Design Date: 1948

Structure Reference
Orientation: N = 10°

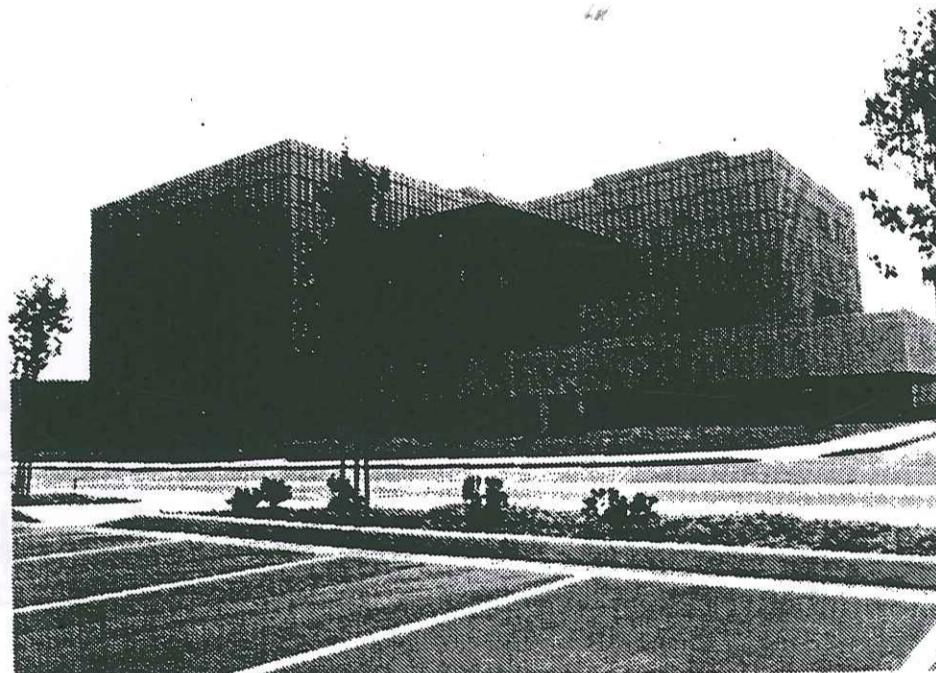
N_{ref}

Basement Plan

3rd Floor Plan

2nd Floor Plan

Sylmar - Olive View Medical Center

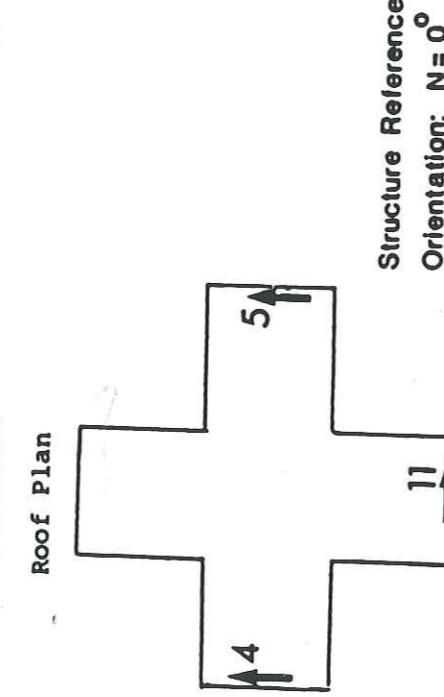
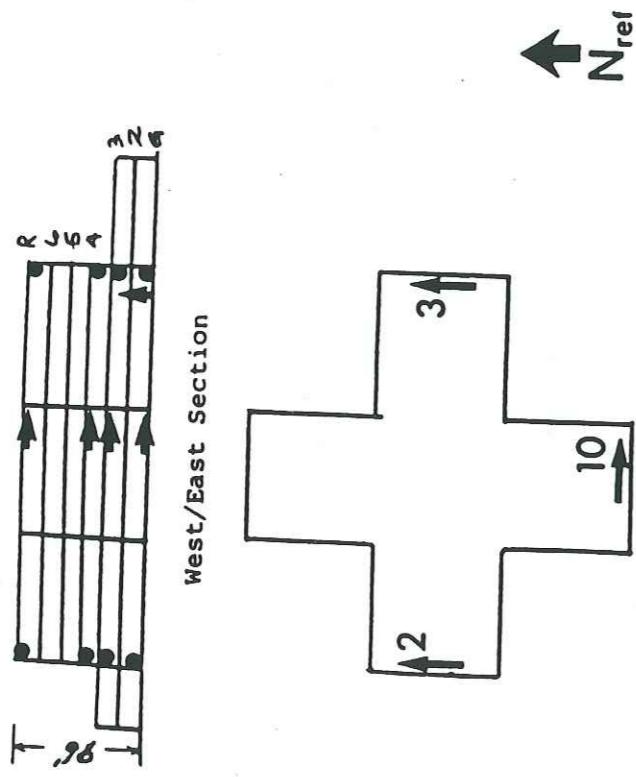


Address: 14445 Olive View Drive
Sylmar, CA
No. of Stories above/below ground: 6/0
Plan Shape:
Rectangular(lower 2 stories)
Cross-shaped(upper 4 stories)
Base Dimensions: 452' x 302'
Typical Floor Dimensions: 101' x 302'
Design Date: 1976
Construction Date: 1977-86

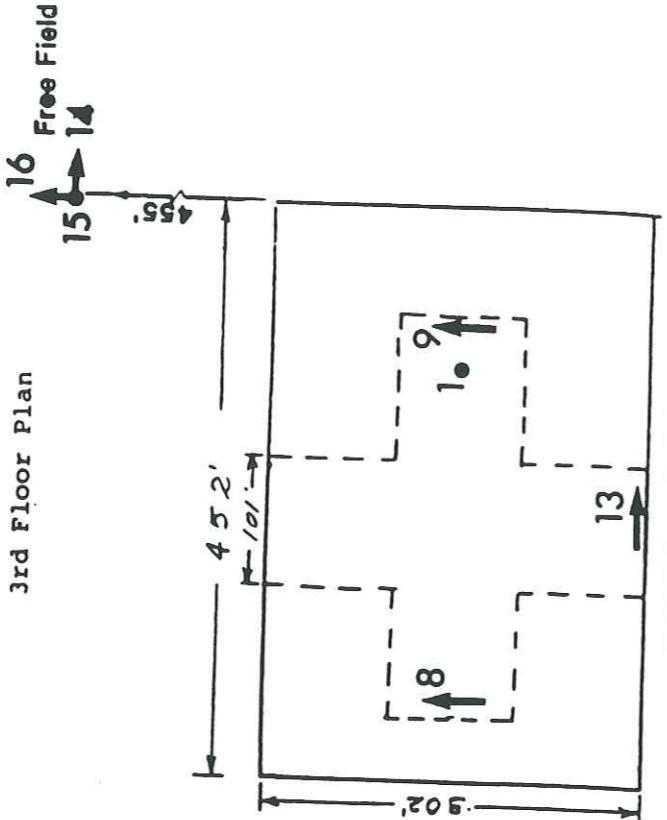
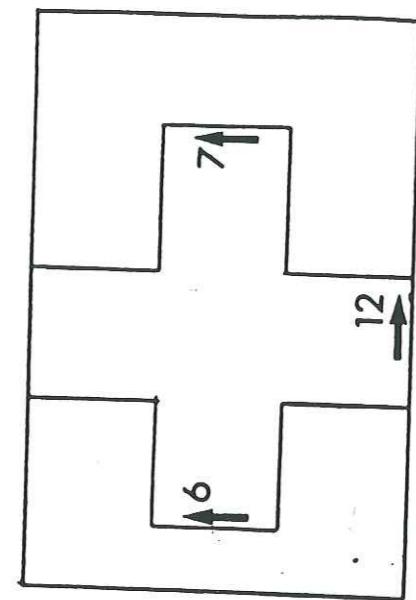
Vertical Load Carrying System:
Concrete slabs over metal deck supported by steel frame.
Lateral Force Resisting System:
Concrete shear walls on lower 2 stories, steel shear walls on the perimeter of upper 4 stories.
Foundation Type:
Spread footings.

Sylmar – Olive View Medical Center
(CSMP Station No. 24514)

SENSOR LAYOUT

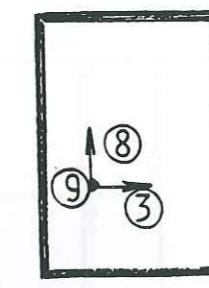
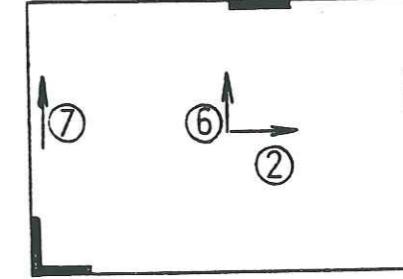
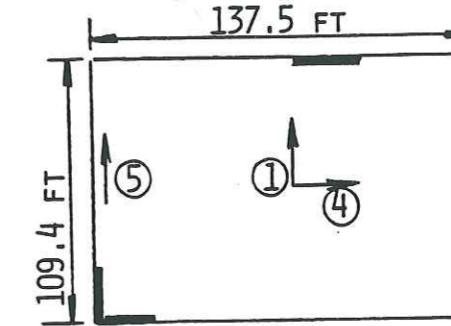
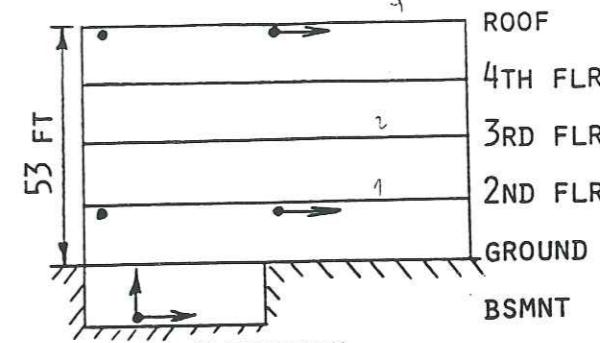


Structure Reference
Orientation: N = 0°



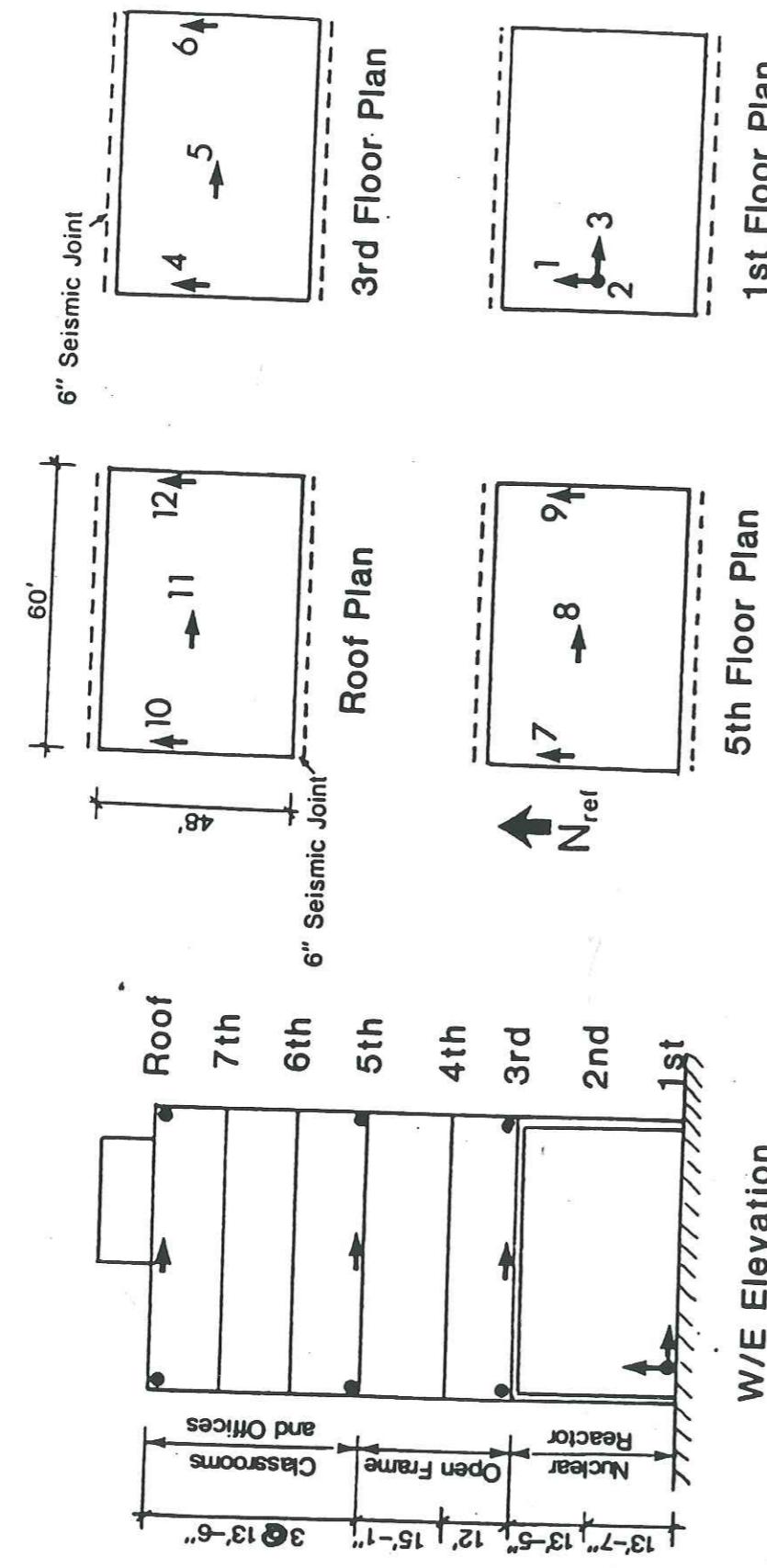
Ground Floor Plan

**STRONG MOTION INSTRUMENTATION
FREITAS BLDG.**



Los Angeles - UCLA Math-Science Bldg.
(CSMIP Station No 24231)

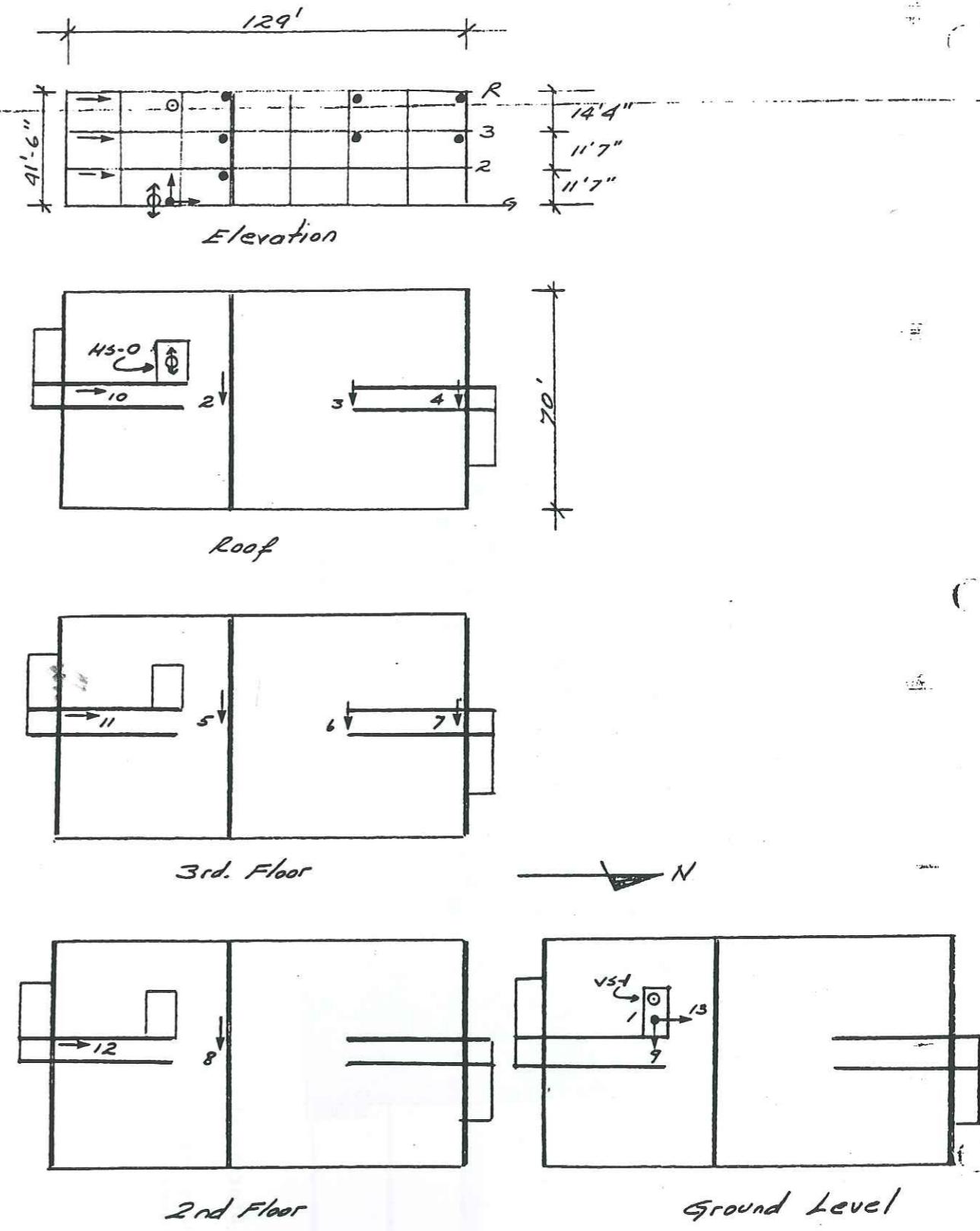
SENSOR LAYOUT



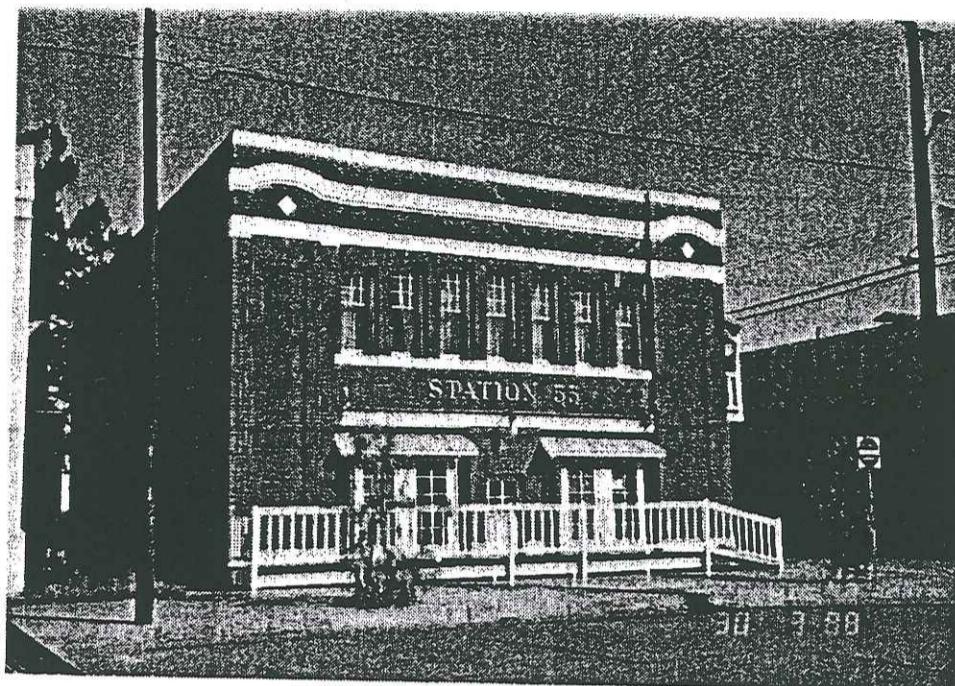
Structural Response - Area 1

Lancaster - Medical Office Bldg

October 186



Gilroy - 2-story Historic Commercial Bldg.



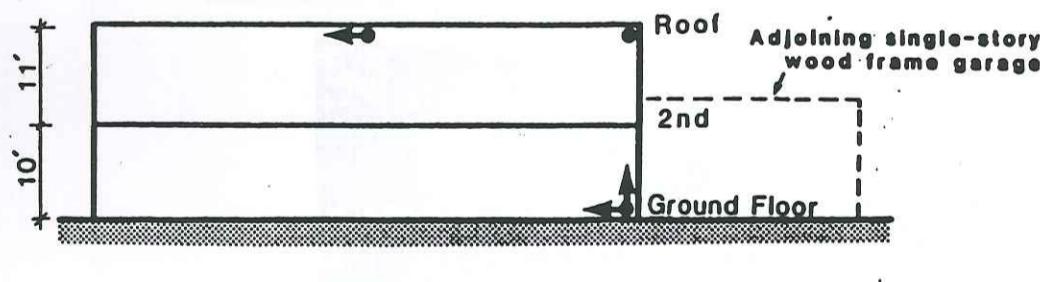
No. of Stories above/below ground: 2/0
 Plan Shape: Rectangular
 Base Dimensions: 40' x 60'
 Typical Floor Dimensions: Same as base
 Design Date: 1916
 Construction Date: 1916

Vertical Load Carrying System:
 Unreinforced masonry (brick) walls; wood beams, joists, sheathing, and columns.
 Lateral Force Resisting System:
 Unreinforced masonry (brick) walls; 2nd floor diaphragm - diagonal sheathing; roof diaphragm - straight sheathing.
 Foundation Type:
 Spread footings.

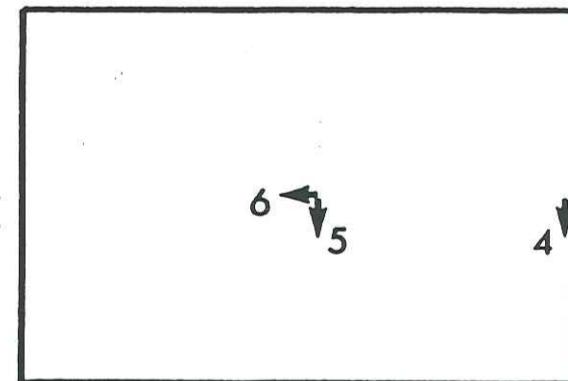
Gilroy - 2-story Historic Commercial Bldg.

(CSMIP Station No. 57476)

SENSOR LOCATIONS

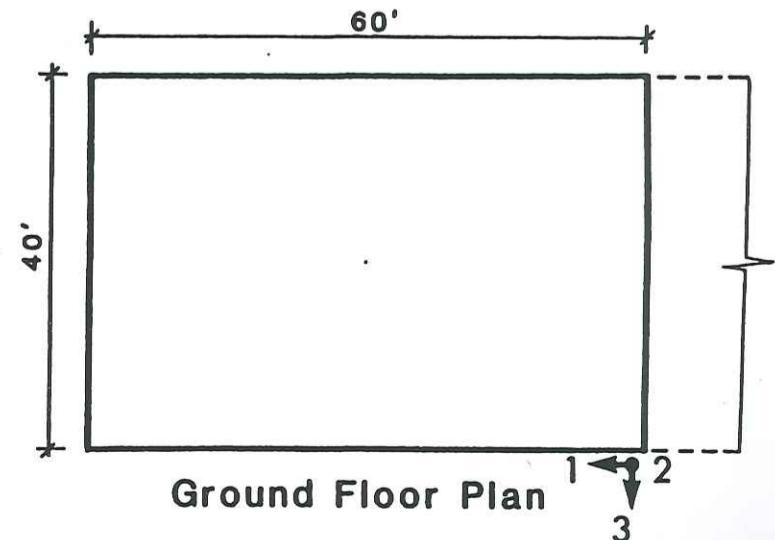


S/N Elevation



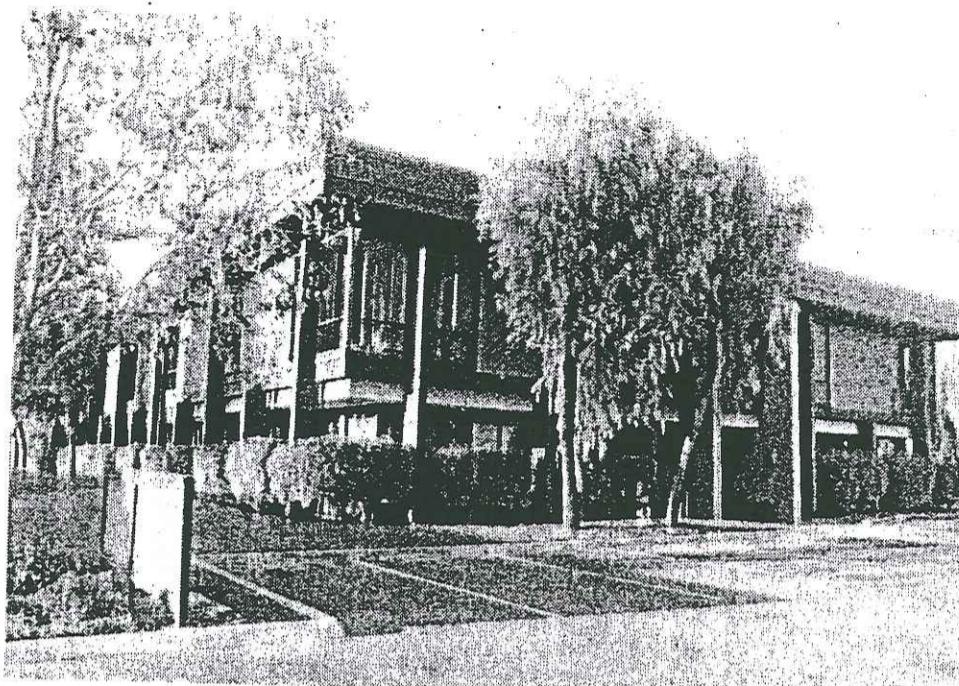
Roof Plan

Structure Reference
 Orientation: N = 70°

 $N_{ref} \rightarrow$ 

Ground Floor Plan

Palo Alto - 2-story Office Bldg.



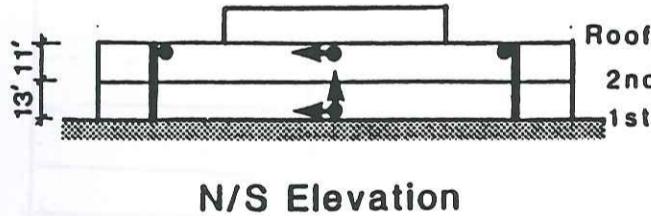
No. of Stories above/below ground: 2/0
 Plan Shape: Rectangular
 Dimensions: 155' x 83'
 Typical Floor Dimensions: Same as base
 Design Date: 1973
 Construction Date: 1974

Vertical Load Carrying System:
 Floor: 1.5" light weight concrete over 3/4" plywood; Roof: plywood over 36" truss joists; interior steel tube columns; exterior glulam columns.
 Lateral Force Resisting System:
 Two-way grouted brick walls at north and south ends.
 Foundation Type:
 Spread footings.

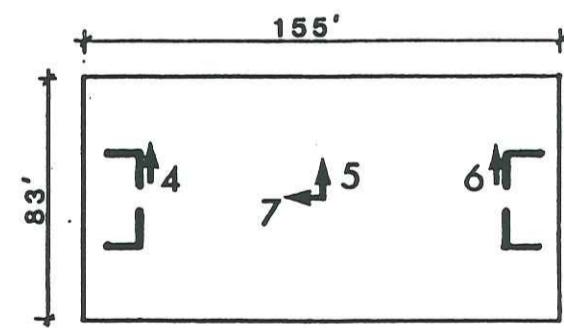
Palo Alto - 2-story Office Bldg.

