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A BUILDING MATERIALS COMPLEX

for

HALIFAX - DARTMOUTH

A report prepared by

Special Projects Group,
Canada Department of Regional Economic Expansion,
Ottawa

October 1971

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INTRODUCTION

The objectives of this study have been:

1. to recommend a business organization able to provide itself with necessary wood raw material, to process that material into finished products, and market these products profitably in export and domestic markets;
2. to determine products suitable to the available wood resources;
3. to suggest economic means of product manufacture; and
4. to make a projection of the market opportunity available to each product.

The integrated operation proposed in this report represents a departure from the manner in which the forest industry has customarily operated in Nova Scotia and the Atlantic region. The diversified manufacturing capability recommended is based on an approach to wood products manufacture that requires efficient conversion of as much of each growing tree as is possible into saleable products. It assumes the economic manufacture of a line of quality products marketed through its own sales organization with a degree of expertness that will ensure a profitable growth enterprise.

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SUMMARY

1. An opportunity exists for the organization and development of a profitable building materials industry in Halifax-Dartmouth based on timber resources throughout the Province which would result in the further development of natural resources and the processing of primary products into higher value secondary products.

2. There are sufficient sawlogs in Nova Scotia to sustain a processing complex as contemplated in this report and the proper organization and development of logging and sawmilling can provide the basis for an expanded wood products industry, particularly in the production of products which require the conversion of primary raw materials (sawlogs and rough lumber) to marketable end items and to which value is added by the expenditure of labour.

3. The local, U.S. and overseas market potential is sufficient to support an integrated woods product building materials industry. To realize the potential, the Halifax-Dartmouth operation must be properly organized, have economic access to timber resources, possess a well developed and aggressive marketing organization and operate efficient and highly automated production facilities.

4. Northeast and the mid-Atlantic United States present a market opportunity for good quality kiln-dried dressed lumber to U.S. specifications. It is estimated a Halifax-Dartmouth operation can sell compe-

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titively 40-60 million board feet annually in this market, provided economic water transportation is available for large volume shipments.

A substantial market also exists in the United Kingdom and Ireland for rough lumber but these markets will become less attractive to the smaller producer who cannot develop volume orders and is not in a position to obtain shipping rates in competition with larger shippers. These markets are also being eroded through intense competition from Russian and Scandinavian countries. It is estimated a Halifax-Dartmouth complex will be able to sell at least 15 to 20 million board feet annually in these markets for the next few years, although it may become increasingly difficult to maintain these markets at this level and it may be necessary to divert these sales to U.S. and domestic markets at a later date.

5. The local market is sufficient to absorb about 20,000,000 board feet of lumber produced by the complex to replace a portion of lumber now imported from other regions in Canada. It is expected that a substantial volume will be required by re-manufacturing facilities to be owned by the complex and manufacturing units now producing building components in the province.

6. Production facilities should be established by stages to kiln dry and dress lumber, and manufacture sash and door products, interior and exterior flush doors, kitchen cabinets, bathroom vanities and store fixtures, prefabricated houses, and waferboard and particle

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board from residues.

7. Since availability of sawlogs, markets for chips and wood wastes and marketing expertise are essential to the success of the proposed operations, existing major sawmill operators should be encouraged to participate in the proposed building materials complex in partnership with the Halifax-Dartmouth Development Corporation.

8. All plants must be equipped with modern equipment and engineered for maximum efficiency. Total capital requirements are estimated to be $19.5 million. This includes $16 million for plant and equipment and $3.5 million for working capital. This also includes costs for acquiring and modernizing existing sawmilling facilities. It is estimated the project might obtain at least $5 million in R.D.I.A. grants.

9. Efficiency, and hence profitability, of the proposed complex can be seriously impaired by a number of structural, traditional or legislative constraints. While not at all insurmountable, the significance of these hurdles must not be underestimated, nor should their essential removal be deferred beyond the initial stage of implementation. These constraints include:

   (a) the need to ensure that trees having characteristics of sawlogs are available to sawmills and trees having only pulpwood characteristics are available to pulp mills.

   (b) the need to ensure the support, and financial participation of pulp mills and preferably

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major viable sawmills.

(c) the need to identify and implement means of increasing efficiency and productivity in logging, transporting, sawing and further manufacturing operations.

(d) the need to reduce the present heavy dependence on U.K. markets for rough lumber in favour of long-term U.S. markets for further processed lumber and other wood products.

(e) the need to identify and remove specific areas of legislation that inhibit modern and efficient practices or tend to increase operating costs.

10. When in full operation the complex will generate direct employment for 500 persons. Equally important is the fact that the proposal will materially contribute to stabilizing sawmilling and logging operations through the province and thus ensure continuation of another 500 jobs.

11. At a later stage consideration should be given to expanding the building materials complex to include the manufacture of building papers, laminated wood structures, plastic bathroom fixtures, aluminum extrusion, builders hardware, fabricated metal products, gypsum products and electrical products provided feasibility studies prove they can be profitable in a Halifax-Dartmouth location.

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PROPOSED ORGANIZATION AND PROCESSING FACILITIES

(a) Organization

The success of a wood products complex in Nova Scotia, as proposed in this report, dependent to a great degree on the export market, will in large be due to the manner in which it is organized. Both technical knowhow and marketing assistance will be needed if the venture is to be a success. Modern wood products production, on a large scale, is extremely complex. The marketing of these products in highly competitive markets is often even more complex. Also important is an assured timber supply.

In order to obtain technical and marketing assistance and assured raw material supply it is proposed a new organization be formed that includes (1) six to eight major existing sawmills with a combined capacity of 80 million board feet per year and who own or have long-term access to timber resources (2) a firm or firms with market contacts and those having production expertise; and (3) the Halifax-Dartmouth Development Corporation. The existing sawmill partners would sell their sawmill facilities to the new corporation. Payment would be in the form of shares in the new corporation. Present sawmill workers would transfer to the new corporation. The corporation, which would be funded with monies from the Halifax-Dartmouth Development Corporation and other partners, would provide the additional re-manufacturing facilities required, working capital and a marketing organization to sell all products produced. The sawmill partners would undertake to provide the required sawtimber needed by the complex and contracts

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would be made for the sale of chips, shavings and veneer logs produced by the complex.

The new corporation would consist of a manufacturing division and a sales division. The manufacturing division would operate all production facilities owned by the corporation. This would enable these re-manufacturing facilities to obtain raw materials at lowest possible cost. The sales division would be responsible for the sale of all products manufactured by the complex. It is proposed that it would also perform customer services, sponsor product development, assist production units in meeting customer requirements, and conduct advertising and public relations activities.

(b) Processing Facilities

Processing operations would involve (1) primary conversion centres and (2) a processing complex centre.

(1) Primary conversion would take place at the sites of the existing sawmills now operated by the proposed partners in the complex. This would involve log collection from forest lands owned or controlled by the partners and logs or rough lumber purchased from independent suppliers. At these centres logs would be debarked, graded, peeled logs accumulated for sale to plywood manufacturers in the Atlantic region, waste material processed into chips, sawlogs converted to lumber for immediate transferral to the processing complex.

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(2) Processing would take place in the Halifax-Dartmouth area. These operations would be designed to be automatic and efficient and would permit relating procurement of wood raw materials to the most advantageous product mix. Rough green lumber from the primary conversion centres would be pre-graded, stacked and moved through the quality controlled dry kilns to the processing centre for finishing and sold from inventories either as lumber in domestic and export markets or in semi-processed form to the re-manufacturing facilities owned by the complex. These facilities would include:

(1) Planing plant with a capacity of 60-80 million board feet;

(2) Sash and door plant to manufacture window-door frames, mouldings, stairways, shelving and other wooden fixtures with a capacity of 2-3 million board feet;

(3) A pre-fab and modular structure manufacturing plant with a capacity to produce about 500 units per year requiring about 5 million board feet of lumber annually;

(4) A kitchen cabinet, vanity and institutional household furniture plant with an annual capacity of 5,000 units and a requirement of 650,000 board feet;

(5) A door plant with a capacity to produce 100,000 interior and 7,000 exterior units per year;

(6) A 100 Ton per day wafer board plant utilizing

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peeled hardwood logs and shavings as inputs coupled, for efficiency, with a 100 Ton per day particleboard plant.

In addition to the above, the complex would market 15-30 million board feet of rough lumber in export and domestic markets.

(c) Integrated Approach to Wood Utilization

As shown on page 10 a number of strong inter-relationships will exist between the various processing units in the complex. As a matter of fact it is this element of mutual reinforcement and total utilization that makes the proposal viable and the orderly flow from tree to finished product so interesting.

Sawlogs will be harvested from timberlands owned or leased by the company, owned privately or by pulp companies, transported to sawmills strategically located throughout the principal timber areas of the province, and there efficiently converted into lumber and wood chips. Peeler logs, softwood and hardwood pulpwood will be harvested concurrently with the sawlogs and sent to independent Maritime plywood and pulpwood conversion plants and to the company-owned waferboard - particleboard production unit. The wood chips produced from sawmill waste will also go to the pulp mills.

Rough lumber from the sawmills will be promptly moved to the processing complex for modern stacking and controlled kiln drying (some rough lumber will be air-dried and dressed to satisfy market demands within the immediate mill areas).

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PLANT INTER-RELATIONSHIPS

PRODUCTION UNITS

SAWMILLS

Annual Inputs (From Own Production)

Softwood Pulpwood
Hardwood Pulpwood - 32,649 cds.
Softwood Sawlogs - 79,500,000 f.b.m.
Hardwood Sawlogs - 500,000 f.b.m.

Annual Outputs

Softwood Pulpwood
Hardwood Pulpwood - 32,649 cds.
Peeler Logs
Wood Chips - 72,000 od. units
Rough Softwood Lumber - 79,500,000 f.b.m.
Rough Hardwood Lumber - 500,000 f.b.m.

RECEIVING, KILNING & PROCESSING

Rough Softwood Lumber - 79,500,000 f.b.m.
Rough Hardwood Lumber - 500,000 f.b.m.

Kiln-dried Rough Packaged Softwood Lumber) 79,500,000 f.b.m.
Kiln-dried Dressed Packaged Softwood Lumber)
Kiln-dried Rough Hardwood Lumber - 500,000 f.b.m.
Wood Shavings - 18,000 T.

WOODWORKING

Kiln-dried Rough Softwood Lumber)
Kiln-dried Dressed Softwood Lumber) 2,700,000 f.b.m.
Kiln-dried Rough Hardwood Lumber)
Particleboard

Interior Flush Doors - 80,000 units
Pre-Hung Interior Flush Doors - 20,000 units
Exterior Solid Core Doors - 5,000 units
Pre-Hung Exterior Solid Core Doors 2,000 units
Window Units
Window-Wall Units
Stairway Units - 1,000 units
Industrial Wood Parts
Construction Mouldings
Wood Shavings - 2,500 T.

CABINET PLANT

Kiln-dried Dressed Softwood Lumber)
Kiln-dried Dressed Hardwood Lumber) 650,000 f.b.m.
Construction Mouldings
Industrial Wood Parts
Particleboard - 500,000 sq. ft.

Unfinished Kitchen Cabinets and Counters
Pre-finished Kitchen Cabinets and Counters
Unfinished Bathroom Vanities
Pre-finished Bathroom Vanities
Pre-finished Industrial and Institutional Furniture
Low-cost Household Furniture

PREFAB HOMES

Kiln-dried Rough Softwood Lumber)
Kiln-dried Dressed Softwood Lumber) 5,000,000 f.b.m.
Kiln-dried Dressed Hardwood Lumber)
Construction Mouldings
Industrial Wood Parts
Pre-finished Kitchen Cabinets and Counters
Pre-finished Bathroom Vanities
Pre-Hung Interior Flush Doors
Pre-Hung Exterior Solid Core Doors
Window Units
Window-Wall Units
Stairway Units - 500 units
Particleboard - 500,000 sq. ft.
Waferboard - 1,250,000 sq. ft.

Pre-Fabricated Homes and Modular Units - 500 Units

BOARD MILL

Hardwood Pulpwood - 32,649 cds.
Wood Shavings - 20,500 T.

5/16" x 43 lb. Waferboard - 53,667,000 sq. ft.
3/4" x 45 lb. particleboard - 21,272,000 sq. ft.

Following kiln-drying, some of this lumber will be graded, dressed, marked and packaged for domestic or export sales. The considerable quantity of wood shavings, produced as a by-product, will be sent to the waferboard - particleboard processing unit.

Some of the kiln-dried stock will proceed to the wood working unit of the complex where it will be further processed into door, window and other construction mouldings; windows and window-wall units; stairway units and industrial wood parts. Particleboard and some other items produced by the complex will be blended with veneers, hardboards, and other purchased products to produce interior and exterior doors and pre-hung flush doors. Here, too, waste in the form of wood shavings will be dispatched for utilization in the board plant.

Some kiln-dried lumber, particleboard, wood parts and mouldings, will be directed to the kitchen cabinet manufacturing unit which also produces post-formed counter-tops, bathroom vanities and institutional household furniture.

Still other products will find their way into the prefabricated home and modular unit plant. Kiln-dried dressed lumber, wood parts and mouldings, kitchen cabinets, counters and vanities, windows, doors and stairway units, particleboard and waferboard will all be used in the homes produced within the complex.

Hardwood pulpwood, when debarked and blended with wood shavings from the initial processing and woodworking units will form the major input for the waferboard - particleboard plant.

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Sawdust and other such waste will constitute an important heat and steam source, thus easing the costly burden of a strictly oil-fired heating plant.

It will be noted careful attention has been given to integrated and joint use of services such as road, rail, water, sewer, electrical and dock facilities.

Intra-complex inventory buffering will be achieved through individual warehousing by the various and manufacturing units. Maximum use will be made of materials-handling equipment to achieve highest possible productivity and the entire complex should be sited as to offer substantial inter-plant efficiencies.

Throughout, the principles of full utilization and maximum efficiency have been pursued in order to achieve a modern and profitable operation yielding high return on primary wood resources and offering the practical maximum in employment.

Drawings on pages 13-19 provide an overview of the complex and offer individual plant flow diagrams.

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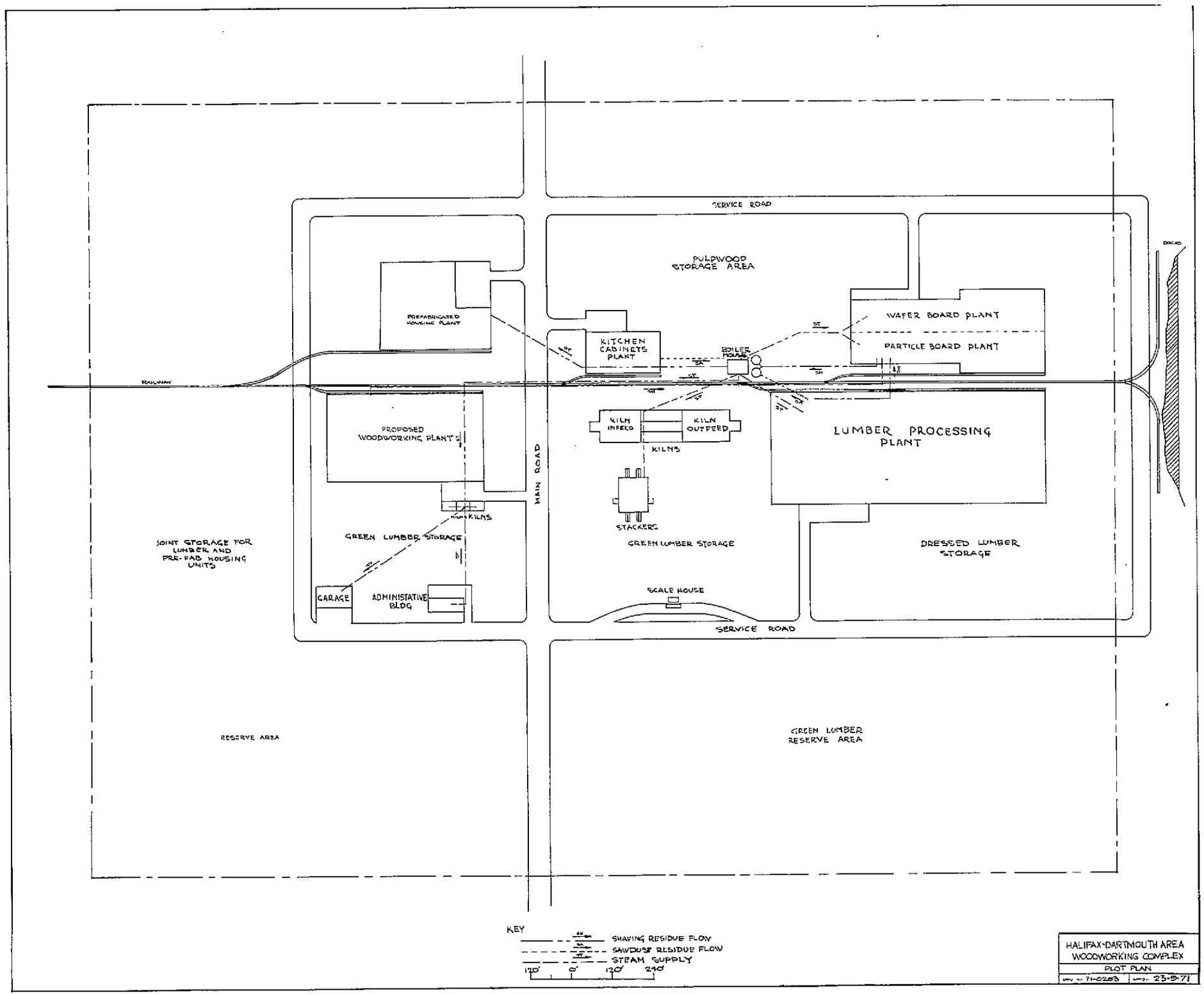
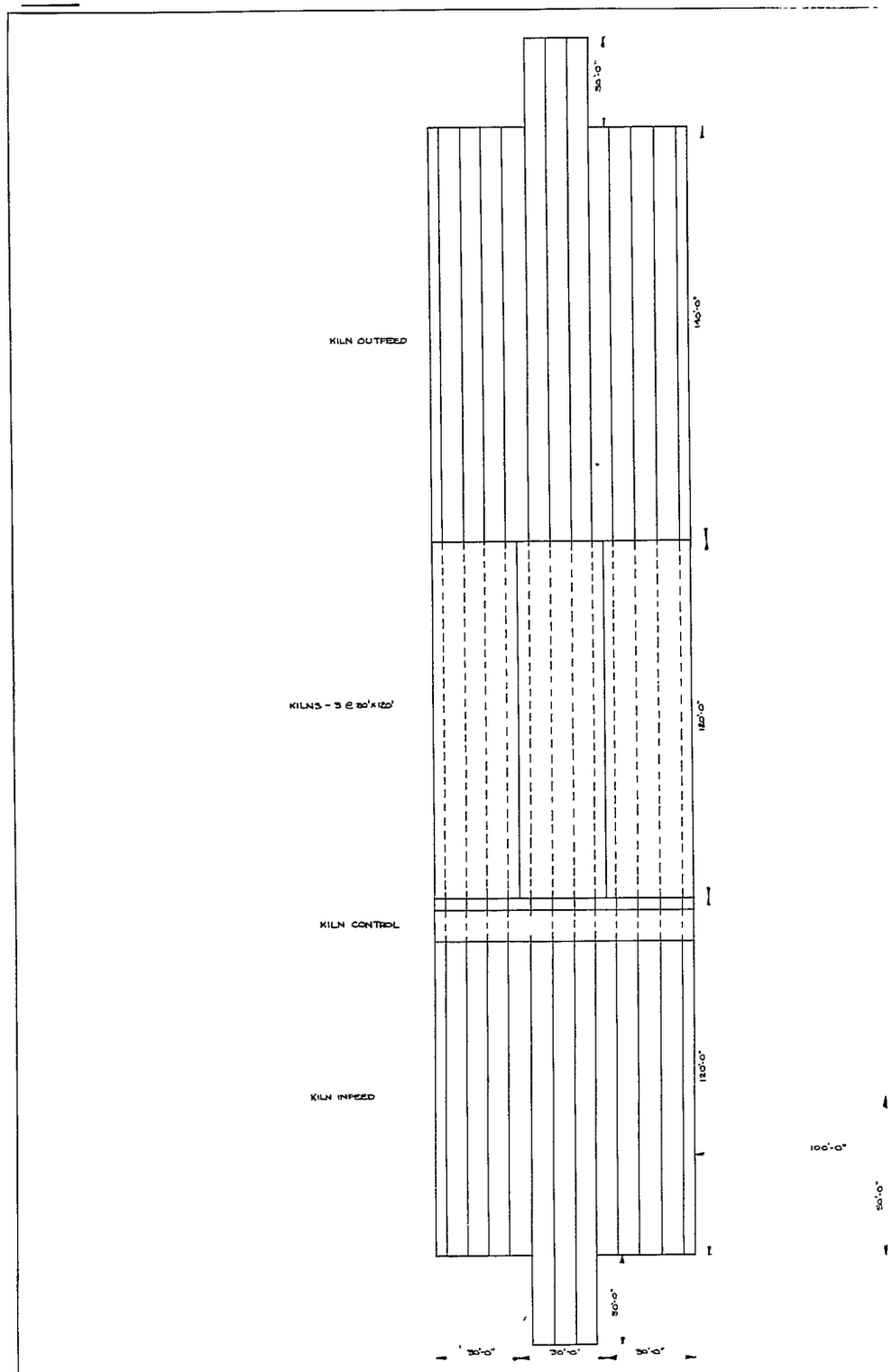
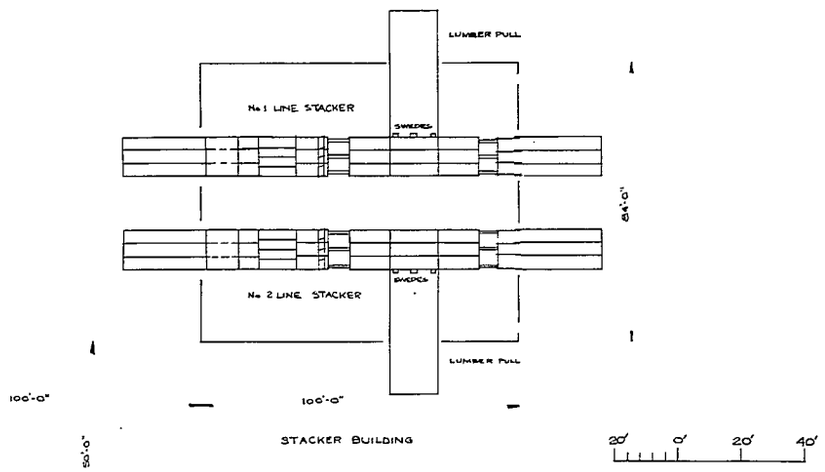

SERVICE ROAD
PULPWOOD STORAGE AREA
PREFABRICATED HOUSING PLANT
KITCHEN CABINETS PLANT
BOILER HOUSE
WAFER BOARD PLANT
PARTICLE BOARD PLANT
RAILWAY
DOCKS
PROPOSED WOODWORKING PLANT
KILN INFEED
KILN OUTFEED
KILNS
LUMBER PROCESSING PLANT
MAIN ROAD
STACKERS
KILNS
GREEN LUMBER STORAGE
GREEN LUMBER STORAGE
DRESSED LUMBER STORAGE
JOINT STORAGE FOR LUMBER AND PRE-FAB HOUSING UNITS
GARAGE
ADMINISTATIVE BLDG
SCALE HOUSE
SERVICE ROAD
RESERVE AREA
GREEN LUMBER RESERVE AREA
KEY
SHAVING RESIDUE FLOW
SAWDUST RESIDUE FLOW
STEAM SUPPLY
120'
0'
120'
240'
HALIFAX-DARTMOUTH AREA
WOODWORKING COMPLEX
PLOT PLAN
DRG. No. TH-0283
DATE 23-9-71





