INTRODUCTION TO THE SEGREGATED COST METHOD

The Segregated Cost Method is designed to enable the assessor to give separate consideration to all of the major construction assemblies or systems (components) of a building with a minimum of time-consuming counting and measuring, and to arrive at a reliable replacement cost in a reasonably short time.

The costs of many parts of a building, such as floor, ceiling and lighting, change directly as the floor area of the building increases. Other building costs vary with relation to parameters other than floor area; however, most costs can be related to floor area, wall area, roof area or sometimes an individual count of unit installations. To facilitate the application of these individualized costs, they are grouped so that all costs related to floor area can be added together and applied to the total floor area. All wall area costs can be added together and applied to the wall area, and all roof costs applied to the ground floor or roofed area.

A breakdown of the components whose costs correspond to the major areas follows:

FLOOR AREA

Site Preparation	Floor Cover	Sprinklers
Foundation	Ceiling	Electrical
Frame	Interior Construction	Heating, Cooling and
Floor Structure	Plumbing	Ventilating

OUTSIDE WALL

Wall Cover	Wall Ornamentation	Storefronts

ROOF

Roof Structure	Roof Trusses	Roof Cover

A separate section is included for buildings in each of six major cost-related groups, classified by type of occupancy so that the user will find the section pertaining to his subject property largely self-contained. The only additional data required are Architects' Fees, Appendix C and County Multipliers, Appendix D. By separating the costs into major occupancy groups, many of the factors which cause variations in costs are automatically considered, thus eliminating the necessity for detailed consideration of each component. For each component of the building, a range of costs representing a typical spread between low and high costs for that component within the occupancy group is given. The costs in this range are subdivided into four groups whose midpoints are generally defined as follows:

COST RANGE RATING

1	2	3	4
Low Cost	Average Cost	Above Avg. Cost	High Cost

The component costs of most buildings, both old and new, will fall within Columns 2 and 3. Columns 1 and 4, while representing the low and high ranges in normally encountered construction costs, do not represent the highest or lowest costs that may be encountered. (A more detailed discussion of the rating numbers follows).

While it is true that a number of factors influence the cost of each component, buildings are fairly consistent in their quality throughout. Therefore, after the overall quality and cost level of the building are established in relation to the group and class (i.e., an average Class A Hospital would not receive the same rating as an average Class C Office building, or a 400,000-square-foot Warehouse the same rating as a 4,000-square-foot facility, etc.) and the general rating is selected, that column is often appropriate for many of the Segregated Cost components. Exceptions may be those components, such as insulation, wall sheathing, heating and cooling and foundations, which can be directly affected by climate. For typical buildings, the procedure is quite simple:

1. Select the section best covering the occupancy of the building as designed.
2. Generally classify the building as to cost level by overall quality and complexity or massiveness for that occupancy as: low cost, average, above average or high cost.
3. Systematically describe each of the major components in order, considering whether that component is consistent with the general cost level of the building as a whole and with the occupancy in that section and its commonality, and enter the appropriate cost.
4. Total the unit costs belonging to each of the major area groups: total floor area, exterior wall area, wall ornamentation and roof area, and multiply each total by its area.
5. The sum of these amounts, modified by the multipliers for the number of stories, architects' fees, current cost and locality, plus any lump-sum additions for miscellaneous items, will be the total replacement or reproduction cost.

To demonstrate this Segregated Cost method in its simplest form, take the following one-story industrial building:

1. The building is occupied as an industrial, so Section SEG 4 is selected.
2. The general quality and design are average.

COST RATING RANGE

	1	2	3	4
	Low Cost	Average Cost	Above Avg. Cost	High Cost

3. $ Foundation unit cost
   \+ Frame unit cost
   \+ Floor unit cost
   \+ Electrical unit cost

4. $ Total of floor area x Floor area = $ Floor area cost
   unit costs* (5000 sq. ft.)
   $ Wall unit cost x Wall area = $ Wall cost
   (3600 sq. ft.)
   $ Roof structure unit cost
   $ Roof cover unit cost

5. $ Total of roof unit X Ground floor area = $ Roof Cost
   (5000 sq. ft.)

Floor Area Cost + Wall Cost + Roof Cost = Total Preliminary Cost

6. The total preliminary cost, including wall ornamentation, modified by the multipliers for the number of stories, where applicable, architects' fees, current cost and locality, plus lump-sum costs for miscellaneous items, will give the total replacement cost.

*Most buildings will have more components under Floor Area Unit Costs, but the example above demonstrates the simplicity of the procedure.

ACCURATE SELECTION OF COSTS depends upon first determining the occupancy and thus selecting the proper section. If the classification of a building falls between two types, then its cost will also be between the two costs. If construction of two types is similar, then the costs will be relatively similar and a choice of one over the other will not greatly affect your final answer.

In the event of mixed occupancies, such as apartments over stores, the area in each occupancy should be priced from its respective Segregated Cost Section. Occasionally a small portion of a building's space will comprise a different occupancy; instead of dividing the building into sections, it may be desirable to price separately only the one or two construction components that may differ and to weigh in these costs with the unit costs of the main occupancy.

Some structures, such as grandstands and bleachers, and prefabricated metal buildings, lend themselves to special pricing procedures and should be priced from Sections UIP 14 through 17.

BASEMENTS, MEZZANINES, PORCHES AND ATTICS are priced by their segregated construction components, such as floors, ceilings, etc., from the appropriate tables used for the main part of the building. Stepped balcony structures are listed separately. If basements have interior construction similar to the floors above, the regular interior construction tables may be used, usually with a lower rating. If there are only a few partitions, it would be best to price them from Section UIP 2 on the basis of square footage of partition area.

