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ABSTRACT

Fiscal accountability has become an important issue with communities and school boards across the nation. Renovation of older school buildings can sometimes result in lower costs than constructing new facilities. The advantages of recycling and criteria for deciding whether to replace or repair structures are discussed. The bulletin recommends that modernization should be part of a long-range master plan. The appendix contains a case study of a successful renovation project at a Corvallis, Oregon elementary school. (Author/MLF)

# OSSC BULLETIN

## THE RECYCLED SCHOOL BUILDING

by

Fred E. Quale

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## PREFACE

Fiscal accountability has become an important issue with communities and school boards across the nation. As taxpayers resist efforts both to increase or to approve existing school budgets, school personnel must increasingly look for ways to get "the most for their dollars."

One major source of expense for districts is in the construction and the subsequent bond retirement for new school buildings. If renovation of older buildings can save in this major cost area, then perhaps more and more school districts will turn to remodeling rather than to building new facilities.

"Recycle or Rebuild?" addresses this growing problem in times of declining enrollments and tight money: How do districts make the decisions to remodel existing structures or to abandon them and rebuild?

Fred Quale, Assistant Superintendent-Instruction at Corvallis, Oregon, provides some criteria for making those kinds of decisions in this month's Bulletin.

Kenneth A. Erickson
Executive Secretary
Oregon School Study Council

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## THE RECYCLED SCHOOL BUILDING

"Fire Damages Lincoln School!" That was the news that shook the Corvallis, Oregon community in early July, 1968.

When the smoke had cleared and the damage had been assessed, the size of the dilemma facing the Corvallis School Board was apparent. Half of the building had been completely gutted and the other half was badly damaged by smoke and water. With the opening of school less than two months away, which course of action should the Board take? Utilize what was left of the gutted section and restore it to its original condition? Demolish the damaged portion of the building and rebuild? Or, should the Board take advantage of the situation (and the insurance money) and abandon the original structure in order to build a new, more functional one?

Although the background events may differ, this same dilemma faces school boards throughout the country today. What should be done with school buildings that are damaged, badly overcrowded, or built in such a way that it is unable to accommodate present modes of teaching? Increasingly, the decision of boards is the same one that the Corvallis Board reached in the case of the Lincoln School fire--repair and modernize!

Interest in the modernization of existing structures--as opposed to tearing down and building anew--has grown rapidly

over the past five to ten years. Over half of the school construction projects scheduled for completion in 1971 were modernizations.[1] Although more construction money is still being spent for new structures, the scale is tipping dramatically toward the process which is variously called remodeling, renovating, or modernizing. In 1974, for example, remodeling accounted for 20 percent of all school construction expenditures. Experts predict that this figure will climb to 50 percent before the end of the decade.[2] Growing interest in school remodeling is also evidenced by the number of articles on the subject appearing in national magazines. In the four year period, 1967-1970, the Education Index listed eleven articles dealing with school renovation. In the years 1971-1974, 43 articles were listed.

## Recycle or Rebuild?

Why are more and more school boards now renovating existing structures rather than building new ones as they did so readily in the '60's? Although each renovation project has its own background of reasons, the over-riding reason in most cases is economic. Ben E. Graves, who, until recently, was the director of the "New Life for Old Schools" project sponsored by Educational Facilities Laboratores, Inc., says, "The simple, obvious, painful truth is that taxpayers have had it. And the easiest place they can demonstrate how fed up they

re with taxes is at the local level where education usually feels their ire first."[3] The taxpayer revolt has become endemic to our culture. School districts that readily passed bond issues for new construction in the 1960's now have a difficult time convincing voters to approve even current operating budgets. New capital expenditures are out of the question in many communities. Modernization, therefore, seems to be the answer in the current tight money economy. It has the "more bang for the buck" appeal which is essential today.

In 1968, Educational Facilities Laboratories produced a report entitled Educational Change and Architectural Consequence. It was a capstone to an era of unparalleled ferment in education, an era when almost anything was possible and money seemed only a transient concern. In the words of the author, "A new spirit enlivens American education today--a spirit of innovation, experimentation, venturesomeness."[4] The report describes the new approaches to teaching and learning that were affecting the design of school facilities--team teaching, use of teacher aides, programmed learning, instructional television, filmed courses, new curricula, non-grading, independent study, the encouragement of creativity, improved professional training, better techniques for evaluation. In response to these new approaches to education, new schools were being built throughout the country which embodied a scope and atmosphere described in such terms as "open,"

"simple," "flexible," "ample," "beautiful," "exciting."