HALIFAX-DARTMOUTH AREA
WOODWORKING COMPLEX

LUMBER RECEIVING AND DRYING

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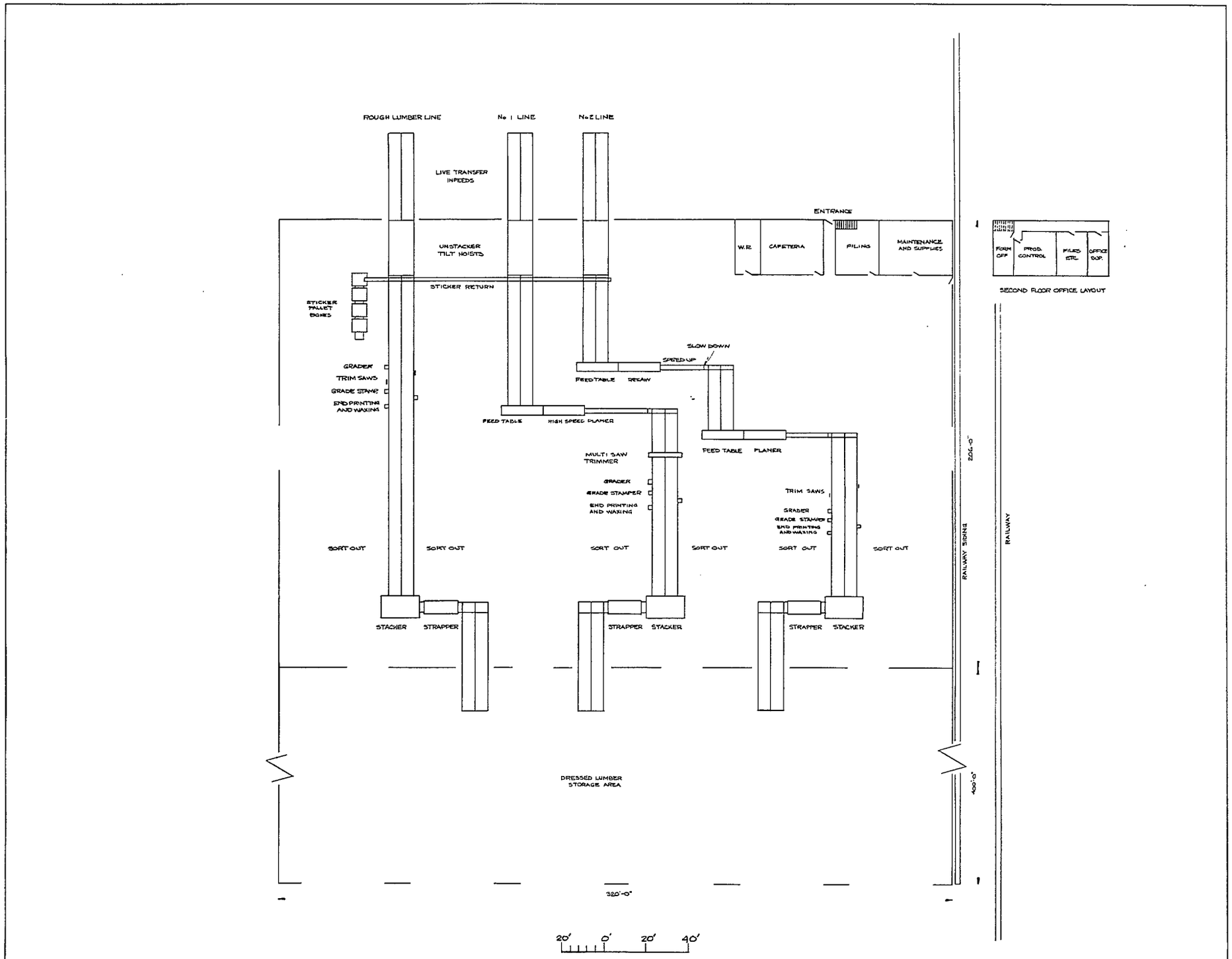
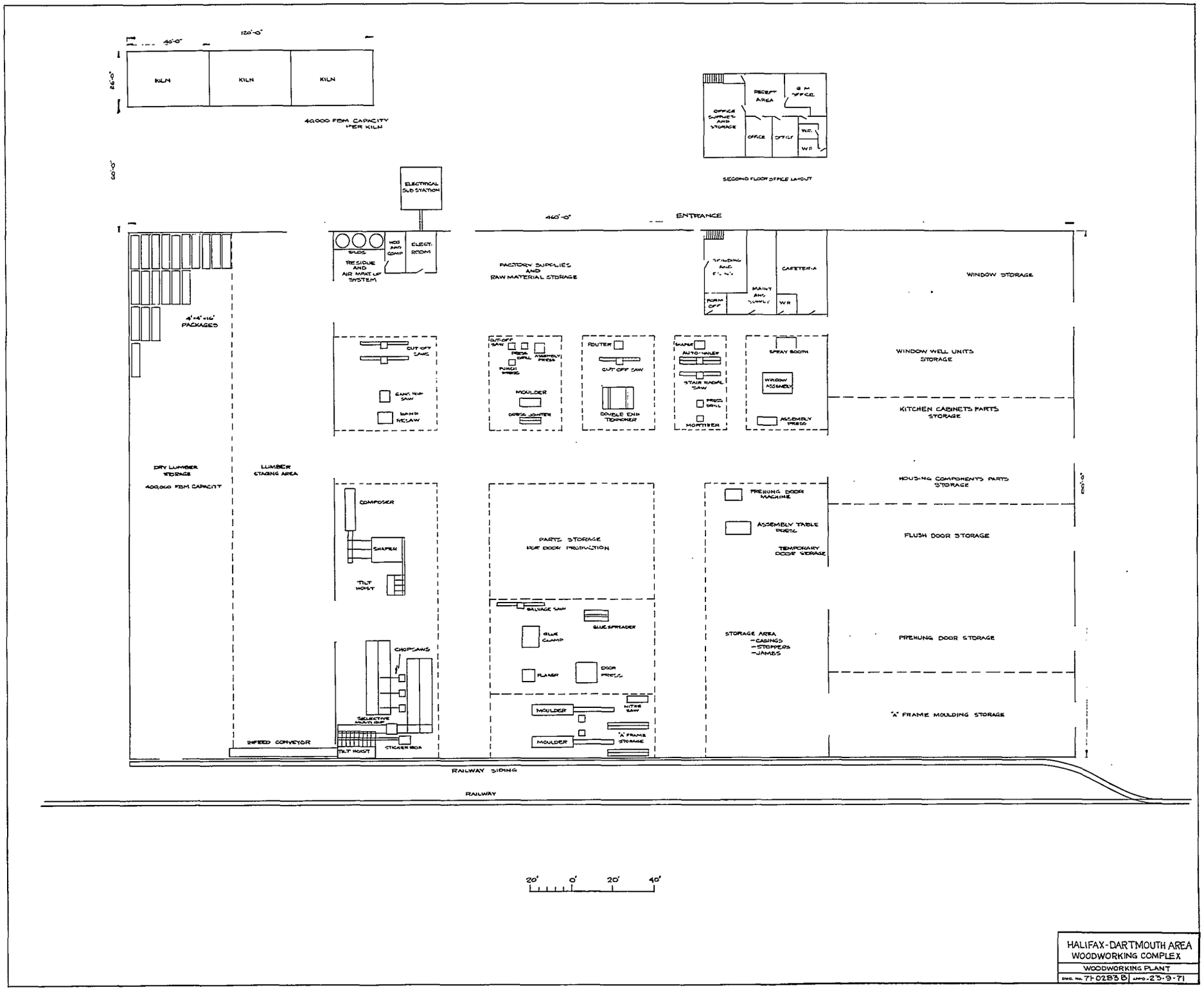

ROUGH LUMBER LINE
No 1 LINE
No 2 LINE
LIVE TRANSFER INFEEDS
UNSTACKER TILT HOISTS
STICKER RETURN
STICKER PALLET BOXES
GRADER
TRIM SAWS
GRADE STAMP
END PRINTING AND WAXING
FEED TABLE
HIGH SPEED PLANER
SLOW DOWN
SPEED UP
FEED TABLE
RESAW
MULTI SAW TRIMMER
GRADER
GRADE STAMPER
END PRINTING AND WAXING
FEED TABLE
PLANER
TRIM SAWS
GRADER
GRADE STAMPER
END PRINTING AND WAXING
SORT OUT
SORT OUT
SORT OUT
SORT OUT
SORT OUT
SORT OUT
STACKER
STRAPPER
STRAPPER
STACKER
STRAPPER
STACKER
DRESSED LUMBER STORAGE AREA
320'-0"
ENTRANCE
W.R.
CAFETERIA
FILING
MAINTENANCE AND SUPPLIES
FORM OFF
PROD. CONTROL
FILES STR.
OFFICE SUP.
SECOND FLOOR OFFICE LAYOUT
206'-0"
RAILWAY SIDING
RAILWAY
400'-0"
20' 0' 20' 40'
HALIFAX-DARTMOUTH AREA
WOODWORKING COMPLEX
LUMBER PROCESSING PLANT
DWG. No. 71-0283 F
APPD. 23·9·71



HALIFAX-DARTMOUTH AREA
WOODWORKING COMPLEX
WOODWORKING PLANT
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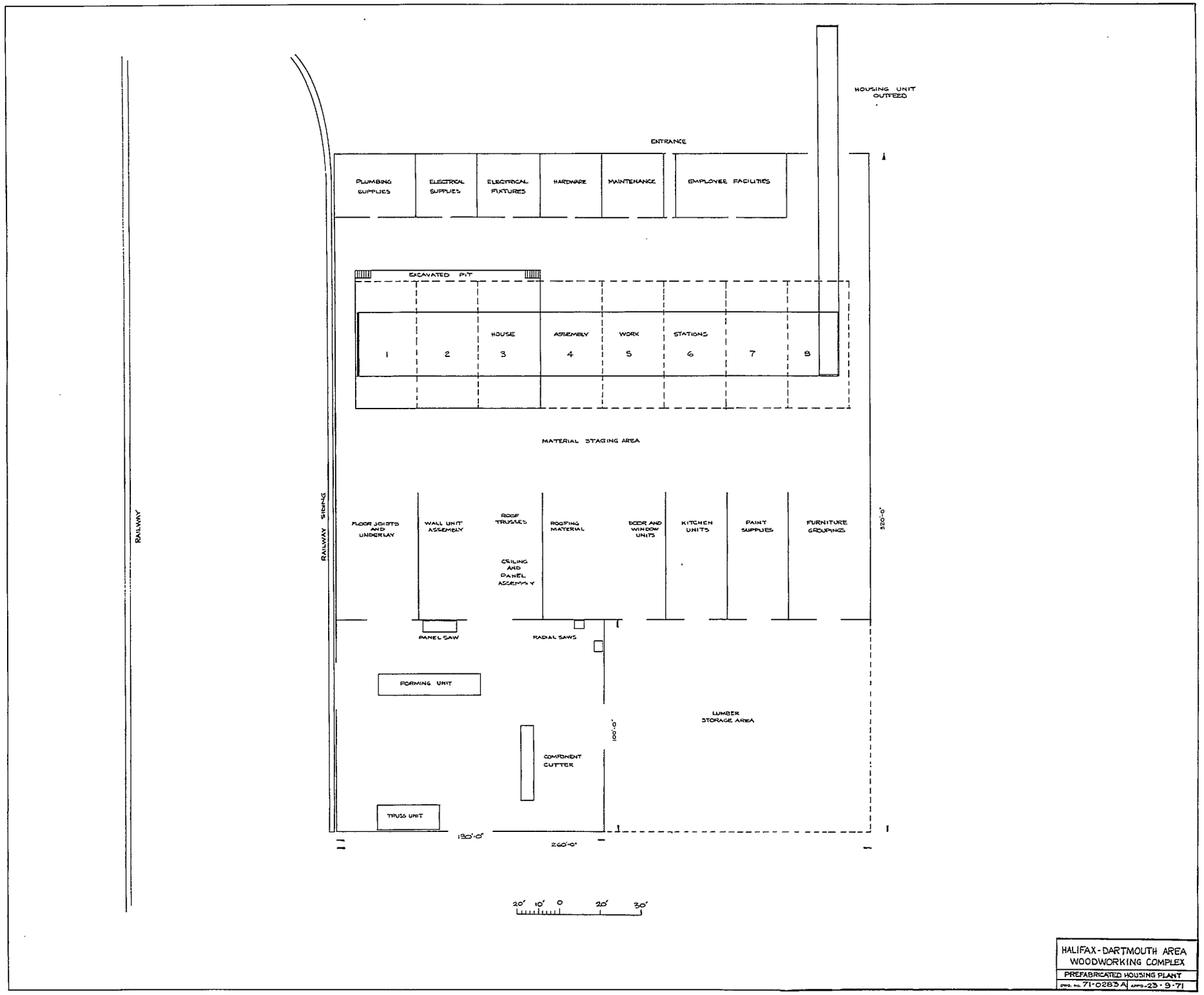
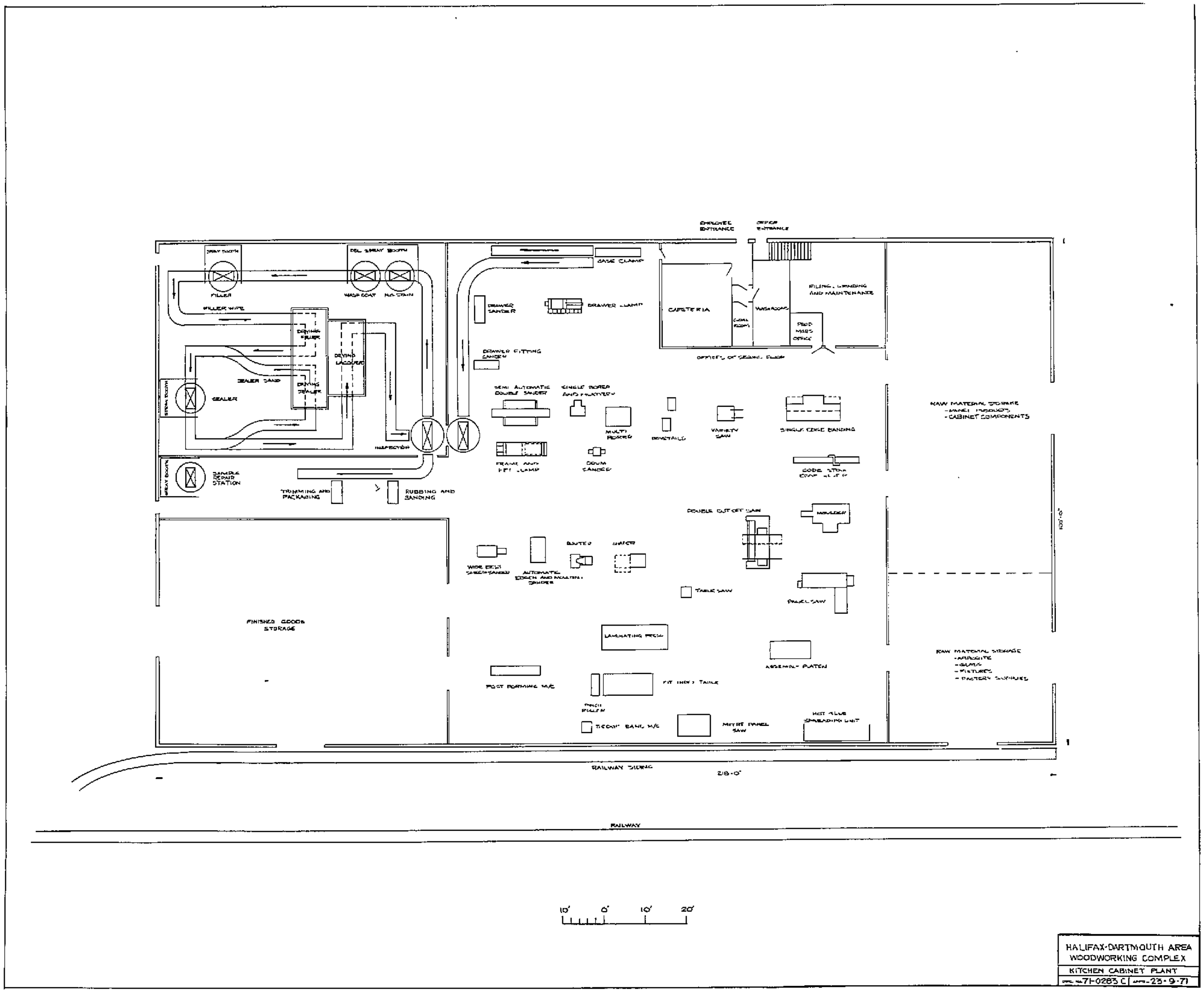


HALIFAX-DARTMOUTH AREA
WOODWORKING COMPLEX

PREFABRICATED HOUSING PLANT

PRO. NO. 71-0283A | APPD-23-9-71



SAMPLE REPAIR STATION
TRIMMING AND PACKAGING
RUBBING AND SANDING
INSPECTION
SEALER
DRYING FILLER
DRYING SEALER
DRYING LACQUER
SEALER SAND
FILLER WIPE
FILLER
WASH COAT
CASE CLAMP
DRAWER SANDER
DRAWER CLAMP
DRAWER FITTING SANDER
SEMI AUTOMATIC DOUBLE SANDER
FRAME AND FIT CLAMP
DRUM SANDER
MULTI BORER
VARIETY SAW
SINGLE EDGE BANDING
EMPLOYEE ENTRANCE
OFFICE ENTRANCE
CAFETERIA
WASHROOMS
PROD MGRS OFFICE
FILING, GRINDING AND MAINTENANCE
RAW MATERIAL STORAGE
-CABINET COMPONENTS
DOUBLE CUT OFF SAW
MOULDER
WIDE BELT
AUTOMATIC
TABLE SAW
PANEL SAW
FINISHED GOODS STORAGE
LAMINATING PRESS
ASSEMBLY PLATEN
POST FORMING M/C
METRE PANEL SAW
HOT GLUE SPREADING UNIT
RAW MATERIAL STORAGE
-FIXTURES
RAILWAY SIDING
218'-0"
105'-0"
RAILWAY
10' 0' 10' 20'
HALIFAX-DARTMOUTH AREA
WOODWORKING COMPLEX
KITCHEN CABINET PLANT
71-0283 C
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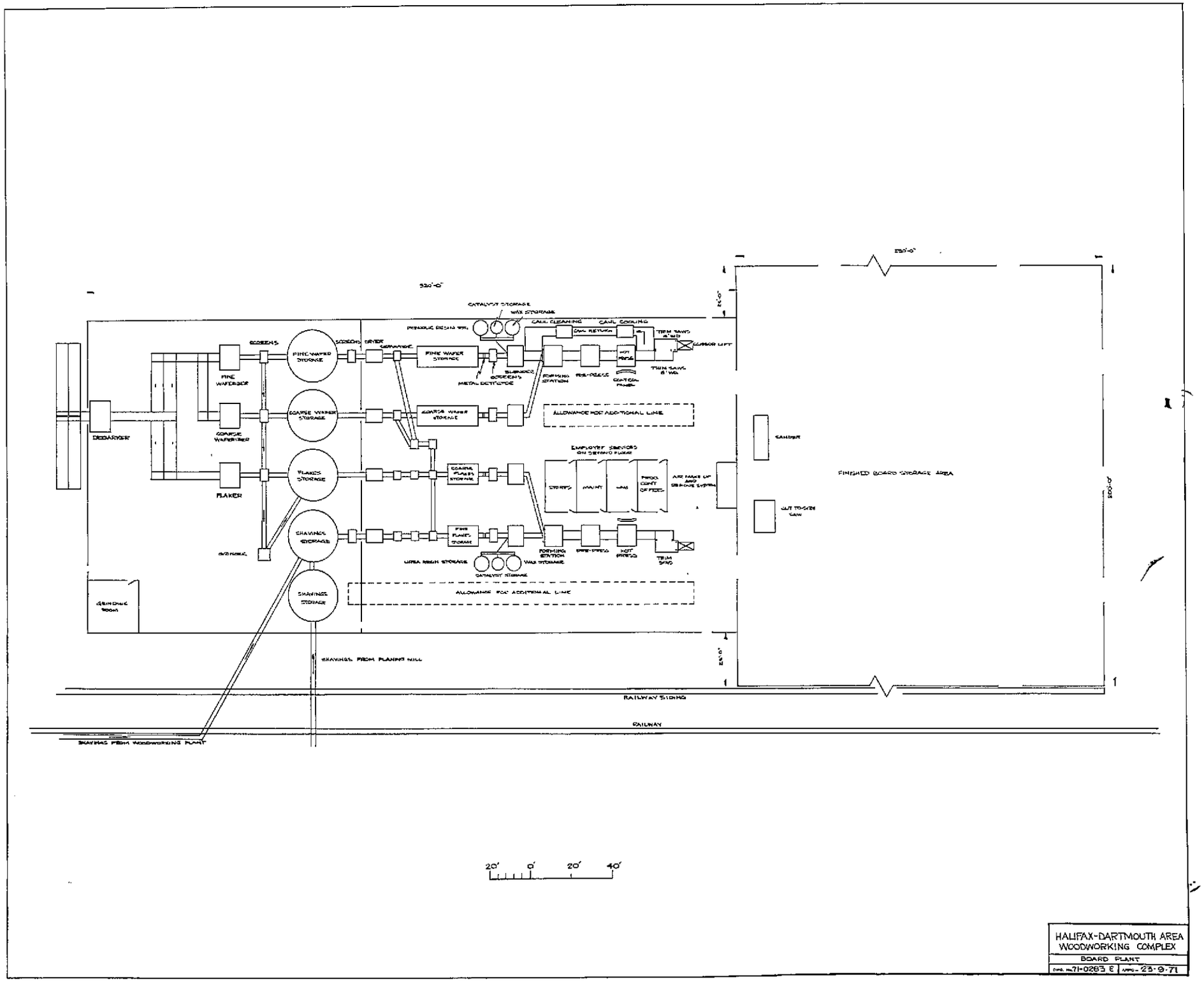

HALIFAX-DARTMOUTH AREA
WOODWORKING COMPLEX

BOARD PLANT

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THE EXISTING NOVA SCOTIA BUILDING MATERIALS INDUSTRY

The building materials industry in Nova Scotia is a composite of over 400 industries that manufacture, among other products, construction materials. (*) It is estimated that these 400 industries employ about 2500 people. It is an important industry to the economy of the Province of Nova Scotia and annual value of production is approximately $30 million. It includes forest and wood products, non-metal m-neral products, primary metal, fabricated metal products, electrical products, machinery and chemical products. Most of these industries presently sell their output exclusively in Nova Scotia. Less than 25% sell in the Atlantic region and the number selling nationally or internationally is negligible. An exception is hardboard manufacturing where over 90 per cent of sales are outside the Atlantic region. Existing industries in many instances are unable to obtain local lumber in sustained quantity over a period of time milled to standard dimensions, and kiln dried. As a result considerable quantities of lumber and other building components are imported into the province with resultant delays in delivery and increased costs to cover transportation charges. Similarly residential and commercial construction contractors in the province purchase significant quantities of lumber from outside the province because of the inability of most local sawmills to produce dried properly cut quality lumber combined with poor deli-

(*) Note: unlike most secondary industries, the building materials industry is defined by its market rather than by its function. Consequently, there are no data specifically collected for this industry and no firms that are classified in this industry per se.

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veries and minimum stocks carried by wholesalers. Contractors also complain about a lack of information of what is available locally and the lack of price lists. The increased demand for building materials to meet an expected level of construction of three quarters of a billion dollars by 1980 should offer a number of very favourable opportunities for most of the industries manufacturing these products.

Wood is the most extensively used material in building construction and this report deals exclusively with that sector of the industry as a logical basis for the first stage in the organization of an integrated building materials industry complex to be located in the Halifax-Dartmouth area. At later stages such a complex might include non-wood products provided markets are identified and production costs are competitive. Lumber, plywood, particleboard, hardboard, doors, flooring, and millwork account for about 22% of the material outputs for new construction and 27% for repair construction. Wooden building materials are used most extensively in the construction of one and two-storey buildings, such as single family residences and smaller multi-family residential buildings. Wood is also used in larger buildings but mostly for trim, doors, partitions and concrete forms.

One-half of the province's wood products are consumed by the construction industry. New construction accounts for about 80% of the wood products used by the construction industry; repair construction accounts for 20%.

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Nova Scotia employs nearly 2,000 people in the manufacture and processing of forest products and wooden building materials. Many are involved in processing imported material, for nearly 50% of the total value of wood products are imported. This segment of the industry is made up of three fairly distinct sectors: sawmills; sashes, doors and other millwork; and miscellaneous wood products.

a) Sawmills At present there are approximately 367 sawmills operating in Nova Scotia, producing approximately 200 million board feet of softwood and 5 million board feet of hardboard annually. Annual value of shipments is estimated at $19,306,000. There are four firms each producing in excess of 6 million board feet annually and they account for 28% of the total lumber production in the province. Forty-nine sawmills produce over one million board feet annually and the balance less than one million board feet. Of these smaller firms, 158 produce less than one hundred thousand board feet per annum. Thirty nine sawmills produce approximately 125,895 cord equivalents of pulp chips. Last year it is estimated 16.8% of the total output was sold in the U.K.; 3.2% in the U.S.A.; 2.7% in Ontario and Québec; 5.1% to Newfoundland; .7% to other offshore markets and 71.5% to local markets. Much of the lumber produced is rough and not planed and finished. Less than 5% is dry kilned, which is becoming a prerequisite to successful long term marketing in the U.S.A.

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b) Sashes, Doors & Other Millwork Nova Scotia's sash, door and other millwork industries consist of 22 plants engaged in production of windows and door frames, interior woodwork and construction moulding. Some of these firms also manufacture pre-cut and fabricated wooden buildings, roof trusses and beams. This industry employs a total of 225 workers in the province in fabrication facilities dispersed throughout the province. The value of Nova Scotia's shipments of wooden sash, door and millwork was $3,763,000 in 1970.

c) Miscellaneous Wood Product There are 40 firms in the province that manufacture a variety of wood-based building materials including hardboard, laths, shingles, concrete forms, shooks and crates. Annual value of production is about $200,000,000.

