

**REAL PROPERTY APPRAISAL MANUAL  
FOR  
NEW JERSEY ASSESSORS  
Third Edition – 2021 update**



**Issued by  
Property Administration – Local Property  
Division of Taxation – Department of the Treasury  
State of New Jersey**

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FOREWORD

The introduction of the Real Property Appraisal Manual for New Jersey Assessors, by the Local Property Tax Bureau in 1955 established a standard uniform statewide appraisal procedure. Since its inception, the Manual has been taught in every in-service training course and today is employed in all district-wide valuation programs. The Appraisal Manual enables the assessor to maintain municipal values. The Manual continues to be a firm foundation for professional assessing practices in New Jersey.

New Jersey, because of its continued reliance upon local property taxes as the prime financial foundation of local government, strives for, and has realized, continued improvement in the quality of local property tax assessment administration. The State requirements of certification and re-certification of tax assessors, the growth of professional associations and in-service training for assessors, and the computerization and improved application of mass appraisal techniques have all contributed to that progress. The publication and use of the Real Property Appraisal Manual for New Jersey Assessors continues to be an integral part of that effort.

In this 2021 update of the Third Edition, the Division of Taxation rewrote what was previously Volume I, and combined both volumes into one manual. In addition to the Volume I rewrite, Digital Billboards were added to the Billboard section. The residential costs updated in 2002 remain the same; however, the commercial costs have been eliminated.

Assessors are urged to make maximum use of the Real Property Appraisal Manual in order to provide taxpayers within their municipality with the highest possible quality of assessment administration.

  
John J. Ficara  
Acting Director  
Division of Taxation

Trenton, New Jersey  
April 2021

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## **100. Legal Basis for the Assessment of Real Property**

The 1947 Constitution of the State of New Jersey is the authorizing instrument for all State Legislation, including that dealing with local property tax. The constitution sets forth in Article VIII, Section 1, and Paragraph 1...

“Property shall be assessed for taxation under general laws and by uniform rules. All real property assessed and taxed locally or by the State for allotment and payment to taxing districts shall be assessed according to the same standard of value, except as otherwise permitted herein, and such property shall be taxed at the general tax rate of the taxing district in which the property is situated, for the use of such taxing district.”

New Jersey statutes provide for the assessment of real property at full and true value or any percentage thereof, so long as the statute is applied uniformly throughout a taxing district. Every three years, each County Board of Taxation must pass a resolution that states the percentage level of assessments for that county. The standard of 100% of market value has been used in New Jersey since 1970. The various statutes and the judicial interpretation provide the significant link to valuing real property for tax purposes and define the “same standard of value” linking “true value” with “market value”. Borough of Englewood Cliffs v. Allison's Estate, 69 N.J. Super. 514 (1961), holds that the assessor must determine “true value” of property assessed which means market value as of the assessment date as of October 1 of the pretax year.

With each constitution, the concept of “same standard of value” evolved to equate with “true value” and “market value” and is widely accepted today. The requirement for “general laws” and “uniform rules” first appeared in the tax clause, Art. IV, Sec. VII, Par. 12, added to the Constitution of 1844 by amendment in 1875. Clarification of this phrase was expressed in Switz v. Middletown Township, 23 N.J. 580, 594 (1957), when the New Jersey Supreme Court announced:

“The direction for the assessment of property ‘under general laws, and by uniform rules, according to its “true value”, the standard laid down in the 1875 Amendment to the 1844 Constitution, requires, and is fulfilled by such regulations as should impose the same percentage of its actual value upon all the taxable property in the township for township purposes, in the county for county purposes, and in the state for state purposes’, Stratton v. Collins, 43 N.J.L., 562 (Sup. Ct. 1881), State Board of Assessors v. Central R. Co., 48 N.J.L. 146, 307 (E. & A. 1886).”

Building on the direction set with the 1875 Amendment, the Constitution of 1947 continued the same basic mandate regarding equality in the distribution of the burden of government among the owners of taxable real property. The Constitution of 1947, however, mandated certain changes. The substitution of "the same standard of value" for the term "true value" differed from the 1875 Amendment that specified the basis for assessment. In the proceedings of the Constitutional Convention of 1947, it plainly appears that “true value” was abandoned because it was thought to restrict the Legislature to a single, inescapable concept of “value”. The term "the same standard of value" was designed to permit flexibility in the approach to the valuation of property. At the same time, to avoid discriminatory treatment, the Constitution of 1947 requires that whatever "standard of value" is legislated, that “same standard” shall be applied to all real property taxable for local government (i.e., municipal, county, school, or special taxing districts).

Though the “true value” clause of the 1875 Amendment was replaced by "the same standard of value" provision under the Constitution of 1947, the implementing legislation (N.J.S.A. 54:4-1; N.J.S.A. 54:4-23) continued to provide for assessment at "true value" until the adoption of Chapter 51, Laws of 1960. Chapter 51 modified the “true value” assessment standard by permitting optional percentage common levels to be declared in each county. After three postponements, Chapter 51 became operative for the first time in tax year 1965.

Primarily a personal property reform law, Chapter 51, as it relates to real estate, provides that all real property subject to assessment and taxation for local use shall be assessed according to "the same standard of value", which shall be the "true

value", but that the assessment shall be expressed in terms of the "taxable value". The "taxable value" is defined as that "percentage of true value" which each County Board of Taxation establishes for the taxing districts within their county (L. 1960, C. 51, sec. 1; N.J.S.A. 54:4-2.25).

The constitutionality of Chapter 51 was upheld by the New Jersey Supreme Court in all respects, with the exception of a provision for the assessment of farm acreage at its farm value, as opposed to the standard of value applicable to all other classes of real property, Switz v. Kingsley, 37 N.J. 566 (1962).

The Supreme Court held that the special treatment given to farm acreage was unconstitutional, resulting in a constitutional amendment affected by voter approval in the 1963 November election. Article VIII, Section 1, Paragraph 1 (b) provides the authority for the preferential treatment of land that is actively devoted to agricultural or horticultural use provided it meets all the stated requirements. The constitutional amendment by legislature was implemented by the enactment of Chapter 48, Laws of 1964 (N.J.S.A. 54:4-23.2 et seq.) generally referred to as the Farmland Assessment Act.

The law provides that "for general property tax purposes, the value of land, not less than five acres in area, which is actively devoted to agricultural or horticultural use and which has been so devoted for at least two successive years immediately preceding the tax year in issue, shall, on application of the owner, and approval thereof, as hereinafter provided, be that value which such land has for agricultural or horticultural use". Values for farmland are developed and published annually by the State Farmland Evaluation Committee through the Division of Taxation. This information can be found on the Division of Taxation's official website <http://www.state.nj.us/treasury/taxation/lpt/farmland.shtml>.

Assessments for qualified farmland are reviewed and calculated annually based on the application. Additional regulations controlling the implementation and

application of farmland assessments are found in the New Jersey Administrative Code, Title 18, Chapter 15.

The other exception to the “same standard of value” is real property classified as “low- and moderate-income housing” under the regulations covered by the Council on Affordable Housing. The purchase price is linked to the potential owner’s income, and profit is limited on the subsequent sale of the property.

The tax assessor is required to determine both the market value and the taxability of real property. Exemption from taxation is the exception rather than the rule. Certain exemptions are provided by the Constitution. Article VIII, Section 1, Paragraph 2 of the Constitution, further provides that exemption from property tax may be granted by general laws. Exempt property is still valued under the “same standard of value” clause in the Constitution.

### **101. Real Property Records**

Establishment and maintenance of an equitable assessment system involves the use of tax maps, individual property record cards, systematic unit land values, building standards and uniform procedures for property appraisal and equalization. Most records now can be stored electronically eliminating the vast amount of paper as used in the past. Electronic data must be easily retrievable and in a format that is understandable to the person using it. With new automated field data collection technologies becoming the norm, an assessor will have higher quality information.

Tax maps, land value records, zoning information, residential and commercial data collection and property record cards are essential for installation of the standardized assessment system and for maintenance of complete and accurate property assessments. Such maps and records are the necessary tools for use by the assessing office in determining and maintaining sound and equitable assessments for all property within the assessment jurisdiction. Other records that are useful include

deeds, photographs, sales information from sales records (SR-1A Forms) and income and expense data.

