VERNON 58, CALIFORNIA

IN REPLY REFER TO:

Dept. of Public Health

January 24, 1962

SUBJECT: Preliminary study of a proposed "Marinite" cutting operation in the pattern shop.

Aluminum Company of America
5151 Alcoa Avenue
Vernon 58, California

Attention: Mr. Frank Regehr,
Safety Director

Gentlemen:

On January 12, 1962, representatives of the Vernon Health Department conducted a preliminary study of a "marinite" cutting operation in the pattern shop.

The pieces of "marinite" were cut on a band saw which is provided with a local exhaust connection to the lower pulley housing and a small hood located directly under the blade opening in the saw table.

Air movement observations were conducted during the cutting operation using smoke tubes and a velometer. Close observation of the blade as it passed through the material disclosed that fine dust was being generated from the top surface of the "marinite" similar to conditions that are encountered in crushing operations. This top surface generation explains why considerable dust was encountered even though an adequate exhaust hood was provided below the saw table.

In discussing this operation with Mr. Smythe and pattern shop personnel, I learned that "marinite" was cut rather infrequently and probably the time spent did not exceed an average of more than 12 hours monthly.

This time factor of course decreased the hazard potential of the operation, but because of the composition of the material local exhaust controls should be instituted. It was also stated that large pieces of the material were cut outdoors using a skill saw.

A sample of the material has been submitted to the laboratory for analysis and as soon as we receive the report, it will be forwarded to you.

An inspection of the local exhaust duct system in the pattern shop was also made during this study and you will find suggestions in regard to this system listed in our recommendations.

RECOMMENDATIONS: (SHOULD THE "MARINITE" CUTTING BE RESUMED)

1. Provide a transparent cylindrical plastic hood to enclose the blade above the material. This hood should be approximately 6" in diameter and long enough to leave about 1/2" of space above the material being cut. The hood should be attached to the upper saw blade guide (angle iron). It is suggested that the top portion of the hood be made of a circular disk of 1/2" plywood slotted to receive the blade. The plastic cylinder should be of material similar to that used in plastic face shields and screwed or tacked to the plywood disk. The plywood disk must also be provided with a hole to receive the flexible exhaust duct. (See attached drawing VS-48.) Approximately 350 cubic feet per minute exhaust volume should be provided.

2. Connect the under table hood to the same exhaust duct supplying the lower pulley housing. (See attached drawing VS-48.)

3. Secure door on lower pulley housing so it will fit tightly, by providing additional door latches. Close openings in lower pulley housing to prevent air leaks. This will increase velocity at blade opening in saw table.

4. Provide a brush or wiper on lower pulley and on blade in lower housing to continuously remove "marinite" adhering to these parts.

5. If large pieces of "marinite" are cut out of doors, the operator should be provided with a respirator approved for use against toxic dust (MSA Dustfoe or equal). The operation should be conducted so that all dust produced will be blown away from windows, doors and air intakes, so that other workers will not be exposed.

6. When making changes or when installing new exhaust systems, it is recommended that the principles of good duct design as advocated by the American Conference of Governmental Industrial Hygienists be followed. (See attached drawings, figures 6-6 through 6-9.)

In closing, we wish to thank you for the courteous cooperation and assistance given to this department during our study. If you should have any questions concerning this report, please do not hesitate to call upon us for any assistance we may be able to offer.

