

A Report Prepared For USAID-Egypt  
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through

The Academy For Educational Development  
Washington, D.C.

A STUDY TO DETERMINE THE FEASIBILITY OF ESTABLISHING  
A VOCATIONAL TRAINING CENTER IN CAIRO FOR  
SKILLED BUS AND TRUCK MAINTENANCE WORKERS  
AS PROPOSED BY  
THE GENERAL SYNDICATE FOR LAND TRANSPORT

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## FORWARD

There were a number of constraints operating in carrying out this feasibility study including a delay of a month in activating the contract which brought me to Egypt on August 11, 1970 instead of the first of July; a delay of almost two weeks in bringing on Dr. Schank to assist in the project and finally the fact that the Ramadan observation was in full swing during the entire period of gathering information, making appointments and visits somewhat difficult. In addition to these limitations, the man primarily responsible for the GSLT proposal, Mr. Sabet, Chairman of General Nile Automotive Repair Company was not available for discussions until August 23, twelve days after I arrived in Egypt.

Despite these limitations we were able to complete the study on schedule because of the excellent support of Dale DeButts, the personable AID/Cairo Education Officer who made it his business to see that we had the appropriate facilities and an Egyptian expert to assist us with the research. Mr. Sobhi Abulsaad, Educational Planning Specialist made appointments with people in the various ministries and bus companies and provided a wealth of information in response to innumerable questions. His input made it possible for us to gather the needed data. The extensive survey he had prepared on Vocational Education In Egypt was our primary source of information and it is to be highly recommended to anyone interested in this area. A special thanks to both of these men for their sincere helpfulness.

Another factor which facilitated our efforts was the very positive attitude of the Cairo AID and Embassy people in general toward contractors. Dr. Applegate's office, finance, travel, the nurse, Marine guards, the people who run the Guest House, all contributed to making our stay both pleasant and productive. We would do it all again!

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**A. INTRODUCTION****1. Purpose**

The purpose of this Report is to respond to the objective set forth in AID Contract No. AID afx-C-1131, Work Order No. 39 with the Academy For Educational Development and carried out by Dr. William S. Reynolds with the assistance of Dr. Kenneth Schank.

**2. Objective**

To conduct a feasibility study concerning the formation of a vocational Training Center in Cairo (Egypt) serving the General Syndicate for Land Transportation.

**B. SCOPE OF WORK**

The Contractor shall be responsible for:

1. Conducting a study proposed by the General Syndicate for Land Transportation (GSLT) to determine the feasibility of establishing a Vocational Training Center (VTC) in Cairo to meet the training needs of maintenance personnel of the bus and truck transportation industries. The study will include but not be limited to:
  - a. An assessment of current training activities for skilled and semi-skilled personnel within the GSLT purview.
  - b. A determination of demand for skilled and semi-skilled workers in vehicle maintenance to be trained in the proposed VTC.
  - c. Identification of the source or supply of personnel for training in the proposed Vocational Training Center.
  - d. An estimation of the recurrent costs involved in the operation of a VTC.
  - e. An estimation of the capital and equipment costs required to establish a VTC.
  - f. A determination of the supply and training of instructors for a VTC.
  - g. A determination of the organizational/administrative structure of a VTC.
  - h. A design for the workshops and an equipment layout for a VTC.
  - i. Identification of the courses to be taught at the VTC and the process for the establishment of a system for curriculum development.

- j. Recommendations for alternative courses of action for possible donor assistance to either the overall VTC institution or specific segments of it.

### C. REQUEST FOR ASSISTANCE

Early in 1977 the General Syndicate for Land Transportation (GSLT) requested assistance from AID/Cairo to develop a vocational training center (VTC) in the Mataria District of Cairo for training and upgrading bus mechanics and technicians for the Cairo area. GSLT is a labor organization operating under the direct authority of the General Trade Union of Egypt (GTU). It should be noted that the President of GTU, Mr. Mohamed El Okeily, who signed off on the request proposal is also the Minister of Manpower and Vocational Training.

There are approximately 360,000 members in the GSLT from both the public and private sectors. They are governed by a committee of representatives composed of 89 members from throughout the country.

The GSLT has had architectural plans drawn up and has started construction on the VTC in the Mataria District of Cairo, using land they already owned. President Sadat has indicated a particular interest in this project as evidenced by his laying the cornerstone and making a commitment to return for the dedication. Thus, there is ample evidence of a strong commitment by the Egyptians to implement their proposal.

### D. NEEDS ASSESSMENT

#### 1. Demand Factors

Discussions with and documents from the Ministries of Education, Industry and Manpower indicate a serious shortage of skilled workers required to support the industrial expansion and priority development programs. The flow of skilled workers to higher paying jobs in neighboring Arab oil states further accentuates the insufficient supply.

One segment that is in serious difficulty at this time is the heavy equipment industry, especially public transport. The influx of 1600 buses under the AID Commodity Import Program has created an additional demand on the already short supply of skilled maintenance workers. The modest training program under the Ward bus company contract was of course not designed to meet the country's continuing need for skilled bus maintenance workers. An additional 1 020 buses are soon to be ordered stretching even further the already scarce supply of skilled workers.

A 1976/77 report from Cairo Transport Authority (serving greater Cairo) shows that they had the following numbers of buses:

Old buses	-	1323
New buses	-	1054
Ward buses	-	400
Total	-	2777

Note: No details were given as to ages of buses in these categories.

The Five Year Plan for 1976 to 1980 shows an intent to import 1587 additional buses for Cairo. The 400 Ward buses are included in this figure. This represents a 66% increase in the number of buses in Cairo alone! Reports show that in addition to the Cairo buses noted above there are about 3,325 intercity buses operating (including 1,000 from Ward). The total buses operational excluding Alexandria is something in the neighborhood of 6,102.

A survey of the two largest heavy vehicle maintenance companies, the General Nile Company and the Agency For Public Transport shows the following immediate needs for skilled mechanics in directly related trade areas.

Company Skill	General Nile Co. for Cairo Buses	General Nile Co. for Upper Egypt Buses	General Nile Co. for Mid Delta Buses	General Nile Co. for East Delta Buses	Agency for Public Transport, Cairo
Diesel Mechanics	362	90	328	250	520
Machine Lathe Operation	32	10	58	50	20
Welding	20	10	47	50	20
Sheet Metal & Body Work	120	40	48	75	0
Blacksmith	20	30	24	75	200
<u>TOTALS</u>	554	180	505	500	760

## 2. Supply Factors

There are two major sources of general auto mechanics, the Ministry of Education (MOE) and the Ministry of Industry and Mineral Resources (MIR). The output of these programs in trades related to diesel bus maintenance are shown below:

	<u>MOE (76/77)</u>	<u>MOI (1975)</u>
Auto Mechanics	1,312	147
Diesel Mechanics	NA	10
Auto Electricity	30	94
Metal Turning	2,529	241
Welding	811	232
Black Smithing	0	53
Forging	5	NA
Sheet Metal	NA	169

Source: MOE and MOI Statistics

#### E. ANALYSIS OF SUPPLY AND DEMAND

Several observations can be made in regard to supply and demand. First, only 10 diesel mechanics were supplied to the entire country in the 75-76 year and only 27 in the past five years by the public sector training programs. Weighed against the indicated demand for 100 per year by the two largest bus maintenance companies alone, it is quite obvious that there is a serious shortage. Add to this the information previously noted regarding a 66% increase in Cairo buses to 1980, it would appear that the actual need far exceeds the estimate reported in the survey. Engineer Sanad, who is the new president of the Greater Cairo Bus Company, reported that 1.7 technical specialist were needed for each bus. This factor multiplied by the expected import of 1587 new buses for Cairo shows a demand for 2,697 skilled mechanics to 1980! From these figures it is evident that Egypt will not be able to meet this urgent need without a massive effort.

Analysis of the other related areas listed in the MOE/MOI statistics is more complex as these skilled trades are not only in demand by automotive and heavy vehicle repair stations, but also the industrial sector which absorbs the bulk of those in metal turning, welding, sheet metal, black smithing and forging. Detailed manpower figures on placement in these areas are unavailable, but it seems safe to say that very few graduates find their way into the maintenance of diesel buses.

In summary then, it is evident that there is both a severe current and long range shortage of diesel mechanics and in most of the specialty areas related to heavy equipment maintenance.

Visits to vocational schools operated by the Productivity and Vocational Training Department (PVTD) of the MOI and the Industrial Schools operated by the MOE, indicate a need to upgrade the school administration, staff and program. Some of the major indicators are:

Ineffective management of facilities as evidenced by extreme filth, wasted space, broken and old equipment, dangerous conditions, buildings in various stages of deterioration and lack of proper supervision.

Inflated administrative staffs with four or more assistants to each school director. Excessive support staff who often fail to do even the minimum required.

Locked in curriculum often developed 10 to 20 years ago by foreign technicians. No evidence of close relationship to industry through advisory councils to maintain currency of course content.

Both Undersecretaries for Vocational Training of the MOE and MOI have asked AID for assistance to upgrade their total programs including the conditions noted above. Since the GSLT Vocational Training Center under development is a fresh start in that it is not tied to the entrenched programs of either the MOE or MOI, it offers a unique opportunity to set new and progressive standards of quality in both management and instruction. Further, Engineer Sabet, Chairman of General Nile Automotive repairs, reports that there are no formal training programs for preparing skilled bus maintenance workers in Egypt.

Considering the severe shortage of heavy equipment maintenance workers, the rapidly increasing bus fleet, the very limited number of mechanics now being turned out by MOI and others, and the lack of similar facilities, it is my recommendation that USAID/Cairo fund the proposed VTC.

#### F. PROJECT PROPOSAL

The basic purpose of this project is the development of a model vocational training center for preparing heavy duty vehicle mechanics and support personnel. The facility should represent the latest in contemporary equipment, safety, organization and management consistent with Egyptian needs. Curriculums should be founded on job analysis and industry advisory committee input to maintain a current, realistic program. Course design should follow the performance based format. Contemporary instructional resources should be used to facilitate learning and meet individual student needs. The administration of the center should reflect current educational management procedures such as management by objectives. These purposes should be carried out through AID providing for:

1. Review of building plan developed by GSLT.
2. Equipment and instructional materials for the six proposed shops.
3. Technical assistance to the school director in managing the center.
4. Technical assistance to the shop instructors in developing curriculums and organizing the shops.
5. Participant training for the school administration and shop teachers.

