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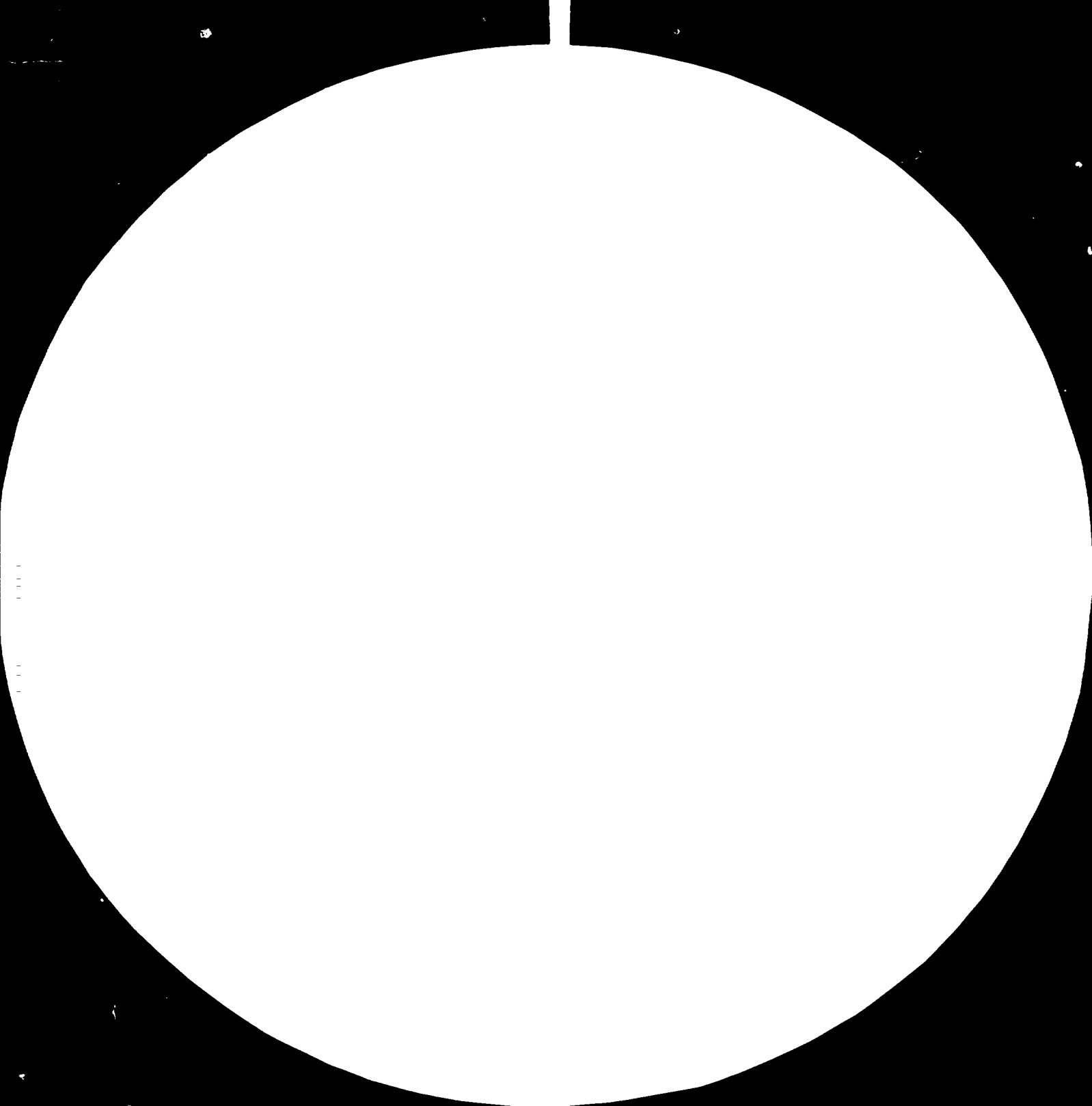
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Resolution Test Chart (NBS 1963-A) (ANSI #2) (NBS 1973-A)

Resolution Test Chart (NBS 1963-A) (ANSI #2) (NBS 1973-A)

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ENGLISH

Zambia. ASSISTANCE TO RUCOM WOOD FURNITURE PROJECT,  
CHATI WOOD WORKSHOP,

SI/ZAM/81/801

REPUBLIC OF ZAMBIA

Terminal Report: The Rehabilitation,  
Modernization and Expansion of RUCOM's Chati Woodworks Plant\*

Prepared for the Government of the Republic of Zambia  
by the United Nations Industrial Development Organization,  
acting as executing agency for the United Nations Development Programme

Based on the work of Horatio P. Brion,  
Expert in Wooden Furniture Production

United Nations Industrial Development Organization

Vienna

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V.81-31130

EXPLANATORY NOTES

The monetary unit of Zambia is the Kwacha (K) of which the current rate of exchange is 1K = US\$ 1.20.

The following acronyms are often referred to in this Report :

- GRZ - Government of the Republic of Zambia
- RUCOM - refers to RUCOM Industries, Ltd., a subsidiary of the State-owned Industrial Development Corp., Ltd., (INDECO)
- IPD - Industrial Plantation Division, Forestry Department, Ministry of National Resources, which is the government agency responsible for the massive reforestation program of the country.
- ZSBS - Zambia Steel and Buildings Stores, a state-owned firm for the manufacture, importation and distribution of building construction materials.
- ZECCO - Zambia Engineering and Construction Corporation Ltd., a State-owned firm engaged in the engineering and construction business, and operates a furniture factory on a joint-venture basis with a Yugoslav firm.
- FURNCOZ - Furniture Corporation of Zambia, privately-owned supplier of school furnitures and other furniture products, located in the Copperbelt Province.

A hyphen between dates (e.g., 1982 - 87) indicates the full period involved, including the beginning and ending year.

A full stop (.) is used to indicate decimals.

A comma (,) is used to distinguish thousands and millions.

The following symbols and/or abbreviations were used in this Report :

- dia. or Ø - diameter
- cu.m. - cubic meter

cm.	-	centimeter
mm	-	millimeter
kms	-	kilometers
kgs./sq.cm.	-	kilograms per square centimeter

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A B S T R A C T

The mission is part of UNIDO's Technical Assistance Programme to help the Government of the Republic of Zambia develop its woodworking industry sector.

The current status of the production facilities at the CHATI Wood Workshop (owned and operated by RUCOM Industries, Ltd., a subsidiary of the State-owned Industrial Development Corporation, Ltd.,) was evaluated. Recommendations were drawn up for additional machinery and equipment, together with other requirements for the plant's internal infrastructure, buildings, etc., to enable the rehabilitated and expanded factory to manufacture school furnitures for the Government of Zambia.

A program of technical assistance was also prepared, to provide the necessary expertise in finalizing the plans for the rehabilitation and expansion of the CHATI workshop for operations on an "Industrial" level, capable of producing furnitures on a "serial" basis. The Technical Assistance program also covers the training of manpower for the CHATI Project and such other similar Plants which RUCOM Industries may decide to establish in the future, in line with its goal to play a bigger role in the development of the wood processing industry of Zambia.

## I N T R O D U C T I O N

In 1973, the Government of the Republic of Zambia, with RUCOM Industries, Ltd., as the executing agency, and under the auspices of the UNIDO, erected the CHATI WOOD WORKSHOP, as one of the activities under a Programme to develop the furniture and joinery manufacturing industry of the country. All machinery and equipment for the shop were provided by UNIDO. Technical assistance was also provided by UNIDO. Three experts were sent to Zambia to assist in the installation and start-up activities of the Wood Workshop.

The CHATI Wood Workshop was fostered as a "PROTOTYPE" for other similar Wood Workshops to be established in other selected areas of the country. Its continued operations were premised on the assurance of sawntimber supply from the nearby Industrial Plantations Division sawmill (Department of Forestry) and government subsidies for operating capital.

Several other wood workshops of much smaller capacities were eventually established in various other locations : Solwezi in the Northwest Zambezi and Mongu in the West; Choma in the South; Mumbwa in the Central Province; Petauke in the East, and Kasama and Mansa in the Northern Province.

In September, 1977, a portion of the CHATI Wood Workshop was gutted by fire and a few pieces of machinery were burned together with three sheds. The principal woodworking machineries, however, were saved from the fire and are still in good operating condition today (see Appendix I and Figures 5 to 18).

The CHATI Project suffered further operational setbacks when the Government of Zambia withdrew general subsidies to various government-owned firms and agencies in 1977/79. This withdrawal of subsidies came at a very critical stage in the implementation of the CHATI Project! RUCOM was thus forced to operate the CHATI Wood Workshop on a very limited basis, such that from a peak operations level employing more than 100 people, only a nucleus of 26 men are now on hand, fabricating small quantities of boxes for soft-drinks, wooden pallets, tomato and onion crates and such other simple wood product items and turnings just to keep the Project alive. RUCOM's retrenchment program also forced the company to lease (on short term basis) the other workshops to private entities due to lack of operating capital.

At present, RUCOM, is embarking on a programme to rehabilitate the CHATI Wood Workshop. This rehabilitation program is premised on the following objectives :

- a. To help the country save on foreign exchange (at least US\$500,000.00/yr., based on 1975 - 77 figures) through the manufacture of school furniture, 78% of which is currently supplied by foreign sources ; and
- b. To resume the development activities in the furniture and joinery manufacturing industry of the country on a more vigorous and extensive basis, using the expanded CHATI Woodworks Plant as a PROTOTYPE and training center to meet the future manpower needs of the industry.

Thus, the Government of the Republic of Zambia, on the request of RUCOM Industries, Ltd., sought UNIDO assistance to provide the services of an expert to :

- a. Assess the country's market for wooden furniture ;
- b. Recommend wooden furniture products to be manufactured by an expanded CHATI Woodworks Plant;
- c. Draw up a list of machinery, spare parts and other manufacturing facilities required by the recommended manufacturing operations ; and
- d. Draft a plan for continued assistance to the wood-working sector of the country.

## FINDINGS AND RECOMMENDATIONS

### 1.0 THE PRODUCTS AND TARGET MARKET

#### 1.1 CHOICE OF PRODUCT LINES

The furniture market in Zambia is still in a "nebulous" stage. Household furniture is largely "MADE-TO-ORDER", while institutional types of furniture were mostly imported. The main demand is for furniture made of "MUKWA" (Pterocarpus Angolensis), an indigenous specie of timber. The GRZ has set high customs duties (more than 100% ad valorem) on imported furniture items, among its various efforts to help develop the furniture manufacturing industry of the country. Yet, the response from the private sector is still minimal, owing to the lack of ancillary materials that are required by the industry. Because of the high cost of transport in the country, even sawntimber has become scarce to large furniture manufacturing firms like ZECCO in Lusaka and FURNCOZ in the Copperbelt. Importation of items not available locally has become almost an "exercise in frustration" to the furniture industry (both government and private sector) ----- the import costs are highly variable and very high, and delivery periods are usually very long and so undependable that original cost estimates for a furniture order has become unrealistic by the time the needed imported materials are received by the furniture manufacturer.

There is no specific furniture design intrinsic to the country. Furniture products are mostly copies of foreign designs.

There is no organized marketing, so that planning for "serially produced" furniture items becomes an almost impossible task.

There are only about seven furniture producing firms in the Lusaka area ; about 12 in the Copperbelt area ; and less than a handful in the Livingston Area which could be considered as furniture manufacturer per se. All other establishments, counting more than two hundred units, operate on a purely handicraft level and produce whatever furniture items are ordered, mostly hand-made items. As a whole, the

industry is FRAGMENTED and no reliable market statistics are as yet available.

However, it is encouraging to note that the idea of establishing an association of furniture manufacturers has taken roots among the manufacturers in the Lusaka Area. This information was brought up during the Plant visit to and talks with the Proprietor-Manager of CHRIS FURNITURE, Ltd., in Lusaka.

It is therefore indicated that the rehabilitation, modernization and expansion of the CHATI WOODWORKS Plant should be based on the manufacture of furniture items which meet the following requirements :

- a) Minimal use of hardware, screws and other non-wood imported ancillary materials ;
- b) Intensive use of wood species which are readily available in the Plant Site region ;
- c) Furniture products which are suitable for "serial" production ; and
- d) Such furniture products which have a ready and continuing market (domestic and/or foreign).

The current need for conserving the foreign exchange reserves of the country imposes another condition for the choice of the products, i.e.:

- a) The products manufactured by the Project should be foreign-exchange-generating items ; or
- b) The products manufactured should be foreign-exchange-saving items, which will substitute locally manufactured goods for goods which are currently being imported.

Recognizing the significant amount of foreign exchange outflow involved in the importation of school furniture items. (About US\$ 500,000.00 per year, representing the value of less than 20% of the total needs of the country's schools), and the urgent need to provide

furnishings for classrooms of about 75% of the country's primary school population, the manufacture of school furniture items appear to offer possibilities as an initial direction for the rehabilitated and expanded CHATI Woodworks Plant.

1.2 THE PRODUCTS, QUANTITIES AND MARKET TARGET

Inquiries at the Ministry of Education, GRZ, brought out the following:

- 1.21 This year, 1981, there are about 40,830 classes in all the public elementary schools in Zambia ;
- 1.22 Only 25% of the total school furniture requirements are supplied from all sources (domestic and foreign) leaving a balance of 75% to be filled if all classes are adequately furnished with classrooms and school furnitures ;
- 1.23 About 50% of the available classrooms are used on a double-shift basis ; 10% of the classrooms are used on a triple-shift basis ; and 40% are used on a one-shift basis.
- 1.24 Private school requirements for school furnitures are less than 1% of the country's total requirements ; and
- 1.25 The following furniture items are the basic requirements for furnishing a classroom in the public elementary schools :
  - i) 20 units of Elementary School Desks, two-seater ;
  - ii) One unit, Teacher's Table ;
  - iii) One unit, Teacher's Chair ; and
  - iv) One unit, Low-level Classroom Cupboard.

Preliminary calculations indicated a total sawntimber input requirement of 40,000 cu.m. per year for the next five (5) years to supply the current deficiency in classroom furnishings and to meet the annual increase in number of classrooms in the public schools system within the same period.

Inquiries at the Industrial Plantation Division, (IPD), indicate that

it is not possible to supply the expanded CHATI Woodworks Plant with this volume of sawntimber, considering their other commitments and expected production capacity during the next five (5) years. However, the IPD indicated that there will be no problem in supplying the Project with 10,000 cu.m. of sawntimber (PINE or EUCALYPTUS) annually. It was further indicated that indigenous specie round timber, (with 20 to 40 cms. diameter) can also be available to the CHATI Project provided RUCOM can set-up a timber yarding and transport system which will be able to keep up with the cutting rate of the IPD operations (2,000 hectares per year) in the areas programmed for reforestation with PINE or EUCALYPTUS trees. (Note : It is not economical to process these small diameter trees into sawntimber. However, these will be good materials for slicing thin veneer.) This indicates a potential supply of small diameter indigenous specie timber of at least 10,000 cu.m. per year. At present, only a small percentage of this yield eventually finds its way to the furniture and construction industry as more than 95% of the yield is burned to make charcoal.

Considering the raw material and the initial capital outlay constraints, it is indicated that the CHATI Woodworks Plant expansion should be limited to serve only a portion of the total school furniture needs of the country. Calculations for the market volume (and production capacity) for the expanded CHATI Woodworks Plant are presented in the following section of this Report.

### 1.3 BASIC CONSIDERATIONS AND CALCULATIONS FOR MARKET VOLUME (AND PRODUCTION CAPACITY)

#### 1.31 Basic Considerations and Assumptions

- i) The expanded operations of the CHATI Woodworks Plant will meet the total requirements of the following areas within five (5) years from start of operations in 1983 :
  - a) KAEWE Province, excluding Lusaka District ;
  - b) COPPERBELT Province ; and

c) NORTH-WESTERN Province.

- ii) The projected annual increase in the number of elementary school classes is as furnished by the Ministry of Education, GRZ, (for 1982 and 1983) and as extrapolated from these data (for 1984 through 1987).
- iii) The number of classrooms, as estimated from data furnished by the Ministry of Education, GRZ, is calculated on the basis of the following information :
  - a) Only 25% of the total school furniture requirements is currently being met by local suppliers ;
  - b) At present about 50% of the classrooms are used on a double-shift basis ; and 10% of the classrooms are used on a triple-shift basis.

PROJECTED NUMBER OF ELEMENTARY SCHOOL CLASSES

TABLE A :

REGION : CENTRAL (Excluding LUSAKA District )

<u>YEAR</u>	<u>G R A D E S</u>							<u>TOTALS</u>
	<u>ONE</u>	<u>TWO</u>	<u>THREE</u>	<u>FOUR</u>	<u>FIVE</u>	<u>SIX</u>	<u>SEVEN</u>	
1982*	404	388	372	369	349	318	295	2,495
1983*	418	404	388	372	364	344	318	2,618
1984	434	418	404	388	372	364	347	2,734
1985	450	434	418	404	388	372	364	2,837
1986	466	450	434	418	404	388	372	2,939
1987	482	466	450	434	418	404	388	3,049



TABLE B :

REGION : COPPERBELT

<u>YEAR</u>	<u>G R A D E S</u>							<u>TOTALS</u>
	<u>ONE</u>	<u>TWO</u>	<u>THREE</u>	<u>FOUR</u>	<u>FIVE</u>	<u>SIX</u>	<u>SEVEN</u>	
1982*	1,139	970	804	789	775	775	736	5,969
1983*	1,308	1,139	970	804	792	775	756	6,541
1984	1,477	1,088	1,139	970	804	792	775	7,262
1985	1,649	1,477	1,308	1,139	970	804	792	8,133
1986	1,815	1,646	1,477	1,308	1,139	970	804	9,156
1987	2,034	1,815	1,646	1,477	1,308	1,139	970	10,386

TABLE C :

REGION : NORTH-WESTERN PROVINCE

<u>YEAR</u>	<u>G R A D E S</u>							<u>TOTALS</u>
	<u>ONE</u>	<u>TWO</u>	<u>THREE</u>	<u>FOUR</u>	<u>FIVE</u>	<u>SIX</u>	<u>SEVEN</u>	
1982*	253	245	238	236	205	178	153	1,508
1983*	261	253	245	238	231	205	178	1,616
1984	269	261	253	245	238	231	205	1,707
1985	277	269	261	253	245	238	231	1,779
1986	285	277	269	261	253	245	238	1,833
1987	293	285	277	269	261	253	245	1,888

Note : 1982 and 1983 figures marked (\*) were supplied by the Ministry of Education, GRZ. Figures for years 1984 through 1987 were extrapolated.

- c) Each classroom is furnished with the following basic furniture items :

<u>Qty.</u>	<u>Furniture Item</u>
20	School Desks, Two-Seater, Drawing No. ME-76.06.01
1	Teacher's Table, Drawing No. ME-76.06.02
1	Teacher's Chair, Drawing No. ME-76.06,03
1	Low-Level Classroom Cupboard Drawing No. ME-76.06.04

1.32 Calculations :

- i) By 1987, the total number of elementary school classes for the three target areas are as follows :

<u>Area</u>	<u>No. of Classes</u>
Kabwe Province	3,049
Copperbelt Province	10,386
North-Western Province	<u>1,888</u>
Total	<u>15,323</u>

- ii) Assume 25% of this requirement is supplied by other local suppliers. Hence the proposed plant will be expected to produce school furniture for the needs of about 11,500 classes.
- iii) Assuming that 50% of the classes will be conducted on a two-shift basis, then the total number of classrooms to be furnished by the proposed CHATI Plant is :

One-shift classrooms	-----	5,750
Two-shift classrooms	-----	<u>2,875</u>
Total number of classrooms by 1987	-----	<u>8,625</u>

- iv) The total furniture items to be supplied by the proposed plant during the period 1983 to 1987 is thus :

<u>Item</u>	<u>Annual Capacity</u>
School Desk	15,000 units
Teacher's Table	750 units
Teacher's Chair	750 units
Classroom Cupboard	750 units

vi) Considering the available manpower resources in the CHATI area, the length of time it takes to train them for woodworks plant operation, and other foreseeable constraints, the proposed plant may be expected to operate at the following efficiency levels for a one-shift per day operating schedule :

<u>Year</u>	<u>% of Plant Capacity</u>
1983	60 %
1984	80 %
1985	95 %
1986	95 %
1987	95 %

vii) The annual production for the five year period, on the basis of the above operating efficiency levels at one-shift per day is thus :

<u>Furniture Item</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>TOTALS</u>
School Desk	9,000	12,000	14,250	14,250	14,250	63,750
Teacher's Table	450	600	713	713	713	3,189
Teacher's Chair	450	600	713	713	713	3,189
Classroom Cupboard	450	600	713	713	713	3,189

viii) Normally, where labour cost is low and cost of equipment and other fixed costs is high, it is desirable to produce more products using the same set of machinery and allied

manufacturing facilities to reduce the unit fixed costs. This situation applies to the CHATI Plant. Thus, a second-shift may be installed by the second year and a third-shift may be installed by the third year of operations. In this manner, the expected annual production for the 5-year period 1983 - 1987 will be :

<u>Furniture Item</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>TOTALS</u>
School Desks	9,000	21,000	35,250	40,000	42,750	148,500
Teacher's Table	450	1,050	1,763	2,025	2,138	7,426
Teacher's Chair	450	1,050	1,763	2,025	2,138	7,426
Classroom Cupboard	450	1,050	1,763	2,025	2,138	7,426

Compared to the figures on total required furniture items for the five-year period (see page 15), it is indicated that by operating on a three-shift basis, the total requirements of school furniture item can be fully served by the year 1988 and onwards, with ample excess capacity which can be used to manufacture other types of furniture products in 1988 and later years.

It is suggested, however, that the socio-economic impact on the work personnel and their families, on one hand, and the company finances, on the other hand, be studied very carefully should Management decide to go into second and/or third-shift operations of the factory.

#### 1.4 SCHOOL FURNITURE DESIGN

It appears that previous work has been done to standardize the design of basic furniture items for furnishing the elementary school classrooms in Zambia. These designs are identified by the Ministry of Education as follows :

<u>Product Description</u>	<u>Design No.</u>
Elementary School Desk, Two-Seater, Types A and B -----	ME 76.06.01
Teacher's Table -----	ME 76.06.02
Teacher's Chair -----	ME 76.06.03
Low-Level Classroom Cupboard -----	ME 76.06.04

These designs were reviewed and revised to fit the expected manufacturing capabilities of the expanded CHATI Project. The major features and dimensions of each furniture item were retained. The weak points in the design were strengthened on the basis of findings during an ocular inspection of the 4 - 7 year old classroom furnitures at the Midland Elementary School in Lusaka. The revised designs are identified with an additional mark : (RIL - Rev.), and are presented in Appendices II - A to II - D.

## 2.0 THE MANUFACTURING PLANT

### 2.1 MANUFACTURING TECHNOLOGY

The Ministry of Education specifies the use of "MUKWA" for the manufacture of school furniture. Sawntimber of this specie has to be bought and transported from the Southern Province (Livingston Area) and costs K550 (US\$660) per cu.m. delivered to the CHATI Plant. This indicates prohibitive costs of producing the target products based on solid-wood construction. On the other hand, PINE or EUCALYPTUS sawntimber are readily available to the CHATI factory and cost at most K200 (US\$240) per cu.m. Thus, an alternative manufacturing technique is indicated. It is proposed to use a mixed type of manufacture :

- a) Laminated wood-based panels for the principal furniture components (desk type, table tops, drawer fronts, cupboard doors, etc.) with "MUKWA" face veneer, and
- b) Solid wood construction for other parts, made out of PINE or EUCALYPTUS. The lighter colored

components will be stain-finished to match the face veneer of the principal components.

Veneer is not readily available in Zambia. Even the only plywood manufacturing plant in Zambia, the Z.S.B.S., Ltd., Timber Division in Kitwe, imports its requirements for face veneers. Thus a small veneer manufacturing section will be provided in the design of the expanded CHATI Woodworks Plant.

Proper seasoning of sawntimber is a pre-requisite for good furniture manufacturing. Hence, a low cost, small capacity kiln-drier (seasoning chamber) will also be provided in the new woodworks plant.

Panel forming techniques will also be required in the production of panels with "MUKWA" face veneer and the other laminates of lower grade wood species. This will require a good knowledge of adhesive technology.

Effective use of production jigs and fixtures, quality control gauges and such other production aids that will help maintain the universal exchangeability of the furniture parts will also be introduced in the proposed plant operations.

A more scientific approach to the use of appropriate finishing systems will also be introduced. Thus, quality control facilities for testing of finishing raw materials is provided for in the complement of additional equipment.

## 2.2 RAW MATERIALS SUPPLY

### 2.21 Round Logs for Veneer Production

Round Logs of indigenous species like "MUKWA", "MUKUSI", "MWANDE", etc. are available in the woodlands being cut by IPD for reforestation with Pines and Eucalyptus trees. These woodlands are situated from 10 to 70 kms Northwest and about 30 kms South of the CHATI Woodworks Plant Site. (see Figure 1) The indigenous timber stand is estimated at 20 to 30 cu.m. per hectare of trees with about 20 to 40 cms. diameter at breast-height. At present, about 95% of these cuttings are burned

to make charcoal. IPD officials gave assurance that RUCOM can be allocated certain areas from which they can gather the indigenous timber species cut by IPD at the same low rates of stumpage fees being levied on the charcoal producers.

Considering the CHATI cost of "MUKWA" logs of about US \$660 per cubic meter delivered from the Livingston Area in the southern region of Zambia, it may be justified for RUCOM to acquire self-loading timber lorries to gather the logs from the IPD cutting sites and transport these to the CHATI Woodworks Plant. This investment in transport facilities is of paramount importance to keep raw material costs at low levels!

#### 2.22 Sawntimber Supply

The supply of PINE and EUCALYPTUS sawntimber from the IPD sawmill next door has been assured by IPD officials. There will be no problem in obtaining sawntimber of the desired thicknesses, width and length up to an annual total volume of 10,000 cubic meters.

#### 2.23 Finishing Materials

Inquiries from the major suppliers of finishing materials in Zambia, show that nitrocellulose lacquer-based coating systems are readily available. The more advanced catalyzed types of materials (e.g. polyurethanes, polyesters, etc.) can be made available only upon special arrangements with the suppliers and at very prohibitive costs. Hence, it is recommended that a nitrocellulose-based system of coatings be used for the school furniture products to be manufactured by the CHATI Woodworks Plant.

Non-grain raising (NGR) woodstains and oil-based woodfillers are also readily available.

#### 2.24 Adhesives

Urea-formaldehyde (UF) adhesives is recommended for laminating panels, while poly-vinyl acetate (PVA) glue is recommended for sub-assembly use (dowels, drawer assembly, etc.). Both types of adhesives are available in Zambia.

#### 2.25 Woodscrews, Nails and other Hardware Items

The school furniture items being considered for production at the CHATI plant were designed with minimal use of imported woodscrews, nails and other non-wood ancillary materials. Thus, with adequate government support, importing small quantities of these required items should present no major difficulties as far as availability of foreign exchange is concerned.

### 2.3 PRODUCTION MACHINERY AND EQUIPMENT

Operations Sequence Sheets (Appendix VII - A to VII - D) were prepared for all the components of each furniture item based on the working drawings (Appendix VI - A to VI - D) of each component. The total machine hours required for each machine type to be used was determined from the Operations Sequences Sheets. The resulting list of additional machinery and equipment is given in Appendix VIII. Cognizant of the possible initial financial constraints of the Project, a schedule of priorities in the acquisition of machinery and equipment was prepared and is given in Appendix IX. It is stressed, however, that the recommended entire complement of machinery and equipment must be acquired if the target plant capacity is to be met!



### 2.31 Machinery and Equipment Replacements

It is expected that full operations of the Woodworks Plant will generate enough funds to enable RUCOM to provide adequate replacements for machinery, equipment and/or their spare parts when such needs arise in the future, and sustain the plant operations adequately.

### 2.4 OTHER MANUFACTURING FACILITIES

Internal infrastructure requirements, quality control equipment, buildings, additional land area, fire safety equipment and fixtures, and other supporting manufacturing facilities are also given in Appendix VIII.

### 2.5 LABOUR SKILLS AND TECHNICAL ASSISTANCE IN MANPOWER TRAINING

The modernization and expansion program calls for the elevation of plant operations from its present "CRAFTSMAN" level to the "INDUSTRIAL" level of woodworks manufacturing to make possible "serial" production of the school furniture items.

The modernization aspects of the program calls for the introduction of appropriate manufacturing systems and technology which have never been practiced at the CHATI Plant, such as :

- i) Veneer production suited to a small or medium-size furniture plant ;
- ii) Laminated construction of principal components of furniture products ;
- iii) Use of readily available raw materials such as PINE or EUCALYPTUS and giving them a higher aesthetic value by the use of FINISHING SYSTEMS that will make them appear very similar to the high grade wood specie of which the principal furniture components are made (such as "MUKWA", "MWANDE", "MUKUSI", etc.) ;

- iv) Extensive use of jigs and fixtures during the machining phase of the manufacturing operations to attain the required degree of machining precision ;
- v) More intensive use, on a mass production scale of available machinery and equipment ; and
- vi) Introduction of the following :
  - a. Abrasive Technology, covering the proper choice and use of sandpapers, sanding belts, and grinding stones ;
  - b. Adhesive Technology, on the appropriate new types of adhesives for use in furniture manufacture ;
  - c. Finishing Technology, covering appropriate finishing material systems and application techniques ;
  - d. Basic Quality Control Systems and Techniques applied to raw materials, materials-in-process and finished goods ;
  - e. Techniques in the translation of furniture designs into working drawings for production purposes (Basic Product Engineering) ; and
  - f. Management and supervision of a small or medium-sized furniture manufacturing plant.

Thus, a manpower training program is required to provide adequately trained labour to operate the expanded plant. Assistance from external sources (most possibly, UNIDO) will be needed to assure successful implementation of this training program.

The Project will require technical assistance in the following aspects :

- i) Final evaluation of tenders submitted for the recommended machinery and equipment ;
- ii) Technical advice on the design of the plant with respect to :

- a. Plant site lay-out ;
  - b. Machinery lay-out ;
  - c. Design of production fixtures ;
  - d. Design of ancillary structures, e.g.  
elevated water tank, incinerator,  
steam generator, kiln-drying chamber, etc.
- 
- iii) Product Engineering ;
  - iv) Production Management ;
  - v) Woodworks Millwright Servites ;
  - vi) Plant and Machinery Maintenance
  - vii) Adhesives Technology ;
  - viii) Appropriate Abrasives Technology ;
  - ix) Finishing Systems and Materials Testing ;
  - x) Veneer Production Technology ;
  - xi) Woodworks Quality Control Systems and Techniques ; and
  - xii) Training of Key Production, Supervisory and Management  
Personnel.

Appendix X gives the job descriptions of the required expertise, while Appendix XI gives the schedule of assignments of the Experts for the Project.

## 2.6 SUGGESTED SITE PLAN AND MACHINERY LAY-OUT

Figures 3 and 4 indicate the relative locations of the buildings and structures, and the production machinery and equipment lay-out. Actual distances between buildings and structures in the site plan and distances between machines and other production fixtures are to be determined later, during final engineering design activities of the Project.

## 2.7 FINISHED GOODS STORAGE AND DISTRIBUTION

The finished school furnitures will be packed, stored and transported in "knock-down" state, to be assembled at designated RUCOM furniture assembling centers in the three provinces to be served by the Plant

(see Figure 2). Only a small quantity of the finished furnitures will be assembled at the CHATI Woodworks Plant, for delivery to classrooms within 50 kilometers distance from the Plant.

This distribution scheme calls for the following :

- i) Trained assemblers at the assembly centers ;
- ii) Adequate storage facilities for both "knock-down" and assembled furniture at the assembly centers ;
- iii) A fleet of small/medium capacity carrier vans which will transport the goods from the Plant to the assembling centers, thence to the school customers.

## 2.8 OTHER FURNITURE AND JOINERY PRODUCTS

At any time when orders for school furniture is satisfactorily met and there still is available manufacturing capacity, the same machinery and equipment can be used, with the same production techniques, to manufacture other furniture and joinery items such as:

- i) Household furniture ;
- ii) Other institutional furniture (chairs, laboratory cabinets, etc.) ;
- iii) Kitchen cabinets ;
- iv) Louvre doors, etc.

## 3.0 DEVELOPMENT PROGRAM FOR THE INDUSTRY ON THE NATIONAL LEVEL

As in other developing countries, directions in the development of the furniture and joinery manufacturing industry of Zambia depend principally on the availability of wood, as the major raw material input of the industry.

The current furniture market characteristic in the country leans heavily on the use of indigenous species such as "MUKWA", "MWANDE", "MUKUSI", etc. and solid-wood construction type of furniture and joinery products. It takes about 80 to 100 years for these wood species to grow to commercial sizes (40 cm. diameter and larger). The few remaining forest stands of

these timber species are found principally in the Southern Region (Livingston Area) and the Eastern Region (Petauke Area). The small and spotty stands of these species found in other areas of the country contain small (20 to 40 cms dia.) trees. Most of these woodlands are allocated for reforestation with fast growing species like PINE or EUCALYPTUS. Current reforestation programs of the IPD calls for cutting 2,000 to 2,500 hectares of these woodlands per year, for the next 5 to 10 years. Thus, round logs and sawntimber of these species will be more scarce in the years to come. It is thus foreseeable that unwise use of these species will leave almost nothing for use in the next two and later generations of Zambians. This has happened in other countries of the world, both developed and developing countries. The present indications are that it is going to happen in Zambia much sooner than it did in other countries.

In anticipation of such eventuality, it is considered judicious for the industry at this early stage, to acquire furniture and joinery manufacturing technology which will help conserve the dwindling supply of indigenous specie timber and make more use of the fast growing non-indigenous timber species which are being planted under the Zambian government's reforestation programme.

The manufacturing technology recommended for use at the rehabilitated and expanded CHATI Woodworks Plant is designed to implement this concept and opens the way for a more accelerated development of the furniture and joinery industry. In this manner, the CHATI Plant Work Force will be equipped with the basic knowledge of modern furniture production. It will further place the Plant's work force in a position to understand the more advanced technology now available from more industrialized nations ; absorb, modify and implement such "know-how" to suit local conditions in Zambia.

### 3.1 THE CHATI WOODWORKS PLANT AS A TRAINING CENTER FOR MANPOWER

The CHATI Woodworks Plant is also expected to train workers, supervisors and technicians in the implementation of systems involved in "serial production" of wooden furniture products. The Training Program should cover :

- i) Training of technicians in the design and fabrication of production jigs and fixtures ;
- ii) Training of technicians for raw materials and process quality control activities ;
- iii) Training of technicians for product design and engineering ;
- iv) Training of technicians in the proper techniques of grinding knives, bits, and other cutting tools, filing circular and bandsaw blades ;
- v) Training technicians in the proper choice and use of adhesives ; abrasives and finishing materials ; and
- vi) Training supervisors on the basic concepts of production management as applied to woodworking plants.

The immediate concern of such a program is to train key personnel for the operations of the CHATI Woodworks Plant. It is anticipated that an adequate number of personnel will have been trained sufficiently by the second year of operations. Potential Trainers will be selected from the more promising trainees. These men will undergo another more intensive training program along their chosen field of skills. Such a program should be designed to equip them with the knowledge and ability to transfer their skills to other qualified workers.

Thus, by the third year of operations, RUCOM will be in a position to man its woodworks plants in other areas of the country with key personnel trained at the CHATI Woodworks Plant.

During the first three years of the Training Program, the services of foreign experts will be needed as per schedule given in Appendix XI. It is further expected that by the fourth year of the training program, sufficient numbers of Zambian trainers will have been adequately trained to take over the training activities from the foreign experts. However, it is foreseen that the services of the Project Director may still be needed up to the fifth year of the

Program, after which his work may be turned over to a Zambian who would have been adequately trained during the fourth and fifth years for the job.

### 3.2 RESEARCH AND DEVELOPMENT ASPECTS OF THE CHATI WOODWORKS PLANT PROJECT

Efforts should be made to prevent the knowledge thus gained by Zambians under the Training Program described above, from remaining stagnant and eventually retrogressing in the face of changing situations in the country during the coming years. This bank of knowledge should be kept alive, and capable of sustaining adequate growth to meet new demands from the country's furniture market. This growth can only be assured through the undertaking of furniture research and development activities at the CHATI Woodworks Plant (or at any other feasible location designated by the government of Zambia). The research and development activities should be programmed to :

- i) Develop new techniques in the various phases of furniture and joinery manufacture ;
- ii) Evaluate and develop the use of non-conventional wood species for furniture manufacturing ;
- iii) Search for indigenous materials that will complement the use of wood in the manufacture of furniture products and develop techniques for their use in the industry ;
- iv) Evaluate the merits of and develop the methods for the proper use of complementary raw materials which become available in the future, e.g. new adhesives ; new hardware designs ; etc.
- v) In cooperation with other government or private agencies, engage in such other development activities that will assure further growth of the furniture and joinery manufacturing industry in the country.

FIGURE 1

FOREST AREAS of ZAMBIA  
 (Adapted from 1975 FOREST ESTATE MAP)  
 FOREST DEPT., H.Q., NDOLA

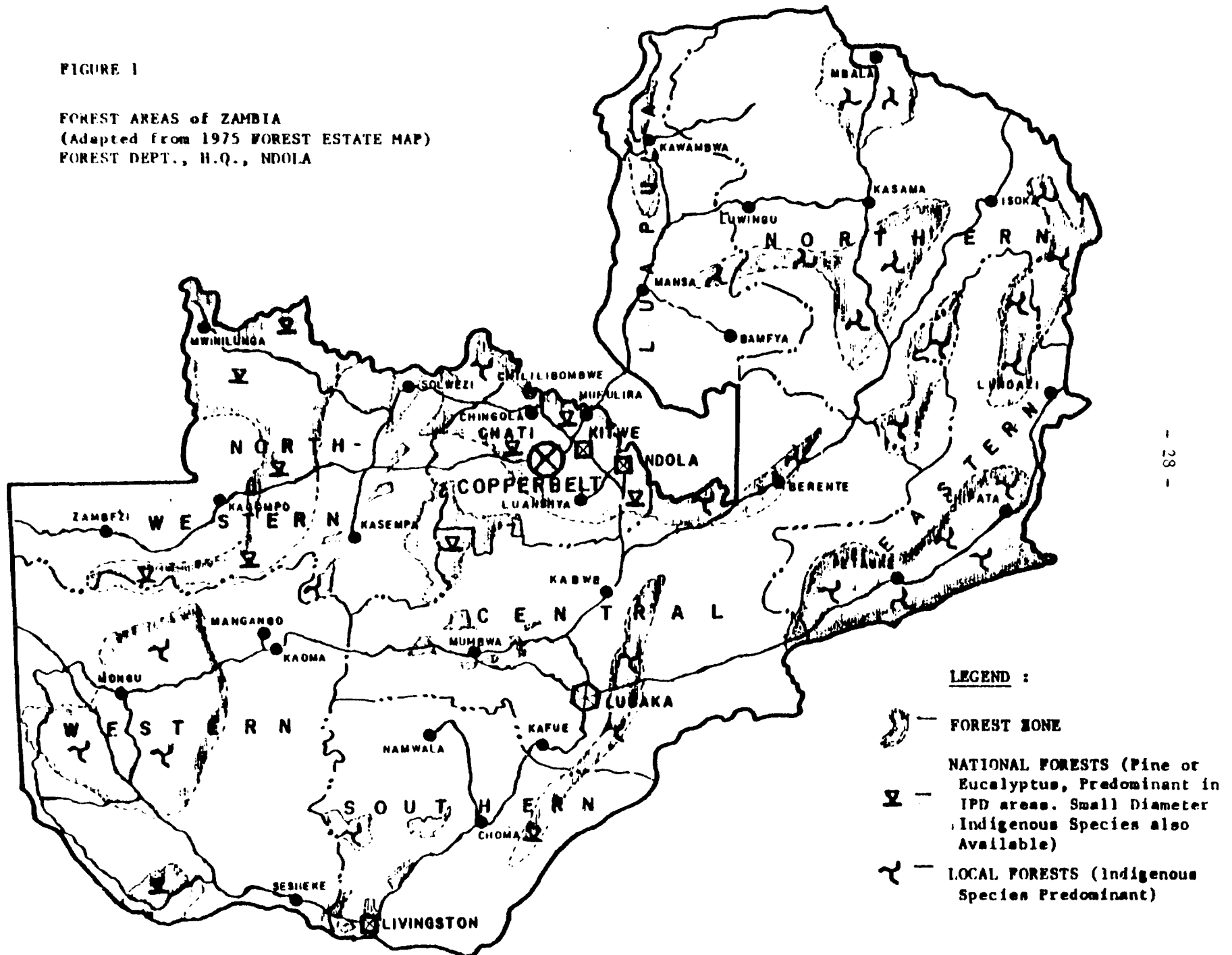
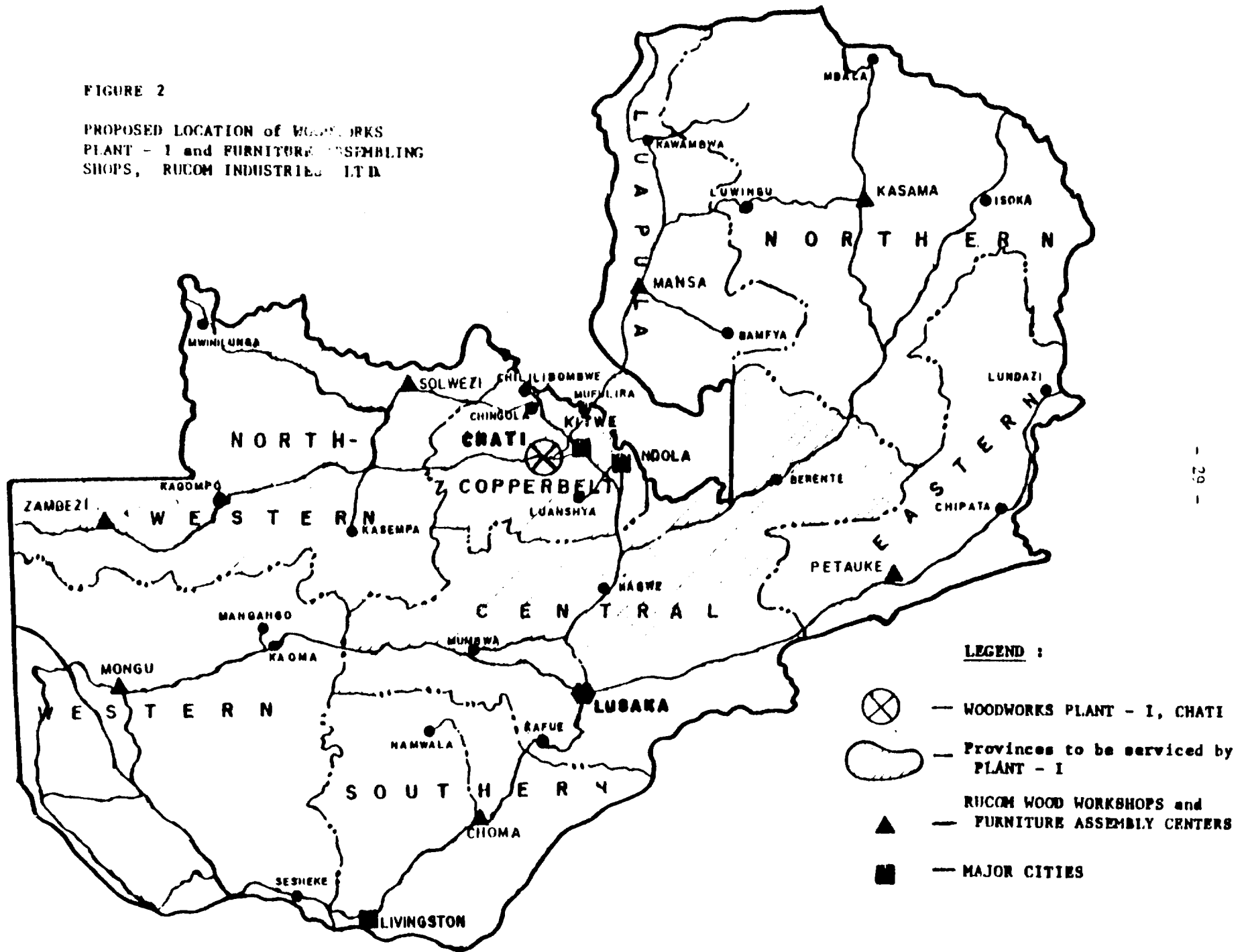




FIGURE 2

PROPOSED LOCATION of WOODWORKS  
PLANT - I and FURNITURE ASSEMBLING  
SHOPS, RUCOM INDUSTRIES LTD



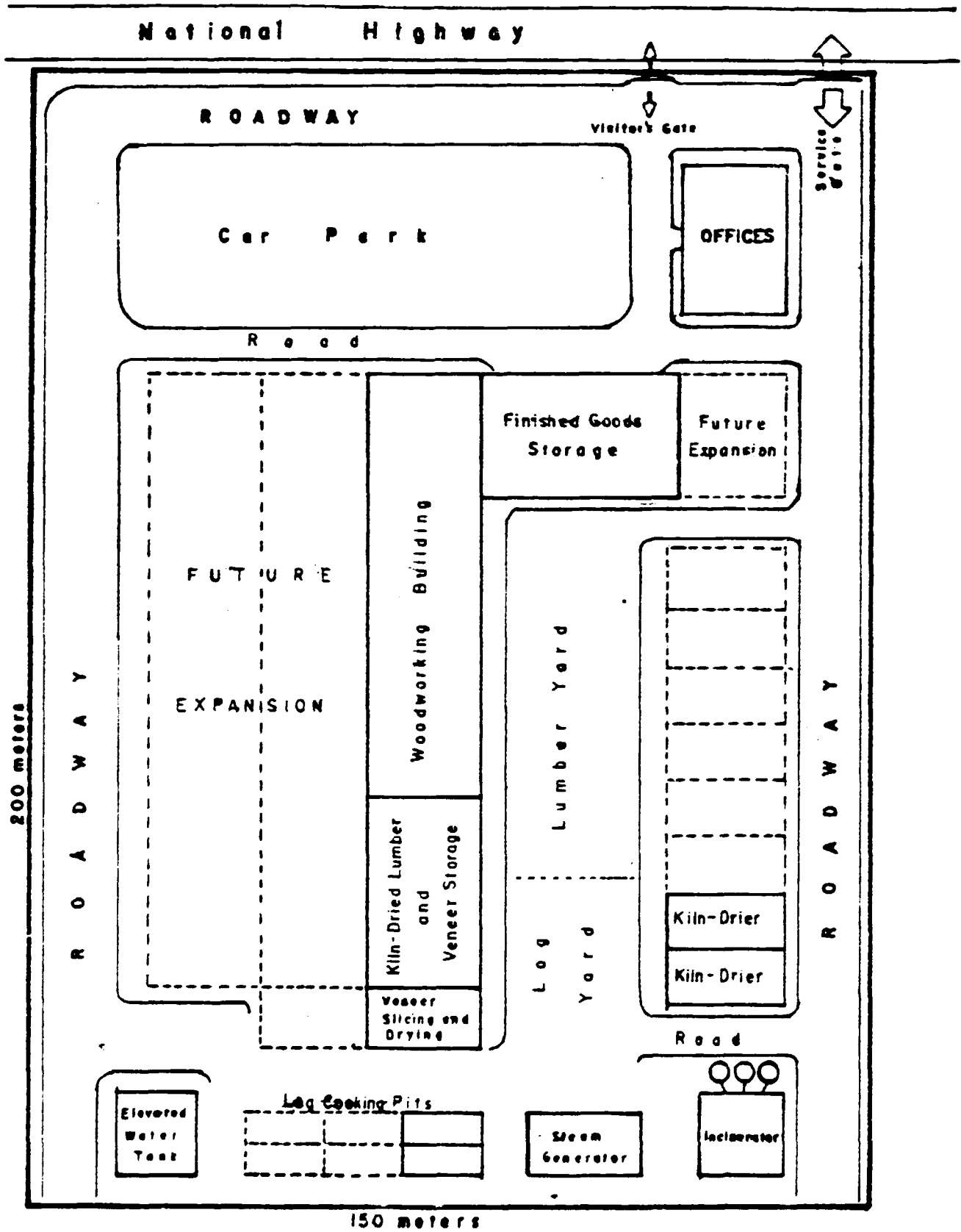


FIGURE 3

PROPOSED SITE PLAN, EXPANDED CHATI WOODWORKS PLANT

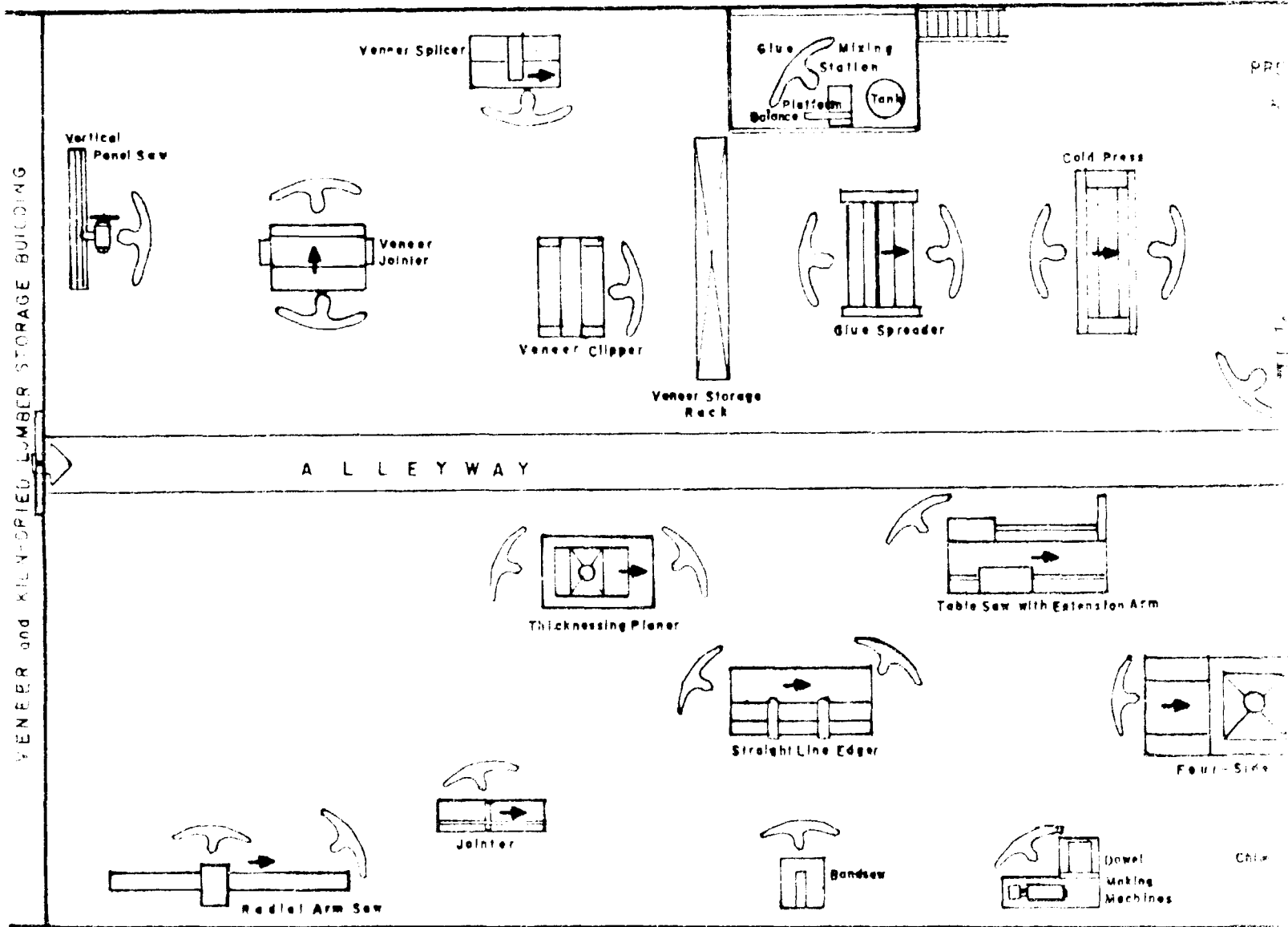
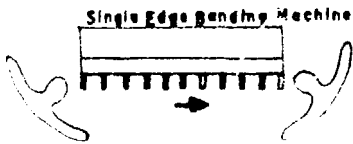


FIGURE 4 - PROPOSED MACHINERY LAY-OUT, CHATI WOODWORKS PLANT (Not to Scale)

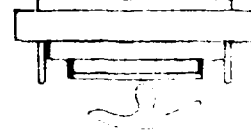
SECTION 1

PRESSED PANELS  
NORMALIZING  
AREA



MAINTENANCE  
and  
MILLWRIGHT  
SHOP

Double Belt Stroke Sander



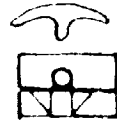
SPRAY  
BOOTH

FINISH

A L L E Y W A Y



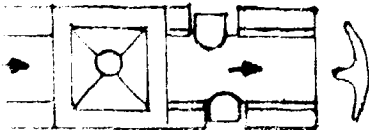
Shaper



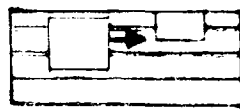
Heavy Duty Rester



2-Head Tenoner



Four-Side Planer



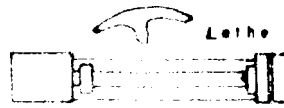
4-Head Tenoner



Table for Pneumatic Drills Set-up



Chisel-Drill Mortizer



Lathe

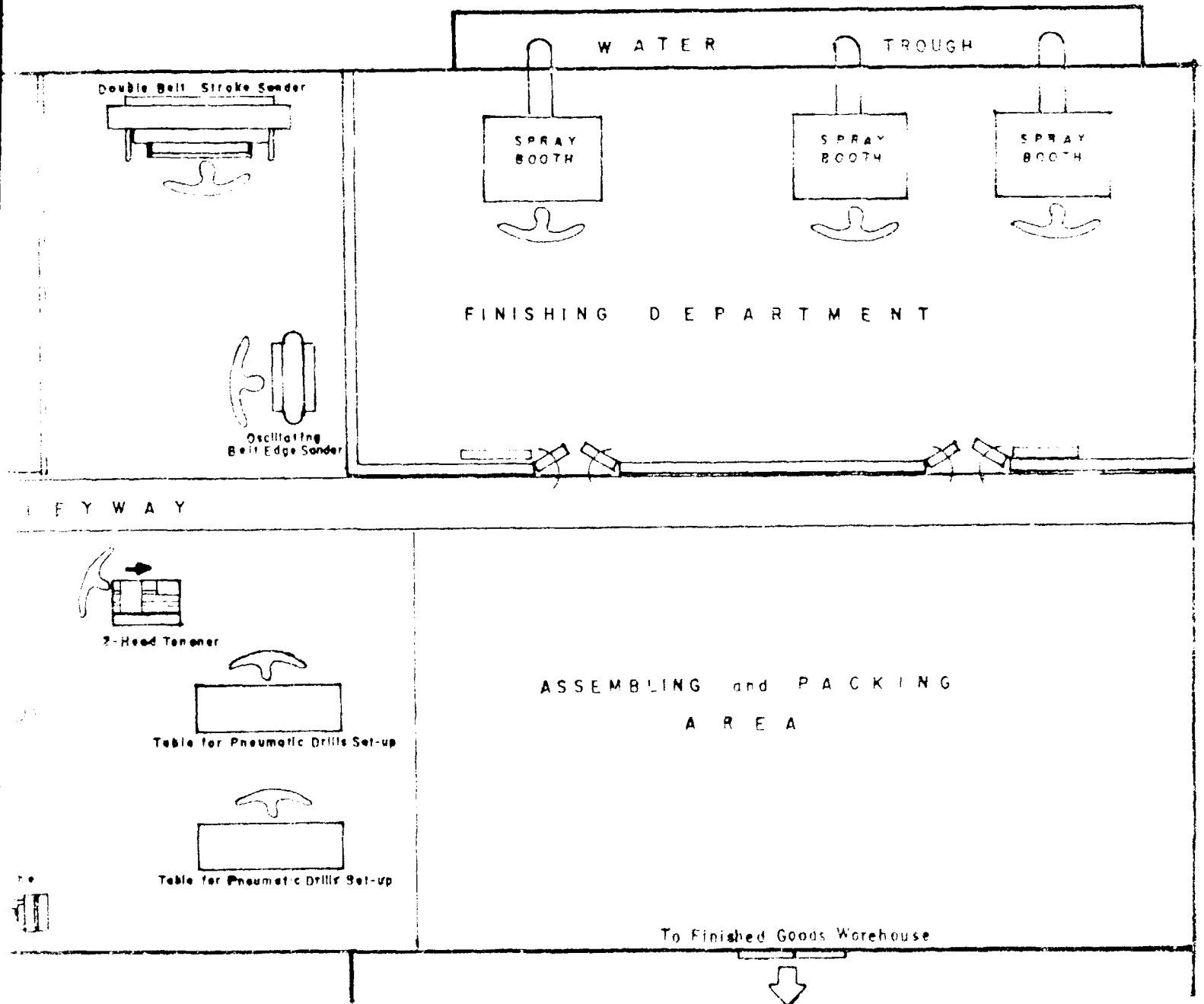


Table for Pneumatic Drills Set-up

ASS

(to Scale)