(CSMIP Station No. 58264)

SENSOR LOCATIONS



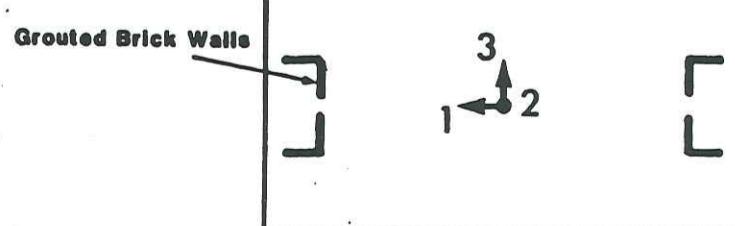
N/S Elevation



Roof Plan

$\leftarrow N_{ref}$

Structure Reference
 Orientation: $N = 325^\circ$

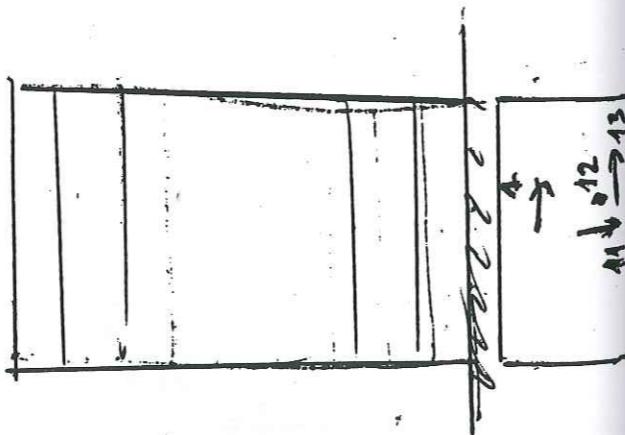
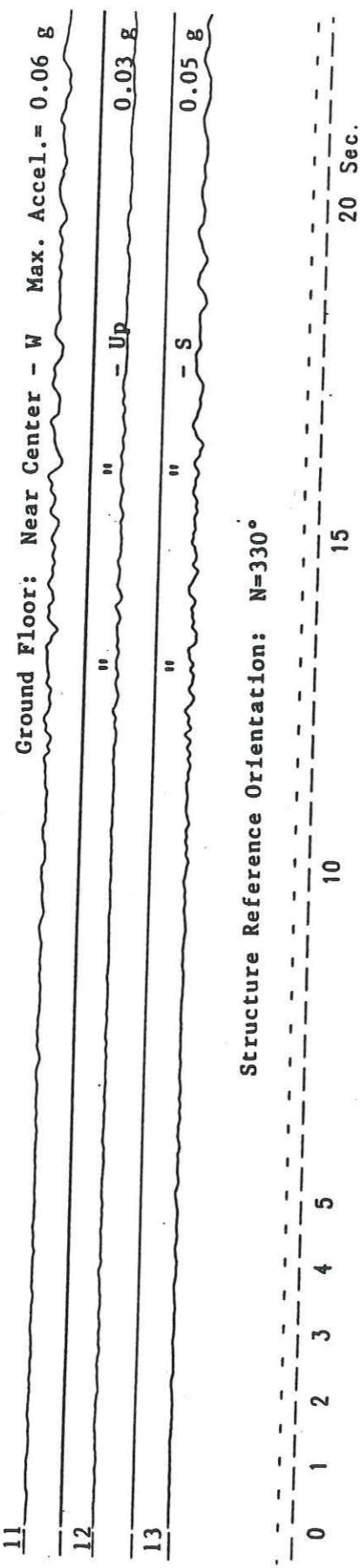


1st Floor Plan

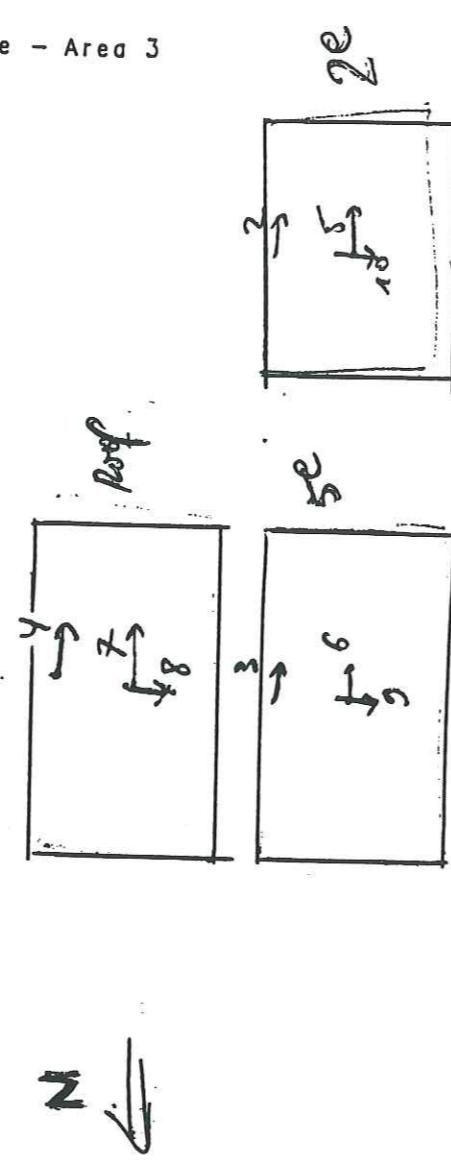
Concord - 8-story Residential Bldg.
(CSWIP Station 58492)

Record 58492-S2264-89298.01

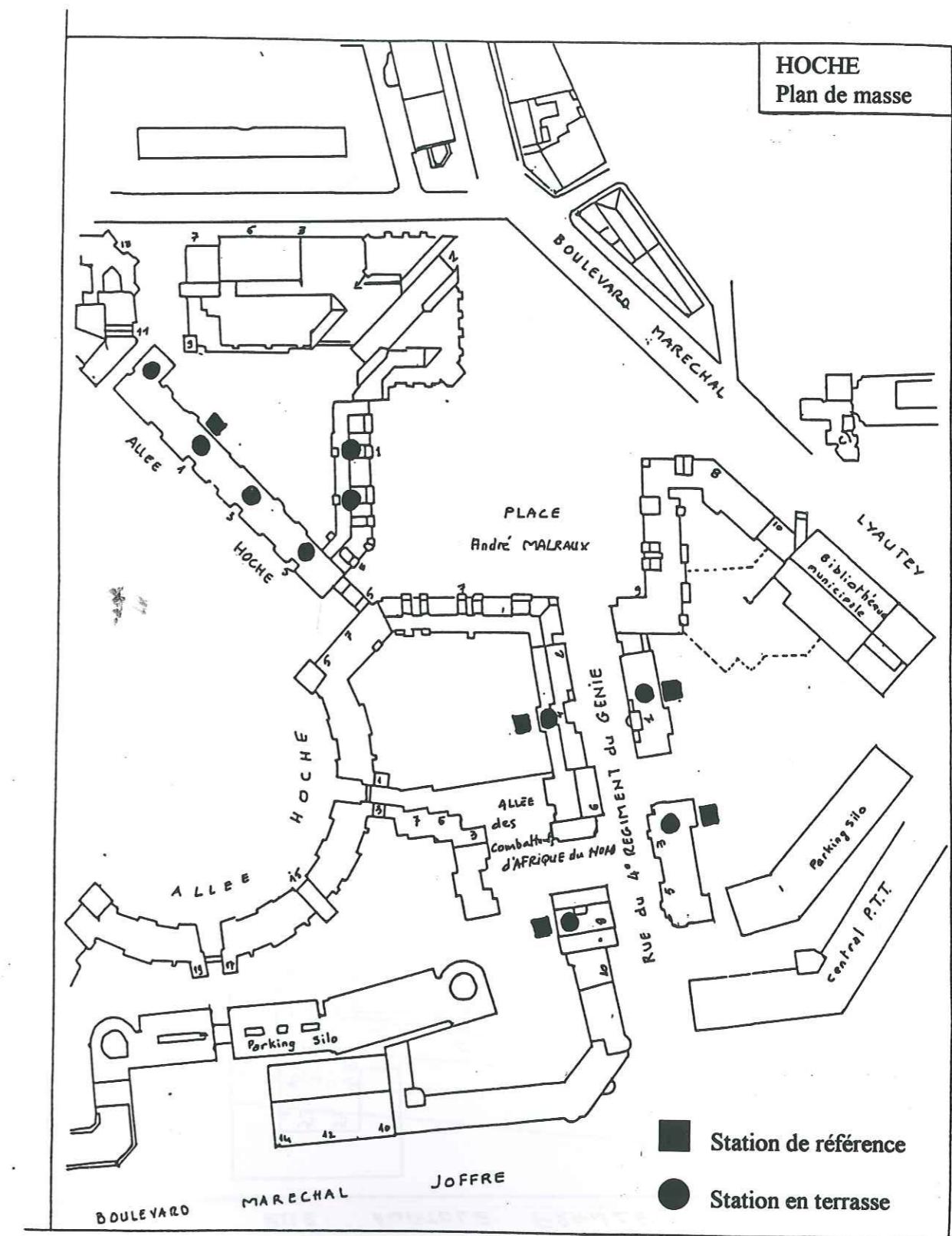
00:04:41 GMT

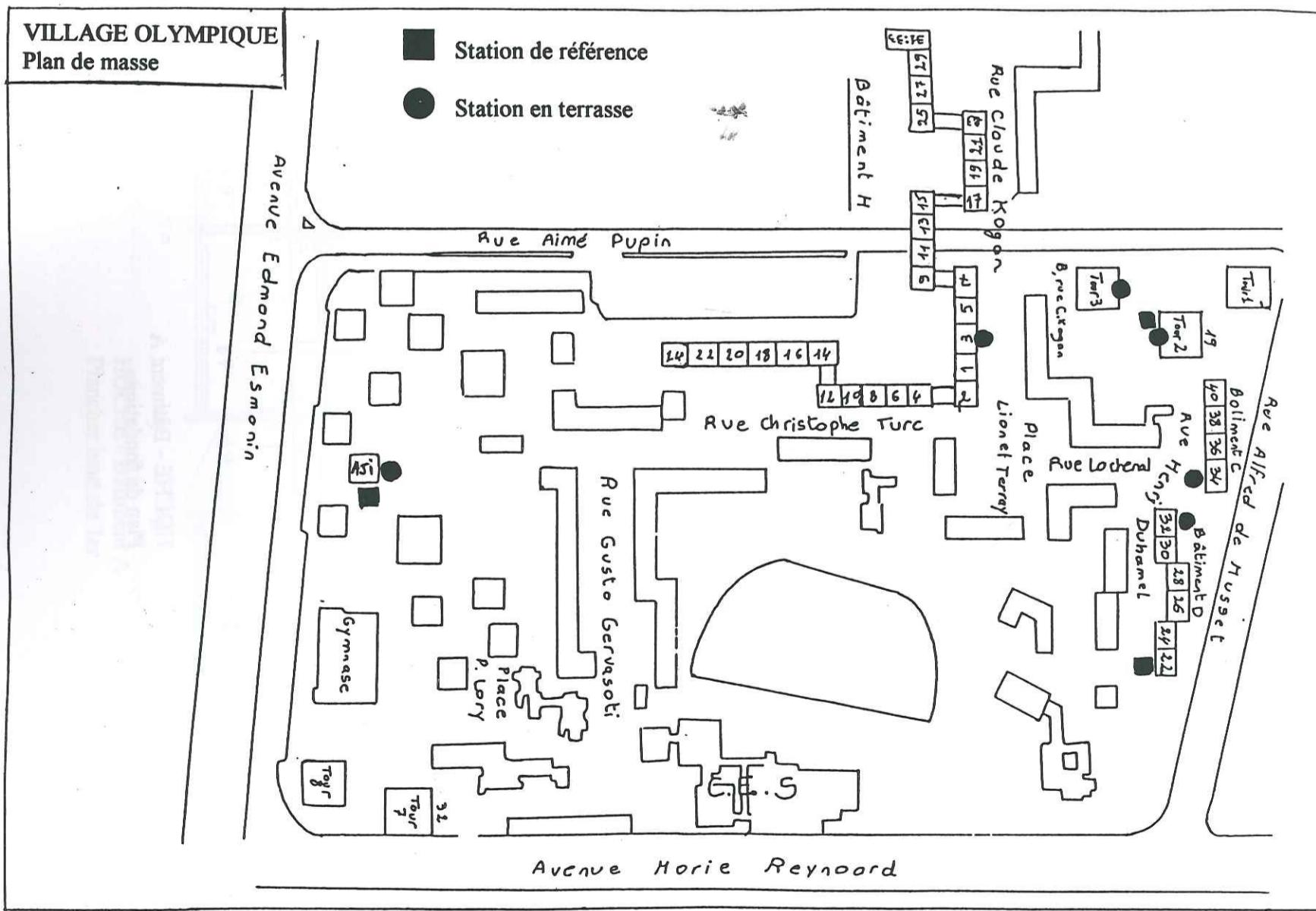
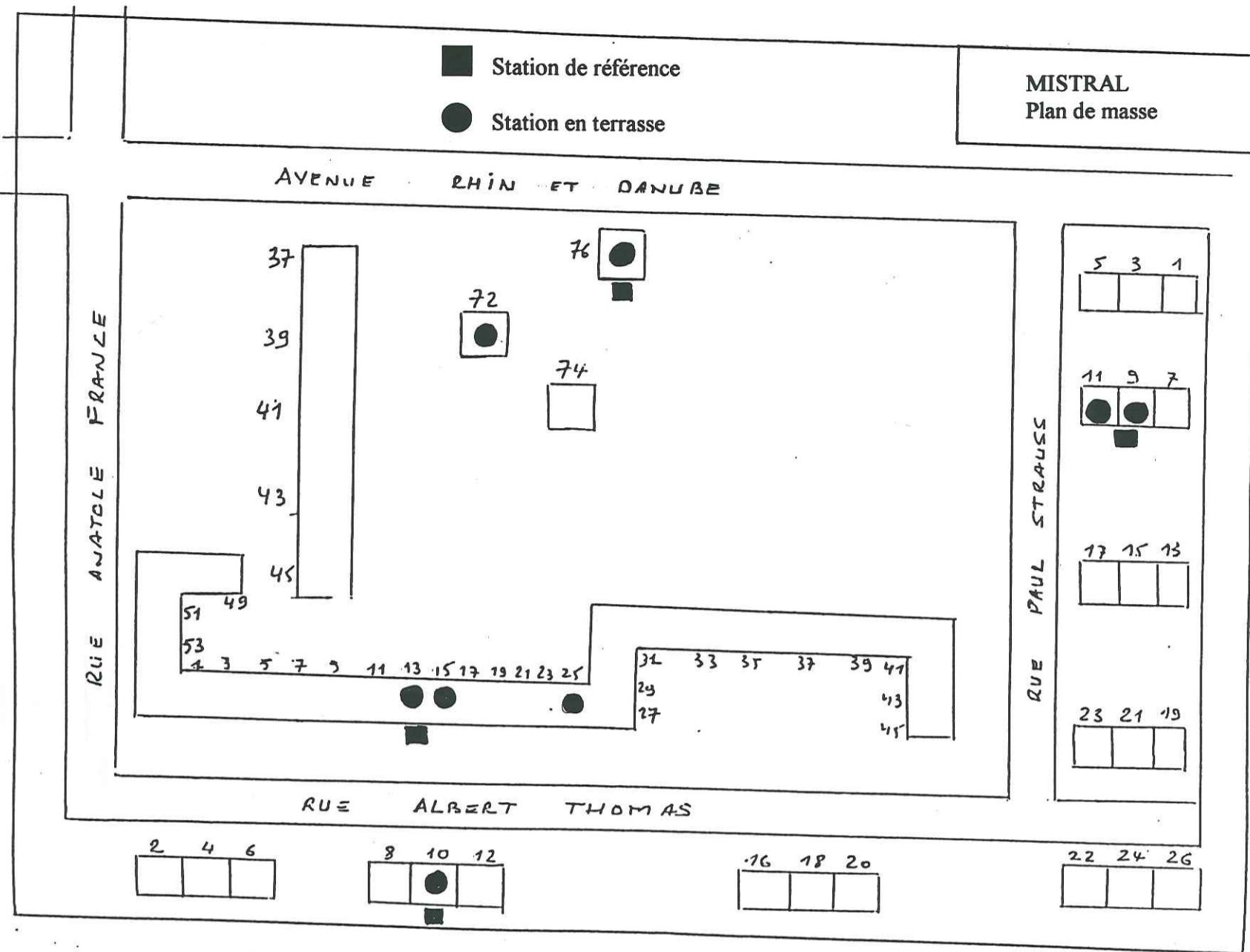


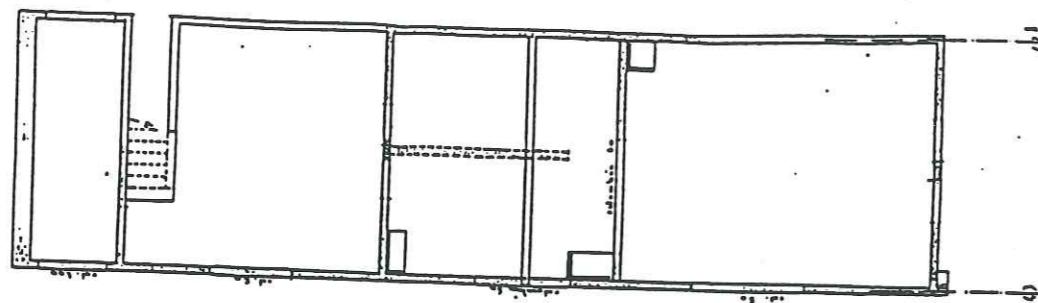
N



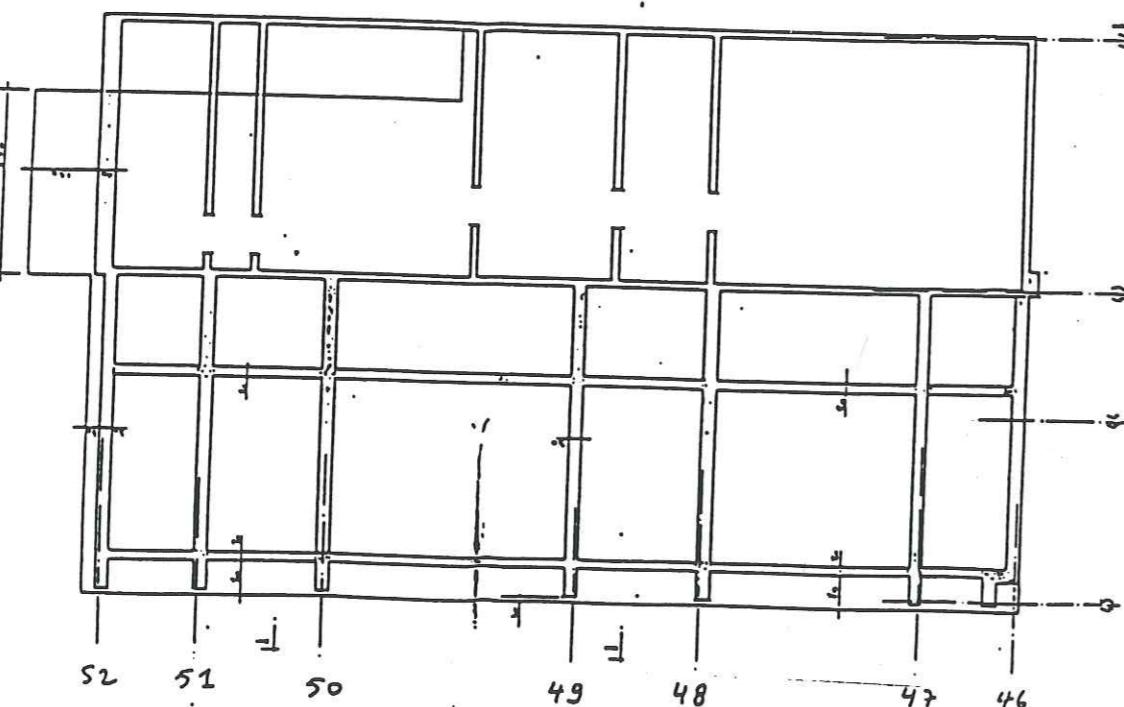
ANNEXE C
PLANS DE MASSE et PLANS DES BATIMENTS
(GRENOBLE)



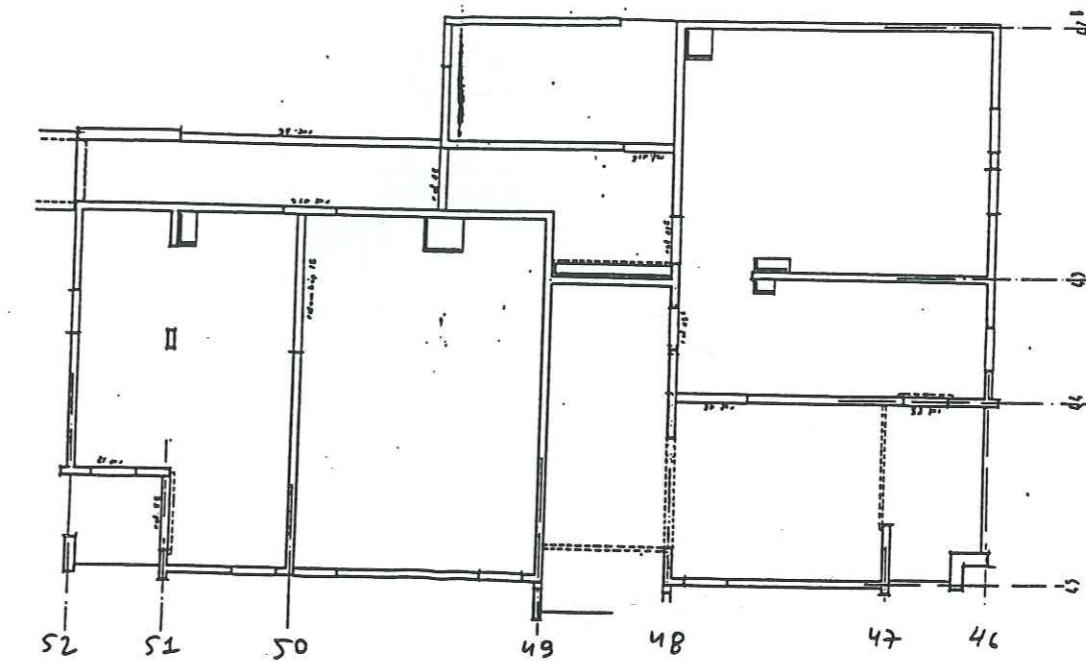




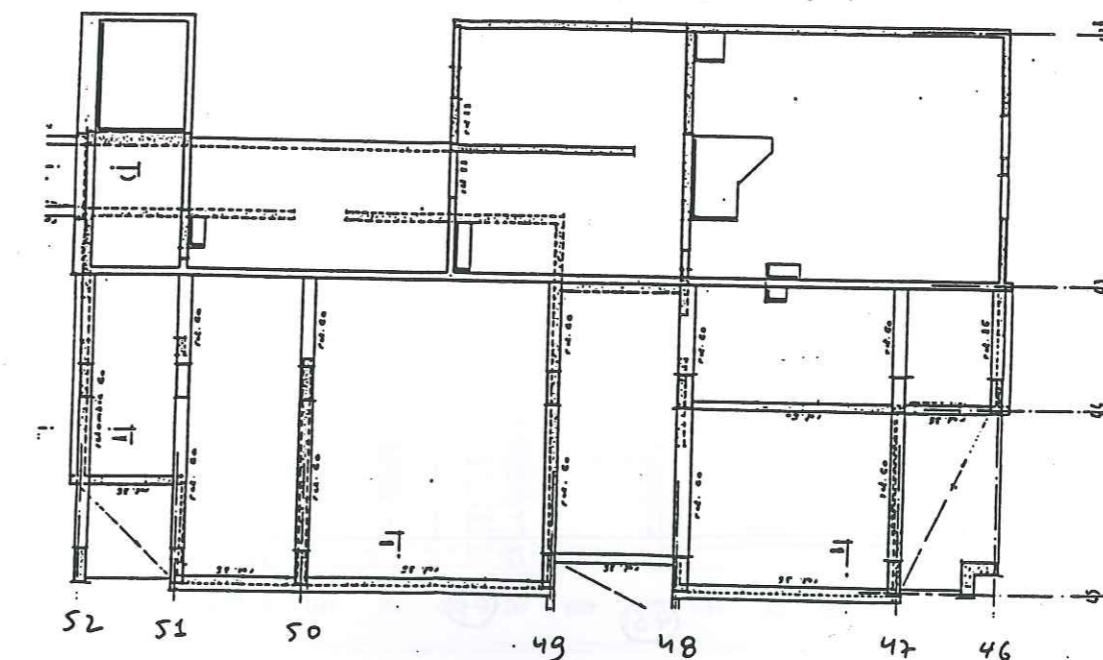
HOCHE - Bâtiment A
Plancher haut du RDC



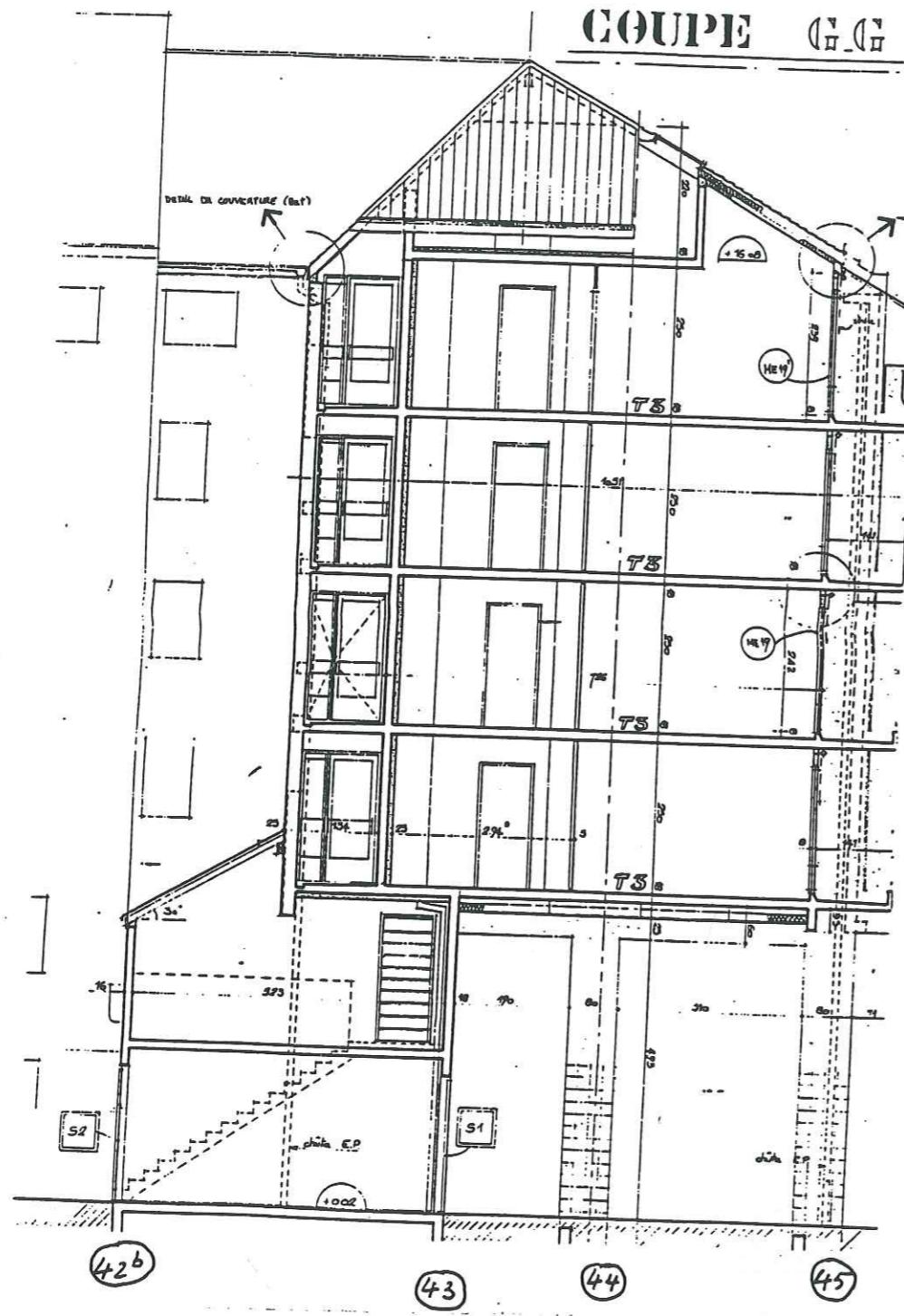
HOCHE - Bâtiment A
Plan de fondations



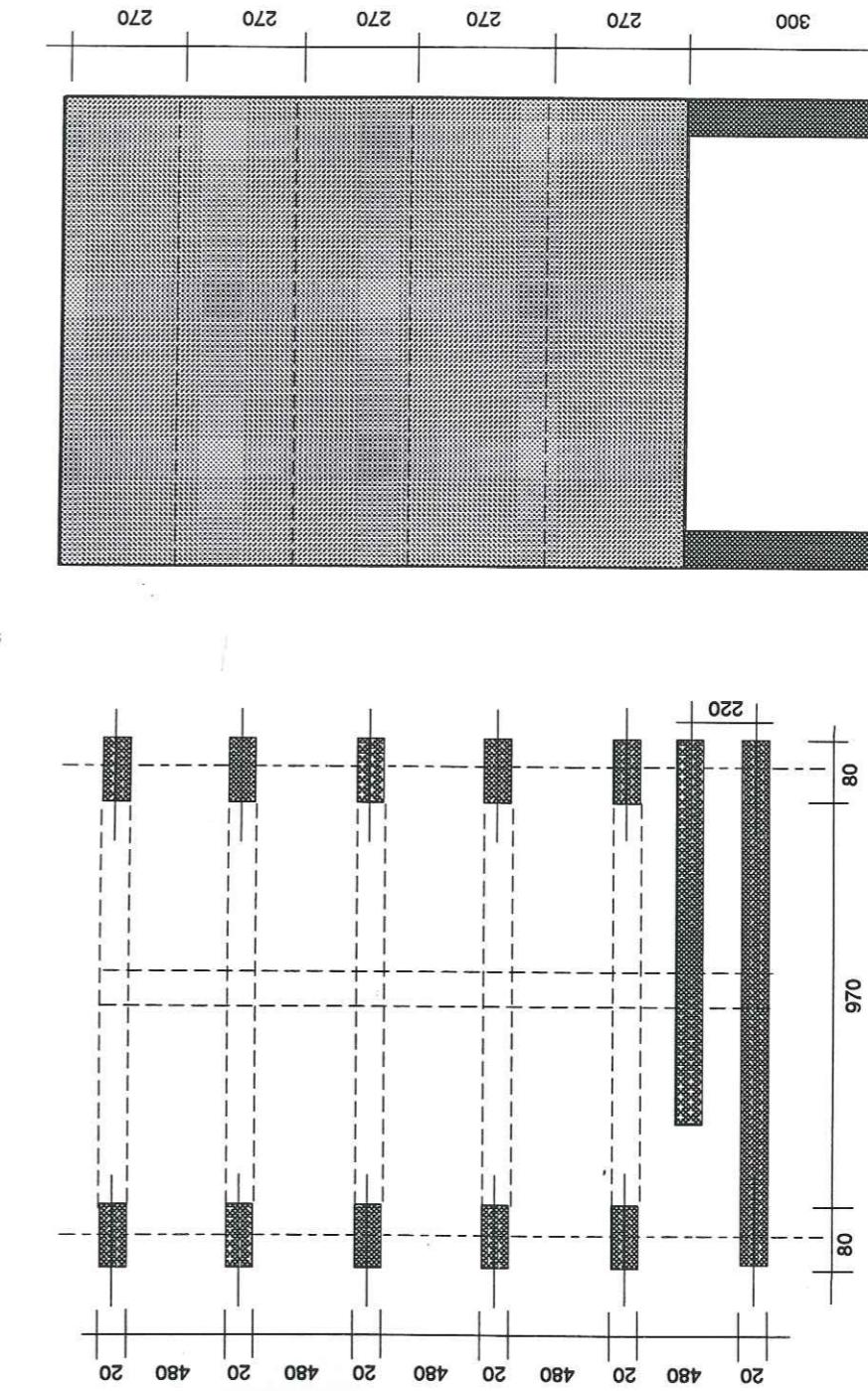
HOCHE - Bâtiment A
Plancher haut du 2e, 3e, 4e et 5e