SIZE AND SHAPE MULTIPLIERS are not used in the Segregated Cost Method, since the exterior walls, which contribute the most to the variation in cost due to size and shape, are measured and priced separately. The main addition in cost due to additional height is taken care of by additional exterior wall area. There are, however, other building components which are affected to some degree by height. The frame, interior construction and some other costs are priced for standard heights, with a suggestion to change the given cost by a certain percentage for deviation from the standard. All other costs which might vary slightly with increased height are not reduced to any specific height, but are averages for the typical height of that occupancy and group. If, in the assessor's judgment, costs would be abnormal due to a height that is appreciably greater or less than normal for a building of that occupancy, the assessor should choose an appropriately higher or lower rating for this component, or modify the basic cost up or down, according to his judgment. Modifiers are also given for high-rise buildings to correct foundation and frame costs for deviation caused by the number of stories.

JUDGMENT IS THE BASIS OF ALL ASSESSING, since each cost or value is an estimate. The cost data in this manual are averages of actual costs, but it is necessary to select the proper cost and to recognize when the given cost must be modified up or down or a new cost developed. This judgment factor comes with study and experience and is necessary for reliable valuations.

There may be economies of scale not recognized by the cost schedules when pricing very large buildings. The user is also cautioned that large buildings frequently include cost items easily overlooked, such as special plumbing and electrical, power wiring, air lines, craneways, etc. Large buildings are frequently built to house a particular operation and include real property costs required by that operation which should not be overlooked.

COST SEGREGATIONS

EXCAVATION AND SITE PREPARATION includes bulk excavation, clearing and site grading, but does not include demolition or trenching for the foundation or footings. Fill is soil brought to the building site to change the topography, i.e., dock height floors, or to alter the structural strength of the on-site soil. The costs apply only to the area under the structure, but when needed, can be applied to the entire building site.

FOUNDATION includes all concrete, treated wood or masonry piers, footings or pads which support posts or columns, and continuous footings or foundation walls. Basement walls are not a part of the foundation. Also included in the foundation cost are costs for trenching, excavating and backfill for the footings. Certain occupancy sections include buildings, such as stores and industrials, which vary widely in the ratio of perimeter to floor area (in square feet). In these cases, alternate sets of tables are provided: Table I is for buildings in which the foundation can be closely related to floor area, such as a fully framed multistory, or occupancies such as apartments, houses, hospitals, etc., with a high proportion of interior construction. Table II is for buildings where the foundation can be more closely related to the perimeter, such as shell-type structures: stores, markets, warehouses, auditoriums, etc. Table III is for use with Table II to obtain the cost of column footings where needed. Pilings or special foundations should be priced from Section UIP 1. When basement walls replace part of the foundation, a lower cost classification may be considered.

FRAME includes posts, columns, beams, girders, sills, underpinning and bracing. The amount of frame may range from that of a fully framed Class A building to that of a building with bearing walls with slab floor and roof joists spanning from wall to wall. In the latter case there would be no frame members. Some buildings with bearing walls have partial frames. In these cases, a percentage of the cost should be used. For example, in a building with bearing exterior walls and one row of posts down the center supporting the girders for the roof or floor above, 2/3 of the vertical and horizontal supports would be eliminated. Thus, assuming the horizontal and vertical members to be approximately the same weight (which is not always the case), the frame percentage would be (1/3 x 1/2) + (1/3 x 1/2) + 1/3 or 33% of the full-frame cost. This percentage would change under different conditions, so the assessor must consider the actual frame members and estimate the percentage of frame cost to use when part of the load is supported by frame members and part by bearing walls.

Guides to the development of these percentages are listed in Section UIP 1. Pilasters and bond beams, although performing some of the functions of a frame, should be priced with the exterior walls as “bearing walls”. The easiest guide as to when a column is a pilaster is, first, was the column and its supported structure built before the wall (framed structure), or was the wall erected first (as in some tilt-up), or at the same time (masonry with pilasters). Another criterion is whether or not the supported structure would stand safely without the wall. In between these types lie the partially framed structures.

In wood frame buildings such as Class D residences, the “framing” for walls, roof and floor is allowed for under the costs given for each heading. The only members to be priced under “Frame” would be the girders and posts supporting a raised floor structure, whose cost is given as “Bearing Walls, wood or steel floor supports only”. If this building has a concrete slab floor, normally there would be no frame cost. In buildings that have a large number of frame members of uniform size and spacing, which are visible and easy to count and measure, the frame cost may be priced quite rapidly and accurately from Section UIP 1.

FLOOR STRUCTURE costs, including costs for mezzanine and balcony structure, allow for the joists and subfloor or decking. Stepped balcony structures are listed separately. Finished wood flooring should be priced with floor cover, even if there is no subfloor. In this case, the structure cost would be taken from “Wood joists and bridging only”. The costs for concrete floors on ground include allowance for reinforcing. Vapor barriers and insulation are listed separately as additives.

FLOOR COVER costs are given for softwood and hardwood as well as for resilient floor coverings and other types.

CEILING costs do not include the supporting structure, since in many cases the ceiling is attached to the structure of the floor or roof above. Ceiling joists are priced with the roof structure. In buildings where ceiling joists are required, but are not a part of a roof or floor structure, the indicated additional cost allowance for ceiling structure or suspended ceilings must be made. Insulation is an additive.

INTERIOR CONSTRUCTION costs cover basic costs of such items as partitions, doors, stairs, closets, cabinetwork, etc. In occupancies such as apartments and offices, the cost is uniformly related to area, and can be determined quite accurately on the basis of square footage of floor area. In other occupancies, such as stores, industrials and sheds, which have a large total area with very little partitioning, a more accurate answer may be obtained by actually measuring the amount of partitioning and pricing on the basis of square footage of partition area from Table II of the Interior Construction tables or from Sections UIP 2 or UIP 5, adding for other interior items. Interior construction requires more judgment than most other items, since it covers more types of construction problems. Special building construction other than that indicated should be either separately priced or noted in the valuation as not being included.