SECTION 2



SECTION 3

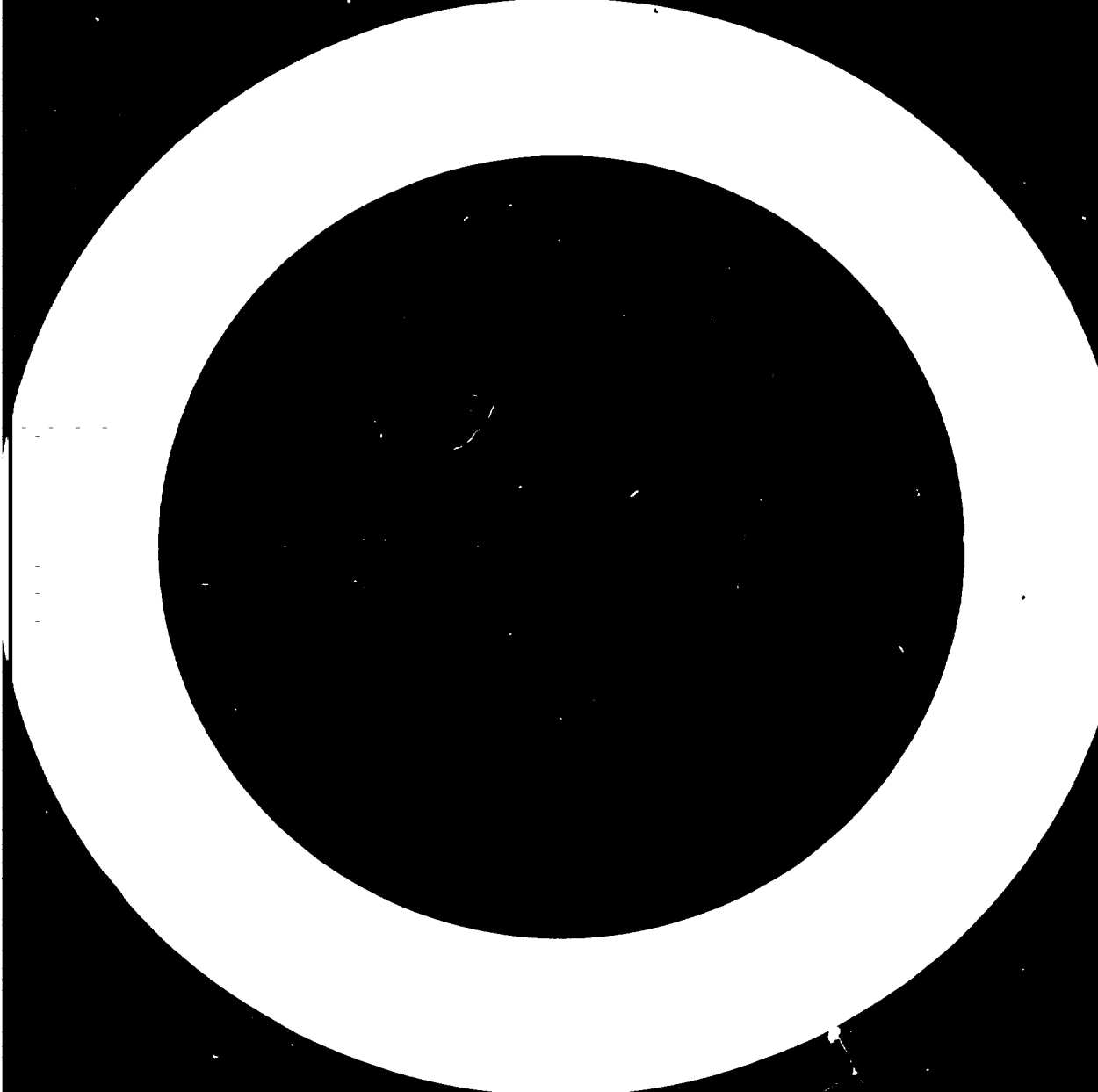




FIGURE 5  
BUCKING Pine log  
with improvised  
Handsaw

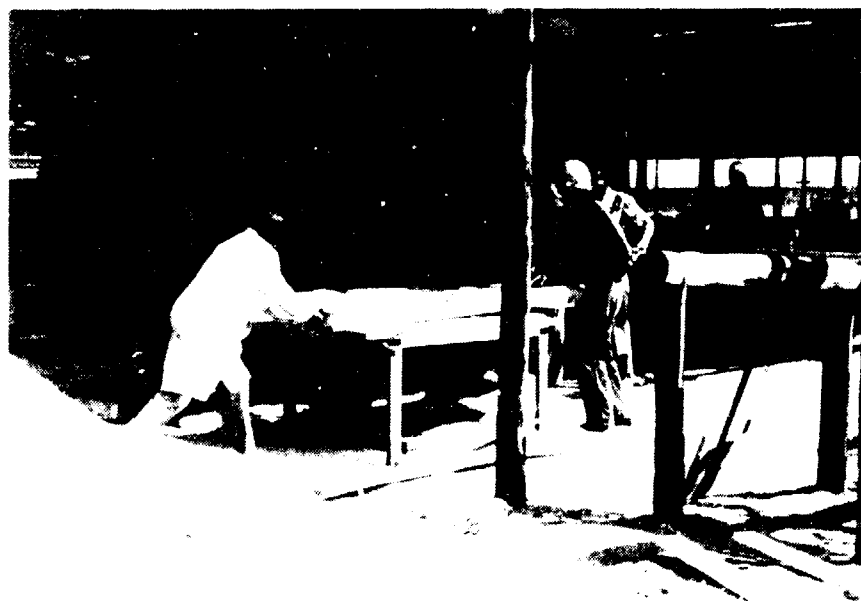


FIGURE 6  
Sawing Pine log on  
locally fabricated  
Table Saw



FIGURE 7  
Sawing "MUKWA" on  
locally fabricated  
Table saw



FIGURE 8

A view of the Input  
End of the Wood  
Workshop

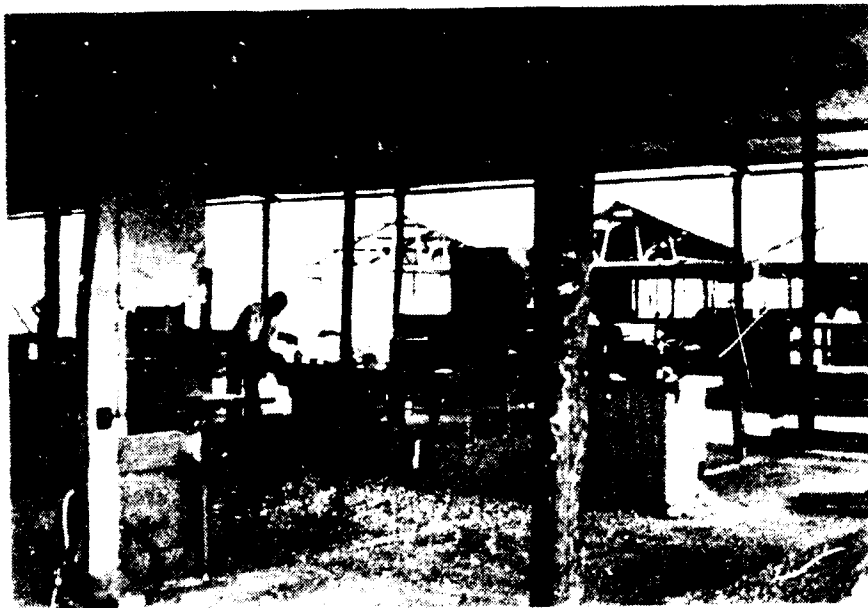


FIGURE 9

A view of the Surfacing  
Section, Chati Wood  
Workshop



FIGURE 10

A view of the Saving  
Section of the Wood  
Workshop





FIGURE 11

Looking at the  
Machining Section,  
with the Assembling  
Section on the left

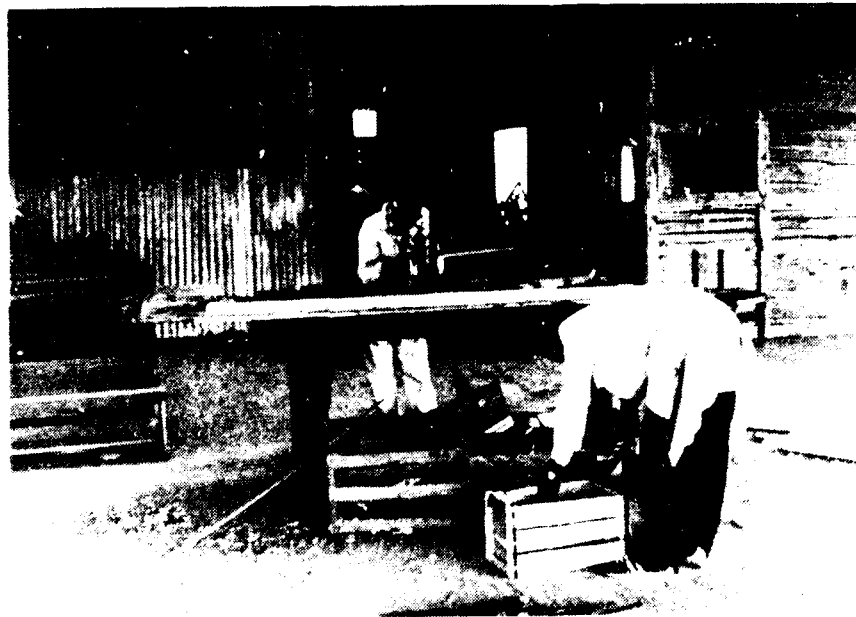


FIGURE 12

Assembling Tomato and  
Onion Crates

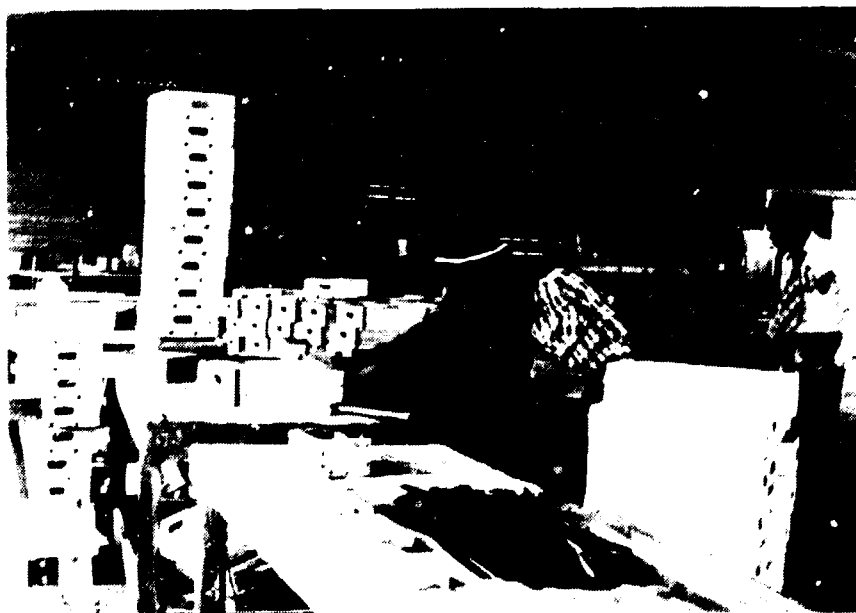


FIGURE 13

Assembling Soft  
Drinks Cases



FIGURE 14

Turning Wooden Bowls  
on the Wood Lathe



FIGURE 15

Another view of the  
Machining Section

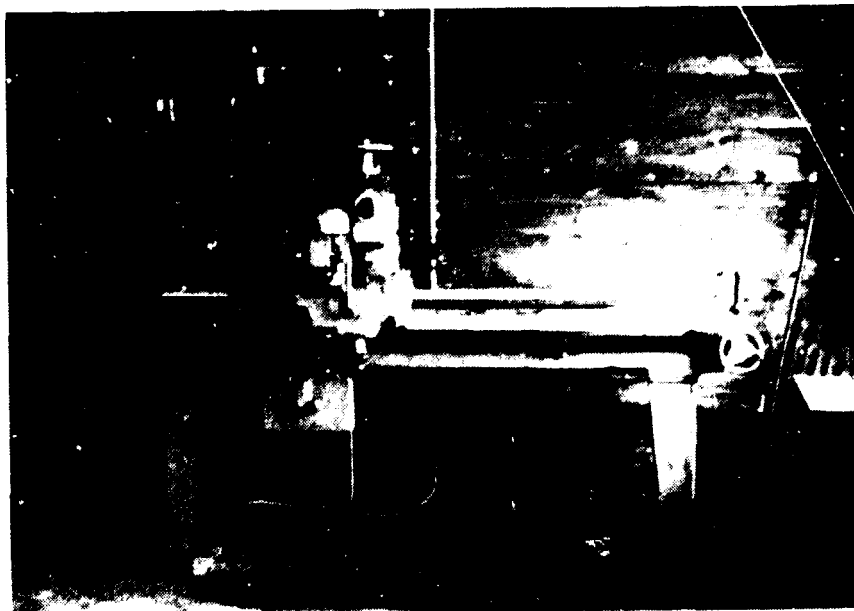


FIGURE 16

Straight Knife  
Grinding Machine

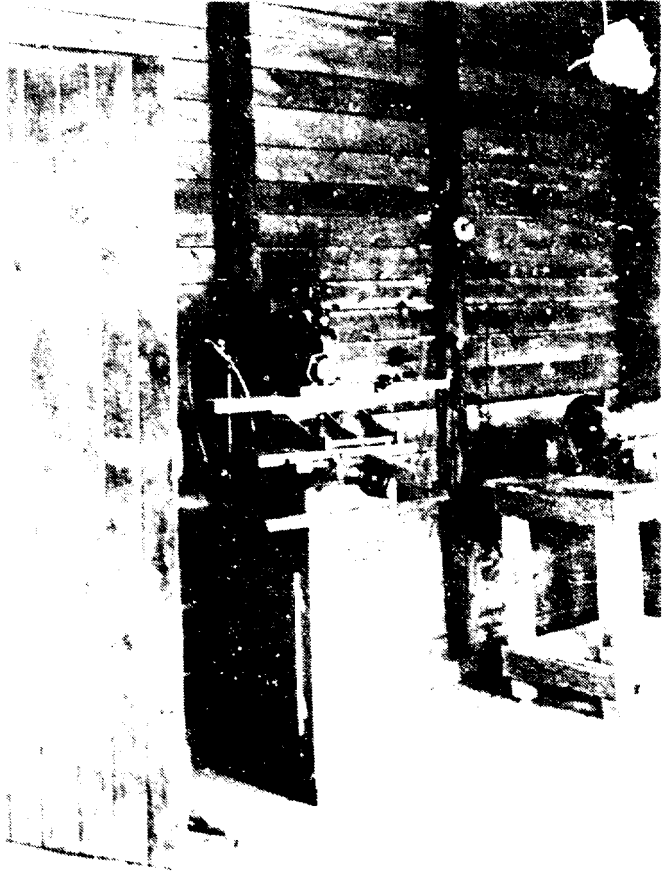


FIGURE 17

Universal Knife Grinder

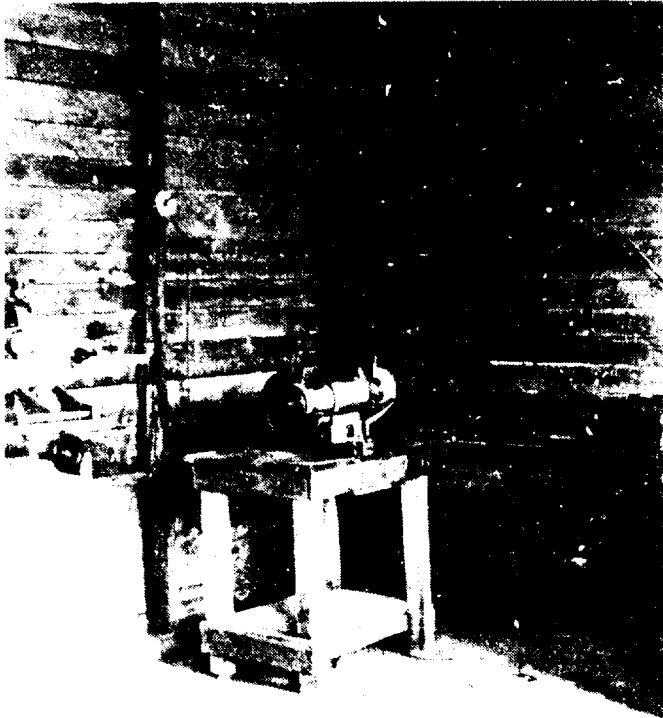
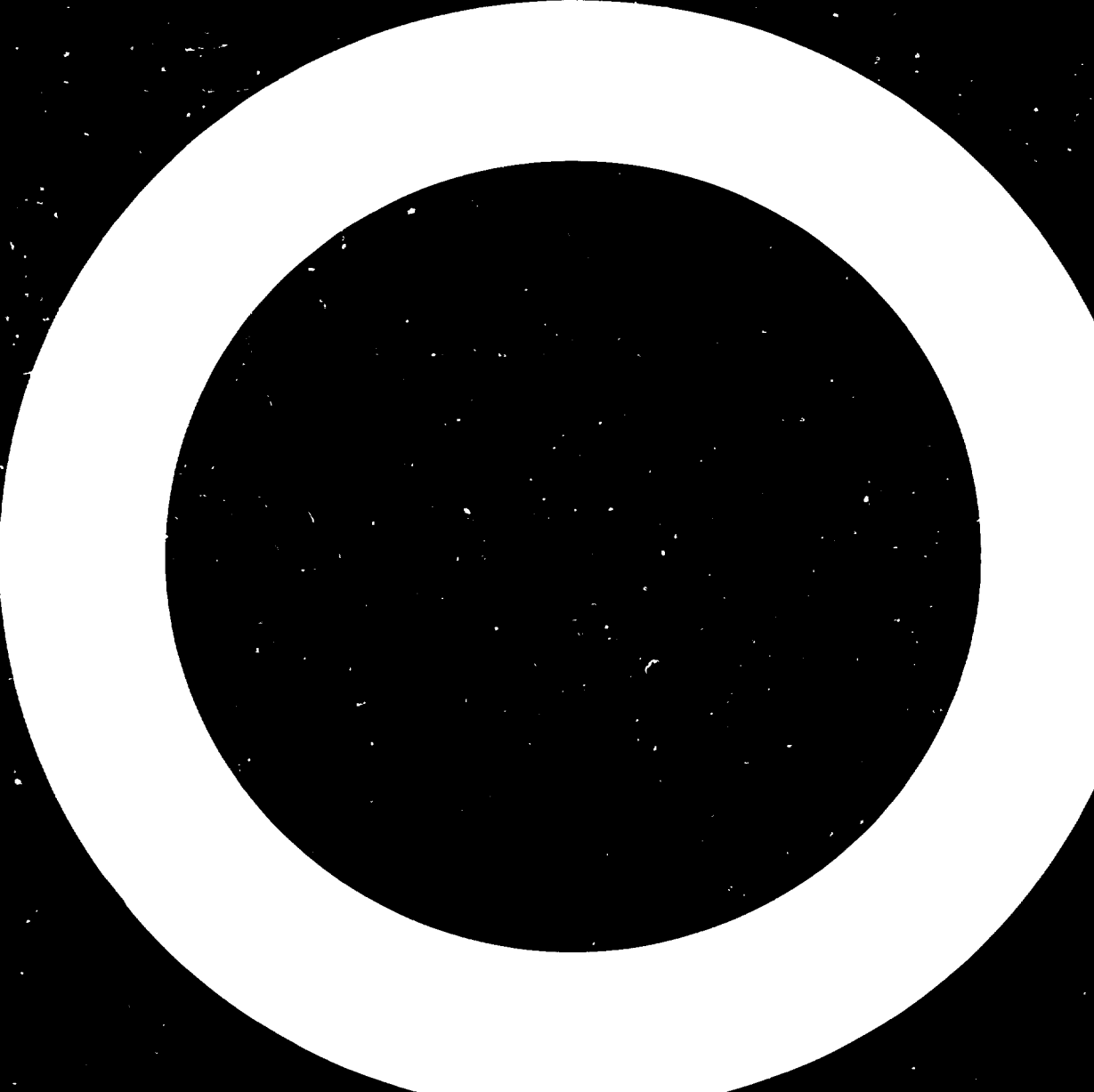


FIGURE 18

Two-wheel Table Grinder



A P P E N D I X I

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EQUIPMENT/TOOLS LIST AS OF  
13 AUGUST 1981, CHATI WOOD  
WORKSHOP

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EQUIPMENT/TOOLS LIST

LOCATION: CHATI WOODWORK SHOP, RUCOM INDUSTRIES LIMITED

AS. OF: 13 AUGUST, 1981

PAGE: 1 OF: 4 PAGES

(Note: Unless otherwise indicated, all electric motors are 380V, 50Hz, 3Ø)

NO. OF UNITS	EQUIPMENT/TOOL/MACHINE DESCRIPTION OR SPECIFICATIONS	ACQUIRED		ELECTRIC MOTORS		REMARKS
		YEAR	SOURCE	KW/HP V-HZ-PH	FUNCTION	
1	WOODTURNING LATHE, "CENTAURO" MODEL T2BC-100	April, 1974	UNIDO	2kw - 5kw -	Movable chuck Drive Workpiece turning motor	In good operating condition, with turning chisels and accessories
1	STRAIGHT KNIFE GRINDER, "WADKIN" MODEL 936	-do-	-do-	0.25kw)- (1Ø) ) 5HP -	Pedestal Movement Drive Grinder Motor	In good operating condition, with accessories. Needs more stones.
1	SURFACE PLANER (JOINTER), "SCM" MODEL F4L	-do-	-do-	5HP -	Cutterhead Drive	In good operating condition, with accessories.
1	THICKNESSING PLANER, "SCM" MODEL S-63	April, 1975	-do-	5HP -	Cutterhead Drive	In good operating condition, with accessories. Needs 2 more sets of knives.
1	VERTICAL SPINDLE MOULDER (SHAPER) "BAUERLE" MODEL SFM/O	April, 1974	-do-	5HP -	Cutterhead Drive	In good operating condition. Needs spare cutterheads and knives.
1	SINGLE-END TENONNING MACHINE, "MULTIGO" MODEL TM3	-do-	-do-	5HP - 5HP -	Top Cutterhead Drive Bottom Cutterhead Drive	In good operating condition.
1	TABLE GRINDER, "ARBOGA" TYPE E-308	-do-	-do-	0.65kw -	Grinder Motor	In good operating condition.
1	BANDSAW BLADE BUTT WELDING MACHINE, "IDEAL" MODEL BS-1	-do-	-do-	2kw - coil	Heating element (Not a motor)	In good operating condition
1	HEAVY DUTY ROUTER, "BAUERLE" MODEL B/4-0F	-do-	-do-	1kw - 5HP -	Frequency changer motor Router Head Motor	In good operating condition. Needs spare chucks and corresponding guide pins.

EQUIPMENT/TOOLS LIST

LOCATION: CHATI WOODWORK SHOP, RUCOM INDUSTRIES LIMITED

AS. OF: 13 AUGUST, 19 81

PAGE: 2 OF: 4 PAGES

(Note: Unless otherwise specified, all electric motors are 380V, 50Hz, 3Ø)

NO. OF UNITS	EQUIPMENT/TOOL/MACHINE DESCRIPTION OR SPECIFICATIONS	ACQUIRED		ELECTRIC MOTORS		REMARKS
		YEAR	SOURCE	KW/HP V-HZ-PH	FUNCTION	
1	ROD MILLING MACHINE, "COSMA" MODEL RA40	April, 1974	UNIDO	5HP -	Cutterhead Drive	Burnt in 1977 fire. But can be reconditioned. Needs cutterheads and knives.
1	CIRCULAR WAS, "WADKIN-BURSGREEN" MODEL BSW (24" max. sawblade Diameter)	-do-	-do-	7HP -	Saw Motor	In good operating condition, with spare sawblades.
1	RADIAL ARM CROSSCUT SAW, MODEL BRA "WADKIN BURSGREEN", (28" max. saw travel, manual operation)	-do-	-do-	5HP	Saw Motor	In good operating condition.
1	UNIVERSAL GRINDING MACHINE, "CIT" MODEL LB5/375-B	-do-	-do-	2kw	Grinder Motor	In good operating condition. Needs grinding stones.
1	FOUR-SIDE PLANER/MATCHER, "ECON" MODEL MHK-500	-do-	-do-	2HP - 5HP - 2HP - 7HP -	Feed Drive Motor Bottom Cutterhead Drive Top Cutterhead Drive Right " " Table Raising Motor	In operating condition. Table raising mechanism needs repair.
1	SINGLE-END TENNONING MACHINE, "DOMINION MACHINERY CORPORATION" MODEL BXA	-do-	-do-	2HP - 5HP - 5HP - 5HP -	Feed Motor Cutterhead Motor -do- -do- -do-	In good operating condition. Needs spare knives and scouring saws.
1	CUTTER SETTING AND BALANCING STAND, "ROBINSON" TYPE ZX	-do-	-do-	None	-	In good operating condition.
1	BANDSAW, "NATIONAL MACHINES, JOHANNESBURG"	Jan. 1973	RUCOM	2kw	Main pulley drive	Not operational. Top pulley needs retaining clip spring.



EQUIPMENT/TOOLS LIST

LOCATION: CHATI WOODWORK SHOP, RUCOM INDUSTRIES LIMITED

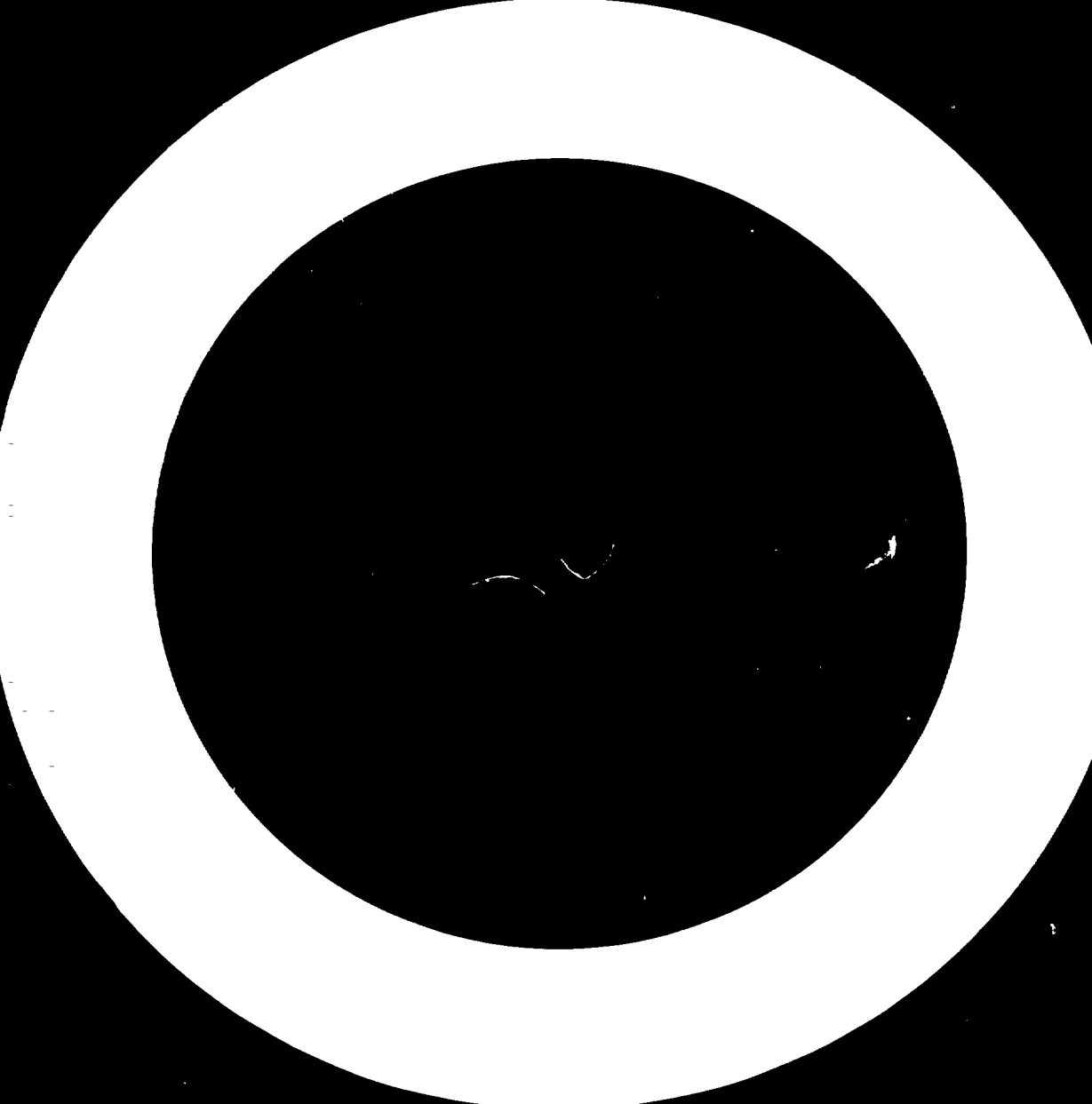
AS. OF: 13 AUGUST, 19 81

PAGE: 3 OF: 4 PAGES

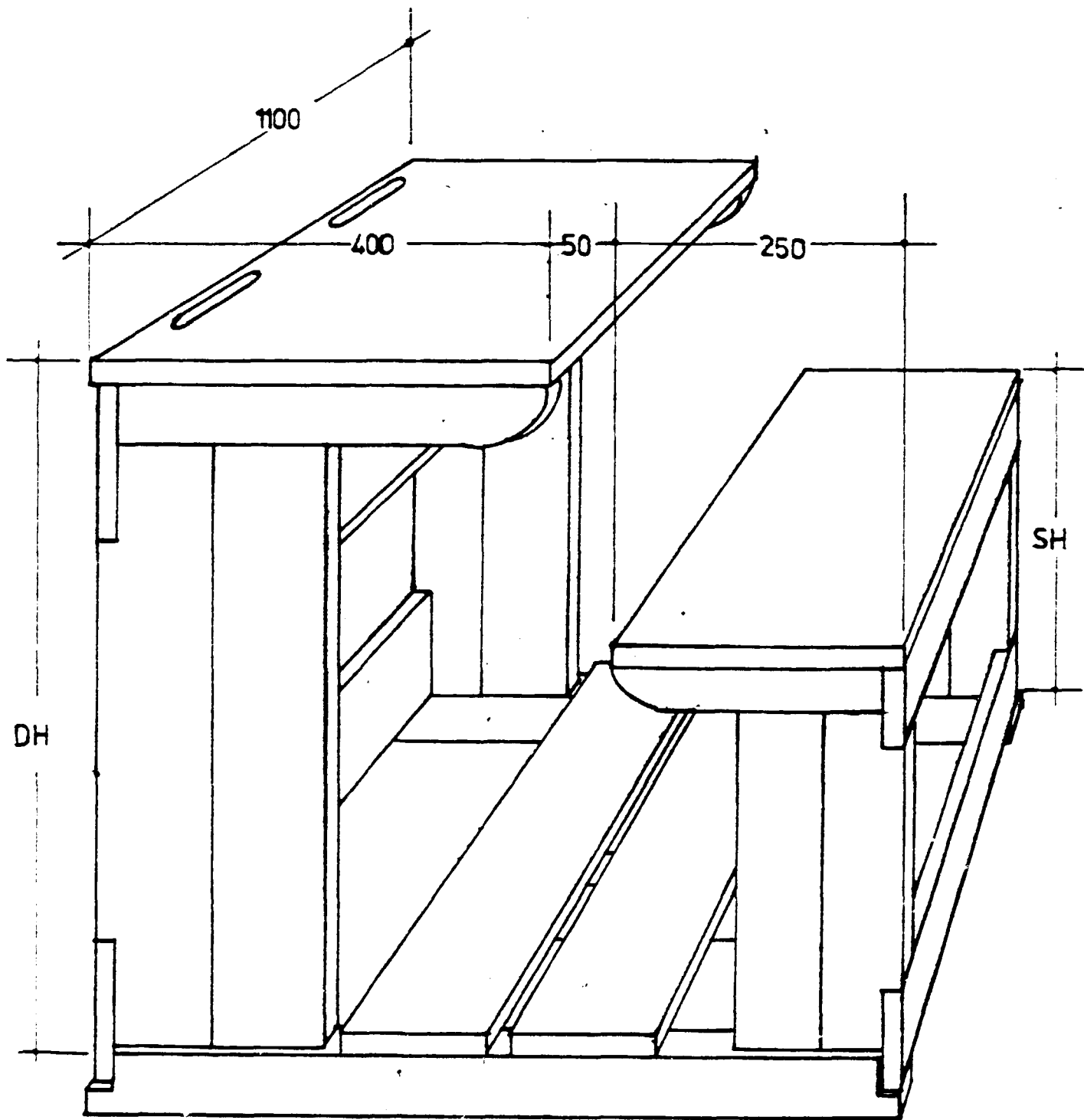
(Note: Unless otherwise specified, all electric motors are 380V, 50Hz, 3Ø)

NO. OF UNITS	EQUIPMENT/TOOL/MACHINE DESCRIPTION OR SPECIFICATIONS	ACQUIRED		ELECTRIC MOTORS		REMARKS
		YEAR	SOURCE	KW/HP V-HZ-PH	FUNCTION	
2	COMBINATION PLANER, JOINTER, SHAPER, SLOT MORTISER, TABLE SAW	Jan. 1973	RUCOM	2 Units, 5HP.	Cutterhead Drive, Feed Drive and saw motors	In good operating condition - Box Factory use.
1	CHAIN MORTISER, "MONTAVOCI" MODEL 380, 5mm x 30mm chain	-do-	-do-	2kw	Chain Drive	In good operating condition.
1	CROSS CUT SAW, LOCAL MANUFACTURE	-do-	-do-	5HP	Saw Motor	In good operating condition - Box Factory use.
3	CIRCULAR SAW, LOCAL MANUFACTURE	-do-	-do-	10HP	-do-	-do-
4	-do-	-do-	-do-	5HP	-do-	-do-
1	AIR COMPRESSOR	-do-	-do-	5HP	Compressor Drive	-do-
3	ELECTRIC MOTORS	-do-	-do-	10HP	Spare Motors	In operating condition - Tool Room.
2	PORTABLE SANDING MACHINES, OSCILLATING TYPE	Jan. 1978	-do-	350W, 1-phase	Cabinet Assembling Tool	-do-





A P P E N D I X II - A

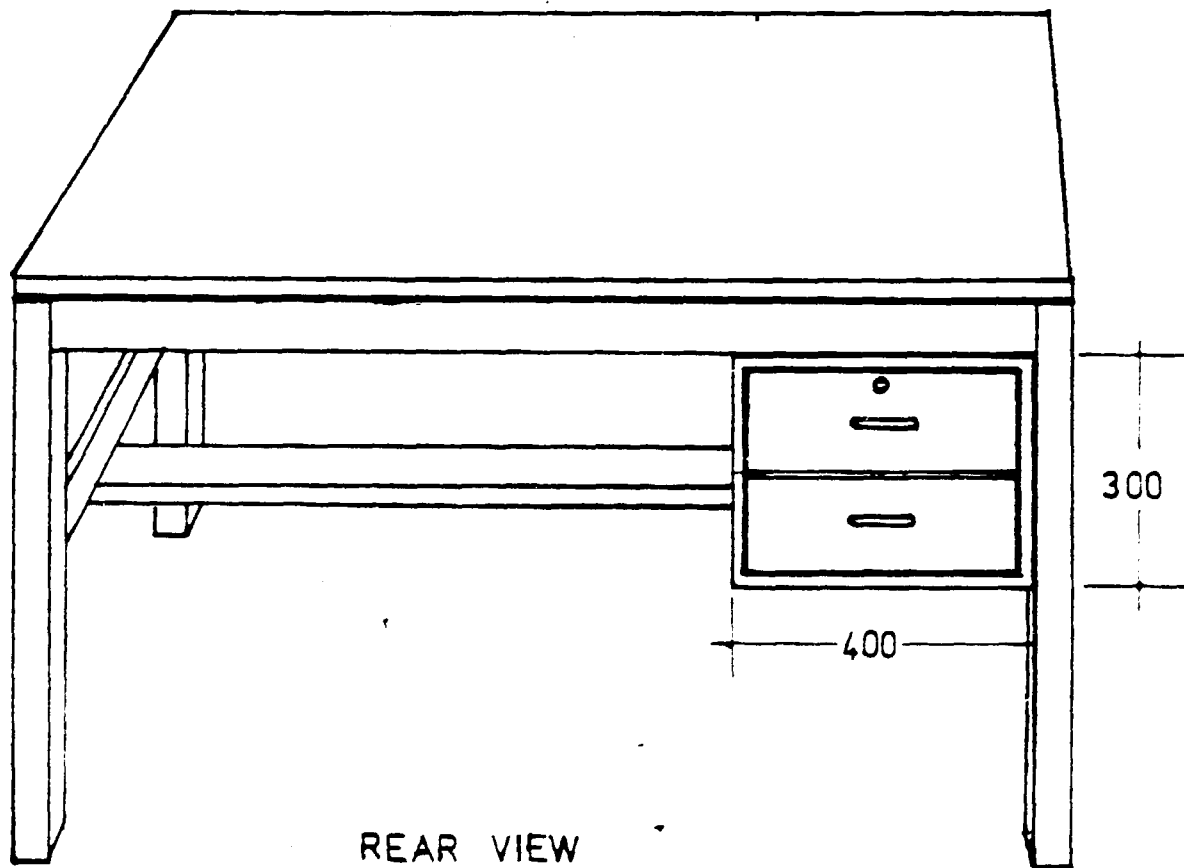
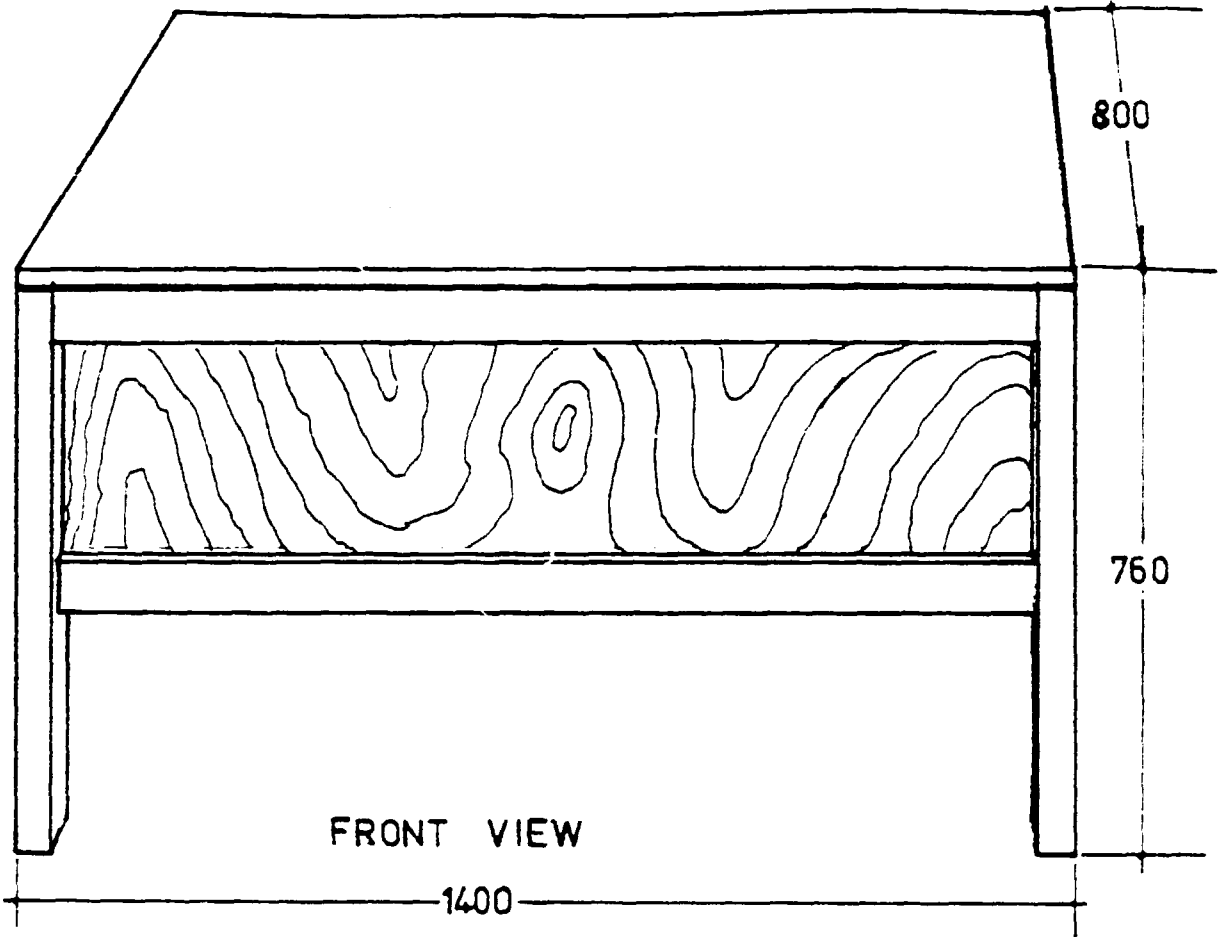


PRIMARY SCHOOL DESK, Two Seater

	<u>DH</u>	<u>SH</u>
Type B —	590	350
Type C —	650	395

Product No. ME.76.06.01 (RIL - Rev.)

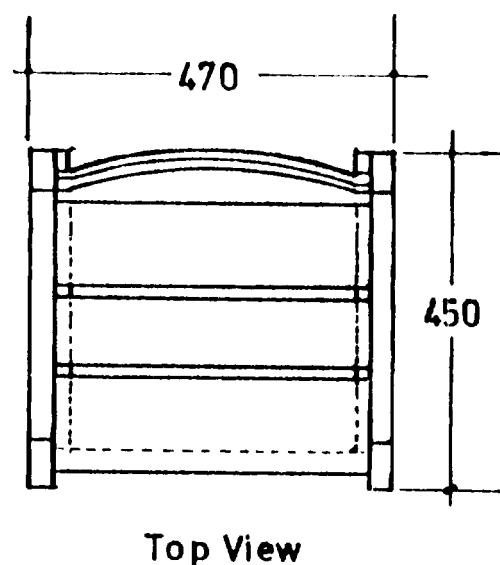
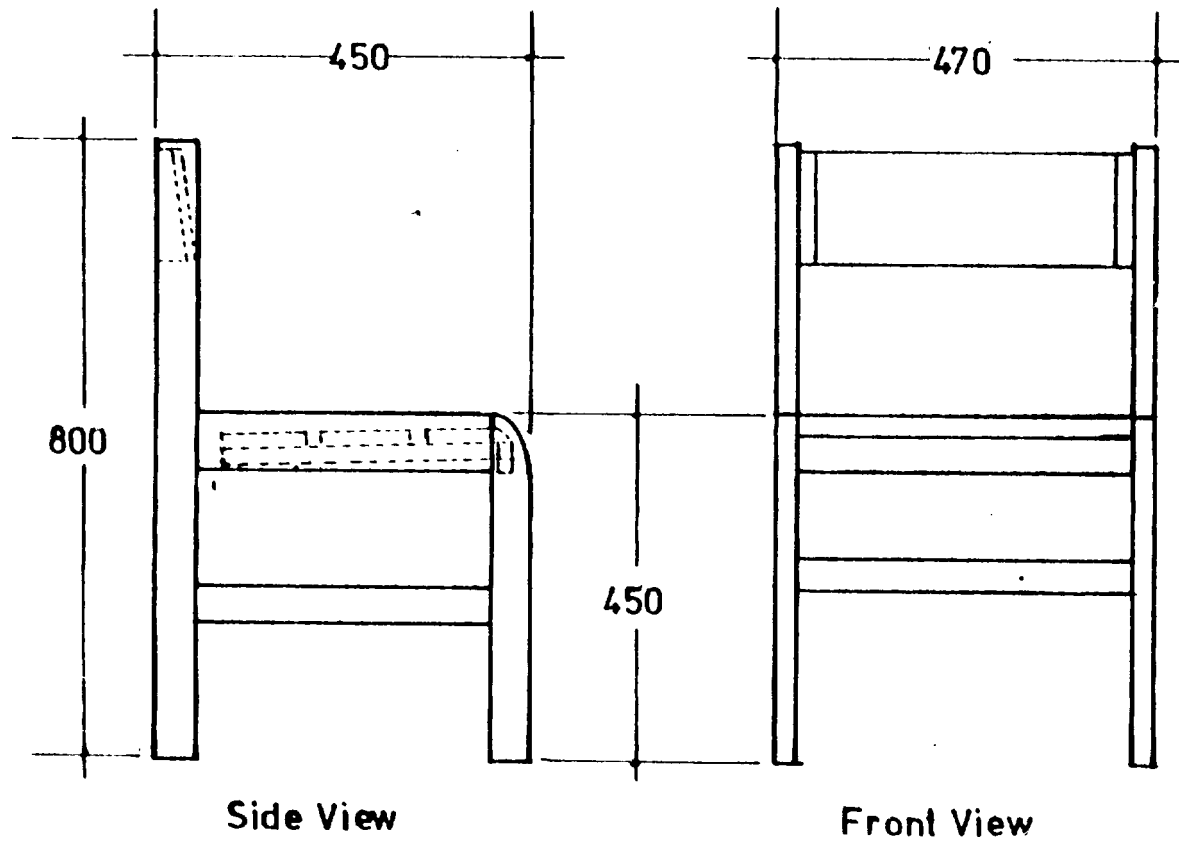
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TEACHER'S TABLE

Product No. ME 76.06.02 (RIL - Rev.)

Scale:- 1 : 10



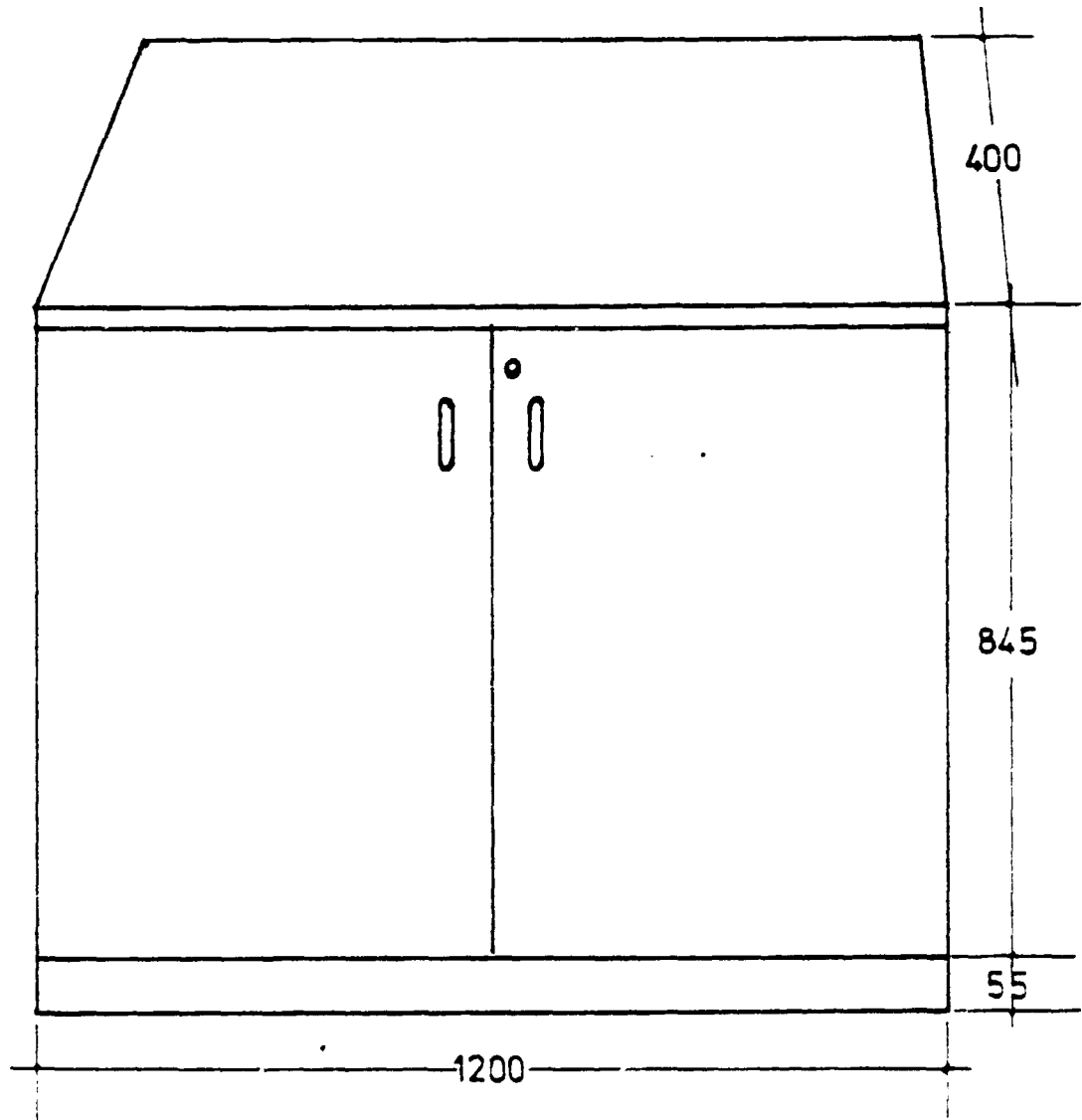
TEACHER'S CHAIR

Product No. ME 76.06.03 (RIL- Rev.)

Scale:- 1 : 10

APPENDIX II-C

A P P E N D I X    II - D



LOW LEVEL CLASSROOM  
CUPBOARD

Product No. ME 76.06.04 (RIL-Rev.)

Scale:- 1 : 10

A P P E N D I X      III - A

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SCHOOL FURNITURE COMPONENTS LIST  
(EXPANDED CHATI WOODWORKS PLANT)  
PRIMARY SCHOOL DESK  
ME-76.06.01 (RIL - Rev.)

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FURNITURE PARTS LIST

Name of Product: PRIMARY SCHOOL DESK, TYPE B  
 Customer: MINISTRY OF EDUCATION, G R Z  
 Annual Requirement: TEN THOUSAND (10 000) Units

Product No: ME-76.06.01 (RIL-Rev.)  
 Ref: Drawings Nos: \_\_\_\_\_  
 Page 1 of 2 Pages

B. NO.	ASSY NO.	PART NO.	NAME OF PART	SANDED DIMENSIONS			QTY PER UNIT	REMARKS
				T	W	L		
		D-1	DESK TOP	20	400	1100	1	W/2 pencil troughs - routing grooved on bottom side for shelf divider.
		D-2	DESK SHELF	20	180	1050	1	Grooved for shelf divider, Rabbet on each end 10mm.
		D-3	DESK TOP FRONT PANEL	20	140	1100	1	
		D-4/R	DESK TOP SUPPORT RAIL, RIGHT	30	50	380	1	
		D-4/L	DESK TOP SUPPORT RAIL, LEFT	30	50	380	1	
		D-5	SHELF DIVIDER	6	130	185	1	Use 6mm Plywood Rejects
		BD-6/FL	DESK LEG, FRONT-LEFT PIECE	20	100	520	1	
		BD-6/FR	DESK LEG, FRONT-RIGHT PIECE	20	100	520	1	
		BD-6/BL	DESK LEG, BACK-LEFT PIECE	20	100	520	1	
		BD-6/BR	DESK LEG, BACK-RIGHT PIECE	20	100	520	1	
		D-7/R	SEAT TOP SUPPORT RAIL, RIGHT	30	50	230	1	
		D-7/L	SEAT TOP SUPPORT RAIL, LEFT	30	50	230	1	
		D-8	DESK LEGS BOTTOM CROSS PIECE	20	140	1100	1	
		D-9	SEAT TOP	20	250	1100	1	
		BD-10/13	SEAT LEG, BACK PIECE (LEFT & RIGHT)	20	75	280	2	

FURNITURE PARTS LIST

Name of Product: PRIMARY SCHOOL DESK, TYPE B  
 Customer: MINISTRY OF EDUCATION, G R Z  
 Annual Requirement: \_\_\_\_\_ Units

Product No: ME-76.06.01 (RIL-Rev.)  
 Ref: Drawings Nos: \_\_\_\_\_  
 Page 2 Of 2 Pages

IB ASSY NO.	PART NO.	NAME OF PART	SANDED DIMENSIONS			QTY PER UNIT	REMARKS
			T	W	L		
	BD-10/F	SEAT LEG, FRONT PIECE (LEFT & RIGHT)	20	75	280	2	
	D-11/R	BASE RAIL, RIGHT	30	70	700	1	
	D-11/L	BASE RAIL, LEFT	30	70	700	1	
	D-12	SEAT TOP CROSS PIECE	20	100	1100	1	
	D-13	SEAT BOTTOM CROSS PIECE	20	100	1100	1	
	D-14	FOOT REST	20	125	1100	2	
	D-15	FOOT REST CROSS RAIL	20	70	270	1	

FURNITURE PARTS LIST

Name of Product: PRIMARY SCHOOL DESK, TYPE C  
 Customer: MINISTRY OF EDUCATION, G R Z  
 Annual Requirement: \_\_\_\_\_ Units

Product No: ME-76.06.01 (RIL-Rev.)  
 Ref: Drawings Nos: \_\_\_\_\_  
 Page 1 of 2 Pages

IB ASSY NO.	PART NO.	NAME OF PART	SANDER DIMENSIONS			QTY PER UNIT	REMARKS
			T	W	L		
	D-1	DESK TOP	20	400	1100	1	See Type B Desk
	D-2	DESK SHELE	20	180	1050	1	-do-
	D-3	DESK TOP FRONT PANEL	20	140	1100	1	-do-
	D-4/R	DESK TOP SUPPORT RAIL, RIGHT	30	50	380	1	-do-
	D-4/L	-do- , LEFT	30	50	380	1	-do-
	D-5	SHELF DIVIDER	4	130	185	1	-do- (Use Plywood)
	CD-6/FL	DESK LEG, FRONT-LEFT PIECE	20	100	580	1	
	CD-6/FR	DESK LEG, FRONT-RIGHT PIECE	20	100	580	1	
	CD-6/BL	DESK LEG, BACK-LEFT PIECE	20	100	580	1	
	CD-6/BR	DESK LEG, BACK-RIGHT PIECE	20	100	580	1	
	D-7/R	SEAT TOP SUPPORT RAIL, RIGHT	30	50	230	1	See Type B Desk
	D-7/L	-do- , LEFT	30	50	230	1	-do-
	D-8	DESK LEGS BOTTOM CROSS PIECE	20	140	1100	1	-do-
	D-9	SEAT TOP	20	250	1100	1	-do-
	CD-10/B	SEAT LEG, BACK PIECE (LEFT & RIGHT)	20	75	325	2	

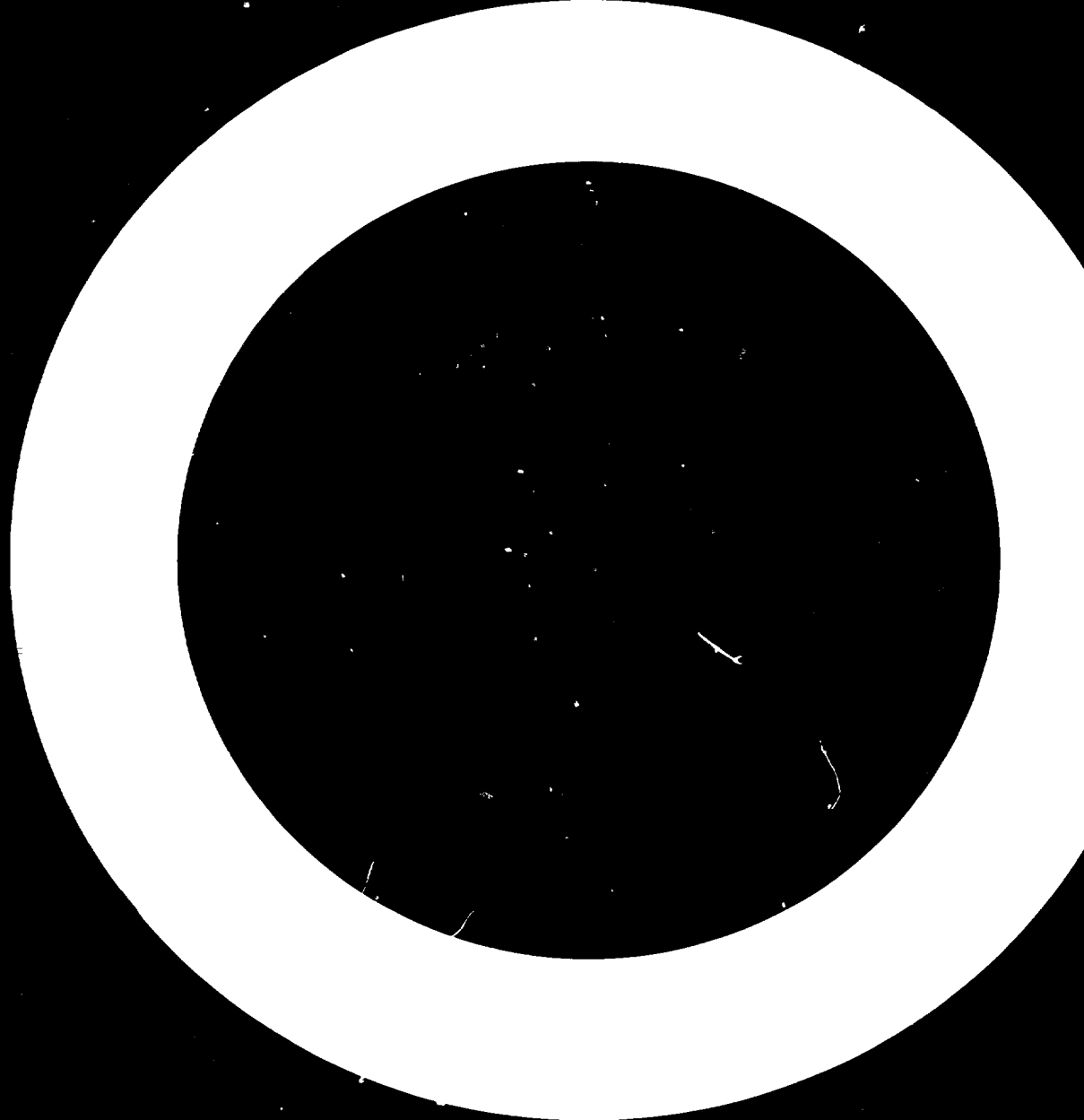
FURNITURE PARTS LIST

Name of Product: PRIMARY SCHOOL DESK, TYPE C  
 Customer: MINISTRY OF EDUCATION, G.R. 7  
 Annual Requirement: \_\_\_\_\_ Units

Product No: ME-76.06.01 (RIL-Rev.)  
 Ref: Drawings Nos: \_\_\_\_\_  
 Page 2 Of 2 Pages

ASSEMBLY NO.	PART NO.	NAME OF PART	SANDED DIMENSIONS			QTY PER UNIT	REMARKS
			T	W	L		
	CD-10/F	SEAT LEG, FRONT PIECE (LEFT & RIGHT)	20	75	325	2	
	D-11/R	BASE RAIL, RIGHT	30	70	700	1	See Type, B Desk
	D-11/L	BASE RAIL, LEFT	30	70	700	1	-do-
	D-12	SEAT TOP CROSS PIECE	20	100	1100	1	-do-
	D-13	SEAT BOTTOM CROSS PIECE	20	100	1100	1	-do-
	D-14	FOOT REST	20	125	1100	2	-do-
	D-15	FOOT REST CROSS RAIL	20	70	270	1	-do-

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A P P E N D I X      III - B

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SCHOOL FURNITURE COMPONENTS LIST  
(EXPANDED CHATI WOODWORKS PLANT)

TEACHER'S TABLE  
ME-76.06.02 (RIL - Rev.)

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FURNITURE PARTS LIST

Name of Product: TEACHER'S TABLE  
 Customer: MINISTRY OF EDUCATION, G R Z  
 Annual Requirement: FIVE HUNDRED (500) Units

Product No: ME-76.06.02 (R11-Rev.)  
 Ref: Drawings Nos: \_\_\_\_\_  
 Page 1 Of 2 Pages

ASSY NO.	PART NO.	NAME OF PART	SANDED DIMENSIONS			QTY PER UNIT	REMARKS
			T	W	L		
-01	TT-1	TABLE TOP	20	800	1400	1	Lam. const. Blockboard core, Dowel Drilled, Edge Banded.
ed-02	TT-2	TOP RAIL, FRONT	25	75	1250	1	Solid wood, Dowel Drilled
-do-	TT-3	TOP RAIL, BACK	25	75	1250	1	-do-
-do-	TT-4	TOP RAIL, L/R SIDES	25	45	750	2	Solid wood, Tenoned at both Ends, Dowel Drilled.
-do-	TT-5	TOP RAIL, CENTER	25	45	725	1	Solid wood, Dowel Drilled.
-do-	TT-6	LEGS ( TT-6a - Front, Left TT-6b - Front, Right TT-6c - Rear, Left TT-6d - Rear, Right	50	50	740	4	Solid wood, mortized, Dowel Drilled, screw pilot hole
-do-	TT-7	BOTTOM RAIL, FRONT	25	75	1250	1	Solid wood, Dowel Drilled
-do-	TT-8	BOTTOM RAIL, L/R SIDES	25	45	750	2	Solid wood, Tenoned at both Ends, Dowel Drilled
-do-	TT-9	FRONT PANEL	6	310	1310	1	Use 6mm Plywood Rejects laminated with face Veneer
IC-03	TT-10	DRAWER CASE TOP	18	400	765	1	Use Blockboard case, lami. construction.
-do-	TT-11	DRAWER CASE SIDES, L/R	18	300	765	2	Use Blockboard core, laminated construction.
-do-	TT-12	DRAWER CASE BOTTOM	18	400	765	1	-do-
-do-	TT-13	DRAWER CASE SUPPORT, FILLÉT	45	45	380	1	Solid wood, Pre-drilled for Woodscrew.
-do-	TT-14	DRAWER RUNNER	15	74	720	4	Solid wood, Pre-drilled for woodscrew.

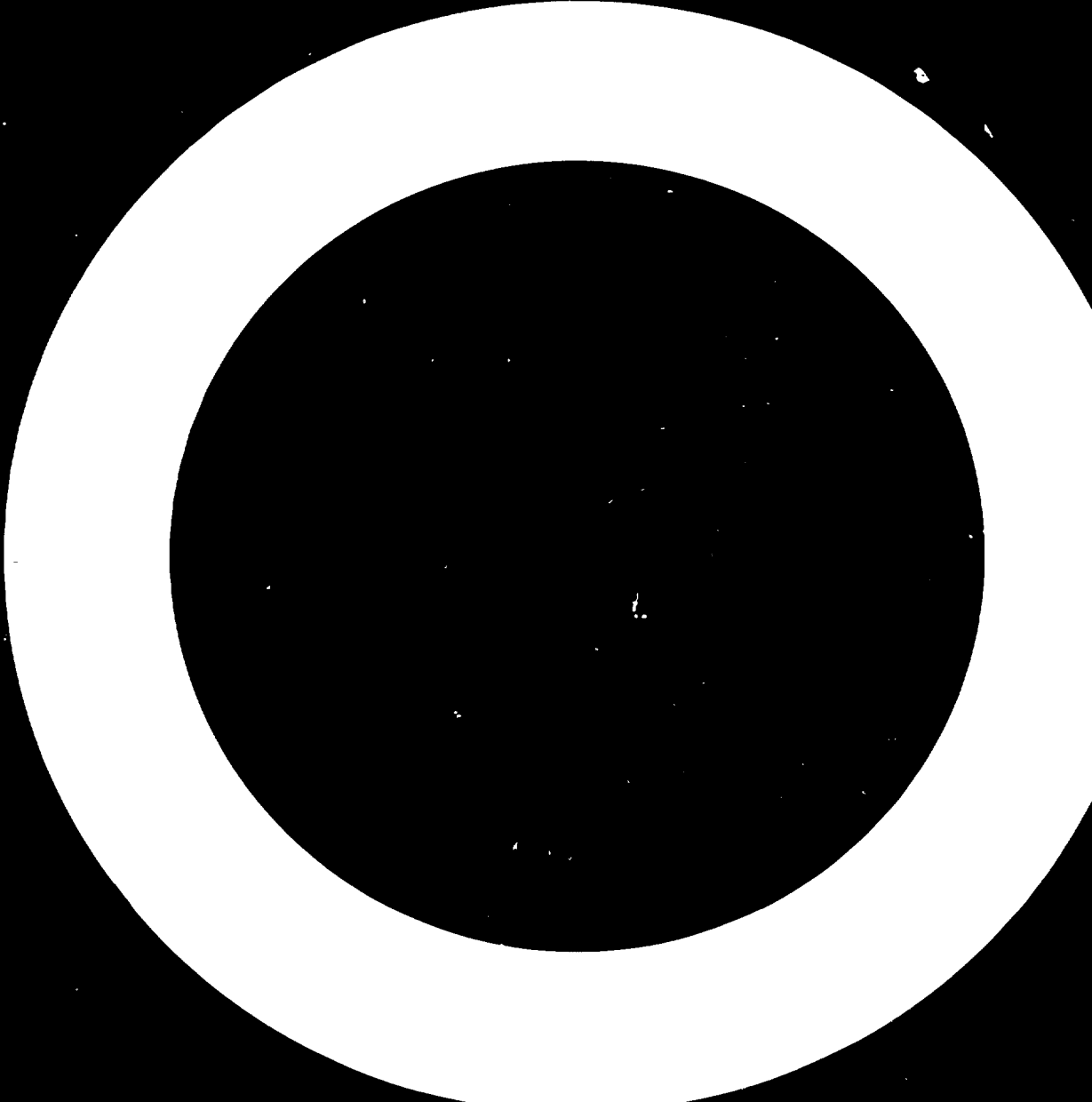
FURNITURE PARTS LIST

Name of Product: TEACHER'S TABLE  
 Customer: MINISTRY OF EDUCATION, G R Z  
 Annual Requirement: FIVE HUNDRED (500) Units

Product No: ME176.06102 (RIL-Rev.)  
 Ref: Drawings Nos: \_\_\_\_\_  
 Page 2 Of 2 Pages

B. ASSY NO.	PART NO.	NAME OF PART	SANDED DIMENSIONS			QTY PER UNIT	REMARKS
			T	W	L		
/DC-03	TT-15	DRAWER FRONT	18	131	362	2	Solid wd - Dove-Tail Mortiz and Grooved. optional: Routed Handhold.
-do-	TT-16	DRAWER BACK	15	115	362	2	Solid wood
-do-	TT-17	DRAWER BOTTOM	6	342	743	2	Use 6mm Plywood Reject
-do-	TT-18	DRAWER SIDE	15	131	750	4	Solid wood, Dove-tailed and grooved.
-do-	TT-19	DRAWER HANDLE	20	30	80	2	OPTIONAL USE. Not Required if Routed Handhold acceptab





A P P E N D I X III-C

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SCHOOL FURNITURE COMPONENTS LIST  
(EXPANDED CHATI WOODWORKS PLANT)

TEACHER'S CHAIR  
ME-76.06.03 (RIL - Rev.)

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FURNITURE PARTS LIST

Name of Product: TEACHER'S CHAIR  
 Customer: MINISTRY OF EDUCATION, G R Z  
 Annual Requirement: FIVE HUNDRED (500) Units

Product No: ME-76.06.03 (RIL-Rev.)  
 Ref: Drawings Nos: \_\_\_\_\_  
 Page 1 of 1 Pages

ASSY NO.	PART NO.	NAME OF PART	SANDED DIMENSIONS			QTY PER UNIT	REMARKS
			T	W	L		
	TC-1	FRONT LEG, LEFT	25	50	450	1	Solid Wood Mortized and pre-drilled for woodscrews
	TC-2	FRONT LEG, RIGHT	25	50	450	1	-do-
	TC-3	BOTTOM RAILS, FRONT & BACK	20	40	420	2	Solid wood, Dowel drilled
	TC-4	BOTTOM RAILS, L/R SIDES	20	40	400	2	Solid wood, Tenoned at both ends.
	TC-5	SEAT RAIL, FRONT	20	45	420	1	Solid wood, Dowel Drilled
	TC-6	SEAT RAIL, BACK	20	40	420	1	-do-
	TC-7	SEAT RAIL, LEFT SIDE	20	75	380	1	Solid wood, Tenoned at both ends, Pre-drilled for Wdscre
	TC-8	SEAT RAIL, RIGHT SIDE	20	75	380	1	-do-
	TC-9	SEAT SLAT, FRONT	20	120	420	1	Solid wood, Pre-drilled for woodscrews.
	TC-10	SEAT SLAT, MIDDLE	20	120	420	1	-do-
	TC-11	SEAT SLAT, BACK	20	120	420	1	-do-
	TC-12	SEAT SUPPORT FILLET	20	20	380	2	-do-
	TC-13	BACK LEG, LEFT/RIGHT	25	50	800	2	Solid wood, mortized, dowel drilled.
	TC-14	BACK REST FILLET	20	40	150	2	Solid wood, dowel drilled, pre-drilled for woodscrews.
	TC-15	BACK REST PANEL	10	151	420	1	Use 6mm plywd (Rej.); lam. const.; curved - pressed; pre drilled for wdscrews.

A P P E N D I X III-D

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SCHOOL FURNITURE COMPONENTS LIST  
(EXPANDED CHATI WOODWORKS PLANT)

CLASSROOM LOW-LEVEL CUPBOARD  
ME-76.06.04 (RIL - Rev.)

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FURNITURE PARTS LIST

Name of Product: LOW LEVEL CLASSROOM CUPBOARD  
 Customer: MINISTRY OF EDUCATION G R Z  
 Annual Requirement: FIVE HUNDRED (500) Units

Product No: ME-76.06.04 (REL - Rev.)  
 Ref: Drawings Nos: \_\_\_\_\_  
 Page 1 of 1 pages

ASSY No.	PART No.	NAME OF PART	SANDED DIMENSIONS			QTY PER UNIT	REMARKS
			T	W	L		
	CC-1	DOOR, LEFT	20	610	815	1	Use 18mm Blockboard, laminated construction, pre-drilled for wood-screws. OPTIONAL - Route handhold
	CC-2	DOOR, RIGHT	20	610	815	1	-do-
	CC-3	TOP PANEL	20	380	1200	1	Use 18mm blockboard, laminated construction
	CC-4	SIDE PANEL, LEFT	20	380	880	1	-do-
	CC-5	SIDE PANEL, RIGHT	20	380	880	1	-do-
	CC-6	BASEBOARD, FRONT	20	55	1200	1	-do-
	CC-7	SHELVINGS, INTERMEDIATE	18	360	460	2	Use 18mm Blockboard, Pre-drilled for woodscrews
	CC-8	BOTTOM SHELF	18	380	1160	1	-do-
	CC-9	DIVIDER PANEL	18	360	807	1	-do-
	CC-10	SHELF SUPPORT FILLETS	20	20	360	4	Solid wood, Pre-drilled for woodscrews
	CC-11	BACK COVER	6	1200	845	1	Use 6mm plywd. (Rej.); Nail to edges of cupboard Back
	CC-12	DOOR HANDLES	20	30	80	2	Solid wd, Pre-drilled for wdscrews; NOT REQ'D if Routed hndhlds okay.
	CC-13	BOLT SPACER BLOCK	10	60	80	1	Solid wood, Pre-drilled for wood-screws.

