

SNOW CONTROL STUDY  
FOR  
MONOLITHIC DOMES  
MEDICINE HAT, ALBERTA

Report No. 78414W1

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# MITR

September 20th, 1978

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No. 2 - 6910 No. 3 Road  
Richmond, B.C.  
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Re: Snow Control Study  
Monolithic Domes  
Medicine Hat, Alberta

Dear Mr. Durksen:

We are enclosing herewith the results of the snow control study for the Monolithic Domes as carried out in the laboratory of Morrison, Hershfield, Theakston and Rowan Limited, in accordance with your request.

Models of three domes arranged in parallel form and one free-standing dome were constructed at a scale of 1" = 16 ft. in accordance with the plans provided by you and were tested in the wind and snow simulator.

As our test procedure only permits us to measure snowdrift depths we cannot determine the exact density of snow. However, based on past experience, we would recommend that your design engineers consider

increasing their design snow density factor in areas where the snow density can be increased by such things as winter rains, snow melt runoff, heat expelled from vents and louvres, etc..

The objective of this study was to determine the snowdrifting conditions on the structure of the domes. These conditions were reviewed with yourself and engineers from Alberta Agriculture during your visit to our Edmonton laboratory on September 11th, 1978.

Meteorological data obtained from Medicine Hat and Lethbridge, Alberta, shown in Figure 1, indicates that the prevailing wind directions during the months in which drifting snow may occur are southwest, west, west-southwest, north and northwest.

Snowdrift depths were recorded for each of the above wind directions and are illustrated by plans and photographs shown in Figures 3, 4, 5, 6, and 7 respectively. Figure 2 illustrates the snowdrifting conditions on a free-standing dome and is representative of all wind directions. Figure 8 shows the snowdrifting conditions on the roof structure of the proposed office building.

Should you have any questions or require further information concerning the results described in this report, we would be pleased to discuss these matters with you at your convenience.

Yours very truly,

Morrison, Hershfield, Theakston and Rowan Limited

for C. J. Williams, P. Eng. Stephen Williams  
H. A. Baker, C. E. T. H. A. Baker

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LEGEND:

