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SURVEYER, NENNIGER & CHÊNEVERT INC.

CONSULTANTS

MONTRÉAL

02282

MANUAL ON PROCESSING PLANT

EXPERIMENTAL PRODUCTION PLANT FOR ASBESTOS PROCESSING COCHABAMBA, BOLIVIA

SNC CONTRACT NO. 3250-0002

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CHAPTER 1

1.0 INTRODUCTION

On 5 March 1970, the United Nations Industrial Development Organization awarded a contract to Surveyer, Nenniger & Chenevert Inc. to assist the Government of Bolivia in the implementation of an experimental production plant for asbestos processing in Cochabamba. The contract was revised on 8 August 1972 and the work to be performed by SNC was divided into four phases:

Phase I	:	Evaluation of Asbestos Mineral Ore
Phase II	:	Preparation of an Economic Study and Selection of Process
Phase III	:	Design of Process and Design of Processing Plant
Phase IV	:	Supply of Process Equipment, Erection of Process and Laboratory Equipment and start-up of Plant

Phase IV also requires the preparation of a manual including instructions for plant maintenance, operation and production of asbestos fibre.

The first part of this manual is intended for persons responsible for the maintenance of the asbestos processing plant. It outlines the basic requirements of an efficient maintenance program and describes the preventive maintenance routine for each type of asbestos processing equipment.

The second part of the manual is intended for persons responsible for the operation of the asbestos processing plant and the production and quality control of asbestos fibre. Processing and control are divided into ten operations. For each operation, it gives a concise description, a list of required process and auxiliary equipment, the responsible persons, the number of required workers and the procedure to perform the operation.

CHAPTER 2

2.0 MAINTENANCE

A maintenance program under the responsibility of a competent and efficient maintenance superintendent shall be initiated immediately after the erection and start-up of the plant equipment.

This program shall include:

a) A preventive maintenance routine at regular intervals for each type of equipment.

b) Immediate action on any defective piece of equipment to prevent additional damage, costly repairs and lengthy interruption of production.

c) A general overhaul at regular intervals on major pieces of equipment.

d) An inspection program at regular intervals for each type of equipment.

e) A maintenance record showing time, repair labour, supplies and material used and replaced on each piece of equipment. The maintenance record shall also indicate the maintenance schedule and the spare part minimum quantities in stock and on order.

f) A procurement program for minimum quantities of spare parts to be purchased and stored in an appropriate location.

SECTION 1

2.1 ROTARY ASPIRATOR

2.1.1 Preventive Maintenance

Lubrication of the pillow blocks is the only maintenance needed for a normal operation of the rotary aspirator. The correct grease for the conditions in which the rotary aspirator operates must be used. Verify with the manufacturer or local representative for the proper grease. The addition of e small amount of grease to the pillow blocks each month is recommended to force entrapped dust and other contaminants out from between the dust seals.

The oil level in the torque arm reducer should be checked periodically as indicated on the manufacturer's tag attached to the reducer.

Frequent visual inspection of the screen mesh is recommended and, if damaged, repair or replace.

SECTION 2

2.2 LIVE BOTTOM BIN

2.2.1 Preventive Maintenance

The live bottom bin and take-away conveyor should operate for long periods with the lubrication of the pillow blocks and flanged bearing units as the only maintenance required.

A small amount of grease added to each bearing housing, by way of the alemite fitting every month, should force out any dust that has entered the housing by way of the seals. Verify with the manufacturer or local representative for the proper grease to use.

A semi-annual verification of the oil level in all reducers is recommended to maintain the correct oil level as indicated on the reducer.

SECTION 3

2.3 CYCLONE COLLECTOR

2.3.1 Preventive Maintenance

Periodic inspections should be made and any build-up of material should be removed from the walls of the collectors. Caution should be taken in the cleaning of the collectors to prevent damage to cyclone surfaces and/or interior linings. All inspections should include signs of corrosion or abrasive wear so that early estimates of cyclone life expectancy for replacement purposes can be made.

The cyclone collector contains no moving parts and therefore requires no lubrication. But it is recommended that oil or light grease be used on bolts and inspection doors, hinges, etc.

SECTION 4

2.4 DUST COLLECTOR

2.4.1 Preventive Maintenance

Once the ultra jet unit has been filtering for a few days, a stable or normal operating level will result. Sudden changes, which may occur, can usually be traced to a malfunction in one phase of the filter operating equipment.

The following conditions could occur and the suggested check-list should indicate the problem.

A. Problem - visible stack discharge

Cause:
1. Torn or punctured bag
2. Loose bag clamps
3. Leaking tube sheet joints
4. Improper bag installation
5. Loose venturi bolts

Solution: Check clean air plenum to find trouble area. Dust accumulation will usually indicate source of leak. Replace damaged bag.

B. Problem - loss of compressed air

Cause: 1. Line leakage from compressor

Solution: Check all connections in air line from compressor to dust collector; make sure all fittings are tight.

Cause: 2. Pilot valve stuck open

Solution: Check pilot valve exhaust parts. One may be blowing air. Remove pilot valve from system and clean plunger.

C. Problem - high differential pressure

Cause: 1. Air-to-cloth ratio too high

Solution: Check fan speed and air flow to ensure design volumes are correct.

Cause: 2. Loss of compressed air supply

Solution: Check air system.

Cause: 3. Improper solenoid operation

Solution: Check timer "Tell-Tale" lights to observe solenoid operation. Check output fuse system. Check the pilot valve discharge port to insure that it is open.

Cause: 4. Timer failure

Solution: Observe timer operation. Increase puleing speed.

Cause: 5. Wet filter bage.

Solution: Check bags and filter housing for condensation. Preheat bag house or insulate housing.

Cause: 6. Leaking dust discharge valve

Solution: Observe dust discharges; make sure seal is maintained and valve ie not leaking air in.

2.4.2 For the screw conveyor, kesp ths area around the conveyor clean and uncluttered for easy access and to avoid any interference with the drive.

Whenever removing trough covers, verify the tightness of all bolts on the inside of the convsyor. If necessary, tap spring type cover clamps to rsetore the grip.

Weekly inspection and lubrication is recommended at first until a routine can be established bassd on conditions observed.

The drive unit has the instructions for lubrication on a tag attached to it. The ball or roller bearings should bs lubricated according to operating conditions and plant standards for rotating equipment.

Babitted or bronze bushed bearings may be furnished at th. trough ends and usually are furnished on the hangers. If there is no provision for grease lubrication, then none is required. If there is a provision for lubrication consult the following table for the type of grease to use.

Operating temperaturs	Grease equivalent to NLGI* No.
-40° to 32° F	No 1 or No 2
-32° to 200° F	No 2 or No 3

* National Lubricating Grease Institute

Hard or chilled iron, oil impregnated wood or plastic laminate hanger bearings do not need any lubrication.

A scheduled service plan is available and can be provided at cost by the Wheelabrator Corporation.

The dodge screw conveyor drive will give an excellent performance by proper installation, lubrication and maintenance. Because reducer is shipped without oil it is necessary to add oil before running. Use high grade oils recommended by the manufacturers. Fill to sight gauge "L" when reducer is not running. Drain, flush and clean magnetic plug every six months of operation. Check oil

level regularly. Too much oil will cause overheating. Too little oil will cause gear failure. Do not use grease or other non-liquid lubricants. Check and clean breather plug when changing oil to be sure it is operable.

Because of the many possible positions of the drive it may be necessary to make special adaptations using the lubrication fitting holes furnished with standard pipe fittings, standpipes and oil level gauges as required.