## **102. Data Collection Forms**

One of the most important forms is the Data Collection Form used when inspecting a property whether residential or commercial. Complete and accurate information is the foundation of sound assessment practice. With the introduction of smaller laptops and tablets, this information can be collected and transmitted electronically at the site back to the office database. Information that should be included can be sectionalized as follows:

- 1.) General Property Information: block, lot, qualifier, owner name, property address, property class, land size, zoning, neighborhood Value Control Sector (VCS), special use zones and building permits.
- 2.) Site Information: utilities, street improvements, topography landscaping, shape, and other descriptive land factors.
- 3.) Improvement Information: type, use, number of stories or height, roof type and material, exterior finish, basement finish, interior wall and floor finish, attic, heating and cooling type, plumbing fixtures, fireplaces, decks and porches, garages, detached items, and interior/exterior condition.
- 4.) Graphs and Notes: area for sketch and remarks or comments.

Though the information that is collected is similar for residential and commercial properties, there can be differences in the two that can be adjusted for each type of property on a collection form. (For samples, see section 104.)

### **103. Property Record Cards**

The data found in a Property Record Card is the cornerstone to the assessment of the real property and includes location and ownership data. The Property Record Card should show the characteristics of the property being assessed and display a variety of information related to the property's value.

Property Record cards are supplied by the vendors and differ in format and display. The data is to be recorded uniformly and is easily retrievable. At a minimum, the Property Record Card must contain the following information:

- Block and Lot
- Owners Name
- Street Address
- Tax Map Page
- Land Dimensions
- Property Class
- Zoning
- Sales Information
- Assessment Information
- Site Information
- Building Characteristics
- Room Count
- Sketch
- Detached and Other Items
- Photo
- Improvement Building Class
- Square Foot Area

Examples of residential and commercial Data Collection Worksheets and Property Record Cards can be found on the following pages:













## **106. Abstract of Deeds**

In most instances, the assessor receives an Abstract of Deed for each sales transaction from the county tax board to assist in completing the SR-1A process. The abstract will serve as an aid in keeping the legal description and ownership records up to date. Most county clerk's offices now have these deeds and mortgages online.

## **107. SR-1A Forms and Market Data Records**

The SR-1A form is used to report transfers of real estate and the assessed values of sales in each taxing jurisdiction. This information is checked and verified by the Division of Taxation's Property Administration Branch for developing assessment-sales ratios throughout the State.

The information included on each sale or transfer aids in determining if the sale is an arm's length transaction between a willing buyer and willing seller and meets the requisite conditions to be deemed a "fair market transaction". Each transfer must be carefully scrutinized before the data is used in the sales comparison approach to arrive at a properties' market value. Sales, which do not appear to be bona fide, such as sales under financial duress, transfers involving property trades, etc. should be set aside for further review. Additionally, sales should be verified against deeds to ensure that additional property, or personal property, is not included in the sales price. It is desirable to contact the grantor, grantee, or their attorneys in each transfer to obtain information about the exact motivation and other data that are useful in the appraisal process.

In reviewing the SR-1A forms, it is important for the assessor to remember that sales classified as "Non-Usable" for the *Director's Ratio* purposes may still be a useful comparable sale for appraisal purposes. For example, a sale of a new home may be classified for ratio purposes as a Non-Usable 7 (*Property substantially improved subsequent to the assessment and prior to the sale*) may be a good comparable if the buyer and seller meet the conditions of a fair market transaction. Similarly, a Non-Usable

6 (*Sales of property conveying only a portion of the assessed unit, usually referred to as split-offs*) may be a good value indicator of a building lot.

Sales data is extremely important in the appraisal process for determining unit land values and building values. The sales ratio of all properties that sold can be determined by dividing the assessed value by the sales price.

### **108. Income and Expense Data**

Income and expense data are of value in the assessment process. Sources of this data include information obtained from property owners, real estate agents, newspapers, banks, and housing associations. The Chapter 91 Income and Expense Form is the most widely used method to obtain this information. Typical data collected includes the number and type of rental units, income received from them, vacancy rates, collection losses, miscellaneous income, and allowable expenses.

### **109. The Appraisal Process**

The appraisal process is a uniform logical method of collecting, analyzing, and processing data into a well-reasoned value estimate. Whether using a mass appraisal system for assessments or doing a single property appraisal for a tax appeal, the steps are the same and no steps should be omitted.

There are seven steps in the appraisal process:

1. Define the problem
2. Scope of work
3. Preliminary survey and planning
4. Data collection and analysis
5. Highest and best use analysis
6. Application of the data using the three approaches to value
7. Reconciliation of the indicated values to come up with the final value estimate

At the end, the appraiser or assessor has studied all three value approaches and decides which one deserves to have the greatest weight in relation to value.

### Define the Problem

This begins the appraisal process and contains several jobs to complete.

- Identify the property being appraised (legal description, street address, etc.)
- Determine the property rights being appraised (fee simple, leased fee, etc.)
- Purpose of Appraisal and Type of Value needed for the appraisal (market value, use value, agricultural value, etc.)
- Date of Appraisal (assessing date specified in NJ by statute is October 1 of the pretax year)

### Preliminary Survey and Planning

- How to allocate time and resources to complete assignment
- Estimating the highest and best use of the property
- Making an inventory of the data that is required to be collected

### Data Collection and Analysis

Three types of data need to be collected and analyzed.

1. General Data
  - Trends in the economy
  - Forces that affect value
  - Character of the neighborhood
  
2. Specific Data
  - Site data
  - Off-site data
  - Improvement information (square footage, depreciation, etc.)

### 3. Comparative Data

- All sales, cost, and income data gathered
- Cost manuals, market data grids, annual income statements

#### Highest and Best Use Analysis

Highest and best use is defined as the use that generates the highest net return to the property over a reasonable period of time. This is one of the most important steps in the process. There are many questions to be answered on the subject property.

- Is the use legally permitted that is allowed by zoning?
- Is the use physically possible?
- Is the use financially feasible?
- Do the approaches to value provide the maximum productivity?

Critical data needed here includes vacant land sales, zoning, market trends and supply and demand factors.

#### Application of the Data Using the Three Approaches to Value

The three approaches to value are cost, sales comparison, and income approach. Not all approaches are relevant to all properties. For example, the cost approach cannot be used to value vacant land as it values improvements only. The sales comparison approach cannot be used for properties that do not sell (single use properties such as churches and hospitals). The income approach is not applicable for single-family dwellings that are not rented.

#### Reconciliation of the Indicated Values to come up with the Final Value Estimate

In this step, the indicators of value are examined to arrive at the three approaches to value: cost, sales comparison, and income approach. The reconciliation of the values is done to resolve the differences, so a final value estimate is achieved.

It could be that all three estimates might be reasonably close together, but it could also be that one or two of the estimates vary widely and only one approach can be relied on for a

good estimate of value. Review the relevance of each approach, data reliability and the approaches strengths and weaknesses.

Never average the value estimates from each approach but look to the approach most relevant to the subject property.

## **110. Approaches to Value**

### **COST APPROACH**

The cost approach is based on the principle of substitution that states the market value is set by the cost of acquiring an equally desirable substitute property. The two most common methods of costing are reproduction and replacement costs.

1. Reproduction cost is the cost of constructing an exact replica structure using the same materials, design construction techniques and workmanship.

2. Replacement cost is the cost of building a substitute structure of equal utility using current materials, design, and standards. The cost figures in the manual are replacement cost values. There are limitations in using this approach that reduce the reliability in certain situations. When the improvements are older, the depreciation from physical deterioration and functional obsolescence becomes increasingly difficult to estimate. It also has limited use where the improvements no longer reflect the highest and best use of the property.

The six main steps in developing a cost value are:

1. Estimate the land value as vacant for its highest and best use.
2. Estimate the total cost new of the improvements.
3. Estimate the total accrued physical depreciation, functional obsolescence, and economic obsolescence.
4. Subtract the depreciation from the total improvement cost new.

5. Estimate the cost new less depreciation of any accessory buildings or site improvements.
6. Add the land value to the depreciated costs of the improvements, accessory buildings, and site improvements.

### **SALES COMPARISON APPROACH**

The sales comparison approach is based on the concept that the sales price negotiated between a willing buyer and seller for a specific property reflects value. It is usually the easiest approach to understand and reflects actions of buyers and sellers in a particular marketplace. No two properties are exactly alike; therefore, this approach compares properties that have sold to the subject property and produces an indicated value by adjusting for differences between the subject and the comparable property.

Adjustments to the comparable sales prices can be made in either lump sum dollar amounts or percentages. If a comparable sale property is inferior to the subject property in an attribute, the sales price of that comparable merit an adjustment upward. Conversely, if the comparable is superior, the sales price is adjusted downward. The main limitation to the sales comparison approach is the possible lack of recent comparable sales information. This is usually the case in special use type properties or properties with a limited market. In some instances, due to a lack of sales, the expansion of the market area for comparables may be necessary. If this is the case, the market area used should have similar characteristics to the subject.