===== FREQUENCY OF WIND IN %

————— VELOCITY OF WIND IN MPH

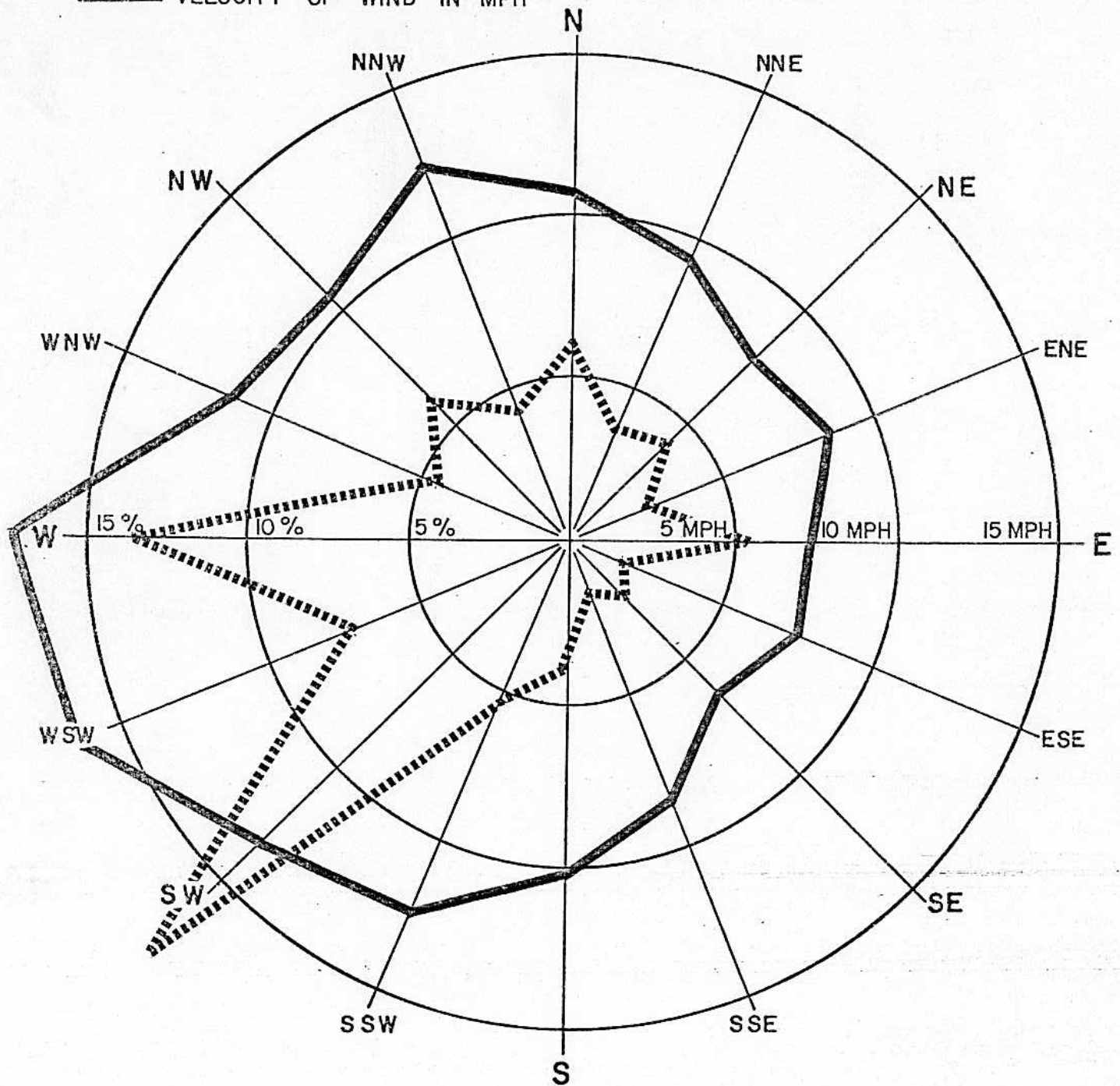


FIGURE 1

WIND DIRECTION, FREQUENCY AND MEAN VELOCITY  