Maintenance - Tighten packing gland or drive shaft as required to keep material in screw conveyor. After run-in period check to see that all bolts and lubrication fittings are tightened securely. Secure tightening is required to prevent oil leakage.

2.4.3 Fan - The fan bearings have been factory prelubricated with high quality grease and, for normal conditions of service, require no further lubrication. Add small amounts of grease once a year for normal applications. For motors, grease ball bearings once a year for large motors or severe service and once every ten years for small motors.

SECTION 5

2.5 BELT CONVEYOR

2.5.1 Preventive Maintenance

A minimum amount of maintenance will be required to assure long-lasting and trouble-free operation of the belt conveyor. Extra attention will be required after the initial running-in period of 500 hours. - Drain the speed reducer, flush and refill with fresh oil as per reducer name-plate instructions. Inspect, re-align and tighten chain and belt drives. If the conveyor is equipped with an oil-tight chain guard, change the oil using Jeffrey No 52 lubricant or equivalent. On take-ups of the gravity type, add or remove counterweights to suit. Regular maintenance will require oil changes every 2500 hours of operation for speed reducer and chain guard; verify frequently the oil levels at these locations and adjust.

Conveyor shaft bearings should be kept sufficiently lubricated; service them at two to four week intervals with Jeffrey lubricant No 64 or equivalent. All bearings should be disassembled once a year, cleaned and inspected. Replace any worn parts. Shaft seals are to be inspected visually and replaced if necessary. All items to be replaced with ones originally furnished.

Parmaseal idlers to be lubricated every 1000 hours under average conditions. Fill the idler only until the lubricant begins to come out the fitting on the far side.

Re-grease with idler standing still. Use a No 2 NLGI grade of lithium base grease with a working penetration of not more than 315 at 10,000 strokes, oil viscosity index of 90 as recommended by the manufacturer.

SECTION 6

2.6 SCREW CONVEYOR

2.6.1 Preventive Maintenance

Practice good housekeeping. Keep the area around the conveyor and drive clean and free of obetacles. Establish routine periodic inspection of the entire conveyor to insure continuous maximum operating performance.

Aleo refer to the separate service instructions for individual components. If conveyor is to be inoperative for a prolonged period of time, operate it until cleared of material at all timee.

Frequency of lubrication will depend on factors such as the nature of the application, bearing materials and operating conditions.

Weekly inspection and lubrication is advisable until sufficient experience permite establishment of a longer interval. Lubricate the drive following separate instructions provided for speed reducer and the other drive components requiring lubrication. Speed reducers sre shipped without oil. For the ball or roller beeringe lubricate in accordance with separate instructions provided. For babitted or bronze bushed bearings in trough ends or hengers, when provision is made for gresse lubrication, follow the teble below for recommended grades.

Operating temperatures	Use grease equivalent to NLGI No
32° to 200° F	No 2 or No 3
32° to - 40° F	No 2 or No 1

For oilless or graphite bronze, hard or chilled iron, oil impregnated wood or plastic laminate hanger bearings, no lubrication is required.

SECTION 7

2.7 IMPACT CRUSHER

2.7.1 Preventive Maintenance

The crusher is equipped with roller bearings which have been serviced at the factory with grease. Bearings must be checked periodically and repacked with standard instructions issued by the bearing manufacturer. Use only pure mineral oil; the lubricant must not contain free mineral acid, free alkaline material or adulterants. Ordinary cup grease must not be used. For operating temperatures over 125° to 250° F a high-temperature grease must be used; for temperatures exceeding 250° F, it is generally advisable to use oil lubrication.

The material being fed to the crusher must be distributed as evenly as possible across the full width of the intake opening to prevent uneven wear of the blow bars and impact plates. Never have the machine choke fed. Make certain the crusher is empty before stopping the motor. Check blow bars periodically for wear. Bars should be reversed when wear threatens the shoulder and seat. To maintain dynamic balance, it is important that bars of equal weight be placed opposite each other.

The gap clearance is the distance between the leading edge of the blow bar on the rotor and the lower edge of the impact plate. The first impact plate should be opened always twice as much as the second impact plate. As the metal wears on the impact plate and on the blow bars the gap clearance will increase.

This gap can be closed by lowering the impact plates accordingly. The gap clearances are not related directly to maximum material product size from the mill. When doing maintenance on the machine check liners for wear. It is imperative to periodically inspect the crusher and check for wear.

SECTION 8

2.8 ROTARY DRYER

2.8.1 Preventive Maintenance

Under normal steady load conditions with constant rate of feed and constant moisture, the dryer will operate under automatic control with routine observation and alertness of the operator being the only requirement.

During start-up the following items will be adjusted:

1- Trunnion alignment

2- Drive alignment

3- Burner air-fuel adjustment

4- Exhaust fan airflow damper

5- Exhaust air temperature controller, set-point, proportional band and reset.

The above items may require periodic check-out and adjustment. In general, items #4 and #5 will only require adjustment if dryer capacity is radically changed for long period of time.

In erecting the dryer, the trunnion shafts are made as nearly parallel as possible to the center line of the dryer and then are adjusted to make the feed and tire "float" between the thrust rollers. With passage of time this adjustment may require resetting.

Care must be taken in re-adjusting rollers so that the "floating" action is preserved: under normal conditions the dryer moves very slowly, longitudinally until it touches one of the thrust

rollers and stops; then the dryer moves very slowly in the opposite direction to the other thrust roller. Do not allow the dryer to push hard and steadily against the one thrust roller as the bearing will wear out very quickly. Further care must be taken to avoid so adjusting the trunnions so that they "fight" each other strongly, for this will cause a build up of friction, resulting in flaking of the tire, excessive wear and sudden shock load due to the sudden release of friction.

After curing, the combustion throat refractory can be brought up to full fire within 10 minutes. Since close direct flame radiation on all mild steel components will weaken and oxidize their surfaces, care should be taken to ensure that the dryer is being fed the product before holding the unit on high fire too long a period.

High gas temperatures increase maintenance requirement to drum.

Dryer tires and trunnions when properly aligned and lubricated will wear into a high polish and very little further wear occurs. However, in certain extreme cases wear does occur. When this has occurred, correct the cause and regrind the tires and trunnions in place.

Coupling, bearings, links and other movable parts should be inspected for lubricant before start-up of equipment. The correct grade and amount of lubricant should be used for each item. Periodic re-lubrication should be done according to recommendation of the item manufacturer or his local representative and based on operating conditions.

SECTION 9

2.9 BUCKET ELEVATOR

2.9.1 Preventive Maintenance

When properly installed, the bucket elevator will operate normally on a routine maintenance inspection baeed on working conditions. Periodical visual inspection of the chain and buckets should be established within the general maintenance of the plant; check for loose buckets and take up slack of the chain when necessary. Verify the oil level of the reducer frequently. Lubrication of the bearings on the head shaft and boot shaft assemblies should be done according to the instructions of the manufacturers of the bearinge and to suit locel conditions of operation.

SECTION 10

2.10 VIBRATING FEEDER

2.10.1 Preventive Maintenance

There must be a clearance of 1 inch around the feeder with or without load.

Always make sure that the electrical cable does not make contact with the covers of the feeder during operation. Make a routine verification of all bolts inside and outside the feeder. Tighten when necessary.

The feeder should operate at a low noise level. If unusual sounds are detected near the feeder, all bolts should be checked and the rubber shear mounts should be examined.