The five steps in the market approach are:

1. Identify and verify recent sales that are comparable to the property being appraised.
2. Select the units of comparison to be used and analyze the comparables accordingly.
3. Compare the comparables to the subject to identify differences to be adjusted.
4. Adjust the comparables for the differences using the selected units of comparison to arrive at an indicated value.
5. Analyze the indicated values produced and reconcile to a final value estimate for the subject.

## **INCOME APPROACH**

The income approach links the value of a property to its ability to produce income. Its underlying principle is that of anticipation, which forecasts future benefits; the income stream from rents, to estimate their present value. This is the main approach used by investors when deciding to purchase or sell income-producing properties. Estimating value of income producing properties is done by capitalization. In simple terms, dividing the annual net income by an appropriate capitalization rate to estimate the property value. The three methods of capitalization are gross rent multipliers, direct capitalization, and yield capitalization. (These are explained further in this manual.) The gathering of income and expense information is often one of the problems with using this approach and may be difficult to obtain. The assessor can obtain this information through a Chapter 91, Income and Expense Statement request to the owner. The assessor often annually sends it to the taxpayer and if proper notice is provided with the Income and Expense Form, the taxpayer must comply by completing the form or risk their right to appeal their assessment.

The seven steps involved in using the income approach are:

1. Estimate potential gross income.
2. Deduct for vacancies and rent loss.
3. Add other sources of miscellaneous income to get effective gross income.
4. Deduct allowable operating expenses to get net operating income.
5. Select the capitalization rate.
6. Determine the method of capitalization to be used.
7. Capitalize the net operating income into an indication of value.

### **111. Introduction to Land Valuation**

The appraisal of real property for assessment purposes is separated into two areas: the appraisal of land itself and the value of improvements, if any, added to the land. The improvements will deteriorate but the land, except for the depletion by erosion or physical removal is a permanent asset. There are six accepted methods in

developing land values: sales comparison, allocation, abstraction, anticipated use/development, ground rent capitalization and land residual capitalization. These will be discussed in section 112. There are three factors that can be applied to the land value. They are the depth factor, commercial corner influence and alley influence.

The appraisal of land involves the analysis of each parcel for its ability to produce profitably or perform services for the owner. This is accomplished by judging the use, which, in the opinion of the appraiser, will produce the greatest future benefits to the owner of the land.

In this analysis of land, the appraiser should understand the application and effect of the various elements which tend to establish the value. Some items, having little or no influence on the value of land if used for one purpose, will be of vital importance for land utilized for another purpose. The items or factors to be considered include the following:

1. Supply and Demand - the supply of and demand for land will regulate the value of land, which there is a finite amount of. However, changes in zoning within a municipality can alter the supply of land by uses in which it is permitted. Demand is determined by buyers who have the ability to purchase property given all available choices.
2. Highest and Best Use - the principles of supply and demand determine the highest and best use of a property.

Land uses will vary from time to time. For example, the demand for housing may require the development of farmland into lots or parcels for residential use. The development of land for residential purposes may, in turn, create a demand for commercial and industrial uses. Conversely, certain uses of land may cause land values to fall.

3. Shape - the shape of some small residential and commercial sites is more important than for farm and industrial tracts which require larger areas. The shape of a lot can have a bearing on value because of limitations to its functional utility. For example, a triangular lot will normally be worth less than a rectangular lot because it lacks utility.
4. Location - the location of land is of prime importance for all uses but to varying degrees. For instance, farmland does not require the same degree of accessibility as commercial or residential land and a corner location is more desirable for commercial use than for industrial use.
5. Frontage and Ingress/Egress - the location of land on a street or highway is desirable for residential, commercial, and industrial sites, but frontage on a highway is of less importance for farm or industrial land. Frontage can also pertain to an amenity such as a lake, bay, ocean, river, or a golf course. Ingress and egress affect the accessibility to a parcel and can greatly affect its value.
6. Depth - farmland and industrial sites require greater depths than residential and commercial sites.
7. Topography - refers to the physical features of a site such as view, drainage, and contour. The physical features of a parcel dictate how it can be developed.
8. Site Improvements - can be classified as on-site and off-site improvements. On-site improvements include grading, landscaping, paving, utility lines and hookups. The site value can be influenced by the value of the off-site improvements such as streets, curbs, sidewalks, and traffic.
9. Soil Type, Productivity and Capability of Soil - the type of soil is of vital importance for farm use. The productivity and capability of soil to produce

crops and support livestock is important to farm valuation. Commercial and industrial uses often require certain subsoil qualities for heavy foundations, drainage, etc. Residential land requires the ability to support the structure, septic system, drainage, etc.

## **112. Land Value Methods**

### **Sales Comparison Method**

The Sales Comparison Method compares the parcel under appraisal to recently sold similar properties. This approach is the most common method used when there are sufficient comparable sales available. The appraiser processes the sales prices into an indication of value by adjusting the sale prices of comparable sales for differences from the subject property. The similarity of the comparables to the subject property requires the use of units of comparison.

The five basic units of comparison used when valuing land are: front foot, square foot, acre, site or lot and units buildable. Front foot is based on the premise that frontage contributes to value. Square foot is typically used for irregular shaped lots where frontage is not the predominant factor. Acres are used for larger parcels. Site or lot is used when the market does not show a difference in value when there are differences in lot sizes. Units buildable are used when sites are sold on a unit basis. One must be careful when choosing a unit of comparison. The appropriate one is usually used in the marketplace when being bought and sold.

As no two parcels are identical, adjustments must be made to account for differences to the subject property. This process shows what a comparable would sell for by adjusting for the differences between the comparable and the subject. Adjustments are made to the comparable sales price, never to the subject property. If the difference in the comparable is superior to the subject, the comparable is adjusted downward. Adjustments are made in two ways, lump sum dollar or percentages. The order of adjustments needs to be considered. The typical order is financing, time, location, and physical characteristics.

In the reconciliation the assessor analyzes the types and number of adjustments made to the comparable to arrive at a final value estimate. Usually, the comparable with the least number of adjustments is given the most weight, although the absolute amount of the adjustments is also taken into consideration.

Below is an example of the sales comparison method using dollar adjustments. Through market analysis it was determined that time adjustment is \$250 per month upward, size adjustments are \$10 per square foot, and there is a \$10,000 difference for superior topography and \$20,000 difference for inferior location.

|  | <b>Subject</b> | <b>Sale 1</b>        | <b>Sale 2</b>           | <b>Sale 3</b>          |
|--|----------------|----------------------|-------------------------|------------------------|
| <b>Sale Price</b>                          |                | \$205,000            | \$223,000               | \$177,000              |
| <b>Sale Date</b><br><b>Time Adjustment</b> |                | 2 months ago<br>+500 | 12 months ago<br>+3,000 | 6 months ago<br>+1,500 |
| <b>Time Adjusted Sale Price</b>            |                | \$205,500            | \$226,000               | \$178,500              |
| <b>Location</b>                            | Average        | Average              | Average                 | Inferior<br>+20,000    |
| <b>Land Size</b>                           | 12,500 SF      | 12,500 SF            | 14,000 SF<br>-15,000    | 10,000 SF<br>+25,000   |
| <b>Topography</b>                          | Average        | Average              | Average                 | Superior<br>-10,000    |
| <b>Net Adjustment</b>                      |                | 0                    | -15,000                 | +35,000                |
| <b>Adjusted Sale Price</b>                 |                | \$205,500            | \$211,000               | \$213,500              |

After allowing for the proper adjustments for differences between the subject and sale properties, the adjusted sale prices of the comparables range from a low of \$205,500 to a high of \$213,500. Additionally, Sale 1 appears to be the most comparable sale having the least number of adjustments.

### **Allocation Method**

This method can be useful if there are no sales of vacant land. In this method the appraiser establishes a land value to total property value ratio from analyzing improved property sales. An allowance is determined based on knowledge of the market for the

property being appraised. The factors considered when applying allocation are previous years site values, land to improvement ratios in comparable areas or developments and analysis of new construction. This method is more reliable when the improvements are new. As they get older the land to property value ratio usually increases.

