Clemson Business Park - A Study in Comprehensive Architectural Services

John Lesesne Wilson
Clemson University

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CLEMSON BUSINESS PARK

A STUDY IN COMPREHENSIVE ARCHITECTURAL SERVICES

by John Lesesne Wilson

A sixth year terminal project submitted to the faculty of Clemson University College of Architecture as partial fulfillment of the requirements for the degree of

MASTER OF ARCHITECTURE

May 7, 1976

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The writer is very grateful to Dean Harlan E. McClure, Professor Gayland B. Witherspoon, Professor George C. Means, and the faculty and students of the College of Architecture for their contribution to his formal education. Gratitude and acknowledgement of indebtedness is expressed to Associate Professor R. Wayne Drummond, Associate Professor James R. Washburn, Assistant Professor Gordon Patterson, and Mrs. Jane Reeves for their continued guidance and concern.
Dedicated to my family, especially my mother and father, for their continued support and ever-present encouragement through the years.
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The traditional role of the architect is changing, and there is a definite need for expanding architectural services to respond to the increasing demands of clients and society. This response is embodied in what is now called "comprehensive architectural services." Phillip Will, Jr., past president of the American Institute of Architects (AIA) put it this way:

"The objectives of the dynamic new concept are to increase our competence in design for today's society and improve our competitive position in today's economy." (1)

Included in these services are project analysis services, promotion services, design and planning services, construction services, and supporting and related services. It is not intended that the architect perform each of these activities or that each of these services be necessary for each project undertaken. Many of these services would not be performed by the architect at all, but might be arranged or coordinated by the architect in the name of the owner.

These comprehensive services can lead to a system that can better unify design and construction to achieve better results. The intent is to improve coordination
of all the diverse elements of the process. The true purpose of comprehensive architectural services is the improvement of architecture.
COMPREHENSIVE ARCHITECTURAL SERVICES
The scope of the complete comprehensive architectural services is so vast that only the architectural profession as a whole, with the help of talented and able consultants and collaborators, can hope to perform its entire range of services. On the other hand, large and small architectural firms can provide the client with the comprehensive services required for a particular project. The firm, large or small, must be competent and organized if it hopes to practice comprehensive services effectively and competitively. Whatever the size firm, the decision to go into areas in addition to those of the basic architectural services has come primarily as a result of recognition of the needs of the firm's own clients. Perhaps equally important has been the realization that the profession has not participated in the early real estate and financial operation and similar decisions. Therefore, the architectural firm has been limited, by decisions over which it has no control or influence, from applying its best skills and talents to the solution of the more strictly architectural problems.
The traditional architectural firm organization (Figure 1) illustrates the land assembly, financing, and project type being decided before the architect enters the process to respond to the client's needs. The comprehensive architectural firm (Figure 2) shows the organization of the entire process offered by a comprehensive firm. The difference between the two is that the architect is a decision making participant in the project from its inception. This is the distinct advantage offered by a comprehensive architectural firm.

By expanding the operational chart of the comprehensive firm (Figure 2), the full scope of a comprehensive firm is seen, showing the interrelationships of these services (Figure 3).

The following is a summary list of services from Compensation Management Guidelines for Architectural Services published by the American Institute of Architects. The services preceded by asterisks on the list designate those services historically considered "Basic
Figure 3. Comprehensive Architectural Services
SUMMARY LIST OF SERVICES (2)

Services under AIA Document B141, Standard Form of Agreement Between Owner and Architect. These services described below are grouped into generally chronological design and construction phases for consistency with groupings used in current AIA Documents. It is again emphasized that the architect does not necessarily provide all of these services or that each of these is performed on each project. A detailed list of these services is in the appendix.

Phase 1. Pre-Design Services

1.01 Project Administration
   .02 Facility Programming
   .03 Space Schematics/Flow Diagrams
   .04 Project Development Scheduling
   .05 Project Budgeting
   .06 Economic Feasibility Studies
   .07 Agency Consulting/Review/Approval
   .08 Existing Facilities Surveys
   .09 Owner-Supplied Data Coordination
   .10 Presentations
   .11 Marketing Studies
   .12 Project Financing

Phase 2. Site Analysis Services

2.01 Project Administration
   .02 Site Analysis and Selection
   .03 Site Development Planning
   .04 Detailed Site Utilization Studies
.05 On-Site Utility Studies
.06 Off-Site Utility Studies
.07 Environmental Studies and Reports
.08 Project Budgeting
.09 Agency Consulting/Review/Approval
.10 Zoning Processing Assistance
.11 Owner-Supplied Data Coordination
.12 Presentations
.13 Project Development Scheduling

Phase 3. Schematic Design Services

*3.01 Project Administration
* .02 Architectural Schematic Design
* .03 Civil Design Concepts
* .04 Structural Design Concepts
* .05 Mechanical Design Concepts
* .06 Electrical Design Concepts
 .07 Landscape Design Concepts
 .08 Interior Design Concepts
* .09 Statement of Probable Construction Cost
* .10 Agency Consulting/Review/Approval
* .11 Owner-Supplied Data Coordination
* .12 Presentations
 .13 Project Development Scheduling

Phase 4. Design Development Services

*4.01 Project Administration
* .02 Architectural Design Development
* .03 Civil Design Development
* .04 Structural Design Development
* .05 Mechanical Design Development
* .06 Electrical Design Development
 .07 Landscape Design Development
 .08 Interior Design Development
* .09 Outline Specifications
* .10 Statement of Probable Construction Cost
* .11 Agency Consulting/Review/Approval
* .12 Owner-Supplied Data Coordination
* .13 Presentations
* .14 Project Development Scheduling
Phase 5. Construction Documents Services

*5.01 Project Administration
* .02 Architectural Working Drawings
* .03 Civil Construction Documents
* .04 Structural Construction Documents
* .05 Mechanical Construction Documents
* .06 Electrical Construction Documents
 .07 Landscape Construction Documents
 .08 Interior Construction Documents
* .09 Specifications
* .10 Statement of Probable Construction Cost
 .11 Detailed Construction Cost Estimates
* .12 Agency Consulting/Review/Approval
* .13 Owner-Supplied Data Coordination
* .14 Document Checking/Coordination
 .15 Special Bid Documents

Phase 6. Bidding or Negotiations Services

*6.01 Project Administration
* .02 Bidding Documents
* .03 Addenda
* .04 Bidding/Negotiations
* .05 Bid Evaluation
* .06 Construction Contract Agreements
* .07 Agency Consulting/Review/Approval
* .08 Owner-Supplied Data Coordination
 .09 Analysis of Alternates/Substitutions
 .10 Special Bidding Services

Phase 7. Construction Contract Administration Services

*7.01 Project Administration
* .02 Construction Observation
* .03 Shop Drawings/Submittals Review
 .04 Construction Cost Accounting
* .05 Supplemental Documents
 .06 Quotation Requests/ Change Orders
 .07 Testing and Inspection Coordination
* .08 Project/Monitoring Schedule
* .09 Agency Consulting/Review/Approval
* .10 Owner-Supplied Data Coordination
   .11 Full-Time Project Representation
* .12 Project Close-Out
* .13 Civil Engineering
* .14 Structural Engineering
* .15 Mechanical Engineering
* .16 Electrical Engineering
   .17 Landscape Architecture
   .18 Interiors

Phase 8. Post Construction Services

8.01 Project Administration
   .02 Maintenance and Operational Programming
   .03 Start-up Assistance
   .04 Record Drawings
   .05 Warranty Review
   .06 Post-Construction Evaluation

Phase 9. Supplemental Services

9.01 Special Studies
   .02 Computer Applications
   .03 Fine Arts and Crafts
   .04 Non-Building Equipment Selection
   .05 Design of Special Furnishings
   .06 Value Analysis
   .07 Life Cycle Cost Analysis
   .08 Environmental Monitoring
   .09 Presentation Models/Renderings
   .10 Mock-Ups
   .11 Demolition Projects
   .12 Tenant-Related Services
   .13 Graphics
   .14 Energy Studies
   .15 Project Promotion
   .16 Quantity Surveys
GOALS
AND
OBJECTIVES
It is the intent of this project to approach and solve a realistic architectural problem using these comprehensive architectural services to arrive at a feasible design solution. The building type in the project is primarily a business park. In the process of examining each of these services, it becomes obvious that not every service is applicable to this particular project. The services which are applicable will be dealt with in chronological design and construction phases. The process of using the comprehensive architectural services from the inception to the completion of the project is the basis of this terminal project. These comprehensive architectural services as related to this project will be evaluated to determine the success of the use of the services. As previously mentioned, a detailed list of services is in the appendix.
PART TWO
The Clemson community offers much to the residents of the city of Clemson and Pickens County, as well as to the Clemson University student body. A close look, however, reveals one of the more sadly lacking community commodities to be quality office space. It is the intent of this project to explore this need. Skelton Realtors has agreed to act as a client in this project and to cooperate in this capacity as a professional realty and investment company.

The pre-design services begin at the inception of a project. It is in this phase of the project that the architect provides the services necessary to establish the financial, programmatic, and other restraints prior to beginning design. These services include the following:

A. Program administration,
B. Market analysis,
C. Economic feasibility study (including project budgeting estimates), and
D. Facility programming.
Project Administration

Project administration services relate to all administrative functions necessarily undertaken by the architect in providing services during this phase of the owner's project and may include initial consultation in development and project-related research, conferences, correspondence, travel, progress reports, etc. These services do not include general firm management. The project administration as specifically related to the Clemson Business Park is to coordinate and supervise the market analysis, the economic feasibility study, and to determine the facility programming. Included in this is the presentation and recommendations to the client concerning the continuation or termination of the project.

Market Analysis

The intent of this market analysis is to examine the existing and future market in the Clemson area for leasable office space, the availability of tenants, and show the amount of leasable square feet
the market can realistically absorb.

Background Data on Clemson:

The city of Clemson is situated in Pickens County in the northwest portion of South Carolina. Pickens County experienced a 17% growth rate between 1960 and 1970 (28% including the annexation of Clemson University in 1967) compared to an average growth rate of 12% in South Carolina's Appalachian Region or to an 8.7% growth rate for the state as a whole.

Tables 1, 2, and 3 show the projected population growth for Pickens County, the city of Clemson, South Carolina, and Clemson University. These tables show a solid growth pattern in Pickens County. This growth pattern also reflects the growth of neighboring Oconee County.

The average personal income in Pickens County is also on the upswing. These are shown and compared to the average personal income in the state (Table 4).
Table 1. Pickens County Projected Population (3)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>46,030</td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>58,956</td>
<td>28%*</td>
</tr>
<tr>
<td>1975</td>
<td>63,200</td>
<td>7%</td>
</tr>
<tr>
<td>1980</td>
<td>70,500</td>
<td>12%</td>
</tr>
<tr>
<td>1985</td>
<td>78,800</td>
<td>12%</td>
</tr>
<tr>
<td>1990</td>
<td>87,600</td>
<td>11%</td>
</tr>
</tbody>
</table>

*Annexation of Clemson University in 1967 is included.

Table 2. City of Clemson Projected Population Growth (4)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>1,587</td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>5,578</td>
<td>252%*</td>
</tr>
<tr>
<td>1975</td>
<td>6,004</td>
<td>8%</td>
</tr>
<tr>
<td>1980</td>
<td>6,693</td>
<td>11%</td>
</tr>
<tr>
<td>1985</td>
<td>7,486</td>
<td>12%</td>
</tr>
<tr>
<td>1990</td>
<td>8,322</td>
<td>11%</td>
</tr>
</tbody>
</table>

*Annexation of Clemson University in 1967 is included.
Table 3. Clemson University Projected Population Growth (5)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>3,649</td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>7,575</td>
<td>110%</td>
</tr>
<tr>
<td>1975</td>
<td>9,510</td>
<td>24%</td>
</tr>
<tr>
<td>1980</td>
<td>11,105</td>
<td>17%</td>
</tr>
<tr>
<td>1985</td>
<td>13,410</td>
<td>21%</td>
</tr>
<tr>
<td>1990</td>
<td>15,300</td>
<td>14%</td>
</tr>
</tbody>
</table>

Table 4. Average Personal Income in Pickens County Compared to the Average Personal Income in Oconee County and the State (6)

<table>
<thead>
<tr>
<th>Year</th>
<th>Pickens County</th>
<th>Oconee County</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970 Median Dollar Income</td>
<td>$8,114</td>
<td>$7,553</td>
<td>$7,621</td>
</tr>
<tr>
<td>1970 Less than Poverty Level</td>
<td>12.3%</td>
<td>14.9%</td>
<td>19.0%</td>
</tr>
<tr>
<td>1970 Over $15,000 Income</td>
<td>10.6%</td>
<td>6.1%</td>
<td>11.1%</td>
</tr>
</tbody>
</table>

There has been an increase in the per capita income in both Pickens and Oconee Counties between 1960 and 1970 as shown in Table 5.
Table 5. Increase in Per Capita Income in Pickens and Oconee Counties Between 1960 and 1970 (7)

<table>
<thead>
<tr>
<th></th>
<th>1960</th>
<th>1970</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pickens</td>
<td>$1,477</td>
<td>$2,680</td>
<td>81.4%</td>
</tr>
<tr>
<td>Oconee</td>
<td>1,329</td>
<td>2,590</td>
<td>94.9%</td>
</tr>
</tbody>
</table>

Tables 4 and 5 show income trends which illustrate growth in economic self-improvement on the individual level. The dramatic increase in per capita income in both Pickens and Oconee Counties shown here is offset by an almost equally dramatic rate of inflation. However, the economy of this area and the state are stable presently and are expected to continue as such.