AVERAGED FOR MEDICINE HAT AND LETHBRIDGE AIRPORTS, ALBERTA  
MONTHS OF NOVEMBER THROUGH APRIL, 1955-72



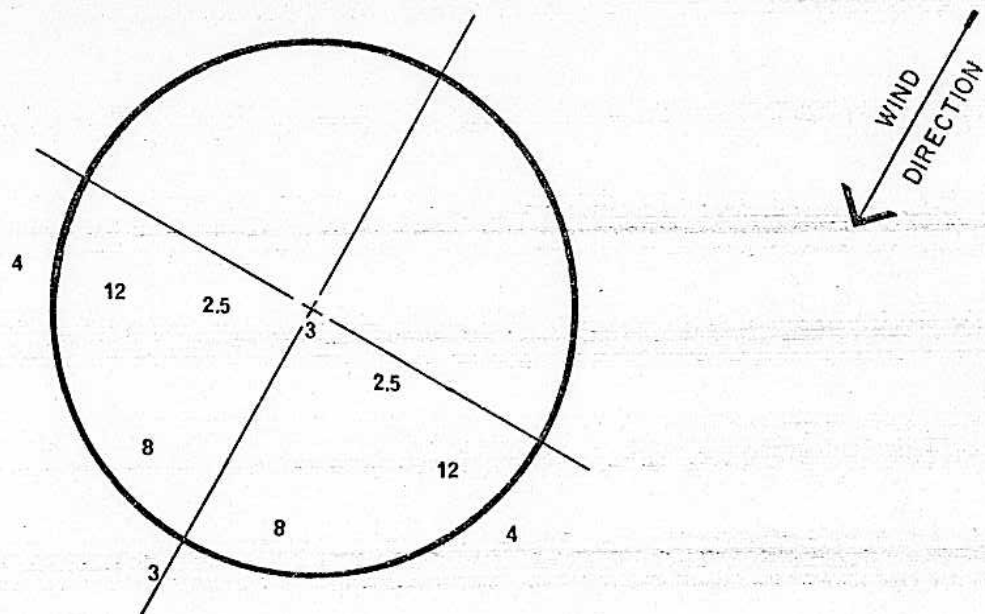
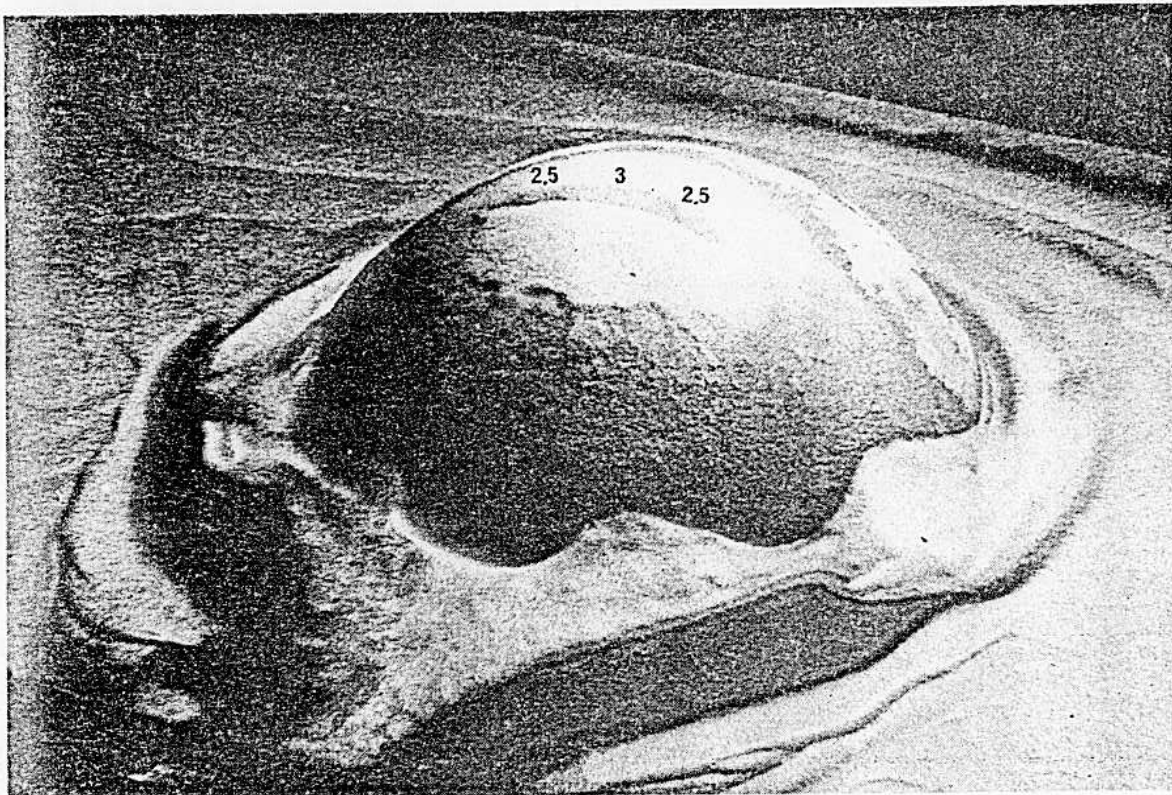


