

CHAPTER 3 PROJECT EVALUATION AND RECOMMENDATIONS

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3-1 Project Effects

Despite the fact that more than 90% of all passengers and freight is transported by road, the total length of national roads managed by the National Road Agency is 8,885km which is only 3.5% of the overall road network. Unfortunately, only 28% of these national roads are in exceptional condition, while the remaining 8% are only favorable, 17% inferior, and 47% very poor, so more half are in need of repair. Therefore, it is important that new roads be constructed primarily in northern region where an adequate road network has not yet been developed.

The following effects can be expected through the implementation of the Project.

(1) Direct Effects

Training equipment at CMTI will be significantly improved and the contents of training to be conducted will be improved to further meet operation and maintenance technologies utilized in Pakistan. As a consequence, existing trainees of the operator course will be able to acquire the skills necessary to operate modern construction machinery. At the same time, some 400 technicians and engineers with advanced welding and maintenance skills in electricity and electronics related to construction machinery and vehicles will also receive training.

(2) Indirect Effects

1. The economy will be revitalized through the performance of new types of construction machinery utilized extensively at construction sites to promote a road improvement plan.
2. Construction machinery or vehicles with electronic control devices will be repaired as soon as possible in order to reduce the number of equipment stoppages.
3. A sufficient number of CAD technicians will be provided at construction sites so that construction work can be implemented efficiently.
4. Noise or dust associated with vehicle operation during road maintenance and repair will be reduced so that the roadside environment can be improved.
5. A road maintenance plan will help to reduce the poverty gap.
6. A road maintenance plan will help to generate more employment for road engineers.

3-2 Recommendations

After careful examination of the Project contents, the level of benefit, equipment applications, and competence with regards to maintenance, in accordance with Japan's grand aid scheme the Project is judged to be appropriate. The following are recommendations to display and continue the effects through the implementation of the Project.

1. Due to the insufficient knowledge of instructors at CMTI with regards to electric and electronic control technologies incorporated in equipment to be procured under the Project, to examine Japanese technical cooperation.
2. Single courses should be divided into three specialized training models for operation because 16 types of equipment are currently being used in the operator course, which could lead to shortages in operating time.

3. In similar manner as the operator course, more trainees should be given as many opportunities as possible to carry out repair work in the mechanic course.
4. An annual budget for necessary upgrading of equipment should be prepared since improvements in construction machinery are expected to continue in the future. Accordingly, equipment should be systematically and independently renewed by the CMTI.

APPENDICES

- Appendix 1. Member List of the Study Team
- Appendix 2. Study Schedule
- Appendix 3. List of Parties Concerned in the Recipient Country
- Appendix 4. Minutes of Discussion
- Appendix 5. Building Drawings
- Appendix 6. List of Facilities and Equipment

Appendix 1. Member List of the Study Team

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(1) Basic Design Study Team

Job Title	Occupation	Name
Leader	Deputy Resident Representative, JICA Pakistan Office	Sachiko MISUMI
Project Coordinator	Officer, Traffic Infrastructure Team, Project Management Group II, Grant Aid Management Department, JICA	Yoshimoto KOYANAGI
Chief Consultant/ Training Program Planner/ Facility Operation and Maintenance Planer	Construction Project Consultants, Inc.	Yoichi HIGAKI
Architectural Planner/ Designer	Yachiyo Engineering Co., Ltd	Takayasu KASE
Construction Planner/ Cost Estimator	Yachiyo Engineering Co., Ltd	Yutaka TAKAHASHI
Equipment Planer I/ Procurement Planner/ Cost Estimator	Construction Project Consultants, Inc.	Hiroei ISHIHARA
Equipment Planer II	Construction Project Consultants, Inc.	Kazuhiko KAMACHI
Coordinator	Construction Project Consultants, Inc.	Kanji WATANABE

(2) Study Team for Basic Design Draft Explanation

Job Title	Occupation	Name
Leader	Team Director, Traffic Infrastructure Team, Project Management Group II, Grant Aid Management Department, JICA	Yuki ARATSU
Project Coordinator	Officer, Traffic Infrastructure Team, Project Management Group II, Grant Aid Management Department, JICA	Kotaro NISHIGATA
Chief Consultant/ Training Program Planner/ Facility Operation and Maintenance Planer	Construction Project Consultants, Inc.	Yoichi HIGAKI
Construction Planner/ Cost Estimator	Yachiyo Engineering Co., Ltd	Yutaka TAKAHASHI
Equipment Planer I/ Procurement Planner/ Cost Estimator	Construction Project Consultants, Inc.	Hiroei ISHIHARA

Appendix 2. Study Schedule

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(1) Basic Design Study Team

No.	Date	JICA		Consultants
		Sachiko MISUMI	Yoshimoto KOYANAGI	Yoichi HIGAKI, Takayasu KASE, Yutaka TAKAHASHI, Hiroei ISHIHARA, Kazuhiko KAMACHI, Kanji WATANABE
1	2004 August 23(Monday)			HIGAKI, KASE, YAKAHASHI, ISHIHARA and WATANABE member Narita 14:00→ Islamabad 21:05(PK853)
2	24 (Tuesday)			Courtesy Call on JICA Courtesy Call on CMTI
3	25 (Wednesday)			Discussion with CMTI, Site Survey
4	26 (Thursday)			Discussion with CMTI, Site Survey
5	27 (Friday)			Discussion with CMTI, Site Survey
6	28 (Saturday)			Discussion with CMTI, Site Survey
7	29 (Sunday)		Narita 11:00→ Bangkok 15:30(JL717) Bangkok 20:00→ Lahore 22:40 (TG505)	Data Analysis
8	30 (Monday)		Lahore 8:40→ Islamabad 8:50 (PK356) Meeting at JICA Office Courtesy Call on Embassy of Japan Courtesy Call on / Discussion with CMTI	(KAMACHI: Narita 14:00→ Islamabad 21:05) (PK853)
9	31 (Tuesday)		Courtesy Call on Ministry of Communications Courtesy Call on Ministry of Finance Discussion with CMTI	
10	September 1 (Wednesday)		Discussion with CMTI	
11	2 (Thursday)		Discussion on M/D with CMTI	(WATANABE: Islamabad 22:35→ Narita 3, 12:40 (PK852))
12	3 (Friday)	Signing on M/D with CMTI, Report to Embassy of Japan and JICA (KOYANAGI: Islamabad 19:30→ Lahore 20:20 (PK381) Lahore 23:50→ Bangkok 4, 6:20 (TG506))		
13	4 (Saturday)		Bangkok 8:35→ Narita 16:35 (JL708)	Continuous Survey
14	5 (Sunday)			Continuous Survey
15	6 (Monday)			Continuous Survey
16	7 (Tuesday)			Continuous Survey
17	8 (Wednesday)			Discussion with CMTI
18	9 (Thursday)			Discussion with CMTI
19	10 (Friday)			Continuous Survey
20	11 (Saturday)			Continuous Survey (TAKAHASHI: Islamabad 19:00→ Karachi 20:55 (PK309) Karachi 23:30→ Bangkok 12, 6:30 (TG502) Bangkok 11:20→ Narita 19:30 12, (TG640))
21	12 (Sunday)			Data Analysis (KAMACHI: Islamabad 22:30→ Karachi 00:25 (PK319) 13, Karachi 02:55→ Bangkok 9:45 (TG508) Bangkok 11:20→ Narita 13, 19:30 (TG640))
22	13 (Monday)			Discussion with CMTI
23	14 (Tuesday)			Report to Embassy of Japan and JICA HIGAKI, KASE, and ISHIHARA : Islamabad 19:30→ Lahore 20:20 (PK381) Lahore 23:50→ Bangkok 24, 6:20 (TG506)
24	15 (Wednesday)			Bangkok 11:20→ Narita 19:30 (TG640)

(2) Study Team for Basic Design Draft Explanation

No.	Date	JICA	Consultants
		Yuki ARATSU Kotaro NISHIGATA	Yoichi HIGAKI Yutaka TAKAHASHI Hiroei ISHIHARA
1	2005 January 25 (Tuesday)		Narita 18:45→ Bangkok 23:45 (JL707) Bangkok 01:00→ Islamabad 26, 04:00 (PK893)
2	26 (Wednesday)	Meeting at JICA Office Courtesy Call on Embassy of Japan	
3	27 (Thursday)	Courtesy Call on Ministry of Communications Courtesy Call on Ministry of Finance Explanation and Discussion of Draft Basic Design Report with CMTI	
4	28 (Friday)	Explanation and Discussion of Draft Basic Design Report with CMTI	
5	29 (Saturday)	Explanation and Discussion of Draft Basic Design Report with CMTI	
6	30 (Sunday)	Internal Meeting	
7	31 (Monday)	Discussion on the M/D with CMTI	
8	February 1 (Tuesday)	Signing on M/D with CMTI, Report to Embassy of Japan and JICA Islamabad 19:30→ Lahore 20:20 (PK381) Lahore 23:50→	Signing on M/D with CMTI Report to Embassy of Japan and JICA
9	2 (Wednesday)	Bangkok 06:15 (TG506) Bangkok 08:20→ Narita 16:00 (TG676)	Reconfirm and Review of Draft Basic Design Report in Detail with CMTI
10	3 (Thursday)		Reconfirm and Review of Draft Basic Design Report in Detail with CMTI
11	4 (Friday)		Report to Embassy of Japan and JICA Islamabad 19:30→ Lahore 20:20 (PK381) Lahore 23:50→
12	5 (Saturday)		Bangkok 06:15 (TG506) Bangkok 08:20 → Tokyo 16:00 (TG676)

Appendix 3. List of Parties Concerned in the Recipient Country

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Pakistan Side

Construction Machinery Training Institute (CMTI)

Mr. Muhammad Asif	Director
Mr. Liaquat Jamil	Acting Director
Mr. Abid Mubarak	Administration Officer
Mr. Muhammad Bilal Bashir	Training Officer
Mr. Zia Ur Rehman	Instructor
Mr. Qazi Mushtaq Ahmed Khattak	Instructor
Mr. Muhammad Ejaz	Instructor
Mr. Nisar Ul Murtaza	Instructor
Mr. Fiaz Hussain Shah	Instructor

Ministry of Communications (COM)

Mr. Mussadaq Mohammad Khan	Joint Secretary
Mr. Atig Ahmad	Director, Road Transport

National Highway Authority (NHA)

Mr. Raja Nowsherwan	Member Planning
Mr. Noboru Kondo	Adviser (JICA Expert)

Pakistan Environmental Protection Agency (PEPA)

Mr. Asif S. Khan	Director General
Mr. Mir Sajjad Hussain Talpur	Deputy Director

Ministry Economic Affairs & Statistics

Mr. Muhammad Ashraf Khan	Joint Secretary
Mr. Samr Dhsan	Section Officer

Ministry of Labour, Manpower & Overseas Pakistanis

Mr. Raja Faiz ul Hassan Faiz	Central Labour Advisor
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Japan Side

Embassy of Japan in Pakistan

Mr. Takeshi MATSUNAGA	Head of Economic and Development Section
Mr. Teruo KOBAYASHI	Second Secretary
Mr. Yoshihito KATSUO	Second Secretary

JICA Pakistan Office

Mr. Nobuyuki YAMAURA	Resident Representative
Mr. Mitsunobu INABA	Deputy Resident Representative
Ms. Sachiko MISUMI	Sr. Deputy Resident Representative
Mr. Sohail Ahmad	Senior Programme Officer

Appendix 4. Minutes of Discussion

(1) Minutes of Discussion on the Basic Design Study Team

(2) Minutes of Discussion on the Study Team for Basic Design Draft Explanation

**Minutes of Discussions
on the Basic Design Study
on the Project for Enhancement of Training Capabilities
of Construction Machinery Training Institute
in the Islamic Republic of Pakistan**

In response to a request from the Government of the Islamic Republic of Pakistan (hereinafter referred to as "Pakistan"), the Government of Japan decided to conduct a Basic Design Study on the Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (hereinafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Pakistan the Basic Design Study Team (hereinafter referred to as "the Team"), headed by Ms. Sachiko Misumi, Senior Deputy Resident Representative, JICA Pakistan Office, and is scheduled to stay in the country from August 23 to September 14, 2004.

The Team held discussions with the officials concerned of the Government of Pakistan and conducted a field survey in the study area.

In the course of the discussions and the field survey, both sides confirmed the main items described in the attached sheets.

Islamabad, September 3, 2004

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Sachiko Misumi
Leader
Basic Design Study Team
Japan International Cooperation Agency

Liaquat Jamil

Liaquat Jamil
Acting Director
Construction Machinery Training Institute
Islamic Republic of Pakistan



Muhammad Ashraf Khan
Joint Secretary
Economic Affairs Division
Ministry of Economic Affairs & Statistics
Islamic Republic of Pakistan



Mussadaq Mohammad Khan
Joint Secretary
Ministry of Communications
Islamic Republic of Pakistan

ATTACHMENT

1. Objective of the Project

The objective of the Project is to enhance training capabilities of Construction Machinery Training Institute (CMTI), Islamabad.

2. Project Site

The Project site is CMTI in Islamabad as shown in Annex-1.

3. Responsible and Implementing Organizations

3-1. The responsible ministry is the Ministry of Communications (MOC).

3-2. The implementing agency is CMTI.

3-3. The organization of MOC and CMTI are shown in Annex -2, respectively.

4. Items Requested by the Government of Pakistan

As the result of discussions, requested components were confirmed as below:

- Construction of facilities (class room, practice room, dormitory and canteen)
- Procurement of training equipment (construction machineries, testing equipment, training aid, network system, etc.)

The detail items are shown in Annex-3. JICA will assess the appropriateness of the request in Japan.

5. Japan's Grant Aid Scheme

The Pakistani side understood the Japan's Grant Aid scheme explained by the Team, as described in Annex-4.

6. Further Schedule of the Study

6-1. The consultant members of the Team will proceed with further studies in Pakistan until September 14, 2004.

6-2. JICA will prepare the Draft Basic Design Study Report in English and dispatch a mission to Pakistan in order to explain its contents in December 2004.

6-3. When the contents of the Report are accepted in principle by the Government of Pakistan, JICA will complete the Final Report and send it to the Pakistani side by the end of March 2005.

7. Other Relevant Issues

7-1. The Pakistani side shall secure the budget necessary for the Project, such as commission of B/A and A/P.

7-2. The Pakistani side confirmed the necessity of the budget for consulting fee, which are not included in the approved PC-1, and they understood that will be part of the Japan's Grant Aid.

7-3. The Pakistani side shall take the necessary measures on a timely manner, as shown in Annex-5, for smooth

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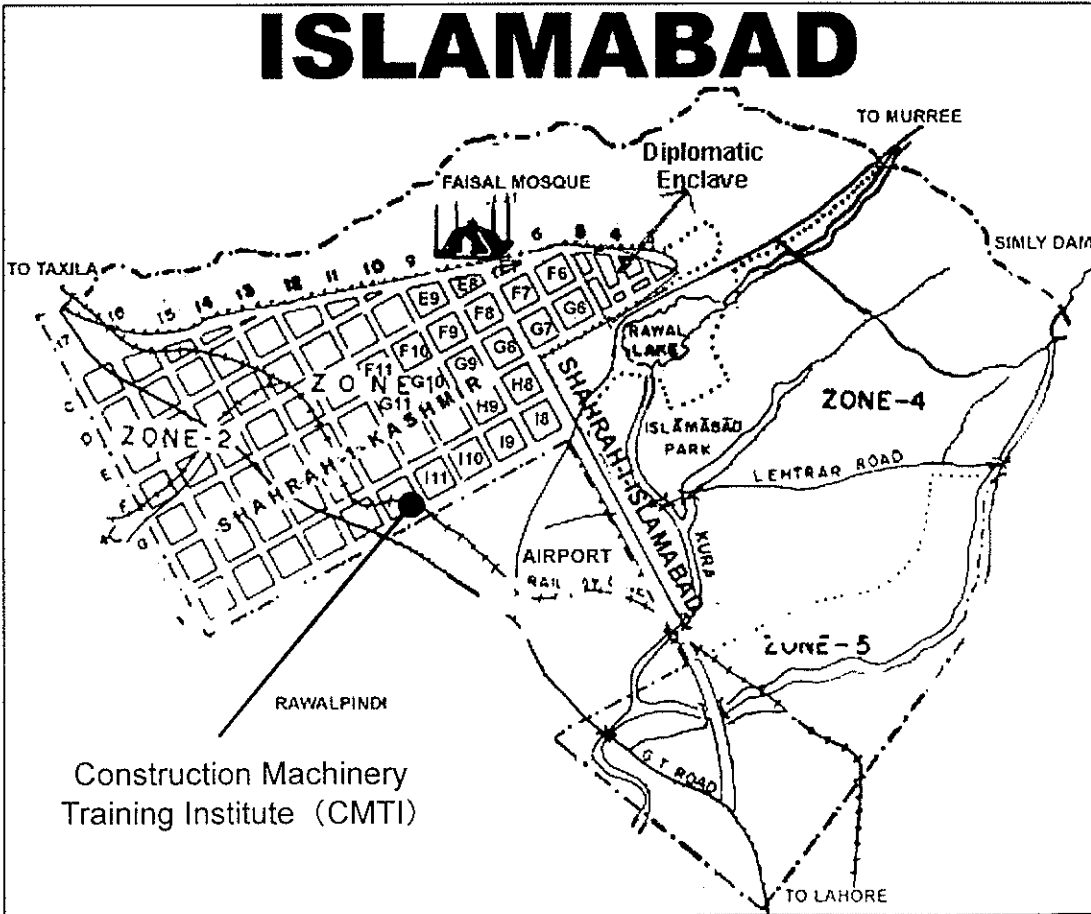
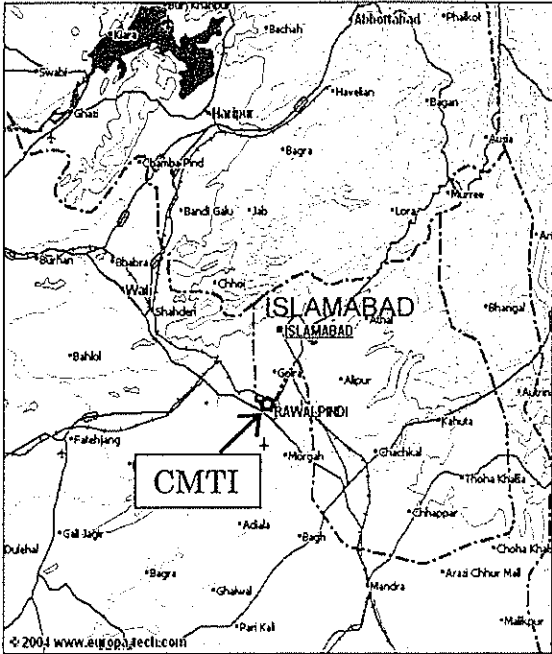
implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

- 7-4. The Pakistani side shall confirm the necessity of approval of IEE (Initial Environmental Examination) from the Ministry of Environment related to construction of the new buildings by the end of October 2004. If IEE is required, the Pakistani side shall get the approval of it by the end of March 2005.
- 7-5. The Pakistani side shall construct the shed for new construction machineries on their own expenses.
- 7-6. The Pakistani side shall prepare the foundation or concrete structure for the installation of the testing equipment for the existing course.
- 7-7. The Pakistani side shall secure the space of the simulators for the crane and hydraulic excavator.
- 7-8. The Pakistani side shall procure the canteen equipment (kettle, pan, etc.) on their own expenses.
- 7-9. The Pakistani side stressed the importance of the JICA technical cooperation after delivery of the new construction machineries to start the new technical training smoothly and effectively, and understood that the official request shall be submitted to the Government of Japan through Economic Affairs Division, Government of Pakistan.

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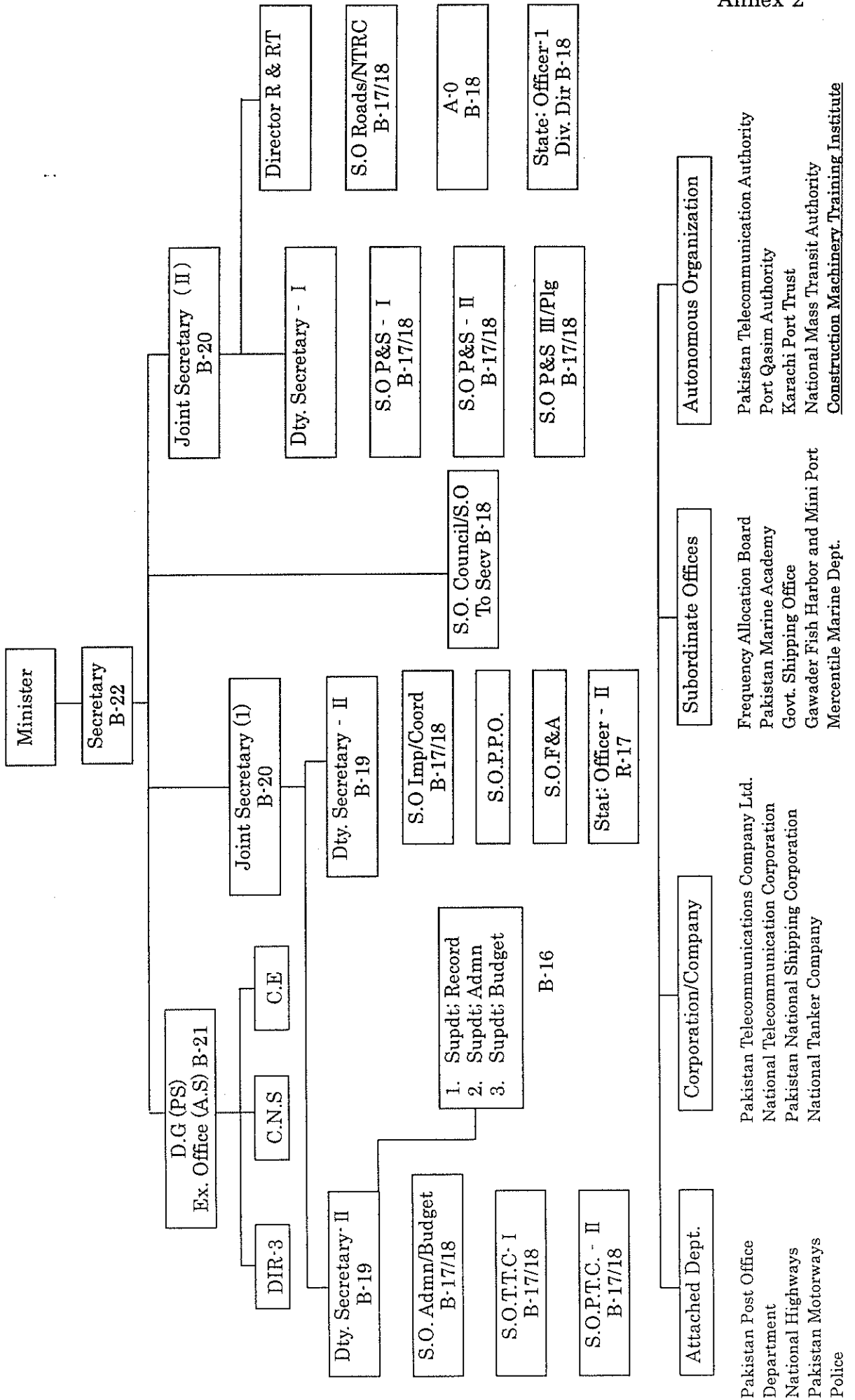
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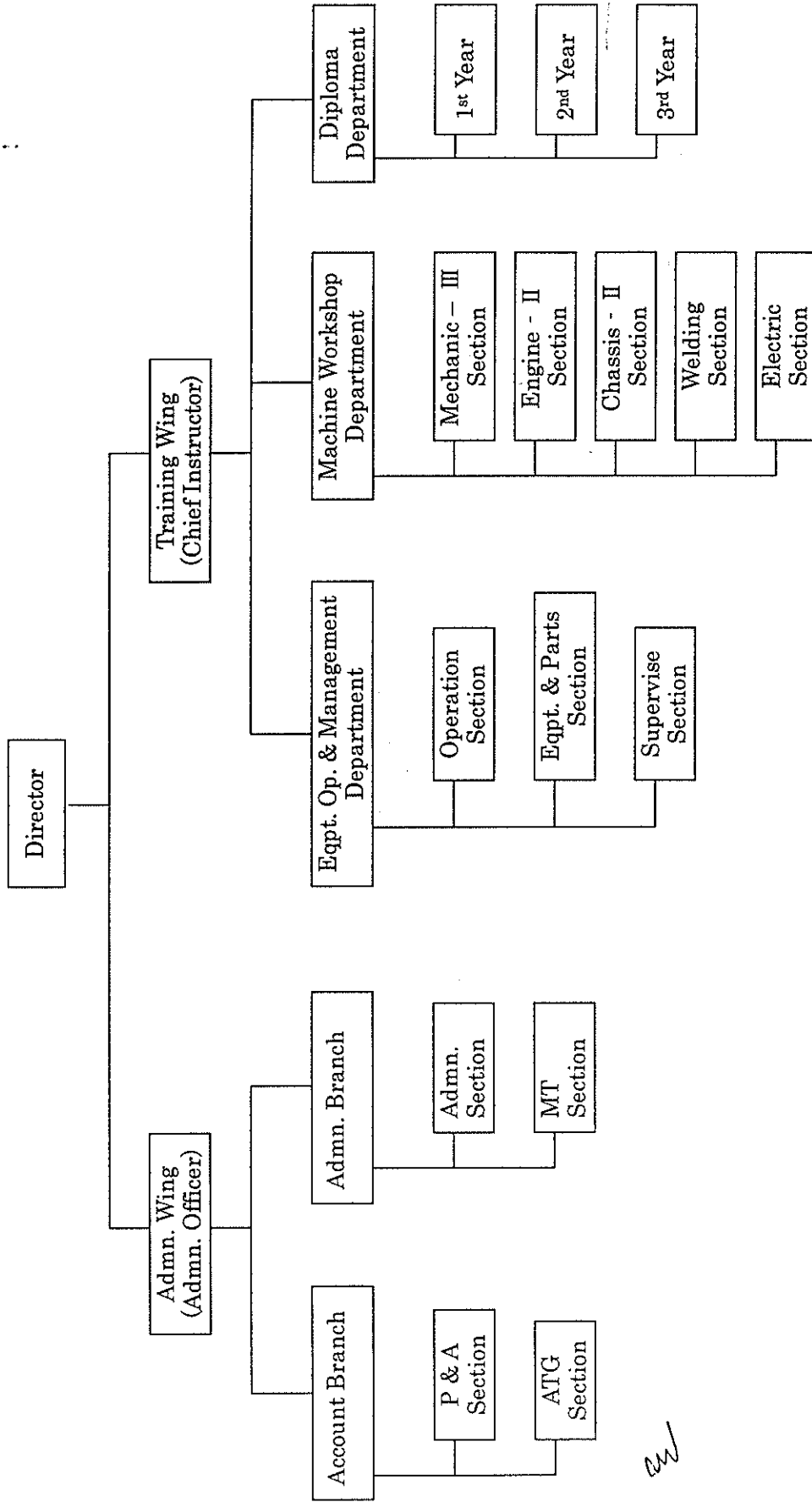
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ORGANIZATION CHART OF CONSTRUCTION MACHINERY TRAINING INSTITUTE (CMTI)