The electric motor is mounted with fittings for regreasing. The bearings are prelubricated at the factory and need not be lubricated again for 5 years.

SECTION 11

2.11 STANDARD GRADER

2.11.1 Preventive Maintenance

The standard grader requires little maintenance when properly mounted. Lubrication of the bearings only is required according to the instructions of the manufacturer or his local representative. A schedule should be established within the planned general maintenance of the plant. Always make sure that all asembled parts are air tight when closing the covers after inspection of the screen.

SECTION 12

2.12 SCREW PACKER

2.12.1 Preventive Maintenance

The vertical screw packer should operate for long periods with the weekly greasing of the pillow blocks as the only maintenance that is required. The level of the oil in the worm gear reducer should be checked semi-annually unless there is an indication of oil leakage around the shaft seal. If so, replace defective seal.

SECTION 13

2.13 PORTABLE SCALE

2.13.1 Preventive Maintenance

Keep all moving parts clean at all times and avoid sudden loads. Do not allow any accumulation of material around the scale. Make regular periodic inspection of lever assembly by removing the platform and inspect all other moving parts. A light oil or a small amount of grease should be used when lubrication of the moving parts is necessary.

SECTION 14

2.14 TRUCK SCALE

2.14.1 Preventive Maintenance

Clean the scale pit periodically to keep extraneous material from contacting the levers. Arrange periods to suit conditions. Pack pivots and bearings with a non-hardening grease to prevent rust. Periodically the old grease should be removed, pivots and bearings cleaned and repacked.

Keep the structural steel free from rust by cleaning and painting as the need arises.

A scale so maintained will render good service for many years.

SECTION 15

2.15 FIBRE SCREENER

2.15.1 Preventive Maintenance

The rotex screener has been designed to minimize lubrication requirements. Instructions appear on the drive head nameplate. For 80 series, oil level in the drive head should stand between 3/4" and 1-1/4" deep in filter elbow. For motor lubrication, follow the instructions of the motor manufacturer.

For inspection, change or replacement of screens purge the machine of material before shutting off; remove inlet sleeve; disengage top cover clamp handles; remove top cover by lifting up and clear of screen box; disengage sieve jacks; remove screen frames and/or spacer frames as required, by lifting out of screen box. For assembling reverse above order; be careful to align all components for proper sealing; do not overtighten sieve jacks; make sure cover clamps are pressing cover uniformly.

For each rotex screener, the weights of the major and minor balance weights in the drive head are precisely adjusted at the factory to counteract the forces of the moving screen box. Do not add or substract weight without consulting The Orville Simpsons Co.

When renewing screen clothing, check for proper number and size of balls in each screen frame pocket. Any ball worn to less than one half the original size should be replaced.

Also, be sure the openings in the ball support screen are approximately 50% larger than the control mesh.

The slide bearing assemblies are located on each side of the screen box at the discharge end. Each slide bearing assembly consists of slide balls, slide plate and ball sockets. All rotex screeners use a specially compounded carbon-graphite material for slide balls. It is not necessary to grease the slide bearing. The slide balls should be inspected regularly and replaced when necessary to maintain clearance between the slide plate and the ball socket. When replacing slide balls, replace the balls on both slide bearing assemblies. When replacing the slide balls, inspect and replace slide plate if uneven wear or surface imperfections are observed.

Replace the ball socket when worn to the point where a new slide ball fits loosely in the socket.

The connecting sleeves are easily replaced. The fixed end of the sleeve must be centered over or under the moving end of the sleeve. If not properly centered, premature fatigue failure can occur. The distance between the connecting rings should be 24.13 cm. Be sure that the groove in the connecting sleeve engages the bead of the connecting ring. Do not pull the sleeve past the bead.

For the clamp handle assembly, excessive pressure is not required to clamp the top cover securely and under no conditions should a pry bar or "persuader" be used to force the handle tight.

Aftar clamping the cover in place, re-check the first row of clamps adjusted to be sura that even pressura is still being maintained.

It is imperative that the sealing strips be properly maintained. Inspact and replace if necessary any time the machine is disassembled for scraen changes or other maintenance.

Drag link maintenance varies according to the model. For the faad and drag link, change bushings when worn. For ths discharge end, the drag link assembly needs no lubrication. Check whan doing general maintenance of the plant as scheduled.

SECTION 16

2.16 ROCK SCREENER

2.16.1 Preventive Maintenance

After the screen has been run for approximately one hour on installation, the head pin nuts should be retightened and this adjustment should be repeated after several months of service. An impact tool may be used. Be sure to loosen the locking set screws before tightening the head pin nuts and relock them after tightening.

The weight of the pan assembly must be supported by the head end support rods and not by the spherical roller bearing in the drive assembly. Extend the rods sufficiently to take the weight.

Force grease through the lubrication system until it appears past the felt seals of the drive head assembly and the pan assembly, every 3 to 4 weeks. Grease conforming to the National Lubricating Grease Institute No 2 (N.L.G.I. No 2) specifications for the range of temperatures under which the screens are expected to operate, is recommended. It is necessary to confirm or verify this recommendation with the manufacturer of the bearings or his local representative.

SECTION 17

2.17 VIBRATING SCREENER

2.17.1 Preventive Maintenance

A regular schedule of complete dismantling, inspection and relubrication intervals assures maximum life and minimum down-time. It is important to correct all minor troubles before serious damages develop.

Maintain proper V-belt tension by adjusting slide motor base. Normal service requires approximately 1/2 oz. (1/2 cu. in.) of grease at 30 hour intervals in each bearing. Surrounding conditions such as moisture, heat and abrasive dust necessitate more frequent lubrication. Use only a good grade of lubricant recommended for high speed roller bearings.

After 1500 to 2000 hours of operation dismantle the vibrator mechanism and clean all parts. Flush bearing with a (200°F) light transformer, sprindle or automotive flushing oil. On reassembly pack the bearing with grease and also fill the adjacent cavity in the housing and retainer with grease only to the bottom of the shaft.

Always tighten screen cloth before beginning to operate a new screen. Re-tighten after running 3 hours. Avoid whipping or secondary vibrations of the screen cloth. Make periodic checks and adjustments for proper tension.

SECTION 18

2.18 PADDLE TROMMEL

2.18.1 Preventive Maintenance

The wearing parts of the 36 in. duster that require periodic replacement are the screen mesh panels and the paddle arms. By releasing the toggle clamps, the aluminum casing panels on one side of the machine can be removed to make the trommel easily accessible for dismantling and reassembly. After removing the bolts on one clamp frame assembly, the frame can be lifted out, thereby enabling the removal and replacement of the screen panels. By removing the diagonally opposite backing frame and screen mesh panels, the interior of the trommel is open and the bolts clamping the paddle arms can be reached for removal and replacement. The paddle arms should be statically balanced in pairs and mounted on the main shaft in the identical position and location as the pair being replaced, so that the balance of the rotor is not disturbed.

Reassembly of the duster is accomplished in the reverse order and with the same care.

The helical screw conveyor trough can also be removed easily without raising the duster frame. This is achieved by removing the bolts attaching it to the casing and sliding the trough longitudinally through the feed end of the support frame.

After removal of the trough, the screw conveyor can ba replaced and re-assembly of the trough can be effacted by reversing the procedure.

All bearings, except for the self-aligning ball beerings locatad within the trommel spider can be greased from central lubricetion stations which ara locatad on aech end of the duster frame. The bearings locatad within tha trommel spider can be graasad through alamite locatad in the center of tha main paddla arm shaft at each and of tha machine.