Clemson is served by U.S. Highways 123 and 76, and Interstate 85 passes within 12 miles of the city. A main line of Southern Railroad passes through Clemson providing passenger and freight service. Private planes may land at Oconee County Airport which is only two miles from Clemson. Major commercial air passenger service is provided at the Greenville-Spartanburg Jetport. (Figure 6)
As shown, Clemson is readily accessible by rail, highway, and private aircraft. This accessibility indicates that the Clemson area is suitable for a business development which could be a strictly local concern or a home base for a larger state-wide business.

To determine the specific amount of leasable area the market can absorb, professional studies and professional opinions were considered. A Clemson Architectural Foundation publication, Greater Clemson Area Generalized Land Use Plan, forecasts in the planning area there will be one hundred ninety two (192) new commercial enterprises in this area by 1990. Of these, one hundred sixty two (162) are planned. There is no breakdown of these enterprises as to specific type, but this category excludes industrial, public, and quasi-public buildings.

A telephone survey of all the realtors in Clemson and the surrounding area shows that there is only a limited amount of vacant leasable office space. Most of the realtors agree that there is a very good potential market for quality leasable office space.
Another study, A Development Study for a General Office Building in Clemson, S.C., specifically estimates the market demand to be 20,000 square feet of leasable area. The client, Skelton Properties, agrees to this projection in his capacity as a professional developer and realtor. The actual commitments are being handled personally by the client in this project. Included in the rental rate of $5.50/sq.ft./yr. are water, janitorial services, and general maintenance. Gas and electricity are metered separately and not included in the rental rate.

In an analysis of similar projects in the area, the fact becomes clear that the greater part of the office space now available in the Clemson community is presently in the congested, deteriorating, and functionally transitional downtown area. Most of these spaces are either in the basement or on the second floor of retail establishments, and very few have adequate parking or the benefit of expansion room. The only separate major office building is the Patterson-Moore Realty Building on College Avenue. Patterson-Moore
Realty Building is much smaller than this proposal, but it is one of the few which provides ample parking, room for expansion and the expected basic amenities of carpet, proper lighting and a business type atmosphere. Since the completion of this building, it has been fully occupied and is one of the best examples of quality leasable office space in the Clemson area.

Other rental office space is scattered about in shopping areas, including the new Omni Mini-Mall project and in the Foothills Realty private office building. These two recently completed projects provide adequate office rental space with interesting paving patterns, building spaces, and landscaping. It is intended that this proposed project surpass the basic functional requirements, adding amenities and excellent design to justify the increase in rental costs. Rental rates in the area vary presently from $2.00 to $5.50 per square foot per year. The Ravenel Research Building rents for $2.50/square foot/year; Richard Lindsay, AIA, rents for $4.00/square foot/year; Patterson-Moore Realty Building rents for $4.00-$5.00/square foot/year;
Omni Mini-Mall rents for $5.50/square foot/year; and the Fife Realty Company rents office space for $5.00-$5.50/square foot/year.

Preliminary Site Selection Study

Considering the nature of the office space to be leased to general tenants, the most desirable location must be sought out. The choices are by necessity of convenience to complementary services, zoning laws and accessibility by foot and automobile, limited to the commercially zoned or planned commercially zoned areas on College Avenue and U.S. Highway 123, respectively. (Figure 7)

College Avenue runs through the very heart of the city of Clemson; this avenue is the image of the town. Highway 123 is in reality a by-pass developing into a strip commercial shopping area due to improper restrictions of land use. Although the client presently owns land on College Avenue and U.S. Highway 123, the College Avenue property projects the image, due to its location, of an integral and active part of the heart.
of the growing closely-knit community. The College Avenue property is more accessible in terms of walking distances within the city, although both are readily accessible by automobile. It appears at this point that it is strongly logical to pursue the property on College Avenue. (Figure 8)

Economic Feasibility Study

The analysis of the market for leasable office space in Clemson has verified a demand for 20,000 square feet, therefore, a feasibility study is required to determine if it is feasible to build a suitable structure for this purpose.

The piece of property which will be examined in the feasibility study is located on College Avenue in Clemson and presently owned in fee simple by the client. There is the superstructure of the old grocery store on the site at present. (See Site Analysis) In considering the economic feasibility of the project, the very important issue arises whether to renovate the existing superstructure or to demolish the superstructure and
build a suitable structure to accommodate the leasable area. Table 6 shows the preliminary economic feasibility study to renovate the existing structure to yield a return on investment of only 5 percent. The building costs here are $30/square foot and the rent as previously mentioned is $5.50/square foot/year. This superstructure would require re-roofing due to the age of the building, seventeen years. The roof structure would require fire proofing; and extensive foundation work would be required to support an added second floor in the interior space to attain the required square footage of the project.

Table 7 shows the preliminary economic feasibility study to remove the existing structure and build a new complex. Building costs are computed at $20/square foot with an allowance of $3.50/square foot in accordance with 1975 Means Cost Data, and a rental rate of $5.50/square foot/year. This feasibility study yields a return on investment of 8.7 percent for the client as compared to 5 percent return on investment in the renovation study.
Table 6. Preliminary Economic Feasibility Study to Renovate Existing Structure*

<table>
<thead>
<tr>
<th>Land Costs:</th>
<th>$100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvements:</td>
<td></td>
</tr>
<tr>
<td>Building (20,000 sq.ft. @ $30/sq.ft.)</td>
<td>600,000</td>
</tr>
<tr>
<td>Site (10%)</td>
<td>60,000</td>
</tr>
<tr>
<td>Fees (Architect 8%)</td>
<td>48,000</td>
</tr>
<tr>
<td>Interior Finishes (20,000 sq. ft. @ $3.50/sq.ft.)</td>
<td>70,000</td>
</tr>
<tr>
<td><strong>Total Improvements</strong></td>
<td>$778,000</td>
</tr>
<tr>
<td>Income: 20,000 sq.ft. @ $5.50/sq.ft./yr.</td>
<td>$110,000</td>
</tr>
<tr>
<td>- 10% Vacancy Rate</td>
<td>$11,000</td>
</tr>
<tr>
<td><strong>Net Income</strong></td>
<td>$99,000</td>
</tr>
<tr>
<td>Stabilized Expenses:</td>
<td></td>
</tr>
<tr>
<td>Management (4%)</td>
<td>$4,400</td>
</tr>
<tr>
<td>Real Estate Tax (7%)</td>
<td>7,700</td>
</tr>
<tr>
<td>Insurance (3%)</td>
<td>3,300</td>
</tr>
<tr>
<td>Operating Expenses (20%)</td>
<td>22,000</td>
</tr>
<tr>
<td>Replacement Costs (2%)</td>
<td>2,200</td>
</tr>
<tr>
<td><strong>Total Stabilized Expenses</strong></td>
<td>$39,600</td>
</tr>
<tr>
<td>Net Income:</td>
<td>$99,000</td>
</tr>
<tr>
<td>Less Stabilized Expenses</td>
<td>39,600</td>
</tr>
<tr>
<td><strong>Net Income</strong></td>
<td>$59,400</td>
</tr>
</tbody>
</table>

$59,400 ÷ 9.75 (capitalization rate) = $579,150 Economic Value

579,150 x .75 = 434,363 Mortgage Loan

434,363 x .10184 (debt service constant) = 44,235 Annual Debt Service

59,400 - 44,235 = 15,165 Annual Cash Flow

(100,000 + 778,000) - 579,150 = 298,850 Equity Required

15,165 ÷ 298,850 = 5% Return on Investment

*Building costs are $30/square foot and rent is $5.50/square foot/year.
Table 7. Preliminary Economic Feasibility Study to Remove Existing Structure and Build New Complex*

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land Costs:</strong></td>
<td>$100,000</td>
</tr>
<tr>
<td><strong>Improvements:</strong></td>
<td></td>
</tr>
<tr>
<td>Buildings (25,000 sq.ft. @ $20/sq.ft.)</td>
<td>$500,000</td>
</tr>
<tr>
<td>Site (10%)</td>
<td>50,000</td>
</tr>
<tr>
<td>Fees (Architect 6%)</td>
<td>33,000</td>
</tr>
<tr>
<td>Interior Finishes (20,000 sq. ft. @ $3.50/sq.ft.)</td>
<td>70,000</td>
</tr>
<tr>
<td><strong>Income:</strong> 20,000 @ $5.50/sq.ft./year</td>
<td>$110,000</td>
</tr>
<tr>
<td>- 10% Vacancy Rate</td>
<td>11,000</td>
</tr>
<tr>
<td><strong>Stabilized Expense:</strong></td>
<td>$99,000</td>
</tr>
<tr>
<td>Management (4%)</td>
<td>4,400</td>
</tr>
<tr>
<td>Real Estate Tax (7%)</td>
<td>7,700</td>
</tr>
<tr>
<td>Insurance (3%)</td>
<td>3,300</td>
</tr>
<tr>
<td>Operating Expense (20%)</td>
<td>22,000</td>
</tr>
<tr>
<td>Replacement Costs (2%)</td>
<td>2,200</td>
</tr>
<tr>
<td><strong>Net Income:</strong>  Less Stabilized Expenses</td>
<td>$59,400</td>
</tr>
<tr>
<td><strong>$ 59,400 * 9.75 (capitalization rate)</strong></td>
<td>$579,150</td>
</tr>
<tr>
<td>579,150 x .75</td>
<td>434,363</td>
</tr>
<tr>
<td>434,363 x .10184 (debt service constant)</td>
<td>44,235</td>
</tr>
<tr>
<td>(100,000 + 653,000) - 479,150 = 173,850 Equity Required</td>
<td>173,850</td>
</tr>
<tr>
<td>15,165 ÷ 173,850 = 8.7% Return on Investment</td>
<td></td>
</tr>
</tbody>
</table>

*Building costs are $20/square foot and rent is $5.50/square foot/year.
It is strongly recommended to remove the existing structure and proceed with the creation of a desirable business park which will enhance the atmosphere of the business activities in the city of Clemson as well as be a drawing point for future tenants of this project.

The following long term cash flow analysis shows the economic advantages of this project as if it were unaffected by the client's other sources of income (Table 8). The analysis indicates a negative taxable income through the third year. Considering the client's present income level and tax bracket, this development would actually produce a negative taxable income for the client through the seventh or eighth year of operation.

The annual net income has been established at $59,400. Subtract the annual depreciation and the interest payments from the net income to get the taxable income. If the taxable income is negative, the actual tax will be nothing. The actual tax is computed using the taxable income taxed using the Federal Tax Code tax rate on corporations. The tax
Table 8. Long Term Cash Flow Analysis Using 5% Double Declining Balance

