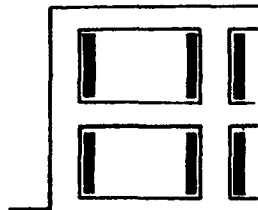


# INTERIOR WALLS

## INTRODUCTION



Many requirements affect the performance of the interior wall surface. Functional requirements of the enclosed space often require that equipment, furniture and other objects be attached to, hung from or abut the interior surface of the wall. As a membrane firmly attached to the load-bearing wall, it often displays tell-tale traces of undue movement before these are noticeable in any other part of the structure. Natural lighting and ventilation of the enclosed space, access to or egress from it, require openings of various dimensions and types, making its surface discontinuous. It must resist deterioration with age, and abuse as well as normal use. It must be maintainable and aesthetically pleasant. The extent to which these requirements are met will determine how well this subsystem performs. This subsystem, however, is not subject to the severe deterioration potential of exterior subsystems. Interior forces on the walls causing problems are rare and with routine maintenance this subsystem should perform well.

A variety of materials were used for the interior walls at the four schools studied, the most prevalent being painted concrete block. The exception is the Smith School in which gypsum wall-board mounted on metal studs was used.

This report concentrates on these predominant material types of such heavily-used areas as classrooms and corridors of each school. Limited application materials and less intensively-used areas of each school have been excluded, except where exceptional problems were encountered in their use.

## METHOD OF EXAMINATION

A sample of classrooms, including more than 50% of each type and at least one from each grade level, was selected and studied in addition to the main common areas of the school and specialized areas such as the library, multi-purpose room, etc., thus ensuring a representative cross-section of room types.

Visual observation of the interior wall surface was the primary method of examination. Walls were examined for cracks, deflections and other indications of structural instability and attempts were made to correlate these findings with the location of expansion joints and known areas of exterior wall movement. The interior walls were also examined to determine if they provided sufficient support for attached loads.

Durability, water resistance, surface cohesion and general maintainability were checked by noting the type, extent and frequency of damage or change in the wall surface.

Equipment used to perform the tests: a four foot level to check for plumbness and deflection; a tape measure to determine the length of cracks; a small rule calibrated to 1/64 inch to measure the width and depth of cracks; various cleaning solutions to test staining and washability; and a camera used to record significant findings.

For a more detailed description of the testing procedures used refer to the Field Test Manual, 'Buildings In Use' Study, December, 1974

SUMMARY OF PERFORMANCE

	P	R	S	M
<b>GYPSUM WALLBOARD</b>				
Structural Stability	NA	NA	O	O
Wearability	NA	NA	O	O
Delamination/Cohesion	NA	NA	O	O
Water Absorption/Stain Resistance/Cleanability	NA	NA	O	O
Repair/Aesthetics	NA	NA	O	O
<b>CONCRETE BLOCK WALLS</b>				
Structural Stability	O	O	NA	NA
Wearability	O	O	NA	NA
Adhesion	⊙	⊙	NA	NA
Water Absorption/ Stain Resistance	O	O	NA	NA
Cleanability	O	O	NA	NA
<b>INTERIOR WOOD TRIM</b>				
Wear/Repair/Aesthetics	⊙	⊙	NA	NA

SUMMARY OF FINDINGS

In no school examined was there any serious technical problem with the interior wall. Some specific minor cracking was found but they are in no way detrimental.

The performance of white paint was found unsatisfactory (75%) in some locations. It quickly soils, stains and shows surface flaws requiring more frequent maintenance.

Wood trim around doors and windows at the Parkside and Richards Schools showed signs of wear, chipping and abrasion, indicating that wood does not perform satisfactorily in these instances.

The interior walls at Smith Elementary School were generally in good condition. Interior wall surfaces at Parkside and Mount Healthy were found to be performing satisfactorily, at the 95% level.

DETAILS OF FINDINGS

C-5

GYP SUM WALLBOARD

GYP SUM WALLBOARD: STRUCTURAL STABILITY

Results: Performance was satisfactory at the Smith School--the only school which typically uses this material, though some hairline cracking does exist, these instances are insignificant from a performance standpoint.

Probable cause: Not applicable

Discussion: Not applicable. Of purely academic interest is a hair-line crack, hardly noticeable, above the midpoint of the classroom. This seems to indicate a slight deflection at this point.