For example, in a similar neighborhood it is determined that the site value is 30% of the total property value. For a property with a total value of \$200,000, the land value would be estimated as follows:

$$\$200,000 \times 30\% = \$60,000$$

### **Abstraction Method**

This method involves using the cost approach to aid with estimating a land value from sales of improved properties. The appraiser subtracts the contributory value or depreciated cost of the improvements from the sale price yielding an indicated land value for the property. This method is helpful in certain circumstances but should be used cautiously. Analysis of several improved sales in a neighborhood could show a pattern of land values as shown below:

| <b>Sale</b> | <b>Price</b> | <b>Bldg. Cost New</b> | <b>Depreciation</b> | <b>Depreciated Bldg. Value</b> | <b>Land Value</b> |
|-------------|--------------|-----------------------|---------------------|--------------------------------|-------------------|
| <b>1.</b>   | \$250,000    | \$175,000             | \$30,000            | \$145,000                      | \$105,000         |
| <b>2.</b>   | \$275,000    | \$180,000             | \$20,000            | \$160,000                      | \$115,000         |
| <b>3.</b>   | \$225,000    | \$150,000             | \$35,000            | \$115,000                      | \$110,000         |

Sale 1 Example:  $\$175,000 - \$30,000 = \$145,000 \rightarrow \$250,000 - \$145,000 = \$105,000$

### **Anticipated Use/Development Method**

This method is used primarily for transitional land (typically farmland) that is to be developed. It is hypothetical in nature, as it requires the appraiser to estimate and forecast the variables used to estimate a value for the parcel before development. In this method, first estimate the number of lots that can be subdivided in the parcel

and the price they would sell for, which gives a projected sale prices for the developed lots. From this total value, all costs of development are deducted such as site improvements, marketing, entrepreneurial profit, overhead and sales expenses. This leaves an indicated value for the raw land. In this example of a 50-acre tract, it is found that the tract could get 45 building lots that would sell for \$100,000 each. From a survey of similar developments in the area, it is determined that site improvements are 20%; 15% for overhead and sales expenses and 25% for profit interest and entrepreneurial profit of the total sale price of the subdivided lots. The indicated value of the raw land is calculated as follows:

|  |              |              |
|--|--------------|--------------|
| Projected Sale Price of Lots (45 Lots x \$100,000)             |              | \$4,500,000  |
| Site Improvements (\$4,500,000 x .20)                          | -\$900,000   |              |
| Overhead and Sales Expense (\$4,500,000 x .15)                 | -\$675,000   |              |
| Profit Interest and Entrepreneurial Profit (\$4,500,000 x .25) | -\$1,125,000 |              |
| Total Development Costs  | =            | -\$2,700,000 |
| Indicated Raw Value of Land (50 Acres)                         |              | \$1,800,000  |

Therefore the value of the raw land is \$1,800,000 ÷ by 50 acres = \$36,000 per acre.

### **Ground Rent Method**

This method uses the income approach to value. The ground rent produced by a parcel is capitalized into an indication of value by an appropriate capitalization rate derived from the market. Rental data comparisons utilized can be on a per square foot, front foot, or acre basis. From the yearly gross rent, net operating expenses are deducted to produce a gross income which is then capitalized into value. For example, a parcel is leased for \$9,000 a month and operating expenses are \$750 a month. From the market, a capitalization rate of 8% was derived. The indicated value of the subject would be calculated as follows:

|  |             |
|--|-------------|
| Gross Income (\$9,000 x 12)            | \$ 108,000  |
| <u>Operating Expenses (\$750 x 12)</u> | - \$ 9,000  |
| Net Income                             | \$ 99,000   |
| <u>Capitalization Rate</u>             | 8%          |
| Indicated Land Value (\$99,000 ÷ .08)  | \$1,237,500 |

### **Land Residual Method**

This technique is used for newer income producing properties where a good building value can be ascertained and supported, and the land value is unknown. It allocates the net operating income between the buildings and capitalizes the residual income left to the land into a value. Information needed to use this method include, the net operating income, a well-developed building value and capitalization rates for both the land and building. In this example, the net operating income is \$80,000 a year and the improvement value has been established at \$800,000. It is found that the building capitalization rate is 7% and the land capitalization rate is 5%:

|  |   |    |           |
|--|---|----|-----------|
| Net Operating Income                             |   | \$ | 80,000    |
| Less Income to the Improvement (\$800,000 x .07) | - | \$ | 56,000    |
| <hr/>  |   |    |           |
| Income Attributable to Land                      |   | \$ | 24,000    |
| Land Capitalization Rate                         | ÷ |    | 5%        |
| <hr/>  |   |    |           |
| Indicated Land Value (\$24,000 ÷ .05)            |   | \$ | 480,000   |
| <br>   |   |    |           |
| Land Value                                       |   | \$ | 480,000   |
| Improvement Value                                | + | \$ | 800,000   |
| <hr/>  |   |    |           |
| Total Property Value                             |   | \$ | 1,280,000 |

### **Depth Factor Tables**

Depth Factor Tables measure changes in value because of differences in lot depth when land is bought on a front foot basis. Depth factors are applied to front foot values for lots to reflect variations from the standard depth. The lot on the following page has a standard depth of 100 feet. Lots in this area whose depth is 120 feet would need a depth factor applied of 1.08 to the standard calculation: number of front feet x the value of front foot x depth. In the case of lots with depths between indicated depths, the next lower factors should be used.

The basis for computing depth tables is called the “4-3-2-1 rule”. It states that the front 25% depth of a lot represents 40% of the total lot value, the next 25% represents 30% of the value, the next 25% is 20% of the value and the rear 25% is worth 10% of the value.

### 4-3-2-1 Rule

|              |          |
|--------------|----------|
| 10% of value | \$7,000  |
| 20% of value | \$14,000 |
| 30% of value | \$21,000 |
| 40% of value | \$28,000 |

100 Feet

Front foot value = \$700

$100 \text{ FF} \times \$700 \times 1.00 = \$70,000$

The following page is a sample of a Residential Depth Factor Table:

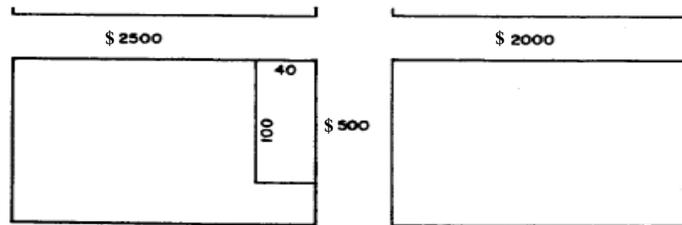
Residential and Apartment Depth Factor Tables  
Standard Depth

| <u>Depth in<br/>Feet</u> | <u>100'</u> | <u>125'</u> | <u>150'</u> | <u>175'</u> | <u>200'</u> | <u>300'</u> | <u>400'</u> |
|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 5                        | .10         | .10         | .10         | .10         | .10         | .02         | .02         |
| 10                       | .18         | .16         | .16         | .14         | .14         | .05         | .04         |
| 15                       | .26         | .22         | .20         | .18         | .18         | .07         | .06         |
| 20                       | .33         | .28         | .24         | .22         | .22         | .10         | .08         |
| 25                       | .40         | .34         | .28         | .26         | .25         | .12         | .10         |
| 30                       | .47         | .40         | .32         | .30         | .28         | .16         | .12         |
| 35                       | .53         | .45         | .36         | .34         | .31         | .18         | .14         |
| 40                       | .59         | .50         | .40         | .38         | .34         | .21         | .16         |
| 45                       | .65         | .54         | .44         | .42         | .37         | .24         | .18         |
| 50                       | .70         | .58         | .48         | .46         | .40         | .26         | .20         |
| 55                       | .75         | .62         | .52         | .49         | .43         | .29         | .22         |
| 60                       | .79         | .66         | .56         | .52         | .46         | .32         | .24         |
| 65                       | .83         | .70         | .60         | .55         | .49         | .34         | .26         |
| 70                       | .87         | .74         | .64         | .58         | .52         | .37         | .28         |
| 75                       | .90         | .78         | .68         | .61         | .55         | .40         | .30         |
| 80                       | .92         | .81         | .72         | .64         | .58         | .42         | .32         |
| 85                       | .94         | .84         | .75         | .67         | .61         | .44         | .34         |
| 90                       | .96         | .86         | .78         | .70         | .64         | .46         | .36         |
| 95                       | .98         | .88         | .81         | .73         | .67         | .48         | .38         |
| 100                      | 1.00        | .90         | .84         | .76         | .70         | .50         | .40         |
| 105                      | 1.02        | .92         | .87         | .79         | .72         | .52         | .42         |
| 110                      | 1.04        | .94         | .89         | .81         | .74         | .53         | .43         |
| 115                      | 1.06        | .96         | .91         | .84         | .76         | .55         | .45         |
| 120                      | 1.08        | .98         | .93         | .86         | .78         | .58         | .46         |
| 125                      | 1.10        | 1.00        | .95         | .88         | .80         | .60         | .47         |
| 130                      | 1.12        | 1.02        | .96         | .90         | .82         | .61         | .49         |
| 135                      | 1.14        | 1.04        | .97         | .92         | .84         | .63         | .50         |
| 140                      | 1.15        | 1.06        | .98         | .93         | .86         | .65         | .52         |
| 145                      | 1.16        | 1.08        | .99         | .94         | .88         | .67         | .53         |
| 150                      | 1.17        | 1.10        | 1.00        | .95         | .90         | .70         | .55         |
| 155                      | 1.18        | 1.12        | 1.01        | .96         | .91         | .71         | .56         |
| 160                      | 1.19        | 1.14        | 1.02        | .97         | .92         | .72         | .58         |
| 165                      | 1.20        | 1.15        | 1.03        | .98         | .93         | .74         | .60         |
| 170                      | 1.21        | 1.16        | 1.04        | .99         | .94         | .75         | .61         |
| 175                      | 1.22        | 1.17        | 1.05        | 1.00        | .95         | .77         | .63         |
| 180                      | 1.23        | 1.18        | 1.06        | 1.01        | .96         | .78         | .64         |
| 185                      | 1.24        | 1.19        | 1.07        | 1.02        | .97         | .80         | .65         |
| 190                      | 1.25        | 1.20        | 1.08        | 1.03        | .98         | .81         | .67         |
| 195                      | 1.26        | 1.21        | 1.09        | 1.04        | .99         | .83         | .68         |
| 200                      | 1.27        | 1.22        | 1.10        | 1.05        | 1.00        | .84         | .70         |
| 250                      | 1.30        | 1.25        | 1.15        | 1.10        | 1.06        | .93         | .80         |
| 300                      | 1.32        | 1.27        | 1.20        | 1.14        | 1.10        | 1.00        | .90         |
| 350                      | 1.34        | 1.29        | 1.24        | 1.18        | 1.13        | 1.05        | .95         |
| 400                      | 1.36        | 1.31        | 1.26        | 1.21        | 1.16        | 1.08        | 1.00        |
| 450                      | 1.38        | 1.33        | 1.28        | 1.23        | 1.18        | 1.10        | 1.04        |
| 500                      | 1.40        | 1.35        | 1.30        | 1.25        | 1.20        | 1.11        | 1.05        |