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Items Requested by the Government of Pakistan

Main requested item	Qty.
1. Class Room and CAD/CAM Room	
1-a. Class Room, Required Size some 25feet some 25feet	3
1-b. CAD/CAM Class Room , required size some 25feet x some 25feet	2
1-c. Practice Room for three newly introduced courses with Administrative Room, required size some 70 feet x some 70 feet(additional request)	1
1-d. Desk/ Chair set for students for (1-a) class room	165
1-e. Desk/ Chair set for 5 instructors for (1-a) and (1-b) class room	5
1-f. Desk/ Chair set for 5 staff for administrative room within practice room (additional request)	5
1-g. Chairs for Visitors for (1-a) and (1-b) class room	10
1-h. Viewgraph/Screen set for (1-a) and (1-b) class room	5
1-i. Computer desk/Revolving Chair set for students for (1-b) class room	62
1-j. Air conditioning system for (1-b) class room	3
1-k. Multimedia /Suspended Video Projection System	5
1-l. Personal Computer for Multimedia	5
2. Dormitory for In Living Students	
2-a. Dormitory with 9 student rooms, 1 study room, 5 instructor room and 1 lobby, required capacity for 50 students/5 instructors	1
2-b. Bed with Side Table for students/instructors	55
2-c. Study Table for study room	30
2-d. Study Chair for study table	55
2-e. 2 Room Chair/1 center table set for instructor's Room	5 Set
2-f. Air conditioners for instructor's room	5
3. Canteen and Recreation block	
3-a. Canteen including kitchen	1
3-b. Dinning Tables	17
3-c. Dinning Chairs	100
3-d. Air conditioner for one instructor's dining room	1
4. Personal Computer	
4-a. Desktop Personal Computer for 2 CAD/CAM class room (1-b)	67
4-b. Server Computer	2
4-c. Lap top personal computer	1
5. Networking for CMTI Faculty Setup	
5-a. 10/100 Mbps Switch (Total 96 Ports)	1
5-b. 8 U Wall Mount Rack With Fan	1
5-c. UTP Patch Cord	1 lot
5-d. Mono-color printer	4
5-e. Color laser printer	1
5-f. A1 size color plotter	1
5-g. Multimedia Projector	1
5-h. UPS	1
5-i. Scanner	1
6. Construction Equipment	
6-a. Bulldozer (220 HP class)	5
6-b. Hydraulic Excavator Tractor Type, 0.7m3 class	5
6-c. Hydraulic Excavator Wheel type, 0.43m class	2
6-d. Motor Grader	3
6-e. Wheel Loader, 150 HP class	3
6-f. Rough Terrain Crane, 20 ton class	1
6-g. Spare parts for above equipment	1 lot
7. Operation Simulator	
7-a. Hydraulic Excavator	2

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Main requested item	Qty.
7-b. Crane	2
8. Transport/Equipment for Administration of Institute	
8-a. Mini Bus	2
8-b. Pickup Car with single cabin	1
8-c. Generator Set 20 KVA, 3 Phase	1
8-d. Desktop personal Computer with printer	5
9. Testing Equipment for Diploma Course	
9-a. Toe-in-Gauge	1
9-b. Camber Caster King Pin	1
9-c. Turning Radius Gauge	1
9-d. Brake Tester	1
9-e. Side Slip Tester	1
10. Equipment/parts for New Training Course	
10-a. Vehicle Mechanic Course	77 Items
1. Power steering assembly (Portable)	1
2. Steering gear assembly with braking system (Portable)	1
3. Dry single disc clutch (OHP transparent sheet) (Portable)	1
4. Synchromesh transmission (OHP transparent sheet) (Portable)	1
5. Clutch and Transmission (Portable)	1
6. Ackerman steering system (OHP transparent sheet) (Portable)	1
7. Ignition system (D-type animated board) (Portable)	1
8. Alternator (Cut-away model) (Portable)	1
9. Advanced mechanism (D-type animated board) (Portable)	1
10. Gasoline engine (cut-away) with motor (Portable)	1
11. Diesel engine model (plastic model)	3
12. Petrol engine model (plastic model)	3
13. Diesel rotating injection pump (cut-away) (Portable)	1
14. Diesel injection pump (cut-away) (Portable)	1
15. Live diesel engines on rotating stand (Portable)	5
16. KE-Jetronic trainer (Portable)	1
17. Sectioned turbocharger (Portable)	1
18. Sectioned motorcycle 2 stroke, 1 cylinder engine (Portable)	1
19. Automotive air conditioning demonstration unit (Portable)	1
20. PC Printer & Software	1
21. Fuel consumption meter (Portable)	2
22. Wheel balance	1
23. Tyre changer	1
24. Tyre gauge (Portable)	2
25. Chain block (Portable)	2
26. Real engine of full set type, practical training (Gasoline) (Portable)	5
27. Automotive education / training kit (Portable)	2
28. Camber, caster, kingpin gauge (Portable)	2
29. Turning Radius Gouge (Portable)	1
30. Brake shoe grinder	1
31. Radiator cap tester (Portable)	1
32. Needle valve Grinding machine	1
33. Cylinder head stand	2
34. Fuel injector pressure tester kit	2
35. Engine support beam (Portable)	2
36. Pressure brake bleeder (Portable)	1
37. 2-post vehicle lift	1
38. Engine stand (Portable)	4
39. Hydraulic press	1
40. Platform trunk (Portable)	4
41. Steel wall rack	4
42. Car creeper (Portable)	4
43. Angle grinder (Portable)	2

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Main requested item	Qty.
44. Dial test indicator (plunger type) (Portable)	2
45. Drill press	2
46. Combustion leakage tester (Portable)	4
47. Brake disk lathe	1
48. Shop press	1
49. Diesel smoke meter (Portable)	1
50. Automatic air inflator (Portable)	1
51. Vertical boring machine (Portable)	1
52. Cylinder honing machine (Portable)	1
53. Vulcanizing machine (Portable)	2
54. Vacuum gauge for gasoline engine (Portable)	2
55. Vacuum fuel pump gauge (Portable)	2
56. Valve spring tester	2
57. Portable hydraulic jack (Portable)	4
58. Brake lining riveter	1
59. Electric drill (Portable)	2
60. Piston ring groove cleaner (Portable)	1
61. Battery hydrometer (Portable)	2
62. Diesel timing and tacho tester (Portable)	4
63. Tripod stand (Stand for display board) (Portable)	10
64. Rack and pinion type of steering box (Portable)	1
65. Torque gauge	1
66. Side slip tester	1
67. Brake/speed meter tester	1
68. EGI (Electric Gasoline Injection) system animated board (Portable)	1
69. Bench electric grinder	1
70. Compression gauge (Portable)	2
71. Painting equipment (Portable)	1
72. Tool for automobile (Portable)	1
73. Safety equipment (Portable)	50
74. HC/CO tester (Portable)	1
75. Engine crane (Portable)	1
76. Drafting equipment	1
77. Diesel engine (cut-away model) with motor	1
10-b. Vehicle Electrician Course	36 Items
1. Electric wiring training board (Portable)	1
2. Ignition system simulator (Portable)	1
3. Automotive electrical chassis (Portable)	1
4. Tach / dwell meter (Portable)	2
5. Engine tuner (Portable)	2
6. Insulation tester (Portable)	2
7. Spark plug cleaner tester	1
8. Ignition system (Portable)	1
9. Battery starter / charging circuit checker (Portable)	1
10. Headlight tester	1
11. Battery drop tester (Portable)	1
12. Starter charger (Portable)	2
13. Ignition tester (Portable)	2
14. Coil and condenser ohm tester (Portable)	2
15. Disc grinder (Portable)	1
16. Silicon normal charger (Portable)	1
17. Silicon quick charger with normal charge (Portable)	1
18. Growler armature tester	1
19. Hydraulic garage jack (Portable)	1
20. Bench drill press	1
21. Distributor test bench (Portable)	1
22. Starter generator test bench	1

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Main requested item	Qty.
23. Alternator modern type and old type each (Portable)	4
24. Bench electric grinder	1
25. Diesel timing and tacho tester (Portable)	2
26. Air compressor (Portable)	1
27. Electric drill (Portable)	2
28. D.C. volt ampere meter (Portable)	4
29. Ohm meter (Portable)	4
30. Battery hydrometer (Portable)	2
31. Battery tester (Portable)	2
32. Circuit tester (Portable)	4
33. Hard plastic container for acid and distilled water (Portable)	2
34. Tool for auto-electrician (Portable)	1
35. Safety equipment (Portable)	50
36. Drafting equipment	1
10-c. Welding and Fabrication Course	23 Items
1. Sheet bending machine	1
2. Shear cutting machine	1
3. Mig welder (Portable)	2
4. Tig welder (Portable)	2
5. Bench grinder (Portable)	4
6. AC Arc welder (Portable)	8
7. Power hacksaw (Portable)	1
8. Electric drill (Portable)	4
9. Gas welder set (Portable)	10
10. Drilling press	2
11. DC Arc welder (Portable)	2
12. Gressel bending machine (Portable)	1
13. Spot welding machine	1
14. Bending roller machine	1
15. Angle grinder (Portable)	2
16. Fan and duct	1
17. Engine welder (Portable)	2
18. Vertical drilling machine	1
19. High speed cutting machine (Portable)	1
20. Compressor (Portable)	1
21. Painting equipment (Portable)	1
22. Tool for welding and fabrication (Portable)	1
23. Safety equipment (Portable)	50
10-d. Working Table for New 3 Courses	1 lot

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JAPAN'S GRANT AID

The Grant Aid Scheme provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

Japan's Grant Aid Scheme is executed through the following procedures.

Application	(Request made by the recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by the Cabinet)
Determination of	(The Note exchanged between the Governments of Japan and recipient
Implementation	country)

Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study) using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Scheme, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

(1) Contents of the study

The aim of the Basic Design Study (hereafter referred to as "the Study") conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

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- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.
- Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA. The consultant firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

(1) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

(2) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as national disaster, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

(3) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, consulting, constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

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(4) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(5) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:

- a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the Project,
- b) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
- c) To secure buildings prior to the procurement in case the installation of the equipment,
- d) To ensure all the expenses and prompt excursion for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
- e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,
- f) To accord Japanese nationals, whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(6) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

(7) "Re-export"

The products purchased under the Grant Aid should not be re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.

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9.

Major Undertaking to be taken by Each Government

NO	Items	To be covered by Grant Aid	To be covered by Recipient side
1	To secure land		•
2	To clear, level and reclaim the site when needed		•
3	To construct gates and fences in and around the site		•
4	To construct the parking lot	•	
5	To construct roads		
1)	Within the site	•	
2)	Outside the site		•
6	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
1)	Electricity		
a.	The distributing line to the site		•
b.	The drop wiring and internal wiring within the site	•	
c.	The main circuit breaker and transformer	•	
7	To bear the following commissions to the related banks for the banking services based upon the B/A		
1)	Advising commission of A/P		•
2)	Payment commission		•
8	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
1)	Marine(Air) transportation of the products from Japan to the recipient country	•	
2)	Tax exemption and customs clearance of the products at the port of disembarkation		•
3)	Internal transportation from the port of disembarkation to the project site	•	
9	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		•
10	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract		•
11	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		•
12	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment		•

(B/A: Banking Arrangement, A/P: Authorization to Pay)

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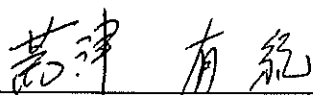
MINUTES OF DISCUSSIONS
ON BASIC DESIGN STUDY ON ENHANCEMENT OF TRAINING CAPABILITIES
OF CONSTRUCTION MACHINERY TRAINING INSTITUTE
IN THE ISLAMIC REPUBLIC OF PAKISTAN
(EXPLANATION ON DRAFT REPORT)

In September 2004, Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (hereinafter referred to as "the Project") to the Islamic Republic of Pakistan (hereinafter referred to as "Pakistan"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult the Pakistan on the components of the draft report, JICA sent to Pakistan the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Yuki Aratsu, Team Director, Traffic Infrastructure Team, Project Management Group II, Grant Aid Management Department, JICA, from January 25 to February 4, 2005.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

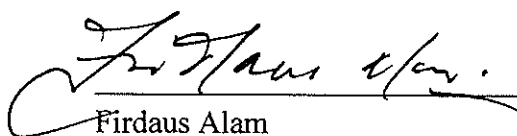
Islamabad, February 1, 2005



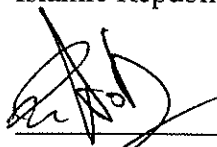
Yuki Aratsu
Leader
Basic Design Study Team
Japan International Cooperation Agency



Muhammad Asif
Director
Construction Machinery Training Institute
Islamic Republic of Pakistan



Firdaus Alam
Joint Secretary
Ministry of Communications
Islamic Republic of Pakistan



Muhammad Ashraf Khan
Joint Secretary
Economic Affairs Division
Ministry of Economic Affairs & Statistics
Islamic Republic of Pakistan

ATTACHMENT

1. Confirmation of Objective and Primary Goal of the Project

Both sides confirmed the objective and primary goal of the project as follows;

- 1) The objective of the Project is to enhance training capabilities of Construction Machinery Training Institute (CMTI), Islamabad.
- 2) The primary goal of the Project is to improve the situation of infrastructure construction through cultivation of construction industry engineers/ technicians.

2. Components of the Draft Report

The Government of Pakistan agreed and accepted in principle the components of the draft report explained by the Team. And required quantities of each items are confirmed as Annex 1.

3. Japan's Grant Aid scheme

Pakistani side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Pakistan as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both parties on September 3, 2004, such measures as but not limited to,

- payments of 'advising commission of A/P (Authorization to Pay)' and 'payment commission',
- ensuring all the expenses and prompt excursion for unloading, customs clearance at the port of disembarkation,
- exemption for Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.

4. Schedule of the Study

JICA will complete the final report in accordance with the confirmed item and send it to the Government of Pakistan by the end of March 2005.

5. Proper Use of Facilities and Equipment

As part of proper use of facilities, construction machineries and other equipment constructed/ procured under the Project and previous Japan's Grant Aid Projects, Pakistani side expressed the policy that, in case these facilities and equipment required to be renovated/ replaced in the future, Pakistani side would do these works by themselves.

6. Other relevant issues

6-1. Pakistani side shall get the approval of IEE (Initial Environmental Examination) from the Ministry of Environment related to construction of the new buildings by the end of March 2005. And Pakistani side shall inform the result of IEE to JICA Pakistan Office.

6-2. Pakistani side shall construct the shed for new construction machineries on their own expenses by the end of December, 2005, if the Project is implemented.

6-3. The Team handed one (1) copy of the draft detailed specifications of Equipment to Pakistani side. These draft specifications are confidential and should not be duplicated or released to other parties in order to secure the fairness of the tender of the Project.

6-4. Pakistani side promised that the revision of PC-1, if required, shall be got approved from Executive Committee of National Economic Council and informed the JICA Pakistan Office of the result of approval procedures by the end of March, 2005.

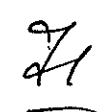


Table 1 Confirmed item table

	No.	Description of items	Qty
	1.	Class Rooms and Computer/CAD Rooms	
1)	1-a.	Class Room, Required Size 25feet x 25feet (approx.)	3
2)	1-b.	Computer/ CAD Class Rooms, required size 25feet x 25feet(approx.)	2
3)	1-c.	Practice Room for three newly introduced courses with Administrative Room, required size 70 feet x 70 feet (approx.) (additional request)	1
4)	1-d.	Desk/ Chair set for students for (1-a) class room	60/150
5)	1-e.	Desk/ Chair set for 5 instructors for (1-a) and (1-b) class rooms	5
6)	1-f.	Desk/ Chair set for 5 staff for administrative room within practice room	5
7)	1-g.	Chairs for Visitors for (1-a) and (1-b) class room	10
8)	1-i.	Computer desk/Revolving Chair set for students 2 CAD room : 42 (21+21) Sever room : 2 Size : 600mm x 1000mm of desk	44 set
9)	1-j.	Air conditioning system for (1-b) class room	3
10)	1-k.	Screen for projector	5 set
	2.	Dormitories for In Living Students	
11)	2-a.	Dormitory with 9 student rooms, 1 study room, 5 instructor room and 1 lobby, required capacity for 50 students/5 instructors	1
12)	2-b.	Bed with Side Table for students/instructors	55
13)	2-c.	Study Table for study room, 8 person per one table	4
14)	2-d.	Study Chair for study table	30
15)	2-e.	2 Room Chair/1 center table set for instructor's Room	5 set
16)	2-f.	Air conditioners for instructor's room	5
	3.	Canteen and Recreation block	
17)	3-a.	Canteen including kitchen	1
18)	3-b.	Dinning Tables	17
19)	3-c.	Dinning Chairs	100
20)	3-d.	Air conditioner for one instructor's dining room	1
	4.	Personal computer	
21)	4-a.	Desktop Personal Computer • Standard type PC • High end type PC for CAD Display, 17inch	Total: 47 21 26 47
22)	4-b.	Sever Computer	2
23)	4-c.	Related software • CAD software, e.g. Auto CAD 2005	26
	5.	Networking for CMTI Facility Setup	
24)	5-a.	16 Port 10/1000 Mbps Switch 10/100 Mbps 16 ports 10/100 Mbps : 3 32 ports 10/100 Mbps : 2	112 ports
25)	5-b.	Wall Mount Rack With Fan Rack With Fan on floor	2

	No.	Description of items	Qty
26)	5-c	UTP cable • 20mUTP cable 2 lines • 15mUTP cable 1 line • 10m UTP cable 59 lines	Total: 645 m
27)	5-d	A4 monochrome laser Jet Printer, 1200dpi	2
28)	5-e	A3 color laser Jet Printer, 1200dpi	1
29)	5-f	A1 color plotter, 1200dpi	1
30)	5-g.	Multimedia Projector	2
31)	5-h.	UPS 1,500VA	2
	6.	Construction Equipments	
32)	6-a - 1	Bulldozer (220 HP class) with ripper	2
33)	6-a - 2	Bulldozer (220 HP class) with winch	1
34)	6-b.	Hydraulic Excavator Tractor Type, 0.7m3 class	3
35)	6-c.	Hydraulic Excavator Wheel type, 0.43m class	2
36)	6-d.	Motor Grader	1
37)	6-e.	Wheel Loader, 150 HP class	3
38)	6-f.	Rough terrain Crane, 25 ton class	1
39)	6-g.	Spare parts for above equipment	1 lot
	8.	Transport/Equipment for Administration of Institute	
40)	8-a.	Mini Bus	2
41)	8-b.	Pickup Car with single cabin	1
42)	8-c.	Generator Set 20 KVA, 3 Phase, 440 Volts	1
	9.	Testing Equipment for Diploma Course	
43)	9-a	Toe-in-Gauge	1
44)	9-b	Camber Caster King Pin	1
45)	9-c	Turning Radius Gauges	1
46)	9-d	Brake Tester	1
47)	9-e	Side Slip Tester	1
	10-a-	Vehicle Mechanic Course	
48)	10-a-1	Power steering assembly (C-AM)*	1
49)	10-a-2	Truck forecarriage (AP)**	1
50)	10-a-3	Hydraulic operated clutch (OHP-Ts)***, for heavy vehicle	1 set
51)	10-a-4	Gear Box with Reduction (C-AM), for heavy vehicle	1
52)	10-a-5	Double Clutch (Hydraulic + Mechanical), for heavy vehicle (C-AM)	1
53)	10-a-6	Ackerman steering system (OHP-Ts)	1 set
54)	10-a-7	Ignition Distributor with Advanced and Retarded Ignition (OHP-Ts), for heavy vehicle	1 set
55)	10-a-8	Alternator (C-AM), for heavy vehicle	1
56)	10-a-9	Vacuum Advance at an Ignition Distributor (OHP-Ts), for heavy vehicle	1 set
57)	10-a-11	Truck Diesel Engine with Turbocharger and Intercooler (C-AM), for heavy vehicle	1
58)	10-a-12	Petrol engine model (C-AM)	1
59)	10-a-14	In-Line type Fuel Injection Pump with Centrifugal Governor (C-AM), for heavy vehicle	1