## G. IMPLEMENTATION

### 1. Review of Building Plan

The site was visited with Engineer Saad El Sabet, Chairman of Automotive Nile Repairs Company and the person responsible for the concept of the VTC. The footings were in, columns mostly completed and a few walls started. The concrete work was halted due to a national shortage of cement. Engineer Sabet indicated he would welcome any modifications to the present plans or would be willing to add space according to our recommendations. I explained that the space allocation for the shops as shown on the architect's plans was less than half of that normally provided for typical vocational schools and as a result considerable space would need to be added in order to accommodate the six shops as planned.

A detailed analysis of the plans were made based on the school curriculum, number of students to be accommodated and principles of planning vocational school shops. The analysis and the revised plan is included as Annex A.

### 2. Equipment and Instructional Materials

The proposal submitted by GSLT included a list of equipment needs for the Center. A detailed review of the list shows that it is incomplete in many areas and excessive in others. A new equipment specification list for all six shops has been developed based on the proposed curriculum and the "model school" concept. This list is included as Annex B.

An analysis of audio visual equipment needs has also been made and an appropriate specification list developed as shown in Annex C.

### 3. School Administration Technician

Time: 24 months

Qualifications: M.S. degree in Education; 5 years experience as a certified public vocational school chief administrator; or a vocational teacher educator with 5 years experience in administration, plus extensive cause-work in educational administration.

Responsibilities: Work cooperatively with the school director to:

- a. Develop the facility management plan.
- b. Design and implement a personnel development plan.
- c. Define duties, responsibilities and relationships of teachers, administrators and support personnel.
- d. Design a system for selecting faculty.
- e. Establish an effective record keeping and reporting system.

- f. Develop a system for supervision, evaluation and feedback of staff effectiveness in order to enhance communications and program quality.
- g. Plan an orientation system for introducing new teachers and other personnel.
- h. Involve students and faculty in developing and implementing a system to encourage student participation in school governance and enhance communication between students, faculty and administration.
- i. Assist faculty in establishing advisory committees.
- j. Develop a plan for accumulating appropriate manpower data concerning on-going needs for heavy vehicle mechanics.
- k. Develop a follow-up study program to ascertain placement data and program effectiveness.
- l. Establish the school admission and exit criteria.
- m. Provide on-the-job training for the school director as needed.

4. Diesel Mechanic Technician

Time: 24 months

Qualifications: Certified public vocational school teacher; 5 years experience in teaching diesel mechanics in a public vocational school; 5 years on-the-job experience as a diesel mechanic.

Responsibilities: Work cooperatively with the teaching staff and the school administration to:

- a. Establish Advisory Committees and provide guidance in their development and function.
- b. Arrange and install the equipment supplied by AID.
- c. Develop performance based curriculum in each subject area.
- d. Develop a shop organization and management plan.
- e. Develop instructional materials.
- f. Upgrade technical skills of the staff.
- g. Assist in establishing admission and exit criteria.
- h. Assist in developing appropriate instruments to evaluate student progress in relation to performance objectives.

- i. Maintain contact with technical representatives of engine and heavy duty vehicle companies.

## 5. Participant Training

Visits to both MOE and MOI vocational schools and teacher training programs indicated that there is a significant need to upgrade teachers in contemporary methods and instructional materials (See previous comments). The administrators of these schools also evidenced a need for upgrading. Although the make up of the VTC staff and administration has yet to be determined it is likely that they will have come from preparation in either MOE or MOI vocational programs. For this reason a participant training section should be written into the Program Plan.

Based on the assumption above, the following program has been designed to meet the anticipated needs of the Center's faculty and administration. Final determination of PT needs should be the responsibility of the USAID technicians working with the Director.

### a. Diesel Mechanic Instructors

Purpose: Upgrade teaching and curriculum development skills.

Training Schedule: 12 teachers for 2 months = 24 man months

Daily: 4 hours instruction / 3 hours study  
3 days for field trips

Program: Intensive teacher training program based on an analysis of individual needs to provide for upgrading in: job analysis, performance based curriculum development, instructional methods and materials, evaluation of instruction, shop organization and management and applied psychology of learning.

Training Site: U.S. accredited college with department of vocational-technical teacher education; offering B.S. degree in Education; faculty with international experience; easy access to a variety of vocational schools and city bus or truck maintenance garages handling at least 200 buses/trucks.

Institution: Recommend State University of New York College at Buffalo which has one of the largest industrial education programs in the U.S. and a faculty with considerable international development experience. The Niagara Frontier Transit Authority operates over 400 city buses and complete maintenance facilities.

Contracting Agency: Recommend Academy For Educational Development which has IQC agreement with AID.

b. Administrators of Vocational Training Center

Purpose: Upgrade skills and knowledge of the Center Director and his assistant in administering a vocational training school.

Training Schedule: 2 administrators for 2 months = 24 man months  
Daily: 2 hours instruction / 6 hours internship

Program: Combination study and internship to develop competence in educational planning, program scheduling, supervision and personnel development, facility management, budgeting, record systems and developing performance based curriculums.

Training Site: U.S. accredited college with department of vocational technical education/teacher education; M.S. degree program with major in educational administration; access to area vocational centers containing at least 6 shop programs for internship experience; access to city bus or truck maintenance garage handling at least 200 buses/trucks for purpose of studying the management and organization.

Institution: Recommend State University College at Buffalo which meets all the requirements.

Contracting Agency: Recommend Academy For Educational Development which has IQC agreement with AID.

i. RECOMMENDATIONS FOR VOCATIONAL TRAINING CENTER OPERATION

1. Organization and Structure

A review of the proposal submitted by GSLT shows a highly inflated number of people to operate the Center. Based on the number of shops and the size of student body the following organization table would be appropriate for an efficient operation. All positions are full-time unless otherwise indicated.

Administration (Total 2)

Director

Assistant Director

Faculty (Total 9 + 12 adjuncts)

6 - Shop teachers

3 - General studies and theory teachers

Adjunct Shop Teachers - Employed as needed for special programs

Support (Total 4)

- 1 - Secretary to Director
- 1 - Secretary for student records
- 1 - Receptionist
- 1 - Supply clerk

Maintenance (Total 9)

- 1 - Chief custodian
- 3 - Day custodians
- 1 - Evening custodian
- 4 - Guards

2. Staffinga. Director

The Director of the VTC should be carefully chosen if the model school concept is to be implemented. His qualifications should include: Engineering degree; two years experience as a teacher; three years experience in industry with both technical, supervision and management responsibilities; fluent in English; evidence of a progressive attitude, a willingness to explore new ideas, leadership ability, a cooperative spirit, communication skills and a high degree of personal integrity.

b. Assistant Director

Engineering degree, three years experience as a teacher, two years industrial experience in personnel management, fluent in English; evidence of a progressive attitude, a willingness to explore new ideas, leadership ability, a cooperative spirit, effective communication skills and a high degree of personal integrity.

c. Teachers

Every effort should be made to secure the best qualified teachers who are fluent in English and have: completed high school or technical school, served an appropriate apprenticeship, worked for five years in industry, two years teaching experience; show evidence of a progressive attitude, communication skills, a cooperative spirit and a high degree of personal integrity.

3. Curriculum Development

The prime purpose of the Center is to prepare and upgrade diesel mechanics. The apprenticeship format used by MOI in their PVTD programs would seem to be appropriate to this situation. This provides for a 3 year program with the first year being full-time in school, the second year allows for

2 days in school and 4 days for on-the-job training, the third allows for 1 day at school and 5 on-the-job. Determination of how much time is needed for school versus on-the-job training should be made through the standard curriculum procedures outlined below.

- a. Form an Advisory Committee composed of: one each truck and bus maintenance garage managers; 2 each bus and truck maintenance mechanics, appropriate shop teacher from VTC and the Center Director or his assistant.
- b. Review existing job analysis for the diesel mechanic and each speciality area; revise to suit local conditions.
- c. Develop list of performance based objectives from the job analysis.
- d. Organize into appropriate teaching-learning format (courses).
- e. Establish time frame requirements.
- f. Develop evaluation instruments.
- g. Review curriculum yearly to adjust to changing requirements of the trade.

The second major purpose of the Center is to upgrade diesel mechanics. The curriculum for this program should be developed using the same procedures as noted above. An additional important step would be the development of a pre-test to ascertain the level of skills and knowledge of trainees entering the upgrading program.

The third program called "accelerated training" is aimed at training lower level skilled workers to become diesel or related area mechanics. Development of the curriculum should follow the same pattern as noted above including the pre-test.

#### 4. Capacity and Productivity

The productivity of the VTC will be governed by the limitations of space, time and types of programs. An estimate of potential capacity and productivity is shown below based on an over-all curriculum that divides instructional time equally between shops and classrooms. It should be noted that this division is arbitrary and may not always be functional.

##### Facility Capacity (Day time classes only)

6 shops x 20 students	=	120
3 classrooms x 20 - 40 students	=	<u>120</u>
Daily Maximum	=	240

Based on the urgent need for skilled maintenance workers, the start up of the Center should emphasize accelerated retraining of the semi-skilled workers already on-the-job as shown below.

Productivity Schedule (Daily Attendance)

Accelerated Program (1 year)	= 120 students
Apprenticeship Program (3 years)	= 60 students
Upgrading (4 weeks - 16 weeks)	= <u>60</u> students
Total	= 240 students

After the first apprenticeship class has completed 3 years, the number of completions per year could be:

Maximum Annual Productivity (Day time classes only)

Accelerated Program (1 year)	= 120 students
Apprenticeship Program (3 years)	= 60 students
Upgrading (4 weeks - 16 weeks)	= <u>450</u> students
Maximum Total	= 630 students

5. Additional Service Options

The above schedule does not include evening hours. A preliminary inquiry indicates that this may not be feasible for regular classes. However, this option should be thoroughly investigated.

As noted elsewhere, there is a need to upgrade the operation and management of the bus maintenance garages. This was also reflected in conversations that AID Education Officer Dale De Butts had with Mr. Rick Fields, General Manager of Ward Bus Company/Cairo. The Center would be the logical place to provide upgrading courses for the garage managers, supervisors and foreman. The course should be aimed at improving or developing competencies in organizing and scheduling work activities, maintaining a safe work environment, improving interpersonal relationships, interpreting maintenance manuals and technical publications and facilitating record keeping. A specialist with extensive experience in managing a large bus/truck transport maintenance garage could be secured through AID funding to provide short upgrading courses for periods of one month.

Two of the Center teaching staff should be trained in the management aspects through these short courses and participant training in the U.S. This would provide the Center with an on-going capability to conduct short courses for upgrading foreman/supervisors.