PLUMBING costs include the complete plumbing installation, rough and finished, and associated structural allowances. Supply and waste lines are included to the property line of a normal building lot. Industrial piping between equipment used in the manufacturing process is not included. If sewer or water lines to the property line on large lots are to be included, price from Sections UIP 3 or UIP 12. Additions must be made to the base plumbing cost for a well and septic system when present.

Costs can be figured accurately on the basis of square footage of floor area for occupancies where there is an even distribution of plumbing fixtures, such as in offices, hotels and apartments and other housing. In the case of industrial buildings, where there may be two toilets and two lavatories in a 1,000- or 10,000-square-foot building, the fixtures often should be priced individually rather than on square footage of floor area.

SPRINKLER costs include all the costs for the system and supply lines, but not tanks, towers or high-pressure pumps. The areas are based on the total area of sprinkler system installation on a single main connection.

HEATING, COOLING AND VENTILATING costs include the basic heating units: boilers, pumps, oil or gas burners, cooling towers, piping and ducts, registers, operating motors and fans. In the case of ground water heat pumps, the cost of the well is not included. In selecting the cost classification, the climate must also be considered. The availability of fuel common to the region will also have a bearing on the cost rating chosen.

ELECTRICAL AND LIGHTING costs allow for the service distribution, fixtures and receptacles for the lighting, and convenience outlets, but do not include the cost of power wiring for industrial equipment. Built-in electrical kitchen or bathroom appliances are not included.

EXTERIOR WALL costs allow for the complete exterior wall including sashes and doors, interior and exterior finishes where applicable, and interior and exterior wall covering where applicable. The exception to this is that major exterior ornamentation is added as a separate item. Insulation, sheathing, infiltration wrap, etc. are listed as additives.

The costs are grouped into five major categories according to basic wall structure: concrete or masonry bearing or nonbearing walls, non-bearing curtain, pre-engineered and single wall construction, and bearing wood or steel-stud walls. Basement walls are listed separately. The cost difference between bearing and nonbearing “concrete or masonry walls” has generally been found to be insignificant. Therefore, only one set of costs is generally listed for “concrete or masonry walls”.

Pilasters and bond beams, although performing some of the functions of frame members, are priced with the exterior bearing wall. If curtain wall costs are used, there must be a frame cost.

Where the cost tables show a thickness dimension for a wall, that dimension is for the total wall. Therefore, Brick, block backup, 12", is a wall consisting of an 8" concrete block plus a 4" brick.

The exterior wall costs are multiplied by the total area of the exterior wall, rather than by the floor area.

EXTERIOR BALCONY AND STAIR costs allow for the complete structure, including any supports.

WALL ORNAMENTATION costs are for any special exterior wall treatments generally found around entrances and front elevations. Costs are for the major ornamental veneer facing only and are not a complete wall cost. Consideration may have to be given to the wall behind the ornamental facing since it may not take the same cost rating as the balance of the surrounding wall.

ROOF costs are divided into three parts: roof structure, roof cover, and trusses and girders.

Roof structure includes joists, rafters, purlins and sheathing or deck, together with necessary bracing and ties. Light trusses may be substituted for rafters (joists).

Roof cover includes the roofing and necessary roof flashing, gravel stops, gutters, skylights, etc., with an additive cost for roof insulation.

Trusses and girders include necessary ties, gussets and bed plates. Light trusses are not included. When frame costs are used, girders are usually included as the horizontal members of the frame, and it would be extremely rare to use a truss or girder cost. In certain cases, a low frame cost (Rating 1) could be used to account for just the vertical portions and then the appropriate truss or space frame cost could be priced separately.

MISCELLANEOUS costs include items which are not included in the building segregations (i.e., fireplaces, built-in appliances, etc.) and should be added when found in certain occupancies. In addition to these costs, other miscellaneous items are included in Sections UIP 1 through UIP 17.

COST RATING NUMBERS

It has already been pointed out that it is not necessary to consider specifically each factor which contributes to variances in costs for buildings. This is true since subdivision of buildings into occupancies and numerous individual descriptions automatically allows for most of the variations. However, one should keep in mind the major factors that influence the costs (i.e., quantity and quality of materials and the overall size of the project), in order that individual components may be up-rated or down-rated when necessary. The following tabulation of some of the items affecting the cost range for each of the major segregated components will serve as a guide. Moreover, the costs listed are not the highest nor the lowest which are found, but represent typical or normal costs within each rating class. Definitions of some individual segregated components can be found in the Glossary.

EXCAVATION costs vary according to type of soil, accessibility of the site, and length of the haul for disposal. If the excavation is soil which is easy to dig with standard equipment, if the site is such that there is ample room for the equipment to operate, and if the dirt can be wasted on the site, Rating 1 should be used. If there are aspects that make the digging more difficult, such as harder soil or longer hauls for disposal, Rating 2 or 3 should be used. If there are difficult conditions, such as very hard soil or rock, or perhaps sandy soil which requires much shoring, Rating 4 costs should be used. The cost range for fill depends on the problems involved in compacting. For long hauls, the additional cost for a radius of over 2 miles must be added.

Site preparation or grading is the work of preparing a level site and may include weed clearing, stump pulling and incidental grading, where cost variations depend on the terrain and vegetation.