* C-AM ; Cut-Away Model

** AP : Actual parts

*** OHP-Ts : OHP Transparent Sheet

	No.	Description of items	Qty
60)	10-a-15	Live diesel engines on rotating stand (AP)	2
61)	10-a-16	KE-Jetronic trainer instruction board	1
62)	10-a-17	Sectioned turbocharger (C-AM)	1
63)	10-a-22	Wheel balancer, for truck	1
64)	10-a-23	Tyre changer, for truck	1
65)	10-a-24	Tyre gauge	2
66)	10-a-25	Portable gantry crane with chain block	2
67)	10-a-26	Actual engine of full set type, practical training (Gasoline)	2
68)	10-a-28	Camber, caster, kingpin gauge	2
69)	10-a-29	Turning Radius Gauge	1
70)	10-a-33	Cylinder head stand, but for heavy vehicle	2
71)	10-a-34	Fuel injector pressure tester kit	2
72)	10-a-35	Engine support beam	2
73)	10-a-36	Pressure brake bleeder	1
74)	10-a-38	Engine stand for heavy vehicle	4
75)	10-a-39	Hydraulic press for heavy vehicle	1
76)	10-a-40	Platform truck	4
77)	10-a-41	Steel wall rack	4
78)	10-a-42	Car creeper	4
79)	10-a-43	Angle grinder	2
80)	10-a-44	Dial test indicator (plunger type)	2
81)	10-a-45	Drill press	2
82)	10-a-46	Combustion leakage tester	2
83)	10-a-48	Shop press	1
84)	10-a-49	Diesel smoke meter	1
85)	10-a-50	Automatic air inflator	1
86)	10-a-51	Vertical boring machine (Portable)	1
87)	10-a-52	Cylinder honing machine (Portable)	1
88)	10-a-53	Vulcanizing machine	2
89)	10-a-54	Vacuum gauge for diesel engine for heavy vehicle	2
90)	10-a-55	Vacuum fuel pump gauge	1
91)	10-a-56	Valve spring tester	2
92)	10-a-57	Portable hydraulic jack	4
93)	10-a-58	Brake lining riveter	1
94)	10-a-59	Electric drill	2
95)	10-a-60	Piston ring groove cleaner	1
96)	10-a-61	Battery hydrometer	2 set
97)	10-a-62	Diesel timing and tacho tester	4
98)	10-a-63	Tripod stand (Stand for display board)	6
99)	10-a-64	Rack and pinion type of steering box	1

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	No.	Description of items	Qty
100)	10-a-67	Brake/speed meter tester	1
101)	10-a-68	Electric Gasoline Injection system (animated board)	1
102)	10-a-69	Bench electric grinder	1
103)	10-a-70	Compression gauge, but for diesel engine	2
104)	10-a-71	Painting equipment	1 set
105)	10-a-72	Tool for automobile, 101 different tools for heavy vehicle	1 lot
106)	10-a-73	Safety equipment, 6 item	17 set
107)	10-a-74	HC/CO tester	1
108)	10-a-75	Engine crane, 1,000kg	1
	10-b-	Vehicle Electrician Course	
109)	10-b-1	Electric wiring training board	1
110)	10-b-2	Ignition system trainer	1
111)	10-b-3	Truck (Diesel) Electric Devices Trainer for heavy vehicle	1
112)	10-b-4	Tacho / dwell meter for gasoline engine	1
113)	10-b-5	Engine tuner for gasoline engine	1
114)	10-b-6	Insulation tester for gasoline engine	1
115)	10-b-8	Ignition system (OHP-Ts), but for Magneto Ignition	1
116)	10-b-10	Headlight tester	1
117)	10-b-11	Battery drop tester	1
118)	10-b-12	Starter charger, for gasoline engine	1
119)	10-b-13	Ignition tester (motor scope), for gasoline engine	1
120)	10-b-15	Disc grinder	1
121)	10-b-16	Silicon normal charger	1
122)	10-b-18	Growler armature tester	1
123)	10-b-21	Distributor test bench	1
124)	10-b-23	Alternator modern type and old type each	4
125)	10-b-24	Bench electric grinder	1
126)	10-b-25	Diesel timing and tacho tester	2
127)	10-b-26	Air compressor for heavy vehicle	1
128)	10-b-27	Electric drill	2
129)	10-b-28	D.C. volt ampere meter	4
130)	10-b-29	Ohm meter	4
131)	10-b-30	Battery hydrometer	2 set
132)	10-b-31	Battery tester, for heavy vehicle	2
133)	10-b-32	Circuit tester	4
134)	10-b-34	Tool for auto-electrician, 44 different tools, but for heavy vehicle	1set
135)	10-b-35	Safety equipment, 6 item	17 set

	No.	Description of items	Qty
	10-c-	Welding and Fabrication Course	
136)	10-c-2	Shear cutting machine	1
137)	10-c-3	Mig welder (Portable), Semiautomatic type	2
138)	10-c-4	Tig welder (Portable)	2
139)	10-c-5	Bench grinder	4
140)	10-c-6	AC Arc welder	8
141)	10-c-7	Power hacksaw	1
142)	10-c-8	Electric drill	4
143)	10-c-9	Gas welder set	10
144)	10-c-10	Drilling press	2
145)	10-c-13	Spot welding machine	1
146)	10-c-14	Bending roller machine, but for manual operation	1
147)	10-c-15	Angle grinder	2
148)	10-c-17	Engine welder	1
149)	10-c-18	Vertical drilling machine	1
150)	10-c-19	High speed cutting machine (Portable)	1
151)	10-c-20	Compressor	1
152)	10-c-21	Painting equipment	1set
153)	10-c-22	Tool for welding and fabrication, 30 tools, for heavy vehicle	1set
154)	10-c-23	Safety equipment, 6 item	17 set
	10-d-	Work table	
155)	10-d-1	Work bench with drawer, Dimensions: approx. 1,800 x 750 x 740mm	12
156)	10-d-2	Pallet rack with shelf panel (3 sections), Dimensions: approx. 2,300x1, 100 x 3, 000mm	2
157)	10-d-3	Parts & Tool rack, medium duty (6 shelves) Dimensions: approx. 2,700x1, 100 x 3, 000mm	3
158)	10-d-4	Parts & Tool rack, medium duty (6 shelves)	8
159)	10-d-5	Parts & Tool rack, medium duty (5 shelves)	8

A *7/11* *4/10*

Appendix 5. Building Drawings

Drawing No.

Title

A. Architectural Drawing

A-01	General Layout
A-02	Location Plan for New Building
A-03	Training Building (GF & 1F PLAN)
A-04	Training Building (Elevation, Section)
A-05	Accommodation Building (GF & 1F PLAN)
A-06	Accommodation Building (Elevation, Section)
A-07	Canteen Building (Elevation, Section)

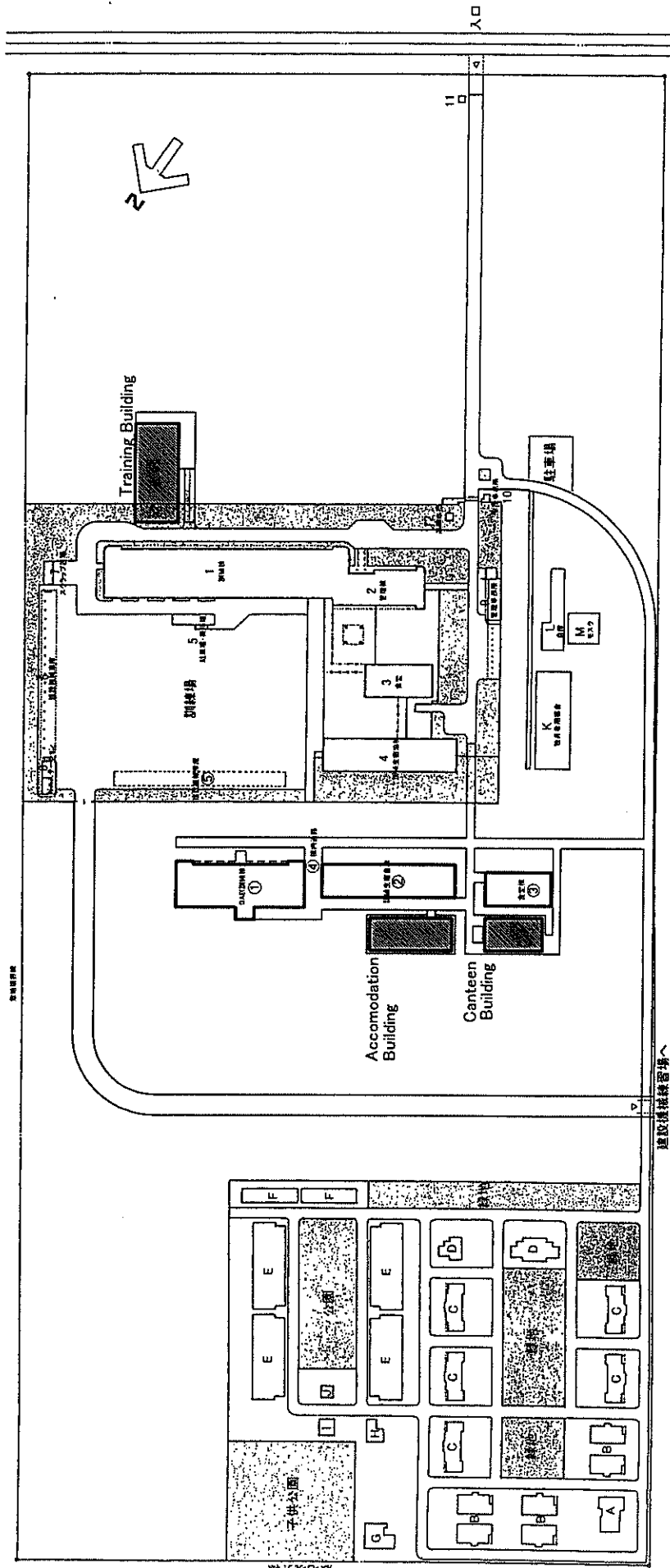
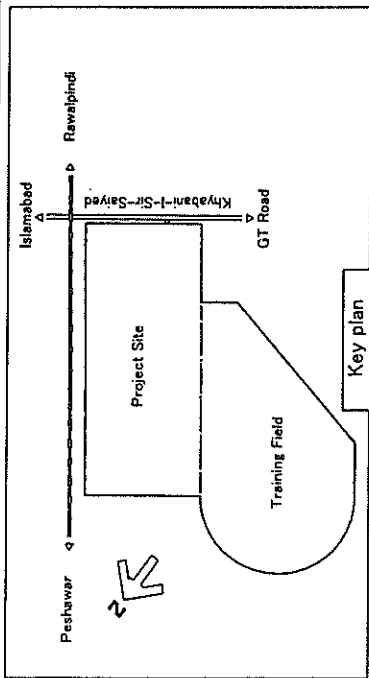
E. Electrical Drawing

E-01	Feeder Trunk Line
E-02	Single Line Diagram
E-03	Training Building (Feeder and Low Voltage Power Plan)
E-04	Accommodation Building (Feeder and Low Voltage Power Plan)
E-05	Canteen Building (Feeder and Low Voltage Power Plan)
E-06	Training Building (Lighting and Socket Outlet Plan)
E-07	Accommodation Building (Lighting and Socket Outlet Plan)
E-08	Canteen Building (Lighting and Socket Outlet Plan)

M. Mechanical Drawing

M-01	External Plumbing System Layout
M-02	Training Building (1st Floor Toilet Plan)
M-03	Training Building (GF & 1st FL Toilet Plan)
M-04	Training Building (1st Floor Ceiling Fan Layout)
M-05	Accommodation Building (1st Floor Plumbing System Layout)
M-06	Accommodation Building (1st Floor Heating System Layout)
M-07	Canteen Building (1st Floor Ceiling Fan Layout)

Network Layout Plan



The Project for Enhancement of Training Capabilities
of Construction Machinery Training Institute (CMTI)
in the Islamic Republic of Pakistan

Title

SCALE

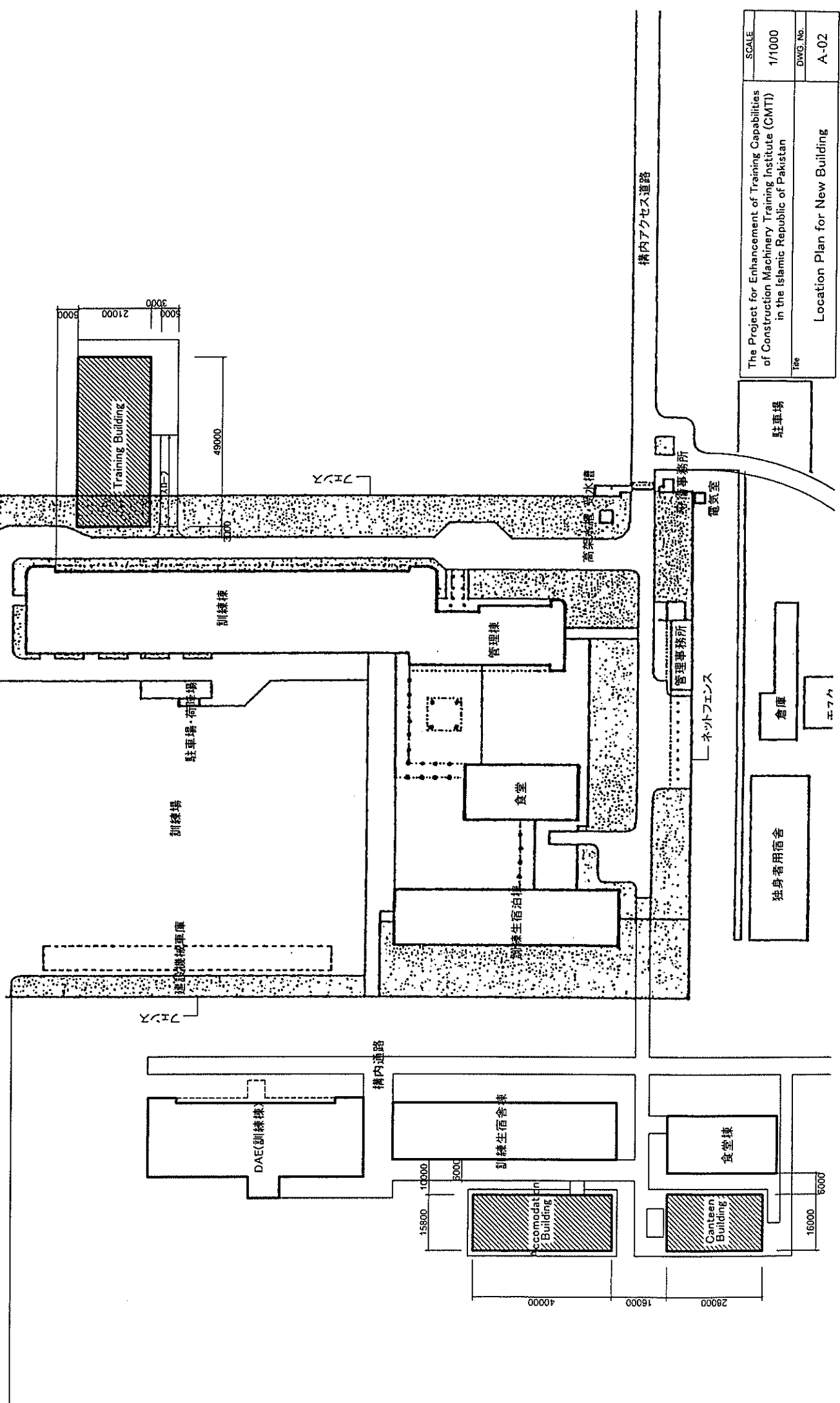
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DWG. No.

A-01

General Layout

練習場



The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE	1/1000
	DWG. No.	A-02
Title		Location Plan for New Building

駐車場

倉庫

单身者用宿舎

食堂棟

Accommodation Building

Canteen Building

Training Building

訓練棟

食堂

訓練生宿泊棟

訓練生宿舎棟

DAE(訓練棟)

管理事務所

ネットフェンス

電気室

構内アクセス道路

構内道路

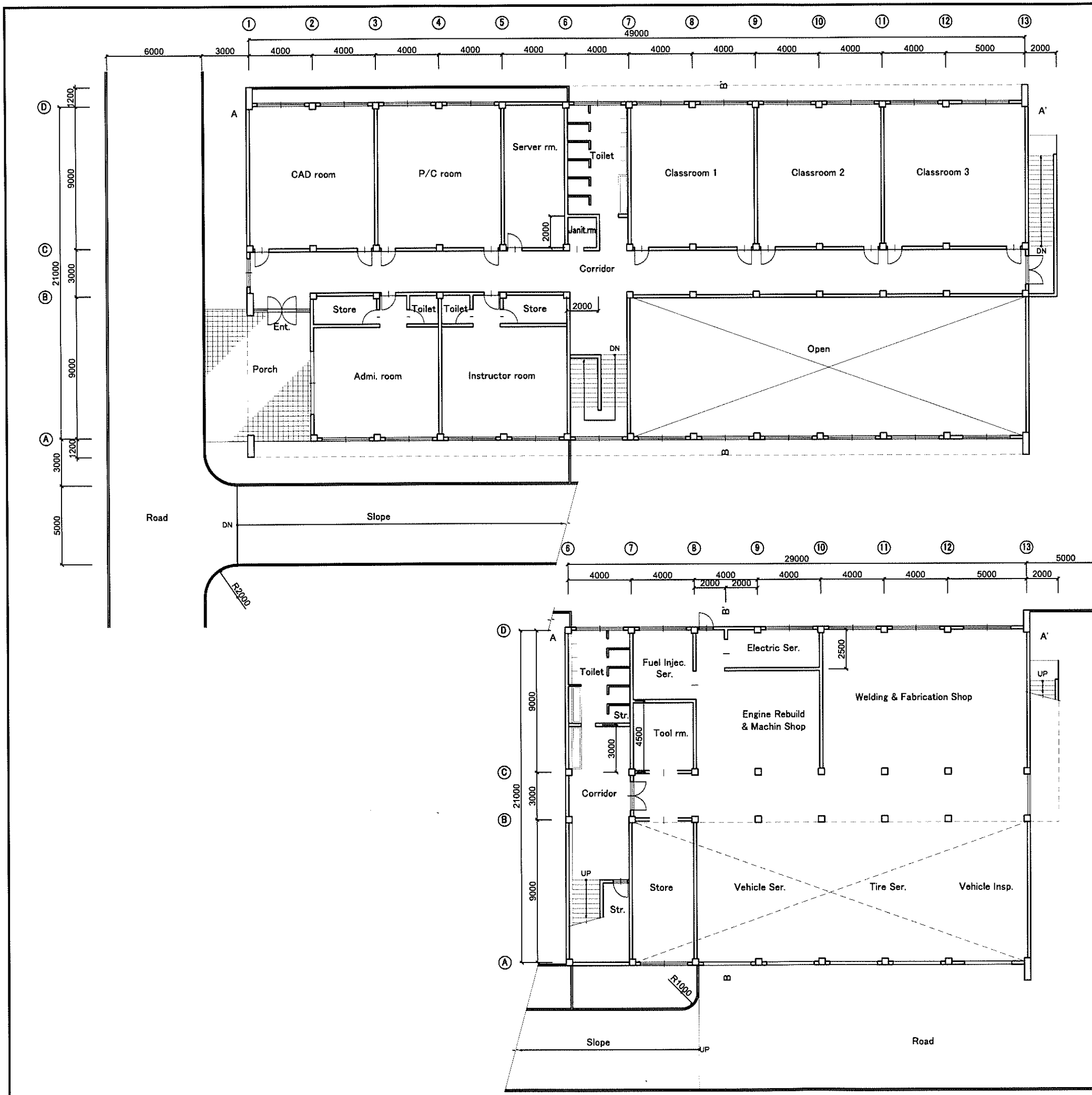
高圧水塔・水塔

建設機械車庫

スライプ舗装

建設機械車庫

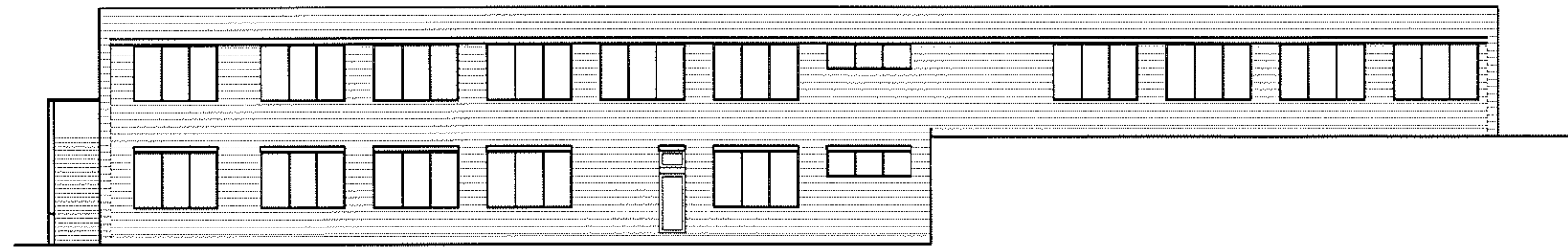
建設機械車庫



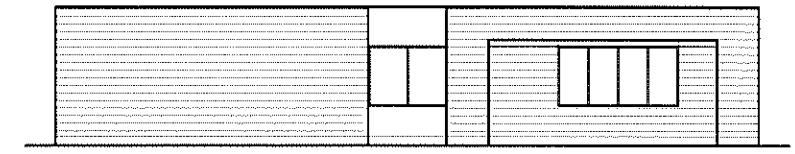
1F PLAN

GF PLAN

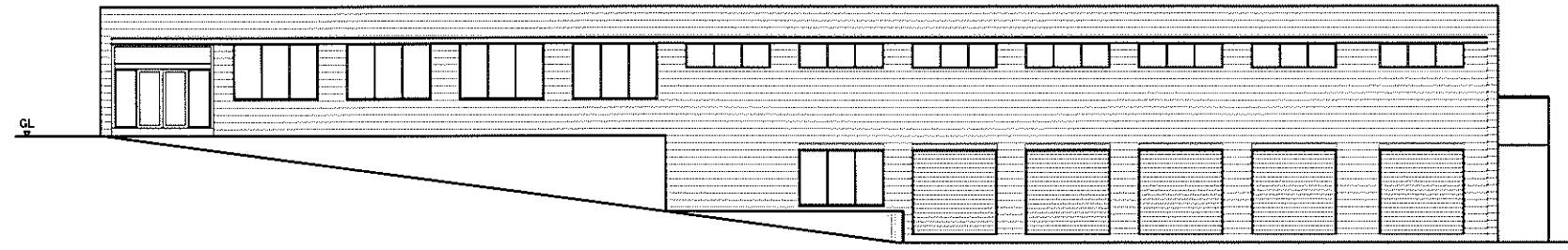
The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (GMTI) in the Islamic Republic of Pakistan	SCALE
	1/250
Title	DWG. No.
	A-03