## 6. Admission Requirements

The GSLT proposal suggests that the apprenticeship students be required to have only a primary education. In light of the complexities of diesel engines and the necessity to be able to read and interpret technical manuals, it is recommended that apprenticeship candidates should have as an absolute minimum completed the general preparatory program, i.e., ninth grade. It would be even more appropriate to require completion of an industrial school program.

## I. ESTIMATE OF CAPITAL COSTS

The following capital costs have been projected by the GSLT in their proposal. Since much of the material in the proposal is incomplete or inaccurate, the figures quoted are probably highly inflated.

<u>Item</u>	<u>Value - L.E. (Egyptian pounds)</u>
* Land	135,000
* Building	160,000
Equipment	250,000
Tools	35,000
Out-away models	5,000
* Furniture	25,000
* Establishing costs and studies	10,000
* Liquid Money	62,115
	<hr/>
TOTAL	682,115

The land, building and furniture costs should be assumed by GSLT.

The proposed AID funding will provide:

Equipment and tools	\$160,554	} Rounded to \$170,000
Audio visual equipment and instructional materials	\$ 6,239	
Supplemental Materials	<hr/>	\$ 25,000
USAID proposed support TOTAL LE 139,285		\$195,000
* GSLT proposed support TOTAL LE 392,115		\$548,961

**J. ESTIMATE OF OPERATING COSTS (Identified in GSLT Proposal)**

The same comments noted in item H apply here, i.e., inflated estimates.

<u>Item</u>	<u>Value - L.E. (Egyptian pounds)</u>
Salaries, incentives	23,280
Social insurance	4,656
Clothing/medical	2,024
Bonus	19,300
Stationary	5,855
Water and Electricity	3,000
Maintenance expenses	2,200
Propaganda and reception fees	500
Transport and travel	200
Cables, telephone and postage	300
Depreciation	44,950
Training needs	500
Cleaning materials	200
Miscellaneous	100
	<hr/>
TOTAL L.E. =	107,065

These operating costs are apparently based on the GSLT proposed staffing pattern which shows:

26	Administrative and supervision
20	Trainers and instructors
<u>23</u>	General service laborers (guards, gardeners)
69	Total personnel

The staffing pattern recommended previously by this report shows:

2	Administrators
9	Permanent faculty; 12 adjunct faculty
4	Secretaries/clerks
<u>9</u>	Maintenance
36	Total personnel

The report figure of 36 total personnel represents one staff member per 6.6 students. The GSLT figure of 69 represents one staff member per 3.4 students. Typical U.S. vocational schools would have a ratio of about one staff to 15 pupils. The VTE would need guards which causes some increase in the ratio, but the GSLT figures are obviously highly inflated.

#### K. EVALUATION OF PROJECT

The project should be reviewed near the end of the first year to determine the extent to which the objectives are being achieved and make recommendations for the second year. A final evaluation should be conducted near the end of the second year of the project to assess the extent to which the objectives have been achieved and make recommendations regarding closing or extending the project.

The project evaluator should be a U.S. college professor with a doctorate in industrial education, extensive experience in vocational teacher education, administration, supervision, vocational facility planning and program evaluation. Experience in technical assistance to developing countries is also preferred.

Recommendation: The Academy For Educational Development has an IQC agreement with AID and can provide candidates with the required expertise.

#### L. PROJECT DEVELOPMENT SCHEDULE

<u>Activity</u>	<u>Completion</u>
1. Feasibility Study	Sept. 8, 1978
2. PID - completed	Sept. 15, 1978
3. PID review with GSLT	Sept. 16, 1978
4. PID mission review	Sept. 17, 1978
5. PID to AID/Wash	Sept. 19, 1978
6. PP development	Nov. 1, 1978
7. PP mission review	Nov. 3, 1978
8. PP to AID/Wash	Nov. 6, 1978
9. PP approval by AID/Wash	Nov. 30, 1978
10. ProAg completed, signed	Dec. 8, 1978
11. Contractor selection	Dec. 15, 1978
12. Technicians selected	Jan. 30, 1979
13. Technicians arrive in country	Feb. 28, 1979
14. Equipment ordered	March 10, 1979
15. Completion of Center construction	March 15, 1979

(Continued)

<u>Activity</u>	<u>Completion</u>
16. Select Vocational Training Center Staff	March 26, 1979
17. Initiate curriculum development	March 27, 1979
18. Initiate development of management systems	March 27, 1979
19. Equipment arrives	Sept. 1, 1979
20. Equipment installed	Oct. 1, 1979
21. Start up of training programs	Oct. 4, 1979
22. Project review	Jan. 1, 1980
23. Select candidates for PT	March 1, 1980
24. Final Project Evaluation	Jan. 1, 1981

M. OTHER RECOMMENDATIONS

1. Additional Support for the GSLT Vocational Training Center

Since it is impossible to insure that the equipment, tools and instructional materials identified for AID purchase will reflect the ideas of the two yet unknown technicians to be brought on, it is recommended that a supplemental budget be included in the agreement in the amount of \$25,000. This should provide for developing the library and for additional equipment or materials as deemed necessary by the AID technicians.

2. Support for Bus Maintenance Garages

Visits to three bus maintenance garages, two belonging to Greater Cairo and one to General Nile Company disclosed very primitive conditions. Mechanics worked under extremely difficult situations with minimal hand tools and ancient equipment and machines. The test equipment for tune ups was extremely limited. In one shop a diesel engine was being test run on the ground - there was no test stand! It was a tribute to the mechanics that they could accomplish anything under the operating conditions. There was no evidence of any common safety devices or precautions. Further, there was little evidence of an effective system for the organization and management of the facilities.

There is little use in developing a model diesel mechanics school if the graduated students are employed in facilities that are inadequate, lacking the fundamental tools, equipment and systems to properly maintain vehicles. It is recommended, therefore, that AID conduct a feasibility study for funding a program to re-equip each of the 4 Cairo Bus Companies maintenance garages with complete tools and equipment normally used in diesel maintenance facilities. A special up-grading course for managers

and supervisors of these garages should be provided at the GSLT Center. The courses should be taught by U.S. management experts with considerable experience in organizing and managing large diesel bus or truck maintenance facilities. At least two of the Centers faculty should participate in this training program in order to develop an on-going capability for training in this area.

Following the up-grading course for the garage managers they should be sent on Participant Training tours to the U.S. to study first hand the maintenance systems and facilities.

### 3. Need for Additional Training Centers

Probably the best means for determining the true need for additional bus mechanics is to multiply the number of anticipated buses by the 1.7 ratio of skilled mechanics to buses noted previously. If the VTC is able to start up in October of 1979 as projected (see Project Development Schedule) it could produce only about 180 upgraded mechanics by 1980 and none in the apprenticeship or accelerated categories. If the projected need of an additional 2,697 skilled mechanics by 1980 is reasonably correct, the number of VTC graduates is insignificant. The Center's maximum productivity can be reached in October 1982 when it can produce 630 students per year of whom only 60 could be considered new mechanics. If it maintains maximum productivity of apprentices (240 per year if the other programs are dropped) it will reach the 1980 demand in 1991! Obviously, in the interim 11 years the demand will have far outstripped the 1980 needs. These figures, remember, refer only to the greater Cairo area and to buses only. The needs for maintaining heavy transport vehicles are not included nor are the needs for bus mechanics in the inter-city and Alexandria area. If rapid action is not taken it would seem that Egypt will face a breakdown of its heavy road transport systems with a serious effect on the economy.

In light of this situation it is recommended that AID fund a feasibility study with participation by representatives of all the Ministries involved in either training or moving people or goods such as those of Industry, Education, Transport, and Manpower along with GSLT. The purpose of this study should be to assess as accurately as possible the real needs for heavy equipment mechanics by trade categories for the next five years. The second purpose would be to identify a means by which all concerned could cooperate in developing sufficient training capacities to meet the needs. Hopefully this could lead to the development of one or more training centers modeled after the GSLT Center. USAID funding of equipment for the additional center(s) would go a long way in alleviating the critical shortage and just possibly prevent a major breakdown in the land transportation sector.

#### 4. Need For Salary Support

The GSLT lacks sufficient funds for operating the Center, according to Engineer Sabet. In order to insure that the Center is initiated on a firm financial base, it is recommended that AID investigate providing a start-up fund. This fund should be reserved primarily for professional salaries with the clear understanding that GSLT would be responsible for providing all administrative office furniture, supplies, seating for lecture rooms, maintenance and guard salaries and other miscellaneous expenses.

The typical vocational teachers salary is about 30 Egyptian pounds (\$42.00) per month. This amount is insufficient to attract and hold on a full-time basis the best qualified teachers. If the salary were doubled it should be sufficient to compete with some of the better equivalent jobs in the private sector and insure a stable staff. A viable approach should also provide for a phased in assumption of salary costs by the GSLT. The following schedule provides the required funds to meet the Center's start-up needs.

#### First Year: 100% of Salaries Funded (L.E. - Egyptian Pounds)

	<u>Monthly</u>	<u>Annual</u>
1 - Director	80	960
1 - Assistant Director	70	840
9 - Teachers, full-time	60	<u>6,480</u>
	Total L.E.	8,280
	Total Dollar Equivalent	11,592

#### Second Year: 75% of Salaries Funded

Total L.E.	5,210
Total \$	8,694

#### Third Year: 50% of Salaries Funded

Total L.E.	4,140
Total \$	5,796

GRAND TOTAL L.E.	18,630
GRAND TOTAL \$	26,082

Note: Total cost to USAID for the  
3 year subsidy would be \$26,082.

During the first year of operation GSLT should explore a means of continuous funding for the Center's operating expenses. One means would be through a tax on the bus companies' payroll. This arrangement, typical of apprenticeship schools in Brazil and other countries, is already being explored by the MOI with a view to funding their schools in this manner. It offers one of the best hopes of providing for adequately funded vocational schools in developing countries.

ANNEX AJUSTIFICATION OF PLAN MODIFICATION

The floor plan for the proposed Diesel Mechanics Training Center as presented by the General Syndicate For Land Transport was reviewed and the conclusion reached that some modification was necessary. The original plan has merit, however, to reach a maximum level of safety, economy, and efficiency, the following items are offered:

- a. The eight small workshops should be re-arranged to provide four larger units within the original parameters.
- b. A larger space for teachers offices/work-area should be provided.
- c. The prayer room should be moved to a more quiet zone.
- d. The clinic space should be closer to the administrative area.
- e. An addition should be designed to provide a drive-in, pit area for work on "live" vehicles.
- f. Space should be provided for a metal-machining shop directly adjacent to the diesel mechanics area.
- g. A more private toilet facility should be provided for both administrators, and ladies visiting the building.
- h. A third lecture room housing an additional forty students for the academic segment of their education was needed to enable full scheduling opportunities.
- i. Lecture/discussion areas within each shop area were needed to provide opportunities for proper use of audio-visual materials concerning current technology.
- j. Modification of the storage/warehousing area was needed to provide a more flexible space.
- k. Storage space for office materials was needed in the administrative zone.
- l. There was a need for a reference library.
- m. Space was needed for storage of audio-visual equipment and materials.