Usa grease conforming to National Lubricating Grease Institute No 2. Confirm this recommendation with the manufecturer of the bearings or his local reprasantative.

Prior to oparating the machine, it is advisabla to add more graase (same typa as used for packing the bearings). Each fitting should be filled, until greasa is extruded past the seals of the pillow block concerned.

Monthly regreasing of the bearings is recommended to forca entrapped dust and othar contaminants out from between the dust seals.

SECTION 19

2.19 ROTARY AIR LOCK VALVE

2.19.1 Preventive Maintenance

The rotary air lock valve should operate for long periods with the lubrication of the flanged bearing as the only maintenance that is required. The level in the torque arm reducer should be checked semi-annually or as specified by the manufacturer of the reducer. Depending upon the abrasiveness of the material and the amount of service, the rubber edge strips around the circumference of the rotor vanes may require periodic replacement.

CHAPTER 3

3.0 OPERATION

The production of asbestos fibre and the control of its quality requires ten distinct operations in the experimental production plant for asbestos processing in Cochabamba, Bolivia. These operations are:

1. Receiving of wet ore
2. Tasting of wet ore
3. Supply processing plant with proper ore
4. Scalping, hammering and drying
5. Tasting of dry ore
6. Handling of dry ore from bin to mill
7. Milling and bagging
8. Quality control
9. Warehousing
10. Fibre reworking

Each operation is developed as follows:

a) each step of the operation is chronologically enumerated;

b) the designation, name and function of each process equipment is given;

c) the number, name and function of each auxiliary equipment is given;

d) the responsible person of the operation is appointed;

e) the number and task of required workers are described;

f) the procedure to be carried out for the proper performance of the operation is explicitly described step by step.

OPERATION 1

3.1 RECEIVING OF WET ORE

3.1.1 DESCRIPTION

This operation consists of weighing hauled ore from mines and dumping wet ore on three possible stockpiles.

3.1.2 EQUIPMENT

1. Process equipment:

No.	Type of Equipment	Function
TS-1	Truck scale	To weigh truck loads and trucks

2. Auxiliary equipment:

None.

3.1.3 PERSONNEL

1. Persons responsible:

The security guard at the plant entrance is responsible for weighing the incoming and outgoing haulage trucks.

The scalping station leader is responsible for dumping truck loads.

2. Workers required:

None

3.1.4 PROCEDURE

The truck driver must have permission from the security guard to move on and off the weighbridge.

1. The truck moves on the weighbridge

OPERATION 1 (Continued)

2. The security guard weighs the total load.

3. The truck moves off the weighbridge to the scalping station.

4. The scalping station leader indicates to the truck driver where the load is to be dumped.

5. After dumping the truck returns to the truck scale.

6. The security guard weighs the empty truck.

NOTE:

The wet ore is supplied from three sources and must be piled separately at the scalping station.

OPERATION 2

3.2 TESTING OF WET ORE

3.2.1 DESCRIPTION

This operation consists of testing each truck load of wet ore for moisture content.

3.2.2 EQUIPMENT

1. Process equipment:

   None

2. Auxiliary equipment:

Qty.	Type of Equipment	Function
1	Clean air tight container	To carry the sample of wet ore
1	Hand shovel	To collect the sample of wet ore

3.2.3 PERSONNEL

1. Persons responsible:

   The scalping station leader is responsible for drawing the sample. The quality control supervisor is responsible for testing the sample.

2. Workers required:

   The sledge hammerer collects the sample. The quality control tester tests the sample.

3.2.4 PROCEDURE

1. Under the supervision of the scalping station leader and as soon as the wet ore is received, the sledge hammerer collects at random over the entire truck load twenty full hand shovels, reduces the sample size down to two kilos by using the cone and quartering

OPERATION 2 (Continued)

method, places it into the clean airtight container, and brings it to the quality control laboratory. The tester proceeds with the sample for moisture content as per the procedure shown in the book "Test Methods for Blue and Amosite Asbestos Fibres" published by Cape Asbestos Fibres Limited, with the following changes: the sample size is increased to 500 gm and the 100 ml capacity glass weighing bottle is replaced by a suitable container.

OPERATION 3

3.3 SUPPLY PROCESS PLANT WITH PROPER ORE

3.3.1 DESCRIPTION

This is not really an operation, but the decision to be taken to supply the processing plant with proper ore.

3.3.2 EQUIPMENT

1. Process equipment:

   None

2. Auxiliary equipment:

   None

3.3.3 PERSONNEL

1. Persons responsible:

   The scalping station leader is responsible for supplying the proper ore to the mill.

   The mill foreman is responsible for ordering from the scalping station leader the kind of ore to be processed in the mill.

2. Workers required:

   None.

3.3.4 PROCEDURE

1. Each working day, the mill foreman orders from the scalping station leader the type of ore he wants to process in the mill the next day.

2. After discussion with the mill foreman and visual examination of the wet ore pile, the scalping station leader will decide which is the best blend to satisfy the mill requirements.

OPERATION 4

3.4 SCALPING, HAMMERING AND DRYING

3.4.1 DESCRIPTION

This operation consists of hand shoveling, wheel barrowing and dumping the wet ore on the vibrating screener, sledge hammering the vibrating screenar overs, hand shoveling, wheel barrowing and dumping the crushed overs on the vibrating screeners, drying the wet ore, storing the dry ore.

3.4.2 EQUIPMENT

1. Process equipment:

No.	Type of Equipment	Function
VS-1	Vibrating screenar	To scalp the plue 25 mm wet ore
BC-1	Belt conveyor	To convey the minus 25 mm wet ore to the sledge hammering station
RD-1	Rotary dryer, Burner and oil pump	To supply heat to the dryer
CC-3	Cyclone	To collect dryer dust
RV-3	Rotary valve	To unload cyclone CC-3
AF-3	Air fan	To provide air circulation through the dryer
BC-2	Belt conveyor	To convey dryar dust into the tailing truck
BE-1	Bucket elevator	To convey dry ors to bin RB-3
RB-3	Rock bin	To store the dry ors

2. Auxiliary equipment:

Qty.	Type of Equipment	Function
5	Hand shovels	To load wheel barrows
4	Wheel barrows	To carry the wet ors to the vibrating screener
1	Sledge hammar	To crush down the plue 25 mm wet ore
1	Truck	To convey tailings to disposal area.

OPERATION 4 (Continued)

3.4.3 PERSONNEL

1. Persons rasponsible:

The scalping station leader is responsible for the supervision of this operation.

2. Workers required:

Three men for wheel barrowing the wet ore close to the vibrating screener feed point.

One man for feeding the vibrating screener.

One man for sledge hammering and wheel barrowing vibrating screener overs.

One dryer operator.

3.4.4 PROCEDURE

1. The scalping station leader must ensure that the discharge gate of bin RB-3 is closed and the tailing truck is empty in the tailing pit. He starts the equipment in the following sequence:

BC-2 Belt conveyor
BE-1 Bucket elevator
RV-3 Rotary valve
AF-3 Air fan
RD-1 Rotary dryer, burner and oil pumps
BC-1 Belt conveyor
BC-3 Belt conveyor
VS-1 Vibrating screener

2. Also the scalping station leader must ensure that all equipment is running properly and dryer stack has reached its operating temperature before ordering to feed the vibrating screener.

OPERATION 4 (Continued)

3. The vibrating screenar is fed manually. Three men wheel barrow end dump tha wet ore closa to tha ecreanar, a fourth one hand shovals it on the screener and a fifth sledge hemmers tha vibrating screener ovars down to minus 25 mm and wheel barrows tham back to the vibrating screener to be recirculated.