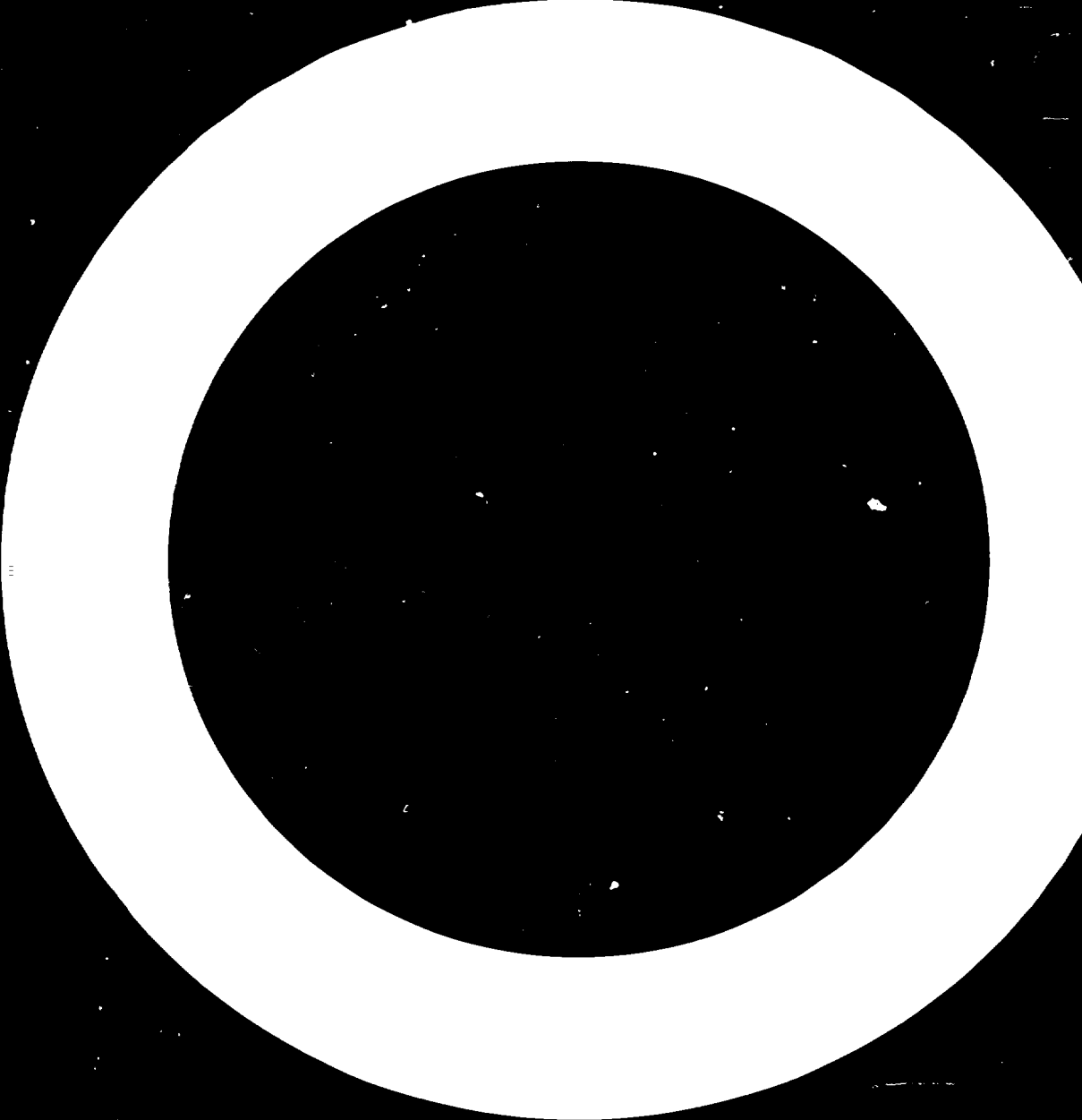
A P P E N D I X IV

PRODUCTION DEPARTMENTS

(Expanded Woodworking Operations, CHATI WOODWORKS SHOP)

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<u>Dept. No.</u>	<u>Department Name</u>	<u>Scope of Operations</u>
1	Veneer Production	Log preparation on to Veneer bundling.
2	Machining	Cutting to rough length on to final sanding (in-the-white).
3	Panel Production	Core preparation on to final sanding (in-the-white).
4	Assembling	Sub-assemblies, and/or full assembly of product parts.
5	Finishing	Application of finish coatings to product component parts, sub-assemblies or fully assembled products.
6	Packing	Packing and/or crating of product components and/or fully assembled products for storage and eventual transport to distribution centres.



A P P E N D I X V

OPERATIONS LIST

(Expanded Woodworking Operations, CHATI WOODWORKS SHOP)

Page 1 of 1 Pages

DEPARTMENT : VENEER PRODUCTION

DEPARTMENT NO. : 1

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<u>Operation No.</u>	<u>Description/Name of Operation</u>	<u>Remarks</u>
1-001	Log Preparation	
1-002	Log Cooking	
1-003	Log Squaring	
1-004	Veneer Slicing	
1-005	Veneer Drying	
1-006	Veneer Jointing	
1-007	Veneer Splicing	
1-008	Veneer Clipping to Size	
1-009	Veneer Grading/Sorting	
1-010	Veneer Bundling	
1-996	Veneer Repair	
1-997	Veneer Machine Set-up	
1-998	Veneer Machine Cleaning	
1-999	Area Cleaning	



OPERATIONS LIST

(Expanded Woodworking Operations, CHATI WOODWORKS SHOP)

Page 1 of 3 Pages

DEPARTMENT : MACHINING

DEPARTMENT NO. : 2

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<u>Operation No.</u>	<u>Description/Name of Operation</u>	<u>Remarks</u>
2-001	Cutting to Rough Length	
2-002	Surface Planing, One Face	
2-003	Surface Planing, Two Faces	
2-004	Surface Planing, Four Faces	
2-005	Planer-Matching	
2-006	Ripping, Single Pass	
2-007	Multi - Ripping	
2-008	Cutting to Final Length	
2-009	Edge Shaping	
2-010	Drilling, Single Hole	
2-011	Multi-Hole Drilling	
2-012	Dowel Milling	
2-013	Dowel Cutting and Chamfering	
2-014	Routing Edges	
2-015	Routing Cut-Outs	

Operation No.	Description/Name of Operation	Remarks
2-016	Routing Rabbers	
2-017	Routing Hinge Seats	
2-018	Turning on Simple Lathe	
2-019	Turning on Automatic Lathe	
2-020	Mortizing on Chain Mortizer	
2-021	Mortizing on Router	
2-022	Mortizing on Drill/Chisel Mortizer	
2-023/a	Tenoning, Single End	
2-023/b	Tenoning, Double End	
2-023/c	Tenoning Special Shape	
2-024	Grooving with Saw	
2-025	Grooving with Router	
2-026	Grooving with Dado	
2-027	Edge Profiling with Dado	
2-028	Dove-Tailing with Router	
2-029	Dove-Tailing with Dove-tailing Machine	
2-030	Machine Sanding Plain Edge	
2-031	Edge Profile Sanding	
2-032	Stroke Sanding, Single Belt	

Operation No.	Description/Name of Operation	Remarks
2-033	Stroke Sanding, Double Belt	
2-034	Single Surface-Sanding, Wide Belt Sander	
2-035	Double Surface-Sanding, Wide Belt Sander	
2-036	Sanding Cut-out Edges	
2-037	Hand-Sanding	
2-997	Machine Set-up	
2-998	Machine Cleaning	
2-999	Area Cleaning	

OPERATIONS LISTS

(Expanded Woodworking Operations, CHATI WOODWORKS SHOP)

Page 1 of 2 Pages

DEPARTMENT :            PANEL PRODUCTION

DEPARTMENT NO. :            3

<u>Operation No.</u>	<u>Description/Name of Operation</u>	<u>Remarks</u>
3-001	Edge Gluing Core-Stock, Manual	
3-002	Edge Gluing Core-Stock, Core Composer	
3-003	Panel Sawing to Rough Sizes	
3-004	Thickness Planing	
3-005	Veneer Laying	
3-006	Cold Pressing Panels	
3-007	Hot Pressing Panels	
3-008	Panel Trimming to Final Size	
3-009	Single Edge Banding with Veneer	
3-010	Double Edge Banding with Veneer	
3-011	Trimming Excess Veneer	
3-012	Combination Edge Banding, Excess Veneer Trimming and Edge Breaking-Single Edge	
3-013	Combination Edge Banding, Excess Veneer Trimming and Edge Breaking-Double Edge	

Operation No.	Description/Name of Operation	Remarks
3-996	Panel Repair	
3-997	Panel Machine Set-Up	
3-998	Panel Machine Cleaning	
3-999	Area Cleaning	

OPERATIONS LIST

(Expanded Woodworking Operations, CHATY WOODWORKS SHOP)

Page 1 of 1 Pages

DEPARTMENT : ASSEMBLING

DEPARTMENT NO. : 4

<u>Operation No.</u>	<u>Description/Name of Operation</u>	<u>Remarks</u>
4-001	Assembling Sub-Assemblies	
4-002	Assembling Complete Product	
4-996	Repair Work	
4-997	Assembling Machine Set-up	
4-998	Assembling Machine Cleaning	
4-999	Area Cleaning	

OPERATIONS LIST

(Expanded Woodworking Operations, CHATI WOODWORKS SHOP)

Page 1 of 2 Pages

DEPARTMENT : FINISHING

DEPARTMENT NO. : 5

<u>Operation No.</u>	<u>Description/Name of Operation</u>	<u>Remarks</u>
5-001	Hand Staining	
5-002	Spray Staining	
5-003	Spraying Wash Coat	
5-004	Sanding Wash Coat	
5-005	Applying Wood Filler	
5-006	Spraying Sanding Sealer	
5-007	Applying Sanding Sealer on Curtain Coating Machine	
5-008	Hand Sanding Sealer Coat	
5-009	Machine Sanding Sealer Coat	
5-010	Spraying First Top Coat	
5-011	Applying First Top Coat on Curtain Coating Machine	
5-012	Spraying Second Top Coat	
5-013	Applying Second Top Coat on Curtain Coating Machine	

Operation No.	Description/Name of Operation	Remarks
5-014	Spraying Third Top Coat	
5-015	Applying Third Top Coat on Curtain Coating Machine	
5-016	Roller Coating	
5-017	Machine Rubbing	
5-018	Hand Polishing	
5-019	Machine Polishing	
5-020	Applying Decorative Appliques	
5-996	Repair and Touch-Up	
5-997	Finishing Machine Set-up	
5-998	Finishing Machine Cleaning	
5-999	Area Cleaning	



OPERATIONS LIST

(Expanded Woodworking Operations, CHATT WOODWORKS SHOP)

Page 1 of 1 Pages

DEPARTMENT :        PACKING

DEPARTMENT NO. :        6

<u>Operation No.</u>	<u>Description/Name of Operation</u>	<u>Remarks</u>
6-001	Wrapping Product Components	
6-002	Bundling Wrapped Components	
6-003	Assembling Carton Boxes	
6-004	Packing in Carton Boxes	
6-011	Assembling Wooden Crates	
6-012	Packing in Wooden Crates	
6-021	Hand Marking Boxes/Crates	
6-997	Packing/Crating Machine Set-Up	
6-998	Packing/Crating Machine Cleaning	
6-999	Area Cleaning	

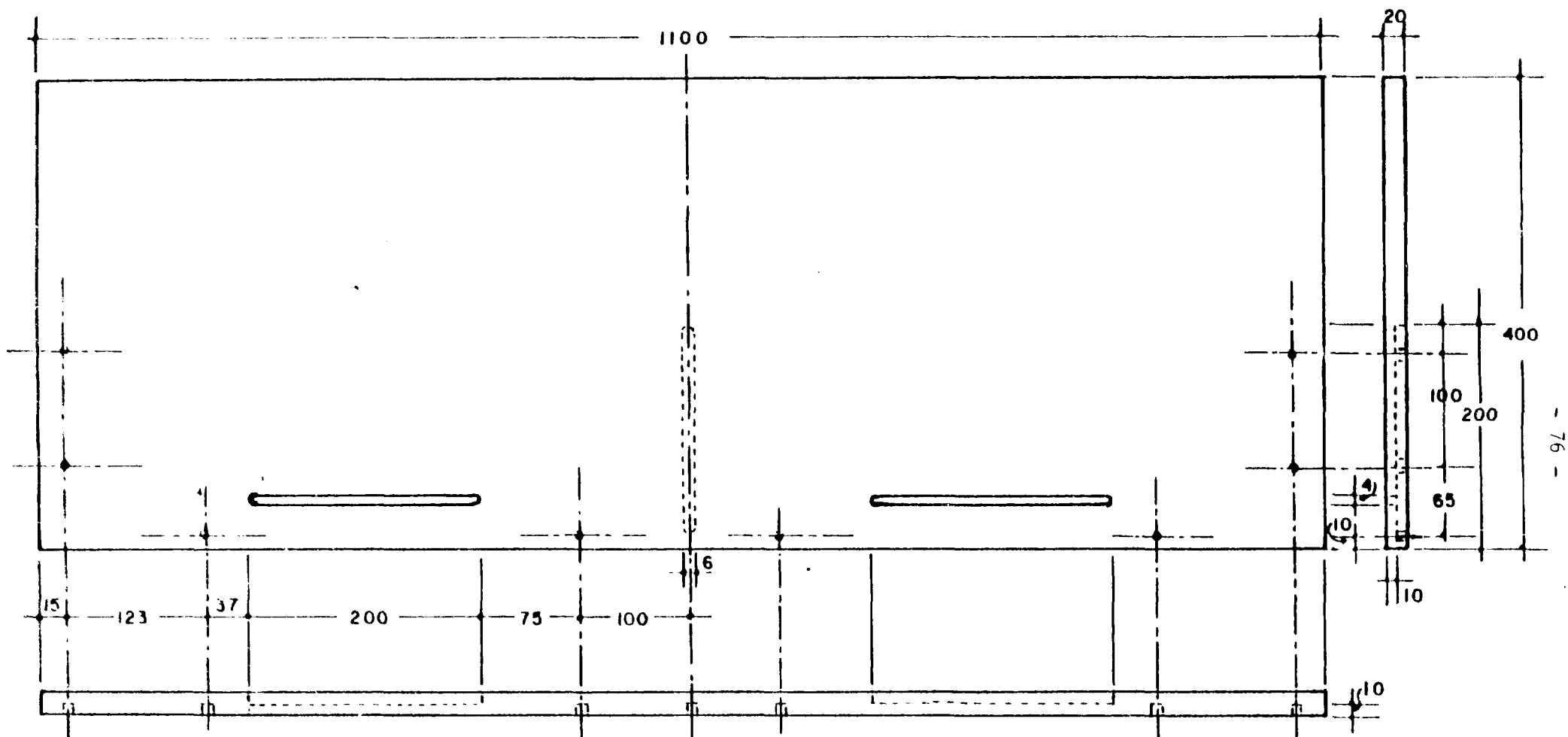
A P P E N D I X VI - A

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WORKING DRAWINGS

PRIMARY SCHOOL DESK  
ME-76.06.01 (RL - Rev.)

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Part No. : D - 1

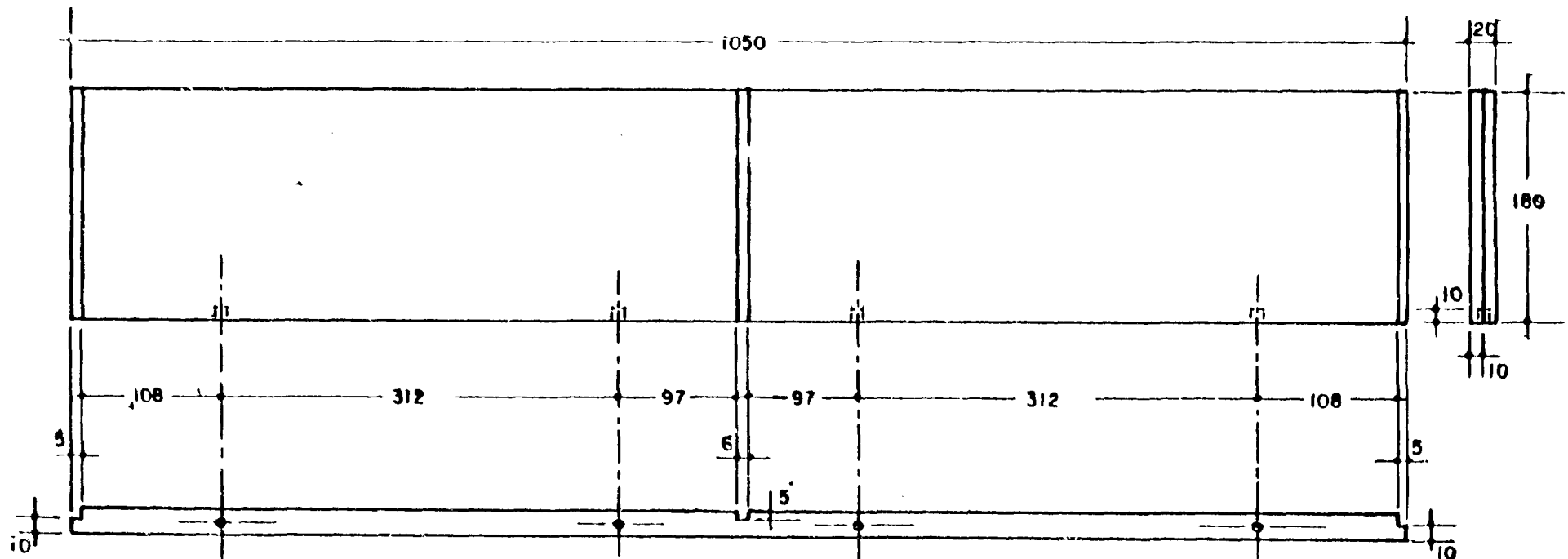
Part Name : DESK TOP

Qty. Per Unit Product : One (1)

Product : Elementary School DESK, Two Seater

Product No. : ME 76.06.01 (RIL - Rev.)

S c a l e : 1 : 5



Part No. :                     D - 2                    

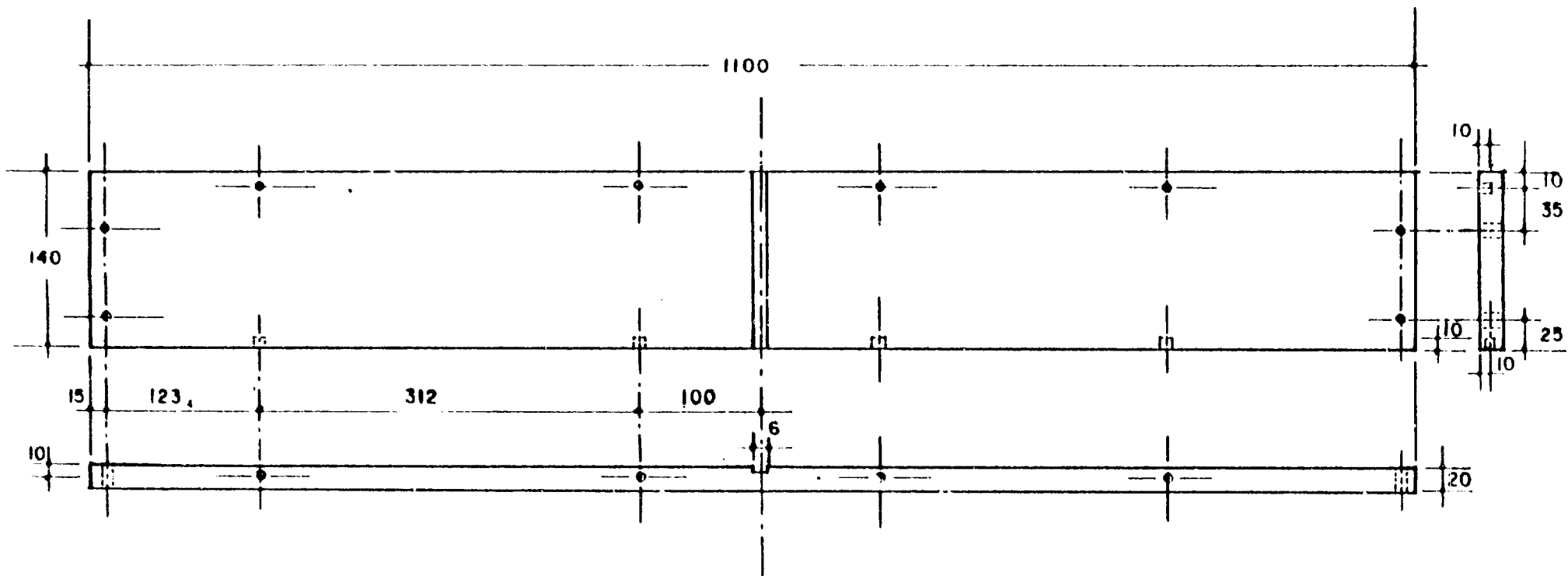
Part Name :                     DESK SHELF                    

Qty. Per Unit Product :                     One (1)                    

Product :                     Elementary School DESK, Two Seater                    

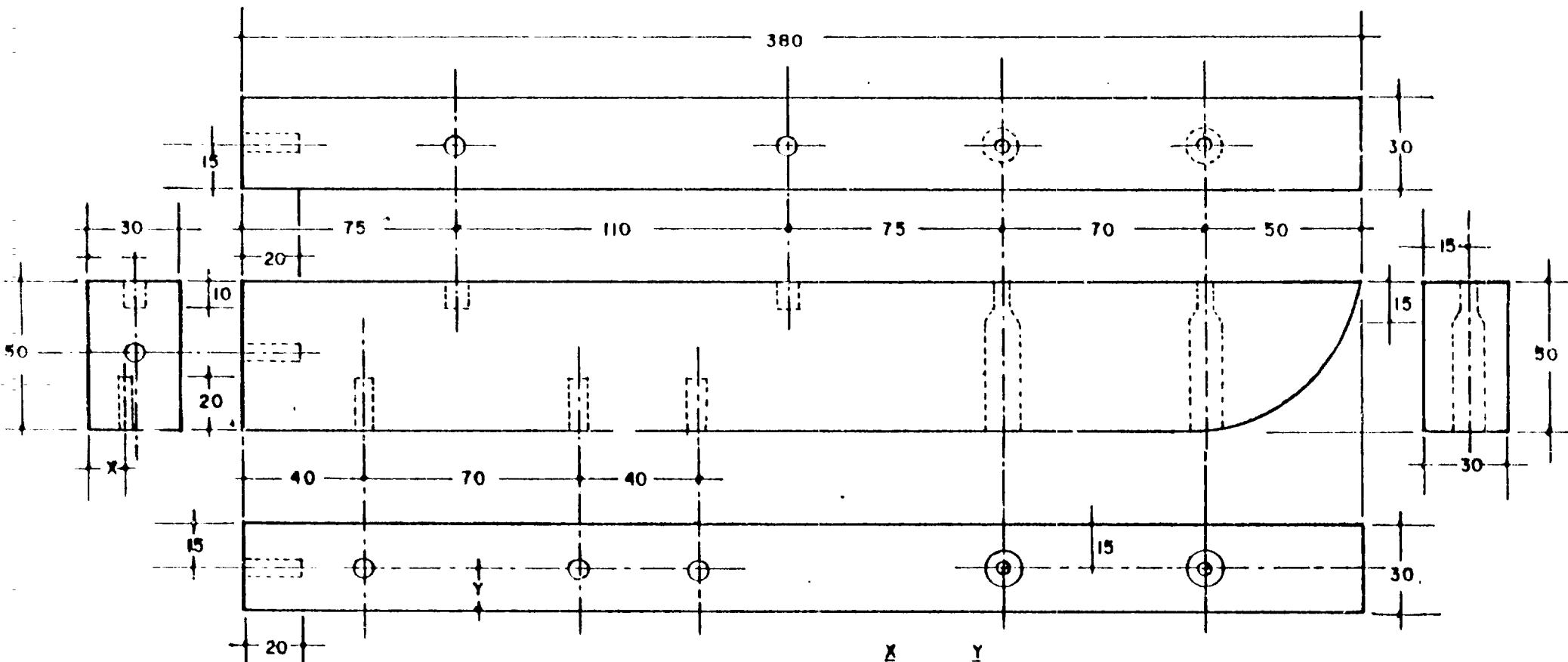
Product No. :                     ME 76.06.01 (RIL - Rev.)                    

Scale :                     1 : 5



Part No. :           D - 3            
 Part Name :           DESK TOP FRONT PANEL            
 Qty. Per Unit Product :           One (1)          

Product :           Elementary School DESK, Two Seater            
 Product No. :           ME 76.06.01 (RIL-Rev.)            
 Scale :           1 : 5



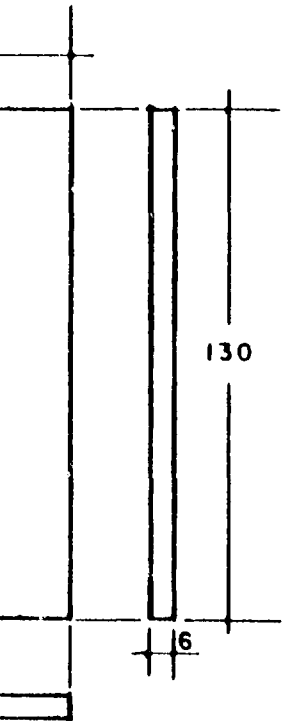
	X	Y
RIGHT PIECE -	10	20
LEFT " -	20	10

Part No. : D - 4 R/L  
 Part Name : DESK TOP SUPPORT RAIL, RIGHT/LEFT  
 Qty. Per Unit Product : One (1)R/One (1) L

Product : Elementary School DESK, Two Seater  
 Product No. : ME 76.06.01 (RIL-Rev.)  
 Scale : 1 : 2

165

Part No. :                   D - 5                    
Part Name :                   SHELF DIVIDER                    
Qty. Per Unit Product :           One (1)



- 08 -

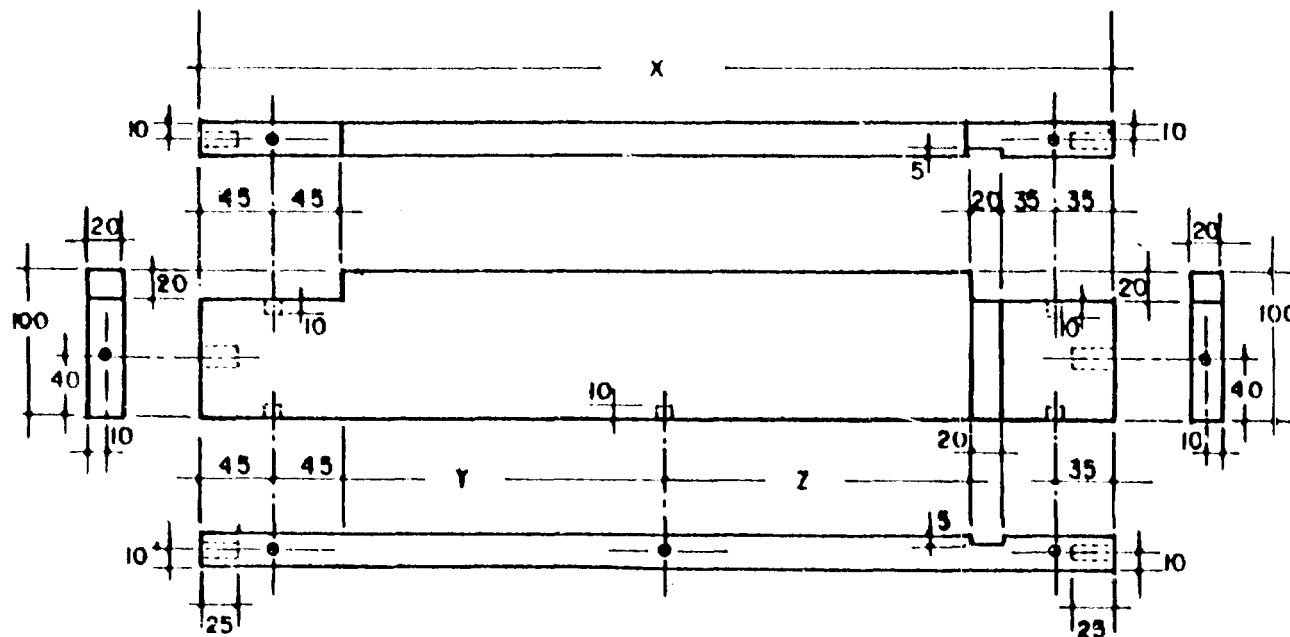
Note: Use 6mm PLYWOOD.

Product : Elementary School DESK, Two Seater

Product No. : ME 76.06.01 (RIL - Rev.)

Scale : 1 : 2



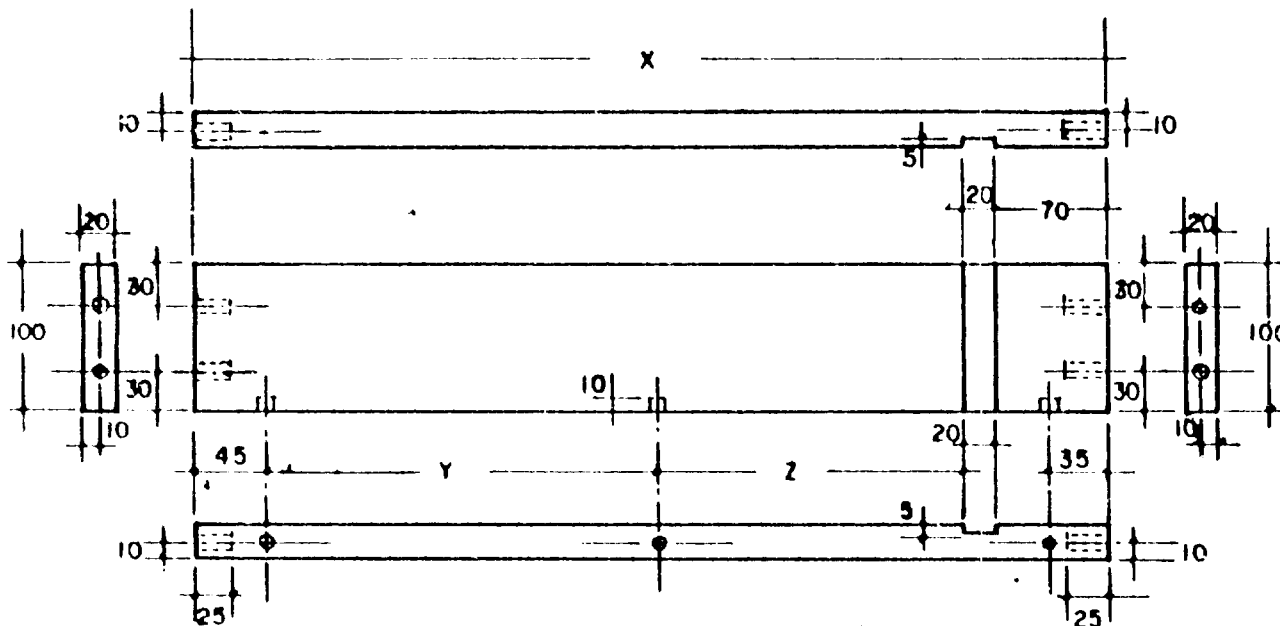


Desk Type	X	Y	Z
B	520	170	170
C	580	200	200

Note:- LEFT Piece IDENTICAL to  
RIGHT Piece, except 5 x 20 mm  
GROOVE is on reverse face of LEG.

Part No. : D - 6 FRONT - L/R  
 Part Name : DESK LEG, FRONT - LEFT/RIGHT  
 Qty. Per Unit Product : One (1) L / One (1) R

Product : Elementary School DESK, Two Seater  
 Product No. : ME 76.06.01 (RIL - Rev.)  
 Scale : 1 : 5

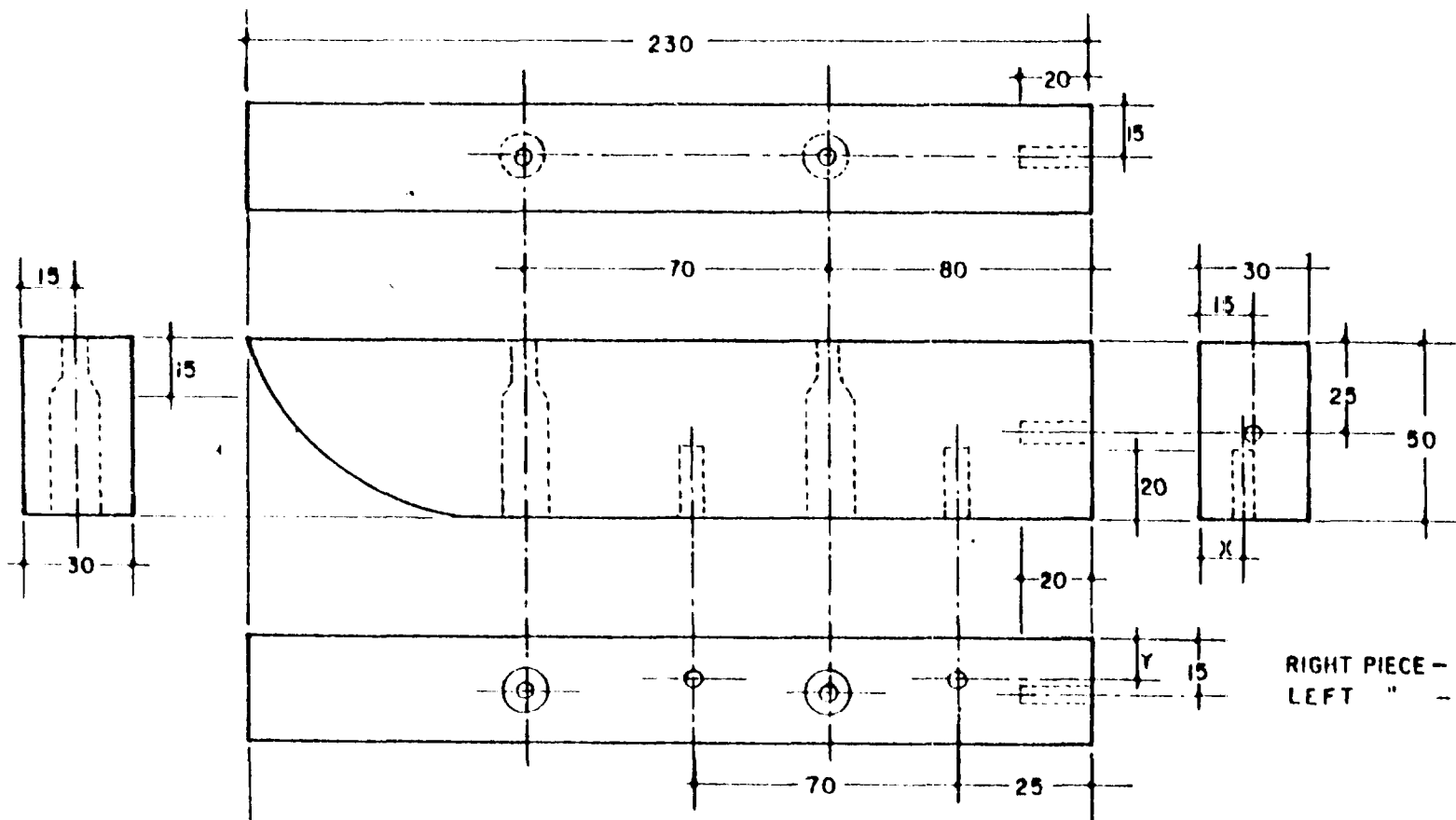


Desk Type	X	Y	Z
B	520	215	170
C	580	245	200

Note:- LEFT Piece IDENTICAL to  
RIGHT Piece, except 5 x 20 mm  
GROOVE is on reverse face of LEG.

Part No. : D - 6 BACK - L/R  
Part Name : DESK LEG, BACK - LEFT/RIGHT  
Qty. Per Unit Product : One (1) L/One (1) R

Product : Elementary School DESK, Two Seater  
Product No. : ME 76.06.01 (RIL-Rev.)  
Scale : 1 : 5



	X	Y
RIGHT PIECE -	10	20
LEFT " -	20	10

Part No. : D - 7 R/L

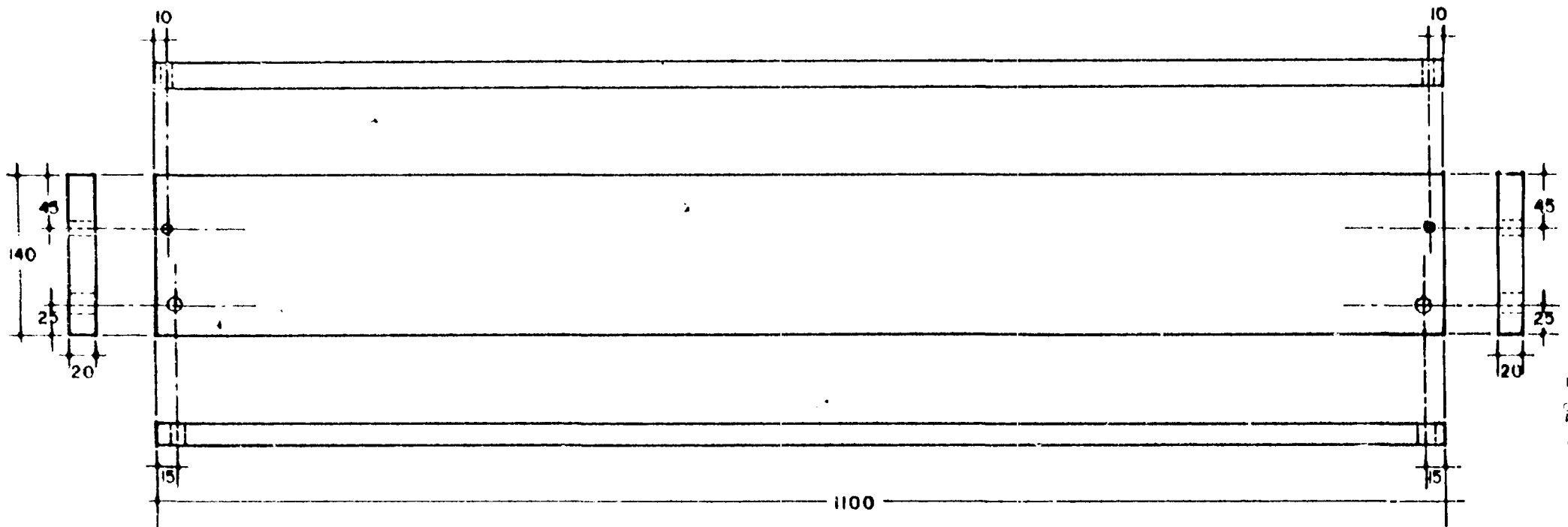
Part Name : SEAT TOP SUPPORT RAIL, RIGHT/LEFT

Qty. Per Unit Product : One (1) R/One (1) L

Product : Elementary School DESK, Two Seater

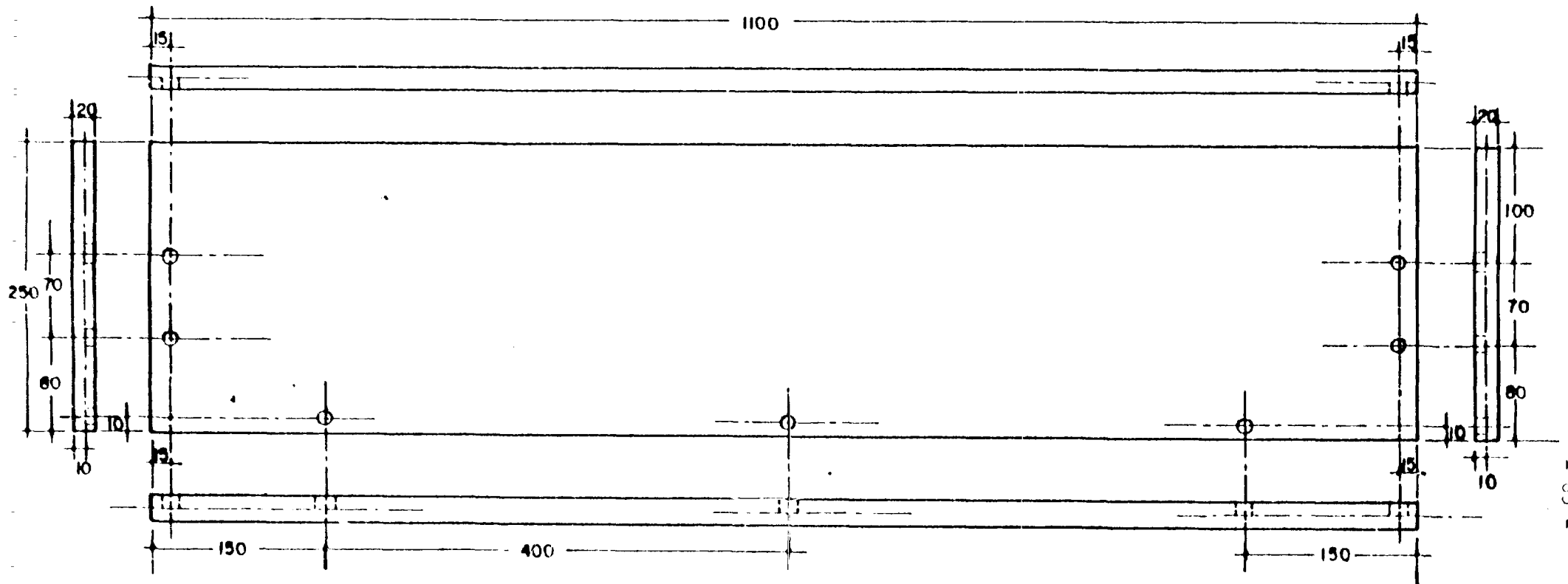
Product No. : ME 76.06.01 (RII. - Rev.)

Scale : 1 : 2



Part No. :           D - 8            
 Part Name :   DESK LEGS BOTTOM CROSS PIECE    
 Qty. Per Unit Product :   One (1)  

Product :   Elementary School DESK, Two Seater    
 Product No. :   ME 76.06.01 (RIL - Rev.)    
 Scale :           1 : 5



Part No. : D - 9

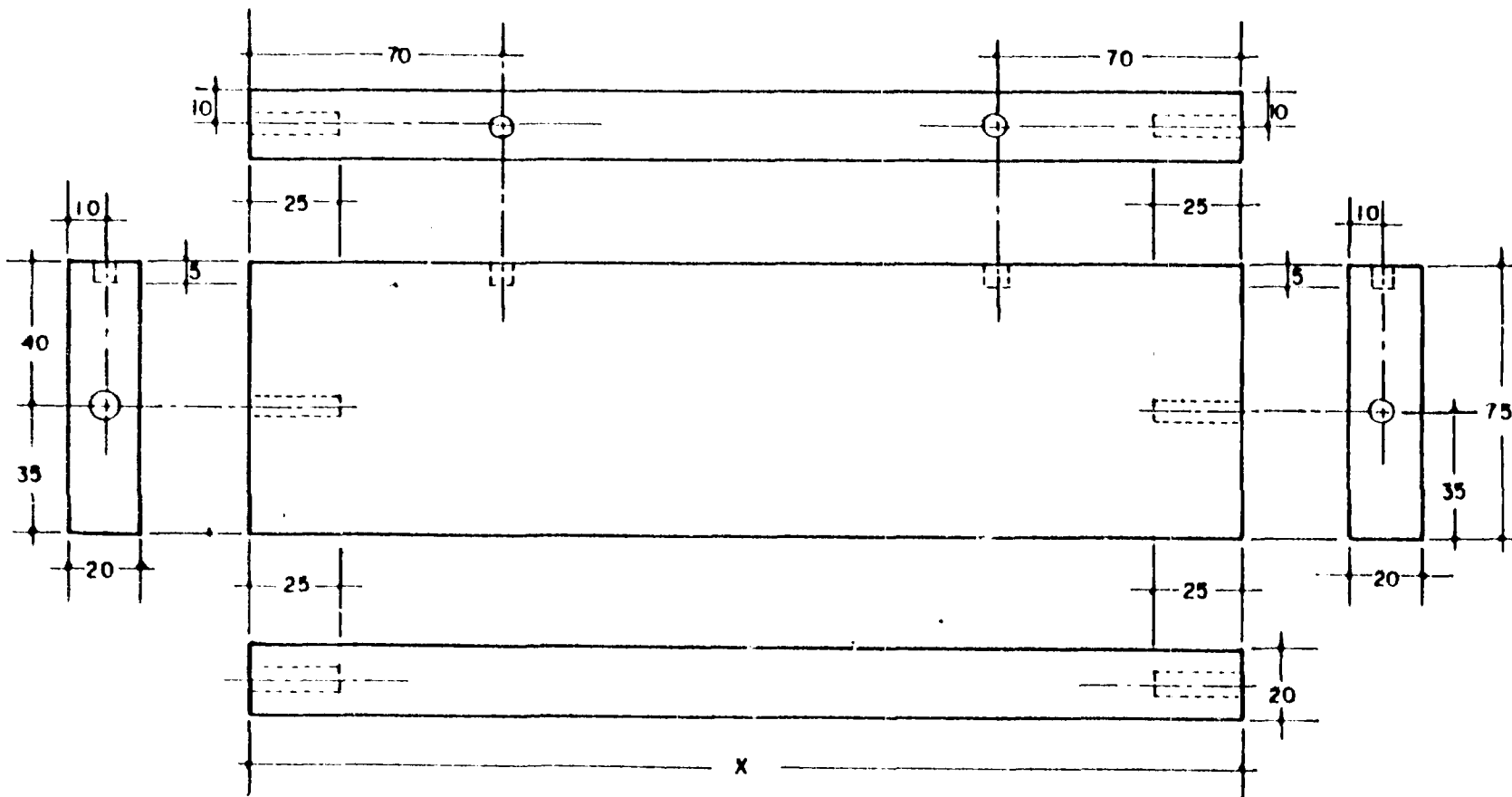
Part Name : SEAT TOP

Qty. Per Unit Product : One (1)

Product : Elementary School DESK, Two Seater

Product No. : ME 76.06.01 (RIL - Rev.)

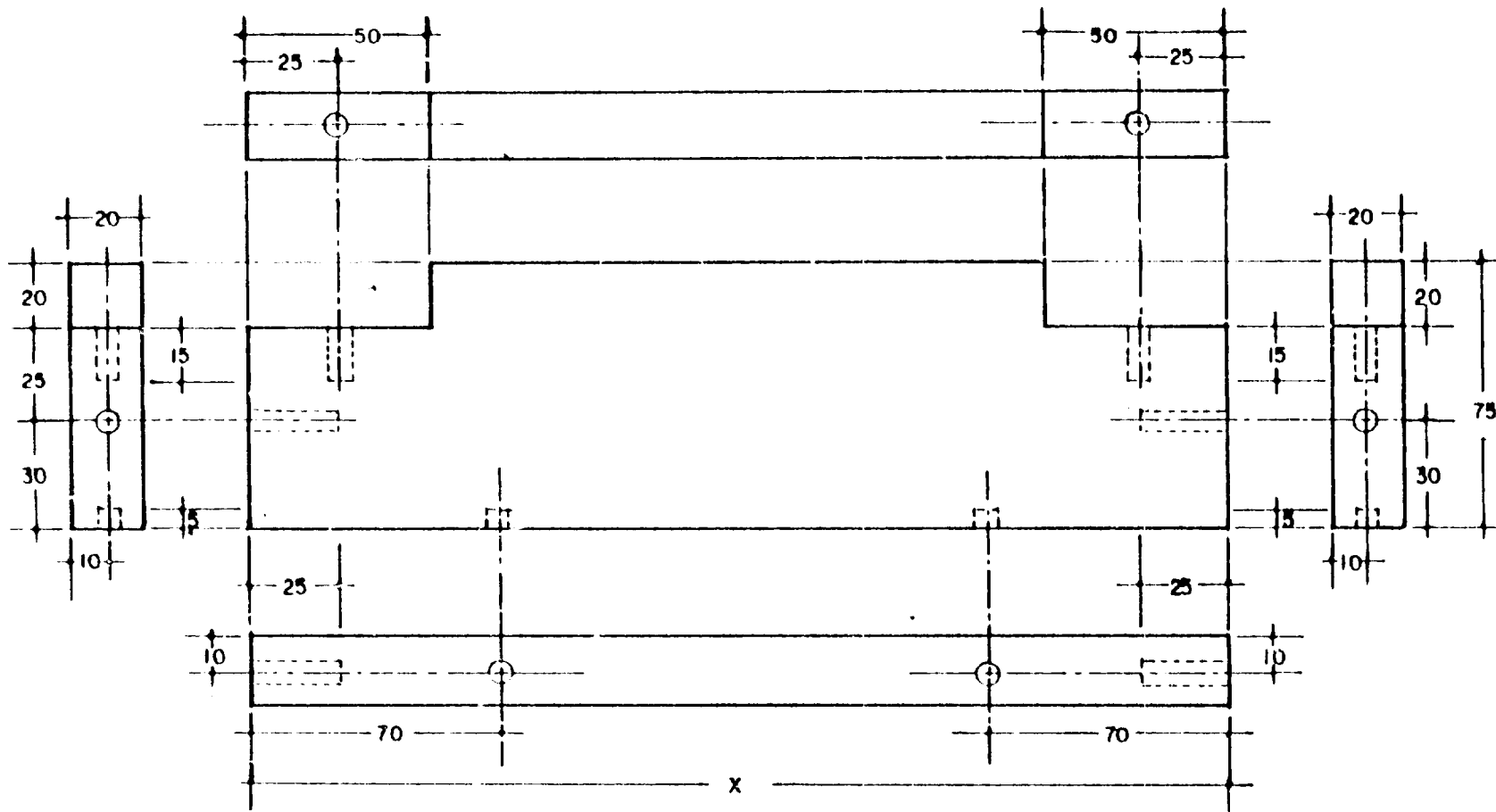
Scale : 1 : 5



Desk Type	X
B	280
C	325

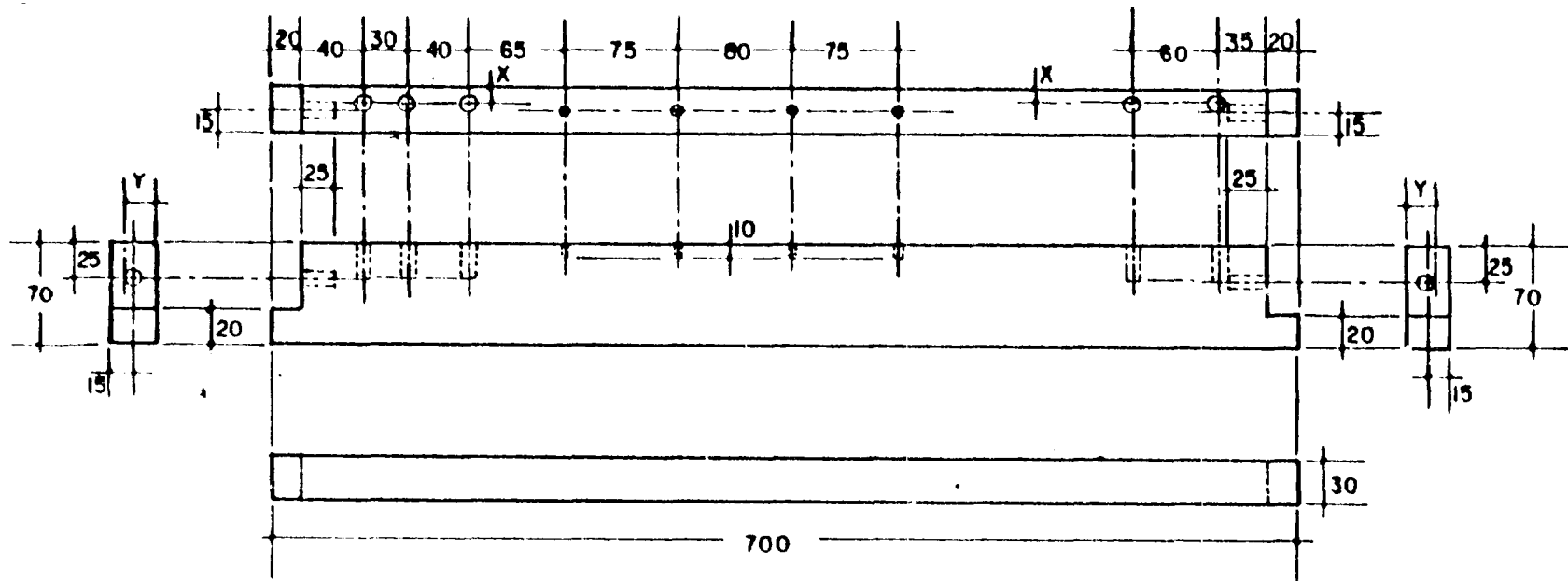
Part No. : D - 10 FRONT - L/R  
 Part Name : SEAT LEG, FRONT PIECE - LEFT/RIGHT  
 Qty. Per Unit Product : Two (2)

Product : Elementary School DESK, Two Seater  
 Product No. : ME 76.06.01 (RIL - Rev.)  
 Scale : 1 : 2



Part No. : D - 10 BACK - L/R  
 Part Name : SEAT LEG, BACK PIECE - LEFT/RIGHT  
 Qty. Per Unit Product : Two (2)

Product : Elementary School DESK, Two Seater  
 Product No. : ME 76.06.01 (R11-Rev.)  
 Scale : 1 : 2

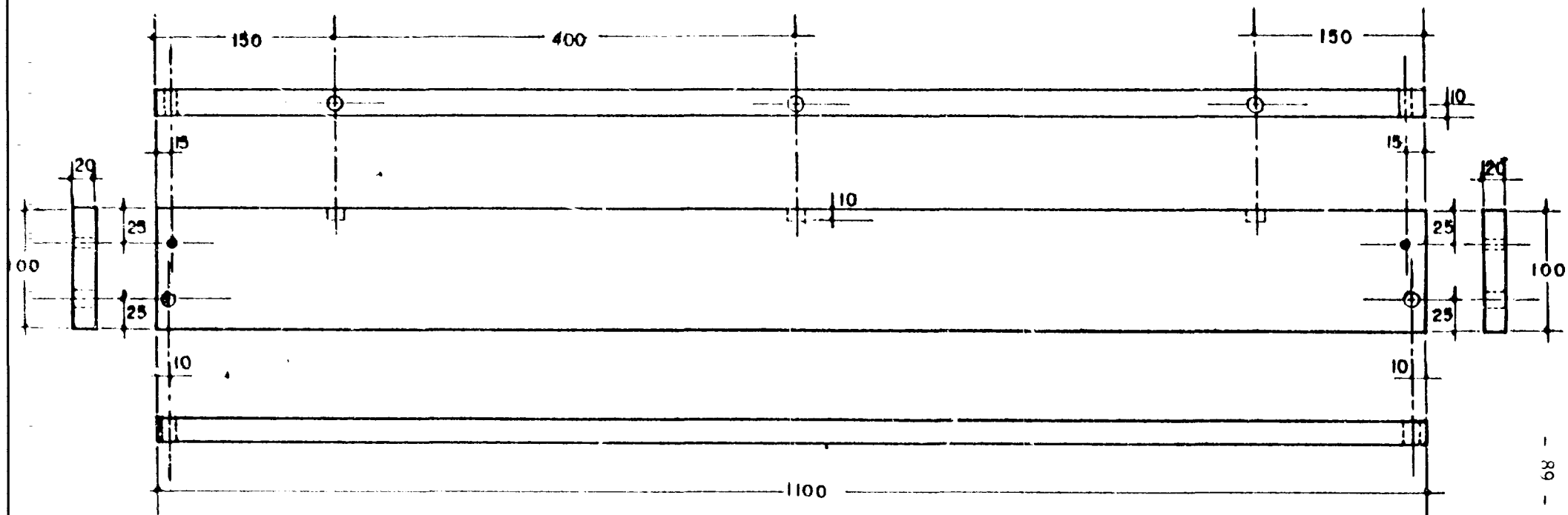


	<u>X</u>	<u>Y</u>
RIGHT Rail -	20	10
LEFT " -	10	20

Part No. :           D - 11  R/L            
 Part Name :           BASE RAIL - RIGHT/LEFT            
 Qty. Per Unit Product :           One (1) R/One (1)L          

Product :           Elementary School DESK, Two Seater            
 Product No. :           ME 76.06.01 (RIL - Rev.)            
 Scale :           1 : 5





Note : Per D - 13, SEAT CROSS RAIL, BOTTOM,  
omit DOWEL HOLES on Top Edge of Board.

Part No. :                     D - 12                    

Part Name :           SEAT TOP CROSS PIECE          

Qty. Per Unit Product :           One (1)          

Product :           Elementary School DESK, Two Seater          

Product No. :           ME 76.06.01 (RIL - Rev.)          

Scale :   1 : 5

\*\*\*PLEASE REFER

Part No. : D - 13

Part Name : SEAT BOTTOM CROSS PIECE

Qty. Per Unit Product : One (1)

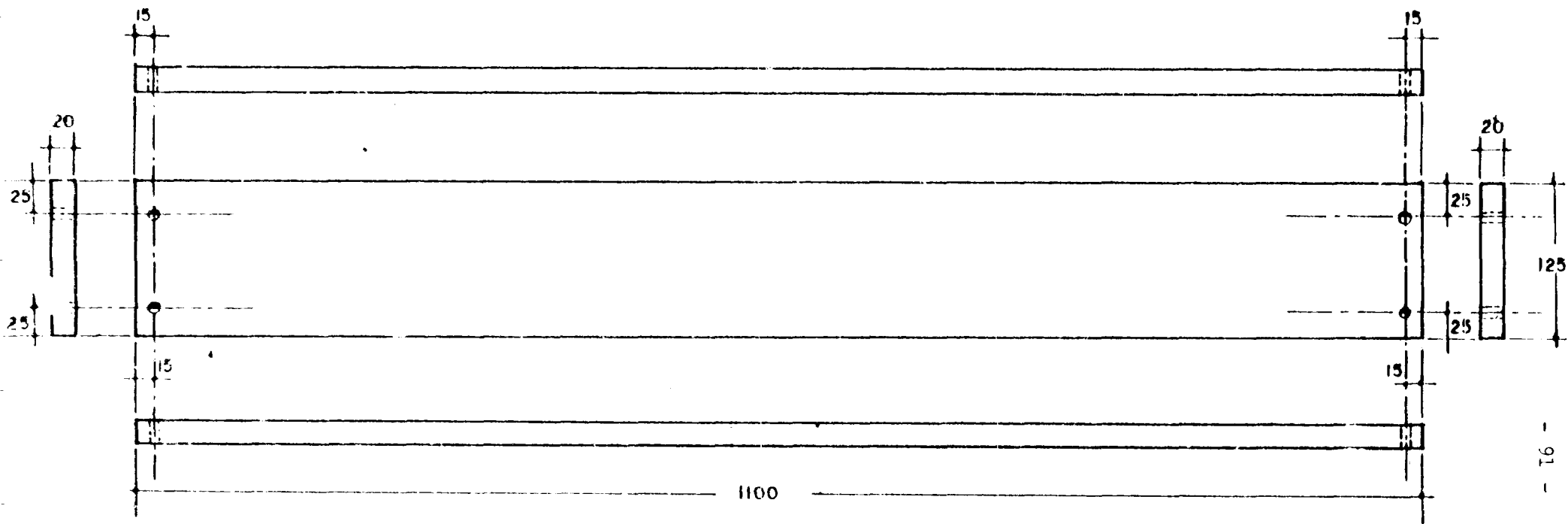
T O D - 12\*\*\*

-  
06  
-

Product : Elementary School DESK, Two Seater

Product No. : ME 76.06.01 (RIL - Rev.)

Scale : 1 : 5



- 16 -

Part No. :           D 14          

Part Name :           FOOI REST          

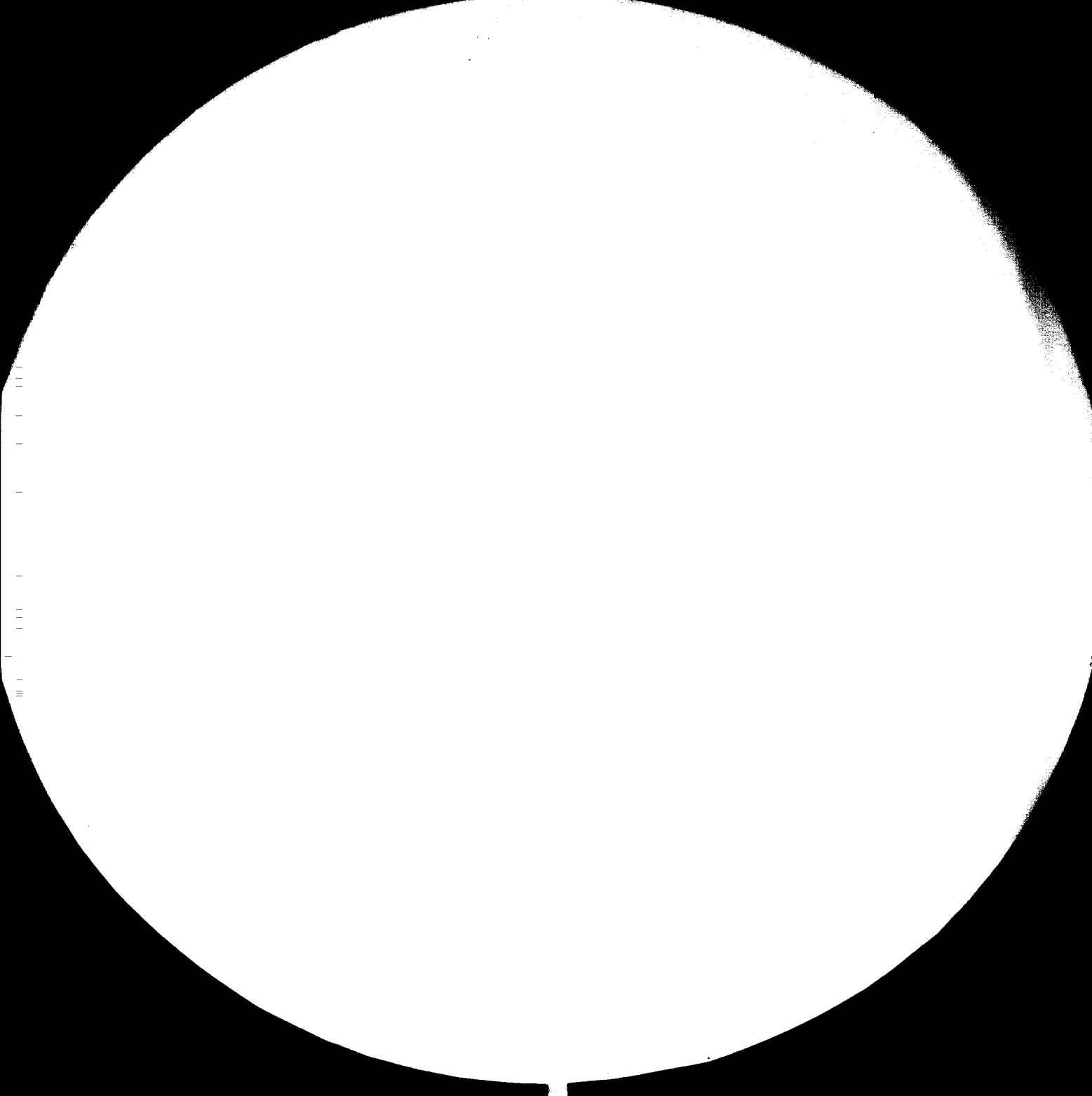
Qty. Per Unit Product :           Two (2)          

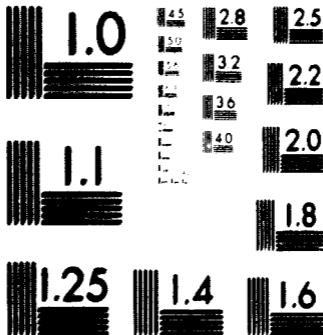
Product :           Elementary School DESK, Two Seater          

Product No. :           ME 76.06.01 (RIL - Rev.)          