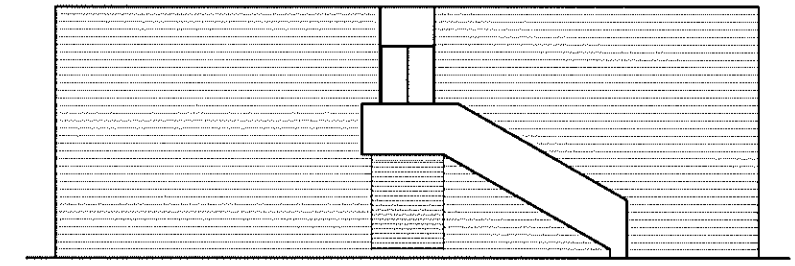
NORTH SIDE ELEVATION



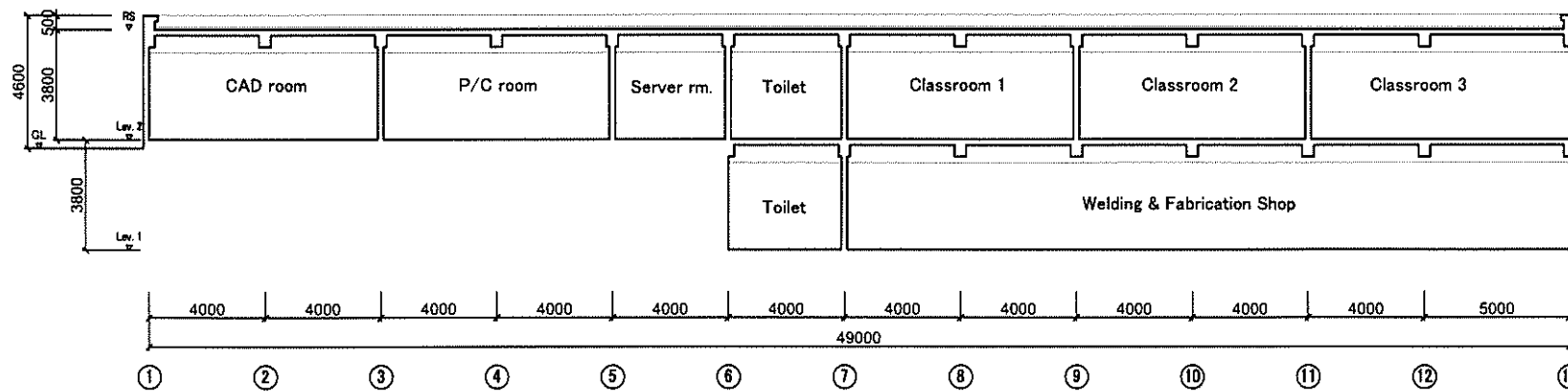
WEST SIDE ELEVATION



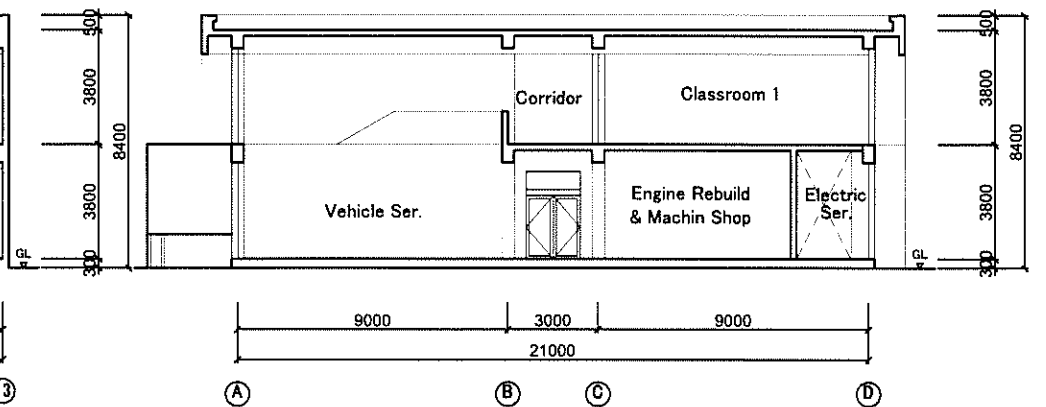
SOUTH SIDE ELEVATION



EAST SIDE ELEVATION

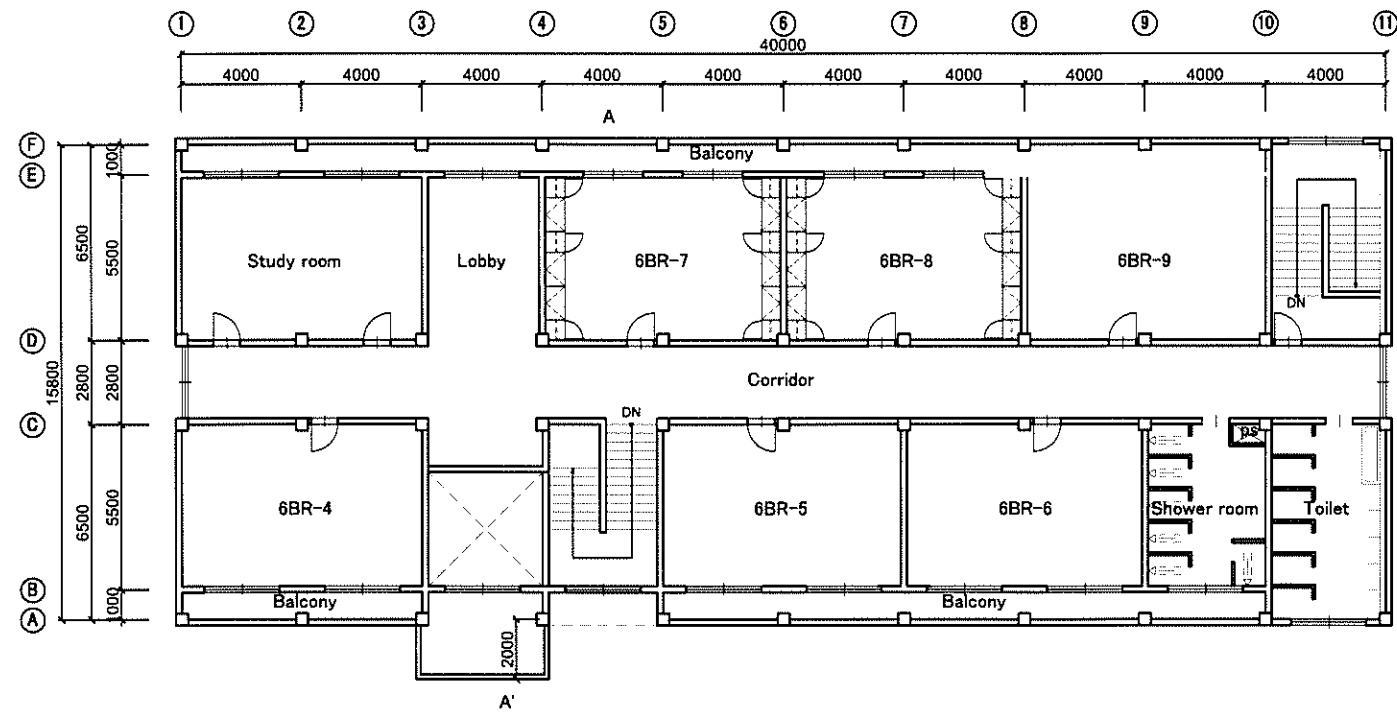


A-A' SECTION

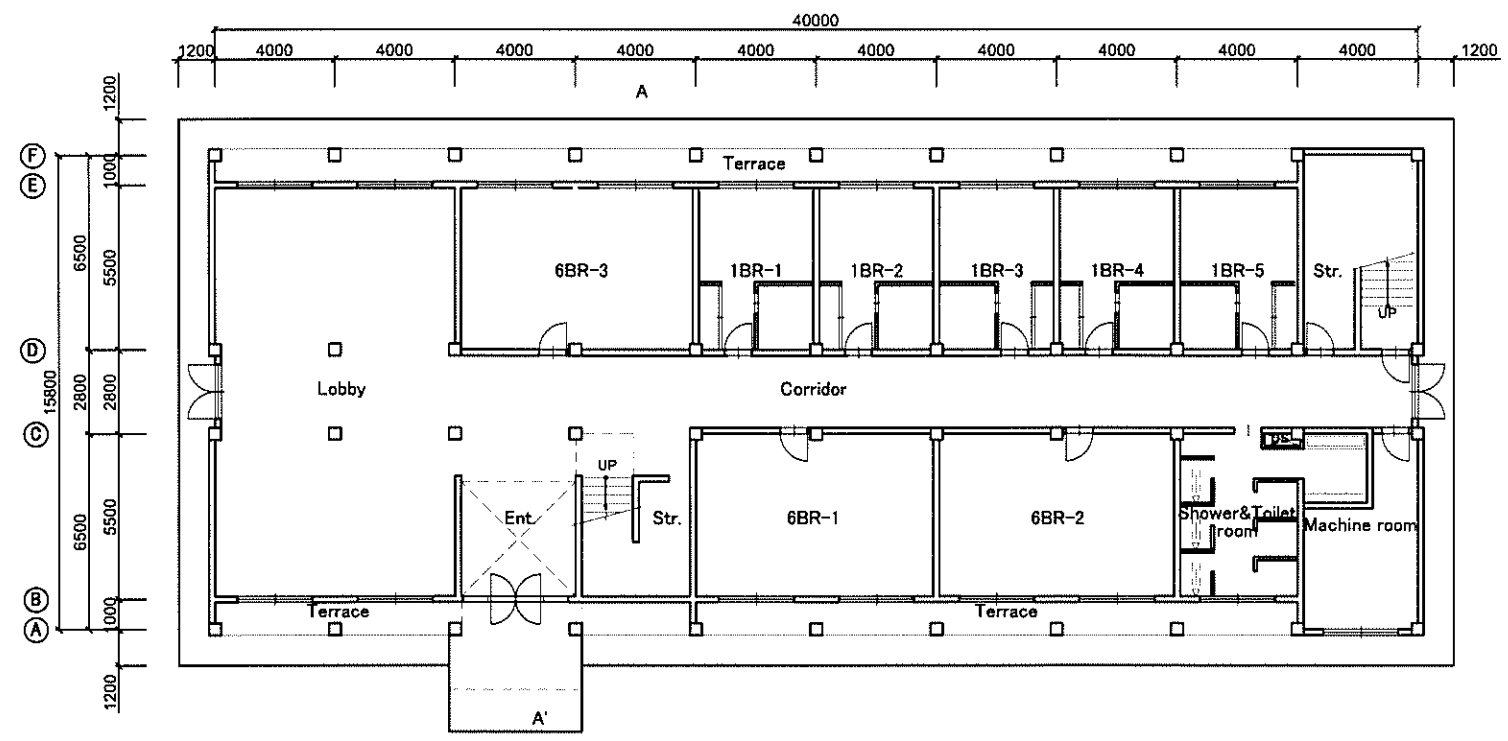


B-B' SECTION

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/250
Title	DWG. No.
Training Building (Elevation, Section)	A-04



1F PLAN



GF PLAN

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/250
Accommodation Building (GF & 1F PLAN)	DWG. No.
	A-05



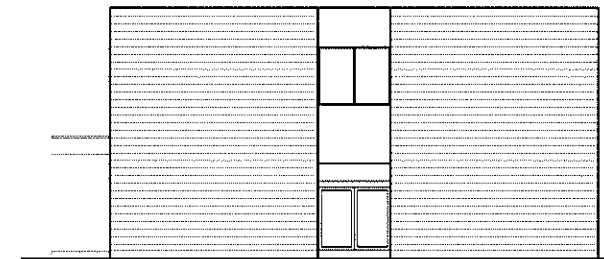
EAST SIDE ELEVATION



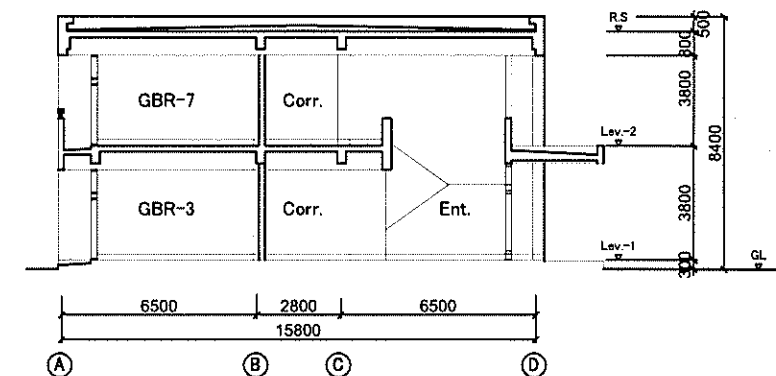
NORTH SIDE ELEVATION



WEST SIDE ELEVATION

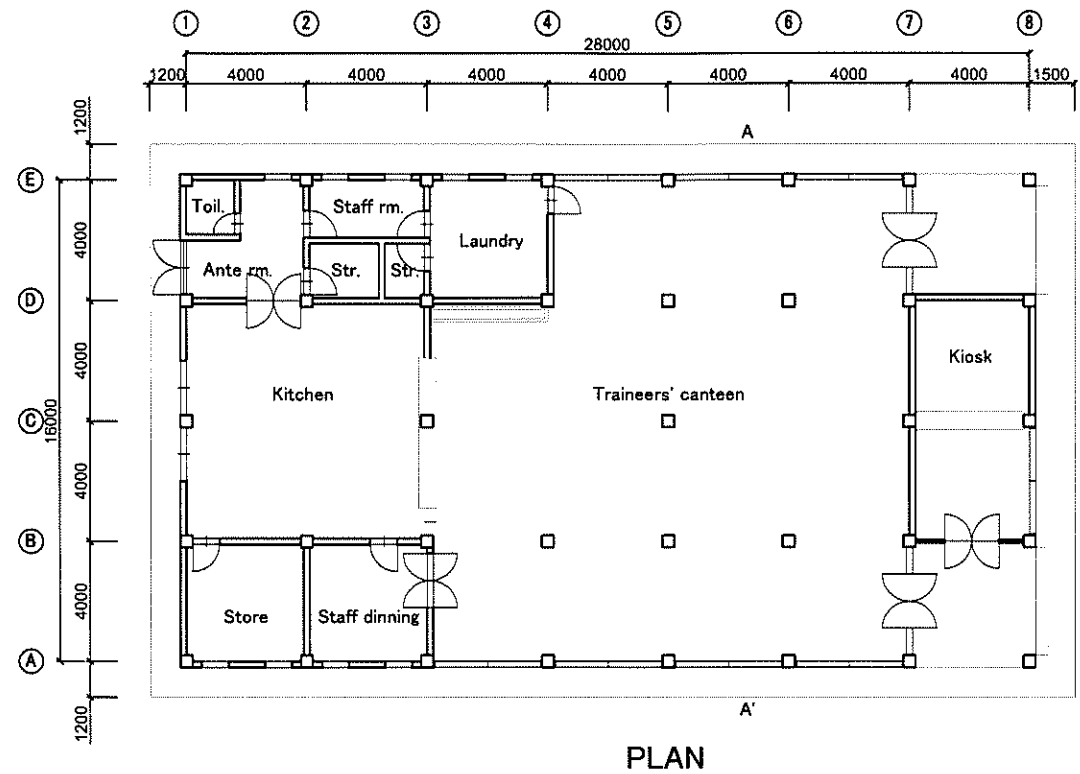


SOUTH SIDE ELEVATION

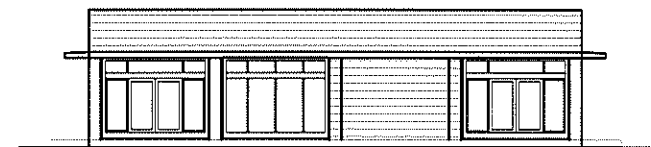


A-A SECTION

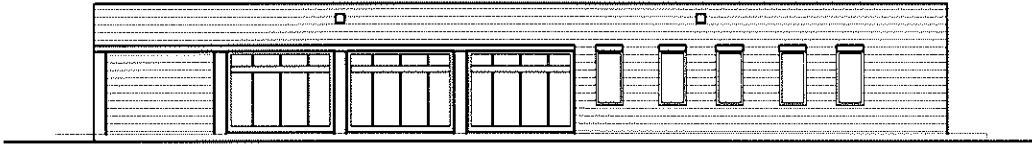
The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/250
Title	DWG. No.
Accommodation Building (Elevation, Section)	A-06



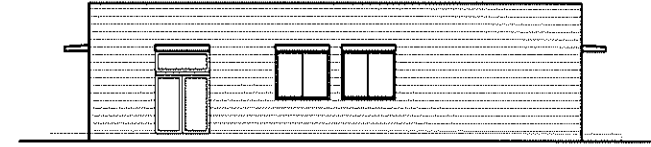
EAST SIDE ELEVATION



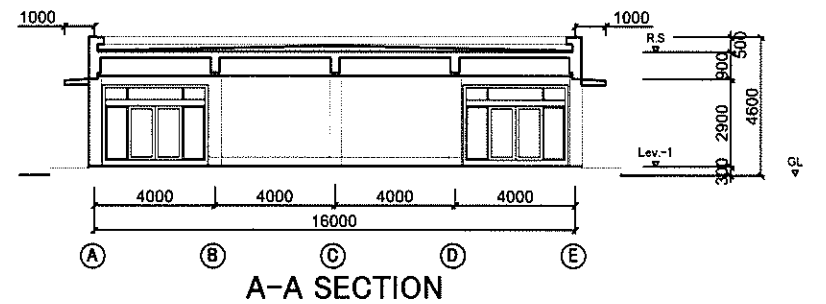
NORTH SIDE ELEVATION



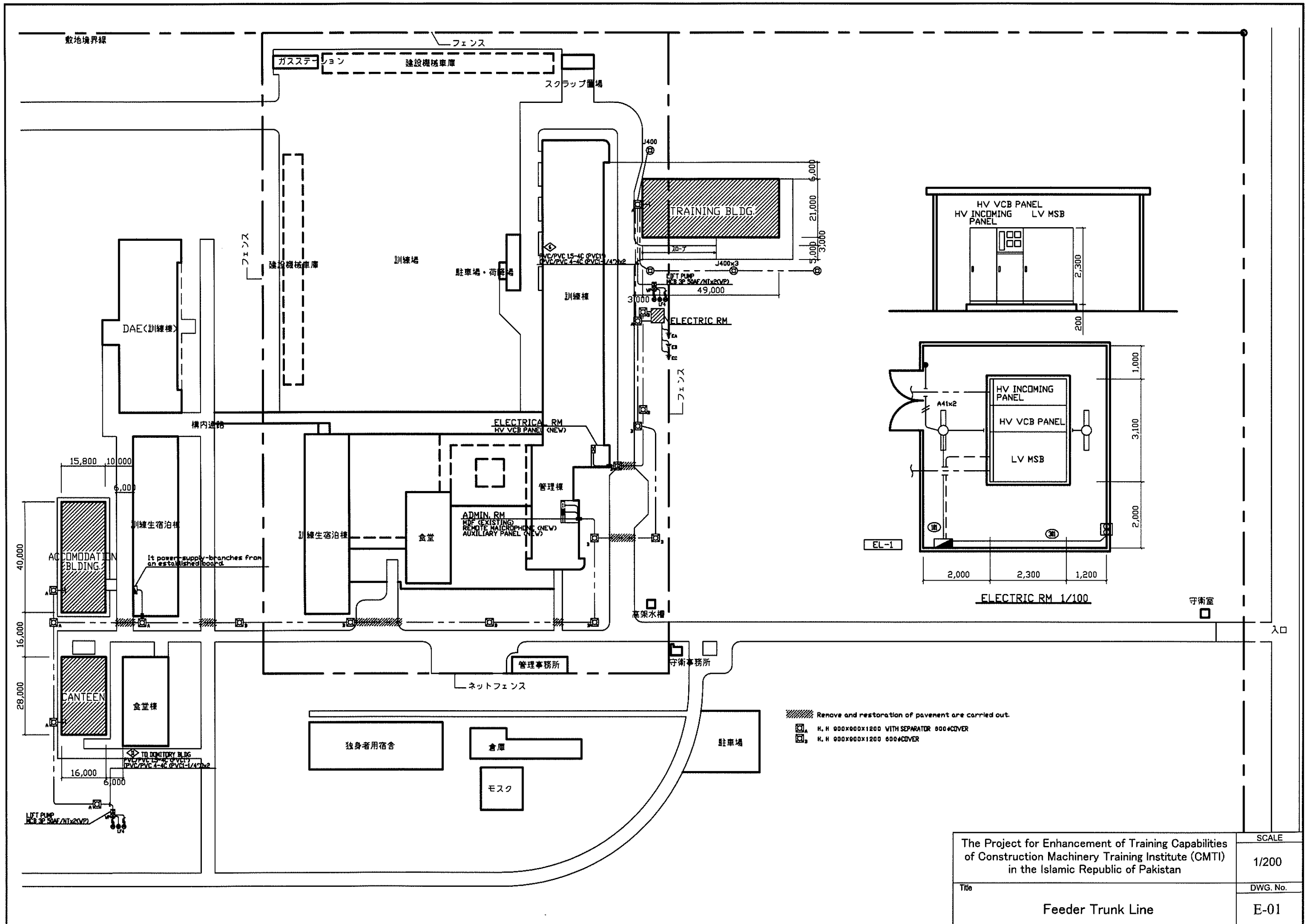
WEST SIDE ELEVATION



SOUTH SIDE ELEVATION

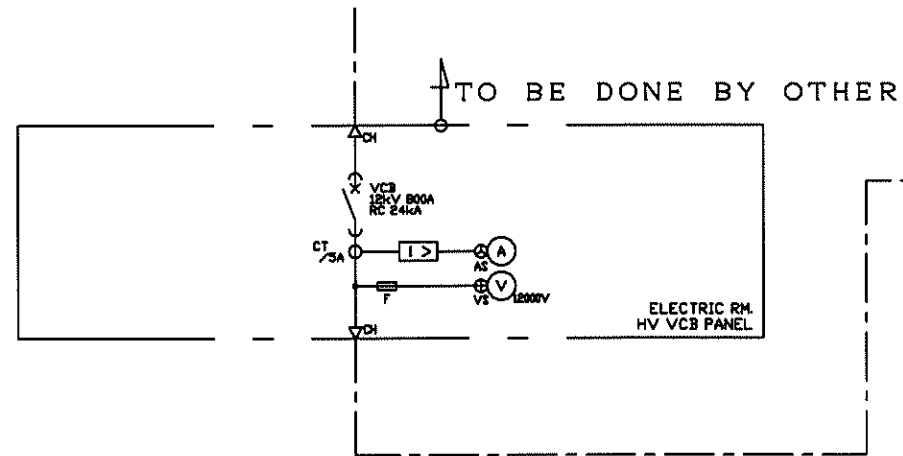


The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/250
Title Canteen Building (Elevation, Section)	DWG. No.
	A-07