From the vantagepoint of the mid-'70's, it is difficult to recognize that era as a part of the same educational world in which we find ourselves today. Instead of a "spirit of innovation, experimentation, and venturesomeness," we now see a spirit of retrenchment. A shift "back to the basics" typifies the paralyzing doubt that many Americans have in their educational processes. The school population explosion is over, and the market is glutted with trained teachers and administrators. Local tax supported agencies--such as the schools--are bearing the brunt of a major voter reaction to rising prices and increased taxes. A good share of the frustration of a people caught between an economic squeeze and lack of a clear vision of personal and national purpose is being visited upon the few remaining bastions of local control and influence.

In 1965, 76 percent of all building bond issues were approved by voters. By 1970, this figure had dropped to 50 percent. Where money is scarce, construction for education becomes highly vulnerable; the search for techniques, materials, and processes that can help keep the lid on building costs becomes more important than ever. In the opinion of the authors of the E.F.L. publication entitled School Renewal,

". . . it is becoming clear that the greatest potential for cost savings in the decade ahead lies in economical modernization of our existing school [5]

## Advantages of Recycling

Warren H. Ashley, a West Hartford, Connecticut, architect says that recycling old buildings can produce a saving of 50 percent or more over the cost of a new building. He cites five factors that give cost advantage to a recycled building.

1. "The land is already owned by the district."

Land costs--especially in the established neighborhoods where a "repair or replace" decision is more likely to be faced--are often astronomical.

2. "The biggest unknown in new school construction is eliminated--the nature of the site."

Architects and builders have nightmares over the unknown factors that may be present on a new site. Since these unknown factors may create expensive delays in new school construction or create problems in the completed building, builders must include enough "cushion" in their bids to provide protection. In contrast, an existing school represents a known quantity. If there is a crack in the wall, it can be observed and studied. If a section has sagged, the architect can usually determine the cause and make corrections in his remodeling plans.

3. "Street and access roads are already built, utilities are already in place."

Improved utility service may be necessary, but it is unlikely that a new water line will need to be laid, or a new booster

pump installed, or that new sewer lines or new sewage treatment facilities will have to be constructed.

4. "The major part of the structure already exists." Frederick C. Wood estimates that 1/3 to 1/2 of the original building does not require change. This includes excavation, footings, foundations, structural frame, roof deck, exterior walls, glass--plus contractor's overhead and profit on these items.[7] The fact that so much of the structure already exists gives a remodeling project several other advantages in addition to lower cost. Work can be done any time of the year; the job can usually be completed in a much shorter time than construction of a new structure would require; and it is usually possible to carry the work out in phases so as to reduce interference with the existing educational program.

5. "Busing and transportation patterns are already well established."

This is an especially important factor in a densely settled urban area, but it is also an important consideration whenever a district considers relocating a school. Can the existing streets support the increased traffic? What will be the additional transportation costs and how will the altered transportation pattern affect other schools in the district?

Bert Brosmith, of the New York Architectural firm of Justin, Brosmith, and Levine, suggests some additional advantages--and cautions--in remodeling.[8] For example, he expands on the concept of location, suggesting that, in

addition to fitting an established traffic pattern, an older building may be familiar enough to generate significant community activity and to have a traditional social value that should not be unsettled.

This latter point is especially significant today when community support for bond levies is so difficult to generate. Community attachment to an established facility may often be the factor which spells the success or defeat of a proposed funding program.

Brosmith also suggests caution when a district is attempting to assess the cost savings in renovating over rebuilding. If what the district wishes to accomplish won't fit the fabric of the old building, remodeling may require more compromises than the district should make--or a greater remodeling cost than the old building warrants.