4. Approximately 45 kilo/min. of wet ore heve to be fed into the dryer. However, this feed rate dapends on the moieture content of the wet ore. The ecelping station leader must check the dryness of the ore discharging from rotary velve RV-3. If the ore is dry, then he checks the feed rate to the dryer for spere capacity. If the ore is wet, he than may have to reduce the feed rate.

5. At the end of the working dey or when there is anough ore in bin RB-3 for the mill betch, the ecalping station leader lete the equipment run empty and then stops tha machines in tha following sequence:

VS-1	Vibreting ecreener
BC-3	Belt conveyor
BC-1	Belt conveyor, burner and oil pumps
RD-1	Rotery dryer
BE-1	Bucket elevator
AF-3	Air Fan
RV-3	Rotery valve

If the mill is not running belt conveyor BC-2 muet be stopped after rotary valve RV-3 is stopped and tha tailing truck weighed before and after dumping.

NOTES:

Care must be taken not to run the burner and oil pump of the dryer for e long period aftar cutting off the feed. Tha procedure used for weighing tha incoming and outgoing haulage trucks described in Operation 1 is also used for weighing the tailing truck.

OPERATION 5

3.5 TESTING OF DRY ORE

3.5.1 DESCRIPTION

This operation consists of treating each mill batch of dry ore in the core lab, testing the extracted fibre in the quality control lab. and calculating the efficiency of the mill.

3.5.2 EQUIPMENT

1. Process equipment:

   None

2. Auxiliary equipment:

   Refer to core lab. test below.

3.5.3 PERSONNEL

1. Persons responsible:

   The scalping station leader is responsible for collecting the sample and the quality control supervisor for treating it in the core lab, testing the extracted fibre and calculating the efficiency of the plant.

2. Workers required:

   The scalping station leader will collect the sample, the core lab operator will treat it and the quality control lab testers will test the extracted fibre.

3.5.4 PROCEDURE

The scalping station leader collects a representative sample of each mill batch as required by the quality control supervisor and has the sample sent to the core lab for the attention of the quality control supervisor who will set up the testing.

OPERATION 5 (Continued)

CORE LAB TEST

a) **Sampling:**

Equipment

One clean container of suitable size.
One scoop with handle.

Procedure

Collect in the dryer discharge chute, with a scoop, at intervals of 20 minutes, small, equal samples totalling 20 kilos over the entire time required to dry the mill batch.

b) **Milling:**

Weigh out the sample.

Treat it as per the core lab flowsheet No.1 and register the results on the core lab data sheet No.1.

Discard the tailings.

Send the fibre samples to the quality control lab for the attention of the quality control supervisor.

c) **Testing:**

Each fibre sample must be tested for:

Quebec Standard Test
Bauer McNett
Surface Area

Send the remainder of the fibre to the mill for blending and bagging.

d) **Calculation of Mill Efficiency:**

At first if the quality of the fibre extracted in the core lab differs from that produced in the mill, one must correct the percentage of fibre extracted in the core lab so that its quality would match that of the fibre produced in the mill. This correction can be computed by a point system which will be formulated from the results obtained from the mill.

OPERATION 5 (Continued)

The mill efficiency for each fibre grade and the total mill efficiency is calculated as follows:

$$EM3 = \frac{100\ FM3}{FC3}$$

$$EM4 = \frac{100\ FM4}{FC4}$$

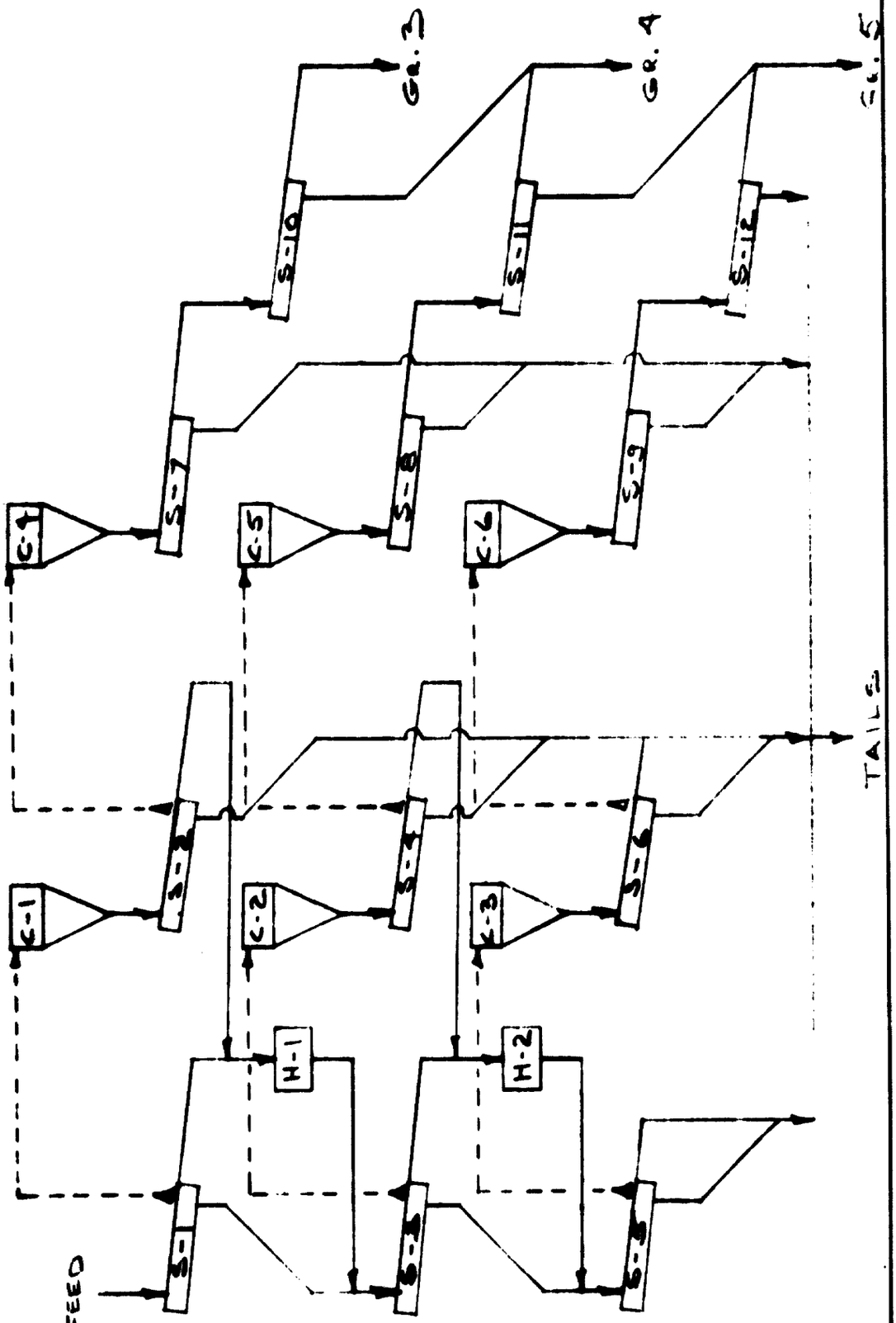
$$EM5 = \frac{100\ FM5}{FC5}$$

$$EM = \frac{100\ FM}{FC}$$

Where EM3 = group 3 mill efficiency
EM4 = group 4 mill efficiency
EM5 = group 5 mill efficiency
EM = total mill efficiency

FC3 = percentage of group 3 fibre extracted in the core lab
FC4 = percentage of group 4 fibre extracted in the core lab
FC5 = percentage of group 5 fibre extracted in the core lab
FC = percentage of all fibre extracted in the core lab

FM3 = percentage of group 3 fibre produced in the mill
FM4 = percentage of group 4 fibre produced in the mill
FM5 = percentage of group 5 fibre produced in the mill
FM = percentage of all fibre produced in the mill



COAL LAB FLOWSHEET No. 1

CORE LAB DATA SHEET

DATE SAMPLED

SAMPLE NO.