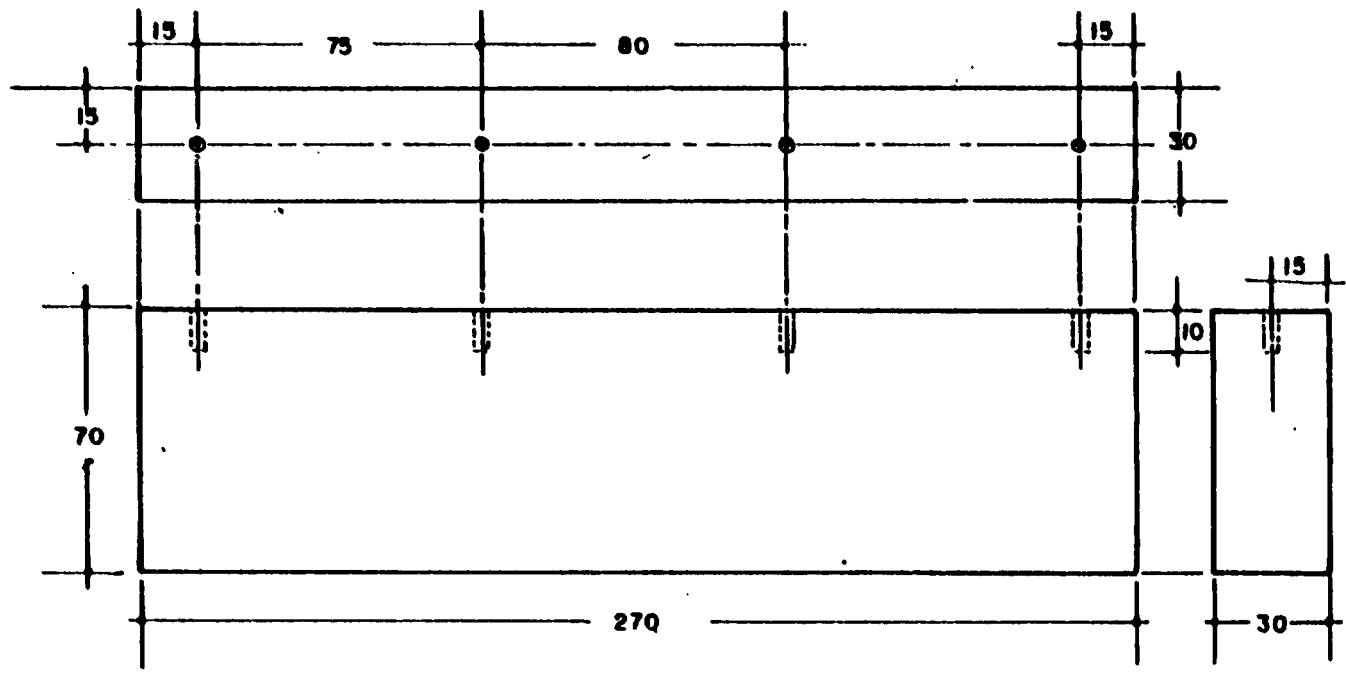
Scale :           1 : 5







MICROCOPY RESOLUTION TEST CHART  
 NATIONAL BUREAU OF STANDARDS-1963-A



Part No. :           D - 15            
 Part Name :           FOOT REST CROSS RAIL            
 Qty. Per Unit Product :           One (1)          

Product :           Elementary School DESK, Two Seater            
 Product No. :           ME 76.06.01 (RIL - Rev.)            
 Scale :           1 : 2



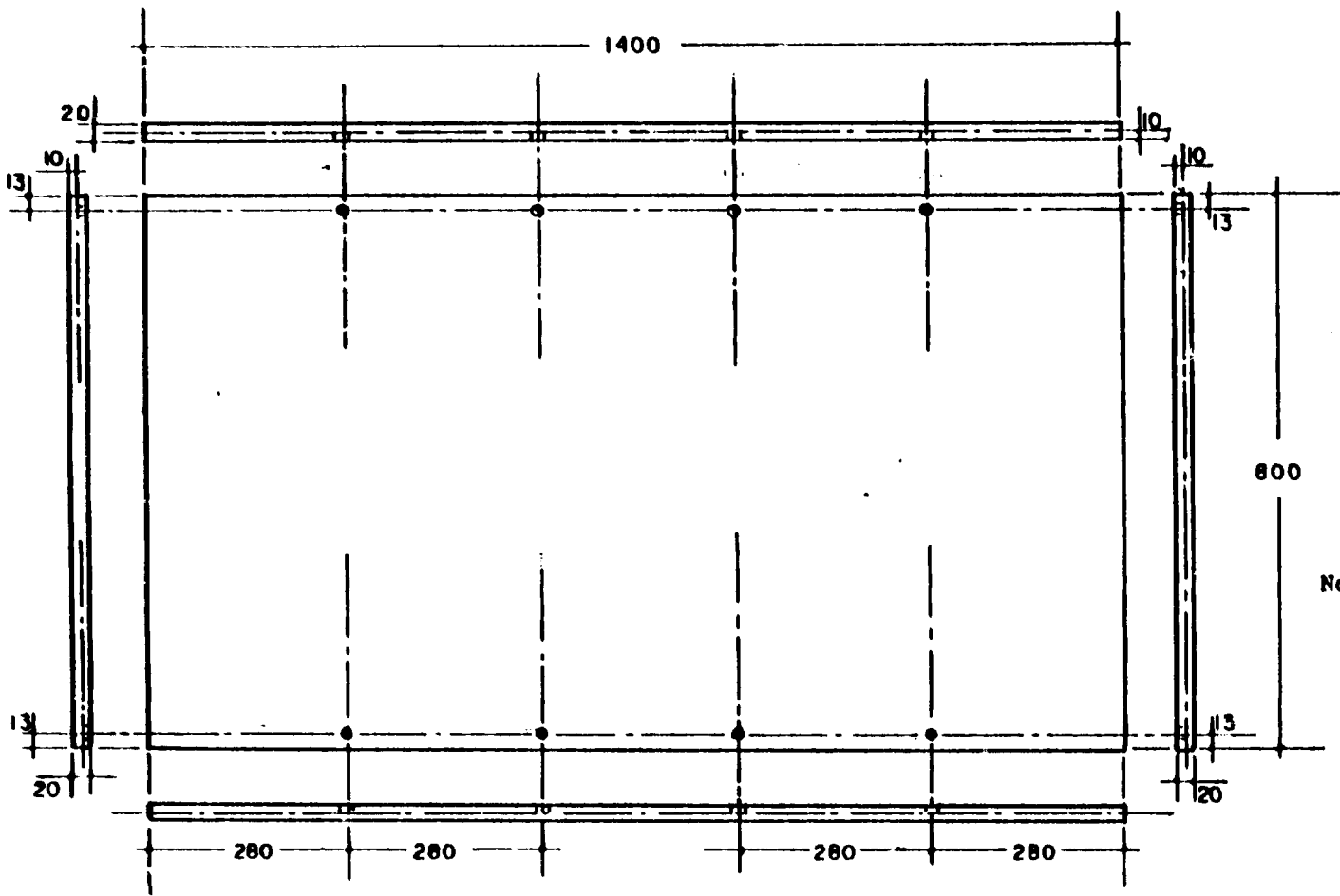
A P P E N D I X VI - B

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WORKING DRAWINGS

TEACHER'S TABLE  
ME-76.06.02 (RIL - Rev.)

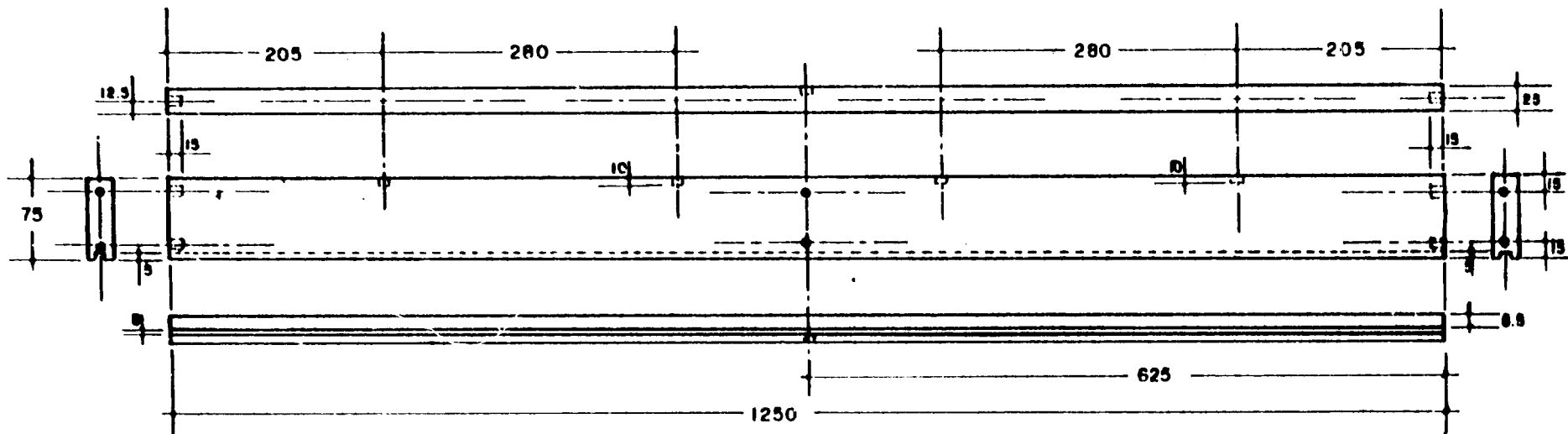
---



Note : Drill DOWEL HOLES  
on Bottom Surface  
of Table Top.

Part No. : TT - 1  
Part Name : TABLE TOP  
Qty. Per Unit Product : One (1)

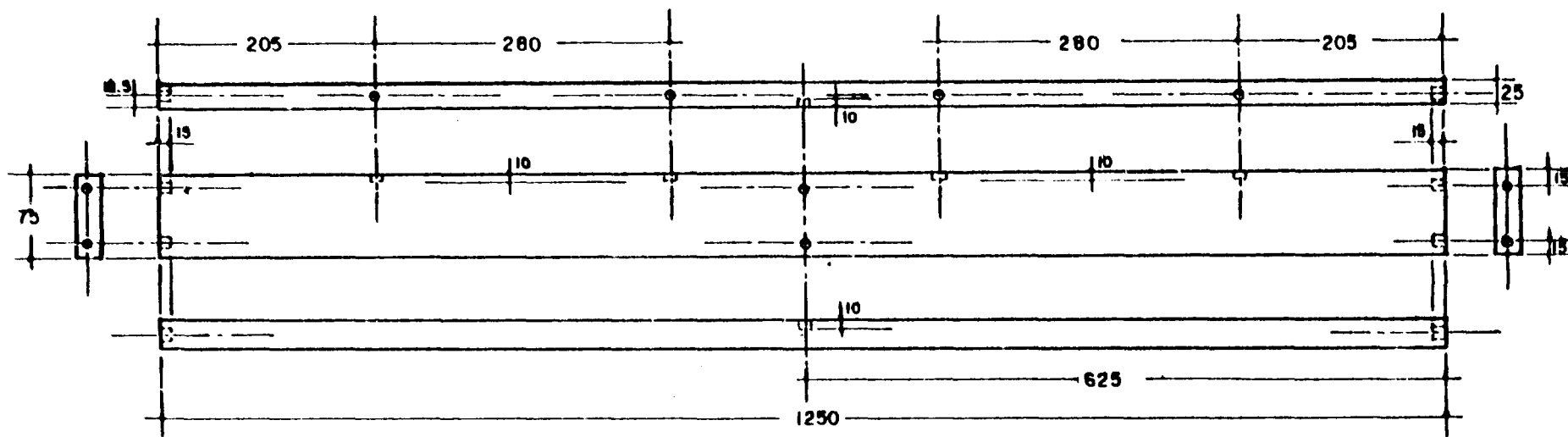
Product : TEACHER'S TABLE  
Product No. : ME 76.06.02 (RIL - Rev.)  
Scale : 1 : 10



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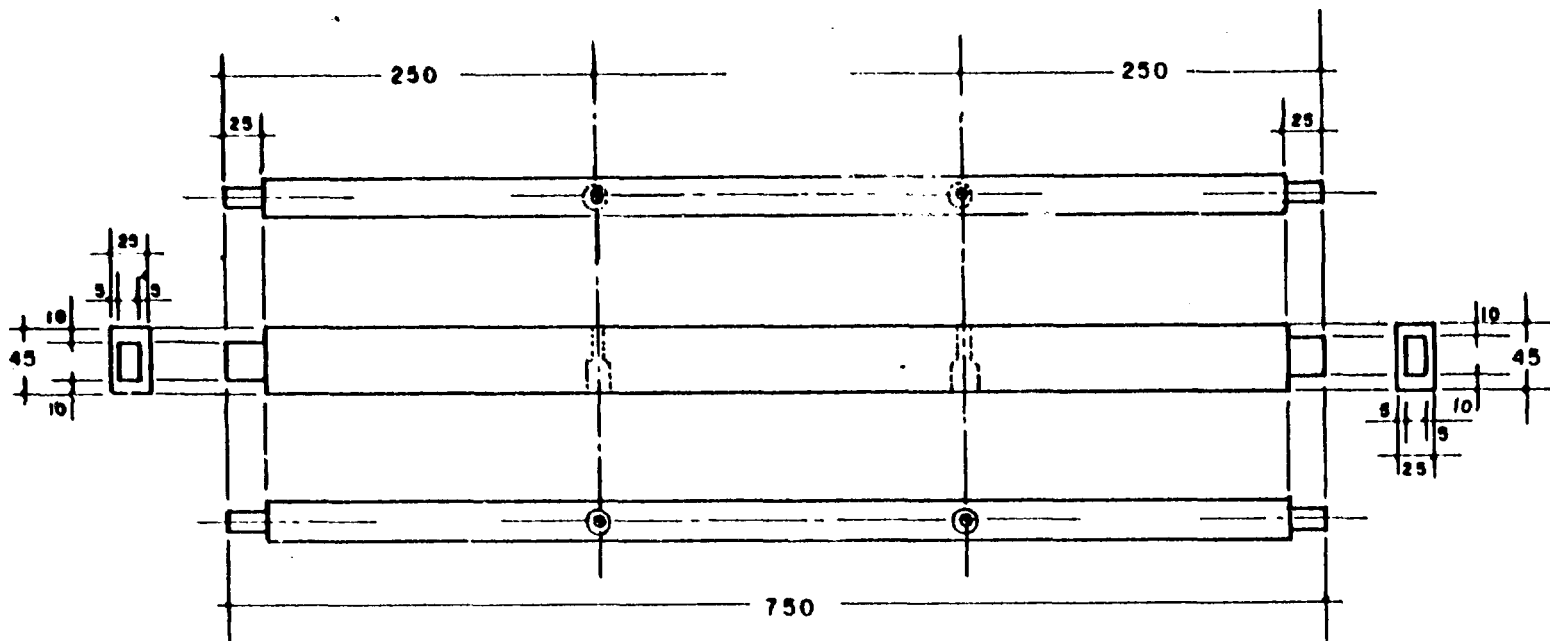
Part No. : TT - 2  
 Part Name : TOP RAIL, FRONT  
 Qty. Per Unit Product : One (1)

Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 6



Part No. :           TT - 3            
 Part Name :           TOP RAIL, BACK            
 Qty. Per Unit Product :           One (1)          

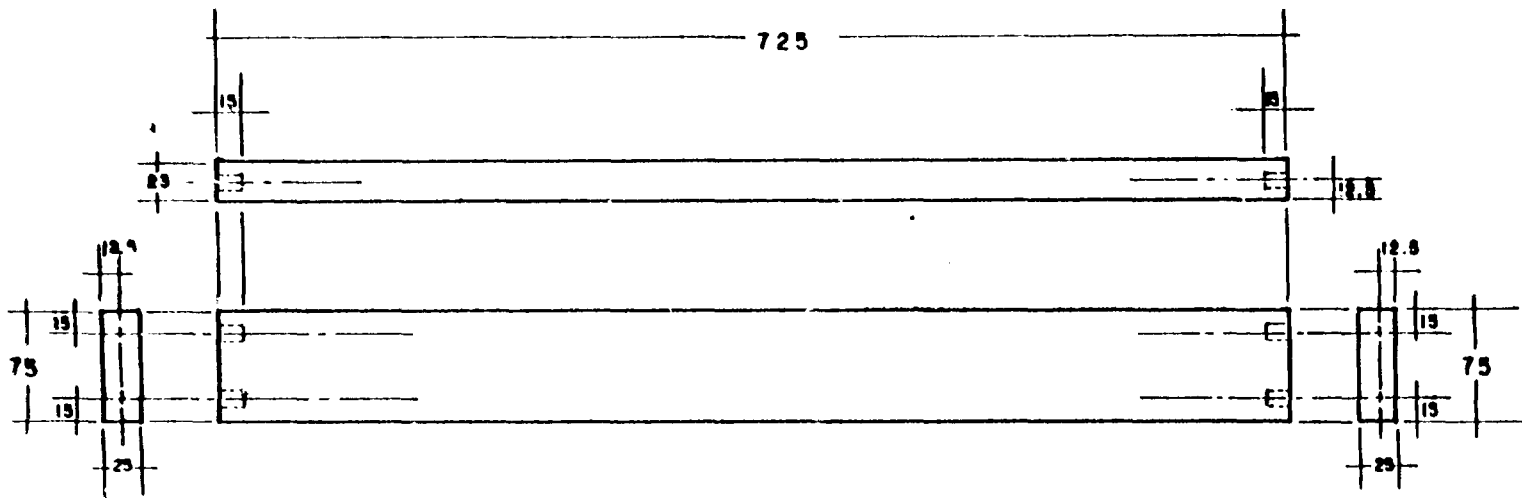
Product :           TEACHER'S TABLE            
 Product No. :           ME 76.06.02 (RIL - Rev.)            
 Scale :           1 : 6



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Part No. : TT - 4 L/R  
 Part Name : TOP RAIL, LEFT/RIGHT SIDES  
 Qty. Per Unit Product : Two (2)

Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 5



Part No. : TT - 5

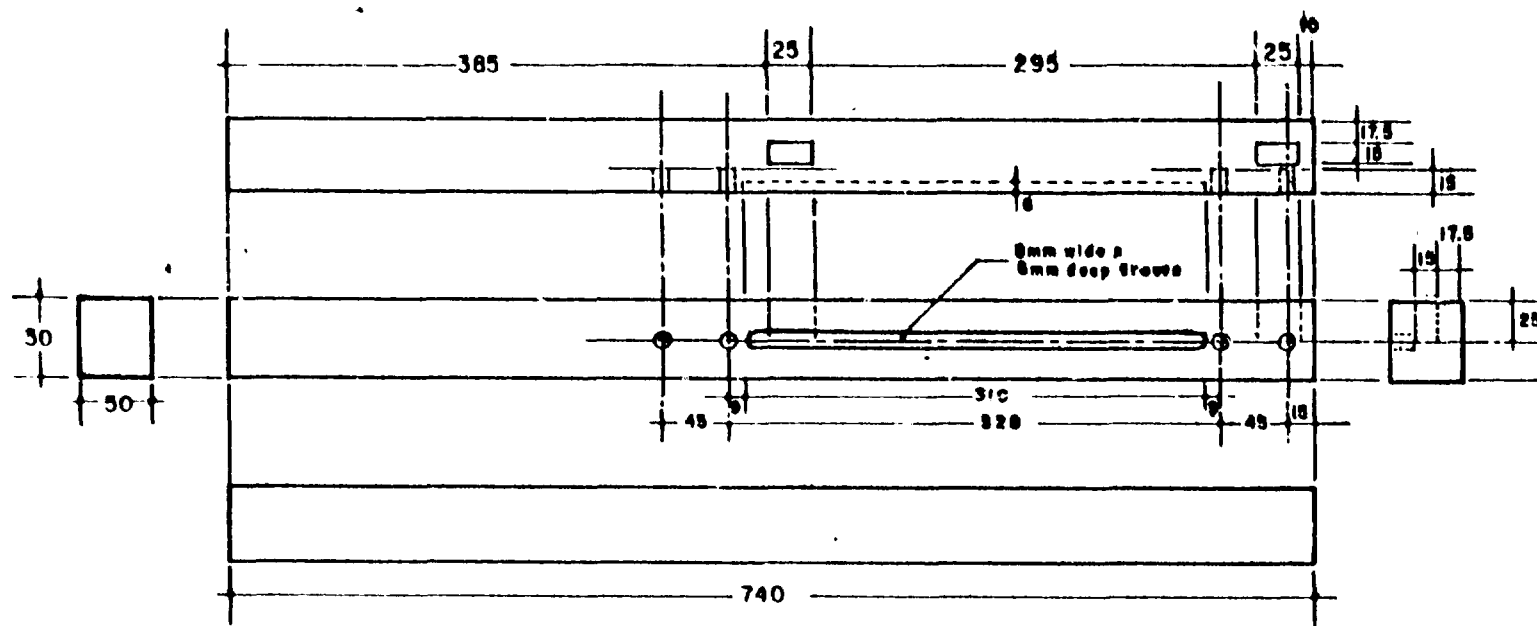
Part Name : TOP RAIL, CENTER

Qty. Per Unit Product : One (1)

Product : TEACHER'S TABLE

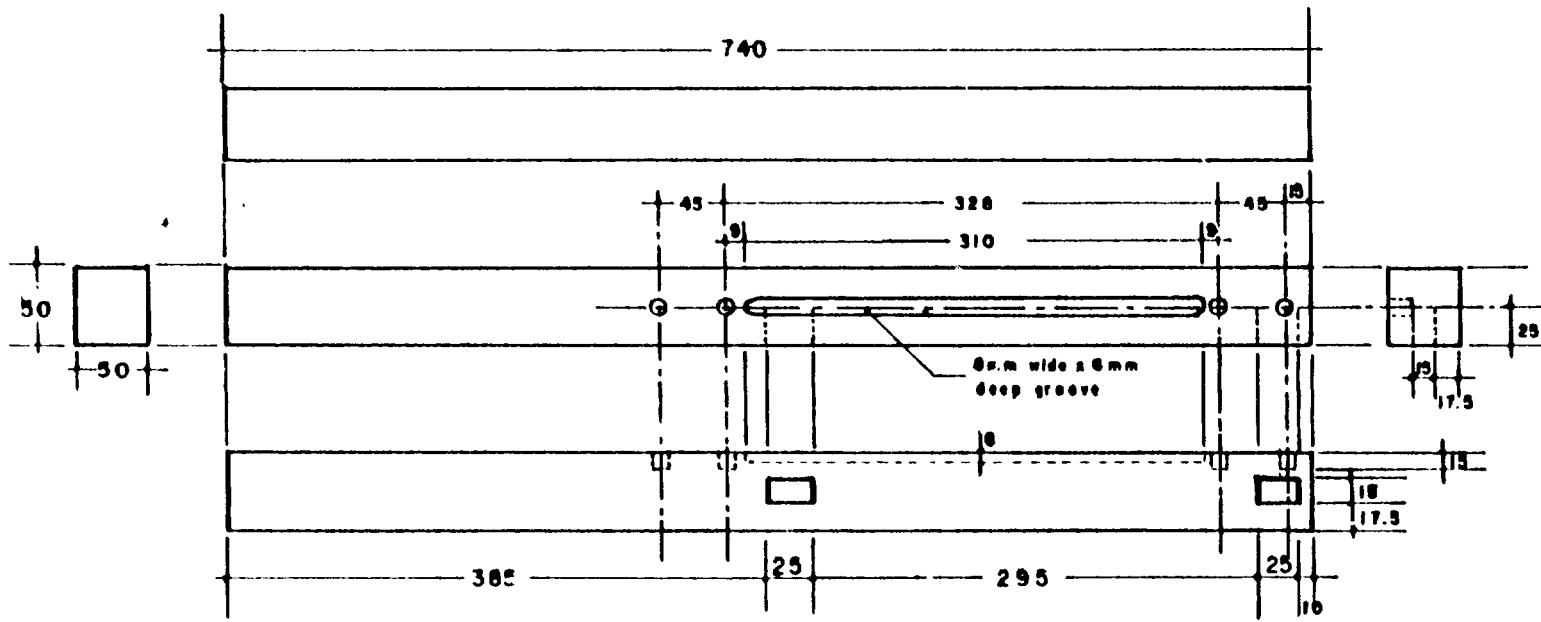
Product No. : ME 76.06.02 (RIL - Rev.)

Scale : 1 : 5



Part No. : TT - 6/a  
 Part Name : LEGS, FRONT, LEFT  
 Qty. Per Unit Product : One (1)

Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 5



Part No. : TT - 6/b

Part Name : LEG, FRONT, RIGHT

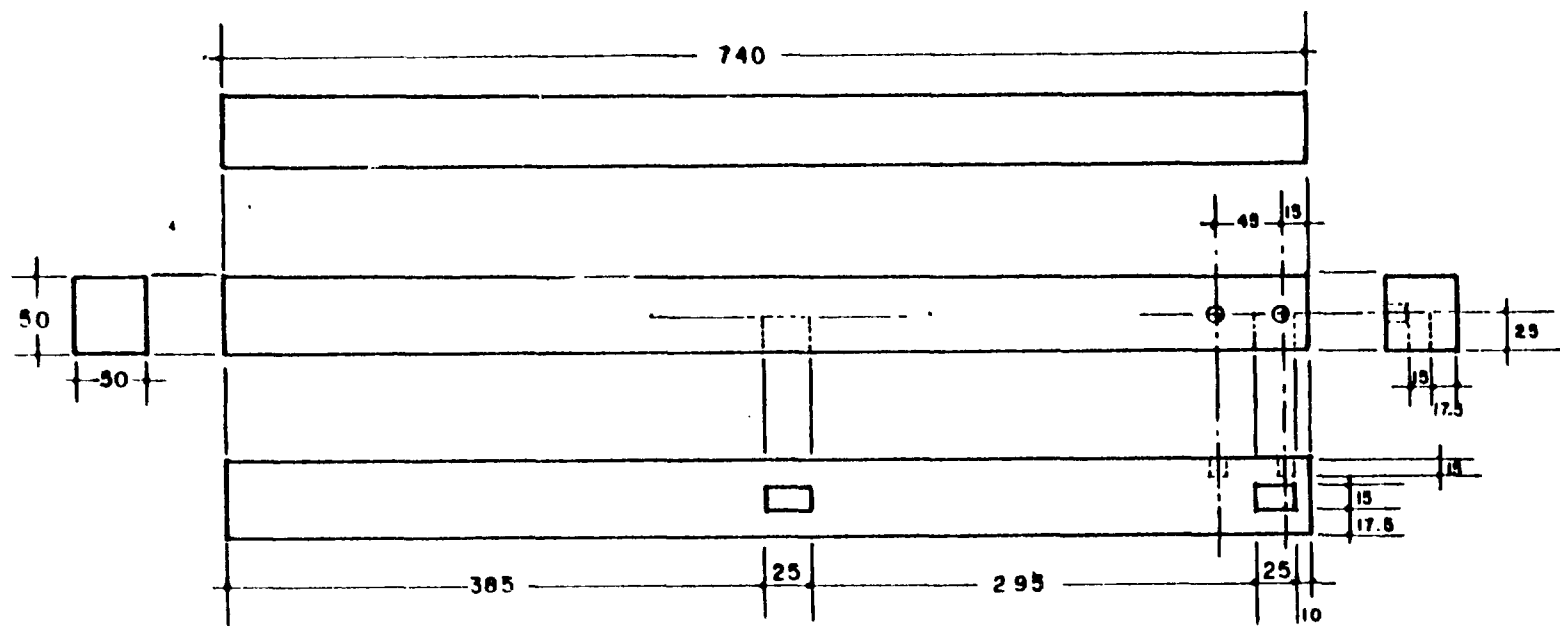
Qty. Per Unit Product : One (1)

Product : TEACHER'S TABLE

Product No. : ME 76.06.02 (RIL - Rev.)

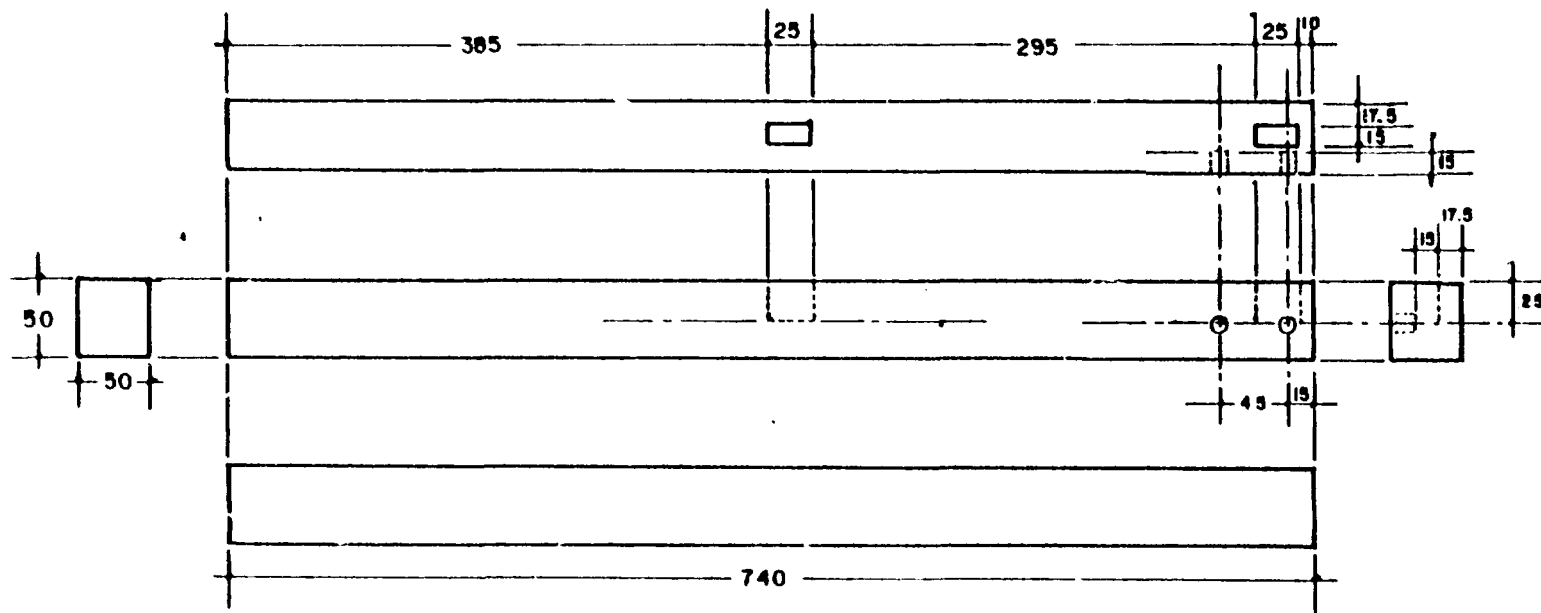
Scale : 1:1





Part No. : TT - 6/c  
Part Name : LEGS, REAR, LEFT  
Qty. Per Unit Product : One (1)

Product : TEACHER'S TABLE  
Product No. : ME 76.06.02 (RIL - Rev.)  
Scale : 1 : 5



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Part No. : TT - 6/d  
 Part Name : LEGS, REAR, RIGHT  
 Qty. Per Unit Product : One (1)

Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 5

\*\*\*\*\*PLEASE REFER TO TT - 2, TOP RAIL, FRONT\*\*\*\*\*

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Part No. : TT - 7  
Part Name : BOTTOM RAIL - FRONT  
Qty. Per Unit Product : One (1)

Product : TEACHER'S TABLE  
Product No. : ME 76.06.02 (RIL - Rev.)  
Scale : 1 : 6

\*\*\*\*\*PLEASE REFER TO TT - 4, TOP RAIL, L/R, SIDES,  
but OMIT COUNTERSINK two (2) HOLES for  
WOODSCREWS.\*\*\*\*\*

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Part No. : TT - 8  
Part Name : BOTTOM RAIL, LEFT/RIGHT - SIDES  
Qty. Per Unit Product : Two (2)

Product : TEACHER'S TABLE  
Product No. : ME 76.06.02 (RIL - Rev.)  
Scale : 1 : 5

\*\*\*\*\*6 mm x 1310 x 310 (PLYWOOD)\*\*\*\*\*

Note : a) Cut from 6 mm x 1220 x 2440  
Commercial Plywood.

b) Lay FACE VENEER on one FACE, with  
GRAIN PATTERN parallel to width  
of Panel.

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Part No. : TT - 9

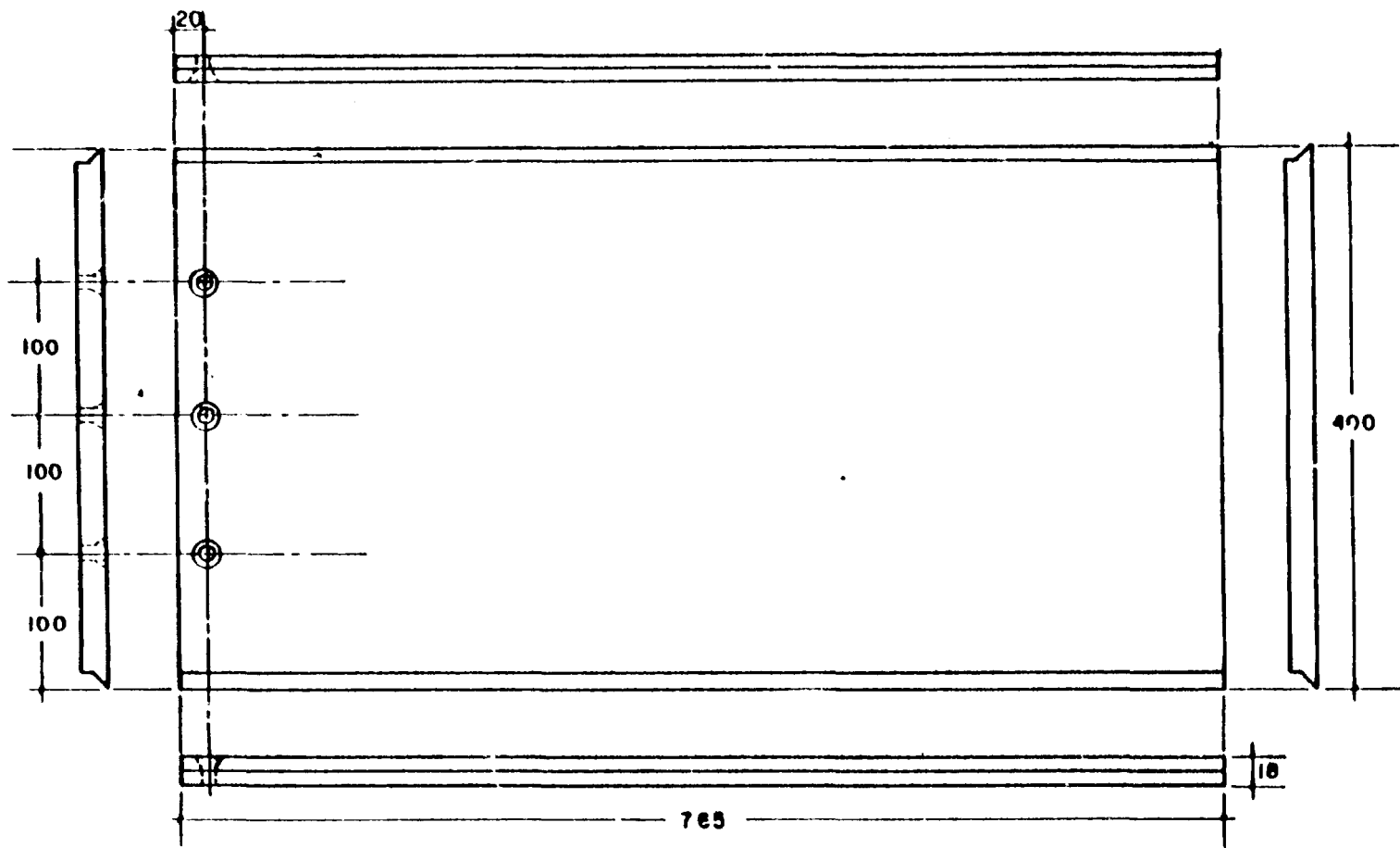
Part Name : FRONT PANEL

Qty. Per Unit Product : One (1)

Product : TEACHER'S TABLE

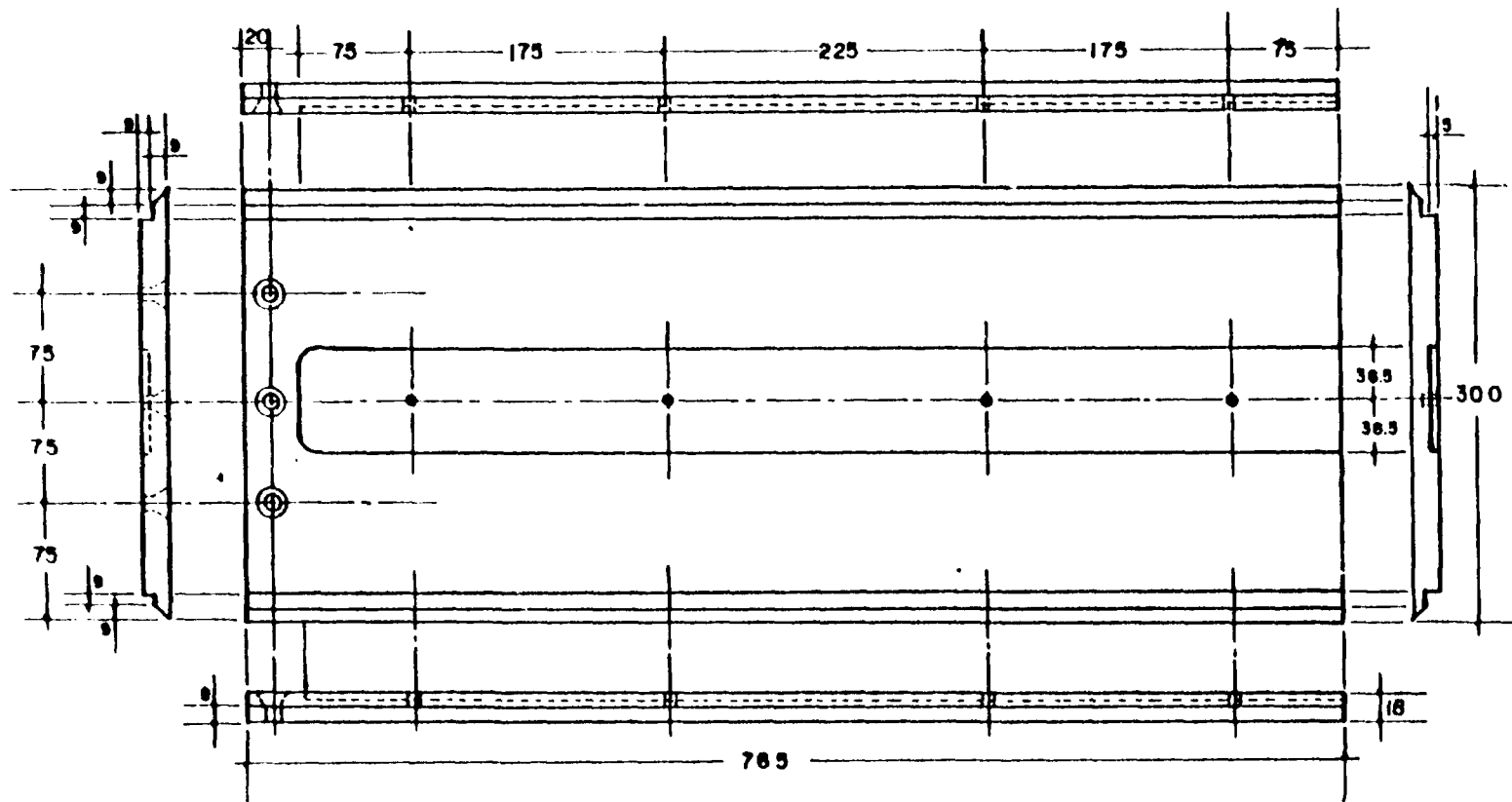
Product No. : ME 76.06.02 (RIL - Rev.)

Scale :



Part No. : TT - 10 & TT - 12  
 Part Name : DRAWER CASE - TOP & BOTTOM  
 Qty. Per Unit Product : Two (2)

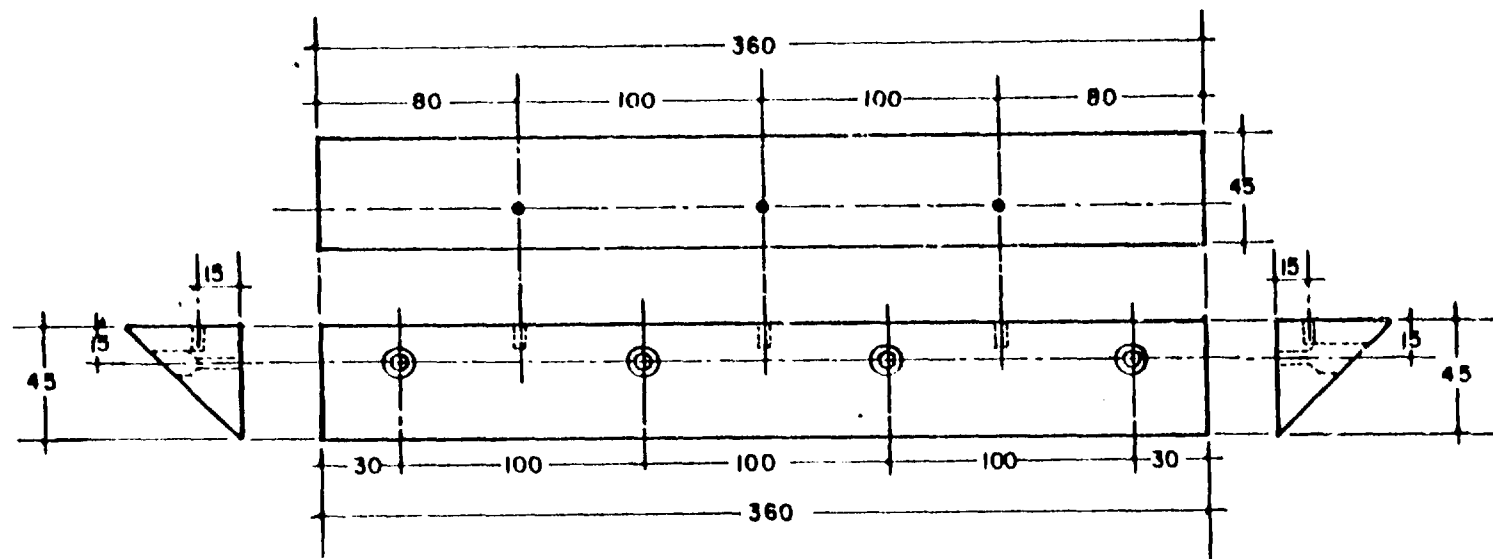
Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 scale : 1 : 5



Note: For TT - 11, DRAWER SIDE, LEFT, omit COUNTERSINK HOLES for WOODSCREWS, three (3).

Part No. : TT - 11 - 1/R  
 Part Name : DRAWER CASE SIDES 1/RIGHT  
 Qty. Per Unit Product : Two (2)

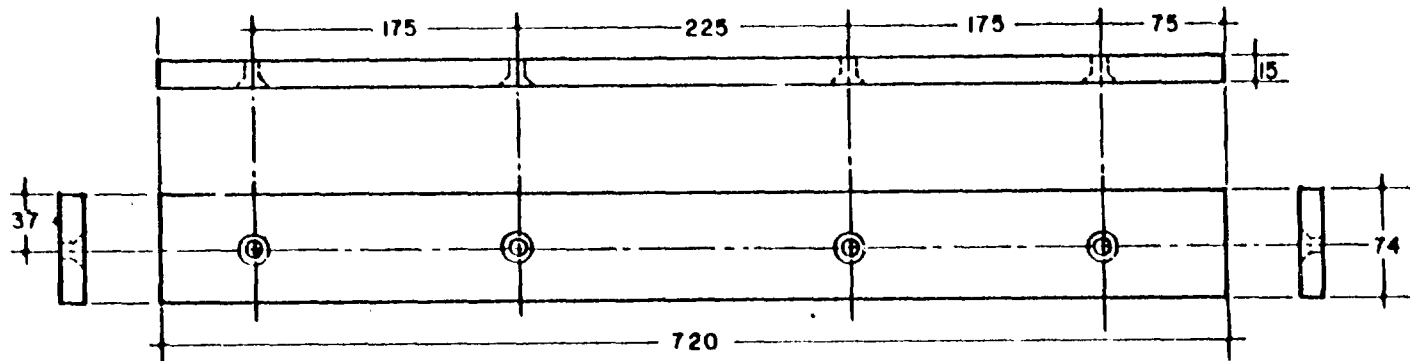
Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 5



Part No. : TT - 13  
 Part Name : DRAWER CASE SUPPORT FILLET  
 Qty. Per Unit Product : One (1)

Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 3

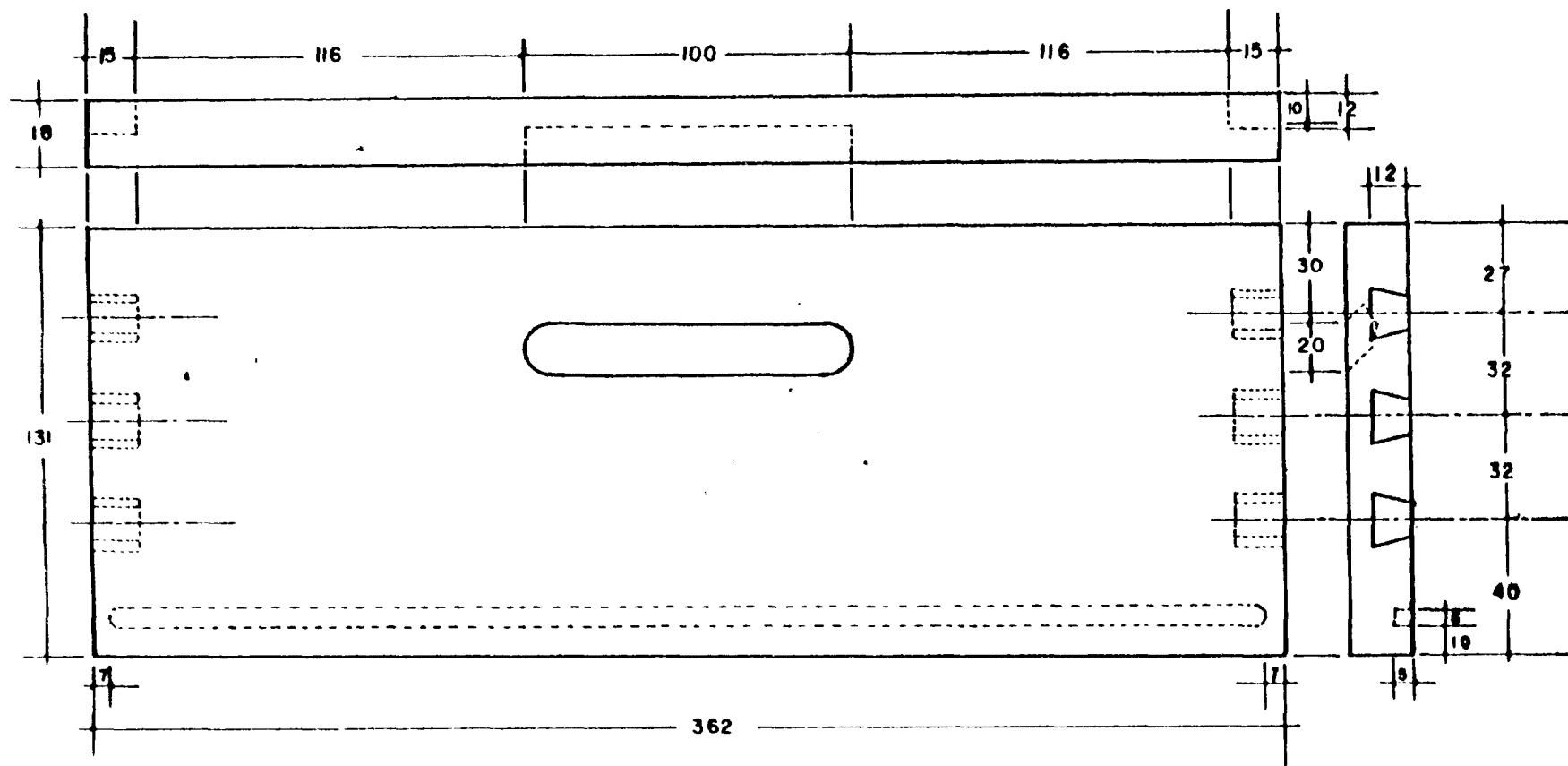




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Part No. : TT - 14  
 Part Name : DRAWER RUNNER  
 Qty. Per Unit Product : Four (4)

Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 5

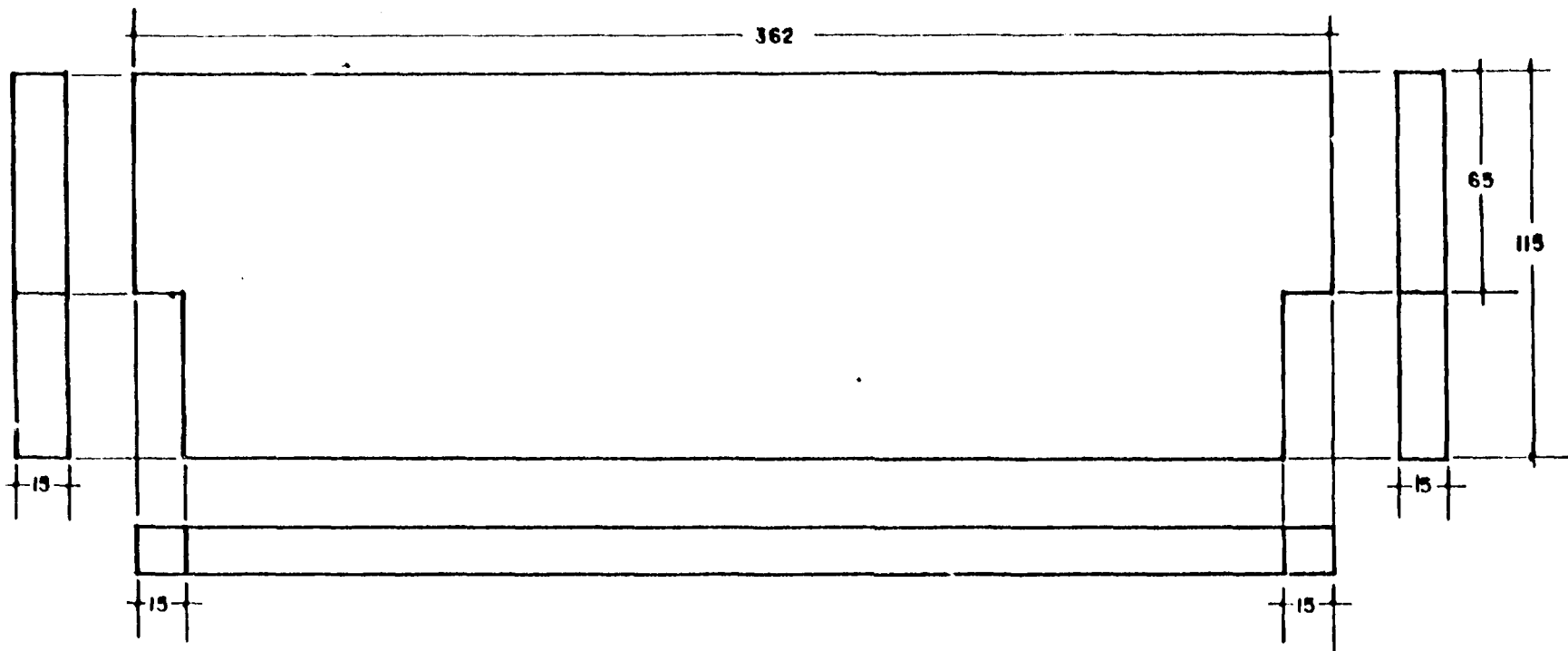


110

Note: Use 16 mm  $\phi$  x 12 mm depth Dove-tail Cutter.

Part No. : TT - 15  
 Part Name : DRAWER FRONT  
 Qty. Per Unit Product : Two (2)

Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 2



- III -

Part No. : DT - 16  
 Part Name : DRAWER BACK  
 Qty. Per Unit Product : Two (2)

Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 2

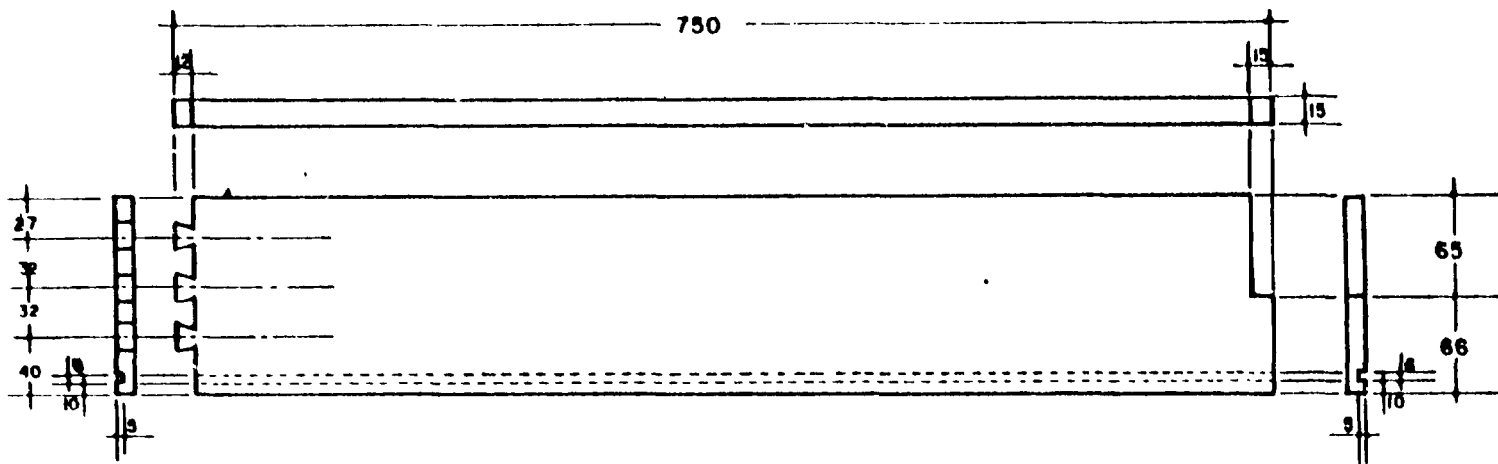
6 mm x 743 x 342

Note : a) Use 6 mm Commercial Plywood  
b) Hand Sand to break sharp edges

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Part No. : TT - 17  
Part Name : DRAWER BOTTOM  
Qty. Per Unit Products Two (2)

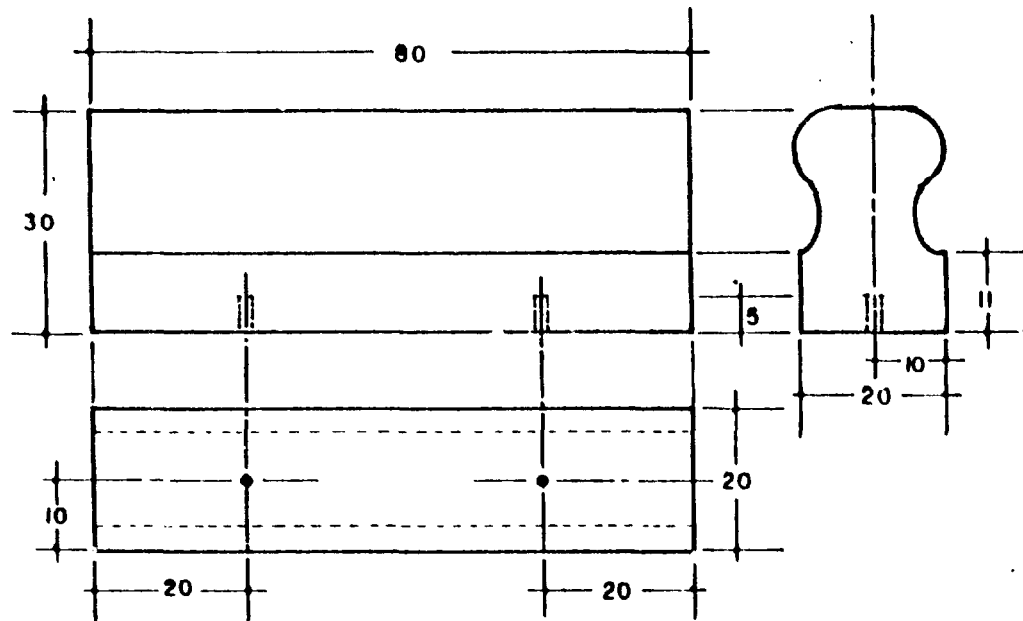
Product : TEACHER'S TABLE  
Product No. : ME 76.06.02 (RIL - Rev.)  
Scale : \_\_\_\_\_



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Part No. : TI - 18  
 Part Name : DRAWER SIDE  
 Qty. per Unit Product : Four (4)

Product : TEACHER'S TABLE  
 Product No. : ME 76.06.02 (RIL - Rev.)  
 Scale : 1 : 5



Part No. : TT - 19

Part Name : DRAWER HANDLE

Qty. Per Unit Product : Two (2)

Product : TEACHER'S TABLE

Product No. : ME 76.06.02 (RIL - Rev.)

Scale : 1 : 1

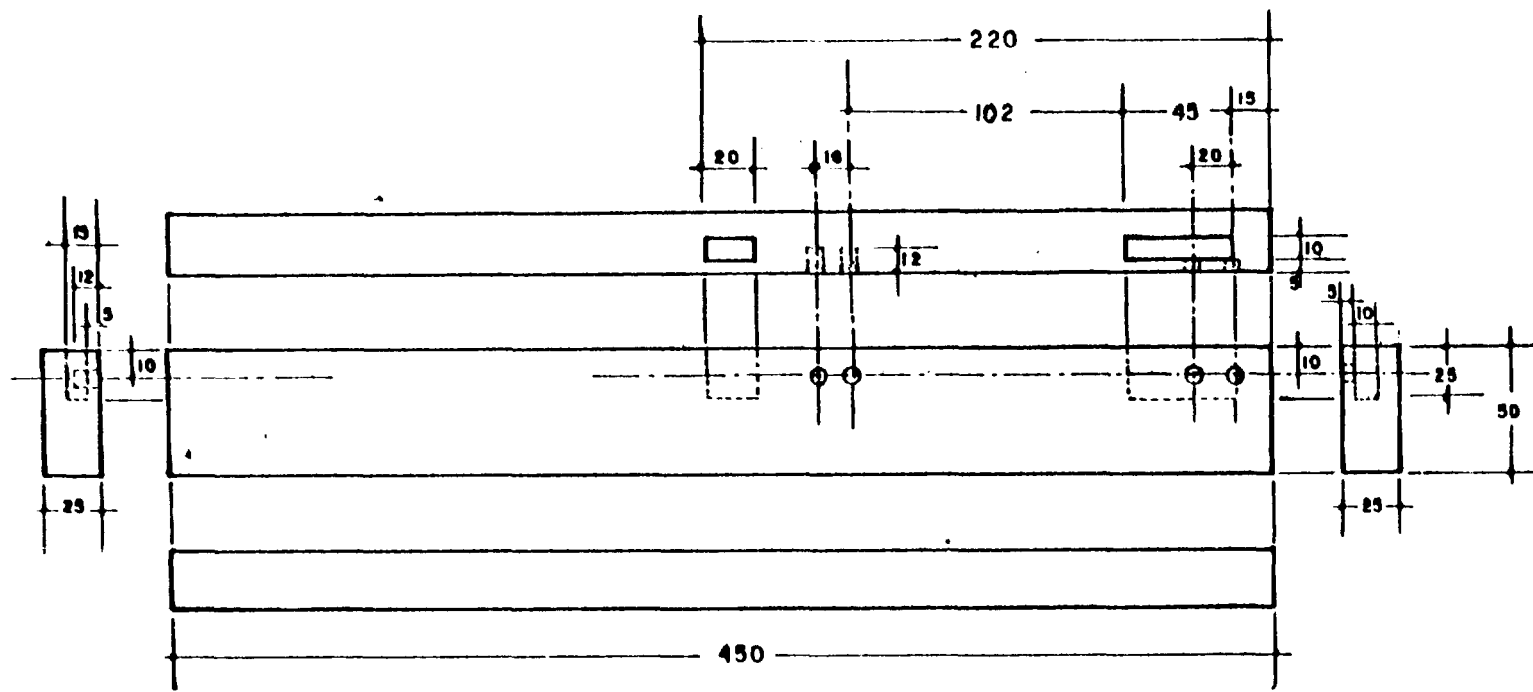
A P P E N D I X VI - C

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WORKING DRAWINGS

TEACHER'S CHAIR  
ME-76.06.03 (RIL - Rev.)