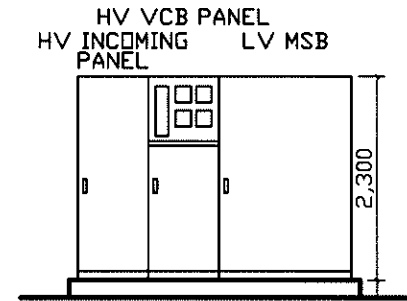
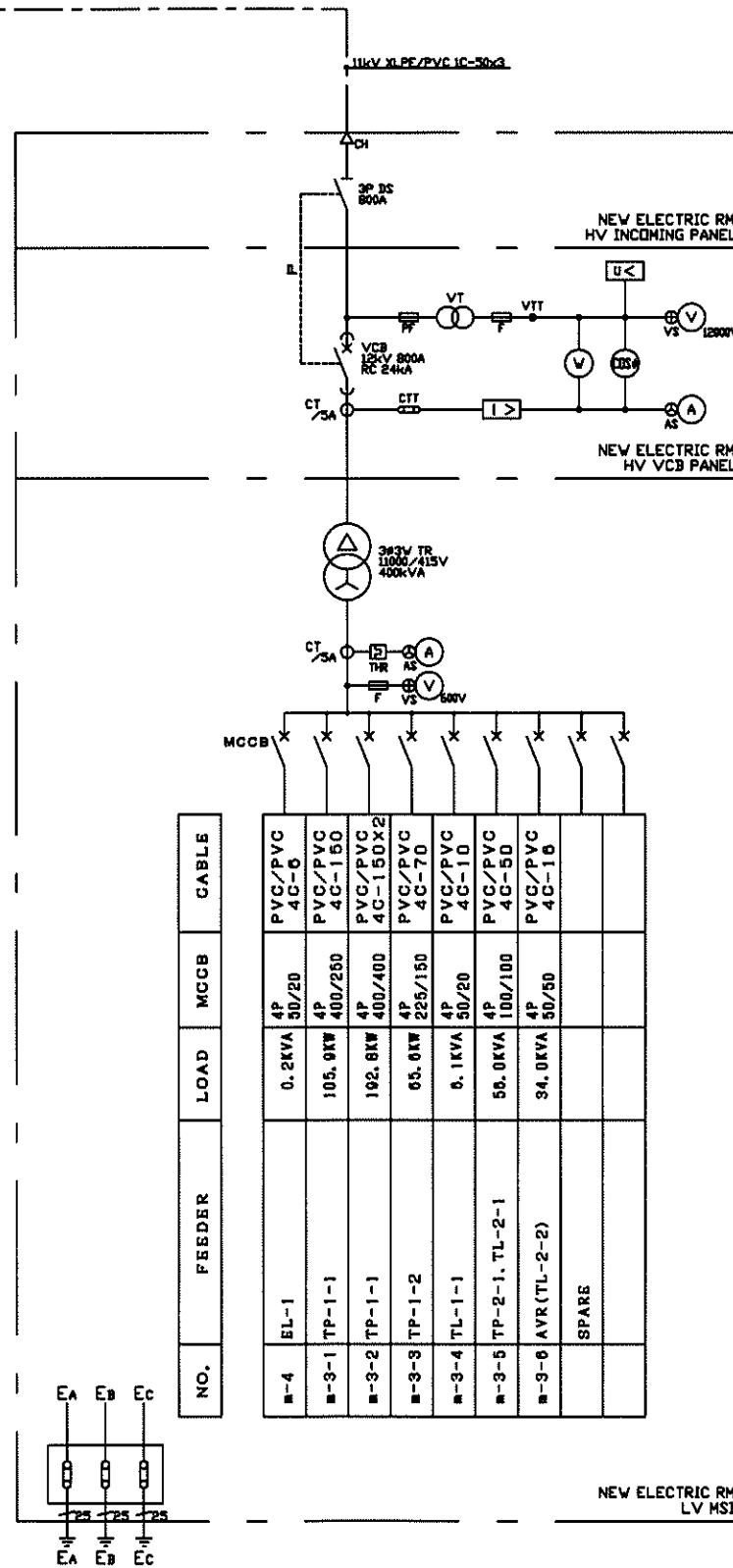


The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/200
Title	DWG. No.
	E-01

11kV XLPE/PVC CABLE (BY OTHER)



TO BE DONE BY OTHER

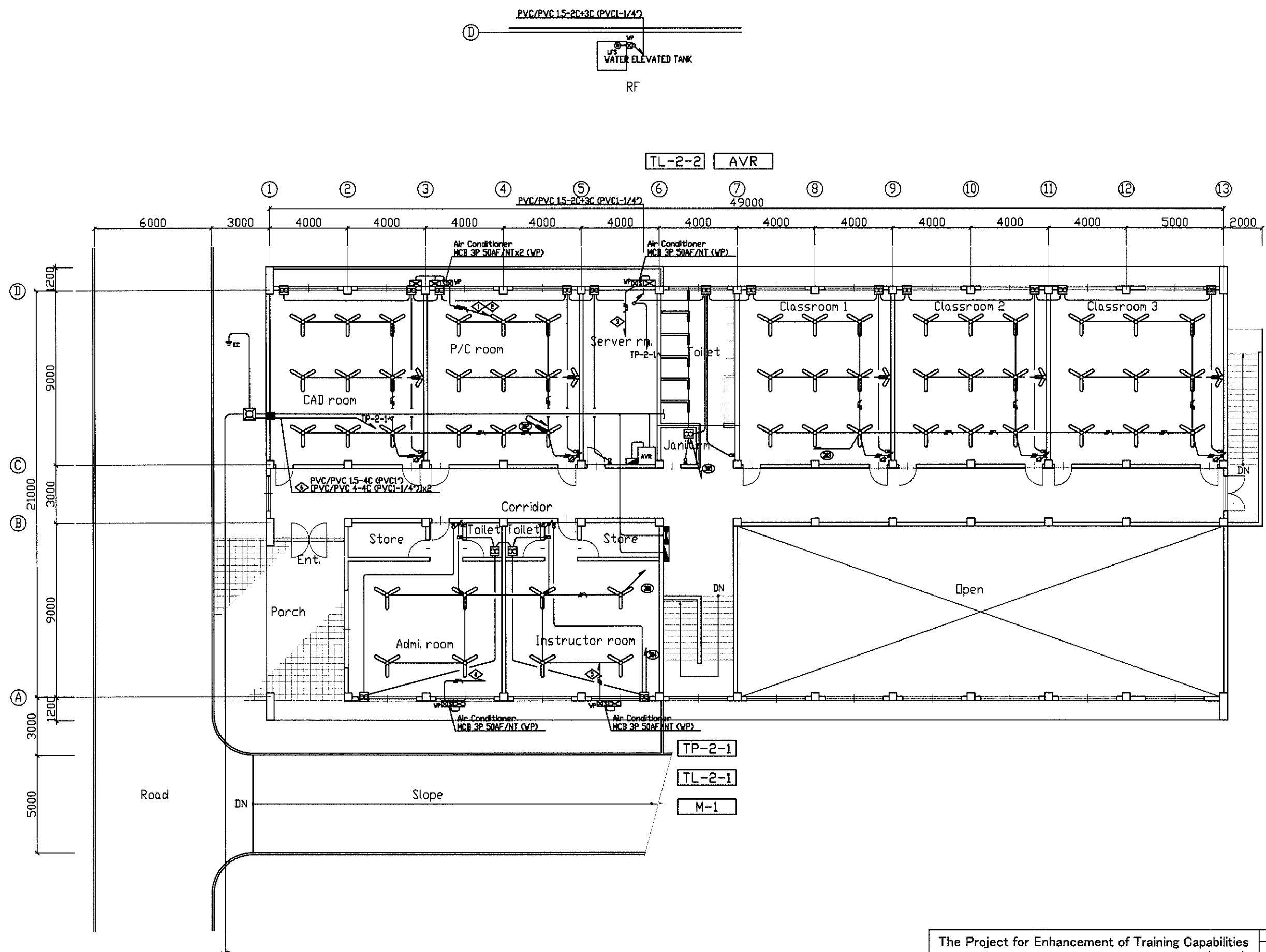


OUTSIDE FIGURE
(SIZE BE A REFERENCE VALUE)

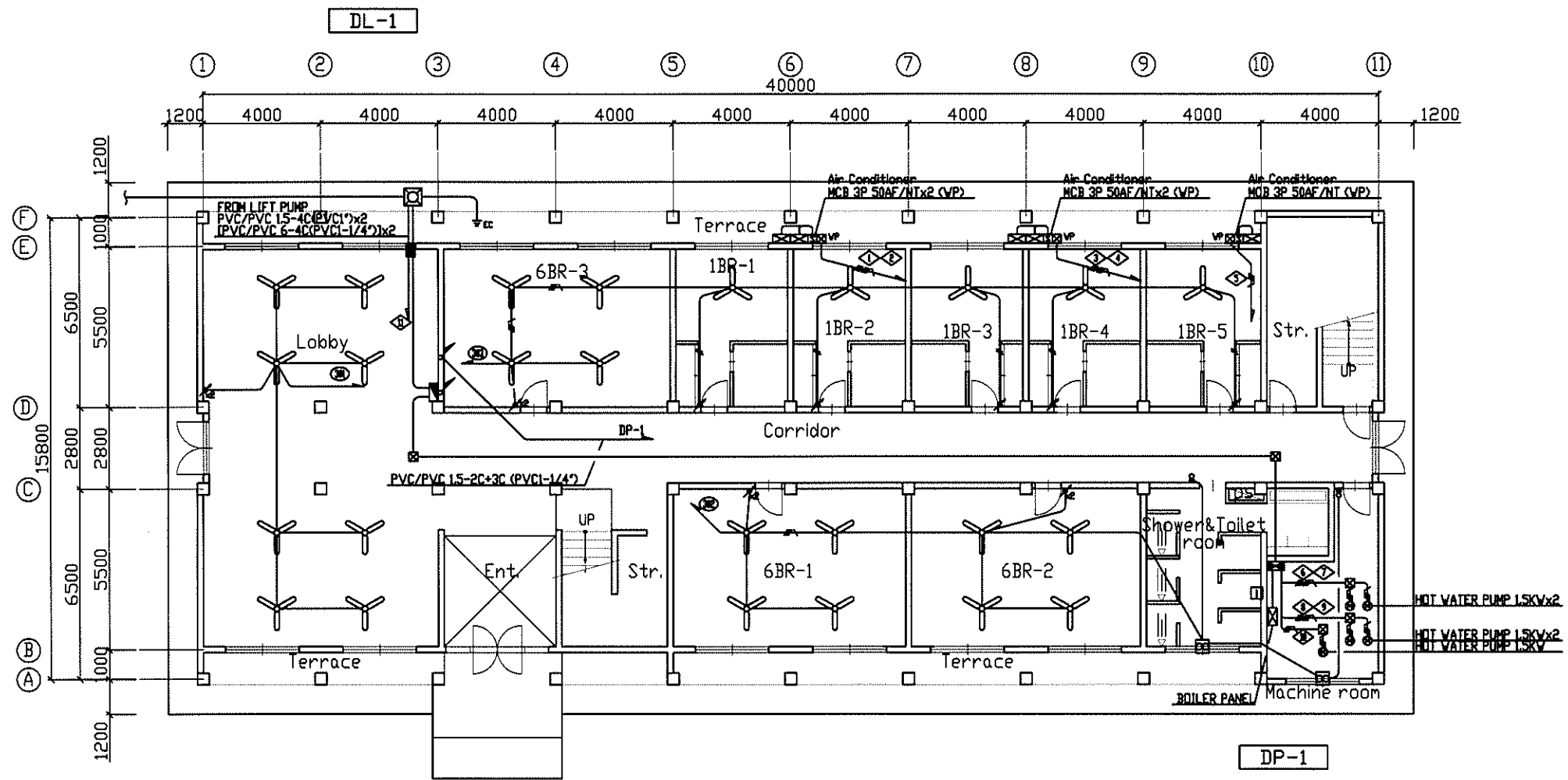
LEGEND

SYMBOL	DESCRIPTION
59	OVER-VOLTAGE
64	VOLTAGE RELAY
27	UNDER-VOLTAGE RELAY
AVR	AUTOMATIC VOLTAGE REGULATOR
APFC	AUTO POWER FACTOR CONTROLLER
A	CURRENT METER
V	VOLTAGE METER
F	FREQUENCY METER
W	WATT METER
WH	WATT-HOUR METER
ATS	DOUBLE THROW SWITCH
I>	OVER CURRENT RELAY
I* >	GLAND RELAY
ACB	AIR CIRCUIT BREAKER
CT	CURRENT TRANSFORMER
ZCT	ZERO-CURRENT TRANSFORMER
MCCB	MOLDED CASE CIRCUIT BREAKER
SC	STATIC CAPACITOR
SR	STATIC REACTOR

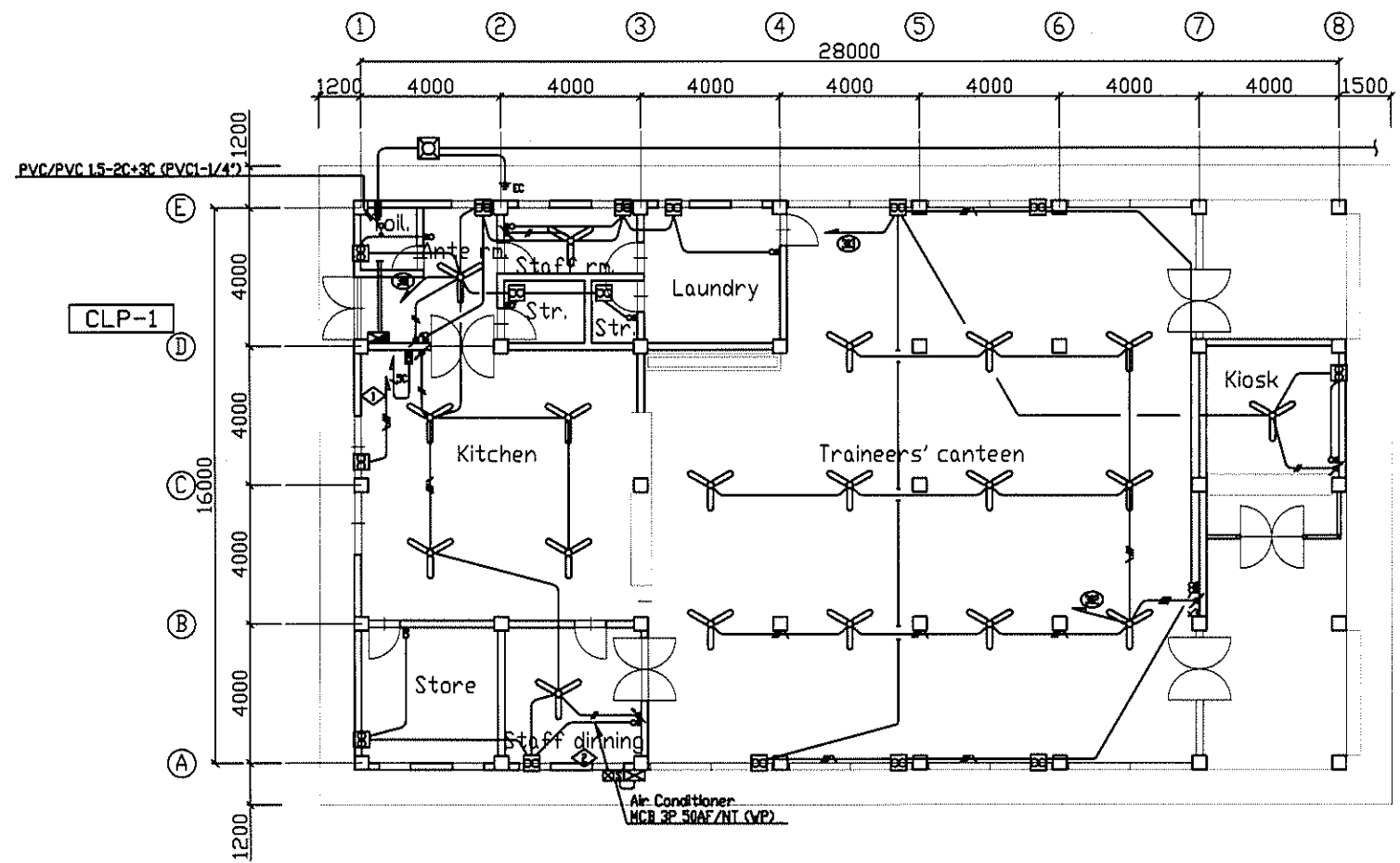
The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/200
Title	DWG. No.
	E-02



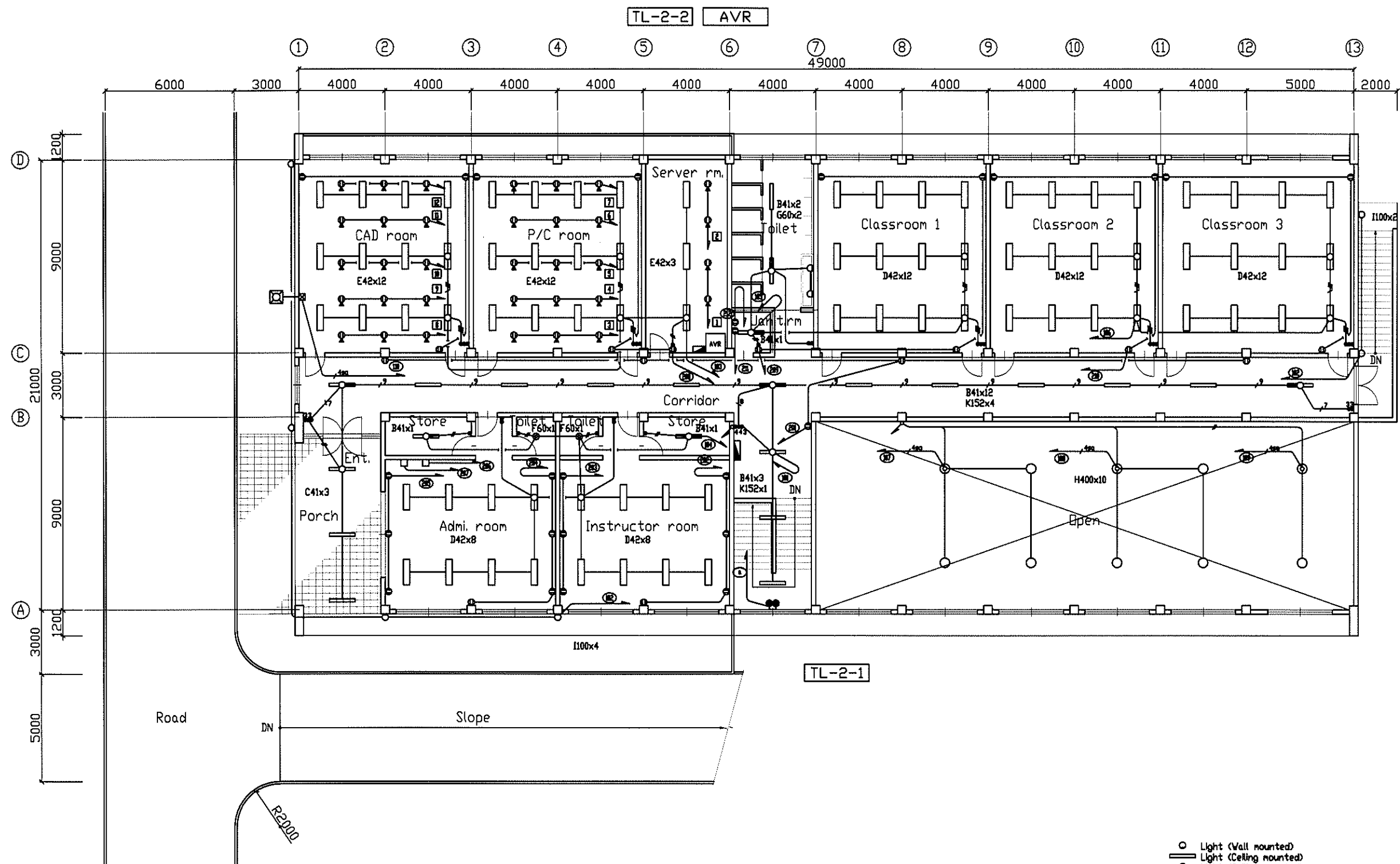
The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/200
Title Training Building (Feeder and Low Voltage Power Plan)	DWG. No.
	E-03



The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/200
Title Accomodatio Building (Feeder and Low Voltage Power Plan)	DWG. No.
	E-04

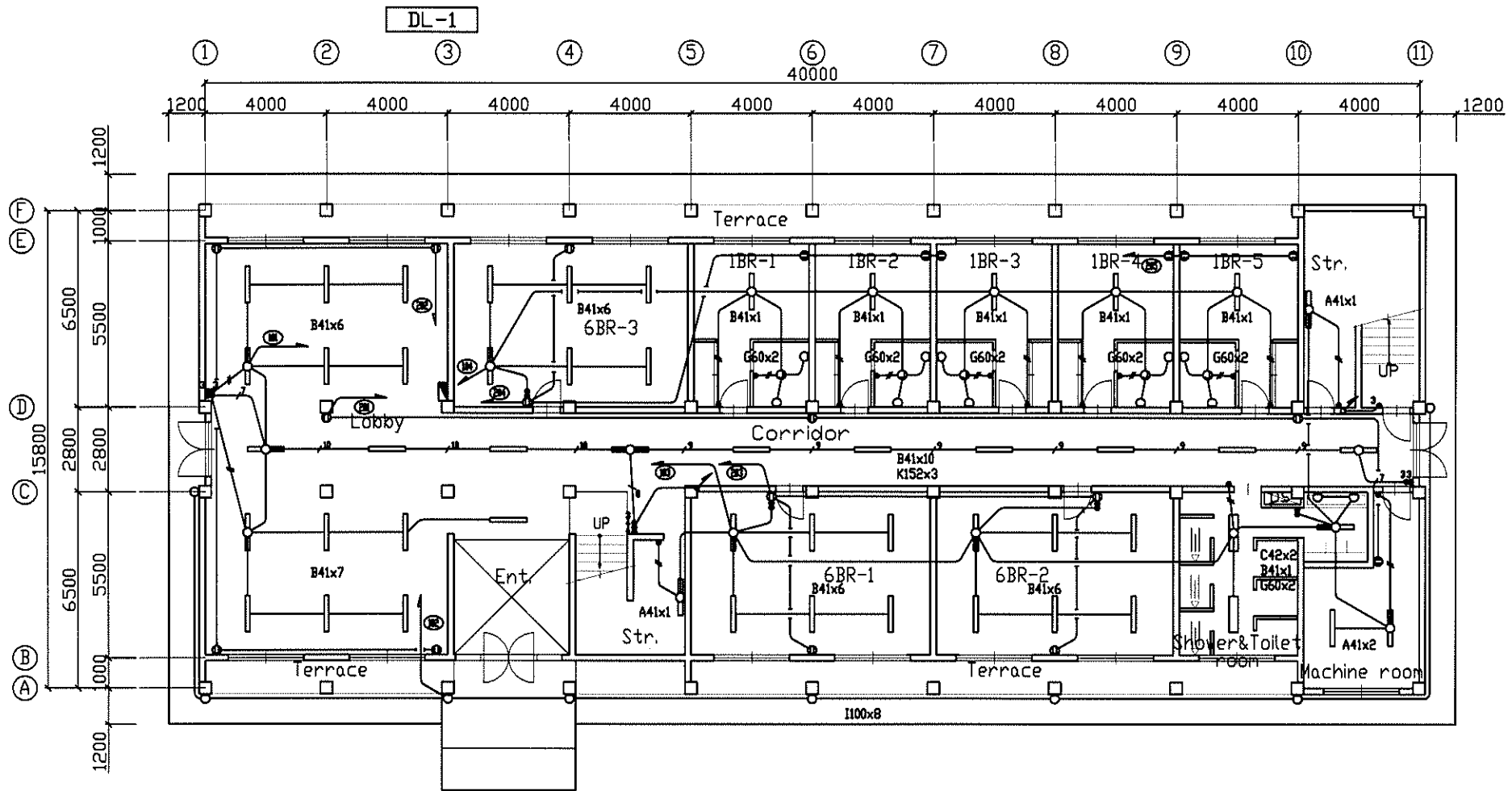


The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/200
Canteen Building (Feeder and Low Voltage Power Plan)	DWG. No.
	E-05