FOUNDATION costs are affected mainly by the load supported. The dead load, which is the weight of the building itself, is affected by the type of frame and exterior walls. The live load depends on the weight imposed by the occupancy. If the building site is not level but slopes enough so that stepped footings are required, more concrete would be needed for the foundation. An average department store will normally have a heavier foundation than an average retail store, etc.

FRAME costs are influenced by loads, which in turn determine the size and spacing of frame members. Where the frame members are visible, the frame cost can be determined from Section UIP 1 and may be used as a guide to future cost selection. Poor soil and heavy wind possibilities in some areas may increase design loads. In single-story buildings where the frame supports only a light roof, Rating 1 might often be chosen, even in average buildings.

Added weight of frame to support multistory buildings is taken care of by the use of the multistory modifier.

FLOOR STRUCTURE costs are also primarily affected by the load requirements. In many buildings the size and spacing of the joists and beams, and the thickness of the slab or sheathing, can be observed. Usually the floor structure would be commensurate with the general occupancy, and with the cost level of the building. Vapor barrier costs vary primarily by the thickness of the fill.

FLOOR COVER costs vary by quality, color, grade, material composition and thickness of the cover. Resilient and ceramic tile floor covers are sometimes patterned rather than plain, solid colored throughout rather than embossed, in which case their cost per square foot is increased. Frequently, resilient floor covering has a matching coved base, which adds to the square foot cost, particularly if the building is divided into small rooms. The type of underlayment is also a cost consideration.

CEILING cost variations are influenced by thickness, quality and in the case of ornamented ceilings, the type of ornamentation, the intricacy of the design and the finish. Acoustical ceiling costs vary with the material, method of attachment, type of suspension and supporting structure.

INTERIOR CONSTRUCTION cost variations depend on the amount of the interior partitioning and its quality, the number of interior doors, the quality of the hardware and the amount and quality of the cabinetwork and other built-in features. The painting and the quality and amount of wallpaper, wood paneling, etc., have a considerable effect on the interior

construction cost. The quality of the interior partitions, of the cabinetwork and of decorating is usually commensurate with the general quality of the building. In occupancies that might have a wide variation in room size, some consideration should be given to the amount of partitioning.

PLUMBING costs should be based mainly on the quality of fixtures if cost per fixture is used. If the cost per square foot is used, the number of fixtures and quality of fixtures in relationship to the occupancy must be considered. Industrial buildings, milk processing plants, etc., often have a great deal of plumbing costs in drains, grease traps and long pipe runs, all of which should be considered. If desired, Unit-in-Place costs may be used for greater detail. The costs of coated steel, fiberglass and cast iron fixtures ascend in that order.

SPRINKLER rating numbers from 1 to 4 represent all types from exposed wet to concealed dry sprinkler systems. Most wet types will fit in Ratings 1 and 3 and dry systems in Ratings 2 and 4. There is an overlap in the costs of the various systems. The following is a general guide:

Column 1 Rate: Wet pipe, without ceiling
Column 2 Rate: Dry pipe, without ceiling
Column 3 Rate: Wet pipe, with ceiling
Column 4 Rate: Dry pipe, with ceiling

HEATING, COOLING AND VENTILATING costs are primarily dependent on the climate and the building insulation, which affect the capacity of the central unit. The complexity and number of outlets also affect the cost. Air conditioning costs, in addition, are dependent somewhat on prevailing humidity for atmospheric coolers. The major costs in heating and cooling are the number of controlled areas and the type of wall and insulation, as well as the personnel density and the amount of traffic in and out of the building. In selecting a proper cost for basement heating, it is important to remember that a minimal number of outlets could be incidental to the overall cost of the system. The heating costs in this manual have been adjusted to Michigan's cold climate. Therefore, column 2 costs are those typical of Michigan's average heating requirements.

ELECTRICAL AND LIGHTING facilities are rated according to the quality of the fixtures, number of outlets and type of wiring.

EXTERIOR WALL costs often represent a considerable percentage of the total building cost. The choice of the rating column to use depends mainly on the type and quality of the interior and exterior facing and finish, and on the amount and quality of the openings. Generally, the more openings there are, the more costly the wall.

ROOF cost variations are affected by the size and spacing of the structural members, the thickness and quality of the sheathing, and the thickness, quality and shingle exposure of the cover. The type and number of ancillary items, e.g., gutters, skylights and miscellaneous roof protrusions should be considered. Since the roof is priced on the basis of ground floor area, the steepness, the amount of overhang and the shape and complexity of the roof are also cost considerations. Very large overhangs may be computed separately.

INSULATION costs, listed as Segregated component additives where encountered, vary by quality and thickness of the material, and are primarily dependent on the climate. Michigan's climate has been recognized in the cost schedules in this manual.

EXAMPLE

The following illustrations, filled-in field form, and discussion demonstrate a reproduction cost estimate of a good-quality, Class B office and apartment building. The building consists of a full basement, offices on the main floor and four floors of apartments above, with two standard apartment house elevators and built-in appliances in all apartments.

Figure 6 shows the filled-in field form used to arrive at the reproduction cost of the subject building. The information necessary to identify the building and generally classify it is entered on the first five lines. This building is a good Class B five-story office and apartment building with a full basement. Since the building has mixed occupancy, its area is broken down into sections. Section I is basement, Section II is office area, and Section III is apartments. The office portion is priced from Section SEG 5, and the apartments from Section SEG 1. There is no separate section to price basements, so the basement portion could actually be priced from Section SEG 5 or Section SEG 1, whichever appears more suitable; however Section SEG 5 is used in this example.

The basement excavation is 13 feet deep. The soil is average. Part of the soil could be disposed of on the site with only a short haul required for the rest, so Rating 2 is used. The $.31 for excavation under Column 2, SEG 5, PAGE 1, is multiplied by the 13-foot depth to get $4.03 for the cost per square foot of basement area. This amount is entered opposite "Excavation, Site Preparation" under Section I.