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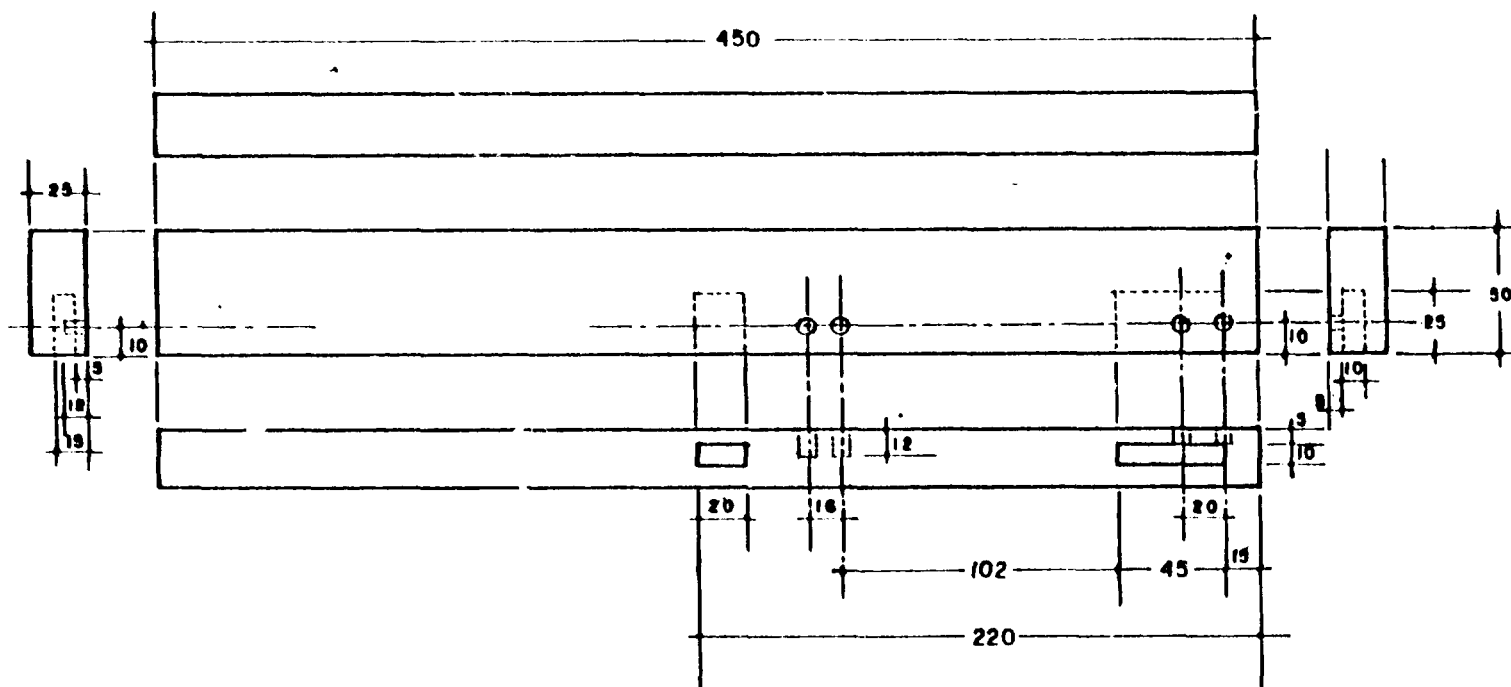


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Part No. : TC - 1  
 Part Name : FRONT LEG, LEFT  
 Qty. Per Unit Product : One (1)

Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (NIL - Rev.)  
 Scale : 1 : 3

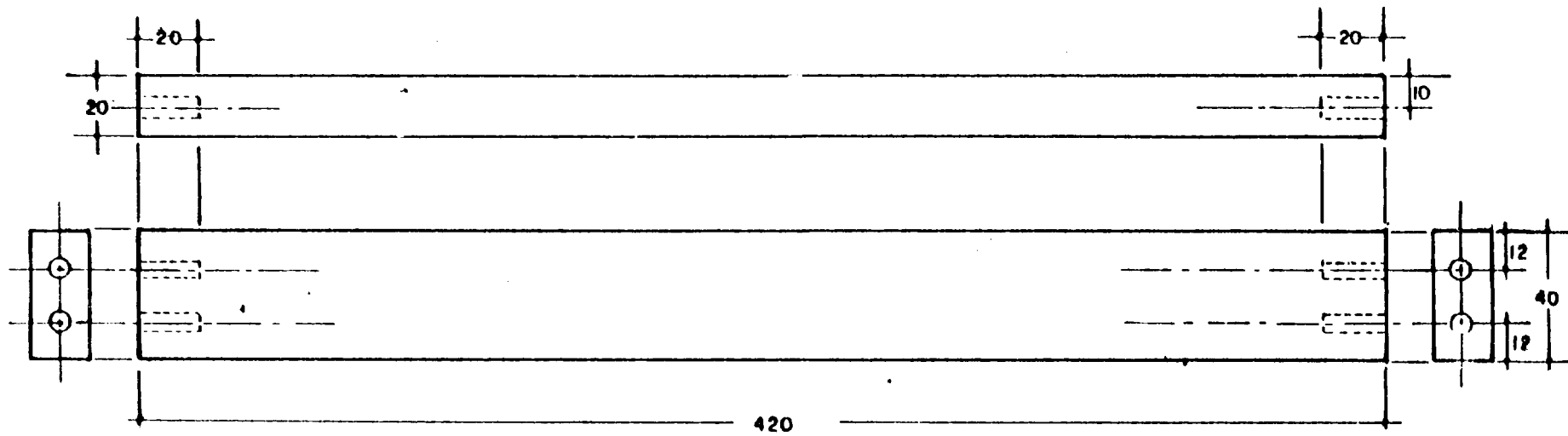




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Part No : TC - 2  
 Part Name : FRONT LEG, RIGHT  
 Qty. Per Unit Product : One (1)

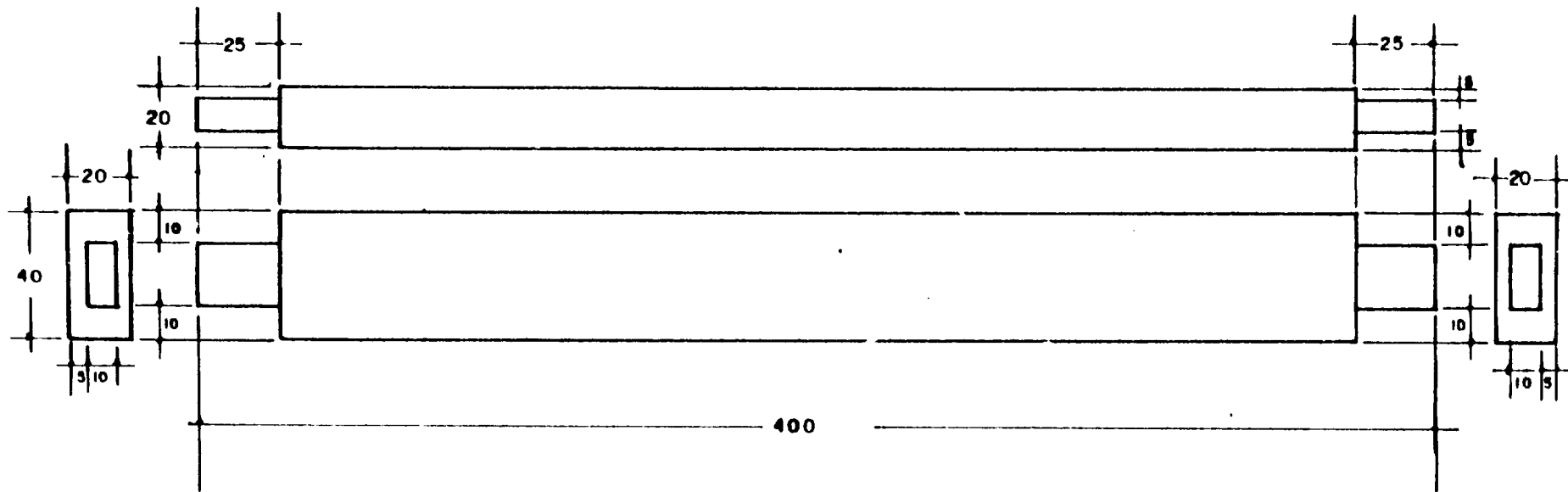
Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 3



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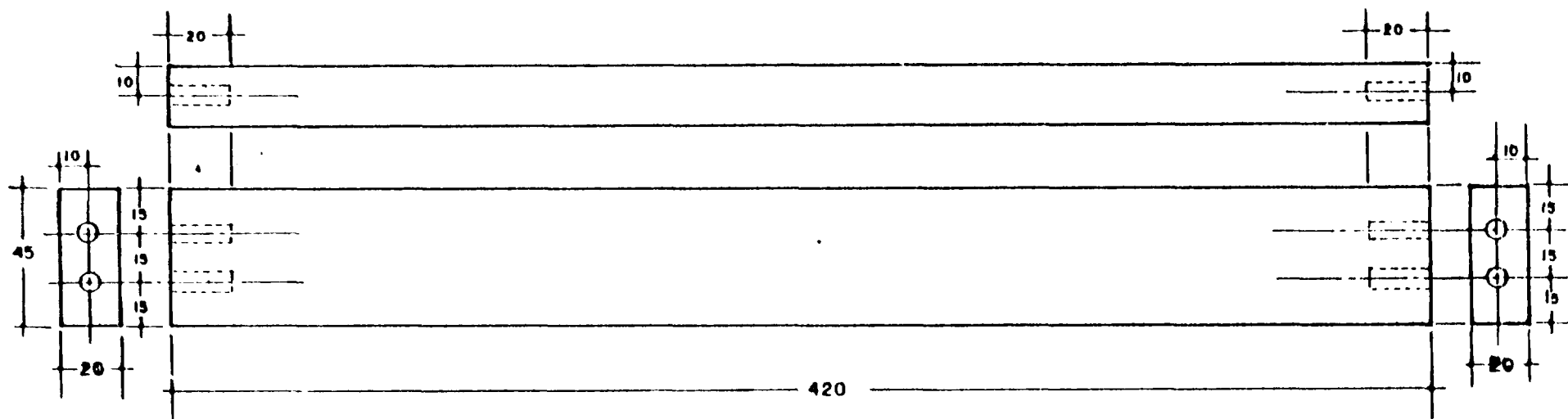
Part No. : TC - 3  
 Part Name : BOTTOM RAILS, FRONT/BACK  
 Qty. Per Unit Product : Two (2)

Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 2



Part No. : TC - 4  
 Part Name : BOTTOM RAILS, L/R SIDES  
 Qty. Per Unit Product : Two (2)

Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 2



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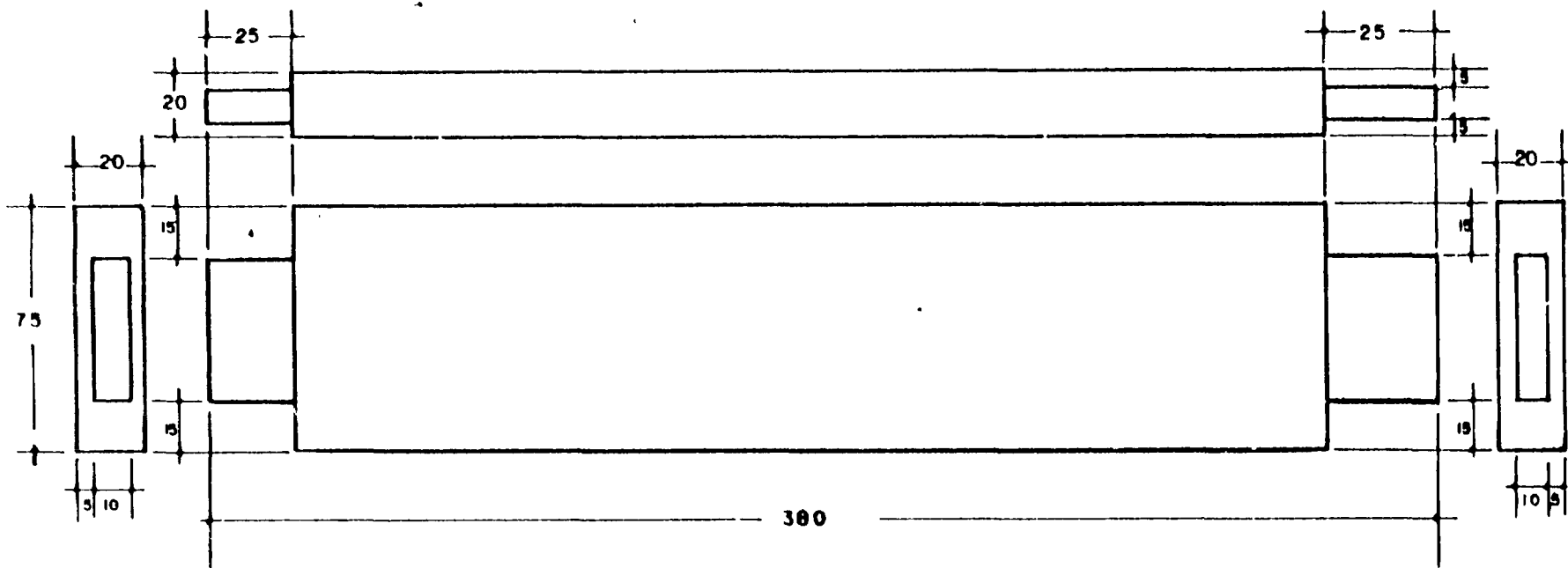
Part No. : TC - 5  
 Part Name : SEAT RAIL, FRONT  
 Qty. Per Unit Product : One (1)

Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 2

\*\*\* IDENTICAL TO TC - 3, BOTTOM RAILS, FRONT/BACK \*\*\*

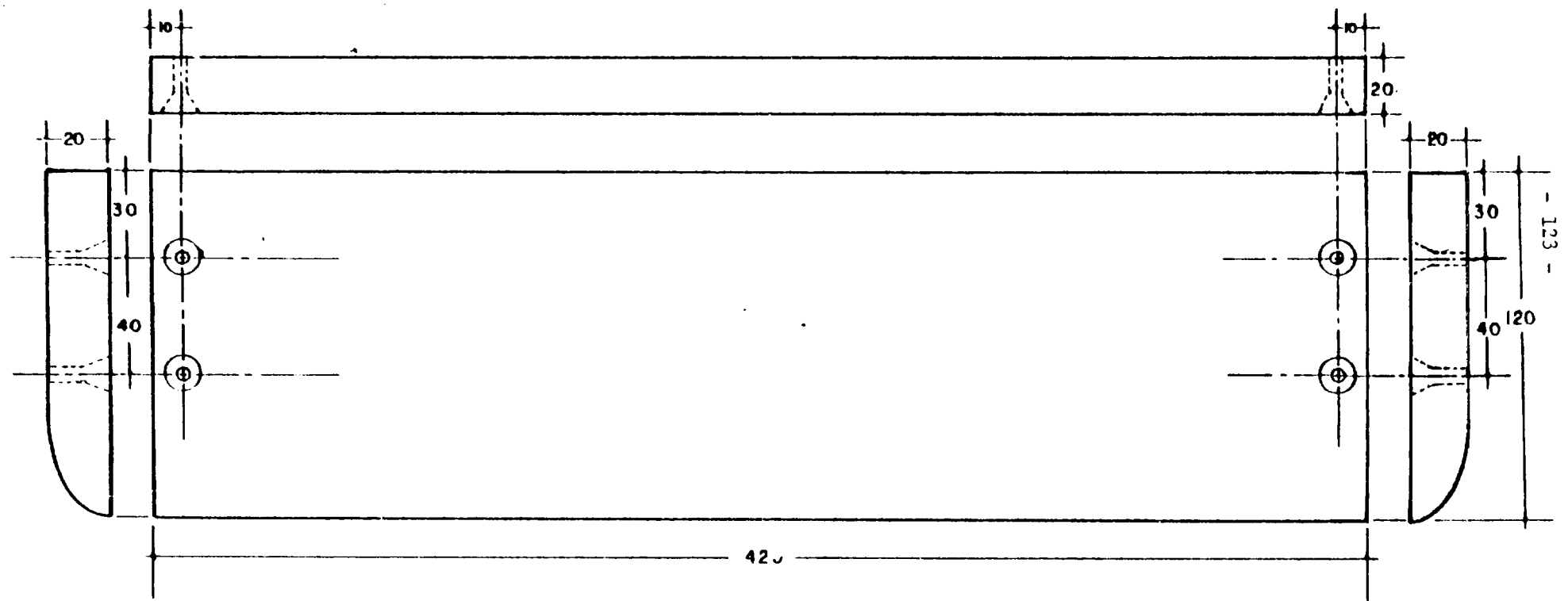
Part No. : TC - 6  
Part Name : SEAT RAIL, BACK  
Qty. Per Unit Product : One (1)

Product : TEACHER'S CHAIR  
Product No. : ME 76.06.03 (RIL - Rev.)  
Scale : 1 : 2



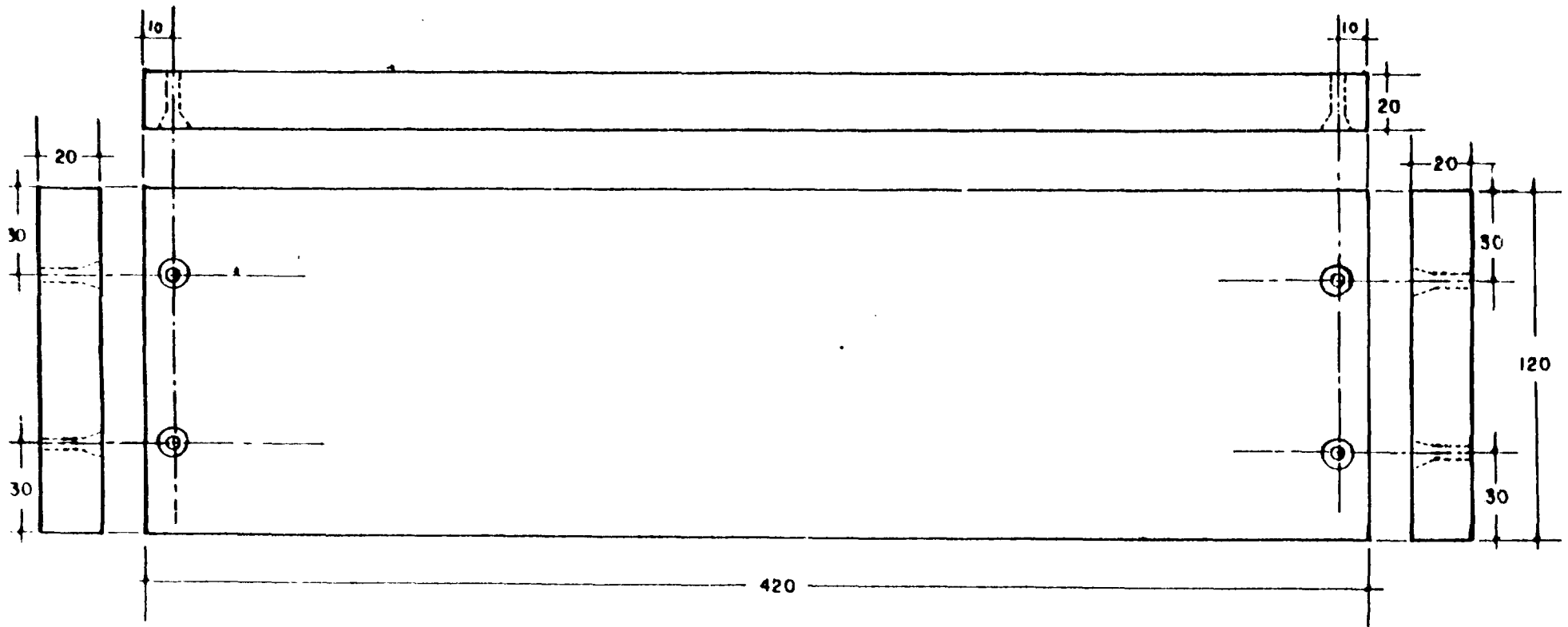
Part No. : TC - 7 & TC - 8  
 Part Name : SEAT RAIL, LEFT/RIGHT SIDE  
 Qty. Per Unit Product : One (1) L/One (1) R

Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 2



Part No. : TC - 9  
 Part Name : SEAT SLAT, FRONT  
 Qty. Per Unit Product : One (1)

Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 2

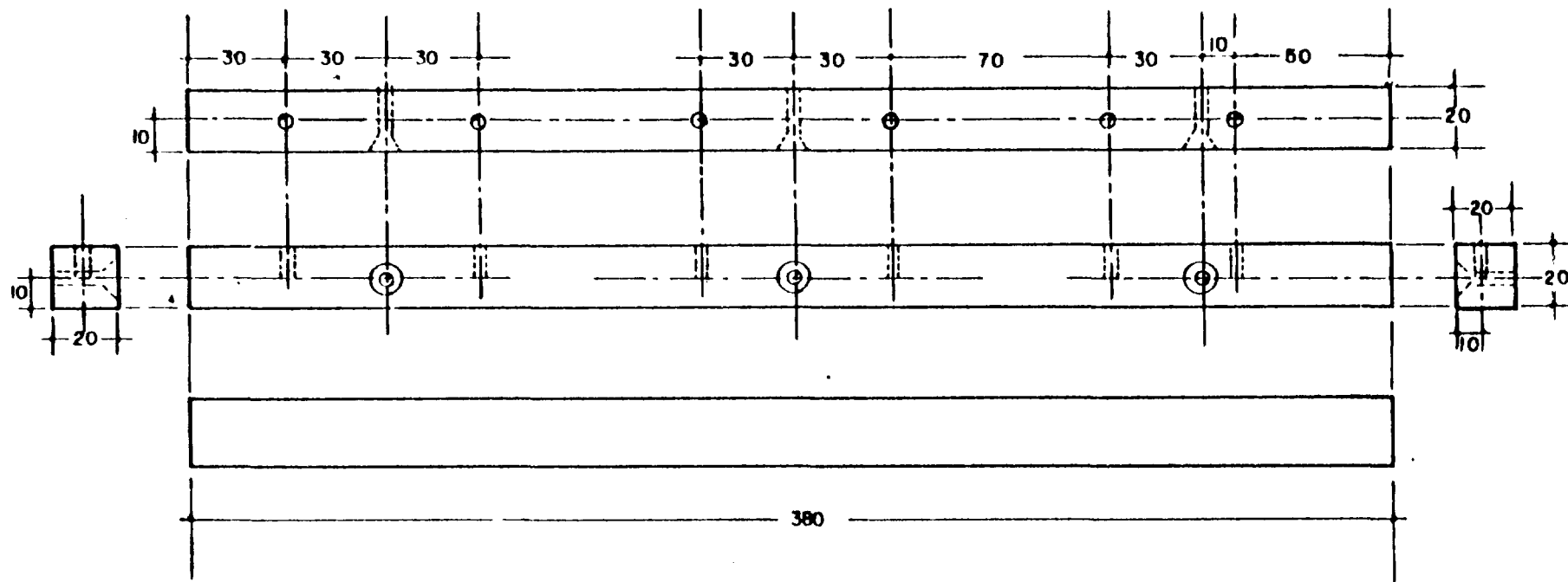


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Part No. : TC - 10 & TC - 11  
 Part Name : SEAT SLAT, MIDDLE/BACK  
 Qty. per Unit Product : One (1)M/One (1)B

Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 2



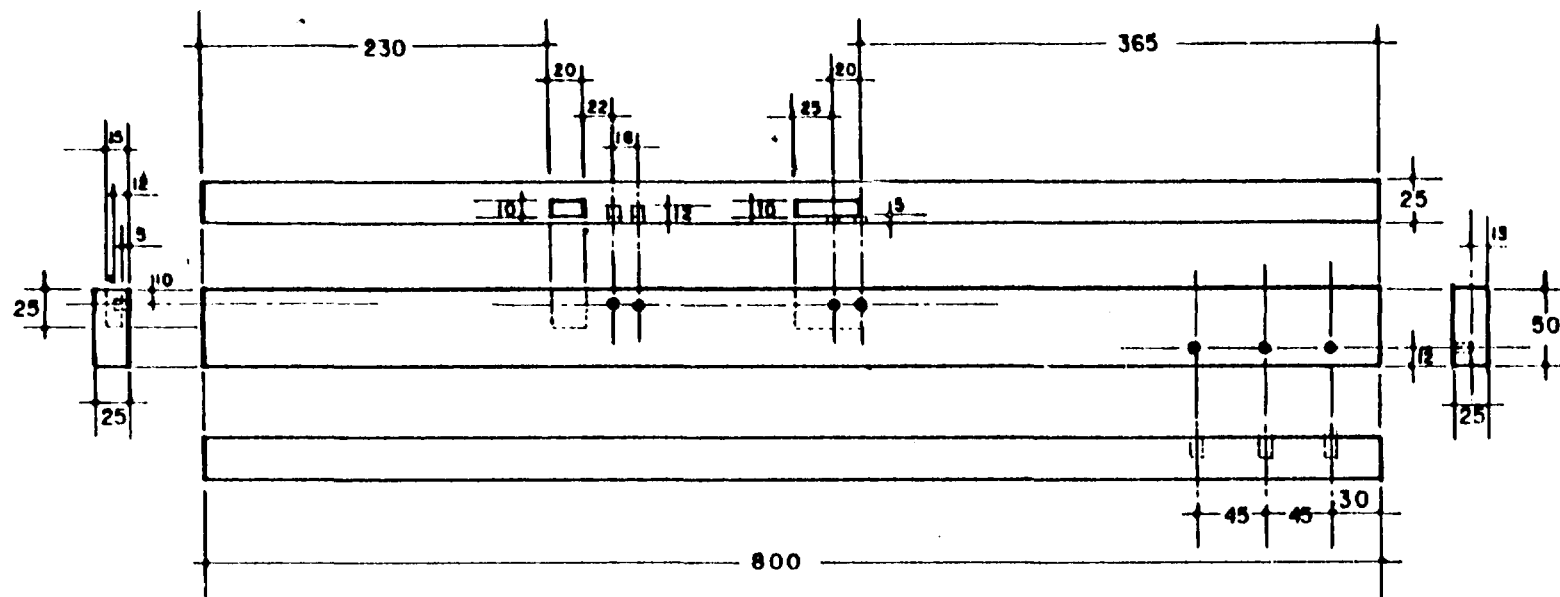


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Note:- For TC-12, RIGHT Seat Support FILLET.  
 drill COUNTERSINK Holes on REVERSE Face.  
 All other machining features identical to those  
 of Left Fillet.

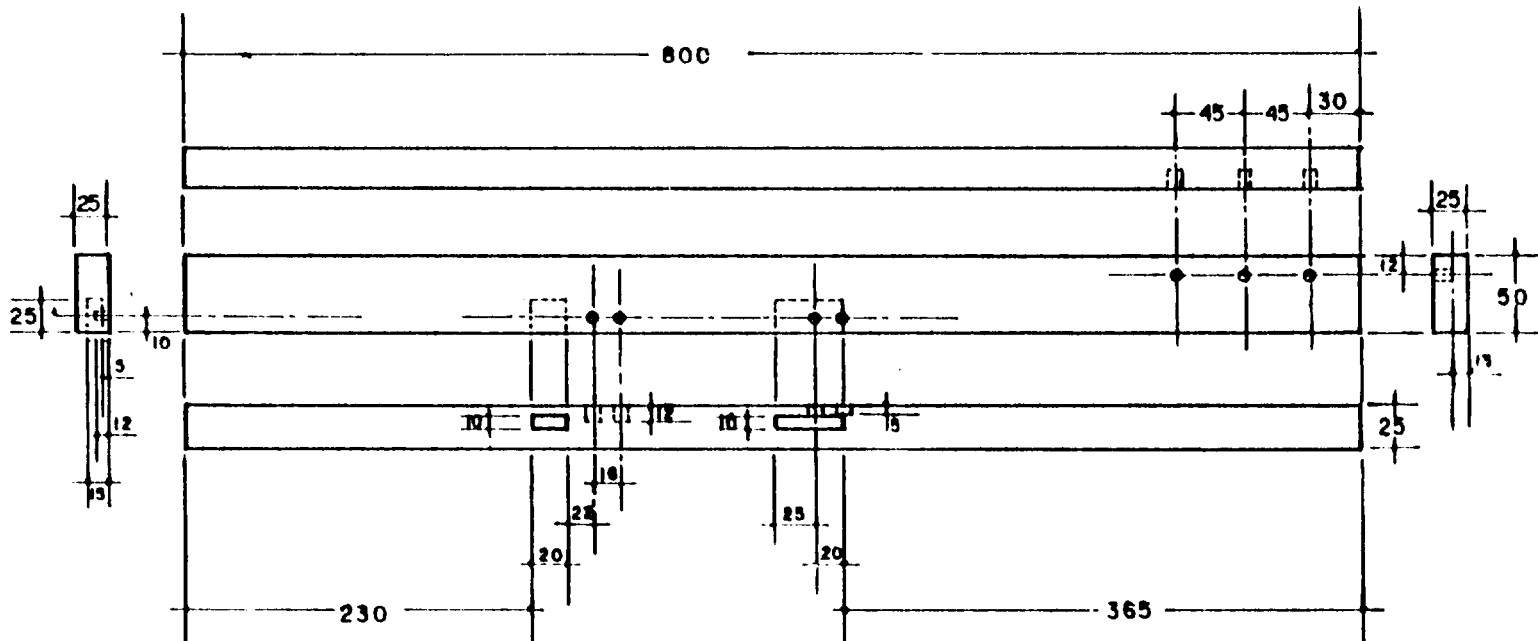
Part No. : TC - 12  
 Part Name : SEAT SUPPORT FILLET  
 Qty. Per Unit Product : Two (2)

Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 2



Part No. : TC - 13/R  
 Part Name : BACK LEG, RIGHT  
 Qty. Per Unit Product : One (1)

Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 5



Part No. : TC - 13/L

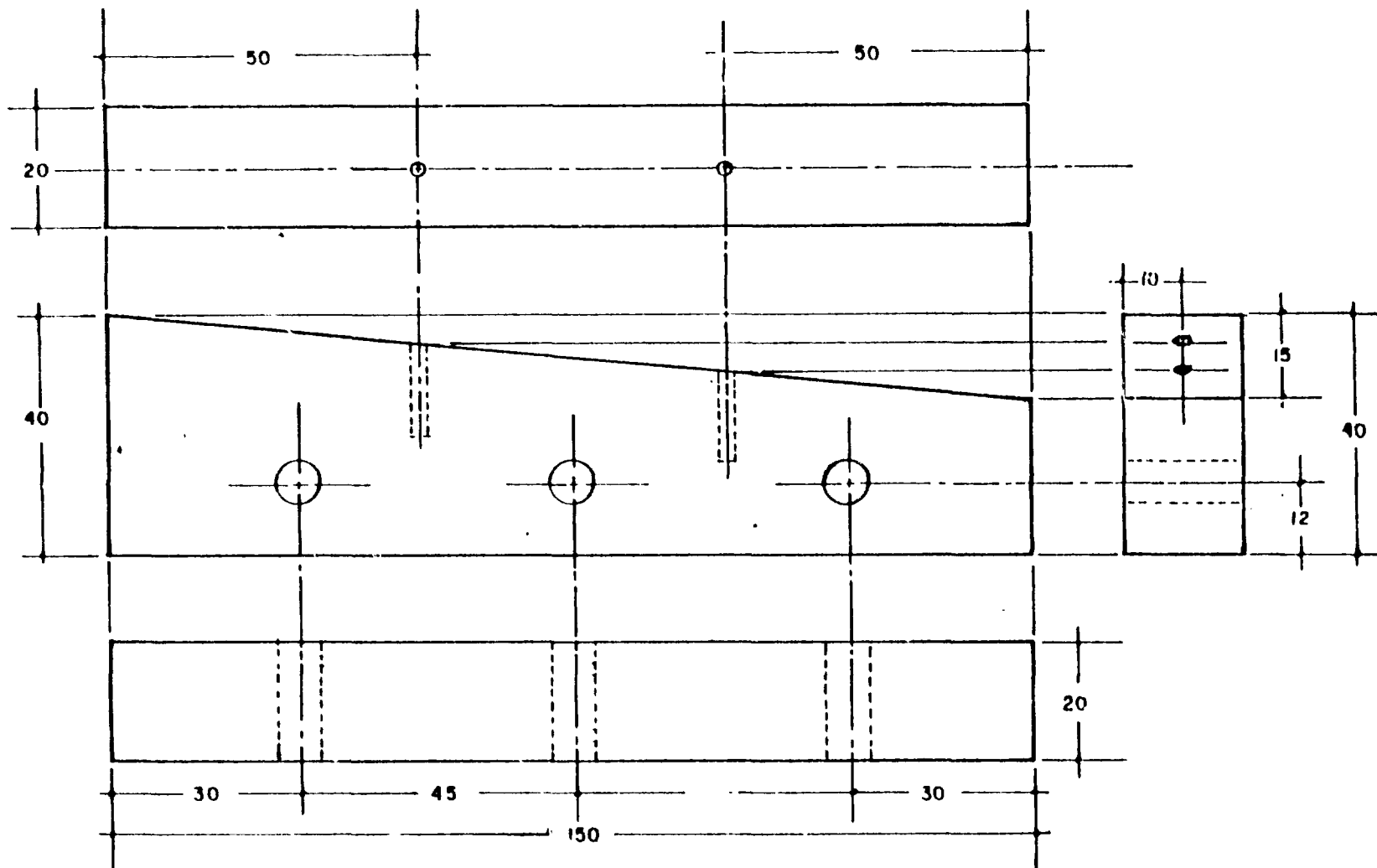
Product : TEACHER'S CHAIR

Part Name : BACK LEG, LEFT

Product No. : ME 76.06.03 (RIL - Rev.)

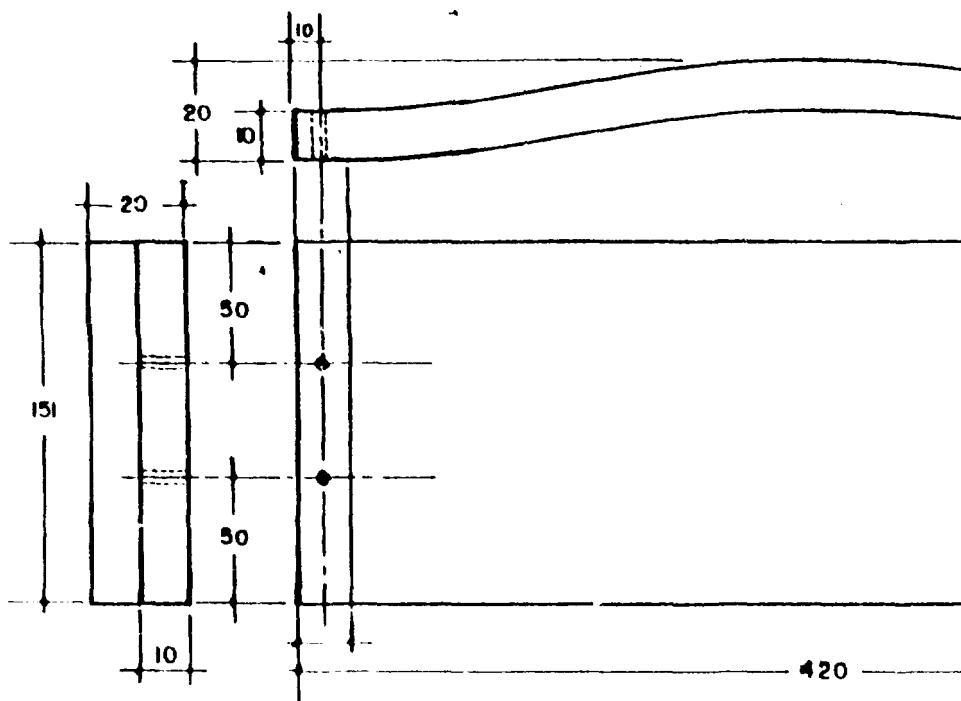
Qty. Per Unit Product : One (1)

Scale : 1 : 5



Part No. : TC - 14 - L/R  
 Part Name : BACK REST FILLET, LEFT/RIGHT  
 Qty. Per Unit Product : Two (2)

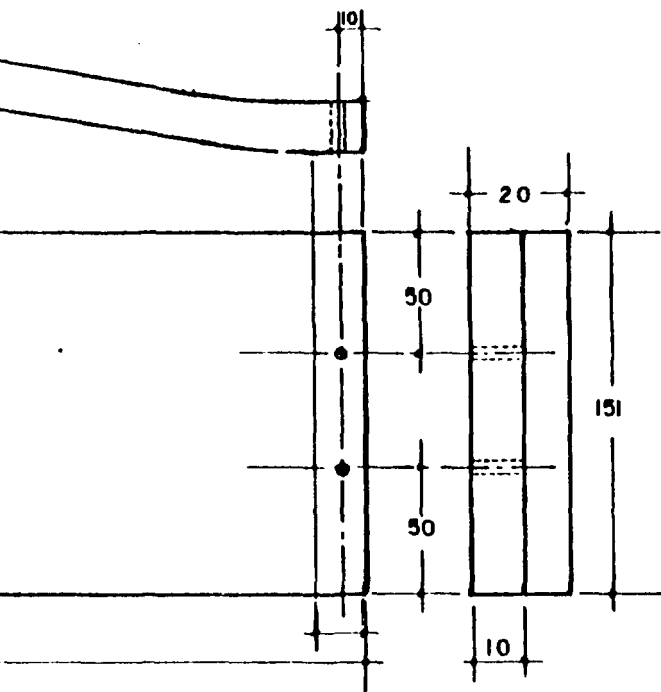
Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 1



Part No. : TC - 15

Part Name : BACK REST PANEL

Qty. Per Unit Product : One (1)



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Product : TEACHER'S CHAIR  
 Product No. : ME 76.06.03 (RIL - Rev.)  
 Scale : 1 : 3

PLEASE REFER TO THE DIMENSIONS AND SHAPE AS IN

TC - 15

- Note:
1. This alternate construction may be used if 6 mm plywood is not available.
  2. Customer's prior approval should be secured before the use of this construction.
  3. Material to be used is solid wood.

Part No. : TC - 15 (A)  
Part Name : BACK REST PANEL  
Qty. Per Unit Product : One (1)

Product : TEACHER'S CHAIR  
Product No. : ME 76.06.03 (RIL-Rev.)  
Scale : As in TC - 15

A P P E N D I X VI - D

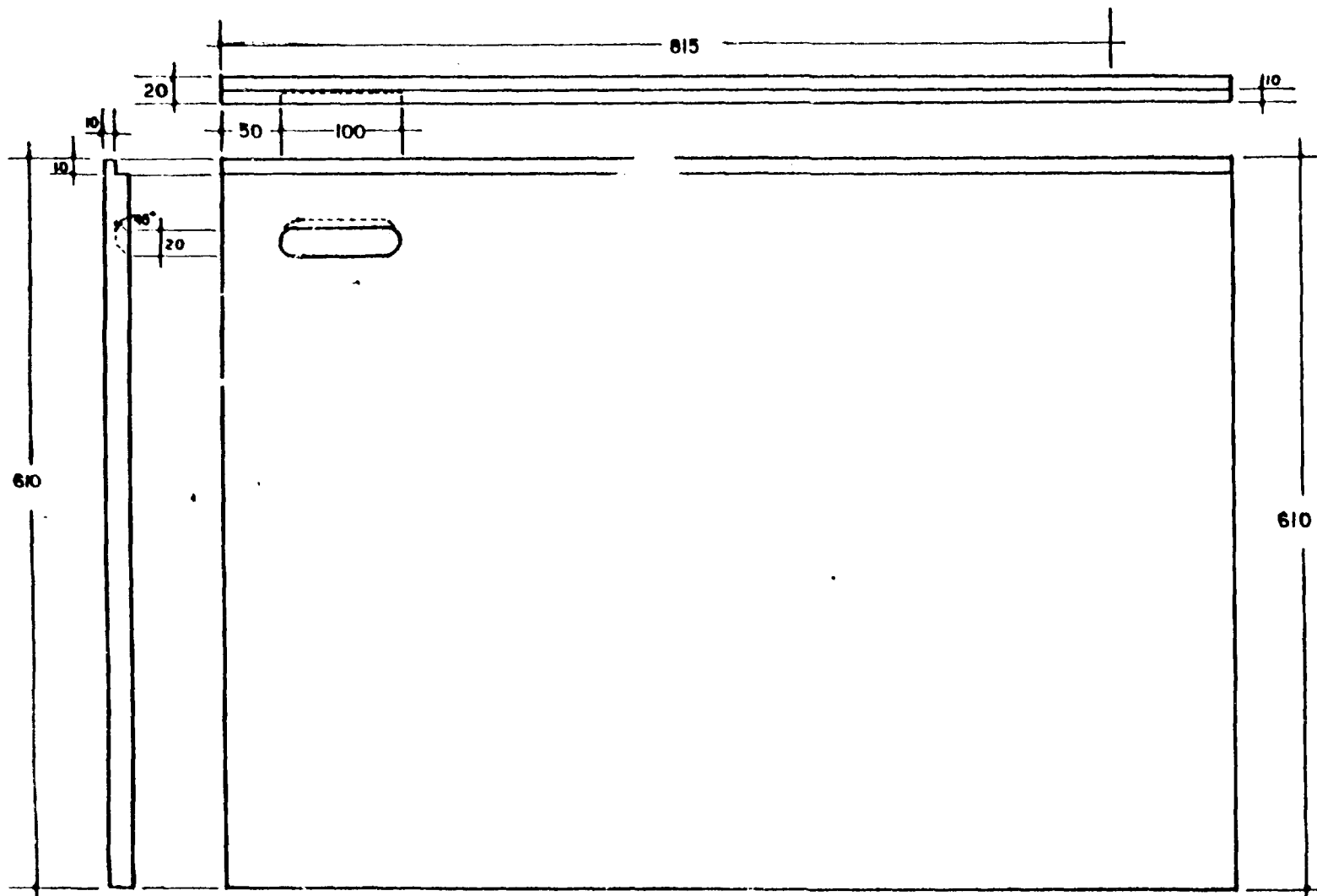
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WORKING DRAWINGS

CLASSROOM LOW-LEVEL CUPBOARD  
ME-76.06.04 (RIL - Rev.)

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Part No. : CC - 1

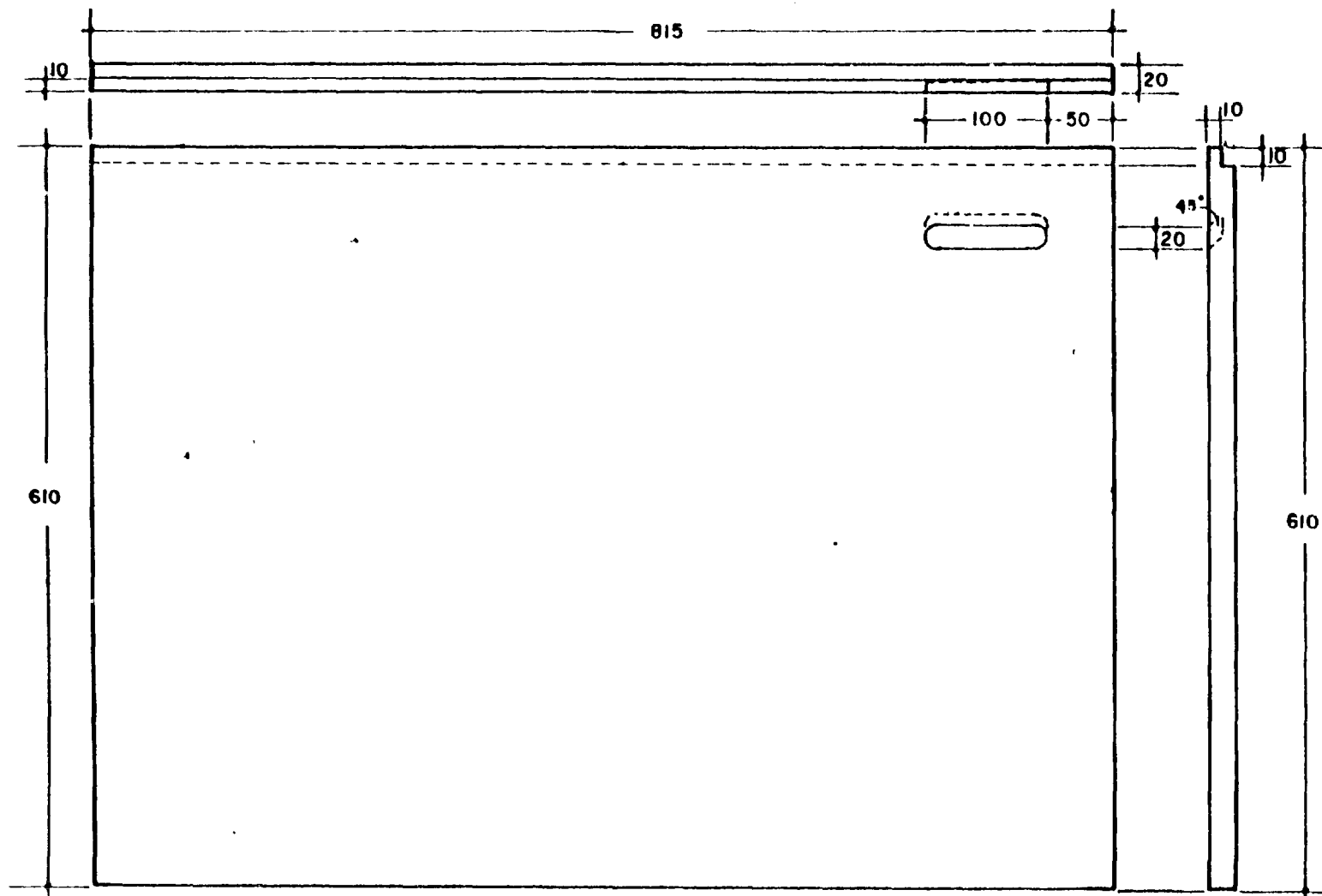
Part Name : DOOR - LEFT

Qty. Per Unit Product : One (1)

Product : LOW LEVEL CLASSROOM CUPBOARD

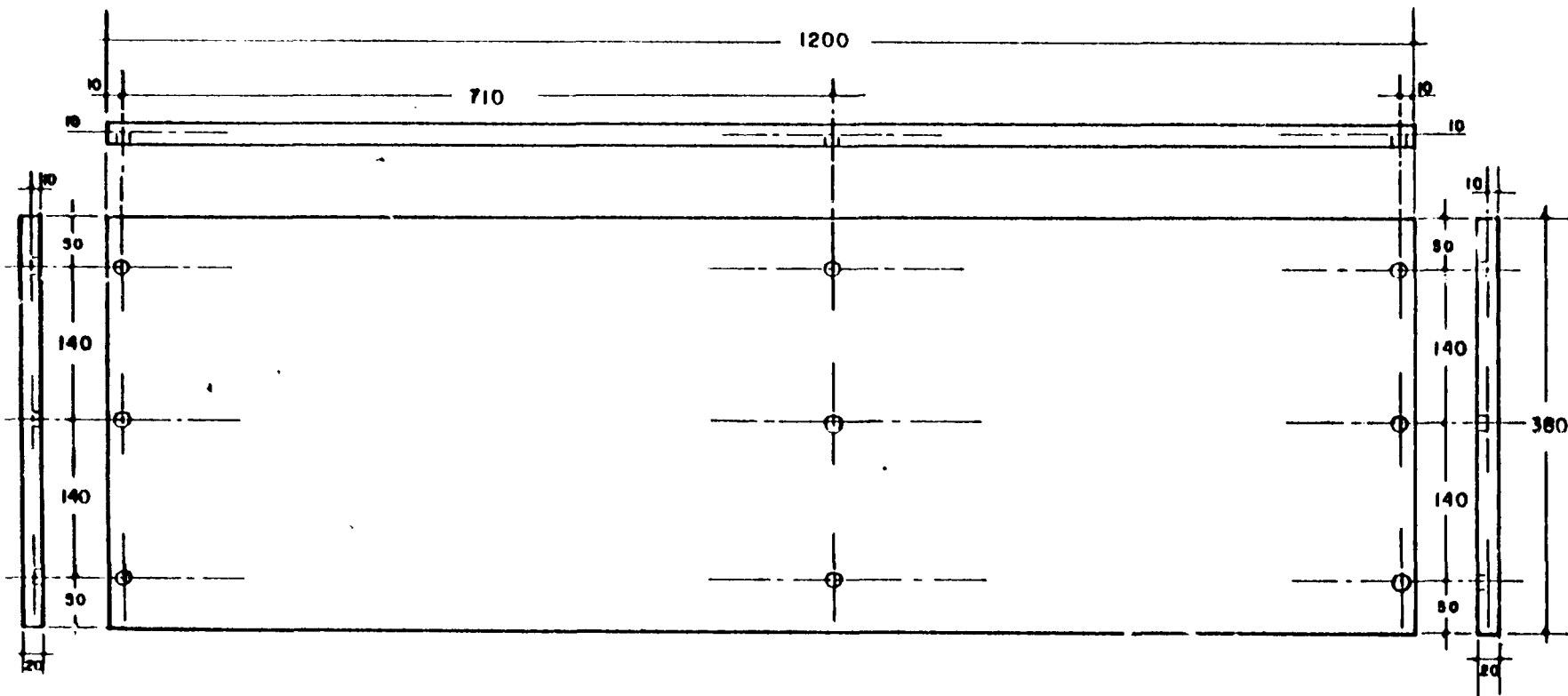
Product No. : ME 76.06.04 (RIL - Rev.)

Scale : 1 : 5



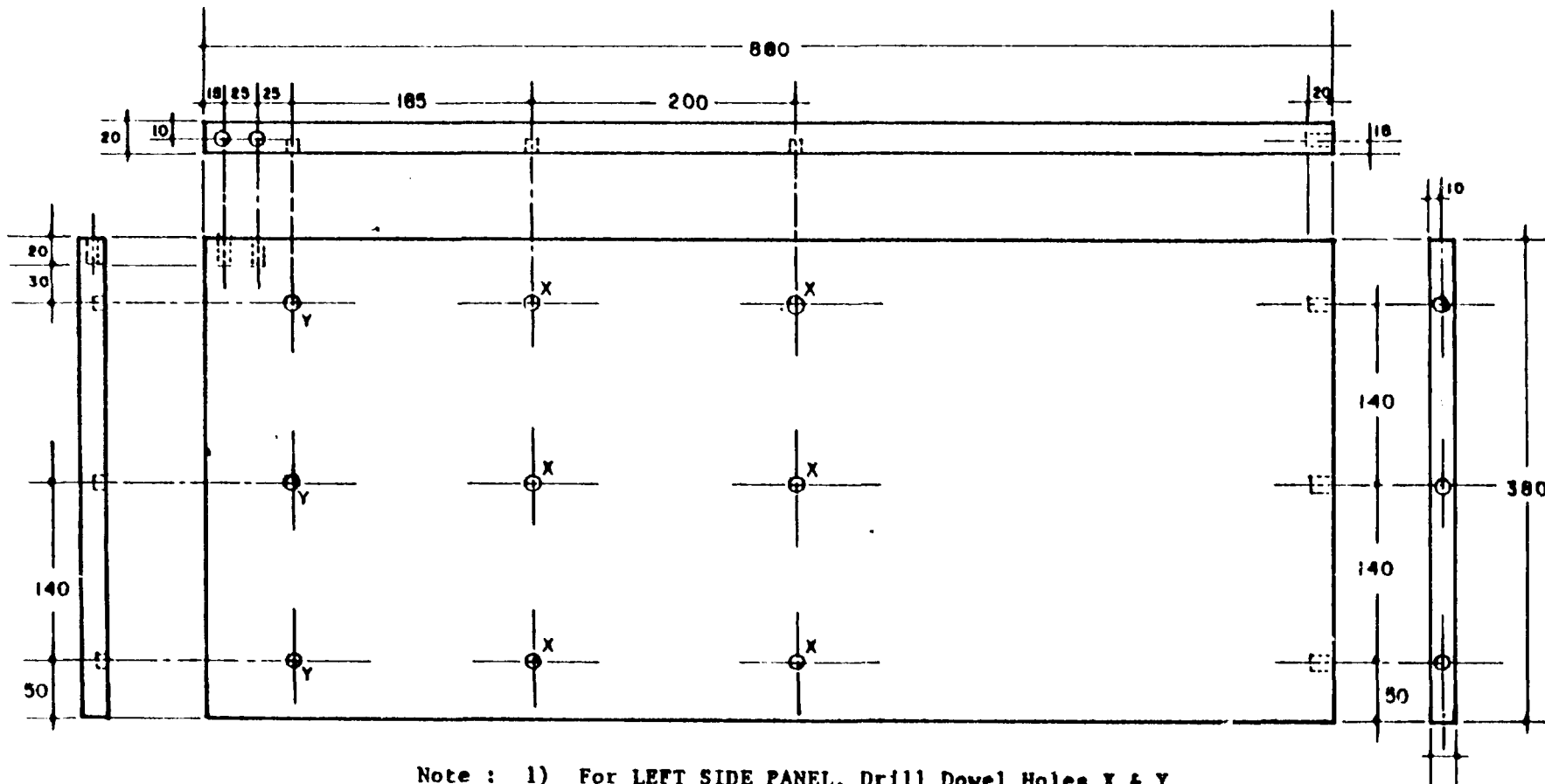
Part No. : CC - 2  
 Part Name : DOOR - RIGHT  
 Qty. Per Unit Product : One (1)

Product : LOW LEVEL CLASSROOM CUPBOARD  
 Product No. : ME 76.06.04 (RIL - Rev.)  
 Scale : 1 : 5



Part No. : CC -3  
 Part Name : TOP PANEL  
 Qty. Per Unit Product : One (1)

Product : LOW LEVEL CLASSROOM CUPBOARD  
 Product No. : ME 76.06.04 (RIL - Rev.)  
 Scale : 1 : 6



- Note : 1) For LEFT SIDE PANEL, Drill Dowel Holes X & Y on INSIDE FACE (Bottom Veneered) of Panel.
- 2) For RIGHT SIDE PANEL, Drill Dowel Holes Y on INSIDE FACE (Bottom Veneered) of Panel and omit Dowel Holes.X.

Part No. : CC - 4 & CC - 5

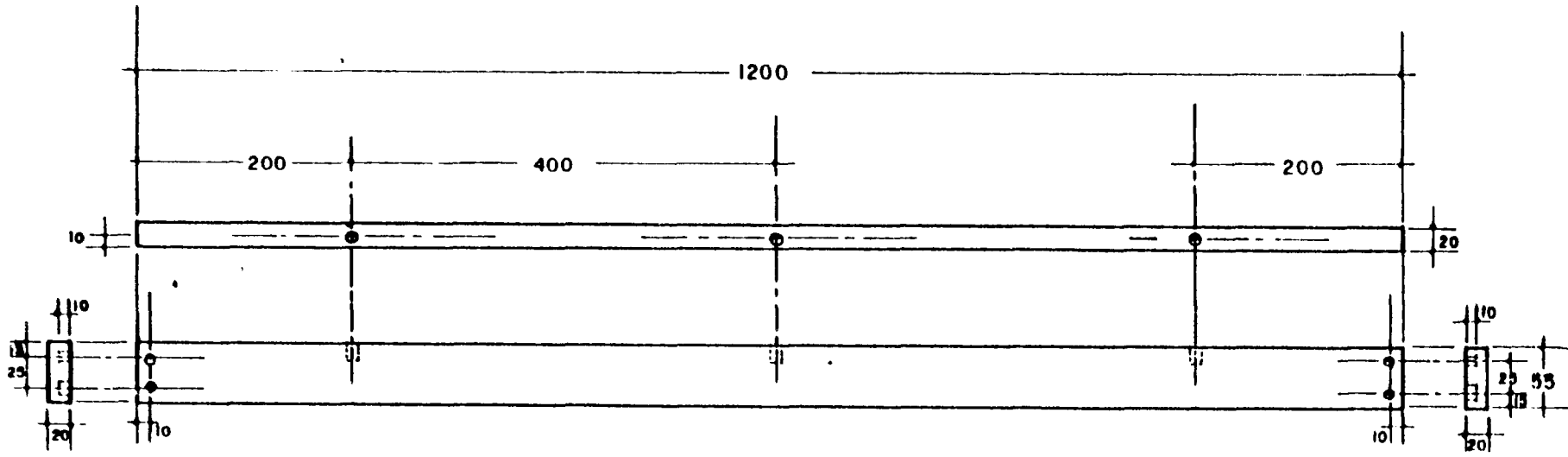
Part Name : SIDE PANEL - LEFT/RIGHT

Qty. Per Unit Product : One(1)L/One(1)R

Product : LOW LEVEL CLASSROOM CUPBOARD

Product No. : ME 76.06.04 (R/L - Rev.)

Scale : 1 : 5



Part No. : CC - 6

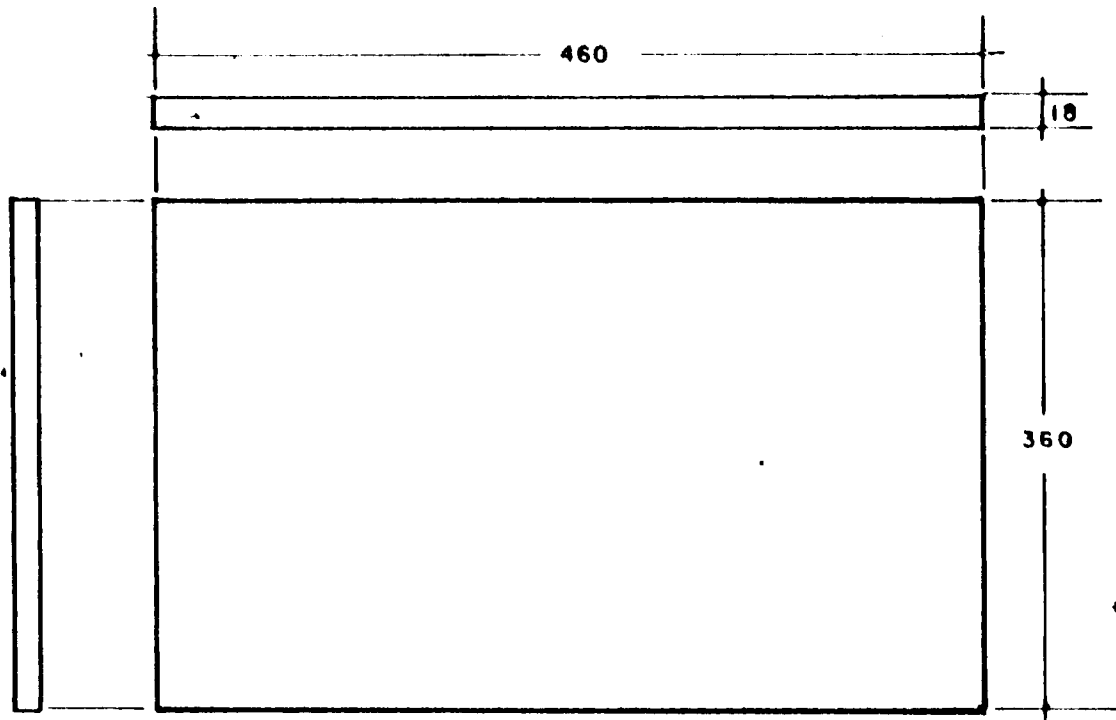
Part Name : BASEBOARD - FRONT

Qty. Per Unit Product : One (1)

Product : LOW LEVEL CLASSROOM CUPBOARD

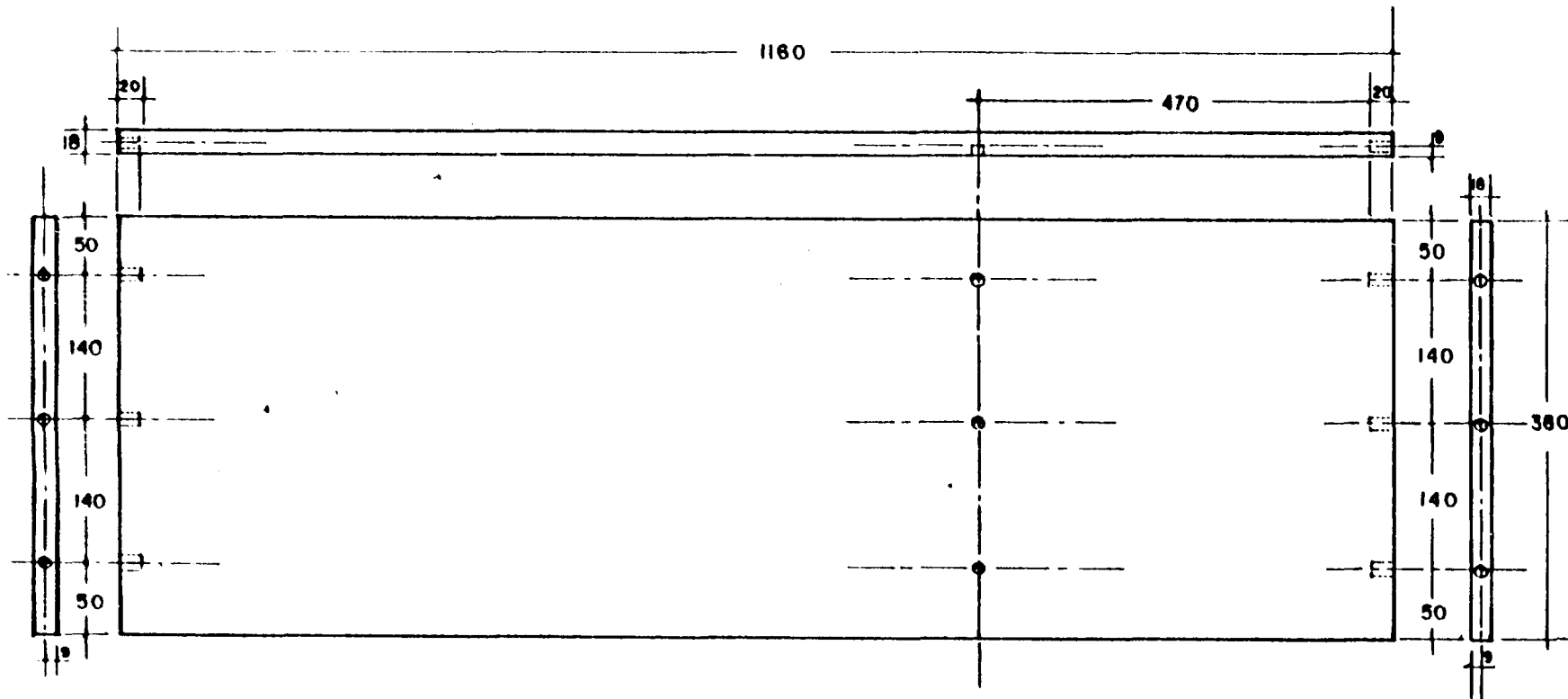
Product No. : ME 76.06.04 (RIL - Rev.)

Scale : 1 : 6



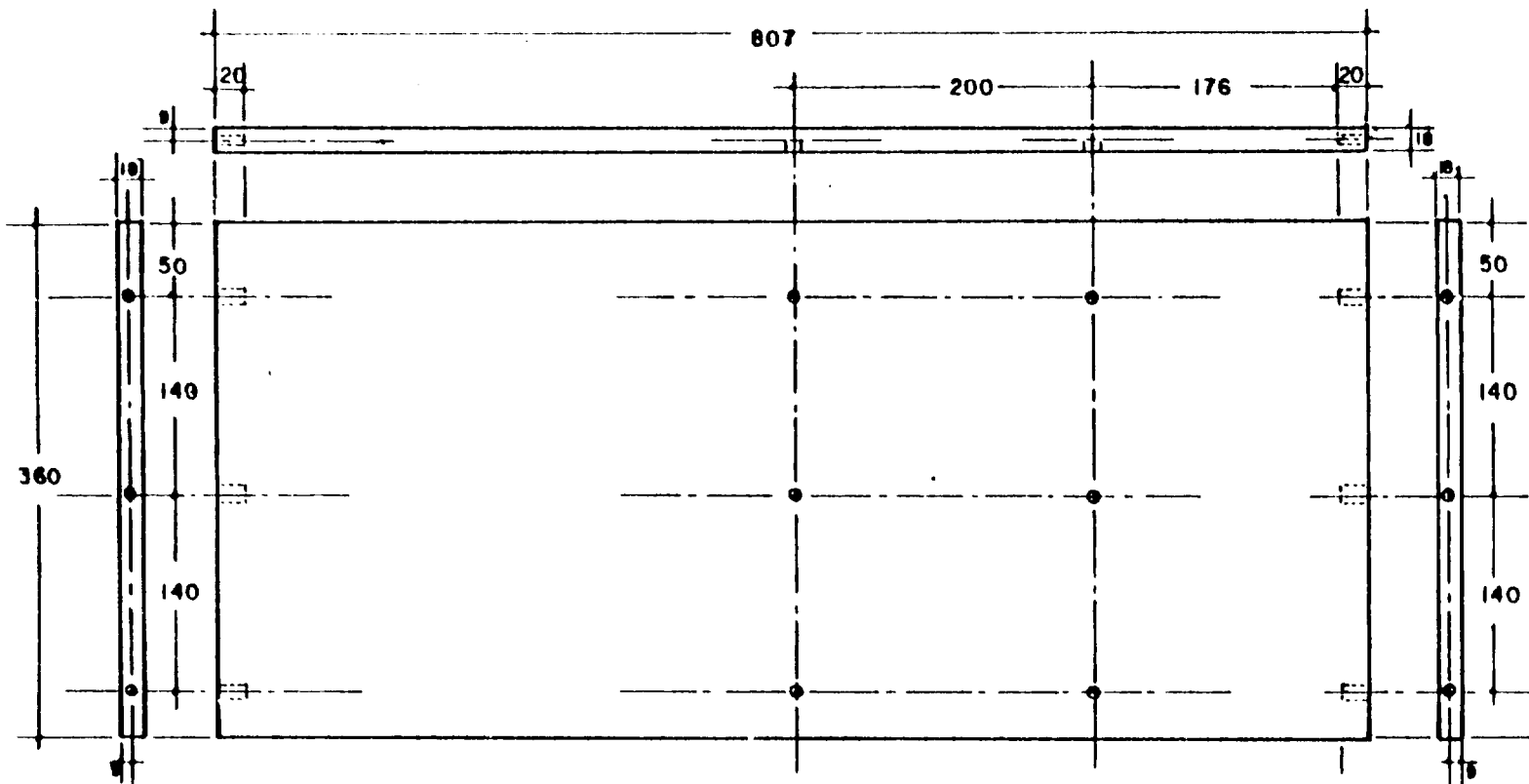
Part No. : CC - 7  
 Part Name : SHELVINGS, INTERMEDIATE  
 Qty. Per Unit Product : Two (2)

Product : LOW LEVEL CLASSROOM CUPBOARD  
 Product No. : ME 76.06.04 (RIL - Rev.)  
 Scale : 1 : 5



Part No. : CC - 8  
 Part Name : BOTTOM SHELF  
 Qty. Per Unit Product : One (1)

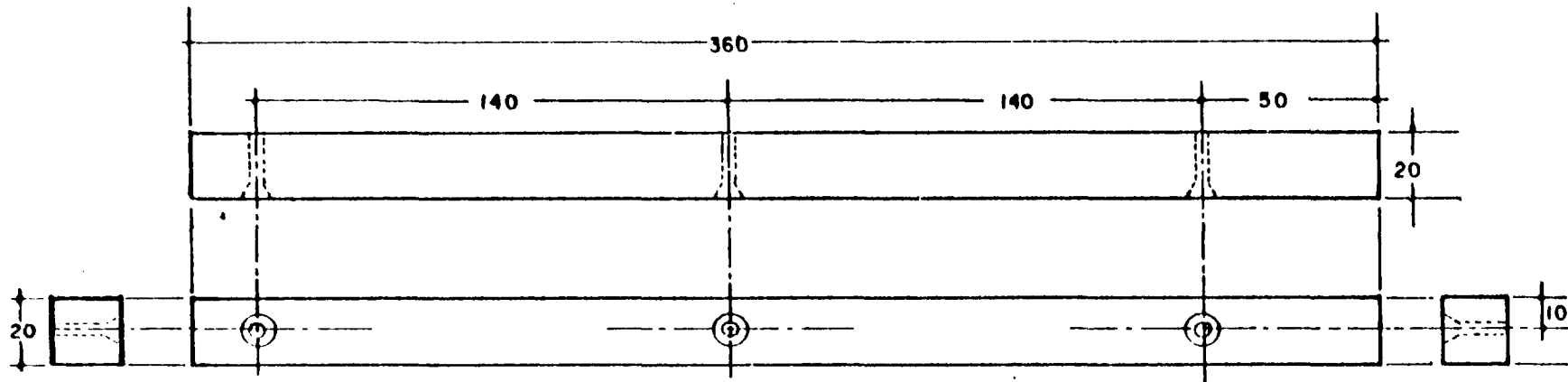
Product : LOW LEVEL CLASSROOM CUPBOARD  
 Product No. : ME 76.06.04 (RIL - Rev.)  
 Scale : 1 : 6



Part No. : CC - 9  
 Part Name : DIVIDER PANEL  
 Qty. Per Unit Product : One (1)

Product : LOW LEVEL CLASSROOM CUPBOARD  
 Product No. : ME 76.06.04 (RIL - Rev.)  
 Scale : 1 : 5





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Part No. : CC - 10

Part Name : SHELF SUPPORT FILLETS

Qty. Per Unit Product : Four (4)

Product : LOW LEVEL CLASSROOM CUPBOARD

Product No. : ME 76.06.04 (RIL - Rev.)