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Income</th>
<th>Depreciation</th>
<th>Interest Payment</th>
<th>Taxable Income</th>
<th>Actual Tax</th>
<th>Cash Flow</th>
<th>After Tax Cash Flow</th>
<th>Annual Equity Gain</th>
<th>Total Annual Gain</th>
<th>% Return on Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>59,400</td>
<td>32,650</td>
<td>41,264</td>
<td>-14,514</td>
<td>0</td>
<td>15,165</td>
<td>15,165</td>
<td>11,603</td>
<td>26,768</td>
<td>15.0</td>
</tr>
<tr>
<td>2</td>
<td>59,400</td>
<td>31,018</td>
<td>37,344</td>
<td>-8,962</td>
<td>0</td>
<td>15,165</td>
<td>15,165</td>
<td>13,127</td>
<td>28,292</td>
<td>16.2</td>
</tr>
<tr>
<td>3</td>
<td>59,400</td>
<td>29,467</td>
<td>33,797</td>
<td>-3,864</td>
<td>0</td>
<td>15,165</td>
<td>15,165</td>
<td>14,768</td>
<td>29,933</td>
<td>17.2</td>
</tr>
<tr>
<td>4</td>
<td>59,400</td>
<td>27,835</td>
<td>30,586</td>
<td>979</td>
<td>195</td>
<td>15,165</td>
<td>14,970</td>
<td>16,400</td>
<td>31,370</td>
<td>18.0</td>
</tr>
<tr>
<td>5</td>
<td>59,400</td>
<td>26,601</td>
<td>27,681</td>
<td>5,118</td>
<td>1,623</td>
<td>15,165</td>
<td>13,542</td>
<td>17,634</td>
<td>31,176</td>
<td>17.9</td>
</tr>
<tr>
<td>6</td>
<td>59,400</td>
<td>25,271</td>
<td>25,051</td>
<td>9,078</td>
<td>1,815</td>
<td>15,165</td>
<td>13,350</td>
<td>18,964</td>
<td>32,314</td>
<td>18.6</td>
</tr>
<tr>
<td>7</td>
<td>59,400</td>
<td>24,007</td>
<td>22,671</td>
<td>12,722</td>
<td>2,544</td>
<td>15,165</td>
<td>12,621</td>
<td>20,228</td>
<td>32,849</td>
<td>18.9</td>
</tr>
<tr>
<td>8</td>
<td>59,400</td>
<td>22,867</td>
<td>20,519</td>
<td>16,005</td>
<td>3,201</td>
<td>15,165</td>
<td>11,964</td>
<td>21,368</td>
<td>33,332</td>
<td>19.2</td>
</tr>
<tr>
<td>9</td>
<td>59,400</td>
<td>21,663</td>
<td>18,568</td>
<td>19,169</td>
<td>3,833</td>
<td>15,165</td>
<td>11,332</td>
<td>22,572</td>
<td>33,904</td>
<td>19.5</td>
</tr>
<tr>
<td>10</td>
<td>59,400</td>
<td>20,580</td>
<td>16,804</td>
<td>22,016</td>
<td>4,403</td>
<td>15,165</td>
<td>10,762</td>
<td>23,655</td>
<td>34,917</td>
<td>19.8</td>
</tr>
<tr>
<td>11</td>
<td>59,400</td>
<td>19,511</td>
<td>15,208</td>
<td>24,681</td>
<td>4,936</td>
<td>15,165</td>
<td>10,229</td>
<td>24,724</td>
<td>34,953</td>
<td>20.1</td>
</tr>
<tr>
<td>12</td>
<td>59,400</td>
<td>18,573</td>
<td>13,763</td>
<td>27,064</td>
<td>5,954</td>
<td>15,165</td>
<td>9,211</td>
<td>25,662</td>
<td>34,873</td>
<td>20.1</td>
</tr>
<tr>
<td>13</td>
<td>59,400</td>
<td>17,645</td>
<td>12,456</td>
<td>29,299</td>
<td>6,446</td>
<td>15,165</td>
<td>8,719</td>
<td>26,590</td>
<td>35,309</td>
<td>20.3</td>
</tr>
<tr>
<td>14</td>
<td>59,400</td>
<td>16,763</td>
<td>11,273</td>
<td>31,364</td>
<td>6,900</td>
<td>15,165</td>
<td>8,265</td>
<td>27,472</td>
<td>35,737</td>
<td>20.6</td>
</tr>
<tr>
<td>15</td>
<td>59,400</td>
<td>15,925</td>
<td>10,201</td>
<td>33,274</td>
<td>7,320</td>
<td>15,165</td>
<td>7,845</td>
<td>28,310</td>
<td>36,155</td>
<td>20.8</td>
</tr>
<tr>
<td>17</td>
<td>59,400</td>
<td>14,372</td>
<td>8,355</td>
<td>36,673</td>
<td>8,068</td>
<td>15,165</td>
<td>7,097</td>
<td>29,863</td>
<td>36,960</td>
<td>21.3</td>
</tr>
<tr>
<td>18</td>
<td>59,400</td>
<td>13,654</td>
<td>7,561</td>
<td>38,185</td>
<td>4,400</td>
<td>15,165</td>
<td>6,765</td>
<td>30,581</td>
<td>37,346</td>
<td>21.5</td>
</tr>
<tr>
<td>19</td>
<td>59,400</td>
<td>12,970</td>
<td>6,893</td>
<td>39,587</td>
<td>8,709</td>
<td>15,165</td>
<td>6,456</td>
<td>31,265</td>
<td>37,721</td>
<td>21.7</td>
</tr>
<tr>
<td>20</td>
<td>59,400</td>
<td>12,322</td>
<td>6,193</td>
<td>40,939</td>
<td>9,006</td>
<td>15,165</td>
<td>6,159</td>
<td>31,913</td>
<td>38,072</td>
<td>21.9</td>
</tr>
</tbody>
</table>
rate is 20% on the first $25,000 of taxable income, and 22% on taxable income between $25,000 and $50,000. The 1975 surtax rate on taxable income over $50,000 is 26%. This surtax charge is not applicable to this because the taxable income does not exceed $50,000 annually. Then, subtract the actual tax amount from the cash flow to find the after tax cash flow. The annual principal reduction less any real depreciation, or plus any real appreciation, will yield the annual equity gain. By adding the after tax cash flow to the equity gain, the total annual gain is calculated. To find the percent return on equity, divide the total annual gain by the equity required for the project.

This analysis shows that the project is capable of annually increasing the return on investment at a rate which is financially attractive to the client through the twentieth year at which time the loan will be paid off. After that time, the return on investment will dramatically increase.

Table 9 shows the preliminary construction cash flow chart directly related to the Clemson Business Park.
<table>
<thead>
<tr>
<th>Months</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receipts:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$173,850</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Disbursements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>125,000</td>
<td>125,000</td>
<td>125,000</td>
<td>125,000</td>
</tr>
<tr>
<td>Land</td>
<td>100,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Design and Supervision</td>
<td>26,400</td>
<td>-</td>
<td>-</td>
<td>6,600</td>
</tr>
<tr>
<td>Sitework</td>
<td>10,000</td>
<td>-</td>
<td>-</td>
<td>50,000</td>
</tr>
<tr>
<td>Principal</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Interest</td>
<td>3,257</td>
<td>6,514</td>
<td>9,771</td>
<td>13,028</td>
</tr>
<tr>
<td>Construction Loan</td>
<td>$108,590</td>
<td>$217,180</td>
<td>$325,770</td>
<td>$434,360</td>
</tr>
</tbody>
</table>
Facility Programming

The two following facts have been established:

1. There is a market for 20,000 square feet of leasable office space.

2. It is feasible in today's building market to erect 25,000 square feet gross space (20,000 square feet leasable space at an 80% efficiency rate) to rent for approximately $5.50/square foot/year and expect an 8% return on the investment.

The program will be further developed in the process leading to the actual design of the facility as the site analysis, zoning laws, and site design concepts are further explored.

Project Administration

Project administration services relate to all administrative functions necessarily undertaken by the architect who is providing services during the site analysis phase of the owner's project and may

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CLEMSON, S. C. 29631
include initial site consultation and project related research, conferences, coordination of the work of in-house personnel and outside consultants, correspondence, travel, and progress reports. These services do not include general firm management. The project administration services as directly related to Clemson Business Park include coordination of all information pertaining to the site selection, as well as presentation and recommendations to the client.

Site Analysis

The site proposed for use by the client is already in the client's possession. It is a two and one-half acre parcel of land located on College Avenue between the Astro III Theater and Keowee Trail on the west side of College Avenue. It is approximately four hundred twenty feet (420') deep in the center. Two hundred sixty-seven and nine-tenths feet (267.9') front on College Avenue. The west one-fifth of the property is one foot above Lake Hartwell's full stage mark of six hundred sixty
feet (660'). This area of the site is somewhat marshy and covered by a grove of trees. This grove very effectively screens this strip of commercial area from the single family residences on the water's edge, but prevents a view of Lake Hartwell from ground level near College Avenue.

There is a flowage easement line across the approximate center of the site allowing flowage of water to be diverted to different drains, one on College Avenue and one near the tree line on the north west portion of the property. The site analysis is shown in detail in Figure 9.

The site slopes gradually from College Avenue dropping ten feet to the back of the lot. The west edge of the property joins the U.S. Army Corps of Engineers' strip of land around Lake Hartwell's shoreline.

The soil composition is clay loam and sandy loam consisting of Madison and Cecil types. The field capacity of the top twelve inches of soil is one and four-tenths (1.4") of water; and three
inches (3") of water for the top twenty-four inches of the soil. The soil bearing capacity would have to be determined at this point.

This is the former site of the Winn-Dixie Store, which has moved out to Highway 123. The structure vacated by the Winn-Dixie Store is presently leased on a short-term basis to a concern offering night club type entertainment. This building has 11,250 square feet of floor space and is structurally sound although the interior is in a serious state of disrepair. There is a basement of 1800 square feet at the rear of the building. A local wrecking company estimates the demolition costs to be $2,300 including removal of materials.

The property is presently served by an eight inch (8") sewer main and a six inch (6") water main line. The city of Clemson Maintenance Department is of the opinion that these sewer and water lines can adequately handle a project of this size.

The commercial center of Clemson is expanding this way since it is blocked from expansion on the
three other sides by Lake Hartwell, residential areas, and Clemson University property. The site is presently zoned commercial. There is a front setback depth of seven feet (7') and no side setback is required. There is a rear setback of ten feet (10') and clear and unobstructed to a height of fourteen feet (14') above grade. The maximum heights of buildings in this district shall be sixty-five feet (65') for main structures. The Zoning Ordinance for the city of Clemson also requires one (1) off street parking space for each two hundred fifty square feet (250 sq. ft.) of gross area. Two loading spaces are required. On College Avenue there is a traffic volume of approximately 6,000 cars per day.

Climatological Data for 1974 compiled by Clemson University shows average temperature from 76.8° monthly average in July to a low average of 42.2° in December. The annual average of precipitation is 49.72 inches. The average monthly solar radiation (Langley's) is 314. The winter winds are out of the north and west while the summer winds blow from the north and east.
The prevailing climate is relatively temperate.

The site is within fifteen minutes walking distance of the university and most of the city of Clemson.

The College Avenue property appears at this point to be a very suitable site for the Clemson Business Park. Its location with respect to the expanding town center is encouraging, as is the market analysis and economic feasibility study.

Site Design Concepts

The site slopes gradually from College Avenue to Lake Hartwell dropping ten feet (10') within the property boundaries. The floor level of the present structure is at an elevation of six hundred sixty-nine feet (669'), the basement floor is at an elevation of six hundred sixty-one feet (661'). Considering the demolition of the building, the previously excavated basement, the desire for the creation of attractive interior views, the use of all these existing topographical features is of prime importance in the
conceptual creation of a courtyard-type situation. It will be from this courtyard that the business establishments will have their entrances. The exterior views to the north, south and east are poor thus reinforcing the conceptual idea of the creation of interior views.

The north light is the best light for natural illumination because it provides a constant source of indirect lighting. The orientation of the buildings is directly aligned to take maximum advantage of this natural amenity. This, of course, leaves the other sides of the buildings at somewhat of a disadvantage orientation-wise but an architectural solution using overhangs, screens, and interior devices can rectify this less desirable situation. (Figure 10)

As discussed in the site analysis, the pleasant summer breezes are out of the northeast and the winter winds are out of the northwest which in this particular situation come directly across the lake.

The natural foliage diverts the chilling winter winds, and the orientation of buildings for maximum
advantage of natural light tends to capture the summer winds in the courtyard as well as provide natural ventilation in the buildings where this is desirable to the tenant.

The image of the Clemson Business Park is of extreme importance for obvious reasons. The secondary advantage is the attraction of customers, but the primary reason is the attraction of potential long-term tenants. Considering these factors of topography, interior views, exterior views, solar orientation, the image of a business park and the demand for smaller tenant spaces, a cluster type of arrangement of smaller, totally leasable areas with exterior circulation around a courtyard blends in strongly with the natural environment. The possibility of public exterior circulation would improve the efficiency of the project considerably and add to the activity within the cluster of buildings, intensifying the atmosphere of a business oriented complex.

The other conditions which must be satisfied and blend well with the natural environment are the
conditions created by man. These include vehicular and pedestrian circulation patterns, flowage easement lines, the zoning laws and other surrounding man-made environs. (Figure 9)

The vehicular traffic on College Avenue is six thousand (6,000) vehicles per day. This creates a constant annoyance of noise penetrating the site. To place a buffer zone along College Avenue would cut down this annoyance considerably and visually enhance College Avenue. More importantly, it would compliment the overall appearance of the business park project. The buffer zone could also be integrated very effectively to beautify the primary pedestrian entrance from College Avenue. The Clemson Zoning Ordinance dictates there be one (1) parking space for every two hundred fifty (250) square feet of gross building area. This requirement specifically related to the programmatic requirements calls for one hundred (100) parking spaces and two (2) loading zones. The distribution of the amount of parking is critical on the site. As much as possible, it is
intended to tuck most of the employee parking behind the complex out of view. On the other hand, the visitor or client parking could be arranged in pockets relating to the individual buildings to which they would primarily relate. The concentration of the employee parking on the rear of the site would allow thinning out of the wooded area and allow an attractive view of Lake Hartwell thru the larger trees from the leasable area with western exposures. A cluster type concept of smaller buildings would allow several secondary entrances which could be coordinated with pedestrian drop-off areas. It would be extremely desirable to separate the pedestrian and vehicular traffic as much as possible. The landscaping would be worked in closely with the existing foliage in the wooded area. Extensive landscaping would be required within and around the complex due to the fact that there is absolutely no foliage on the four-fifths of the site on the College Avenue end of the property. The site design concepts are shown in Figure 11.
In conclusion, it is intended that the Clemson Business Park architecturally blend in and work well with the natural and man-made environs to result in a complex which would be financially successful, visually inviting, and an asset to the city of Clemson.