FIGURE 2

SNOW ACCUMULATION ON FREE-STANDING DOME

NOTE : NUMBERS INDICATE MAXIMUM SNOWDRIFT DEPTH IN FEET SCALE : 1" = 50'

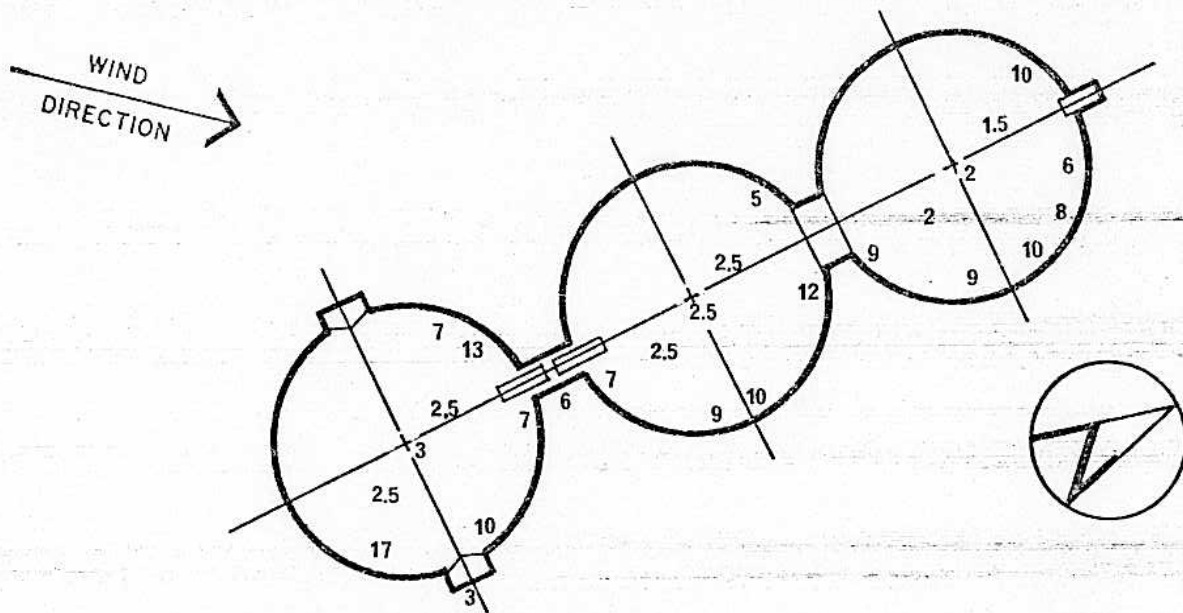
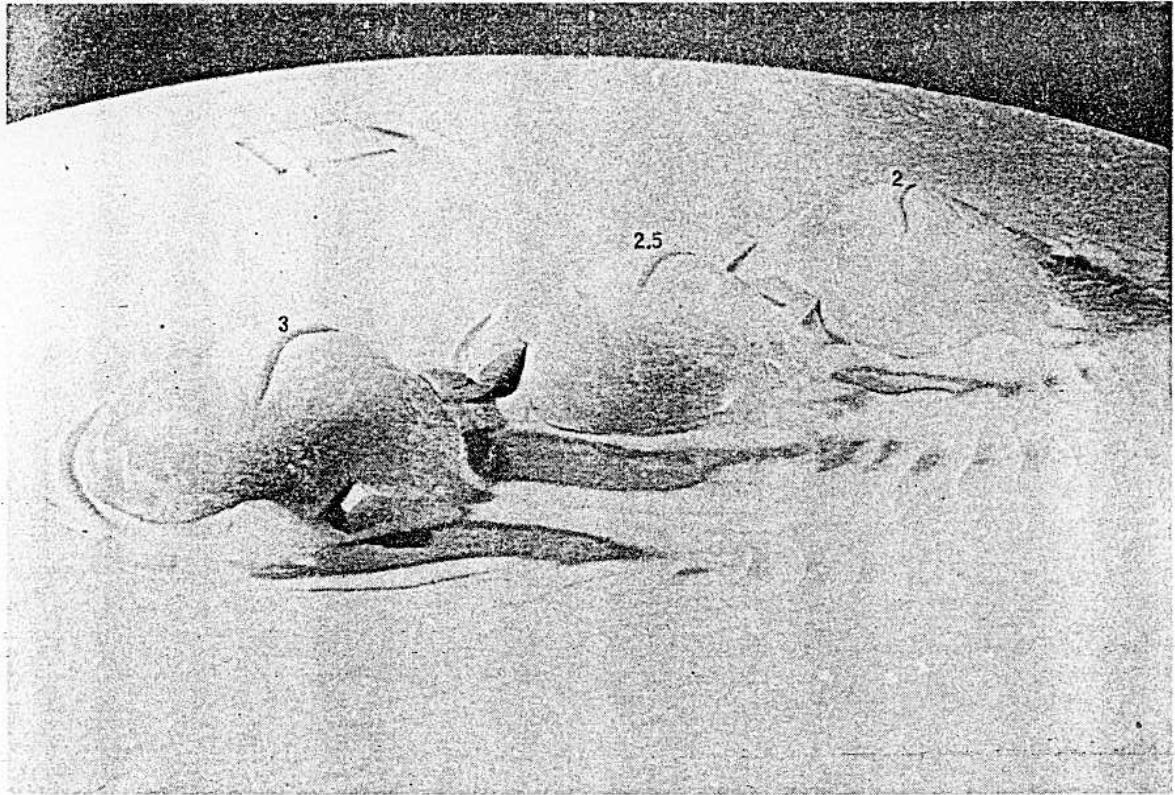