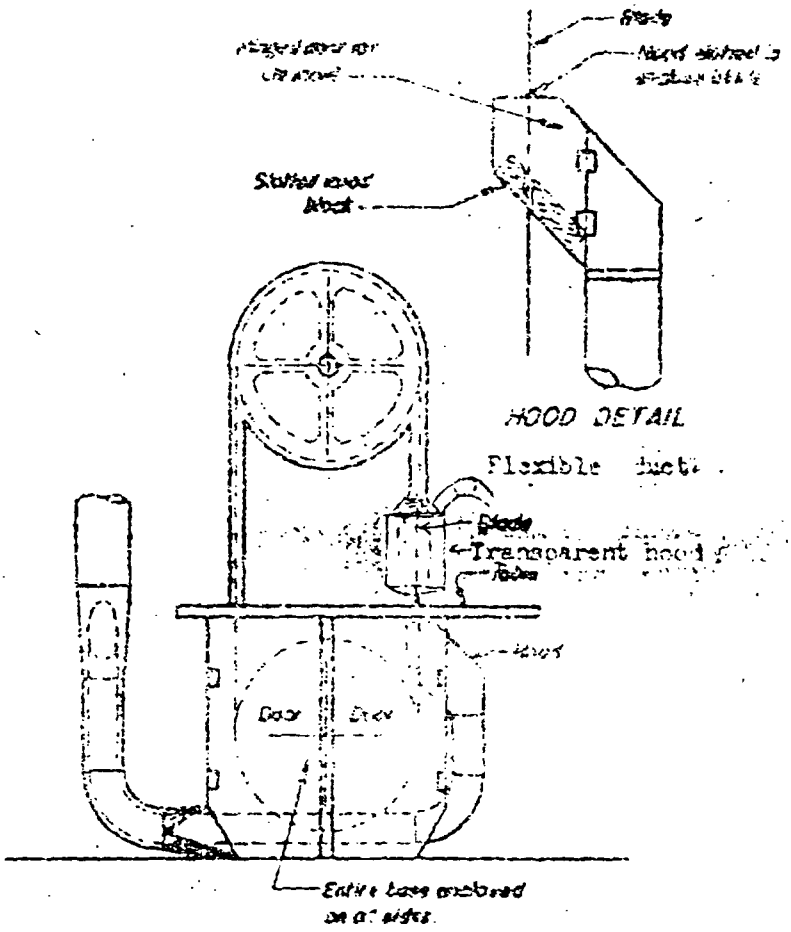
Very truly yours,

C. E. Nemethi, M.D.
Health Officer

Louis S. Hauger

LSH:r

Louis S. Hauger, R.S.
Dep. Dir. of Sanitation



HOOD DETAIL

Blade width, inches	Exhaust volume, CFM		
	Bottom	Top	Total
Up to 2	350	350	700
over 2 to 3	350	550	900
over 3 to 4	550	800	1350
over 4 to 6	550	1100	1650
over 6 to 8	550	1400	1950

Duct velocity = 4000 FPM
Entry loss = 1.78 slot VP plus conversion.

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SAND SAW

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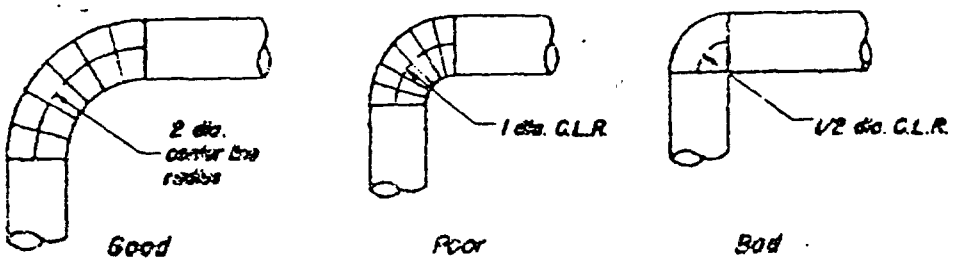
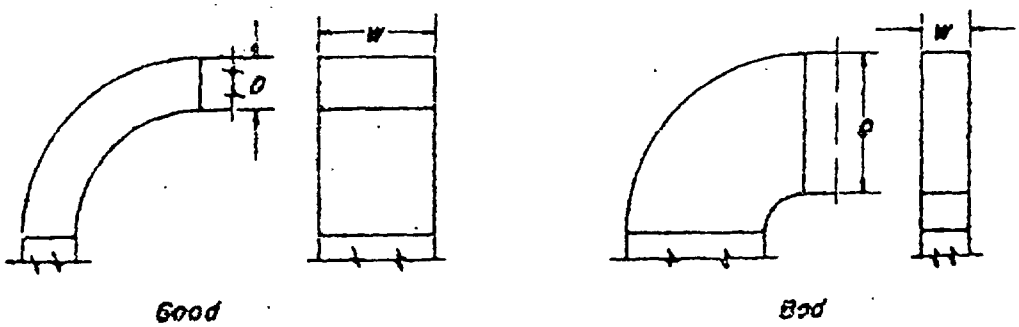