HOCHE - Bâtiment A
Plancher haut du 1er



HOCHE - Bâtiment A



Condillac Bt A - Plan du RDC et elevation

ANNEXE D

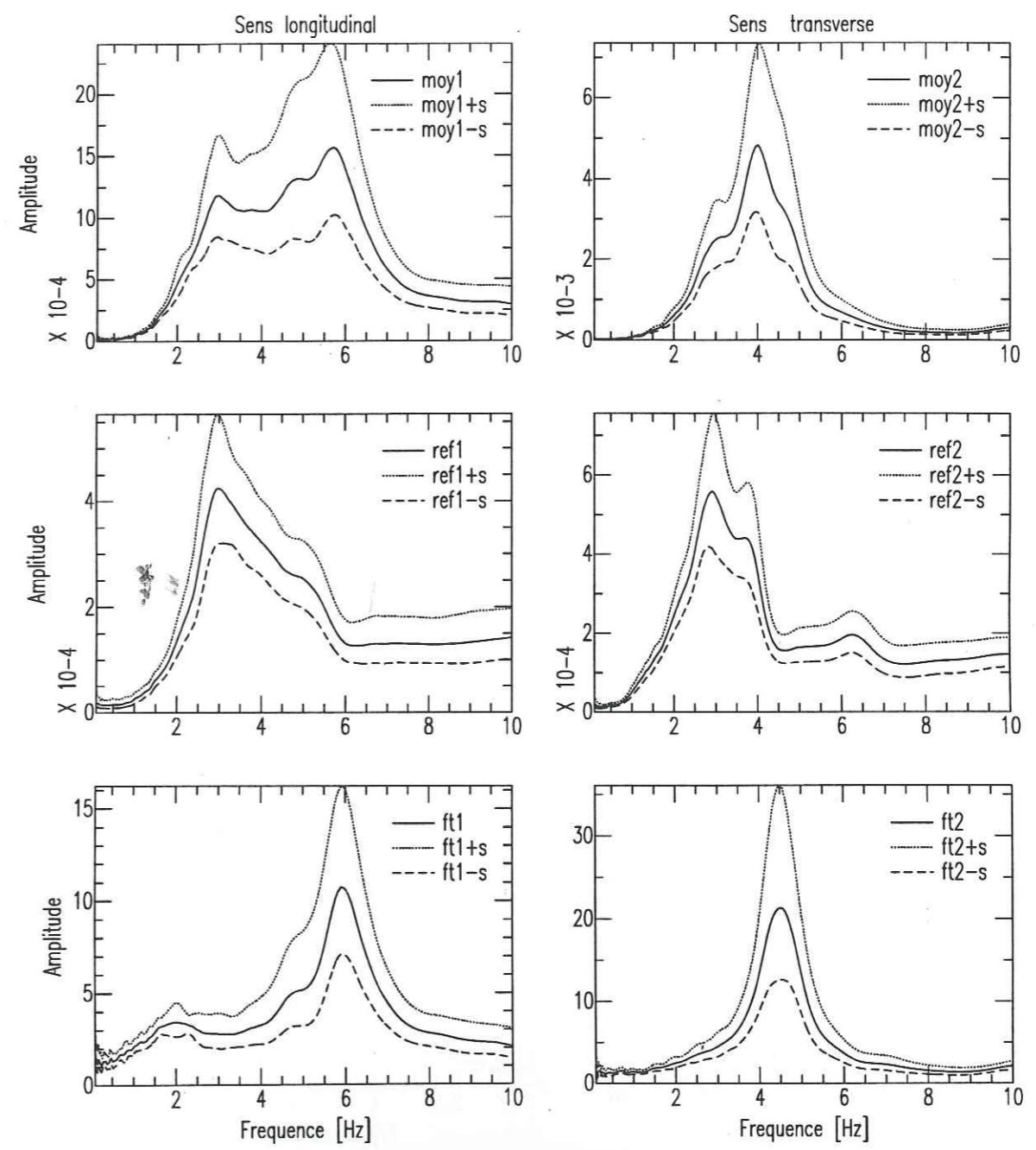
BRUIT DE FOND - BATIMENTS GRENOBLOIS

**SPECTRES ET FONCTIONS DE TRANSFERT DES BATIMENTS
INSTRUMENTES DANS L'AGGLOMERATION GRENOBLOISE**

Les spectres sont lissés avec une fenêtre logarithmique de 10%

Notations:

EURO_eur44 : Europole allée N° 44
HOCH_bt1 : Hoche bâtiment N°1
MIST_bt09 : Mistral bâtiment N° 09
MIST_tr72 : Mistral tour N° 72
VO_aji : Village Olympique tour de l'Association des Jeunes
VO_dh32 : Village Olympique Rue Duhamel au N° 32
VO_lt3 : Village Olympique Rue leonel Terray au N° 3
VO-tour3 : Village Olympique tour N° 3
IV_vercors : Ile Verte tour Vercors
SMH_mlg4 : St Martin d'Heres Malfangeat au N° 4
ECHIR_auv4 : Echirolls tour d'Auvergne N° 4
ECHIR_psm3 : Echirolls Pierre Semart N° 3
CPUS_condA : Campus bâtiment A de la résidence Condillac.
CPUS_arpej : Campus tour de l'arpej
THIERS_Bt44 : Rue Thiers au numéro 44
VQT_qperr42 : Vieux quartiers, quai Perrière au numéro 42

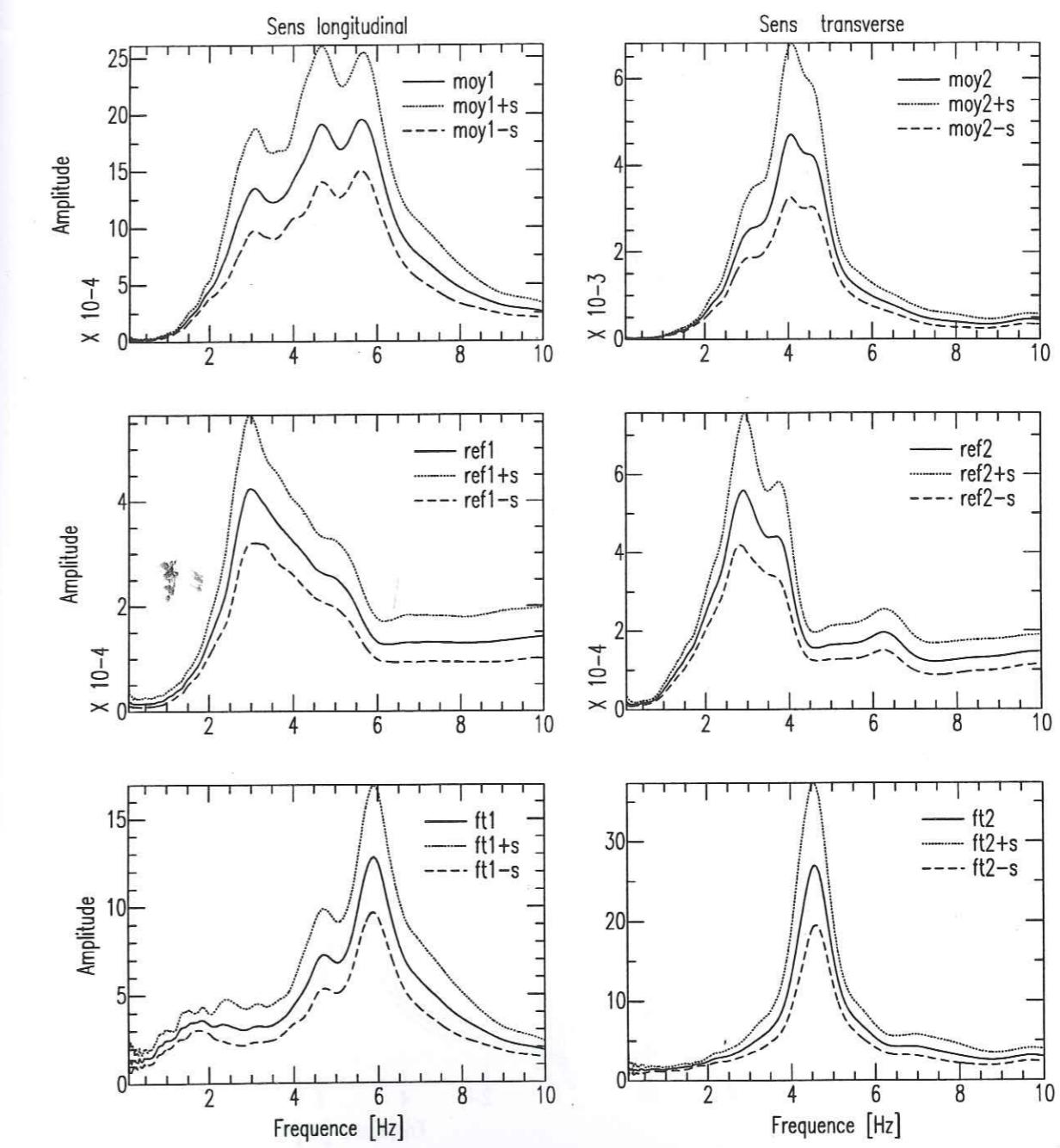
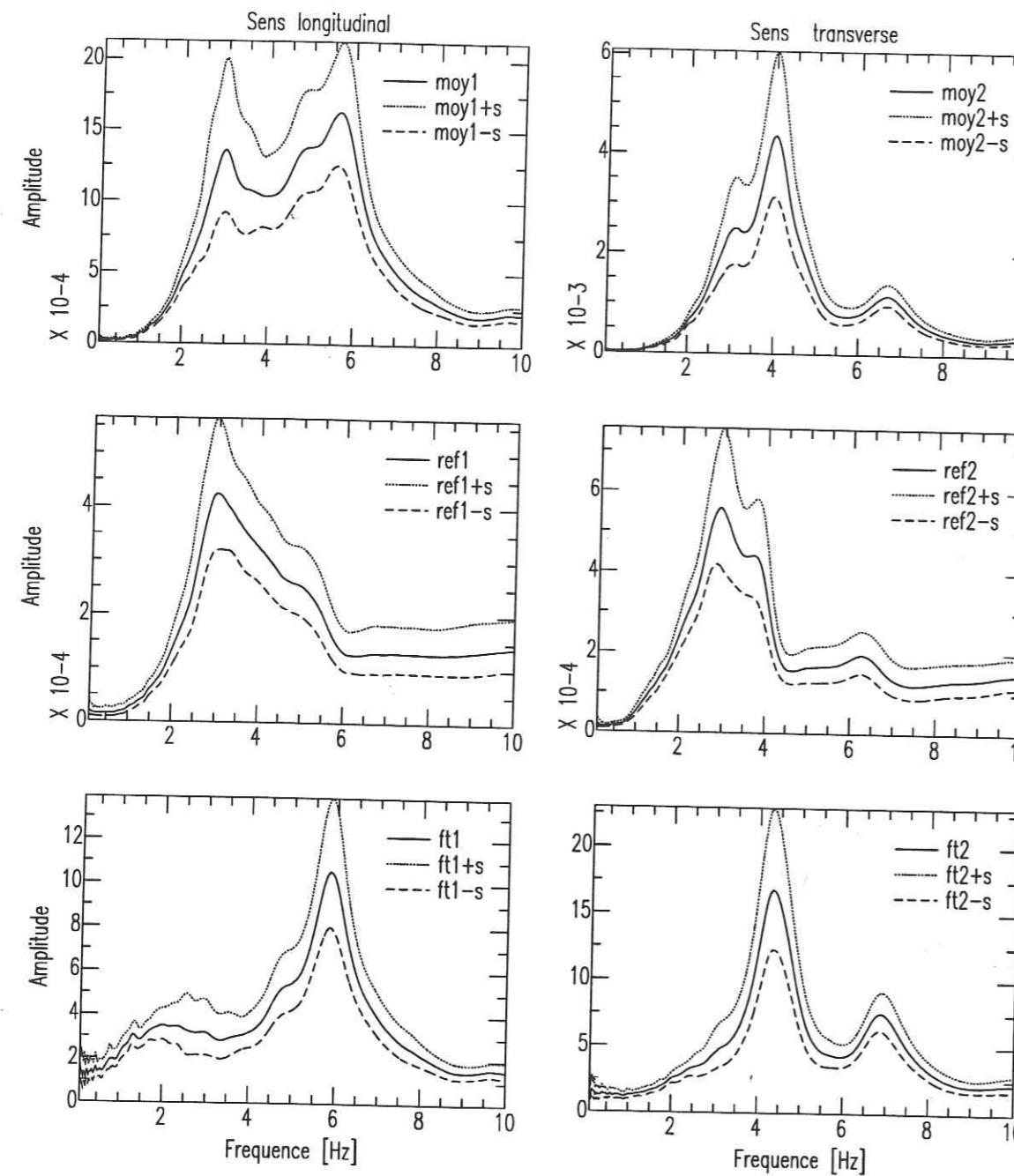


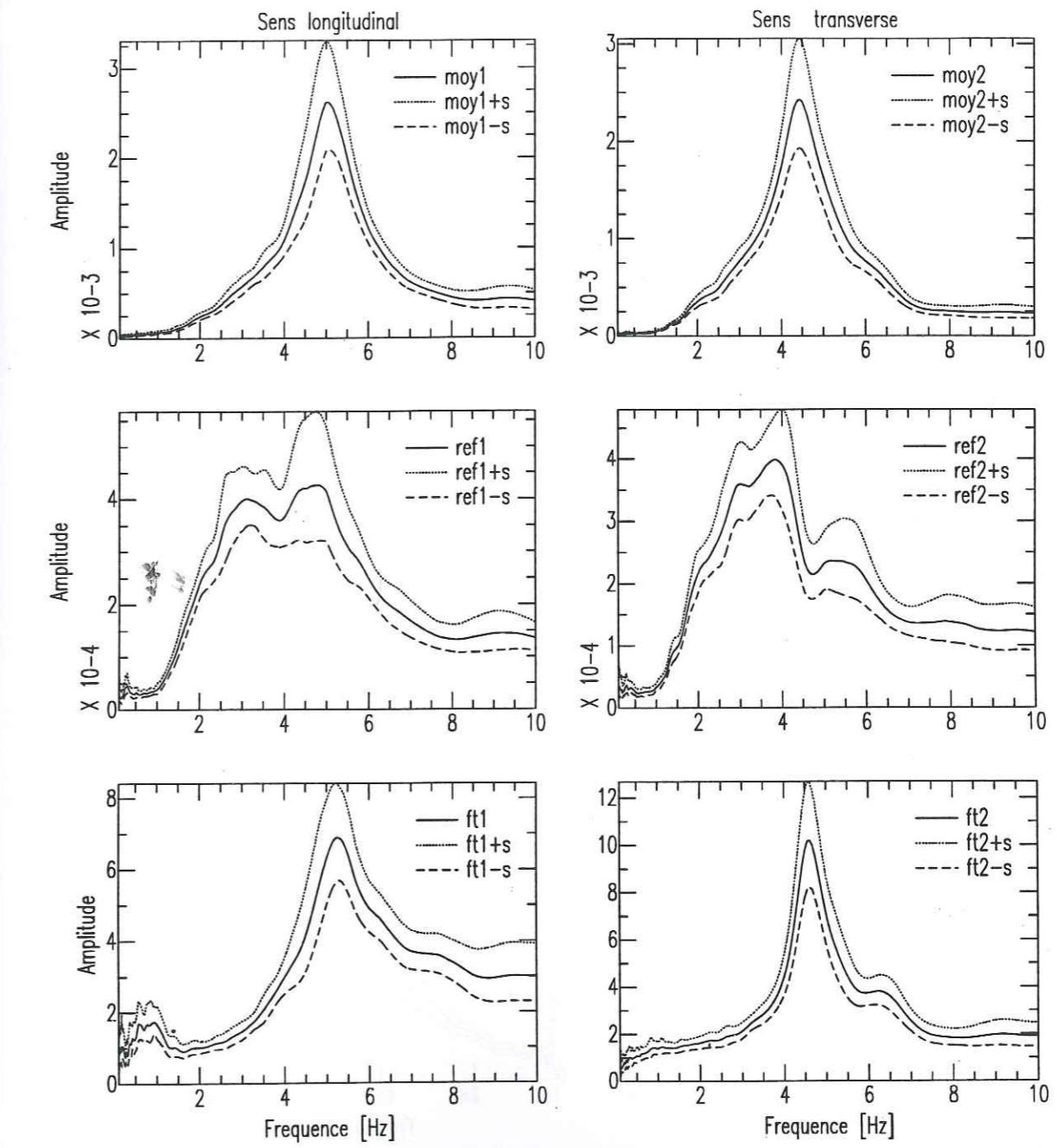
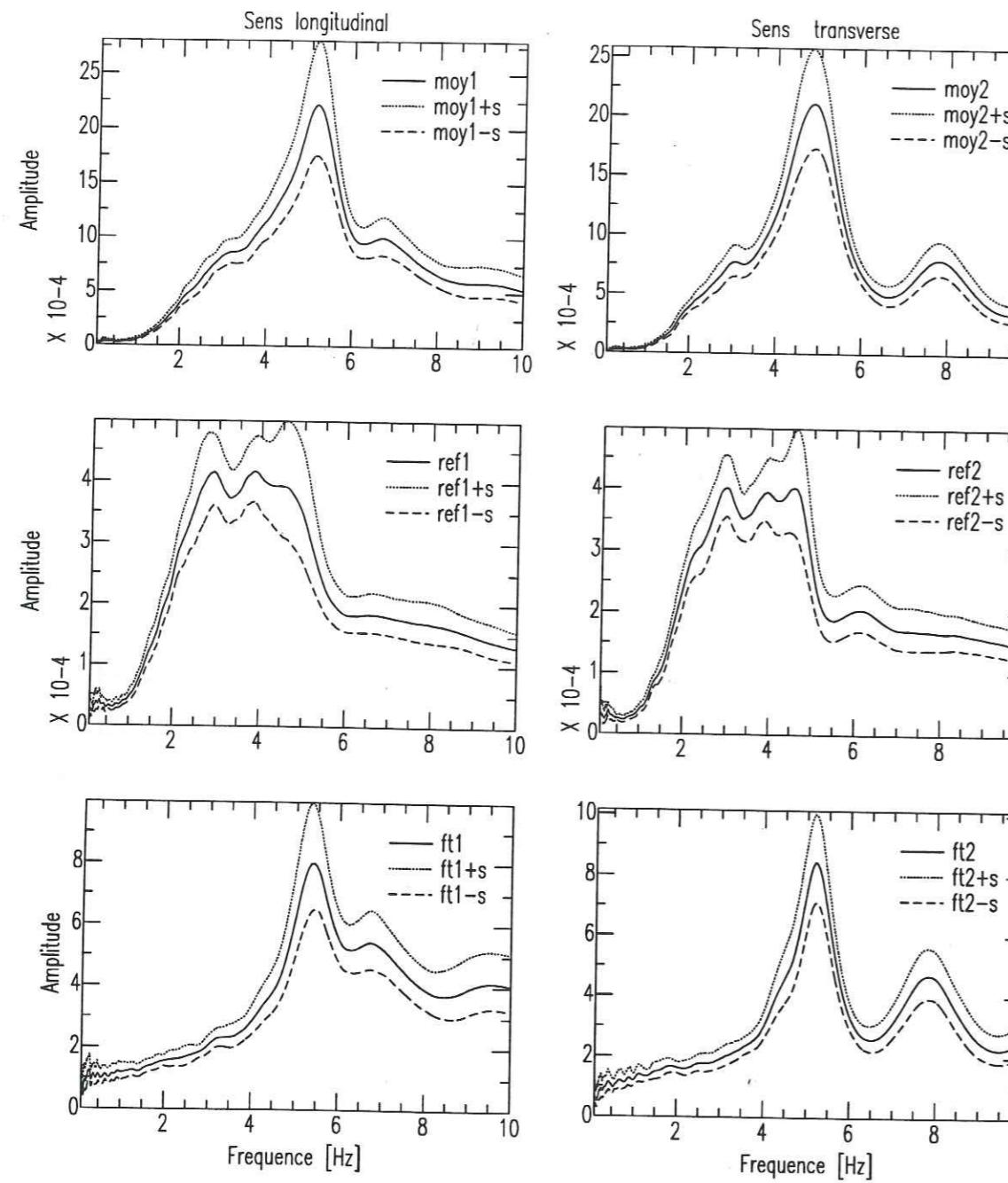
**EURO_eur44 - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type**

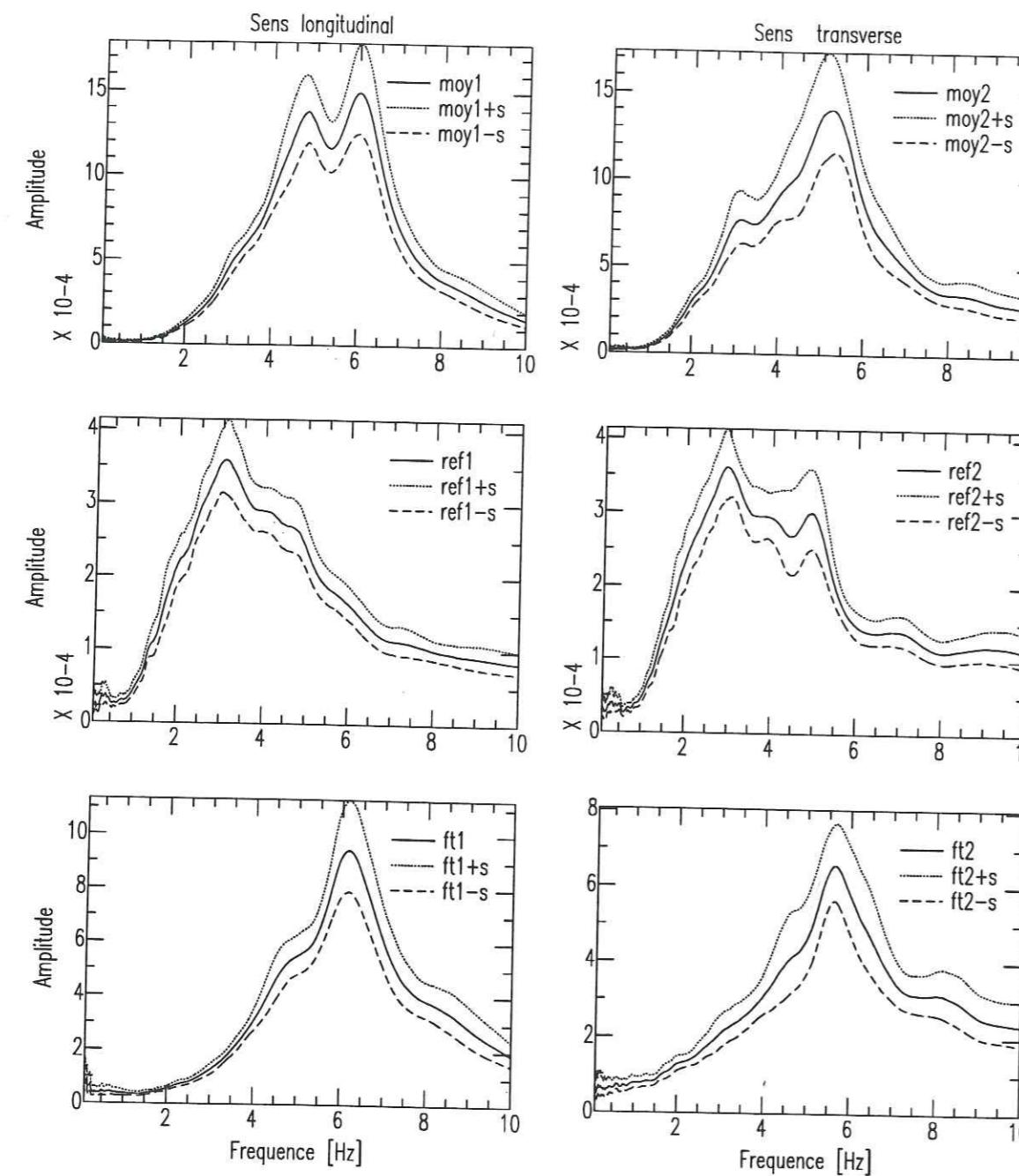
Trait continu : moyenne sur plusieurs enregistrements (20 à 30)

Trait pointillé fin : moyenne + écart type

Trait pointillé : moyenne - écart type

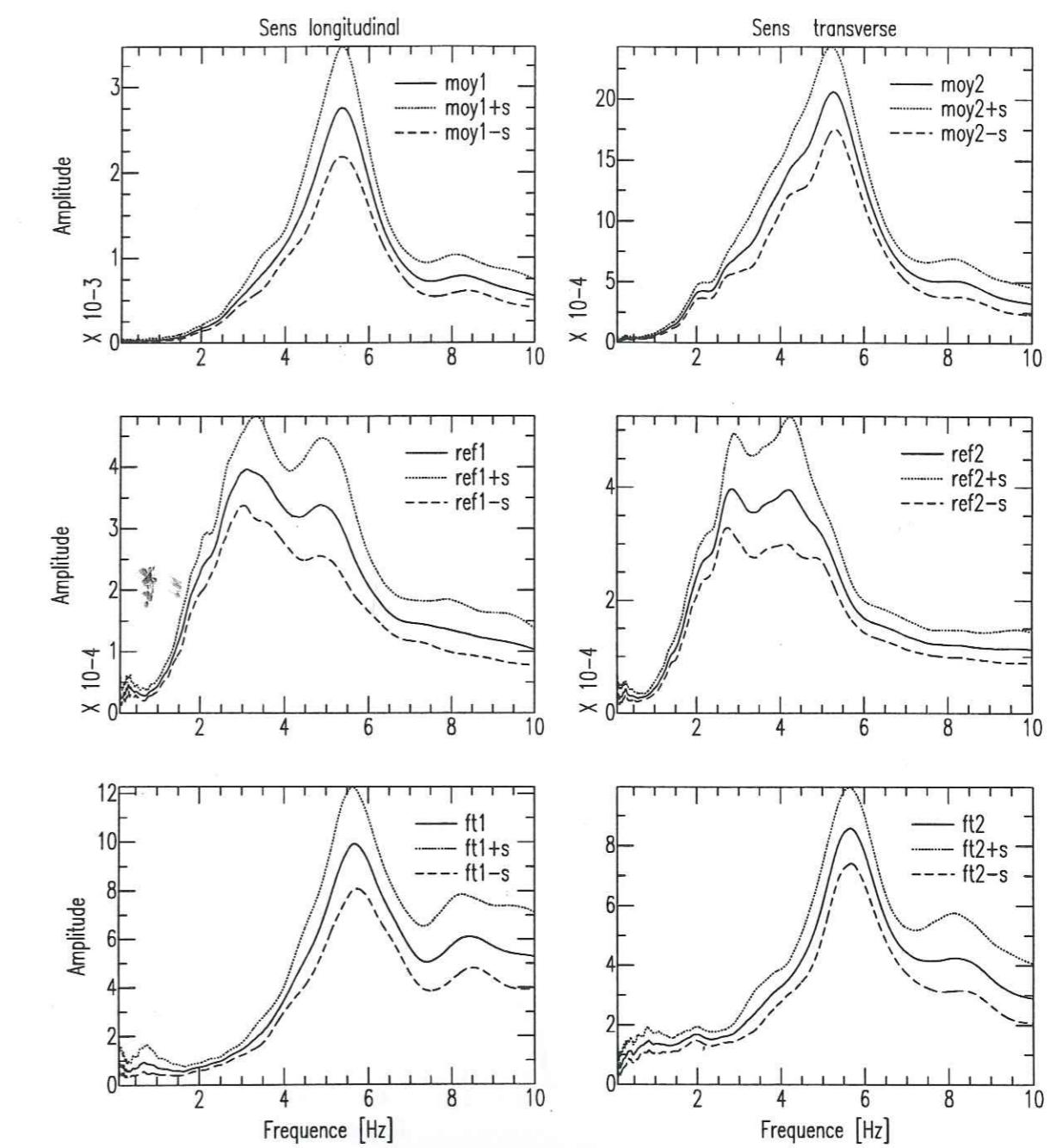






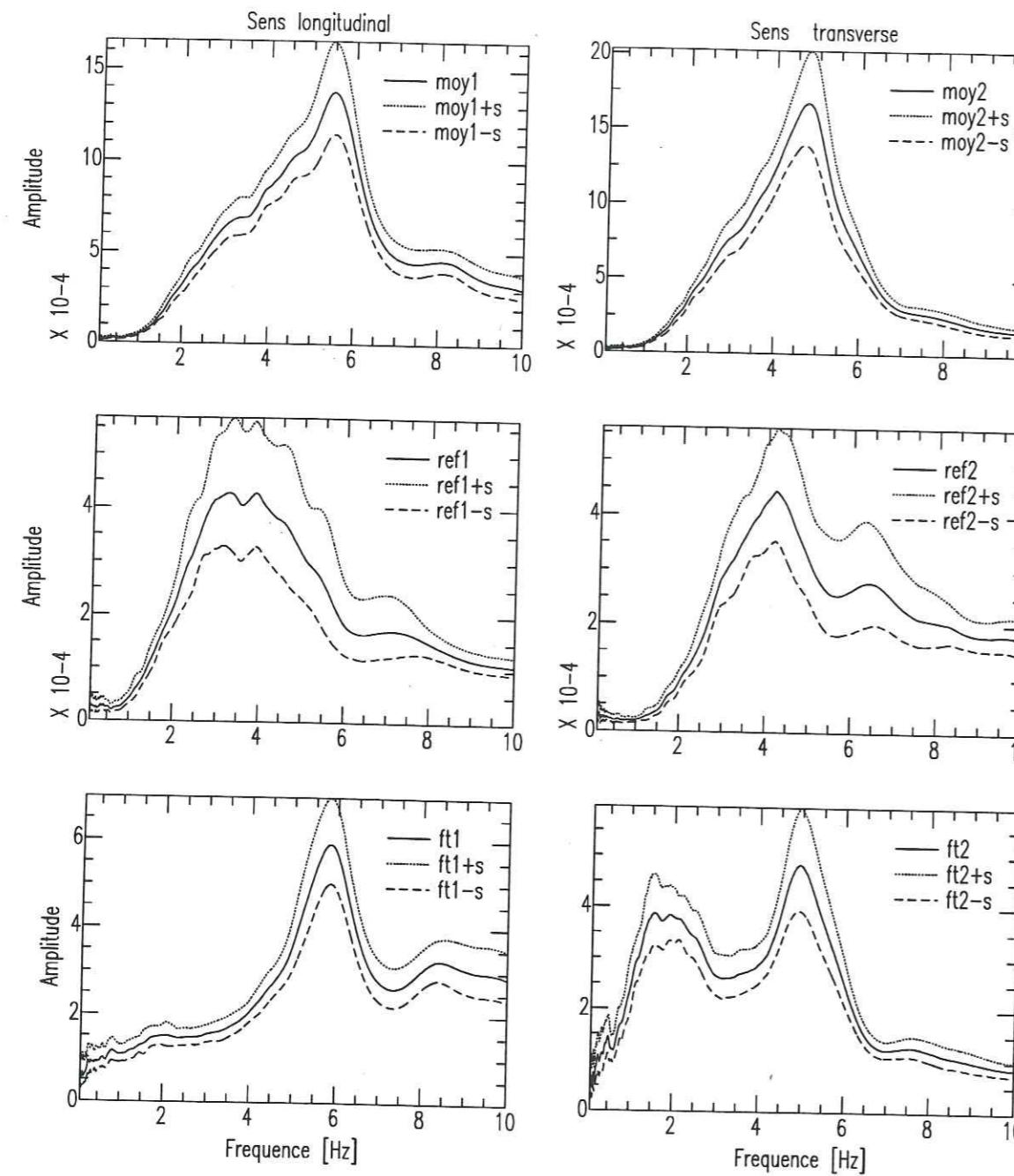
HOCH_bt4 - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type
Trait continu : moyenne sur plusieurs enregistrements (20 a 30)