Add .02 for Each 50 ft. over 500.

**Corner Influence Table**

This refers to the additional value of property bounded on two sides by intersecting roadways. This is most important for retail and commercial properties since the location makes the site more accessible to consumer traffic. The market analysis will show where corner influence factors should be applied. The following is the standard corner influence table applicable to commercial parcels. The corner influence is applied to the corner property up to 50 feet from the corner on the high value street in the central business district, as shown on the unit land value maps.



**Corner Influence Table**

| Depth in Feet<br>From Low<br>Value Street | Low Value Street<br><u>Depth Factor</u> |
|---|---|
| 5   | .21                                     |
| 10  | .31                                     |
| 15  | .38                                     |
| 20  | .43                                     |
| 25  | .47                                     |
| 30  | .51                                     |
| 35  | .54                                     |
| 40  | .57                                     |
| 45  | .59                                     |
| 50  | .60                                     |

**CORNER INFLUENCE FACTOR RULE**

To find the value of a corner lot, in cases where this Table is adopted, calculate first the value of the lot from the high value street; add to this sum the value of the lot calculated from the low value street to the depth of the corner up to 50 feet. Multiply the low value front foot value by the low value street depth factor to obtain the side street adjusted front foot.

EXAMPLE:

| <u>Lot Dimensions</u>        | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|------------------------------|-------------------|---------------------|------------------------|------------------|
| High Value Street 40' X 100' | 40' X (\$2,500 X  | 1.00) =             | \$2,500                | \$100,000        |
| Low Value Street 100' X 40'  | 100' X (\$500 X   | .57) =              | \$285                  | \$28,500         |

Total Land Value \$128,500

On land zoned and used for apartments, a flat corner influence percentage may be added to unit front foot values for the first 50 feet of the corner only if there is an indication that the corner lot has an increment of value over an inside lot.

**Alley Influence**

On land adjacent to rear or side public alleys, the following alley influence factors are applicable in larger cities and may be added to unit front foot values if the market so indicates.

Rear alley - add 5% (multiply the unit land value of affected property by factor 1.05)

Side alley - add 7% to adjacent property holdings only up to 50 feet frontage of such property from the side alley (multiply the unit land value of affected property by factor 1.07).

**Unit Values of Industrial Land**

The standard unit of valuation for industrial land is either square foot or acre. Exceptions to this rule are where light industrial lands, improved with loft or similar light structure buildings, located in commercial and other subdivided areas, or where platted areas have been zoned for industrial use. In these areas, the standard unit is front foot.

**Unit Values of Unsubdivided Land**

The standard unit of value for unsubdivided land is price per acre. Exceptions to this rule occur when the unsubdivided land fronts on a business or main thoroughfare. In this case, the applicable standard of value can be price per front foot.

### **113. Land Value Rules for Lots of Various Shapes and Sizes**

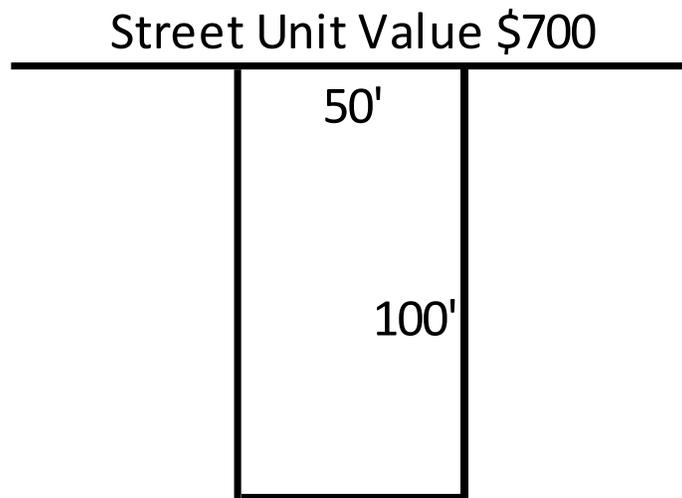
Rules 1 to 9 are examples based on Residential Standard Lot Depth of 100 Feet, Table R-IOO; rules 10 to 12 are examples based on Commercial Standard Lot Depth of 100 Feet, Table C-IOO:

#### **RULE 1**

#### **RECTANGULAR LOT**

To find the value of a rectangular lot, multiply the unit front foot value by the depth factor. Multiply the resulting front foot value (rounded off to the nearest dollar) by the linear feet of frontage or width of the lot.

| <b><u>Lot Dimensions</u></b> | <b><u>Unit Value</u></b> | <b><u>Depth Factor</u></b> | <b><u>Adj. Unit Value</u></b> | <b><u>Lot Value</u></b> |
|------------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|
| 50' X 100'                   | 50' X (\$700 X           | 1.00) =                    | \$700                         | \$35,000                |



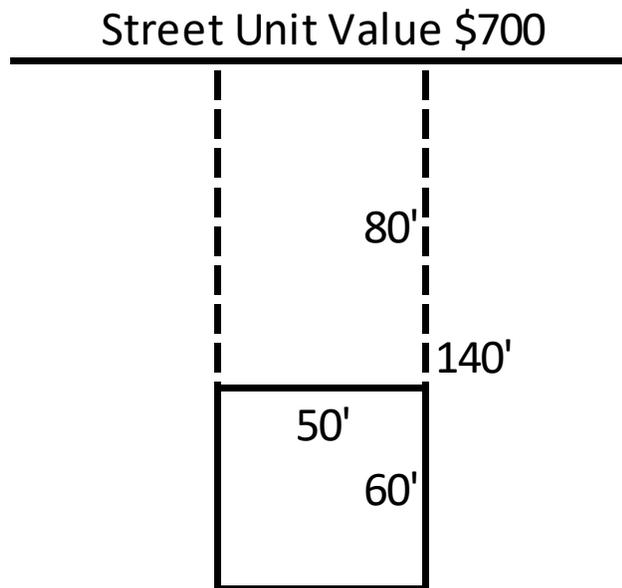
## RULE 2

### REAR RECTANGULAR LOT

To find the value of a rear rectangular lot, multiply the unit front foot value by the difference between the depth factors for the farthest and nearest distances of the lot from the street. Multiply the resulting adjusted front foot value by the frontage.