Scale : 1 : 2

6 mm x 1200 x 845 Panel

Note : Use 6 mm Commercial Plywood (Rejects)

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Part No. : CC - 11  
Part Name : BACK COVER  
Qty. Per Unit Product : One (1)

Product : LOW LEVEL CLASSROOM CUPBOARD  
Product No. : ME 76.06.04 (RIL - Rev.)  
Scale : \_\_\_\_\_

\*\*\*\*\*USE DRAWER HANDLES, PART NO.

Part No. : CC 12

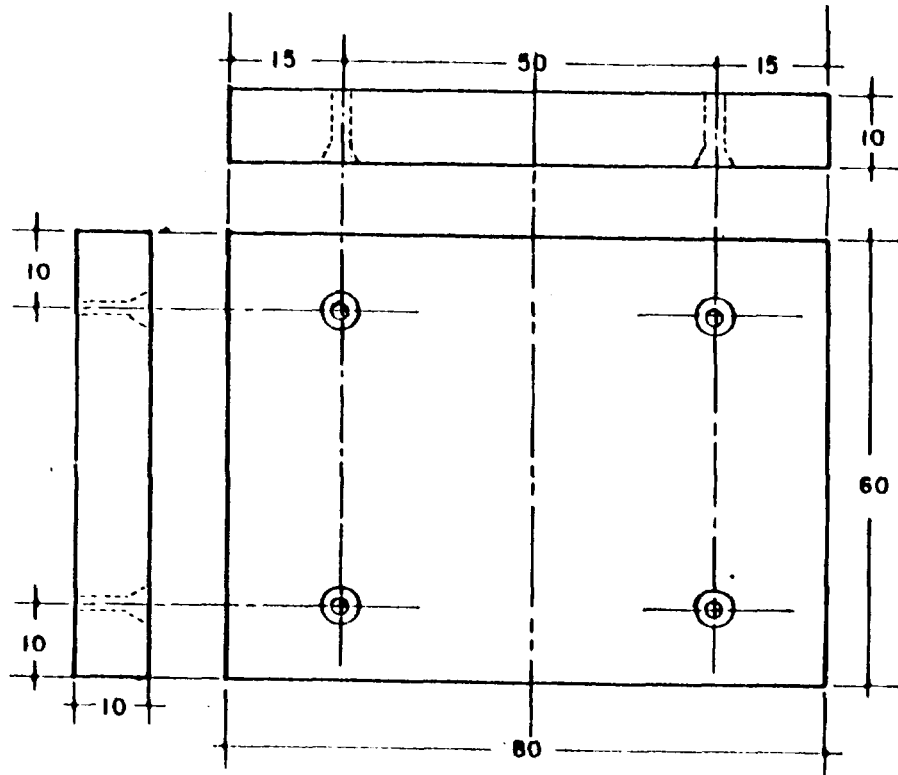
Part Name : DOOR HANDLES

Qty. Per Unit Product : Two (2)

TT - 19\*\*\*\*\*

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Product : LOW LEVEL CLASSROOM CUPBOARD  
Product No. : ME 76.06.04 (RIL - Rev.)  
Scale : \_\_\_\_\_



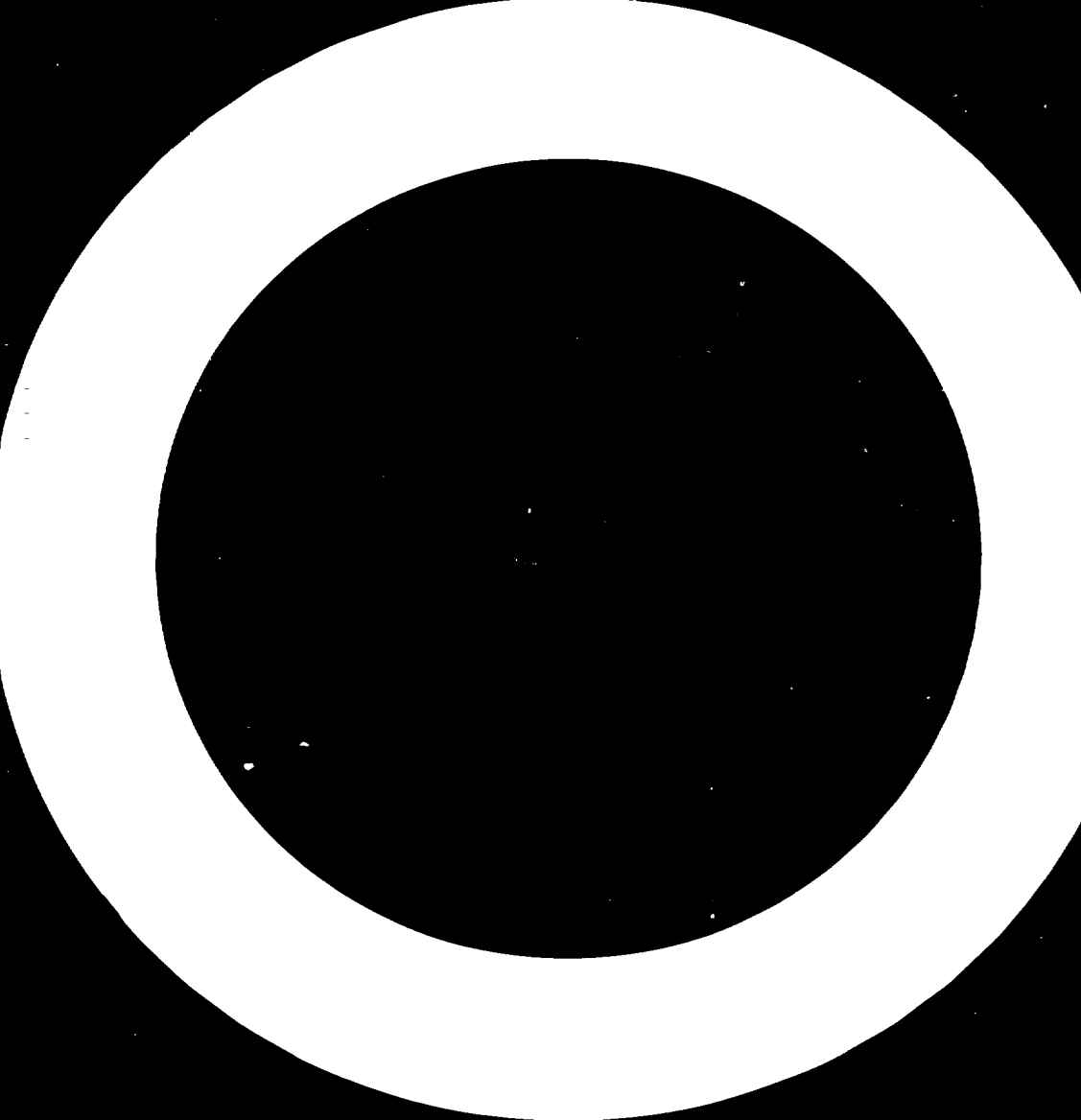
Part No. : CC - 13  
 Part Name : BOLT BLOCK SPACER  
 Qty. Per Unit Product : One (1)

Product :  
 Product No.  
 Scale :

LOW LEVEL CLASSROOM CUPBOARD

: ME 76.06.04 (RIL - Rev.)

1 : 1



A P P E N D I X VII - A

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OPERATIONS SEQUENCE SHEETS

for

ELEMENTARY SCHOOL DESK

TWO-SEATER

ME 76.06.01 (RIL - Rev.)

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OPERATIONS SEQUENCE SHEET

ELEMENTARY SCHOOL

ME-26.06.01

PART DESCRIPTION: FACE VENEER, DESK TOP

PART NO.: D-1/A

PRODUCT: DESK

PRODUCT NO.: (RIL - REV)

MATERIAL INPUT SPECIFICATIONS: ROUND LOG'S 200mm AND LARGER X 1250mm AND LONGER TOP GRADE WOOD SPECIES

ROUGH DIMENSION: 1.1x410x1110

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: DESK TOP

S.A NO.: D-1

PAGE: 1

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	LOG PREPARATION	4		0.333 cu.m	0.083 cu.m.	0.1503	CHAIN SAW AND DEBAR-KING AXE		
1-002	LOG COOKING	1		0.104 cu.m	0.104 cu.m	0.4814	LOG COOKING PIT		
1-003	LOG SQUARING	3		0.750 cu.m	0.250 cu.m	0.0667	CIRCULAR SAW		
1-004	VENEER SLICING	2		30.000 sq.m	15.000 sq.m	1.517	HORIZONTAL VENEER SLICER		-146-
1-005	VENEER DRYING	2		30.000 sq.m	15.000 sq.m	1.517	VENEER DRYER		
1-006	VENEER JOINTING	1		80.000 sq.m	80.000 sq.m	0.569	VENEER JOINTER (GUILLOTINE TYPE)		
1-007	VENEER SPLICING	1		60.000 sq.m	60.000 sq.m	0.759	VENEER SPLICER		
1-008	VENEER CLIPPING TO SIZE	1		130 pcs	130 pcs	0.7692	VENEER CLIPPER		
1-009	VENEER GRADING/SORTING	1		200 pcs	200 pcs	-	-		
1-010	VENEER BUNDLING	1		300 pcs	300 pcs	-	-		
	NOTHING FOLLOWS	-		-	-	-	-		

PART DESCRIPTION: CORE REST TOP

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76.06.01

PART NO.: D-1/b

PRODUCT: SCHOOL DESK PRODUCT NO.: (RIL - REV)

MATERIAL INPUT SPECIFICATIONS: 18mm x 2440x1220 BLOCK BOARD

ROUGH DIMENSION: 18x1104x404

FINISHED DIMENSIONS: 18x1098x398

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: DESK TOP

S.A NO.: D-1

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PANEL PRODUCT DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-003	PANEL SAWING	2		72	36	1.3889	VERTICAL PANEL SAW		6 PCS IN COME BLOCKBOARD PANEL

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PART DESCRIPTION: BOTTOM VENEER, DESK TOP

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME -76.06.01

PART NO: D-1/c

PRODUCT: SCHOOL DESK PRODUCT NO.: (RIL-REV)

MATERIAL INPUT SPECIFICATIONS: ROUND LOGS, 200MM (AND LARGER) X 1250mm (AND LONGER) PINE OR EUCALYPTUS (OR EQUIVALENT SPECIES)

ROUGH DIMENSION: 1.1 X 110 X 110

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 1 P

SUB-ASSEMBLY: DESK TOP

S.A NO.: D-1

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	LOG PREPARATION	4		0.500 cu.m	0.1250 cu.m	0.1004	CHAIN SAW AND DEBARKING AXE		
1-003	LOG SQUARING	3		0.875 cu.m	0.2917 cu.m	0.0574	CIRCULAR SAW		
1-004	VENEER SLICING	2		50.000 sq.m	25.000 sq.m	0.910	HORIZONTAL VENEER SLICER		
1-005	VENEER DRYING	2		50.000 sq.m	25.000 sq.m	0.910	VENEER DRYER		
1-006	VENEER JOINTING	1		100.000 sq.m	100.000 sq.m	0.455	VENEER JOINTER (GUILLOTINE TYPE)		
1-007	VENEER SPLICING	1		75.000 sq.m	75.000 sq.m	0.607	VENEER SPLICER		
1-008	VENEER CLIPPING TO SIZE	1		130 pcs	130 pcs	0.7692	VENEER CLIPPER		
1-009	VENEER GRADING/SORTING	1		200 pcs	200 pcs	-	NONE		
1-010	VENEER BUNDLING	1		300 pcs	300 pcs	-	NONE		

PART DESCRIPTION: DESK TOP

OPERATIONS SEQUENCE SHEET

ELEMENTARY SCHOOL DESK

ME-76.06.1

PART NO: D-1

PRODUCT: PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: D-1/a; D-1/b; D-1/c and VS-1

ROUGH DIMENSION: \_\_\_\_\_

FINISHED DIMENSIONS: 20 x 400 x 1100 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_

S.A NO.: \_\_\_\_\_ PAGE: 1 OF 2 PAGES

PANEL FORMING AND MACHINING DEPARTMENTS

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-005	Veneer Laying	3		60	10	1.667	Glue Spreader		
3-006	Cold Pressing	2		150	75	0.667	Cold Press		
3-008	Panel Trimming to Size	2		90	45	1.111	Vertical Spindle Moulder		
3-009a	Single Edge Banding 1st Edge	2		120	60	0.833	Single - Edge Banding Machine		
3-009b	" 2nd Edge	2		120	60	0.833	-do-		
3-009c	" 3rd Edge	2		200	100	0.500	-do-		
3-009d	" 4th Edge	2		200	100	0.500	-do-		
3-011	Trimming Excess Veneer	2		200	100	0.500	Vertical Spindle Moulder		
2-030	Machine Sanding Plain Edges	2		90	45	1.111	Oscillating Edge Sander		
2-033/a	Stroke Sanding Top Face	1		30	30	3.333	Double Belt Stroke Sander		
2-033/b	" Bottom Face	1		30	30	3.333	Double Belt Stroke Sander		
2-025/a	Grooving Pencil Troughs on Router	1		40	40	2.500	Heavy Duty Router		
2-025/b	Grooving Slot for Shelf Divider	1		80	80	1.250	-do-		

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OPERATIONS SEQUENCING SHEET

PART DESCRIPTION: \_\_\_\_\_

PART NO: D-1

PRODUCT: \_\_\_\_\_

PRODUCT NO.: \_\_\_\_\_

MATERIAL INPUT SPECIFICATIONS: \_\_\_\_\_

ROUGH DIMENSIONS: \_\_\_\_\_

FINISHED DIMENSIONS: \_\_\_\_\_

NO. OF PARTS/UNIT PRODUCT: \_\_\_\_\_

SUB-ASSEMBLY: \_\_\_\_\_

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OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-011	Drilling for Dowel Holes	1		30	30	3.333	Pneumatic Drilling Set-up		
2.037	Hand Sanding	1		90	90	1.111	-NIL-		

OPERATIONS SEQUENCE SHEET

ELEMENTARY

MF-76.06.11

PART DESCRIPTION: DESK TOP

PART NO: D-1

PRODUCT: SCHOOL DESK PRODUCT NO.: (R11-REV)

MATERIAL INPUT SPECIFICATIONS: D-1 FROM MACHINING DEPARTMENT

ROUGH DIMENSION: FINISHED DIMENSIONS 20x400x1100

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO. 1

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FINISHING DEPARTMENT

QRRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-005	FILLING	4		40	10	2.500	FILLING LINE		
5-006a	SPRAY SEALER, BOTTOM FACE	1		60	60	1.667	SPRAY GUN		
5-006b	SPRAY SEALER, TOP/EDGE	1		50	50	2.000	SPRAY GUN		
5-008	BAND SEALER COAT	1		80	80	1.250	-		
5-010a	SPRAY 1ST COAT LACQUER TOP EDGES	1		50	50	2.000	SPRAY GUN		
5-011a	SPRAY 2DT COAT LACQUER TOP & EDGES	1		50	50	2.000	SPRAY GUN		
5-996	REPAIR & TOUCH - UP	1		30	30	3.333	-		

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PART DESCRIPTION: DESK SHELF

OPERATIONS SEQUENCE SHEET

ELEMENTARY

MF -76.06.C

PART NO: D-2

PRODUCT: SCHOOL DESK PRODUCT NO.: (PIL-REV)

MATERIAL INPUT SPECIFICATIONS: 25x200x2400, PINE OR EUCALYPTUS, K:IN DRIED TO 10% M.C.

ROUGH DIMENSION: 25x200x1060 (2 IN 1)

FINISHED DIMENSIONS: 20x180x1050 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	CUT TO ROUGH LENGTH	2		80	40	1.250	RADIAL ARM SAW		
2-006	RIP TO ROUGH WIDTH	2		60	30	1.667	STRAIGHT LINE EDGER		
2-004	PLANING 4 FACES	2		60	30	1.667	4-SIDE PLANER		
2-008	TRIMMING TO FINAL LENGTH	1		100	100	1.000	CIRCULAR SAW TABLE TYPE		
2-033	STROKE SANDING	1		40	40	2.500	DOUBLE BELT STROKE SANDER		
2-011a	DRILL FOR DOWEL HOLES	1		50	50	2.000	PNEUMATIC DRILLS SET-UP		
2-011b	DRILL FOR DOWEL HOLES	1		50	50	2.000	PNEUMATIC DRILLS SET-UP		
2-025	GROOVE FOR SHLF DIVIDER	1		80	80	1.250	HEAVY DUTY ROUTER		

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PART DESCRIPTION: DESK SHELF

OPERATIONS SEQUENCE SHEET

ELEMENTARY SCHOOL

ME-76-06-01

PART NO: 0 - 2

PRODUCT: DESK

PRODUCT NO.: (P11 - PEV)

MATERIAL INPUT SPECIFICATIONS: 0 - 2 FROM MACHINING DEPARTMENT

ROUGH DIMENSION: \_\_\_\_\_

FINISHED DIMENSIONS: 20 x 180 x 1050 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_

S.A NO.: \_\_\_\_\_

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002	Spray Stain, Top Edges Face &	1		70	70	1.429	Spray Gun		
5-003	Spray Wash Coat Top Face & Edges	1		70	70	1.429	Spray Gun		
5-004	Hand (Scuff) Sanding	1		100	100	1.000	None		
5-005	Routing	4		60	15	1.667	Filing Line		
5-006a	Spray Sealer, Bottom Face	1		80	80	1.250	Spray Gun		
5-006b	Spray Sealer, Top & Edges	1		70	70	1.429	Spray Gun		
5-008	Sabd Sealer Coat	1		90	90	1.111	None		
5-010a	Spray 1st Coat Lacquer Top & Edges	1		80	80	1.250	Spray Gun		
5-011a	Spray 2nd Coat Lacquer Top & Edges	1		80	80	1.250	Spray Gun		
5-996	Repair & Touch - Up	1		50	50	2.000	None		

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PART DESCRIPTION: DESK TOP FRONT PIECE

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76.06.01

MATERIAL INPUT SPECIFICATIONS: D-3 FROM MACHINING DEPT.

PART NO: D-3

PRODUCT: SCHOOL DESK PRODUCT NO.: (RIL-Rev.)

RAW DIMENSION:

FINISHED DIMENSIONS: 20x140x1100

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002a	Spray Stain, Bottom Face	1		75	75	1.333	Spray Gun		
5-002b	Spray Stain, Top Face and Edges	1		75	75	1.333	-Do-		
5-003a	Spray Wash Coat, Bottom Face	1		75	75	1.333	-Do-		
5-003b	Spray Wash Coat, Top Face Edges	1		75	75	1.333	-Do-		
5-004	Hand (Scuff) Sanding	1		120	120	0.833	None		
5-005	Filling	4		60	15	1.667	Filling Line		
5-006a	Spray Sealer, Bottom Face	1		90	90	1.111	Spray Gun		
5-006b	" " , Top & Edges	1		90	90	1.111	-Do-		
5-008	Sand Sealer Coat	1		100	100	1.000	None		
5-010a	Spray 1st Coat Lacquer, Top and Edges	1		90	90	1.111	Spray Gun		
5-011a	Spray 2nd Coat Lacquer, Top and Edges	1		90	90	1.111	-Do-		
5-996	Repair & Touch-up	1		50	50	2.000	None		

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PART DESCRIPTION: DESK TOP SUPPORT, L/R

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76.06.01

PART NO: D-4 L/R

PRODUCT: SCHOOL DESK

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 38 x 115 x 2700, PINE OR EUCALYPTUS KILN DRIED TO 10% M.C

ROUGH DIMENSION: 38 x 56 x 415 (8 in 1)

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A NO.:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		160	80	0.633	Radial Arm Saw		Obtain per Board: 8pcs; D-4 and 8pcs D.
2-006	Rip to Rough Width	2		120	60	0.833	Straight Line Edger		
2-004	Planing 4 Faces	2		120	60	0.833	4-Side Planer		
2-008	Trimming to Final Length	1		100	100	1.000	Circular Saw, Table Type		
2-011a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-Up		Left Piece differs fr from Right Piece on setting of Dowel Hole for Desk Legs.
2-011b	Drill for Dowel Holes	1		50	50	2.000	-do-		
2-011c	Drill for Wdscrew Holes	1		50	50	2.000	-do-		
2-033	Stroke Sanding	1		80	80	1.250	Double Belt Stroke Sander		

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PART DESCRIPTION: DESK TOP SUPPORT, L/R

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76.06.01

MATERIAL INPUT SPECIFICATIONS: D-4 FROM MACHINING DEPARTMENT

PART NO: D-4, L/R

PRODUCT: SCHOOL DESK PRODUCT NO.: (RII-Rev)

ROUGH DIMENSION:

FINISHED DIMENSIONS: 30x50x380

NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A. NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002a	Spray Stain, Two Sides	1		105	105	0.952	Spray Gun		
5-002b	Spray Stain, One Side	1		120	120	0.833	-do-		
5-003a	Spray Wash Coat, Two sides	1		105	105	0.952	-do-		
5-003b	Spray Wash Coat, One Side	1		120	120	0.833	-do-		
5-004	Hand (Scuff) Sanding	1		120	120	0.833	None		
5-005	Filling	4		80	20	1.250	Filling Line		
5-006a	Spray Sealer, Two Sides	1		105	105	0.952	Spray Gun		
5-006b	Spray Sealer, One Side	1		120	120	0.833	-do-		
5-008	Sand Sealer Coat	1		110	110	0.909	None		
5-010a	Spray 1st Coat Lacquer Two Sides	1		105	105	0.952	Spray Gun		
5-010b	Spray 1st Coat Lacquer, One Side	1		120	120	0.833	-do-		
5-011a	" " " , Two Sides	1		105	105	0.952	-do-		
5-011b	" " " , One Side	1		120	120	0.833	-do-		
5-996	Repair & Touch-Up	1		60	60	1.667	None		

**PART DESCRIPTION:** SHELF DIVIDER      **OPERATIONS SEQUENCE SHEET**  
**MATERIAL INPUT SPECIFICATIONS:** 6 x 1220 x 2440 COMMERCIAL PLYWOOD (REJECTS)      **PART NO.:** D-5      **PRODUCT:** ELEMENTARY SCHOOL DESK      **PRODUCT NO.:** ME-76.06.01 (R11-Rev.)  
**ROUGH DIMENSION:** \_\_\_\_\_      **FINISHED DIMENSIONS:** \_\_\_\_\_      **NO. OF PARTS/UNIT PRODUCT:** 1 PC  
**SUB-ASSEMBLY:** \_\_\_\_\_      **S.A. NO.:** \_\_\_\_\_      **PAGE:** 1      **OF:** 1      **PAGES**

**MACHINING DEPARTMENT**

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-003	Panel Sawing	2		1000	500	0.100	Panel Saw and Circular Saw		122 pcs. per plywood panel.

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PART DESCRIPTION: SHELF DIVIDER

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76.06.01

PART NO: D-5

PRODUCT: SCHOOL DESK PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: D-5 FROM MACHINING DEPARTMENT

ROUGH DIMENSION:

FINISHED DIMENSIONS: 6x130x180

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-005	Filling	4		400	100	0.250	Filling Line		
5-006a	Spray Sealer, One Face and Edge	1		250	250	0.400	Spray Gun		
5-006b	Spray Sealer, One Face	1		300	300	0.333	-do-		
5-008	Sand Sealer Coat	1		200	200	0.500	None		
5-010a	Spray 1st Lacquer Coat 1 Face	1		300	300	0.333	Spray Gun		
5-010b	Spray 1st Lacquer Coat One Face and Edge	1		250	250	0.400	-do-		
5-996	Repair & Touch-Up	1		150	150	0.667	None		

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76.06.01

PART DESCRIPTION: DESK LEG, FRONT PIECE, RIGHT

PART NO.: D-6 fr/R

PRODUCT: SCHOOL DESK

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 25 x 115 x (1800/2100) PINE OR EUCALYPTUS, KILN DRIED TO 10% M.C.

ROUGH DIMENSIONS: 25 x 115 x (600/700)

FINISHED DIMENSIONS: 20 x 100 x (570)

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: DESK LEG, LEFT/RIGHT

S.A. NO.:

PAGE: 680

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		100	50	1.000	Radial Arm Saw		3 pcs from 1 Board; Type B-1800; Type C-2100
2-006	Rip to Rough Width	2		80	40	1.250	Straight Line Edger		
2-004	Planing 4 Faces	2		100	50	1.000	4-Side Planer		
2-008	Trimming to Final Length	1		100	100	1.000	Circular Saw, Table Type		160
2-026a	Groove for Desk Shelf	1		50	50	2.000	Dado Saw		Groove on inner face
2-026b	Cut Clearance for Rails	1		40	40	2.500	Dado Saw		
2-011a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-Up		
2-011b	Drill for Dowel Holes	1		50	50	2.000	-do-		
2-011c	Drill for Dowel Holes	1		50	50	2.000	-do-		

PART DESCRIPTION: DESK LEG, FRONT PIECE, LEFT

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ML176.06.01

MATERIAL INPUT SPECIFICATIONS: 25 x 115 x (1800/2100) PINE OR EUCALYPTUS, KIEN DRIED TO 10% M.C. PART NO: D-6 fr/L PRODUCT: SCHOOL DESK PRODUCT NO.: (RIL-Rev.)

ROUGH DIMENSION: 25 x 115 x (600/700) FINISHED DIMENSIONS: 20x100x588 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: DESK LEG, LEFT/RIGHT S.A NO.: D-6 L/R PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	As in D-6 fr			AS IN	D-6 fr				As in D-6 fr/R
2-006	-do-				do				-do-
2-004	-do-				do				-do-
2-008	-do-				do				-do-
2-026a	-do-				do				Groove inner face
2-026b	-do-				do				As in D-6 fr/R
2-011a	-do-				do				-do-
2-011b	-do-				do				-do-
2-011c	-do-				do				-do-

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**OPERATIONS SOURCE SHEET**      ELEMENTARY ME - 76-08  
**PART DESCRIPTION:** DESK LEG L/R      **SCHOOL DESK PRODUCT NO.:** (RIL-REV) ---  
**MATERIAL INPUT SPECIFICATIONS:** D - 6 FROM AND D-6b/c FROM MACHINING DEPARTMENT      **PART NO:** D - 6      **FINISHED DIMENSIONS:** 20x100x1528  
**ROUGH DIMENSION:**      **S.A NO.:** D-6 L/R      **PAGE:** 1      **OF:** 1      **PAGES**  
**SUB-ASSEMBLY:** DESK LEG, LEFT OR RIGHT      **NO. OF PARTS/UNIT PRODUCT:** 2

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-040	Edge Glue Assembling	1		30	30	3.333	Assembling Jig		
2-033	Stroke Sanding	1		50	50	2.000	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME - 76 - 06

PART DESCRIPTION: DESK LEG, L/R

PART NO: D - 6

PRODUCT: SCHOOL DESK PRODUCT NO.: (P11 -REV)

MATERIAL INPUT SPECIFICATIONS: D - 6 FROM MACHINING DEPARTMENT

FINISHED DIMENSIONS: 20x200x1500

NO. OF PARTS/UNIT PRODUCT: 2 P

SIZE DIMENSION:

SUB-ASSEMBLY: DESK LEG, LEFT OR RIGHT

S.R. NO.: D - 6 L/P

PAGE: 1 OF: 2 PAGES

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002a	Spray Stain, 1 face & Edge	1		60	60	1.667	Spray Gun		
5-002b	Spray Stain, 1 face & Edge	1		60	60	1.667	Spray Gun		
5-003a	Spray Wash Coat, Edge	1		60	60	1.667	Spray Gun		
5-003b	Spray Wash Coat, Edge	1		60	60	1.667	Spray Gun		
5-004	Hand (Scuff) Sanding	1		90	90	1.111	None		
5-005	Filling	4		40	10	2.500	Filling Line		
5-006a	Spray Sealer, 1 face & Edge	1		60	60	1.667	Spray Gun		
5-006b	Spray Sealer, 1 face & Edge	1		60	60	1.667	Spray Gun		
5-006	Sand Sealer Coat	1		80	80	1.250	None		
5-010a	Spray 1st Coat Lacquer 1 face & Edge	1		60	60	1.667	Spray Gun		
5-010b	Spray 1st Coat Lacquer 1 face & Edge	1		60	60	1.667	Spray Gun		
5-011a	Spray 2nd Coat Lacquer 1 face & Edge	1		60	60	1.667	Spray Gun		
5-011b	Spray 2nd Coat Lacquer 1 face & Edge	1		60	60	1.667	Spray Gun		

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OPERATIONS SOURCE SHEET

ELEMENTARY

ME - 76-06-01

PART DESCRIPTION: DESK LEG, L/R

PART NO: 0 - 6

PRODUCT: SCHOOL DESK PRODUCT NO.: (PTL-REV)

MATERIAL INPUT SPECIFICATIONS: 0 - 6 FROM MACHINING DEPARTMENT

ROUGH DIMENSION:

FINISHED DIMENSIONS: 20x200x120

NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: DESK LEG, LEFT OR RIGHT

S.A. NO.: 0 - 6 L/R

PAGE: 2

OF: 2 PAGES

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-996	Repair & Touch - Up	1		30	30	3.333	None		

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME - 76-06-01

PART DESCRIPTION: SEAT TOP SUPPORT, L/R

PART NO: D-7 L/R

PRODUCT: SCHOOL DESK

PRODUCT NO.: (PIL - PEV)

MATERIAL INPUT SPECIFICATIONS: 38 x 115 x 2700 PINE OR EUCALYPTUS, KILN DRIED TO 10% M.C

ROUGH DIMENSION: 38 x 56 x 265 (8th I)

FINISHED DIMENSIONS: 30 x 50 x 230 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A NO.:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		160	80	0.633	Radial Arm Saw		See D-4 L/R
2-006	Rip to Rough Width	2		120	60	0.833	Straight Line Fdper		
2-004	Planing 4-faces	2		150	75	0.667	4-Side Planer		
2-008	Trimming to final Length	1		100	100	1.000	Circular Saw Table type		
2-011a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drill Set - 1P		Left piece differs fr right piece on setting of Dowelholes for Des Leg
2-011b	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set - 1p		
2-011c	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set - 1p		
2-033	Stroke Sanding	1		80	80	1.250	Double Belt Stroke Sander		

SEAT TOP SUPPORT, L/R

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76-06-04

MATERIAL INPUT SPECIFICATIONS: D-71 L/R FROM MACHINING DEPARTMENT

PART NO: D-7 L/R

PRODUCT: SCHOOL DESK PRODUCT NO.: (RTL-REV)

ROUGH DIMENSION:

FINISHED DIMENSIONS: 30x40x230

NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A NO.:

PAGE: 1 OF: 2 PAGES

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002a	Spray Stain, two sides	1		105	105	0.952	Spray Gun		
5-002b	Spray Stain, one side	1		120	120	0.833	Spray Gun		
5-003a	Spray Wash Coat, two sides	1		105	105	0.952	Spray Gun		
5-003b	Spray Wash Coat, one side	1		120	120	0.833	Spray Gun		
5-004	Hand (Scuff) Sanding	1		120	120	0.833	None		
5-005	Filling	4		80	20	1,250	Filling time		
5-006a	Spray Sealer, two sides	1		105	105	0.952	Spray Gun		
5-006b	Spray Sealer, one side	1		120	120	0.833	Spray Gun		
5-008	Sand sealer coat	1		110	110	0.909	None		
5-010a	Spray 1st Lacquer Coat two sides	1		105	105	0.952	Spray Gun		
5-010b	Spray 1st Lacquer Coat one side	1		120	120	0.833	Spray Gun		
5-011a	Spray 2nd Lacquer Coat two sides	1		105	105	0.952	Spray Gun		
5-011b	Spray 2nd Lacquer Coat one side	1		120	120	0.833	Spray Gun		

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**PART DESCRIPTION:** SEAT TOP SUPPORT L/R

**OPERATIONS SEQUENCE SHEET**

ELEMENTARY SCHOOL DESK

ME-76-116-01

PART NO.: D-7 L/R

PRODUCT:

PRODUCT NO.: (PIL-REV)

**MATERIAL INPUT SPECIFICATIONS:** 0.7 L/R FROM MACHINING

**ROUGH DIMENSION:**

**FINISHED DIMENSIONS:** 30x40x230

**NO. OF PARTS/UNIT PRODUCT:** 2

**SUB-ASSEMBLY:**

**S.A. NO.:**

**PAGE:** 2

**OF:** 2

**PAGES**

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATEL PROCESS RECOVERY	REMARKS
5-996	Repair & Touch - Up	1		60	60	1.667	None		

**PART DESCRIPTION:** DESK LEGS BOTTOM CROSS PIECE

**OPERATIONS SEQUENCE SHEET**

ELEMENTARY  
STANDARD DESK

ME-70-06-01  
(PTL-REV)

**MATERIAL INPUT SPECIFICATIONS:** 25 x 175 x 2400, PINE OR EUCALYPTUS, KILN DRIED TO 10% M.C.

**PART NO.:** 11-8

**PRODUCT:**

**PRODUCT NO.:**

**ROUGH DIMENSION:** 25 x 175 x 1060

**FINISHED DIMENSIONS:** 20 x 140 x 1100 **NO. OF PARTS/UNIT PRODUCT:** 1 PC

**SUB-ASSEMBLY:**

**S.A. NO.:**

**PAGE:** 1

**OF:** 1

**PAGES**

**MACHINING DEPARTMENT**

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		80	40	1.250	Radial Arm Saw		2 pieces from 1 board
2-006	Rip to Rough Width	2		60	30	1.667	Straight Line Edger		
2-004	Planing 4 faces	2		60	30	1.667	4 side planer		
2-008	Trimming to final length	1		100	100	1.000	Circular Saw, Table type		
2-011	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-Up		
2-033	Stroke Sanding	1		45	45	2.222	Double Belt Stroke Sander		



OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: DESK LEGS BOTTOM CROSS PIECE

ELEMENTARY

ME: 26. 00. 01

PART NO.: D-8

PRODUCT: CITRUS DESK PRODUCT NO.: (111) (111)

MATERIAL INPUT SPECIFICATIONS: D-8 FROM MACHINING DEPARTMENT

ROUGH DIMENSION: \_\_\_\_\_

FINISHED DIMENSIONS: 20x14x1100

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_

S.A. NO.: \_\_\_\_\_

PAGE: 1 OF: 1 PAGES

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATE PROCESS RECOVERY	REMARKS
5-002a	Spray Stain, Bottom Face	1		75	75	1.333	Spray Gun		
5-002b	Spray Stain, Top Face & Edge	1		75	75	1.333	Spray Gun		
5-003a	Spray Wash Coat, Bottom face	1		75	75	1.333	Spray Gun		
5-003b	Spray Wash Coat, Top face & Edges	1		75	75	1.333	Spray Gun		
5-004	Hand (Scuff) Sanding	1		120	120	0.833	None		
5-005	Filling	4		60	15	1.667	Filling Line		
5-006a	Spray Sealer Bottom face	1		90	90	1.111	Spray Gun		
5-006b	Spray Sealer, Top face & Edges	1		90	90	1.111	Spray Gun		
5-008	Sand Sealer Coat	1		100	100	1.000	None		
5-012a	Spray 1st Coat Lacquer, Top & Edges	1		90	90	1.111	Spray Gun		
5-011	Spray 2nd Coat Lacquer Top & Edges	1		90	90	1.111	Spray Gun		
5-990	Repair & Touch -up	1		50	50	2.000	None		

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**PART DESCRIPTION:** FACE VENEER, SEAT TOP  
**OPERATIONS SEQUENCE SHEET** ELEMENTARY ME - 76-06-0  
**MATERIAL INPUT SPECIFICATIONS:** ROUND LOGS, 200 mm AND LARGER X 1200mm AND LONGER, TOP GRADE WOOD SPECIE  
**ROUGH DIMENSION:** 1.1 x 260 x 1110 **FINISHED DIMENSIONS:**  
**SUB-ASSEMBLY:** DESK SEAT **S.A. NO.:** **PAGE:** 1 **OF:** 1 **PAGES**  
**NO. OF PARTS/UNIT PRODUCT:** 1

VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Long Preparation	4		0.333 cu.m	0.083 cu.m	0.1503	Chain Saw and Debarking Axe		
1-002	Log Cooking	1		0.104 cu.m	0.104 cu.m	0.4814	Log Cooking Pit		
1-003	Log Squaring	3		0.750 cu.m	0.250 cu.m	0.0667	Circular Saw		
1-004	Veneer Slicing	2		30.000 sq.m	15.000 sq.m	0.0152	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30.000 sq.m	15.000 sq.m	0.0152	Veneer Dryer		
1-006	Veneer Jointing	1		80.000 sq.m	80.000 sq.m	0.0057	Veneer Jointer (Guillo- tine Type)		
1-007	Veneer Splicing	1		60.000 sq.m	60.000 sq.m	0.0076	Veneer Splicer		
1-008	Veneer Clipping to Size	1		130 Pcs	130 Pcs	0.7692	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 Pcs	200 Pcs	-	None		
1-010	Veneer Bundling	1		300 Pcs	300 Pcs	-	None		

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76-06-1

PART DESCRIPTION: CORE, SEAT TOP

PART NO.: D-9/B-

PRODUCT: SCHOOL DESK

PRODUCT NO.: (P1)-REV1

MATERIAL INPUT SPECIFICATIONS: 18mm x 2440 x 1220 BLOCKBOARD

ROUGH DIMENSION: 18 x 1104 x 254

FINISHED DIMENSIONS: 18 x 1098 x 48

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: SEAT TOP

S.N. NO.: D-9

PAGE: 1 OF: 1 PAGES

PANEL FORMING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-003	Panel Sawing to Rough Size	2		72	36	1.3889	Vertical Panel Saw		6pcs in one blockboard panel

OPERATIONS SEQUENCE SHEET

ITEM DESCRIPTION: BOTTOM VENEER, SEAT TOP

PART NO: D-9/c

ELEMENTARY PRODUCT: SCHOOL DESK PRODUCT NO.: (BTL-REV) ME-76-06-01

MATERIAL SPECIFICATIONS: ROUND LOGS, 200mm Ø AND LARGER x 1250 mm AND LONGER, LOW GRADE WOOD SPECIES

ROUGH DIMENSION: 1.1 x 260 x 1110

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 1 PC

SUBASSEMBLY: DESK SEAT

S.A. NO.: D-9

PAGE: 1 OF 1 PAGES

VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.500 cu.m	0.1250 cu.m	0.1004	Chain Saw and Debarking Axe		
1-003	Log Squaring	3		0.875 cu.m	0.2917 cu.m	0.0574	Circular Saw		
1-004	Veneer Slicing	2		50,000 sq.m	25.00 sq.m	0.0091	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		50,000 sq.m	25,000 sq.m	0.0091	Veneer Dryer		
1-006	Veneer Jointing	1		100,000 sq.m	100,000 sq.m	0.0046	Veneer Jointer (Guillo-line Type)		
1-007	Veneer Splicing	1		75,000 sq.m	75,000 sq.m	0.0061	Veneer Splicer		
1-008	Veneer Clipping to size	1		130 Pcs	130 Pcs	0.7692	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 Pcs	200 Pcs	-	None		
1-010	Veneer Bundling	1		300 Pcs	300 Pcs	-	None		

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## OPERATIONS SEQUENCE SHEET

ELEMENTARY

MF - 76-06-01

PART DESCRIPTION: SEAT TOP

PART NO.: 0-9

PRODUCT: SCHOOL DESK

PRODUCT NO.: (RTL-PFV)

MATERIAL INPUT SPECIFICATIONS: D-9/a, D-9/b, D-9/c AND VS - 1

ROUGH DIMENSIONS:

FINISHED DIMENSIONS: 20x250x1100

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.:

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## PANEL FORMING AND MACHINING DEPARTMENTS

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-005	Veneer Laying	3		75	25	1.333	Glue Spreader		
3-006	Cold Pressing	2		150	75	0.667	Cold Press		
3-008	Panel Trimming to size	2		100	50	1.000	Vertical Spindle Moulder		
3-009a	Single Edge Banding 1st Edge	2		120	60	0.833	Single - Edge bonding Machine		
3-009b	Single Edge Banding 2nd Edge	2		120	60	0.833	Single - Edge bonding Machine		
3-009c	Single Edge Banding 3rd Edge	2		220	110	0.455	Single - Edge bonding Machine		
3-009d	Single Edge Banding 4th Edge	2		220	110	0.455	Single Edge bonding Machine		
3-011	Trimming Excess Veneer	2		220	110	0.455	Vertical Spindle Moulder		
2-030	Machine Sanding Plain Edges	2		100	50	1.000	Oscillating Edge Sander		
2-033a	Stroke Sanding top face	1		40	40	2.500	Double belt stroke Sander		
2-033b	Stroke Sanding bottom face	1		40	40	2.500	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME -76-06-

PART DESCRIPTION: SEAT TOP

PART NO: D-9'

PRODUCT SCHOOL DESK PRODUCT NO.: (RTL-REV)

MATERIAL INPUT SPECIFICATIONS:

ROUGH DIMENSION:

FINISHED DIMENSIONS: 20 x 250 x 1100 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.:

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PANEL FORMING AND MACHINING DEPARTMENTS

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-011	Drilling for Dowel Holes	1		40	40	2.500	Pneumatic Drills Set-Up		
2-012	Hand Sanding	1		100	100	1.000	None		

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PART DESCRIPTION: seal top SEAT TOP

OPERATIONS SEQUENCE SHEET

ELEMENTARY

MF -76-06-01  
(RIL-REV)

PART NO.: 0-8

PRODUCT: SCHOOL DESK

PRODUCT NO.:

MATERIAL INPUT SPECIFICATIONS: 0-9 FROM MACHINING DEPARTMENT

FINISHED DIMENSIONS: 20 x 250 x 1100 NO. OF PARTS/UNIT PRODUCT: 1

ROUGH DIMENSION:

S.A. NO.:

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1 PAGES

SUB-ASSEMBLY:

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATE PROCESS RECOVERY	REMARKS
5-005	Filling	4		40	10	2.500	Filling Line		
5-006a	Spray Sealer, Bottom face	1		60	60	1.667	Spray Gun		
5-006b	Spray Sealer Top & Edges	1		50	50	2.000	Spray Gun		
5-008	Sand Sealer Coat	1		80	80	1.250	None		
5-010a	Spray 1st lacquer coat Top & Edges	1		50	50	2.000	Spray Gun		
5-010b	Spray 2nd lacquer coat Top & Edges	1		50	50	2.000	Spray Gun		
5-996	Repair and Touch - Up	1		30	30	3.333	None		

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11-6-76 10:00 AM

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: SEAT LEG, FRONT PIECE, R/L

PART NO.: D-10 FOR R/L

PRODUCT: ELEMENTARY STUDY DESK

PRODUCT NO.: ME-726-06-01 (PTL-REV)

MATERIAL INPUT SPECIFICATIONS: 25 x 175 x (1800/2100) PINE OR EUCALYPTUS

FINISHED DIMENSIONS: 20 x 25 x 595

NO. OF PARTS/UNIT PRODUCT: 2 P.

ROUGH DIMENSION: 25 x 86 x (2973/7)

SUB-ASSEMBLY: SEAT LEG, LEFT OR RIGHT

S.A. NO.: D-10 L/R

PAGE: 1

OF: 1

PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0.833	Radial Arm Saw		6 pcs from 1 board type B-1800, type c-210
2-006	Rip to Rough Width	2		100	50	1.000	Straight Line Edger		2 pcs from 1 board
2-004	Planing 4 face	2		120	60	0.833	4 side Planer		
2-008	Trimming to final length	1		100	100	1.000	Circular Saw Table Type		
2-011a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set - Up		
2-011b	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set - Up		



PART DESCRIPTION: SEAT LEG, REAR PIECE, RIGHT/LEFT

OPERATIONS SEQUENCE SHEET

ELEMENTARY

MF -76-06-01

MATERIAL INPUT SPECIFICATIONS: 25 x 175 x (1800/2100) PINE OR EUCALYPTUS, KTLN - DRIED TO 10% M.C.  
 ROUGH DIMENSION: 25 x 86 x (297 x 342) FINISHED DIMENSIONS: 20 x 100 x 2125 NO. OF PARTS/UNIT PRODUCT: 1 P  
 SUB-ASSEMBLY: DESK LEG L/R S.A NO. 10-10 L/R PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRV NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0.833	Radial Arm Saw		6 pcs from 1 board type A-1800, type c-21
2-006	Rip to Rough Width	2		100	50	1.000	Straight Line Edger		2 pcs from 1 board
2-04	Planing 4 faces	2		120	60	0.833	4 Side Planer		
2-008	Trimming to final length	1		100	100	1.000	Circular Saw Table Type		
2-026	Cut Clearance for Rails	1		40	40	2.500	Dado Saw		
2-011a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set - 1/4"		
2-011b	Drills for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set - 1/4"		
2-011c	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set - 1/4"		

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PART DESCRIPTION: SEAT LEG, R/L

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76-06-01

MATERIAL INPUT SPECIFICATIONS: 10 FOR 8 D-10 b/c FROM MACHINING DEPARTMENT

PART NO: D-10 R/L

PRODUCT: SCHOOL DESK PRODUCT NO.: (PIL-REV)

ROUGH DIMENSION: \_\_\_\_\_

FINISHED DIMENSIONS: 20x150x(290/350) NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: \_\_\_\_\_

S.A NO.: \_\_\_\_\_

PAGE: 1, OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-040	Edge Glue Assembling	1		30	30	3.333	Assembly Jig		
2-033	Stroke Sanding	1		60	60	1.667	Double Belt Stroke Sander		

11-6-66  
3-1-66

OPERATIONS SEQUENCE SHEET

ELEMENTARY

MF-76-06-U:

PART DESCRIPTION: SEAT LEG R/L

PART NO: D-40

PRODUCT SCHOOL DESK PRODUCT NO.: (PIL-REV)

MATERIAL INPUT SPECIFICATIONS: D-10 R/L FROM MACHINING DEPARTMENT

FINISHED DIMENSIONS 20x75x25<sup>5200</sup>

NO. OF PARTS/UNIT PRODUCT: 1

ROUGH DIMENSION:

S.A NO.:

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GUN-ASSEMBLY:

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002a	Spray Stain, 1 face & Edge	1		80	80	1.250	Spray Gun		
5-002b	Spray Stain, 1 face & Edge	1		80	80	1.250	Spray Gun		
5-003a	Spray Wash Coat, 1 face & Edge	1		80	80	1.250	Spray Gun		
5-003b	Spray Wash Coat, 1 face & Edge	1		80	80	1.250	Spray Gun		
5-004	Hand (Scuff) Sanding	1		120	120	0.833	None		
5-005	Filling	4		60	15	1.667	Filling Line		
5-006a	Spray Sealer, 1 face & Edge	1		80	80	1.250	Spray Gun		
5-006b	Spray Sealer, 1 face & Edge	1		80	80	1.250	Spray Gun		
5-008	Sand Sealer Coat	1		100	100	1.000	Spray Gun		
5-010a	Spray 1st Lacquer Coat, 1 face & Edge	1		80	80	1.250	Spray Gun		
5-010b	Spray 1st Lacquer Coat, 1 face & Edge	1		80	80	1.250	Spray Gun		
5-011a	Spray 2nd Lacquer Coat, 1 face & Edge	1		80	80	1.250	Spray Gun		
5-011b	Spray 2nd Lacquer Coat, 1 face & Edge	1		80	80	1.250	Spray Gun		

**PART DESCRIPTION:** SEAT LEG R/L

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76-06-03

**MATERIAL INPUT SPECIFICATIONS:** D-10 R/L FROM MACHINING DEPARTMENT

**PART NO.:** D-10

**PRODUCT:** SCHOOL DESK **PRODUCT NO.:** (P) L-RE 91

**ROUGH DIMENSION:**

**FINISHED DIMENSIONS:** 20x75 x 299<sup>5290</sup>

**NO. OF PARTS/UNIT PRODUCT:** 1

**SUB-ASSEMBLY:**

**S.A. NO.:**

**PAGE:** 2 **OF:** 2 **PAGES**

FINISHING DEPARTMENT

<b>OPRN NO.</b>	<b>DESCRIPTION OF OPERATION</b>	<b>NO. OF MEN</b>	<b>LABOUR GRADE</b>	<b>OUTPUT PER HOUR</b>	<b>OUTPUT PER MAN-HOUR</b>	<b>MACHINE HOURS PER 100 UNIT PRODUCTS</b>	<b>MACHINE USED</b>	<b>ESTIMATED PROCESS RECOVERY</b>	<b>REMARKS</b>
5-996	Repair & Touch - Up	1		40	40	2.500	None		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: BASE RAIL, LEFT

ELEMENTARY SCHOOL DESK

MF-76-06-01

PART NO: D-11 L

PRODUCT

PRODUCT NO.: (RIL-REV)

MATERIAL INPUT SPECIFICATIONS: 38 x 150 x 2400 PINE OR EUCALYPTUS, KILN-DRYED TO 10% M.C.

RAW DIMENSION: 38 x 72 x 897

FINISHED DIMENSIONS: 30 x 70 x 700

NO. OF PARTS/UNIT PRODUCT: 1 PC

SHIP-ASSEMBLY:

S.A NO.:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		100	50	1.000	Radial Arm Saw		3 pcs from 1 Board
2-006	Rip to Rough Width	2		80	40	1.250	Straight Line Fdver		2 pcs from 1 Board
2-004	Planing 4 faces	2		90	45	1.111	4-Side Planer		
2-008	Trimming to final length	1		100	100	1.000	Circular Saw Table type		
2-026	Cut Clearance for Cross Pieces	1		40	40	2.500	Dado Saw		
2-011a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-Up		Drill Holes Nearer Inner face
2-011b	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-Up		
2-011c	Drill for Woodscrew Pilot Holes	1		50	50	2.000	Pneumatic Drills Set-Up		
2-033	Stroke Sanding	1		60	60	1.667	Double Belt Stroke Sander		

## OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME 76-06-01

PART DESCRIPTION: BASE RAIL, LEFT

PART NO. D-11. L

PRODUCT: SCHOOL DESK PRODUCT NO.: (RTL-RFV)

MATERIAL INPUT SPECIFICATIONS: D-11L FROM MACHINING DEPARTMENT

ROUGH DIMENSIONS:

FINISHED DIMENSIONS: 30x70x700

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.:

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FINISHING DEPARTMENT:

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002a	Spray Stain, 1 face & Edge	1		60	60	1.667	Spray Gun		
5-002b	Spray Stain, 1 face	1		60	60	1.667	Spray Gun		
5-003a	Spray Wash Coat, - 1 face & Edge	1		60	60	1.667	Spray Gun		
5-003b	Spray Wash Coat, 1 face &	1		60	60	1.667	Spray Gun		
5-004	Hand (Scuff) Sanding	1		90	90	1.111	None		
5-005	Filling	4		40	10	2.500	Filling Line		
5-006a	Spray Seal, 1 face & Edge	1		60	60	1.667	Spray Gun		
5-006b	Spray Sealer, 1 face	1		60	60	1.667	Spray Gun		
5-008	Sand Sealer Coat	1		80	80	1.250	None		
5-010a	Spray 1st Lacquer Coat 1 face & Edge	1		60	60	1.667	Spray Gun		
5-010b	Spray 1st Lacquer Coat, 1 face & Edge	1		60	60	1.667	Spray Gun		
5-011a	Spray 2nd Lacquer Coat 1 face & Edge	1		60	60	1.667	Spray Gun		
5-011b	Spray 2nd Lacquer Coat 1 face	1		60	60	1.667	Spray		

OPERATIONS SEQUENCE SHEET

ELEMENTARY

MF-76-06-01

PART DESCRIPTION: BASE RAIL, LEFT

PART NO.: D-11L

PRODUCT: SILICON DESK

PRODUCT NO.: (PIL-PEV)

MATERIAL INPUT SPECIFICATIONS: D-11L FROM MACHINING DEPARTMENT

ROUGH DIMENSION: \_\_\_\_\_

FINISHED DIMENSIONS: 30x70x700

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_

S.A. NO.: \_\_\_\_\_

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-996	Repair & Touch - Up	1		30	30	3.333	None		

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OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76-06-01

PART DESCRIPTION: BASE RAIL, RIGHT

PART NO: 0- 11/R

PRODUCT: SCHOOL DESK

PRODUCT NO.: (PTL - REV)

MATERIAL INPUT SPECIFICATIONS: 38 x 150 x 2400 PINE OR EUCALYPTUS, KILN DRIED TO 10% M.C

ROUGH DIMENSION: 38 x 75 x 797

FINISHED DIMENSIONS: 30 x 70 x 700

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A NO.:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to rough Length	2		100	50	1,000	Radial Arm Saw		3 pieces from 1 board
2-006	Rip to Rough Width	2		80	40	1,250	Straight Line edger		2 pieces from 1 board
2-004	Planing 4 - faces	2		90	45	1,111	3 - Side Planer		
2-008	Trimming to final Length	1		100	100	1,000	Circular Saw Table type		
2-026	Cut Clearance for Cross Pieces	1		40	40	2,500	Band Saw		
2-011a	Drill for Dowel Holes	1		50	50	2,000	Pneumatic Drills Set - 1/2"		Drill holes nearer inner face
2-011b	Drill for Dowel Holes	1		50	50	2,000	Pneumatic Drills Set - 1/2"		
2-011c	Drill Woodscrew Pilot Hole	1		50	50	2,000	Pneumatic Drills Set - 1/2"		
2-033	Stroke Sanding	1		60	60	1,667	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: BASE RAIL, RIGHT

ELEMENTARY

ME - 76-06-01

PART NO.: 0 - 11/R

PRODUCT: SCHOOL DESK PRODUCT NO.: (P11-REV)

MATERIAL INPUT SPECIFICATIONS: 11 FROM MACHINING DEPARTMENT

FINISHED DIMENSIONS: 30 x 70 x 700 NO. OF PARTS/UNIT PRODUCT: 1 P

ROUGH DIMENSIONS:

S.A. NO.:

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SUB-ASSEMBLY:

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002a	Spray Stain, 1 face & Edge	1		60	60	1,667	Spray Gun		
5-002b	Spray Stain, 1 face	1		60	60	1,667	Spray Gun		
5-003a	Spray Wash Coat, 1 face & Edge	1		60	60	1,667	Spray Gun		
5-003b	Spray Wash Coat, 1 face & Edge	1		60	60	1,667	Spray Gun		
5-004	Hand (Scuff) Sanding	1		90	90	1,111	None		
5-005	Filling	4		40	10	2,500	Filling Line		
5-006a	Spray Sealer, 1 face & Edge	1		60	60	1,667	Spray Gun		
5-006b	Spray Sealer, 1 face	1		60	60	1,667	Spray Gun		
5-008	Sand Sealer Coat	1		80	80	1,250	None		
5-010a	Spray 1st Lac. Coat 1 face & Edge	1		60	60	1,667	Spray Gun		
5-010b	Spray 1st Lacquer Coat 1 face Edge	1		60	60	1,667	Spray Gun		
5-011a	Spray 2nd Lacquer Coat, 1 face & Edge	1		60	60	1,667	Spray Gun		
5-011b	Spray 2nd Lacquer Coat 1 face & Edge	1		60	60	1,667	Spray Gun		

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CONV.

BASE RAIL, RIGHT

OPERATIONS SEQUENCE SHEET

ELEMENTARY

MP - 76-06-01

PART DESCRIPTION:

PART NO.: D-11R

PRODUCT/FINISH DESK PRODUCT NO.: (RIL-REV)

MATERIAL INPUT SPECIFICATIONS: D-1/2 FROM MACHINING DEPARTMENT

FINISHED DIMENSIONS: 30 x 70 x 700 NO. OF PARTS/UNIT PRODUCT: 1

ROUGH DIMENSION:

S.A. NO.:

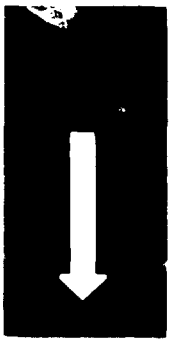
PAGE: 2 OF: 2 PAGES

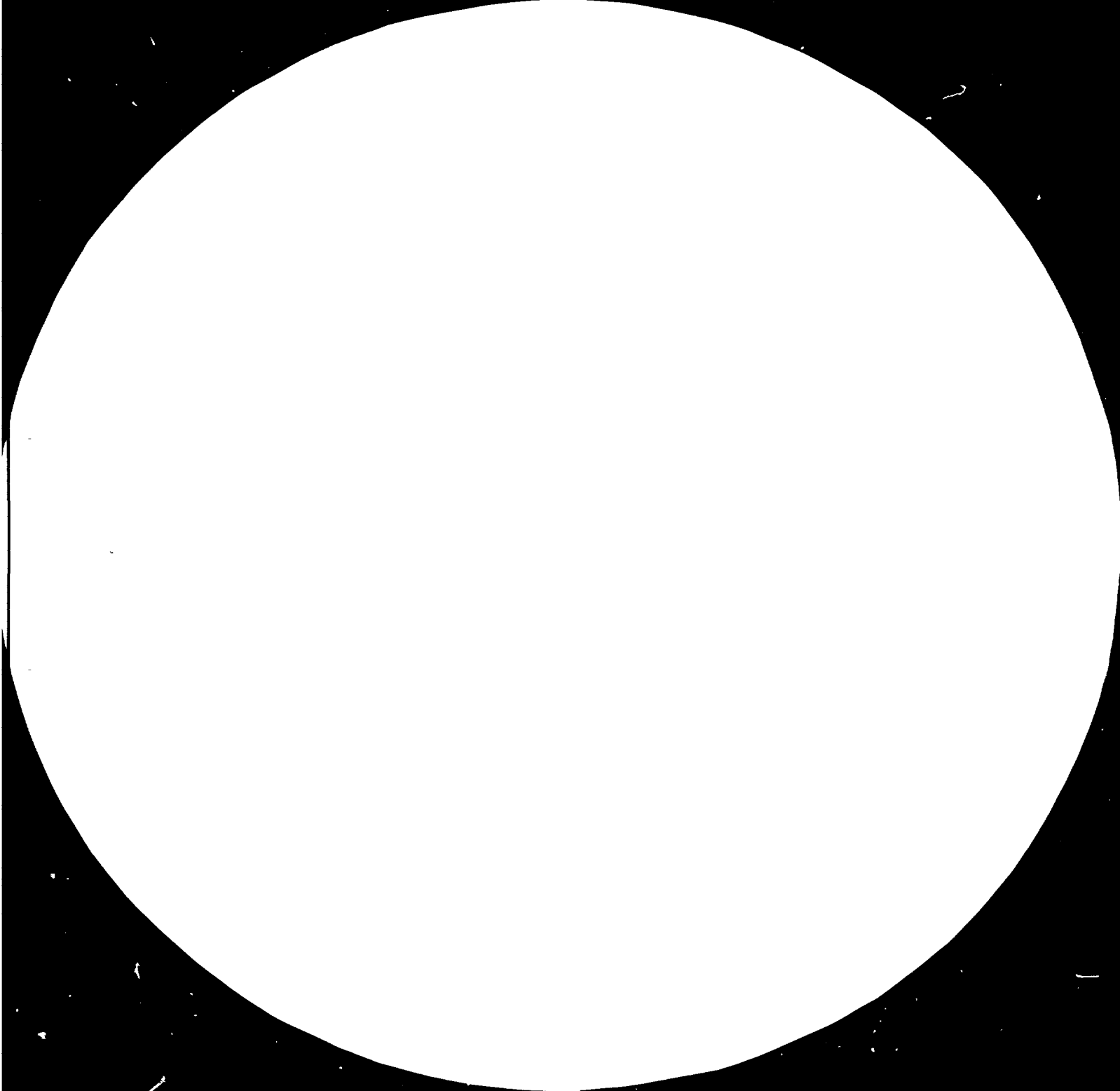
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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-996	Repair & Touch - Up	1		30	30	3.333	None		

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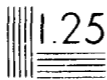
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OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME - 76-06-0

PART DESCRIPTION: SEAT CROSS PIECE, TOP

PART NO.: P-12

PRODUCT: SCHOOL DESK PRODUCT NO.: (RTL REV)

MATERIAL INPUT SPECIFICATIONS: 25 x 115 x 2400, PINE OR EUCALYPTUS, K1EN CUT TO 10% M.C.

ROUGH DIMENSION: 25 x 115 x 1200

FINISHED DIMENSIONS: 20 x 100 x 1100

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.:

PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		80	40	1,250	Radial Arm Saw		2 pieces from 1 board
2-006	Rip to Rough Width	2		60	30	1,667	Straight line Edger		
2-004	Planing 4 faces	2		60	30	1,667	4 Side Planer		
2-008	Trim to final length	1		100	100	1,000	Circular Saw Table type		
2-011	Drill for Dowel and Wood screw Pilot Holes	1		50	50	2,000	Pneumatic Drills Set - 4p		
2-033	Stroke Sanding	1		45	45	2,222	Double - Belt Stroke Sander		

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**OPERATIONS SEQUENCE SHEET**

**PART DESCRIPTION:** SEAL CROSS PIECE, TOP

**PART NO.:** 1-12

ELEMENTARY ME-76-06 01  
**PRODUCT:** SCHOOL DESK **PRODUCT NO.:** (REV) \_\_\_\_\_

**MATERIAL INPUT SPECIFICATIONS:** D-12 FROM MACHINING DEPARTMENT

**ROUGH DIMENSION, :** \_\_\_\_\_

**FINISHED DIMENSIONS:** 20x100x1100

**NO. OF PARTS/UNIT PRODUCT:** 1

**FOR ASSEMBLY:** \_\_\_\_\_

**S.A. NO.:** \_\_\_\_\_

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**PAGES**

**FINISHING DEPARTMENT**

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002a	Spray Stain, 1 face & Edge	1		80	80	1,250			
5-002b	Spray Stain 1 face & Edge	1		80	80	1,250			
5-003a	Spray Wash Coat 1 face & Edge	1		80	80	1,250			
5-003b	Spray Wash Coat 1 face & Edge	1		80	80	1,250			
5-003c	Spray Wash Coat, 1 face & Edge	1		80	80	1,250			
5-004	Hand (Scuff) Sanding	1		140	140	0,714			
5-005	Filling	4		72	18	1,389			
5-006a	Spray Sealer, 1 face & Edge	1		100	100	1,000			
5-008	Sand Sealer Coat	1		120	120	0,833			
5-010	Spray 1st Lacquer Coat, 1 face & edge	1		100	100	1,000			
5-010b	Spray 1st Lacquer Coat 1 face & Edge	1		100	100	1,000			
5-011a	Spray 2nd Lacquer Coat, 1 face & Edge	1		100	100	1,000			
5-011b	Spray 2nd Lacquer Coat	21		100	100	1,000			

PART DESCRIPTION: SEAT CROSS PIECE, TOP

OPERATIONS SEQUENCE SHEET

ELEMENTARY

MF-76-06-011

PART NO: D-12

PRODUCT: SCHOOL DESK PRODUCT NO.: (RLL-REV)

MATERIAL INPUT SPECIFICATIONS: D-12 FROM MACHING DEPARTMENT

ROUGH DIMENSION: .

FINISHED DIMENSIONS: 20x100x110

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: .