Trait pointille fin : moyenne + ecart type
Trait pointille : moyenne - ecart type

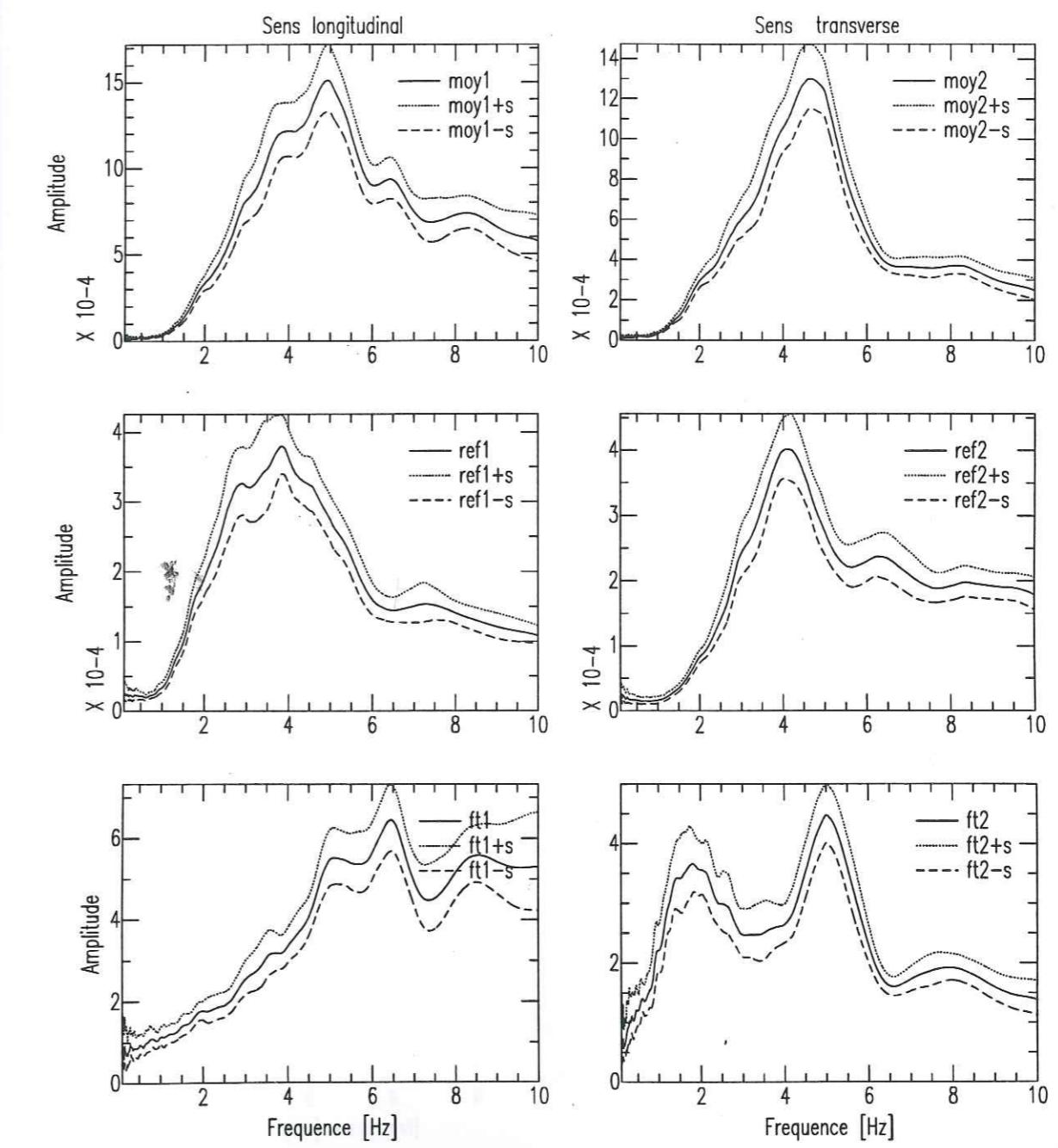


HOCH_bt8 - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type
Trait continu : moyenne sur plusieurs enregistrements (20 a 30)

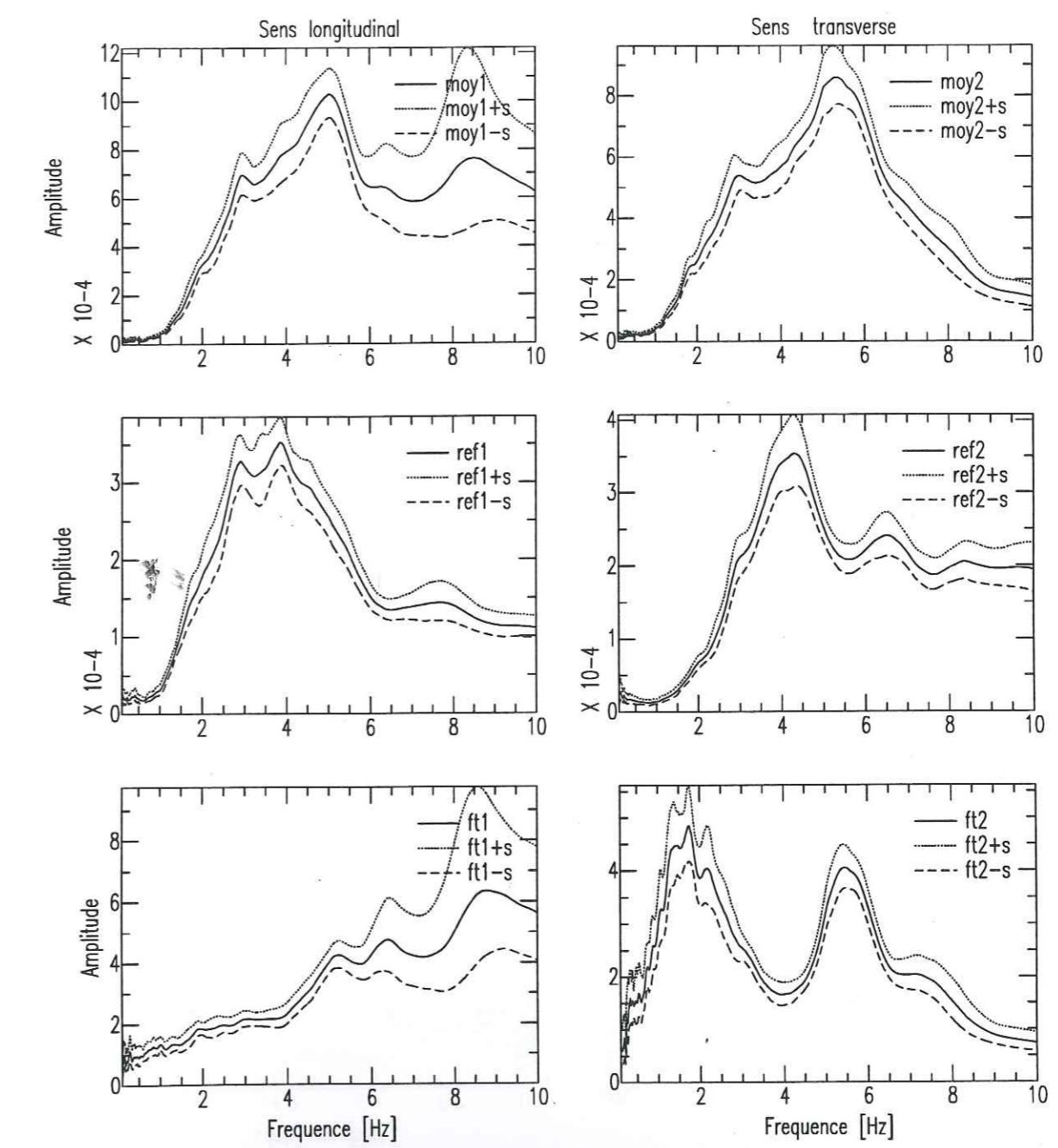
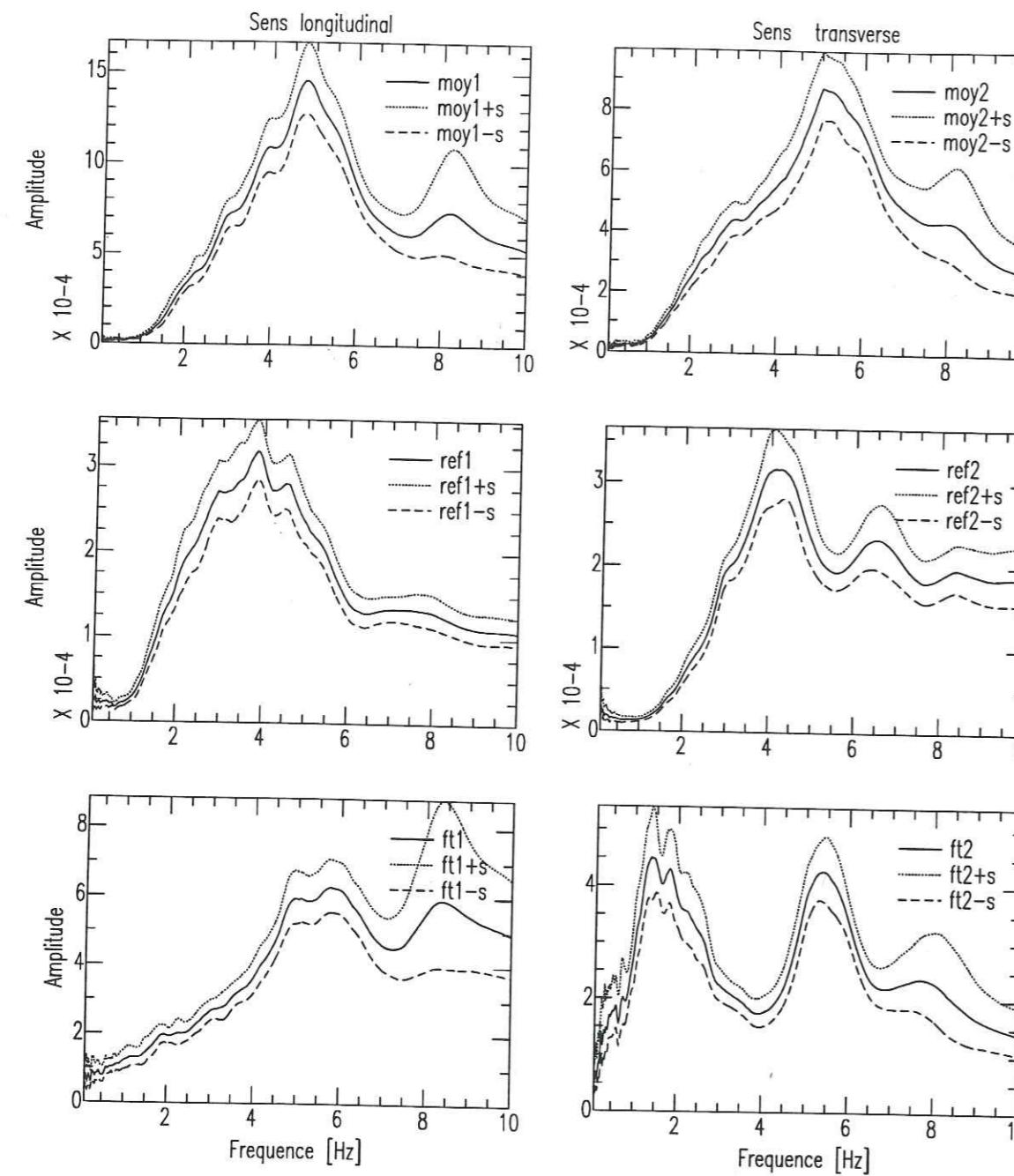
Trait pointille fin : moyenne + ecart type
Trait pointille : moyenne - ecart type

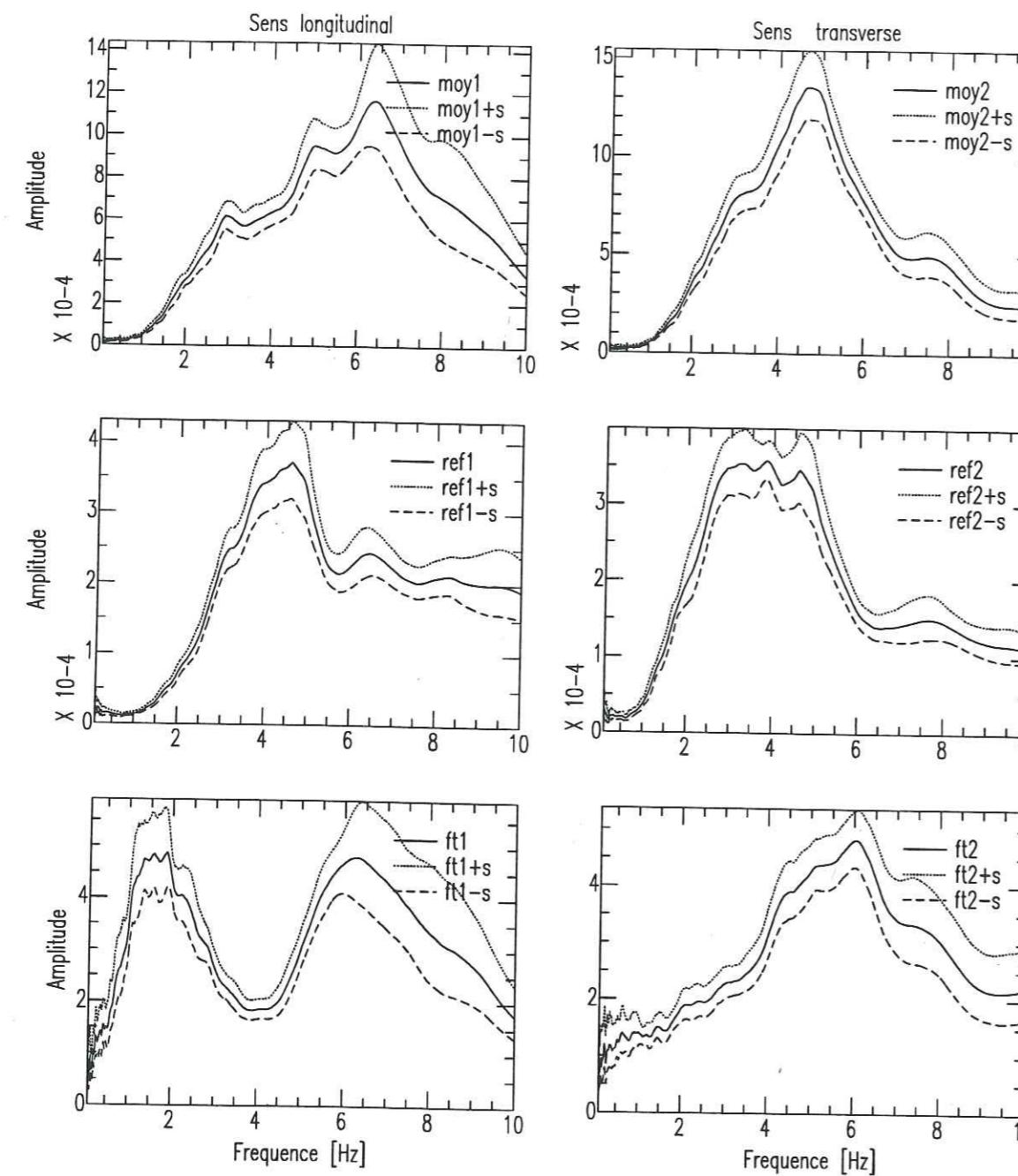


HOCH_btA - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type
Trait continu : moyenne sur plusieurs enregistrements (20 a 30)
Trait pointille fin : moyenne + ecart type
Trait pointille : moyenne - ecart type

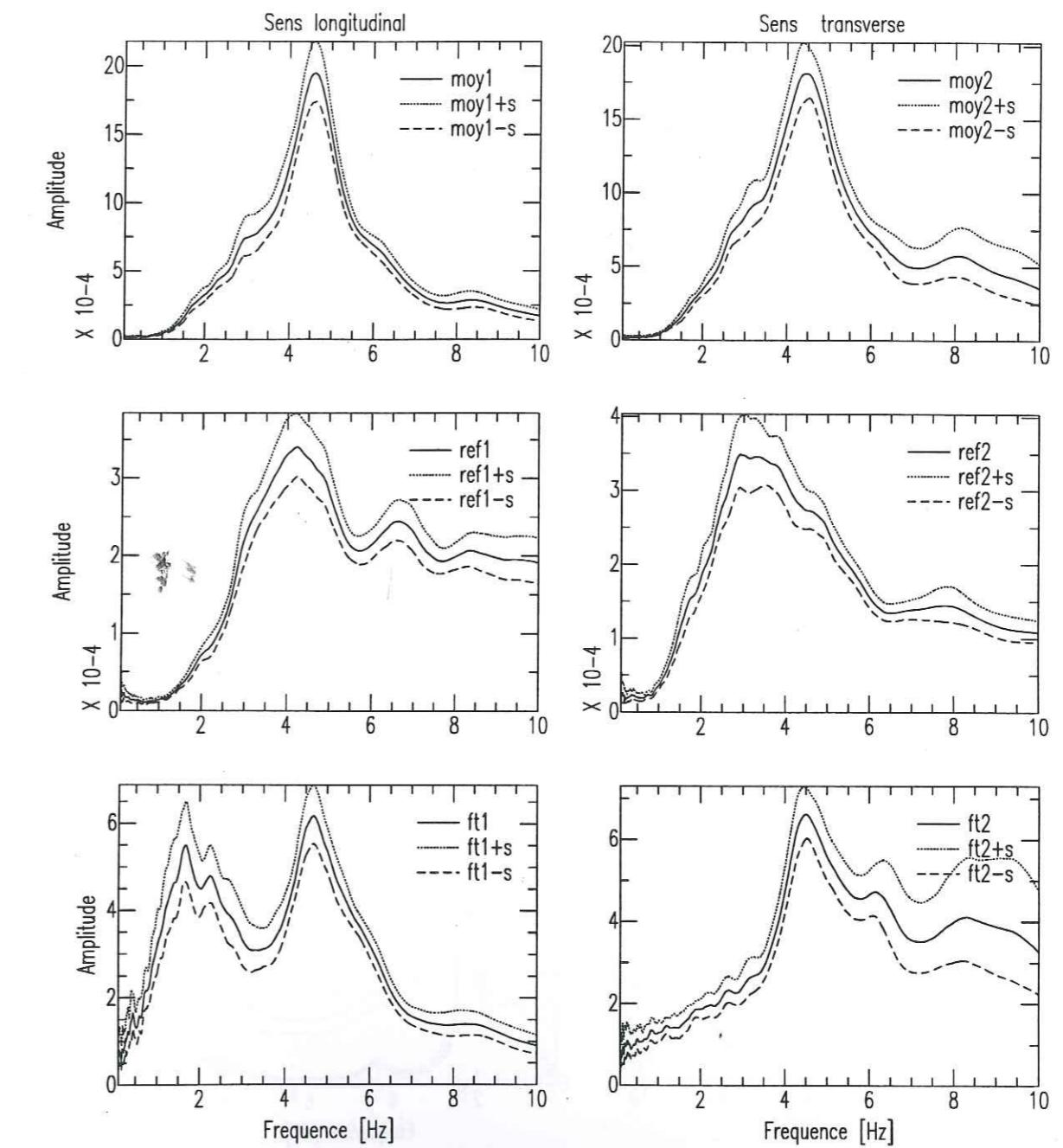


HOCH_btB - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type
Trait continu : moyenne sur plusieurs enregistrements (20 a 30)
Trait pointille fin : moyenne + ecart type
Trait pointille : moyenne - ecart type

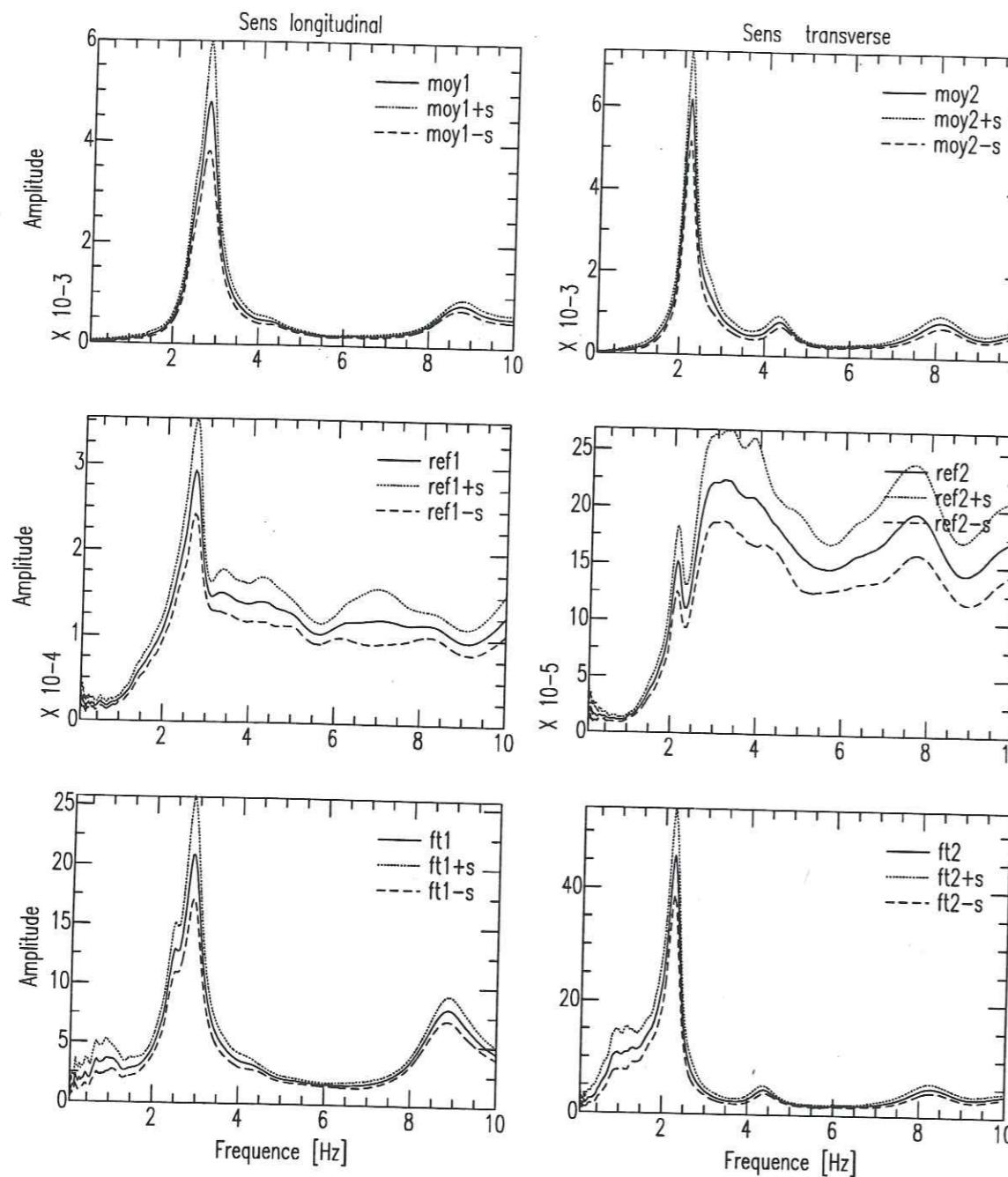




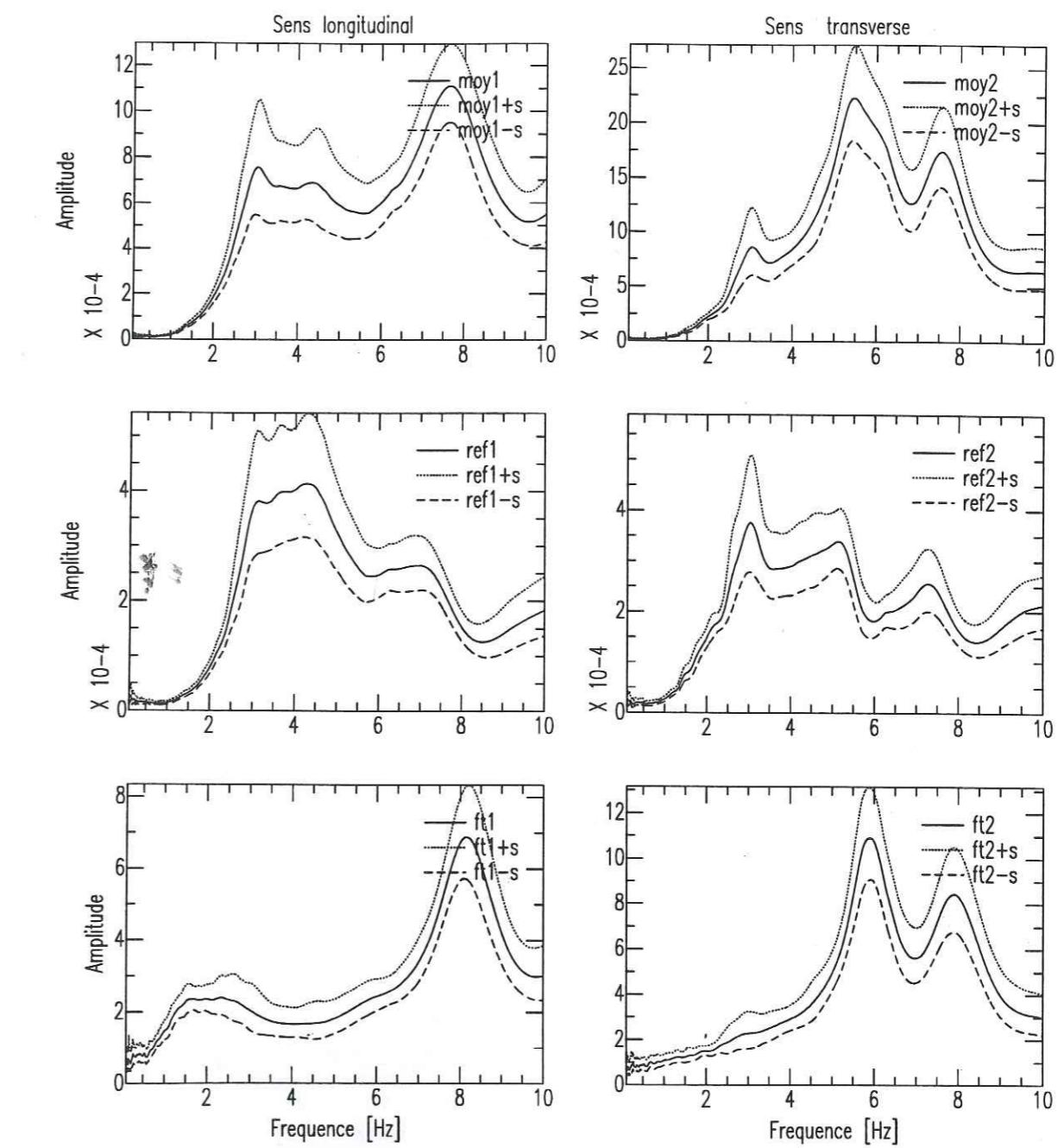
HOCH_btE1 - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type
Trait continu : moyenne sur plusieurs enregistrements (20 a 30)
Trait pointille fin : moyenne + ecart type
Trait pointille : moyenne - ecart type