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------|
| 50' X 60'             | 50' X (\$700 X    | .23) =              | \$161                  | \$8,050          |

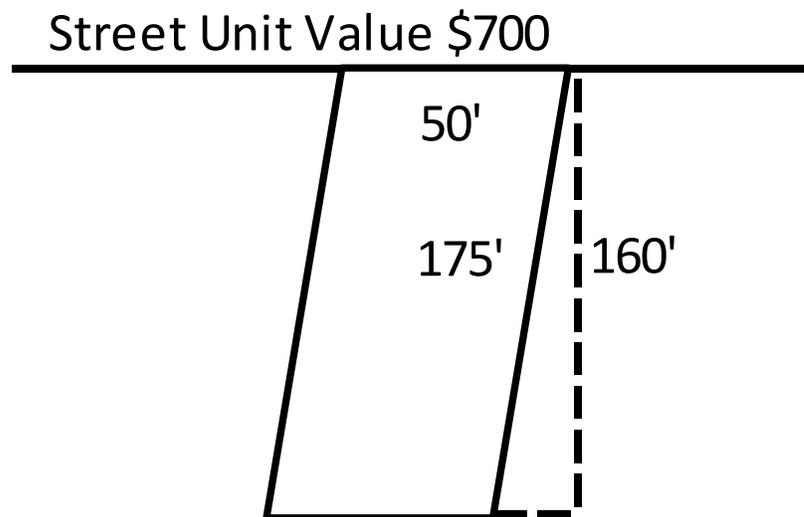
Depth (140' - 80'). Depth Factor (1.15 - .92) = .23



**RULE 3**  
**PARALLELOGRAM-SHAPED LOT**  
**(Oblique to the Street)**

To find the value of the lot, multiply the unit front foot value by the depth factor for the perpendicular depth of the lot. Multiply this adjusted front foot value by the frontage.

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------|
| 50' X 160'            | 50' X (\$700 X    | 1.19) =             | \$833                  | \$41,650         |

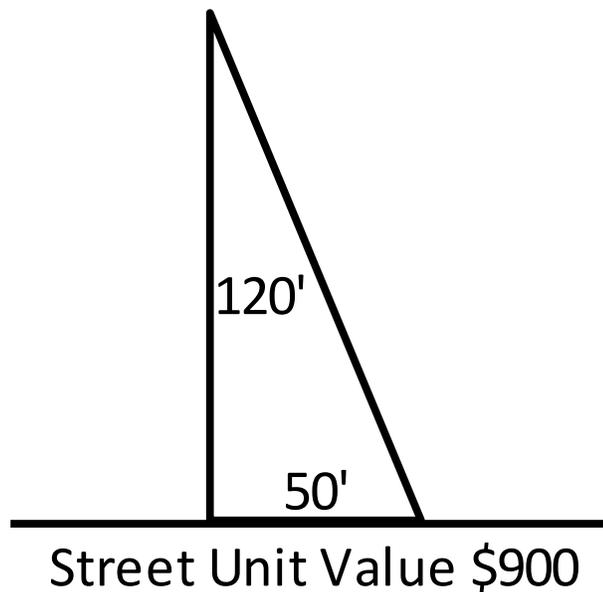


**RULE 4**  
**TRIANGULAR LOT**

**(With base on the street at right angles to the street)**

To find the value of the lot, first compute as a rectangular or parallelogram lot of identical frontage and perpendicular depth. Take 65% of the value of this lot for the value of a triangular lot with base on the street at right angles to the street and round to the nearest hundred.

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Triangle Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------------|------------------|
| 50' X 120'            | 50' X (\$900      | X 1.08 X            | .65) =                 | \$632                  | \$31,600         |

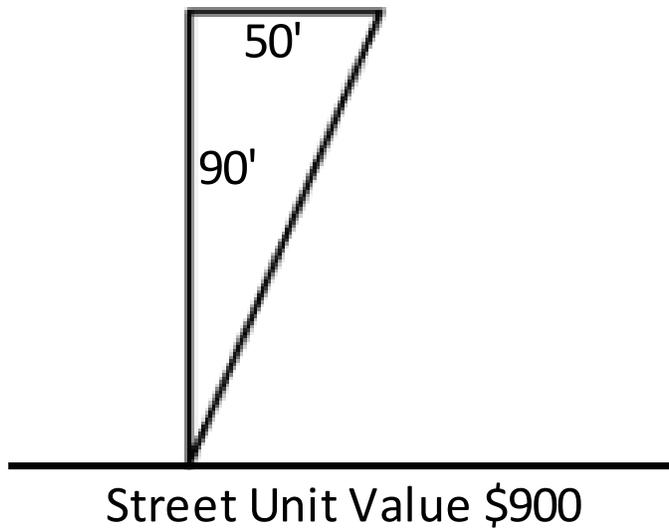


**RULE 5**  
**TRIANGULAR LOT**

**(With apex on the street and at right angles to the street)**

To find the value of the lot, first compute as a rectangular or parallelogram lot with frontage and perpendicular depth identical to the base and depth of the triangular lot. Take 35% of the value of this lot for the value of a triangular lot with apex on the street and at right angles to the street.

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Triangle Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------------|------------------|
| 50' X 90'             | 50' X (\$900      | X .96 X             | .35) =                 | \$302.40               | \$15,120         |

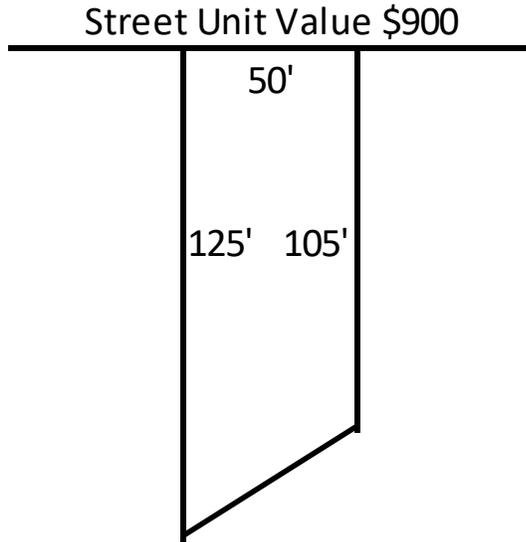


**RULE 6**  
**TRAPEZOIDAL LOT**

**(At right angles to the street)**

To find the value of the trapezoidal lot at right angles to the street, multiply the unit front foot value by the depth factor for the average depth of the parallel sides of the lot. Multiply this adjusted front foot value by the frontage.

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------|
| 50' X 115'            | 50' X (\$900 X    | 1.06) =             | \$954                  | \$47,700         |

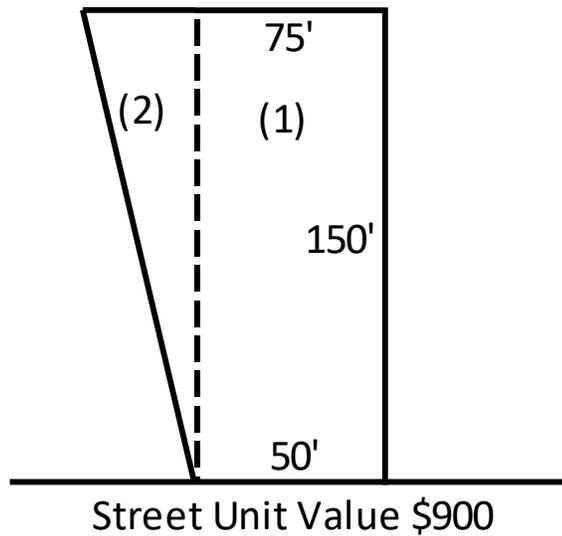


**RULE 7**  
**Trapezoidal Lot**  
**(Parallel front and rear)**

To find the value of the lot, compute the rectangular and triangular portions separately, according to rule, and take the sum of the two computations for the total value.

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Triangle Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------------|------------------|
| (1) 50' X 150'        | 50' X (\$900      | X 1.17)             |                        | \$ 1,053.00            | \$52,650         |
| (2) 25' X 150'        | 25' X (\$900      | X 1.17              | X .35) =               | \$ 368.55              | \$ 9,214         |

Total Land Value \$61,864



**RULE 8**  
**IRREGULAR LOT**

Reduce the irregular lot to the nearest equivalent rectangular, trapezoidal, or triangular sections and apply the applicable rules.