**Project Administration**

Project administration services relate to those administrative functions necessarily undertaken by the architect in providing services during this phase of the owner's project and include project-related research, conferences, correspondence, travel, and progress reports. These services may include coordination of the work of in-house personnel and outside consultants for normal architectural work and for normal civil, structural, mechanical, and electrical engineering disciplines. These services do not include general firm management. As specifically related to the Clemson Business Park, these services entail architectural schematic design, civil design concepts, structural design concepts, mechanical
design concepts, landscape design concepts, interior design concepts, and a preliminary statement of probable costs.

Architectural Schematic Design

It is the intent of this particular phase of development to refine the conceptual ideas to a degree from which the design development may be initiated.

At this point, the cluster type arrangement of buildings has been explored and is being implemented to result in a successful, appealing and inviting business park. The arrangement of this cluster as seen in the site plan takes advantage of the natural amenity of north light by the orientation of each building. (Figure 12) The tree-covered area adjoining the Army Corps of Engineers' property is to be thinned out to allow for the major concentration of employee parking. Hopefully, the smaller trees which are removed may be successfully transplanted in other places on the site to reduce landscaping costs. The building arrangement goes down the slope as seen in
the model photographs. This arrangement of different levels allows barrier free access from the drop-off and loading areas. The level above this provides a barrier free entrance on the College Avenue end of the site. A primary centrally located vertical circulation spine, accessible to all three levels provides a barrier free entrance to every office in the complex. Secondary spines for vertical circulation are scattered in the courtyard and these are simply stairs linking the exterior public circulation walkways to all levels of the complex.

A forty-foot strip of property on College Avenue is proposed to be a buffer zone to screen the noise created by automobiles. This green strip will be a visual asset to the complex as well as enhance the primary pedestrian entrance.

As previously mentioned, the employee parking is concentrated on the rear of the site. The visitor parking is on either side of the complex allowing close access to the secondary entrances between the
buildings. The vehicular circulation pattern is one-way counter-clockwise around the complex with a covered pedestrian drop-off zone near the elevator for convenient access to the vertical circulation spine. From this drop-off point an employee or customer can move about anywhere in the complex, with adequate weather protection. These factors, combined with the overall image of the complex, constitute the schematic architectural solutions for the exterior portion of the project.

The interior image and functional flexibility is as important as the exterior image in the attraction of long term tenants. A proven successful personal working module for leasable office space is a five by five-foot (5'x5') module. This module is used throughout the complex to optimize the leasability of the areas. This, to be later discussed, is integrated successfully with the structural and mechanical systems offering a wide variety of leasable areas according to size. The leasable areas range in size from one office, consisting of one hundred (100) square feet, to an entire floor of one of the larger buildings which is twenty-four
hundred (2,400) square feet. Each of these leasable areas follows the idea of being organized on a 5'x5' personal working space module. The size of the leasable area naturally follows the tenant's demands. In this light, the flexibility of the entire 5'x5' modular system is of extreme importance. This requirement, as shown in the leasable options available in the suggested floor plans, is well provided for. Each of the seven buildings, according to the tenant's demands, could range from entirely open plan space to an entirely separate private office situation. Several of these various options are shown in the floor plans illustrated in the visual presentation of the project.

The programmatic projection of 25,000 square feet gross area at 80 percent efficiency is being seriously challenged in this phase. The use of exterior public circulation tends to increase the net to gross area efficiency ratio. In the schematic phase, this ratio of efficiency is being increased. This will result in a more economical energy consumption situation by not having to climatically control the exterior circulation
ways, although these exterior circulation ways would require adequate maintenance to preserve a neat and orderly appearance to the complex.

In the architectural schematic design phase, the major material selections are usually decided upon. At this point, timber construction is planned for the superstructure shell of all buildings. Appropriate interior materials to achieve desired sound isolation and sound control will be used to produce a quality office complex.

It is in the architectural schematic design phase that the architect obtain the owner's approval to continue or alter the direction of the project. The schematic design services are graphically shown in the floor plans, the building sections, the character sketches, and the model which are in this project shown as finalized drawings in the presentation. These are shown in the visual presentation section of the project.
Civil Design Concepts

As discussed in the site analysis, there are adequate water and sewer mains to link into. An electrical transformer will, by necessity, be provided on site, landscaped into the employee parking area on the edge of the site at the present location of the utility pole. It is planned to run the incoming power lines underground to the complex from this point.

In the schematic design phase of a project, the civil design concepts require interpretation of the necessary building codes and zoning laws. At this point the guidelines set forth in the building codes and zoning laws begin to mesh with the other schematic design services and concepts to yield a building design which is in compliance with the codes and ordinances. These are discussed in greater detail in the design development services.

Structural Design Concepts

The personal working station module of 5'x5' has been expanded to define the structural system. The
standard structural bays in this complex are 10'x10', 10'x15', and 15'x15' timber construction and will meet the building code requirement of 50 pounds per square foot. Due to the scale of the buildings in the complex and the desired character, wood construction at this stage appears very suitable structurally and visually. The walkways as well as the seven buildings will be of wood construction. A more detailed explanation and illustration will occur in the design development and the final presentation drawings.

**Mechanical Design Concepts**

The client plans to retain ownership of the project and desires each floor of each building to be metered and mechanically supplied separately. By using exterior public circulation, it is projected that the project owner will have a very small amount of unleased mechanically conditioned area to compensate for. The separate spaces to be artificially conditioned are on a scale of residential ranges from six hundred square feet to twenty-four hundred square feet. The
power source is electrical. The individual units will be located either on the roofs, or skillfully landscaped out of view. If roof units are to be used, the unit will be located on each building core with consideration for adequate elimination of vibration and noise. The unit size and duct size would be furnished in the design development phase specifically for each of the seven buildings.

Landscape Design Concepts

The site analysis shows that four-fifths of the site is paved with no foliage, and the remaining fifth of the site is covered with trees. By selectively thinning these trees, the employee parking can be tucked away. It is hoped that some of these smaller trees to be removed can be replanted into the landscaping scheme shown in the site plan. For economic reasons, all of the parking on a 90° scheme is planned. It is intended to reach an optimum balance of natural features to man-made features to yield the best possible landscape design solution.
Interior Design Concepts

The division of the interior spaces would result directly from the tenants' demands. Although each interior layout could differ, a high standard of quality would be maintained. As previously mentioned in the preliminary economic feasibility study, $3.50 per square foot has been allotted in the budget for the development of the interior spaces. These design concepts will be more fully explored in the design development phase.

Each building, as shown in the suggested office layouts, has entrances from the external circulation areas. Upon entering, the customer is in a reception area. This space serves as a waiting area, a control point, and a reception station. There is the option available that this reception area become an office space if necessary, but still will remain a control point between the public waiting area and the private offices. Beyond this control point is the internal circulation leading to each office space with the proper utilities supporting the facility.
Statement of Probable Construction Costs

The statement of probable construction cost services relate to the development of a probable cost range for project construction based on updated historic unit cost information and appropriate contingencies. The prices would be in line with U.S. Government Specifications and represent good sound construction. No allowance would be made for overtime. Variations in wage rates, labor efficiency, union restrictions, and material prices would result in local fluctuations. It should be kept in mind that these figures would reflect the schematic stage showing allowances for the various materials, etc., and will be specifically updated in the design development phase. These cost figures would include the contractor's overhead and profit but would not include land costs or architectural fees. The total project budget is the full economic value of the project ($579,150) less the architect's 6 percent fee ($33,000). This figure, the total budget less land costs and architect's fee is $546,150. An average contingency fee of 10 percent
is desirable since there are likely to be future variations in some stages of the project. Thus, the overall project budget is $600,765. The change in square footage costs as determined here would directly influence changes made in the design development phase of the project as a simple matter of economics. The statement of probable costs in the schematic design phase is used as a guideline to obtain the client's approval of the schematic design phase or as a point from which to begin alterations to trim down the costs.

Project Administration

Project administration services relate to those administrative functions necessarily undertaken by the architect in providing the services required during this phase of the owner's project and include project related research, conferences, correspondence, travel, progress reports, etc. These services may include coordination of the work of in-house personnel and outside consultants for normal architectural work for normal civil, structural, mechanical and electrical
engineering disciplines. These services do not include general firm management. The project administration as specifically related to Clemson Business Park is to supervise and coordinate architectural, civil, structural, landscape, and interior design development. Included is a statement of probable costs.

Architectural Design Development

It is the intent of this particular phase of development to bridge the gap between schematic design and construction documents. Assuming the schematic design was approved by the client, the architect refines the design in terms of the building's size, appearance and form. The site design concepts (Figure 8) have at this point been approved and their development is best seen in the visual presentation and three dimensional representation.

Civil Design Development

It is in the civil design development phase that critical decisions are made regarding compliance with
building codes and zoning laws. It is here that the schematic design must be fully integrated with these specific guidelines for the protection of the public. As set forth in the Life Safety Code 1973 by the National Fire Protection Association (NFPA), the general requirements concerning occupancy, number, types, capacity, and arrangement of exits, etc., are specified (Chapter 13, Business Occupancies) in detail and must be strictly adhered to in this design solution.

For purposes of determining required exits, the occupant load of business buildings or parts of buildings used for business purposes shall be no less than one person per 100 square feet of gross floor area. Office occupancy is classified as "light hazard occupancy."

The number of exits required is spelled out in Section 13-2411 as follows:

13-2411. Not less than two exits shall be accessible from every part of every floor, including floor levels below the street floor occupied for office purposes or uses incidental thereto.
Exception No. 1: For a room or area with a total occupant load of less than 100 persons having direct exit to the street or to an open area outside the building at ground level, with a total travel distance from any point of not over 100 feet, a single exit may be permitted. Such travel shall be on the same floor level or, if the traversing of stairs is required, such stairs shall not be more than 15 feet in height, and they shall be provided with complete enclosures to separate them from any other part of the building, with no door openings therein.

Exception No. 2: Any three story building not exceeding 3,000 square feet gross floor area per floor may be permitted with a single stairway to the third floor, if the total travel distance to the outside of the building does not exceed 100 feet, if such stairway does not communicate with any other floor, and if it is fully enclosed or is an outside stairway.

Strict interpretation of these codes allows one exit per floor per building. Section 13-2113 deals with the exit details and is as follows:

13-2113. Where a stairway, escalator, outside stair, or ramp serves two or more upper floors, the same stairway or other exit required to serve any one upper floor may also serve other upper floors.

Section 13-2311 reads as follows to determine the capacity of exits for business occupancies:

13-2311. The minimum width of any corridor or passageway serving as a required exit or means
of travel to or from a required exit shall be 44 inches in the clear.

The travel distance to exits shall be no more than 200 feet. The occupancy of the largest floor is 24 persons, the largest single floor area is 2400 square feet. This low occupancy eliminates the necessity of any manual alarm system or any automatic sprinkler system.

Concerning the discharge from exits, the NFPA requires in Section 13-2711 that the entire area on the floor of discharge is separated from areas below by construction having a minimum of two-hour fire-resistance rating. A manually operated extinguisher of an approved type must be provided on each floor of each building.

In conclusion, the NFPA requires the following for "light hazard occupancy" as directly related to the Clemson Business Park for all buildings, the largest single floor area being 2400 square feet:

1. One access/egress point per floor per building is permissible.
2. The exterior stairs in the complex serve adequately as fire stairs for the buildings in the complex.

3. Minimum corridor width is 44 inches.

4. Construction between floors must have a two-hour fire rating.

5. A manually-operated extinguisher must be provided on all floors of each building.

The construction sequence is investigated and resolved at this time. As seen in the visual presentation section of this project, the proposed CPM for Clemson Business Park outlines the construction activities from obtaining the building permit through the final inspection.

**Structural Design Development**

The personal working station module of 5'x5' has been expanded to define the standard structural system as shown in a typical framing plan (Figure 13). The structural bays are of three sizes: 10'x10', 10'x15',
and 15'x15'. The three major structural components are 8"x8" timber posts, 4"x12" beams, and various size joists. The 4"x12" beams are on the north-south axis to accommodate the solar screening on the south facades of the buildings. The joists in almost all situations run on an east-west axis. The exceptions to both are to adequately support the exterior circulation ways.