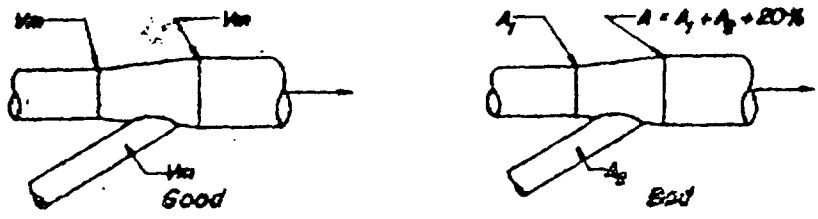
ELBOW RADIUS

Elbows should be 2 or 2 1/2 diameters centerline radius except where space does not permit.



ASPECT RATIO

Keep AR ($\frac{W}{D}$) high in using rectangular duct



Vm = Minimum transport velocity.
A = Cross section of duct.

PROPER DUCT SIZE

Size the duct to hold the selected transport velocity or higher.

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PRINCIPLES OF DUCT DESIGN

DATE 1-56 | Fig. 6-6

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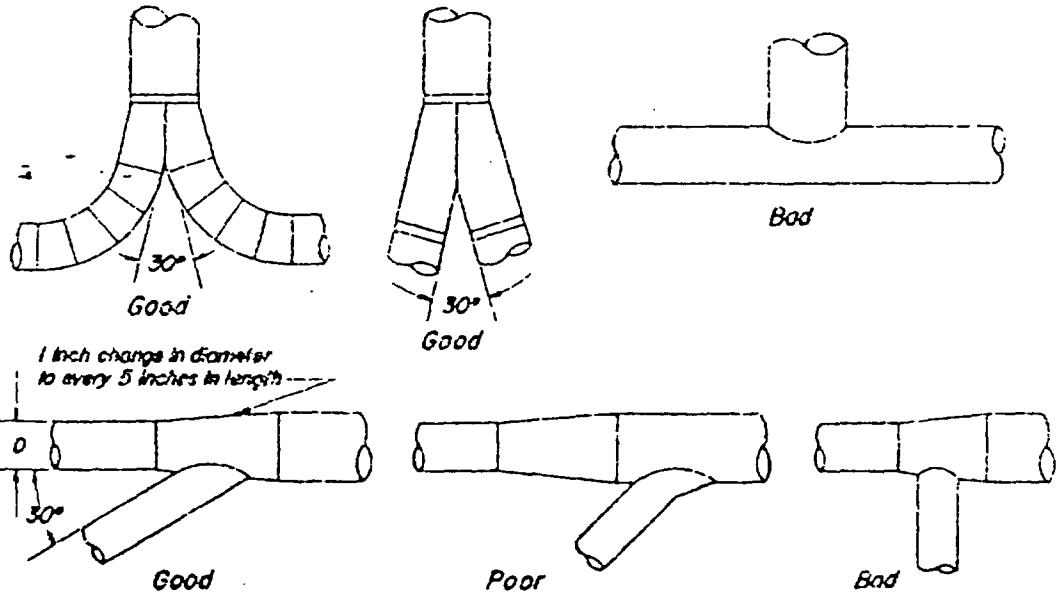
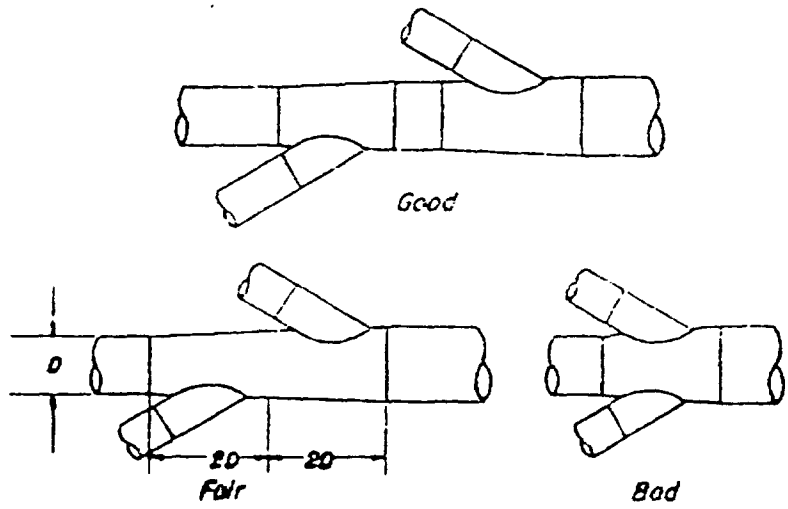