The proposed changes/modifications were considered, keeping in mind that foundations were already in place at the site. Further, radical changes in the plot plan were not possible, due to space limitations.

To meet the need for two additional large sized laboratories, a plan was needed to provide an area 16 meters by 26.5 meters (424 sq. meters) adjacent to the original structure. This was accomplished by extending the building but maintaining the same configuration.

All of the previously stated needs were met, (see attached plan) and placement of machinery and equipment plotted to insure maximum safety for the staff and students. It is imperative that the concrete deck be laid around the building so that items can be readily moved from one section of the building to the other and to a storage area if necessary, by means of wheeled carts or mobile engine stands.

Equipment Source and Reference Numbers

Note: References to "B. G. No." indicate the items such as tools, benches, equipment, etc. were to be found in the 1978 - 1979 Brodhead Garrett Co. catalog, 49th Edition. Prices, therefore, are current as of September 1978. A copy of the B. G. Catalog is on file in Mr. Dale DeButts' Office, USAID Education Division, Cairo, Egypt.

ANNEX BEQUIPMENT SPECIFICATIONS  
COST ANALYSIS

	<u>Equipment</u>	<u>Hand Tools</u>	<u>Total</u>
General Instruct.	9,438.00	-0-	9,438.00
Forge Shop	17,804.00	1,464.26	19,268.26
Welding Shop	17,564.00	4,261.54	21,825.54
Sheet Metal Shop	18,149.00	1,135.84	19,284.84
Electrical Shop	17,403.00	719.44	18,122.44
Diesel Mechanic Shop	21,422.00	7,538.00	28,960.00
Machine Shop	<u>40,537.00</u>	<u>3,118.63</u>	<u>43,655.63</u>
TOTAL	142,317.00	18,237.71	160,554.71
Instructional Equipment - A.V., Hardware		5,477.00	
Instructional Equipment - A.V., Software		762.85	
			<u>6,239.85</u>
			166,794.56
			ROUNDED TO GRAND TOTAL = <u>170,000.00</u>

Note: The grand total for equipment with an inflation factor included should be rounded to \$170,000. This figure does not include shipping costs.

GENERAL INSTRUCTIONAL EQUIPMENT

<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
6 ea.	Unility Table, B.G. No. 367587	133.00	798.00
6 ea.	Instructors' Chair, B.G. No. 463010	80.00	480.00
100 ea.	Tablet arm chair	42.00	4,200.00
20 ea.	Steel Stool, 24"	18.00	360.00
9 ea.	Chalkboard, permanent mount	400.00	<u>3,600.00</u>
		<b>TOTAL</b>	<b>9,438.00</b>

FORGE SHOP  
EQUIPMENT

Plan No.	Unit	Name	Unit Price	Total \$
1 - 2	2 ea.	Johnson "A" Unit Composed of: No. 120 Heat Treating Furnace No. 900 Crucible Furnace No. 122 Forge Furnace No. 101 Soldering Furnace No. 118 Soldering Furnace	3,660.	7,320.00
3, 3	2 ea.	Cut-off Shear	105.	210.00
4	1 ea.	Power Hacksaw, Band Style	1,000.	1,000.00
5	1 ea.	Drill press, 15", Utility, pedestal, 3/4 H.P.	750.	750.00
6	1 ea.	Leaf-spring test unit	800.	800.00
7 - 16	10 ea.	Anvil, 140#	300.	3,000.00
	10 ea.	Anvil stand	26.	260.00
17 - 20	4 ea.	Workbench, B.G. No. 452055	480.	1,920.00
	4 ea.	Machinist Bench Vise, B.G. No. 224234	120.	480.00
21	1 ea.	AV Storage Cabinet, B.G. No. 471519	76.	76.00
22	1 ea.	Storage Cabinet, B.G. No. 458877	740.	740.00
23, 23	2 ea.	Service Workbench, B.G. No. 455868	162.	324.00
24	1 ea.	Metal & Scrap Rack B.G. No. 461578	324.	324.00

FORGE SHOP

HAND TOOLS

<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
12 ea.	Hammer, Blacksmith, B.G. No. 227920, 861H-40 oz	9.10	109.20
12 ea.	Tongs, B.G. No. 206862, 202A	24.80	297.60
10 ea.	Hot Chisel, B.G. No. 206851, 161H	18.75	187.50
6 ea.	Hammer, Sledge, B.G. No. 206946, 6 lb.	14.11	84.66
12 ea.	Plier, Combination, 8", B.G. No. 227287	3.00	36.00
12 ea.	Wrench, Adjustable, B.G. No. 194698, AT-18, 8"	4.70	56.40
12 ea.	Wrench, Adjustable, B.G. No. 194716, AT-112, 12"	8.48	101.76
12 ea.	Hacksaw, Adjustable, B.G. No. 235150, No. 368	7.26	87.12
2 ea.	Drill, Electric Portable, B.G. No. 438590, 621HD	72.00	144.00
1 set	Combination Wrench, 14 pcs. B.G. No. 476355	73.98	73.98
1 set	Combination Wrench, 17 pcs. Metric, B.G. 483331	54.98	54.98
24 ea.	Safety Glasses, B.G. No. 404399, 9148P	3.95	94.80
12 ea.	Hammer, Ball Pien, B.G. No. 352682, H0309	5.01	60.12
3 ea.	Cold Chisel/Punch Set, B.G. No. 225902, No. M19 12 pieces	18.50	55.50
6 ea.	Screw Driver, Flat blade B.G. No. 429194, 63-366, 6"	1.40	8.40
6 ea.	Screw Driver, Flat blade, B.G. No. 429201, 63-368, 8"	2.04	12.24

TOTAL: 19,268.26

WELDING SHOPEQUIPMENT

<u>Plan No.</u>	<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
1 - 5	5 set	Oxy-Acetylene, Welding Cutting Outfit	175.	875.
6 - 9	4 ea.	Electric (Arc) Welder, AC-DC, 220V. - 300A	825.	3,300.
10	1 ea.	MIG (Metal Inert Gas) Electric Welder, 250 A.	2,000	2,000.
11, 12	2 ea.	Arc Welder, A.C., Portable	300.	600.
25, 26	2 ea.	Bend Tester	300.	600.
27	1 ea.	Tensile Tester	900.	900.
14	1 ea.	Shear, H.D. (Flat-Rd.-Angle) Hydraulic	725.	725.
15	1 ea.	Universal Bender	600.	600.
16, 17	2 ea.	Grinder, pedestal	500.	1,000.
18, 19	2 ea.	Drill, 15" Utility, pedestal, 3/4 H.P.	750.	1,500.
20	1 ea.	Power hacksaw, band style	1,000.	1,000.
21 - 24	4 ea.	Workbench, B.G. No. 452055, ML4	480.	1,920.
	4 ea.	Machinist Vise, B.G. No. 224234	120.	480.
28	1 ea.	Metal and Scrap Rack, B.G. No. 461578	324.	324.
29	1 ea.	A.V. Storage, B.G. No. 471519	76.	76.
30	1 ea.	Storage Cabinet, B.G. No. 458877	740.	740.
13, 13	2 ea.	Service Workbench, B.G. No. 455868	462.	924.

WELDING SHOPHAND TOOLS

<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
12 ea.	Chipping hammer, B.G. No. 203111, No. 1329-0280	5.60	67.20
24 ea.	Welding Clamp, Vise-grip, B.G. No. 203166, # 9R	6.88	165.12
12 ea.	Clamp, "C", B.G. No. 225036, 2-1/2"	4.48	53.76
12 ea.	Clamp, "C", B.G. No. 225069, 5"	7.70	92.40
12 ea.	Clamp, "C", B.G. 225080, 8"	13.29	159.48
3 ea.	Cold Chisels/Punch, B.G. No. 225902, No. M19 12 pc. set	18.50	55.50
12 ea.	Hammer, Ball Pien, B.G. No. 352682, H 0309	5.01	60.12
10 ea.	Welding Helmet, B.G. No. 344838, Model 680	12.94	129.40
10 pr.	Welding Goggles, Gas, B.G. No. 261878	4.45	44.50
24 ea.	Safety Glasses, B.G. No. 404399, 9148 P	3.95	94.80
36 pr.	Welders Gloves, B.G. No. 202744, 565 FL	5.50	198.00
24 ea.	Welders Apron, B.G. No. 493305, 12165	13.95	334.80
5 ea.	Cylinder Truck, Rubber tire	50.00	250.00
4 ea.	Drill, electric, portable, B.G. No. 438590, 621 HD	72.00	288.00
2 ea.	Grinder, portable, air	200.00	400.00
1 set	Combination Wrench, 14 pcs., B.G., No. 476355	73.98	73.98
1 set	Combination Wrench, 17 pcs., Metric, B.G. No. 483331	54.98	54.98
		<b>TOTAL:</b>	<b>21,825.54</b>

SHEET METAL SHOPEQUIPMENT

<u>Plan No.</u>	<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
1 - 4	4 ea.	Spot welder, portable plus stand	550.	2,200.
5	1 ea.	Bench brake, 48" universal	400.	400.
6, 7	2 ea.	Stake Plate, B.G. No. 197831, SM-1, <u>plus</u> :	179.	358.
	4 ea.	197703, 921 Stake, seaming	142.	570.
	4 ea.	197736, 927 Creasing stake	127.	510.
	4 ea.	197747, 932 Square Stake	75.	300.
	4 ea.	197758, 935 Coppersmith Stake	60.	240.
	4 ea.	197770, 943 Hatchet Stake	45.	180.
8	1 ea.	Squaring Shear, 36", Light guage	1,000.	1,000.
9	1 ea.	Sliproll with stand, 36"	600.	600.
18, 19	2 ea.	Universal Grinder, 7"	500.	1,000.
20, 21	2 ea.	Grinder/Buffer, 7", Bench	165.	230.
22,23	2 ea.	Anvil and stand	246.	492.
10 - 13	4 ea.	Sheet metal bench w/plates, B.G. # 457483, SM-60	582.	2,328.
14 - 17	4 ea.	Workbench, B.G. No. 452055	480.	1,920.
	8 ea.	Bench Vise, Machinist, B.G. No. 224234	120.	960.
24	1 ea.	Brake riveter	1,500.	1,500.
25	1 ea.	Power hacksaw, band type	1,000.	1,000.
26, 27	2 ea.	Drill press, 15", Utility, pedestal, 3/4 HP	700.	1,400.
28	1 ea.	A.V. Storage, B.G. No. 471519	76.	76.