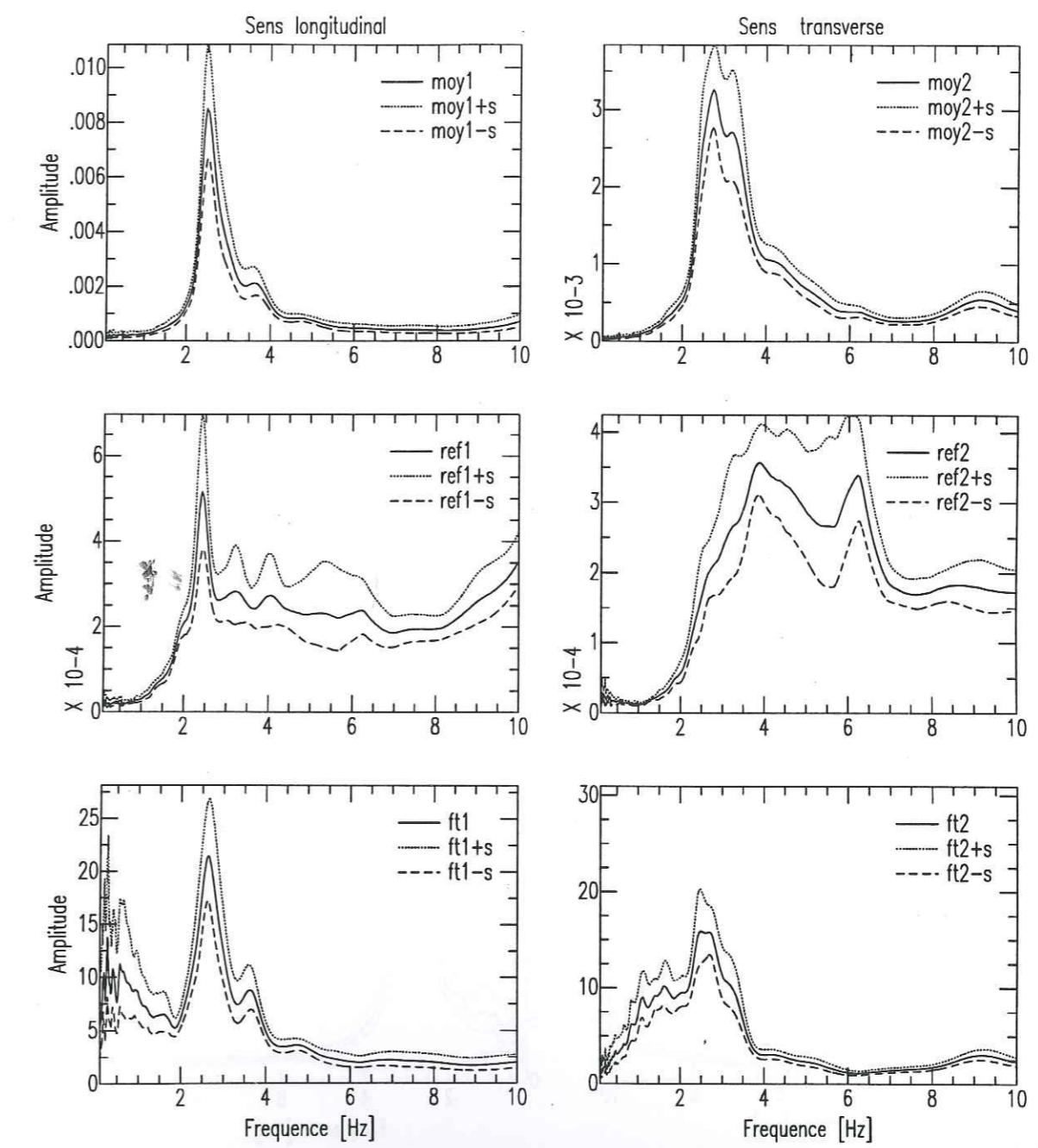
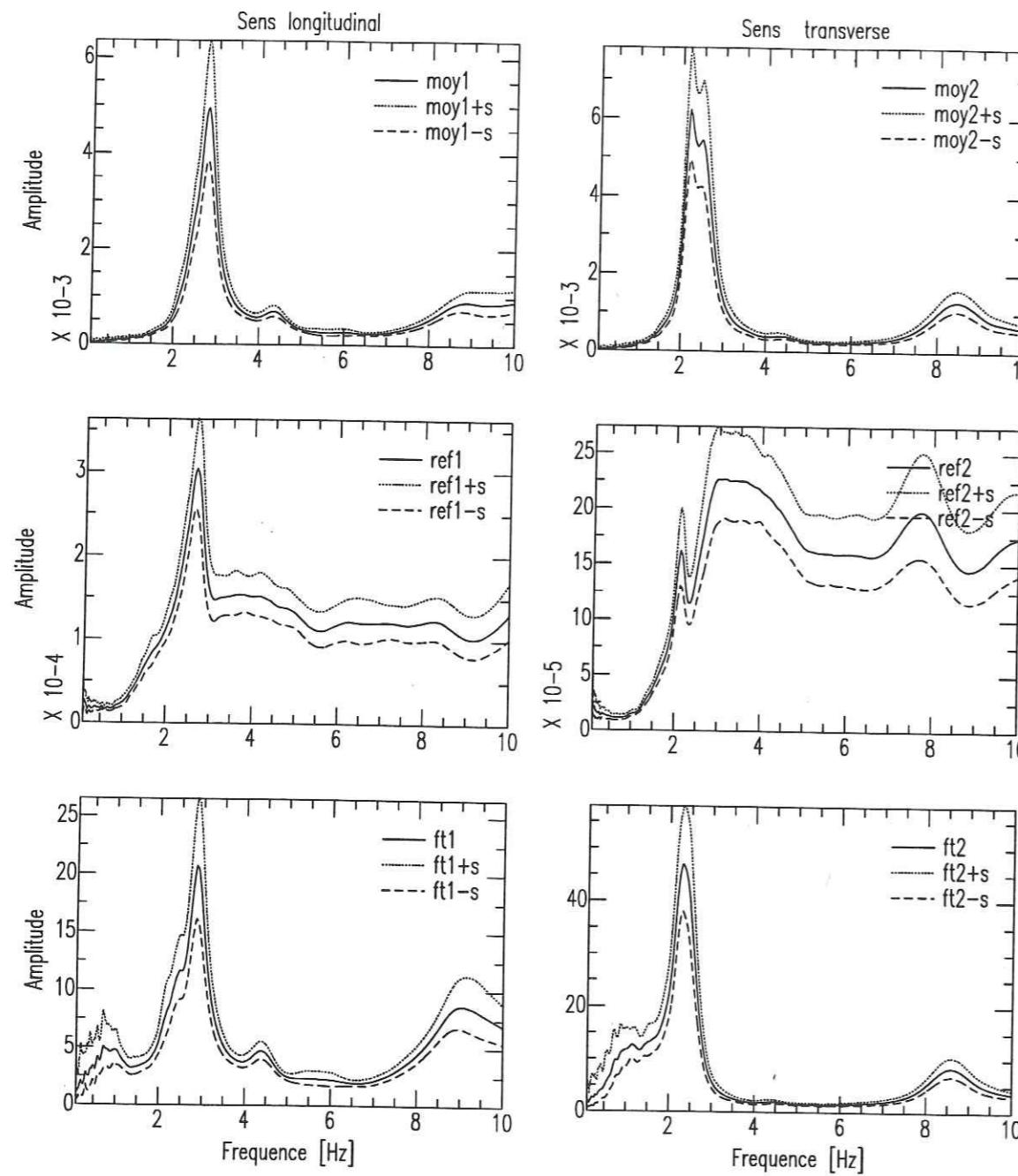
HOCH_btE2 - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type
Trait continu : moyenne sur plusieurs enregistrements (20 a 30)
Trait pointille fin : moyenne + ecart type
Trait pointille : moyenne - ecart type

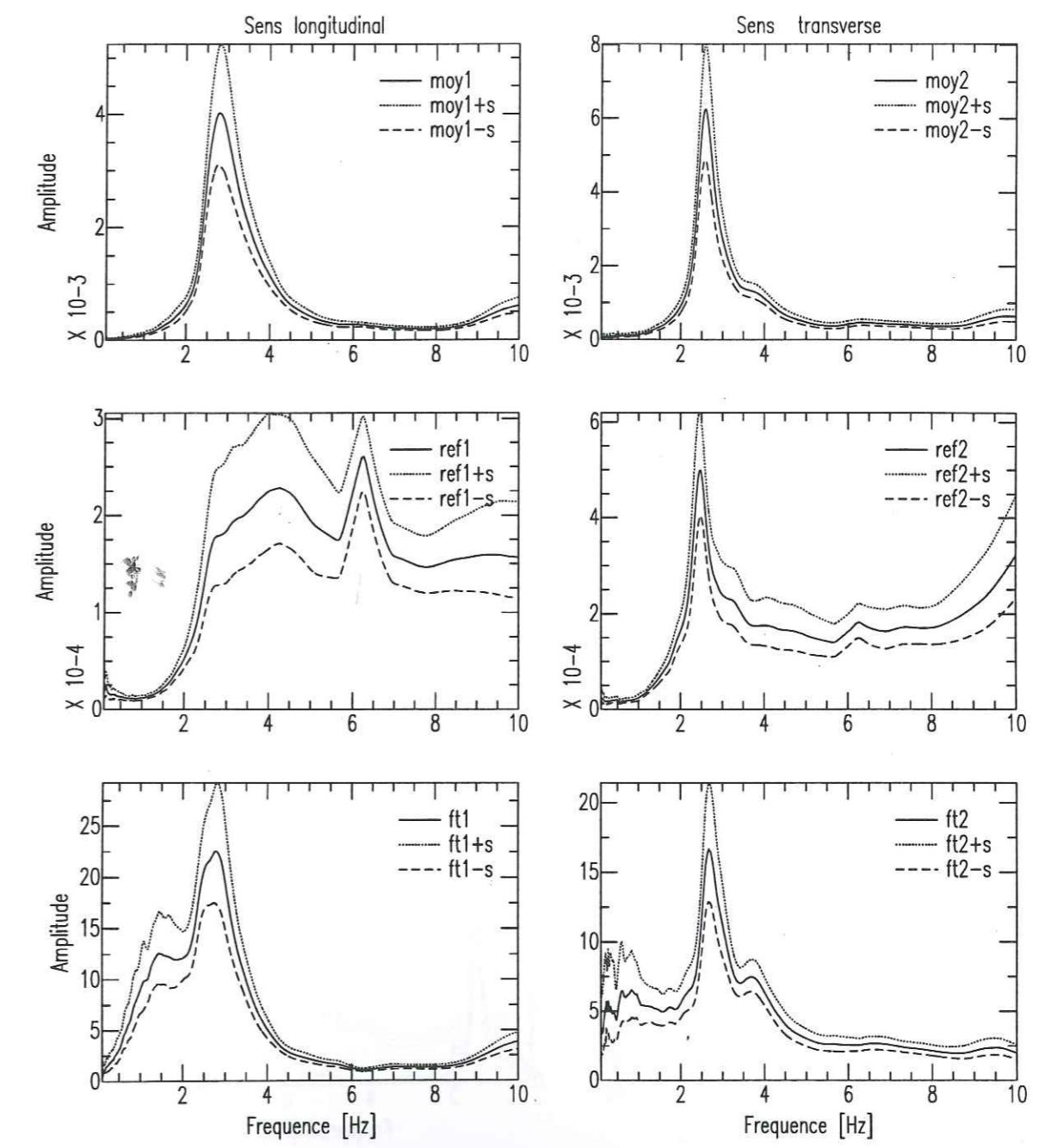
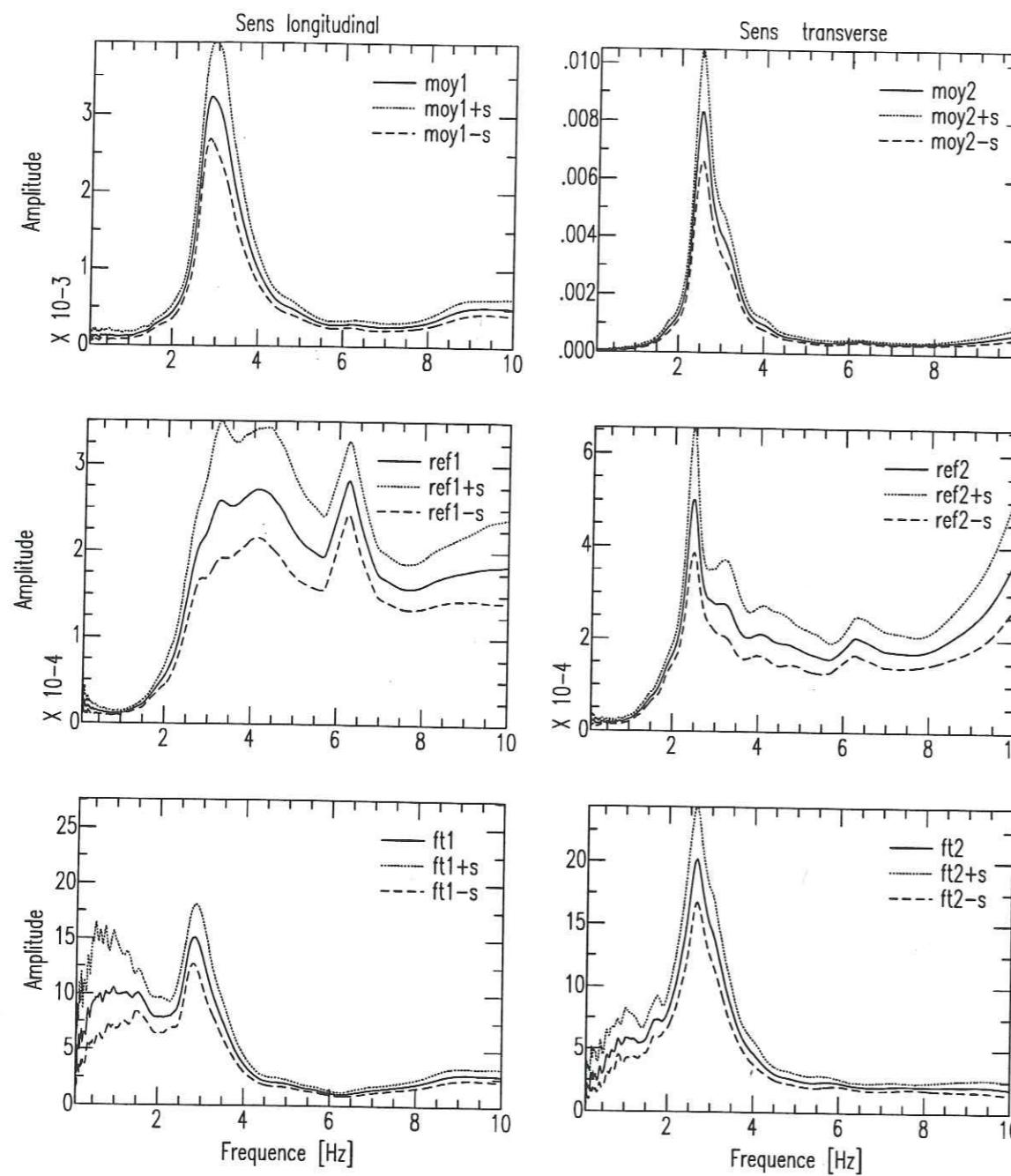


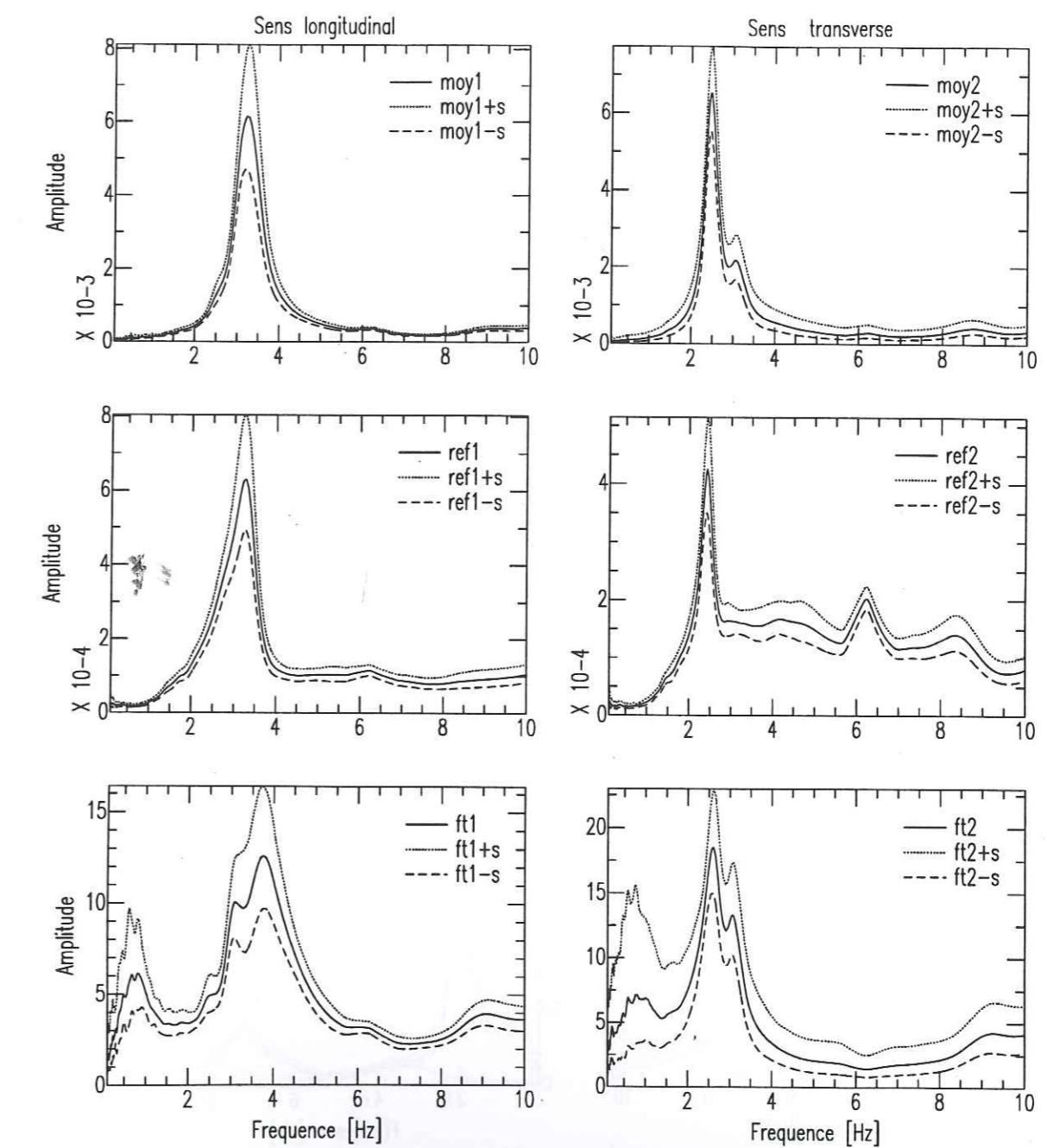
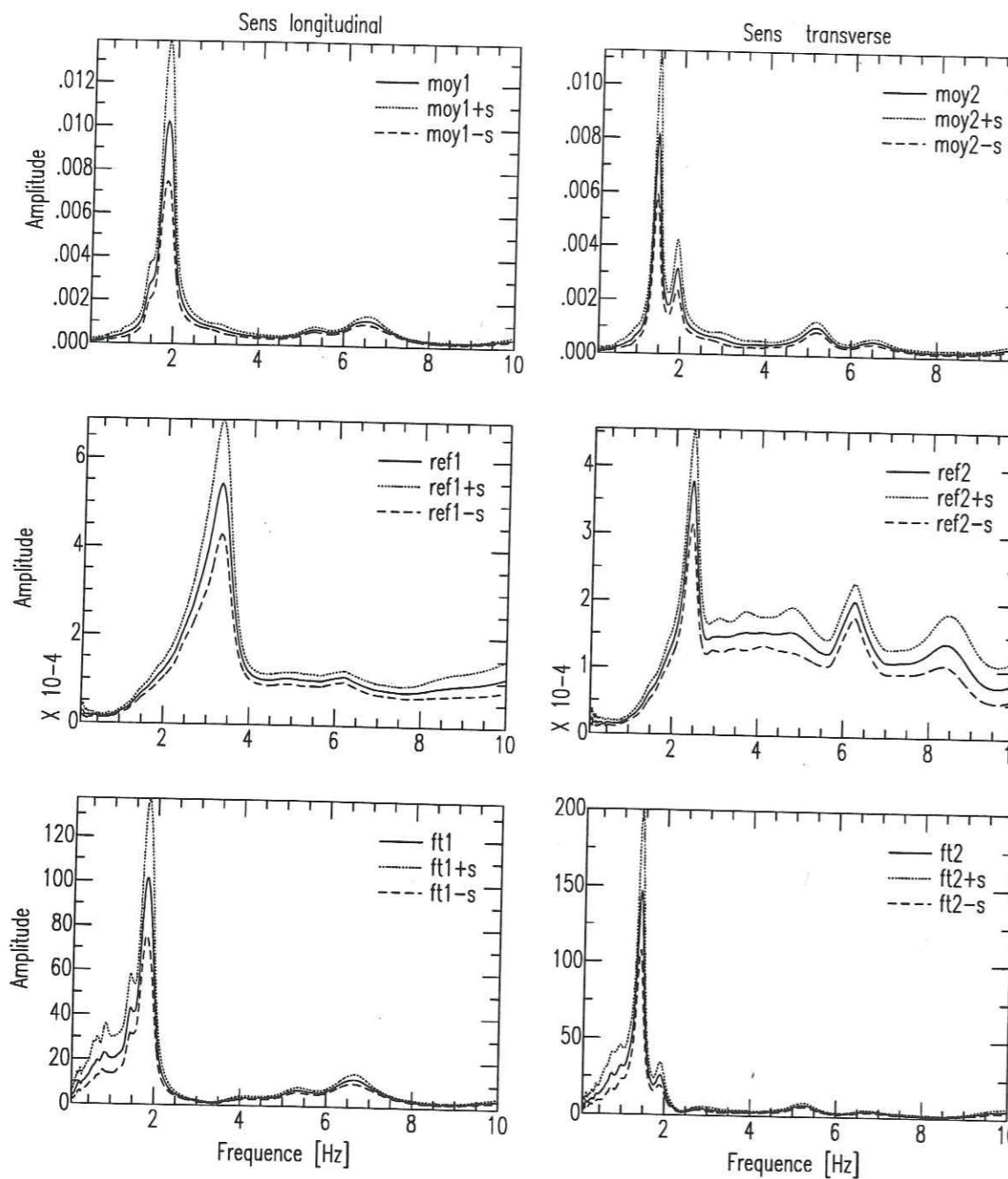
MIST_bt09 - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type
Trait continu : moyenne sur plusieurs enregistrements (20 a 30)
Trait pointille fin : moyenne + ecart type
Trait pointille : moyenne - ecart type

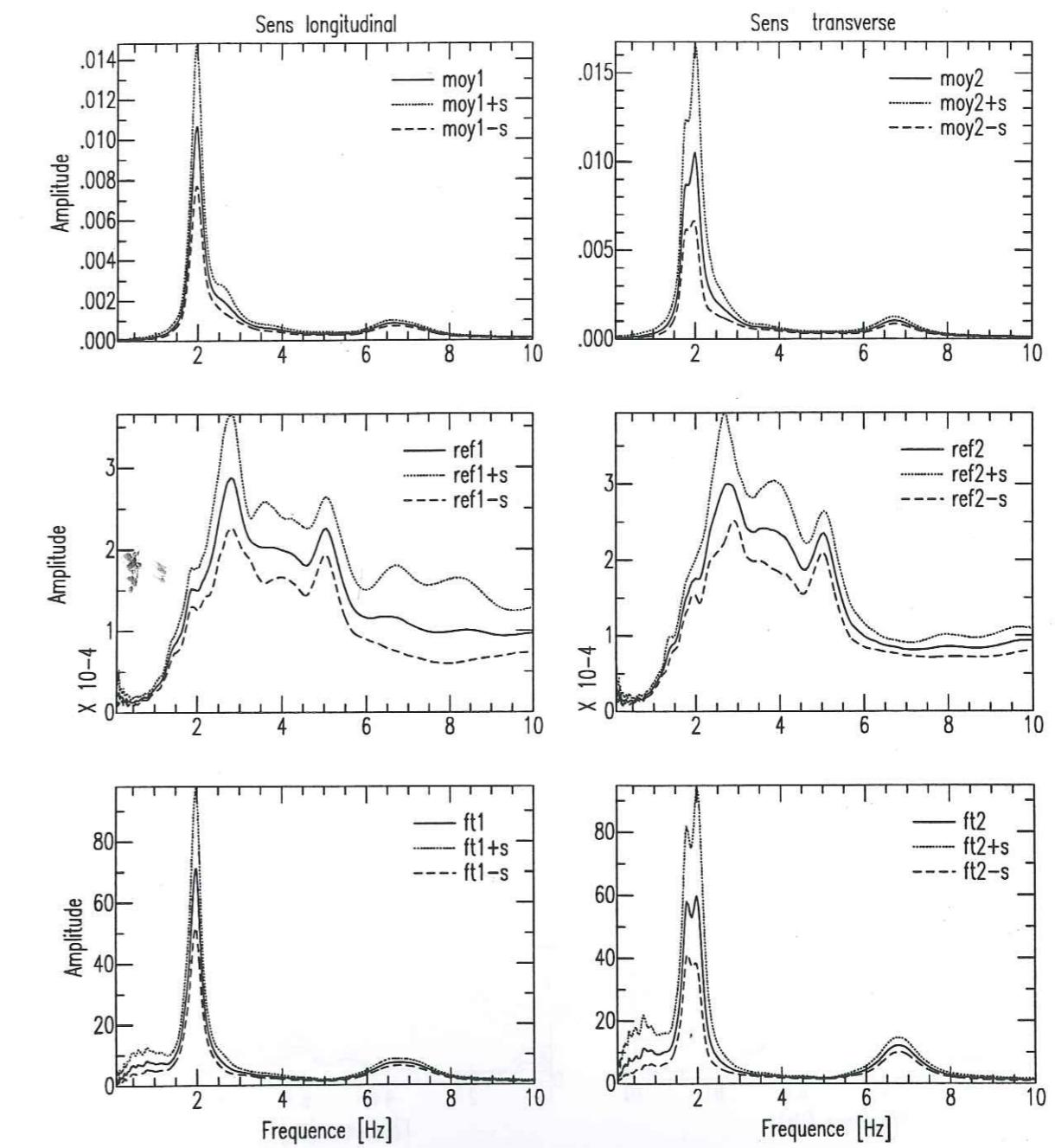
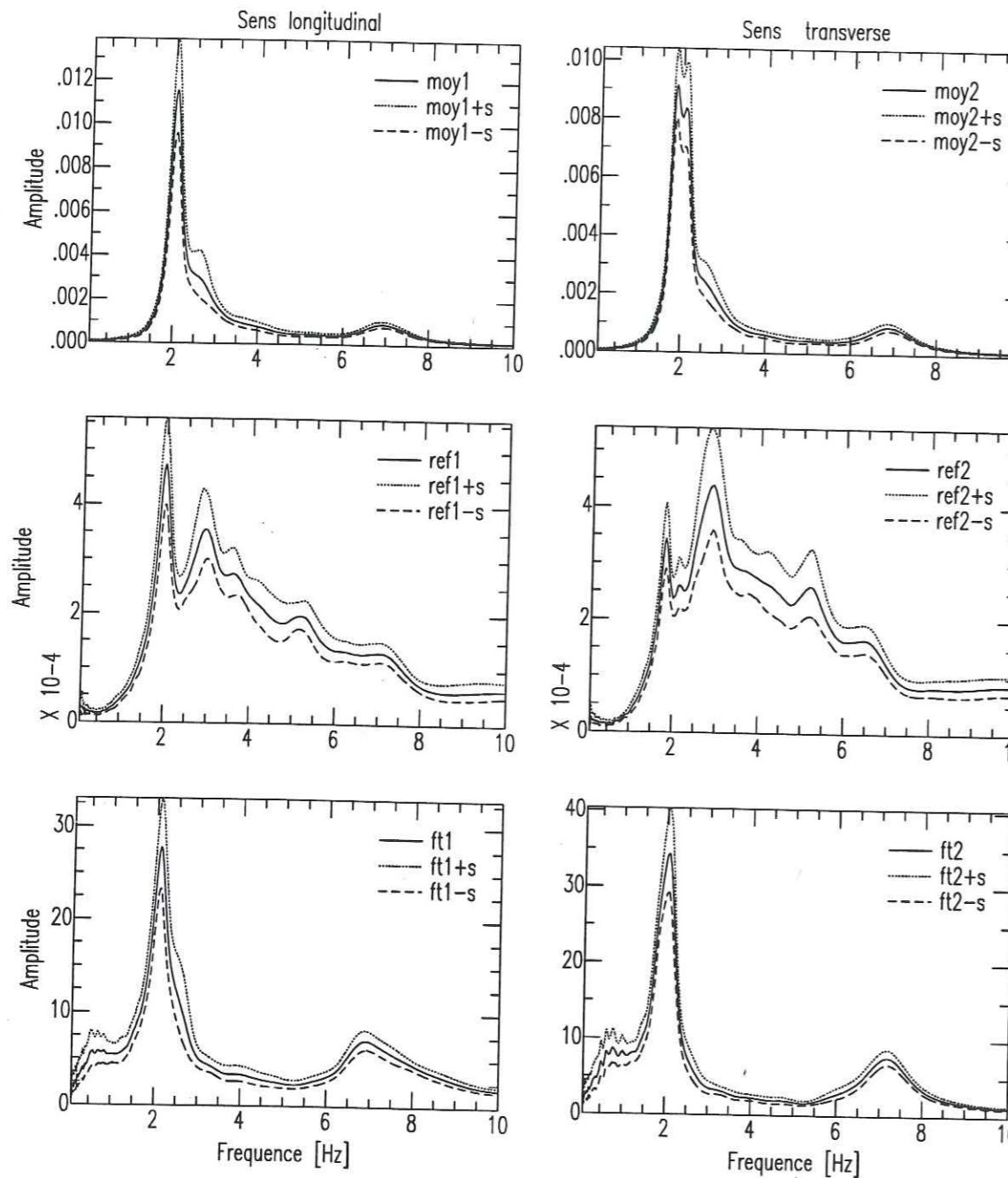