BRANCH ENTRY

Branches should enter at gradual expansions and at an angle of 30° or less (preferred) to 45° if necessary.



BRANCH ENTRY

Branches should not enter directly opposite each other.

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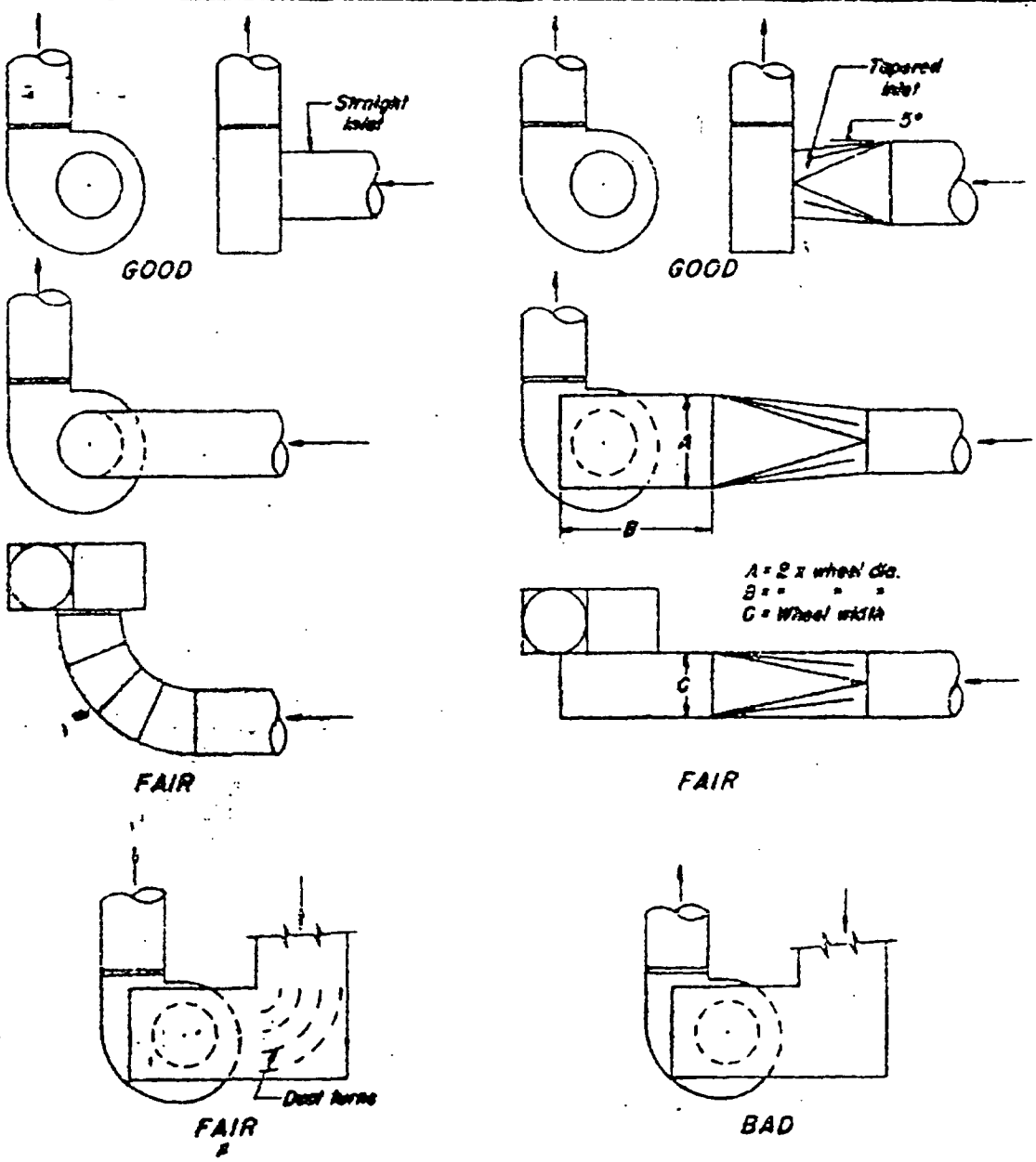
PRINCIPLES OF DUCT DESIGN