## How To Make the Decision

How does a school board decide whether to replace or repair? Ben Graves suggests four areas of primary concern that need to be considered.[9]

1. Safety. If the building is not safe, or cannot be made safe, it is not a proper place for children.

Graves suggests that buildings built prior to 1920 have very limited remodeling possibilities because of the difficulty or expense of bringing them up to code. An additional safety factor has been creeping into school building codes since

Mr. Graves wrote in 1971. This factor is brought about by recent court decisions making public schools responsible for the education of severely handicapped children. Coupled with these decisions has been the educational trend to "mainstream" these children. This, of course, means that schools in the future which are built or remodeled in a major way must be able to ensure tha all children--handicapped or not--will have equal access to all facilities. A remodeled multi-story building must be able to accommodate wheel-chair ramps or elevators. Wash rooms, toilets, physical education areas, drinking fountains must be capable of being redesigned to serve the needs of handicapped students.

2. Educational adequacy: If the building cannot be adapted to meet the educational goals of the district, it should be abandoned.

To fashion a school after the educational goals of a district, however, can be tricky at best. Buildings tend to last longer than the fabled 20-year educational cycle, and the maligned "egg crate" school of yesterday might become the educational innovation of tomorrow. "In a time of rapid change in education," say the authors of Educational Change and Architectural Consequences, "the responsible school superintendent will work to plan new schools with a built-in 'second guess.' The superintendent-after-next may have different ideas, or conditions in the community may have changed. The school building planned today will perforce serve new functions and goals well into the next century during its lifetime; it should be

designed to serve them as well as possible."[10]

The pinnacle of "educational adequacy" today is probably embodied in the term "flexibility." An educationally adequate school must provide flexibility for today's use--so that teachers and administrators can adjust the space needs to meet the requirements of the lesson, the learning style of the student, and the teaching style of the teacher. In addition, it must provide flexibility for tomorrow's use--so that major renovation will not be required to enable the building to accommodate the unforeseen changes in educational goals in the future.

3. Location adequacy: If the building is located in an area where there are no "customers," or if projections make it obvious that there will be no customers within the next few years, it doesn't make sense to keep the old building.

Few board decisions, however, are made with as much clamor as that of closing an old building. Those residents who are left--whether they have children in school or not--see the closing of their school as the 'coup de grace' which will ruin their property investment and turn their community into an area of industrial blight.

4. Site adequacy. If the site is too small to meet the current standards and there is no way of adding to it, the building should be abandoned, unless the district is willing to compromise.

Many states--including Oregon--have standards that specify minimum acreage on which a school of given size can be built. If an older building is to be renovated in such a way as to

materially increase its capacity, the site size might be a major factor in securing state building approval. One interesting solution to a small-site problem--and one that state authorities may be induced to accept--was developed for the North Main Street Elementary School in Pleasantville, New Jersey.[11] In this case, a decision was made to enlarge and modernize an existing building on a three-acre site in a built-up area near the central business district. Because the need for playground area would be increased in direct proportion to the reduction of the land area needed for the building, a decision was made to build additional sections below ground level. The below-ground portion of the original building was remodeled into a media/administrative center, and additional classrooms were built at the basement level on all four sides. The roof of the new lower level became a grade level play yard. This plan has other characteristics which will make it even more appealing in future years. It is an energy conserving plan since the cost of heating and cooling is greatly minimized. It also permits the school to remain in a central area where children have ready access to city offices and cultural centers.

In an April, 1972, article written for The American School Board Journal, Mr. Graves adds the economic factor to his list of conditions which will weigh heavily in a board's decision to rebuild or modernize. Increased costs of

maintaining an old building, the waste of square or cubic footage in many old structures, the cost of remodeling--all will require a thorough analysis. An economic "rule of thumb" which seems to be accepted by most writers in the field is that if satisfactory remodeling will cost over 50 percent of the estimated cost of replacement, a district should take a long, hard look before deciding to modernize.[12]

## Planning for Building Renovation

When the decision has been made to "do something about the old school," all authorities strongly oppose the "bandaid" approach. Usually this type of modernization represents a hasty effort to appease citizen groups or to stem the tide of current enrollment pressures, with little thought to how the future will really be affected. When pressure groups--whether they are PTA's, powerful school principals, or other special interest groups--are allowed to determine remodeling needs, the result is not only financial waste, but also vast educational and environmental inequities between schools within the same system.