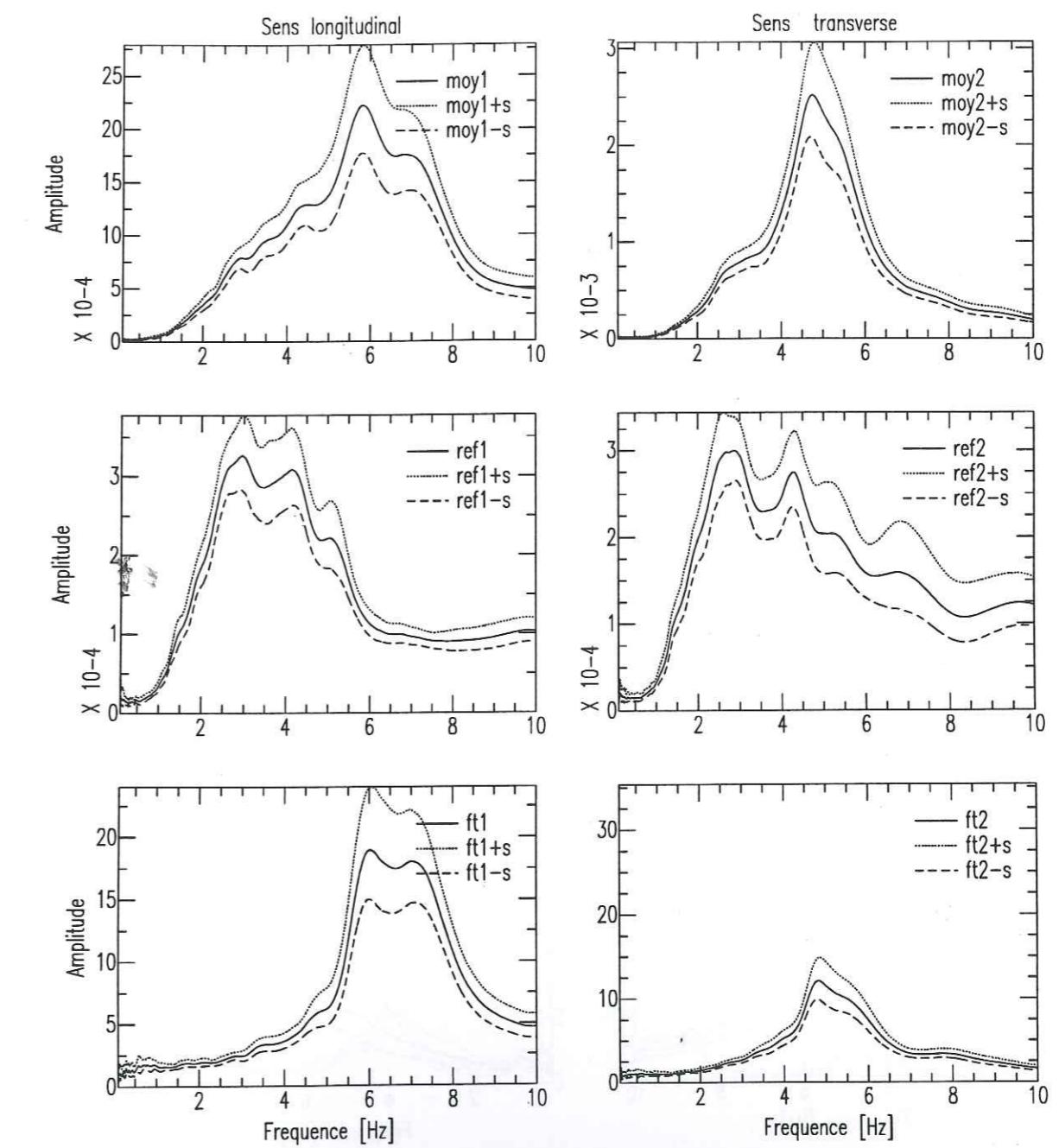
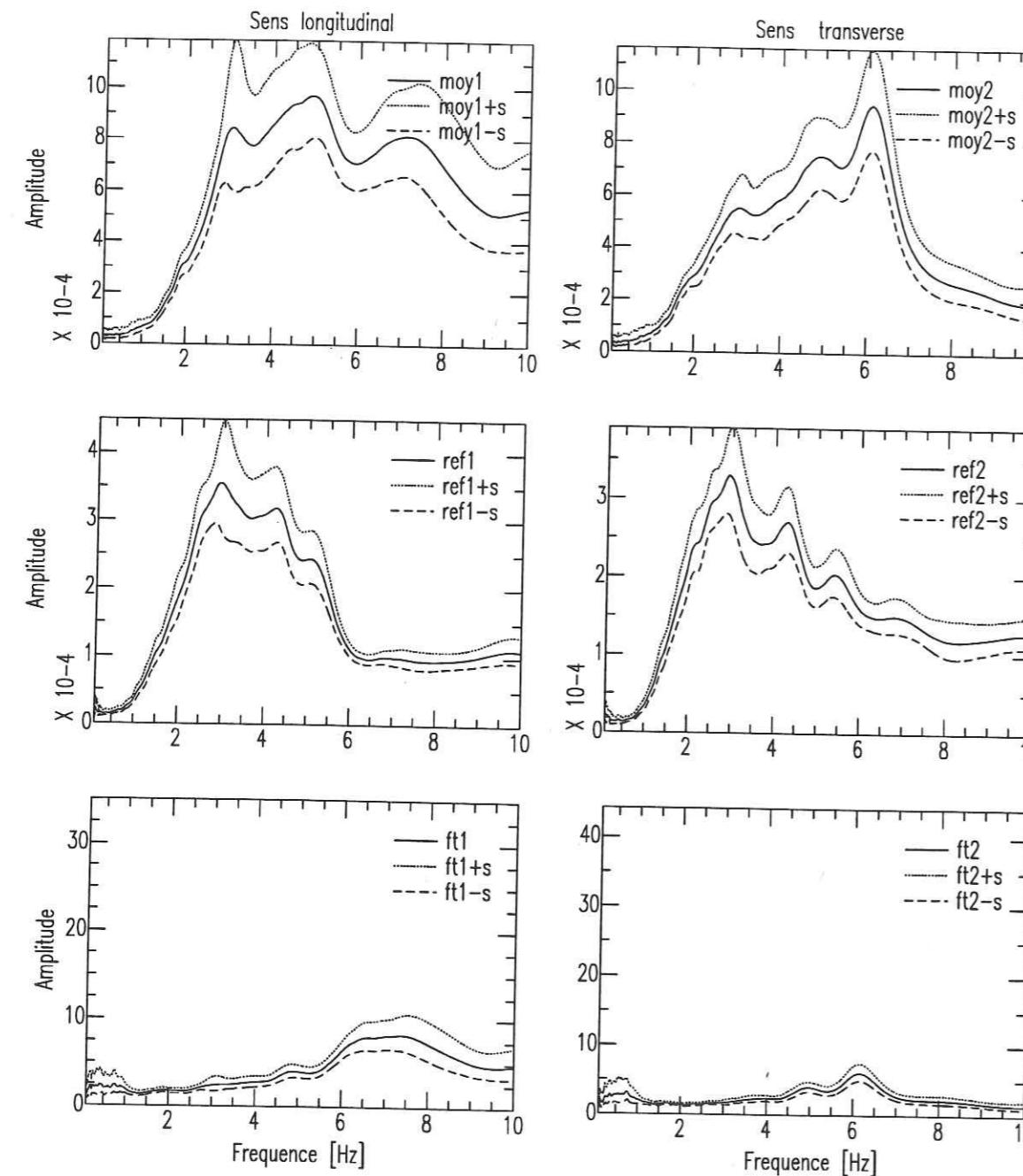
MIST_bt10 - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type
Trait continu : moyenne sur plusieurs enregistrements (20 a 30)
Trait pointille fin : moyenne + ecart type
Trait pointille : moyenne - ecart type

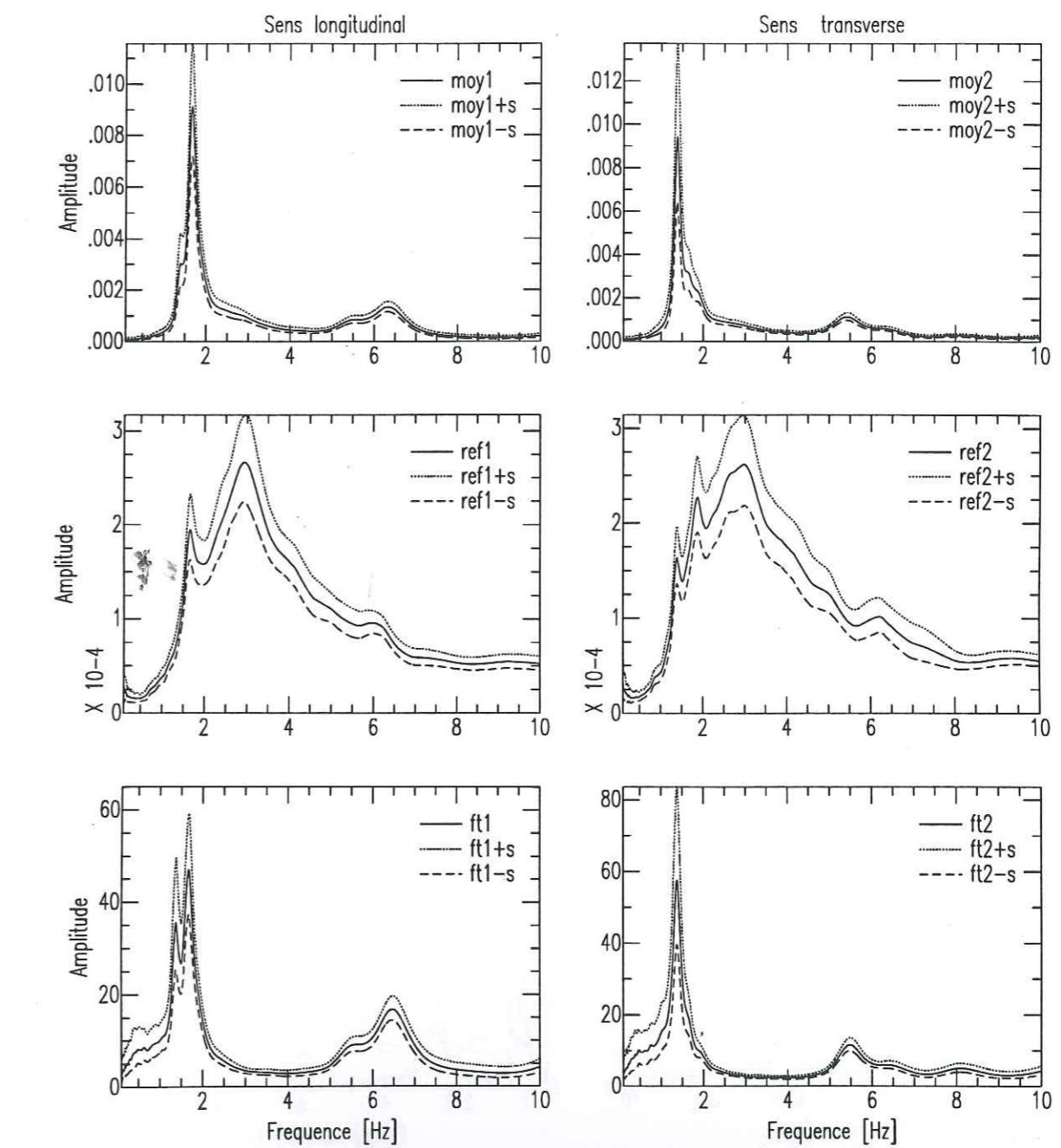
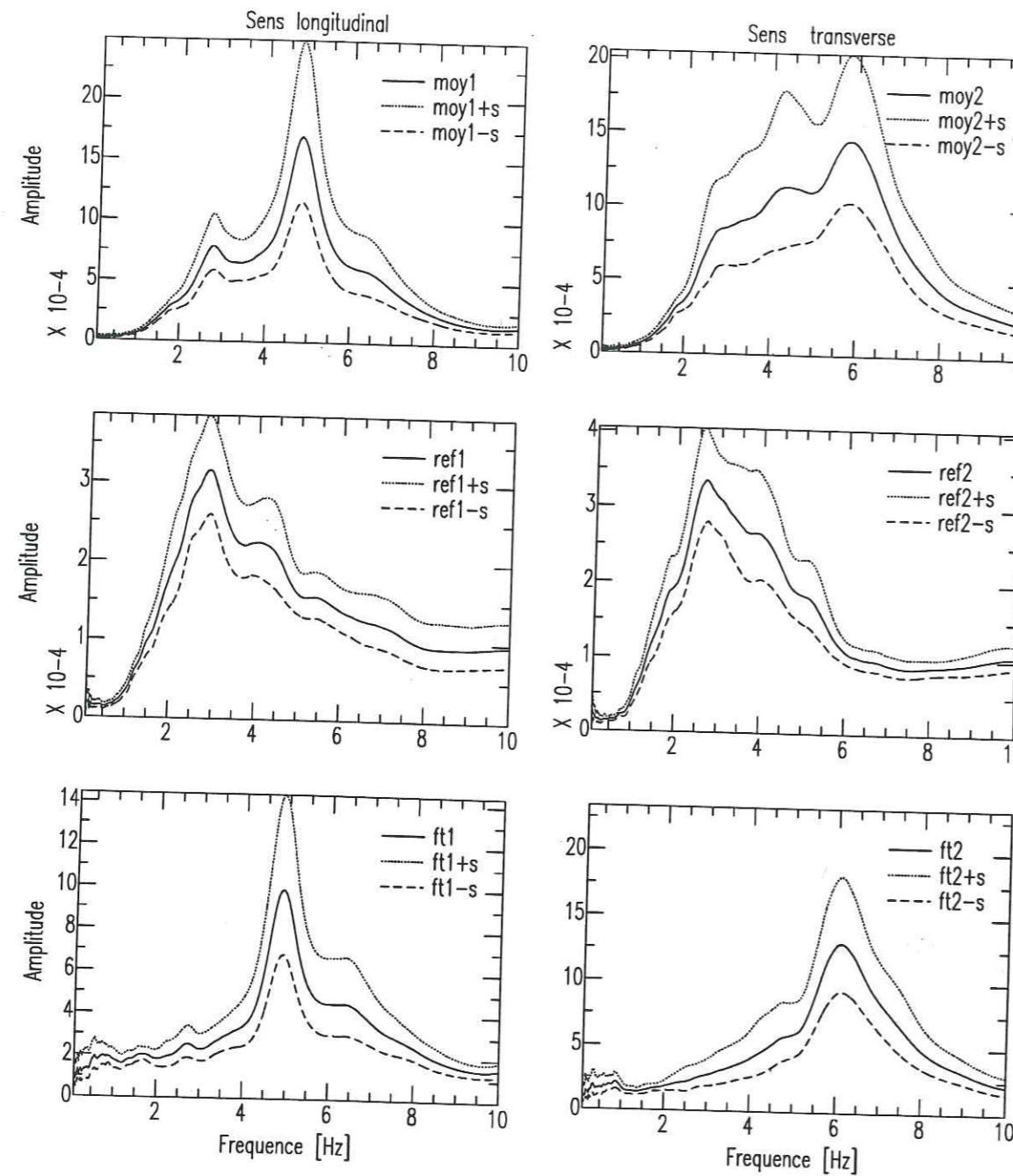


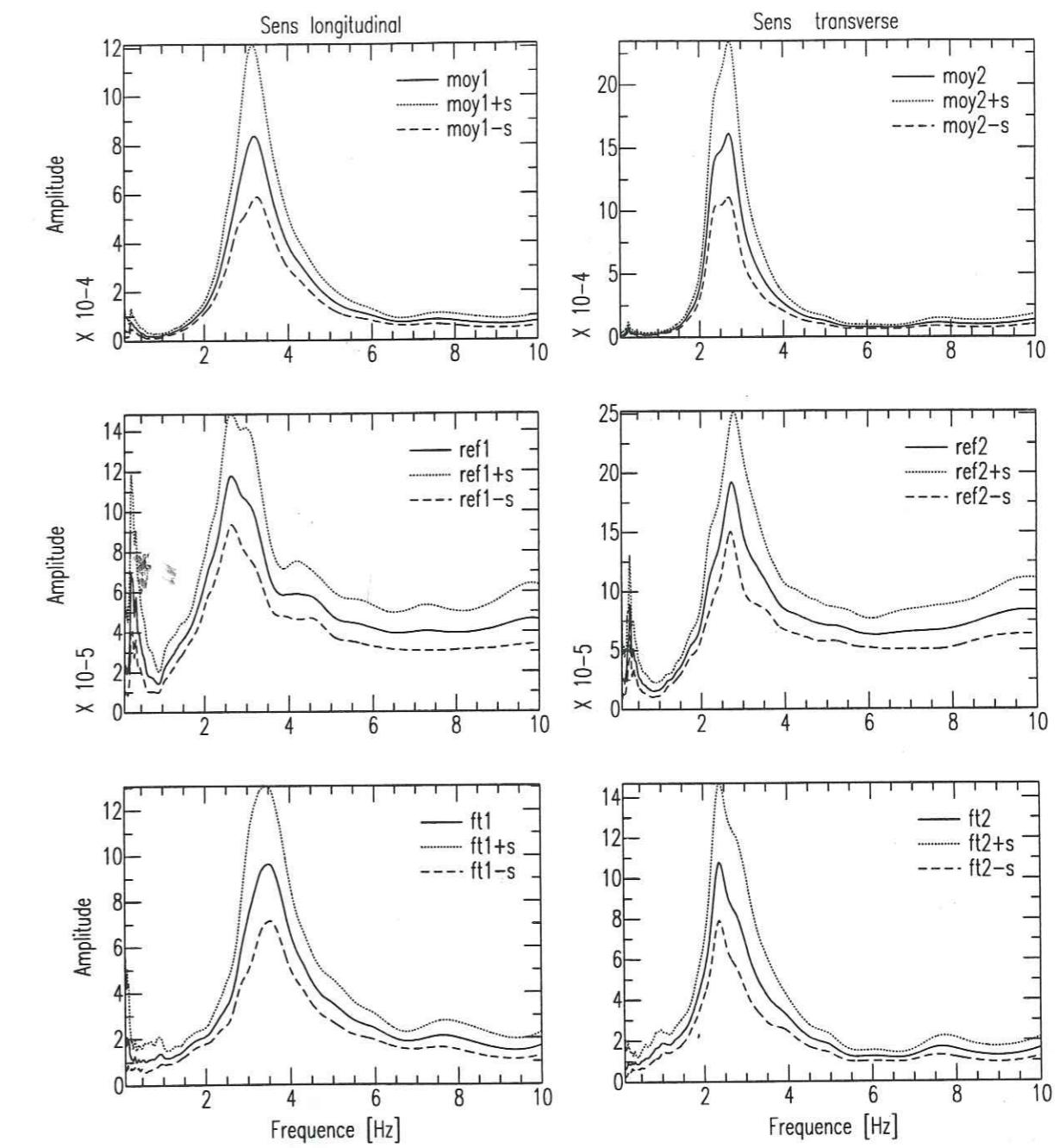
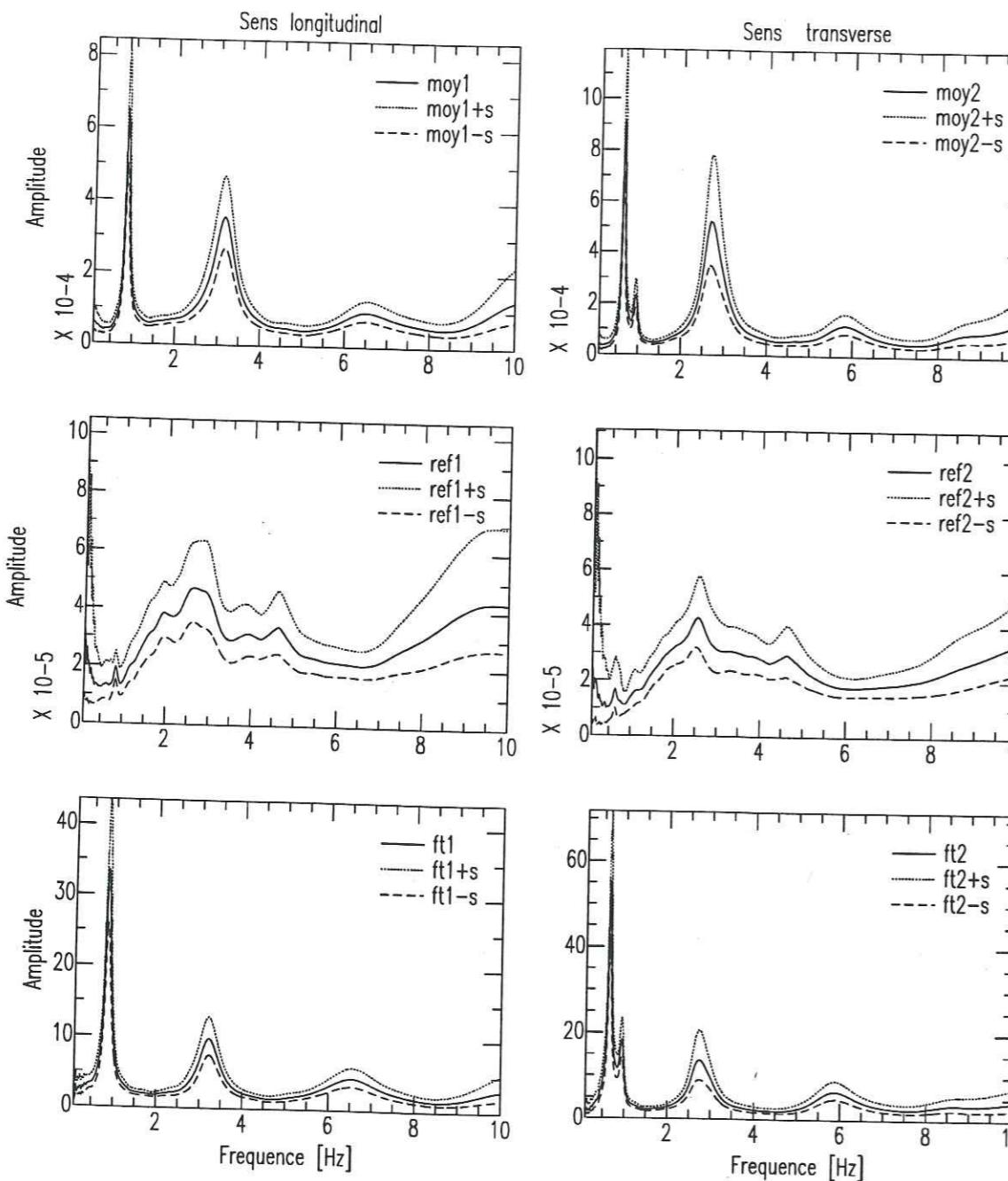


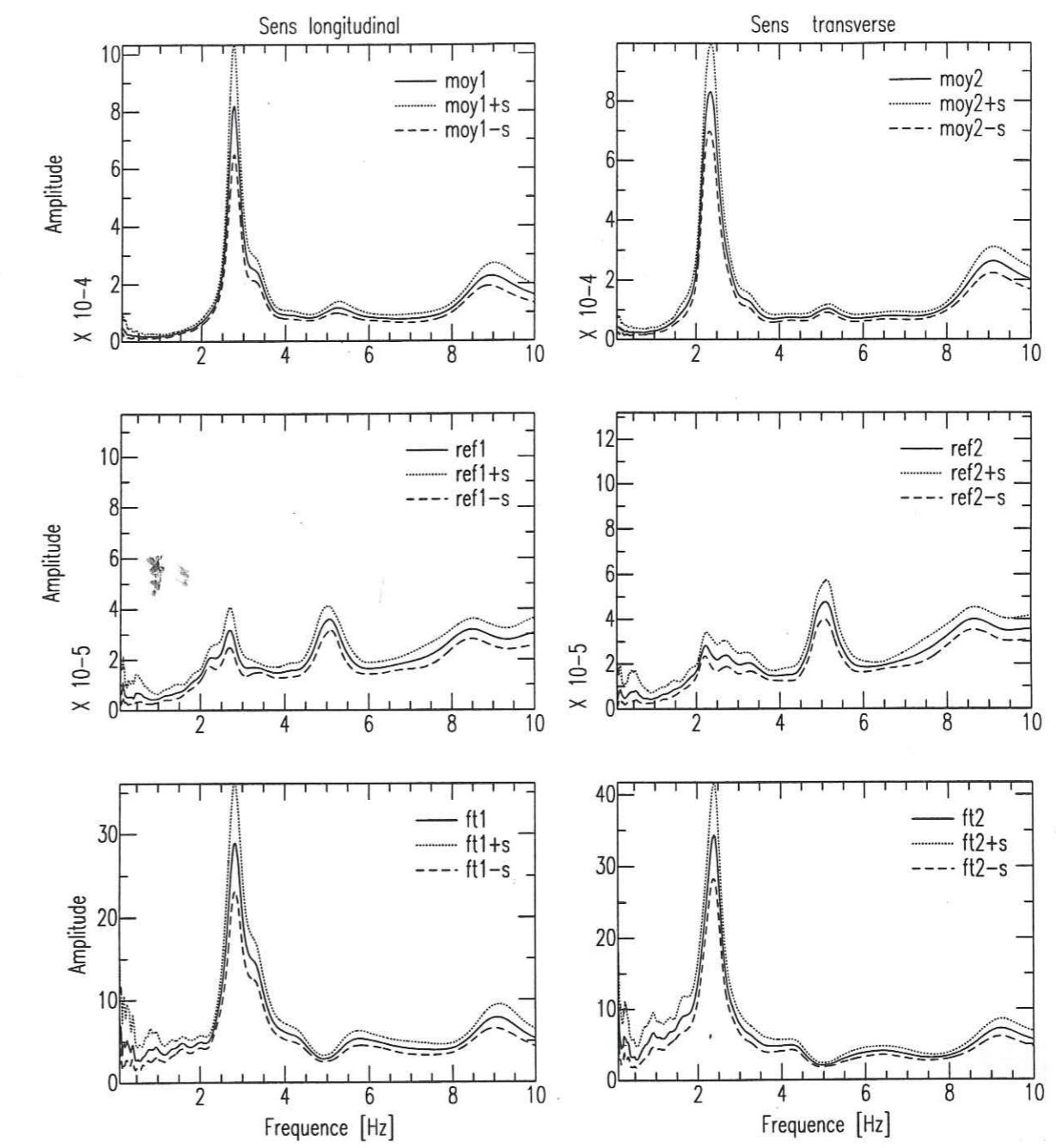
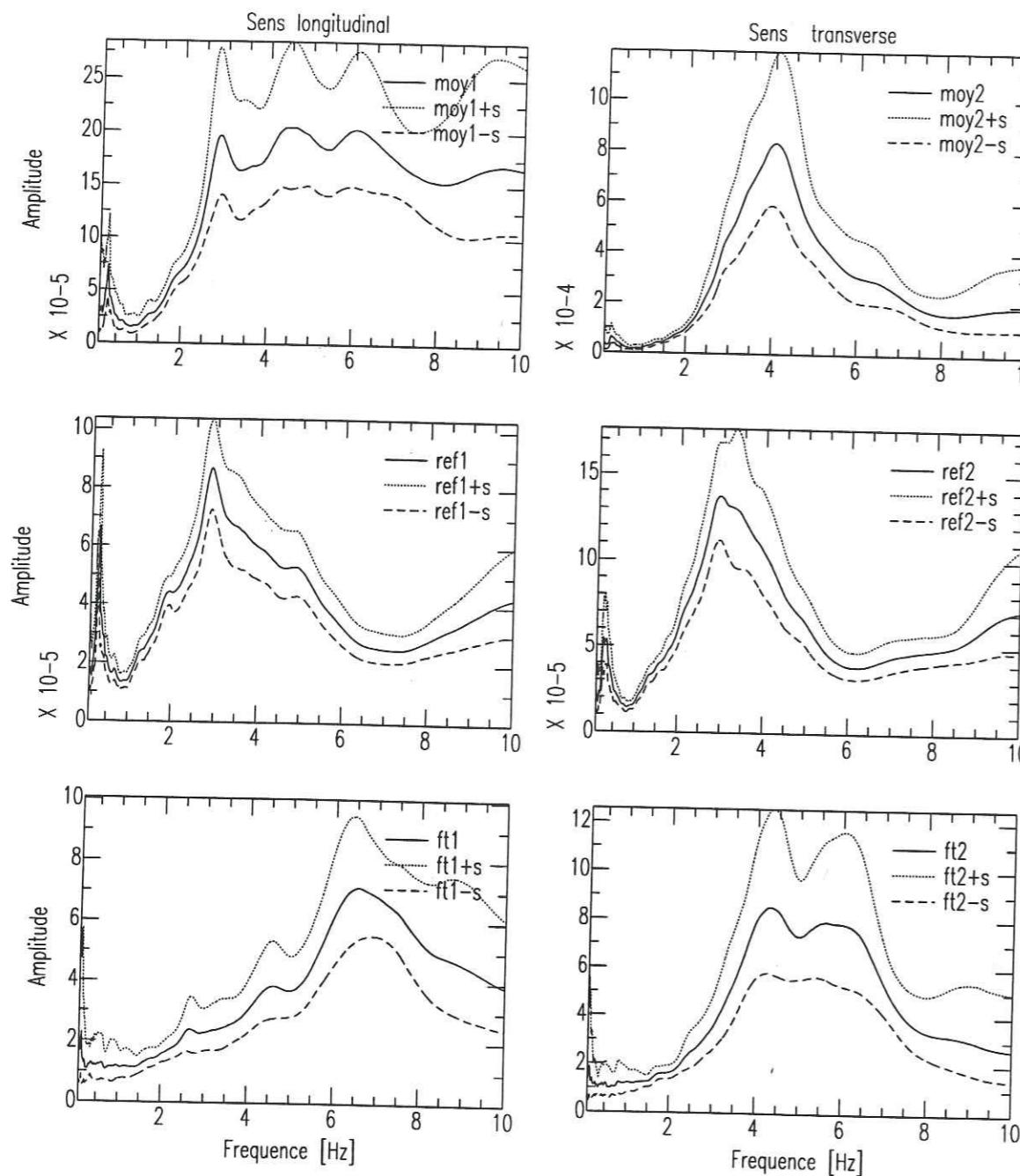