MINE

TAILINGS					
FIBRE					
FLOATS					
TOTAL					

	SCREEN MESH. SET UP. NUMBER OF PASSES	FEED Kg	DISCHARGE Kg	LIFT Kg	OVERS Kg	UNDERS Kg	TAILING Kg
SCREEN S-1							
SCREEN S-2							
HAZEMAG H-1							
SCREEN S-3							
SCREEN S-4							
HAZEMAG H-2							
SCREEN S-5							
SCREEN S-6							
SCREEN S-7							
SCREEN S-8							
SCREEN S-9							
SCREEN S-10							
SCREEN S-11							
SCREEN S-12							

REMARKS

	CORE LAB AS IS	CORE LAB CORRECTED	MILL AS IS	MILL EFFICIENCY
3				
4				
5				
TOTAL				

SECTION 1

AB DATA SHEET NO. 1

QUEBEC STANDARD	UNITS	CORE LAB -3	CORE LAB -4	CORE LAB -5	MILL -3	MILL -4	MILL -5
1 2"	gm						
4 MESH	gm						
10 MESH	gm						
35 MESH	gm						
PAN	gm						
McNETT							
4 US MESH							
16 US MESH							
40 US MESH							
100 US MESH							
PAN							
SURFACE AREA	cm^2 gm						

SECTION 2

CORE LAB OPERATOR _____

TESTER _____

QUALITY CONTROL SUPERINTENDENT _____

OPERATION 6

3.6 HANDLING OF DRY ORE FROM BIN TO MILL

3.6.1 DESCRIPTION

This operation consists of transferring the dry ore from bin RB-3 to bin RB-1 late in the working day so that it occupies the right place to start the mill operation on the next working day.

3.6.2 EQUIPMENT

1. Process equipment:

No.	Type of Equipment	Function
BE-2	Bucket elevator	To convey the dry ore
RB-3	Rock bin	To store the dry ore after drying
RB-1	Rock bin	To store the dry ore before milling

2. Auxiliary equipment:

None

3.6.3 PERSONNEL

1. Persons responsible:

The mill foreman is responsible for this operation.

2. Workers required:

One mill labourer to look after the operation.

3.6.4 PROCEDURE

1. Normally before commencing this operation, the scalping, hammering and drying operation is over. However, after common agreement between the scalping station leader and the mill foreman, it can be begun earlier, but whenever possible, this should be avoided.

OPERATION 6 (Continued)

2. Ensure that vibrating feeder VF-1, rock impactor RI-1 and screw conveyor SC-2 are not operating.

3. Turn the dumper of the discharge chute of bucket elevator BE-2 so that material can flow into rock bin RB-1.

4. Start bucket elevator BE-2.

5. Open the gate at the bottom of rock bin RB-3 so that bucket elevator BE-2 conveys 15 to 20 tons per hour while ensuring it is not overloaded.

6. Close the gate at the bottom of rock bin RB-3 when it is empty (only dead load is left) or when rock bin RB-1 is full. For smooth operation, it must be tried to reach the ideal condition, namely, rock bin RB-1 is full when rock bin RB-3 is empty.

7. Stop bucket elevator BE-2 and turn the dumper of the discharge chute so that the material can flow into rock bin RB-2.

OPERATION 7

3.7 MILLING AND BAGGING

3.7.1 DESCRIPTION

This operation consists of extracting the free and trapped fibre from the dry ore and bagging the extracted fibre.

3.7.2 EQUIPMENT

1. Process equipment:

No.	Type of Equipment	Function
VF-1	Vibrating feeder	To feed BE-3 from RB-1
VF-2	Vibrating feeder	To feed BE-3 from RB-2
BE-3	Bucket elevator	to feed RS-1 from RB-1 via VF-1 and RI-1 from RB-2 via VF-2
RS-1	Rock screener	To separate the dry ore into three fractions: coarse, medium and fine.
RA-1	Rotary aspirator	To lift free fibre from coarse
SC-2	Screw conveyor	To convey overs and middlings of RS-1 and overs of FS-1 to BE-2.
BE-2	Bucket elevator	To convey discharge of RI-1 and middlings of RS-1 to RB-1, and overs of RS-1 and FS-1 to RB-2
RI-1	Rock impactor	To liberate trapped fibre
CC-1	Cyclone collector	To collect fibre lifted over RA-1
RV-1	Rotary valve	To discharge fibre from CC-1
FS-1	Rotex screener	To remove rock particles and fines
CC-2	Cyclone collector	To collect fibre lifted over FS-1
RV-2	Rotary valve	To discharge fibre from CC-1
FT-1	Paddle trommel	To remove fines and dust
BE-4	Bucket elevator	To convey overs of FT-1 to SG-1
SG-1	Standard grader	To classify the fibre
BE-5	Bucket elevator	To convey overs and unders of SG-1 to FB-1

OPERATION 7 (Continued)

No.	Type of Equipment	Function
FB-1	Fibre bin	To store and blend the fibre prior to bagging
SC-1	Screw conveyor	To convey the fibre from FB-1 to BE-6
BE-6	Bucket elevator	To recirculate the fibre, or to convey it to JP-1 from FB-1 via SC-1
JP-1	Screw packer	To bag the fibre
AF-1	Air fan	To provide suction to lift the fibre over RA-1 and FS-1, and the dust from pick up points
DC-1	Dust collector	To collect dust from CC-1 and CC-2, and from all pick up points throughout the mill
BC-2	Belt conveyor	To convey the tailings into the tailing truck
TS-1	Truck scale	To weigh tailing truck

8. Auxiliary equipment :

No.	Type of Equipment	Function
30	0.10 cu.m. capacity, 54.0 cm high, round, tapered, steel containers	To collect middlings of RS-1 and feed them into SC-2
2	Containers (as above)	To collect overs of FS-1 and feed them into SC-2
-	Jute bags	To collect unders of SG-1 and feed them into BE-5
2	Jute bag stands	To hold jute bags while collecting unders of SG-1
1	Truck	To haul tailings to dump
2	Containers	To collect dust of DC-1 and dump it on BC-2
1	Carriage	To carry fibre bags from JP-1 to a suitable area in the mill

OPERATION 7 (Continued)

3.7.3 PERSONNEL

1. Persons responsible:

The mill foreman is responsible for the supervision of this operation.

2. Workers required:

Two baggers for bagging the fibre.

Two mill labourers for collecting middlings of RS-1 and feeding them into SC-2.

Four screen men for changing the screens of RS-1, and collecting overs of FS-1 and feeding them into SC-2.

Two screen men for changing the screens of SC-1, and collecting unders of SC-1 and feeding them into BE-5.

One tailing man for driving the tailing truck and looking after tailing conveyor DC-1.

3.7.4 PROCEDURE

The mill, a batch mill, was designed to process one batch per working day and produced successively three grades of fibre out of each batch. Each batch required three passes over the mill circuit. The long fibre is produced during the first pass, the medium length fibre during the second and the short during the third.