A map showing the location of forest industries and primary wood convertors is enclosed at the end of this report.

The future growth of construction activity expected in Nova Scotia and the Atlantic region in the next 10 years can be expected to provide Nova Scotia manufacturers of building materials with increased opportunities for production in the province. The greatest opportunities for local manufacturers in the wood products field will be in (1) a substantial increase in the volume of export of dressed lumber; (2) producing building materials currently imported; and (3) introducing new products that reduce on-site construction labour.

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RAW MATERIAL SUPPLIES

The forest resources of Nova Scotia are an important natural resource and have contributed, and will continue to contribute, under sound management, significantly to the economy of the province. The development of an integrated timber complex will ensure the most efficient use is made of Nova Scotia timber resources and will make possible a broad product mix from all grades and by-products of the original raw material. It will also make possible greater utilization of lower value species and more efficient production.

The principal tree species in Nova Scotia are spruce, balsam, fir, yellow birch, maple and pine. The province can be broken down into a number of zones, eco regions, and site districts which are based on species associations, climate and topography. A forest classification map is given on page 25.

The first zone is the sugar maple-hemlock-pine zone. This zone is divided into the Bras d'Or eco region which is characterized by sugar maple, beech, balsam fir, yellow birch, white pine, and white spruce with a moderate, cool, and dry climate.

The next zone is the sugar maple-yellow birch-fir zone. The eco region under this zone is called the Maritime Uplands Eco Region which has a cold, moist climate and where is found maple, yellow birch, balsam fir, beech, white spruce, red spruce, and red maple in association with each other.

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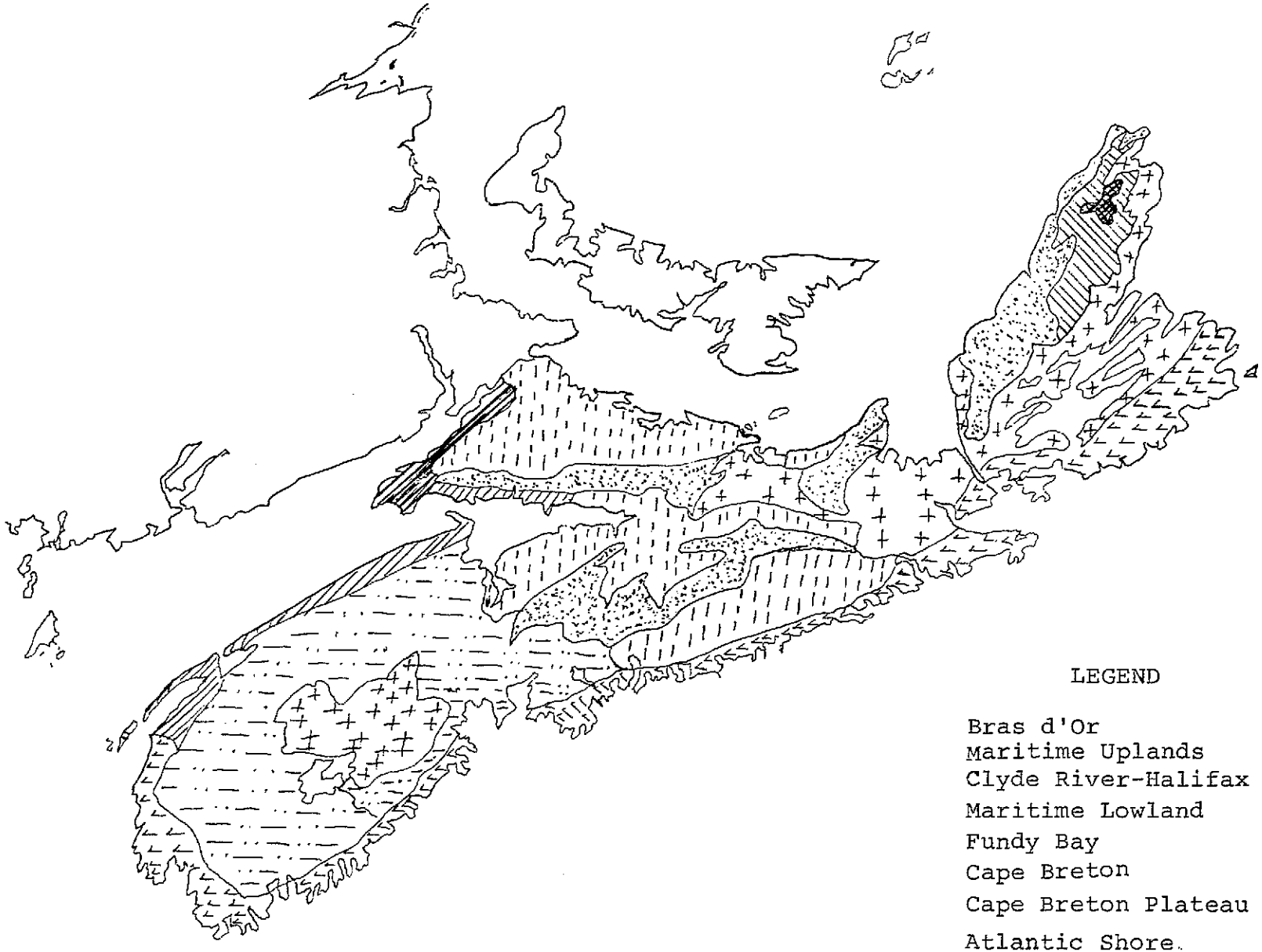
FOREST CLASSIFICATION
OF
NOVA SCOTIA



The red spruce-hemlock-pine zone is divided into two eco regions, one of which has the red spruce, white pine, hemlock, red oak, red maple, black spruce, and beech in a warm dry climate which is called the Clyde River-Halifax Eco Region. The other eco region in this zone, Maritime Lowlands, has balsam fir, red spruce, hemlock, white pine, red maple, jack pine, white spruce, and beech in association with a moderate, cool, and dry climate.

The spruce-fir zone comprises, first of all, the Fundy Bay Eco Region with red spruce, balsam fir, white birch, black spruce, yellow birch species, and the Atlantic Shore Eco Region which has white spruce, balsam fir, black spruce, and white birch growing together in a cold, wet climate.

The fir-pine-birch zone with its eco region called Cape Breton, we find black spruce, white birch, white spruce, and black spruce growing in association in a cold, wet climate.

The final zone, the Spruce Taiga Zone, whose eco region, Cape Breton Plateau, has a cold wet climate, and the species found there are black spruce, balsam fir, white spruce, and white birch.

There are sufficient sawlogs in Nova Scotia to sustain a sizable processing complex for an indefinite period of time providing adequate inputs are put back in the forest in order to provide the type of raw material required of a size, species and quality when required. The most recent estimates of timber resources are shown on pages 27 and 28. It should be noted

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Gross Merchantable Softwood Volume on Productive Forest Land by Species
and Size Class by Region and Ownership
000,000's Cu. Ft.

REGION	Spruce		Balsam fir		White Pine		Hemlock		Other		Sub-total		Total
	4"-9"	10" +	4"-9"	10" +	4"-9"	10" +	4"-9"	10" +	4"-9"	10" +	4"-9"	10" +	4" +
West	620.8	403.1	311.1	61.8	43.7	206.4	34.9	131.9	38.1	28.6	1048.6	831.8	1880.4
Crown	106.8	25.8	39.9	7.2	14.8	56.5	2.0	6.4	17.2	12.2	180.7	108.1	288.8
Private	514.0	377.3	271.2	54.6	28.9	149.9	32.9	125.5	20.9	16.4	867.9	723.7	1591.6
Large	205.3	174.4	109.2	22.9	17.2	99.8	12.1	65.0	4.8	6.3	348.6	368.4	717.0
Small	308.7	202.9	162.0	31.7	11.7	50.1	20.8	60.5	16.1	10.1	519.3	355.3	874.6
Central	704.5	568.5	543.5	110.2	12.0	77.5	30.3	61.9	42.9	18.6	1333.2	836.7	2169.9
Crown	114.1	59.6	60.6	11.2	3.8	30.8	.3	.6	13.5	6.4	192.3	108.6	300.9
Private	590.4	508.9	482.9	99.0	8.2	46.7	30.0	61.3	29.4	12.2	1140.9	728.1	1869.0
Large	242.9	305.4	185.7	47.6	2.8	22.8	7.6	26.0	7.4	3.6	446.4	405.4	851.8
Small	347.5	203.5	297.2	51.4	5.4	23.9	22.4	35.3	22.0	8.6	694.5	322.7	1017.2
East	269.4	144.4	277.9	65.4	13.3	23.6	2.1	22.1	9.8	3.0	572.5	258.5	831.0
Crown	76.9	27.8	73.4	18.1	1.6	10.7	.5	.6	4.4	1.5	156.8	58.7	215.5
Private	192.5	116.6	204.5	47.3	11.7	12.9	1.6	21.5	5.4	1.5	415.7	199.8	615.5
Large	30.5	23.6	28.6	7.8	.5	7.1	.1	.5	1.3	.5	61.0	39.5	100.5
Small	162.0	93.0	175.9	39.5	11.2	5.8	1.5	21.0	4.1	1.0	354.7	160.3	515.0
Cape Breton	315.3	169.5	781.0	249.8	1.1	17.3	1.7	15.1	20.8	6.6	1119.9	458.3	1578.2
Crown	72.2	40.5	449.2	185.4	.5	7.0	.2	1.8	4.9	1.7	527.0	236.4	763.4
Private	243.1	129.0	331.8	64.4	.6	10.3	1.5	13.3	15.9	4.9	592.9	221.9	814.8
Large	7.5	2.1	14.4	3.6		.3	.1	1.0	1.0	.1	23.0	7.1	30.1
Small	235.6	126.9	317.4	60.8	.6	10.0	1.4	12.3	14.9	4.8	569.9	214.8	784.7
All Regions	1910.0	1285.5	1913.5	487.2	70.1	324.8	69.0	231.0	111.6	56.8	4074.2	2385.3	6459.5
Crown	370.0	153.7	623.1	221.9	20.7	105.0	3.0	9.4	40.0	21.8	1056.8	511.8	1568.6
Private	1540.0	1131.8	1290.4	265.3	49.4	219.8	66.0	221.6	71.6	35.0	3017.4	1873.5	4890.9
Large	486.2	505.5	337.9	81.9	20.5	130.0	19.9	92.5	14.5	10.5	879.0	820.4	1699.4
Small	1053.8	626.3	952.5	183.4	28.9	89.8	46.1	129.1	57.1	24.5	2138.4	1053.1	3191.5

Gross Merchantable Hardwood Volume on Productive Forest Land by Species
and Size Class by Region and Ownership
000,000's Cu. Ft.

REGION	Birch-No Maple		Red Maple		Aspen-Poplar		Other		Sub-total		Total
	4"-9"	10" -	4"-9"	10" -	4"-9"	10" -	4"-9"	10" -	4"-9"	10" -	4" -
West	123.5	85.1	283.2	184.2	49.5	30.4	94.4	52.4	550.6	352.1	902.7
Crown	20.9	5.4	60.1	41.5	11.6	7.4	21.7	7.9	114.3	62.2	176.5
Private	102.6	79.7	223.1	142.7	37.9	23.0	72.7	44.5	436.3	289.9	726.2
Large	32.9	44.5	102.9	79.1	11.3	7.8	22.4	10.8	169.5	142.2	311.7
Small	69.7	35.2	120.2	63.6	26.6	15.2	50.3	33.7	266.8	147.7	414.5
Central	158.0	148.7	225.3	139.4	44.4	24.5	29.0	19.0	456.7	331.6	788.3
Crown	23.2	14.6	40.4	20.4	4.4	1.6	1.5	1.4	69.5	38.0	107.5
Private	134.8	134.1	184.9	119.0	40.0	22.9	27.5	17.6	387.2	293.6	680.8
Large	65.1	81.1	77.0	58.8	7.0	5.0	10.0	5.6	159.1	150.5	309.6
Small	69.7	53.0	107.9	60.2	33.0	17.9	17.5	12.0	228.1	143.1	371.2
East	88.9	114.6	89.7	63.9	12.0	11.2	14.9	12.0	205.5	201.7	407.2
Crown	25.7	41.8	29.6	22.4	.2	.4	1.8	2.2	51.3	66.8	124.1
Private	63.2	72.8	60.1	41.5	11.8	10.8	13.1	9.8	148.2	134.9	283.1
Large	8.5	14.6	10.1	6.9	.1	.1	.8	.6	19.5	22.2	41.7
Small	54.7	58.2	50.0	34.6	11.7	10.7	12.3	9.2	128.7	112.7	241.4
Cape Breton	158.1	268.2	80.3	60.9	5.5	6.1	34.7	32.3	278.6	367.5	646.1
Crown	65.8	132.7	19.2	15.3	.5	.5	8.8	7.1	94.3	155.6	249.9
Private	92.3	135.5	61.1	45.6	5.0	5.6	25.9	25.2	184.3	211.9	396.2
Large	3.6	6.6	3.3	2.8	.5	.2	1.4	.9	8.8	10.5	19.3
Small	88.7	128.9	57.8	42.8	4.5	5.4	24.5	24.3	175.5	201.4	376.9
All Regions	528.5	616.6	678.5	448.4	111.4	72.2	173.0	115.7	1491.4	1252.9	2744.3
Crown	135.6	194.5	149.3	99.6	16.7	9.9	33.8	18.6	335.4	322.6	658.0
Private	329.9	422.1	529.2	348.8	94.7	62.3	139.2	97.1	1156.0	930.3	2086.3
Large	110.1	146.8	193.3	147.6	18.9	13.1	34.6	17.9	356.9	325.4	682.3
Small	282.8	275.3	335.9	201.2	75.8	49.2	104.6	79.2	799.1	604.9	1404.0

timber volumes in Yarmouth, Shelburne and Digby counties in the Western Region are estimates taken from permanent sample plots. The forest inventory is not available for these counties. The most recent estimates of AAC for sawlogs using von Mantel's formula, is 178 million cubic feet for softwood and 72 million cubic feet for hardwood. The sawn lumber equivalent, converting at the rate of 5.0 board feet per cubic foot, is 890 million board feet for softwood and 360 million board feet for hardwood. These are gross merchantable figures, i.e. cull has not been removed. They also assume that all the trees suitable for sawlogs in the productive forest are being managed on sawlog rotations. Certain species, for various reasons, are not suitable for sawlogs and volume-wise amount to approximately 508 million board feet for softwoods and approximately 191 million board feet for hardwoods. Of the softwood species balsam fir is the most important and generally speaking cannot be managed for sawlogs because of its susceptibility to red heart rot at advanced ages. Finally a large volume of the resource is used for pulpwood and this must not be ignored in the calculations of wood availability on a continuous basis for an integrated forest industry complex. Present forest production is shown at Appendix 1.

As indicated elsewhere in this report sawmills presently operating in the province produce annually approximately 200 million f.b.m. of softwood and 5 million f.b.m. of hardwood. About 80% of the lumber produced from red spruce sawlogs in Nova Scotia is first grade merchantable stock capable of being dressed. Ten per cent of the lumber produced from the log is very low grade and many mills put

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this portion of the log into chippers. For other species the percentage of first grade merchantable lumber obtained from the log would be less - perhaps 75% in jack pine, 60% in hemlock and as low as 40% in white pine. In other words, it is necessary to saw approximately 100 million f.b.m..of spruce logs to obtain 80 million f.b.m. of top grade lumber. While no single mill in the province is a heavy producer of hardwood lumber, most mills cut various species of hardwood logs as they occur in their logging areas and saw them following accumulation of a reasonable quantity. It should not be difficult to purchase up to 500,000 f.b.m. of hardwood from various sawmills in the province if required.

In Nova Scotia 73% of the forest land is privately owned and crown land under lease accounts for about 16% to 20% of the total forest land containing 38% of the province's timber volume. The trend is toward greater consolidation of large holdings and this can result in underutilization of the resource unless some method is found to ensure maximum utilization.

The organization of an integrated manufacturing and marketing complex would assist in the future development of logging and sawmilling and provide the basis for an expanded wood products industry particularly in the production of products which require the conversion of primary raw materials (sawlogs and rough lumber) to marketable end items and which value is added by the expenditure of labour. This approach is required in Nova Scotia because of:

1. the special raw material situation which exists in the province and is described above;

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2. the large number of relatively small and inefficient sawmills operating in the province;

3. the lack of technological and management skills required for sophisticated industrial operations in the wood products industry;

4. the need for volume sales and bulk transportation in order to be competitive and which is unavailable to small producers.

Although the commercial forest resources of Nova Scotia are available as a source of supply for an expanded woods product industry the circumstances of pattern of tenure and ownership, location of resources, and quality of species imposes a requirement for a systematic approach to the procurement of raw materials that will satisfy the exact needs of the complex and guarantees the complex a long range supply of quality sawlogs. It is not felt that open market purchase of sawlogs from private landowners and established commercial sources would be practicable. Ideally the proposed complex should own and control forest land to ensure a long range supply of quality sawlogs. On the other hand, to stabilize the market, reduce administrative costs and provide a market for the many independent and small loggers in the province it is proposed the complex purchase sawlogs and rough lumber from individual loggers and sawmill operators and obtain the balance of its requirements on long term contracts from its partners in the enterprise. The proposed partners should be existing major sawmill operators with a capacity of producing a minimum of 60-80 million board feet per year.

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The dressing of 60-70 million f.b.m. of lumber will produce a very significant quantity of wood fibre in the form of shavings. It is estimated that this will amount to approximately 20,500 tons annually, which is too great a quantity of paid-for-fibre to ignore. With the addition of approximately 30,000 cords of local hardwood per year this raw material could provide the basis for the production of waferboard and particleboard and add to the profitability of the overall complex.

The diverse operations involved in converting sawlogs into finished products can be performed to best advantage by an integrated complex as recommended in this report equipped with processing facilities that will enable manufacture of a broad product mix obtained from all grades and by-product forms of the original raw material. It will also make possible the use of as much of its total raw material as technical knowledge will permit.

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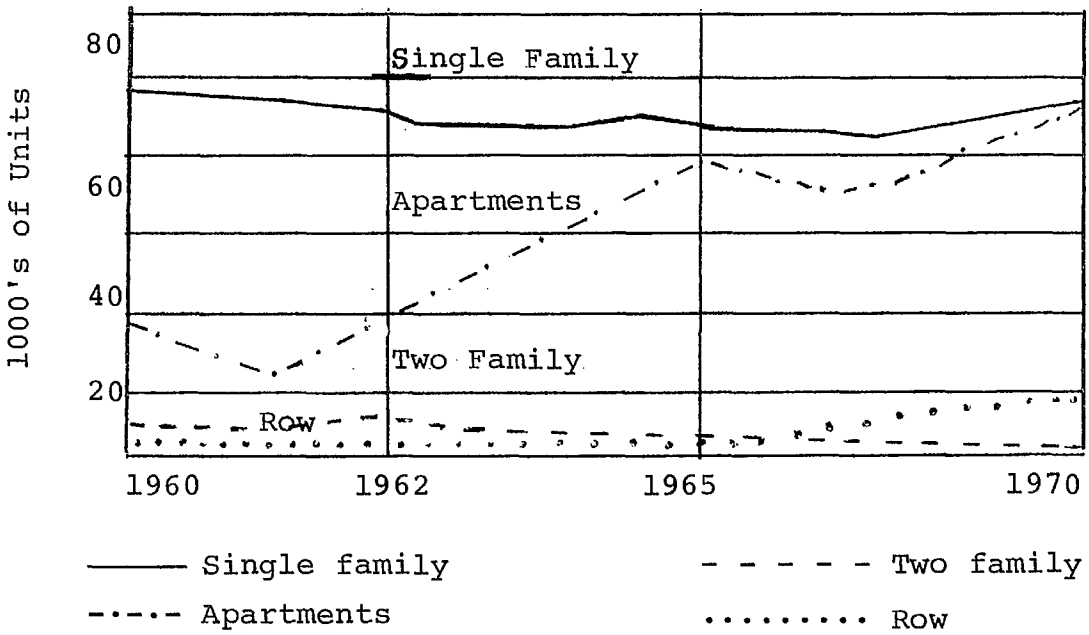
MARKETS

The key to a feasible building material complex as outlined in this report will be in the ability to market products in domestic and export markets, at competitive prices. A brief analysis of changing patterns of demand in residential housing in Canada, local market potential, as well as an indication of the market in north-east United States, which it is felt represents the most important export market for Nova Scotia producers, has been prepared and follows.

(i) CHANGING PATTERNS OF DEMAND IN RESIDENTIAL HOUSING

Since 1962, the residential market in Canada has undergone a strong transition. A high influx of young people has created a strong demand for living space and changing living patterns have brought about new types of housing. From a relatively stagnant market in 1962, demand has risen from approximately 126,000 dwelling units to 190,000 in 1970; a 51 per cent increase.

Dwelling Completions - Canada 1960-1970



Other changes are:

* Single family units have been priced into the suburbs by rising land, labour and material costs. Prefabrication is becoming increasingly important in this market.

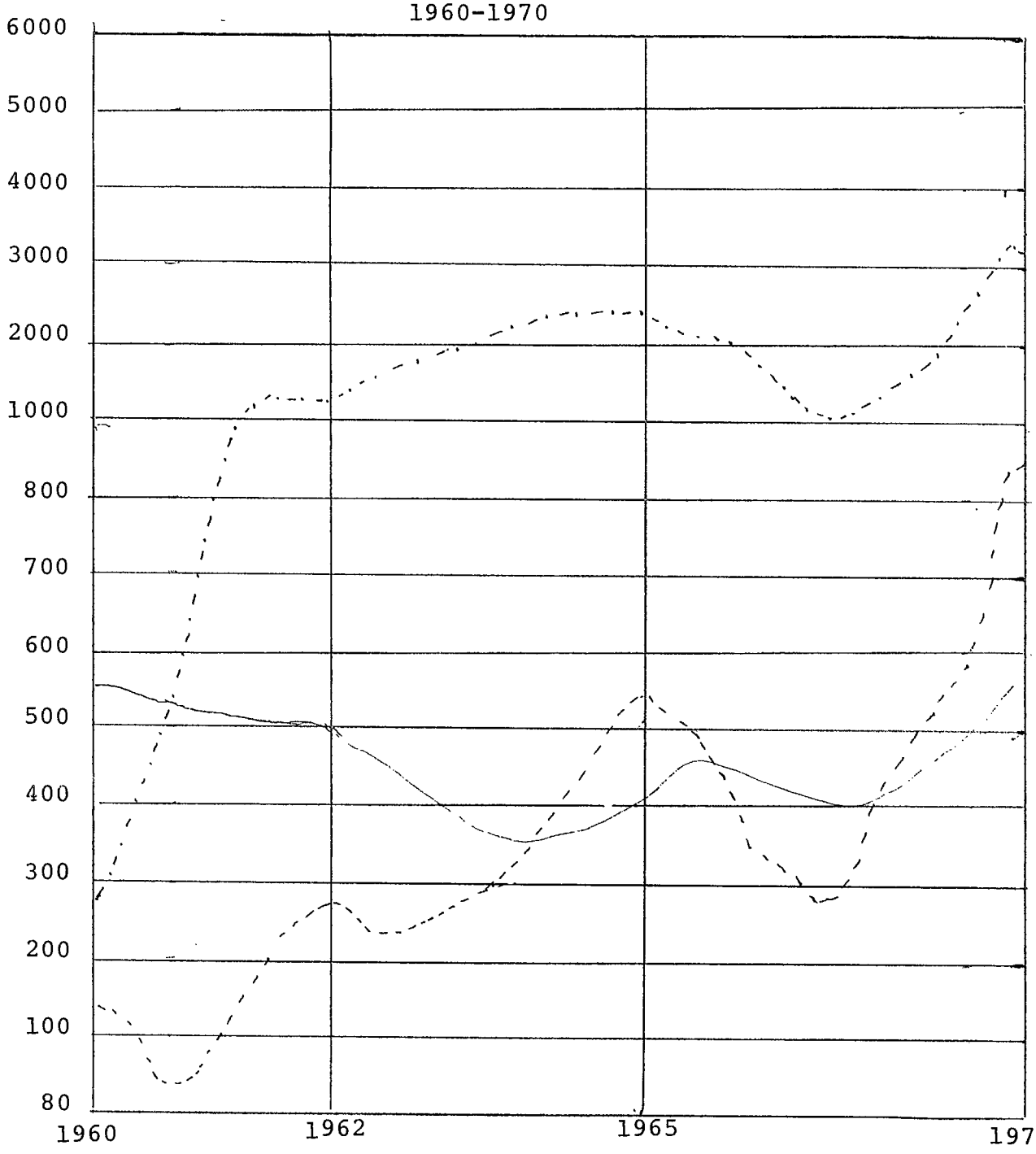
* Duplexes and semi-attached houses have declined and this trend is expected to continue and there has been a dramatic switch to multiple housing.

