How can savings in construction of your new maintenance building be realized when today's building and construction costs are at all-time highs? Metal building systems offer certain economies, from getting the building up and ready to use sooner to reduced maintenance for years after the building is complete.

One big way "systems buildings" can cut costs is by speeding design, bill of materials ordering and acquisition, and field construction. Generally speaking, a systems approach cuts total project time approximately one-third compared to conventional construction.

**Structural systems**

Golf course superintendents or others involved with the overall management of golf facilities can choose from a wide variety of functional framing systems. Many courses have several canopies conveniently located to provide protection against sudden changes in the weather; canopies consist only of roof panels and structural supports.

Some small buildings, such as Armco's Tec-Line buildings, need no structural framing members through 24 feet in length. Beyond 24 feet, light frames are introduced to extend the building to any desired length. These buildings can house pump stations on courses with elaborate irrigation systems. They can also be used for remote restrooms, separate caddy houses, concession stands, golf car storage, or pro shops.

The most popular of all metal building structural systems are the clear-span designs because of their

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*Product manager of Tec-Line buildings for Armco Building Systems, Robert E. Stevens has 12 years of experience in the design and construction of metal buildings. He has a degree in civil engineering from the University of Cincinnati.*
sightly through-the-wall bolts or fasteners. These ribs also provide a sive color change. Moreover, Steelox is available in ten grained exterior finish to enrich the appearance of the wall and resist cracking, flaking, peeling, or exces-sive deflection, a frequent cause of rib separation and consequent leaks. The extra strength of 24-gauge steel provides the ability to absorb impact, thereby providing long-term resis-tance to foot traffic and movement due to vibration or thermal expansion and contraction. In 1976, Armco intro-duced its Steelox CF roof which has a concealed fastening method and a nonconducting thermal spacer to pro-vide a dependable covering system with economical thermal character-istics for energy conservation.

Roof systems, too, have been de-signed for improved maintenance performance. Aluminized Steel offers superior weathering characteristics with its high reflectivity to keep summer heat out and winter heat inside the buildings. Because steel has greater strength than aluminum, steel roof panels are better able to resist ex-cessive deflection, a frequent cause of rib separation and consequent leaks. The extra strength of 24-gauge steel provides the ability to absorb impact, thereby providing long-term resis-tance to foot traffic and movement due to vibration or thermal expansion and contraction. In 1976, Armco intro-duced its Steelox CF roof which has a concealed fastening method and a nonconducting thermal spacer to pro-vide a dependable covering system with economical thermal character-istics for energy conservation.

Roof and wall panels are assem-bled with removable nuts, bolts, and sheet metal fasteners. Therefore, when it comes time for expansion, a pre-engineered wall system can be reused. It's a simple matter of removing the original material, adding new structural members and extending the sidewalks. Then, original components are reassembled. Unlike a block or brick wall, there is no loss of mate-rials. And because the pre-engi-neered panels are standardized, there is compatibility in appearance.

Design/build contracts
Most metal building manufacturers distribute through independent deal-ers who are usually equipped to co-ordinate the entire construction proj-ect and thereby provide a single-source service.

By negotiating a "turn-key" con-tract, the building owner can assign the full range of building responsi-bilities to a single source. These responsibilities can include founda-tions, mechanical and electrical equipment, interior finishing, fenc-ing, landscaping, and everything else required to make your new facility attractive and efficient. The Armco dealer is organized to design the facili-ty with qualified professionals or assist the golf course's own indepen-dent architects or consulting engi-neers. In the construction phase, the Armco dealer is the general con-tractor.

With single-source responsibility, a building owner can avoid the frustra-tion, time, and expense normally associated with conventional con-struction methods. The design and construction phases can be placed on a "fast track" basis for earlier occu-pancy and lower initial costs for the owner.

Costs
Predictability of cost is another advan-tage. Major cost factors for facilities are labor, materials, design, and financing. On-site labor represents the largest factor for most construc-tion projects. Hourly labor rates are high and spiraling higher. In addition to high hourly pay for construction workers, many union contracts have nonwage clauses, which call for con-tractors to include hourly contribu-tions for pension, vacation, health and welfare, and apprenticeship training. Bricklayers, carpenters, electricians, ironworkers, laborers, operating engi-neers, and plumbers all have differ-ent rates. Then there is the question of which building trade members per-form that work. Even within the same craft, the rates can vary widely from local to local. The labor factor is the most expensive and most complicated element in estimating the cost of a new building.
Metal building materials account for about 20 percent of the cost of a typical completed facility. But because pre-engineered steel components — structural members, wall panels, and roof panels — are drilled, welded, and cut to size at a factory, field labor costs and jurisdictional problems are reduced to a minimum. Thus, the installed cost of a brick or block wall will often significantly surpass that of a steel wall. The reason, obviously, is that steel panels are bolted together to form a wall in a matter of minutes; the bricks must be laid one by one, a process consuming many more man-hours.

Because machine-made steel components are standardized, the design and specification phase lends itself to analysis by computer. Thus, a computer can order the minimum materials needed and, thereby, reduce the specification workload on the designer.

The speed with which a metal building is completed relates directly to both the labor and financing factors. Quick assembly means that the project is under roof much faster and, therefore, far less susceptible to delays caused by foul weather.

These delays can contribute to a higher labor factor in the cost of construction. Without such delays, inside work — such as installation of electrical wiring, lighting, heating, air conditioning, ceilings, and interior walls and partitions — can begin and end sooner.

The earlier your building is ready for occupancy, the sooner you realize a return on your investment. After all, your original decision to build newer, more efficient facilities was made in anticipation of either making more money or reducing expenses. Another point to be considered with the speed of construction is the financing factor and today’s high interest rates.

Conclusions
Metal building systems have the design flexibility to meet specific appearance needs and preferences. Initial cost is usually less than conventional construction because computerized design, standardized components, factory production, and ease of construction all combine to minimize original investment. Procedures required for design and construction of metal buildings allow owners to occupy their new facilities several months sooner than with other types of buildings.

Low maintenance and operating costs are possible with weathertight construction, durable color finishes, and easy-to-apply insulation materials. Flexibility of interior layout and attractiveness of exterior design make metal buildings ideal for golf facilities.

Dealers are listed under “Buildings — Metal” in the Yellow Pages.

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