**Mechanical Design Development**

It has been established in the schematic design phase that each leasable space be mechanically conditioned, and that the separate floors be metered and mechanically supplied separately. These are the client's demands. The units will be roof-top units and will be located on each building core with consideration for adequate elimination of vibration and noise. The suggested BTUH per square foot for office space is 25 to 65 for the heating load, 350 to 150 square feet per ton; the air quantity delivered for general office space is one to two and one-half cubic feet per minute
per square foot. The requirements will vary according to the glass area in relation to the solid wall area, and will vary according to shading devices, natural or artificial. The planned all air system is a variable volume double duct system with supply ducts feeding each enclosed space with a return in the central corridor. Adequate exhaust from the bathrooms would be required. These are shown in Figure 13. An open plan office layout would necessarily have to be designed so that the duct system would be flexible enough to service a different layout resulting from a change of tenants. The floor area required for mechanical space in these buildings would vary from four to eight percent. The unit size and duct size would be furnished in this phase specifically for each of the seven buildings. It is projected that the use of the solar screening devices result in an average cost reduction of 30 percent. This is achieved by blocking the direct sunlight, thus the radiant heat in the summer months would be used to reduce the cooling load and likewise, in the winter months, the direct sunlight and radiant heat would be used to reduce the heating load. (Figure 10)
As previously stated, the module of 5'x5' is being used here to optimize the leasability and efficiency of the office areas. Accordingly, the lighting layout is also on this module (Figure 13). The standards of illumination level on the work which are now recommended by the Illumination Engineering Society range from 300 lux (30 lm/sq.ft.) for general offices to 600 lux (60 lm/sq.ft.) for drawing offices and business machine operation and 1000 lux (100 lm/sq.ft.) for work which requires greater visual effort. These criteria could be adequately adhered to with the proposed layout which would be the standard layout offered in the lease. Any alterations would be by the tenant. Natural lighting would provide a large share of the necessary illumination as planned and provided for by the orientation of the buildings and the presence of the shading devices on the east, south and west facades of the complex.
Landscape Design Development

The landscape design development is a continuation of the concepts set forth in the schematic design phase. That is to reach an optimum balance of natural features to man-made features to yield the best possible design solution. The planting proposed is to serve several different functions. The buffer zone along College Avenue must cut down noise and be visually appealing. The planting along the north facade will need to provide a relief from glare. The courtyard planting will be required to serve as a ground cover and as an atmosphere-enhancing element. The exact type of planting would be determined at this point. (Figure 14)

Interior Design Development

The standard package offered in the lease to each tenant is a building shell. The specific office layouts generated from the tenants' demands would surface here. As previously mentioned, $3.50 per square foot has been allotted in the budget for the development of these interior spaces.
Statement of Probable Costs

The statement of probable costs in the schematic design phase would be updated and the specific costs calculated. The total cost for the entire building should be close to the low bid and inside the bid range. These figures are again based upon updated historic unit cost information and appropriate contingencies.

The research, concepts, and design of Clemson Business Park to this point has been carried through the design development phase. Here the design is theoretically frozen and the remainder of the job is processed through the remaining phases to completion.

In the construction documents phase, the architect provides services necessary to prepare from the approved design development documents, for approval by the owner, drawings, specifications, and other documents, setting forth in detail the requirements for construction of the entire project.
In the bidding or negotiations phase, the architect, following the owner's approval of the construction documents and the latest statement of probable construction costs, provides those services necessary to assist the owner in obtaining bids or negotiated proposals and in awarding and preparing construction contracts. In the case of phased construction, the owner may authorize bidding and negotiation of portions of the work prior to completion of the construction documents and prior to completion of the construction documents phase statement of probable construction costs.

In the construction contract administration phase, the architect provides administration of the construction contract as set forth in AIA Document B141, Standard Form of Agreement Between Owner and Architect.

In the post-construction phase, the architect provides those services intended to facilitate utilization of the project.

The supplemental services phase is not precisely a phase in the sense that it has no specific sequential
position in the overall work of the architect. The services provided might be performed during any single or several of the eight previous sequential phases. In addition to the supplemental services listed in the Appendix, this phase would include any services not provided for in any other phase and which the architect agrees to perform. One of these might be construction management. Some offices consider construction management a separate discipline; and, therefore, it is not included in this document. Others may offer construction management services and include it in the list of supplemental services.
PART THREE
EVALUATION AND CONCLUSION
As the traditional role of the architect changes, there is an increased demand from the client and society upon the architect. The architect is responding by offering more to the client. This response is an expansion of what the architect already does as a professional, and this response includes additional services taking place before and after design. The design and construction are still the dominant phases and still under the strict auspices of the architect. As the additional services are included in the scope of services, the architect becomes the controlling factor overseeing the early progress of a project. Thus the architect is involved in a project much earlier and is able to act as a decision-making participant. Ideally, the architect would be able to exert proper influence on early project related decisions which would have a tremendous impact on the design itself. This leads to the improvement of architecture through the use of comprehensive architectural services.

There are 117 services in comprehensive architectural services. Of these, only 53 are included in AIA Document
Bl41, Standard Form of Agreement Between Owner and Architect, the 64 other services are not. Some legal problems could arise if proper channels are not followed. The American Institute of Architects is responding to this by offering the legal forms in most cases. Also new accounting procedures and compensation methods must be implemented. This is a change which will take place in time and to the degree required by the firm, large or small.

An obvious disadvantage is that a tremendous amount of knowledge is required by more than doubling the services performed by the architect. Continuing education for the architect is of prime importance as well as necessary consultants to yield a superior product.

Comprehensive architectural services must be approached with a high degree of professional competence reinforcing the continued improvement of the architect and the practice of architecture.
THE TRADITIONAL FIRM

THE COMPREHENSIVE FIRM

COMPREHENSIVE ARCHITECTURAL SERVICES

CLEMSON BUSINESS PARK A STUDY IN COMPREHENSIVE ARCHITECTURAL SERVICES

TERMINAL PROJECT

JOHN L. WILSON
PROJECTED MARKET DEMAND: 20,000 sq.ft.

MARKET ANALYSIS

CLEMSON BUSINESS PARK A STUDY IN COMPREHENSIVE ARCHITECTURAL SERVICES
TERMINAL PROJECT

JOHN L WILSON
LAND COSTS:

$100,000

IMPROVEMENTS:

BUILDINGS

$500,000

SITE [10%] [ARCHITECT 6%]

$50,000

INTERIOR FINISHES [3.5/% sq. ft.]

$33,000

$883,000

FEES

ARCHITECT

6%1

$50,000

$50,000

$33,000

$883,000

INCOME: [20,000 sq. ft. 55.50/sq. ft.]

$110,000

-10% VACANCY RATE

$-11,000

$99,000

STABILIZED EXPENSES:

MANAGEMENT [4%]

$4,400

REAL ESTATE TAX [7%]

7,700

INSURANCE [3%]

3,300

OPERATING EXPENSE [20%]

22,000

REPLACEMENT COSTS [2%]

2,200

$39,600

NET INCOME:

- STABILIZED EXPENSES

$99,000

-39,600

$59,400

$59,400 x 9.75 [CAPITALIZATION RATE] = $578,090 ECONOMIC VALUE

75

434,353 MORTGAGE LOAN

434,353 - 2094 [DEBT SERVICE CONSTANT] = 44,235 ANNUAL DEBT SERVICE

-49,400 - 44,235

100,000 - 653,000 - 479,150

15,165 + 173,850

$59,400 x 9.75 [DEBT SERVICE CONSTANT] = $578,090 ECONOMIC VALUE

8.7% RETURN ON INVESTMENT

$578,090

$579,150

$579,150

$579,150

$579,150

$579,150

$579,150

RETURN ON INVESTMENT: 8.7%

PRELIMINARY ECONOMIC FEASIBILITY STUDY

CLEMSON BUSINESS PARK
A STUDY IN COMPREHENSIVE ARCHITECTURAL SERVICES
TERMINAL PROJECT

JOHN L WILSON
LEGEND

- LEASABLE OFFICE SPACE
- VEHICULAR TRAFFIC
- EXTERIOR STAIRS
- ELEVATOR
- PRIMARY PEDESTRIAN ENTRY
- SECONDARY PEDESTRIAN ENTRY

SITE DESIGN CONCEPTS

VIEW THRU TREES TO LAKE
CONCENTRATION OF EMPLOYEE PARKING
VISUAL IMPACT

SITE PLAN

CLEMSON BUSINESS PARK A STUDY IN COMPREHENSIVE ARCHITECTURAL SERVICES
TERMINAL PROJECT JOHN L WILSON
SECOND FLOOR PLAN

OFFICE LAYOUTS

CLEMSON BUSINESS PARK A STUDY IN COMPREHENSIVE ARCHITECTURAL SERVICES

TERMINAL PROJECT

JOHN L WILSON
CLEMSON BUSINESS PARK A STUDY IN COMPREHENSIVE ARCHITECTURAL SERVICES
TERMINAL PROJECT
JOHN L WILSON
TYPICAL BUILDING SECTION

CLEMSON BUSINESS PARK A STUDY IN COMPREHENSIVE ARCHITECTURAL SERVICES
TERMINAL PROJECT
JOHN L WILSON
CLEMSON BUSINESS PARK  A STUDY IN COMPREHENSIVE ARCHITECTURAL SERVICES

TERMINAL PROJECT  JOHN L WILSON
Clemson Business Park A Study in Comprehensive Architectural Services

Terminal Project John L. Wilson
Aerial View of Courtyard

Primary Pedestrian Entrance

Covered Passenger Drop-Off Zone


4. Ibid., Table 5.

5. Ibid., Table 1.

6. Ibid., Table 6.

7. Ibid., Table 7.
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BIBLIOGRAPHY


LBC&W Associates/Planning and Development Consultants, Zoning Ordinance, City of Clemson, South Carolina, 1971.


INTRODUCTION

The following is a detailed list of comprehensive architectural services from Compensation Management Guidelines for Architectural Services, published by The American Institute of Architects. The services preceded by asterisks on the list designate those services historically considered "Basic Services" under AIA Document B141, Standard Form of Agreement Between Owner and Architect. These services described in detail below are grouped into generally chronological design and construction phases for consistency with groupings used in current AIA documents.
PHASE ONE
PRE-DESIGN SERVICES
PHASE DESCRIPTION

In the Pre-Design Phase the architect provides those services necessary to establish the programmatic, financial and time constraints and requirements for the project prior to beginning design.

LIST OF SERVICES

1.01 Project Administration
   .02 Facility Programming
   .03 Space Schematics/Flow Diagrams
   .04 Project Development Scheduling
   .05 Project Budgeting
   .06 Economic Feasibility Studies
   .07 Agency Consulting/Review/Approval
   .08 Existing Facilities Surveys
   .09 Owner-Supplied Data Coordination
   .10 Presentations
   .11 Marketing Studies
   .12 Project Financing

DESCRIPTION OF SERVICES

1.01 Project Administration services relate to all administrative functions necessarily undertaken by the architect in providing services during
this phase of the owner's project and may include initial consultation in project development and project-related research, conferences, correspondence, travel, progress reports, etc. These services do not include general firm management.

1.02 Facility Programming services relate to establishment of a detailed set of requirements for a proposed facility. This often includes determination of: quantity, size, technical, human, and physical requirements of each type of space; functional interrelationships among spaces; requirements for flexibility and expandability; needs relative to special equipment and systems; and site requirements. Programming may be staged to provide only basic requirements initially, with more detailed requirements established as needed.

1.03 Space Schematics/Flow Diagrams services relate to development of diagrammatic studies and pertinent text relative to: internal functions; human,
vehicle and material flow patterns; and general space allocations. They are customarily developed in collaboration with the owner and may include a detailed analysis of all operating functions and studies of adjacency, circulation and traffic patterns. The studies will normally relate to numbers of personnel; special facilities and equipment requirements; materials handling; flexibility and expandability; and site requirements/constraints.

1.04 Project Development Scheduling services relate to establishing with or for the owner a schedule for overall development of a project. It will usually entail careful determination of the architect's services, the owner's responsibilities and the design and construction procedures to be followed. Scheduling is used to establish a time framework for pre-design services, decision-making, design, documentation and construction. It can reflect overlapping of the various service phases, including design and construction, when appropriate. The
schedule should usually be kept flexible at this early stage, and a contingency to permit schedule adjustment should be incorporated.

1.05 **Project Budgeting** services relate to development of probable costs based on programming and scheduling studies. It usually consists of: conversion of net programmed areas to gross areas, use of factors appropriate to the particular project to develop an initial probable gross area; conversion to a probable construction cost range by application of updated unit cost data from other completed projects with similar requirements; and the addition of estimates of related costs such as site development, landscaping, utilities, furniture, equipment, and design costs. Adjustments in scope of program, quality standards and/or project budget may be required at this time. When the owner has approved a project budget it can be used in economic feasibility studies.
1.06 Economic Feasibility Studies services relate to economic analysis and determination of economic feasibility of a building project. The services may include: estimates of total project cost; project of owning and operating costs; cash flow requirements; return on investment; and probable financing needs. Total project cost estimating will usually include costs of land, construction, furnishings and equipment; compensation for design professionals; interest, insurance and taxes during construction; legal fees, miscellaneous and contingency items. Projecting financial needs includes establishing necessary equity, cash and loan requirements, and expected interest and amortization payments. Cash flow requirements may be projected for the pre-design, design, documentation and construction periods based on the estimated project costs and the project development schedule. Owning and operating cost projections may include both total project cost amortization and operating management costs
including: utilities, maintenance, repairs, replacements, supplies, staff and contracted services. Comparative economic feasibility studies may be needed for alternative design schemes and options for a particular project.