* Row housing has once again become fashionable. Improved living comfort and more efficient use of land and materials have caused demand to increase 67% since 1962. The trend to row housing and town houses is expected to continue upward.

* Apartments have shown the most spectacular growth by providing convenient living space in the cities at reasonable cost. The "Garden-type" apartment of 1962 has virtually disappeared and has been replaced by high-rise concrete towers.

Similar changes have occurred in the Maritimes as shown:

Dwelling Completions - Maritimes *
1960-1970



Preliminary projections of total households by type that will be in existence to the year 1986 are shown on page 4. It can be seen the local market will increase and this will be important to a building materials complex located in Halifax-Dartmouth.

PRELIMINARY PROJECTIONS
OF
TOTAL HOUSEHOLDS BY TYPE **
(000's)

Halifax	1971	1976	1980*	1981	1986
Family Households	47.8	52.5	56.8	57.9	63.4
Non-Family Households	7.2	8.6	9.6	9.8	10.9
Total	55.0	61.1	66.4	67.7	74.3
Atlantic Region					
Family Households	407.9	425.7	430.6	431.9	423.8
Non-Family Households	69.9	79.2	85.7	87.3	93.5
Total	477.8	504.9	516.7	519.2	517.3
Newfoundland					
Family Households	96.5	103.7	107.8	108.8	110.6
Non-Family Households	9.7	11.3	12.6	12.9	14.4
Total	106.2	115.0	120.4	121.7	125.0
Prince Edward Island					
Family Households	22.3	23.5	24.0	24.1	24.3
Non-Family Households	4.5	4.8	5.0	5.1	5.3
Total	26.8	28.3	29.0	29.2	29.6
Nova Scotia					
Family Households	161.9	166.7	166.9	167.0	162.3
Non-Family Households	32.8	36.7	39.3	39.9	42.2
Total	194.7	203.4	206.2	206.9	204.5
New Brunswick					
Family Households	127.2	131.8	132.0	132.0	126.6
Non-Family Households	22.9	26.4	28.8	29.4	31.6
Total	150.1	158.2	160.8	161.4	158.2

* Interpolation

** Source: Central Mortgage and Housing Corporation

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(ii) LOCAL MARKETS

Substantial quantities of building materials used in Nova Scotia are obtained from out-of-province suppliers. An analysis made by Management Engineering Services, which is a provincially sponsored agency, indicates that almost 67% of the value of all materials currently being used in building construction in Nova Scotia represents items manufactured outside the province. In 1969 this represented a total "input" market of some $72,663,000 for Nova Scotia alone. An estimated breakdown by building sector for 1969 is as follows:

	Building Materials Manufactured in Nova Scotia (per cent)	Building Materials Manufactured Out-of-Province (per cent)
Housing	37.1	62.9
Apartments	27.0	73.0
All Residential ...	33.1	66.9
Industrial	34.6	65.4
Educational	34.1	65.9
Office Buildings	28.4	71.6
Other Non Residential	33.6	66.4
All Non Residential	33.6	66.4
TOTAL	33.4	66.6

Nova Scotia material content is highest in housing with 37.1 per cent and lowest in apartment buildings with 27.0 per cent and office buildings with 28.4 per cent.

An analysis of building materials based on timber resources and used in new building construction indicates opportunities exist in local markets in three broad product areas:

1. Rough carpentry materials
2. Finish carpentry materials
3. External openings

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Wood products in these categories account for imports into Nova Scotia alone of $16,786,000 or 72% of a total market for these products of $23,450,000. In addition there is an undetermined but very sizeable repair or home improvement market. On page 39 is a recent market estimate for wood products in new building construction by construction sector and sub-sector for the Maritime provinces.

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TABLE THE MARITIME PROVINCES MARKET FOR WOOD PRODUCTS IN NEW BUILDING CONSTRUCTION BY CONSTRUCTION SECTOR *

	Rough Carpentry	Finish Carpentry	External Openings	Total
	$000's	$000's	$000's	$000's
Housing				
N.S.	$ 5,682	$ 2,095	$ 2,841	$10,618
N.B./P.E.I.	5,559	2,049	2,779	10,387
Total	$11,241	$ 4,144	$ 5,620	$21,005
Apartments				
N.S.	2,276	1,568	1,530	5,374
N.B./P.E.I.	867	597	583	2,047
Total	$ 3,143	$ 2,165	$ 2,113	$ 7,421
All Residential				
N.S.	7,958	3,663	4,371	15,992
N.B./P.E.I.	6,426	2,646	3,362	12,434
Total	$14,384	$ 6,309	$ 7,733	$28,426
Industrial				
N.S.	$ 58	$ 107	$ 832	$ 997
N.B./P.E.I.	73	135	1,048	1,256
Total	$ 131	$ 242	$ 1,880	$ 2,253
Educational				
N.S.	$ 1,037	$ 1,546	$ 1,042	$ 3,625
N.B./P.E.I.	571	851	574	1,996
Total	$ 1,608	$ 2,397	$ 1,616	$ 5,621
Offices				
N.S.	$ 67	$ 10	$ 202	$ 279
N.B./P.E.I.	$ 51	$ 8	$ 155	$ 214
Total	$ 118	$ 18	$ 357	$ 493
Other Non-Residential				
N.S.	$ 606	$ 868	$ 1,083	$ 2,557
N.B./P.E.I.	264	378	675	1,317
Total	$ 870	$ 1,246	$ 1,758	$ 3,874
All Non-Residential				
N.S.	$ 1,768	$ 2,531	$ 3,159	$ 7,458
N.B./P.E.I.	959	1,372	2,452	4,783
Total	$ 2,727	$3,903	$5,611	$12,241
TOTAL				
N.S.	$ 9,726	$ 6,194	$ 7,530	$23,450
N.B./P.E.I.	7,385	4,018	5,814	17,217
ALL	$17,111	$10,212	$13,344	$40,667

Source: Management Engineering Services

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Following is a brief analysis of the three broad product areas noted above:

1. Rough Carpentry Materials which is composed of
   - lumber;
   - plywood;
   - trusses and beams;
   - other.

An estimate of the Maritime Provinces' market for these products is the following:

	New Residential Construction	New Non-Residential Bldg. Construction	Total for Both
Lumber	$ 5,813,000	$ 787,000	$ 6,600,000
Plywood	5,063,000	1,540,000	6,603,000
Trusses & Beams	2,024,000	400,000	2,424,000
Other	1,484,000	N/A	1,484,000
Total	$14,384,000	$2,727,000	$17,111,000

2. Finish Carpentry Materials which is composed of
   - siding;
   - interior doors, frames;
   - millwork;
   - cabinetry, vanities.

An estimate of the Maritime Provinces' market for these products is the following:

	New Residential Construction	New Non-Residential Bldg. Construction	Total for Both
Siding	$ 1,579,000	N/A	$ 1,579,000
Interior Doors, Frames	1,317,000	$ 1,410,000	2,727,000
Millwork	1,360,000	2,493,000	3,953,000
Cabinetry, Vanities	2,053,000	N/A	2,053,000
Total	$ 6,309,000	$ 3,903,000	$10,212,000

3. External Openings which is composed of window and frames and entrances. The materials in this category are far from being just wooden windows and doors. There is of course a high aluminum and steel content as well as glass. It has not been possible to split, for example, the residential window market into wood and aluminum. This depends a great deal on individual preferences of builders, architects and owners as well as price considerations.

As far as Canadian production of all types of windows and frames is concerned, wood windows and frames account for approximately 31% of the total dollar value of shipments. It is quite possible that this proportion is higher for the Maritime Provinces, but it is not possible to confirm this.

An estimate of the Maritime Provinces' market for these products is the following:

	New Residential Construction	New Non-Residential Bldg. Construction	Total for Both
Windows, Frames	$ 6,010,000	$ 3,436,000	$ 9,446,000
Entrances	1,723,000	2,175,000	3,898,000
Total	$ 7,733,000	$ 5,611,000	$13,344,000

It also should be noted that entrances includes a host of items including regular house doors, side-lites, garage doors and overhead doors for factories and warehouses.

4. All Products

The total annual market for these product areas in New Building Construction in the Maritime Provinces is therefore the following:

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	New Residential Construction	New Non-Residential Bldg. Construction	Total for Both
	$000's	$000's	$000's
Lumber	$ 5,813	$ 787	$ 6,600
Plywood	5,063	1,540	6,603
Trusses & Beams	2,024	400	2,424
Other Rough Materials	1,484	-	1,484
Total Rough Carpentry	14,384	2,727	17,111
Siding	1,579	-	1,579
Interior Doors, Frames	1,317	1,410	2,727
Millwork	1,360	2,493	3,853
Cabinetry, Vanities	2,053	-	2,053
Total Finish Carpentry	6,309	3,903	10,212
Windows, Frames	6,010	3,436	9,446
Entrances	1,723	2,175	3,898
Total External Openings	7,733	5,611	13,344
TOTAL	$28,426	$12,241	$40,667

5. Repair

No study has been made of the repair or home improvement market for building materials. Nevertheless, it is a very significant market and one that should not be neglected in appraising manufacturing feasibility.

In 1969, in the three Maritime provinces, the value of repair construction was:

25.4% of new residential construction;
17.7% of new non-residential building construction;
21.3% of all new building construction.

Applying these very rough percentages to the market estimates given above would add another $8.4 million to the market.

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Manufacturing Opportunities

The market for many building material products in the three broad product areas noted above will be very adequately served by existing manufacturers. There would, however appear to be large enough markets for the following manufacturing operations by the proposed building materials complex in Halifax-Dartmouth.

Lumber

The size and growth of the Nova Scotia and Maritime provinces building construction market as outlined in this report will make it possible for the building materials complex to sell at least 15 million f.b.m. of finished lumber in local and regional markets. Captive plants will utilize a further 1½-2 million f.b.m. The export market, particularly in the United States is adequate to support additional imports of lumber. It is proposed the complex export 40-60 million f.b.m. of rough and finished lumber to these markets annually. No difficulties are anticipated in disposing of this volume profitably providing good market contacts are established and more economic means of transport are developed.

New private housing units started last year in north eastern United States were 207,900 or 16% of the U.S. total. This region now imports annually $62.5 million of Canadian lumber and approximately $10 million comes from the Atlantic region. The mid-Atlantic U.S. market now imports about $113 million of Canadian lumber each year and approximately $4 million comes from the Atlantic region. Forecasts of increased construction activity throughout the northeast United States should ensure Maritime producers of quality lumber, a steady market for their products, and projected sales for the complex are estimated at 40-60 million f.b.m.

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New lumber standards recently developed in Canada and the United States provide new standard dressed sizes for green and dry lumber. There is a trend towards the use of dry lumber throughout North America and more and more companies are installing kiln facilities to meet this demand. It is becoming increasingly difficult to ship green lumber to distant markets in the face of rising freight costs and market preference for dry lumber.

Exports of eastern Canadian species to United States in 1970 was as follows. It can be assumed that the bulk of these exports were consumed in the northeast region.

	Quantity (M FBM)*
Lumber Basswood	5,322
Lumber Birch	44,929
Lumber Maple	55,267
Lumber Other Hardwoods	13,402
Lumber Jackpine	75,197
Lumber Red Pine	6,407
Lumber White Pine	41,070
Lumber Spruce (excl.Western White)	747,267

A comparison of lumber sales in 1970 between Nova Scotia and New Brunswick is given below:

SHIPPED TO	FROM NOVA SCOTIA 1970 (Mfbm)	%	FROM NEW BRUNSWICK 1970 (Mfbm)	%
U.K., N. Ireland & Irish Free State	34,073,105	16.8	6,433,996	2.6
United States	6,455,000	3.2	(75,151,138) (12,000,000)	35.5
Quebec & West	5,429,286	2.7	21,163,779	8.6
Newfoundland	10,333,258	5.1	5,879,924	2.5
Other Off Shore	1,461,000	0.7	412,000	0.2
Local	(98,419,664)	71.5	(67,505,895) (57,000,000)	50.6
	202,671,313	100	245,546,732	100

* Only a small portion of this volume, and only some of these species, originate in Nova Scotia.

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It will be noted that less than four per cent of Nova Scotia's production in 1970 was sold in the United States while over a third of New Brunswick's sales were in that market. At present the northeast U.S. market is served from the Maritimes primarily by rail and road transport. The rate into New England markets from western New Brunswick is lower than from the lumber producing areas of Nova Scotia. To offset this freight disadvantage for Nova Scotian shippers the Eastern United States market should be served by water transportation and by large shipments in order to warrant competitive water rates.

Although capital costs for the manufacture of pallets have not been included in the financial projections in this report it is a possibility that should be kept in mind in the future. In the past two years the pallet market in the United States has suffered from the general economic conditions and has not provided too many possibilities for Canadian producers. However, it is generally believed that the economy will pick up in the near future, and requirements for pallets should expand very rapidly and offer the complex a marketing opportunity. It should be noted that the U.S. tariff structure is such that it is nearly impossible to ship, competitively, complete and assembled pallets to United States. The tariffs on wooden pallets, i.e. complete packing boxes, cases, crates, and other containers, is 16 2/3%. It is possible, however, to compete by shipping knocked down pallets or by supplying pallet components to U.S. pallet manufacturers. The sizes are mostly 2 x 4 - 36" and 48" for stringers and 1 x 4 and 1 x 6 - 36" and 48" for deck boards. Provided the lumber is only dressed four sides and cut to length, it can be shipped into the U.S. as lumber free of duty. The market potential exists in the northeast and mid-Atlantic U.S. regions and at the appropriate time could be supplied by an aggressive and well organized Nova Scotia lumber producer.

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Most eastern Canadian softwood lumber producers sell through American wholesalers and it is recommended the building materials complex do the same. Trying to perform the wholesale function can be quite costly for a Canadian producer -- settling claims and acquiring up-to-date credit information can best be handled by the wholesaler who is well known to the local trade. Specialty producers such as those servicing the furniture industry may find it advantageous to deal through a commission salesman who is a specialist in this field. Items such as panelling, plywood, etc. may be better handled by a warehouse distributor carrying large inventories for fast delivery to local dealers. Normal wholesaler discounts on softwood construction lumber is 5% and 2% cash 30 days. These discounts may be slightly higher on white pine, select grades of hardwood and specialty items.

A substantial market exists in the U.K. & Ireland for rough lumber. Britain will continue to be an important market for softwood lumber but it will become less attractive to the smaller producer who cannot develop volume orders and is not in a position to obtain shipping rates in competition with the large shipper who can charter ships. A demand for eastern lumber will continue to exist but a different marketing approach will be required if Maritime shippers expect to remain in this market. The move towards containerization and the servicing of fewer ports by shipping companies is also adversely affecting the export efforts of the small Nova Scotia lumber producer. This market is also being eroded through intense competition from Russia and Scandinavia. Because of these factors over time it may become increasingly difficult for Nova Scotia producers to maintain their present share of these overseas markets. Sales of rough lumber to the U.K. by the complex are projected at 15 million f.b.m. per year which is approximately 50% of present sales in that market.

Kitchen Cabinets, Bathroom Vanities, Store Fixtures and Low Priced Furniture

An opportunity exits in Nova Scotia for the manufacture of

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well engineered kitchen cabinets, vanities, store fixtures and low priced household furniture. To be competitive a Nova Scotia plant must be mechanized and automated with a minimum annual capacity of 5,000 units of cabinets, vanities and low-priced household furniture. It is estimated that an annual $3 million market exists in the Maritimes for these products. Very little in the way of kitchen cabinets are presently manufactured in Nova Scotia and most of them are made on a job shop basis.

Estimates prepared by the Department of Industry, Trade and Commerce indicate a potential market of $256 million for kitchen cabinets in north eastern United States for remodeling, new homes and mobile homes. Kitchen cabinets are dutiable at 6% during 1971 and will be dutiable at 5% in 1972 and thereafter.

Gregg Cabinets of Québec, Raywall Cabinets and Hanover Kitchens of Ontario are now exporting to eastern United States but total volume probably does not exceed $1 million yearly. In order to market cabinets in the United States a high quality knocked down cabinet system should be considered. This will also help to develop a substantial "do it yourself" market which is a relatively untouched market in Canada at present and should receive attention. The complex should also consider the manufacture of storage units for use in dens, recreation rooms, laundry rooms, etc. or other storage units for non-kitchen installation in their product mix. Because the fastest growing sector of the residential construction industry in North America is represented by the mobile home industry this market sector should be carefully investigated in relation to new opportunities it could offer as well.

The prefabricated house plant will provide the kitchen cabinet plant with a captive market for 500 units when in full production. To avoid total dependency on the construction market for kitchen cabinets it is contemplated one third of the total production consist of low-priced furniture directed to the prefabricated and mobile home industries.

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Woodworking Products

As indicated on pages 39 and 40 of this report it is estimated there exists in the Maritimes region an annual market of approximately $10-12 million for interior and exterior doors, windows, frames, entrances and mouldings. To sell the output of the woodworking plant the complex must capture one fifth of the Maritimes market which should not be too difficult. Practically all grades of interior and exterior flush doors are now imported into the Maritimes region. It is estimated the annual market for these products alone is approximately $3 million and the major proportion comes from plants located in Québec.

With the trend towards pre-assembly and systems building the complex must develop sales for pre-hung doors, windows and mouldings. This in turn will assist builders and developers reduce building costs through minimizing on site construction and increase sales for the building complex.

The wood working plant will sell about $500,000 of products annually to the prefabricated housing plant.

Prefabricated Houses

There is a substantial demand for lower cost housing in Nova Scotia and the Atlantic region. The cost of housing of all types has increased substantially in recent years and will continue to increase in the future. Advantage must be taken of new techniques and new materials of construction in order to maintain a reasonable level of cost, but still provide adequate comfort and space. One important way is to provide factory built prefabricated houses. There are two types:

(1) modular homes where components are assembled at the factory and are transported to the site for erection.

(2) prefab homes in which factory-assembled wall, room, floor, ceiling and partition components

are shipped to the site "knocked down" to be assembled into a home.

Both modular units and prefab homes or structures can be developed from standard components into a wide variety of sizes and styles and floor plans.

Nova Scotia does not have manufacturing facilities for the production of "prefab" or "modular" structures in the true sense. It has several small producers of "prefab" parts and vacation homes. In 1962 about 6½% of all single family residences built in the United States were "factory built". This percentage has now increased to almost 30%. Within 5 years it is expected that most homes in the under $20,000 category will be "factory built". A similar trend can be expected in Canada.

The normal housing demand in Nova Scotia could support a modern prefabricated and modular structures manufacturing plant producing 500-600 units annually. The output of such a plant would require less than a 10% penetration of the provincial market and less than 5% of the regional market. Market penetration could be substantially increased if the manufacturer becomes involved in real estate development, either on his own or in partnership with an existing developer. The market can also be further expanded by serving the vacation home market and by producing a variety of prefab structures.

The possibilities of designing prefabricated housing units for public housing deserves careful consideration. In 1971-72 the Nova Scotia Housing Commission is planning or has under construction a total of approximately 1400 units: 800 family public housing units ranging in cost between $16,000 and $19,500 per unit; 145 phased housing units costing $12,500 to $13,000 per unit, and 485 senior citizen housing units costing between $12,000 and $13,000 per unit. The production level is forecast to be approximately 1200 family and phased units and 600 senior citizen units per year. Providing certain current

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constraints could be removed these projections could almost be doubled.

In general a "prefab" package will provide the purchaser with from 30% to 50% of the final cost of the home. Further furnishing is not possible as utilities, foundation, some of the finishing, and erection must be done on the site. "Prefab" units, however, can be provided in a variety of levels of completeness; from those that are just a shell to those that contain all of the rough finishing and much of the final finishing. It is usually advantageous for an individual purchaser to obtain as much finishing as possible in the package, as the producer with volume buying can obtain lower cost material. In some cases, however, an individual with time and some skill can complete a "prefab" home with little out-of-pocket cost for labor and will choose a "shell" type "prefab" unit.

The market can be served in a variety of manners. The normal practice is to sell the factory produced "prefab" or modular package through dealers and with company salesmen. A sales office is usually maintained where plans and model homes are displayed. The purchaser may have the manufacturer complete the erection of the package or buy the component package and have it erected by a builder of the purchaser's choice. A manufacturer will often sell a complete "prefab" or modular package to a dealer-erector who will complete the home for resale to the customer.

There has been a recent trend for manufacturers to become involved in real estate development, as well as for real estate developers to become involved in manufacturing.

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Each of these marketing procedures should be used, but emphasis should be placed on carrying marketing all the way through real estate development which will allow the most rapid market penetration and produce the maximum profits.

In marketing it is essential that the consumer be convinced of the advantages of "prefab" and modular construction in providing the most value for money spent in terms of space or features or both as compared with on-site construction of the same cost.

Particleboard and Waferboard

The markets for particleboard in Canada have grown rapidly in recent years and are presently over-supplied. Because a board plant in the building materials complex would obtain residues at no cost it probably could sell particleboard in local markets in competition to products now imported from outside the province. However, because of the market situation it is proposed the major portion of the output be sold in the United Kingdom. As particleboard is an important material in prefabricated homes and can also be used in kitchen cabinets, for roof and floor decking and for counter tops it is estimated the building material complex will provide a market for upwards of 10% of the output of the particleboard plant.

Particleboard production in Canada since 1963 is estimated as follows:

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Year	Production Msf 5/8"	Capacity Msf 5/8"	Production as a Percent of Capacity %
1963	59,320	80,000	74
1964	74,720	128,000	58
1965	102,040	154,000	66
1966	119,750	159,000	75
1967	132,520	175,000	76
1968	143,230	183,000	78
1969	171,090	185,000	92
1970	190,310	412,000	47

Source:

Data assembled from Dominion of Statistics Publications, with plant capacities estimated by the Department of Trade and Industry, Ottawa, based on a recent survey of the Canadian industry.

The following table shows the relationship between capacities and consumption to 1975:

Year	Capacity MMsf 5/8"	Consumption Low MMsf 5/8"	Consumption High MMsf 5/8"	Consumption as Percent of Capacity Low %	Consumption as Percent of Capacity High %
1970	412	226	234	55	57
1971	420	261	299	62	71
1975	690	399	533	58	77

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On the basis of the estimated growth in demand capacity will exceed demand at least until 1975 and probably much longer and for that reason it is not proposed that the board plant in the building materials complex rely on Canadian sales.

The United Kingdom has been and will continue to be one of the world's leading trading nations for particleboard showing an average annual growth of 21% over the period 1960-1970. Last year consumption is estimated to have exceeded 360,000 metric tons. Traditionally, Scandinavia has captured the major share of this market, although for brief periods low priced material from Romania and Poland have flooded the market. Trade reports indicate that demand for particleboard in the Russian home market has grown so greatly that all surplus particleboard from Eastern Europe is being absorbed by Russia.

U.K. PARTICLEBOARD CONSUMPTION (LONG TONS PER ANNUM)

Item	1966	1967	1968	1969
Production	162,000	148,000	179,000	190,000
Imports	54,000	95,000	165,000	149,000
Exports	-	-	-	-
Apparent Consumption	216,000	243,000	344,000	339,000

In spite of rapid growth in domestic production during the sixties, lack of economic feedstocks severely inhibit continued growth in U.K. production and indicate increased dependence on imports. For this reason and with the U.K. market expected to further expand by at least 10% per year it is believed a captive market for the production of the particleboard plant could be located in the U.K.

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Transport costs are a critical consideration in marketing all commodity products, and particleboard is no exception. It is particularly sensitive to cartage costs because of the very low value to weight ratio and European suppliers to the United Kingdom have developed several systems for moving particleboard directly from mill to consumer with practically no intermediate handling.

The most commonly used system, which is termed the "roll-on, roll-off" system reduces delivery costs and delivery times to between 7 and 14 days from western Europe, thus allowing importers and end users in the U.K. to maintain minimal inventories. Major West Coast shippers of forest products have also developed a system which allows delivery direct from mill to end user. As with roll-on, roll-off, these systems include special handling equipment, charter vessels, and the ability to select advantageous ports of entry, all of which allows substantial reductions in transport costs. It is very apparent that in order to service the U.K. market successfully, a complete delivery system must be made an integral part of any proposed particleboard plant marketing plan.

Present productive particleboard capacity in the United States is expected to exceed demand at least until 1975 and probably for some years after that. As a general assessment of the United States market it seems apparent that projected excess capacity based mainly on low cost residue, large U.S. plant size and tariffs combine to make the development of satisfactory sales to the United States a difficult task and it is not proposed the particleboard plant attempt to sell in this market at this time.

Waferboard is an exterior grade phenolic board used for sheathing and cladding with comparable strength, quality and durability to -xterior softwood plywood. It is a recently developed process in North America and is being successfully

produced and sold in Western Canada.