Educational Facilities Laboratory, in its report entitled, "School Renewal," recommends that modernization should be part of a well-thought-out, long-range master plan. A "piecemeal" job--knocking out a wall here and adding a partition there--may seem an appropriate solution at the

time, but it is unwise if not tied to an overall, long-range modernization plan.[13]

The mechanism for developing and maintaining a comprehensive master plan will vary according to the size and complexity of a district. Many larger school districts have established planning departments with high degrees of professional competence. Although consultant help is called on to solve specific problems, the overall coordination of the program is under the aegis of the department.

Many school districts--and especially the smaller ones--find it more advantageous to contract at least the initial work of developing the master plan. Such tasks as surveying, designing, and formulating procedures can be performed better under contract than by straining a district's own organizational resources.

Whatever the mechanism, however, several elements of the basic operational model of a master plan tend to be fairly consistent. These are:

1. Establishment of educational goals. The development of these goals should precede any architectural programming. They deal with such questions as: optimum school size; grade and age distribution; social or racial implications within attendance areas, the place of early childhood, career, and special education; the extent of individualized learning, team teaching, nongraded education.

2. Development of a feasibility study. A feasibility study includes such elements as: assembling and analyzing data, surveying existing conditions; studying the options and recommending a course of action. In many cases, this need not be an expensive operation.

Most of the preliminary data is already available in the district's files. What is needed is a team of specialists representing the fields of architecture, engineering, and education to study the data and arrive at recommendations. Often after a review of existing data, a brief walk-through inspection will provide an adequate basis for an initial recommendation.

In the case of both of these "mechanisms," it is important to give appropriate and balanced attention to the opinions of the public as well as the professionals. It is difficult to find effective methods of involving the public in building decisions, and often specialists--whether educators, architects, or engineers--see this involvement as an unwarranted interference. But the right kind of involvement is frequently the key to a successful renovation project.

## Looking Toward the Future

There seems to be no question but that school construction will turn increasingly in the direction of modernization. To accommodate this trend, architects are improving their skills or establishing specialties in this area and new building materials are being developed which are especially designed for use in renovated buildings. Some of the factors that will tend to promote renovations in the future are:

1. A continuing "tight money" picture as far as school construction is concerned.
2. New legal impositions on schools, such as more stringent safety codes and increased emphasis on accommodating the special needs of handicapped children.

3. New energy requirements and higher energy costs. This will tend to increase the need to reduce large energy wasters--large window areas and high ceilings, for example--and to require more efficient heating and cooling equipment.

4. Increased year-round use of schools, causing more and more schools to be redesigned to accommodate efficient air-conditioning systems.

5. Increased community use of school buildings, which will increase the tendency to construct shared-use facilities such as swimming pools, theaters, shops, meeting rooms.

6. Increased tendency for school districts to utilize buildings which were not originally constructed for school use, such as abandoned hotels and warehouses.

## APPENDIX

Case Study

A Successful Renovation Project
in the
Corvallis (Oregon) Public Schools

### Lincoln Elementary School (1968)

After the fire described in the first section of this report, the School Board declared an emergency and employed a local firm of architects to assess the damage and estimate the cost of repair. The following estimates were made

| | |
|---|---|
| Total school area | 32,900 square feet |
| Major loss area | 11,424 square feet |
| Minor loss area | 4,708 square feet |
| Area needing redecorating | 13,960 square feet |
| Area needing cleaning | 2,622 square feet |

The architects also estimated that new construction on an equivalent building would cost $13.50 per square foot. They also estimated that, if the salvageable portions of the existing building were used, $2.00 per square foot could be saved in the major loss area, and $3.00 per square foot could be saved in the minor loss area

Replacement cost totals as initially estimated by the architect were as follows

| | | | | | |
|---|---|---|---|---|---|
| Demolition | 16,132 sq. ft. | X | .70 | = | $ 11,292.00 |
| Major loss area | 11,424 sq. ft. | X | 11.50 | = | 133,376.00 |
| Minor loss area | 4,708 sq. ft | X | 8.50 | = | 40,018.00 |

| | | | | |
|---|---|---|---|---|
| Redecorating | 13,960 sq. ft. | X | 2.00 | = 27,920.00 |
| Cleaning | 2,622 sq. ft. | X | .55 | = 1,142.00 |
| | | | TOTAL | = $214,048.00 |

| | | | |
|---|---|---|---|
| Fees | Architectural | = | $ 3,000.00 |
| | Mechanical | = | 3,000.00 |
| | Supervision | = | 3,500.00 |
| | | | $ 9,500.00 |
| | | | $223,548.00 |

A decision was made by the Board to clean and restore the west wing of the building (where minor damage--mostly smoke, heat, and water--occurred). It was hoped that this project could be ready for the opening of school, September 1. Approximately half of the students could then be housed in the restored portion of the school, and the remainder could be bused to temporary classrooms in other district buildings pending reconstruction of the east wing.

