

## VIII 関 連 資 料

1. 公開技術セミナー実施要領
2. 供与文献参考資料目録
3. 公開技術セミナー出席者への  
Questionnaire および集計結果
4. 公開技術セミナー出席者への  
Questionnaire 集計結果のまとめ
5. 帰国研修員へのアンケート調査
6. 帰国研修員リスト



資料 1. 公開技術セミナー実施要領

OPEN TECHNICAL SEMINAR IN THE FIELD OF SEISMOLOGY AND EARTHQUAKE ENGINEERING

IN 1987

( コ ロ ン ビ ア 国 )

JAPAN INTERNATIONAL COOPERATION AGENCY

## Introduction:

Hazard of destructive earthquakes seems to be a destiny to human race from which no nations in the world is immune. The fact that intense earthquakes attack the area not well developed makes the situation sadder and more miserable. JICA, the sole governmental agency of Japan for technical cooperation, is cooperating with developing countries in the technology for earthquake hazard mitigation. And one of those cooperation activities in the human resource development programme for earthquake engineering sector. Through its individual and group training courses for i) Earthquake engineering, ii) Civil engineering, and iii) Seismology, JICA has invited professionals of Colombia to Japan for their training.

This seminar will be held in Bogota, under the auspices of relevant authorities of Colombia Government, i) to give a brush-up opportunity to the ex-participants of the above mentioned training courses as well as other interested professionals of the sector, and ii) to exchange opinions about the main constraints for the improvement of the sector and the countermeasures to overcome them.

Period: September 23 ~ September 25, 1987 in Bogotá

Lecturer: Dr. Masaya Hirose  
(Head of the Team)

Director,  
International Institute of Seismology and  
Earthquake Engineering (IISEE),  
Building Research Institute (BRI),  
Ministry of Construction

Dr. Ken Sudo  
(Member of the Team)

Head of Overseas Earthquake Information Division,  
IISEE, B. R. I.  
Ministry of Construction

Dr. Hatsukazu Mizuno  
(Member of the Team)

Head of Housing Construction Division,  
Production Department,  
B. R. I.  
Ministry of Construction

Mr. Toichi Hashimoto  
(Team Coordinator)

Deputy Head of Training Division,  
Tsukuba International Centre,  
Japan International Cooperation Agency

Dr. Sergio Londono Korgi

Assistant Professor Colombian College of  
Engineering

## FOR COLOMBIA

### PROGRAMME

September 23 (Wednesday):

09:00 ~ 09:20	Inscription
09:20 ~ 09:50	Inauguration
09:50 ~ 10:00	Coffee Break
10:00 ~ 12:00	JICA's Cooperation Activities
12:00 ~ 13:30	Lunch
13:30 ~ 15:20	Large Scale Earthquake Countermeasure Act in Japan
15:20 ~ 15:30	Coffee Break
15:30 ~ 17:00	Recent Trend on Earthquake Engineering Technology

September 24 (Thursday):

09:00 ~ 11:00	Laboratory and Field Experimental Studies of Earthquake Engineering in Japan
11:00 ~ 11:10	Coffee Break
11:10 ~ 12:30	Seismic Inspection and Retrofitting Method for Existing or Damaged Buildings and An Example of the Application in Mexico City (1)
12:30 ~ 14:00	Lunch
14:00 ~ 14:50	Seismic Inspection and Retrofitting Method for Existing or Damaged Buildings and An Example of the Application in Mexico City (2)
14:50 ~ 15:00	Coffee Break
15:00 ~ 17:00	The Modern Ideas in Seismology and its Application to Earthquake Prediction

September 25 (Friday):

09:00 ~ 10:20	Questions and Answers
10:20 ~ 10:30	Coffee Break
10:30 ~ 12:00	Panel Discussion on 1) Finding ways to solve problems in seismology and earthquake engineering
12:00 ~ 13:30	Lunch
13:30 ~ 14:20	Panel Discussion on 2) Promoting the future technical cooperation between both the Governments of Colombia and Japan in seismology and earthquake engineering
14:20 ~ 14:30	Coffee Break
16:10 ~ 17:00	Evaluation
14:30 ~ 14:45	
14:50 ~ 16:30	(1) Closing speech by Dr. M. Hirose (2) A word of award by Prof. (3) Delivery of Certificate
14:30 ~ 16:00	Personal consultation*
17:00 ~ 17:30	Closing
17:30 ~ 18:30	Cocktail Party

\* Personal consultation with resource persons of the Seminar for the participants who hand the attached personal consultation form to the secretariat by the end of 2nd day of the Seminar. (by September 24, Thursday)

Function and Performance of Japan International Cooperation Agency (JICA)

The Subject matters are explained in line with JICA annual report.

1. The Japan International Cooperation Agency and its Functions
2. Performance of Japan International Cooperation Agency
  - 1) Government-Based Technical Cooperation
    - (1) Training Program for Overseas Trainees
    - (2) Expert Dispatch Program
    - (3) Equipment Supply Program
    - (4) Project-Type Technical Cooperation Program
    - (5) Development Survey Program
  - 2) Grant Aid Program
  - 3) Japan Overseas Cooperation Volunteers Program (JOCV)
  - 4) Development Cooperation Program (Investment in and Financing of Development Projects)
  - 5) Emigration Service
  - 6) Recruiting and Training of Qualified Japanese Experts for Technical Cooperation

Earthquake Countermeasures in Japan

The followings are explained.

1. A large earthquake anticipated in the Tokai district, Japan
2. The Large Scale Earthquake Countermeasures Act  
Allarm Issue, Evacuation, Medical and First-Aid Measures, Life Lines, and others
3. Monitoring system for the earthquake prediction

## Recent Trend on Earthquake Engineering Technology

The following items as recent trend on earthquake engineering technology are introduced mainly in case of Japan.

1. Seismic Regulations:
  - a. Evaluation of damage degree
  - b. Seismic inspection
  - c. Seismic repair and retrofitting of existing or damaged buildings
2. Earthquake Force:
  - a. High-density strong motion observation
  - b. Earthquake force on super soft ground condition (Water-front project)
3. New Materials and New Construction System:
  - a. Reinforced concrete high-rise buildings with high aseismic performance
  - b. New timber construction (big sections, large space or 3-storied)
  - c. New R/C construction (Super high strength concrete and steel)
  - d. Seismic retrofitting method and evaluation method
4. New Seismic Control System and Analytical Method
  - a. Base isolation method
  - b. Active control method
  - c. Dynamic response analysis of planer frame
  - d. Finite element analysis method including ground condition

## Laboratory and Field Experimental Studies of Earthquake Engineering in Japan

Earthquake engineering and structural dynamics research in Japan is characterized by more emphasizing on laboratory and field experimental studies, compared with that in the United States and other countries.

Experimental facilities and equipment, methodology and some study examples of the following earthquake engineering and structural dynamics research in Japan are presented;

1. Vibration Tests (Oscillator test, Free vibration test, Ambient vibration test (Microtremor measurement), etc.)
2. Shaking Table Test
3. Earthquake Observation
4. Pseudo-Dynamic Test
5. Others (Reconnaissance survey of seismic damage, etc.)

Seismic Inspection and Retrofitting Method for Existing or Damaged Buildings and An Example of the Application in Mexico City

Referring to the recent damages of many buildings in such big cities as Sendai, Japan and Mexico city, Mexico, inspection method for existing or damaged buildings and repair & retrofitting method for buildings judged as unsafe are now attracting world-wide attention. Outline of those methods developed in Japan will be introduced mainly on reinforced concrete construction and example of the application to a 10-storied building suffered from 1985 Mexico Earthquake will be discussed.

Also, future related problems such as bond-split failure mode and estimation of ductility will be pointed out through the discussion.

Modern Ideas on Seismology and Applications to Earthquake Prediction

The followings are explained.

1. The modern technology in earthquake observation
2. POSEIDON project as a network of global earthquake observation
3. The modern idea on earthquake source and strong ground motion
4. The modern technique for knowing the under ground structure
5. Applying the above to earthquake hazard mitigation program including the earthquake prediction



Seminar on Seismology and Earthquake Engineering, 23~25 September, 1987 in Bogotá

PERSONAL CONSULTATION FORM

Title (Mr., Mrs., Ms., Dr., Ir., etc.): \_\_\_\_\_

Name: \_\_\_\_\_  
(Please underline "surname" for alphabetical listing.)

Position: \_\_\_\_\_

Organization: \_\_\_\_\_

JICA's Ex-Participants: Yes \_\_\_\_\_ No \_\_\_\_\_

(If yes, please write down the name and the year of your training course:  
\_\_\_\_\_ )

Name of resource person with whom you would like to consult:

\_\_\_\_\_

Brief Description of Your Consultation:

(Even your comments or any question on the seminar are welcome.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Note: In case you wish to make personal consultation, please fill in this form and hand it to the Secretariat by the end of 2nd day of the Seminar.  
(by September 24, Thursday)

OPEN TECHNICAL SEMINAR IN THE FIELD OF SEISMOLOGY AND EARTHQUAKE ENGINEERING

IN 1987

( 予      り      国      )

JAPAN INTERNATIONAL COOPERATION AGENCY

## Introduction:

Hazard of destructive earthquakes seems to be a destiny to human race from which no nations in the world is immune. The fact that intense earthquakes attack the area not well developed makes the situation sadder and more miserable. JICA, the sole governmental agency of Japan for technical cooperation, is cooperating with developing countries in the technology for earthquake hazard mitigation. And one of those cooperation activities in the human resource development programme for earthquake engineering sector. Through its individual and group training courses for i) Earthquake engineering, ii) Civil engineering, and iii) Seismology, JICA has invited professionals of Chile to Japan for their training.

This seminar will be held in Santiago, under the auspices of relevant authorities of Chile Government, i) to give a brush-up opportunity to the ex-participants of the above mentioned training courses as well as other interested professionals of the sector, and ii) to exchange opinions about the main constraints for the improvement of the sector and the countermeasures to overcome them.

Period: September 30 ~ October 2, 1987 in Santiago

Lecturer: Dr. Masaya Hirose  
(Head of the Team)

Director,  
International Institute of Seismology and  
Earthquake Engineering (IISEE),  
Building Research Institute (BRI),  
Ministry of Construction

Dr. Ken Sudo  
(Member of the Team)

Head of Overseas Earthquake Information Division,  
IISEE, B. R. I.  
Ministry of Construction

Dr. Hatsukazu Mizuno  
(Member of the Team)

Head of Housing Construction Division,  
Production Department,  
B. R. I.  
Ministry of Construction

Mr. Toichi Hashimoto  
(Team Coordinator)

Deputy Head of Training Division,  
Tsukuba International Centre,  
Japan International Cooperation Agency

PROGRAMME

September 30 (Wednesday)

14:00 - 15:45 Inauguration, JICA's Cooperation Activities  
15:45 - 17:15 Recent Trend on Earthquake Engineering  
Technology  
17:15 - 17:30 Coffee Break  
17:30 - 19:00 Large Scale Earthquake Countermeasure Act  
in Japan

October 1 (Thursday)

10:00 - 11:15 Seismic Inspection and Retrofitting Method  
for Existing or Damaged Buildings and An  
Example of the Application in Mexico  
City (1)  
11:15 - 11:30 Coffee Break  
11:30 - 12:30 Seismic Inspection and Retrofitting Method  
for Existing or Damaged Buildings and An  
Example of the Application in Mexico  
City (2)  
12:30 - 14:00 Lunch  
14:00 - 16:00 Laboratory and Field Experimental Studies  
of Earthquake Engineering in Japan  
16:00 - 16:15 Coffee Break  
16:15 - 18:15 The Modern Ideas in Seismology and its  
Application to Earthquake Prediction

October 2 (Friday)

14:00 - 15:30 Panel Discussion on  
1) Finding ways to solve problems in seis-  
mology and earthquake engineering  
15:30 - 15:45 Coffee Break  
15:45 - 16:45 Panel Discussion on  
2) Promoting the future technical  
cooperation between both the Governments  
of Chile and Japan in seismology and  
earthquake engineering  
16:45 - 17:45 Questions and Answers  
17:45 - 18:00 Evaluation  
18:00 - 18:30 Closing ceremony  
18:30 - 20:00 Cocktail Party

\* Personal consultation with resource persons of the Seminar for the participants who hand the attached personal consultation form to the secretariat by the end of 2nd day of the Seminar. (by October 1, Thursday)

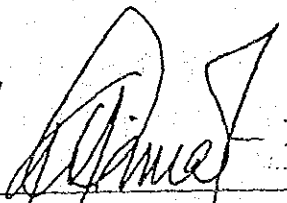
資料 3. 供与文献参考資料目録

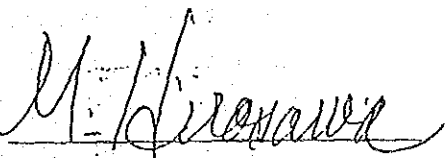
The List of Books and Reference Documents prepared and donated  
by the Open Technical Seminar Team in the field of Seismology and  
Earthquake Engineering in 1987.

at Bogota, September , 1987

Received by

Signature

  
Dr. ALEJANDRO OSPINA TORRES  
Dean of School of Engineering  
National University of  
Colombia

  
Dr. M. Hirosawa  
Head,  
Open Technical Seminar Team,  
Japan International Cooperation  
Agency

Part 1 Books

- |  |        |
|--|--------|
| 1. Some Recent Earthquake Engineering Research and Practice in Japan.                          | 1 Vol. |
| 2. Guidelines for Earthquake Resistant for-Engineered Construction.                            | "      |
| 3. Basic Concept of Seismic Codes. Vol. I & II.  | 2 Vol. |
| 4. Quantitative Seismology, Vol. 2.  | 1 Vol. |
| 5. Earthquake Resistant Regulations - A World List 1984. (English, some in European languages) | "      |
| 6. The Building Standard Law of Japan.   | "      |
| 7. Earthquake Resistant Design for Civil Engineering Structures in Japan.                      | "      |
| 8. Engineering Seismology.   | "      |
| 9. Introduction to the Building Standard Law.  | "      |
| 10. Introduction to the Technical Appraisal.   | "      |
| 11. Outline of the Approval & Certification System under the Building Standard Law.            | "      |

---

Total

12 Vol.

Part 2 Documents

Reference Documents prepared by the Open Technical Seminar Team in the field of Seismology and Earthquake Engineering in 1987.