S.A NO. 1

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-99b	Repair & Touch - Up	1		50	50	2,000			

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76-08-01

PART DESCRIPTION: SEAT CROSS PIECE, BOTTOM

PART NO.: D-13

PRODUCT: SCHOOL DESK PRODUCT NO.: (RTE-REVI)

MATERIAL INPUT SPECIFICATIONS: 25 x 115 x 2400, PINE OR EUCALYPTUS, DRTED TO 10% M.C

ROUGH DIMENSION: 25 x 115 x 1200

FINISHED DIMENSIONS: 20 x 100 x 1100 NO. OF PARTS/UNIT PRODUCT: 1

WIP-ASSEMBLY:

S.A NO.:

PAGE: 1 OF 1 PAGES

PATTERNING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		80	40	1,250	Radial Arm Saw		2 pieces from 1 board
2-006	Rip to Rough Width	2		60	30	1,667	Straight Line Fdger		
2-004	Planing 4 faces	2		80	40	1,667	4-side planer		
2-008	Trim to final length	1		100	100	1,000	Circular Saw Table type		
2-011a	Drill for Dowel and Woodscrow Pilot holes	1		50	50	2,000	Pneumatic Drills Set - 1p		
2-033	Stroke Sanding	1		45	45	2,222	Double - Belt Stroke Sander		





OPERATIONS SEQUENCE SHEET

ELEMENTARY

MCC/6-06-01

PART DESCRIPTION: FOOT REST

PART NO: P-14

PRODUCT: SCHOOL DESK PRODUCT NO.: (PTL-REV)

MATERIAL INPUT SPECIFICATIONS: 25 x 150 x 2400 PINE OR EUCALYPTUS, KILN DRIED 10% M.C.

ROUGH DIMENSIONS: 25 x 150 x 1060

FINISHED DIMENSIONS: 20 x 125 x 1100

NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A NO.:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		80	40	1,250	Radial Arm Saw		2 pieces from 1 board
2-002	Rip to Rough Width	2		60	30	1,667	Straight line edger		
2-004	Planing 4 faces	2		60	30	1,667	4- Side Planer		
2-008	Trim to final length	1		100	100	1,000	Circular Saw, Table Set - Up		
2-011	Drill for Woodscrew Pilot holes	1		50	50	2,000	Pneumatic Drills Set - Up		
2-033	Stroke Sanding	1		45	45	2,222	Double - Belt Stroke Sander		



OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76-06-01

PART DESCRIPTION: FOOT REST CENTER CROSS RAIL

PART NO.: D-15

PRODUCT: SCHOOL DESK

PROJECT NO.: (PTL - REV)

MATERIAL INPUT SPECIFICATIONS: 38 x 150 x 2400, PINE OR EUCALYPTUS, KILN-DRIED TO 10% M.C.

ROUGH DIMENSION: 38 x 72 x 297

FINISHED DIMENSIONS: 30 x 70 x 270

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.:

PAGE: 1

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0,833	Radial Arm Saw		3 pieces from 1 Board
2-006	Tip to Rough Width	2		120	60	0,833	Straight Line Edger		2 pieces from 1 Board
2-004	Planing 4 faces	2		100	50	1,000	4 - Side Moulder		
2-008	Trim to final length	1		100	100	1,000	Crosscut Saw, Table type		
2-011	Drill for Woodscrew pilot hole	1		50	50	2,000	Pneumatic Drills Set-Up		
2-033	Stroke Sanding	1		80	80	1,250	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

ELEMENTARY

ME-76-06-01

PART DESCRIPTION: FOOT REST CENTER CROSS RAIL

PART NO.: D-15

PRODUCT: SSBRODLOFSK

PRODUCT NO.: (P(L-REV))

MATERIAL INPUT SPECIFICATIONS: D-15 FROM MACHINING DEPARTMENT

FINISHED DIMENSIONS: 31 x 70 x 270 NO. OF PARTS/UNIT PRODUCT: 1

ROUGH DIMENSION:

S.A. NO.:

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PAGES

SUB-ASSEMBLY:

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-005	Filling	2		60	30	1,667	Filling Line		
5-006a	1 face & edges Spray Sealer,	1		80	80	1,250	Spray Gun		
5-006b	1-face & edge Spray Sealer,	1		80	80	1,250	-Do-		
5-008	SAnd Sealer Coat	1		100	100	1,000			

A P P E N D I X VII - B

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OPERATIONS SEQUENCE SHEETS

for

TEACHER'S TABLE

ME 76.06.02 (RIL - Rev.)

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: FACE VENEER, TABLE TOP

PART NO: TT - 1/a

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: Round Logs, 200 mm Ø and Larger x 1250 mm and Longer, TOP GRADE WOOD SPECIES

ROUGH DIMENSION: 1.1 x 810 x 1410

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: TABLE TOP

S.A NO.: TT - 1

PAGE: 1

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.333 cu.m.	0.083 cu.m.	0.3773	Chainsaw and Debarking Axe		
1-002	Log Cooking	1		0.104 cu. m.	0.104 cu. m.	1.2080	Log Cooking Pit		
1-003	Log Squaring	3		0.750 cu. m.	0.250 cu. m.	0.1675	Circular Saw		
1-004	Veneer Slicing	2		30sq. meter	15 sq. meter	3.807	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	3.807	Veneer Dryer		
1-006	Veneer Jointing	1		80 sq. meter	80 sq. meter	1.428	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	1.904	Veneer Splicer		
1-008	Veneer Clipping to Size	1		130 pcs.	130 pcs.	0.769	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 pcs.	200 pcs.	-----	None		
1-010	Veneer Bundling	1		300 pcs.	300 pcs.	-----	None		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: CORE, TABLE TOP

PART NO: TT - 1/b

PRODUCT: TABLE

PROJECT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 18 mm x 2440 x 1220 Commercial Blockboard

ROUGH DIMENSION: 18 x 1404 x 804

FINISHED DIMENSIONS: 18 x 1400 x 800 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: TABLE TOP

S.A NO.: TT - 1

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PANEL PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-003	Panel Sawing	2		16	8	6.250	Vertical Panel Saw		1 pc. in one black-board panel ; Use rest for drawer case TOP SIDES and BOTTOM and DRAWER FRONT.



OPERATIONS SEQUENCE SHEET

TEACHER'S

ME -76.06.0

PART DESCRIPTION: BOTTOM VENEER, TABLE TOP

PART NO.: TT - 1/c

PRODUCT: TABLE PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: ROUND LOGS, 200 mm Ø (and larger) x 1250 mm (and longer), PINE or EUCALYPTUS (or equivalent Spec

ROUGH DIMENSION: 1.1 x 810 x 1410

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: TABLE TOP

S.A NO.: TT - 1

PAGE: 1 OF: 1 PAGES

VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.500 cu. m.	0.1250 cu.m.	0.251	Chainsaw and Debarking Axe		
1-003	Log Squaring	3		0.875 cu.m.	0.2917 cu.m	0.144	Circular Saw		
1-004	Veneer Slicing	2		50 sq. meter	25 sq. meter	2.284	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		50 sq. meter	25 sq. meter	2.284	Veneer Dryer		
1-006	Veneer Jointing	1		100 sq. meter	100 sq. meter	1.142	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		75 sq. meterq	75 sq. meter	1.523	Veneer Splicer		
1-008	Veneer Clipping to Size	1		130 pcs.	130 pcs.	0.769	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 pcs.	200 pcs.	-----	None		
1-010	Veneer Bundling	1		300 pcs.	300 pcs.	-----	None		

OPERATIONS SEQUENCE SHEET

TEACHER'S

No. 3.06.02

ITEM DESCRIPTION: CORE, TABLE TOP

PART NO.: TT - 1/b

PRODUCT: TABLE PRODUCT NO. (II-Rev.)

MATERIAL INPUT SPECIFICATIONS: 18 mm x 2440 x 1220 Commercial Blockboard

ROUGH DIMENSION: 18 x 1404 x 804

FINISHED DIMENSIONS: 18 x 1400 x 800 NO. OF PARTS/ PRODUCT: 1

SUB-ASSEMBLY: TABLE TOP

S.A NO.: TT - 1

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PANEL PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-003	Panel Sawing			16	8	6.250	Vertical Panel Saw		1 pc. in one black-board panel ; Use rest for drawer case TOP SIDES and BOTTOM and DRAW FRONT.

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: TABLE TOP

PART NO.: TT - 1

PRODUCT: DESK

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS: TT - 1/a; TT - 1/b and TT-1/c and VS - 1

ROUGH DIMENSION: \_\_\_\_\_ FINISHED DIMENSIONS: 20 x 800 x 1400 NO. OF PARTS/UNIT PRODUCED: 1

SUB-ASSEMBLY: \_\_\_\_\_ S.A. NO.: \_\_\_\_\_ PAGE: 1 OF: 1 PAGES

PANEL FORMING AND MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATE PROCESS RECOVERY	REMARKS
3-005	Veneer Laying	3		50	16.667	2.000	Glue Spreader		
3-006	Cold Pressing	2		120	60	0.833	Cold Press		
3-008	Panel Trimming to Size	2		70	35	1.433	Vertical Spindle Moulder		
3-009a	Single Edge Banding First Edge	2		100	50	1.000	Single Edge Bander		
3-009b	Single Edge Banding Second Edge	2		100	50	1.000	- do -		
3-009c	Single Edge Banding Third Edge	2		180	90	0.556	- do -		
3-009d	Single Edge Banding Fourth Edge	2		180	90	0.556	- do -		
3-011	Trimming Excess Veneer	2		180	90	0.556	Vertical Spindle Moulder		
2-030	Machine Sanding Plain Edges	2		70	35	1.433	Oscillating Edge Bander		
2-037a	Stroke Sanding Top Face	1		20	20	5.000	Double Belt Stroke Sander		
2-037b	Stroke Sanding Bottom Face	1		20	20	5.000	- do -		
2-011/a	Drill Dowel Holes	2		20	10	5.000	Pneumatic Drills Set-Up		
2-037	Hand Sanding	2		70	35	1.433	None		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: TABLE TOP

TEACHER'S

ME-76.06.02

PART NO: TT - 1

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT - 1 from Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 20 x 800 x 1400 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-005	Filling	4		20	5	5,000	Filling Line		
5-006/a	Spray Sealer, Bottom Face	2		40	20	2,500	Spray Gun		
5-006/b	Spray Sealer, Top and Edges	2		40	20	2,500	do		
5-008	Sand Sealer Coat	2		60	30	None	None		
5-010/a	Spray First Lac. Coat, Top and Edges	2		40	20	2,500	Spray Gun		
5-011/a	Spray Second Lac. Coat Top and Edges	2		40	20	2,500	do		
5-996	Repair and Touch-Up	1		20	20	None	None		

**OPERATIONS SEQUENCE SHEET**

**PART DESCRIPTION:** TOP RAIL, FRONT

**TEACHER'S**

**ME -76.06.C**

**MATERIAL INPUT SPECIFICATIONS:** 38 x 175 x 3000, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

**PART NO.:** TT - 2

**PRODUCT:** TABLE

**PRODUCT NO.:** (RIL-Rev.)

**ROUGH DIMENSION:** 38 x 85 x 1495

**FINISHED DIMENSIONS:** 25 x 75 x 1250 **NO. OF PARTS/UNIT PRODUCT:** 1

**SUB-ASSEMBLY:**

**S.A. NO.:**

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**MACHINING DEPARTMENT**

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		80	40	1.250	Radial Arm Saw		2 pcs. from one board
2-006	Rip to Rough Width	2		60	30	1.667	Straight Line Edger		2 pcs. from one board
2-004	Planing 4 - Sides	2		60	30	1.667	4 - Side Planer		
2-008	Trim to Final Length	1		100	100	1.00	Circular Saw, Table Type		
2-025	Groove for Front Panel	1		60	60	1.667	Heavy Duty Router		
2-011/a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-Up		
2-011/b	Drill for Dowel Holes	1		50	50	2.000	- do -		
2-033	Stroke Sanding	1		40	40	2.500	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: TOP RAIL, FRONT

PART NO: TT - 2

PRODUCT: TABLE

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT - 2 from Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 25 x 75 x 1250 NO. OF PARTS/UNIT PRODUCT: 1

FINISHING DEPARTMENT

S.A NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002	Spray Stain, Front Face and One Edge	1		70	70	1,429	Spray Gun		
5-003	Spray Wash Coat, Front Face and One Edge	1		70	70	1,429	- do -		
5-004	Hand (Scuff) Sanding	1		100	100	1,000	None		
5-005	Filling	4		60	15	1,667	Filling Line		
5-006/a	Spray Sealer, Front Face and One Edge	1		70	70	1,429	Spray Gun		
5-006/b	Spray Sealer, Back Face	1		80	80	1,250	- do -		
5-008	Sand Sealer Coat	1		90	90	1,111	None		
5-010/a	Spray first Lac. Coat, Front Face & Edge	1		70	70	1,429	Spray Gun		
5-010/b	Spray First Lac. Coat, Back Face	1		80	80	1,250	- do -		
5-011/a	Spray Second Lac. Coat Front Face & Edge	1		70	70	1,429	- do -		
5-011/b	Spray Second Lac. Coat Back Face	1		80	80	1,250	- do -		
5-996	Touch-Up and Repair	1		50	50	2,000	None		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: TOP RAIL, BACK

PART NO: TT -3

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 38 x 175 x 3000, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION, : 38 x 85 x 1495

FINISHED DIMENSIONS: 25 x 75 x 1250 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
			*****				PLEASE REFER TO TT - 2, TOP FRONT RAIL, *****		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: TOP RAIL, BACK

PART NO.: TT - 3

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT - 3 from Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 25 x 75 x 1250 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
									*****PLEASE REFER TO TOP FRONT RAIL, TT-2*****



OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: TOP RAIL, SIDES, L/R

TEACHER'S

ME-76.06.02

PART NO: TT - 4 R/L

PRODUCT: DESK

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS:

38 x 100 x 1800, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION:

38 x 47 x 895

FINISHED DIMENSIONS: 25 x 45 x 750

NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		100	50	1.000	Radial Arm Saw		2 pcs. from one box
2-006	Rip to Rough Width	2		80	40	1.250	Straight Line Edger		2 pcs. from one box
2-004	Plane 4 - Sides	2		80	40	1.250	4 - Side Planer		
2-008	Trim to final Length	1		120	120	0.833	Circular Saw, Table Type		
2-011	Drill for Woodscrew Pilot Holes	1		50	50	2.000	Pneumatic Drills Set - up		
2-023a	Tenon One End	2		100	50	1.000	Single End Tenoning Machine		
2-023b	Tenon One End	2		100	50	1.000	-- do --		
2-033	Stroke Sanding	1		60	60	1.667	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: TOP RAIL, SIDES, L/R

TEACHER'S

ME-76.06.02

PART NO: TT-4, L/R

PRODUCT: DESK

PRODUCT NO.: (RTL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT-4 L/R from Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 25 x 45 x 750 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002	Spray Stain, 1 Face and Edge	1		60	60	1.667	Spray Gun		
5-003	Spray Wash Coat, One Face and Edge	1		60	60	1.667	- do -		
5-004	Hand (Scuff) Sanding	1		90	90	1.111	None		
5-005	Filling	4		50	12	2.000	Filling Line		
5-006a	Spray Sanding Sealer, One Face and Edge	1		60	60	1.667	Spray Gun		
5-006b	Spray Sanding Sealer, One Face and Edge	1		60	60	1.667	- do -		
5-008	Sand Sealer Coat	1		80	80	1.250	None		
5-010	Spray first Lac. Coat, One Face and Edge	1		60	60	1.667	Spray Gun		
5-011	Spray Second Lac. Coat One Face and Edge	1		60	60	1.667	- do -		
5-996	Repair and Touch-UP	1		30	30	3.333	None		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: TOP RAIL, CENTER

TEACHER'S

ME-76.06.02

PART NO.: TT -5

PRODUCT: TABLE

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS: 38 x 100 x 1800, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION: \_\_\_\_\_ FINISHED DIMENSIONS: 25 x 45 x 725 NO. OF PARTS/UNIT PRODUCT: 1 P

SUB-ASSEMBLY: \_\_\_\_\_ S.A. NO.: \_\_\_\_\_ PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		100	50.	1.000	Radial Arm Saw		2 pcs. from one board
2-006	Rip to Rough Width	2		80	40	1,250	Straight Line Edger		2 pcs from one board
2-004	Plane 4 - Sides	2		80	40	1,250	4 - Side Planer		
2-008	Trim to Final Length	1		120	120	0.833	Circular Saw, Table Type		
2-011	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-up		
2-033	Stroke Sanding	1		60	60	1.667	Double Belt Stroke Sanding		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: TOP RAIL, CENTER

PART NO: TT - 5

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT - 5 from Machining Department

DESIGN DIMENSION:

FINISHED DIMENSIONS: 25 x 45 x 725 NO. OF PARTS/UNIT PRODUCT: 1

SHIP-ASSEMBLY:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-006	Spray Sealer, 3 Sides	1		80	80	1.250	Spray Gun		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: LEGS

TEACHER'S

ME-76.06.02

PART NO: TT-6/a to 6/d PRODUCT: TABLE PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 75 x 115 x 2400, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

FINISH DIMENSION: 75 x 56 x 790 FINISHED DIMENSIONS: 50 x 50 x 740 NO. OF PARTS/UNIT PRODUCT: 4

SUB-ASSEMBLY: \_\_\_\_\_ S.A. NO.: \_\_\_\_\_ PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0.833	Radial Arm Saw		3 pcs from one board
2-006	Rip to Rough Width	2		100	50	1.000	Straight Line Edger		2 pcs from one board
2-004	Plane 4 - Sides	2		80	40	1.250	4-Side Planer;		
2-008	Trim to Final Length	1		120	120	0.833	Circular Saw, Table Type		
2-011/a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-up		
2-011/b	- do -	1		50	50	2.000	- do -		
2-025	Groove for Front Panel	1		80	80	1.250	Heavy Duty Router		
2-033	Stroke Sanding	1		100	100	1000	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: LEGS

TEACHER'S

PART NO: TT-6/a to 6/d

PRODUCT: TABLE

PRODUCT NO.: ME-76.06.02 (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT - 6/a to 6/d from Machining Department

MINIMUM DIMENSIONS:

FINISHED DIMENSIONS: 50 x 50 x 740 NO. OF PARTS/UNIT PRODUCT: 4

SUB-ASSEMBLY:

S.A. NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002/a	Spray Stain, 2 Edges	1		60	60	1.667	Spray Gun		
5-002/b	- do -	1		60	60	1.667	- do -		
5-003/a	Spray Wash Coat, Two Edges	1		60	60	1.667	- do -		
5-003/b	- do -	1		60	60	1.667	- do -		
5-004	Hand (Scuff) Sanding	1		90	90	1.111	None		212
5-005	Filling	4		50	12	2.000	Filling Line		
5-006/a	Spray Sealer, Two Edges	1		60	60	1.667	Spray Gun		
5-006/b	- do -	1		60	60	1.667	- do -		
5-008	Sand Sealer Coat	1		80	80	1.250	None		
5-010/a	Spray First Lac. Coat, Two Edges	1		60	60	1.667	Spray Gun		
5-010/b	- do -	1		60	60	1.667	- do -		
5-011/a	Spray Second Lac. Coat Two Edges	1		60	60	1.667	- do -		
5-011/b	- do -	1		60	60	1.667	- do -		
5-996	Repair and Touch-Up	1		30	30	3.333	None		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: BOTTOM RAIL, FRONT

PART NO: TT - 7

TEACHER'S PRODUCT: TABLE

ME-76.06.02  
PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 38 x 175 x 3000, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION: 38 x 85 x 1495

FINISHED DIMENSIONS: 25 x 75 x 1250 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: BOTTOM RAIL, FRONT

PART NO: TT- 7

PRODUCT: TABLE

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT -7 from Machining Department

FINISHED DIMENSION:

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
	****PLEASE REFER TO TOP RAIL, FRONT, TT-2, FINISHING DEPT.****								



OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: BOTTOM RAIL, SIDES, L/R

PART NO: 4T - 8 L/R

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

38 x 100 x 1800, PINE or EUCALYPTUS, Kiln Dried to 10% M.C.

ROUGH DIMENSION:

38 x 47 x 895

FINISHED DIMENSIONS:

25 x 45 x 750 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A NO.:

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MACHINING DEPARTMENT

OPIN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		100	50	1.000	Radial Arm Saw		2 pcs from one board
2-006	Rip to Rough Width	2		80	40	1.250	Straight Line Edger		2 pcs from one board
2-004	Plane 4 - Sides	2		80	40	1.250	4 - Side Planer		
2-008	Trim to final Length	1		120	120	0.833	Circular Saw, Table Type		
2-023a	Tenon One End	2		100	50	1.000	Single-End Tenoner		
2-023b	Tenon One End	2		100	50	1.000	- do -		
2-033	Stroke Sanding	1		60	60	1.667	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: BOTTOM RAIL, SIDES, L/R

TEACHER'S

ME-76.06.02

PART NO.: TT-8 L/R

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT-8, L/R from Maching Department

RAW DIMENSIONS:

FINISHED DIMENSIONS: 25 x 45 x 750 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A. NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002	Spray Stain, One Face and Edge	1		60	60	1,667	Spray Gun		
5-003	Spray Wash Coat, One Face and Edge	1		60	60	1,667	do		
5-004	Hand (Scuff) Sanding	1		90	90	1,111	None		
5-005	Filling	4		50	12	2,000	Filling Line		
5-006a	Spray Sealer, One Face and Edge	1		60	60	1,667	Spray Gun		
5-006b	do	1		60	60	1,667	do		
5-008	Sand Sealer Coat	1		80	80	1,250	None		
5-010	Spray First Lac. Coat One Face and Edge	1		60	60	1,667	Spray Gun		
5-011	Spray Second Lac. Coat One Face and Edge	1		60	60	1,667	do		
5-996	Repair and Touch - Up	1		30	30	3,333	None		

PART DESCRIPTION: FACE VENEER, FRONT PANEL

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

MATERIAL INPUT SPECIFICATIONS:

PART NO: TT-9/a

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

RAW DIMENSIONS: 1.1 x 1.20

LOGS, 200 mm Ø and larger x 1250 mm and longer, TOP GRADE Wood Species

FINISHED DIMENSIONS: 6 x 1310 x 310 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.:

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.333 cu.m.	0.833 cu.m.	0.3773	Chainsaw and Debarking Axe		
1-002	Log Cooking	1		0.104 cu.m.	0.104 cu.m.	1.2080	Log Cooking Pit		
1-003	Log Squaring	3		0.750 cu.m.	0.250 cu.m.	0.1675	Circular Saw		
1-004	Veneer Slicing	2		30 sq. meter	15 sq. meter	3.807	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	3.807	Veneer Dryer		
1-006	Veneer Jointing	1		80 sq. meter	80 sq. meter	1.428	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	1.904	Veneer Splicer		
1-008	Veneer Clipping to Size	1		180 pcs.	180 pcs.	0.556	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		220 pcs.	220 pcs.	-----	None		

OPERATIONS SEQUENCE SHEET

TEACHER'S

MF-76.06.02

PART DESCRIPTION: CORE, FRONT PANEL

PART NO.: TT - 9/b

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

6 x 1220 x 2440 Commercial Plywood (Rejects)

ROUGH DIMENSION:

6 x 320 x 1320

FINISHED DIMENSIONS:

6 x 310 x 1310 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.:

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PANEL PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-003	Panel Sawing	2		48	24	2,083	Vertical Panel Saw		3 pcs. from one plywood panel, Use the rest of panel for Drawer Bottoms

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: BOTTOM VENEER, FRONT PANEL

PART NO: TT - 9/c

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: Round Logs, 200 mm Ø (and Larger) x 1250 mm (and Longer), PINE or EUCALYPTUS (or Equivalent Species)

ROUGH DIMENSION: 1.1 x 1320 x 320

FINISHED DIMENSIONS: 1.1 x 1310 x 320

SUB-ASSEMBLY: \_\_\_\_\_

S.A NO.: \_\_\_\_\_

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.500 cu.m.	0.1250 cu.m.	0.9293	Chainsaw and Debarking Axe		
1-003	Log Squaring	3		0.875 cu.m.	0.2917 cu.m.	0.5310	Circular Saw		
1-004	Veneer Slicing	2		50 sq. meter	25 sq. meter	0.845	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		50 sq. meter	25 sq. meter	0.845	Veneer Dryer		
1-006	Veneer Jointing	1		100 sq. meter	100 sq. meter	0.422	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		75 sq. meter	75 sq. meter	0.563	Veneer Splicer		
1-008	Veneer Clipping to Size	1		180 pcs.	180 pcs.	0.556	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		260 pcs.	260 pcs.	-----	None		
1-010	Veneer Bundling	1		350 pcs.	350 pcs.	-----	None		

**OPERATIONS SEQUENCE SHEET**

TEACHER'S

ME-76.06.02

**PART DESCRIPTION:** FRONT PANEL

**PART NO.:** TT - 9

**PRODUCT:** TABLE **PRODUCT NO.:** (RIL-Rev.)

**MATERIAL INPUT SPECIFICATIONS:** TT-9/a; TT-9/b and TT-9/c, from Veneer Production and Panel Production Department

**ROUGH DIMENSION:** **FINISHED DIMENSIONS:** 8 x 1310 x 310 **NO. OF PARTS/UNIT PRODUCT:** 1

**SHOP-ASSEMBLY:** **S.A NO.:** **PAGE:** 1 **OF:** 1 **PAGES**

**PANEL FORMING AND MACHINING DEPARTMENT**

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-005	Veneer Laying	3		50	16	2.000	Glue Spreader		
3-006	Cold Pressing	2		120	60	0.833	Cold Press		
3-008	Panel Trimming to Size	2		60	30	1.667	Vertical Spindle Moulder		
3-009a	Single Edge Banding First Edge	2		90	45	1.111	Single Edge Bander		
3-009b	Single Edge Banding Second Edge	2		90	45	1.111	- do -		
3-009c	Single Edge Banding Third Edge	2		200	100	0.500	- do -		
3-009d	Single Edge Banding Fourth Edge	2		200	100	0.500	- do -		
3-011	Trimming Excess Edge	2		200	100	0.500	Vertical Spindle Moulder		
2-030	Machine Sanding Plain Edges	2		80	40	1.250	Oscillating Edge Sander		
2-037a	Stroke Sanding Top Face	1		30	30	3.333	Double Belt Stroke Sander		
2-037b	Stroke Sanding Bottom Face	1		30	30	3.333	- do -		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: FRONT PANEL

TEACHER'S

ME-76.06.02

PART NO: TT - 9

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT - 9 from Machining Department

MAJOR DIMENSION:

FINISHED DIMENSIONS: 8 x 1310 x 310 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-005	Filling, Top Face	4		40	10	2.500	Filling Line		
5-006/a	Spray Sealer, Top Face	2		80	40	1.250	Spray Gun		
5-006/b	Spray Sealer, Bottom Face	2		80	40	1.250	- do -		
5-008	Sand Sealer Coat	2		80	40	1.250	None		
5-010/a	Spray First Lac. Coat Top Face	2		80	40	1.250	Spray Gun		
5-011/a	Spray Second Lac. Coat Top Face	2		80	40	1.250	- do -		
5-996	Repair and Touch-Up	1		30	30	3.333	None		

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OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: DRAWER CASE, TOP/BOTTOM

TEACHER'S

ME-76.06.02

PART NO: TT-10 & TT-12

PRODUCT: TABLE

PRODUCT NO.: (RIL-REV.)

MATERIAL INPUT SPECIFICATIONS: 18 x 2440 x 1220

ROUGH DIMENSION, : 18 x 405 x 776

FINISHED DIMENSIONS: 18 x 400 x 765 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: Drawer Case

S.A NO.: D/DC-03/a

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PANEL FORMING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-003	Panel Sawing	2		24	12	4.167	Vertical Panel Saw and Circular Saw Table Type		Use remnants of BB panel after cutting TT-1/c.



OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER CASE TOP

PART NO: TT - 10

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT-10 from Panel Forming Department

FINISH DIMENSION: 18 x 770 x 405

FINISHED DIMENSIONS: 18 x 765 x 400 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: Drawer Case Assembly

S.A NO.: D/DG-03/a

PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-009a	Shape one Edge	1		30	30	3.333	Vertical Spindle Moulder		
2-009b	Shape other Edge	1		30	30	3.333	- do -		
2-030	Sand Front Edge	1		40	40	2.500	Oscillating Edge Belt Sander		
2-011a	Drill Woodscrew Pilot Holes	1		50	50	2.000	Pneumatic Drills Set-up		
2-011b	- do -	1		50	50	2.000	- do -		
2-033	Stroke Sanding	1		50	50	2.000	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER CASE SIDES, L/R

PART NO: TT - 11L/R PRODUCT: TABLE PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 18 x 2440 x 1220; Commercial Blockboard

ROUGH DIMENSION: 18 x 770 x 305 FINISHED DIMENSIONS: 18 x 765 x 300 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: Drawer Case S.A NO.: D/DC-03/a PAGE: 1 OF: 1 PAGES

PANEL FORMING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-003	Panel Sawing	2		24	12	4.167	Vertical Panel Saw and Circular Saw Table Type		Use remnants of Blockboard after cutting TT -1/c.

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER CASE SIDE, L

PART NO: TT-11/L

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT - 11 L from Panel Forming Department

ROUGH DIMENSIONS: 18 x 770 x 305

FINISHED DIMENSIONS: 18 x 765 x 300 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: Drawer Case

S.A NO.: D/DC-03/a

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-009a	Shape one Edge	1		30	30	3.333	Vertical Spindle Moulder		
2-009b	Shape Other Edge	1		30	30	3.333	do		
2-030	Sand Front Edge	1		40	40	2.500	Oscillating Edge Belt Sander		
2-033	Stroke Sanding	1		50	50	2.000	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER SE SIDE, R

PART NO.: TT-11/R

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT-11/R from Panel Production Department

ROUGH DIMENSION: 18 x 770 x 305

FINISHED DIMENSIONS: 18 x 765 x 300 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: Drawer Case

S.A NO.: D/DC-03/a

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-009a	Shape One Edge	1		30	.30	3.333	Vertical Spindle Moulder		
2-009b	Shape Other Edge	1		30	30	3.333	- do -		
2-030	Sand Front Edge	1		40	40	2.500	Oscillating Edge Belt Sander		
2-011	Drill for Woodscrew Pilot Holes	1		50	50	2.000	Pneumatic Drills Set-up		
2-033	Stroke Sanding	1		50	50	2.000	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER CASE BOTTOM

PART NO: TT - 12

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT - 12 from Panel Forming Department

ROUGH DIMENSION: 18 x 770 x 405

FINISHED DIMENSIONS: 18 x 765 x 400 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: Drawer Case Assembly

S.A NO.: D/DC-03/a

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-009/a	Shape one Edge	1		30	30	3.333	Vertical Spindle Moulder		
2-009/b	Shape other Edge	1		30	30	3.333	- do -		
2-030	Sand Front Edge	1		40	30	2.500	Oscillating edge Belt Sander		
2-011	Drill Woodscrew Pilot Holes	1		50	50	2.000	Pneumatic Drills Set-Up		
2-033	Stroke Sanding	1		50	50	2.000	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER CASE

PART NO: D/DC-03/a

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: TT-10; TT-12 and TT-11 L/R from Machining Department

ROUGH DIMENSION: 1

FINISHED DIMENSIONS: 300 x 400 x 765 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_

S.A NO.: \_\_\_\_\_

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ASSEMBLING SECTION, MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNITS PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
4-00V <sub>a</sub>	Assemble Drawer Runner	1		50	50	2.000	Assembling Jig		
4-00V <sub>b</sub>	Assemble Sides to Top and Bottom	1		15	15	6.667	Assembling Jig		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER CASE

PART NO: DC-03

PRODUCT: TABLE PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: DC-03 from Assembling Section, Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002/a	Spray Stain, Two Sides and Edges	1		80	80	1.250	Spray Gun		
5-002/b	Spray Stain, Two Sides	1		100	100	1.000	- do -		
5-003/a	Spray Wash Coat, Two Sides and Edges	1		100	100	1.000	- do -		
5-003/b	Spray Wash Coat, Two Sides	1		120	120	0.833	- do -		
5-004	Hand (Scuff) Sanding	1		160	160	0.633	None		
5-005	Filling			40	10	2.500	Filling Line		
5-006/a	Spray Sealer, Two Sides Sides and Edges	1		120	120	0.833	Spray Gun		
5-006/b	Spray Sealer, Two Sides	1		140	140	0.711	- do -		
5-008	Sand Sealer Coat	1		80	80	1.250	None		
5-010/a	Spray First Lac. Coat Two Sides & Edges	1		120	120	0.833	Spray Gun		
5-010/b	Spray First Lac. Coat Two Sides	1		140	140	0.711	- do -		
5-011/a	Spray Second Lac. Coat Two Sides & Edges	1		120	120	0.833	- do -		
5-011/b	Spray 2nd Lac. Coat 2 Sides	1		140	140	0.711	- do -		
5-996	Repair and Touch-Up	1		40	40	2.500	None		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: DRAWER CASE SUPPORT FILLET

PART NO.: TT - 13

TEACHER'S PRODUCT: TABLE PRODUCT NO.: (RIL-Rev.) ME-76 06.02

MATERIAL INPUT SPECIFICATIONS: 38 x 100 x shorts, RL, PINE or EUCLAYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION, 1 FINISHED DIMENSIONS: 45 x 45 x 360 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_ S.A. NO.: \_\_\_\_\_ PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-006	Rip to Rough Width	2		80	40	1.250	Straight Line Edger		
2-004	Plane to Shape	2		60	30	1.667	4 - Side Planer		
2-008	Cut to Final Length	1		100	100	1.000	Circular Saw, Table Type		
2-037	Hand Sanding	1		100	100	1.000	None		



OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER CASE SUPPORT FILLET

PART NO.: TT - 13

PRODUCT: TABLE

PRODUCT NO.: (RII.-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TT-13 from Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 45 x 45 x 360 NO. OF PARTS/UNIT PRODUCT: 1

FIN-ASSEMBLY:

S.A. NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-006	Spray Sealer, One Face	1		150	150	0.667	Spray Gun		

PART DESCRIPTION: DRAWER RUNNER

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

MATERIAL INPUT SPECIFICATIONS: 25 x 80 x 2400

PART NO: TT - 14 PRODUCT: TABLE PRODUCT NO.: (RII-Rev.)  
PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION: 20 x 80 x 7.5

FINISHED DIMENSIONS: 15 x 74 x 7.20 NO. OF PARTS/UNIT PRODUCT: 4

SUB-ASSEMBLY: Drawer Case

S.A NO.: DC-03

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		80	40	1.250	Radial Arm Saw		3 pcs. in one board
2-006	Rip to Rough Length	2		80	40	1.250	Straight Line Edger		
2-004	Plane 4 - Sides	2		40	20	2.500	Thickness Planer		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: DRAWER RUNNER

TEACHER'S

ME-76.06.02

PART NO.: TT - 14

PRODUCT: TABLE

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS: TT - 14 from Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 15 x 74 x 720

NO. OF PARTS/UNIT PRODUCT: 4

APP-ASSEMBLY: Drawer Case

S.A NO.: DC-03

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-006/p	Spray Sealer, 3 Edges	1		120	120	0.833	Spray Gun		
5-006/b	- do -	1		120	120	0.833	- do -		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: DRAWER FRONT

TEACHER'S

ME-76.06.02

PART NO.: TT - 15

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 18 x 2440 x 1220, Commercial Blockboard

ROUGH DIMENSION: 18 x 136 x 367

FINISHED DIMENSIONS: 18 x 131 x 362 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: Drawer

S.A NO.: D/DC-03/b

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PANEL FORMING AND MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-003	Panel Sawing to Rough Size	2		36	18	2.778	Vertical Panel Saw		Use rest of Panel for classroom cupboard parts.
2-009	Edge Shape to Final Size	1		50	50	2.000	Vertical Spindle Moulder		
2-025	Rout Handhold	1		80	80	1.250	Heavy Duty Router		
2-028/a	Dovetail One Edge	1		30	30	3.333	Dovetailing Machine		
2-028/b	Dovetail Other Edge	1		30	30	3.333	- do -		
2-024	Groove for Drawer Bottom	1		50	50	2.000	Circular Saw, Table Type		
2-033	Stroke Sanding	1		80	80	1.250	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER BACK

PART NO.: TT - 16

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 25 x 125 x 1800, PINE or EUCALYPTUS, Kiln-Dried, to 10% M.C.

RAW DIMENSION: 25 x 125 x 1800

FINISHED DIMENSIONS: 15 x 115 x 362 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: Drawer

S.A NO.: D/DC-03/b

PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		140	70	0.714	Radial Arm Saw		5 pcs in one board
2-006	Rip to Rough Width	2		120	60	0.833	Straight Line Edger		
2-003	2 - Side Planer	2		80	40	1.250	Thicknessing Planer		
2-009	Shaping 2-Edges	1		80	80	1.250	Vertical Spindle Moulder		
2-008	Trim to Final Length	1		150	150	0.667	Circular Saw, Table Type		
2-026	Cut Clearance for Drawer Sides	1		40	40	2.500	Dado Saw		
2-033	Stroke Sanding	1		100	100	1.000	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER BOTTOM

PART NO.: TT - 17

PRODUCT: TABLE

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS: 6 mm x 1220 x 2440, Commercial Plywood (Rejects)

ROUGH DIMENSION: 6 x 342 x 143 FINISHED DIMENSIONS: 6 x 342 x 143 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: Drawer S.A NO.: D/DC-03/b PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-008	Panel Sawing	2		100	50	1.000	Vertical Panel Saw and Circular Saw Table Type		Use Remnants of Panels after cutting for cup- board back cover.

OPERATIONS SKOUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER SIDES

PART NO.: TT - 18

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 25 x 750 x 2400, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION: 15 x 136 x 755

FINISHED DIMENSIONS: 15 x 131 x 750 NO. OF PARTS/UNIT PRODUCT: 4

SUB-ASSEMBLY: Drawer

S.A NO.: D/DC-03/b

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0.833	Radial Arm Saw		3 pcs in one board
2-006	Rip to Rough Width	2		100	50	1.000	Straight Line Edger		
2-005	Planer- Matching	2		80	40	1.250	4 - Side Planer		
2-008	Trim To Final Length	1		120	120	0.833	Circular Saw, Table Type		
2-024	Groove for Drawer Bottom	1		40	40	2.500	- do -		
2-026	Cut Clearance for Drawer Back	1		40	40	2.500	Dado Saw		
2-028	Dove-tail One End	1		30	30	3.333	Dove-tailing Machine		
2-033	Stroke Sanding	1		80	80	1.250	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.02

PART DESCRIPTION: DRAWER

PART NO.: D-03

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: TT-15; TT-16; TT-17; TT-18 and TT-19 from Machining Department

ROUGH DIMENSIONS:

FINISHED DIMENSIONS: 131 x 162 x 756 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: Drawer

S.A NO.: D/DC-03/b

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ASSEMBLING SECTION, MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCFSS RECOVERY	REMARKS
4-001	Assemble Drawer	1		20	20	5.000	Drawer Assembling Jig		Use nails PVA Glue for ; D. Sides to D. Front D. Back to D. Sides and D. Bottom to D. Back.



OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: DRAWER

TEACHER'S

ME-76.06.02

PART NO: D - 03

PRODUCT: TABLE

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

D-03 from Assembling Section, Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 111 x 362 x 756

NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

Drawer

S.A NO.: U/DC-03/b

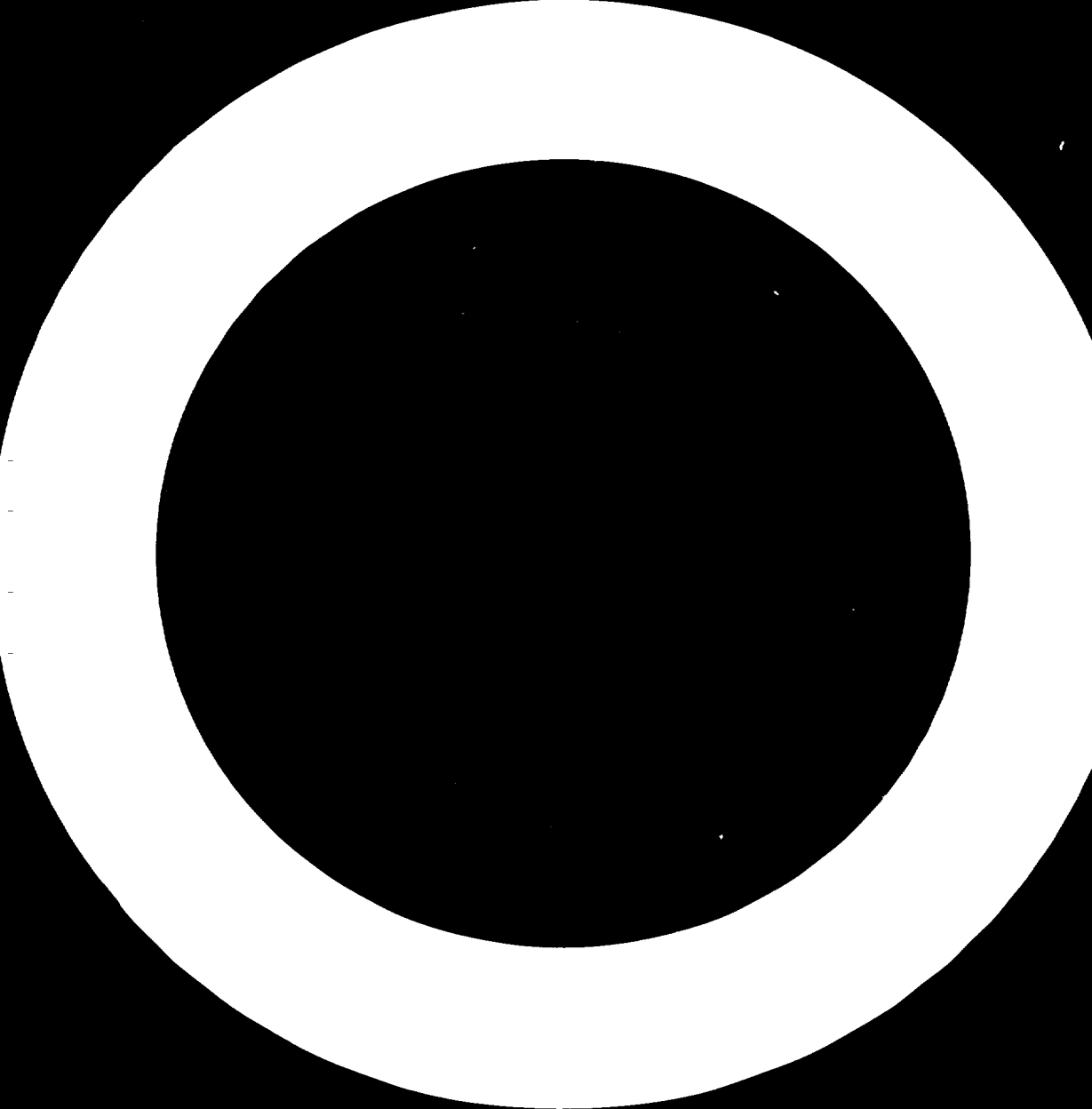
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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002	Spray Stain, Drawer Front and Edges	1		120	120	0.833	Spray Gun		
5-003	Spray Wash Coat, Drawer Front and Edges	1		150	150	0.667	- do -		
5-004	Hand (Scuff) Sanding	1		200	200	0.500	NONE		
5-005	Filling (Drawer Front only)	1		80	80	1.250	Drawer Filling Line		
5-006/a	Spray Sealer, Drawer Front	1		150	150	0.667	Spray Gun		
5-006/b	Spray Sealer, Drawer Body	1		60	60	1.667	- do -		
5-008	Sand Sealer Coat	1		100	100	1.000	None		
5-010	Spray First Lac. Coat, Front and Edge only	1		150	150	0.667	Spray Gun		
5-011	Spray Second Lac. Coat Front and Edges only	1		150	150	0.667	- do -		
5-996	Repair and Touch-Up	1		50	50	2.000	None		



A P P E N D I X VII - C

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OPERATIONS SEQUENCE SHEETS

for

TEACHER'S CHAIR

ME 76.06.03 (RIL - Rev.)

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: FRONT LEG, LEFT

PART NO: TC - 1

PRODUCT: CHAIR

PRODUCT NO.: (RIL-REV.)

MATERIAL INPUT SPECIFICATIONS: 38 x 125 x 2400, PINE OR EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION: 38 x 58 x 475

FINISHED DIMENSIONS: 25 x 50 x 450 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A NO.:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut To Rough Length	2		120	50	1,000	Radial Arm Saw		5 pcs. from one board
2-006	Rip to Rough Width	2		80	40	1,250	Straight Line Edger		2 pcs. from one board
2-004	Plane 4-Sides	2		100	50	1,000	4-Side Planer		
2-008	Trim to Final Length	1		100	100	1,000	Circular Saw, Table Type		
2-021/a	Mortise for Top Rail	1		50	50	2,000	Heavy Duty Router		
2-021/b	Mortise for Bottom Rail	1		50	50	2,000	- do -		
2-011/a	Drill for Dowel Holes	1		50	50	2,000	Pneumatic Drills Set-Up		
2-011/b	Drill for Dowel Holes	1		50	50	2,000	- do -		
2-033	Stroke Sanding	1		60	60	1,667	Double Belt Stroke Sander		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: FRONT LEG, RIGHT

PART NO: TC - 2

PRODUCT: CHAIR

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS:

38 x 125 x 2400, PINE OR EUCALYPTUS, kiln-Dried to 10% M.C.

ROUGH DIMENSION: 38 x 58 x 475

FINISHED DIMENSIONS: 25 x 50 x 450 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A NO.:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	50	1,000	Radial Arm Saw		5 pcs. from one board
2-006	Rip to Rough Width	2		80	40	1,250	Straight Line Edger		2 pcs. from one board
2-004	Plane 4 - Sides	2		100	50	1,000	4 - Side Planer		
2-008	Trim to Final Length	1		100	100	1,000	Circular Saw, Table		
							Type		
2-021/a	Mortise for Top Rail	1		50	50	2,000	Heavy Duty Router		
2-021/b	Mortise for Bottom Rail	1		50	50	2,000	- do -		
2-011/a	Drill for Dowel Holes	1		50	50	2,000	Pneumatic Drills Set-		
							Up		
2-011/b	Drill for Dowel Holes	1		50	50	2,000	- do -		
2-033	Stroke Sanding	1		60	60	1,667	Double Belt Stroke		
							Sander		

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: BOTTOM RAIL, FRONT/BACK

PART NO: TC - 3

PRODUCT: CHAIR

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TC - 3 from Machining Department

ROUGH DIMENSION, :

FINISHED DIMENSIONS: 20 x 40 x 420 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002/a	Spray Stain, 1 Face & Edge	1		100	100	1.000	Spray Gun		
5-002/b	- do -	1		120	120	0.833	- do -		
5-003/a	Spray Wash Coat, 1 Face and Edge	1		100	100	1.000	- do -		
5-003/b	- do -	1		120	120	0.833	- do -		
5-004	Hand (Scuff) Sanding	1		150	150	0.667	None		
5-005	Filling	4		80	20	1.250	Filling Line		
5-006/a	Spray Sealer, 1 Face and Edge	1		100	100	1.000	Spray Gun		
5-006/b	- do -	1		100	100	1.000	- do -		
5-008	Sand Sealer Coat	1		120	120	0.833	None		
5-010/a	Spray first Lac. Coat, 1 Face and Edge	1		90	90	1.111	Spray Gun		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: BOTTOM RAIL, FRONT/BACK

PART NO: TC - 3

PRODUCT: CHAIR

PRODUCT NO.: (RIL - Rev.

MATERIAL INPUT SPECIFICATIONS:

TC - 3 from Machining Department

ROUGH DIMENSION, :

FINISHED DIMENSIONS: 20 x 40 x 420 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-010/b	Spray first Lac. Coat,								
	1 Face and Edge	1		90	90	1.111	Spray Gun		
5-011/a	Spray 2nd Lac. Coat,								
	1 Face and Edge	1		90	90	1.111	- do -		
5-011/b	- do -	1		90	90	1.111	- do -		
5-996	Repair and Touch-up	1		60	60	1.667	None		

PART DESCRIPTION: BOTTOM RAIL, SIDES, L/R

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

MATERIAL INPUT SPECIFICATIONS:

25 x 100 x 1800, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

PART NO.: TC-4, L/R

PRODUCT: CHAIR

PRODUCT NO.: (RIL-Rev.)

ROUGH DIMENSION:

25 x 47 x 410

FINISHED DIMENSIONS:

20 x 40 x 400

NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0.833	Radial Arm Saw		4 pcs. in one board
2-006	Rip to Rough Width	2		100	50	1.00	Straight Line Edger		2 pcs. in one board
2-004	Plane 4 - Sides	2		80	40	1.250	4 - Side Planer		
2-008	Trim to Final Length	1		120	120	0.833	Cross-Cut Saw, Table Type		
2-023	Tenon One End	1		80	80	1.250	Single End Tenoner		
2-023	Tenon other End	1		80	80	1.250	- do -		
2-033	Stroke Sanding	1		80	80	1.250	Double Belt Sander		

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PART DESCRIPTION: SEAT FRAME, FRONT RAIL

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

MATERIAL INPUT SPECIFICATIONS:

25 x 125 x 1800, FINE or EUCALYPTUS, Kiln Dried to 10% M.C.

PART NO: TC - 5

PRODUCT: CHAIR

PRODUCT NO.: (PIL-Rev.)

ROUGH DIMENSION:

25 x 53 x 435

FINISHED DIMENSIONS:

20 x 45 x 420

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0.833	Radial Arm Saw		4 pcs. in one board
2-006	Rip to Rough Width	2		100	50	1.000	Straight Line Edger		2 pcs. in one board
2-004	Plane 4 - Sides	2		80	40	1.250	4 - Side Planer		
2-008	Trim to final length	1		120	120	0.833	Cross - cut Saw, Table Type		
2-01/a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set - up		
2-01/b	Drill for Dowel Holes	1		50	50	2.000	- do -		
2-033	Stroke Sanding	1		80	80	1.250	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: SEAT FRAME, FRONT RAIL

PART NO: TC - 5

PRODUCT: CHAIR

PRODUCT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TC - 5 from Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 20 x 45 x 420 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNITS PRODUCE	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002/a	Spray Stain,								
	1 Face and Edge	1		100	100	1,000	Spray Gun		
5-002/b	Spray Stain, 1 Face	1		120	120	0,833	- do -		
5-003/a	Spray Wash Coat,								
	1 Face and Edge	1		100	100	1,000	- do -		
5-003/b	Spray Wash Coat, 1 Face	1		120	120	0,833	- do -		
5-004	Hand (Scuff) Sanding	1		150	150	0,667	None		
5-005	Filling	4		80	20	1,250	Filling Line		
5-006/a	Spray Sealer,								
	1 Face and Edge	1		100	100	1,000	Spray Gun		
5-006/b	Spray Sealer, 1 Face	1		100	100	1,000	- do -		
5-008	Sand Sealer Coat	1		120	120	0,833	None		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: SEAT FRAME, FRONT RAIL

PART NO: TC - 5

PRODUCT: CHAIR

PRODUCT NO.: (RIL- Rev.)

MATERIAL INPUT SPECIFICATIONS: TC - 5 from Machining Department

ROUGH DIMENSION: FINISHED DIMENSIONS: 20 x 45 - 420 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: S.A NO.: PAGE: 2 OF: 2 PAGES

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-010/a	Spray first Lac. Coat, 1 Face and Edge	1		90	90	1.111	Spray Gun		
5-010/b	Spray first Lac. Coat, 1 Face	1		90	90	1.111	- do -		
5-011/a	Spray Second Lac. Coat, 1 Face and Edge	1		90	90	1.111	- do -		
5-996	Touch-up and Repair	1		60	60	0.667	None		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: SEAT FRAME, SIDE RAIL, L or R

PART NO: TC-7 & TC-8 PRODUCT: CHAIR PRODUCT NO. (K11-Rev.)

MATERIAL INPUT SPECIFICATIONS:

25 x 75 x 2400, PINE OR EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION:

25 x 75 x 390

FINISHED DIMENSIONS: 20 x 75 x 380 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		150	75	0.667	Radial Arm Saw		6 pcs. in one board
2-006	Rip to Rough Width	2		120	60	0.833	Straight Line Edger		2 pcs. in one board
2-004	Plane 4 - Sides	2		100	50	1.000	4 - Side Planer		
2-008	Trim to Final Length	1		150	150	0.667	Cross - cut Saw, Table Type		
2-021/a	Tenon One End	2		100	50	1.000	Single End Tenoner		
2-023/b	Tenon other End	2		100	50	1.000	- do -		
2-033	Stroke Sanding	1		80	80	1.250	Double Belt Stroke Sander		

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PART DESCRIPTION: SEAT SLAT, FRONT/BACK

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76,06.03

MATERIAL INPUT SPECIFICATIONS:

25 x 125 x 1800, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

PART NO.: TC-9 & TC-11 PRODUCT: CHAIR PRODUCT NO.: (RIL-Rev.)

ROUGH DIMENSION:

25 x 125 x 435

FINISHED DIMENSIONS: 20 x 120 x 420 NO. OF PARTS/UNIT PRODUCT: 2 P

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0.833	Radial Arm Saw		4 pcs. in one board
2-006	Rip to Rough Width	2		120	60	0.833	Straight Line Edge		
2-004	Plane 4 - Sides	1		80	80	1.250	4 - Side Planer		
2-008	Trim to Final Length	1		120	120	0.833	Cross - cut Saw, Table Type		
2-011/a	Drill for Woodscrew						Pneumatic Drills		Use Countersink
	Holes	1		50	50	2.000	Set - up		Drill Bit
2-011/b	do	1		50	50	2.000	do		do
2-033	Stroke Sanding	1		80	80	1.250	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: SEAT SLAT, MIDDLE

PART NO: TC - 10

PRODUCT: CHAIR

PROJECT NO.: (RII-Rev.)

MATERIAL INPUT SPECIFICATIONS: 25 x 125 x 1800, PINE or EUCLAYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION: 25 x 125 x 435

PINISHED DIMENSIONS: 20 x 120 x 420 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
	*****PLEASE REFER TO SEAT SLAT, FRONT/BACK, TC -9 & TC - 11*****								





OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: SEAT SUPPORT FILLET

PART NO: TC - 12

PRODUCT: CHAIR

PRODUCT NO.: (RIL-REV.)

MATERIAL INPUT SPECIFICATIONS: 25 x 100 x 2400, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSIONS: 25 x 100 x 390

FINISHED DIMENSIONS: 20 x 20 x 380 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNITS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0,833	Radial Arm Saw		6 pcs. in one board
2-006	Rip to Rough Width	2		100	50	1,000	Straight Line Edger		4 pcs. in one board
2-004	Plane 4 - Sides	2		80	40	1,250	4 - Side Planer		
2-008	Trim to Final Length	1		120	120	0,833	Cross - cut Saw, Table Type		
2-011/a	Drill for Woodscrew						Pneumatic Drills		Use Countersink
	Holes	1		50	50	2,000	Set - Up		Drill Bit
2-011/b	Drill for Woodscrew						- do -		
	Pilot Holes	1		50	50	2,000			
2-033	Stroke Sanding	1		80	80	1,250	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: REAR LEG, LEFT/RIGHT

PART NO: TC - 13 L/R PRODUCT: CHAIR PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 38 x 115 x 2700, PINE or EUCLAYPTUS, Kilo-Dried to 10% M.C.

ROUGH DIMENSION: 38 x 55 x 810 FINISHED DIMENSIONS: 25 x 50 x 800 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: S.A NO.: PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		100	50	1.00	Radial Arm Saw		3 pcs. in one board
2-006	Rip to Rough Width	2		80	40	1.250	Straight Line Edger		2 pcs. in one board
2-004	Plane 4 - Sides	2		80	40	1,250	4 - Sides Planer		
2-008	Trim to Final Length	1		100	100	1,000	Cross - cut Saw, Table Type		
2-021/a	Mortise for Top Rail	1		50	50	2,000	Heavy Duty Router		
2-021/b	Mortise for Bottom Rail	1		50	50	2,000	- do -		
2-011/a	Drill for Dowel Holes	1		50	50	2,000	Pneumatic Drills Set-up		
2-011/b	Drill for Dowel Holes	1		50	50	2,000	- do -		
2-033	Stroke Sanding	1		60	60	0,667	Double Belt Stroke Sander		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: BACK REST FILLET, L/R

PART NO: TC-14 L/R

PRODUCT: CHAIR

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

25 x 100 x RL (Shorts), PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION:

25 x 85 x 160

FINISHED DIMENSIONS:

20 x 40 x 150

NO. OF PARTS/UNIT PRODUCT:

2

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATE PROCESS RECOVERY	REMARKS
2-001	Rip to Rough Width	2		120	60	0.833	Straight Line Edger		As many as board length allows
2-005	Planer Matching	2		80	40	1.250	4 - Side Planer		2 pcs. in one board
2-008	Trim to Final Shape	1		120	120	0.833	Cross - cut Saw, Table Type		
2-011/a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set - Up		
2-011/b	Drill for Woodscrew Pilot Holes	1		50	50	2.000	- do -		
2-037	Hand Sanding	1		80	80	2.000	None		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

PART DESCRIPTION: BACK REST PANEL

PART NO.: TC - 15

PRODUCT: CHAIR

PRODUCT NO.: (RFL-Rev.)

MATERIAL INPUT SPECIFICATIONS: 6 mm x 1220 x 2440, Commercial Plywood (Rejects)

ROUGH DIMENSION: 18 x 350 x 440

FINISHED DIMENSIONS: 15 x 151 x 420 NO. OF PARTS/UNIT PRODUCT: 1 P.

SUB-ASSEMBLY:

S.A. NO.:

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PANEL FORMING AND MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-003	Panel Sawing to Rough						Panel Saw & Cross-cut		
	Width and Length	2		120	60	0.833	Saw, Table Type		15 pcs. in one board
3-006	Cold Pressing	2		60	30	1.667	Cold Press		Use Pressing Mold
									Hand Brush Glue
2-008	Cut to Final Length	1		160	160	0.633	Cross-cut Saw		
							Table Type		Use cutting jig
2-006	Trim to Final Width	1		100	100	1.000	Radial Arm Saw		2 pcs in one pc. of
									molded panel
2-011	Drill for Woodscrew						Pneumatic Drill		Use Countersink
	Holes	1		50	50	2.000	Set-up		Drill Bit
2-030	Edge Sanding	1		150	150	0.667	Oscillating Edge		
							Belt Sander		
2-037	Hand Sanding	1		100	100	1.000	None		

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OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: BACK REST PANEL

TEACHER'S

ME-76.06.03

PART NO: TC - 15

PRODUCT: CHAIR

PRODUCT NO.: (11-Rev.)

MATERIAL INPUT SPECIFICATIONS: TC - 15 from Machining Department

ROUGH DIMENSION: \_\_\_\_\_ FINISHED DIMENSIONS: 15 x 151 x 420 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_ S.A NO.: \_\_\_\_\_ PAGE: 1 OF: 2 PAGES

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002/a	Spray Stain,								
	1 Face and Edge	1		150	150	0.667	Spray Gun		
5-002/b	Spray Stain,								
	1 Face	1		150	150	0.667	- do -		
5-003/a	Spray Wash Coat,								
	1 Face and Edge	1		180	180	0.556	- do -		
5-004/b	Spray Wash Coat,								
	1 Face	1		180	180	0.556	- do -		
5-004	Hand (Scuff) Sanding	1		120	120	0.833	None		
5-005	Filling	4		100	25	1.000	Filling Line		
5-006/a	Spray Sealer,								
	1 Face and Edge	1		150	150	0.667	Spray Gun		

PART DESCRIPTION: BACK REST PANEL

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

MATERIAL INPUT SPECIFICATIONS:

TC - 15 from Maching Department

PART NO.: TC - 15

PRODUCT: CHAIR

PRODUCT NO.: (R11-Rev.)

ROUGH DIMENSION:

FINISHED DIMENSIONS: 15 x 151 x 420 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002/b	Spray Sealer,								
	1 Face	1		150	150	0.667	Spray Gun		
5-008	Sand Sealer Coat	1		120	120	0.833	None		
5-01/a	Spray first Lac. Coat,								
	1 Face and Edge	1		120	120	0.833	Spray Gun		
5-010/b	Spray first Lac. Coat,								
	1 Face	1		120	120	0.833	- do -		
5-011/a	Spray 2nd Lac. Coat,								
	1 Face and Edge	1		120	120	0.833	- do -		
5-011/b	Spray 2nd Lac. Coat,								
	1 Face	1		120	120	0.833	- do -		
5-996	Touch-up and Repair	1		80	80	1.250	None		

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OPERATIONS SEQUENCE SHEET

TEACHER'S

PART DESCRIPTION: LEFT SIDE FRAME

PART NO.: SF - L

PRODUCT: CHAIR

PRODUCT NO.: ME-76.06.03 (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS:

TC - 1; TC - /L ; TC - 7 ; TC - 12; TC - 13/L and TC - 14

ROUGH DIMENSION:

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: LEFT SIDE FRAME

S.A NO.: SF - L

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ASSEMBLING SECTION, MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
4-00/a	Assemble Back Rest								
	Fillet	1		40	40	2.500			
4-00/b	Assemble Side Rails,								Use Assembling
	Top and Bottom	1		12	12	8.333			Fixtures
4-00/c	Assemble Seat Support								
	Fillet	1		30	30	3.333			
2-037	Hand Sand	1		60	60	1.667			



PART DESCRIPTION: LEFT SIDE FRAME

OPERATIONS SEQUENCE SHEET

TEACHER'S

ME-76.06.03

MATERIAL INPUT SPECIFICATIONS:

SF - L from Assembling Section Machining Department

PART NO.: SF - L

PRODUCT: CHAIR

PRODUCT NO.: (R11-Rev.)

ROUGH DIMENSION:

LEFT SIDE FRAME

FINISHED DIMENSIONS:

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

S.A. NO.: SF - L

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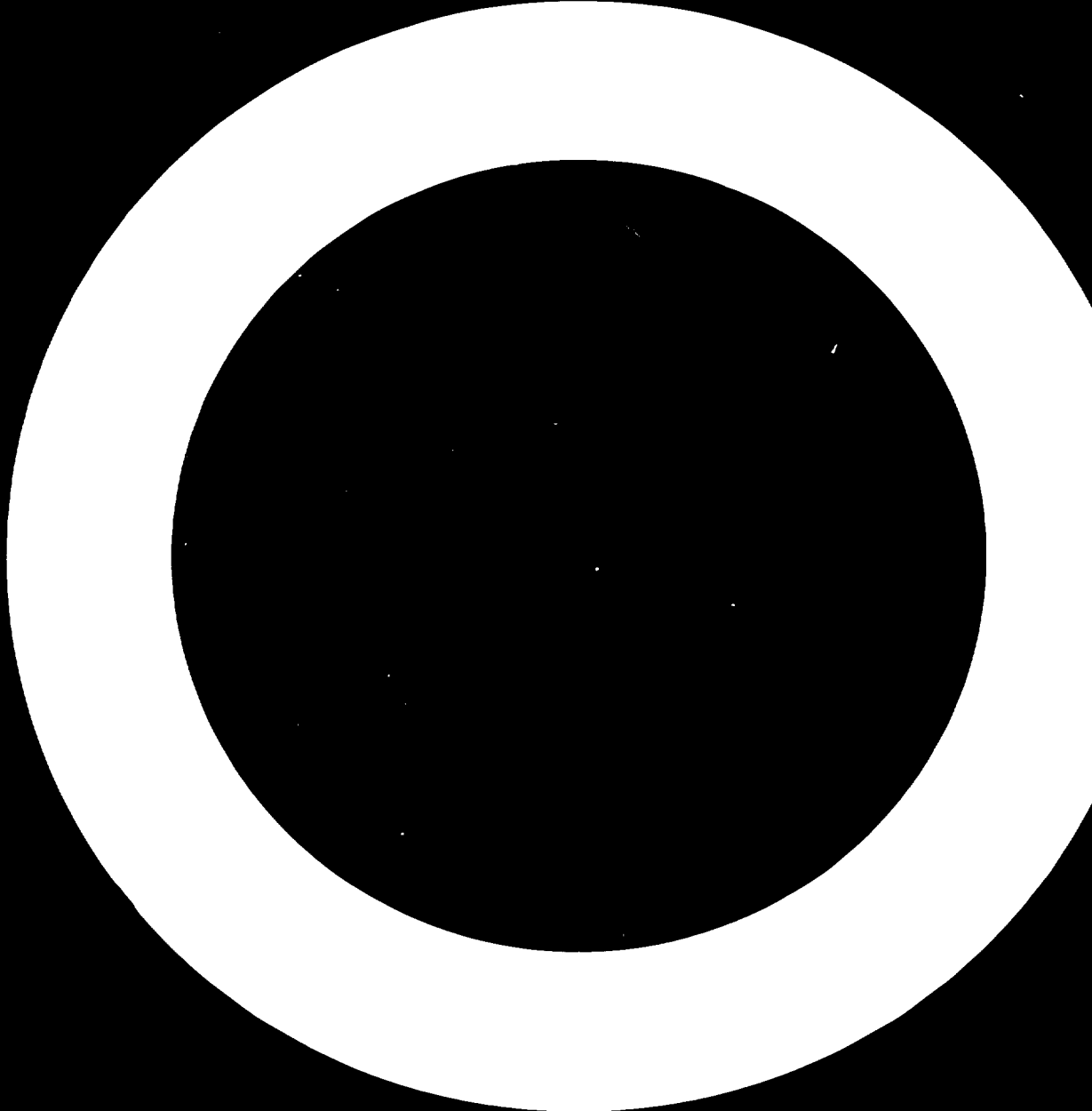
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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-002	Spray Stain	1		15	15	6.667	Spray Gun		Use Special Spraying Fixtures
5-003	Spray Wash Coat	1		20	20	5.000	- do -		- do -
5-004	Hand (Scuff) Sanding	1		30	30	3.333	None		Use #280 Sandpaper (for Stearate Sandin)
5-005	Filling	1		20	20	5.000	Filling Line		
5-006	Spray Sealer Coat	1		20	20	5.000	Spray Gun		
5-008	Sand Sealer Coat	1		30	30	3.333	None		Use #280 Sandpaper (for Stearate Sandin)
5-010	Spray first Lac. Coat	1		20	20	5.000	Spray Gun		
5-011	Spray 2nd Lac. Coat	1		20	20	5.000	- do -		
5-996	Repair Touch - Up	1		30	30	3.333	None		







A P P E N D I X VII - D

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OPERATIONS SEQUENCE SHEETS  
for  
LOW-LEVEL CLASSROOM CUPBOARD  
ME 76.06.04 (RIL - Rev.)