FIGURE 3  
SNOW ACCUMULATION ON MONOLITHIC DOMES  
WIND FROM THE SOUTHWEST

NOTE: NUMBERS INDICATE MAXIMUM SNOWDRIFT DEPTH IN FEET SCALE: 1"=100'

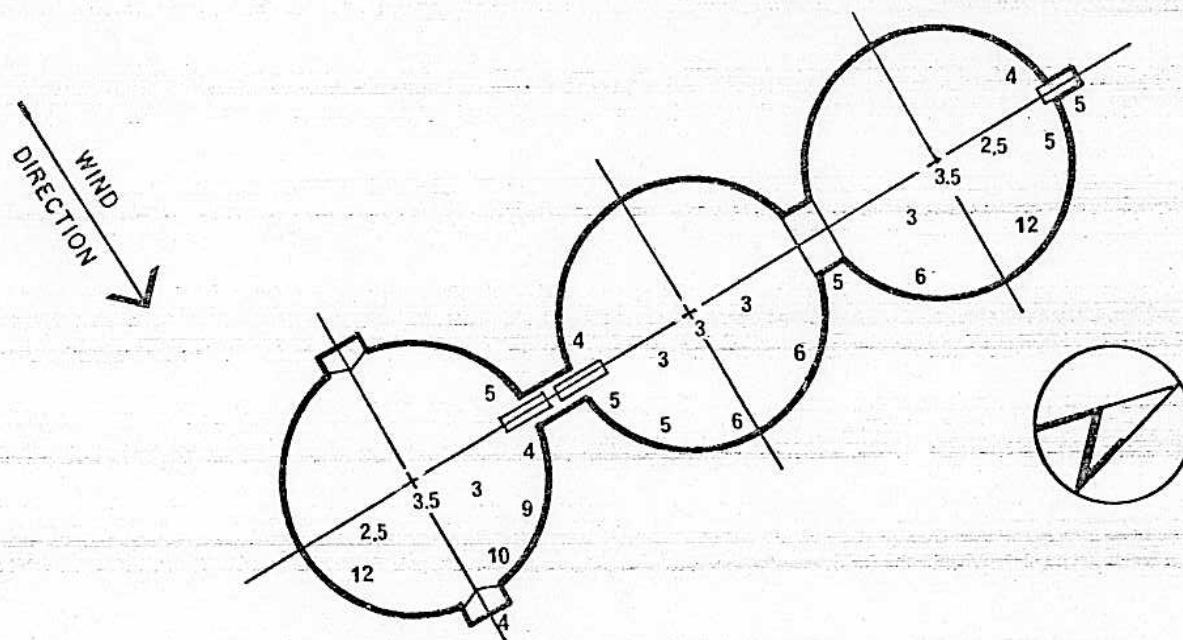
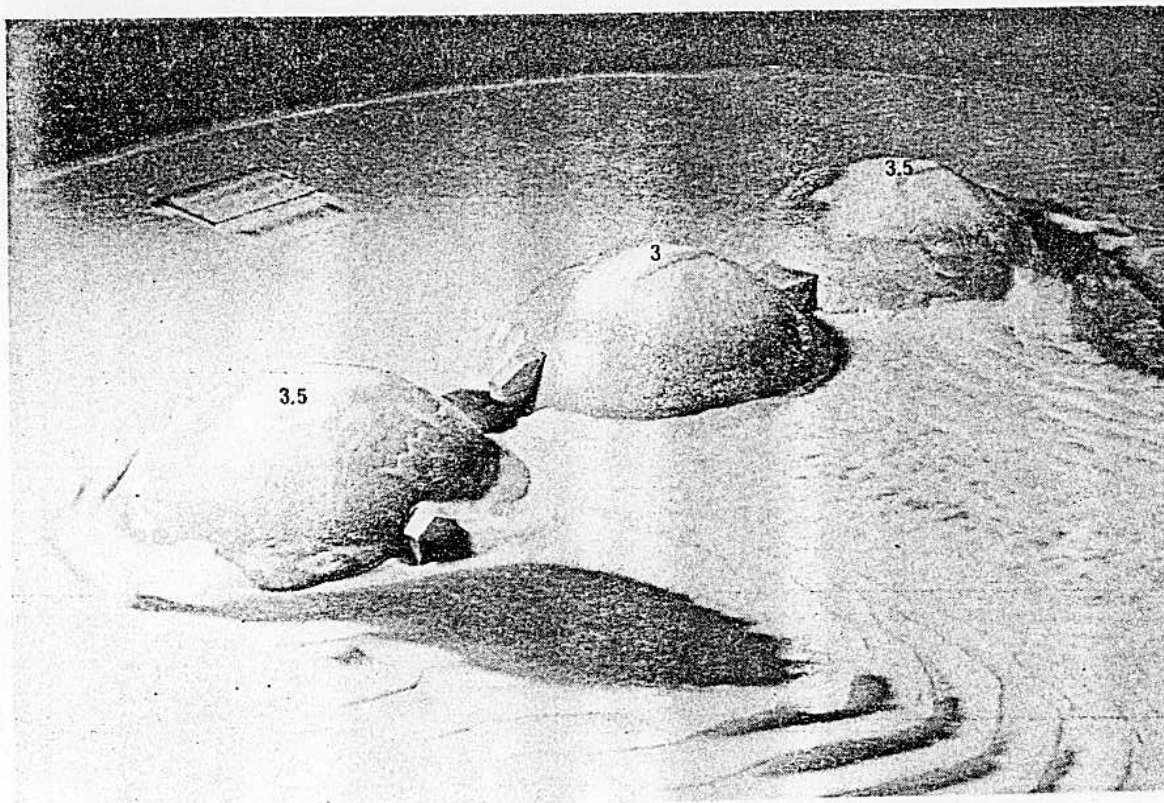