The foundation, as indicated in Figure 5, is reinforced concrete. Unless there is some unusual load requirement, Column 2 foundation rates are appropriate. Actually, the same foundation supports the office and apartments. Other portions of the building are also similar in both occupancies. The suggested procedure, however, is generally to price, from the same occupancy page, all of the components to be entered in the corresponding column under "Unit Costs." Thus the $3.25 from SEG 5, PAGE 1, Rating 2 for Class B, is modified for number of stories (deduct .8% x 4 floors) and story height (add 2%), and the resulting answer, $3.21, is entered under Section I. It is then modified for the first floor story height and the number of stories, and the resulting answer, $3.15, is entered under Section II. From SEG 1, PAGE 1, the cost of $3.06, Rating 2, Class B, is modified for the number of stories and the average story height, leaving the answer, $3.02 entered in Section III.

The frame is Class B, reinforced concrete. In the example, Rating 3 is used for all sections of the building, each modified by the average story height modifier for the occupancy and by the multistory modifier. Thus the base for both Sections I and II is $14.40 from SEG 5, PAGE 1 and after modification the Section I entry is $16.02 and Section II, $15.55. The base for Section III from SEG 1, PAGE 1 is $10.61 and the entry is $13.80. The floor structure is concrete slab on ground for the basement and is waterproofed. Rating 3 was used from SEG 5, PAGE 1 and $4.03 for slab

plus $ .95 for vapor barrier or a total of $4.98 entered for Section I. For the upper floors, the concrete elevated slab floors from SEG 5, PAGE 1 and SEG 1, PAGE 2 with Rating 2 were used, giving $10.21 and $9.61 for Sections II and III respectively. The floor covering is vinyl composition tile throughout the first floor and 25% vinyl composition and 75% carpet on the upper floors. The basement floor was treated with hardener and sealer, Rating 3, at $1.11 (SEG 5, PAGE 2). From Rating 3, SEG 5, PAGE 2 we get $2.45 for Section II and from Rating 3, SEG 1, PAGE 2, 25% of $2.30 plus 75% of $4.25 or $3.77 for Section III.

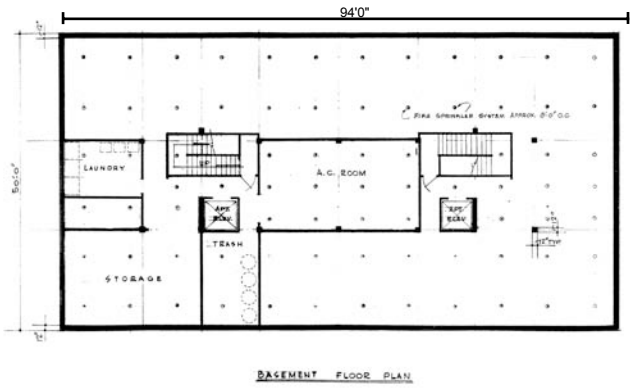

FIGURE 1

The basement ceiling was unfinished. The first floor ceiling was fiberglass acoustic tile on a suspended T-bar frame which we priced from SEG 5, PAGE 2, Rating 2, $1.72 plus $1.29 equals $3.01 for Section II. The apartments had a standard plaster ceiling on metal lath, with metal furring on suspended runners, which we priced from SEG 1, PAGE 3, Rating 2, at $2.73 + $.40 + $1.25 + $1.16 or $5.54 for Section III.

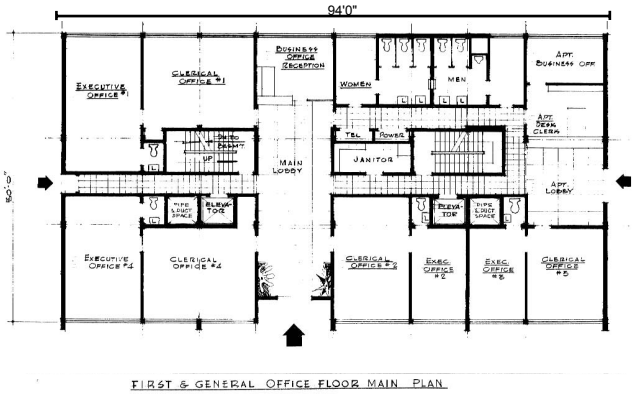

FIGURE 2

Since the basement was only partially partitioned, the interior costs were computed from Section UIP 2 of the manual and a reference made in Section I of the form. The first floor partitions were masonry, and from Rating 3 of SEG 5, PAGE 3, we selected the cost of $31.98 and entered it under Section II. The apartments had 50% frame and 50% masonry partitions, so from SEG 1, PAGE 4 we selected 50% of $15.07 (Rating 2 for average apartment size of four rooms) plus 50% of $16.31 for a total of $15.70 which, when modified for story height, gives the cost to enter in Section III of $16.33 ($15.70 x 1.04 Height Adjustment).