1. Volume 1 (Dr. M. Hirose)
2. Volume 2 (Dr. K. Sudo)
3. Volume 3 (Dr. H. Mizuno)
4. Volume 4 (Dr. Y. Osaki)

Peck. Slides

The List of Books and Reference Documents prepared and donated by the Open Technical Seminar Team in the field of Seismology and Earthquake Engineering in 1987.

at Santiago, September 28, 1987.

Received by



Signature

Prof. Atilano Lamana  
Dean,  
Faculty of Physical Sciences  
and Mathematics  
University of Chile



Dr. M. Hirosawa  
Head,  
Open Technical Seminar Team,  
Japan International Cooperation  
Agency

Part 1 Books

- |  |        |
|--|--------|
| 1. Some Recent Earthquake Engineering Research and Practice in Japan.                          | 1 Vol. |
| 2. Guidelines for Earthquake Resistant for-Engineered Construction.                            | "      |
| 3. Basic Concept of Seismic Codes. Vol. I & II.  | 2 Vol. |
| 4. Quantitative Seismology, Vol. 2.  | 1 Vol. |
| 5. Earthquake Resistant Regulations - A World List 1984. (English, some in European languages) | "      |
| 6. The Building Standard Law of Japan.   | "      |
| 7. Earthquake Resistant Design for Civil Engineering Structures in Japan.                      | "      |
| 8. Engineering Seismology.   | "      |
| 9. Introduction to the Building Standard Law.  | "      |
| 10. Introduction to the Technical Appraisal.   | "      |
| 11. Outline of the Approval & Certification System under the Building Standard Law.            | "      |

---

Total

12 Vol.

Part 2 Documents

Reference Documents prepared by the Open Technical Seminar Team in the field of Seismology and Earthquake Engineering in 1987.

1. Volume 1 (Dr. M. Hirose)
2. Volume 2 (Dr. K. Sudo)
3. Volume 3 (Dr. H. Mizuno)
4. Volume 4 (Dr. Y. Osaki)

Peck. Slides



### 資料 3. 公開技術セミナー出席者への Questionnaire 及び集計結果

ここにはコロンビア及びチリーの両国で実施した公開技術セミナー出席者を対象にして行ったアンケートとその集計結果を示す。なお、アンケートでは、主として下記の内容について尋ねている。

1. 今回実施したセミナーに関連して
  - a. セミナーの有効性
  - b. セミナーの内容に対する時間配分
  - c. セミナーに対する要望
2. 建設省建築研究収国際地震工学部で行っている地震学、地震工学の集団研修に関連し
  - a. この研修コースを知っているか否か
  - b. どのように知ったか
  - c. 何を研修したいか
3. 将来の両国の技術協力に対する提案

アンケートの回答者はコロンビアは73名、チリーは78名であった。

以下、各アンケート項目毎に回答者数を示し、また、コメントについてはその全てを別紙に記した。

コロンビア

Questionnaire on the Open Technical Seminar

in the field of Seismology and Earthquake Engineering

September & October, 1987

JICA Open Technical Seminar Team in the field of  
Seismology and Earthquake Engineering .

(1) Please write your name, job title, etc.

NAME \_\_\_\_\_

JOB TITLE \_\_\_\_\_

AFFILIATION \_\_\_\_\_

COUNTRY

( ) Colombia

( ) Chile

集計なし

カウント  
集計結果

(2) Please write your present job as specific as possible, if you do not mind.

(3) The seminar is the main job of this Open Technical Seminar Team.  
Please answer the following questions on the seminar.

(1) Did you get anything by attending the seminar? Please select items with  
which you are impressed, if any.

(47) a. To get an outlook of Japanese earthquake engineering within the limited  
time.

(31) b. To get advanced knowledge or information of some fields in earthquake  
engineering. If so, please write specific fields.

別紙

(26) c. To get some information of governmental or municipal activities for  
seismic disaster mitigation in Japan.

(31) d. To get some information of overseas technology cooperation activities  
in earthquake engineering fields by Japanese Government.

(5) e. Others.

別紙

(2) f. Not so much.

(2) Please select the items that we should have referred to or spent much more  
time on in the seminar.

(23) a. Appropriate earthquake engineering technology that you can apply to your  
country's own problems related to earthquake engineering. If so, please  
write your own problems in earthquake engineering fields.

別紙

(36) b. Earthquake-resistant design of civil engineering structures except the  
buildings of reinforced concrete and steel structures.

(16) Earthen(adobe) building or house (22) Timber house or bilding

(40) Masonry structure building or house (26) Bridge (9) Railway

(9) Embankment (5) Port and harbor (7) Water supply facilities

(5) Fuel gas pipeline (2) Nuclear reactor building

(1) Others (

別紙

(9) c. Japanese construction technology. What kinds of technology?

) 別紙

(6) d. Others. Please write them.

) 別紙

(3) Please write your comments or advice for improvement of the seminar, if any.

[

) 別紙

(4) What do you expect the Open Technical Seminar Team to do besides the seminar?

[

) 別紙

(4) The seminar is a reflection of "The Training Course of Seismology and Earthquake Engineering" organized by Japanese Government since 1960. This "Training of Seismology and Earthquake Engineering" is given at International Institute of Seismology and Earthquake Engineering, Building Research Institute, Ministry of Construction, Tsukuba, Japan, which has full-time and professional staff, as one of the group training courses of Japan International Cooperation Agency. The curricula of two subcourses of this group training course (seismology and earthquake engineering) are attached in appendix. Please answer the following questions on your job and "Seismology and Earthquake Engineering Course".

(1) Please write three interesting subjects from each subcourse of Training Course in Seismology and Earthquake Engineering (cf. appendix).

SEISMOLOGY Subcourse {  
{  
{ } 別紙

EARTHQUAKE ENG. Subcourse {  
{  
{ }

(2) Did you know anything about "the Training Course in Seismology and Earthquake Engineering"? If yes, please answer how you came to know it.

(24) YES

(24) a. General information of "the Training Course in Seismology and Earthquake Engineering" from a governmental institution of your country.

(6) b. Information from Japanese Embassy or from a branch office of Japan International Cooperation Agency.

(7) c. Information from ex-participants of "the Training Course in Seismology and Earthquake Engineering".

(2) d. Information from ex-participants of the other JICA training courses.

(4) e. Others. [

] 別紙

(35) NO

(3) Would you like to apply for the group training course of "Seismology and Earthquake Engineering"?

- (66) YES
- ( 2 ) NO

(4) If your answer is yes about the above question, what items do you expect to study in the Training Course in Japan.

FOR RESEARCH PURPOSE

- (25) a. To attend the lectures and improve generally earthquake engineering knowledge.
- (22) b. To master instrumentation of laboratory and fields experiments in the lectures and practices.
- (12) c. To deepen knowledge of some earthquake engineering fields and carry out research. If so, what fields? ( 別紙 )
- (18) d. To get academic degree such as doctor or master. ( 別紙 )
- ( 3 ) e. Others. ( )

FOR DESIGN AND CONSTRUCTION MANAGEMENT PURPOSE

- (32) a. To extend theoretical background of earthquake engineering and master earthquake-resistant design of structures.
- (33) b. To study construction technology as a construction manager or as a field engineer.
- ( 3 ) c. Others. ( 別紙 )

FOR DISASTER MANAGEMENT PURPOSE

- (11) a. To establish countermeasure plan for some natural disasters related to seismology and earthquake engineering. Please write specific natural disasters. ( 別紙 )
- (36) b. To study seismology or earthquake engineering for disaster mitigation planning. ( 別紙 )
- ( 1 ) c. Others. ( )

FOR OTHER PURPOSE

[ ] ( 別紙 )

(6) Please write items as best-conceivable technology cooperation of earthquake engineering between your country and Japan, if any.

[ ] ( 別紙 )

Thank you very much for your patient filling out!

APPENDIX CURRICULA OF GROUP TRAINING COURSE OF "EARTHQUAKE ENGINEERING"

1. Seismology Course [ Subcourse ]

Subject	1) Days	Year and Month									
		1987				1988					
		9	10	11	12	1	2	3	4	5	
General Seismology	# 1	-									
General Earthquake Engineering	# 1		-								
Strong Ground Motion	1										-
Mathematics I	! 3		—								
Computer I	!# 5		—								
Mathematics II	! 5				—						
Computer II	! 5					—					
Data Processing	4					—					
Basic Theory of Elasticity	! 4				—						
Seismic Surface Waves	2							—			
Ray Theory	! 4				—						
Statistical Seismology	! 3							—			
Theory of Instrumentation	! 4										
Interpretation of Seismograms	! 8			—	—	—					
Microearthquake Observation	8							—	—		
Instrumental Practice	4					—					
Source Mechanism	4								—		—
Practice on Mechanism	! 7		—						—		
Mechanical Properties of Rocks	2							—			
Earthquakes and Fractures	2								—		
Seismic Prospecting	4				—						
Crust and Upper Mantle Structure	2										—
Seismicity	4							—			
Plate Tectonics	6				—	—					
Physical Geology	2		—								
Crustal Deformation I, II	5								—		
Earthquake Prediction	4								—		
General Geophysics	2							—			
Ocean-Bottom Seismology	1										—
Volcano Physics	2							—			
Active Fault	1									—	
Tsunamis	1										—
History of Seismology	1										—
Colloquium	2								—		
Special Lecture by UNESCO Expert	3								—		
Special Lectures and Observation	28										
Study Trip	8			—					—		—
Individual Study	52										—
Total	215 days										

1) # Joint lecture with Earthquake Engineering course.

! Examination will be given. — Lecture time

2. Earthquake Engineering Course [ Subcourse ]

Subject	1)	Days	Year and Month											
			1987				1988							
			9	10	11	12	1	2	3	4	5			
Mathematics	!	6		—										
Computer	#!	5		—										
Practice of Computer		2			—									
General Seismology	##	1		—										
General Earthquake Engineering	##	3		—										
Engineering Seismology		1				—								
Strong Ground Motion		2				—								
Soil Mechanics	!	5			—									
Soil Test & Survey		2			—									
Soil Dynamics I		4			—									
Soil Dynamics II		3				—								
Foundation Engineering		5				—								
Dynamic Soil-Structure Interaction		3				—								
Structural Dynamics I	!	8		—										
Structural Dynamics II	!	2										—		
Structural Analysis A	!	5			—									
Structural Analysis B	!	6			—									
Structural Analysis C		3				—								
Limit Analysis		3					—						—	
Finite Element Method	!	8					—							
Random Vibration	!	5					—							
Safety of Structures and Design		*						—						
Strong-Motion Earthquake Observation		2												—
Structural Testing		5		—										
Spectral Analysis		3				—								
Masonry Structure		*												
Wooden Structure		*												
RC Structure	!	8						—						
PC Structure		*												
Steel Structure	!	5						—						
Nuclear Power Plant		*												
Bridge Engineering		5											—	
Dam Engineering		2											—	
Harbour Structures		*												
Railway Facilities		*												
Waterworks Facilities		*												
Disaster Mitigation Planning		*												
Lifeline Earthquake Engineering		*												
Earthquake Countermeasures Act		*												
Colloquium		1											—	
Study Trip		18		—									—	
Individual Study		52												→
Total			215 days.											

1) # Joint lecture with Seismology course; ! Examination will be given.

\* The lecture will be given as a special lecture. More than 30 days will be allotted for special lectures. — Lecture time

(3)(1)b 記入用

( ) b. To get advanced knowledge or information of some fields in earthquake engineering. If so, please write specific fields.

- Earthquake Prediction.
- Traditional material behavior in Housing in Seismic conditions.
- Field & Lab Techniques.
- Soil-structure interaction.
- To get work methods of studies and analysis.
- General view of dicipation systems in buildings.
- Mexico city Earthquake.
- Seismic Inspection and retrofitting method.
- Seismic behavior of Reinforced concrete beam with differents stirrops arrangements.
- Seismic inspection and retrofitting method for Existing or Damage Building: F.C. Mexico city.
- Design and construction techniques.
- I want some information how is the response of structures.
- Seismology - Earthquake Engineering Research.
- Soil mechanics.
- The way structures are studied and solved in very active seismic regions.
- The experimental investigation on buildings.
- Evaluation of seismic risks on R/C design.
- Earthquake resistant design.
- Repairing of damaged buildings.
- Earthquake resistant design.
- Evaluation of seismic risks and earthquake simulations.
- Methods of design and resolving of structures.
- Loads for seismic design.
- Example of the application in Mexico.