During the three or four years immediately preceding 1968, a great deal of support had developed in the teaching staff and in the Corvallis community for "team" approaches to teaching and for greater emphasis on individualized learning. One of the factors which many felt restricted progress in these areas in elementary schools was the "self-contained" classroom approach which was reflected both in the elementary school curriculum and in the design of Corvallis elementary buildings. Prior to 1968, all thirteen of the elementary

schools in the Corvallis system were built to accommodate self-contained classes--each room large enough for one class of 25-30 students.

During the two-year period from 1966-1968, staff committees had been busy planning a new elementary school which was projected to be in operation by fall of 1968. After a great deal of staff study and community discussion, this school was designed in such a way that pods of two or three classrooms could be opened up to allow for large group instruction and a free flow of students and teachers

With this background, the Corvallis School Board decided that the badly damaged east wing of Lincoln School should be redesigned to accommodate some of the methodological changes that had been incorporated into the new school about to go into operation.

The seven classrooms, small library, and hall areas were opened up in such a way as to provide a large instructional materials center with over 2500 square feet of floor space, and a large open area capable of accommodating eight normal classes of children. The entire area was carpeted and attractively lighted and decorated.

The final restoration cost of Lincoln School exceeded the architect's estimates chiefly because of the decision to modernize the original plan.

| | |
|---|---|
| Total project cost | $262,266.00 |
| Fire insurance | 141,743.00 |
| District cost | $120,523.00 |

When considering the Lincoln School project strictly in terms of renovation, and excluding the many problems of student, staff, and district resource displacement caused by the fire, the results were as follows. At a cost to the District of less than $4.00 per square foot:

1. A major portion of the building was relighted and redecorated.

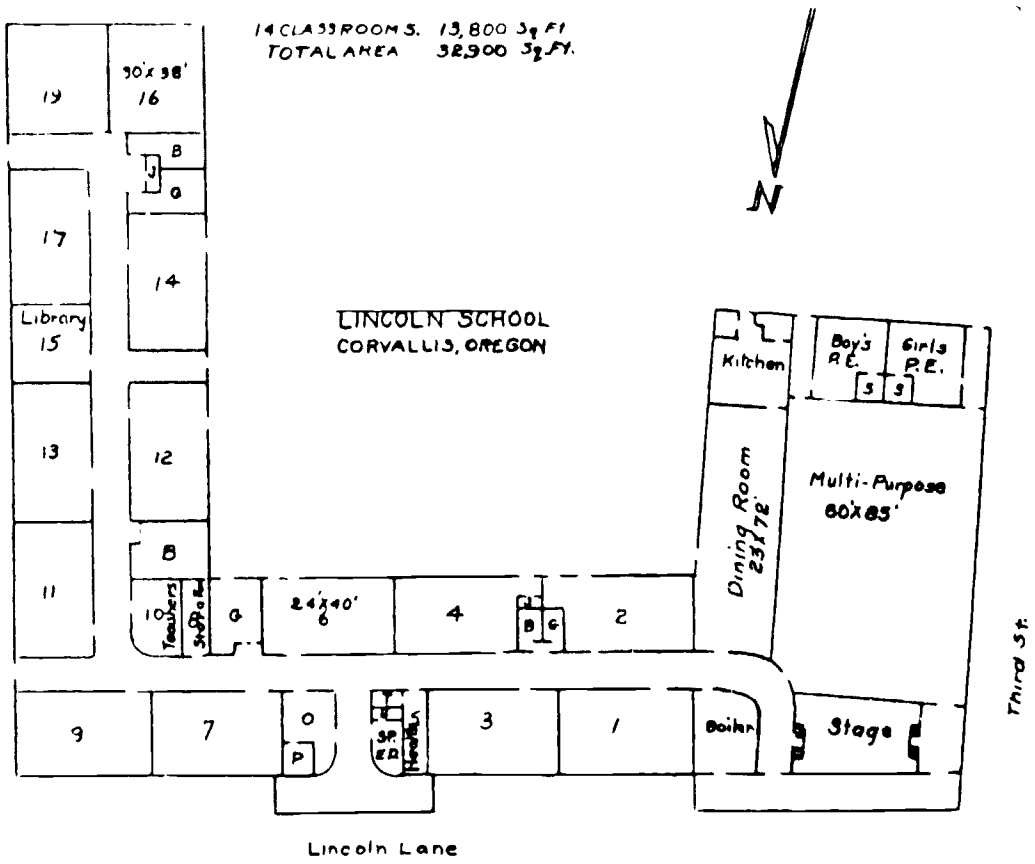
2. Approximately one-half of the building was completely redesigned--hallways were eliminated, interior walls were removed to accommodate a learning materials center and a large open area for team teaching.