GYP SUM WALLBOARD: IMPACT RESISTANCE, SUPPORT FOR ATTACHED LOADS, INDENTATION, WEARABILITY

Results: Performance levels were acceptable at the Smith School

Probable cause: Not applicable

Discussion: Not applicable

INTERIOR GYP SUM WALLBOARD: DELAMINATION, COHESION

Results: Performance levels were generally satisfactory (95%). However, instances of surface delamination of the gypsum wall-board occur in classroom walls.

Probable cause: The use of adhesive tape to hang wall displays, posters, etc. Removal of such tape often pulls paint off with it.

Discussion: No wall area is designed specifically for display and thus existing gypsum walls are used for this purpose. For further discussion of this issue, refer to the Display section of the Functional Factors Report, "Buildings In Use" Study, March, 1974.

INTERIOR GYPSUM WALLBOARD: WATER ABSORPTION, STAIN RESISTANCE,  
CLEANABILITY

Results: Performance levels at the Smith School were very satisfactory.

Probable cause: Not applicable

Discussion: Not applicable

INTERIOR GYPSUM WALLBOARD: REPLACEMENT/REPAIR, AESTHETICS

Results: Performance was acceptable at the Smith School.

Probable cause: Not applicable

Discussion: Not applicable

CONCRETE BLOCK  
WALLS

CONCRETE BLOCK WALLS: STRUCTURAL STABILITY

Results: Performance levels were satisfactory (95%) at Parkside and Mount Healthy. Performance levels of the interior walls were only adequate (85%) at Richards due to specific occurrences of cracking.

Probable cause: Thermal expansion and contraction, shrinkage and construction are all possible causes.

Discussion: The concrete block wall interior at Parkside and Mount Healthy were found to perform satisfactorily. Discussion of extensive cracking in the Richards School can be found in the exterior walls section (A-6 ).

**CONCRETE BLOCK WALLS: IMPACT RESISTANCE, COHESION, DELAMINATION, WEARABILITY, INDENTATION**

Results: Performance levels were very satisfactory (95%) in all schools using this material.

Probable cause: Not applicable

Discussion: Not applicable

**CONCRETE BLOCK WALLS: ADHESION**

Results: Performance levels were generally satisfactory (95%), however, difficulty is experienced in mounting posters and displays on the concrete block walls.

Probable cause: Concrete block resists adhesive tape because of its surface texture and typically glossy painted surface.

Discussion: For further discussion, refer to the Display Section, Functional Factors Report, 'Buildings In Use' Study, March, 1974.

**CONCRETE BLOCK INTERIOR WALLS: WATER ABSORPTION, STAIN RESISTANCE**

Results: Performance levels were satisfactory (85%) at the Richards School. Some visible water staining has occurred at Mount Healthy (85%).

Probable cause: Interior of exterior wall was water stained, probably due to water infiltration.

Discussion: This seems to have been an isolated occurrence.

**CONCRETE BLOCK INTERIOR WALLS: CLEANABILITY**

Results: Performance was generally satisfactory (95%) at Parkside and Mount Healthy, but only adequate (85%) at Richards. A 'smudge' line between 2'-4' above floor level is easily

visible, especially in corridors. This line is lower in the lower grade corridor and higher in the upper grades.

Probable cause: Use of white paint on concrete block walls at Richards. Children's hands often run over this painted surface as they move through the halls.

Discussion: The use of white paint on both concrete block wall surfaces and wood trim, in that it soils and stains quickly and this requires more frequent cleaning and does not perform well in an elementary school. Brightly painted but darker colors between 1'-4' above the ground in the corridors would greatly improve this situation--reducing the frequency of cleaning and routine painting.

INTERIOR WOOD TRIM

INTERIOR WOOD TRIM: ABRASION, WEAR, REPAIRABILITY, AESTHETICS

Results: Performance of wood trim was only adequate (75-85%) at Parkside and Richards, showing signs of extensive wear, abrasion and chipping of paint. Performance was acceptable (95%) at Smith and Mount Healthy where metal trim was used.

Probable cause: Normal 'wear and tear' of an elementary school environment.

Discussion: The use of wood trim around classroom doors and windows (particularly on window sills as low as those at Parkside) was an inappropriate choice of material in such a high-intensity use facility as an elementary school. Parkside's oak trim is wearing better than Richards' white painted soft wood. The oak trim on the Parkside window sills is often stained because plants are placed upon them, leak, and oak stains readily when wetted. A clear plastic finish may prevent this occurrence.