(3)(1) 記入用

( ) e. Others.

- Solutions in the repairing in the earthquake of Mexico.
- Knowing the state of the art of the Seismology and the Earthquake Engineering.
- Investigation of Earthquake Prediction.
- To compare with knowledge acquired about 1963 in San Juan, Argenieria, Fac. Ingenieria, Univ. Nac. Cuyo.
- To get information about JICA and its activities in the world.
- To get knowledge about JICA.



(3)(2)a 記入用

( ) a. Appropriate earthquake engineering technology that you can apply to your country's own problems related to earthquake engineering. If so, please write your own problems in earthquake engineering fields. )

- Instrumentation and interpretation of seismograph.
- Instrumentation (Seismographs).
- We have no studies about earthquake.
- Telemetrics.
- Analysis of Seismic Risk on Regions of scarce information.
- An adequate Array observation system on the West of Colombia.
- Evaluation of earthquake resistance of existing building and its improvement.
- No funds for investigation.
- Topography. Need of stepped building.
- Make a more general study of earthquake in order to teach the population.
- Earthquakes effects on bridge.
- Problems related to Volcanizm, studies about San Andres Trench,
- Structural Dynamics and scale models.
- For big buildings (up to 50 story). In great Civil Engineer work as tall buildings Embankment, etc.
- Knowing the state of the art of the seismology and the Earthquake Engineering.
- Develop maps of seismic risk for the most important cities, because they don't exist.
- The need of seismographs and accelerographs.
- Interaction between soil and structure.
- Networks of measuring equipment of earthquakes.
- Seismic situation in Colombia.
- There are responsibility in the following of laws (codes) about earthquake resistant structures.
- You did not referred to bridge.
- Seismic resistance of masonry construction for 1 to 3 stories.

(3)(2) b Others 記入用

- ( ) b. Earthquake-resistant design of civil engineering structures except the buildings of reinforced concrete and steel structures.
- ( ) Earthen(adobe) building or house ( ) Timber house or bilding
  - ( ) Masonry structure building or house ( ) Bridge ( ) Railway
  - ( ) Embankment ( ) Port and harbor ( ) Water supply facilities
  - ( ) Fuel gas pipeline ( ) Nuclear reactor building
  - ( ) Others ( )
- この  
み →

- Soil structures in general terms, and the interaction between soil and structure.
- Foundation.
- Oil Pipeline.
- Building evaluation on earthquake resistance.
- Embankment Dams.
- Brick environment façades in 8/12 floor buildings in BOGOTA.
- Water supply lines.

(3)(2) c 記入用

( ) c. Japanese construction technology. What kinds of technology?

- Stability slopes countermeasures.
- Adobe - Soilcement - Brick masonry - R.Concrete-
- Design, construction of shock absorbers and their use in building's foundations.
- Construction of buildings and houses.  
construction of typical structures for office or house (precast).
- Related with the items signed in 2.b. (paged 1).
- Precast Construction.
- About ductility.
- Ductility, shock absorbers, criteria for beams and columns.
- Shock absorbers - Ductility.
- Ductility.
- Earthquake Resistant structures.
- Design seismic load to building structure.
- Damper to isolate buildings.
- The application of computers in structural Engineering.

(3)(2) d 記入用

( ) d. Others. Please write them.

- Earthquake Forest.
- Preventive methods for earthquakes.
- to get advanced information related with Seismology.
- Influence and Relation between the type of the soil foundation and the collapse of the constructions.
- Earthquake prediction, new instruments technology.
- Above about Seismic Modern Ideas.
- Earthquake performance and design of slopes.
- Stability slopes counter measure.
- Seismology, with emphasis in problems arising in South America, especially in Colombia. Interpretation of seismographs, Seismic zones, shallow earthquakes and plate tectonics.

(3)(3) 記入用

(3) Please write your comments or advice for improvement of the seminar, if any.

- Everything is great.
- The deliver the report some days before the Seminar in order to know something about the lectures and so get more knowledge at the lecture.
- Give the papers of lectures before the inauguration day, thus the participants can study them and get more benefits of each lecture.
- Two days more(a week).
- To deep more in the way you Define the shear in the base and with so much difference in the constant of base shear.
- This seminar of Seismology & Earthquake Engineering is very interesting but short time is adverse to understand much better all advanced topics that it carries.
- Improve the translation item.
- The seminar it's very interest.
- The seminar must be programmed in at least a week of durations.
- It requires simultaneous translation.
- More days - More Geology.
- Transmit experience and Technology.
- I think, It'll be important more irectuently.
- More time for each topic.
- In general terms the Seminar's goal was achieved.
- Too many topics were discussed and the time was too short.
- Longer seminar is needed in order to obtain more comparehensive understanding.
- The time is short, but it's difficult to spent more time, I think, if it's possible, to make someone application to one general problem, like one design.
- If it is possible to have one colombian authority in this subject (Seismology and Engineering Earthquakes). To make a comparison the Last day of the Seminar.
- I think a short introduction of the field should be done to give an idea of the seminar and of the main subjects of an Earthquake.
- The seminar was very short, and it was a general information about Earthquake.
- It is very important to speak in native language.
- It's very important. The knowledge of Earthquake Engineering and the Japanese Technology is a form to save human being in many countries.
- With more films the lectures are lasier to follows and so you avoid the problems of simultaneous translation.
- New technics on structural design.
- The seminar may not only be for engineers. Other fields of the knowledge ( professionals) need these knowledge.
- I think this types of seminar is important for the Colombian Engineer. 2nd it'll be important more frequently.
- For the next time try to have a simultaneous translation or speak in the language of the country.
- The seminar five a great opportunity to know about and treat problems related with seismology.
- The seminar should be longer and much more specific in area concerning aseismic design and seismic risk evaluation.
- Because of the little time I missed other important topics.
- Here important should have had given to the local effects of sub-soil in earthquake emplification.

- Three days are too short for the seminar, it should best at least a week.
- Increase the five of each topic and try to present than at different levels so the technical know-how is understood better.
- It should have more time explaining some topics like ductility using high strength concrete and steel.
- Too much topics for a short time.
- Little participation of the assistants, which where limited only to attend is among the audience there are people with little and other with great knowledge on the themes of each lecture.
- Try to bring slided in spanish or at least in English.
- In spite of our excellent organization the result could be even better if simultaneous translation were used.
- They are very good.
- Sound Equipment could be better.
- It would be better if the duration of each conference is longer and if the translation can be made into spanish language.
- Each lecturer knows his field very well.
- In order to have a better development of the seminar it is necessary to increase its duration (longer time) and to have theoretical and practical parts.

(3)(4) 記入用

(4) What do you expect the Open Technical Seminar Team to do besides the seminar?

- My interesting in the field of Seismology and Earthquake Engineering Apply to my country.
- To propose structural systems used in in Japan for high seismic risk.
- Make a brief summary of seismology and earthquake engineering as well as update the asistants knowledge.
- Give an idea of Japanese collaborater's achievements in this country.
- To know about Japanese experiences in Seismology and Seismology Engineering and there improvements.
- Contact other Universities and the colombian Institute of Earthquake Engineering.
- I hope that for the next time your will go one with topics about seismology and earthquakes, I wish you will present more specific solutions.
- More time, because the topics are interesting and you spend little time on each one.
- An exposition of theories and projects for the integration and develop of our countries.
- The time assigned to each topic is short. Could be possible to make the seminar for a whole week instead of 3 days?
- More technological contac with japanese scientists and investigators in topics of seismology and earthquake engineering.
- Permanent communication between IISEE, BRI or JICA, and, professionals interested in the theme.
- To continue the technical cooperation between Japan and Colombia.
- To stabilize a strong relationship between Japan and Colombia, and to promote a technical interchange.
- Offer more specific seminars.
- Make information available in order to enable practical applications.
- Permanent contact between JICA and the professional people of difficult countries.
- Improve building structure design knowledge.
- An important technological interchange program between Japan and colombia.
- Some aids, with equipment and aid with experts in Seismology, because it is very important to improve our research about Seismology.
- Be related with Universities in investigation projects.
- Open discussion.
- Get new ideas for seismic research for prediction of earthquake.
- Obteiner bibliografic sobre analysis and desino antisismicro.
- Show some equipment.
- I think no one want to Popayan, Colombia, to investigate the causes of the earthquake. I would be very important if you do so.
- To show techniques applied in Japan of details of reinforcement in order to compare with the ones we do here in colombia.
- Cooperative small research projects.
- Visit Universities when a course of E.Q. and Seismology is taught.
- The most interesting was the conference of Dr.Sudo.

(4) (1) 「I ISEEレギュラーコース(地震学、地震工学)で出席したい科目は？」の回答

[Seismology]

Earthquake prediction	47
Computer	4
Computer II	4
General Earthquake Engineering	2
Earthquake and Fractures	6
Active Faults	5
Structural dynamics	2
Theory of Instrumentation	4
Computer applications	2
Source mechanics	1
Instrumental practice	8
Crust and Upper Mantle structure	3
Mechanical properties rock	4
Instrumental practice	8
Mechanical properties rock	2
Volcano physics	5
Seismic prospecting	8
Seismicity	10
Plate tectonics	20
Seismic surface waves	2
Plate tectonics	20
Computer	4
Ray theory	3
Statistical seismology	5
Tsunami	5
Physical geology	4
Interpretation of Seismograms	10
Micro earthquake observation	4
Practice on mechanism	3
General Seismology	9
Crust information	3
Basic theory of elasticity	8
General geophysics	1
Structural analysis	3
Structural testing	2
History of seismology	3
Source mechanism	2
Data processing	2
Volcano physics	1
Special lectures and observation	2
Mathematics	2
Earthquake phenomena	1



[Earthquake Engineering]

Structural dynamics	6
Structural dynamics I	4
Structural dynamics II	3
Structural analysis	9
Structural analysis A	5
Structural analysis B	3
Structural analysis C	2
Safety of structures and dynamics	2
R/C structure	15
Foundation Engineering	6
Safety of structure and design	4
Disaster Mitigation	2
Earthquake prediction	2
General Seismology	2
Practice of computer	1
Dynamic Soil-structure interaction	4
Safety of structures and design	10
Masonry structure	7
Soil mechanics	5
Foundation Engineering	6
Structural testing	14
Soil dynamics I	6
Soil dynamics II	2
Dam Engineering	2
Limit analysis	3
Disaster mitigation planning	7
Earthquake countermeasure	2
Spectral analysis	9
Strong-motion Earthquake observation	6
PC structure	3
Steel structure	2
Wooden structure-masonry	2
General earthquake engineering	4
Random vibration	3
Finite element method	11
Bridge engineering	3
Harbor structures	2
Practice of computer	1
Engineering Seismology	4

(4)(2) 記入用

(2) Did you know anything about "the Training Course in Seismology and Earthquake Engineering"? If yes, please answer how you came to know it.

( ) YES

( ) a. General information of "the Training Course in Seismology and Earthquake Engineering" from a governmental institution of your country.

( ) b. Information from Japanese Embassy or from a branch office of Japan International Cooperation Agency.

( ) c. Information from ex-participants of "the Training Course in Seismology and Earthquake Engineering".

( ) d. Information from ex-participants of the other JICA training courses.

( ) e. Others. ( )

27 →

- I am an ex-participants of Seismology Course.
- News paper
- Information for newspaper.

(4)(4) c 記入用

FOR RESEARCH PURPOSE What fields?

(4) If your answer is yes about the above question, what items do you expect to study in the Training Course in Japan.

FOR RESEARCH PURPOSE

- a. To attend the lectures and improve generally earthquake engineering knowledge.
- b. To master instrumentation of laboratory and fields experiments in the lectures and practices.
- c. To deepen knowledge of some earthquake engineering fields and carry out research. If so, what fields? ( ← 〇〇  
a/b

- Foundation, and Interaction Soil-structure.
- Soils dynamics and seismic risk.
- Finite element method
- Structural Testing
- Housing popular massive
- Numerical Modelling
- Risk analysis
- Topografia

(4)(4) e 記入用

FOR RESEARCH PURPOSE Others

(4) If your answer is yes about the above question, what items do you expect to study in the Training Course in Japan.

FOR RESEARCH PURPOSE

- a. To attend the lectures and improve generally earthquake engineering knowledge.
- b. To master instrumentation of laboratory and fields experiments in the lectures and practices.
- c. To deepen knowledge of some earthquake engineering fields and carry out research. If so, what fields? ( )
- d. To get academic degree such as doctor or master.
- e. Others. ( ) ← いろいろ

- Techniques about the prediction of earthquakes.
- Individual course to get a doctor degree.
- To get a knowledge for the interpretation of seismographs.
- Determination of seismic risk and earthquake prediction. To determine in time and space the location of hypocenters, epicenters, origin and the earthquake mechanism. Practice in instrumentation.