1.07 Agency Consulting/Review/Approval services relate to both governmental and non-government entities which have statutory or non-statutory impact on a proposed project. They may be local, county, regional, state and/or federal agencies having jurisdiction regarding applicable laws, statutes, regulations and codes; or they may be user or community groups with little or no statutory authority but significant influence on approving agencies and individuals. The architect may: do extensive agency consulting, research critical applicable regulations and community attitudes, prepare written and graphic explanatory material, and appear on the owner's behalf at a wide range of agency and community meetings.
1.08 Existing Facilities Surveys services relate to researching, assembling, reviewing and supplementing information for projects involving alterations and/or additions. They may include photographic, measurement and capability surveys of existing facilities and systems. When original construction documents and initial systems design data are available, a building measurement check and a review of the design data may be needed to verify accuracy of original documents and to record any changes from the original.

1.09 Owner-Supplied Data Coordination services relate to reviewing, handling and coordinating data furnished for the project as a responsibility of the owner. Site visits may be needed and the architect's services may include establishing criteria and assisting the owner in arranging for the data. In this phase, acquisition of preliminary and exploratory surface and subsurface site information is a typical activity.
1.10 **Presentations** services relate to presentations, to the owner and closely related groups, of the material and studies prepared under this phase. They may include presentations to individuals, building committees, staff and user committees, boards of directors, groups and individual representing financial interests, and any special consultants retained by the owner.

1.11 **Marketing Studies** services relate to determination of need for and/or the social, economic and political acceptability of a proposed project and may range from a very simple to a highly sophisticated survey of the market. Marketing studies do not apply to all building types but do often apply to non-profit as well as profit-making entities. The service is often provided by consultants and is often required by financial approving entities.

1.12 **Project Financing** services relate to obtaining financing commitments from financing entities.
The service may be provided in its entirety, or the architect may simply assist the owner in preparing and submitting data, including supplementary drawings and documentation, to private and/or public financing institutions. Project financing may include the need for seed money and financing for: interim planning and development; construction; and long term mortgaging.
PHASE TWO
SITE ANALYSIS SERVICES
In the Site Analysis Phase the architect provides those services necessary to establish site-related constraints, requirements and planning for the project. Some of the services will normally be provided during pre-design activities and some during project design. They are grouped here for convenience to identify the site analysis services normally required during the early stages of project development.

LIST OF SERVICES

2.01 Project Administration
  .02 Site Analysis and Selection
  .03 Site Development Planning
  .04 Detailed Site Utilization Studies
  .05 On-Site Utility Studies
  .06 Off-Site Utility Studies
  .07 Environmental Studies and Reports
  .08 Project Budgeting
  .09 Agency Consulting/Review/Approval
  .10 Zoning Processing Assistance
  .11 Owner-Supplied Data Coordination
  .12 Presentations
  .13 Project Development Scheduling
DESCRIPTION OF SERVICES

2.01 **Project Administration** services relate to all administrative functions necessarily undertaken by the architect in providing services during this phase of the owner's project and may include initial site consultation and project-related research, conferences, coordination of the work of in-house personnel and outside consultants, correspondence, travel, progress reports, etc. These services do not include general firm management.

2.02 **Site Analysis and Selection** services relate to the process of analyzing and ultimately selecting a site and basically entail assisting the owner in evaluating sites for a proposed project or locating a site, for the owner, to meet the needs of the proposed facility. Specific operations may include comparative studies of the physical characteristics of alternative sites to test the adequacy of each with regard to the proposed project. Site analysis also usually entails a
detailed study of topographic and subsurface conditions, utilities, zoning and land use requirements, parking and traffic flow regulations, and determination of deed restrictions and any existing or proposed easements, etc. Studies of labor potential, availability of special skills, labor relations and public relations values may also be included.

2.03 Site Development Planning services relate to the preparation of development plans for a site considering land utilization, structures placement and massing, facilities development, development phasing, circulation and utility systems, and parking and landscape forms for the creation of a pre-planned, total environment.

2.04 Detailed Site Utilization Studies services relate to more detailed analysis of a particular site than is needed under site development planning and may be necessary to develop the full
utilization capability of the site and to determine optimum location of facilities. Activities within this service heading may include: a review of existing conditions and site information, a soils report, and research of all code and planning requirements to establish all facility locations, grounds improvements and landscaping concepts needed to prepare site development drawings.

2.05 **On-Site Utility Studies** services relate to development studies of all on-site utility requirements to determine practical and economical solutions prior to preparing for design review, engineering and final working drawings. These may include electrical service and distribution, sewer and storm collection and drainage, water supply and distribution, fire control and alarm, emergency lighting, security, air conditioning, pollution control, site illumination and telephone service. Where master planning for future development is needed, preliminary selection and routing of
utility systems may be included under this service heading.

2.06 Off-Site Utility Studies relate to confirming the location and size and determining the adequacy of all existing utilities serving the building site, and determining the cost and physical requirements for making connection thereto in preparation for engineering design and working drawings. Design of separate off-site utilities facilities would normally not be included under this service heading.

2.07 Environmental Studies and Reports services relate to obtaining approval of environmental agencies and may include: determination of the need and/or requirements for environmental monitoring, assessment and/or impact reports; preparation of reports in accordance with the requirements of governing authorities; attendance at hearings and presentations if needed; and general follow-through of processing. Environmental monitoring
is considered a supplemental service included under Phase 9 of the scope of services.

2.08 **Project Budgeting** services relate to development of probable site development costs based on programming and scheduling studies. A probable construction cost range is usually developed by application of updated unit cost data from other completed projects with similar requirements. It normally includes estimates of such costs as on-site utilities, utilities connections, drainage, roads and paving, site lighting, lawn and landscaping work and site furniture. Adjustments in scope of program, quality standards and/or project budget may be required at this time.

2.09 **Agency Consulting/Review/Approval** services relate to both governmental and non-governmental entities which have statutory or non-statutory impact relative to site analysis on a proposed project. They may be local, county, regional, state and/or
federal agencies having jurisdiction regarding applicable laws, statutes, regulations and codes; or they may be user or community groups with little or no statutory authority but significant influence on approving agencies and individuals. The architect may: do extensive agency consulting, research critical applicable regulations and community attitudes, prepare written and graphic explanatory material, and appear on the owner's behalf at a wide range of agency and community meetings.

2.10 **Zoning Processing Assistance** services relate to changes of variances in zoning as opposed to normal zoning research and compliance. The architect may assist the owner in preparing applications for adjustments, variances, or use permits with supporting data and evidence that the project will be constructed in accordance with designated requirements. Specific activities may include: assistance in preparation of petition for rezoning,
when indicated; attendance at hearings; presentations, if requested or required; and assistance in application and presentation of appeal, if required.

2.11 **Owner-Supplied Data Coordination** services relate to reviewing, handling and coordinating data furnished for the project as a responsibility of the owner. Site visits will usually be needed and the architect's services could include establishing criteria and assisting the owner in arranging for the data. In this phase, acquisition of detailed surface and subsurface site information is a typical activity.

2.12 **Presentations** services relate to presentations, to the owner and closely related groups, of the material and studies prepared under this phase. It may include presentations to individuals, building committees, staff and user committees, boards of directors, groups and individuals
representing financial interests, and any special consultants retained by the owner.

2.13 **Project Development Scheduling** services in this phase relate primarily to establishing with or for the owner a schedule for overall site development of a project. It will usually entail careful determination of the architect's services, the owner's responsibilities and the design and construction procedures to be followed. Scheduling is used to establish a time framework for pre-design services, decision making, design, documentation and construction. It can reflect overlapping of the various service phases, including design and construction, when appropriate. The schedule should usually be kept flexible at this early stage, and contingency to permit schedule adjustment should be incorporated. If a project development schedule was established under Pre-Design Phase services it may require updating as part of the Site Analysis Phase services.
PHASE THREE
SCHEMATIC DESIGN SERVICES
PHASE DESCRIPTION

In the Schematic Design Phase the architect provides those services necessary to prepare Schematic Design Studies consisting of drawings and other documents illustrating the scope and relationship of project components for approval by the owner. Designs are normally conceptual in character and are based on the requirements developed under previous phases and approved by the owner and/or provided directly by the owner and reviewed and confirmed by the architect.

LIST OF SERVICES

*3.01 Project Administration
* .02 Architectural Schematic Design
* .03 Civil Design Concepts
* .04 Structural Design Concepts
* .05 Mechanical Design Concepts
* .06 Electrical Design Concepts
 .07 Landscape Design Concepts
 .08 Interior Design Concepts
* .09 Statement of Probable Construction Cost
* .10 Agency Consulting/Review/Approval
* .11 Owner-Supplied Data Coordination
* .12 Presentations
 .13 Project Development Scheduling

DESCRIPTION OF SERVICES

*3.01 Project Administration services relate to those administrative functions necessarily undertaken by the architect in providing services during
this phase of the owner's project and include project-related research, conferences, correspondence, travel, progress reports, etc. These services may include coordination of the work of in-house personnel and outside consultants for normal architectural work and for normal civil, structural, mechanical and electrical engineering disciplines. Coordination of the work of other disciplines should be included in the appropriate line item. These services do not include general firm management.

*3.02 Architectural Schematic Design services relate to initial physical representations responding to the requirements of the program and normally include simplified site and building plans, vertical sections, elevations and perspective sketches or other three-dimensional representations to obtain the owner's approval. Preliminary material selections may be made at this time. Development of approximate dimensions permits calculation of
gross areas and volumes based on physical planning for comparison with programmed gross areas.

*3.03 Civil Design Concepts services relate to development of initial basic solutions for on-site utility systems, fire protection systems and drainage systems for consideration of alternatives. The systems selected are normally developed in sufficient detail to permit coordination with building and landscape design and preparation of specific cost projections.

*3.04 Structural Design Concepts services relate to development of initial basic structural design concepts to determine the specific structural system(s) appropriate for the project. Preliminary designs are often developed for consideration of alternatives. The designs selected are normally developed in sufficient detail to permit coordination with other building elements and to allow preparation of specific cost projections.
*3.05 Mechanical Design Concepts services relate to development of initial basic mechanical design concepts to determine the specific heating, ventilating, air conditioning and plumbing systems appropriate for the project. Preliminary designs are developed for consideration of alternatives. The systems selected are normally developed in sufficient detail to permit coordination with other building elements and to allow preparation of specific cost projections.

*3.06 Electrical Design Concepts services relate to development of initial basic electrical design concepts to determine the specific power service and distribution systems, lighting, telephone, fire detection and alarm, security and electronic communications systems appropriate for the project. The designs selected are normally developed in sufficient detail to permit coordination with other building elements and to allow preparation of specific cost projections.
3.07 Landscape Design Concepts services relate to the development and coordination of landscape design concepts entailing analyses of natural, physical and social determinants. Studies usually include locations of planting, amenities and ground improvements.

3.08 Interior Design Concepts services relate to development and coordination of interior design concepts through studies of all interior spaces based on programmed usage, economic considerations and compatibility with the architectural concepts.

*3.09 Statement of Probable Construction Cost services relate to development of a probable cost range for project construction based on updated historic unit cost information and appropriate contingencies. Sources of data may be the architect's records of previous similar projects, published data or data banks with broad based professional input. The data may be expressed in overall probable area
or volume cost or in unit costs per area, volumes or building elements. Cost projections will normally reflect the current project schedule and the latest schematic design studies. Adjustments in facilities, quality standards and/or project budget may be needed at this time.

*3.10 Agency Consulting/Review/Approval services in this phase relate primarily to governmental entities which have statutory impact on a proposed project. They may be local, county, regional, state and/or federal agencies having jurisdiction regarding applicable laws, statutes, regulations and codes. The architect may: do extensive agency consulting, research critical applicable regulations, prepare written and graphic explanatory material, and appear on the owner's behalf at agency meetings.

*3.11 Owner-Supplied Data Coordination services relate to reviewing, handling and coordinating data
furnished for the project as a responsibility of the owner. Specialized health care, research, educational, process and manufacturing equipment are examples under this phase.

*3.12 Presentations services relate to presentations, to the owner and closely related groups, of the material and studies prepared under this phase. They may include presentations to individuals, building committees, staff and user committees, board of directors, groups and individuals representing financial interests, and any special consultants retained by the owner.

3.13 Project Development Scheduling services in this phase primarily to a review and updating of previously established project schedules. If schedules were not established earlier, they would be set in this phase.
In the Design Development Phase the architect provides those services necessary to prepare from the approved Schematic Design Studies for approval by the owner, the Design Development Documents consisting of drawings and other documents which fix and describe the size and character of the entire project.