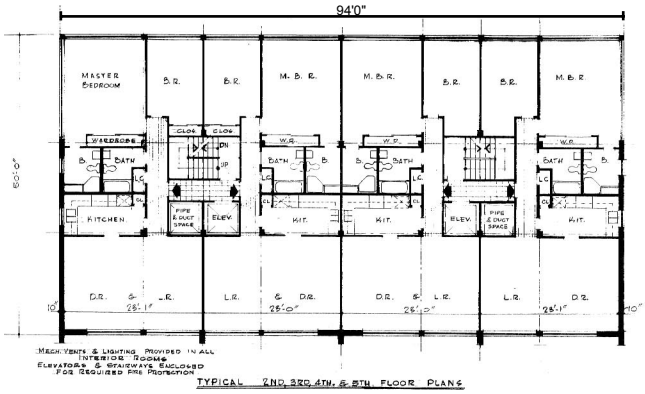

FIGURE 3

The square foot figures for plumbing were used in this example. The office area has more fixtures than the average, although of average quality; a rating between 2 and 3 is used, giving a cost of $3.85 from SEG 5, PAGE 4 for Section II. The cost for a four-room, two-bath apartment, Rating 3, gives a cost of $7.73 from SEG 1, PAGE 4 for Section III. The basement had automatic washers and dryers and the central hot water heater. The washers and dryers were not considered part of the building for this example, and the rough plumbing and hot water system are considered to be taken care of in the square foot costs of the upper stories. There was an exposed wet type sprinkler system in the basement, for which the cost from SEG 5, PAGE 3, was $2.30.

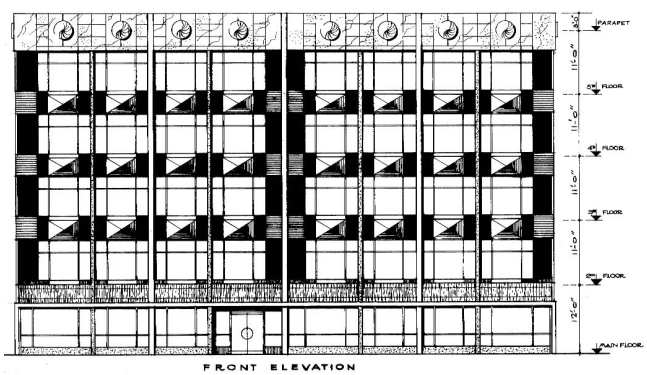

FIGURE 4

There is a combined hot and chilled water heating and air conditioning unit. Assuming that there is an average number of zone controls, Rating 2 is used for these costs. No heating was figured for the basement, although there may be an outlet or two. These costs are modified for story height.

The electrical wiring is in rigid conduit and there is an above average number of outlets and good quality fixtures on the finished floors so $3.25 (Rating 3 for the unfinished basement areas) and $18.49 from SEG 5, PAGE 4 and $8.27 from SEG 1, PAGE 5 are entered.

The exterior walls are porcelainized metal, prefabricated, curtain walls which are taken from Rating 3, “Metal and Glass panels (ordinary).” The granite trim at the top of the front and two sides of the building is listed as wall ornamentation and taken from Rating 2, SEG 1, PAGE 7. Strictly speaking, the wall behind the granite facing would not take the same cost as the balance of the wall, but this extra refinement is omitted for the example. The basement wall is reinforced concrete and is waterproofed. From SEG 5, PAGE 6, Rating 2, the cost is $14.35 plus $ .91, or $15.26. The roof is a two-way flat slab system. In SEG 1, PAGE 8, Rating 2 gives $8.69 after the general heading “Concrete joists, slab.” The roof covering is a good-quality built-up roof with good insulation, so under Rating 3, we find $1.98 plus $1.42 equals $3.40.

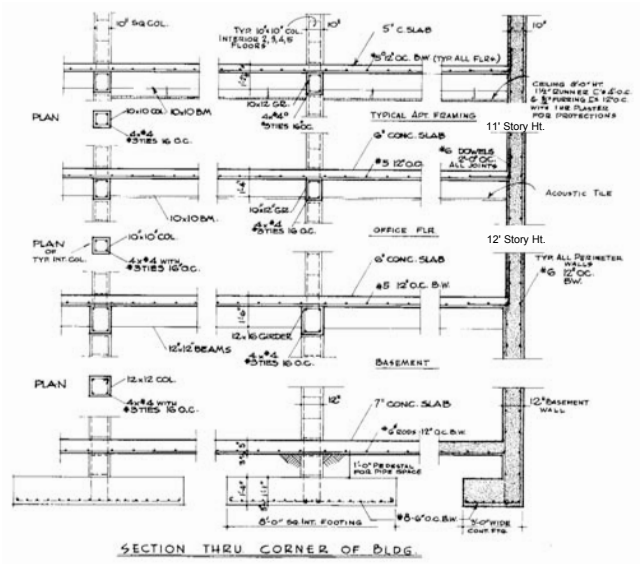

FIGURE 5

LUMP SUM ADDITIONS – The basement partitions were computed from Section UIP 2, PAGE 1 for unfinished 6" clay tile, and the steps for the basement from Rating 2, concrete stairs, under Exterior, Basement and Tower Stairs, SEG 5, PAGE 6, 22 risers in 13', are $185.25. Other stairs are included in the interior costs of the upper floors. Any costs taken from other sections should also be modified by the County Multiplier and by the architects’ fee. The elevators were priced from Section UIP 8, and the built-in appliances, Rating 2, from SEG 1, PAGE 9 to complete the pricing.

COMPLETION OF THE FORM – The figures in each column on Lines 1 through 11 are added and the totals of $34.90 , $107.99 and $82.90 are placed on Lines 12 and 17, for the floor area unit costs of the basement, office, and apartments, respectively. Similarly the costs on Line 40 are transferred to Lines 18 and 19, and the Roof Costs, Lines 13 through 15, are totaled on Line 16 and transferred to Line 20. The floor areas are computed on the back of the form and placed in the boxes under Final Calculations on Line 17. The perimeter is 288 linear feet, which, when multiplied by the respective wall heights, gives the wall areas for Line 18. Since the minimum parapet was negligible in this case, it was not considered. The actual ornamented area of 1,164 square feet is placed on Line 19. On Line 20 the roofed area, 4,700 square feet is entered. After multiplication of these areas by their respective total unit costs, the products in column are added, and the subtotal for each section is entered on Line 21. Where required for multistory buildings, the number of stories multiplier for all the aboveground sections of the building is entered on Line 22. In the example there are five stories above ground. Adding .25% for each story over three results in a number of stories multiplier of 1.005 (1 + .005), which is entered on Line 22 for Sections II and III. No number of stories multiplier is entered on Line 22 for Section I, since this portion of the building is not above ground. The products of the multiplication of the section subtotals on Line 21 and the number of stories multipliers on Line 22 are entered on Line 23 for each section.