The waferboard to be manufactured in the board plant in the building materials complex will be marketed in direct competition to exterior softwood and hardwood plywoods and exterior fibreboards. Sales will be in the Atlantic region where the plant will have a major competitive advantage because of a lower freight burden in comparison to competing products from western Canada. The proposed sales for the waferboard plant represents between 30-40% of the potential market in the Maritimes and the complex should have no difficulty in disposing of its entire output of the plant. The prefabricated housing unit will require an annual volume of 3,266,000 square feet of waferboard valued at approximately $245,000.00.

PRODUCTION FACTORS

Timber supplies and modern and efficient production and marketing are the most important segments of a building materials complex. In Nova Scotia, however, transportation becomes another critical factor. In addition, power and labour are important to the operation. Timber supplies and markets have been covered in separate sections of the report.

1. Labour

(a) Plant, Maintenance and Clerical Labour

The cost of labour in Nova Scotia is competitive with other provinces in the Atlantic region. There are a large number of workers in the province who have been involved in handling logs and in lumber production and there should be no problems in recruiting the required labour force required by the building materials complex. Some re-training will be required to ensure high productivity and the maintenance of capacity output of several key pieces of equipment in the various units in the complex. This type of operation will undoubtedly attract young skilled workers who are graduates of vocational training establishments. The Department of Education in Nova Scotia provides machine wood-working training and would be receptive to arranging specific training for the needs of the complex which could result in well trained and properly motivated workers. Qualified secretarial, accounting and clerical workers are readily available.

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Skilled and semi-skilled labour to maintain the equipment involved in an efficient and modern building materials manufacturing complex can be obtained from other industries or construction companies in the province. It may be necessary to carry out a training program for maintenance staff.

(b) Supervising Labour

Trained supervisory personnel for modern highly automated industrial operations in a building materials manufacturing complex are extremely scarce in Nova Scotia. This type of labour can be trained, but time will be required in order to obtain proficiency in the new technology involved. It will be necessary to bring in from other regions experienced supervisors who are qualified and capable of training various assistants, foremen and mechanics under them and to assist in training the general labour force. All supervisory personnel will need to be paid salaries equivalent to those paid by large modern wood products plants in other parts of Canada.

(c) Administrative and Management Staff

Staff to handle routing, accounting, purchasing, payroll and personnel functions can be obtained in Nova Scotia without any difficulty. For top management positions, however, outside personnel with actual operating experience should be recruited to manage the various sectors of the complex. The overall management of the complex outlined in this report will also require

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the relatively scarce skills of corporation finance experts, sales managers and transportation consultants, and others not readily available in Nova Scotia. It is imperative that attention be paid to early recruitment and training of qualified management personnel.

Typical union wage rates in the wood products industry in Nova Scotia are given on pages 59 and 60. These rates are subject to change as new labour agreements are negotiated.

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Nova Scotia Wage Rates in Wood Products Industry

Logging:	$ per hr/day/wk
Chopper and Cutter	19.00 - 27.00 **
Skidder Operator	17.63 - 18.00 **
Tractor Driver	19.66 - 19.80 **
Pulpwood Cutter	17.26 **
Scaler	15.00 **
Sawmills:	
Manager, Office	150.00 - 175.00 *
Band Head Sawyer	2.91
Boom Man	2.71
Carrier-Driver	2.71
Circular Head Sawyer	2.91
Edgerman	2.74
Grader	2.74
Loader	2.54
Log Turner	2.54
Piler	2.54
Resaw Operator	2.91
Sealer	2.54
Setter	2.54
Sorter	2.54
Tail Sawyer	2.62
Tallyman	2.54
Trimmerman	2.54
Saw Filer	2.91
Sash, Door, and Planning Mills:	
Cabinet Maker	2.75
Glazier	2.62
Grader	2.74
Plane Operator	2.74
Sash, Door or Frame Assembler	2.74

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Sash, Door, and Planning Mills: (con'td)	$ per hr/day/wk
Saw Operator	2.91
Woodworking Machine Operator	2.74
Loader	2.54
Piler	2.54
Household Furniture:	
Assembler Wood or Cabinet Maker, Class B	2.30 - 2.50
Pulp and Paper:	
Stenographer, Senior	93.10 *
Stenographer, Junior	79.76 *
Acid Maker	3.82
Digester Cook	4.23
Grinderman	2.66
Woodhandler	2.26 - 2.85
Laboratory Technician	145.86 *
Paper Tester	3.34
General Labour:	
Unskilled	1.87 - 2.10
Semi-skilled	2.00 - 3.50
Skilled	2.50 - 5.00

* per week

** per day

2. Power

Electric power is generated and supplied to the Halifax-Dartmouth area by the Nova Scotia Light and Power Company Ltd. At Appendix 2 specific information on power rates is given. Included is a copy of Nova Scotia Government Bill No. 73 which relates to the supply of electrical power to new or expanding industries and which permits the Nova Scotia Light and Power Limited to negotiate an agreement with an industry providing that the provisions of the Act are fulfilled. Requirements include that the industry will have an electrical demand of at least 2,000 kilowatts and that the industry will provide employment for at least one person per 50 kilowatts of demand. Also included is Nova Scotia Light and Power A.C. Power Industrial Rate and Regulations which is available to an industrial customer having a connected electrical load of 400 kilowatts or more and who purchases energy at transmission voltage.

The industry would normally be metered at the primary voltage level and all facilities on the load size of the metering point would be the responsibility of the customer. If requested Nova Scotia Light and Power will provide transformation to a single service voltage or the industry may provide all transformation and enjoy the reduced base charge as indicated on the Rate sheet in Appendix 2. It will be noted there is also provision in this Rate for reduced base charge for limiting demand during certain peak

hours as described.

In the case of the proposed building materials complex power could probably be supplied at a central substation location for transformation to distribution voltage with distribution extended to the various remanufacturing facilities for further transformation to utilization voltage as required. Information regarding standard service voltages and rate regulations for a connected load under 400 kilowatts is also included at Appendix 2.

3. Transportation

Transportation is probably the singularly most important factor in the operations of a building materials manufacturing complex to be located at Halifax-Dartmouth. Regardless of type of transport used, present costs are abnormally high. This affects both the cost of logs to sawmills and the return to be expected from both export and domestic sales. At the present time some Nova Scotian mills are having their lumber trucked over a distance of 200 miles for $8 per thousand f.b.m. As it is anticipated that on the average, the sawmills that will become part of the building materials complex will be much closer, it appears reasonable to assume that the cost of moving sawn lumber from the sawmills to the manufacturing building materials complex will be about an average per m cost of $5-6.

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At Appendix 2 published rail rates on commodities to be sold by the materials complex are shown from Halifax and St. John to selected centres. At Appendix 2 truck rates are provided on the same articles with the exception of lumber.

Information received shows that insofar as lumber is concerned it is now being transported by truck at the following rates:

To	From	
	Halifax	Saint John
Boston, Mass.	119¢/Cwt.	76¢/Cwt.
New York, N.Y.	156¢/Cwt.	114¢/Cwt.
	(Minimum weight 40,000 lbs.)	

Ocean rates on softwood lumber from Saint John and Halifax to the United Kingdom and Ireland are as follows for movement by the Conference Line Vessels of Furness Warren Limited.

Ocean Conference Rates on Spruce Lumber from Halifax and Saint John to United Kingdom and Ireland
($ per standard)

Butted both ends	$ 80.00
Butted one end	$ 90.00

Standard 1980 fbm, which is equal to 165 cu. ft.

Tramp operators are prepared to quote a rate of $69.50 per standard.

Preliminary discussions have indicated that ocean rates for lumber from Halifax to ports within the general range of Boston/Norfolk could probably be developed at

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something less than $15.00 per thousand board feet. It is assumed that not less than 20 boat loads or shipments would be made per year.

Present or potential rates applicable on rail carload shipments and truckload movements of particleboard are also given at Appendix 2. Conference rates for shipping particleboard from Halifax-Europe range from $30-$35 per M sq. ft. Again preliminary discussions indicate rates could be developed at $20-$25 per M sq. ft.

Published rates do not reflect actual rates which must be negotiated. Evidence exists that indicates a major shipper of lumber and lumber products could negotiate substantial reductions over published rates. In this regard. before finalizing plans, the Halifax-Dartmouth complex should consider a number of alternatives including negotiation of reduced rail, truck and water rates, the economics of owning and operating barges particularly for lumber and the possibilities of encouraging the establishment and use of a coastal feeder service.

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PLANT LOCATION AND SITE SELECTION

There are three critical criteria in the location of the building materials complex. One is access to timber and sawmilling facilities; second is availability to the Halifax-Dartmouth urban market; and third is access to transportation for exportation of a large percentage of the total value of finished products. There are other important factors to consider such as power, labour, supplies and access to services, but some adjustments can be made to accommodate variations if the major criteria are met.

The commercial forest resources of Nova Scotia vary in timber concentration, but are generally distributed throughout the province. Some areas tend to offer better opportunities for the production of species or sizes adaptable to sawlog production; while in other areas conditions tend to favour pulpwood production. In practically all cases, however, integrated sawlog-pulpwood operations are indicated in order to achieve highest and best use of the resource. For this reason, it is emphasized that efforts should be made to select and seek the participation of a network of viable sawmills, throughout the province, having regard to their long-term access to adequate timber stands, their ability to deliver chipped residue to pulp mills, and their proximity and relationships with one another.

In order to maximize quality and minimize land and capital requirements, operations should be so designed as to facilitate a prompt and orderly flow from stump to ultimate market. This concept implies the application of controlled artificial drying techniques at the centrally located processing complex.

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A relatively flat site of about 100 acres is needed for the processing complex in Halifax-Dartmouth and should be located at harbour facilities with a minimum wharf frontage of 1,000 feet. It must have good road access and also be served by rail. Costs included in this report are estimates and may require some revision, depending upon the actual plant site chosen and the final plant engineering study which should be completed prior to construction.

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PROJECTED FINANCIAL STATEMENTS

The integrated project outlined in this report consists of sawmills and five related manufacturing plants. Each unit has been examined separately to establish its profitability.

The following financial projections outline the probable capital costs, suggested financial plan and likely operating results of the proposed complex for its first five years. For the sake of simplicity, they do not include detailed balance sheets, income or cash flow statements for each individual manufacturing unit in the complex. These figures are, however, available on request.

Furthermore, these projected statements only itemize the capital cost of acquiring and modernizing the existing sawmills in the Capital Financing Program and in the Fixed Asset Schedule. They do not reflect revenues or costs in operating the mills, or amortization of the short-term debt occasioned by their acquisition. For purposes of brevity and simplicity it has been assumed that the sawmills would sell their lumber at delivered cost to the complex (including depreciation and debt service and after deducting revenues from the sale of wood chips) and thereby incurring neither profit nor loss to affect the overall operating projections.

Similarly no allowances have been made for service or amortization of the debt incurred for the purpose of creating the necessary infrastructure facilities, nor for their operations. Instead, each plant has been assessed a pro rata charge for heat, steam, etc.

The following factors should be kept in mind when considering these projected statements.

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1. With the exception of the lumber processing plant, which provides the residue foundation for the manufacture of particle board in the board plant, construction of one or more of the individual plants could be deferred, or a plant could be completely eliminated without seriously affecting the function of the overall complex.

2. Provision for management and supervisory staff has been made in the financial structure of each plant. Centralized management and supervisory control would result in a sizeable reduction in operating costs; e.g., the computer in the lumber processing plant could be utilized by the entire complex.

3. Raw material interchange between the respective plants has been calculated at open market prices rather than at cost.

4. Inward transportation costs and sales expenses have been calculated for the individual plants. The centralization of these functions could result in considerable savings.

5. The average wage rate for the complex has been calculated at $2.25 per hour, indicating a possible variance from $2.00 to $3.00 per hour. It is assumed that the complex will operate under a collective agreement with one union. The financial statements reflect a 4% annual wage increase.

6. The rate for indirect labour has been established at $6,500 per year. The same 4% yearly wage increase applies. Costs of machinery and equipment were determined from qualified engineers and on the basis of recently completed projects.

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7. Structural costs for all buildings were determined on the basis of total square footage, taking into account the height requirements. The prices were computed for standard steel struss, insulated, metal faced buildings. Prices quoted have been verified by reputable construction companies.

8. Provision has been made in the financial structure of each plant for necessary engineering costs. No architectural fees are included because of the standard construction of the buildings.

9. Projected sales figures for the respective plants have been determined by a study of market prices for products competitive to those to be manufactured in the complex. Because the costs and average selling prices vary with each plant, there is a corresponding difference in the margin of profit for each operation. All prices quoted are F.O.B. net mill, and include selling costs, discounts for volume, and profit. Transportation tariffs for exports have not been included in net mill prices.

In summary the statements indicate:

1. GROSS SALES & PROFITS

YEAR	GROSS SALES	PERCENTAGE PROFIT ON SALES
Year 1	$12,913,000	(1.97)
Year 2	17,515,000	4.54
Year 3	21,675,000	5.72
Year 4	22,426,000	5.96
Year 5	22,960,000	6.15

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2. LUMBER REQUIREMENTS & DISTRIBUTION

Year	LUMBER SALES M.F.B.M.	CAPTIVE USE M.F.B.M.	TOTAL M.F.B.M.
Year 1	37,000	3,000	40,000
Year 2	56,000	4,000	60,000
Year 3	75,000	5,000	80,000
Year 4	75,000	5,000	80,000
Year 5	75,000	5,000	80,000

3. FINAL MARKETS OF LUMBER (Third Year of Operation)

(a)	Kiln dried and packaged dimensions to Eastern Seaboard, U.S.A.	38,300	F.M.B.M.
(b)	Kiln dried and packaged boards and specialties to Eastern Seaboard, U.S.A.	6,700	"
(c)	Local markets - dimensions	10,000	"
(d)	Local markets - boards and specialties	4,800	"
(e)	Captive plants - dimensions	1,200	"
(f)	Captive plants - boards and specialties	500	"
(g)	Specialty lumber for captive plants	3,500	"
(h)	Rough processed lumber for European markets	15,000	"
	TOTAL LUMBER ALLOCATION	80,000	F.M.B.M.

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4. SALES AND CAPITAL INVESTMENT FOR THE INDIVIDUAL PLANTS IN THE COMPLEX

(Third Year of Operation)

		Value of Sales	Capital Investment
1.	Lumber Processing Plant	$9,200,000	$ 2,669,155
2.	Woodworking Plant	2,390,000	1,605,400
3.	Cabinet Plant	900,000	4,700,280
4.	Prefabricated Housing	4,125,000	866,350
5.	Board Plant	5,060,000	435,449
		$21,675,000	$ 10,276,634

NOTE: The sawmills and infrastructure costs have not been included in this table.

Total manpower requirements for the complex, including estimates of labour requirements in the fifth year for operating the heat and steam generating plant, the sawmills and supporting woods operations, are as follows:

PLANT	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr.5
			Direct Personnel		
Lumber Processing	42	49	58	58	58
Woodworking	54	62	75	80	80
Kitchen Cabinet	22	27	32	35	35
Prefab. Housing	63	75	82	82	82
Board	78	90	99	99	99
TOTAL COMPLEX	259	303	346	354	354

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PLANT	Yr. 1	Yr. 2	Yr. 3	Yr.4	Yr. 5
			Indirect Personnel		
Lumber Processing	12	14	18	18	18
Woodworking	15	17	20	21	21
Kitchen Cabinet	6	6	7	7	7
Prefab. Housing	14	14	16	16	16
Board	20	20	20	20	20
TOTAL COMPLEX	67	71	81	82	82
			General & Administration Personnel		
Lumber Processing	12	12	12	12	12
Woodworking	4	4	4	4	4
Kitchen Cabinet	4	4	4	4	4
Prefab. Housing	5	5	6	6	6
Board	10	10	10	10	10
TOTAL COMPLEX	35	35	36	36	36
			Salesmen		
Lumber Processing	3	3	3	3	3
Woodworking	3	3	3	3	3
Kitchen Cabinet	2	2	2	2	2
Prefab. Housing	6	6	6	6	6
Board	4	4	4	4	4
TOTAL COMPLEX	18	18	18	18	18
			Total Manpower		
Direct Labour	259	303	346	354	354
Indirect Labour	67	71	81	82	82
Administration	35	35	36	36	36
Salesmen	18	18	18	18	18
	379	427	481	490	490
Central Steam Plant					10
Sawmills					500
					250
Woods Crews					750
					250
					1,000

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While these projections are assumed to be valid at the time of writing and on the basis of information now available, they are intended to serve only as indicators of likely results and not as definitive proposals. Detailed feasibility studies should, of course, be undertaken for each unit on the complex prior to actual implementation - if only to update figures and verify details.

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HALIFAX - DARTMOUTH AREA WOODWORKING COMPLEX

CAPITAL FINANCING PROGRAM

Capital Requirements:

	UNIT	FIXED	WORKING CAPITAL	TOTAL
1.	Acquisition of Sawmills	$ 2,000,000	$ -	$ 2,000,000
2.	Modernization of Sawmills	1,000,000	1,500,000	2,500,000
3.	Kilns and Lumber Processing Plant	2,669,155	900,000	3,569,155
4.	Woodworking Plant	1,605,400	206,000	1,811,400
5.	Board Plant	4,700,280	525,000	5,225,280
6.	Prefab. Housing Plant	866,350	316,000	1,182,350
7.	Kitchen Cabinet Plant	435,449	100,000	535,449
8.	Heating Plant, Dock Facilities, Site Preparation & Infrastructure	2,630,664	-	2,630,664
	TOTAL FIXED COST OF COMPLEX	$15,907,298	$ 3,547,000	$19,454,298

Sources of Capital:

1.	Shareholders' Equity:				
	a) Common Shares	1,000,000			
	b) Common Shares - Development Corporation	1,500,000	$2,500,000		
	c) Subordinated Shareholders Loans		1,500,000	$4,000,000	
2.	R.D.I.A. Grants (40% of $12,907,298)	5,162,919			
	(30% of $ 1,000,000)	300,000		5,462,919	
3.	Mortgage Financing:				
	Long Term Financing (70% mortgage)			8,241,379	
4.	Short Term Financing:				
	(Under Section 88 of The Bank Act) 50% of Working Capital			1,750,000	$19,454,298

HALIFAX - DARTMOUTH AREA WOODWORKING COMPLEX

FIXED ASSETS SUMMARY

	Plant	Land Acres	Buildings No. Sq.Ft.	Land Costs	Infra-Structure Costs	Building Costs	Machinery/ Equipment Costs	Total Capital Costs
1.	Acquisition of Sawmills			$	$	$	$	$2,000,000
2.	Modernization of Sawmills							1,000,000
3.	Lumber Processing Plant	50	207,020	150,000	56,500	1,000,680	1,461,975	2,669,155
4.	Woodworking Plant	5	115,000	25,000	15,000	920,000	645,400	1,605,400
5.	Board Plant	20	98,000	60,000	35,000	768,000	3,837,280	4,700,280
6.	Prefab. Housing Plant	10	70,200	75,000	18,500	545,100	230,750	866,350
7.	Kitchen Cabinet Plant	3	26,400	15,000	9,500	211,200	199,749	435,449
8.	Heating Plant, Dock Facilities, Site Preparation & Infrastructures							2,630,664
		88	516,620	$325,000	$134,500	$3,441,980	$6,375,154	$15,907,298

SUMMARY OF PRO FORMA INCOME STATEMENTS

HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

	Year 1		Year 2		Year 3		Year 4		Year 5	
SALES										
Lumber Processing	4,600,000		6,900,000		9,200,000		9,200,000		9,200,000	
Woodworking Plant	1,660,000		1,992,000		2,390,000		2,629,000		2,650,000	
Cabinet Plant	650,000		775,000		900,00		1,000,000		1,100,000	
Pre Fab Housing	2,475,000		3,300,000		4,125,000		4,537,000		4,950,000	
Board Plant	3,528,000	12,913,000	4,548,000	17,515,000	5,060,000	21,675,000	5,060,000	22,426,000	5,060,000	22,960,000
COST OF GOODS SOLD										
Lumber Processing	3,995,313		5,524,016		7,118,177		7,110,745		7,111,645	
Woodworking Plant	1,474,730		1,669,722		1,943,959		2,090,924		2,093,953	
Cabinet Plant	488,720		580,129		686,331		751,146		810,639	
Pre Fab Housing	2,137,435		2,725,504		3,293,000		3,587,431		3,890,192	
Board Plant	3,167,553	11,263,751	3,598,778	14,098,149	3,852,515	16,893,982	3,773,050	17,313,296	3,716,635	17,623,064
GROSS PROFIT ON SALES										
Lumber Processing	604,687		1,375,984		2,081,823		2,089,255		2,088,355	
Woodworking Plant	185,270		322,278		446,041		538,076		556,047	
Cabinet Plant	161,280		194,871		213,669		248,854		289,361	
Pre Fab Housing	337,565		574,496		832,000		949,569		1,059,808	
Board Plant	360,447	1,649,249	949,222	3,416,851	1,207,485	4,781,018	1,286,950	5,112,704	1,343,365	5,336,936
SELLING EXPENSES		843,000		1,073,900		1,305,290		1,371,719		1,425,219
G & A EXPENSES		445,630		471,097		515,364		540,657		557,266
OTHER EXPENSES		615,247		615,247		615,247		615,247		615,247
Net Income (Loss)		(254,628)		1,256,607		2,345,117		2,585,081		2,739,204
Percentage of Sales		(1.97%)		7.17%		10.82%		11.53%		11.93%
Allow. for Taxes		-		461,040		1,105,670		1,247,399		1,326,681
Net Profit on Sales		(254,628)		795,567		1,239,447		1,337,682		1,412,523
Percentage of Sales		(1.97%)		4.54%		5.72%		5.96%		6.15%

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HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

COMPLETE COMPLEX

PRO FORMA BALANCE SHEET

	Year 1		Year 2		Year 3		Year 4		Year 5	
ASSETS:										
CURRENT ASSETS										
Cash		1,312,711		1,646,289		2,225,362		2,170,227		2,261,523
A/C Receivable	1,407,875		1,914,375		2,365,625		2,425,175		2,457,500	
Inventories:										
Materials	485,700		600,858		878,314		922,730		955,780	
W.I.P.	166,000		209,950		263,535		289,063		316,780	
Finished Goods	1,563,000		2,333,050		2,728,813		2,828,334		2,937,040	
Prepaid Expenses	45,000	3,667,575	45,000	5,163,233	45,000	6,281,287	45,000	6,510,302	45,000	6,712,100
FIXED ASSETS										
Land	399,500		399,500		399,500		399,500		399,500	
Buildings	3,501,980		3,501,980		3,501,980		3,501,980		3,501,980	
Machinery & Equipment	5,843,154		5,843,154		5,843,154		5,843,154		5,843,154	
Automotive Equipment	469,000		469,000		469,000		469,000		469,000	
Office Equipment	63,000		63,000		63,000		63,000		63,000	
	10,276,634		10,276,634		10,276,634		10,276,634		10,236,634	
Less: Accum. Depreciation	1,677,529	8,599,105	3,040,571	7,236,063	4,152,497	6,124,137	5,063,509	5,213,125	5,866,388	4,410,246
OTHER ASSETS										
Incorporation and Organization Expenses		145,000		145,000		145,000		145,000		145,000
TOTAL ASSETS		13,724,391		14,190,585		14,775,786		14,038,654		13,528,869

HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

COMPLETE COMPLEX

PRO FORMA BALANCE SHEET

	Year 1		Year 2		Year 3		Year 4		Year 5	
LIABILITIES & OWNERS' EQUITY										
CURRENT LIABILITIES										
A/C Payable	840,700		974,665		1,005,546		1,005,546		1,036,257	
Short Term Loans (Sec. 88)	1,750,000	2,590,700	1,690,950	2,665,615	1,529,660	2,535,206	1,381,728	2,407,218	1,269,053	2,305,310
Long Term Loans		5,606,438		5,202,150		4,266,780		3,344,954		2,659,554
SHAREHOLDERS' EQUITY										
Common Shares	1,000,000		1,000,000		1,000,000		1,000,000		1,000,000	
Common Shares Devel. Corp.	1,500,000	2,500,000	1,500,000	2,500,000	1,500,000	2,500,000	1,500,000	2,500,000	1,500,000	2,500,000
Retained Earnings (Deficit)		259,705		535,862		1,365,104		1,677,786		1,955,309
RDIA Incentive*		3,286,958		3,286,958		4,108,696		4,108,696		4,108,696
TOTAL LIABILITIES & OWNERS' EQUITY		13,724,391		14,190,585		14,775,786		14,038,654		13,528,869

NOTE: The $4,108,696 shown as contributed surplus resulting from RDIA Incentives represents the portion of the Federal Incentive grant applicable to complex capital costs and jobs excepting those creditable to sawmill operations and infrastructure.

HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

COMPLETE COMPLEX

PRO FORMA CASH FLOW

	Pre-Construction Period		Year 1		Year 2		Year 3		Year 4		Year 5	
CASH AT BEGINNING OF PERIOD				2,866,762		1,312,711		1,646,289		2,225,362		2,170,227
SOURCES OF CASH:												
R.D.I.A. (80% of Grant)	3,286,958		-		-		821,798		-		-	
Bank Loan	1,750,000		-		-		-		-		-	
Long Term Loans	5,606,438		-		-		-		-		-	
Equity Capital	2,500,000		-		-		-		-		-	
Net Income	-		(259,705)		710,424		1,139,022		1,337,683		1,412,523	
Depreciation	-		1,676,529		1,363,042		1,061,926		911,012		802,879	
Increase in Payables	-	13,143,396	-	1,416,824	157,400	2,230,866	131,000	3,153,746	-	2,248,695	-	2,215,402
TOTAL CASH				4,283,586		3,543,577		4,800,035		4,474,057		4,385,629
APPLICATION OF CASH:												
Bank	2,866,762		-		-		-		-		-	
Land	399,500		-		-		-		-		-	
Buildings	3,501,980		-		-		-		-		-	
Machinery & Equipment	5,843,154		-		-		-		-		-	
Mobile Equipment	469,000		-		-		-		-		-	
Office Equipment	63,000		-		-		-		-		-	
Increase in Inventories	-		1,563,000		770,050		395,763		99,521		108,706	
Increase in Receivables	-		1,407,875		506,500		451,250		59,551		32,325	
Repayment of Loans	-		-		463,338		1,096,660		1,069,758		798,075	
Dividends	-	13,143,396	-	2,970,875	157,400	1,897,288	631,000	2,574,673	1,075,000	2,303,830	1,185,000	2,124,106
CASH AT END OF PERIOD				1,312,711		1,646,289		2,225,362		2,170,227		2,261,523

LUMBER PROCESSING PLANT

LUMBER PROCESSING PLANT
HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX
FIXED ASSETS SCHEDULE

A)	Lumber Receiving, Tallying, Piling: 80,000,000 f.b.m. per year		
1.	Land (Piling):		
	50 acres @ $300.	150,000	
	Site Improvement	15,000	165,000
2.	Buildings:		
	20' x 30' = 600 sq. ft. @ $9.00		5,400
3.	Lumber Bunks		3,000
4.	Scales		25,000
5.	Services		1,500
	SUB-TOTAL: LUMBER RECEIVING, TALLYING, PILING		199,900
B)	Stacking Facilities: 80,000,000 f.b.m. per year		
	a. STACKERS		
	1. Buildings: 100' x 85' = 8,500 sq.ft. @ $4.00	34,000	
	2. Site Improvement	3,000	
	3. Electrical Services	3,000	
	4. Foundations	6,000	46,000

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5. Machinery & Equipment:

1.	Compressor	1,500	
2.	Infeed	6,000	
3.	Hoist	5,000	
4.	Bunk & Stabilizer Removal	1,500	
5.	Spill Chain	2,000	
6.	Unscrambler	5,000	
7.	Even End Rolls	1,000	
8.	Transfer Chains	2,000	
9.	Stacker	15,000	
10.	Hoist After Stacker	5,000	
11.	Roll Case	6,000	
12.	Stacker Placer	6,000	
13.	Tally Machines	5,000	
	Total Cost - 1 Stacker	61,000	
	Requirement - 2 Stackers 2 x 61,000		122,000
6.	Installation	7,500	
7.	Electrical Hook-up	2,000	
8.	Freight	5,000	14,500
	SUB-TOTAL: STACKING FACILITIES		182,500

C) Kiln System:

1. Softwood Kilns - Batch Progressive:

Capacity - 75,000,000 fbm per year

1.	Kiln Equipment (4 Buildings & Trackage) - 3 units @ $90,000 per unit	270,000	
2.	Instrumentation & Controls	100,000	
3.	Car Pullers	30,000	
4.	Electrical Room & Distribution (310 HP)	16,000	
	SUB-TOTAL: KILN SYSTEM		416,000

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D) LUMBER PROCESSING & PLANING FACILITIES:

1. Buildings:

Planing Mill:

206' x 320' = 65,920 sq.ft. @ $9.00	593,280	
Storage:		
400' x 320' = 128,000 sq.ft. @ $2.50	320,000	913,280

2. Machinery & Equipment:

1.	Input Transfers (3 units) 3 x 40' = 120'	24,000
2.	Tilt Hoists with Sticker Removal (3)	25,785
3.	Cross Chain Transfers (3) (4-strand) Tilt Hoists to Feed Tables	16,290
4.	Roll Feed Tables (2)	15,900
5.	Transfer to Resaw (1)	4,500
5a.	Resaw Removal Belt	1,850
6.	60" Resaw (Motor Driven)	17,500
7.	Planer, 6-head Yates-American A-20 Stetson-Ross 610A (325 FPM)	55,500
8.	High Speed Planer Newman 712 Woods 415 Stetson-Ross 6-12C (700LFPM)	95,000
9.	30' Speed Up & Slow Down Belt (2) @ $4,500	9,000

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10.	Planer Feed Drives (2)	17,000	
11.	Multi-Saw Trimmer	37,000	
12.	Canadian Two-Saw Trimmer (2)	13,000	
13.	Grade Markers (3 @ $5,500)	16,500	
14.	Grading Printers & Waxers	39,000	
15.	"Moore" Automatic Lumber Stacker	35,000	
16.	Four Arm Tilt Hoist (2) Lumber Stacker @ $7,625	15,250	
17.	Lumber Stack Roll Cases 160' @ $16.00	25,000	
18.	4-Strand Cross Chain Conveyors	16,900	
19.	Piling Room Equipment	17,500	
20.	Knives & Saws	6,500	
21.	Planer Mill Exhaust System	43,000	546,975
3.	Engineering	12,000	
4.	Transportation	5,000	
5.	Installation Charges	24,000	42,500
	SUB-TOTAL: LUMBER PROCESSING & PLANING FACILITIES		1,502,755

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E) Mobile Handling Equipment:		
1. Mobile Garage:		
100' x 60' = 6,000 sq.ft. @ $7.00	42,000	
2. Garage Equipment	16,000	
3. Mobile Equipment:		
1. 6 Carry Lifts @ $38,000	228,000	
2. Lumber Carrier	32,000	
3. 2 Half-ton Trucks	5,000	
4. 1 Five-ton Truck	8,000	
SUB-TOTAL: MOBILE HANDLING EQUIPMENT		331,000
F) Administrative Offices:		
1. Buildings:		
100' x 40' = 4,000 sq.ft. @ $15.00	6,000	
2. Office Equipment & Machines	7,000	
3. Computer Control	24,000	
SUB-TOTAL: ADMINISTRATIVE		37,000
TOTAL COST OF LUMBER PROCESSING PLANT		2,669,155

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HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

BACKGROUND INFORMATION - LUMBER PROCESSING PLANT

(Based on Third Year Of Operation)

1) Lumber Control:

Total Lumber Purchases:	Volume-FBM	Percentage
- Spruce	65,000,000	80.7
- Balsam	11,500,000	15.0
- Hardwoods	500,000	.6
- White Pine	2,000,000	2.5
- Outside Softwoods	1,000,000	1.2
	80,000,000	100.0%

2) Lumber Destination:

1. Dimensions - 48,000,000 per year (2 x 4, 2 x 6, 2 x 8)

	Volume-FBM
- Local Markets	10,000,000
- Exports	38,300,000
- Captive Plants	1,200,000
	49,500,000

2. Boards & Specialties - 12,000,000 per year (1 x 2, 2 x 2, Ship Lap, etc.)

- Local Markets	4,800,000
- Exports	6,700,000
- Captive Plants	500,000
	12,000,000

3. Rough Processed Lumber - 15,000,000 fbm per year (European Market)

- Exports	15,000,000

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	Volume-FBM
4. White Pine Lumber:	
- Captive Plants	2,000,000
5. Hardwoods:	
- Captive Plants	500,000
6. Special Imported Softwoods:	
- Captive Plants	1,000,000
	80,000,000

3) Capacity of Machines

Machine	Operating Requirement Per Year FBM	Maximum Capacity FBM
1. Stacker Units		
Stacker 1	50,000,000	60,000,000
Stacker 2	30,000,000	50,000,000
	80,000,000	110,000,000
2. Kilns		
1	75,000,000	85,000,000
2	4,000,000	5,000,000
	79,000,000	90,000,000
3. Planers		
Line 1 - Dimension	49,500,000	100,000,000
Line 2 - Boards	12,000,000	20,000,000
Line 3 - Rough	15,000,000	30,000,000
	76,500,000	150,000,000
4. Captive Plants - Woodworking	3,500,000	5,000,000

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4) Production Costs Per M F.B.M. of lumber - (Normal Operation - Third Year)

	Cost Per M.FBM	Percentage/ Selling Price
Lumber (at site)	$ 75.00	65.2
Shipping & Packaging Materials	1.65	1.4
Direct Labour	3.75	3.3
Manufacturing Overhead	8.59	7.5
Total Manufacturing Cost	$ 88.99	77.4
Selling Expenses	6.82	6.0
General & Administrative Expense	2.10	1.8
Interest Payments	2.10	1.8
Total Cost of Sales	$ 100.01	87.0
Allowance For Taxes	7.35	6.4
Net Profit	7.64	6.6
Sales Value	$ 115.00	100.0%

5) Total Annual Sales and Unit Costs

Year	Volume F.B.M	Unit Rate Per M.FBM Of Sales	Value of Sales	Manufacturing Cost Per Unit
1	40,000,000	$ 115.00	$ 4,600,000	$112.67
2	60,000,000	$ 115.00	$ 6,900,000	$ 96.53
3	80,000,000	$ 115.00	$ 9,200,000	$ 92.14
4	80,000,000	$ 115.00	$ 9,200,000	$ 89.18
5	80,000,000	$ 115.00	$ 9,200,000	$ 89.18

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6) Costing

a)	Average cost of rough lumber at site of complex	= $ 75.00 per M.f.b.m.
b)	Established value for lumber, F.O.B. dockside, Halifax	= $115.00 per M.f.b.m.
c)	Estimated loading, transportation and freight costs to Eastern Seaboard	= $ 15.00 per M.f.b.m.
d)	Average selling price for kiln dried, graded and packaged lumber (2 x 4) at Boston	= $130.00 per M.f.b.m.

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WOODWORKING PLANT

WOODWORKING PLANT

HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

FIXED ASSETS SCHEDULE

1.	Land:		
	5 acres @ $5,000	25,000	
	Site Improvement	10,000	35,000
2.	Buildings:		
	460' x 250' = 115,000 sq.ft. @ $8.00		920,000
3.	Kilns:		
	26' x 120', 120M f.b.m. Capacity		115,000
4.	Service Connections:		5,000
	Sub-Total		1,075,000
5.	Machinery & Equipment:		
	1. Double Surfacer Gang Rip	22,000	
	2. Cut-off Saws (3)	7,800	
	3. Finger-Jointing Equipment	50,000	
	4. Rip Saw	9,000	
	5. Band Resaw	6,000	
	6. Radial Saw	2,600	
	7. Glue Clamp	3,500	
	8. Wide Mouth Planer (36")	6,000	
	9. Variety Saw	2,500	
	10. Glue Spreader	5,500	
	11. Door Press	3,500	
	12. Door Sizer	35,000	
	13. Pre-hanging Equipment	8,000	
	14. Assembly Table Press	2,000	
	15. Molder, 6-head, 12"	35,000	
	16. Molder, 5-head, 8"	25,000	

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17.	Mitre Saw	4,000	
18.	Window Cut-off Saw	4,000	
19.	Selective Rip	6,000	
20.	Jointer (Dressing)	5,000	
21.	Molder (Windows)	25,000	
22.	Dewalt Saw	3,000	
23.	Router	4,000	
24.	Shaper	4,000	
25.	Automatic Nailer	3,500	
26.	Spray Booth Equipment	5,000	
27.	Mortizer for Doors	5,500	
28.	Assembly Press (Doors)	2,000	
29.	Drill Press	1,000	
30.	Stair Saw	3,000	
31.	Metal Cut-off	2,000	
32.	Punch Press	1,000	
33.	Drill Press	1,000	
34.	Metal Assembly Press	1,000	
35.	Tilt Hoist	43,000	
36.	Hog	9,000	
37.	Conveying Equipment	35,000	
38.	Residue Collection & Air System	45,000	
39.	Miscellaneous Electrical Apparatus	14,000	
40.	Compressors	15,000	
41.	Installation	17,000	
42.	Structurals & Bins	12,000	
43.	Engineering	10,000	
Sub-Total			503,400
6.	Mobile Equipment:		
	1. Lumber Lift (1)	18,000	
	2. Factory Lift (2)	9,000	27,000
7.	TOTAL FIXED ASSETS - WOODWORKING PLANT		1,605,400

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HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

BACKGROUND INFORMATION - WOODWORKING PLANT

1. Annual Sales

	Annual Sales	Profit
Year 1	$1,660,000	(1.3)
Year 2	1,992,000	3.8
Year 3	2,390,000	5.0
Year 4	2,629,000	6.1
Year 5	2,650,000	6.3

2. Products to be Manufactured

1) Door Production

(a) Flush Doors:

No. of Units	Price Per Unit	Total Value
80,000	$4.50	$360,000

Lumber Input:

Each door requires 2 fbm of lumber @ $100 per M fbm = 160,000 fbm $ 16,000

(b) Prehung Flush Doors:

20,000	$15.00	$300,000

Lumber Input:

2 fbm per door @ $140 per M fbm = 40,000 fbm

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	No. of Units	Price Per Unit	Total Value
Prehung Moldings:			
15 fbm per unit =	300,000 fbm		
Total lumber input for Prehung Flush Doors =	340,000 fbm		$ 47,600

(c) Exterior Solid Core Doors:

	No. of Units	Price Per Unit	Total Value
Lumber Input:	5,000	$20.00	$100,000
60 fbm per door @ $80 per M fbm =	300,000 fbm		$ 24,000

(d) Prehung Solid Exterior Doors:

	No. of Units	Price Per Unit	Total Value
	2,000	$50.00	$100,000
Lumber Input:			
75 fbm per unit @ $125 per M fbm =	150,000 fbm		$ 18,750

2) Window Production:

(a) Value of Sales - Window Units: $300,000

Lumber Input:

400,000 fbm @ $150 per M fbm $ 60,000

(b) Windowwall Units:

Value of Sales $150,000

Lumber Input:

200,000 fbm @ $150 per M fbm $ 30,000

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3) Stairs:

No. of Units	Price Per Unit	Total Value
1,000	$50.00	$ 50,000

Lumber Input:

100 fbm per unit @ $175 per M fbm = 100,000 fbm $ 17,500

4) Construction Moldings:

Total Sales $150,000

Lumber Input:

550,000 fbm @ $135 per M fbm $ 74,250

5) Industrial Wood Parts and Kitchen Cabinet Parts:

Total Value of Sales $150,000

Lumber Input:

500,000 fbm @ $150 per M fbm $ 75,000

3. Value of Products Manufactured

Product	M.F.B.M.	Lumber Value	Sales Value
Flush Doors	160	$ 16,000	$ 360,000
Prehung Flush Doors	40)		
Prehung Moldings	300)	47,600	300,000
Exterior Solid Core Doors	300	24,000	100,000
Prehung Solid Exterior Doors	150	18,750	100,000
Window Production	400	60,000	300,000
Windowwall Units	200	30,000	150,000
Stairs	100	17,500	50,000
Construction Moldings	550	74,250	150,000
Industrial Wood Parts	500	75,000	150,000
	2,700	$363,100	$1,660,000

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4. Lumber Requirements

Flush Doors	6/4		160,000 fbm
Prehung Doors	6/4	40,000	
	4/4	300,000	340,000 "
Exterior Solids	8/4		300,000 "
Exterior Prehung Solids	8/4		150,000 "
Windows	6/4		400,000 "
Windowwall Units	6/4	100,000	
	8/4	100,000	200,000 "
Stairs	8/4		100,000 "
Industrial Wood Parts	4/4		500,000 "
Construction Moldings	4/4	400,000	
	5/4	150,000	550,000 "
			2,700,000 fbm

Summary:

Size	F.B.M. Volume	Percentage
4/4	1,200,000	44.4
5/4	150,000	5.6
6/4	700,000	25.9
8/4	650,000	24.1
	2,700,000	100.0

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KITCHEN CABINET PLANT

KITCHEN CABINET PLANT

HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

FIXED ASSETS SCHEDULE

1.	Land: 3 acres @ $5,000	15,000	
	Site Improvement	2,000	17,000
2.	Buildings:		
	120' x 220' x 16' = 26,400 sq.ft. @ $8.00		211,200
3.	Services:		
	Water, Power, Sewage, Roads		7,500
	Sub-Total		235,700
4.	Machinery:		
	1. Moulder, 5 heads	12,500	
	2. Double Cut-off Saw	12,500	
	3. Heavy Duty Spindle Shaper	1,275	
	4. Router	3,795	
	5. Single Sided Automatic Edge Bander	8,700	
	6. Variety Saw, 14" Tilting Arbor	1,600	
	7. Multi-borer-60", 8 spindles	3,520	
	8. Drilling Machine	262	
	Mortizer Attachment	66	
	9. Edge Sander	1,800	
	10. Semi-automatic Double Sander & Polisher	3,950	
	11. Wide Belt Speedsander	7,250	
	12. Drum Sander	1,105	
	13. Revolving Case Clamp	2,950	
	14. Drawer Clamping Machine	1,100	
	15. Clamping Machine with Screw Set-up 110" capacity	1,790	
	16. Drawer Edge Sander	2,725	
	17. Assembly Platen, First Step Sub-assembly Station	4,950	

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18.	Hot Spray Unit, Air Agitator & Mobile Stand	1,450	
19.	Glue Dispenser - 1-5/8" Flat Wheel	330	
20.	Index Table - 60"	1,925	
21.	Pinch Roller - 60"	2,800	
22.	Mitre Panel Saw with Table	2,178	
23.	Edge Banding Machine	2,375	
24.	Vacuum Table	1,340	
25.	Post-Forming M/C	4,378	
26.	Auto Saw Sharpener	600	
27.	Hand Tooth Setting M/C	60	
28.	Carbine Saw Grinder	800	
29.	Straight Knife Grinder--40"	1,875	
	Sub-Total: Machinery		91,949

5. Equipment:

1.	Spray Booth, Dry Baffle Type 8' x 6' x 7'	2,100	
2.	Spray Booth, Dry Baffle Type 16' x 6' x 7'	900	
3.	Related Equipment, Spray Gun Pressure Feed Tank, Air Regulator, Air Hose	1,200	
4.	Conveying System, Gravity Guided Pallet Conveyor, Turntable Work Station & Mechanical Booster	14,000	
5.	Drying, Lacquer, Gas-fired Convection Oven-Ventilation Exhaust Combustion Equipment Temperature Control Safety Controls Electrical Controls Piping & Wiring	8,000	
6.	Drying, Filler & Sealer (Intermediate)	4,000	
7.	Air Replacement Unit Gas-fired Motorized Damper Combustion Equipment Flame Supervision Safety Controls		

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	Temperature Control Electrical Controls Air Filter Unit Piping & Wiring	7,800	
8.	Dust Evacuation System & Collector, Equipped with Air Make-up Unit	15,000	
9.	Compressor and Air Plumbing To Machines and Clean-up Stations	1,800	
10.	Roller Conveyors and Transfer Cars. Installed & Operational	15,000	69,800
	Installation & Services:		15,000
	Mobile Equipment:		
1.	Factory Lift	9,000	
2.	5-ton Truck	7,000	16,000
8.	Office & Showroom:		
1.	Fittings	3,000	
2.	Furniture & Machines	4,000	7,000
9.	TOTAL FIXED ASSETS - KITCHEN CABINET PLANT		435,449

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HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

BACKGROUND INFORMATION - KITCHEN CABINET PLANT

1.

Year	Sales	Percentage of Profit on Sales
Year 1	$ 650,000	3.6
Year 2	775,000	4.6
Year 3	900,000	4.0
Year 4	1,000,000	4.8
Year 5	1,100,000	6.0

2. First Year

Products	No. of Units	Value
(a) Captive Prefabricated Plant Average of $450 per house	300	$135,000
(b) Regional Sales (New Housing) Average of $325 per unit	490	160,000
(c) Replacement Field Average of $300 per unit	450	135,000
Total Kitchen Units	1,240	$430,000
(d) Low Cost Furniture Bedroom Sets @ $80	275	220,000
Total Production of Kitchen Cabinet Plant	1,515	$650,000

NOTE: To avoid total dependency on the construction market for kitchen cabinets, one-third of the total production of the plant will consist of low-cost furniture to be directed to the prefabricated and mobile home industries.

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Second Year

Products	No. of Units	Value
(a) Captive Prefabricated Plant Average of $450 per house	400	$180,000
(b) Regional Sales (New Housing) Average of $325 per unit	590	185,000
(c) Replacement Field Average of $300 per unit	550	165,000
Total Kitchen Units	1,540	530,000
(d) Low Cost Furniture Bedroom Sets @ $80	306	245,000
Total Production of Kitchen Cabinet Plant	1,846	$775,000

NOTE: Production for respective products will gradually increase in the third, fourth and fifth year.

3. Raw Materials

The woodworking plant will supply all the structural lumber requirements of the kitchen cabinet plant.

4. The plant is equipped to produce high pressure and low pressure laminated kitchen cabinets and household furniture. Products produced will be in the low to medium price range.

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PREFABRICATED HOUSING PLANT

PREFABRICATED HOUSING PLANT

HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

FIXED ASSETS SCHEDULE

1.	Land:		
	10 acres		75,000
2.	Buildings:		
	260' x 220' x 26' = 57,200 sq.ft. @ $8.00	457,600	
	130' x 100' x 20' = 13,000 sq.ft. @ $7.00	84,500	
		542,100	
	Site Improvement:		
	Drainage, Surfacing	5,000	
	Services to Site:		
	Electrical	1,000	
	Water	1,000	
	Sewage	1,500	
	Rail	4,000	
	Roads	6,000	
		13,500	
	SUB-TOTAL: BUILDINGS, ETC.		560,600
3.	Machinery & Equipment:		
	1. Radial Saws, 3 HP, (3) ("Rockwell")	4,000	
	2. Electric Drills (5)	900	
	3. Portable Saws "Porter Cable"	900	
	4. Components Cutter "Clary"	8,000	
	5. Compressor, (15HP)	7,500	
	6. Routers (2)	550	
	7. Special Wall Jigs	3,000	
	8. Small Tools	2,000	
	9. Knives & Blades	800	
	10. Truss Assembly	4,200	
	11. Spraying Units	6,500	
	12. Air Gun Assembly	1,300	39,650

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3.A	Equipment:		
1.	Moving Track System	15,000	
2.	Track Bridge Crane	10,000	
3.	Hoist Cranes (2) -moveable	8,500	
4.	Electrical Cables & Extension Cords	600	
5.	Hydraulic Systems (Lower & Lift Houses)	8,000	
6.	Hoists (15,000 lbs.) (4)	2,400	
7.	Air Make-up System & Evacuation (Components Building)	12,000	
8.	Assembly Tables & Moving Work Stations	20,000	
9.	Air Hammers (20)	4,000	
10.	Electrical Hook-up & Panels	12,000	
11.	Air Distribution	3,000	95,500
	Miscellaneous:		
	Installation	10,000	
	Insurance	1,000	
	Tariffs	600	11,600
	SUB-TOTAL: MACHINERY & EQUIPMENT		146,750
4.	Mobile Equipment:		
1.	Trucks (2) @ $9,000	18,000	
2.	Trailers (6)	36,000	
3.	Tractors (2)	20,000	74,000
5.	Office Equipment		10,000
	TOTAL FIXED ASSETS - PREFABRICATED HOUSING PLANT		866,350

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HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

PREFABRICATED HOUSING PLANT

PRO FORMA INCOME STATEMENTS

	Year 1		Year 2		Year 3	Year 4		Year 5	
SALES		2,475,000		3,300,00	4,125,000		4,537,000		4,950,000
COST OF GOODS SOLD (see statement)		2,137,435		2,725,504	3,293,000		3,587,431		3,890,192
GROSS PROFIT ON SALES		337,565		574,496	832,000		949,569		1,059,808
SELLING EXPENSES									
Salesmen	120,000		160,000		200,000	220,000		240,000	
Advertising	48,000		64,000		80,000	88,000		96,000	
Transportation	120,000	288,000	160,000	384,000	200,000	480,000	220,000	528,000	240,000	576,000
G & A EXPENSES									
Office Salaries	7,000		8,000		13,500	15,000		16,500	
Management Salaries	44,200		46,200		48,200	50,200		52,200	
Supplies	1,000		1,200		1,400	1,600		1,600	
Fringe Benefits	7,680		8,130		9,255	9,780		10,275	
Telephone	3,000		3,500		4,000	4,500		5,000	
Bank Charges	700		800		900	1,000		1,100	
Travel	6,000		7,000		8,000	9,000		9,000	
Depreciation - Office	2,000		1,600		1,280	1,024		819	
Other	4,000	75,580	5,000	81,430	6,000	92,535	7,000	99,104	8,000	104,494
OTHER EXPENSES									
Interest		59,128		59,128	59,128		59,128		59,128
NET INCOME-(LOSS)		(85,143)		49,938	200,337		263,337		320,186
Allowance For Taxes		-		-	73,969		125,035		154,597
NET PROFIT-LOSS) ON SALES-Cumm.		(85,143)		(35,205)	91,163		138,302		165,589
Percentage of Sales		(3.4%)		(1.1%)	2.2%		3.0%		3.3%

HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

BACKGROUND INFORMATION-PREFABRICATED HOUSING PLANT

1. PRODUCTION

	Number of Units	Unit Value	Value of Sales
Year 1	300	$8,250	$2,475,000
Year 2	400	8,250	3,300,000
Year 3	500	8,250	4,125,000
Year 4	550	8,250	4,537,000
Year 5	600	8,250	4,950,000

2. PLANT CAPACITY

The plant will manufacture 2 houses per day on a one-shift basis.