First pass:

1. The equipment must be properly set-up as indicated in the procedure.

2. Place the empty tailing truck in the tailing pit.

3. Start the equipment in the following sequence:

DC-1 Dust collector - place one container under its screw conveyor to collect dust

OPERATION 7 (Continued)

AF-1	Air fan
BC-2	Belt conveyor
BE-6	Bucket elevator - turn the dumper of its discharge chute so that the fibre can flow into FB-1
SC-1	Screw conveyor
FB-1	Fibre bin
BE-5	Bucket elevator
SG-1	Standard grader fitted with 1/2" (12.7 mm) perforated plate, and turn the dumper of the chute which discharges its unders so that it can be collected into jute bags
BE-4	Bucket elevator
PT-1	Paddle trommel
RV-2	Rotery valve
RV-1	Rotery valve
FS-1	Fibre screener fitted with 24 square mesh steel wire cloth, 0.0135" (0.343 mm) diameter wire, 0.0282" (0.72 mm) wide opening, and turn the dumper of the chute which discharges its overs so that they can be collected into containers.
BE-2	Bucket elevator - turn the dumper of its discharge chute so that the material can flow into RB-2, and ensure VF-2 is stopped.
SC-2	Screw conveyor
RA-1	Rotary aspirator fitted with 1/16" (1.6 mm) perforated plate and turn the dumper of its discharge chute so that the materiel can flow into SC-2.
RS-1	Rock screener with its top deck fitted with 3/8" (9.5 mm) perforated plate and its bottom deck with 1/16" (1.6 mm) perforated plate, and turn the dumper of the chute which discharges its middlings so that they can be collected into containers.
BE-3	Bucket elevator - turn the dumper of its discharge chute so that the material can flow to RS-1.

4. Start VF-1 and adjust it so that the feed rate is approximately 20 tons per hour.

5. Adjust the damper at the outlet of CC-1 so that maximum free fibre and minimum rock particles are lifted over RA-1.

OPERATION 7 (Continued)

6. Collect in containers middlings of RS-1 and keep them aside.

7. Adjust the damper at the outlet of CC-2 so that maximum free fibre is lifted over FS-1 without rock particles.

8. Collect in containers overs of FS-1 and feed them into SC-2.

9. Collect in jute bags the unders of SG-1 and keep them aside.

10. Right after RB-1 is empty stop VF-1 and wait until the circuit is empty.

11. Start RI-1 and adjust the speed and opening as per the table below:

Source of Ore	Speed	Opening
Filadalfia	rpm	mm
San Francisco	rpm	mm
Tres Amigos	rpm	mm

12. Turn the dumper of BE-3 discharge chute so that the material can flow to RI-1.

13. Turn the dumper of BE-2 discharge chute so that the material can flow to RB-1.

14. Start VF-2 and adjust its feed rate to approximately 20 tons per hour.

15. Feed at a constant rate and over the entire crushing period, the RS-1 middlings, previously kept aside in containers, into SC-2.

16. Stop RA-1 and RS-1 and change the top deck screen of RS-1. Fit it with 1/8" (3.2 mm) perforated plate.

17. Stop SG-1 and change its trommel screen. Fit it with 3/16" (4.8 mm) perforated plate.

OPERATION 7 (Continued)

18. Dump DC-1 dust on BC-2.

19. Weigh the tailing truck before and after dumping and replace it in the tailing pit. (For weighing procedure see the note on page 4.4).

20. Start JP-1, turn the dumper of BE-6 discharge chute so that the fibre can flow to JP-1 and bag the fibre.

21. After bagging is completed turn the dumper of BE-6 discharge chute so that the fibre can flow to F8-1 and stop JP-1.

22. Sample the fibre produced by taking a handful from each bag. Put the sample in a clean container, identify it with the source, grade, date and number of bags, and send them to the quality control superintendent.

23. Adjust the weight of each bag to the predetermined weight, 40 kilos, by manually adding or removing some fibre.

24. Code the bags and store them temporarily in the mill.

25. Right after RB-2 is empty stop VF-2 and wait until the circuit is empty.

26. Stop RI-1.

27. Turn the dumper of BE-3 discharge chute so that the material can flow to RS-1.

28. Ensure that feeding of RS-1 middlings into SC-2 is finished and turn the dumper of BE-2 discharge chute so that the material can flow to RB-2.

29. Start SG-1.

30. Start RA-1.

31. Start RS-1.

OPERATION 7 (Continued)

Second pase:

1. Start VF-1 and adjust its feed rate along with the damper at the outlst of CC-1 eo that maximum free fibre and minimum rock particles are liftsd over RA-1.

2. Repeat items 6, 7, 8 and 9 of first pass.

3. Feed at a constant rate and over the entire screening time of the second pass, the SG-1 unders, kept aside during the first pass, into BE-5.

4. Repeat item 10 of first pass.

5. Start RI-1 and adjust its speed and its opening as per the table below:

Source of ore	Speed	Opening
Filadelfia	rpm	mm
San Francieco	rpm	mm
Tres Amigos	rpm	mm

6. Repeat items 12, 13, 14 and 15 of first pass.

7. Stop RA-1 and RS-1 and change the top deck screen of RS-1. Fit it with 1/16" (1.6 mm) perforated plate.

8. Stop SG-1 and change its trommel screen. Fit it with a flat (non-perforated) plate.

9. Repeat items 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 and 28 of first pass.

10. Turn the dumper of RA-1 diecharge chute so that the material can flow to BC-2.

11. Turn the dumper of discharge chute of RS-1 middlings so that same can flow to BC-2.

12. Turn the dumper of the discharge chute of FS-1 overs so that same can flow to BC-2.

OPERATION 7 (Continued)

13. Repeat items 29, 30 and 31 of first pass.

Third pass:

1. Repeat item 1 of second pass.

2. Repeat item 7 of first pass.

3. Feed at a constant rate and over the entire screening time of the third pass, the SG-1 unders, kept aside during the second pass, into BE-5.

4. Repeat item 10 of first pass.

5. Begin the operation "Handling of Dry Ore from RB-3 to RB-1" explained in Section 5.

6. Stop BE-3, RS-1, RA-1, SC-2, FS-1, RV-1, RV-2, PT-1, BE-4, SG-1 and BE-5. Fit RS-1, FS-1 and SG-1 and turn the dumpers as indicated in item 3 of the first pass.

7. Repeat items 20, 21, 22, 23 and 24 of the first pass.

8. Stop FB-1, SC-1 and BE-6.

9. When the operation "Handling of Dry Ore from RB-3 to RB-1" is over stop AF-1 and DC-1.

10. Dump DC-1 dust on BC-2.

11. Wait until BC-2 is empty and stop it.

12. Repeat item 19 of first pass.

OPERATION 8

3.8 QUALITY CONTROL

3.8.1 DESCRIPTION

This operation consists of testing the finished products, establishing specifications for same, evaluating the test results and accepting or rejecting the production.

3.8.2 EQUIPMENT AND SUPPLIES

The equipment and supplies required for each test are listed in each test procedure.

3.8.3 PERSONNEL

1. Persons responeible:

   The quality control supervisor is responsible for the supervision of this operation.

2. Workers required:

   One laboratory technician and two testers.

3.8.4 PROCEDURE

1. A 2.0 kilo sample of each grade representative of the daily production is received in the quality control lab. right after the production of the grade is completed. The procedure to pick-up and identify the sample is shown in Operation 7, item 22 (first pass).