(4)(4) 記入用

FOR DESIGN & CONST MANAGEMENT

C. Others

FOR DESIGN AND CONSTRUCTION MANAGEMENT PURPOSE

- a. To extend theoretical background of earthquake engineering and master earthquake-resistant design of structures.
- b. To study construction technology as a construction manager or as a field engineer.
- c. Others. ( ) ← <sup>22</sup> a4

- To study foundation Engineering for machine foundations.
- Foundations having a seismic resistant.
- Implement housing building plans.
- Earthquake.
- Earthquake, Tsunamies, floods, volcanic activity, and influence of the earthquakes for the soil conditions and in the landscape condition.

(4)(4) 記入用

FOR DISASTER MANAGEMENT /

A. Specific natural disasters

FOR DISASTER MANAGEMENT PURPOSE

( ) a. To establish countermeasure plan for some natural disasters related to seismology and earthquake engineering. Please write specific natural disasters. ( )

18-22A  
of

- Landslides-Mudflows.
- Earthquake and eruption.
- Disaster on Ruiz's snow-covered hill.

(4)(4) 記入用

FOR DISASTER MANAGEMENT

C. Others

FOR DISASTER MANAGEMENT PURPOSE

- ( ) a. To establish countermeasure plan for some natural disasters related to seismology and earthquake engineering. Please write specific natural disasters. ( )
- ( ) b. To study seismology or earthquake engineering for disaster mitigation planning.
- ( ) c. Others. ( ) ← = 14

- Prevention in architecture design.
- Theory of influence of Moon and Sun over Crust and Earthquakes.
- Application of seismology in Geotechnics and earthquake engineering in the during and construction of civil engineering works, foods, slope stability and so on, because the heavy rainfall in our region.
- Disaster prevention.

(4)(4) 記入用

FOR OTHER PORPOSE

FOR OTHER PURPOSE

- Bring this top technology to Colombia and have it applied in our country.
- Give us information.
- Give us further information.
- To improve our knowledge to design and build safer structures, and for teaching our students and engineers your technics for designed and building structures.
- To implement massive housings design and construction with additional and modern construction methods.
- In the field of structural safety.  
Make the evaluation of the potential hazard of any cities of Colombia.
- Personaly in the seismic prospecting.
- To determine the seismic risk and hazard areas and the influence in specially in a geographics region and its influence in some elements of nature.



(4)(5) 記入用

(5) Please write items as best-conceivable technology cooperation of earthquake engineering between your country and Japan, if any.

- Future interchange of technological knowledge.
- The training courses it is necessary to know all the equipment the Japanese industry has developed related with the topic.
- Louper visits of Professors to Colombia for seminar and lecture.
- Creation of an international Research Center on up hearing Seismology, technical supported by Japanese Experts which wiikd form past of the world net.
- Duration of equipment and literature.
- Acceptation of participants in Japanese courses of Training and Grant support for them.
- Close ties with local universities.
- Technology and know how for factoring new instruments.
- Help to install instrumentation.
- Select a group of Colombia people to go around the country to inform them about disaster mitigation planning.
- To establish countermeasure plan for effect sites of natural disasters.
- To elaborate Colombia map of earthquakes.
- To interchange professions with the more important universities (public ones) in order to improve the knowledge of our students in the seismic field (Seismology and Seismic or earthquake engineering. So, our government should try to have Japanese and improve our net of seismological devices.
- Instrumentation.
- E.Q. prediction.
- To establish a pilot seismic net with coop, assistant.
- colombia has a high risk seismic and we haven't equipment seismic and we haven't instrumentation. Japan will help us with technical cooperation and equipment. Then, between Japan and Colombia can make recommendations for our conditions.
- An technological interchange between Japan and Colombia.
- To make a better introduction of four technology with technical institutes and universities.
- A continuing education program for our university students and for our professionals.
- A technological interchange.
- To create a seismologic network in Colombia with Japanese Technology.
- On the earthquake prediction field training of technics and equipment supply.
- On building design and construction : training of engineers for understanging seismic behavior of structurer, learning appropriate and latest design technics.
- Seismic instrumentation.
- Technology in construction (in seismic engineering).
- Structural safety.
- To do session to the seismic design of large dwelling constructions for low level class people.
- To improve technics to seismic - resistant constructions.
- Better coordination with the differents Institution of Colombian Government with Japan in the advise about disaster events.
- More activity between universities.
- Develop of projects in my country with your assistance and with our people.

- Interchange of Japanese students with some level of Colombian students to apply on field experiences from both countries.
- We hope some help with Seismological Equipment, Seismological experts, and portables Seismographs to study aftershocks. After a big earthquake because we don't have this kind of equipment.
- To create a connection more closely between and university and JICA's experts.
- Seismology and Earthquake Engineering like a complementary sciences.
- Cooperation for the instrumentalization of the country.
- Joint research to evaluate existing buildings and hospitals.
- Financial aid to develop some structural systems for earthquake resistant design.
- Joint research in structural materials.
- I am Argentinian from San Juan residence in Colombia since 1964.
- I'll try to implement a Seismic Prevention Institute at the Department of Construction, architecture, Universidad Nacional de Colombia, similar at the existing INPRES in SAN JUAN, Argentina.
- Give easy entrance to the Colombia people in the different courses held in Japan and so quality people in this area in Colombia.
- Technology to avoid eruptions and land slides in the "Merado del Ruiz"
- Instrumentation plan of array observation system.
- New Methods and technology on Disaster prevention and seismic resistant constructions.
- A sound integration in order to establish a seismological network and an accelerographs array in Colombia because this is a high seismic risk zone.
- Aids in future Seismic Risk projects.
- Help as equipment and technology in order to install a seismological effective network, not only by installing seismographs but also accelerographs which are very useful for our work as Engineers.
- By intensifying the exchange through training Colombia techniques in Japan, and increasing the help through technicians and equipment.
- Prediction by moon and sun, also.
- Seismological instrumentation.
- Individual training according to Colombia's necessity.
- Personal training.
- Instrumentation.
- Joint analysis of instrumentation through exchanges.
- Help on seismic resistant construction of buildings.
- System measurements and prediction of seismic events.
- Technology and knowledge interchange.
- By means of the technical cooperation of Japanese Gov. in the fields of seismology and earthquake engineering, techniques applied to Colombian reality.
- Interchange of experts, training of Colombian counterparts, donation of equipment and seismic disaster studies could be done.

セミナー資料  
総敬78通

チリ

Questionnaire on the Open Technical Seminar  
in the field of Seismology and Earthquake Engineering

September & October, 1987  
JICA Open Technical Seminar Team in the field of  
Seismology and Earthquake Engineering .

(1) Please write your name, job title, etc.

NAME \_\_\_\_\_

JOB TITLE \_\_\_\_\_

AFFILIATION \_\_\_\_\_

COUNTRY ( ) Colombia ( ) Chile

集計なし

カ  
ウ  
ン  
ト  
集  
計  
結  
果

(2) Please write your present job as specific as possible, if you do not mind.

(3) The seminar is the main job of this Open Technical Seminar Team.  
Please answer the following questions on the seminar.

(1) Did you get anything by attending the seminar? Please select items with which you are impressed, if any.

(57) a. To get an outlook of Japanese earthquake engineering within the limited time.

(25) b. To get advanced knowledge or information of some fields in earthquake engineering. If so, please write specific fields.

別紙記入

(41) c. To get some information of governmental or municipal activities for seismic disaster mitigation in Japan.

(46) d. To get some information of overseas technology cooperation activities in earthquake engineering fields by Japanese Government.

(5) e. Others.

別紙

(2) f. Not so much.

(2) Please select the items that we should have referred to or spent much more time on in the seminar.

(20) a. Appropriate earthquake engineering technology that you can apply to your country's own problems related to earthquake engineering. If so, please write your own problems in earthquake engineering fields.

別紙

(34) b. Earthquake-resistant design of civil engineering structures except the buildings of reinforced concrete and steel structures.

(12) Earthen(adobe) building or house (18) Timber house or bilding

(31) Masonry structure building or house (25) Bridge (5) Railway

(18) Embankment (21) Port and harbor (6) Water supply facilities

(5) Fuel gas pipeline (1) Nuclear reactor building

(9) Others (

別紙

(11) c. Japanese construction technology. What kinds of technology?  
(

) 別紙記入

(2) d. Others. Please write them.  
(

) 別紙

(3) Please write your comments or advice for improvement of the seminar, if any  
[

] 別紙

(4) What do you expect the Open Technical Seminar Team to do besides the seminar?  
[

] 別紙

(4) The seminar is a reflection of "The Training Course of Seismology and Earthquake Engineering" organized by Japanese Government since 1960. This "Training of Seismology and Earthquake Engineering" is given at International Institute of Seismology and Earthquake Engineering, Building Research Institute, Ministry of Construction, Tsukuba, Japan, which has full-time and professional staff, as one of the group training courses of Japan International Cooperation Agency. The curricula of two subcourses of this group training course (seismology and earthquake engineering) are attached in appendix. Please answer the following questions on your job and "Seismology and Earthquake Engineering Course".

(1) Please write three interesting subjects from each subcourse of Training Course in Seismology and Earthquake Engineering (cf. appendix).

SEISMOLOGY Subcourse {  
{  
{ } 別紙

EARTHQUAKE ENG. Subcourse {  
{  
{ }

(2) Did you know anything about "the Training Course in Seismology and Earthquake Engineering"? If yes, please answer how you came to know it.

(18) YES

- (6) a. General information of "the Training Course in Seismology and Earthquake Engineering" from a governmental institution of your country.
- (1) b. Information from Japanese Embassy or from a branch office of Japan International Cooperation Agency.
- (6) c. Information from ex-participants of "the Training Course in Seismology and Earthquake Engineering".
- (4) d. Information from ex-participants of the other JICA training courses.
- (4) e. Others. (

) 別紙

(47) NO

(3) Would you like to apply for the group training course of "Seismology and Earthquake Engineering"?

(54) YES

(11) NO

(4) If your answer is yes about the above question, what items do you expect to study in the Training Course in Japan.

FOR RESEARCH PURPOSE

(28) a. To attend the lectures and improve generally earthquake engineering knowledge.

(18) b. To master instrumentation of laboratory and fields experiments in the lectures and practices.

(28) c. To deepen knowledge of some earthquake engineering fields and carry out research. If so, what fields? ( )

別紙記入

(19) d. To get academic degree such as doctor or master.

(2) e. Others. ( )

別紙

FOR DESIGN AND CONSTRUCTION MANAGEMENT PURPOSE

(46) a. To extend theoretical background of earthquake engineering and master earthquake-resistant design of structures.

(21) b. To study construction technology as a construction manager or as a field engineer.

(1) c. Others. ( )

別紙

FOR DISASTER MANAGEMENT PURPOSE

(11) a. To establish countermeasure plan for some natural disasters related to seismology and earthquake engineering. Please write specific natural disasters. ( )

別紙

(28) b. To study seismology or earthquake engineering for disaster mitigation planning.

( ) c. Others. ( )

FOR OTHER PURPOSE

[

別紙

(6) Please write items as best-conceivable technology cooperation of earthquake engineering between your country and Japan, if any.

[

別紙

Thank you very much for your patient filling out!

APPENDIX CURRICULA OF GROUP TRAINING COURSE OF "EARTHQUAKE ENGINEERING"

1. Seismology Course [ Subcourse ]

Subject	1) Days	Year and Month									
		1987				1988					
		9	10	11	12	1	2	3	4	5	
General Seismology	# 1	-									
General Earthquake Engineering	# 1		-								
Strong Ground Motion	# 1									-	
Mathematics I	! 3		—								
Computer I	!# 5		—								
Mathematics II	! 5				—						
Computer II	! 5				—						
Data Processing	4					—					
Basic Theory of Elasticity	! 4				—						
Seismic Surface Waves	2						—				
Ray Theory	! 4				—						
Statistical Seismology	! 3							—			
Theory of Instrumentation	! 4			—							
Interpretation of Seismograms	! 8			—	—	—					
Microearthquake Observation	8						—	—			
Instrumental Practice	4					—					
Source Mechanism	4							—		—	
Practice on Mechanism	! 7		—					—		—	
Mechanical Properties of Rocks	2							—			
Earthquakes and Fractures	2							—			
Seismic Prospecting	4			—							
Crust and Upper Mantle Structure	2									—	
Seismicity	4						—				
Plate Tectonics	6				—	—					
Physical Geology	2		—								
Crustal Deformation I, II	5							—			
Earthquake Prediction	4								—		
General Geophysics	2						—				
Ocean-Bottom Seismology	1									—	
Volcano Physics	2						—				
Active Fault	1								—		
Tsunamis	1								—		
History of Seismology	1									—	
Colloquium	2							—			
Special Lecture by UNESCO Expert	3							—			
Special Lectures and Observation	28										
Study Trip	8		—					—		—	
Individual Study	52									—	
Total	215 days										

1) # Joint lecture with Earthquake Engineering course.