Additional production, up to 600 units per year, will be manufactured in a second shift, during peak periods.

NOTE: Production run-in and marketing are the limiting factors in the first two years of operation.

3. Production Ratios Per Units (Year 3)

(Production - 500 units per year)

	COST PER UNIT	%
Materials	$5,110	62.0
Direct Labour	875	10.6
Indirect Labour	333	4.1
Factory Burden	388	4.7
Selling Expense & Transportation	960	11.6
G & A	185	2.2
Total Manufacturing Cost	7,851	95.2
Allowance for Profit	399	4.8
	$8,250	100.0

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RAW MATERIALS SCHEDULE FOR PREFABRICATED HOUSING

AVERAGE OPERATING RATIOS FOR ONE UNIT

RAW MATERIALS VALUE FOR ONE UNIT = $5,110

	Materials	Total Material Requirement %	Cost Per Unit	Total Cost For Plant	Materials To Be Manufactured By Complex Available From Complex %	Total Value	Value Per Unit
1.	Framing Lumber	26.5	$1,354	$ 667,000	80	$1,083	$ 541,600
2.	Plywood & Synthetic Boards - Wafer & Particle Board	12.8	654	327,000	75	490	245,000
3.	Interior Wall Board	6.0	307	153,500	-	-	-
4.	Insulation	3.9	199	99,500	-	-	-
5.	Windows	17.0	868	434,000	90	781	390,000
6.	Doors	8.2	419	209,500	80	335	167,000
7.	Roofing	3.4	173	86,500	-	-	-
8.	Cabinets & Hardware	8.3	423	211,500	85	360	179,500
9.	Plumbing	5.2	268	134,000	-	-	-
10.	Lighting Fixtures	1.8	92	46,000	-	-	-
11.	Paint, Adhesives & Nails	4.6	235	117,500	-	-	-
12.	Miscellaneous	2.3	118	59,000	20	24	11,800
		100.0	$5,110	$2,554,000		$3,073	$1,534,900

NOTE: Sixty percent of all materials to be produced by the complex.

BOARD PLANT

BOARD PLANT

HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

FIXED ASSETS SCHEDULE

1.	Land: 20 acres @ $3,000	60,000	
	Site Improvement	15,000	
	Services	20,000	95,000
2.	Buildings:		
	a) Plant 150' x 320' = 48,000 sq.ft. @ $11.00	528,000	
	b) Warehouse: 200' x 200' = 40,000 sq.ft. @ $6.00	240,000	768,000
3.	Machinery & Equipment:		
	Yard Equipment & Wood Room:		
	1. Storage Bins (5 @ $20,000)	100,000	
	2. Debarker & Conveyors	39,500	
	3. Slasher Saws (2)	42,000	
	4. Flaker Machine	55,000	
	5. Waferizer Machines (2)	144,000	
	6. Knife Grinding Machine	18,000	
	7. Blowing & Transfers	16,000	
	8. Bark Disposal (Boilers)	9,000	
	9. Green Screens	23,000	
	10. Grinder - Hog & Conveyors	19,000	
	11. Residue Conveying	65,000	530,500
	Drying & Classification:		
	12. Driers-Flakes (2)	75,000	
	13. Driers-Wafers (2)	190,000	
	14. Dry Screens (4)	42,000	
	15. Fines Transfer	12,000	
	16. Drier Feeders (4)	28,500	
	17. Classifiers (4)	48,000	
	18. Refiners & Conveyors	66,000	
	19. Dry Storage Bins (4)	60,000	521,500

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	Blending & Metering:		
20.	Fines Screens (4)	36,000	
21.	Feeder	37,000	
22.	Wax System (Wafers)	32,000	
23.	Resin System (Wafers)	18,900	
24.	Metering System (Wafers)	27,500	
25.	Blenders (2) (Wafers)	32,000	
26.	Tramp Magnets (4)	26,000	
27.	Blender Surge & Feed (Flakes)	24,000	
28.	Resin & Wax Storage, Mixing, Pumping, etc. (Flakes)	28,000	
29.	Resin & Wax Instrumentation (Flakes)	13,000	
30.	Weighing & Conveying (Flakes)	11,000	285,400
	Machine Line (Wafers):		
31.	Felters (4)	27,000	
32.	Forming Line	32,000	
33.	Return Line	24,000	
34.	Mat Separators	11,000	
35.	Recycle Conveyor	15,000	
36.	Racks (3)	47,500	
37.	Load & Unload	26,000	
38.	Bottom Transfer	7,500	
39.	Mat Reject	4,000	
40.	Mat Stabilizers	8,000	
41.	Caul Reject	3,000	
42.	Caul Cleaning	9,000	
43.	Caul Cooling	6,000	
44.	Pre-press	62,000	
45.	Press	244,000	
46.	Cauls	20,000	
47.	Structurals	22,000	568,000
	Machine Line (Flakes):		
48.	Mat Former	160,000	
49.	Rejects, Clean-up Conveyors	27,000	
50.	Press System	230,000	
51.	Exhaust Systems (2)	43,000	
52.	Stackers & Roll Cases	22,000	
53.	Rough Edge & Crosscuts (2)	94,000	576,000
	Finishing:		
54.	Curing Chamber (Wafers)	38,000	
55.	Sander System	114,000	
56.	Precision Trim & Cut-up Line	70,000	
57.	Dust Residue System	40,000	262,000

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	Auxiliary & Miscellaneous:		
58.	Laboratory Equipment	22,000	
59.	Maintenance Equipment	19,000	
60.	Compressed Air System	24,000	
61.	Steam Transmission	35,000	
62.	Electrical System & Controls	210,000	310,000
	Sub-Total-Machinery & Equipment		3,053,400
4.	Mobile Equipment:		
	Outside Fork Lift	35,000	
	Two Factory Lifts	44,000	79,000
	Sub-Total Machinery & Equipment, Mobile Equipment, Land & Bldgs.		3,995,400
5.	Engineering Fees:		
	10% of 3,053,400		305,340
6.	Contingencies:		
	10% of 3,995,400		399,540
7.	TOTAL FIXED ASSETS - BOARD PLANT		4,700,280

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HALIFAX-DARTMOUTH AREA WOODWORKING COMPLEX

BACKGROUND INFORMATION - BOARD PLANT

Production & Operating Ratios:

A) Particle Board

1. Capacity Levels (Year 3)

Thickness	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"
Density (cubic feet)	45	45	45	45	45	45
Cu.Ft./M Sq.Ft.	20.8	26.0	31.2	41.6	52.0	62.5
Weight/M Sq.Ft. (lbs.)	937	1,170	1,406	1,874	2,340	2,813
Sq.Ft. Production/Hour	8,964	7,179	5,974	4,482	3,590	2,986
Annual Capacity/M Sq.Ft.	63,860	51,145	42,560	31,931	25,572	21,272
Tons Production/hour	4.2	4.2	4.2	4.2	4.2	4.2
Tons Production/day (300 days)	100	100	100	100	100	100
Tons Production/year	29,920	29,920	29,920	29,920	29,920	29,920

2. Production Costs

Production Basis	- 3/4" Board
Weight	- 45 lbs.
Capacity (tons)	- 100 tons per day
Annual Capacity (sq.ft.)	- 21,272

Average Operating Costs	Cost Per M f.b.m. 3/4" basis	Percentage
Wood	$ 5.00	7.2
Resin	20.63	29.4
Wax	3.50	5.0
Fuel	2.80	4.0
Power	2.71	3.9
Labour	11.34	16.2
Maintenance & Repairs	4.76	6.8
General & Administration	4.40	6.3
Operating Contingencies (12.5%)	7.86	11.2
Total Operating Costs	$63.00	90.0
Profit Margin	$ 7.00	10.0
F.O.B. Price, Halifax	$70.00	100.0%

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NOTE: Residues available from captive plants at no cost. $5.00 per M f.b.m. represents handling costs and extras, using planer shavings and other wood residues. A similar cost, using primary round wood would be $20.00 per M f.b.m.

3. Market Prices for Particle Board (3/4" Basis - 45 lb. board)

1. Quoted price of Airscrew Weyroc in England (F.O.B. plant) = $115.00
2. Quoted price of Airscrew Weyroc (F.O.B. docks, Chatham, N.B.) = $ 73.00
3. Wholesale prices 3/4" board per M sq.ft. in Britain (Discounts not shown -3-2-2-) = $190.00 - $200.00

4. Reason for price differential between Weyrock, England and Chatham, N.B. ($73.00 vs $115.00) -
Wood costs in Britain are higher (importing round wood from Scandinavia) - $29.00 higher
Labour higher in Britain - $9.00
Factory overhead higher in Britain - $1.00

NOTE: Plant at Newcastle would have higher wood costs than plant at Halifax. This plant, at 500 tons per day, must purchase chips in competition to pulpmills. Wood cost at Halifax is expected to be $5.00-$10.00 lower than at Chatham, New Brunswick when operating solely on residues.

5. Quoted prices for 3/4" high quality particle board, F.O.B. Toronto, Ontario - up to $125.00 per M f.b.m.

6. Reported F.O.B. Net Mill Prices, 3/4", from Levesque Plywoods Ltd., Hurst, Ontario - $76.00 per M f.b.m.

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7. Quoted prices, F.O.B. Sogefor Mill, 3/4", - $65.00-$75.00 per M f.b.m.

4. Raw Material Supply (3rd year of operation - 100 tons per day)

Tons produced per year - 300 days @ 24 hours = 29,920

NOTE: 10% loss of wood equals 10% gain from resin and wax. These wood requirements constant to tonnage produced per day

a) Available Residues:

	Tons
1. Planer Shavings	12,000
2. Woodworking Plant Residues	2,340
3. Waferboard Plant	12,000
	26,340
Roundwood Requirements	3,580
	29,920

b) Roundwood Requirement:

29,920 - 26,340 = 3,580 tons

Cords of wood:

3598 tons + 4,000 lbs. (weight of red maple, 4,000 lbs./cord) = 1,799 cords
Falldown - 15% x 1,799 = 269

Total Roundwood Requirement = 2,068 cords

Value of Cordwood per year @ $20.00 = $41,360

Roundwood cost per ton of particle board = $1.38

NOTE: The roundwood cost of $1.38 per ton forms part of the $5.00 per ton for wood costs, shown in the average operating costs per ton of particle board produced. (See Item 2., "Production Costs").

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5. Utilization of Residues

a) Planer Shavings:

Planer shavings at 18% moisture content to be dried to 8% m.c.
Dry material to be screened for core stock and fines for surface.

- 75% core material
- 15% fines for surface
- 10% to boiler room

b) Woodworking Residues:

Material at 8% m.c. will go directly to screens, refiners and separators.

- 65% core
- 15% fines for surface
- 20% to boiler room

c) Waferboard Screenings:

8% m.c., ground for fine material and cores.

- 50% core material
- 30% fines
- 20% to boiler room

d) Flaker Material From Round Cordwood:

Core material only - 3,580 tons
= 1,799 cords

6. Product Pricing - Particle Board - 3/4" Basis:

	Per M Sq.Ft.
F.O.B. Net Mill Price including Transportation to Europe (estimated)	$ 70.24 25.24
Landed Price Europe	$ 95.48
Determined Price of 3/4" particle board in Europe	$115.00
Margin for tariffs and discharging	$ 19.52

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B) Waferboard

1. Capacity Levels (Year 3)

Thickness	1/4"	5/16"	3/8"	1/2"
Density (cubic feet/M sq.ft.)	20.8	26.0	31.2	41.6
Lbs. per cu.ft.	43	43	43	43
Weight/M Sq.Ft.	894	1,118	1,341	1,788
Sq. Ft. Production/Hour	9,320	7,453	6,214	4,660
Tons Production/Hour	4.3	4.3	4.3	4.3
Tons Production/Day	100	100	100	100
Tons Production Per Year	30,000	30,000	30,000	30,000
Annual Capacity/M Sq.Ft.	67,110	53,667	44,742	33,557
Base Price (Net Mill)-$	55.24	55.24	66.26	88.35

Value of Sales - Year 3 =$2,965,000

2. Production Costs

100 tons per day - 3rd year of operation.

Weight of Board = 43 lbs.

Annual Capacity (tons) = 100

Annual Capacity (5/16" sq.ft.) = 53,667

Average Material Ratios - 5/16" Basis/M sq.ft.:

Wood	- 1,000 lbs.	89.5%
Resin	- 42 lbs.	3.8%
Wax	- 22 lbs.	1.9%
Water	- 54 lbs.	4.8%
	1,118 lbs.	100.0%

Red Maple - Weight per cubic foot = 38 lbs.

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3. Cordwood Requirement

Each cord of red maple will yield an average of 3,200 lbs. of bone dry wood. Losses at saws, screens and edge trim will be 800 lbs., or 25% of log input. (A high portion of this residue will be utilized for the production of particle board). The remaining 75% or 2,400 lbs., will form the wood base for waferboard production.

4. Average Operating Costs per M Sq.Ft.(5/16" basis):

	$	Percentage
Raw Materials -		
- Wood	10.83	19.6
- Resin	15.10	27.3
- Wax	1.77	3.2
Direct Labour	5.75	9.3
Indirect Labour	1.21	2.2
Factory Burden	10.75	19.5
Total Manufacturing Expense	44.81	81.%
Selling Expense	1.36	2.5
Administration	1.29	2.5
Total Cost of Goods	47.46	86.%
Profit Margin	7.78	14.0
Total Cost/M Sq.Ft. - 5/16"	55.24	100.%

5. Product Guidelines

a) Markets

- 80% Atlantic Provinces
- 10% Quebec & Ontario
- 10% United States

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b) End Usages - Plant will efficiently manufacture boards in 1/4" and 1/2" thicknesses.

Product will displace present imports of rough plywood and sanded plywood. Major uses: sheathing, cladding and "do-it-yourself" projects.

53,667 x 1,000	=	53,667,000 lbs.
53,667,000 + 2,400	=	22,361 cords
Cords of wood directed to waferboard production	-	22,361
Residue to particle board production	-	6,708
Total Cordwood Requirement	-	29,069
Average Deliver Cost	-	$20.00 per cord
TOTAL CORDWOOD COST	_	$581,380.
Value of Cordwood directed to particle board production 12,000 tons @ $5.00	-	$ 60,000
Cost of Cordwood to waferboard plant	-	$521,380

4. Production Cost Ratios

Production Basis	- 5/16" rough waferboard
Weight	-43 lbs. per cubic foot
Daily Capacity	-100 tons per day
Annual Capacity	-53,667 sq.ft.
Value per M sq.ft.-5/16"	-$55.24
Value of annual production	-$2,965,000.

c) Manufacturing process is based on the use of liquid phenolic resin and medium density hardwoods; e.g., soft maple.

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RAW MATERIALS SCHEDULE - BOARD PLANT

A) Particle Board

1. Wood Requirements:

The particle board plant will be designed to utilize the following materials. Total tonnage per year equals 34,000 tons.

Planer Shavings	-	60%
Waferboard Rejects	-	20%
Roundwood Flakes	-	20%

The plant will require 120 tons of materials per day to produce 100 tons of particle board.

Wood Material	-	100 tons per day
Wax & Resin	-	10 tons per day
Wood Rejects	-	10 tons per day

NOTE: Wood rejects will be used for fuel in the boilers.

2. Availability:

Planer Shavings - 1,000 f.b.m. planing = 600 lbs
60,000,000 " " = 36,000,000 lbs., or 18,000 tons per year

Millwork Plant Shavings - 10 tons per day = 2,500 tons per year

Total Available Shavings = 20,500 tons per year

Requirements: $\frac{60}{100} \times 34{,}000$ = 20,400 tons per year

Waferboard Rejects: $\frac{20}{100} \times 35{,}000$ = 7,000 tons per year

Round Flakes Requirements: = 6,600 tons per year

Total = 34,000 tons per year

Roundwood Requirements (Approximate) = 3,300 cords per year

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B) Waferboard

1. Wood Requirements:

The waferboard plant will initially require 20,000 cords of hardwoods per year. Running at full capacity (3 shifts per day, 7 days per week) the plant will require between 25,000 and 30,000 cords per year.

The preferred material for the plant is eight-foot long wood with minimum diameter or 5" and maximum diameter of 12". Larger sticks of wood would have to be split. At this stage of manufacturing technology, waferboard cannot be manufactured from slabs, edgings or machine residues.

Cost for hardwood pulpwood has been estimated at $20.00 per cord.

2. Other Materials:

The following is an approximate breakdown of the volume and price of the materials contained in 1,000 square feet of 5/16" waferboard:

Material	Volume	Value
Wood	930 lbs.	$10.92
Phenolic Resin	40 lbs.	13.60
Wax	50 lbs.	2.05
Water	50 lbs.	
TOTAL	1,040 lbs.	$26.57

CONSTRAINTS

The success of this proposal depends very much upon the willingness of Nova Scotians to discard traditional approaches and techniques no longer appropriate to today's production demands and in their place to boldly adopt new and broader concepts with respect to resource use, integrated harvesting and wood utilization. These very significant changes must be adequately reinforced through legislative revisions wherever present laws inhibit change or tend to perpetuate costly operating procedures. This will include amendments to existing regulations which will make possible an increase in the efficiency of log transportation methods from the forests to both primary and processing centres.

More specifically, the province, the pulp companies, the major sawmill operators, and others having interest in the forest resources of Nova Scotia must accept and be prepared to find ways to effectively implement the principle of "sawlogs to sawmills and pulpwood to pulp mills". For the complex this must mean that adequate quantities of good quality and reasonably priced sawlogs will be made available on a long-term basis to its sawmills. Only in this way can efficient and viable primary conversion units be assured and these constitute the very core of the entire proposal.

Naturally, means will have to be found to resolve the many and inevitable questions that will arise concerning the mechanics of such a proposal -- questions that must be raised by parties having divergent interests --

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and ones that relate to such matters as the planning, building and funding of forest-access roads, the cost, type, location and timing of stumpage agreements, the legal definitions of "sawlogs" and "pulpwood", methods of cutting and costs of reforestation, forest taxation, methods of trucking and relative highways legislation, etc., but while these obstacles may now appear in frightening proportions, solutions can be found if the various interests approach the challenge cooperatively and with abundant determination.

Government policies and programs will also have to reinforce the principle of "fibre to its most appropriate use", continue to assist in opening up hitherto inaccessible timber resources, and encourage efficient protection, growth, harvesting, transporting and re-growth.

The complex itself will have to aggressively seek out areas offering cost saving possibilities and adopt or devise means to implement these efficiencies. Key areas that come quickly to mind include cheaper methods of moving sawlogs and pulpwood from the forest to the mills, methods and machines that will reduce waste and further maximize the portion of the log converted into lumber and wood chips, primary conversion equipment that will enable maximum labour productivity, and more economic means of transporting finished products to offshore markets -- particularly those in the eastern United States. This proposal already includes allowances for up-grading the existing sawmills that would participate in the complex. It also provides for acquiring the utmost sophistication in plant design and machinery and equipment in the suggested further-manufacturing facilities.

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Traditionally Nova Scotia producers have marketed a significant portion of their rough, partially air-dried lumber in the U.K. Today this market is being seriously challenged by major producers in Russia and the Scandinavian countries. Moreover ocean transport is becoming increasingly scarce and expensive. Means will therefore have to be found for the development of alternative and potentially more profitable markets. The heavily populated areas of the eastern United States offer such a market possibility provided quality products are made available on a competitive and reliable basis. Such should be the sales strategy of the complex.

There is a great need for increased activity in the low-income housing area in Nova Scotia. The problems are complex and require good programming over at least a three year period to service needs and to aid in the development of the construction industry in the province and in the development of the proposed building materials complex. Builders must be assured mortgage funds will be available on a long term basis, difficulties in obtaining sites on serviced land in Halifax-Dartmouth must be resolved, existing planning legislation must be reviewed and amended to reflect present day conditions, housing standards must be studied in view of increasing standards pushing up costs, and the cost-sharing formulas at federal-provincial and municipal levels should be reviewed. Existing legislation should be amended to ensure that approved types of prefabricated homes which meet National Housing Standards are approved for construction in all municipalities in the province. As a means of encouraging the pro-

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posed building materials complex outlined in this report, the Nova Scotia Housing Corporation should encourage the use of prefabricated homes for public housing projects.

And finally a prerequisite to the proposal for a building materials complex in Halifax-Dartmouth will be availability of funds and management expertise as envisaged for the Halifax-Dartmouth Development Corporation. If such an agency does not exist it is unlikely this project will materialize.

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OTHER PRODUCTS

The Halifax-Dartmouth area is emerging as the Atlantic region and is in a strategic location for manufacturers wishing to serve provincial and regional markets. It is also well located to serve markets in north east United States when it is not excluded by commodity tariffs.

This report has concentrated on the feasibility of building material products based on timber resources in the province. Once this stage of the building materials complex is established consideration should be given to -xpanding it to include the manufacture of building papers, laminated wood structures, plastic bathroom fixtures, aluminum extrusion, builders hardware, fabricated metal products, gypsum products and electrical products provided feasibility studies prove they can be profitable in a Halifax-Dartmouth location. In this manner the proposed complex can become the building materials centre for the Atlantic provinces.

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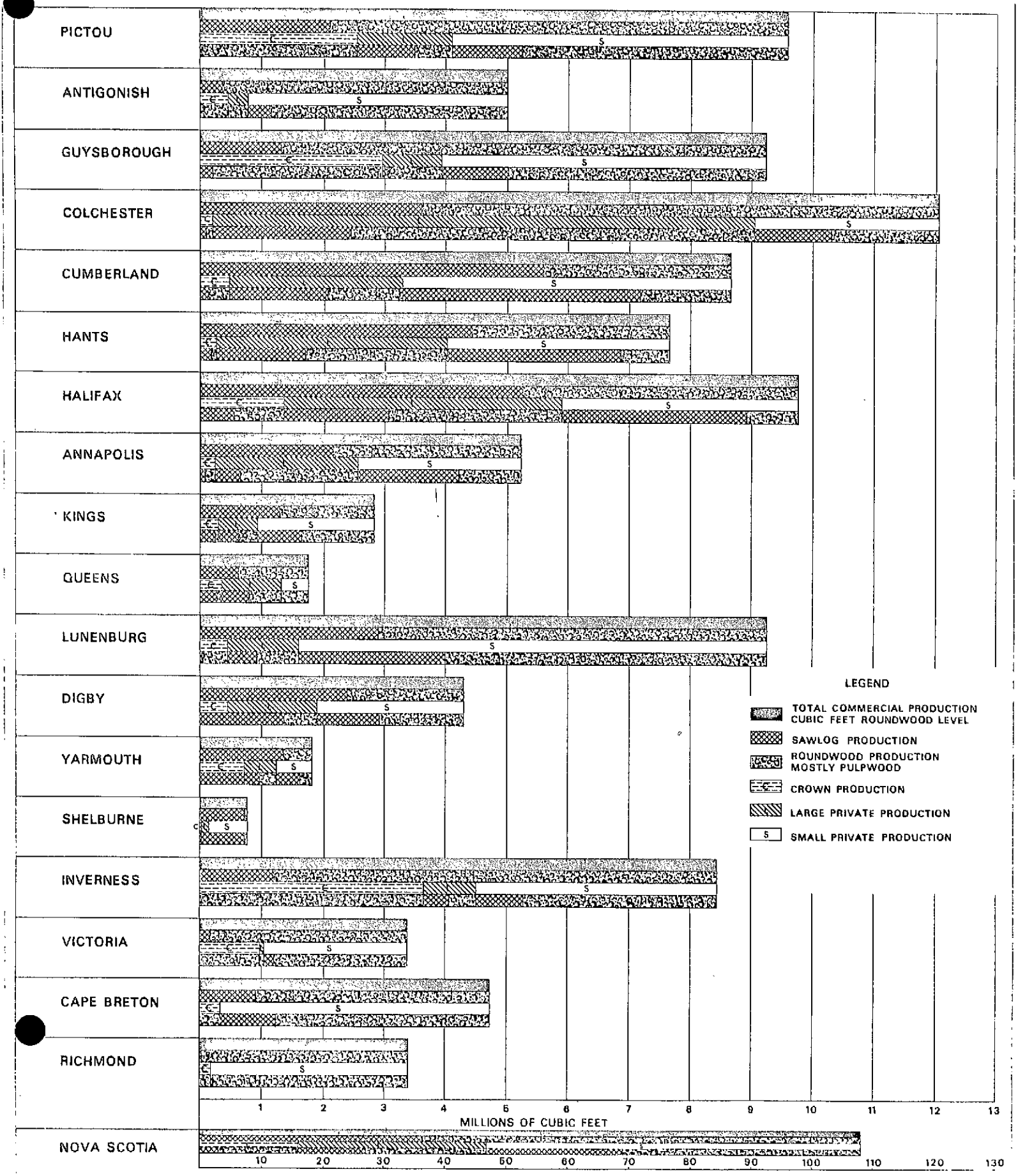
APPENDIX 1

NOVA SCOTIA FOREST PRODUCTION 1970

NOVA SCOTIA
FOREST PRODUCTION 1970

CUBIC FEET SOLID WOOD BY COUNTY,
SAWLOG, ROUNDWOOD, TOTAL BY OWNERSHIP CLASS.