**LIST OF SERVICES**

*4.01* Project Administration  
* .02 Architectural Design Development  
* .03 Civil Design Development  
* .04 Structural Design Development  
* .05 Mechanical Design Development  
* .06 Electrical Design Development  
* .07 Landscape Design Development  
* .08 Interior Design Development  
* .09 Outline Specifications  
* .10 Statement of Probable Construction Cost  
* .11 Agency Consulting/Review/Approval  
* .12 Owner-Supplied Data Coordination  
* .13 Presentations  
* .14 Project Development Scheduling

**DESCRIPTION OF SERVICES**

*4.01* Project Administration services relate to those administrative functions necessarily undertaken by the architect in providing the services required during this phase of the owner's project and include project-related research, conferences, correspondence, travel, progress reports, etc.
These services may include coordination of the work of in-house personnel and outside consultants for normal architectural work and for normal civil, structural, mechanical and electrical engineering disciplines. Coordination of the work of other disciplines should be included in the appropriate line item. These services do not include general firm management.

*4.02 Architectural Design Development services relate to more detailed development and expansion of the architectural design in terms of the building's size, appearance and form, and coordination with engineering systems, through sketches and/or three-dimensional studies and two-dimensional drawings of plans, elevations, sections, and certain critical construction details. Major materials selections are normally made at this time.
*4.03 Civil Design Development services relate to development of on-site utility systems, fire protection systems and drainage systems in sufficient detail to permit close coordination with building and landscape design and to allow preparation of refined cost projections. Consideration is usually given to availability of materials and labor, construction sequence and scheduling, economic trade-offs, safety and maintenance requirements.

*4.04 Structural Design Development services relate to development of the specific structural system(s) in sufficient detail to permit preliminary sizing of major components and establishment of clearances, and to allow preparation of preliminary structural plans, sections and refined cost projections. Consideration is usually given to availability of materials and labor, access to site, construction schedule and economic trade-offs.
*4.05 Mechanical Design Development services relate to development of the specific heating, ventilating, air conditioning and plumbing systems in sufficient detail to permit preliminary sizing of major components; establishment of required equipment areas, chases and clearances; and preparation of diagrammatic plans, sections, riser diagrams, equipment layouts and refined cost projections. Consideration is usually given to availability of components, construction sequence and scheduling, economic trade-offs, acoustical and vibration control, safety and maintenance requirements.

*4.06 Electrical Design Development services relate to development of the specific power service and distribution systems, lighting, telephone, fire detection and alarm, security and electronic communications systems in sufficient detail to permit preliminary sizing of major components; establishment of required equipment areas, chases
and clearances; and preparation of diagrammatic plans, sections, riser diagrams, equipment layouts and refined cost projections. Consideration is usually given to availability of components, construction sequence and scheduling, economic trade-offs, safety and maintenance requirements.

4.07 Landscape Design Development services relate to development and coordination of scope and location of all ground improvements, amenities and planting closely coordinated with building placement. Designs are usually sufficiently developed to permit refined cost projections.

4.08 Interior Design Development services relate to development and coordination of interior designs based on programmed usage, economic considerations and compatibility with the architectural development. They may include finish materials selection, furniture and equipment layouts, sound attenuation and basic color palette and are normally based on
plans, elevations, schedules, sketches and material samples. Designs are usually sufficiently developed to permit refined projections of cost for items in general construction and interiors installation contracts.

*4.09 Outline Specifications services relate to development of an itemized list of major components of each section of the specifications, including the General and Supplementary Conditions of the Contract, and reflecting initial materials and systems selections.

*4.10 Statement of Probable Construction Cost services relate to development of a refined probable cost range for project construction through updating of the Schematic Design Phase statement of probable construction cost, taking into account such information developed during this phase as availability of material and labor and construction sequence and scheduling. Adjustments in facilities,
quality standards and/or project budget may be needed at this time.

*4.11 Agency Consulting/Review/Approval services in this phase relate primarily to governmental entities which have statutory impact on a proposed project. They may be local, county, regional, state and/or federal agencies having jurisdiction regarding applicable laws, statutes, regulations and codes. The architect may: do extensive agency consulting, research critical applicable regulations, prepare written and graphic explanatory material, and appear on the owner's behalf at agency meetings.

*4.12 Owner-Supplied Data Coordination services relate to reviewing, handling and coordinating data furnished for the project as a responsibility of the owner. Specialized health care, research, education, process and manufacturing equipment requirements are examples under this phase.
*4.13 Presentations services relate to presentations, to the owner and closely related groups, of the material and studies prepared under this phase. They may include presentations to individuals, building committees, staff and user committees, boards of directors, groups and individuals representing financial interests, and any special consultants retained by the owner.
PHASE DESCRIPTION

In the Construction Documents Phase the architect provides services necessary to prepare from the approved Design Development Documents, for approval by the owner, drawings, specifications and other documents setting forth in detail the requirements for construction of the entire project.

LIST OF SERVICES

*5.01  Project Administration
  * .02  Architectural Working Drawings
  * .03  Civil Construction Documents
  * .04  Structural Construction Documents
  * .05  Mechanical Construction Documents
  * .06  Electrical Construction Documents
  .07  Landscape Construction Documents
  .08  Interior Construction Documents
  * .09  Specifications
  * .10  Statement of Probable Construction Cost
  .11  Detailed Construction Cost Estimates
  * .12  Agency Consulting/Review/Approval
  * .13  Owner-Supplied Data Coordination
  * .14  Document Checking/Coordination
  .15  Special Bid Documents

DESCRIPTION OF SERVICES

*5.01  Project Administration  services relate to those administrative functions necessarily undertaken by the architect in providing services during this phase of the owner's project and include project-related research, conferences,
correspondence, travel, progress reports, etc. These services may include coordination of the work of in-house personnel and outside consultants for normal architectural work and for normal civil, structural, mechanical and electrical engineering disciplines. Coordination of the work of other disciplines should be included in the appropriate line item. These services do not include general firm management.

*5.02 Architectural Working Drawings services relate to preparation of civil working drawings to represent graphically those features dealing with on- and off-site improvements such as utilities, roadways, bridges, culverts, drainage, grading, excavation, compaction, shoring, underpinning, retaining walls, parking lots and fire systems. The services usually include both the engineering calculations which establish the size, shape, dimensions and capacity of the work involved, and careful coordination with landscape,
mechanical, electrical, structural and architectural drawings.

*5.04 Structural Construction Documents services relate to preparation of structural working drawings in concert with the architectural working drawings, which present graphically the complete structural concept of the project and include details, schedules, notes and information necessary to facilitate construction. The services usually include both the preparation of engineering calculations, which establish the size, dimensions and capacity of foundations, structural reinforcing walls, columns, beams, floor and roof structure, and careful coordination with mechanical, electrical, civil and architectural drawings.

*5.05 Mechanical Construction Documents services relate to preparation of detailed engineering calculations and drawings for heating, ventilating, air conditioning, plumbing work and building fire
protection systems related to the approved architectural design and engineering analysis in order to establish the size, shape, dimensions and capacity of the various elements involved. Mechanical working drawings services usually include plans, sections, details, schedules, diagrams and notes as necessary to construct the mechanical work, and careful coordination with the structural, civil, electrical and architectural drawings to insure proper clearances and location for all ductwork, piping, support and equipment as necessary.

*5.06 Electrical Construction Documents services relate to preparation of detailed engineering calculations and drawings for electrical work entailed by the approved architectural design and engineering analysis in order to establish the size, location and capacity of the various elements involved. Electrical systems may include power acquisition and generation (on- and off-site), major power
distribution, interior and exterior lighting, telephone and communication systems, low voltage systems, direct current applications, and emergency and special effects lighting. Electrical working drawings services usually include plans, sections, details, schedules, diagrams and notes as necessary to construct the electrical work, and careful coordination with mechanical, structural, civil and architectural drawings for proper location of electrical outlets, fixtures, panels, switchgear, equipment and appurtenances.

5.07 Landscape Construction Documents services relate to preparation and coordination of landscape working drawings from approved Design Development Phase documents for all ground improvements, amenities, planting and irrigation systems. Calculations necessary to establish the size, shape, dimensions and capacity of the work involved are usually included.
5.08 Interior Construction Documents services relate to preparation and coordination of detailed interior working drawings to represent graphically, usually with plans, sections, details, schedules, and notes, all information necessary to provide interior services.

5.09 Specifications services relate to assistance in review of general conditions of the contract for construction, which are normally standardized provisions of the construction contract describing the rights, responsibilities and relationships of parties to the contract and the related duties and responsibilities of the architect; preparation of supplementary conditions, which may be written to modify or extend the general conditions as the special requirements or location of the project may indicate or as may be required by the owner and legal counsel or by regulatory agencies having jurisdiction over the project; and preparation of specifications, which are written
requirements complementing the working drawings to amplify and further describe materials, systems, methods of construction, performance, and quality to be obtained and tests to verify performance of all the components of the project. Included with these services may be assistance in developing bidding documents which describe the time, place and conditions of bidding and the form of bonds and agreements to be executed by the contractor(s) and the owner.

*5.10 Statement of Probable Construction Cost services relate to updating, when the construction documents are approximately 90 percent complete, of the statement of probable construction cost prepared at completion of the Design Development Phase in order to reflect changes in materials, systems or details of construction which have been effected during the preparation of construction documents. Adjustments are usually also made for known changes in the cost of
materials, labor and services vs. those allowed for in the previous statement of probable construction cost. Adjustments may also be made for known or anticipated changes in the bidding market for the project.

5.11 Detailed Construction Cost Estimates services relate to development, when the working drawings and specifications are approximately 90 percent complete, of a detailed final statement of probable construction cost, which may include alternative adjustments for the project and which is normally based on estimates of the quantity and cost of all materials, labor, tools, equipment and services needed for the work. To this total direct cost is added an estimate of the contractor's overhead, estimates of the cost to comply with the General and Supplementary Conditions, a reasonable contingency, and an allowance for the contractor's profit. The detailed construction cost estimate serves as a check on
the budget payments and evaluation of future contract modifications. This service is usually furnished by a special consultant and replaces the updated statement of probable construction cost. Coordination, research and computation by the architect is normally needed.

*5.12 Agency Consulting/Review/Approval services in this phase relate primarily to governmental entities which have statutory impact on a proposed project. They may be local, county, regional, state and/or federal agencies having jurisdiction regarding applicable laws, statutes, regulations and codes. The architect may: do extensive agency consulting, research critical applicable regulations, prepare written and graphic explanatory material, and appear on the owner's behalf at agency meetings.

*5.13 Owner-Supplied Data Coordination services relate to reviewing, handling and coordinating data
furnished for the project as a responsibility of the owner. Specialized health care, research, educational, process and manufacturing equipment are examples under this phase.

*5.14 Document Checking/Coordination services relate to reviewing all input from architectural, engineering and related disciplines and checking all contract documents for compliance with project scope, accuracy and interface among disciplines.

5.15 Special Bid Documents services relate to preparation and coordination of special drawings and specifications for alternate bid proposals as may be needed when the owner wishes to insure a bid within a limited appropriation. Alternate bid documents may cover changes in material quality, finishes or equipment and areas to be added to or deleted from the project. Special drawings and specifications
for advanced bid proposals may be needed when
the owner wishes to occupy the new building at
the earliest possible date. Advanced bid
documents may cover sub-contracts for site pre-
paration, foundation or structural steel con-
tracts to permit fast-tracking or phased con-
struction while the architect is completing the
contract documents. Special drawings and
specifications for segregated bid proposals may
be needed when the owner wishes to order certain
mechanical equipment, furniture, fixtures, or
technical services prior to the receipt of bids
from the prime contractors.
PHASE SIX
BIDDING OR NEGOTIATIONS SERVICES
In the Bidding or Negotiations Phase the architect, following the owner's approval of the construction documents and of the latest statement of probable construction cost, provides those services necessary to assist the owner in obtaining bids or negotiated proposals and in awarding and preparing construction contracts. In the case of phased construction the owner may authorize bidding and negotiation of portions of the work prior to completion of the construction documents and prior to completion of the Construction Documents Phase statement of probable construction cost.

*6.01 Project Administration
* .02 Bidding Documents
* .03 Addenda
* .04 Bidding/Negotiations
* .05 Bid Evaluation
* .06 Construction Contract Agreements
* .07 Agency Consulting/Review/Approval
* .08 Owner-Supplied Data Coordination
* .09 Analysis of Alternates/Substitutions
* .10 Special Bidding Services

*6.01 Project Administration services relate to those administrative functions necessarily undertaken
by the architect in providing services during this phase of the owner's project and may include project-related research, conferences, coordination of the work of in-house related research, conferences, coordination of the work of in-house personnel and outside consultants, correspondence, travel, progress reports, etc. These services do not include general firm management.

*6.02 Bidding Documents services relate to assistance in organizing bidding documents and may include the review, checking and reproduction of all the general bidding documents, such as the invitation to bid, instructions to bidders, proposal forms, the conditions of the contract (general, supplementary and other conditions), the working drawings, the specifications, and an example of the agreement form. Bid security requirements, performance bonds and labor and material payment bonds requirements may be included.
*6.03 Addenda services relate to preparation and
distribution of addenda documents as may be
needed during bidding and may include supple-
mentary drawings, specifications, instructions
and notices of any changes in bidding procedures.