! Examination will be given. — Lecture time

2. Earthquake Engineering Course [ Subcourse ]

Subject	1) Days	Year and Month											
		1987				1988							
		9	10	11	12	1	2	3	4	5			
Mathematics	!	6		—									
Computer	#	5		—									
Practice of Computer		2			—								
General Seismology	#	1		—									
General Earthquake Engineering	#	3		—									
Engineering Seismology		1				—							
Strong Ground Motion		2			—								
Soil Mechanics	!	5			—								
Soil Test & Survey		2			—								
Soil Dynamics I		4			—								
Soil Dynamics II		3				—				—			
Foundation Engineering		5					—			—			
Dynamic Soil-Structure Interaction		3					—						
Structural Dynamics I	!	8		—									
Structural Dynamics II	!	2										—	
Structural Analysis A	!	5			—								
Structural Analysis B	!	6			—								
Structural Analysis C		3					—						
Limit Analysis		3						—					—
Finite Element Method	!	8							—				
Random Vibration	!	5								—			
Safety of Structures and Design		*											
Strong-Motion Earthquake Observation		2											—
Structural Testing		5		—									
Spectral Analysis		3					—						
Masonry Structure		*											
Wooden Structure		*											
RC Structure	!	8								—			
PC Structure		*											
Steel Structure	!	5						—					
Nuclear Power Plant		*											
Bridge Engineering		5											—
Dam Engineering		2											—
Harbour Structures		*											
Railway Facilities		*											
Waterworks Facilities		*											
Disaster Mitigation Planning		*											
Lifeline Earthquake Engineering		*											
Earthquake Countermeasures Act		*											
Colloquium		1											—
Study Trip		18		—									—
Individual Study		52											—
Total		215 days											

- 1) # Joint lecture with Seismology course; ! Examination will be given.  
 \* The lecture will be given as a special lecture. More than 30 days will be allotted for special lectures. — Lecture time

記入回答集計

(3) (1) b 記入用

( ) b. To get advanced knowledge or information of some fields in earthquake engineering. If so, please write specific fields.

- To design ductile Buildings.
- Recent trend on Earthquake countermeasure act in Japan.
- Seismic design of foundation.
- New Trends in Earthquake Engineering.
- Earthquake Engineering Technology and Dynamic Testing.
- Tsunami Risk: Prediction, Protection against Tsunami.
- Recent trends on Earthquake Eng. Technology.
- Seismology.
- New trends in the Seismic analysis of R/C structures.
- Earthquake prediction, Experimental work, Retrofitting.
- Seismic design in Masonry, Timber and R/C.
- Retrofitting.
- Retrofitting methods.
- Equipment and Structures for industrial projects.
- Seismic Predictions and trending of structures.
- Inspection and Retrofitting of damaged structures, Laboratory tests.
- New trends in Seismic design of structures.
- Base isolation and trends in Earthquake Engineering.
- Topics about seismic prediction.
- New Techniques and materials for ever all reparations retrofitting purposes.
- About foundation of buildings.
- Seismic design, Building repair, Seismic prediction, Industrial
- Equipment seismic analysis.
- Modelation and Soil-structure interaction.
- Laboratory experience in Buildings Subjected to cyclic and Dynamic Loads
- Loads Energy disipating elements.
- Earthquake prediction.



(3)(1) 記入用

( ) e. Others.

- To get Information about Seismological Topics.
- Shaking Table.
- Empirical Seismic Test of Models Structures.
- Some insight on testing and Instrumentism used in Structures Response studies at Japan.
- Personal contact with Japanese team.
- Too much knowledge, too limited time.
- Empirical seismic test of small structures by using shaking table.
- Up date my knowledge about (a),(b),(c),(d) above.
- To get an outlook of research and design trends of Japanese earthquake engineering.

(3) (2) a 記入用

( ) a. Appropriate earthquake engineering technology that you can apply to your country's own problems related to earthquake engineering. If so, please write your own problems in earthquake engineering fields.

- Energy dissipating elements.
- Foundation, Soil quality, Wood systemes buildings.
- How to structure weight loading and boundary conditions in the testing of model structures.
- Design of Reinforced walls column, beamsin connection with the experimental investigation. Be more specific in repairing buildings.
- More emphasis on design aspects.
- Seismicity and seismic risk.
- Dynamics soil-structure interaction.
- Soil Dynamics.
- Use of unite element, Computer simulation and Seismic prediction.
- Port and Harbor seismic design.
- Relation of seismic design standards.
- Equipment and structures for civil and industrial projects.
- Soil dynamics.
- Evaluation of bolls dynamic properties.
- "Adobe" and stone structure for buildings regulations.
- Relations between ductility of R/C structures and ductility of R/C structures and ductility of a R/C section.
- Port and Harbor design test on.
- Retrogitting method.
- Tsunami :run-up area, determination of the initial wave front protection against Tsunami.
- Port design structure aseismic.
- Technology for testing structures in laboratory in Chile.
- Earthquake and geotechnical instrumentation.
- To estimate the global ductility of a building.
- Building design, seismic disaster, mitigation.

(3)(2)b Others 記入用

- ( ) b. Earthquake-resistant design of civil engineering structures except the buildings of reinforced concrete and steel structures.
- ( ) Earthen(adobe) building or house ( ) Timber house or bilding
  - ( ) Masonry structure building or house ( ) Bridge ( ) Railway
  - ( ) Embankment ( ) Port and harbor ( ) Water supply facilities
  - ( ) Fuel gas pipeline ( ) Nuclear reactor building
  - ( ) Others ( )
- この  
み →

- Constitutive laws porsoils.
- Heavy process equipment, piping, tanks, etc.
- Prefabricated elelments.
- Wooden structure.
- Equipments.
- Industrial buildings.
- Industrial equipment, pipline of large diameter, tell vessel etc.
- Reinforced underground caverns and rock or soil slops.

(3) (2) c 記入用

( ) c. Japanese construction technology. What kinds of technology?

- Reinforced concrete.
- Prefabricated construction.
- RC structure.
- Shock absorbers, dampers.
- Pile foundation.
- Special technologies involved in construction of large industrial and civil projects.
- I'd like to know about isolated construction: Damper at the foundation the cost compared with conventional solution. What's the matter in the future with the damper for maintenance and replace.
- Timber.
- Reinforced Concrete.
- Isolation base.
- Ductile R/C shear walls.
- Timber and masonry construction technology.
- Ductility of Reinforced Concrete walls.
- Construction programming, Inspection.
- Precast concrete construction.

(3) (2) d 記入用

( ) d. Others. Please write them.  
(

)

- Masonry and wood structural.
- Time was very short and topics selection was O.K.
- Construction management-field engineering.
- Design of short columns, Effect of Non-structural elements on ductility.
- "Adobe" and other low-cost construction.
- Earthquake prediction.
- Behavior of accelerograph network.

(3) Please write your comments or advice for improvement of the seminar, if any.

- To improve language communications.
- To compare with all pictures and videos (is it possible) the bibliographic about the seminary. Perhaps, to get some copies for the bibliotec.
- The present seminar was very interest and like me what future seminars include items over soil & rocks mechanics.
- Seminar should have been extended if possible from Monday to Friday but only afternoons to faciliate attendance.
- Written material at least in English.
- it was good.
- This kind of activities are very important to improve the advances of the both bouches but I think should be better to separate the conferences for Engineer and Seismolologist.
- good.
- This seminar was excellent, and the publications distributed will help us very much.
- I think the seminar could be with parell translation, to make it more easy to understand.
- More time, in spanish.
- It should be shorter and more general.
- Simultaneous translation.
- Very-short.
- The lectures must be not too fest. I had problem for understand the orator spoke very fest.
- Language is a great difficult against the successful of the seminar, so it would be reasonably to have some translation.
- Very good but very short.
- I don't think that can be improved, for the time spent.
- Perform previous questions about subjects to be included in the seminar.
- Repair periodically in Chile Seminars like this.
- Talking should be done slower and more time for each topic would be necessary.
- Slides should be in English and they should be shown for a longer period of time.
- It was good.
- In general, the seminar has been very fruitful, conridering the brief time available. One suggestion, the paper on Modern technology in Seismology should be more fully translated to English.
- Better English is convenient.
- None ; it has been a very good seminar considering the short time available and large scope of subjects.
- It might be helpful to have on hand a Japanese to English or Japanese to Spanish translator for help lecturers with fence parts of their prescutations, so that can effectively envy there knowledge and expence to fue audience.
- I think the extent of time is too short lectures should be given two days, in order to be able to read and prepare all the literature, which has been handed to us, before the lecture takes place.

- It should be convenient to do shorter expositions.
- Because I was in Japan I can understand English (spoken by Japanese people) perfectly, but some persons here don't understand English at all, so may be simultaneous translation could be desirable (we usually do it at Santa Maria Universities).
- The language problem should be avoided in the future.
- You must take into account that in this country a lot of people had been abroad, and had Engineerings, master or Ph.D degree. So the seminar should be more technical and more specific. I have noticed that almost 50% or more is very simple or without been of interest for the audience.
- Considering the language problems no include Japanese in figure(slide) or title (figure or text).
- Language has been very difficult to understand.
- I'm really improved by the quality of the seminar, particularly by the well choose I topics.
- It's necessary that the picture showed are wrote in English because most the people don't understand Japanese.
- The pictures may be written in English or Spanish.
- Efforts must be made in order to improve the use of languages (English or say other) spoken as well as written. The help or visual aids is excellent.
- May be could exist a view of the concrete effects of the cooperation given by Japan to our countries.
- The topics may be orientated more to the local engineering.
- The way the lecture are presented is very interesting, because they provide a general outlook of Earthquake Engineering.
- Simultaneous translation (To Spanish) could make de lecture easier to follow.
- For a better understanding of the lecture by people who don't speak English it would be better if the conferences have simultaneous translation.
- It will be good to have simultaneous translation.
- I believe that simultaneous translation would improve the comprehension of the seminar.
- Having a simultaneous translation, the transference of knowledge could be improved.
- The team should dispose more time in order to deepen the expositions. Since to get sismographic information is very very cult, booklet should be more detailed.
- I would like to keep contact with the team, with the intention of getting more information on seismic building design and retrofitting method.
- Direct contact with the investigations.

(4) What do you expect the Open Technical Seminar Team to do besides the seminar?

- . I expect that they could do some short courses on specific subjects.
- . Some counselling for the research projects in course at the Universities, in Chile.
- . To know out technical level.
- . To know the country and its people.
- . Seminar like this is one of the very few opportunities we have to meet our teachers ( and friends) of BRI again. I hope you can organize a new seminar soon.
- . To hold short courses on specific subjects in Chile. About one week of duration.
- . Some brief specific course, if possible.
- . I think they are doing good contacts to spread their knowledge about the applications in seismology, where it is most advanced.
- . Visit soil mechanics laboratories meet with Chilean experts discuss experiential results.
- . If possible, a more personal and contact with Chilean Engineers, to exchange ideas, information, cooperation...
- . Plastic seismic analysis of several wind of structures.
- . Have some kind of publication reach in a regular way to the people influence in Japanese investigation on Seismic Engineering.
- . Maybe these seminars more often.
  - to establish contact with local Consulting engineering firms to discuss their problems and cooperation requirements.
- . To open possibilities for cooperative research work.
- . I expect seminar more specific in each subject.
- . Study news technologies.
- . Have direct meeting with people involved in Earthquake Eng.
- . To talk with the participants and to interchange opinions.
- . They could do congresses with the problems on seismic, Films, I expect also they could send any kind of publication.
- . The team, I hope, will receive copies in English of our research results. I should like to receive comments or advice in order to improve our work.
- . For design knowledge.
- . Implementation of more efficient methods for interchange of technology and experience between Japan and Chile.
- . Know the actual technology in Seismology.
- . Open some way that maybe possible in future to consult.
- . Promote exchange of information and personal relationship between Japanese and Chilean experts.



(4)(1) 「IISEEレギュラーコース(地震学、地震工学)で出席したい科目は？」の回答

[SEISMOLOGY]

Basic theory of elasticity	5
Plate tectonics	2
Source mechanics	2
Tsunami	14
Ray theory	1
Seismology	1
Prediction	1
Source mechanism	1
Seismicity	9
Earthquake Prediction	22
Interpretation of seismograms	7
Seismic prospecting	10
Seismic prediction	1
Mechanical properties of rocks	6
Theory of Instrumentation	22
General geophysics	1
Plate tectonics	22
Earthquake and Fractures	20
History of Seismology	1
Source mechanism	5
Volcano physics	1
General Earthquake Engineering	4
Data processing	1
Active Faults	2
Practice on mechanism	1
Statistical Seismology	1
General Seismology	5
Seismic Surface waves	2
Special lecture by Unesco Expert	1
Computer I	2
Instrumental practice	5
Data processing	2
Strong ground motion	2
Ocean-bottom Seismology	1
Micro earthquake observation	1

[EARTHQUAKE ENGINEERING]

Limited analysis	3
Foundation engineering	9
Structural analysis	9
Structural analysis A	1
Steel structure	9
Masonry structure	5
Wooden structure	2
Bridge engineering	3
R/C structure	12
Structural testing	15
Dynamic soil-structure interaction	15
Finite element method	14
Harbor structures	5
Masonry structures	5
Lifeline earthquake engineering	2
Engineering seismology	2
Soil mechanics	1
Random vibration	2
Soil dynamics II	5
Nuclear power plant	1
Soil dynamics I	6
Computer	3
Structural dynamics II	3
Safety of structures and design	6
Dam engineering	8
Disaster Mitigation planning	6
Foundation engineering	8
Soil & Rock, Dynamics	3
Soil Mechanics	3
Strong ground motion	2
Fundamental engineering	3
Structural dynamics I	6
Structural dynamics A	2
Spectral analysis	2
General earthquake engineering	3
Earthquake countermeasures Act.	2
Strong motion earthquake observation	1

(4) (2) 記入用

(2) Did you know anything about "the Training Course in Seismology and Earthquake Engineering"? If yes, please answer how you came to know it.