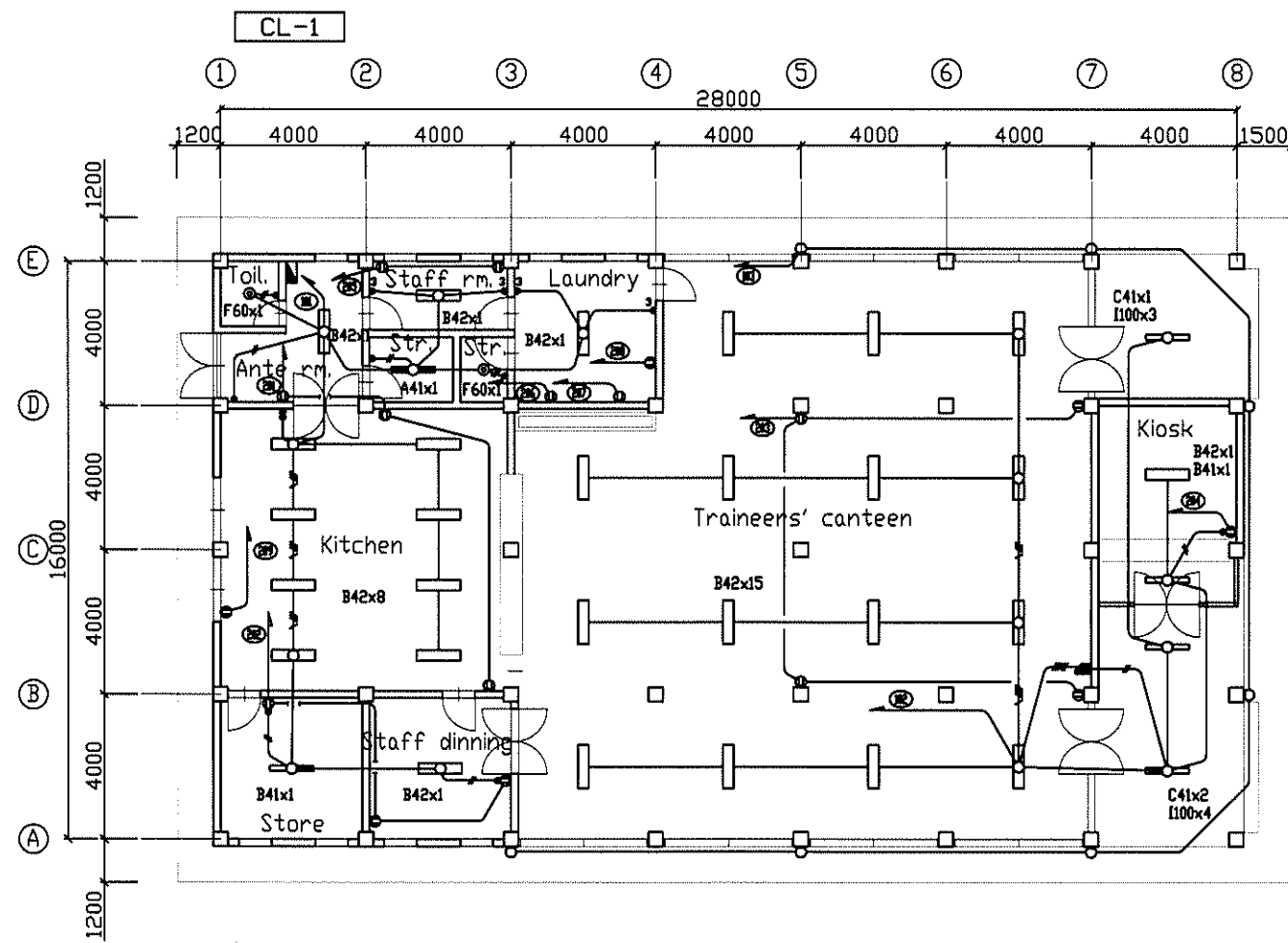
- Light (Wall mounted)
- Light (Ceiling mounted)
- Light (Ceiling mounted) with Jbox
- Emergency light
- Switch 1way
- Switch 2way
- Socket outlet
- Socket outlet (Floor type)

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/200
Title Training Building (Lighting and Socket Outlet Plan)	DWG. No.
	E-06

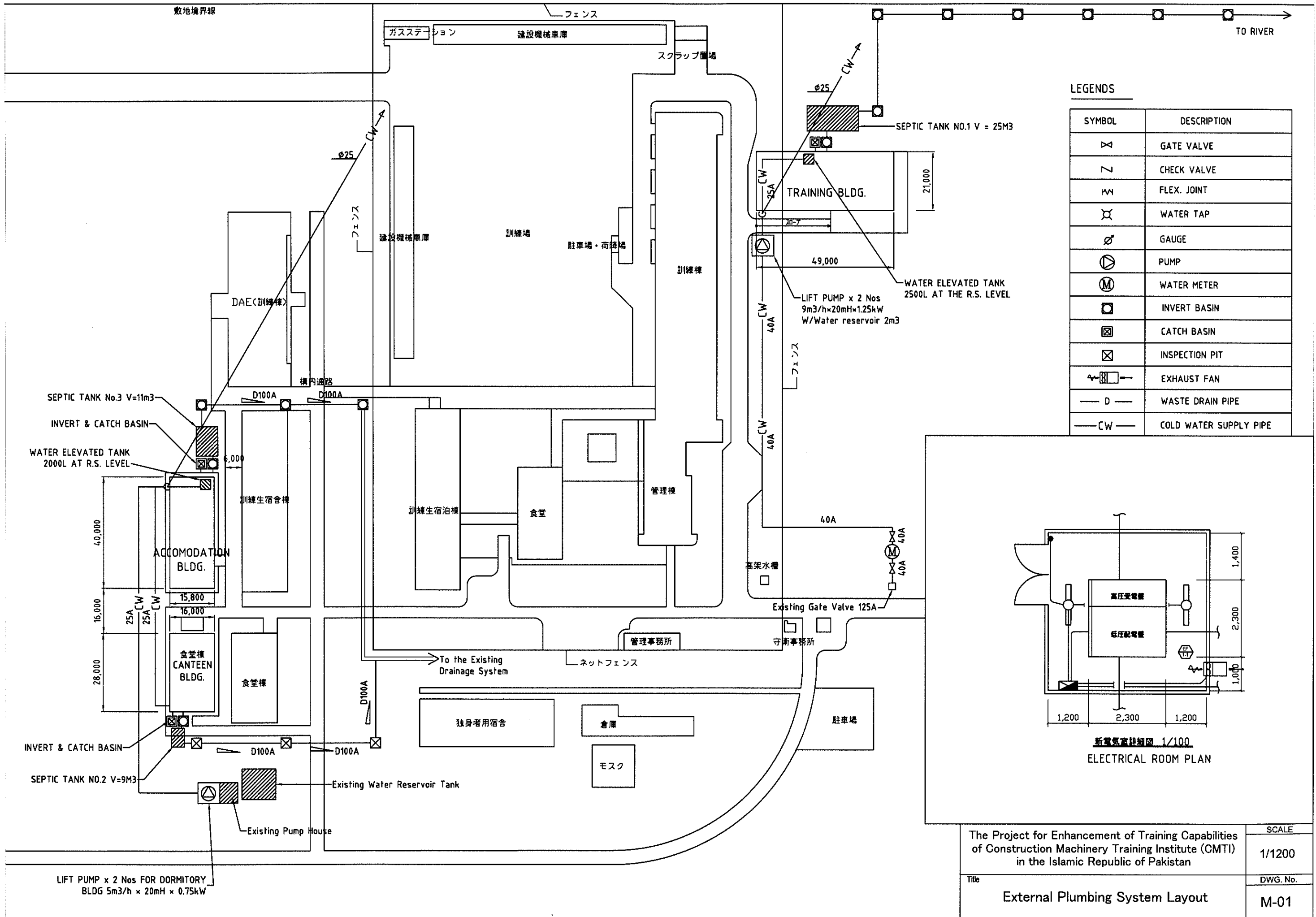


- Light (Wall mounted)
- Light (Ceiling mounted)
- Light (Ceiling mounted) with Jbox
- Emergency light
- Switch 1way
- Switch 2way
- Socket outlet
- ⊕ Socket outlet (Floor type)

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/200
Title Accommodation Building (Lighting and Socket Outlet Plan)	DWG. No.
	E-07

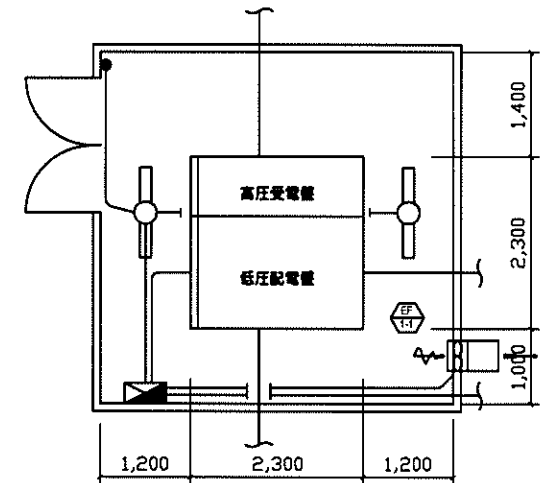


The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/200
Title Canteen Building (Lighting and Socket Outlet Plan)	DWG. No.
	E-08



LEGENDS

SYMBOL	DESCRIPTION
	GATE VALVE
	CHECK VALVE
	FLEX. JOINT
	WATER TAP
	GAUGE
	PUMP
	WATER METER
	INVERT BASIN
	CATCH BASIN
	INSPECTION PIT
	EXHAUST FAN
	WASTE DRAIN PIPE
	COLD WATER SUPPLY PIPE



新電気室詳細図 1/100
ELECTRICAL ROOM PLAN

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan		SCALE
		1/1200
Title	External Plumbing System Layout	DWG. No.
		M-01