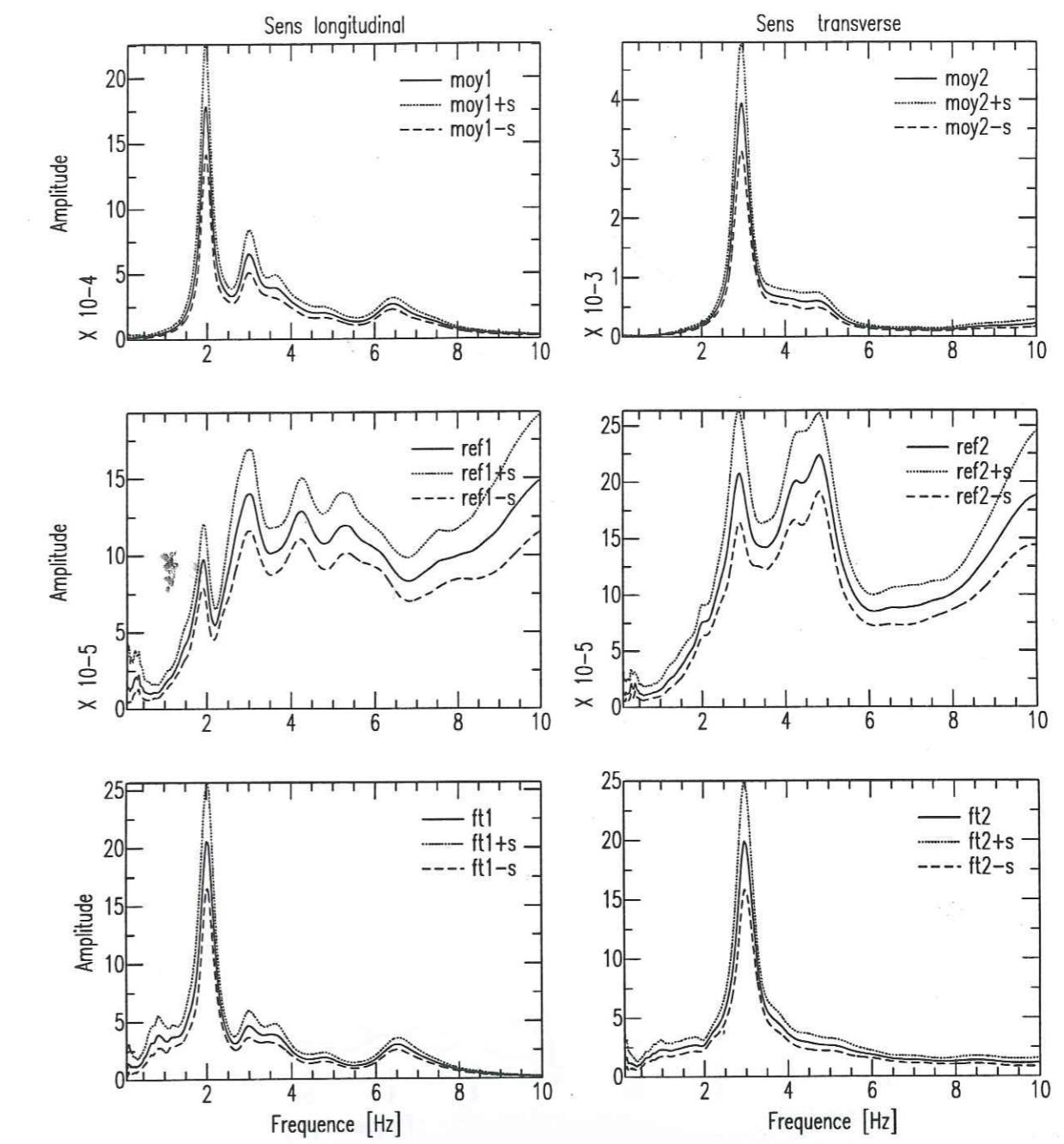
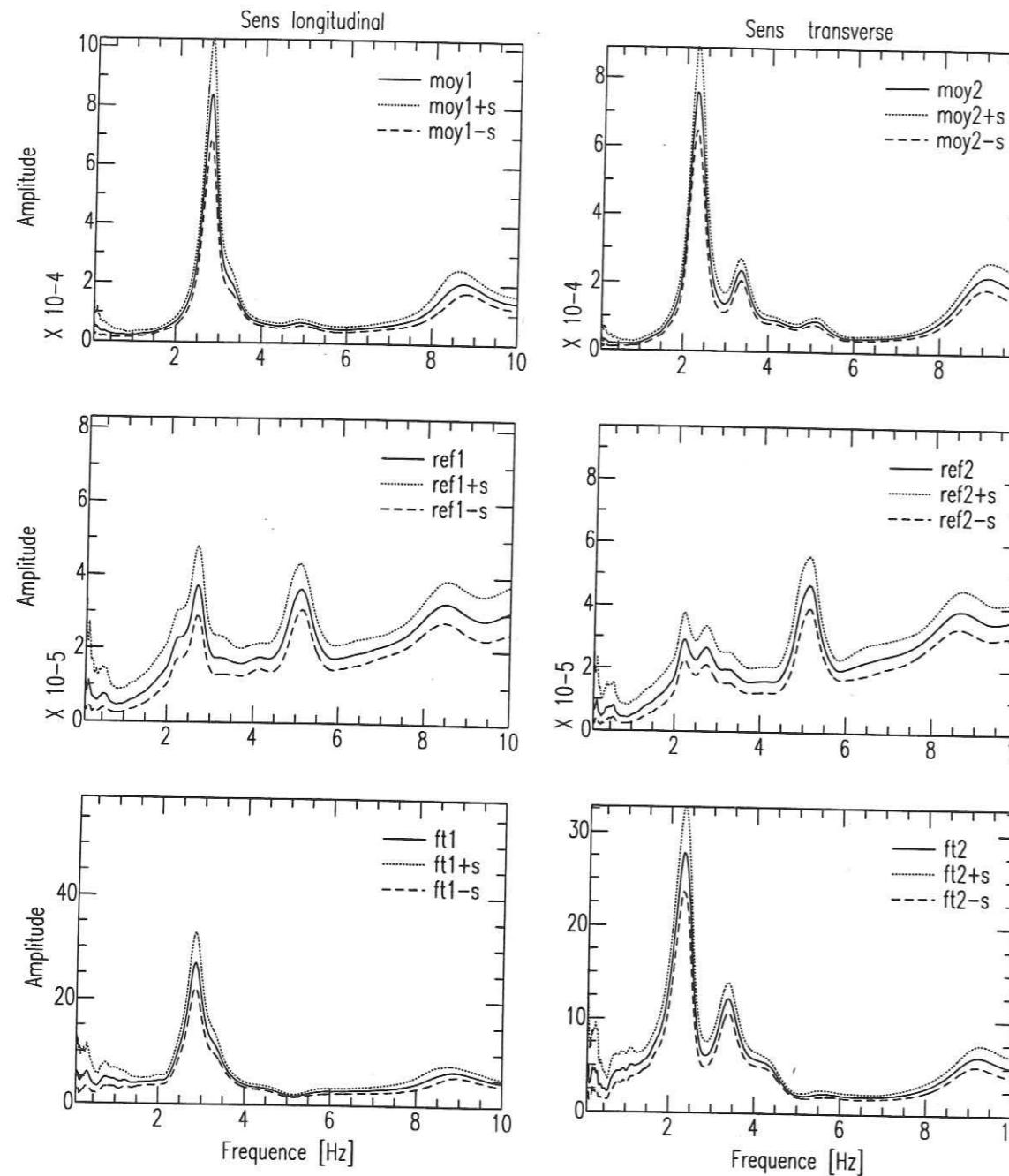


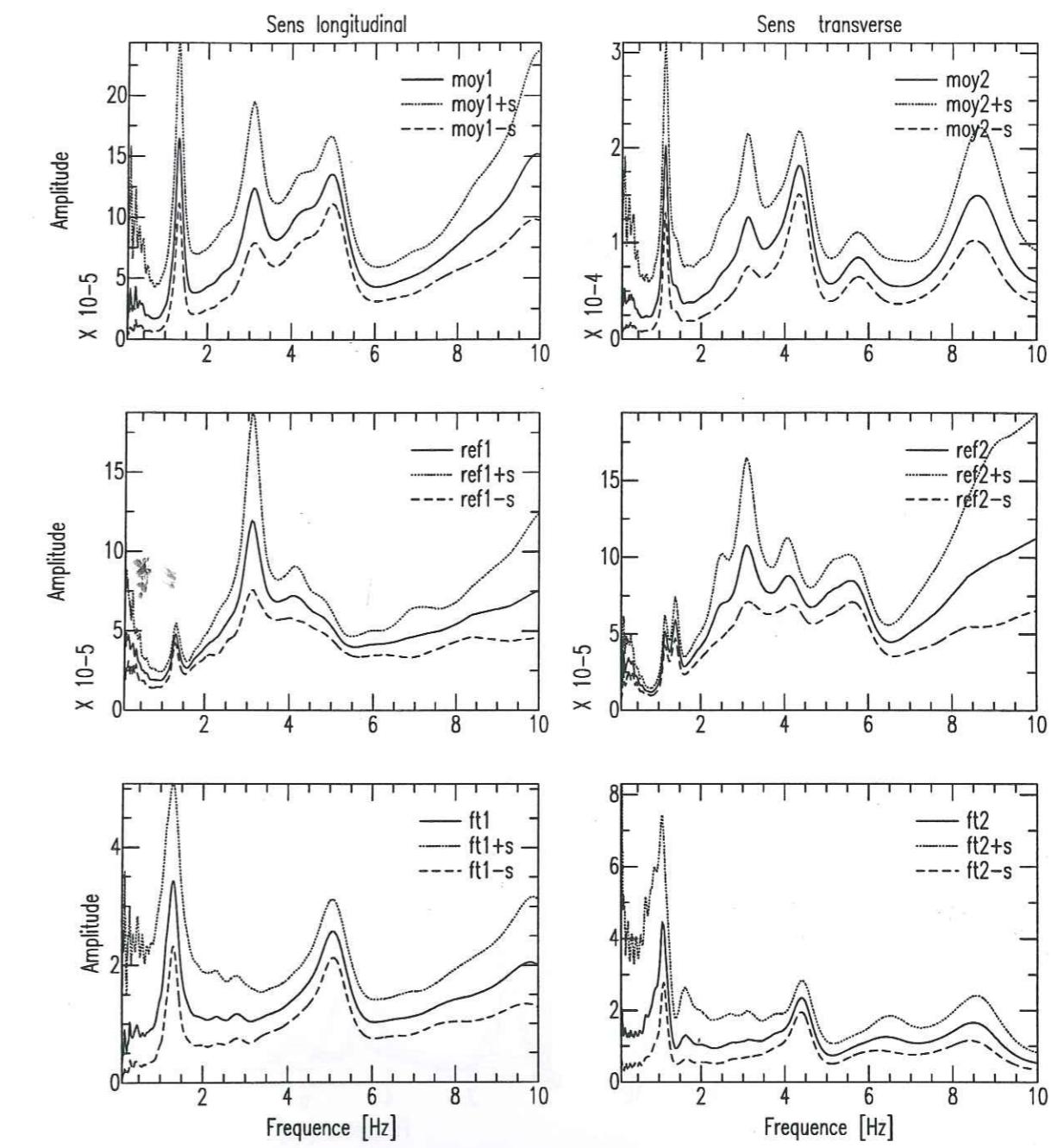
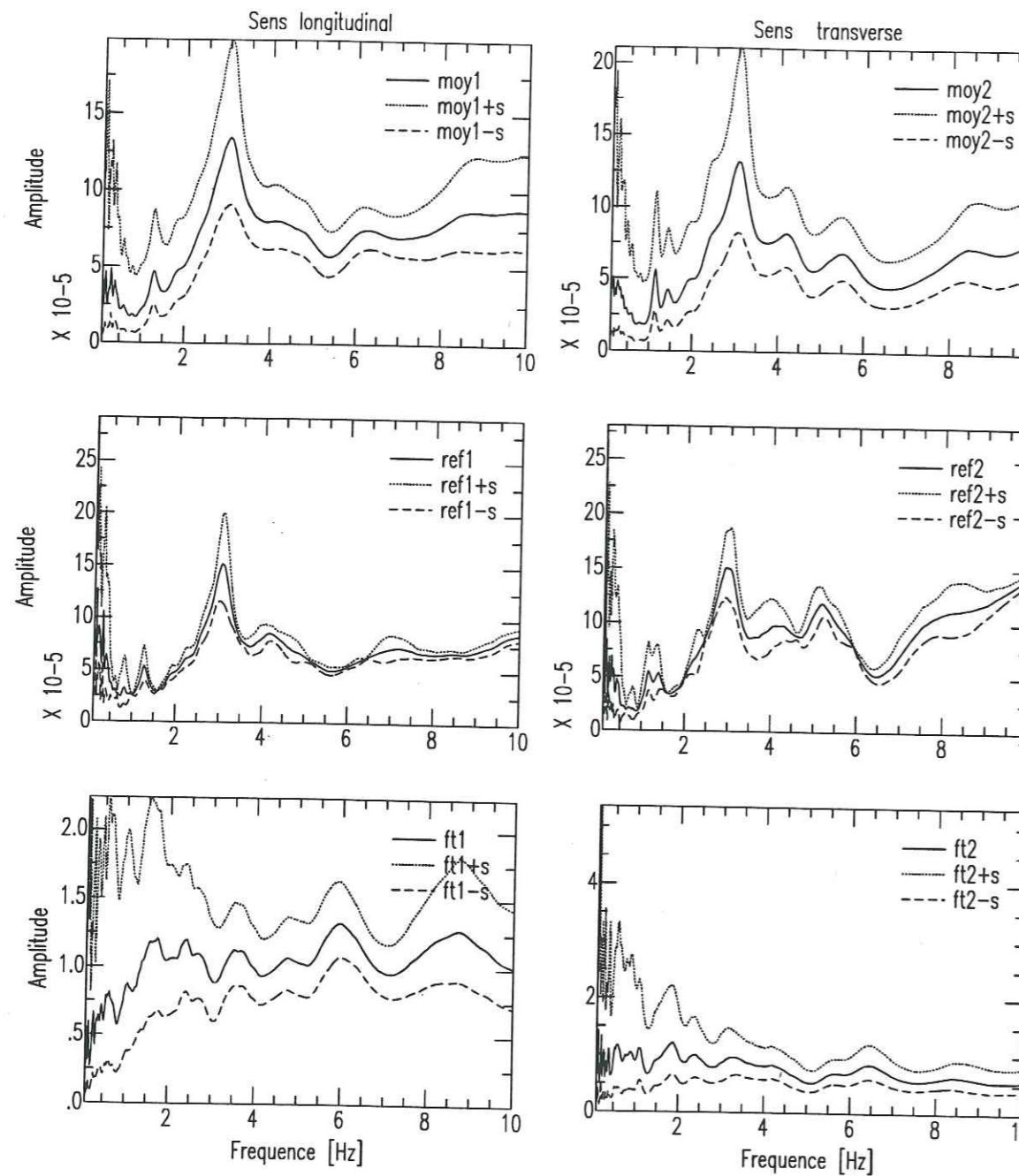


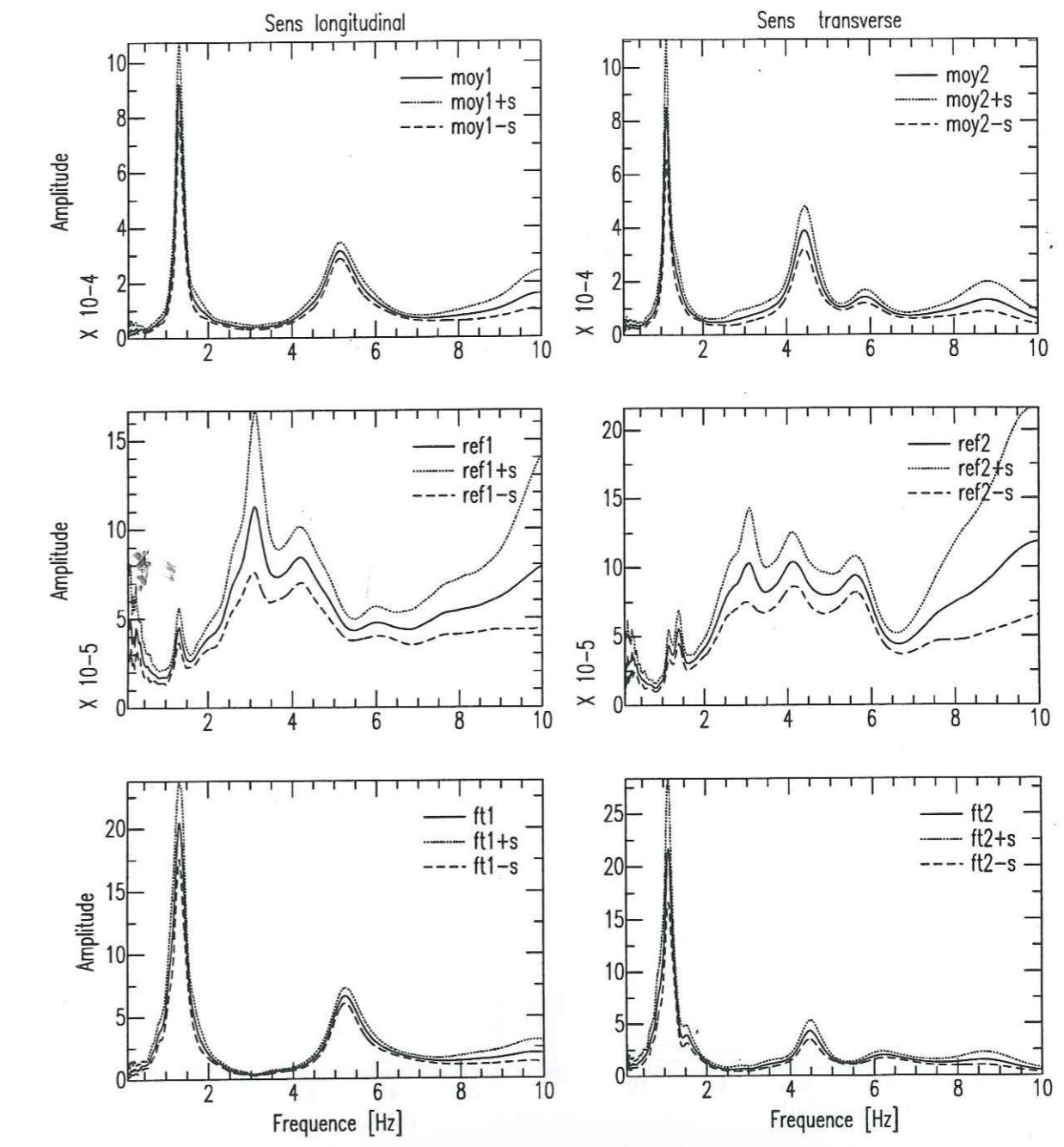
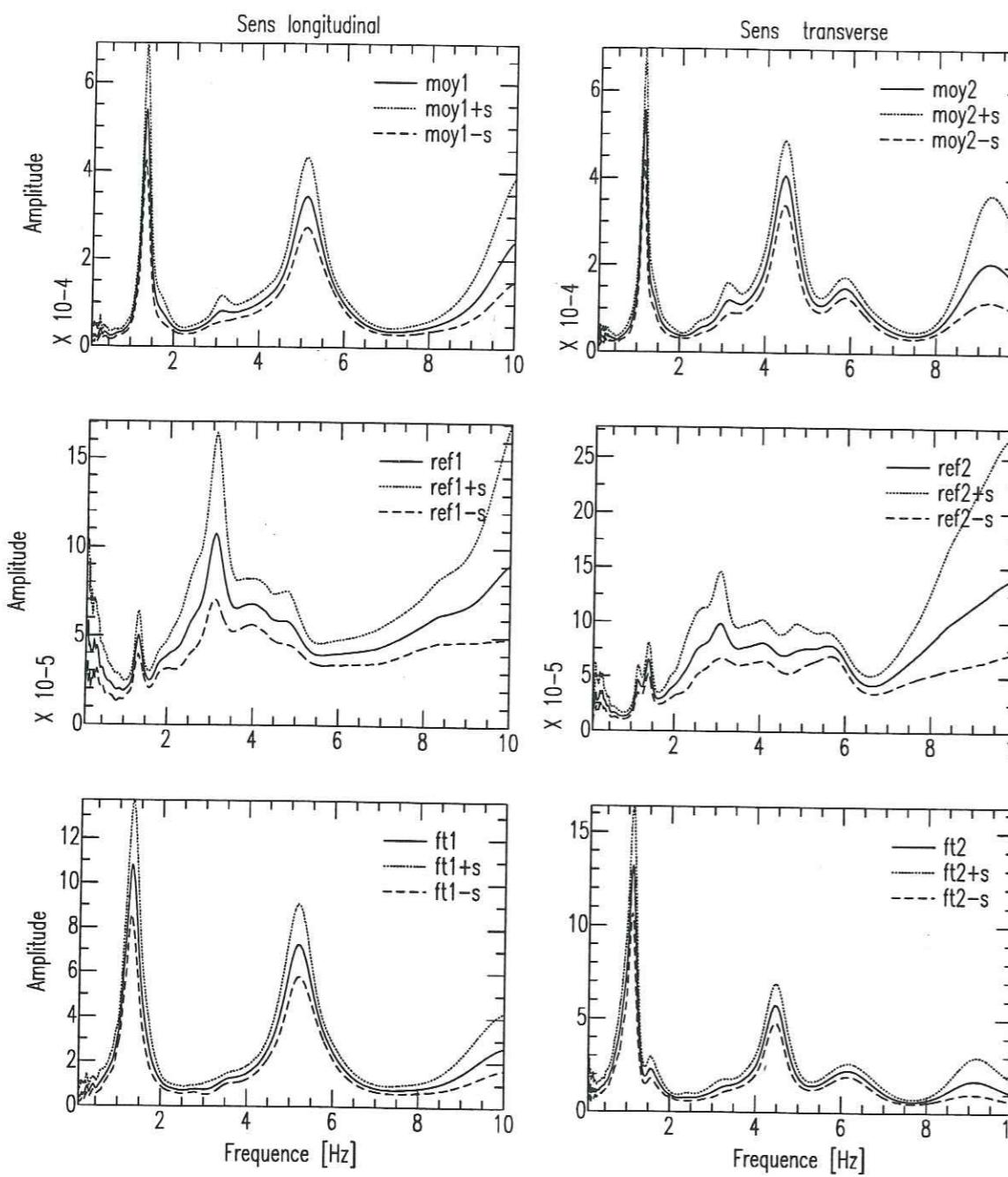