YES

- a. General information of "the Training Course in Seismology and Earthquake Engineering" from a governmental institution of your country.
- b. Information from Japanese Embassy or from a branch office of Japan International Cooperation Agency.
- c. Information from ex-participants of "the Training Course in Seismology and Earthquake Engineering".
- d. Information from ex-participants of the other JICA training courses.
- e. Others. ( )

- 
- A trend.
  - I was participant.
  - I postulated, without be selected.
  - Ex-participant. (1964/65 course)

FOR RESEARCH PURPOSE What fields ?

(4) (4) 記入用

(4) If your answer is yes about the above question, what items do you expect to study in the Training Course in Japan.

FOR RESEARCH PURPOSE

- ( ) a. To attend the lectures and improve generally earthquake engineering knowledge.
- ( ) b. To master instrumentation of laboratory and fields experiments in the lectures and practices.
- ( ) c. To deepen knowledge of some earthquake engineering fields and carry out research. If so, what fields? ( ← 22 24
- ~~( ) d. To get academic degree such as doctor or master.~~
- ~~( ) e. Others. ( )~~

- Official Regulation.
- Isolation systems for buildings.
- Isolate systems for foundations.
- Construction of Housing.
- New Material and construction methods.
- Numerical methods.
- Soil Dynamics.
- Soil and Structural Dynamics.
- R/C Design for Earthquake.
- Seismic Design of R/C Structures.
- Soil-Structure interaction.
- Building seismic repair.
- Soil mechanics & rock.
- Structural testing.
- Earthquake theory and seismic design.

FOR RESEARCH PURPOSE

Others

(4) (4) 記入用

(4) If your answer is yes about the above question, what items do you expect to study in the Training Course in Japan.

FOR RESEARCH PURPOSE

- a. To attend the lectures and improve generally earthquake engineering knowledge.
- b. To master instrumentation of laboratory and fields experiments in the lectures and practices.
- c. To deepen knowledge of some earthquake engineering fields and carry out research. If so, what fields? ( )
- d. To get academic degree such as doctor or master.
- e. Others. ( )

) 4-229  
4

• To know Japanese earthquake engineering methods.

FOR DESIGN & CONST MANAGEMENT

(4) (4) 記入用

C. Others

FOR DESIGN AND CONSTRUCTION MANAGEMENT PURPOSE

- ( ) a. To extend theoretical background of earthquake engineering and master earthquake-resistant design of structures.
- ( ) b. To study construction technology as a construction manager or as a field engineer.
- ( ) c. Others. ( ) ← 04

Official's regulation.

FOR DISASTER MANAGEMENT

(4) (4) 記入用 a. Specific natural disasters

FOR DISASTER MANAGEMENT PURPOSE

- ( ) a. To establish countermeasure plan for some natural disasters related to seismology and earthquake engineering. Please write specific natural disasters. ( ) ← 229/27
- ~~( ) b. To study seismology or earthquake engineering for disaster mitigation planning.~~
- ~~( ) c. Others. ( \_\_\_\_\_ )~~

- Earthquake.
- Tsunami.
- Landslide, Liquefaction.
- Fire.

FOR DISASTER MANAGEMENT

(4) (4) 記入用

C. Others

FOR DISASTER MANAGEMENT PURPOSE

- ( ) a. To establish countermeasure plan for some natural disasters related to seismology and earthquake engineering.
- ( ) b. To study seismology or earthquake engineering for disaster mitigation planning.
- ( ) c. Others. (

) ← 22  
94



FOR OTHER PURPOSE

(4) (4) 記入用

記入用

FOR OTHER PURPOSE



- Industrial seismic analysis of equipments such a file.
- Method for inspection in the construction. I think that the kind and quality of construction was the main problem in the cuilding damage in Chile.
- To introduce in my country the new technology known and learnt outside.
- For teaching in some University.
- Is very important for the organization where I work, to improve their background in this fields and specially in the area of the design of bridges.

(4) (5) 記入用

(6) Please write items as best-conceivable technology cooperation of earthquake engineering between your country and Japan, if any.

- . A long stay( one seventeen ) at the university of team to do some joint research.
- . Training courses in special Earthquake Engineering a field.
- . Equipment Donation.
- . Books donation for university libraries.
- . Equipment for reasure soil.
- . I think that the University is the best in the lecture between both countries. but there are another institution ."Colegio deIngenieros" This institution maintain more Communication with the professionals out of the university.
- . To intensify the number of seminars similar to their one, given at regular penods of time.
- . To establish an exchange program for researchers of International Institute of Seismology and Earthquake Engineering to course to Chilean Universities for 6 to 9 months to teach and carrying out joint research programs.
- . Soil Dynamics.
- . Software development of analysis method in Chile.
- . Instrumentation and field techniques of seismic prospection.
- . Seismic design standards.
- . Experimental activities, like with building scale models(1:10 or other), because we have here the people and the interest but not the founds and the technology. Since many years in my university my professors had been stoped cause that. Please remember US(U.Sta Maria) If you have interest contact with : Engineer Mr. Patricio Bonell, Departamento Obras Civiles Universided Tecnica Fdo sta, Maria, Casilla 110-V, Valparaiso, Chile.
- . Measuring our earthquake behavior perhaps a more global view could be conceived, So more instruments should be installed in our country. We should apply to P.O.S.E.I.D.O.N, may be.
- . To give seminar inspecific topics : par example: structural testing.
- . To develop some investigation program between Japanese center and Chilean University.
- . I think that should be cooperation in knowing the results of the exper.
- . See annex "A".
- . Analysis of: safety methods for designing several sort of seismic structures. : Existant software (computer) for seismic analysis of methods of structures and theriors main characteristic.
- . To cooperate for stablishing an instrumental network of accelerograms and to give help for processing date. Stacy and Analysis of Chilean codes.
- . Prediction of seisms.
- . Countermeasure acts for Earthquake.
- . Earthquake prediction.
- . Design techniques for improve ductility of buildings.
- . Evaluation of actual state of safety of old constructions.
- . Exchange of professional experiences.
- . Seismic inspection and retrofitting method for Exicting or damaged Buildings.

- Earthquake prediction.
- Seminars like this one.
- Training course.
- Literature on the subject.
- Shock absorbers investigation.
- Effect of non-structural elements in ductility.
- Shear-Walls.
- Implementation technology in order to predict large scale earthquake on the other hand, in order to improve the knowledge about Chilean Earthquake.
- I think that should be cooperation in knowing the results of the experimental work and how do you change the codes or the design based on that. In the other hand we could tell you how we did to design and to build some structures, and what were the problems we had in past earthquakes. In summary we can communicate the results our natural laboratories with our success and failures with your experience.
- To establish an expedict communication, with special emphasis in exchanging bibliographic material.
- To instrumentate chilean tones with a high seismic risk, in order to calibrate the methods of seismic prediction.
- Structure testing.
- Strong motion earthquake observation.
- Earthquake countermeasures acts( Disaster Mitigation)
- To organize new seminars oriented or applied to the National(Chilean) reality for the design, construction and inspection of civil works and reminar for seismic risks prevention.

#### 資料4 公開技術セミナー・セミナー出席者へのアンケート集計結果のまとめ

コロンビアとチリの公開技術セミナー出席者に対してアンケート調査を実施した。スペイン語で記入された回答は、現地で英訳（極く一部は日本で英訳）したものである。アンケート前半はセミナーに関する設問、後半は国際地震工学研修と地震工学分野の技術協力に関する設問よりなっている。回収数はコロンビア73通、チリ78通である。

ここではまとめに代えて、主要な設問の集計結果にコメントを加える。詳細については別添資料3の集計結果を参照されたい。

##### I 公開技術セミナー〔特にレクチャーについて〕

1. 「セミナーに出席して何か得ることがありましたか？」という設問に対して、両国とも50～60名の人（回答者の70%、出席者の1/3）が「限られた時間で日本の地震工学の概観がわかった」と回答している。これより判断して当初のセミナーの目標は十分達成されたものと判断できよう。

コロンビアでは2位、3位が「地震工学の特定の分野について進んだ知識を得た」、「日本政府の地震工学分野における海外技術協力について情報を得た」である。さらに「どの分野の進んだ知識を得たか？記入して下さい」という設問に対しては、① 耐震設計に関するもの（耐力診断、補修・補強、1985年メキシコ地震への適用例、耐震設計に用いる荷重、異ったスタラップのアレンジメントと鉄筋コンクリート梁の地震時挙動など）、② 建物の応答、地盤の動的問題、地盤と建物の動的相互作用など、③ フィールドと実験室における構造実験法、地震観測法 ④ 施工法に関するもの（住宅の伝統的材料の挙動、設計法と施工法） ⑤ 地震学・地震予知の項目について記述があった。

チリでは、2位、3位、4位が「日本政府の地震工学分野における海外技術協力について情報を得た」、「日本における政府と地方自治体の地震防災活動について情報を得た」、「地震工学の特定の分野について進んだ知識を得た」である。チリでは、政府と自治体の地震防災活動に対する関心が高いのが注目される。これは、チリが何度も大地震をこうむっていること、最近でも1985年3月に大地震があったことが影響していると思われる。「地震工学のどの分野で進んだ知識を得たか？」という設問に対しては、① 耐震設計に関するもの（組積造、木造、鉄筋コンクリート構造、耐力診断と補修、機器の耐震設計）、② 地震工学の最新のすう勢、③ 実験室における動的実験法・構造実験法、④ 地震学と地震予知、⑤ 地盤と建物の動的相互作用、基礎の耐震設計、⑥ 津波、日本の地震対策の項目について記述があった。

2. 「セミナーでもっと時間を割りあてるべきであった項目は？」という設問に対し、最も多かったのは両国とも「鉄筋コンクリート構造と鋼構造の建物以外の構造物の耐震設計」の回答で

ある。

具体的な構造物では両国とも「組積造建物・住宅」と「橋梁」が1位、2位を占める。コロンビアでは、次いで2位から5位に「木造建物・住宅」「アドベ(アースン)建物・住宅」、「鉄道」「土構造物」の記入があった。チリでは2位に「港湾構造物」が入っているが、これは1985年3月の地震でバルパライソの港が被害を受けたことと関係があるようである。3位～5位には「木造建物・住宅」「土構造物(土盛り、堤防など)」「アドベ(アースン)建物・住宅」の記入があった。

3. 「セミナーでもっと時間を割りあてるべきであった項目は？」の設問に対し、2位に多い回答は「自国の固有の地震工学分野の問題に適用できるような適切な地震工学技術」であった。

具体的な問題の記述については、コロンビアでは、① 実験測定・観測法特に、地震計の設置と地震観測法、(テレメーターを含む)、他に模型構造物の相似則と構造動力学、② 地震活動度、マイクロゾーンネーション、地震危険度の解析、③ 地震学と地震工学の分野でもっと一般的な知識を得ること、④ 橋梁の耐震設計、⑤ 火山に関する問題、⑥ 1～3階建の組積造の耐震性、⑦ 実在建物の耐力診断、⑧ 50階位の超高層建物の建設、⑨ 土構造物(土盛り、堤防など)の建設の項目についての記述があった。

一方、チリでは、① 鉄筋コンクリート建物の補修・補強法(もっと具体的に説明してほしい、もっと設計法を中心にしてほしかったとの要望あり)、鉄筋コンクリート部材のダクテリティから建物全体のダクテリティを評価する方法、② 土質動力学・地盤と建物の動的相互作用、③ 模型構造物などを用いた構造実験法、実験室における土質実験法、④ 港湾構造物の耐震設計法、⑤ 有限要素法を用いたコンピューターシミュレーション、⑥ アドベ造石造建物の耐震規準、⑦ 一般的な耐震規準、⑧ 木造建物、⑨ 地震予知の記述があった。

4. 「セミナーでもっと時間を割りあてるべきであった項目は？」の設問に対し、3位に多い回答は「日本の建設工学」であった。

具体的な記述項目は、コロンビアでは、① 建物、特に住宅の建設(特にプレキャスト構法について注目している)、② ダクテリティを改善する施工法、③ ショックアブソーバー(衝撃吸収器)、基礎の免震(ベースアイソレーターとダンパー)、④ アドベ造、ソイルセメント、組積造、鉄筋コンクリート造の施工法であった。

一方、チリでは、① 鉄筋コンクリート構造の施工法、② プレファブリケーション構法、③ ショックアブソーバー、基礎の免震(アイソレーターとダンパー)、④ 木造の建設法、⑤ 大規模構造物の建設法、⑥ 杭基礎の施工法の記述があった。

日本の建設工学に対する期待では、鉄筋コンクリート構造の施工法以外に、組積造、アドベ造(ソイルセメント工法を含む)、木造など住宅の耐震性向上、住宅の質の向上についての期待が大きいと読みとれよう。プレキャスト構法(鉄筋コンクリート部材の工場生産と現地組立て)