DATE 1-56 | Fig. V-7



FAN INLET

A straight inlet is best: If an elbow inlet is necessary, provide an inlet box and duct turn vanes to eliminate air spin or uneven loading of the fan wheel. Inlet boxes should not be used for dust-laden air.

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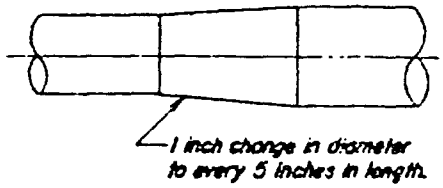
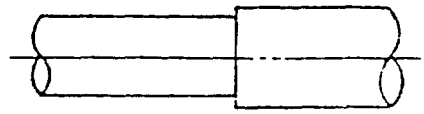
PRINCIPLES OF DUCT DESIGN

DATE 8-55 | Fig 6-8

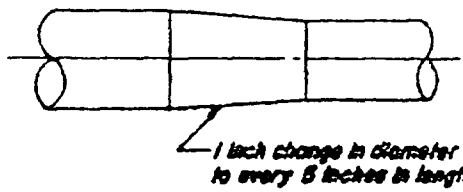


GOOD



BAD

DUCT ENLARGEMENT



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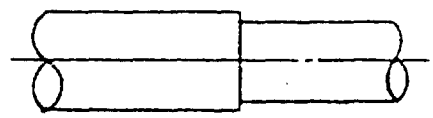
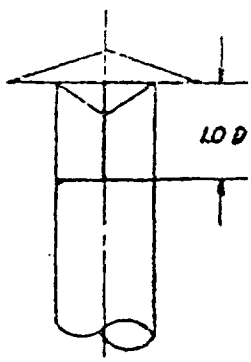


BAD

DUCT CONTRACTION



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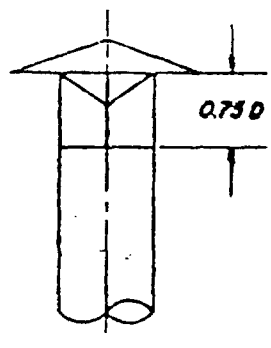
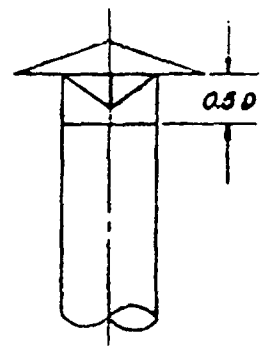


FAIR



POOR

WEATHER CAP

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PRINCIPLES OF DUCT DESIGN

DATE 8-11-55 | Fig. C-9

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