## SHEET METAL SHOP - EQUIPMENT (Cont'd)

<u>Plan No.</u>	<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
29	1 ea.	Metal and Scrap Rack, B.G. No. 461578	324.	324.
30, 31	2 ea.	Soldering Bench, B.G. No. 457216, 6123 T	130.	260.
32, 33	2 ea.	Steel Workbench, 30" x 6', B.G. No. 456308, Model 1315	97.	194.
34	1 ea.	Sheet Metal Shorts rack, D.G. No. 461355, Model SSR-100	107.	107.

SHEET METAL SHOPHAND TOOLS

<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
6 ea.	Tin Snips, 8", B.G. No. 181119, A-12	5.97	35.82
6 ea.	Tin Snips, 11", B.G. No. 181130, A-10	7.57	45.42
6 ea.	Tin Snips, 13-1/2" Comb., B.G. No.200180, 124	10.74	64.44
6 ea.	Tin Snips, 10" Duckbill, B.G. No.200220, D-10	5.93	35.58
4 ea.	Handy Seamer, B.G. No. 199710, 793	14.52	58.08
2 ea.	Rivet Set, 00, 0, 1, 2, 3, 4, 5, 6, 7, 8	40.00	80.00
10 ea.	Wing Dividers, 8", B.G. 199563	7.65	76.50
10 ea.	Combination plier, 8", B.G. 227287	3.00	30.00
2 ea.	Wrench, Adjustable, 8", B.G. No. 194698	4.70	9.40
8 ea.	Hacksaw, Adjustable, B.G. No. 235150	7.26	58.08
2 ea.	Drill, electric portable	72.00	144.00
10 ea.	Screwdriver, 6"	1.40	14.00
10 ea.	Tinners Riveting Hammer	8.65	86.50
10 ea.	Tinners Setting Hammer	8.65	86.50
10 ea.	Ball pien hammer, 12 oz.	5.01	50.10
6 ea.	End cutting nippers, 8"	8.57	51.42
24 ea.	Safety Glasses	3.95	94.80
4 ea.	Cold Chisel/Punchset, 12 pcs.	18.80	75.20
10 ea.	Tinners Mallets 3 x 5	4.00	40.00
		<b>TOTAL :</b>	<b>19,284.04</b>

ELECTRICAL SHOPEQUIPMENT

<u>Plan No.</u>	<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
1	1 ea.	Generator, Alternator, Regulator Test Stand	4,400.	4,400.
	1 ea.	Electronic Service Tachometer	100.	100.
	4 ea.	Starter and Generator Current Indicator	5.	20.
2	1 ea.	Battery Fast Charger-Tester	379.	379.
	4 ea.	Truck Battery	15.	60.
	4 ea.	Battery Booster Cables	30.	120.
3	1 ea.	Drying Oven	300.	300.
	1 ea.	Charging-Starting Analyzer	100.	100.
4 - 5	2 ea.	Battery Charger, 50 Amp	200.	400.
6	1 ea.	Coil Winder	3,300.	3,300.
	6 ea.	Automotive Lighting Demo Boards	175.	1,050
	2 ea.	Battery Starter Tester	350.	700.
7 - 8	2 ea.	Parts Washer	215.	430.
9	1 ea.	Arbor press, 6 ton	800.	800.
10 - 13	4 ea.	Workbench, B.G. 452055	480.	1,920.
	4 ea.	Machinist Vise, B.G. 224234	120.	480.
15	1 ea.	Storage Cab. B.G. No. 458877	740.	740.
14	1 ea.	AV storage, B.G. No. 471519	76.	76.
16, 17	2 ea.	Standard Bench, B.G. No. 457205	119.	238.
18	1 ea.	Cabinet, Sliding Door, B.G. No. 45550	258.	258.
19, 20	2 ea.	Bench, Deluxe Electrical, B.G. No.456670 Model 5000	281.	562.
21 - 30	10 ea.	Steel Workbench, 30" x 6', B.G. No.456308 Model 1315	97.	970.

ELECTRICAL SHOPHAND TOOLS

<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
4 ea.	Volt Ohm Meter, B.G. No. 363129, NH-55	9.85	39.40
12 ea.	Wire Cutter, B.G. No. 171028, No. 95 MS	11.09	133.08
	Plier		
6 ea.	" Needle Nose, B.G. No. 416620, AA4MS, 6"	10.61	63.66
6 ea.	" Electrician Side Cutting, B.G. No. 358010 50-7C, 7"	7.12	42.72
6 ea.	" Combination, B.G. No. 227287, K-28, 8"	3.00	18.00
6 ea.	" Round Nose, B.G. No. 357993, 21-4-1/2 SC	6.08	36.48
3 ea.	Wrench, Adjustable, B.G. No. 194698, AT-18, 8"	4.70	14.10
3 ea.	Wrench, Adjustable, B.G. 194716, AT-112, 12"	8.48	25.44
8 ea.	Hacksaw, Adjustable, B.G. No. 235150, No. 368	7.26	58.08
2 ea.	Drill, Electric Portable, B.G. No. 438590, 621 H.D.	72.00	144.00
6 ea.	Screwdriver, Flatblade, B.G.# 429183, 63-364, 4"	1.00	6.00
6 ea.	Scrawdriver, Flatblade, B.G.# 429194, 63-366, 6"	1.40	8.40
6 ea.	Screwdriver, Flatblade, B.G.# 429201, 63-368, 8"	2.04	12.24
6 ea.	Screwdriver, Phillips Head, B.G.# 228754, 65-321, 3"	1.04	6.24
6 ea.	Screwdriver, Phillips Head, B.G.# 228765, 65-322, 4"	1.15	6.90
6 ea.	Screwdriver, Phillips Head, B.G.# 228776, 65-323, 6"	1.65	9.90
24 ea.	Safety Glasses, D.G.# 404399, 9148P	3.95	94.80
		<b>TOTAL:</b>	<b>18,122.44</b>

DIESEL MECHANIC SHOPEQUIPMENT

<u>Plan No.</u>	<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
1	1 ea.	Arbor press, 12 ton	1,700.	1,700.
2	1 ea.	Steam Cleaner, oil oper.	1,000.	1,000.
3	1 ea.	High pressure Lubrigun, portable	400.	400.
4	1 ea.	Gear Lubricant Dispenser	300.	300.
5,6,7,8	4 ea.	Engine Test Stand	300.	1,200.
9, 9	2 ea.	Parts Washer	215.	430.
10, 11	1 ea.	Wheel Alignment Unit	3,500.	3,500.
12	1 ea.	Air Compressor, 2 H.P. - 2 stage	1,400.	1,400.
13, 14	2 ea.	Engine test stand on wheels	350.	700.
15	1 ea.	Hydraulic Crane Engine Hoist	800.	800.
16	1 ea.	Dynamometer Module, portable	2,400.	2,400.
19	2 ea.	Diesel injector nozzle cleaning unit	625.	1,250.
20	2 ea.	Diesel nozzle pressure test unit	320.	640.
21 - 24	4 ea.	Work bench, B.G. # 452055, ML 4	480.	1,920.
	4 ea.	Machinist Vise, B.G. # 224234	120.	480.
25	4 ea.	Hydraulic Jack, Truck - 5 ton	200.	1,000
26	1 ea.	Brake bleeder unit	225.	225.
27	1 ea.	Storage Cabinet, tool, B.G.# 458877	740.	740.
29	1 ea.	A.V. Storage, B.G. # 471519	76.	76.
30	1 ea.	Chain Hoist, 2 ton elect., B.G.# 158280	828.	828.
	1 ea.	Glider Trolley, 2 ton, B.G.# 191550	88.	88.
31	1 ea.	Transmission bench, B.G.# 455824	345.	345.

DIESEL MECHANIC SHOPTOOLS

<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
2 ea.	Service Jack, 4 ton	390.	780.
2 ea.	Impact tool and accessories	250.	500.
6 ea.	Safety Stands, 10 ton, pair	125.	375.
1 ea.	Torque Wrench 10-200 ft. pounds, 3/8 dr.	62.	62.
1 ea.	Torque Wrench 0-100 ft. pounds, 3/8 dr.	25.	25.
2 ea.	Gear puller, two/three jaw	50.	100.
2 ea.	Gear puller, Straight line	120.	240.
2 ea.	Compression Tester, Detroit Diesel	125.	250.
2 set	Drive Sockets and attachments, Panel 52-SP B.G.# 193271	440.	880.
1 set	Brake and Tubing Tools, Panel 1-SP B.G.# 193198	190.	190.
1 set	Drive Sockets and Attachments, Panels 54-SP and 54A-SP, B.G.# 193282	600.	600.
1 set	Power Sockets and Attachments, Panel 73 B.G.# 439380	280.	280.
3 set	Flat Wrenches, 60A-SP, Combination, B.G.# 193311	325.	975.
1 set	Automotive Tools, Special, Panel 565, B.G.# 439369	195.	195.
1 set	Automotive Tools, Panel 65-SP, B.G.# 167675	80.	80.
3 set	Screw Driver, Panel 36-SP, B.G.# 193238	110.	330.
3 set	Pliers, Panel 32-A-SP, B.G.# 139269	156.	468.
2 ea.	Metric Socket Panel, B.G.# 313794	295.	590.
3 ea.	Metric Flat Wrench Panel, B.G.# 313801	206.	618.
			TOTAL: 28,960.00

MACHINE SHOPEQUIPMENT

<u>Plan No.</u>	<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
1, 2	2 ea.	Drill press, 15", Utility, pedestal, 3/4 H.P.	700.	1,400.
3	1 ea.	Lathe, 10"	3,600.	3,600.
4	1 ea.	Milling Machine, Horiz. (w/tooling)	5,500.	5,500.
5, 6	2 ea.	Tool Grinder	500.	1,000.
7	1 ea.	Valve Face Grinder	1,600.	1,600.
8	1 ea.	Valve Seat Grinder	550.	550.
9	1 ea.	Lathe, Armature	325.	325.
10	1 ea.	Brake Drum and Disc Lathe	5,500.	5,500.
17	1 ea.	Lathe, 13"	5,000.	5,000.
11	1 ea.	Buffer/Grinder	150.	150.
12	1 ea.	Power Hacksaw, reciprocating	1,650.	1,650.
13 - 16	4 ea.	Workbench, 452005	480.	1,920.
	8 ea.	Bench Vise, Machinist, 224234	120.	960.
25 - 28	4 ea.	Tool Cabinet	120.	480.
29	1 ea.	A.V. Storage	76.	76.
30 - 31	2 ea.	Tool Access. Cabinet	120.	240.
20, 21	2 ea.	Workbench, 452005	480.	960.
19	1 ea.	Milling Machine, Vertical (w/tooling)	5,000.	5,000.
33	1 ea.	Access. Cabinet	120.	120.
34	1 ea.	Stock Rack	324.	324.
35	1 ea.	Connecting Rod Alignment Mach.	262.	262.