3. The entire east wing was carpeted.

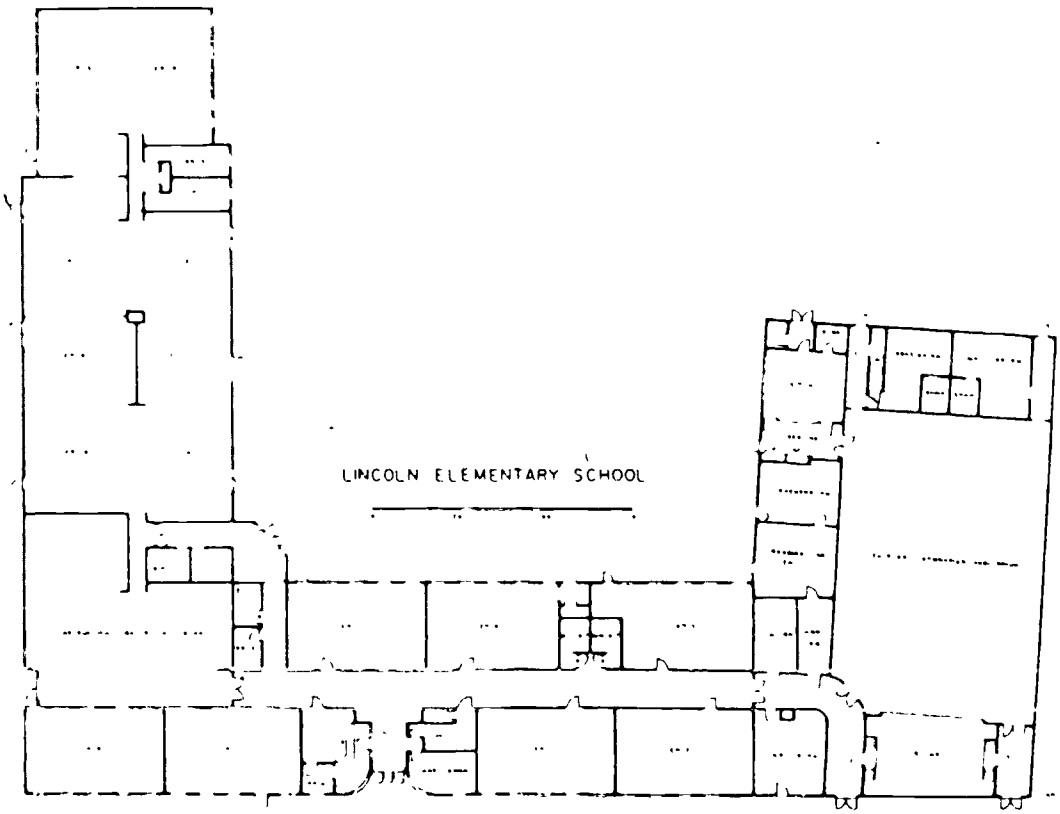
4. Enough space was saved through better utilization of hall space to enable the building to accommodate at least one additional class of students.

Lincoln Elementary School
Corvallis, Oregon

1. Floor plan of the school before the fire, July 2, 1968




2. Floor plan of the school after restoration, showing the remodeled East wing.



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