FIGURE 4  
SNOW ACCUMULATION ON MONOLITHIC DOMES  
WIND FROM THE WEST

NOTE : NUMBERS INDICATE MAXIMUM SNOWDRIFT DEPTH IN FEET SCALE: 1"=100'



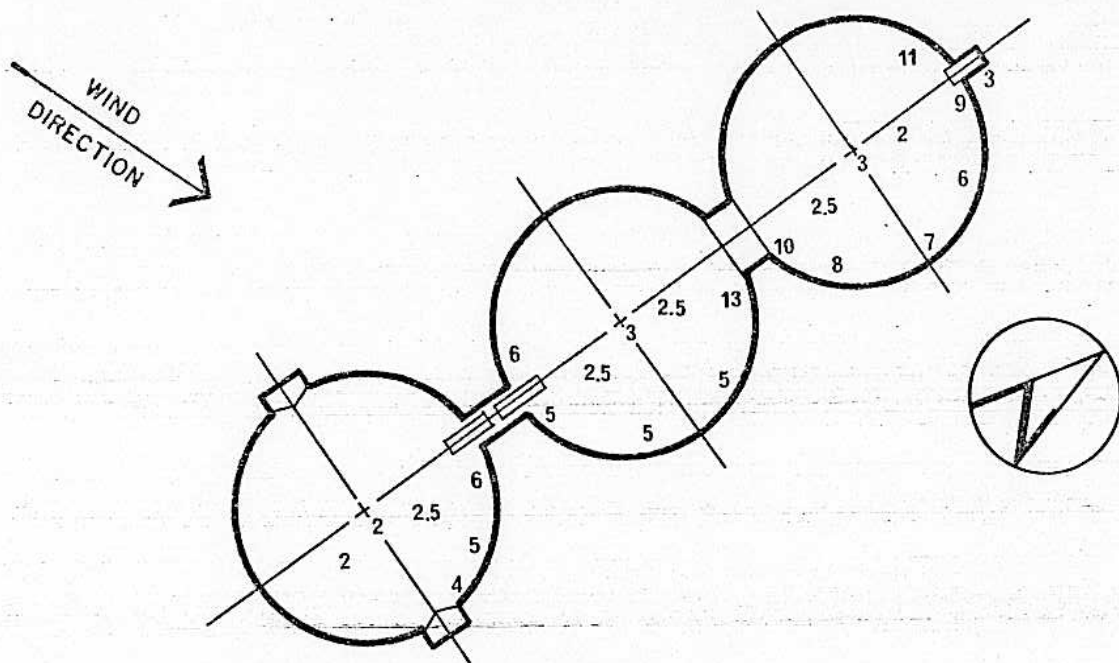
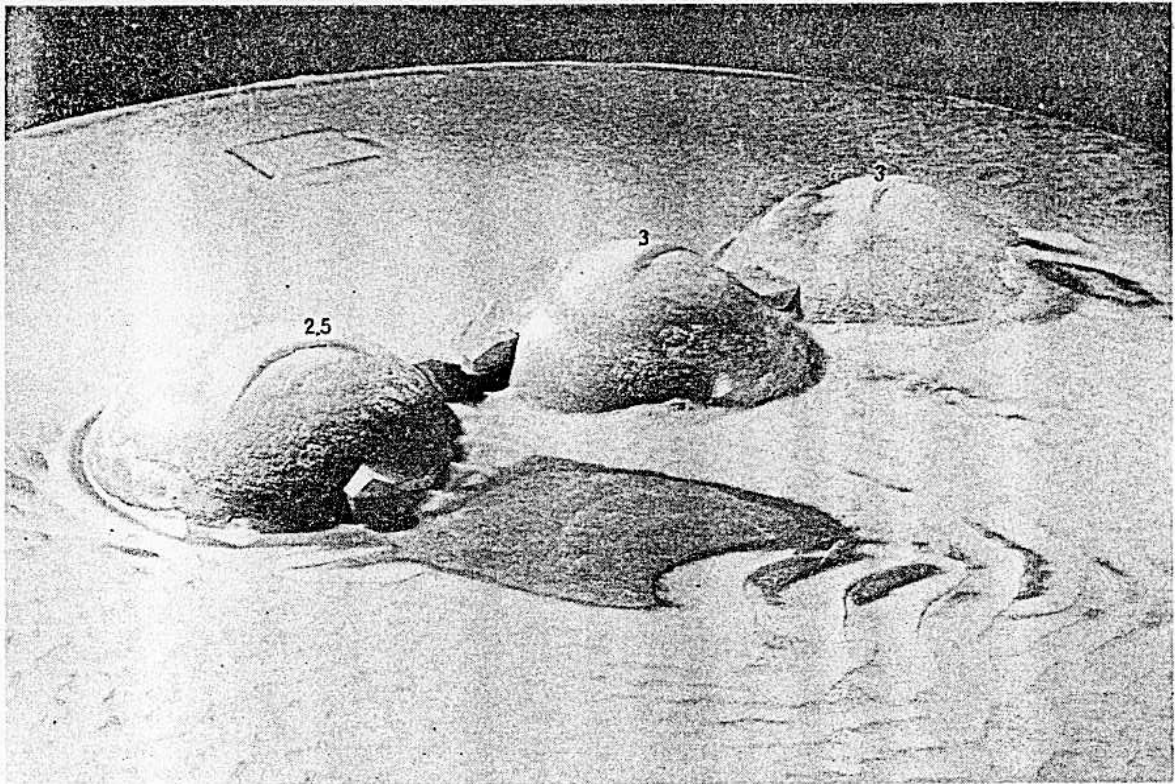
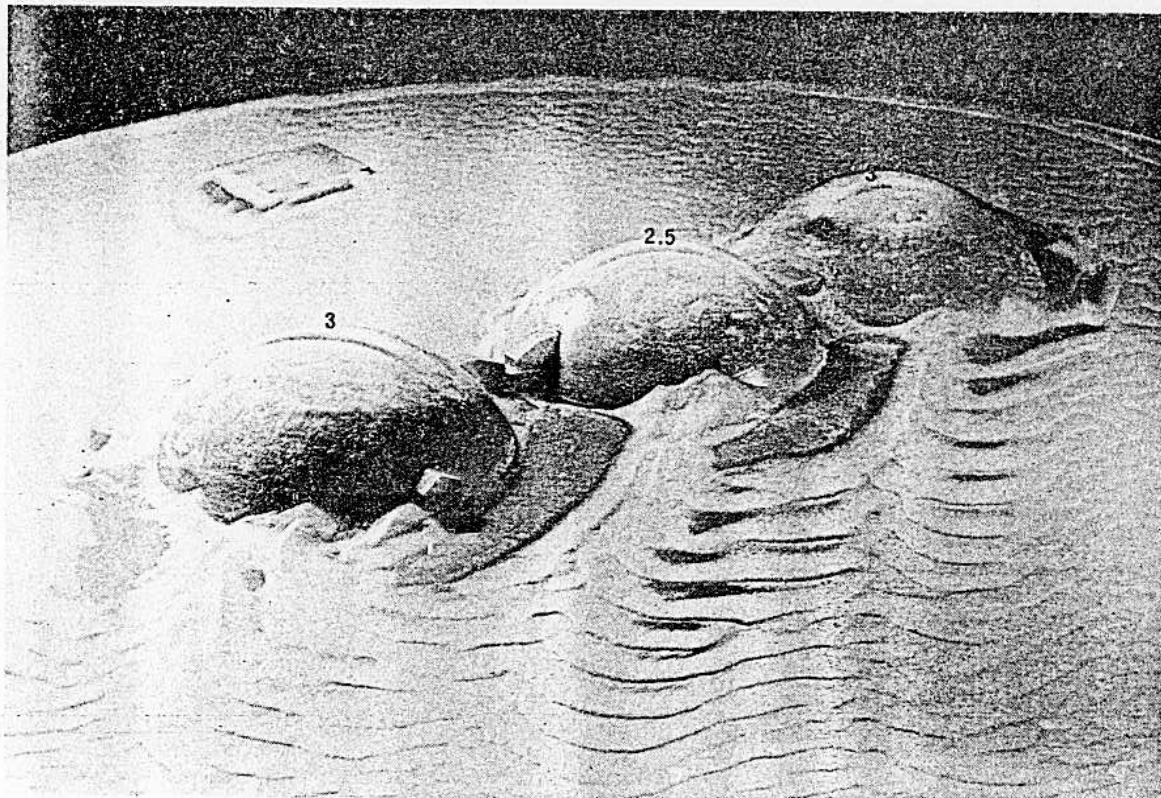


FIGURE 5  
SNOW ACCUMULATION ON MONOLITHIC DOMES  
WIND FROM THE WEST-SOUTHWEST

NOTE : NUMBERS INDICATE MAXIMUM SNOWDRIFT DEPTH IN FEET SCALE: 1"=100'