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OPERATIONS SEQUENCE SHEET

LOW-LEVEL

PART DESCRIPTION: FACE VENEER DOOR, LEFT/RIGHT

PART NO: CC-1/a; CD-2/a PRODUCT: CUPBOARD PRODUCT NO.: ME-76.06.0 (RIL-Rev.)

RAW MATERIAL INPUT SPECIFICATIONS: Round Logs, 200 mm Ø (or larger) x 1,800 mm (or longer), TOP GRADE WOOD SPECIES.

ROUGH DIMENSION: 1.1 x 620 x 825

FINISHED DIMENSIONS: 20 x 610 x 815 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A NO.:

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.333 cu.m.	0.333 cu.m.	0.1691	Chainsaw and Debarking Axe		
1-002	Log Cooking	1		0.104 cu.m.	0.104 cu.m.	0.5413	Log Cooking Pit		
1-003	Log Squaring	3		0.750 cu.m.	0.250 cu.m.	0.0751	Circular Saw		
1-004	Veneer Slicing	2		30 sq. meter	15 sq. meter	1.7060	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	1.7060	Veneer Dryer		
1-006	Veneer Jointing	1		80 sq. meter	80 sq. meter	0.6398	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	0.8530	Veneer Splicer		
1-008	Veneer Clipping to Size	1		130 pcs	130 pcs	0.7690	Veneer Clipper		
1-009	Veneer Grading./ Sorting	1		200 pcs	200 pcs	-----	None		
1-010	Veneer Bundling	1		300 pcs	300 pcs	-----	None		



OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: BOTTOM VENEER DOOR, LEFT/RIGHT

LOW-LEVEL

ME-76.06.04

PART NO: CC-1/c; CC-2/c PRODUCT: CUPBOARD PRODUCT NO.: (RIL-Rev.)

MATERIAL UNIT SPECIFICATIONS: Round Logs, 200 mm  $\phi$  (or larger) x 1800 mm (or longer) PINE or EUCALYPTUS or Equivalent Species.

ROUGH DIMENSION: 1.1 x 620 x 825

FINISHED DIMENSIONS: 20 x 608 x 813 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: Doors, Left/Right

S.A NO.: CC-1/2-R/L

PAGE: 1 OF: 1 PAGES

VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.333 cu.m.	0.083 cu.m.	0.1691	Chainsaw and Debarking Axe		
1-003	Log Squaring	3		0.730 cu.m.	0.250 cu.m.	0.0751	Circular Saw		
1-004	Veneer Slicing	2		30 sq. meter	15 sq. meter	1.7060	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	1.7060	Veneer Dryer		
1-006	Veneer Jointing	1		80 sq. meter	80 sq. meter	0.6398	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	0.8530	Veneer Splicer		
1-008	Veneer Clipping to Size	1		130 pcs	130 pcs	0.7690	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 pcs	200 pcs	-----	None		
1-010	Veneer Bundling	1		300 pcs	300 pcs	-----	None		



OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: DOOR, LEFT/RIGHT

LOW-LEVEL

ME-76.06.04

PART NO: CC-2; CC-1

PRODUCT: CUPBOARD

PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: CC-1/a, b & c and VS-1 from Veneer Production Department and Panel Forming Department

ISSUE DIMENSIONS: 22 x 615 x 820

FINISHED DIMENSIONS: 20 x 610 x 815 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: Door, Left/Right

S.A NO.: CC-1 L/R

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PANEL FORMING AND MACHINING DEPARTMENTS

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCT	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-005	Veneer Laying	3		60	20	1.667	Glue Spreader		
3-006	Cold Pressing	2		120	60	0.833	Cold Press		
3-008	Panel Trimming to Final Size	2		70	35	1.433	Vertical Spindle Moulder		
3-009a	Veneer Band 1st Edge	2		100	50	1.000	Single Edge Banding Machine		
3-009b	Veneer Band 2nd Edge	2		100	50	1.000	- do -		
3-	Veneer Band 3rd Edge	2		200	100	0.500	- do -		
3-	Veneer Band 4th Edge	2		200	100	0.500	- do -		
3-	Trimming Excess Veneer	1		180	180	0.567	Vertical Spindle Moulder		
3-	Panel Repair	1		50	50	2.000	None		

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OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76.06.04

PART DESCRIPTION: DOOR, LEFT

PART NO: CC - 1

PRODUCT: CUPBOARD PRODUCT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS: CC - 1 from Panel Forming Department

ROUGH DIMENSION: \_\_\_\_\_ FINISHED DIMENSIONS: 20 x 610 x 815 NO. OF PARTS/UNIT PRODUCT: 1 P

TEMP-ASSEMBLY: \_\_\_\_\_ S.A. NO.: \_\_\_\_\_ PAGE: 1 OF: 1 PAGES

MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-009	Rabbet One Edge	1		60	60	1.667	Vertical Spindle Moulder		
2-015	Rout Handhold	1		80	80	1.250	Heavy Duty Router		To be done only if Routed Handholds are acceptable to customer.
2-017	Rout Hinge Seats	1		40	40	2.500	None		
2-033	Stroke Sanding	1		60	60	1.667	Double Belt Stroke Sander		
2-037	Hand Sand Edges	1		80	80	1.250	NONE		

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OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: DOOR, RIGHT

LOW-LEVEL

ME-76.06.04

MATERIAL INPUT SPECIFICATIONS:

CC-2 from Panel Forming Department

PART NO: CC - 2

PRODUCT: CUPBOARD

PRODUCT NO.: (RIL-Rev.)

ROUGH DIMENSION:

FINISHED DIMENSIONS: 20 x 610 x 815 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER JOB UNIT PRODUCE	MACHINE USED	ESTIMATE PROCESS RECOVERY	REMARKS
2-009	Rabbit One Edge	1		60	60	1.667	Vertical Spindle Moulder		
2-015	Rout Handhold	1		80	80	1.250	Heavy Duty Router		
2-017	Rout Hinge Seats	1		40	40	2.500	- do -		
2-033	Stroke Sanding	1		60	60	1.667	Double Belt Stroke Sander		
2-037	Hand Sand Edges	1		80	80	1.250	None		

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OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76.06.04

PART DESCRIPTION: DOOR, LEFT/RIGHT

PART NO: CC-1; CC-2

PRODUCT: CUPBOARD

PRODUCT NO. (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: CC-1 and CC-2 from Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 20 x 610 x 815 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A. NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTION	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-005	Filling	4		40	10	2,500	Filling Line		
5-006/a	Spray Sealer, One Face and Edge	2		80	40	1,250	Spray Gun		
5-006/b	Spray Sealer, One Face	2		80	40	1,250	- do -		
5-008	Sand Sealer Coat	1		100	100	1,000	None		
5-010/a	Spray First Lac. Coat, One Face and Edges	2		80	40	1,250	Spray Gun		
5-010/b	Spray First Lac. Coat One Face	2		80	40	1,250	- do -		
5-011/a	Spray Second Lac. coat One Face and Edges	2		80	40	1,250	- do -		
5-011/b	Spray Second Lac. Coat One Face	2		80	40	1,250	- do -		
5-996	Touch-Up and Repair	1		50	50	2,000	None		

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OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: TOP PANEL FACE VENEER

LOW-LEVEL

ME-76.06.04

PART NO.: CC-3/a

PRODUCT: CUPBOARD PRODUCT NO.: (R11,-Rev.)

MATERIAL INPUT SPECIFICATIONS:

Round Logs, 200 mm  $\phi$  (or larger) x 1800 mm (or longer), TOP GRADE WOOD SPECIE

ROUGH DIMENSION:

1.1 x 190 x 1210

FINISHED DIMENSIONS:

20 x 180 x 120

NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY:

Top Panel

S.A. NO.: CC - 3

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.133 cu.m.	0.083 cu.m.	0.0016	Chainsaw and Debarking Axe		
1-002	Log Cooking	1		0.104 cu.m.	0.104 cu.m.	0.0050	Log Cooking Pit		
1-003	Log Squaring	3		0.750 cu.m.	0.250 cu.m.	0.0007	Circular Saw		
1-004	Veneer slicing	2		30 sq. meter	15 sq. meter	0.0157	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	0.0157	Veneer Dryer		
1-006	Veneer Jointing	1		80 sq. meter	80 sq. meter	0.0059	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	0.0079	Veneer Splicer		
1-008	Veneer Clipping to Size	1		130 pcs	130 pcs	0.7690	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 pcs	200 pcs	-----	None		
1-010	Veneer Bundling	1		300 pcs	300 pcs	-----	None		

OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76.06.04

PART DESCRIPTION: CORE, TOP LEVEL

PART NO.: CC-3/b

PRODUCT: CUPBOARD

PRODUCT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS: 18 mm x 2440 x 1220 Commercial Blockboard

ROUGH DIMENSION: 18 x 1200 x 380

FINISHED DIMENSIONS: 18 x 1198 x 378 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: Top Panel

S.A NO.: CC-3

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PANEL FORMING DEPARTMENT

<u>OPRN NO.</u>	<u>DESCRIPTION OF OPERATION</u>	<u>NO. OF MEN</u>	<u>LABOUR GRADE</u>	<u>OUTPUT PER HOUR</u>	<u>OUTPUT PER MAN-HOUR</u>	<u>MACHINE HOURS PER 100 UNIT PRODUCTIONS</u>	<u>MACHINE USED</u>	<u>ESTIMATED PROCESS RECOVERY</u>	<u>REMARKS</u>
3-003	Panel Sawing to Rough Size	2		30	15	3.333	Vertical Panel Saw and Circular Saw Table Type		Cut from remainder of BB Panel after cutting CC-1/b and cc - 2/b.

OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76.06.04

PART DESCRIPTION: BOTTOM VENEER, TOP PANEL

PART NO.: CC-3/c

PRODUCT: CUPBOARD PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: Round Logs, 200 mm Ø (or larger) x 1800 mm (or longer), PINE or EUCALYPTUS or Equivalent Species:

ROUGH DIMENSION: 1.1 x 290 x 1210

FINISHED DIMENSIONS: 1.1 x 280 x 1200

PART-ASSEMBLY: Top Panel

S.A NO.: CC - 3

PAGE: 1 OF: 1 PAGES

VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCE	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.313 cu.m.	0.083 cu.m.	0.0016	Chainsaw and Debarking Axe		
1-002	Log Squaring	3		0.730 cu.m.	0.250 cu.m.	0.0007	Circular Saw		
1-004	Veneer Slicing	2		30 sq. meter	15 sq. meter	0.0157	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	0.0157	Veneer Dryer		
1-006	Veneer Jointing	2		80 sq. meter	40 sq. meter	0.0059	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	0.0079	Veneer Splicer		
1-008	Veneer Clipping to Size	1		30 pcs	30 pcs	0.7690	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 pcs	200 pcs	---	None		
1-010	Veneer Bundling	1		300 pcs	300 pcs	---	None		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: TOP PANEL

LOW-LEVEL

ME-76.06.04

PART NO.: CC - 3

PRODUCT: CUPBOARD

PRODUCT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS: CC-3/a, 3/b and 3/c and VS from Panel Forming and Veneer Production Departments

ROUGH DIMENSION: \_\_\_\_\_ FINISHED DIMENSIONS: 20 x 390 x 1200 NO. OF PARTS/UNIT PRODUCT: \_\_\_\_\_

NO. ASSEMBLY: \_\_\_\_\_

S.A. NO.: \_\_\_\_\_

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PANEL FORMING AND MACHINING DEPARTMENTS

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-005	Veneer Laying	2		60	30	1.667	Glue Spreader		
3-006	Cold Pressing	1		120	120	0.833	Cold Press		
3-008	Panel Trimming to Rough Size	1		80	80	1.250	Vertical Spindle Moulder		
3-009a	Veneer Banding, First Edge	2		150	75	0.667	Single Edge Banding Machine		
3-009b	Veneer Banding, Second Edge	2		150	75	0.667	- do -		
3-009c	Veneer Banding, Third Edge	2		180	90	0.567	- do -		
3-009d	Veneer Banding, Fourth Edge	2		180	90	0.567	- do -		
3-011	Trimming Excess Veneer	1		180	180	0.567	Vertical Spindle Moulder		
2-011a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-up		
2-011b	- do -	1		50	50	2.000	- do -		
2-011c	- do -	1		50	50	2.000	- do -		
2-013	Stroke Sanding	1		60	60	1.667	Double Belt Stroke Sander		
2-037	Hand Sand Edges	1		30	30	3.333	None		
3-996	Panel Repair	1		50	50	2.000	None		

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OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: TOP PANEL

LOW-LEVEL

ME-76.06.04

PART NO: CC - 3

PRODUCT: CUPBOARD

PRODUCT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS:

CC-3 From Machining Department

RAW DIMENSION: \_\_\_\_\_

FINISHED DIMENSIONS: 30 x 380 x 1200 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_

S.A. NO.: \_\_\_\_\_

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCT	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-005	Filling	4		40	10	2.500	Filling Line		
5-007a	Spray Sealer, One Face and Edges	2		80	40	1.250	Spray Gun		
5-007b	Spray Sealer, One Face	2		80	40	1.250	- do -		
5-008	Sand Sealer Coat	1		100	100	1.000	None		
5-017a	Spray First Lac. Coat One Face and Edges	2		80	40	1.250	Spray Gun		
5-017b	Spray First Lac. Coat One Face	2		80	40	1.250	- do -		
5-017c	Spray Second Lac. Coat One Face and Edges	2		80	40	1.250	- do -		
5-017d	Spray Second Lac. Coat One Face	2		80	40	1.250	- do -		
5-996	Touch-Up and Repair	1		50	50	2.000	None		

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PART DESCRIPTION: FACE VENEER FOR SIDE PANELS, L/R

OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76.06.04

MATERIAL INPUT SPECIFICATIONS: Round Logs, 200 mm Ø (or larger) x 1800 (or longer), TOP GRADE WOOD SPECIE,

PART NO.: CC-4-5/a PRODUCT: CUPBOARD PRODUCT NO.: (RTI-Rev.)

ROUGH DIMENSIONS: 1.1 x 390 x 890

FINISHED DIMENSIONS: 1.1 x 380 x 880 NO. OF PARTS/UNIT PRODUCT: 2

APP ASSEMBLY: Side Panels, L/R

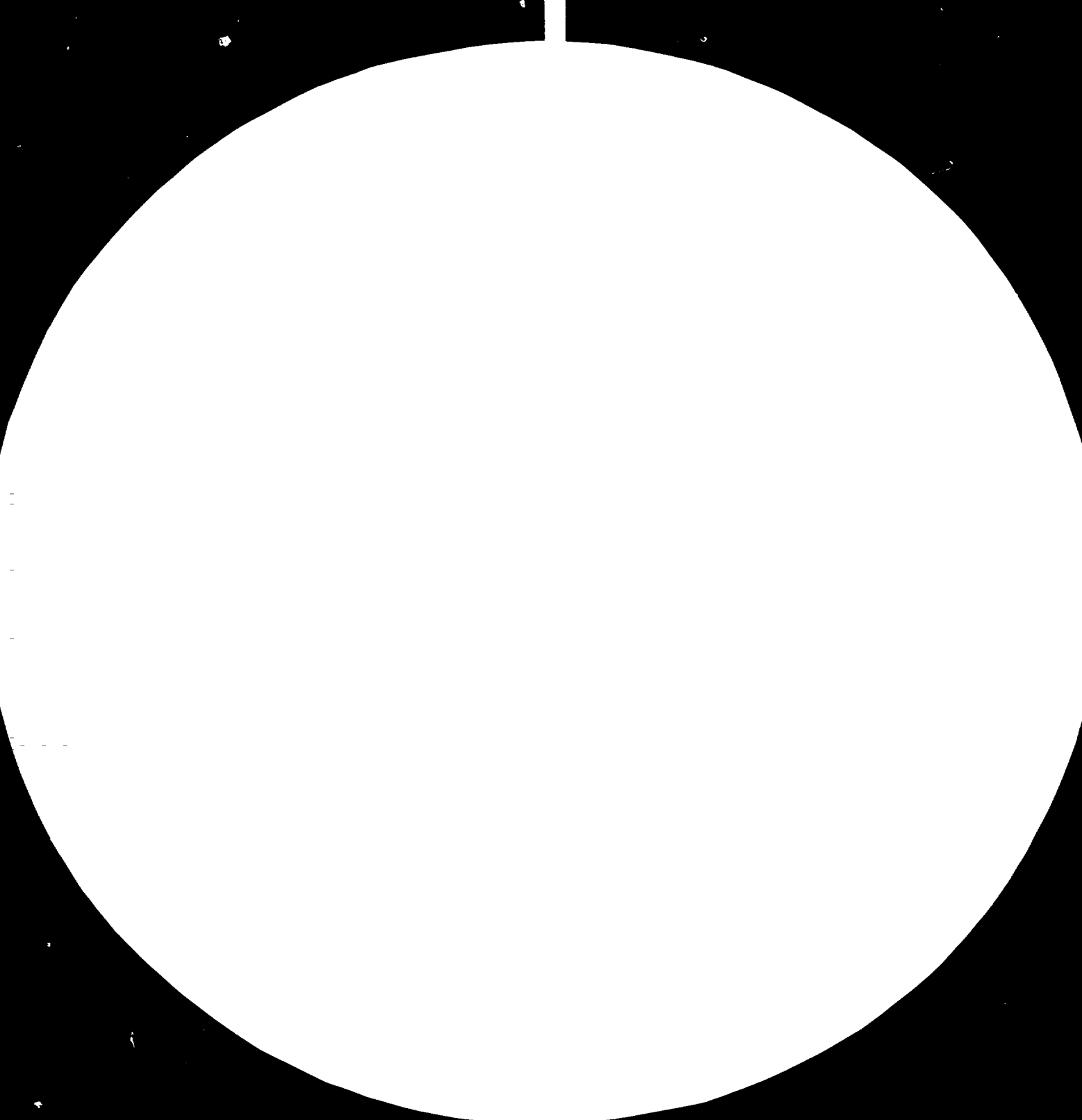
S.A NO.: CC-4/5 PAGE: 1 OF: 1 PAGES

VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.333 cu.m.	0.083 cu.m.	0.0115	Chainsaw and Debarking Axe		
1-002	Log Cooking	1		0.404 cu.m.	0.104 cu.m.	0.0367	Log Cooking Pit		
1-003	Log Squaring	3		0.750 cu.m.	0.250 cu.m.	0.0051	Circular Saw		
1-004	Veneer Slicing	2		30 sq. meter	15 sq. meter	0.1157	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	0.1157	Veneer Dryer		
1-006	Veneer Jointing	1		80 sq. meter	80 sq. meter	0.434	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	0.0579	Veneer Splicer		
1-008	Veneer Clipping to Size	1		130 pcs	130 pcs	0.769	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 pcs	200 pcs	----	None		
1-010	Veneer Bundling	1		300 pcs	300 pcs	----	None		

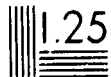








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OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: BOTTOM VENEER, SIDE PANELS, L/R

LOW-LEVEL

ME-76,06,04

PART NO.: CC-4/5-c

PRODUCT: CUPBOARD

PRODUCT NO.: (R11 Rev.)

MATERIAL INPUT SPECIFICATIONS: Round Logs, 290 mm Ø (or larger) x 1800 (or logner), PINE or EUCALYPTUS or Equivalent Species.

ROUGH DIMENSION: 1.1 x 390 x 890

FINISHED DIMENSIONS: 1.1 x 380 x 880 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: Side Panels, L/R

S.A NO.: CC-4/5

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCE	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.333 cu.m.	0.083 cu.m.	0.0011	Chainsaw and Debarking Axe		
1-003	Log Squaring	3		0.730 cu.m.	0.250 cu.m.	0.0005	Circular Saw		
1-004	Veneer Slicing	2		30 sq. meter	15 sq. meter	0.0116	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	0.0116	Veneer Dryer		
1-006	Veneer Jointing	2		80 sq. meter	40 sq. meter	0.0043	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	0.0058	Veneer Splicer		
1-008	Veneer Clipping to Size	1		30 pcs	30 pcs	3.333	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 pcs	200 pcs	----	None		
1-010	Veneer Bundling	1		300 pcs	300 pcs	----	None		

PART DESCRIPTION: SIDE PANELS, L/R

OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76.06.04

MATERIAL INPUT SPECIFICATIONS:

CC-4/5-a; b,c and VS from Veneer Productions and Panel Forming Sections

PART NO.: CC-4/5

PRODUCT: CUPBOARD PRODUCT NO.: (R11-Rev.)

ROUGH DIMENSION: \_\_\_\_\_

FINISHED DIMENSIONS: 20 x 380 x 880 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY: \_\_\_\_\_

S.A. NO.: \_\_\_\_\_

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PANEL FORMING AND MACHINING DEPARTMENTS

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCE	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-005	Veneer Laying	2		60	30	1.667	Glue Spreader		
1-006	Cold Pressing	1		120	120	0.833	Cold Press		
1-008	Panel Trimming to Final Size	1		100	100	1.000	Vertical Spindle Moulder		
1-009	Edge Banding, Front Edge	2		150	75	0.667	Single Edge, Banding Machine		
2-011/a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-up		
2-011/b	- do -	1		50	50	2.000	- do -		
2-011/c	- do -	1		50	50	2.000	- do -		
2-011/d	- do -	1		50	50	2.000	- do -		
2-011/e	- do -	1		50	50	2.000	- do -		
2-017	Rout Hinge Seats	1		40	40	2.500	Heavy Duty Router		
2-033	Stroke Sanding	1		60	60	1.667	Double Belt Stroke Sander		
2-037	Hand Sand Front Edge	1		50	50	2.000	None		
2-996	Repair and Touch-up	1		30	30	3.333	None		

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OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: SIDE PANELS, LEFT/RIGHT

LOW-LEVEL

ME-76.06.04

PART NO: CC-4; CC-5 PRODUCT: CUPBOARD PRODUCT NO.: (RIL-Rev.)  
 CC-4 and CC-5 from Machining Department

MATERIAL INPUT SPECIFICATIONS:

ROUGH DIMENSION:

FINISHED DIMENSIONS: 20 x 380 x 880 NO. OF PARTS/UNIT PRODUCT: 2

SUB-ASSEMBLY:

S.A. NO.:

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FINISHING DEPARTMENT

ORGN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-005	Filling	4		60	15	1.667	Filling Line		
5-006a	Spray Sealer, One Face & Front Edge	1		80	80	1.250	Spray Gun		
5-006b	Spray Sealer, One Face	1		80	80	1.250	- do -		
5-008	Sand Sealer Coat	1		120	120	0.833	None		
5-010a	Spray First Lac. Coat One Face & Front Edge	1		80	80	1.250	Spray Gun		
5-010b	Spray First Lac. Coat One Face	1		80	80	1.250	- do -		
5-011a	Spray Second Lac. Coat One Face & Front Edge	1		80	80	1.250	- do -		
5-011b	Spray Second Lac. Coat One Face	1		80	80	1.250	- do -		
5-996	Repair and Touch-up	1		50	50	2.000	None		

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PART DESCRIPTION: FACE VENEER BASEBOARD FRONT

OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-16.06.04

PART NO.: CC-6/a

PRODUCT: CUPBOARD

PRODUCT NO.: (R11-Rev.)

SERIAL INPUT SPECIFICATIONS: Round Logs, 200 mm Ø (or larger) x 1800 (or longer), TOP GRADE WOOD SPECIE

ROUGH DIMENSION: 1.1 x 60 x 1205

FINISHED DIMENSIONS: 1.1 x 55 x 1200

SUB-ASSEMBLY: Baseboard Front

S.A. NO.: CC-6

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCE	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.333 cu.m.	0.083 cu.m.	0.0025	Chainsaw and Debarking Axe		
1-002	Log Cooking	1		0.104 cu.m.	0.104 cu.m.	0.0079	Log Cooking Pit		
1-003	Log Squaring	3		0.750 cu.m.	0.250 cu.m.	0.0011	Circular Saw		
1-004	Veneer Slicing	2		30 sq. meter	15 sq. meter	0.0250	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	0.0250	Veneer Dryer		
1-006	Veneer Jointing	1		80 sq. meter	80 sq. meter	0.0094	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	0.0125	Veneer Splicer		
1-008	Veneer Clipping to Size	1		130 pcs	130 pcs	0.769	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 pcs	200 pcs	---	None		
1-010	Veneer Bundling	1		300 pcs	300 pcs	----	None		



OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76,06.04

PART DESCRIPTION: BOTTOM VENEER, BASEBOARD FRONT

PART NO.: CC - 6/c

PRODUCT: CUPBOARD PRODUCT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS: Round Logs, 200 mm Ø (or larger) x 1800 (or longer), PINE or EUCALYPTUS or Equivalent Species

ROUGH DIMENSION: 1.1 x 60 x 1205

FINISHED DIMENSIONS: 1.1 x 55 x 1200 NO. OF PARTS/UNIT PRODUCT: 1

JOB-ASSEMBLY: Baseboard Front

S.A NO.: CC- 6

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VENEER PRODUCTION DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTION	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
1-001	Log Preparation	4		0.333 cu.m.	0.083 cu.m.	0.0025	Chainsaw and Debarking Axe		
1-003	Log Squaring	3		0.70 cu.m.	0.250 cu.m.	0.0011	Circular Saw		
1-004	Veneer Slicing	2		30 sq. meter	15 sq. meter	0.250	Horizontal Veneer Slicer		
1-005	Veneer Drying	2		30 sq. meter	15 sq. meter	0.0250	Veneer Dryer		
1-006	Veneer Jointing	2		80 sq. meter	40 sq. meter	0.0094	Veneer Jointer (Guillotine Type)		
1-007	Veneer Splicing	1		60 sq. meter	60 sq. meter	0.0125	Veneer Splicer		
1-008	Veneer Clipping to Size	1		30 pcs	30 pcs	0.769	Veneer Clipper		
1-009	Veneer Grading/Sorting	1		200 pcs	200 pcs	---	None		
1-010	Veneer Bundling	1		300 pcs	300 pcs	---	None		

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OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76.06.04

PART DESCRIPTION: BASEBOARD FRONT

PART NO.: CC - 6 PRODUCT: CUPBOARD PRODUCT NO.: (RIL-Rev.)

MATERIAL INPUT SPECIFICATIONS: CC - 6 (a,b,6c) and VS from Veneer Production Department

ROUGH DIMENSIONS: \_\_\_\_\_ FINISHED DIMENSIONS: 20 x 55 x 1200 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_ S.A. NO.: \_\_\_\_\_ PAGE: 1 OF: 1 PAGES

PANEL FORMING AND MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTION	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
3-005	Veneer Laying	2		120	60	0.833	Glue Spreader		
3-006	Cold Pressing	1		240	240	0.420	Cold Press		
3-008	Panel Trimming to Final Size	1		160	160	0.667	Vertical Spindle Moulder		
3-009a	Edge Band, One End	2		220	110	0.450	Single Edge Banding Machine		
3-009b	Edge Band Other End	2		220	110	0.450	- do -		
2-011a	Drill for Dowel Holes	1		50	50	2.000	Pneumatic Drills Set-up		
2-011b	- do -	1		50	50	2.000	- do -		
2-033	Stroke Sanding	1		80	80	1.250	Double Belt Stroke Sander		
2-037	Hand Sand Edges	1		60	60	1.667	None		
2-996	Repair and Touch-up	1		50	50	2.000	None		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: BASBOARD FRONT

PART NO.: CC - 6

LOW-LEVEL

ME-76,06,(04

PRODUCT: CUPBOARD PRODUCT NO.: (K11-Rev.)

MATERIAL INPUT SPECIFICATIONS: CC - 6 from Machining Department

ROUGH DIMENSION: \_\_\_\_\_ FINISHED DIMENSIONS: 20 x 55 x 1200 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_ S... NO.: \_\_\_\_\_ PAGE: 1 OF: 1 PAGES

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTION	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-005	Filling	4		100	25	1.000	Filling Line		
5-006/a	Spray Sealer, Face and Ends	1		120	120	0.833	Spray Gun		
5-006/b	Spray Sealer, Back	1		120	120	0.833	- do -		
5-008	Sand Sealer Coat	1		180	180	0.560	None		
5-010/a	Spray First Lac. Coat Face and Ends	1		120	120	0.833	Spray Gun		
5-010/b	Spray First lac. Coat Back	1		120	120	0.833	- do -		
5-011/a	Spray Second Lac. Coat Face and Ends	1		120	120	0.833	- do -		
5-011/b	Spray Second lac. Coat Back	1		120	120	0.833	- do -		
5-996	Repair and Touch-up	1		60	60	1.667	None		



OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: SHELVINGS, INTERMEDIATE

LOW-LEVEL

ME-76.06.04

PART NO: CC - 7

PRODUCT: CUPBOARD

PRODUCT NO.: (RJI-Rev.)

MATERIAL INPUT SPECIFICATIONS:

CC - 7 from Machining Department

ROUGH DIMENSION:

FINISHED DIMENSIONS: 18 x 460 x 360 NO. OF PARTS/UNIT PRODUCT: 2 P

JOB-ASSEMBLY:

S.A NO.:

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-007a	Spray Sealer, Top Face and Front Edge	1		100	100	1.000	Spray Gun		
5-007b	Spray Sealer, Bottom Face	1		120	120	0.833	- do -		
5-008	2nd Sealer Coat	1		120	120	0.833	None		
5-010a	Spray Lacquer, Top Face and Front Edge	1		100	100	1.000	Spray Gun		
5-010b	Spray Lacquer, Bottom Face	1		120	120	0.833	- do -		
5-996	Touch-up and Repair	1		60	60	1.667	None		





OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76.06.04

PART DESCRIPTION: OTTOM SHELF

PART NO: CC - 8

PRODUCT: CUPBOARD

PRODUCT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS: CC-8 from Machining Department

FINISHED DIMENSIONS: 18 x 1160 x 380 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_ S.A NO.: \_\_\_\_\_ PAGE: 1 OF: 1 PAGES

FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-004a	Spray Sealer, Top Face and Front Edge			80	80	1.250	Spray Gun		
5-004b	Spray Sealer, Bottom Face	1		90	90	1.111	- do -		
5-008	Sand Sealer Coat	1		100	100	1.000	None		
5-010	Spray Lacquer, Top Face and Front Edge	1		80	80	1.250	Spray Gun		
5-996	Touch-up and Repair	1		50	50	2.000	None		



OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: DIVIDER PANEL

LOW-LEVEL

ME-76.06.04

PART NO: CC-9

PRODUCT: CUPBOARD

PRODUCT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS: CC-9 from Machining Department

BRIDGE DIMENSION: \_\_\_\_\_

FINISHED DIMENSIONS: 18 x 807 x 360 NO. OF PARTS/UNIT PRODUCT: 1

SUB-ASSEMBLY: \_\_\_\_\_

S.A. NO.: \_\_\_\_\_

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FINISHING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNITS PRODUCE	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-006/a	Spray Sealer, One Face and Front Edge	1		90	90	1.111	Spray Gun		
5-006/b	Spray Sealer, One Face	1		100	100	1.000	- do -		
5-008	Sand Sealer Coat	1		120	120	0.833	None		
5-010/a	Spray Lacquer, One Face and Front Edge	1		90	90	1.111	Spray Gun		
5-010/b	Spray Lacquer, 1 Face	1		100	100	1.000	- do -		
5-996	Repair and Touch-Up	1		60	60	1.667	None		

OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: SHELF SUPPORT FILLET

LOW-LEVEL

ME-76.06.04

PART NO: CC - 10

PRODUCT: CUPBOARD

PROJECT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS: 25 x 115 x 3000, PINE or EUCALYPTUS, Kiln-Dried to 10% M.C.

ROUGH DIMENSION: 25 x 25 x 365

FINISHED DIMENSIONS: 20 x 20 x 360 NO. OF PARTS/UNIT PRODUCT: 4

NO. ASSEMBLY:

S.A. NO.:

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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-001	Cut to Rough Length	2		120	60	0.833	Radial Arm Saw		8 pcs from each board
2-006	Rip to Rough Width	2		120	60	0.833	Straight Line Edger		4 pcs from each board
2-004	Plane 4 - Sides	2		80	40	1.250	4 - Side Planer		
2-008	Trim to Final Length	1		100	100	1.000	Circular Saw, Table Type		
2-011	Drill for Woodscrew Holes	1		50	50	2.000	Pneumatic Drills Set-up		Use countersink drill bits
2-037	Hand Sanding	1		80	80	1.250	None		

OPERATIONS SEQUENCE SHEET

LOW-LEVEL

ME-76.06.04

PART DESCRIPTION: SHELF SUPPORT FILLET

PART NO.: CC - 10

PRODUCT: CUPBOARD

PRODUCT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS: CC-10 from Machining Department

FINISHED DIMENSIONS: 20 x 20 x 360 NO. OF PARTS/UNIT PRODUCT: 4

S.A. NO.: \_\_\_\_\_ PAGE: 1 OF: 1 PAGES

FINISHING DEPARTMENT

OPN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNIT PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
5-006	Spray Sealer, Two Faces	1		100	100	1.000	Spray Gun		
5-008	Sand Sealer Coat	1		120	120	0.833	None		
5-010	Spray Lacquer, Two Faces	1		100	100	1.000	Spray Gun		







OPERATIONS SEQUENCE SHEET

PART DESCRIPTION: BOLT SPACER BLOCK

LOW-LEVEL

ME-76,06.04

PART NO.: CC-13

PRODUCT: CUPBOARD

PRODUCT NO.: (R11-Rev.)

MATERIAL INPUT SPECIFICATIONS: Offals and Trimmings from Other Solid Wood Components Production

ROUGH DIMENSION: (From OFFALS of other Components)

FINISHED DIMENSIONS: 10 x 60 x 80

NO. OF PARTS/UNIT PRODUCT: 1

PRE-ASSEMBLY:

S.A. NO.:

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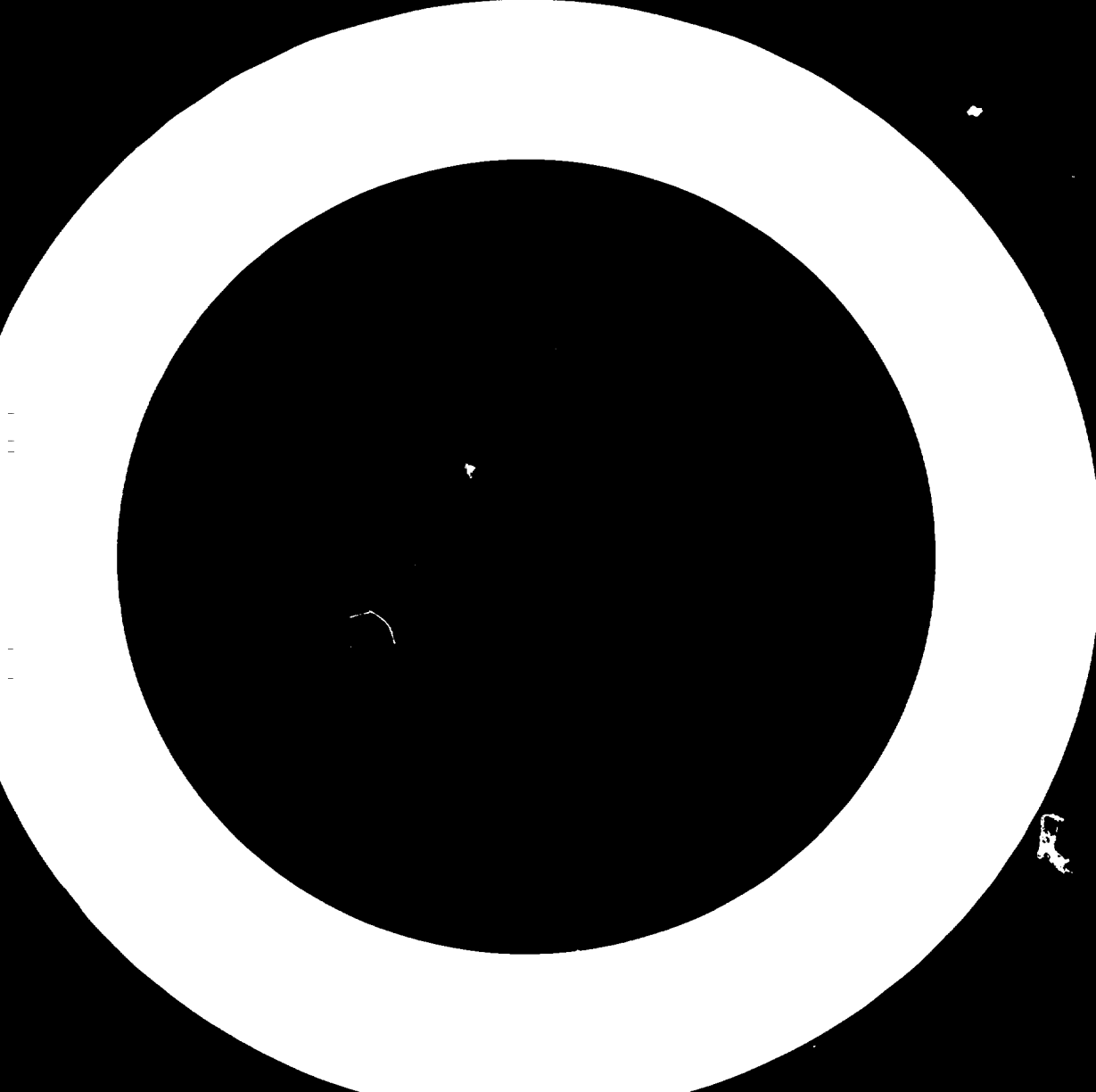
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MACHINING DEPARTMENT

OPRN NO.	DESCRIPTION OF OPERATION	NO. OF MEN	LABOUR GRADE	OUTPUT PER HOUR	OUTPUT PER MAN-HOUR	MACHINE HOURS PER 100 UNITS PER. PRODUCTS	MACHINE USED	ESTIMATED PROCESS RECOVERY	REMARKS
2-002	Thickness Planing	2		80	40	1.250	Thickness Planer		
2-008	Cut to Final Size	1		100	100	1.000	Circular Saw, Table Type		
2-011	Drill for Woodscrew Holes	1		50	50	2.000	Pneumatic Drills Set-up		
2-037	Hand Sanding	1		120	120	0.833	None		

-300-





A P P E N D I X VIII

LIST OF NEW MANUFACTURING FACILITIES  
FOR THE EXPANDED CHATI WOODWORKS PLANT

(Note : Unless otherwise stated all motors and electrical fixtures should be rated for 380V, 50Hz, 3- $\phi$  electric power service.)

1. PRODUCTION MACHINERY AND EQUIPMENT

A. VENEER PRODUCTION

i - Portable Chainsaw

Gasoline-fed motor, 600 mm chainsaw bar with 3 spare chainblade sets, and blade sharpening tool ----- 2 units

ii - Log Cooking Pit

2 cu.m. round log capacity, steam-heated up to 200°C, with 1-ton overhead hoist system ----- 2 units

iii - Horizontal Veneer Slicer

0.5 mm to 5 mm, thickness; 800 mm to 1600 mm width, 2000 mm minimum length capacity complete with knives, recommended spare parts and electrical switchgears ----- 1 unit

iv - Veneer Drier

With wire-mesh-belt feed, drying capacity good for veneer thickness up to 5 mm, hot-air heated, (gas-fired acceptable) complete with recommended spare parts and electrical switchgears ----- 1 unit

v - Veneer Jointer

Guillotine, type hydraulic powered, up to 200 mm throat opening up to 1800 mm work-width capacity, complete with 2 spare parts and electrical switchgears ----- 1 unit

vi - Veneer Splicer

Glue-melt thread type, minimum of 5m/min feed speed, foot-operated

up to 800 mm work width x 5 mm  
work thickness capacity, complete  
with accessories, electrical  
switchgears ----- 1 unit

vii - Veneer Clipper

Pneumatic, foot-operated, with  
standard safety device, work  
capacity of up to 7 mm thick-  
ness x 2000 mm length,  
complete with 2 spare knives  
and electrical switchgears  
and recommended spare parts ----- 1 unit

B. KILN-DRYING DEPARTMENT

i - Kiln-drying Chamber

Hot-air convection type, wood-waste  
fired, 50 cu.m. capacity, manually  
controlled, good for seasoning  
hardwood down to 10% M.C.,  
complete with electric motor,  
circulating fan and baffles, hot-  
air ducting system ----- 2 units

ii - Kiln-truck and Rails System

(to be designed later) ----- 24 units

C. PANEL FORMING AND MACHINING DEPARTMENTS

i - Vertical Panel Saw

Work capacity of 25 x 1220 x  
2440 panels, complete with  
accessories, motor and standard  
electrical switchgears and  
recommended spare parts ----- 1 unit

ii - Glue Spreader

Four rolls type, up to 3000 work  
length capacity, complete with  
electrical switchgears and  
recommended spare parts ----- 1 unit

iii - Glue Mixer

Stainless Steel 50 litre capacity,  
electric-motor operated, complete  
with motor, electrical switch-  
gears and recommended spare  
parts ----- 1 unit

- iv - Platform Scale  
Up to 500 kgs: capacity, 10<sup>1</sup> gms  
minimum scale reading, complete  
with counter-weights ----- 1 unit
- v - Cold Press  
Hydraulic Type, capable of  
delivering at least 36 kgs/sq.cm.  
pressure, work capacity 1000 mm  
x 1200 x 2000 ----- 1 unit
- vi - Single Edge-Banding Machine  
3 work stations, up to 50 mm work  
thickness capacity, complete  
with accessories, spare cutter-  
heads, recommended spare parts  
and standard motors, electrical  
switchgears ----- 1 unit
- vii - Chisel-Drill Mortizer  
Up to 25 x 25 chisel and drill bit,  
foot-operated, mortizer depth  
capacity up to 100 mm, complete  
with spare chisel drill sets  
(2 each of 5mm, 7mm, 10mm, 15mm,  
20mm, 25mm) recommended spare  
parts and standard motors and  
electrical switchgears ----- 1 unit
- viii - Straight Line Edger  
Chain feed up to 40 m/min., work  
capacity of 120 mm x 1220 mm  
complete with motors, standard  
electrical switchgears and  
recommended spare parts ----- 1 unit
- ix - Pneumatic Drill  
With air-cylinder thrust mechanism,  
drill chucks up to 13 mm capacity,  
air motor driven, complete with  
spare drill chucks (1 each of  
4mm, 6mm, 8mm, 10mm, 12mm, 15mm,  
and 18mm single bit chucks and 6mm,  
8mm and 10mm twin bit chucks),  
standard accessories and the  
recommended spare parts ----- 8 units
- x - Dowel Making Machine  
With cutterheads for spiral and plain  
4mm, 6mm, 8mm, 10mm, 12mm, 15mm and  
18mm diameter dowels, complete with  
knives and recommended spare parts  
and electric motor and switchgears -- 1 unit

xi - Dowel Cutting and Chamfering Machine

Cutting up to 75 mm long dowels with  
4 mm to 18 mm diameter dowels, having  
standard chamfer on both ends, with  
1 set of spare cutterhead and saw,  
complete with standard motor,  
switchgears and recommended spare  
parts ----- 1 unit

xii - Double Belt Stroke Sander

150 mm wide belts, work table capacity  
up to 600 mm work height, 1000 mm  
work length, single stroking pad,  
complete with electric motor and  
standard switchgears ----- 1 unit

xiii - Oscillating Edge Belt Sander

Work capacity 100 mm x 1000 mm x  
2000 mm, complete with motor,  
electrical switchgears and  
recommended spare parts ----- 1 unit

D. FINISHING DEPARTMENT

i - Spray Guns

Pressure feed, complete with fluid  
tips, needles and air caps for  
spraying lacquer material, 5 meters  
each of air hose and fluid hose  
and corresponding fittings and  
recommended spare parts ----- 4 units

ii - Spray Gun

Suction feed, complete with stainless  
steel fluid tips, needles and air  
caps, for spraying NGR wood stains,  
5 each meters of air hose and fluid  
hose and recommended spare parts ----- 2 units

iii - Finishing Tanks

Pressurized type, 25 liters capacity,  
with agitator and air motor ----- 3 units

iv - Stainless Steel Insert

For 25-liter tank, to contain NGR wood  
stain ----- 1 unit

v - Air Motors

With variably controlled speed,  
similar to those provided with  
the finishing tanks ----- 2 units

- vi - Combination Air Filter, De-Humidifier and Pressure Regulator  
1 cu.m./minute, air capacity, with recommended spare parts ----- 4 units
- vii - Air Hose  
Standard diameter to fit spray guns and finishing tank fittings and couplings ----- 100 meters
- viii - Fluid Hose  
Standard diameter to fit spray guns and finishing tank fittings and couplings ----- 100 meters
- ix - Assorted Fittings and Couplings for Air and Fluid Hose ----- 16 units
- x - Spray Booth  
Dry type, single station complete with exhaust fans, baffles, electric motors and switchgears ----- 3 units

E. AUXILIARY EQUIPMENT

- i - Air Compressor and Accessories  
Two-stage, up to 10 atmospheres pressure, 3 cu.m./minute, free air delivery, complete with electric motor, and switchgears, drive system, receiver tank and recommended spare parts ----- 1 unit
- ii - Electric Transformer  
Step-down, oil-cooled, out-door type, 100KVA, 380V output, 50Hz, 3-Ø ----- 1 unit
- iii - Steam Generator  
(to be designed later, based on available used locomotive steam generators or equivalent) ----- 1 unit
- iv - Central Sawdust and Sanding Dust Exhaustion System  
(to be designed later) ----- 1 set



F. BUILDINGS AND STRUCTURES

- i - Air-Drying Shed  
(to be designed later, using materials from present sheds), good for 600 cu.m. of sawn timber ----- 1 unit
- ii - Veneer and Kiln-Dried Timber Storage Building  
4.5 meters floor to ceiling height, 20 m x 35 m floor area, concrete flooring, totally enclosed ----- 1 unit
- iii - Woodworks Factory Building  
4.5 meters floor to ceiling height, 20 m x 70 m floor area, 15 cm. concrete slab flooring, ventilated roof, sliding doors at both ends, CHB walls, louvered windows ----- 1 unit
- iv - Finished Goods Storage Building  
Same design as Veneer and K.D. timber storage building, 20 x 35 meters floor area ----- 1 unit
- v - Elevated Water Tank  
45,000 liters capacity, tank bottom 18 meters high from the ground, complete with piping system to buildings in the factory compound ----- 1 unit
- vi - Woodwaste Incinerator  
Mixed steel and concrete construction, to burn approximately 20 cu.m./hour of sawdust, sanding dust, shavings, etc. ----- 1 unit

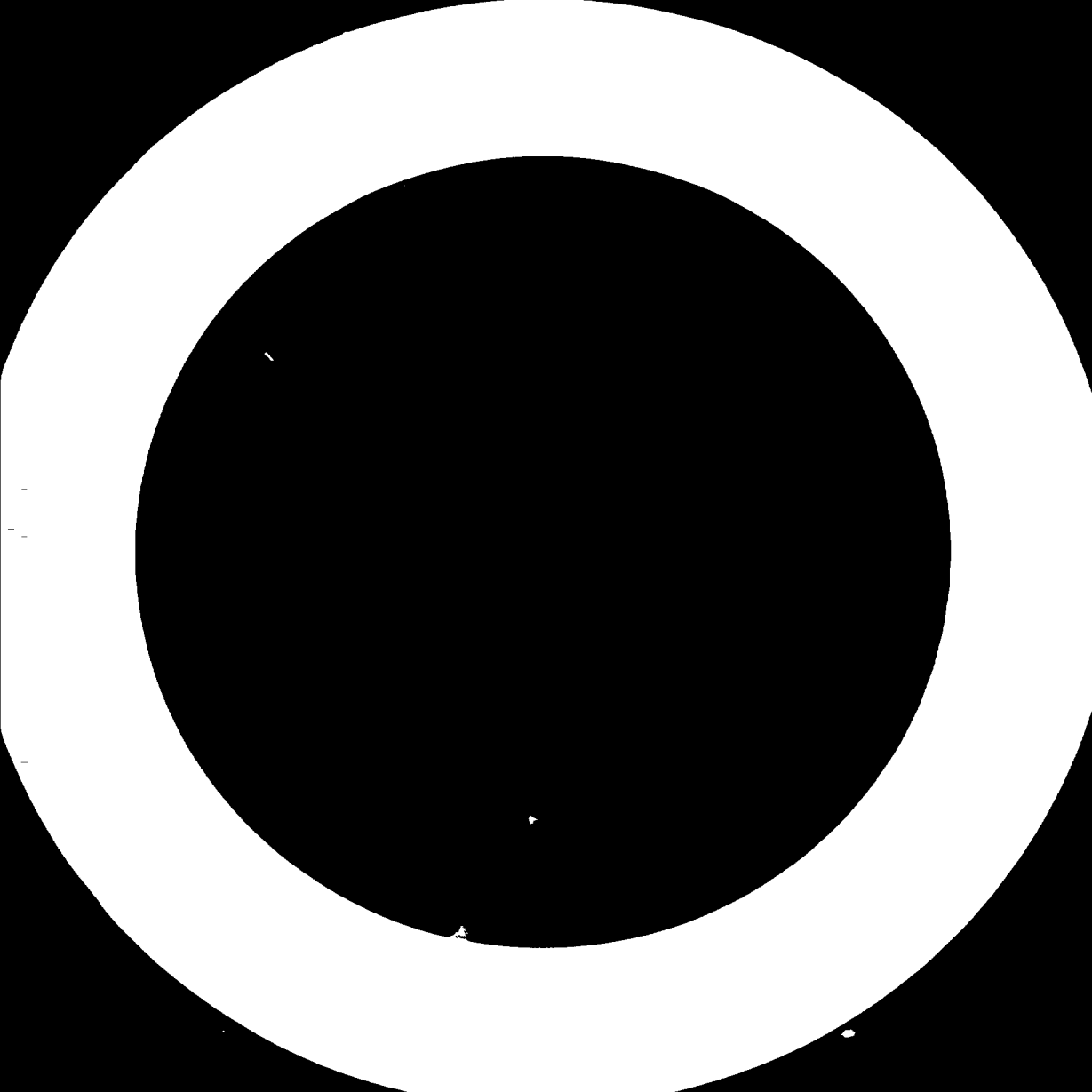
Note : The floor areas of the storage and factory buildings should be re-checked before final plans are drawn.

G. MATERIALS TESTING LABORATORY MAJOR EQUIPMENT

- i - Analytical Balance  
0.001 gram sensitivity, 500 grams capacity protective glass-walled cabinet and set of weights and "riders" ----- 1 unit
- ii - Drying Oven  
Variably controlled temperatures up to 350°C, complete with

- electrical switchgears, thermostat  
and thermometer ----- 1 unit
- iii - Shear Block Testing Machine  
(to be designed later, using hydraulic  
jack for cars and other readily  
available materials) ----- 1 unit
- iv - Wet Film Thickness Gauge  
0.001 mil to 10 mils, roller tape ----- 1 unit
- v - Dry Film Thickness Gauge  
0.001 mil to 20 mils ----- 1 unit

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A P P E N D I X IX

SCHEDULE OF PRIORITIES FOR MACHINERIES  
AND EQUIPMENT ACQUISITION

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- I. The following machinery and equipment, buildings and structures are essential and vital to the rehabilitation and expansion of the CHATI Woodworks Plant. They should be given TOP PRIORITY in procurement.

<u>Descriptions</u>	<u>Quantity</u>
All Veneer Production Machinery and Equipment _____	As specified in Appendix VIII
Kiln-drying Chamber _____	1 unit
Kiln-trucks and corresponding Rail System for _____	18 units
Glue Spreader _____	1 unit
Glue Mixer _____	1 unit
Platform Scale _____	1 unit
Cold Press _____	1 unit
Chisel - Drill Mortizer _____	1 unit
Pneumatic Drills _____	8 units
Dowel Making Machine _____	1 unit
Dowel Cutting and Chamfering Machine _____	1 unit
Double Belt Stroke Sander _____	1 unit
Oscillating Belt Edge Sander _____	1 unit
Spray Guns, Pressure Feed Type _____	2 units
Spray Gun , Suction Feed Type _____	1 unit
Finishing Tanks _____	2 units
Combination Air Filter, De-Humidifier and Pressure Regulator _____	2 units

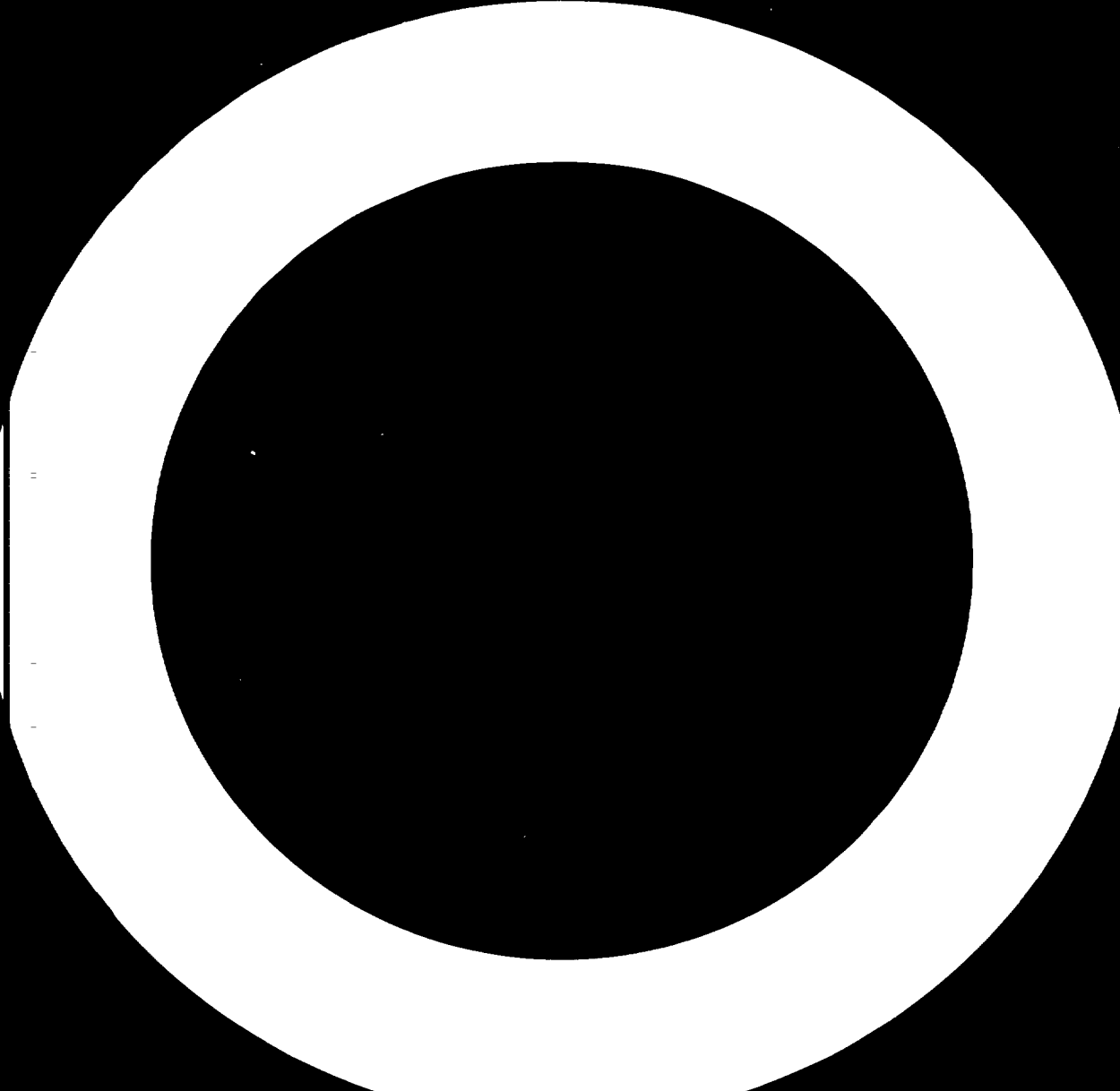
<u>Descriptions</u>	<u>Quantity</u>
Air Hose -----	100 meters
Fluid Hose -----	100 meters
Assorted Fittings and couplings for Air and Fluid Hoses -----	16 units
Spray Booth, Dry Type, Single Station -----	2 units
Air Compressor -----	1 unit
Electric Transformer -----	1 unit
Steam Generator -----	1 unit
Central Sawdust and Sanding Dust Exhaustion System -----	1 set
Air-drying Shed -----	1 unit
Veneer and Kiln-Dried Sawntimber Storage Building -----	1 unit
Woodworks Factory Building -----	1 unit
Finished Goods Storage Building -----	1 unit
Elevated Water Tank -----	1 unit
Woodwaste Incinerator -----	1 unit
All Laboratory Equipment -----	As specified in Appendix VIII

21. The following machinery and equipment may be procured and installed within 12 months (or earlier) from date of start-up of the expanded factory :

<u>Descriptions</u>	<u>Quantity</u>
Kiln-drying Chamber -----	1 unit
Kiln-trucks -----	6 units
Vertical Panel Saw -----	1 unit
Single Edge Banding Machine -----	1 unit
Straight Line Edger -----	1 unit

<u>Descriptions</u>	<u>Quantity</u>
Spray Guns, Pressure Feed Type -----	2 units
Spray Gun , Suction Feed Type -----	1 unit
Finishing Tank -----	1 unit
Stainless Steel Insert -----	1 unit
Air Motors -----	2 units
Combination Air Filter, etc. -----	2 units
Spray Booth -----	1 unit

Note : The above-listed machines should be provided with the corresponding recommended spare parts, and should conform to specifications given in Appendix VIII.



A P P E N D I X X

JOB DESCRIPTION - EXPERTS FOR THE PROJECT

A. PROJECT DIRECTOR

DURATION ----- 36 months

DUTIES :

1. To provide Technical Assistance in the final design of building, ancillary structures, site plan, production fixtures, machinery lay-out, selection of machinery and equipment for the expanded CHATI Woodworks Plant ;
2. To provide Technical Advice on the recruitment of key personnel for the expanded CHATI Woodworks Plant ;
3. To direct, administer and control the implementation plans of the Project, as approved by officials of RUCOM Industries, Ltd., and, if called upon, UNIDO; and
4. To draw up and direct a Training Program for the key personnel of the expanded CHATI Woodworks Plant.

QUALIFICATIONS :

Production Engineer or consultant having broad experience in advising furniture companies on technical and management aspects of production planning and administering the erection of woodworks plants, operations of wooden furniture and joinery products factories, and training of factory personnel. Experience in developing countries is most desirable.

LANGUAGE REQUIREMENT : English



B. WOODEN FURNITURE PRODUCTION EXPERT

DURATION \_\_\_\_\_ 24 months

DUTIES :

1. Assist the Project Director in the preparation and implementation of plans for the rehabilitation, modernization and expansion of the CHATI Woodworks Plant ;
2. Assist the Project Director in the preparation and implementation of plans for training key personnel of the Plant ; and
3. Under the direction of the Project Administrator, supervise the Production activities of the wood-working plant.

QUALIFICATIONS :

Production engineer or consultant having broad experience in the operation of wooden furniture and joinery products manufacturing plant.. Experience in veneer production and kiln-drying operations essential. Experience in developing countries is most desirable.

LANGUAGE REQUIREMENT : English

C. WOODWORKS MILLWRIGHT SPECIALIST

DURATION \_\_\_\_\_ 30 months

DUTIES :

1. To assist the Project Director in the design and fabrication of production gauges, jigs and fixtures and maintenance of cutting tools (knives, sawblades, bits, etc.) for use in the production operations of the

expanded CHATI Woodworks Plant ; and

2. To train qualified local personnel in the techniques of setting-up machinery for serial production runs, design and fabrication of jigs and fixtures, cutting tools and production gauges required in wooden furniture and joinery manufacturing plants,

QUALIFICATIONS :

Woodworks millwright with broad experience in servicing machinery for wooden furniture and joinery products factories. Experience in developing countries is most desirable.

LANGUAGE REQUIREMENT : English

D. WOODEN FURNITURE QUALITY CONTROL SPECIALIST

DURATION \_\_\_\_\_ 18 months

DUTIES :

1. To assist the Project Director in setting-up and operating the quality control system for the expanded CHATI Woodworks Plant ; and
2. To assist the Project Director in training quality control personnel for the Project.

QUALIFICATIONS :

Broad experience in designing, setting-up and developing quality control systems for wooden furniture and joinery product manufacturing plant. Experience in developing countries is most desirable.

LANGUAGE REQUIREMENT : English

E. PACKAGING SPECIALIST

DURATION \_\_\_\_\_ 6 months

DUTIES :

1. To assist the Project Director in the development of packing systems for the products of the expanded CHATI Woodworks Plant ;
2. To assist the Project Director in training local personnel on the design and fabrication of packing systems for "knock-down" and completely assembled furniture and joinery products.

QUALIFICATIONS :

Broad experience in designing and implementing packing designs for "knock-down" and completely assembled furniture and joinery products. Experience in developing countries is most desirable.

LANGUAGE REQUIREMENT : English





A P P E N D I X XII

SOURCES OF UNPUBLISHED INFORMATION

Unpublished information on the Zambian furniture manufacturing industry, timber stands and IPD operations targets, and other information relevant to this MISSION, were gathered during conferences with the following responsible officials of the GRZ or private firms in Zambia :

1. Mr. M. MUFAERE  
The Permanent Secretary  
Ministry of Commerce and Industry  
GRZ, Lusaka
2. The Deputy Conservator of Forests  
Forest Department, GRZ, Ndola
3. Mr. F. B. NDUNA  
Director  
Industrial Plantation Division (IPD)  
Forest Department, GRZ, Ndola
4. The Deputy Director  
Division of Forest Products Research  
Forest Department, GRZ, Ndola
5. Mr. H. G. F. WEERSINGHE  
UNIDO Chief Technical Adviser  
Ministry of Commerce and Industry  
GRZ, Lusaka
6. Mr. L. C. MBEWE  
Manager (Development Services)  
Projects Division  
INDECO LIMITED, Lusaka
7. Mr. R. L. BVULANI  
General Manger  
RUCOM Industries, Ltd., Lusaka
8. Mr. MIODRAG KOVACEVIC  
Production Manager  
ZECCO FURNITURE, Lusaka
9. Mr. VLADIMIR MARJANOVIC  
Commercial Manager  
ZECCO FURNITURE, Lusaka

10. The PRODUCTION MANAGER  
TIMBER DIVISION  
Zambia Steel and Building Stores, (ZSBS)  
Copperbelt
11. The SALES MANAGER  
TIMBER DIVISION  
Zambia Steel and Building Stores, (ZSBS)  
Copperbelt
12. The PRODUCTION MANAGER  
KITE SAWMILL, CHATI, Copperbelt
13. Mr. J. BANDA  
Depot Manager  
Vitretext Paints, Ltd., Lusaka
14. Mr. P. QUILT  
Managing Director  
ZAP Limited, Lusaka
15. Mr. K. L. JENSEN  
Officer-in-charge  
Dzithandizensi Trades School  
Lusaka
16. The HEAD MISTRESS  
Woodlands Elementary School, Lusaka
17. Mr. C. T. S. NDHLOVU  
Proprietor/General Manager  
CHRIS FURNITURES, Ltd., Lusaka

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