LIFT PUMP x 2 Nos FOR DORMITORY BLDG 5m3/h x 20mH x 0.75kW

LIFT PUMP x 2 Nos 9m3/h x 20mH x 1.25kW W/Water reservoir 2m3

SEPTIC TANK No.3 V=11m3
INVERT & CATCH BASIN
WATER ELEVATED TANK 2000L AT R.S. LEVEL

SEPTIC TANK NO.1 V = 25M3

WATER ELEVATED TANK 2500L AT THE R.S. LEVEL

Existing Gate Valve 125A

Existing Water Reservoir Tank

Existing Pump House

To the Existing Drainage System

SEPTIC TANK No.3 V=11m3

INVERT & CATCH BASIN

WATER ELEVATED TANK 2000L AT R.S. LEVEL

40,000

16,000

28,000

15,800

16,000

6,000

25A

25A

28,000

16,000

28,000

16,000

28,000

16,000

28,000

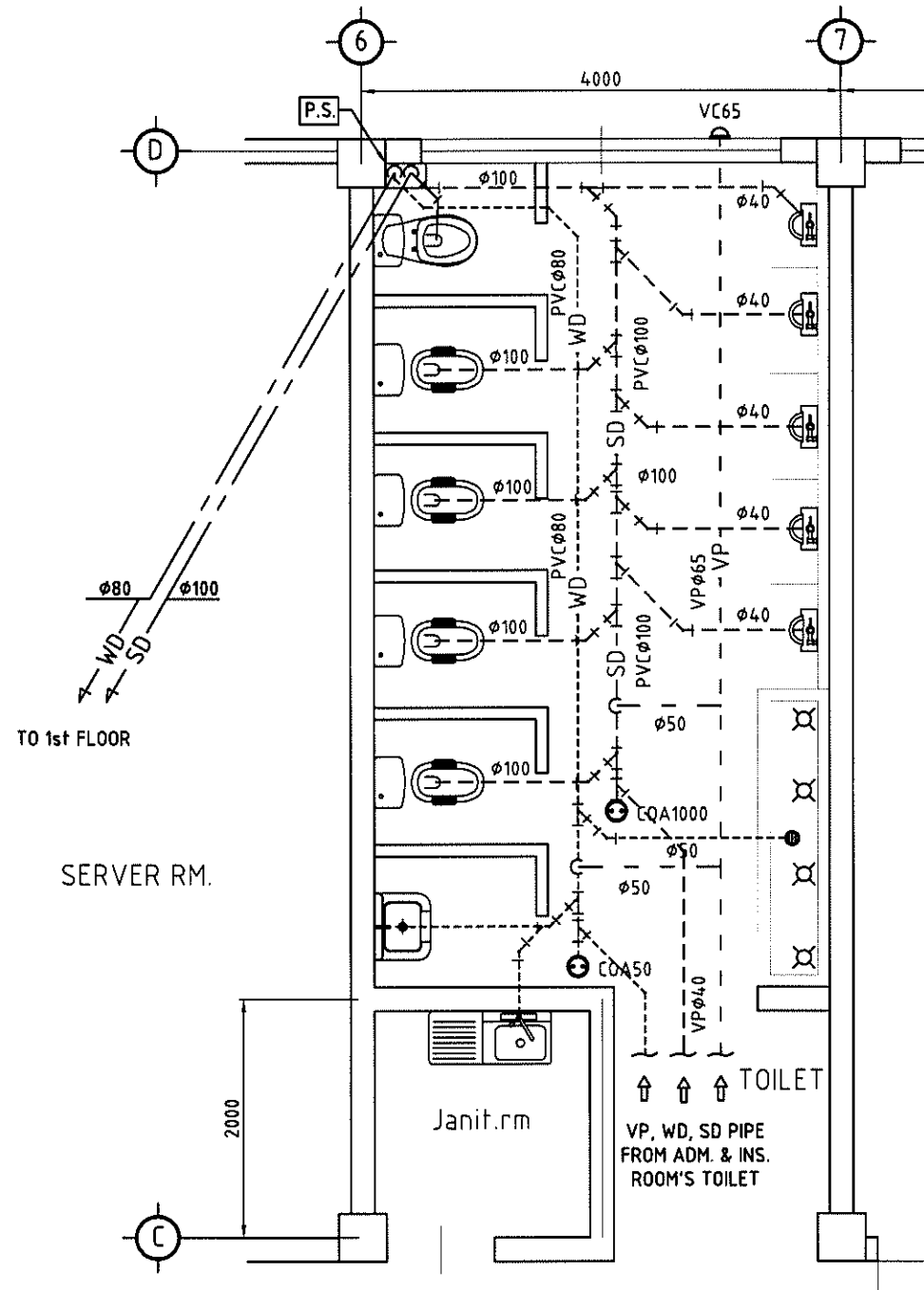
16,000

28,000

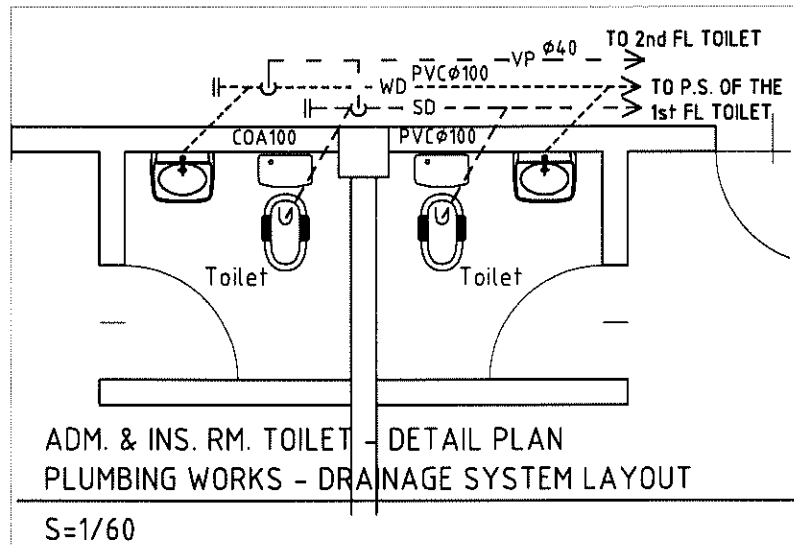
16,000

28,000

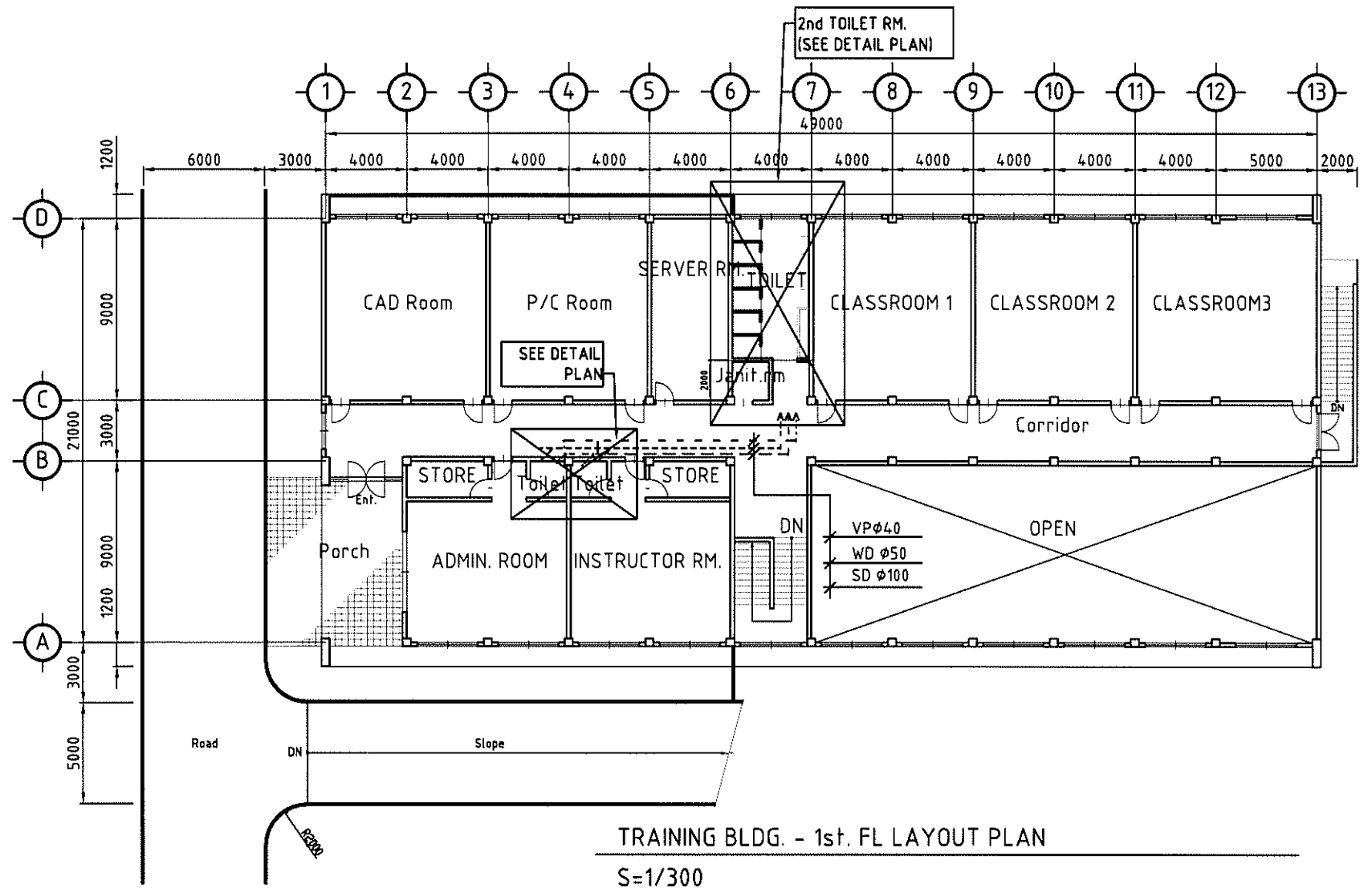
16,000



1st. FL TOILET - DETAIL PLAN
 PLUMBING WORKS - DRAINAGE SYSTEM LAYOUT
 S=1/60



ADM. & INS. RM. TOILET - DETAIL PLAN
 PLUMBING WORKS - DRAINAGE SYSTEM LAYOUT
 S=1/60

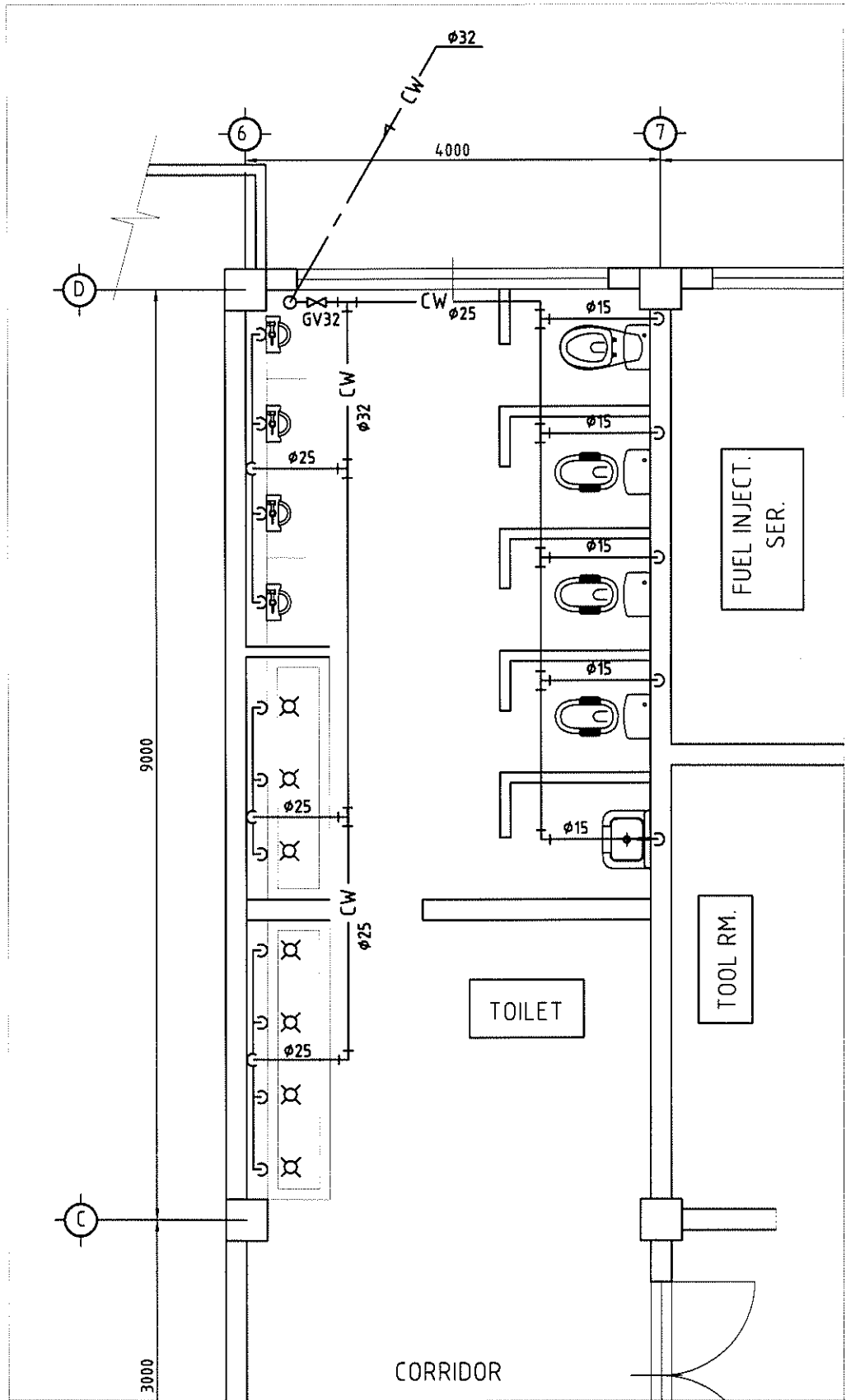


TRAINING BLDG. - 1st. FL LAYOUT PLAN
 S=1/300

LEGENDS

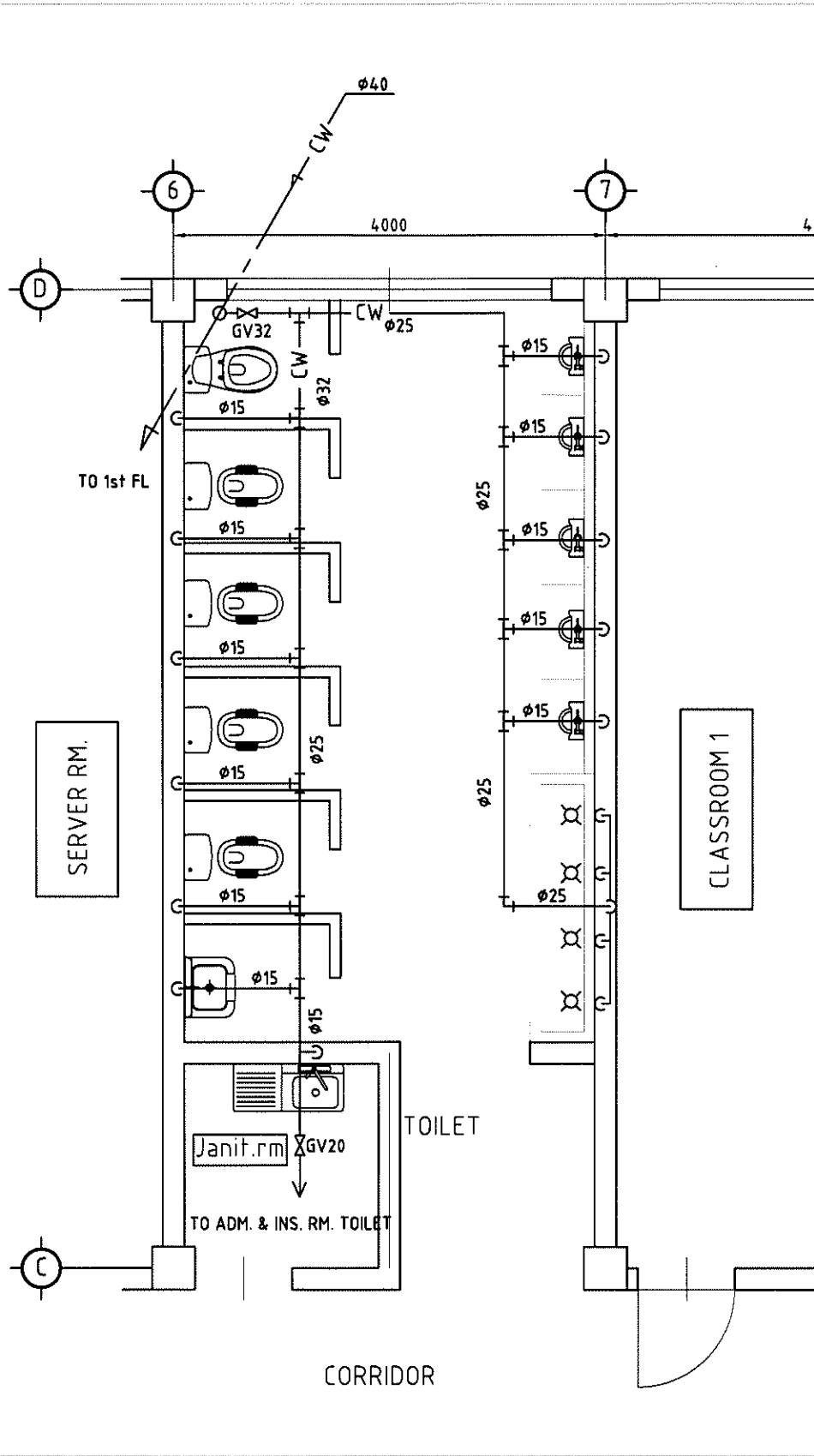
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	INVERT BASIN		WASTE WATER DRAIN PIPE (EXPOSED - UNDER 2nd SLAB)
	CATCH BASIN		SEWAGE DRAIN PIPE (EXPOSED - UNDER 2nd SLAB)
	WATER TAP		VENT PIPE (EXPOSED - UNDER 2nd SLAB)
	WATER CLOSET - LOW TANK TYPE		SERVICE SINK
	WATER CLOSET - HIGH TANK TYPE		URINAL

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	AS SHOWN
	DWG. No.
Training Building (1st Floor Toilet Plan)	
	M-02



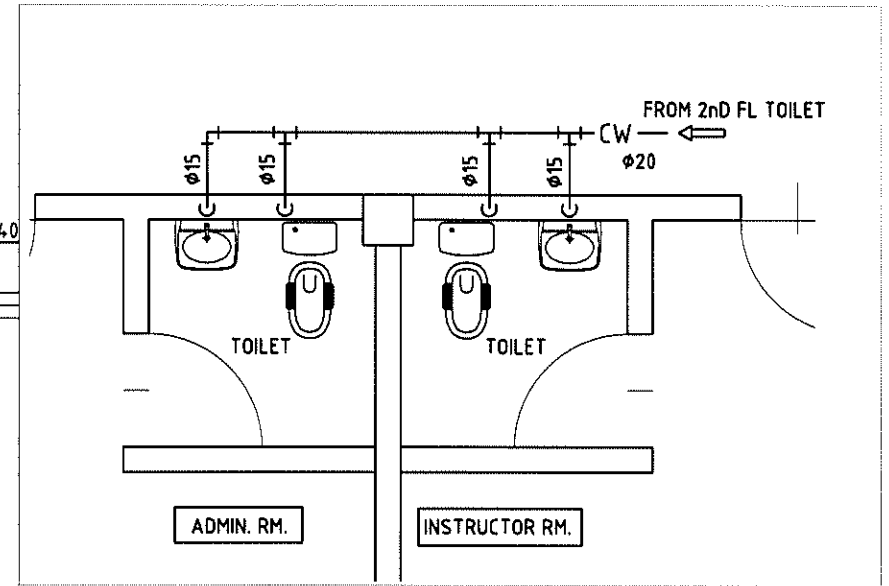
GF FLOOR TOILET
PLUMBING SYSTEM - COLD WATER SUPPLY PIPING PLAN

S=1/60



1st FLOOR TOILET
PLUMBING SYSTEM - COLD WATER SUPPLY PIPING PLAN

S=1/60



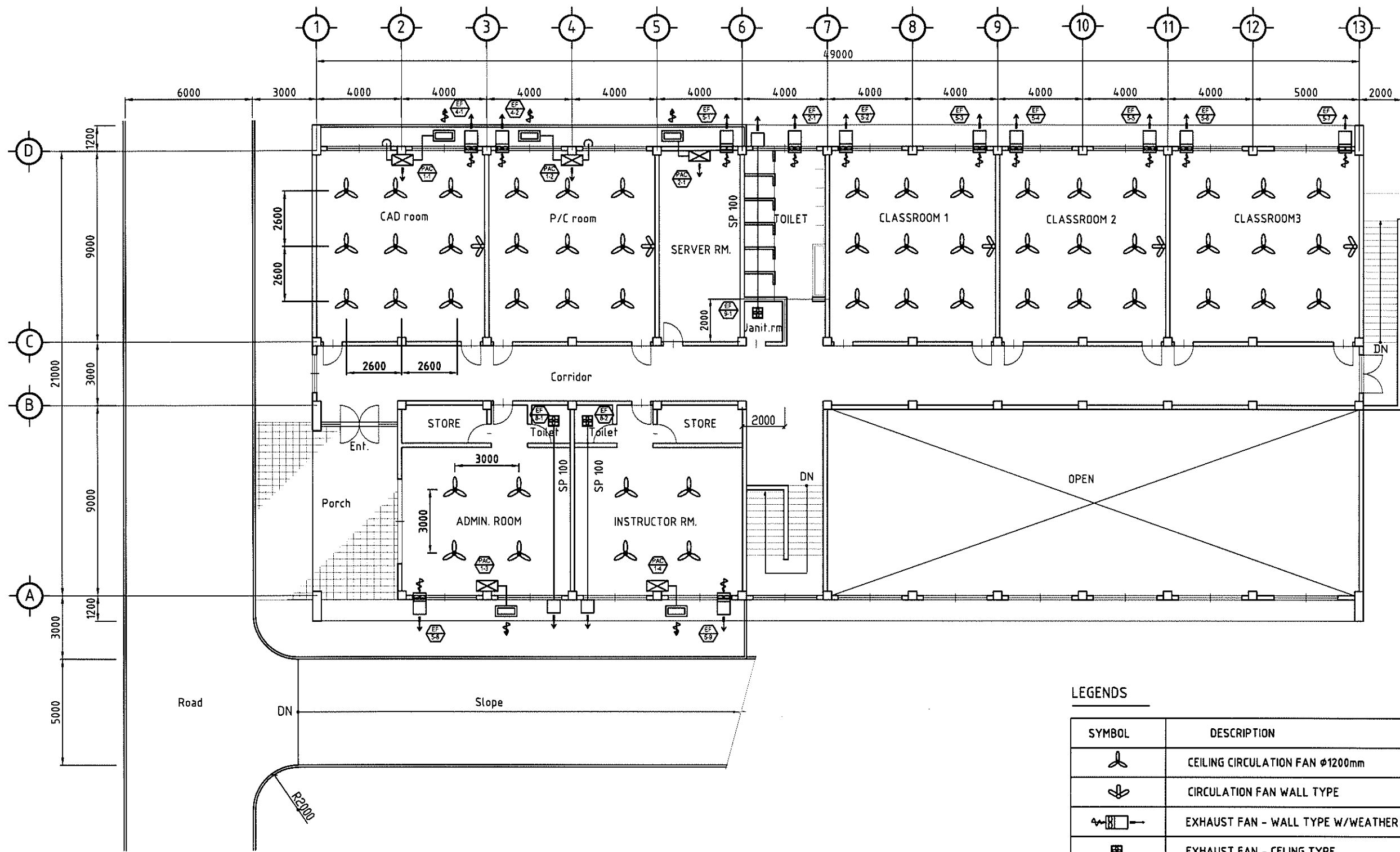
ADMIN & INSTRUCTOR ROOM
PLUMBING SYSTEM - COLD WATER SUPPLY PIPING PLAN

S=1/60

LEGENDS

SYMBOL	DESCRIPTION
	GATE VALVE
	CHECK VALVE
	FLEX. JOINT
	WATER TAP
	COLD WATER SUPPLY PIPE

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	AS SHOWN
Title Training Building (GF & 1st FL Toilet Plan)	DWG. No.
	M-03

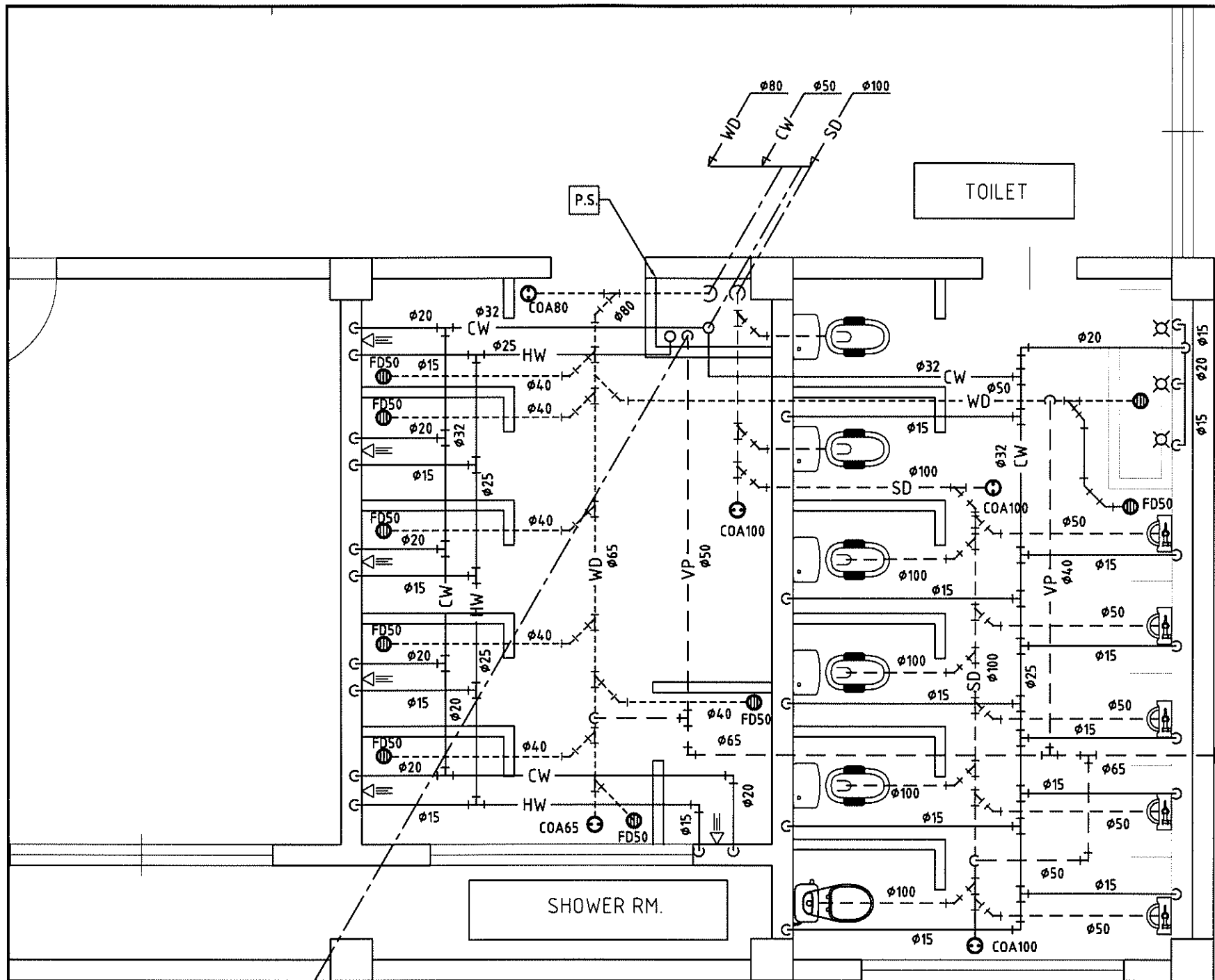


ACMV SYSTEM
1st FLOOR LAYOUT
S=1/200

LEGENDS

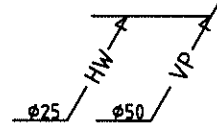
SYMBOL	DESCRIPTION
	CEILING CIRCULATION FAN ϕ 1200mm
	CIRCULATION FAN WALL TYPE
	EXHAUST FAN - WALL TYPE W/WEATHER COVER
	EXHAUST FAN - CELING TYPE
	A/C INDOOR UNIT
	A/C OUTDOOR UNIT
	EXHAUST FAN - CENTRIFUGAL TYPE

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/200
	DWG. No.
Title	
Training Building (1st Floor Ceiling Fan Layout)	
M-04	



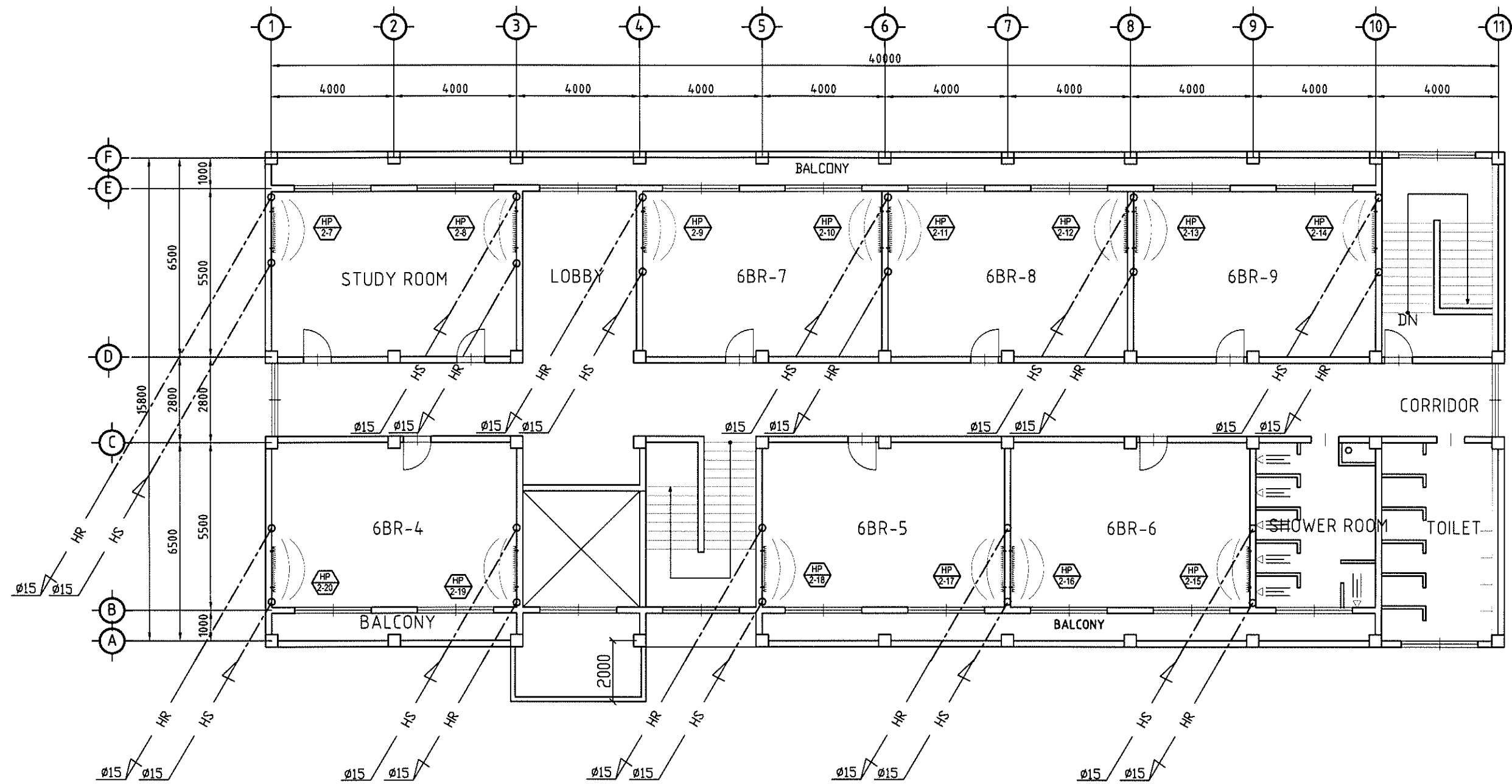
LEGENDS

SYMBOL	DESCRIPTION
	GATE VALVE
	WATER TAP
	SOWER SET
	FLOOR DRAIN
	CLEAN OUT
	LAVATORY
	SERVICE SINK
	WASTE WATER DRAIN PIPE (UNDER THE 2ndFL SLAB)
	SEWAGE DRAIN PIPE (UNDER THE 2ndFL SLAB)
	VENT PIPE
	COLD WATER SUPPLY PIPE (ABOVE 2nd FL CEILING)
	COLD WATER SUPPLY PIPE (ABOVE 2nd FL CEILING)
	WATER CLOSET - SQUAT TYPE
	WATER CLOSET - LOW TANK TYPE
	URINAL
	BATH TUB



1st FLOOR - TOILET & SHOWER ROOM PLAN
 PLUMBING SYSTEM - PIPING LAYOUT PLAN
 S=1/50

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/50
Title Accommodation Building (1st Floor Plumbing System Layout)	DWG. No.
	M-05

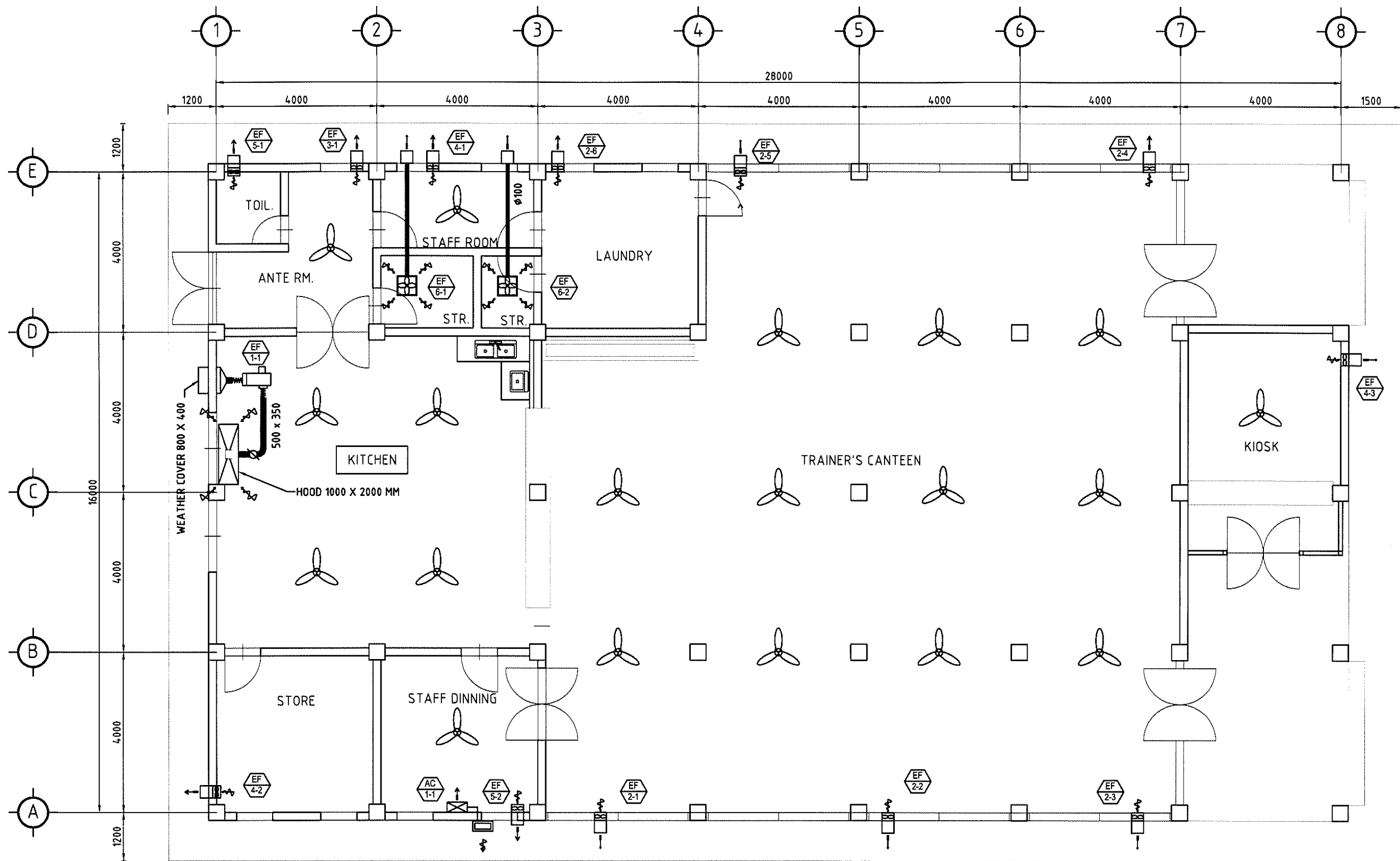


1st FLOOR PLAN - HEATING SYSTEM LAYOUT
S=1/150

LEGENDS

SYMBOL	DESCRIPTION
	HEATING PANEL TYPE VLX70/56
	HEATING PANEL TYPE RX1000
	HOT WATER SUPPLY PIPE
	HOT WATER RETURN PIPE
	COLD WATER SUPPLY PIPE

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan		SCALE
		1/150
Title	Accommodation Building (1st Floor Heating System Layout)	DWG. No.
		M-06



LEGENDS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CEILING CIRCULATION FAN ϕ 1200mm		A/C INDOOR UNIT
	EXHAUST FAN - WALL TYPE W/WEATHER COVER		A/C OUTDOOR UNIT
	EXHAUST FAN - CEILING TYPE		EXHAUST FAN - CENTRIFUGAL TYPE
			VOLUME DAMPER

TRAINER'S CANTEEN PLAN
ACMV SYSTEM LAYOUT
 S=1/100

The Project for Enhancement of Training Capabilities of Construction Machinery Training Institute (CMTI) in the Islamic Republic of Pakistan	SCALE
	1/100
Title Canteen Building (1st Floor Ceiling Fan Layout)	DWG. No.
	M-07

