Project Design Matrix (PDM) **Date: 1 Aug, 2002(Ver.4)**

Name of the Project: The Project on Reduction of Seismic Risk for Buildings and Structures **Main Target Group: Civilians in Bucharest, Romania**

Narrative Summary	Verifiable Indicators	Means of Verification	important Assumptions Vera
Overall Goal Measures against earthquake-induced disasters in Romania are strengthened.	1.Number of citizens who are expected not to be injured and/ or killed by earthquake damage 2.Value of economic losses that are expected to be prevented from earthquake damage	1.MLPTL/ Center report or survey report 2.Survey report	
Project Purpose Improvement and dissemination of technology for reducing building collapse in case of great earthquakes are achieved.	1.Number of buildings/ housing units retrofitted by technology introduced by Center, and number of residents and users of the buildings/ housing units 2.Number of buildings/ housing units that are expected to be designed based on technical manuals or regulations introduced by Center, and the number of residents and users of those buildings/ housing units 3.Level of the structural engineers' skills on post- earthquake evaluation for earthquake-damaged buildings 4.Disaster prevention preparedness of citizens	1-1. Report explaining number of retrofitted buildings, issued by MLPTL and other ministries 1-2.Questionnaire survey to contractors 2.Report explaining number of buildings that will be constructed by MLPTL and other ministries 3.Questionnaire survey of seminar effect to the seminar participants 4.Questionnaire survey of seminar effect to the seminar participants	-Residents and users' consensus on retrofitting works will be obtained. -Building structure is properly maintained by the residents. (Residents do not damage or remove structural elements.) -Other concerned ministries owning 1st class importance buildings finance retrofitting works.
Outputs 1.Effective and low-cost retrofit techniques are developed by Center and acquired by structural engineers. 2.Regulations/ codes concerning seismic issues for both new buildings and existing ones are improved by MLPTL and Center. 3.Post- earthquake evaluation techniques of the damaged buildings are developed by Center and acquired by structural engineers. 4.Disaster prevention education for the citizens is improved by Center.	1-1.Number of examined buildings/ housing units 1-2.Number of technical manuals 1-3.Number of seminars on retrofit techniques, structural engineers attended the seminar, and evaluation of the seminar by the participants 2-1.Availability of experiment equipment and facilities (number of experiments and data) 2-2.Number of technical manuals and regulations, including draft of the new code which are newly developed or improved by Center 2-3.Number of seminars on regulations/ codes concerning seismic issues, structural engineers attended the seminar, and evaluation of the seminar by the participants 3-1.Number of technical manuals 3-2.Number of seminars on quick inspection of damaged buildings, structural engineers attended the seminar, and evaluation of the seminar by the participants 4-1.Number of seminars on earthquake disaster prevention, citizens attended the seminar, and evaluation of the seminar by the participants 4-2.Number of printed matters published by Center, and evaluation of the printed matters by citizens	1-1. MLPTL/ Center report 1-2. MLPTL/ Center report 1-3. MLPTL/ Center report and questionnaire survey 2-1. MLPTL/ Center report 2-2. MLPTL/ Center report 2-3. MLPTL/ Center report and questionnaire survey 3-1. MLPTL/ Center report 3-2. MLPTL/ Center report and questionnaire survey 4-1. MLPTL/ Center report and questionnaire survey 4-2. MLPTL/ Center report and questionnaire survey	

Activities 1-1. To examine the building seismic performance listed in the MLPTL's retrofit projects 1-2. To support and evaluate MLPTL's retrofit projects 1-3. To study the methods of building retrofitting (strength and ductility, and displacement-based methods) 1-4. To prepare manual explaining retrofit methods 1-5. To disseminate the technical information to structural engineers by seminar 2-1. To prepare equipment and facilities for seismic structural testing 2-2. To implement experiment and analyze data 2-3. To study the methods of seismic design (shear strength and ductility, and displacement-based design) 2-4. To prepare equipment for strong-motion earthquake record (underground, free field and building) 2-5. To collect ground information (microtremor characteristic, underground soil condition) and analyze/accumulate the data 2-6. To prepare equipment and facilities for soil test/ investigation 2-7. To study the methods for soil test 2-8. To accumulate the data on earthquake intensity corresponding to ground condition 2-9. To accumulate the data on input earthquake -ground-motion to buildings 2-10. To prepare the manual of input design earthquake- ground- motion 2-11. To disseminate the technical information to structural engineers by seminar 2-12. To prepare draft of technical manuals, regulations and new codes 3-1. To collect information concerning post- earthquake evaluation techniques (quick inspection of damaged buildings and judgment of damage degree) 3-2. To prepare technical manual explaining the methods of post- earthquake evaluation techniques 3-3. To disseminate the technical information to structural engineers by seminar 4-1. To investigate disaster prevention preparedness of the citizens 4-2. To disseminate information on disaster prevention preparedness to the citizens by seminar 4-3. To publish printed matter concerning disaster prevention preparedness to the citizens	Inputs (Japanese side) 1.Dispatch of expert -Number of long-term experts: 3 persons -Number of short-term experts: Approx. 6 persons per year 2.Acceptance of counterpart training: Approx. 4 persons are accepted every year 3.Equipment provision	(Romanian side) 1.Arrangement of counterparts and administrative staffs 2.Necessary budget 3.Necessary facilities	-Economic conditions of each side do not get worse. -T- Trained engineers remain active for ongoing projects. Pre-conditions -Great earthquake does not occur before the Project is completed. -Unexpected severity of earthquake is not identified