*6.04 Bidding/Negotiations services relate to the
bidding and/or negotiation process and may
include prequalifying bidders, issuing copies
of the bidding documents, maintaining records of
documents issued, handling of document deposits
required of prospective bidders, receiving and
responding to questions from bidders, partici-
pation in bidders conference, attending bid
opening, recovering documents from unsuccessful
bidders, and checking and repair of documents
sets for use in construction.

*6.05 Bid Evaluation services relate to bid evaluation,
which may include consultation with the owner
subsequent to the receipt of bids, certification
of bids if needed, recommendations on award of contract(s), and participation in post-bidding negotiations between the owner and the successful bidder.

*6.06 Construction Contract Agreements services relate to assisting in the final preparation of the construction contract agreement(s) and may include notifying the successful contractor(s) of award of contract; drafting owner-contractor agreement form(s) for review and approval by the owner's attorney, providing complete sets of the contract documents for signature and distribution to the owner and the contractor(s); receiving certificates of the required insurance and bonds; and notifying the contractor(s) to proceed with the work.

*6.07 Agency Consulting/Review/Approval services in this phase relate primarily to governmental entities which have statutory impact on a
proposed project before construction begins. They may be local, county, regional, state and/or federal agencies having jurisdiction regarding applicable laws, statutes, regulations and codes. The architect may: do extensive agency consulting, research critical applicable regulations, prepare written and graphic explanatory material, and appear on the owner's behalf at agency meetings. There may be a similar need for dealings with non-governmental entities such as community and user groups to assure that updated and accurate information is available before construction begins.

*6.08 Owner-Supplied Data Coordination services relate to reviewing, handling and coordinating data furnished for the project as a responsibility of the owner. Specialized construction arrangements, procedures and bidding requirements are examples under this phase.
6.09 Analysis of Alternates/Substitutions services relate to consideration, analysis and recommendations of proposed alternates or substitutions prior or subsequent to receipt of bids or conducting negotiations for the purpose of determining a final basis for the construction contract(s) award.

6.10 Special Bidding Services relate to providing any additional contract documents over and above those required for normal bidding procedures when phased construction, systems bidding/building and similar procedures are used.
PHASE SEVEN
CONSTRUCTION CONTRACT ADMINISTRATION SERVICES
In the Construction Contract Administration Phase the architect provides administration of the construction contract as set forth in AIA Document B141, Standard Form of Agreement Between Owner and Architect.

**LIST OF SERVICES**

*7.01 Project Administration
*.02 Construction Observation
*.03 Shop Drawings/Submittals Review
*.04 Construction Cost Accounting
*.05 Supplemental Documents
*.06 Quotation Requests/Change Orders
*.07 Testing and Inspection Coordination
*.08 Project/Monitoring Schedule
*.09 Agency Consulting/Review/Approval
*.10 Owner-Supplied Data Coordination
*.11 Full-Time Project Representation
*.12 Project Close-Out
*.13 Civil Engineering
*.14 Structural Engineering
*.15 Mechanical Engineering
*.16 Electrical Engineering
*.17 Landscape Architecture
*.18 Interiors

**DESCRIPTION OF SERVICES**

*7.01 Project Administration services relate to those administrative functions necessarily undertaken by the architect in providing services during this phase of the owner's project and include project-related research,
conferences, correspondence, travel, progress reports, etc. These services may include coordination of the work of in-house personnel and outside consultants for normal architectural work and for normal civil, structural, mechanical and electrical engineering disciplines. Coordination of the work of other disciplines should be included in the appropriate line item. These services do not include general firm management.

*7.02 Construction Observation services usually include periodic visits to the site to generally monitor the progress and quality of the work and to determine in general if the work is proceeding in accordance with the contract documents. Based on observations made at the site and on the contractor's applications for payment, the amount owing to the contractor may be determined and certificates for payment in such amounts issued.
7.03 Shop Drawings/Submittals Review services usually include receipt, review, and comment on all shop drawings, samples, material submittals and other submittals required by the contract documents; review with the owner of items of particular interest to the owner; provision of copies to full-time project representative; return of copies to the contractor, properly marked as to their disposition and status; and verification that changes required are actually effected.

7.04 Construction Cost Accounting services relate to monitoring and administration of construction cost accounting and may include maintenance of records on the cost of the construction and all changes (additions and deductions) thereto, evaluation of the amount owed to the contractor based on the progress of construction and payments certified theretofore, and adjustments for unsatisfactory or uncorrected work. The complexities of construction cost accounting increase
as the construction contract arrangements vary from single to multiple contracts and lump sum to unit price to "cost-plus." This service encompasses only the exercise of judgment relative to the value of work performed. It does not include verification that the contractor has paid sub-contractors, material suppliers or workmen.

*7.05 Supplemental Documents services relate to responsibilities for supplemental documents and usually include receipt and processing of requests from the contractor(s) for clarifications of the contract documents (including errors and/or omissions in the documents); modifications required by construction exigencies; consultation with and advice to the owner on those matters which may affect the utilization of the project, extra cost or additional time; and issuance of the appropriate instructions to the contractor or modifications to the contract documents.
7.06 **Quotation Requests/Change Orders** services relate to administration, preparation and issuance of necessary drawings and specifications to describe work to be added, deleted or modified; review of contractors' proposal and detailed breakdowns of quantities of labor and materials and their costs for general accuracy of quotations; review for general validity of any changes in contract completion time; recommendations to the owner to accept, reject or question quotations; negotiations with contractors; securing of the owner's approval to act on the modifications; and preparation of appropriate documents to modify owner-contractor agreements.

7.07 **Testing and Inspection Coordination** services relate to testing and inspection coordination and administration, and may include making arrangements, on behalf of the owner, for independent testing and inspection agencies to perform those services, either specified
or required, which the owner will pay for; de-
termining (and informing those agencies) what
materials or procedures are to be tested and/or
inspected and the frequency thereof; establishing
a procedure for notification of the agencies as
to when their services are required; ascertaining
whether those services are being performed; and
reviewing the reports generated thereby for
compliance with the requirements of the contract
documents of the materials or procedures. The
architect does not conduct technical tests and
inspections or make arrangements for those which
are to be paid for by the contractor or to be
made by governmental agencies having jurisdiction.
The architect usually reviews any reports gener-
ated by the same for compliance with the require-
ments of the contract documents.

*7.08 Project/Monitoring Schedule services relate to
monitoring the progress of construction rela-
tive to an established schedule, the maintenance
of the schedule by the contractor(s), and the reporting of such information to the owner. When required due to multiplicity of contracting parties or complexity or scope of the project, these services may include monitoring relative to all entities involved in the construction process and the reporting required to coordinate the work and services of all parties with the master project schedule. Integration of this information with construction disbursements and project cash flow may also be included.

*7.09 Agency Consulting/Review/Approval services in this phase relate primarily to governmental entities which have statutory impact on the project. They may be local, county, regional, state and/or federal agencies having jurisdiction regarding applicable laws, statutes, regulations and codes. The architect may: do extensive agency consulting, research critical applicable regulations, prepare written and graphic
explanatory material, and appear on the owner's behalf at agency meetings.

*7.10 Owner-Supplied Data Coordination services relate to reviewing, handling and coordinating data furnished for the project as a responsibility of the owner. Specialized health care, research, educational, process and manufacturing equipment are examples under this phase, as well as specialized construction arrangements and procedures.

7.11 Full-Time Project Representation services relate to the need on some projects for the architect to be represented at the project site on a full-time basis. If authorized, the architect's service includes selection, employment, and direction of such a representative. The duties, responsibilities and limitations of authority of the full-time project representative should be set forth in an exhibit appended to the Owner-Architect Agreement and incorporated in the contract documents.
7.12 Project Close-Out services may be initiated on receipt of the contractor's notice that the project is sufficiently complete to permit occupancy by the owner for its intended use, and usually include a detailed inspection, with the owner's representative if desired, of the project for conformity to the contract documents; review of the contractor's list of items to be completed or corrected; determination of the partial contract sum(s) to be retained until final completion is secured; receipt of consent by the surety, if any, on the performance and payment bonds to all payments; and issuance of a certificate of substantial completion. Services usually include detailed follow-up inspection and comparison of the work with the contractor's list(s); conveyance to the contractor, by an appropriate means, of the nature of any discrepancies found; final inspection of the work with the owner, if desired, to ascertain whether corrections have been made; receipt and review
of warranties, affidavits, etc.; receipt of lien release or bond indemnifying the owner against any lien; receipt of consent of surety to final payment; and issuance of final certificate for payment.

*7.13 Civil Engineering services relate to the services of the civil engineering discipline which may be needed to assist the architect in the performance of services in this phase as related to civil engineering work.

*7.14 Structural Engineering services relate to the services of the structural engineering discipline which may be needed to assist the architect in the performance of services in this phase as related to structural engineering work.

*7.15 Mechanical Engineering services relate to the mechanical engineering discipline which may be needed to assist the architect in the performance
of services in this phase as related to mechanical engineering work.

*7.16 Electrical Engineering services relate to the services of the electrical engineering discipline which may be needed to assist the architect in the performance of services in this phase as related to electrical engineering work.

7.17 Landscape Architecture services relate to the services of the landscape architecture discipline, coordinated by the architect, which may be needed to assist the architect in the performance of services in this phase as related to landscape work.

7.18 Interiors services relate to the services of the interior design discipline, coordinated by the architect, which may be needed to assist the architect in the performance of services in this phase as related to interior design work.
PHASE EIGHT
POST CONSTRUCTION SERVICES
In the Post-Construction Phase the architect provides those services intended to facilitate utilization of the project.

**LIST OF SERVICES**

8.01 Project Administration
- .02 Maintenance and Operational Programming
- .03 Start-Up Assistance
- .04 Record Drawings
- .05 Warranty Review
- .06 Post-Construction Evaluation

**DESCRIPTION OF SERVICES**

8.01 **Project Administration** services relate to those administrative functions necessarily undertaken by the architect in providing services during this phase of the owner's project and may include project-related research, conferences, coordination of the work of in-house personnel and outside consultants, correspondence, travel, progress reports, etc. These services do not include general firm management.

8.02 **Maintenance and Operational Programming** services may include establishing a program for either in-house or contract operation and maintenance
of the physical plant and its equipment. Provision may be made for instruction by equipment manufacturers' representatives and the preparation of an operations manual.

8.03 Start-Up Assistance services may include on-site observation, trouble-shooting, and assistance in the operation of building systems during initial occupancy and subsequent periods until proper operations are established and building maintenance and operating personnel are adequately trained and experienced. This service is supplementary to the construction phase services which establish the contractor's responsibilities to demonstrate completion and initial proper operation of building systems, usually before occupancy. The services usually include coordination of contractors' call-backs, accelerated familiarization of building maintenance and operating personnel with complex systems, and in-depth troubleshooting to establish responsibilities for corrective
measures or procedures as may be needed.

8.04 Record Drawings services relate to preparation of drawings by the architect, after completion of construction, from data supplied by the contractor(s) and subcontractors showing significant changes in the location of concealed piping, etc., from the diagrammatic locations indicated on the contract documents, or other revisions made during the construction period. If the owner wishes more precise data relative to these or other items of construction, the owner should so indicate to the architect prior to beginning construction. The architect can then make arrangements for obtaining and certification of such data by other parties, if necessary, and check on the progress and general accuracy of such data gathering periodically during construction. On completion of the service, the architect transmits all data, with appropriate identification, to the owner.
8.05 **Warranty Review** services may include consultation and advice in the event that a particular material, item or piece of equipment fails to perform its expected function during the warranty period. The services usually include a detailed inspection prior to expiration of the warranty period to ascertain whether any previously undetected failures of materials, items or equipment exist. The findings of this inspection are incorporated into a report, and instructions for correction of noted defects are presented to the contractor.

8.06 **Post-Construction Evaluation** services may include evaluation of the initial programming vs. actual use of a facility; of the operation and effectiveness of the facility plan; and of the applicability and effectiveness of the design/construction process used. The services may include project inspection; review with supervisory, operating and maintenance personnel; user interviews; and review of operating costs and related data.
The Supplemental Services Phase is not precisely a phase in the sense that it has no specific sequential position in the overall work of the architect. The services provided herein might be performed during any single or several of the eight sequential phases. In addition to the services listed below, this phase would include any services not provided for in any other phase and which the architect agrees to perform. One of these might be construction management. Some offices consider construction management a separate discipline and therefore it is not included in this document. Others may offer construction management service and may wish to include it in the following list.

LIST OF SERVICES

9.01 Special Studies
   .02 Computer Applications
   .03 Fine Arts and Crafts
   .04 Non-Building Equipment Selection
   .05 Design of Special Furnishings
   .06 Value Analysis
   .07 Life Cycle Cost Analysis
   .08 Environmental Monitoring
   .09 Presentation Models/Renderings
   .10 Mock Ups
   .11 Demolition Projects
   .12 Tenant-Related Services
   .13 Graphics
   .14 Energy Studies
Because of the substance of many of the services in this phase is likely to be determined largely by the nature of the specific project to which they contribute, no attempt has been made here to provide generalized definitions. It is critical, however, that the owner and the architect discuss any such services and be in general agreement as to their nature.