Appendix 6. List of Facilities and Equipment

Appendix 6. List of Facilities and Equipment

	No.	Description of items	Qty
	1.	Class Rooms and Computer/CAD Rooms	
1)	1-a	Class Room, Required Size 25feet x 25feet (approx.)	3
2)	1-b	Computer/ CAD Class Rooms, required size 25feet x 25feet(approx.)	2
3)	1-c	Practice Room for three newly introduced courses with Administrative Room, required size 70 feet x 70 feet (approx.) (additional request)	1
4)	1-d	Desk/ Chair set for students for (1-a) class room	60/150
5)	1-e	Desk/ Chair set for 5 instructors for (1-a) and (1-b) class rooms	5
6)	1-f	Desk/ Chair set for 5 staff for administrative room within practice room	5
7)	1-g	Chairs for Visitors for (1-a) and (1-b) class room	10
8)	1-i	Computer desk/Revolving Chair set for students 2 CAD room : 42 (21+21) Sever room : 2 Size : 600mm × 1000mm of desk	44 set
9)	1-j	Air conditioning system for (1-b) class room	3
10)	1-k	Screen for projector	5 set
	2.	Dormitories for In Living Students	
11)	2-a	Dormitory with 9 student rooms, 1 study room, 5 instructor room and 1 lobby, required capacity for 50 students/5 instructors	1
12)	2-b	Bed with Side Table for students/instructors	55
13)	2-c	Study Table for study room, 8 person per one table	4
14)	2-d	Study Chair for study table	30
15)	2-e	2 Room Chair/1 center table set for instructor's Room	5 set
16)	2-f	Air conditioners for instructor's room	5
	3.	Canteen and Recreation block	
17)	3-a	Canteen including kitchen	1
18)	3-b	Dinning Tables	17
19)	3-c	Dinning Chairs	100
20)	3-d	Air conditioner for one instructor's dining room	1
	4.	Personal computer	
21)	4--a	Desktop Personal Computer • Standard type PC • High end type PC for CAD Display, 17inch	Total: 47 21 26 47
22)	4--b	Sever Computer	2
23)	4--c	Related software •CAD software, e.g. Auto CAD 2005	26
	5.	Networking for CMTI Facility Setup	
24)	5-a	10/1000 Mbps Switch 16 port Switch : 3	112 ports

	No.	Description of items	Qty
		32 port Switch : 2	
25)	5-b	Wall Mount Rack With Fan Rack With Fan on floor	2
26)	5-c	UTP cable • 20m UTP cable 2 lines • 15m UTP cable 1 line • 10m UTP cable 54 lines	Total:5 95 m
27)	5-d	A4 monochrome laser Jet Printer, 1200dpi	2
28)	5-e	A3 color laser Jet Printer, 1200dpi	1
29)	5-f	A1 color plotter, 1200dpi	1
30)	5-g	Multimedia Projector	2
31)	5-h	UPS 1,500VA	2
	6.	Construction Equipments	
32)	6-a-1	Bulldozer (220 HP class) with ripper	2
33)	6-a-2	Bulldozer (220 HP class) with winch	1
34)	6-b.	Hydraulic Excavator Tractor Type, 0.7m ³ class	3
35)	6-c.	Hydraulic Excavator Wheel type, 0.43m class	2
36)	6-d.	Motor Grader	1
37)	6-e.	Wheel Loader, 150 HP class	3
38)	6-f.	Rough terrain Crane, 25 ton class	1
39)	6-g.	Spare parts for above equipment	1 lot
	8.	Transport/Equipment for Administration of Institute	
40)	8-a	Mini Bus	2
41)	8-b	Pickup Car with single cabin	1
42)	8-c	Generator Set 20 KVA, 3 Phase, 440 Volts	1
	9.	Testing Equipment for Diploma Course	
43)	9-a	Toe-in-Gauge	1
44)	9-b	Camber Caster King Pin	1
45)	9-c	Turning Radius Gauges	1
46)	9-d	Brake Tester	1
47)	9-e	Side Slip Tester	1
	10-a-	Vehicle Mechanic Course	
48)	10-a-1	Power steering assembly (C-AM)*	1
49)	10-a-2	Truck forecarriage (AP)**	1
50)	10-a-3	Hydraulic operated clutch (OHP-Ts)***, for heavy vehicle	1 set
51)	10-a-4	Gear Box with Reduction (C-AM), for heavy vehicle	1
52)	10-a-5	Double Clutch (Hydraulic + Mechanical), for heavy vehicle (C-AM)	1
53)	10-a-6	Ackerman steering system (OHP-Ts)	1 set
54)	10-a-7	Ignition Distributor with Advanced and Retarded Ignition (OHP-Ts), for heavy vehicle	1 set
55)	10-a-8	Alternator (C-AM), for heavy vehicle	1
56)	10-a-9	Vacuum Advance at an Ignition Distributor (OHP-Ts), for heavy vehicle	1 set

	No.	Description of items	Qty
57)	10-a-11	Truck Diesel Engine with Turbocharger and Intercooler (C-AM), for heavy vehicle	1
58)	10-a-12	Petrol engine model (C-AM)	1
59)	10-a-14	In-Line type Fuel Injection Pump with Centrifugal Governor (C-AM), for heavy vehicle	1
60)	10-a-15	Live diesel engines on rotating stand (AP)	2
61)	10-a-16	KE-Jetronic trainer instruction board	1
62)	10-a-17	Sectioned turbocharger (C-AM)	1
63)	10-a-22	Wheel balancer, for truck	1
64)	10-a-23	Tyre changer, for truck	1
65)	10-a-24	Tyre gauge	2
66)	10-a-25	Portable gantry crane with chain block	2
67)	10-a-26	Actual engine of full set type, practical training (Gasoline)	2
68)	10-a-28	Camber, caster, kingpin gauge	2
69)	10-a-29	Turning Radius Gauge	1
70)	10-a-33	Cylinder head stand, but for heavy vehicle	2
71)	10-a-34	Fuel injector pressure tester kit	2
72)	10-a-35	Engine support beam	2
73)	10-a-36	Pressure brake bleeder	1
74)	10-a-38	Engine stand for heavy vehicle	4
75)	10-a-39	Hydraulic press for heavy vehicle	1
76)	10-a-40	Platform truck	4
77)	10-a-41	Steel wall rack	4
78)	10-a-42	Car creeper	4
79)	10-a-43	Angle grinder	2
80)	10-a-44	Dial test indicator (plunger type)	2
81)	10-a-45	Drill press	2
82)	10-a-46	Combustion leakage tester	2
83)	10-a-48	Shop press	1
84)	10-a-49	Diesel smoke meter	1
85)	10-a-50	Automatic air inflator	1
86)	10-a-51	Vertical boring machine (Portable)	1
87)	10-a-52	Cylinder honing machine (Portable)	1
88)	10-a-53	Vulcanizing machine	2
89)	10-a-54	Vacuum gauge for diesel engine for heavy vehicle	2
90)	10-a-55	Vacuum fuel pump gauge	1
91)	10-a-56	Valve spring tester	2
92)	10-a-57	Portable hydraulic jack	4
93)	10-a-58	Brake lining riveter	1
94)	10-a-59	Electric drill	2
95)	10-a-60	Piston ring groove cleaner	1
96)	10-a-61	Battery hydrometer	2 set

	No.	Description of items	Qty
97)	10-a-62	Diesel timing and tacho tester	4
98)	10-a-63	Tripod stand (Stand for display board)	6
99)	10-a-64	Rack and pinion type of steering box	1
100)	10-a-67	Brake/speed meter tester	1
101)	10-a-68	Electric Gasoline Injection system (animated board)	1
102)	10-a-69	Bench electric grinder	1
103)	10-a-70	Compression gauge for diesel engine	2
104)	10-a-71	Painting equipment, 6 items	1 set
	71-1	Air pressure regulator	1
	71-2	Spray gun : gravity feed type 1.3mm	1
	71-3	Spray gun : suction feed type 1.3mm	1
	71-4	Container : gravity feed type 400cc	1
	71-5	Container : suction feed type 1,000cc	1
	71-6	Air hose : 10m	1
105)	10-a-72	Tool for automobile, 101 different tools for heavy vehicle	1 lot
	72-1	Hacksaw frame & spare blade 12pcs	16
	72-2	Adjustable wrench, 250, 375 & 600mm	16
	72-3	Screw plate, M3 to M20 (Fine & Coarse)	4
	72-4	Ball peen hammer, 450 & 900g	16
	72-5	Pin punch, 3.2, 4.5 & 8mm	16
	72-6	Flat chisel, 19 & 25mm in width	16
	72-7	Combination pliers, 150 & 200mm	16
	72-8	Combination wrench set, 8~22mm (10kinds/set)	4
	72-9	Copper hammer, 1,300g	8
	72-10	Cross rim wrench(S): 17x19x21x23mm	16
	72-11	Cross rim wrench(L): 27x30x32x33mm	16
	72-12	Diagonal cutting pliers, 150mm	16
	72-13	Double offset box wrench, 6x7~18x19mm (7kinds/set)	8
	72-14	Engineer's file set, 250mm, medium cut (5kinds/set)	8
	72-15	External micrometer, 25~50mm	8
	72-16	Thickness gauge, 75mm(L), 0.04~0.3mm(T) (9 lives)	16
	72-17	Hose pinch-off pliers, 245mm	4
	72-18	Plastic funnel, 175mm	16
	72-19	Gasket scraper	16
	72-20	Grease gun, 400cc, 25MPa	8
	72-21	Vice grip pliers, curved jaw, 210mm	16
	72-22	Drum pump	2
	72-23	Adjustable pipe wrench, 350 & 600mm	16
	72-24	1/2"sq. Socket wrench set, 20-sockets & handles	2
	72-25	3/4"sq. Socket wrench set, 11-sockets & handles	2
	72-26	L-type hexagon wrench, 2.5~10mm (7kinds/set)	16
	72-27	Magnetic finger, 500mm	2

No.	Description of items	Qty
72-28	Mechanists vise, 100mm with swivel base	16
72-29	Metal tool box, 400x200x190mm or more	4
72-30	Tube cutter, 3~16mm	16
72-31	Needle file set (5kinds/set)	16
72-32	Pistol oilier, metal	8
72-33	Oil stone, 100x25x13mm (Combination type)	4
72-34	Open end wrench, 5.5 or 6~24mm (6kinds/set)	8
72-35	Open end wrench, 5/16"~7/8" (6kinds/set) or wider	8
72-36	Center punch	16
72-37	Prick punch	16
72-38	Solid punch	16
72-39	Spark plug socket, 1/2"-16, 19 & 20.8mm	16
72-40	Radio pincher, 150mm	16
72-41	Rubber hammer, 450g	8
72-42	Stubby Driver, (+) & (-)	16
72-43	Screw driver, Phillips head set, #0 to #4 (5kinds/set)	16
72-44	Screw driver set, 50, 75, 100, 150, 200mm (6knds/set)	16
72-45	Screw extractor set, For 1/8~3/4" (5kinds/set)	16
72-46	Side cutting pliers, 175 & 200mm	16
72-47	Snapping pliers (internal), 6~10mm dia. or wide	16
72-48	Snapping pliers (external), 5~28mm dia. or wider	16
72-49	Plug wrench, M10x380mm(L) & M14x500mm(L) or longer	16
72-50	Belt (strap) wrench, 15~280mm dia	16
72-51	Stud remover, 19mm dia.	16
72-52	Tappet wrench, 10x12, 12x14, 17x19mm (each 2pcs/set)	16
72-53	Test hammer, 100g	16
72-54	T-type hexagon wrench, 2.5~10mm (7kinds/set)	16
72-55	T-handle screw driver, Phillips head, #2	16
72-56	Venire caliper, 0~150 & 0~200mm	8
72-57	Vice pliers, curve jaw, 210mm	16
72-58	Water pump pliers, 250mm	16
72-59	Connecting rod aligner, 50~105mm dia. or wider	1
72-60	Cylinder liner puller, 82~150mm dia. or wider	2
72-61	Piston ring compressor, 75~175mm dia. or wider	2
72-62	Clutch aligner, For truck and bus	2
72-63	Universal wheel hub puller, For truck (Front)	4
72-64	Universal wheel hub puller, For truck (Rear)	4
72-65	Torque multiplier for wheel nut, Socket 21 & 41mm	1
72-66	Valve spring compressor for OHV valve	2
72-67	Drain plug wrench set	2
72-68	K jetronic mixture adjusting key wrench	2
72-69	Brake service tool set (for Drum & Disc brake)	4

	No.	Description of items	Qty
	72-70	Ball joint separator for small car to medium truck	4
	72-71	Torque multiplier, Torque ratio 1 : 6 or more	2
	72-72	Snapping pliers set, internal / external, 10~80mm dia.	1
	72-73	Hydraulic nut splitter	2
	72-74	Tire bead breaker	4
	72-75	Coil spring compressor	4
	72-76	Brake spring pliers, approx. 300mm & 500mm	4
	72-77	Shoe hold spring cap tool (2kinds/set)	4
	72-78	Cold patch set for tube repair	4
	72-79	Wheel bearing puller for large truck	4
	72-80	Cylinder ridge reamer, 75~125mm or wider	1
	72-81	Flywheel pilot bearing puller, 24~39mm dia. or wider	2
	72-82	Torque wrench, 20~130Nm or wider	2
	72-83	Torque wrench, 50~280Nm or wider	2
	72-84	Torque wrench, 150~850Nm or wider	2
	72-85	Thread restorer, P=0.75 to 3mm (8kinds)	4
	72-86	Tube cutting & flaring tool set for brake pipe	2
	72-87	Automotive puller set for large vehicle with board	2
	72-88	Stainless straight rule, 150, 300, 600 & 1,000mm	4
	72-89	Straight rule stand for 300mm scale	4
	72-90	Height gauge, 0~300mm	4
	72-91	Square, 150mm with base	4
	72-92	Caliper, inside, outside & hermaphrodite (3kinds/set)	4
	72-93	Surface gauge, 200mm with square base	4
	72-94	Straight edge, 300mm	4
	72-95	Surface plate, 300x300x50mm or more	4
	72-96	Inside micrometer, 25~50mm or wider	4
	72-97	Dial indicator, 0~10mm (0.01mm) with magnetic base	4
	72-98	Tire depth gauge, 0~50mm (0.05mm) or wider	4
	72-99	Thermometer, 0~100°C with protector	8
	72-100	Cylinder gauge, 50~150mm	8
	72-101	Shock driver with bits (-) & (+) each 2pcs	8
106)	10-a-73	Safety equipment, 6 items	17 set
	73-1	Goggles	1
	73-2	Respirator	1
	73-3	Ear muffs	1
	73-4	Gloves	1
	73-5	Helmet	1
	73-6	Safety shoes	1
107)	10-a-74	HC/CO tester	1
108)	10-a-75	Engine crane, 1,000kg	1
	10-b-	Vehicle Electrician Course	

	No.	Description of items	Qty
109)	10-b-1	Electric wiring training board	1
110)	10-b-2	Ignition system trainer	1
111)	10-b-3	Truck (Diesel) Electric Devices Trainer for heavy vehicle	1
112)	10-b-4	Tacho / dwell meter for gasoline engine	1
113)	10-b-5	Engine tuner for gasoline engine	1
114)	10-b-6	Insulation tester for gasoline engine	1
115)	10-b-8	Ignition system (OHP-Ts), but for Magneto Ignition	1
116)	10-b-10	Headlight tester	1
117)	10-b-11	Battery drop tester	1
118)	10-b-12	Starter charger, for gasoline engine	1
119)	10-b-13	Ignition tester (motor scope), for gasoline engine	1
120)	10-b-15	Disc grinder	1
121)	10-b-16	Silicon normal charger	1
122)	10-b-18	Growler armature tester	1
123)	10-b-21	Distributor test bench	1
124)	10-b-23	Alternator modern type and old type each (C-AM)	4
125)	10-b-24	Bench electric grinder	1
126)	10-b-25	Diesel timing and tacho tester	2
127)	10-b-26	Air compressor for heavy vehicle	1
128)	10-b-27	Electric drill	2
129)	10-b-28	D.C. volt ampere meter	4
130)	10-b-29	Ohm meter	4
131)	10-b-30	Battery hydrometer	2 set
132)	10-b-31	Battery tester, for heavy vehicle	2
133)	10-b-32	Circuit tester	4
134)	10-b-34	Tool for auto-electrician, 44 different tools, but for heavy vehicle	1set
	34-1	Magnetic ratchet screw driver with bits & sockets	8
	34-2	Hacksaw frame & spare blade 12pcs	16
	34-3	Adjustable wrench, 150, 200 & 250mm	8
	34-4	Adjustable Reamer Set, $\phi 12 \sim 27$ mm	4
	34-5	Screw plate, M3 to M20 (Fine & Coarse)	8
	34-6	Ball peen hammer, 450 & 900g	16
	34-7	1/2"sq. Socket wrench set; 8~19mm 12-sockets, 8~19mm 12-long sockets & handles	8
	34-8	Pin punch, approx. 3, 5 & 8mm	16
	34-9	Chisel & Punch set (11kinds/set)	16
	34-10	Combination pliers, 150 & 200mm	16
	34-11	Combination wrench set, 8~22mm (10kinds/set)	4
	34-12	Copper hammer, 900g	8
	34-13	Claw hammer, 450g or more	8
	34-14	Double offset box wrench, 6x7~18x19mm (7kinds/set)	8
	34-15	Hand drill, $\phi 6.5$ mm in dia.	2

	No.	Description of items	Qty
	34-16	Electric soldering iron set : Two(2)soldering iron, disordering pump & solder	16
	34-17	Electrical insulated screw driver set : (+) #0, #1, #2 & (-) 75, 100, 125, 150mm (7knds/set)	16
	34-18	Electrician knife	16
	34-19	Engineer's file set, 250mm, medium cut (5kinds/set)	8
	34-20	Engineer's file set, 150mm, fine cut (5kinds/set)	8
	34-21	Thickness gauge, 75mm(L), 0.04~0.3mm(T) (9 lives) or more	16
	34-22	Vice grip pliers, curved jaw, 210mm	16
	34-23	Hand spring balance, 10kg	4
	34-24	Adjustable pipe wrench, 300 & 450mm	16
	34-25	L-type hexagon wrench, 6~19mm (12kinds/set)	8
	34-26	Long nose pliers, 150mm or more	16
	34-27	Mechanists vise, 100mm with swivel base	16
	34-28	Open end wrench, 6~24mm or wider(6kinds/set)	8
	34-29	Open end wrench, 5/16"~7/8"or wider (6kinds/set)	8
	34-30	Center punch	16
	34-31	Prick punch	16
	34-32	Solid punch	16
	34-33	Radio pincher, 150mm	16
	34-34	Rubber hammer, 450g	16
	34-35	Side cutting pliers, 175 & 200mm	16
	34-36	Soft hammer, 450g	16
	34-37	Stainless straight rule, 300, 600 & 1,000mm	16
	34-38	Torch lamp, gasoline 1 liter	4
	34-39	Water pump pliers, 250mm	16
	34-40	Spark plug wrench set, 3/8"-16 & 20.8mm & handles	2
	34-41	Arbor press, 1ton	1
	34-42	Thermometer, 0~150°C with protector	16
	34-43	Spark plug gap gauge (9 leaves)	16
	34-44	Solderless terminal kit with terminal pliers	16
135)	10-b-35	Safety equipment, 6 items	17 set
	35-1	Goggles	1
	35-2	Respirator	1
	35-3	Ear muffs	1
	35-4	Gloves	1
	35-5	Helmet	1
	35-6	Safety shoes	1
	10-c-	Welding and Fabrication Course	
136)	10-c-2	Shear cutting machine	1
137)	10-c-3	MIG welder (Portable), Semiautomatic type	2
138)	10-c-4	TIG welder (Portable)	2
139)	10-c-5	Bench grinder	4

	No.	Description of items	Qty
140)	10-c-6	AC Arc welder	8
141)	10-c-7	Power hacksaw	1
142)	10-c-8	Electric drill	4
143)	10-c-9	Gas welder set	10
144)	10-c-10	Drilling press	2
145)	10-c-13	Spot welding machine	1
146)	10-c-14	Bending roller machine, but for manual operation	1
147)	10-c-15	Angle grinder	2
148)	10-c-17	Engine welder	1
149)	10-c-18	Vertical drilling machine	1
150)	10-c-19	High speed cutting machine (Portable)	1
151)	10-c-20	Compressor	1
152)	10-c-21	Painting equipment, 6 items	1set
	21-1	Air pressure regulator	1
	21-2	Spray gun : gravity feed type 1.3mm	1
	21-3	Spray gun : suction feed type 1.3mm	1
	21-4	Container : gravity feed type 400cc	1
	21-5	Container : suction feed type 1,000cc	1
	21-6	Air hose : 10m	1
153)	10-c-22	Tool for welding and fabrication, 30 tools, for heavy vehicle	1set
	22-1	Hacksaw frame & spare blade 12pcs	16
	22-2	Adjustable wrench, 150, 200 & 250mm	16
	22-3	Air rivet gun, Rivet dia.: 2.4, 3.2, 4, 4.8mm	4
	22-4	Anvil, 15kg	8
	22-5	Ball peen hammer, 450 & 900g	16
	22-6	Mechanists vise, 100mm with swivel base	8
	22-7	Cast iron swage block, 75kg	8
	22-8	Center punch (3kinds/set)	16
	22-9	Combination pliers, 150 & 200mm	16
	22-10	Combination wrench set, 8~22mm (10kinds/set)	8
	22-11	Compass, 120mm	16
	22-12	Divider, 200mm	16
	22-13	Double offset box wrench, 6x7~18x19mm (7kinds/set)	8
	22-14	Engineer's file set, 250mm, medium cut (5kinds/set)	16
	22-15	Figure & Letter Punch set, 4mm	4
	22-16	Hand lever shears, Blade length: 200 mm	4
	22-17	Oilier, metal 250cc	16
	22-18	Open end wrench, 6~24mm (6kinds/set)	16
	22-19	Open end wrench, 5/16"~7/8" (6kinds/set)	16
	22-20	Torch, gasoline, 1 liter	8
	22-21	Scriber, 200mm or more	16
	22-22	Square (Flat Type), 300x200mm	4

	No.	Description of items	Qty
	22-23	Stainless straight rule, 300, 600 & 1,000mm	16
	22-24	Surface plate, 300x300x50mm	4
	22-25	Trammel, Beam Set, 265~500mm or wider	4
	22-26	Venire caliper, 0~150 & 0~300mm	8
	22-27	Water pump pliers, 250mm	16
	22-28	Wire Brush, 50mm	16
	22-29	Surface gauge, 200mm with square base	4
	22-30	Fender tool set, 9kinds/set	16
154)	10-c-23	Safety equipment, 6 items	17 set
	23-1	Goggles	1
	23-2	Respirator	1
	23-3	Ear muffs	1
	23-4	Gloves	1
	23-5	Helmet	1
	23-6	Safety shoes	1
	10-d-	Work table	
155)	10-d-1	Work bench with drawer, Dimensions: approx. 1,800 x 750 x 740mm	12
156)	10-d-2	Pallet rack with shelf panel (3 sections), Dimensions: approx. 2,300x1, 100 x 3, 000mm	2
157)	10-d-3	Parts & Tool rack, medium duty (6 shelves) Dimensions: approx. 2,700x1, 100 x 3, 000mm	3
158)	10-d-4	Parts & Tool rack, medium duty (6 shelves)	8
159)	10-d-5	Parts & Tool rack, medium duty (5 shelves)	8

* C-AM: Cut-Away Model

** AP: Actual parts

*** OHP-Ts: OHP Transparent Sheet