## MACHINE SHOP - EQUIPMENT (Cont'd)

<u>Plan No.</u>	<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
36	1 ea.	Access. Cabinet	120.	120.
37	1 ea.	Drill Press, H.D.	2,000.	2,000.
38	1 ea.	Access. Cabinet	120.	120.
39	1 ea.	Tool Cabinet	840.	840.
40	1 ea.	Tool Cabinet	840.	840.

MACHINE SHOPTOOLS

<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
4 ea.	Micrometer, B.G. No. 213403 0-1	25.50	102.00
4 ea.	Micrometer, B.G. No. 213414 1-2	30.50	122.00
4 ea.	Micrometer, B.G. No. 213427 2-3	33.75	135.00
4 ea.	Micrometer, B.G. No. 213436 3-4	37.50	150.00
6 ea.	Caliper, B.G. No. 213637 Series 79, 4"	5.85	35.10
6 ea.	Caliper, B.G. No. 213648 Series 79, 6"	5.95	35.70
6 ea.	Caliper, B.G. No. 213659 Series 79, 8"	7.45	44.70
6 ea.	Caliper, B.G. No. 213660 Series 79, 4"	5.85	35.10
6 ea.	Caliper, B.G. No. 213670 Series 79, 6"	5.95	35.70
6 ea.	Caliper, B.G. No. 213681 Series 79, 8"	7.45	44.70
2 ea.	Inside Micrometer Caliper, B.G. No. 160928 No. 823B	66.50	133.00
2 ea.	Micrometer, Depth Gage, B.G. No. 213604 No. 440-3L	46.50	93.00
2 ea.	Telescope Gages, B.G. No. 213871, No. 229 (Set of 3)	22.80	45.60
2 ea.	Telescope Gages, B.G. No. 213850, No. 229-D	9.50	19.00
2 ea.	Telescope Gages, B.G. No. 213860, No. 229-E	11.00	22.00
1 set	Combination Square Sets, B.G. No. 214494, 12"	42.65	42.65
1 ea.	Dial Caliper, B.G. No. 428560, No. 120	79.80	79.80
1 ea.	Universal Dial Test Indicator (Last Word) B.G. No. 214629, No. 711FS	36.00	36.00
1 set	Precision Tool Set, Metric, B.G. No. 197484 S-909-M	990.00	990.00
1 set	Combination Wrenches, 14 pcs. B.G.No. 476355	73.98	147.96

## MACHINE SHOP - TOOLS (Cont'd)

<u>Unit</u>	<u>Name</u>	<u>Unit Price</u>	<u>Total \$</u>
2 set	Combination Wrenchs, 17 pcs., Metric B.G. No. 483331	54.98	109.98
6 ea.	Screwdriver, Flatblade, B.G. No.429183, 63-364, 4"	1.00	6.00
6 ea.	Screwdriver, Flatblade, B.G. No.429194, 63-366, 6"	1.40	8.40
6 ea.	Screwdriver, Flatblade, B.G. No.429201, 63-368, 8"	2.04	12.24
2 ea.	Screwdriver, Phillips Head, B.G. No. 228754 65-321, 3"	1.04	2.08
2 ea.	Screwdriver, Phillips Head, B.G. No. 228765, 65-322, 4"	1.15	2.30
2 ea.	Screwdriver, Phillips Head, B.G. No. 228776 65-323, 6"	1.65	3.30
24 ea.	Safety Glasses, B.G. No. 404399, 9148P	3.95	94.80
4 ea.	Cold Chisel/Punch Set, 12 pcs.	18.80	75.20
10 ea.	Ball pien hammers, 12 oz.	5.01	50.10
4 ea.	Wing Divider, 8"	7.65	30.60
2 ea.	Fillet/Radius Gage	8.90	17.80
2 ea.	#40 Screw Pitch Gage	7.00	14.00
2 ea.	Tap and Drill Gage	13.25	26.50
6 ea.	Center Gage	4.50	27.00
24 ea.	Steel Rule 604 RE	8.00	192.00
6 ea.	Wire Gage - Am. Standard Wire	8.21	49.26
6 ea.	Sheet Metal Gage, U.S. Standard	8.01	48.06
		<b>TOTAL:</b>	<b>43,655.63</b>

ANNEX DSCHEDULE OF CONFERENCES AND FIELD TRIPS

- Tuesday, August 15** Conference with: Engineer Mohamed Roushdy, Undersecretary, Productivity and Vocational Training Department, Ministry of Industry and Mineral Resources; discussed programs.
- Wednesday, August 16** Conference with: Dr. Nabin Moshen, Undersecretary for Technical Education, Ministry of Education; discussed programs.
- Saturday, August 19** Conference with: Issat El Saadawi, Director, Technical Teacher Training Institute (MOE) at Kubba; reviewed facilities and program.
- Monday, August 21** Conference with: Engineer Shewki Fahim Kbaid, Assistant Director, Instructor Training Institute (MOI/PVTD) at Al Amiria; reviewed facilities and program.
- Tuesday, August 22** Conference with: Engineer Mohamed Khalil Abd El-Aal, Director, Vocational Training Center (MOI/PVTD) at Dar El Salam; reviewed facilities and program; accompanied by Eng. Abul Futowh who is in charge of all the VTCs for PVTD.
- Wednesday, August 23** Conference with: Engineer Saad El Din Sabet, Chairman, General Nile Automotive Repairs Co., responsible for initiating the GSLT proposal; discussion of proposal and visit to construction site of the Vocational Training Center;
- Visit to Bus Driver Training Center operated by MOT. (Note: Sabet indicated that instructors from this Center could be available to staff the GSLT Center for which AID support has been requested.
- Monday, August 28** Conference with: Dr. M. Reda Sewailem, Consulting Engineer for Ward Industries and Gary L. Smith, Overseas Contract Officer, Ward Industries; discussed need for skilled bus mechanics.

- Tuesday, August 29** Conference with: Engineer El Sayed Sanad, Chairman, Board of Directors, Greater Cairo Bus Co.; Port Saad Maintenance Garage; visit arranged by Ward Co., accompanied by their factory representative Gerald Lancaster; discussed maintenance problems, visited facilities here and one other city maintenance garage.
- Wednesday, August 30** Conference with: Mohamed Ahmed El-Okeily, President, General Syndicate of Land Transport; discuss the GSLT proposal.
- Thursday, August 31** Conference with: Engineer Saad Sabet to review our revised plans for the VTC building and discuss other aspects of the proposal.

THE GENERAL SYNDICATE FOR  
LAND SYNDICATE  
90, EL GALAA STR. - CAIRO  
TEL: 918775 - 975263.  
CABLE: AUTOMATO-CAIRO.  
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ANNEX E  
M E M O R A N D U M  
FOR ESTABLISHING A " VOCATIONAL TRAINING CENTER "  
\*\*\*\*\*

1- PROJECT DESCRIPTION:

The proposed " TRAINING CENTER " will be established at Mataria, 15 km. from Cairo Center. It will be built on a part of a land owned by the Syndicate, it will occupy an area of 1800 square meters. A contract was signed between the Syndicate and a Company belonging to the Ministry of Housing for the construction of its building which amounts to L.E. 150.000 and is expected to be finished on next May.

Moreover the rest of the mentioned land could be used for any extension, if needed, for training purposes.

The building of the Training Center comprises the following:

- 6 classrooms ( capacity of each 40 trainees ).
- 4 warehouses ( for storing stationary requirement, tools, materials ).
- 1 Laboratory ( capacity 40 trainees ).
- 2 halls ( capacity 150 and 200 persons for lectures, meetings ).
- workshops for different trades ( total area 708 m2 ).
- 1 library ( 5.75 x 9.75 m. )
- 6 rooms ( for administration ).
- 3 rooms ( for teachers and instructors ).

## 2- PURPOSES OF THE PROJECT:

- 1) To give definite and systematic training in basic manual skills.
- 2) To give classes instructions and practical training in the workshops for the trainees.

## 3- A I M S:

Imparting training to different levels of workmen and technicians needed for passengers and freight transport authorities and companies or for those who are joining these companies including:

- a) Basic Training
- b) Accelerating Training
- c) Upgrading Training
- d) Production Training

### a) BASIC TRAINING:

For underage youth who got the certificate of primary education and others of their level who will be appointed by the companies as apprentices till they reach 18 years ages at which they will be assistant workers.

- Estimated number annually: 280 for different trades.

- Period of Training:

1st Year ( 11 months ) : at the Center.

2nd Year ( 11 months ) : divided halfly at the Center and the company.

3rd Year ( 11 months ) : at the company.

### b) ACCELERATED TRAINING:

The Syndicate plans to avoid shortage in technical workers by imparting training to the normal workers who are working in the general services in the companies to transfer them to technical workers.

- Estimated number annually: 90 for different trades.

- Period of Training: 11 months at the Center.

c) UPGRADING TRAINING:

This training aims at raising the productivity of the workers for carrying out their duties properly and efficiently.

d) PRODUCTION TRAINING:

The Syndicate is planning to get use of the machines and equipment of the Centre by utilising them for the public by paid services to achieve:

- Cutting down training expenses.
- Giving additional practical chances for trainees.

N.B. Systems c & d will be postponed after the settlement of the other training systems.

4- TRADES OF TRAINING:

The following are the estimated annual numbers of trainees to be trained on different trades concerned with maintenance and repairs of diesel trucks and buses:

<u>T R A D E</u>	<u>TRAINING SYSTEM</u>	
	<u>BASIC</u>	<u>ACC.</u>
- Mechanical " Autoactive "	80	20
- Electrical " Automotive "	40	10
-Turning and machining	40	10
- Blacksmithing	40	10
- Tinsmithing	40	10
- Welding	<u>40</u>	<u>10</u>
TOTAL	280	70

5- TRAINING REQUIREMENTS:

It is proposed to utilise recovered demonstration parts and pieces from defective stock which is suggested to be obtained as an assistance from transport companies.