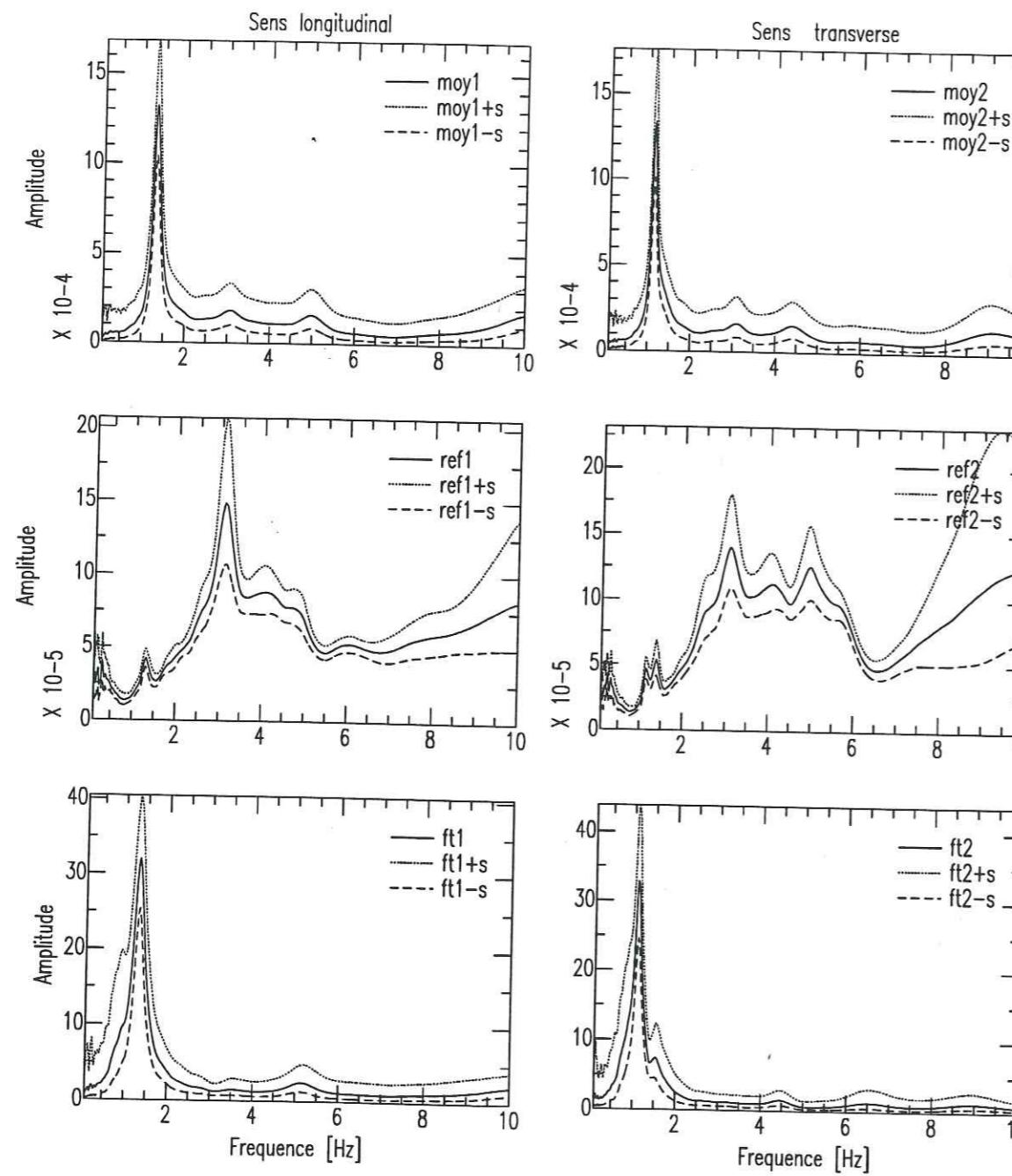




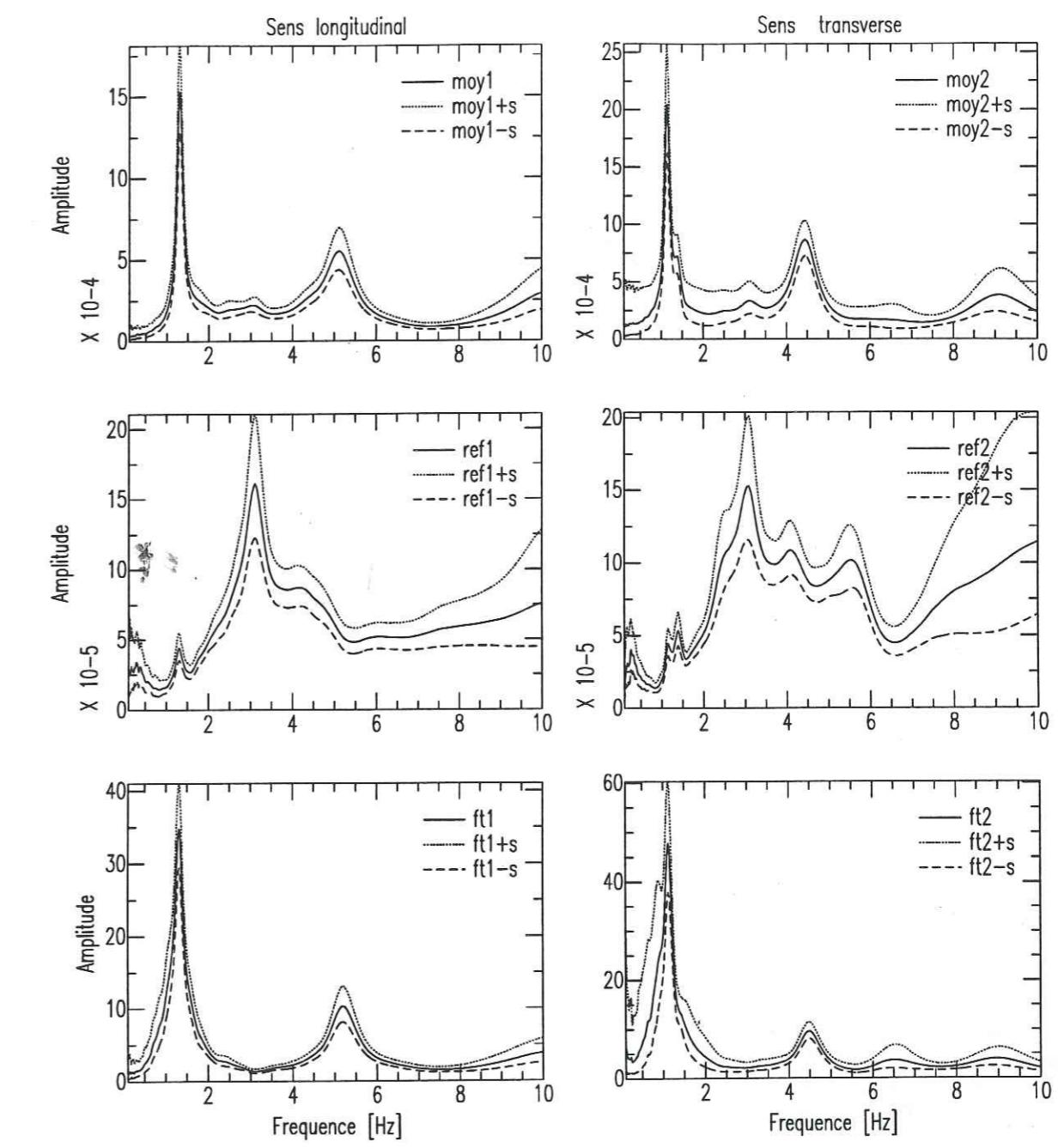




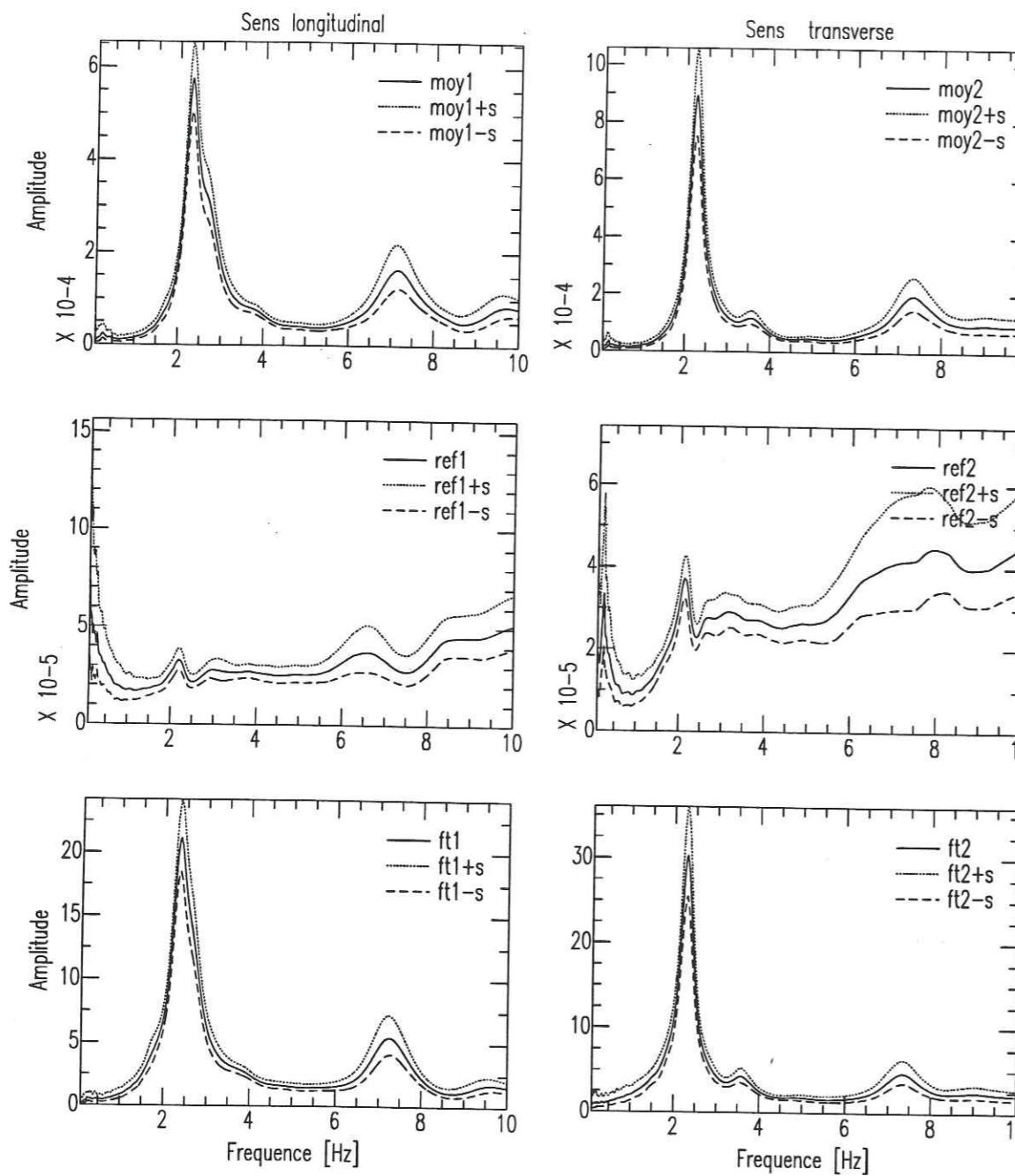




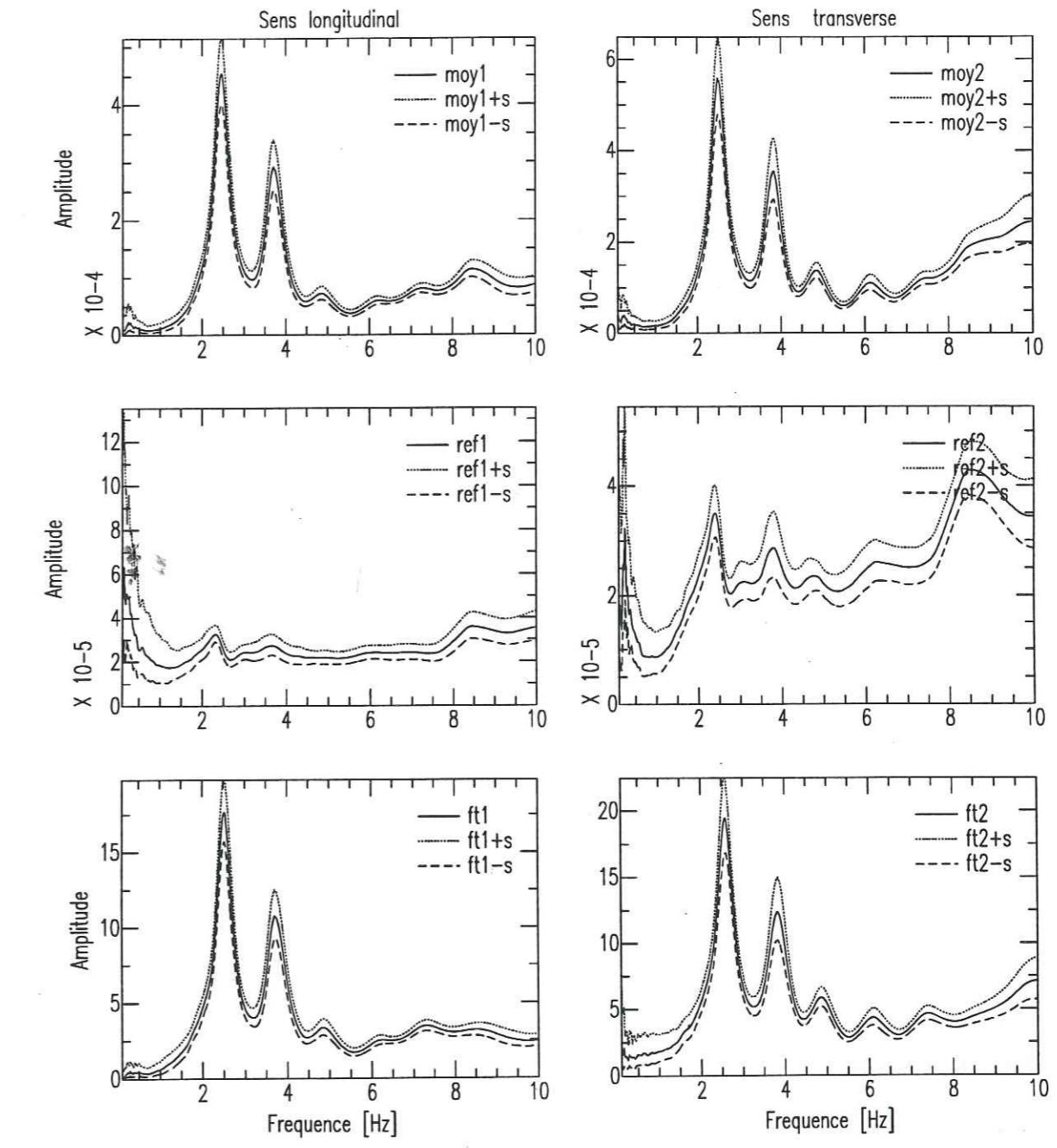
CPUS_arpej_13 - Spectre d'accélération en terrasse (moy1,moy2) et à la base (ref1,ref2), et fonction de transfert (ft1,ft2). s = écart-type
Trait continu : moyenne sur plusieurs enregistrements (20 à 30)
Trait pointille fin : moyenne + écart type
Trait pointille : moyenne - écart type



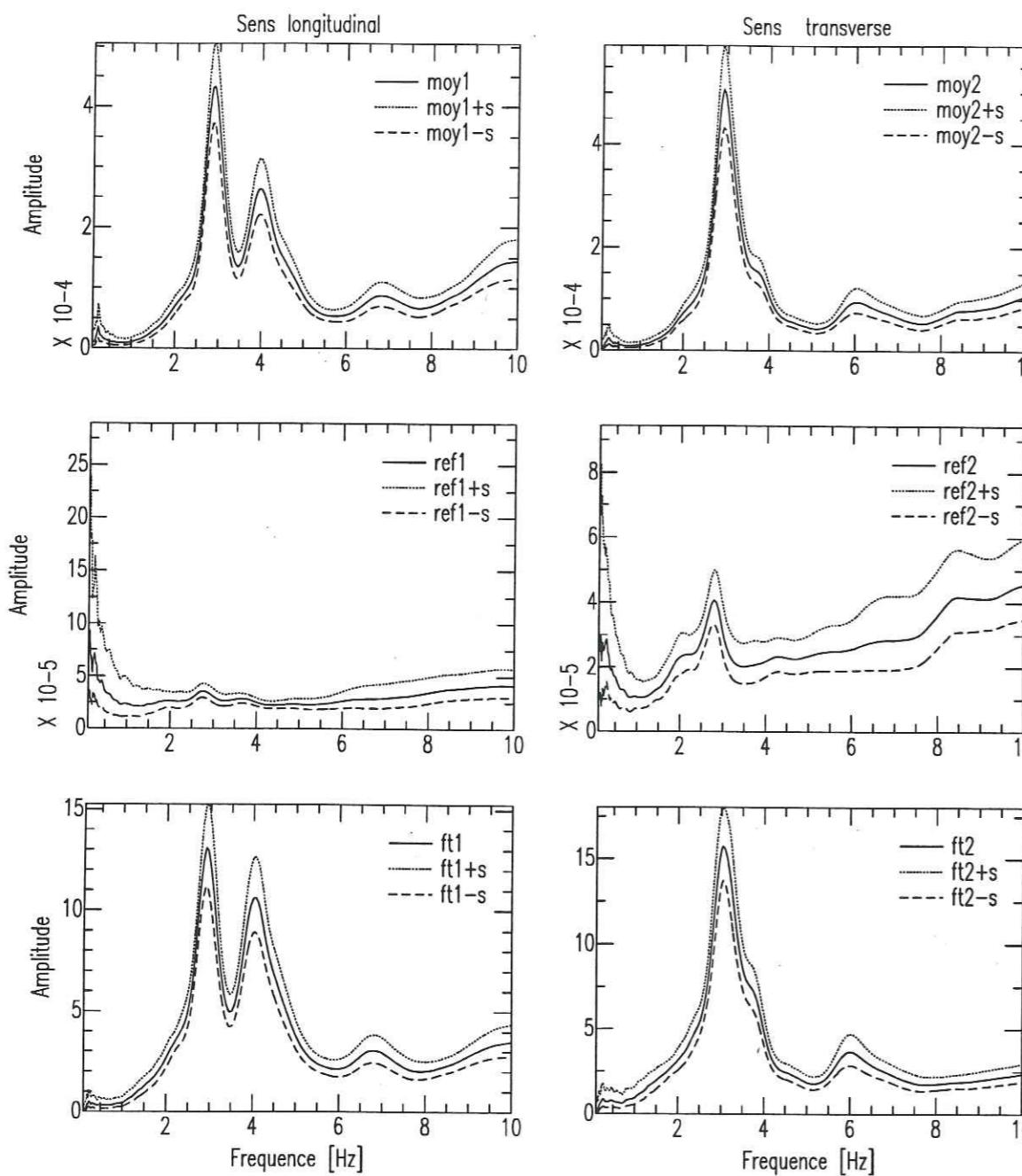
CPUS_arpej_T - Spectre d'accélération en terrasse (moy1,moy2) et à la base (ref1,ref2), et fonction de transfert (ft1,ft2). s = écart-type
Trait continu : moyenne sur plusieurs enregistrements (20 à 30)
Trait pointille fin : moyenne + écart type
Trait pointille : moyenne - écart type



THIERS_Bt44 - Spectre d'accélération en terrasse (moy1,moy2) et à la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = écart-type
Trait continu : moyenne sur plusieurs enregistrements (20 à 30)
Trait pointille fin : moyenne + écart type
Trait pointille : moyenne - écart type



THIERS_Bt47 - Spectre d'accélération en terrasse (moy1,moy2) et à la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = écart-type
Trait continu : moyenne sur plusieurs enregistrements (20 à 30)
Trait pointille fin : moyenne + écart type
Trait pointille : moyenne - écart type

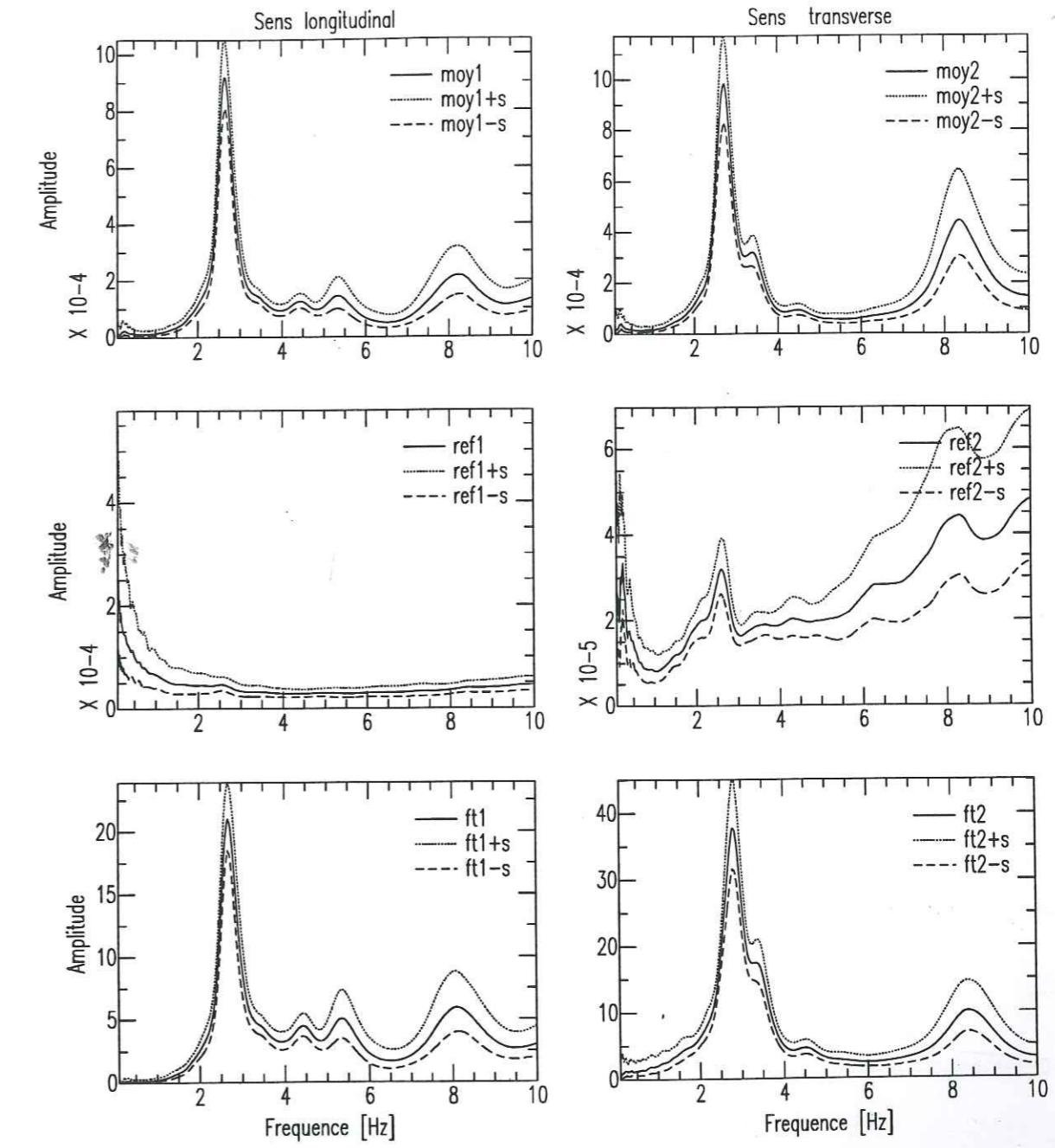


THIERS_Bt49 - Spectre d'accélération en terrasse (moy1,moy2) et à la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = écart-type

Trait continu : moyenne sur plusieurs enregistrements (20 à 30)

Trait pointillé fin : moyenne + écart type

Trait pointillé : moyenne - écart type

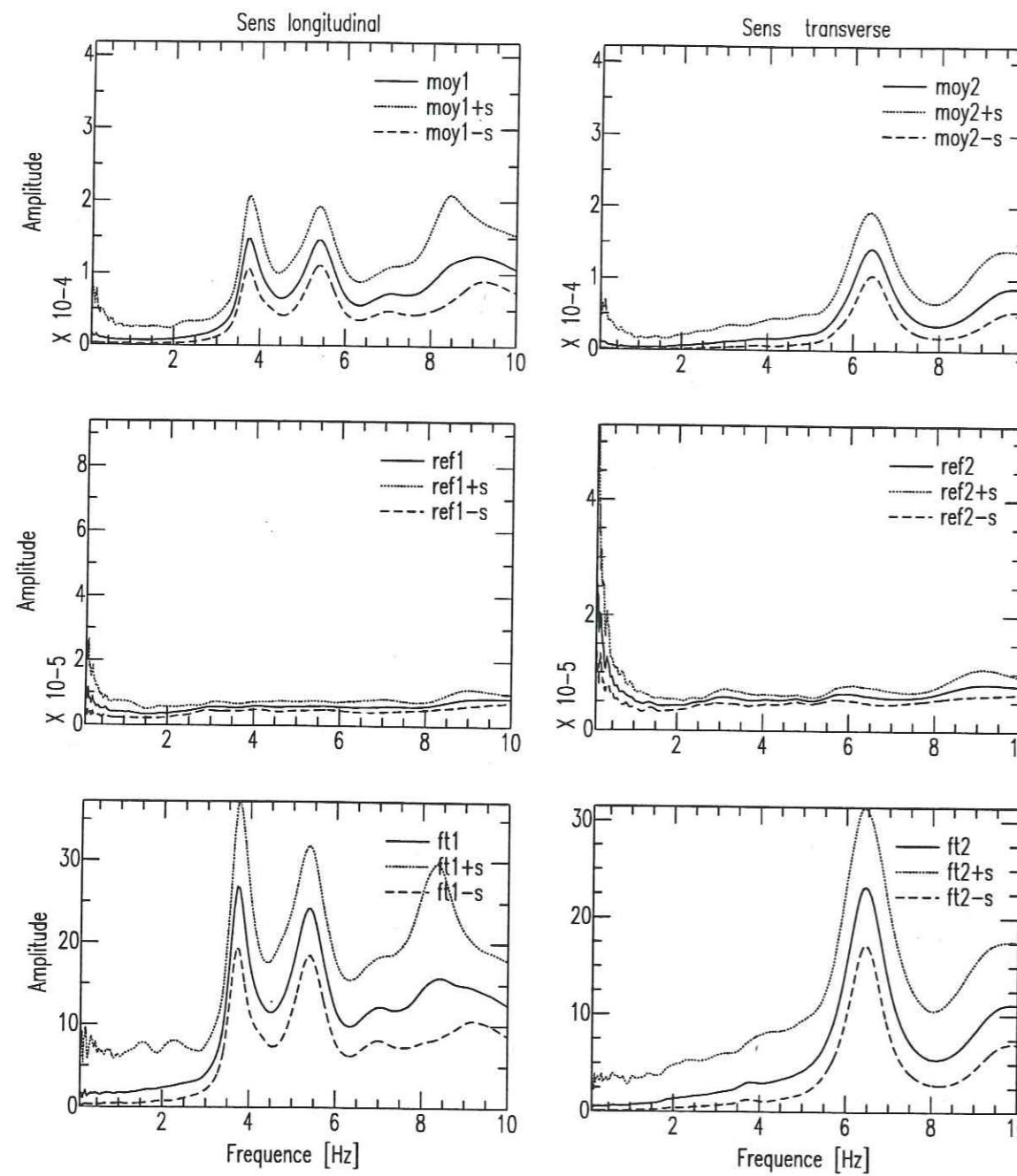


THIERS_Bt50 - Spectre d'accélération en terrasse (moy1,moy2) et à la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = écart-type

Trait continu : moyenne sur plusieurs enregistrements (20 à 30)

Trait pointillé fin : moyenne + écart type

Trait pointillé : moyenne - écart type

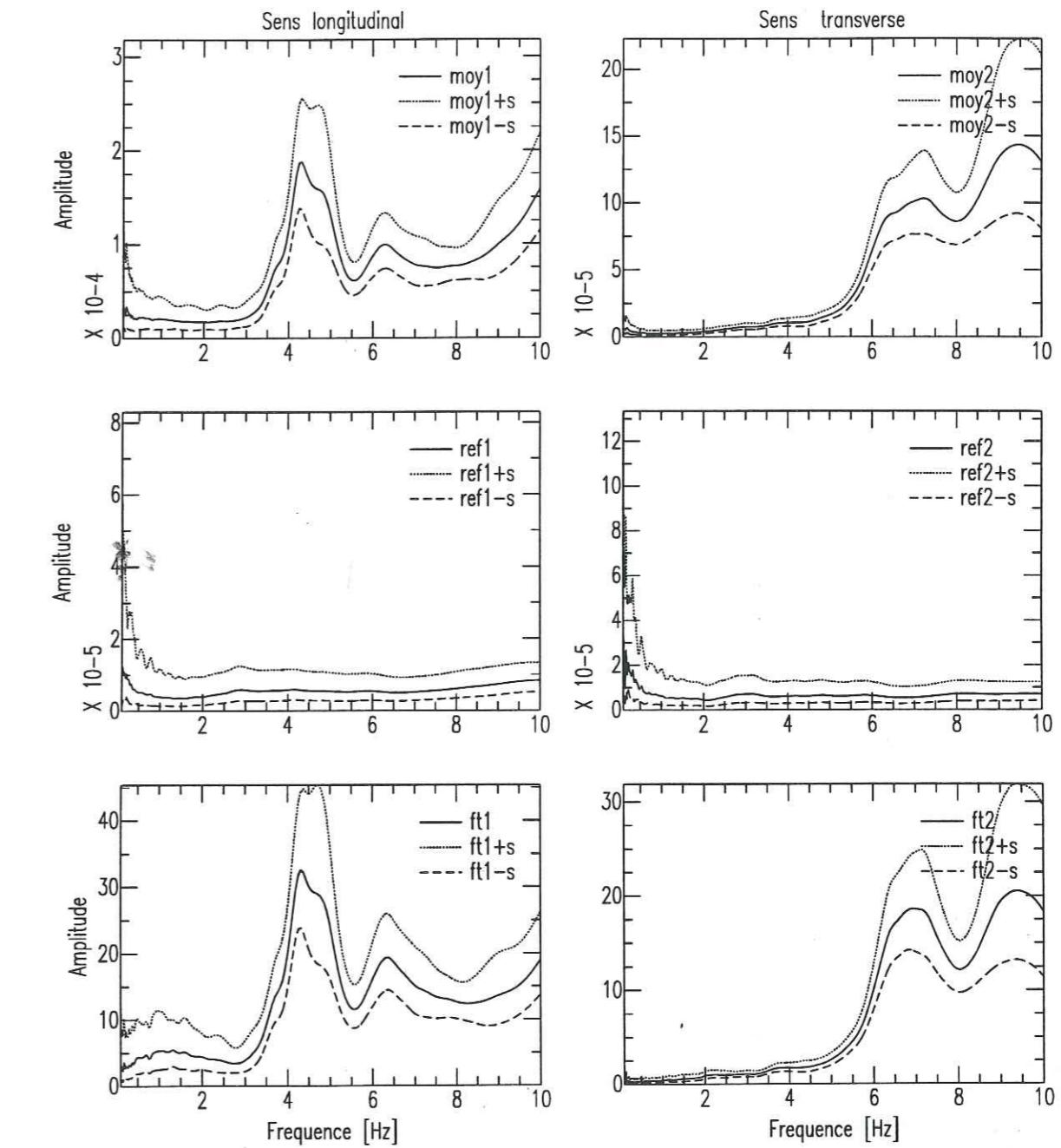


VQT_qperr10 - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type

Trait continu : moyenne sur plusieurs enregistrements (20 a 30)

Trait pointille fin : moyenne + ecart type

Trait pointille : moyenne - ecart type

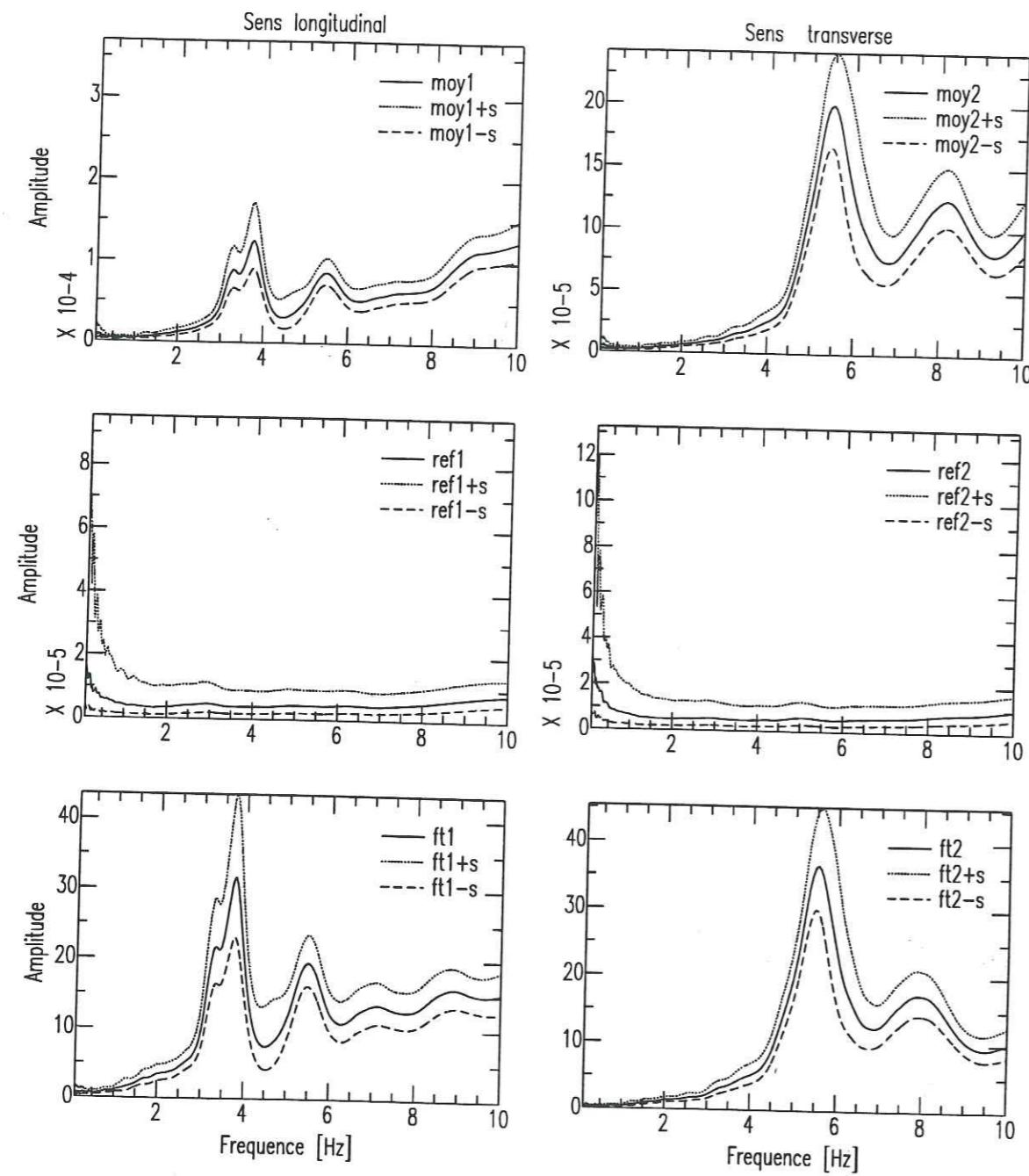


VQT_qperr12 - Spectre de vitesse en terrasse (moy1,moy2) et a la base
(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type

Trait continu : moyenne sur plusieurs enregistrements (20 a 30)

Trait pointille fin : moyenne + ecart type

Trait pointille : moyenne - ecart type



VQT_qperr42 - Spectre de vitesse en terrasse (moy1,moy2) et a la base

(ref1,ref2), et fonction de transfert (ft1,ft2). s = ecart-type

Trait continu : moyenne sur plusieurs enregistrements (20 a 30)

Trait pointille fin : moyenne + ecart type

Trait pointille : moyenne - ecart type