The Architects’ Fee Multiplier of 1.07 is from the Average Architect Fees table. Both SEG 1 and SEG 5 require 1.07. A more detailed fee is available from Table IV. This multiplier (1.07) and the County Multiplier (.97) are entered on Lines 25 and 26 and combined to give the final multiplier (1.038) for Sections I, II and III on Line 27. Line 24 is now multiplied by Line 27 and the total entered on Line 28. The total lump sum costs are brought forward from the reverse side of the form and entered on Line 29 and added to Line 28 to give the reproduction new cost, which goes on Line 30.

Michigan Department of Treasury
L-4105 (Rev. 10-91)

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STC SEGREGATED COST COMPUTATION SHEET (S.F. COSTS)

OWNER	TENANT	PROPERTY ADDRESS	
TYPE	YEAR BUILT / YEAR REMODELED	PERCENT CONDITION	SECTION
COUNTY	UNIT / EXAMINED BY		DATE
NO. OF STORIES	HEIGHT PER STORY	QUALITY	AGE / CLASS
1/1/4	*13'/12'/11'*	*Good/Good/Good*	*11 years* / *B/B/B*

FLOOR AREA COSTS

		AREA	*4,700 sq. ft.*		*4,700 sq. ft.*		*18,800 sq. ft.*		
		FLOOR/USE	*1/Bsmt.*		*1/Office*		*4/Apt.*		
		NO.	SECTION I	NO.	SECTION II	NO.	SECTION III	NO.	SECTION IV
1. Excavation, Site Preparation	*Bsmt.: 13' deep @ $.31/cu. ft.*	*2*	*4.03*						
2. Foundation	*Class B bsmt.: $3.25 x .968 x 1.02/office: $3.25 x .968/apt.: $3.06 x .968 x 1.02*	*2*	*3.21*	*2*	*3.15*	*2*	*3.02*		
3. Frame	*Class B bsmt.: $14.40 x 1.03 x 1.08/office: $14.40 x 1.08/apt.: $12.64 x 1.03 x 1.06*	*3*	*16.02*	*3*	*15.55*	*3*	*13.80*		
4. Floor Structure	*Bsmt.: conc. slab w/vapor barrier/upper floors: elevated slab*	*3*	*4.98*	*2*	*10.21*	*2*	*9.61*		
5. Floor Cover	*Bsmt.: conc. hardener & sealer/office: VCT/apt.: 75% carpet, 25% VCT*	*3*	*1.11*	*3*	*2.45*	*3*	*3.77*		
6. Ceiling	*Bsmt.: unfin./office: fbgls. acoust. w/T-bar susp./apt.: furn. lath/plaster*	*–*	*——*	*2*	*3.01*	*2*	*5.54*		
7. Interior Construction	*Bsmt.: see lump sum/office: 100% masonry/apt.: 50% frame, 50% mason.*		*L.S.*	*3*	*31.98*	*2*	*16.33*		
8. Plumbing	*Bsmt.: none/office: many avg. fixt./apt: 4 rooms, 2 baths*		*——*	*2/3*	*3.85*	*3*	*7.73*		
9. Sprinklers	*Bsmt.: only: wet system, exposed, unfinished ceiling*	*1*	*2.30*		*——*				
10. Heating, Cooling, Ventilating	*Bsmt.: none/office & apt.: hot & chilled water*		*——*	*2*	*19.30*	*2*	*14.83*		
11. Electrical	*Bsmt.: unfin. rigid conduit/office & apt.: above avg. fixtures & circuits*	*3*	*3.25*	*3*	*18.49*	*3*	*8.27*		
12. _____	*Total floor area unit costs; move to line 17*		*$34.90*		*$107.99*		*$82.90*		

ROOF COSTS

13. Roof Structure	*Concrete slab*	*2*	*$ 8.69*
14. Roof Cover and Insulation	*3-ply built-up/good roof insulation*	*3*	*3.40*
15. Trusses			
16. _____	*Total roof unit costs; move total to line 20*		*$12.09*