プレファブリケーション構法についての期待も、同じ脈絡でとらえることができる。また、基礎の免震などやや先端的な、あるいは世界的にブームの工法についても、両国とも関心が深いようである。

## II 公開技術セミナー改善のためのコメント・アドバイス

### 1) コロンビア

改善の要望が最も多いのは、「公開技術セミナーの期間が短かすぎる。最低一週間は欲しい」というものである。関連したものとしては「各トピックスにもっと時間をさいてほしい」、「時間が短いので十分理解できない」といった回答があった。

次いで多いものは、レクチャーの言語の問題である。コロンビアでは、JICAコロンビア事務所で帰国研修員と相談の結果、講師が英語で話し、地震工学の帰国研修生がスペイン語で逐語訳あるいは要約をした。しかし、「同時通訳を採用してほしい」「通訳の問題を改善してほしい」「自国の言葉で話すのが重要である」という回答が比較的多く見られた。関連するものとしては「もっとフィルムを使ってほしい。そうすればわかりやすいし、同時通訳の問題を避けることができる」「スライドはスペイン語、少なくとも英語のものを持って来て欲しい」（注、極く一部に日本語のものが含まれていた）の回答があった。

他にセミナーの運営に関する要望としては「レクチャーノートセミナーの前に配布してほしい。そうすれば、もっと深く理解することができる」、「セミナーをもっと何度も催してほしい」「セミナー出席者（聴衆）のアシストがほとんどなかったが、もっとアシストすべきである」、「コロンビアの関連当局をこの分野で参加させることが可能である。そしてセミナーの最終日に比較検討を行うことができる」「マイク・拡声器をもっと良いものを使ったら…」の回答があった。

セミナーの内容についての要望としては「地震波の増幅問題における地盤の影響（ローカルエフェクト）についてもっと説明されるべきであった」「定義して使われたベースシャーの意味が、通常使われる定義とは異ったものであった」、「セミナーの主旨とか主要な目的について理解するために、この分野のイントロダクションをすべきであった」の回答があった。

最後に「セミナーは素晴らしい」「大変興味深い」といった回答もかなり多くあったことを念のため付け加えておく。

### 2) チリ

改善の要望が圧倒的に多いものは（47の記入項目中16項目）レクチャーの使用言語の問題である。チリではJICAチリ事務所、帰国研修員と相談した結果、英語でレクチャーを行うこととした。具体的な回答としては「言葉のコミュニケーションの改善を」「スライド等の教材は少なくとも英語で」、「同時通訳をして欲しい。そうすれば理解が深まる」「レクチャ

「速すぎる」「もっとゆっくり話して欲しい。各トピックにもっと時間をかけて欲しい」、「より良い英語であれば便利である」というものである。

次いで要望が多いのは「大変良いが、期間が非常に短い」、「各トピックにもっと時間をかけて欲しい」、「時間が短すぎる。配布資料を事前に渡して読んで準備ができるようにして、レクチャーは2日間(2日間フルにという意味か?)かけて欲しい」「可能ならば、セミナー全部に出席できるよう、月曜日から金曜日の午後すべきであった」という期間の延長を望むものである。

セミナーの運営の方法については「この種の活動では地震学と地震工学の分野の双方の進歩を改善するのが非常に重要である。技術者(エンジニア)と地震学者(サイスマロジスト)とで別に会議をした方が良い」、「セミナー中に主題についての質問を設けて欲しい」(チリではパネルディスカッションが延びたため、質問・個別相談の時間を割愛した)、「時間のことを考えれば、全体として非常に成果が多い。一つ助言するなら、地震学の現代技術についての論文は完全に英訳されるべきである」、「スライドは英語で書かれるべきである。そしてもっと長い時間見せて欲しい」、「写真・図表は英語で書く必要がある。そうしないと大部分の人は理解できない」の回答があった。

セミナーの内容については「トピックはもっとローカルエンジニアリング(現地工法など)を指向して良いと思う」、「セミナーは非常に興味深い。将来のセミナーでは土質・岩石の力学に関するトピックを入れて欲しい」、とすることで、唯一人であるが、「我国では多くの人が海外へ行き、工学修士・工学博士(Ph.D)を持っていることを考慮しなければならない。したがってセミナーはより技術的に、より具体的でなければならない。およそ50%の人が、それ以上の人が非常に単純であると考えているし、出席者(聴衆)の興味を引いていないことを私は忠告したい」の回答があった。

チリにおいても「セミナーは大変優れている。配布教材は我々にとり大変役立つ」「使用時間と主題のスコープの大きさを考えれば、大変良いセミナーである。注文はなし」などの積極的に評価する回答がかなり多くあったことを付記する。

### III セミナー以外に公開技術セミナーチームに望むもの

いままでに出て来たものとは異なるタイプの回答に焦点をあわせて示す。

コロンビアでは「日本とコロンビアでもっと技術交流をして欲しい」、「小さな研究プロジェクトを協同して作りたい」、「実験機材・文献の供与をして欲しい」といった要望が多い。次いで多いものは、「地震学と地震工学のもっと特定の(specific)分野でセミナーを開催して欲しい」、「もっとspecificな分野で1週間程度セミナーを開催して欲しい」、「セミナーの頻度を増やして欲しい」「実際の適用に役立つような情報をもっと欲しい」というものである。

チリで最も多い要望は「もっと特定の分野に絞ってセミナーを開催して欲しい」というものである。次いで「チリの技術者ともっと多くの情報を交換して欲しい」、「地方のコンサルタントエンジニアと彼らのかかえている問題を議論して欲しい」、「チリの大学と研究プロジェクトのためコンサルティングをして欲しい」といった技術交流を望む回答が多く見られた。

#### IV 国際地震工学研修について

1. 地震学サブコースと地震工学サブコースのカリキュラムから興味のある3科目を選んでもらった。ただし、カリキュラムに示されているのはタイトルのみであって、シラバス(議義の内容を説明したもの)は示していない。

##### 1) 地震学サブコース

コロンビアで圧倒的に多いものは「地震予知」で、次いで「プレートテクトニクス」、「サイスミシティ」、「地震波の解釈」「一般地震学」の順になっている。

チリでは「プレートテクトニクス」、「観測・測定(Instrumentation)の理論」、「地震予知」、「地震学の歴史」、「波動理論」の順に多い。

両国の回答を比較するとチリの方の回答がより具体的な傾向があるのに対し、コロンビアではやや一般的もしくは概論的なものを指向しているのがうかがえる。

##### 2) 地震工学サブコース

コロンビアでは「鉄筋コンクリート構造」、「構造実験法」、「構造物と設計の安全性」、「有限要素法」、「スペクトル解析」の順に多い。ただし、これは単独の科目での順位であり、「構造解析A,B,C」の3科目、「構造動力学I,II」の2科目、「土質力学」「土質動力学I,II」の3科目をまとめると、これらの科目への回答がかなり見受けられる。基礎的な力学系の講義への指向が強いことがうかがえる。

チリでは「有限要素法」、「地盤と建物の動的相互作用」、「構造実験法」、「鉄筋コンクリート構造」の順に回答が多い。力学系の基礎的レクチャー「構造動力学I,II」「土質動力学I,II」などへの指向も見受けられるが、コロンビアと比較すると弱く、やや進んだあるいは高度な科目への指向が強い。

2. 「地震工学研修について何か知っていましたか?」という設問への回答

コロンビアでは、この設問に対する有効回答数の4割が「Yes」と答えている。知った手段の中では「コロンビア政府機関からのGeneral Informationによる」としたものが圧倒的に多いのが注目される。コロンビアではGeneral Informationのサーキュレーションが非常に良いと判断できる。また「地震工学研修コースの帰国研修員からの情報による」、「日本大使館、JICA現地事務所からの情報による」とした回答も比較的多い。「新聞によって知った」(JICAボゴタ事務所が出したセミナーの広告を指すものと考えられる)と2名の人が回答を



寄せたのも一つの特徴である。「何も知らなかった」と回答した人は、有効回答数の6割である。

一方、チリではこの設問に対する有効回答数の28%が「Yes」と答えている。地震工学研修の帰国研修員の数が22名とコロンビアの13名より多いにもかかわらず、地震工学研修の知名度が比較的低いものとなっているのが注目される。知った手段の中では「チリ政府機関からのGeneral Informationによる」、「地震工学研修の帰国研修員からの情報による」、「JICAの他の研修コースの帰国研修員からの情報による」とした回答がほぼ同数である。「何も知らなかった」と回答した人は、有効回答数の72%である。

### 3. 「地震工学研修の集団研修コースに応募したいか?」「そうとすれば、どんなことを地震工学研修に期待するか?」という設問への回答

コロンビアでは、この設問の有効回答数の97%の人が応募したいと回答している。その目的は「研究目的のため」が最も多く、次いで、ほぼ同数で「設計・コンストラクションマネジメントのため」と回答している人が多い。「防災マネジメントのため」と答えた人は、前の二つの回答の約半数となっている。

「研究目的のため」との回答の中では、「レクチャーに出席して、一般的な地震工学の知識を向上させたい」が最も多い。次いで、「レクチャーや演習で、実験室・フィールドにおける実験方法をマスターしたい」、「博士・修士の学位を得たい」の回答が多い。

「設計・コンストラクションマネジメントのため」との回答の中では「コンストラクションマネージャー、またはフィールドエンジニアとして建設工学を学びたい」、「地震工学の理論的背景を整え、構造物の耐震設計法をマスターしたい」の二つの回答がほぼ同数で圧倒的に多い。

「防災マネジメントのため」との回答の中では、「防災計画のために地震・地震工学を学びたい」の回答が多い。

チリでは、この設問の有効回答数の82%の人が応募したいと回答している。その目的は、「研究の目的のため」との回答が圧倒的に多く、他の「設計・コンストラクションマネジメントのため」、「防災マネジメントのため」との回数2倍以上である。

「研究の目的のため」との回答の中では、「レクチャーに出席して、一般的な地震工学の知識を向上させたい」、「地震工学の特定の分野について知識を深め、研究を行いたい」、「博士・修士の学位を得たい」の3つの回答が、ほぼ同数で最も多い。次いで「レクチャーや演習で、実験室・フィールドにおける実験方法をマスターしたい」の回答が多い。

「設計・コンストラクションマネジメントのため」との回答の中では、「コンストラクションマネージャー・フィールドエンジニアとして、建設工学を学びたい」の回答が最も多く、次いで「地震工学の理論的背景を整え、構造物の耐震設計法を学びたい」が多い。

「防災マネジメントのため」との回答の中では「防災計画のため、地震学・地震工学を学びたい」の回答が最も多い。

コロンビアとチリの回答を全体として比較すると、次のような点を指摘できる。

1) 両国とも「研究の目的のため、地震工学研修に応募したい」との回答が最も多い。しかし、コロンビアでは、それと並んで「設計・コンストラクションマネジメントの目的のため」の回答が多いのが、特徴である。

一方、チリでは「研究の目的のため」との回答が圧倒的に多い。

2) 「研究の目的のため」との回答の中で、コロンビアでは「レクチャーに出席して、一般的に地震工学の知識を向上させたい」が最も多いのに対し、チリではこの回答と並んで「地震工学の特定の分野について知識を深め、研究を行いたい」、「博士・修士の学位を得たい」との回答が多い。このことから、コロンビアの概論指向、チリの特定分野指向・学位指向を指摘できよう。

3) 「研究の目的のため」との回答の中で「レクチャー・演習で、実験室・フィールドにおける実験・測定方法をマスターしたい」の回答がかなり多い。特に、コロンビアではその傾向がやや顕著である。地震工学研修において、今後とも充実をはかって行くべき分野であろう。

4) 「地震工学研修に期待するものは？」との設問を初めて途上国の人にアンケートした。コロンビアとチリのわずか2ヶ国の結果であるが、国により期待するもののニュアンスが異なる。今後とも機会を見つけ、このようなアンケートを他の国で実施しながら、地震工学研修の質の向上、制度改善、きめ細やかな研修指導を図ることが期待される。

## V 地震工学分野において最善と考えられる技術協力の項目

この設問の回答（セミナー2日目に回収したもの）をとりまとめて、各国のパネルディスカッションのテーマとした。集計結果にはその後、回収された結果も含まれている。

### 1) コロンビア

① 圧倒的に多いものは（26件）、日本との技術協力・技術交流をもっと活発にしてほしいというもので、やや漠然とした要望も含まれている。

提案する形態としては「研修生の受入れ」、「公開技術セミナーの定期的開催と長期化（1週間程度）」、「防災計画策定の協力」「コロンビアの大学・研究機関との情報交換」「特に地方の大学との関係」、「コロンビアの現実に適用可能な地震工学」が挙げられた。

現在、コロンビアからの地震工学研修の受入れは5～6年に1人といった程度（ここ3年間は、例外的に2年間各1人ずつ計2人が研修を受けている）なので、ほぼ毎年、研修生を受け入れるよう特別の配慮が必要であろう。先のアンケート結果で見たように、コロンビアでは、チリと比較して地震学・地震工学の科目について、概論指向と力学系の基礎科目への