WIND  
DIRECTION

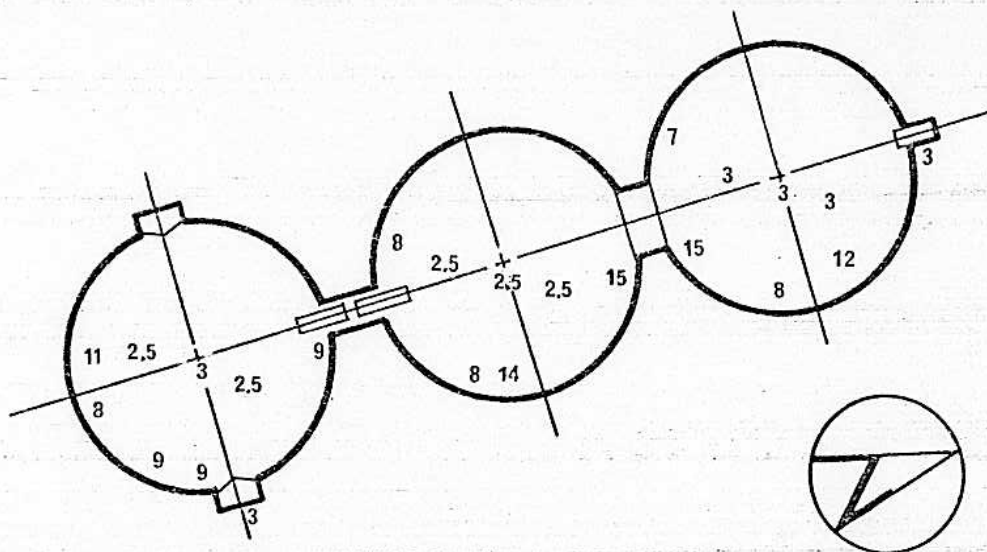


FIGURE 7

SNOW ACCUMULATION ON MONOLITHIC DOMES  
WIND FROM THE NORTHWEST

NOTE: NUMBERS INDICATE MAXIMUM SNOWDRIFT DEPTH IN FEET SCALE: 1"=100'

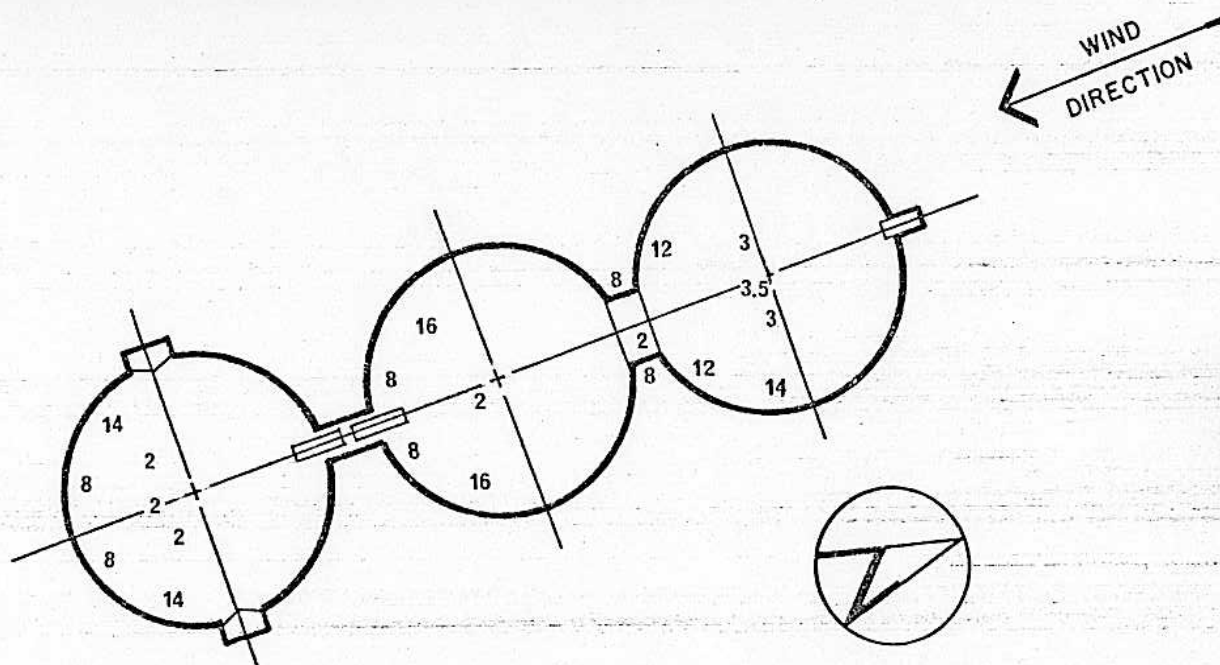
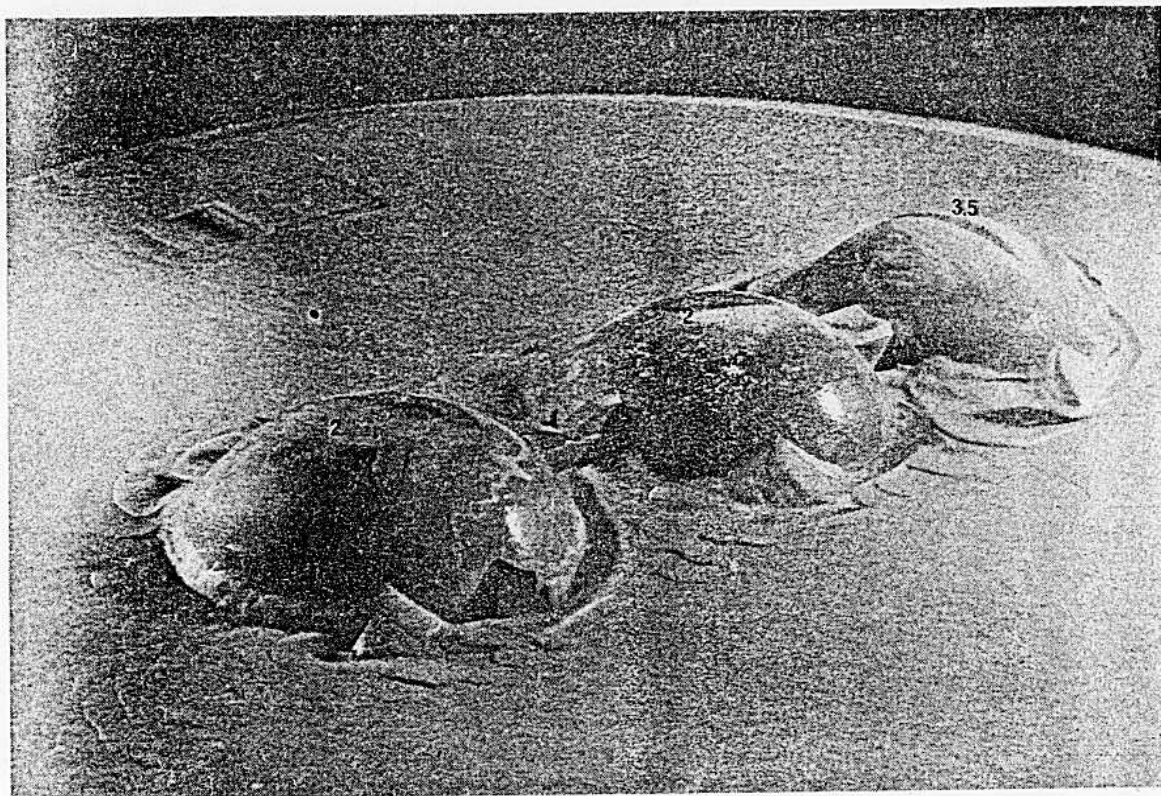