As regards to the equipment, the Syndicate announced for purchasing it by a tender, a copy of its conditions and specifications is attached. The Sybdicate received some offers accordingly which are still under study.

The Syndicate intends to make another tender for the tools required, it is planned that the announcement of this tender will be in the few next days.

The cut-away models and other training-aids such as maps, charts, complete units of different makes and types of trucks and buses are required for the basic training and for the upgrading training shall be of the same present used makes of trucks and buses in the companies. It is proposed that these could be borrowed to the Training Center from the companies for certain period.

The Syndicate will provide the Center with the available furnitures from those in its possession, other furnitures required shall be bought from the local market (these furnitures are, benches, desks, blackboards, cupboards, chairs, shelves and pins for stores, etc...).

#### 6- STAFF REQUIRED:

The staff required are as follows:

- a) Administrative staff.
- b) Teachers and Workshop Instructors.
- c) General Services Labourers.

It is proposed that all the staff required will be borrowed from the companies according to the Training Center organization chart planned by the Syndicate either for full or part time the numbers estimated are:

<u>S T A F F</u>	<u>NUMBER REQUIRED</u>
a) Administrative and Supervision	26
b) Trainers and Instructors	20
c) General Services Labourers: ( guards, labourers gardners, etc..)	<u>23</u>
TOTAL	69

#### 7- THE ESTIMATED BUDGET OF THE CENTER:

The proposed project is scheduled to be completed in May 1978 and inaugurated officially on 18th June 1978, after that date all the steps will be taken for receiving the first group of trainees to start running the Center on

a) The following are the capital costs estimated for this project:

<u>DESIGNATION</u>	<u>L. E.</u>
Land	135.000
Construction	160.000
Equipment	250.000
Tools	35.000
Cut-aways models and parts	5.000
Furnitures	25.000
Establishing costs and studies	10.000
Liquid money	62.115
	<hr/>
TOTAL	682.115
	=====

b) Estimated annual running costs:

	<u>L. E.</u>
Salaries, incentives	23.280
Social Insurances	4.656
Advantages (clothes - medical treatment)	2.024
Bonus	19.300
Stationary	5.855
Water & Electricity	3.000
Maintenance expenses	2.200
Propaganda & Reception fees	500
Transport & Travel fees	200
Cables, telephones & post fees	300
Depreciation	44.950
Training needs	500
Cleaning materials & tools	200
Miscellaneous	100
	<hr/>
TOTAL	107.065
	=====

**8- MISCELLANEOUS:**

- (1) The trainees will be paid five pounds monthly.
- (2) The training syllabus are under study and preparation.

(3) It is assumed that the following subjects will be negotiated with the concerned companies:

- Assistance to be offered from their side to the Center.
- Studying the requirements of the companies and how the Center could fulfill its obligations towards these companies.
- Coordination between the Training Centers belonging to the Land Transport Sector.
- Procedures required for the recognition of the certificate of the Center from the concerned authorities.
- Legislation of appointing the trainees in the companies after completion of training.

(4) The followings are under study:

a) Acts required for controlling and supervising different aspects of the Center activities such as:

- Training act.
- Administration act.
- Financial act.

b) Forms required for these different activities.

\*\*\*\*\*

110 M

30 M

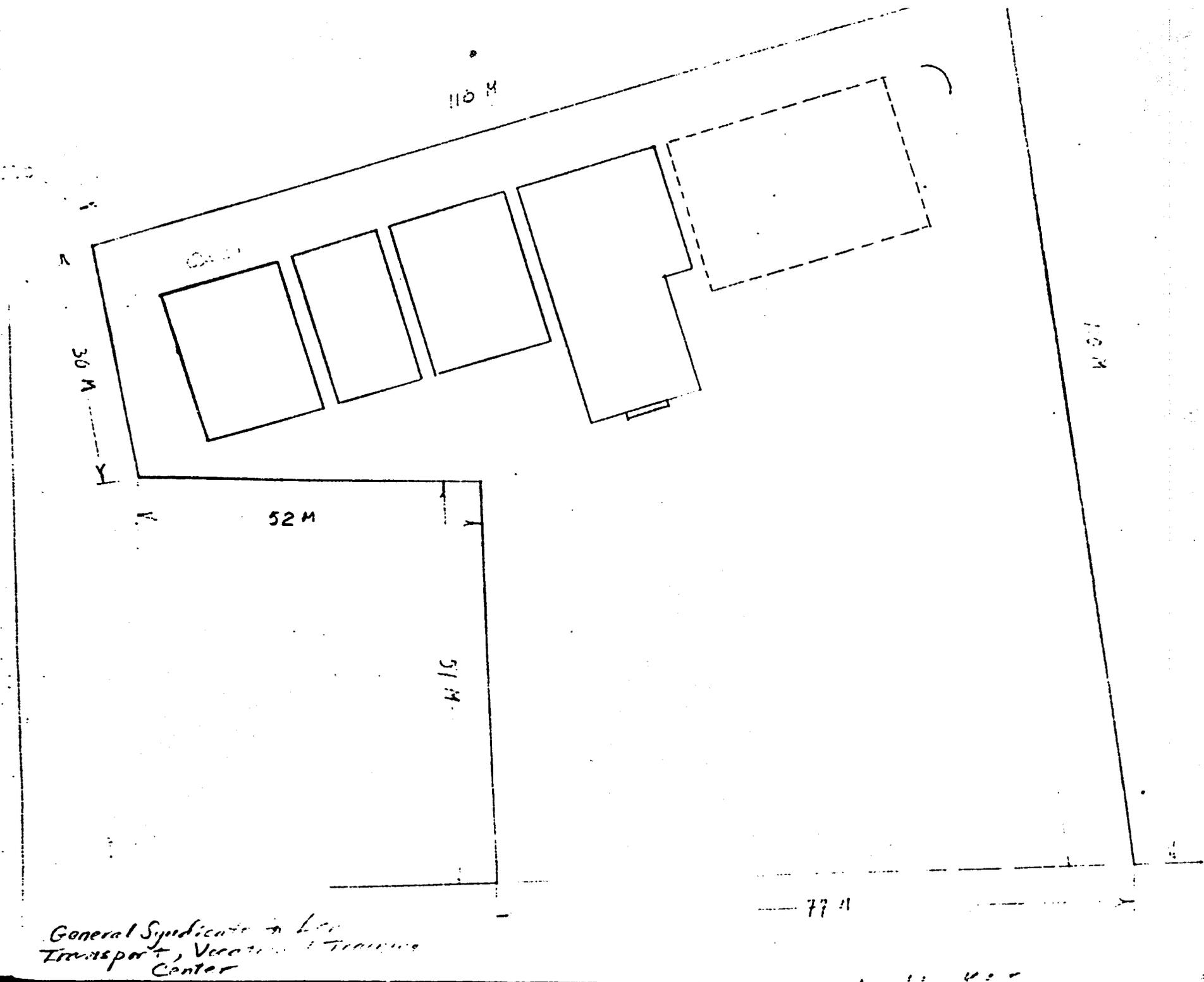
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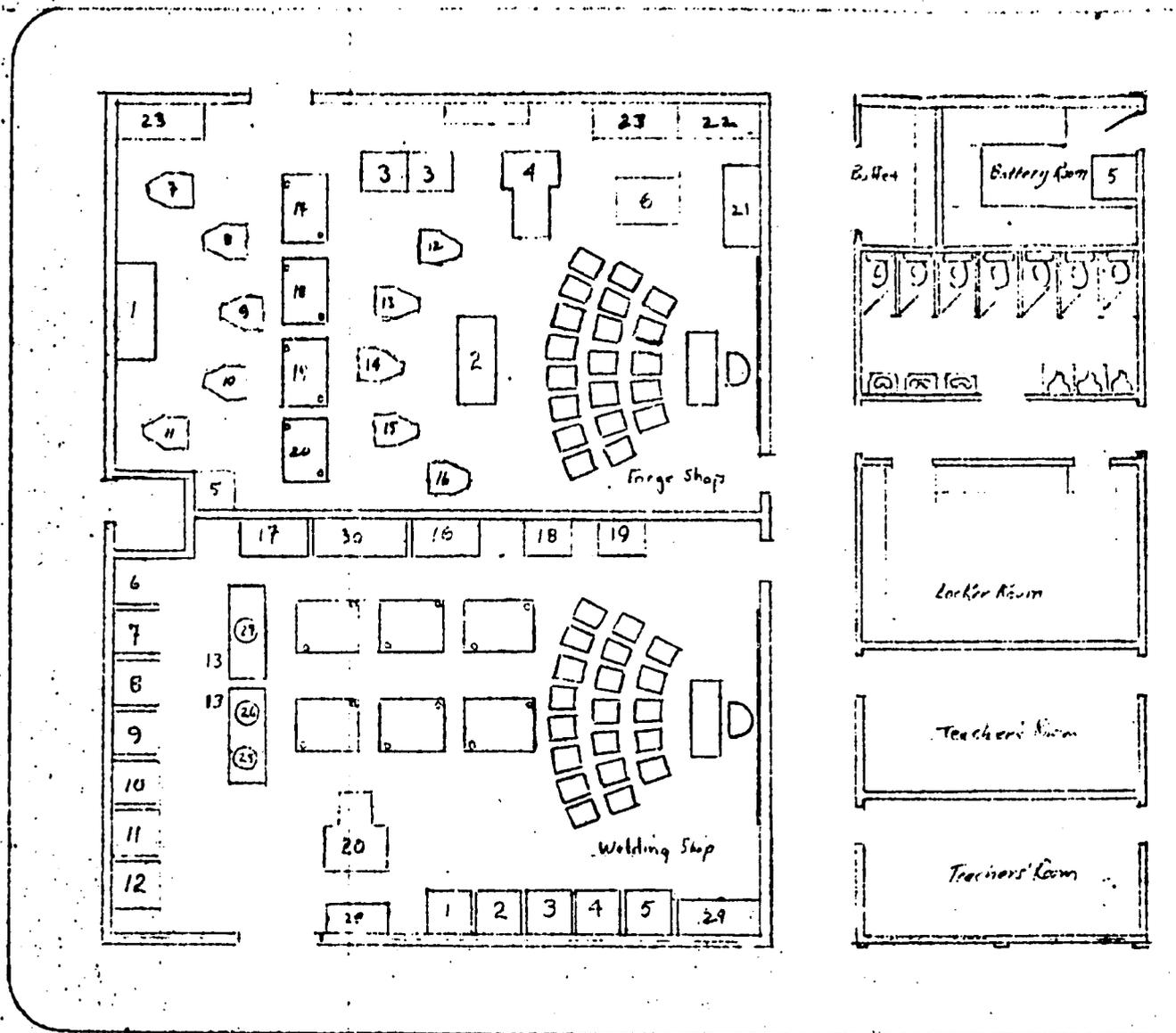
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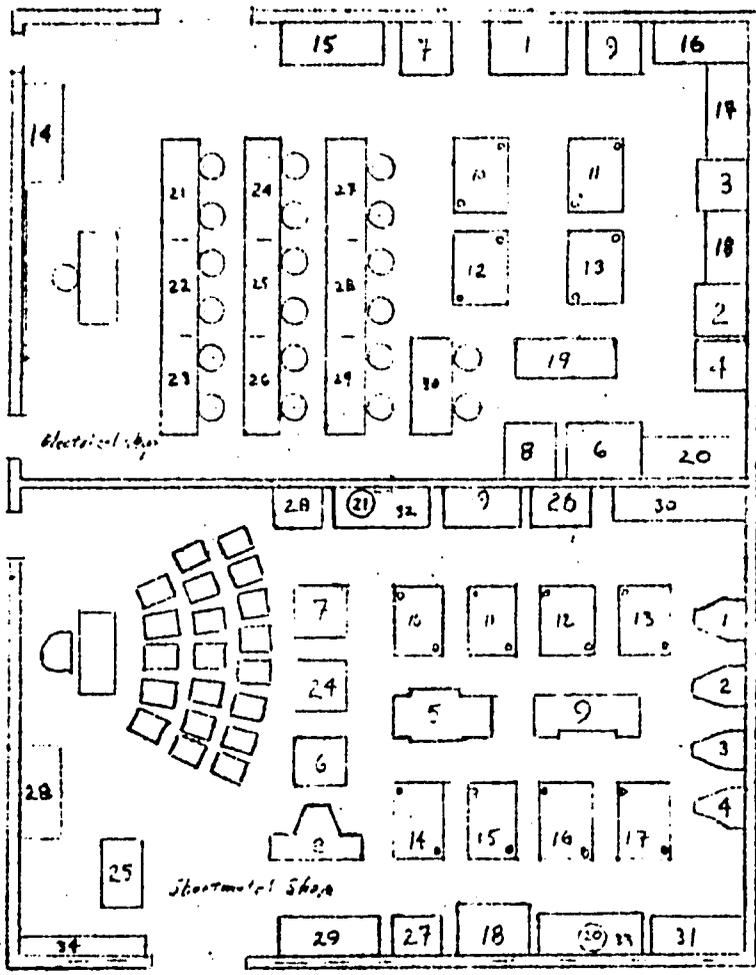
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General Syndicate in Law  
Transport, Vocational Training  
Center