指向が見受けられた。これはコロンビアの人が、問題解決の手掛りを得るために、地震学・地震工学を学びたいという要望が強いためと考えられる。この提案は現状の地震工学研修に正に符合するものであり、定期的な研修生の受入れが当面実現可能な、有効な対策と考えられる。

- ② 次いで、多い(21件)のが Instrumentation (地震計・強震計・構造実験・土質試験を含む実験観測法)、Equipment の供与である。

この中で具体的な提案として多く挙げられているものは、「地震計・強震計のネットワーク(アレイ観測)」である。「パイロットネットワーク」と控え目なものもある。この提案の中で最も多いのは(Instrumentation 又は Equipment の供与の提案の約半数)、どんなものか特定せずに Instrumentation, Equipment とのみ書いているものである。翻訳の問題もあるかもしれない。

- ③ 数は5件であるが、前述の①②と関連するのが、「人材の派遣」である。

単独に人材の派遣を提案しているものと、前の①②とセットで提案しているものがある。具体的なものとしては「レクチャー・セミナーのための人材派遣」、「国際研究センターを設立して講師として来て欲しい」、「大学に長期滞在して欲しい」「Instrumentation の指導に来て欲しい」というものである。

- ④ 「研究プロジェクトの援助をして欲しい」というものが5件あった。テーマとしては「地震計・強震計のネットワーク」、「実在建物と病院建物の耐力診断」「耐震設計法の開発」が挙げられた。

- ⑤ 前述の技術協力のタイプ(①~④)の総合したものとして「センターの設立」を提案しているものが2件あった。大学の具体名が挙げられているもの1件、国立大学の1校としてあるものの1件である。

- ⑥ 特定のテーマを絞って提案して来たものの中で、最も数が多いものは、建物の設計又は建設工学に関連するもので8件あった。「建物の耐震設計」、「低所得者向けの大規模な住宅建設と耐震設計」、「耐震設計法の改善」、「建設工法」が挙げられた。

- ⑦ 特定のテーマの中で、同じく数が多いのが、「コロンビアのサイスミンティマップの作成」、「マイクロゾーンネーション」、「サイスマックリスクの解析」などの地震防災のための資料整備に関するものである。

- ⑧ 前の⑦と関連するのが「地震防災対策」「地震防災計画の立案」の援助の提案である。「ネバド・デル・ルイス火山の噴火と泥流を避ける技術」もこのカテゴリに入るであろう。

- ⑨ わずか1件であるが、「日本とともに、コロンビア政府が、コロンビアの異なった機関を調整して、防災に関する助言を」という提案があった。今後、地震学・地震工学分野での技術協力を進めるためには、各機関の詳細な調査と調整が是非必要であろう。

## 2) チリ

- ① コロンビアと異なり、提案の中で圧倒的に数の多いものは見あたらない。「技術交流」(12件)と「建物の設計・建設」(8件)に関係するものが比較的多く、各10件程度である。提案がより specific であるのが、全体としての特徴である。
- ② 「技術交流」の提案の中で最も多いのは「もっと特定の分野でのセミナーの定期的開催」である。特定の分野では「構造実験法」「実験研究と耐震規準」が挙げられた。「6~9ヶ月間の、チリへの大学への派遣」「共同研究をするための人材派遣」と人材の派遣を提案しているのは2件である。この他に具体的なテーマを挙げない「研究プロジェクトの実施」が2件あった。「地震工学研修コース(日本での)」が2件あった。
- ③ 建物の設計・建設の関連で提案されたものの中で、多い順に「実在建物の耐力診断と補修・補強」、「解析のためのソフトウェアの整備」、「ダクテリティを改善する設計法」「耐震規準」である。1件のみのものは「ダクテリティのある非構造部材の建方」、「耐震壁」、「シヨックアブソーバー(免震のダンパーのこと?)」であった。
- ④ Instrumentation 又は Equipment の供与の提案は9件程度である。その内訳は「強震計のネットワークとデータ処理」、「土質試験装置」「地震計のグローバルネットワーク」、「地震探査のフィールド技術」「1/10 程度の縮小模型を用いる実験装置と実験活動」「構造実験法」、その他は分野を特定していない機器の供与である。
- ⑤ 興味深いのは、地震防災対策あるいはその基礎となる資料作成(例えばサイスミシティ、マイクロゾーンネーションなど)についての技術協力の提案が極めて少ないことである。「地震防災対策」「地震対策法」の2件あるだけである。単に、チリの人々の控え目な性格によるとは言えないであろう。あるいは、問題が既に見えており、機器を供与されれば、独力でできるということか、今後の検討が必要であろう。
- ⑥ 「文献の供与」が2件あった。コロンビアではなかったものである。良い文献はコストの割に技術協力・交流の実をあげることができるので、今後、文献供与の制度化を図ることが良いと考えられる。

資料5 帰国研修員へのアンケート調査について

当該国の地震・地震工学分野での実情を多面的に把握する事を目的として、セミナー開始に先立って Ⅰ) 研修員の履歴、Ⅱ) 現行コース、Ⅲ) 当該国の実情に関するアンケート調査を行なった(資料参照)。アンケートの回収状況は以下の通りである。

国名	研修員数 ( S E )	回答者数 ( S E )
コロンビア	14 ( 4 10 )	4 ( 1 3 )
チリ	22 ( 8 14 )	12 ( 3 9 )

以下に調査結果を概観する。但しこの内(Ⅲ)は別節(例えばⅣ節)で詳述されるので、本節では触れない。

A. コロンビア

(Ⅰ) 履歴・職業等

大学に職を持つ者が3名(退官者1名を含む)、企業に職を持つもの1名である。

一般に次のような傾向がある。

地震学コースの修了生：国の研究機関又は大学で国のプロジェクトの推進、学生の教育に携わっている。

地震工学コースの修了生：大学に職を有する者も含めて独自の設計コンサルタントに従事するものが多い。

(尚、上記回答者の所属機関の組織・機構図が添付されている。)

(Ⅱ) 現行コースについて

- ① 研修の形態として個人研修が極めて有効であった事を全員が指摘している。
- ② 講義については下記が有益であったと回答している(回答数が少ないので平均的意見とは見なせないことに注意)。

地震コース：発震機構(1)、プレート(1)、津波(1)、海底地震(1)

地震工学コース：構造解析(3)、R・C構造(1)、ダム(1)、基礎(1)、土質力学(1)、有限要素法(1)、強震動(1)、組積造(1)

- ③ 技術の進展に照らして改善されるべき講義として、微小地震観測(1)、地震探査(1)(以上地震学)、有限要素法(2)、構造力学(1)(以上地震工学)をあげている。
- ④ 研修のフォローアップとして上級個別コース(1)、セミナー・コース(4)への参加を希望している。

B. チリ

(Ⅰ) 履歴・職業等

大学に職を持つ者が8名、企業に職を持つもの1名、自らコンサルタント会社等を経営す

る者2名である。この国では大学で教育に携わる傍ら会社などを経営する例がすくなくない。一般に次のような傾向がみられる。

地震学コースの修了生：全員が大学で学生の教育に携わっている。しかし講義科目は数学、物理学、計算機、および一般教養地学としての地震学である。

地震工学コースの修了生：国立チリ大学(2)、カトリカ大学(1)、サンタマリア大学(2)とこの国の地震工学の指導的機関に職を有する者が多い。その他の者もいずれも自己の専門を活かした活動をおこなっている。

(なお、上記回答者の所属機関の組織・機構図が添付されている。)

### (iii) 現行コースについて

① 研修の形態として個人研修が極めて有効であった事が指摘されている(9名、これを有効と回答しなかった3名は本コースの初期の研修生で、その頃カリキュラムには未だ個人研修システムは無かった)。或者は本コースの最も大切な部分であるとさえ言っている。その他旅行(4)、実験(4)、文献・情報(3)等が有効であったとしている。

② 講義については下記が有益であったと回答している(回答数が少ない事及び回答が過去25年間にまたがっているので平均的意見とは見なせないことに注意)。

地震コース：地震波解析(1)、コンピュータ(1)、表面波(1)

地震工学コース：構造解析(3)、R. C 構造(7)、ダム(2)、基礎(1)、土質力学(1)、木構造(1)、強震動(1)、組積造(3)、構造物試験(3)、鋼構造(3)、安全設計(2)、橋梁(2)、耐震コード(1)、地震防災(1)、構造力学(2)、港湾(1)、水利施設(1)、一般地震学(2)、一般地震工学(4)

本コースの初期に一般地震・地震工学の講義が有益と評価されていたことは注目されるべきであろう。

③ 技術の進展に照らして改善されるべき講義として、地震波解析(1)、地震探査(1)(以上地震学)、被災構造物復旧法(1)、構造力学(1)耐震低廉住宅建設(1)(以上地震工学)をあげている。また研修生の質に応じたカリキュラムの柔軟な編成を最近の研修生はもとめている。

④ 研修のフォローアップとして上級個別コース(3)、セミナー・コース(7)への参加を希望している。又文献などの情報の交換を6名が望み、3名が個別分野の技術協力の必要性を指摘している。

資料6. 帰国研修員リスト (コロンビア)

No.	氏名	年令	現職	来日時のポジション	来日年度
1	Mr. Santiago ESCALLON Angel		ディストリアル大学 (停年退官) Distrial Univ.	都市開発研究所研究員	1964
2	Mr. Luis Arturo BERMUDEZ		地質調査所部長 INGEOMINAS, Director		1967
3	Mr. Miguel RAMIREZ		Geologist Engineer, National Univ. of Colombia		1968
4	Mr. Rene Van HISENHOVEN Goenaga S. J.		Civil Engineer, Javeriana Univ.		1968
5	Mr. Enrique LOZANO		Civil Engineer	Consultant Engineer	1969
6	Mr. Victor Julio LOPEZ Correa		Professor, Univ. of Texas (Dallas)		1971
7	Mr. Guillermo GONZALEZ G.		Consultant Engineer		1971
8	Mr. Enrique TAFUR Tafur		Civil Engineer		1972
9	Mr. Fernanto VALENCIA Vasquez				1973
10	Mr. Jean Paul VERGNAUD Naranjo				1973
11	Mr. Harrison Elberto GONZALEZ Rubio		Resident Structural Engineer		1974
12	Mr. Alfonso RUBIANO Vicaria		Engineer, Esso Colombiana S. A., Head of Technology	エッソ・コロンビア, ビジネス部	1979
13	Mr. Sergio LONDONO Korzi	30	コロンビア工科大学助教授 Assistant Professor, Colombian College of Engineering	same as left	1985
14	Mr. William Arias Lopez	33	地球物理研究所研究員 Geophysical Inst., Javeriana Univ.	same as left	1986
15					
16					
17					
18					
19					
20					
21					

帰国研修員リスト (チリ)

No.	氏名	年令	現職	来日時のポジション	来日年度
1	Mr. Jorge LAVAL Zuloaga		Head Engineer, Civil Works Design	Structural Engineer	1960
2	Mr. Joaquin MONGE Espineira		Professor, Univ. of Chile	Univ. of Chile	1961
3	Mr. Luis Alberto ROSENBERG Vigoroux		Engineer, Univ. of Chile		1962
4	Mr. Fortunato YOMA Yoma		Professor, Univ. of Chile		1963
5	Mr. Peter WELKNER Mattensohn		Professor, Civil Engineer, E. C. Rowe of Assoc.	Univ. of Chile, Geophys. Lab.	1964
6	Mr. Juan CASSIS Mohor		Professor, Univ. of Chile	Univ. of Chile	1964
7	Mr. Harry Arthur LEE Mosca		General Manager of Company	Engineer of Lee and L. Ltd.	1964
8	Mr. Roberto AGUIRRE Romero		Chief Engineer		1966
9	Mr. Jose FREZ C.		Programmer (Sismologico), Ensenada, Higher Scientific and Educational Investigation Center		1968
10	Mr. Ramon ARIAS Ferrada		Civil Engineer		1968
11	Ms. Yerka Magdalena FRANULIC Figueroa		Seismologist, Univ. of Chile		1969
12	Mr. Emilio LORCA MELLA		Seismologist, Univ. of Chile		1970
13	Mr. Manuel SAAVEDRA Sancho		Structural Designer	Professor, Univ. of Chile	1971
14	Mr. Francisco Humberto VARGAS Aguilera		Computer Expert, Amsterdam College	チリ・テムコ大学付属観測所長	1972
15	Mr. Luis Ignacio CRUZ Romero		Structural Designer	Univ. of BIO	1973
16	Mr. Baldur Hans-Karl HEIM Gessner		Civil Engineer, Univ. Catolica de Valparasio	same as left	1973
17	Mr. Leopoldo Enrique RATHGED Dunner		Lecturer, Univ. Technica del Estado		1973
18	Mr. Jose Manuel CIRTES Frias		Professor, Catolica Univ. Temuco	フロンテラ大学研究員	1980
19	Mr. Carlos Eduardo HERMOSILLA SPANO		Professor, Universidad de Concepcion		1981
20	Mr. Carlos M. AGUIRRE	39	Lecturer, Univ. Federico Santa Maria	same as left	1983
21	Mr. Eduardo ROZAS Elgueta	53	Associated Professor, Univ. de la Serena	same as left	1985
22	Mr. Rene Enrique TOBAR Ramos	32	Civil Engineer, Univ. Federico Santa Maria	same as left	1985













JICA