APPENDIX 2

POWER RATES

ALTERNATING CURRENT POWER - INDUSTRIAL Rate #65
23,000 Volts or 69,000 Volts
400 Kilowats or more

Base Charge:- $2.50 per month per kilowatt of maximum demand.

or

$2.25 per month per kilowatt of maximum demand when the transformers are supplied by the Customer.

or

$2.00 per month per kilowatt of maximum demand when off-peak demand is more than twice the demand during designated peak hours.

or

$1.75 per month per kilowatt of maximum demand when the off-peak demand is more than twice the demand during designated peak hours and the transformers are supplied by the customer.

Energy Charge:-0.8 cents per kilowatt hour.

Minimum Bill:- The "Base Charge".

Adjustments for Changes in the Cost of Fuel:-

The energy charge will be increased or decreased 0.0124¢ per kilowatt hour for each 1¢ increase above 37¢ or decrease below 35¢ per million Btu in the average cost of fuel to the company. Such average will be calculated on the basis of -(a) the cost of fuel used in the thermal generating stations of the Company from other utilities under contracts which commit the Company to purchase a specified number of kilowatts of capacity.

The increase or decrease in respect of each calendar year shall be applied on the basis of estimated fuel costs and shall be reflected in bills rendered during the months from March to November to reflect a difference between the

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actual cost of fuel in such calendar year and the estimated cost for the same period shall be made in bills rendered in December of such calendar year and in January and February of the following year. This increase or decrease will be rounded out to the nearest one hundredth of a cent in the billed rate.

ALTERNATING CURRENT POWER - INDUSTRIAL

31. AVAILABILITY: This rate shall be available to any industrial customer engaged principally in the business of manufacturing, assembling, transporting or processing of materials, and having a connected load of 400 KW or more who purchases energy at transmission voltages of approximately 23,000 volts or 69,000 volts.

Metering will normally be at the primary supply service voltage. Should the metering be installed on the low-tension or secondary side of the transformers, the metered kilowatt hours in each billing period shall be increased by 1.75 per cent to compensate for transformer losses.

32. FORM OR RATE: The charge for this service shall be made up of two parts: (1) a "Base Charge" based on maximum demand, and (2) an energy charge. The maximum demand shall be determined as described in Regulation 24. The maximum demand may be adjusted for power factor at the Company's option in accordance with Regulation 25.

33. REDUCED BASE CHARGE FOR OFF-PEAK DEMAND: There shall be four rates for the "Base Charge", two applying in ordinary cases where the time of maximum demand is unrestricted, and two applying to customers whose maximum demand occurs outside of certain designated peak hours (see Regulation 27) and is more than twice as great as any demand occurring within those hours.

Should a customer's demand during the designated "peak hours" exceed one-half of the demand during normal off-peak hours in any billing period, the "Base Charge" will be billed at the regular base rate of $2.50 or $2.25 (which ever is applicable) per month per kilowatt of maximum demand for that billing period and for the next two regular billing periods.

Should a customer fail to meet the demand requirements of the "Reduced Base Charge" for a second time during the months of November to February inclusive, the customer will be deemed as not being able to comply with the requirements of the rate and henceforth will pay the regular base rate of $2.50 or $2.25 (which ever is applicable) per month per kilowatt of maximum demand for at least the next twelve months.

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Z 58 RECOMMENDED SERVICE VOLTAGES LISTED BY RATES

The voltages listed below are the ones from which a selection is normally recommended for any particular rate. This does not rule out the possibility of other Standard Service Voltages being available for any particular rate. See Z56 regarding non-standard voltages.

RATE #	RATE	SERVICE VOLTAGE (S)
01	Domestic Service - 2-wire	120 1-Phase, 2-Wire
02	Domestic Service - 3-wire	120/240 1-Phase, 3-Wire
50 53	Commercial Lighting Optional Rate for Commercial Cooking and/or Water Heating	120/240 1-Phase, 3-Wire 120/208Y 3-Phase, 4-Wire
59	All-Electric Power	120/240 1-Phase, 3-Wire 120/208Y 3-Phase, 4-Wire 347/600Y 3-Phase, 4-Wire 600 3-Phase, 3-Wire
52	General Service Light and Power Company-Owned Transformers	120/240 1-Phase, 3-Wire 120/208Y 3-Phase, 4-Wire 240 3-Phase, 3-Wire 347/600Y 3-Phase, 4-Wire 600 3-Phase, 3-Wire
52	General Service Light and Power Customer-Owned Transformers	2,400/4,160Y 3-Phase, 4-Wire 4,160 3-Phase, 3-Wire 7,200/12,470Y 3-Phase, 4-Wire 12,470 3-Phase, 3-Wire
51	A-C Power - General Use Company-Owned Transformers	120/240 1-Phase, 3-Wire 120/208Y 3-Phase, 4-Wire 240 3-Phase, 3-Wire 347/600Y 3-Phase, 4-Wire 600 3-Phase, 3-Wire
51	A-C Power - General Use Customer-Owned Transformers	2,400/4,160Y 3-Phase, 4-Wire 4,160 3-Phase, 3-Wire 7,200/12,470Y 3-Phase, 4-Wire 12,470 3-Phase, 3-Wire 23,000 3-Phase, 3-Wire
65	A-C Power - Industrial - Company-Owned Transformers	347/600Y 3-Phase, 4-Wire 600 3-Phase, 3-Wire 2,400 3-Phase, 3-Wire 2,400/4,160Y 3-Phase, 4-Wire 4,160 3-Phase, 3-Wire
65	A-C Power - Industrial Customer-Owned Transformers	23,000 3-Phase, 3-Wire 69,000 3-Phase, 3-Wire

No. 73 BILL 1970

An Act Relating to the Supply of Electrical Power to New or Expanding Industries

BE IT ENACTED by the Governor and Assembly as follows:

1 In this Act:

(a) "agreement" includes an agreement, an amendment or renewal thereof that is entered into under this Act;

(b) "Board" means the Board of Commissioners of Public Utilities;

(c) "industry" means an industry that is operated principally for the purpose of processing materials or manufacturing or assembling products;

(d) "public utility" means a public utility that furnishes electrical energy and provides electrical facilities.

2 Where a public utility is satisfied that industry

(a) is being newly established in the Province or is expanding its facilities;

(b) will normally operate for twelve months in each year;

(c) will have an electric demand of at least two thousand kilowatts or at such other demand base as the Governor in Council may from time to time establish; and

(d) will provide employment directly and in activities relating to its operations for at least one person for each fifty kilowatts of its electric demand

the utility, without the approval of the Board, may enter into and carry out an agreement with the industry respecting the furnishing of electrical energy and the provision of electrical facilities to the industry.

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BILL NO. 73

3 (1) An agreement may

(a) fix the tolls, rates and charges payable for electrical energy furnished to the industry;

(b) prescribe rules and regulations under which electrical energy will be furnished to the industry;

(c) establish the terms and conditions under which electrical facilities will be provided to the industry;

(d) provide for the term, renewal, amendment, alteration or cancellation of the agreement.

(2) No agreement shall exceed a term of ten years including any renewals of the agreement.

(3) No agreement shall fix or provide for the payment of tolls, rates or charges for energy or facilities at lower rates than are from time to time fixed by the Governor in Council either generally or with respect to any industry or class of industries.

4 A public utility that enters into an agreement shall file with the Board a copy of every agreement forthwith after its execution.

5 An agreement and any provision of it shall be deemed not to be discriminatory or in violation of the Public Utilities Act or any rules or regulations made under it.

6 An agreement shall not set rates below the estimated incremental costs to the utility.

7 For the purposes of the Public Utilities Act and the Board, where a public utility has entered an agreement,

(a) operating expenses incurred by the public utility in relation to the agreement shall be charged and all revenues related to the agreement shall be credited to its operating account in calculating the return that the public utility is entitled to earn annually; and

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(b) the prudent original cost of any property acquired by the public utility in relation to the agreement shall be deemed to be the cost thereof for the purpose of determining the rate base of the public utility.

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ALTERNATING CURRENT POWER - GENERAL USE Rate #51

Base Charge:

$2.00 per month per kilowatt of maximum demand when a demand indicator is installed;

or

$1.50 per month per kilowatt of connected load;

or

$1.25 per month per kilowatt of maximum demand when the maximum demand or the connected load is 50 kilowatts or more and when the customer's demand during designated "peak hours" is less than one-half of the demand during off-peak hours;

or

$1.75 per month per kilowatt of maximum demand when the transformers are owned by the customer;

or

$1.00 per month per kilowatt of maximum demand when the maximum demand or connected load is 50 kilowatts or more, and when the customer's demand during designated "peak hours" is less than one-half of the demand during off-peak hours, and the transformers are supplied by the customer.

Energy Charge:

2.0 cents per kilowatt hour for the first 100 kilowatt hours per month per kilowatt of maximum demand or per kilowatt of connected load, whichever is the basis of the "Base Charge".

1.35 cents per kilowatt hour for all additional consumption.

Minimum Net Bill:

$3.00 per month, or the base charge, whichever is the greater.

Adjustments for Changes in the Cost of Fuel:

The energy charge will be increased or decreased 0.0124¢ per kilowatt hour for each 1¢ increase above 37¢ or decrease below 35¢ per million Btu in the average cost of fuel to the Company. Such average will be calculated on the basis of (a) the cost of fuel used in the thermal generating stations of the Company; and (b) the equivalent cost of fuel used to produce the electric energy purchased by the Company from other utilities under contracts which commit the Company to purchase a specified number of kilowatts of capacity.

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The increase or decrease in respect of each calendar year shall be applied on the basis of estimated fuel costs and shall be reflected in bills rendered during the months from March to November, both inclusive. Any revision required to reflect a difference between the actual cost of fuel in such calendar year and the estimated cost for the same period shall be made in bills rendered in December of such calendar year and in January and February of the following year. This increase or decrease will be rounded out to the nearest one hundredth of a cent in the billed rate.

21. AVAILABILITY: The rate for alternating current power - general use shall be applicable to electric energy supplied to any customer at 23,000 volts or less, for all uses, including lamps used as part of a production process, except as provided in the domestic service rates, the commercial lighting rate, the street lighting rates, and the other power rates.

22. MEASUREMENT OF CONNECTED LOAD:

(a) The total rated capacity in kilowatts of all motors and other electrical equipment installed shall be used as the basis of the charges, except as hereinafter provided.

(b) For elevator motors, portable electric tools, electric welding transformers and electric welding motor generators, 50% of their maximum rated capacity shall be used.

(c) For all motors used in colleges, schools, and other public institutions of learning and in buildings or parts of buildings used for public worship, one-half of the connected load shall be used as the basis of the charges instead of the full connected load; with the exception, however, that when colleges or school buildings or portions of them are used for residential purposes, the full connected load shall be used in such buildings or portions of buildings.

(d) Where two or more motors are connected by means of a double-throw switch or are arranged in any way so that they cannot be operated simultaneously, the connected load shall be taken as the largest total kilowatts which can be operated simultaneously.

(e) When any customer's connected load is less than one kilowatt, his charge shall be based on a load of one kilowatt.

(f) For electric ranges, other cooking equipment and water heating equipment, installed on premises other than residences, 50% of their rated capacity shall be used.

23. FACTORY AND INDUSTRIAL LIGHTING: In factories, etc., where the connected load for lighting is not more than 10% of the total connected load, and where the lighting can be supplied from the same transformers and meters as the power load, the

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lighting service may be furnished under this rate. If these conditions do apply, commercial lighting rates shall be charged for the lighting service. This clause does not apply to lighting in office buildings and stores.

24. MAXIMUM DEMAND AS AN ALTERNATIVE FOR CONNECTED LOAD: At its own option, regardless of connected load or upon the request of any customer having a connected load of more than 3 kilowatts, the Company shall install a suitable demand indicator, and thereafter instead of the connected load shall use, as a basis for the charges, the average of the monthly, or bimonthly maximum 15 minute loads as recorded in the twelve months preceding each bill. During the first twelve months after the indicator is installed, the average of the monthly or bimonthly maximum 15 minute loads recorded since such installation shall be used.

25. POWER FACTOR: When charges are based on minimum demand, they may, at the Company's option, be adjusted for power factor in the following manner: The demand shall be measured in kilovolt amperes by means of an indicating kva meter. The demand recorded by this meter shall be multiplied by 80% for installation of 10 kilowatts connected; 85% over 10 kilowatts and up to 100 kilowatts connected; 90% over 100 kilowatts and up to 5000 kilowatts connected; and 92% more than 5000 kilowatts connected. The result shall be treated as the kilowatt demand in Regulation 24.

26. REDUCED BASE CHARGE FOR OFF-PEAK DEMAND: A reduced rate for the "Base Charge" shall be available to customers having a connected load of 50 kilowatts or more, whose maximum demand occurs outside of certain designated peak hours, (see Regulation 27) and is more than twice as great as any demand occuring within those designated "peak hours".

Should a customer's demand during the designated "peak hours" exceed one-half of the demand during normal off-peak hours in any billing period, the "Base Charge" will be billed at the regular base rate of $2.00 or $1.75 (whichever is applicable) per month per kilowatt of maximum demand for that billing period and for the next two regular billing periods.

Should a customer fail to meet the demand requirements of the "Reduced Base Charge" for a second time during the months of November to February inclusive, the customer will be deemed as not being able to comply with the requirements of the rate and henceforth will pay the regular base rate of $2.00 or $1.75 (whichever is applicable) per month per kilowatt of maximum demand for at least the next twelve months.

27. PEAK HOURS: The hours referred to in Regulation 26 and 33 as "designated peak hours" shall be as follows, subject to modification from time to time as load conditions require:

From 4:30 p.m. to 8:00 p.m. during the months of November to February, inclusive.

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Z56 STANDARD SERVICE VOLTAGES AVAILABLE

Service voltages other than these Standard Service Voltages are generally not available. Inquiries regarding non-standard voltages should be referred to Technical Division.

For a listing of the Standard Service Voltages recommended for the various rates, refer to Z58.

VOLTAGE AND DESCRIPTION		NOTES
120	1-Phase, 2-wire	See schedule of Rates, Regulation No. 16 regarding availability
120/240 120/208y 240	1-Phase, 2-wire 3-Phase, 4-wire 3-Phase, 3-wire	
347/600y 600	3-Phase, 4-wire 3-Phase, 3-wire	Available by Special Negotiations only
2,400 2,400/4,160y 4,160 7,200/12,470y 12,470 23,000 69,000	3-Phase, 3-wire 3-Phase, 4-wire 3-Phase, 3-wire 3-Phase, 4-wire 3-Phase, 3-wire 3-Phase, 3-wire 3-Phase, 3-wire	Available by Special Negotiations only

Z 57 VOLTAGE VARIATION LIMITS

The voltage variation limits listed below are those expected to be maintained at any service entrance or point of sale.

VOLTAGE AND DESCRIPTION		VOLTAGE VARIATION LIMITS			
		←EXTREME OPERATING CONDITIONS→			
			NORMAL OPERATING ←CONDITIONS→		
120	1-phase,2-wire	110	113	125	127
120/240	1-phase,3-wire	110/220	113/226	125/250	127/254
120/208Y	3-phase,4-wire	110/190	113/196	125/216	127/220
240	3-phase,3-wire	220	226	250	254
347/600Y	3-phase,4-wire	318/550	326/565	360/625	367/635
600	3-phase,3-wire	550	565	625	635
2,400	3-phase,3-wire		-6%	+6%	
2,400/4,160Y	3-phase,4-wire		-6%	+6%	
4,160	3-phase,3-wire		-6%	+6%	
7,200/12,470Y	3-phase,4-wire		-6%	+6%	
12,470	3-phase,3-wire		-6%	+6%	
23,000	3-phase,3-wire		-6%	+6%	
69,000	3-phase,3-wire		-6%	+6%	

NOTES:

1- Normal Operating Conditions - User electrical systems shall be so designed and operated that with service voltages within this range, utilization equipment should give satisfactory performance.

2- Extreme Operating Conditions - This range of voltage generally results from practical operating conditions beyond control on the supply and/or user systems. These conditions shall be limited in extent, frequency and duration. Corrective measures shall be undertaken within a reasonable period to improve the voltage to Normal Operating Conditions. Where voltages lie outside this range; prompt improvement or corrective action is called for.

APPENDIX 3

TRANSPORTATION RATES

STATEMENT SHOWING CARLOAD RAIL RATES IN CENTS PER 100 POUNDS

COMMODITY DESCRIPTION	TO BOSTON			TO CHICAGO			TO NEW YORK			TO MONTREAL			TO TORONTO		
	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax
Lumber, rough or dressed, Canadian Wood.	36,000R	88	107	40,000	153	157	36,000R	114	131	40,000	69	77	40,000	95	102
	60,000	67	-	60,000	141	145	60,000	100	119	60,000	67	74	60,000	92	99
										70,000	65	73	70,000	90	97
										80,000	64	72	80,000	89	95
Kitchen Cabinets:															
Knocked-Down (flat):	30,000R	182	241	30,000R	344	399	30,000R	229	286	14,000R	145	145	14,000R	198	198
Knocked-Down (other than flat):	20,000R	246	333	20,000R	467	546	20,000R	317	399	14,000R	145	145	14,000R	198	198
Set-Up:	12,000R	382	514	12,000R	722	842	12,000R	487	612	14,000R	145	145	14,000R	198	198
Doors, Not Glazed (Note 1)	24,000R	166	200	24,000R	244	269	24,000R	195	220	20,000R	111	111	20,000R	149	149
Door Frames: (Note 1)															
Knocked-Down:	24,000R	166	200	24,000R	244	269	24,000R	195	220	20,000R	111	111	20,000R	149	149
Set-Up:	10,000R	262	319	10,000R	412	466	10,000R	310	364	20,000R	111	111	20,000R	149	149
Sash, Not Glazed: (Note 1)															
Knocked-Down:	24,000R	166	200	24,000R	244	269	24,000R	195	220	20,000R	111	111	20,000R	149	149
Set-Up:	16,000R	234	280	16,000R	358	399	16,000R	272	316						
Houses, portable or fabricated, Wooden, Knocked-down or in flat Sections:	24,000R	182	241	24,000R	344	399	24,000R	229	286	24,000R	123	123	24,000R	165	165

REFERENCE:

R - Applicable in closed cars not exceeding 40 feet 7 inches in length. If longer car is used minimum weight shall be greater.

NOTE 1.

Provisions apply on articles of Native Wood, Canadian wood or foreign birch, pine, or spruce, not further finished than primed.

ATLANTIC PROVINCES TRANSPORTATION COMMISSION
MONCTON, NEW BRUNSWICK.
AUGUST 16TH, 1971.

STATEMENT SHOWING TRUCKLOAD RATES IN CENTS PER 100 POUNDS

(RATES INCLUDE ONE PICK-UP AND ONE DELIVERY)

COMMODITY DESCRIPTION	TO BOSTON			TO CHICAGO			TO NEW YORK			TO MONTREAL			TO TORONTO		
	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax	Minimum Weight (Lbs.)	FROM Saint John	FROM Halifax
Kitchen Cabinets, Wooden, comprised of top and base sections, whether attached or separated	10,000	310	400	12,000	682	765	10,000	385	473	10,000	(1) 99	(1) -	30,000	172	176
	15,000	254	329	16,000	633	716	15,000	317	389	15,000	(1) 99	(1) 112			
	22,000	201	259	18,000	495	562	22,000	249	306	30,000	128	128			
	36,000	182	236	22,000	446	500	36,000	227	278						
				24,000	409	463									
				36,000	389	426									
Doors, Not Glazed, (Note 1):	24,000	201	259	24,000	373	427	24,000	249	306	15,000	(1) 99	(1) 112	30,000	140	145
	36,000	182	236	36,000	353	390	36,000	227	278	30,000	95	128			
Door Frames: (Note 1)															
Knocked-Down:	24,000	201	259	24,000	373	427	24,000	249	306	15,000	(1) 99	(1) 112	30,000	140	145
	36,000	182	236	36,000	353	390	36,000	227	278	30,000	95	128			
Set-Up:	12,000	310	400	12,000	682	765	12,000	385	473	15,000	(1) 99	(1) 112	30,000	140	145
										30,000	95	128			
Sash, (Note 1):															
Knocked-Down:	24,000	201	259	24,000	373	427	24,000	249	306	15,000	(1) 99	(1) 112	30,000	140	145
	36,000	182	236	36,000	353	390	36,000	227	278	30,000	95	128			
Set-Up:	16,000	254	329	16,000	562	629	16,000	317	389	15,000	(1) 99	(1) 112	30,000	140	145
										30,000	95	128			
Houses, portable or fabricated, Wood, Knocked down or in flat Sections:	24,000	201	259	30,000	373	427	24,000	249	306						
	36,000	182	236	36,000	353	390	36,000	227	278	30,000	95	112	30,000	140	145

REFERENCES:

(1) - Will not apply on articles having a density of less than 10 lbs. per cubic foot.

NOTE 1 :

Provisions apply on articles of native wood, Canadian wood or foreign birch, pine or spruce, not further finished than primed.

ATLANTIC PROVINCES TRANSPORTATION COMMISSION
MONCTON, NEW BRUNSWICK.
AUGUST 16TH, 1971.

STATEMENT SHOWING CARLOAD RAIL RATES IN CENTS PER 100 POUNDS

Commodity Description	To: Boston, Mass. Minimum Weight (lbs.)	From Saint John,N.B.	From Halifax N.S.	To: Chicago, Ill. Minimum Weight (lbs.)	From Saint John, N.B.	From Halifax N.S.	To: New York, N.Y. Minimum Weight (lbs.)	From Saint John, N.B.	From Halifax N.S.	To: Montreal, Que. Minimum Weight (lbs.)	From Saint John, N.B.	From Halifax N.S.	To: Toronto, Ont. Minimum Weight (lbs.)	From Saint John, N.B.	From Halifax N.S.
Boards or Sheets, rigid, flat made from wood chips, wood particles and wood shavings with added resin binder, not to exceed ten per cent by weight, compressed not tongued, not grooved, not coated, not lacquered, not oiled, not painted, not plasticized, not polished, not stained, not varnished, not waxed, loose or in packages.	36,000 60,000	88 67	107 -	40,000 60,000	153 141	157 145	36,000R 60,000	114 100 -	131 119	36,000 50,000	#85 #78	#85 #78	36,000 50,000	#117 #108	#117 #108

- Rates shown as applying to this Commodity do not presently apply from Halifax, N.S. or Saint John, N.B. but are shown as rates that could be secured through negotiation with the carriers should a regular movement of traffic develop

R - Applicable in closed cars not exceeding 40 feet 7 inches in length. If longer car is used minimum weight shall be greater

STATEMENT SHOWING TRUCKLOAD RATES IN CENTS PER 100 POUNDS

Rates Include One Pick-up and One Delivery

Commodity Description:	To: Boston, Mass. Minimum Weight (lbs.)	From Saint John,N.B.	From Halifax N.S.	To: New York, N.Y. Minimum Weight (lbs.)	From Saint John, N.B.	From Halifax N.S.	To: Montreal, Que. Minimum Weight (lbs.)	From Saint John,N.B.	From Halifax N.S.	To: Toronto, Ont. Minimum Weight (lbs.)	From Saint John, N.B.	From Halifax N.S.
Boards or Sheets, not bent nor curved, consisting of sawdust or ground wood with added resin binder not exceeding 10 per cent by weight, compressed, without surface covering of other materials.	35,000 40,000	@77 @67	@118 @103	35,000 40,000	@115 @100	@155 @136	30,000 40,000	X77 X67	 Y75	40,000	X80	Y87

References:

@ - Potential Rates Only — Based on charges of 60 cents per mile using the one way mileage.
X - Potential Rates Only — Based on the rates published from Milltown, N.B.
Y - Potential Rates Only — Based on the rates published from East River, N.S.

Rates to Chicago, Ill. because of distance and movement are not shown.