**LOT "A"**

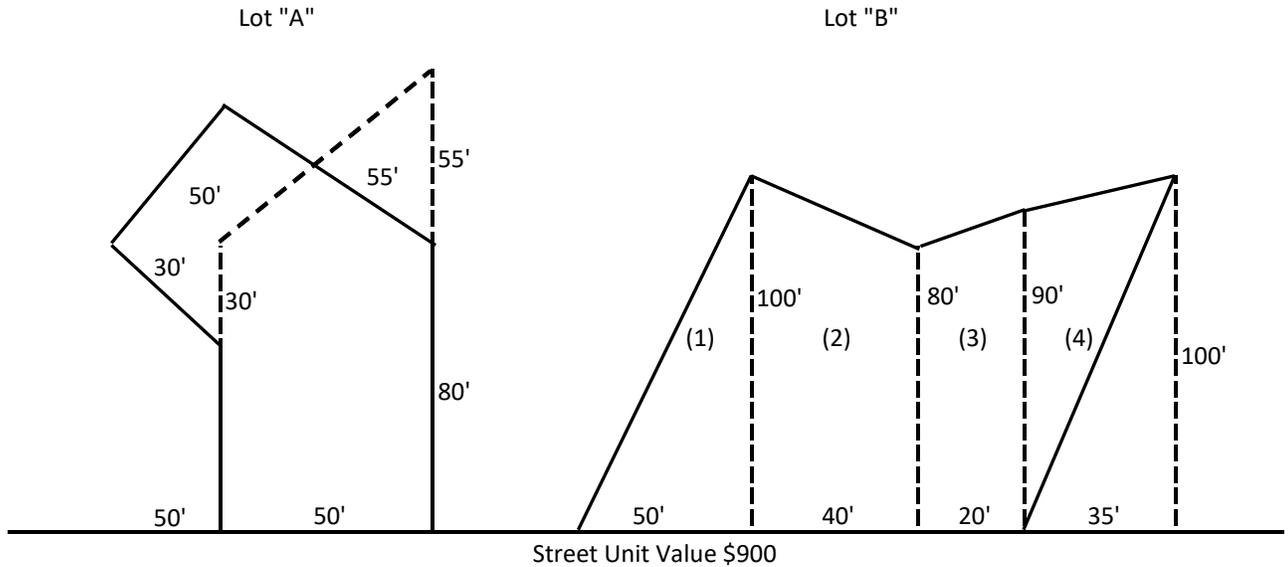
| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Triangle Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------------|------------------|
| 50' X 108' *avg.      | 50' X (\$900      | X 1.02) =           |                        | \$918                  | \$45,900         |

\*Total average of both sides

**LOT "B"**

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Triangle Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------------|------------------|
| (1) 50' X 100'        | 50' X (\$900      | X 1.00 X            | .65) =                 | \$585                  | \$29,250         |
| (2) 40' X 90'         | 40' X (\$900      | X .96) =            |                        | \$864                  | \$34,560         |
| (3) 20' X 85'         | 20' X (\$900      | X .94) =            |                        | \$846                  | \$16,920         |
| (4) 35' X 95'         | 35' X (\$900      | X .98 X             | .35) =                 | \$308.70               | \$10,805         |

Total Land Value \$91,535



**LOT "B"**

Lot (2)  $100 + 80 = 180 \div 2 = 90'$  Depth

Lot (3)  $80 + 90 = 170 \div 2 = 85'$  Depth

Lot (4)  $90 + 100 = 190 \div 2 = 95'$  Depth

**RULE 9**  
**CURVED LOT**

To find the value of a curved lot, rectify the curvatures and reduce the lot to its nearest equivalent lot shape. Then, compute according to the applicable rules.

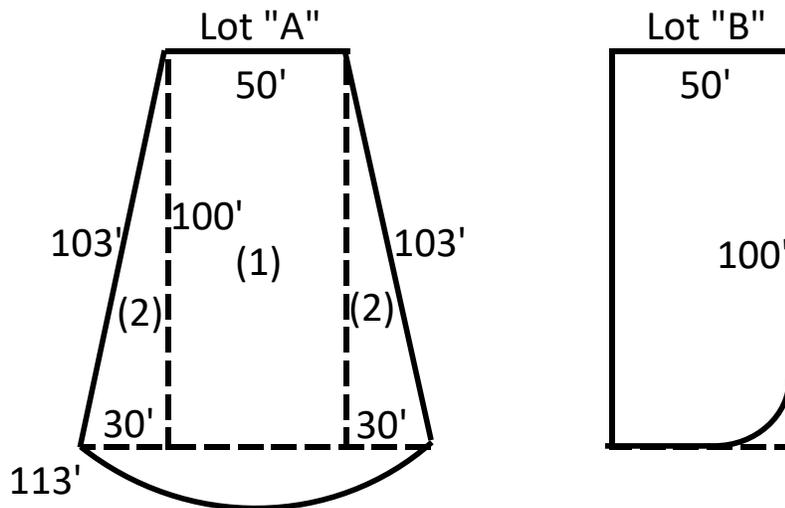
**LOT "A"**

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Triangle Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------------|------------------|
| (1) 50' X 100'        | 50' X (\$900      | X 1.00) =           |                        | \$900                  | \$45,000         |
| (2) 60' X 100'        | 60' X (\$900      | X 1.00              | X .65) =               | \$585                  | \$35,100         |

Total Land Value \$80,100

**LOT "B"**

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Triangle Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------------|------------------|
| 50' X 100'            | 50' X (\$900      | X 1.00) =           |                        | \$900                  | \$45,000         |



Street Unit Value \$900

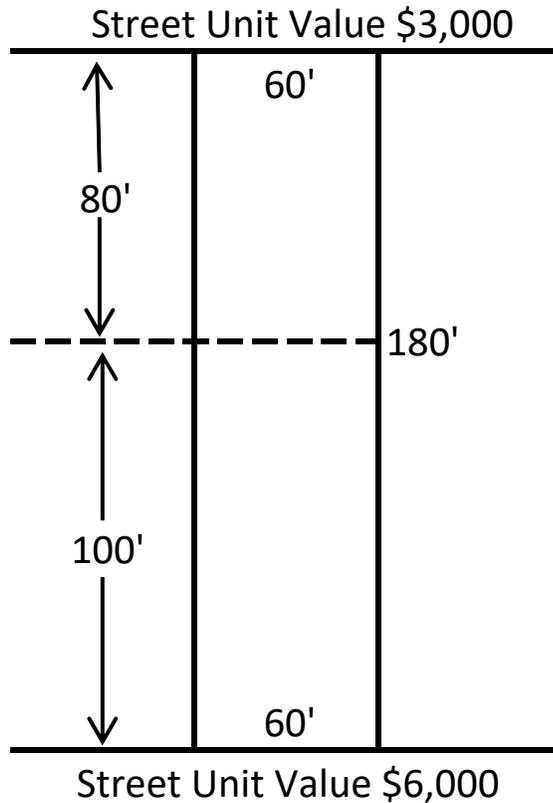
**RULE 10**

**BUSINESS THROUGH LOT**

To find the value of a through lot with two street fronts, compute from the high-value street to the standard depth or from half the depth, whichever is greater, and from the low-value street for the remaining depth. Then, add them together for the total value.

| <u>Lot Dimensions</u>        | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|------------------------------|-------------------|---------------------|------------------------|------------------|
| 60' X 180'                   |                   |                     |                        |                  |
| High Value Street 60' X 100' | 60' X (\$6,000)   | X 1.00) =           | \$6,000                | \$360,000        |
| Low Value Street 60' X 80'   | 60' X (\$3,000)   | X .92) =            | \$2,760                | \$165,600        |

Total Land Value \$525,600

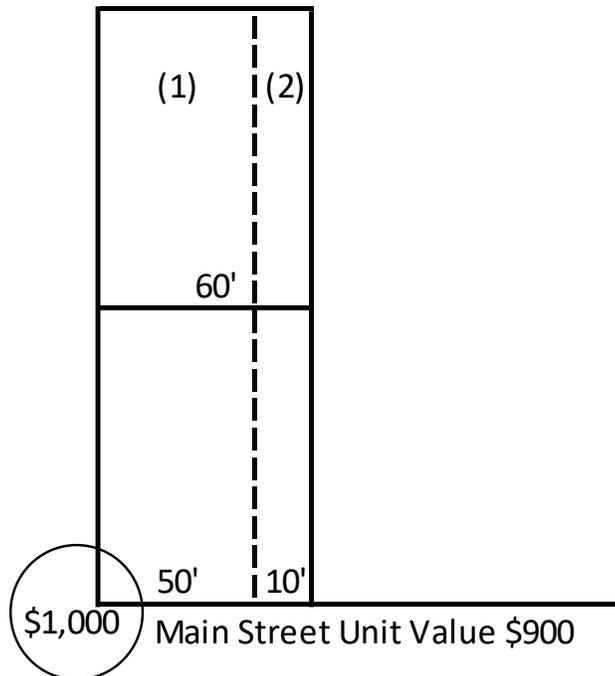


**RULE 11**  
**BUSINESS CORNER LOT**

To find the value of a business corner lot:

- (a) Compute the frontage up to 50' on the high unit value street to depth of the lot on the basis of the circled unit front foot value.
- (b) Compute the remainder of frontage on the high unit value street to depth of the lot on the basis of the unit front foot value of the street.