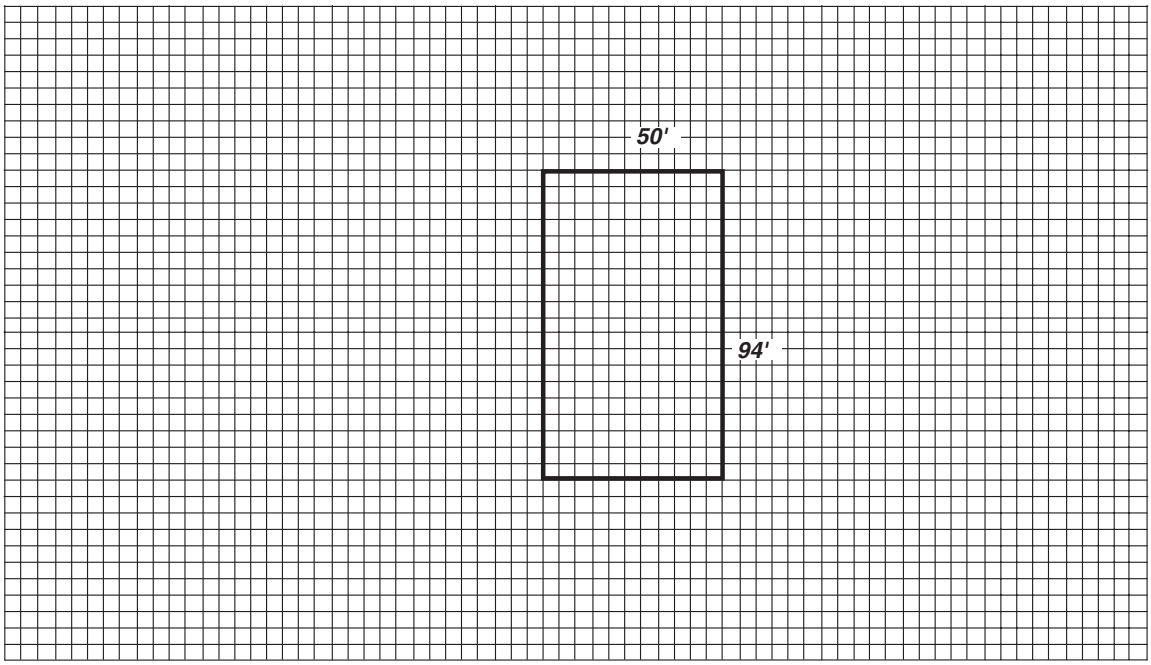
FINAL CALCULATIONS

	from line	SECTION I Unit Cost X Area = Total Cost	SECTION II Unit Cost X Area = Total Cost	SECTION III Unit Cost X Area = Total Cost	SECTION IV Unit Cost X Area = Total Cost
17. Floor Area Costs	12	*$34.90 x 4,700 = $164,030*	*$107.99 x 4,700 = $507,553*	*$82.90 x 18,800 = $1,558,520*	
18. Exterior Walls	40	*$15.26 x 3,744 = $57,133*	*$35.00 x 3,456 = $120,960*	*$32.75 x 12,672 = $ 415,008*	
19. Wall Ornamentation	40			*$38.25 x 1,164 = $ 44,523*	
20. Roof	16			*$12.09 x 4,700 = $ 56,823*	
21. Section Sub Totals		*$221,163*	*$628,513*	*$2,074,874*	
22. Number of Stories Multiplier		X *1.00*	X *1.005*	X *1.005*	X
23. Section Totals		*$221,163*	*$631,656*	*$2,085,248*	

24. Total of all Sections	*$2,938,067*
25. Architect's Fees	*1.07*
26. County Multiplier	*.97*
27. Composite Multiplier (Multiply Line 25 by Line 26)	*1.038*
28. Line 24 X Line 27	*$3,049,714*
29. Lump Sums (Total from Line 39)	*$270,799*
30. Reproduction/Replacement Cost (Add Line 28 to Line 29)	*$3,320,513*
31. Depreciation Multiplier (Assessor's Manual)	%
32. Functional Obsolescence (Percent Good)	%
33. Economic Obsolescence (Percent Good)	%
34. Depreciated Cost (Multiply Line 30 X 31 X 32 X 33)	
35. Economic Condition Factor (E.C.F.)	
36. True Cash Value (Multiply Line 34 X 35)	
37. Reproduction/Replacement Cost Divided by Floor Area	
38. True Cash Value Divided by Floor Area	

COMPUTATION AND NOTES

FIGURE 6



LUMP SUM ADDITIONS: For items not priced on front, add as lump sums: Elevators, Refrigeration, Stained Glass, also miscellaneous costs from the segregated cost pages. (Apply architect's fees and appropriate county multipliers before transferr ing total to line 29.)

Item	Cost Per Square Foot	MULTIPLIERS				Area	Total Cost
		Section	County	Arch. Fee	Composite		
Bsmt. interior, 6" tile	*$8.50*	*UIP 2*	*.97*	*1.07*	*1.038*	*2,100 sq. ft.*	*$ 18,528*
Bsmt. stairs, 7" risers	*② $185.25/riser*	*SEG 5*	*.97*	*1.07*	*1.038*	*22 ea.*	*4,230*
Elevators: 200 fpm, 2500#							
2 selective/collective	*$80,900*	*UIP 8*	*.97*	*1.07*	*1.038*	*2 ea.*	*167,948*
6 stops per elevator	*$4,350*	*UIP 8*	*.97*	*1.07*	*1.038*	*12 ea.*	*54,184*
Built-ins: Range/oven	*② 765*	*SEG 1*	*.97*	*1.07*	*1.038*	*16 ea.*	*12,705*
Dishwasher	*② 590*	*SEG 1*	*.97*	*1.07*	*1.038*	*16 ea.*	*9,799*
Disposal	*② 205*	*SEG 1*	*.97*	*1.07*	*1.038*	*16 ea.*	*3,405*
							$ *270,799*

39. TOTAL LUMP SUM COSTS - Move Total to Line 29

WALL COSTS

Column Rating			SQ. FT.	RATE	COST
2	BASEMENT WALLS *Unfin./reinforced concrete, 288' x 13'*	L.F. X Ht.	*3,744*	*$15.26*	*$ 57,133*
3	EXTERIOR WALLS *Metal & glass panels, office, 288' x 12'*	L.F. X Ht.	*3,456*	*35.00*	*120,960*
3	*Exterior walls: metal & glass panels, apt. 288' x 11' x 4 floors*		*12,672*	*32.75*	*415,008*
2	WALL ORNAMENTATION *Granite facing, 194' x 6'*	L.F. X Ht.	*1,164*	*$38.25*	*$ 44,523*

40. WALL COSTS - Move COSTS to Line 18 or 19

FIGURE 7