FIGURE 6  
SNOW ACCUMULATION ON MONOLITHIC DOMES  
WIND FROM THE NORTH

NOTE : NUMBERS INDICATE MAXIMUM SNOWDRIFT DEPTH IN FEET SCALE : 1"=100'



WIND  
DIRECTION →

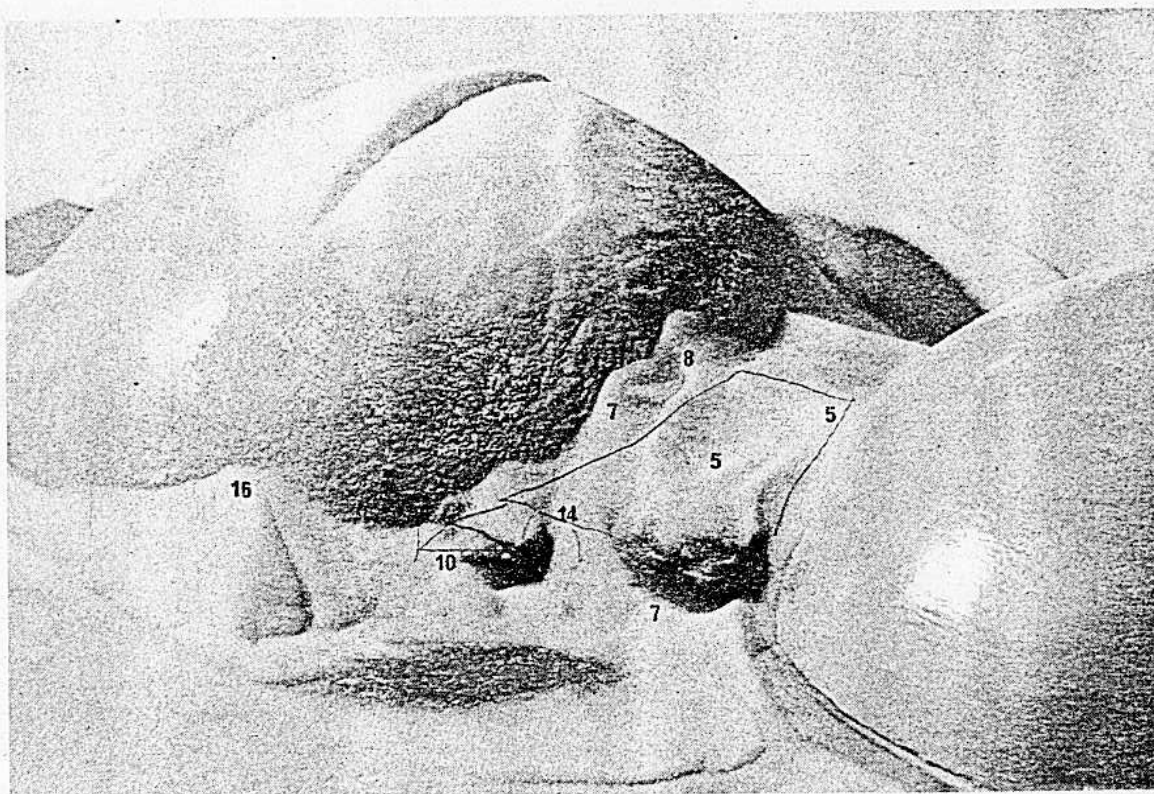


FIGURE 8

SNOW ACCUMULATION ON ROOF STRUCTURE OF OFFICE  
WIND FROM THE NORTH

NOTE : NUMBERS INDICATE MAXIMUM SNOWDRIFT DEPTH IN FEET SCALE : 1" = 16'

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