2. Each of these daily samples are tested for Quebec Standard, Bauer McNett, Surface Area and Standard Filtration, and the remainder of each sample is kept aside for future testing.

3. Based on the test results obtained above the production is accepted or rejected.

OPERATION 8 (Continued)

4. When the accepted production of one grade totalizes 10 tons, a composite sample representative of the 10 ton lot is prepared in taking in each daily sample of the same grade an amount equal to 10 gm per bag. This will give a composite sample of 2500 gm.

5. Each composite sample is tested as follows:

	Group 3	Group 4	Group 5
Quebec Standard	*	*	*
Bauer McNett	*	*	*
Surface Area	*	*	*
Standard Filtration	*	*	*
Suter-Webb Comb Sorter	*		
Reinforcing Value	*	*	*

One 1 kilo sample is identified and kept aside for future reference.

6. Specifications for the finished products are established from the result of the composite samples. The test results of at least five composite samples are required.

7. Test results are evaluated in comparing them against specifications.

NOTE:

For all the tests enumerated above use the test procedures shown in the book "Test Methods for Blue and Amosite Asbestos Fibres" published by Cape Asbestos Fibres Limited.

OPERATION 9

3.9 WAREHOUSING

3.9.1 DESCRIPTION

This operation consists of warehousing the accepted finished products into 10 ton lots.

3.9.2 EQUIPMENT

1. Process equipment:

   None

2. Auxiliary equipment:

Qty.	Type of Equipment	Function
1	Carriage	To carry fibre bags from mill to warehouse

3.9.3 PERSONNEL

1. Persons responsible:

   The mill foreman is responsible for the supervision of this operation under the direction of the quality control supervisor.

2. Workers required:

   Two baggers.

3.9.4 PROCEDURE

1. The daily production is kept aside in the mill and carried into the warehouse the day after as per the quality control supervisor's instructions.

2. If accepted for shipping, the fibre bags are warehoused with the other already accepted ones of the same grade to form a 10 ton lot, and if not, they are warehoused with the other rejected bags of the same grade to be re-worked.

3. The fibre bags are warehoused so that their crest is up.

OPERATION 10

3.10 FIBRE REWORKING

3.10.1 DESCRIPTION

This operation consists of mixing rejected fibres so that the resultant product is within specification.

3.10.2 EQUIPMENT

1. Process equipment:

No.	Type of Equipment	Function
SC-1	Screw conveyor	To convey the fibre from FB-1 to BE-6
BE-6	Bucket elevator	To recirculate the fibre, or to convey it to JP-1 from FB-1 via SC-1
FB-1	Fibre bin	To store and blend the fibre prior to bagging
JP-1	Screw packer	To bag the fibre

2. Auxiliary equipment:

Qty.	Type of Equipment	Function
1	Carriage	To carry fibre bags from warehouse to SC-1 and from JP-1 to a suitable area in the mill.

3.10.3 PERSONNEL

1. Persons responsible:

The mill foreman is responsible for the supervision of this operation under the direction of the quality control supervisor.

2. Workers required:

Two baggers.

OPERATION 10 (Continued)

3.10.4 PROCEDURE

1. Start SC-1.

2. Start BE-6 and turn the dumper of its discharge chute so that the fibre can flow to FB-1.

3. Carry the fibre to be reworked close to SC-1 and feed it into same conveyor as instructed by the quality control supervisor.

4. When the bin is full or all the fibre to be mixed has been fed into SC-1, start FB-1 and let run for an hour.

5. Carry out items 20, 21, 22, 23 and 24 in Operation 7 - first pass.

6. Use the old bags for rebagging the fibre and ensure that the old code is crossed off.

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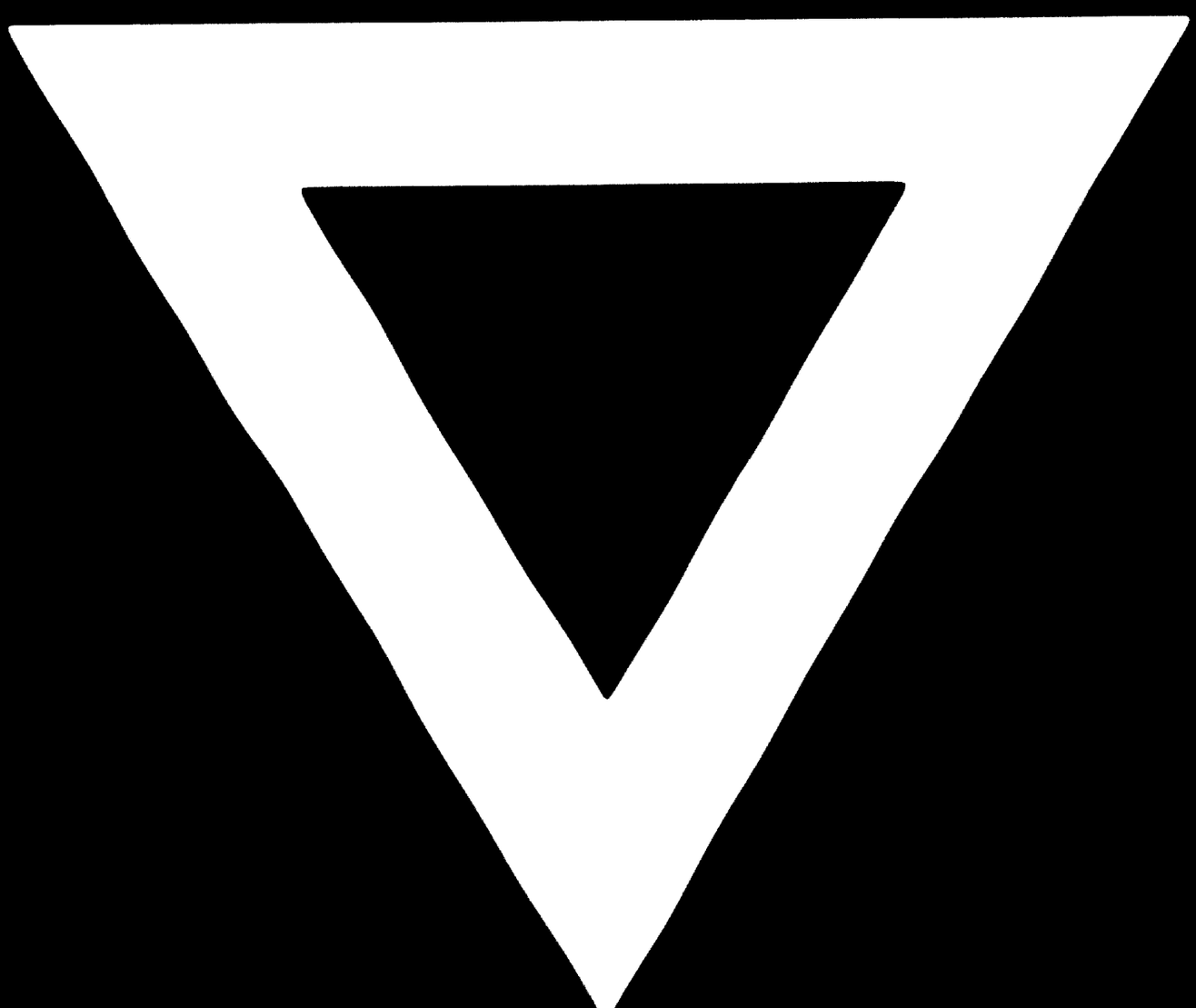

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