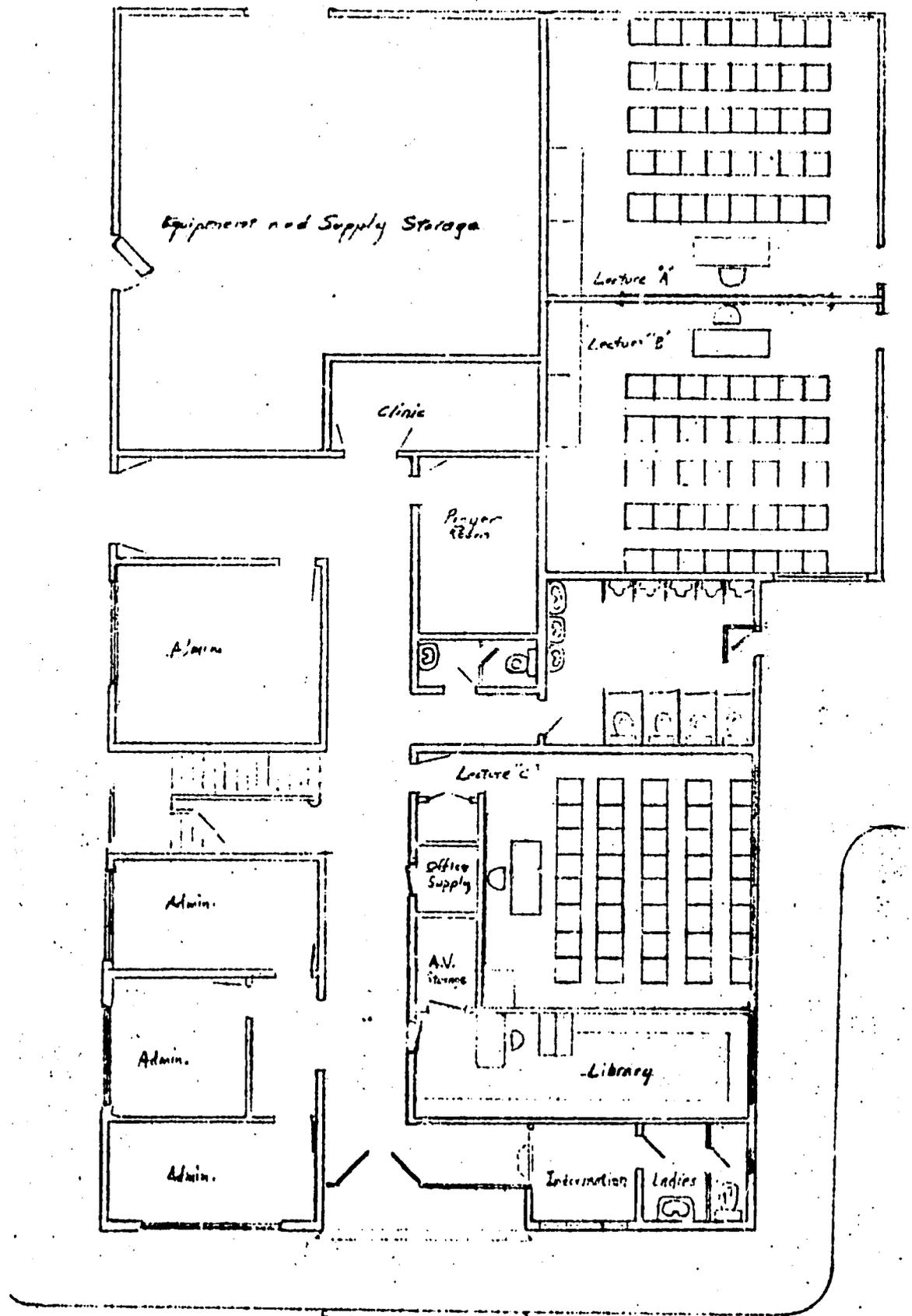


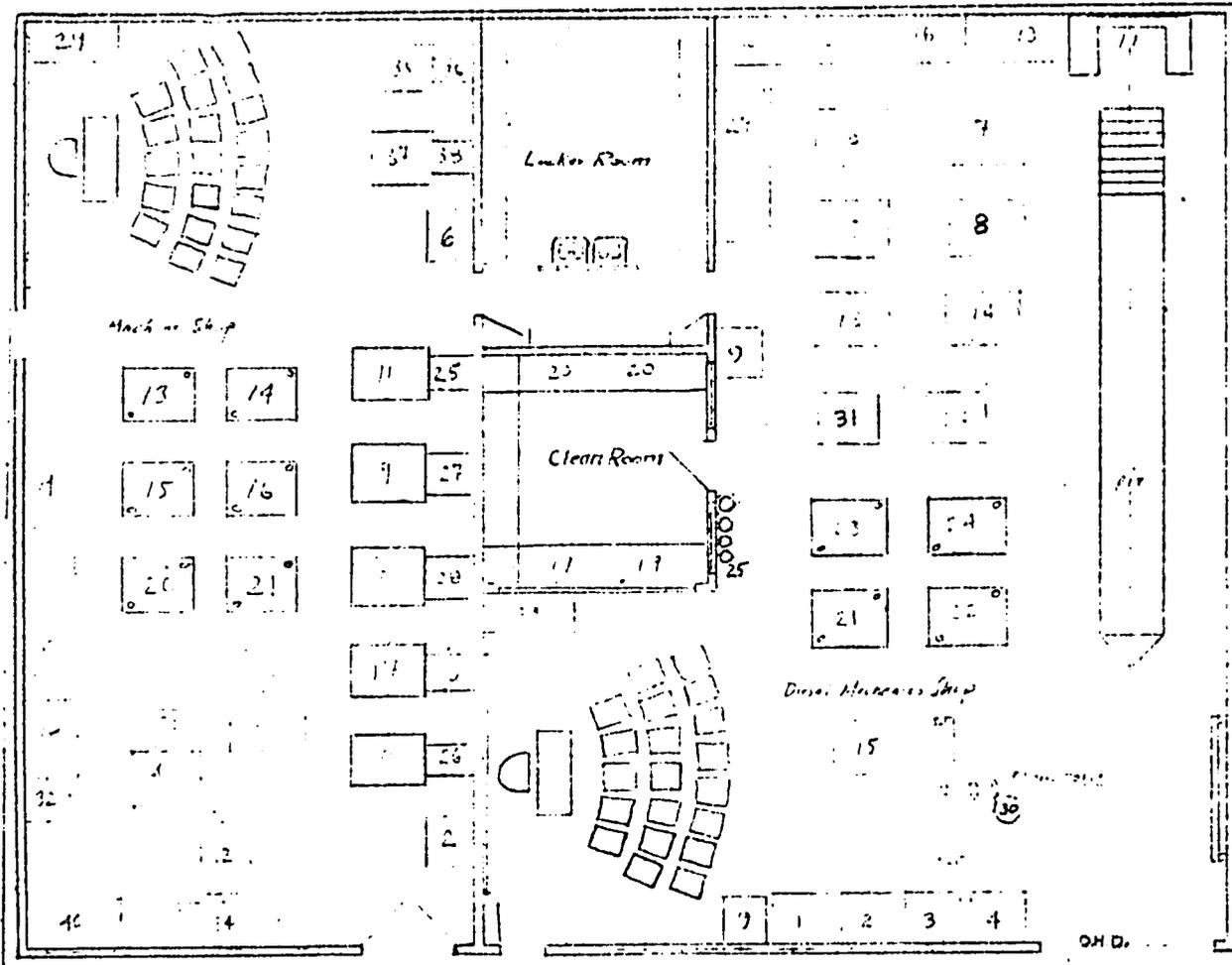


General Syndicate for Land Transport  
 proposed  
 Vocational Training Center



access ramp to all parts of the Bldg.





Modified 8-25-98 / 9-7-98 by Dr. K. L. Schank and Dr. W. S. Reynolds