| <u>Lot Dimensions</u> | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|-----------------------|-------------------|---------------------|------------------------|------------------|
| 50' X 100'            | 50' X (\$1,000    | X 1.00) =           | \$1,000                | \$50,000         |
| 10' X 100'            | 10' X (\$900      | X 1.00) =           | \$ 900                 | \$ 9,000         |
| Total Land Value      |                   |                     |                        | \$59,000         |



## RULE 12

### TRIANGULAR CORNER ON TWO STREETS\*

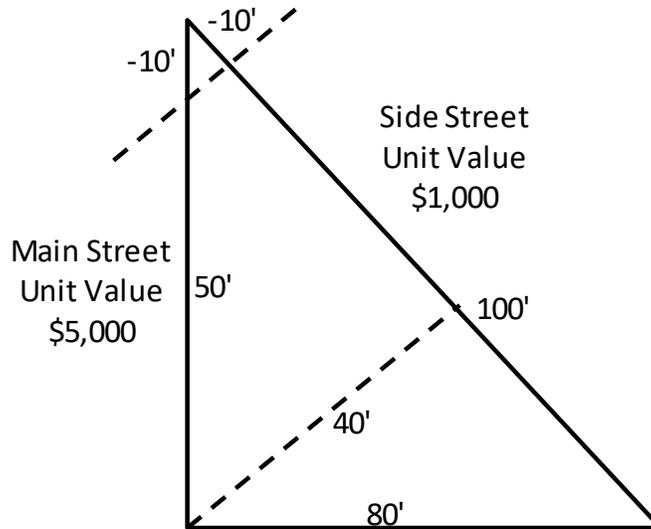
To find the value of the lot:

- (a) Deduct 10' from frontage on both streets if the angle is 45° or less.
- (b) Compute the frontage on the high unit value street as a triangle.
- (c) Compute the frontage on the low unit value street as a triangle.

| <u>Lot Dimensions</u>        | <u>Unit Value</u> | <u>Depth Factor</u> | <u>Triangle Factor</u> | <u>Adj. Unit Value</u> | <u>Lot Value</u> |
|------------------------------|-------------------|---------------------|------------------------|------------------------|------------------|
| (b) 40' X (50' - 10') X 80'  | 40' X (\$5,000)   | X .92 X             | .65) =                 | \$2,990                | \$119,600        |
| (c) 90' X (100' - 10') X 40' | 90' X (\$1,000)   | X .59 X             | .65) =                 | \$383.50               | \$ 34,515        |

Total Land Value    \$154,115

NOTE: Triangle corner lots may present unusual problems. If the rules develop unrealistic results, judgment and special consideration should be given in comparison with similar properties.



## **114. Farmland Assessment Act of 1964 (Chapter 48, Laws of 1964)**

### **1. Statutory Limitation**

The Farmland Assessment Act is a jurisdictional exception authorized by the NJ State Constitution of assessing property at its “full and true value”. It authorizes and mandates assessment of qualified farmland on the basis of its use and productivity value in agriculture or horticulture rather than on the basis of its market value.

### **2. Use and Productivity Value**

Assessment of farmland on the basis of its use and productivity value presents a number of difficulties. The principal difficulties arise for two important reasons:

1. Exact measures of the innate productivity of the 215 soil types in New Jersey are not available although there is a scientific base for making reasonable estimates of productivity.
2. The productivity of farmland varies with its particular use.

A method of overcoming the principal difficulties lies in combining the scientific knowledge available on the characteristics of New Jersey soils and their economic potential according to the current uses in agriculture. The procedure is simplified by grouping the 215 soil types into five rated soil groups based on the land’s productivity. Net income from the land is capitalized and allocated on the basis of the below rated capabilities, found in the agricultural soil groupings.

### **3. Agricultural Soil Groupings**

New Jersey is fortunate in having a complete set of maps and a description of all of its soils. To aid in the assessing process, the agricultural soils have been categorized into five groups:

- Group A      Very productive farmland - suitable for permanent cultivation. With proper management, yields tend to be high. Usually the most desirable soil in the area.
- Group B      Good farmland - suitable for permanent cultivation. Yields are generally fairly high.
- Group C      Fair farmland - suitable for permanent cultivation. Yields tend to be lower than those in Groups A and B. The limiting factors are usually shallowness, droughtiness or excessive moisture.
- Group D      Rather poor farmland - usually wet, stony, droughty, or otherwise unsuitable for permanent cultivation.
- Group E      Land unsuitable for tillage - usually because of excessive water, shallowness, stoniness or droughtiness.

In arriving at a realistic classification (placing each soil into one of five groups), the following factors were primarily used: General suitability of the soil for farming, mechanical composition, depth of the soil, drainage, stoniness, and other related properties.

#### 4. Land Use Classes

Land use on the typical New Jersey farm differs for various reasons but the primary uses of land can be combined into five distinct classes: cropland harvested, cropland pastured, permanent pasture, appurtenant woodland, and non-appurtenant woodland. These classes are described below:

- a.) Cropland Harvested - This is the heart of the farm and represents the highest use of land in agriculture. All land from which a crop was harvested in the current year falls into this category, as well as boarding, training, and rehabilitation facilities.
  
- b.) Cropland Pastured - This land can be and sometimes is used for cropland. However, because of the organization of certain types of farming, it is often

found in pasture from which the maximum potential income may not be realized in any particular year. All cropland pastured falls into this category.

c.) Permanent Pasture - This land is not cropped because its economic potential is greater in pasture. It is meadow land, the rough and stony land, the land with a high degree of slope. It is usually unimproved land which farmers have found to be nonproductive except for pasturing and haying.

d.) Appurtenant Woodland - Woodland that is part of a qualified farm. Usually, this land is restricted to woodlots because of slope, drainage capability, soil type or topography. Such land has limited productive use, but it provides a windbreak, watershed, buffers, or controls soil erosion.

e.) Non-Appurtenant Woodland - Woodland which can only qualify for farmland assessment on the basis of being in compliance with a woodland management plan filed with the Department of Environmental Protection. It is actively devoted to the production for sale of tree and forest products unless it is under a Forest Stewardship Plan.

f.) Wetlands - Those lands as determined by regulations adopted by the Department of Environmental Protection.

##### 5. Deriving Ranges of Value for Farmland

See the latest annual report of The State Farmland Evaluation Committee for the method used in determining the ranges of value for farmland in each county. These reports are published annually on October 1<sup>st</sup> on the taxation website at <http://www.state.nj.us/treasury/taxation/lpt/farmland.shtml>.

## **115. Cost Approach to Value**

The cost approach is based on the principle of substitution which states that a buyer will pay no more for a property than the cost of acquiring an acceptable

replacement of like utility. It reflects market behavior as the real estate market relates value to cost. It involves two parts: estimating the land value and the depreciated cost of the building.

There are four types of cost:

1. **Reproduction cost** is the cost of producing an exact replica of an improvement using the same materials, design, and workmanship.
2. **Replacement cost** uses costs that have the same utility using modern materials, design, and workmanship.
3. **Historical cost** is the cost at the time a property was originally built.
4. **Trended historical cost** is historical cost factored by a current index for property components.

There are four categories of estimating cost:

1. The **quantity survey method** is the most detailed using an itemization of all the direct and indirect costs to construct a building, generally used by contractors and builders.
2. The **unit-in-place method** is a modified quantity survey that combines direct and indirect costs into a unit-in-place value.
3. The **comparative unit method** combines direct and indirect costs divided by a unit of value, square foot, or cubic foot, to get a cost per unit.
4. **Trended historical cost method** obtains a cost value by trending its historical cost with a factor from a construction cost index.

The New Jersey Appraisal Manual utilizes both unit-in-place and comparative unit methods. In order to estimate uniform, sound appraisals for individual properties, this manual provides for determination of replacement cost for buildings of similar type and construction. Examinations of typical buildings in different sections of the State show that there are basic similarities in building type and construction to permit classification into several classes of buildings. Variations in the construction and size of buildings within such groups are reflected by the unit replacement costs of the different building classes.

The following page shows the list of the major groups of residential and farm building classes for which base replacement costs and depreciation allowances have been developed for this manual.

Single-Family Dwelling

|                                  |      |
|----------------------------------|------|
| Low Quality Dwelling             | R-12 |
| Fair Quality Dwelling            | R-13 |
| Below Average Quality Dwelling   | R-14 |
| Average Quality Dwelling         | R-15 |
| Standard Quality Dwelling        | R-16 |
| Above Standard Dwelling          | R-17 |
| Good Quality Dwelling            | R-18 |
| High Quality Dwelling            | R-19 |
| Superior Quality Dwellings       | R-20 |
| Mansion Quality Dwellings        | R-21 |
| Estate Quality Dwellings         | R-22 |
| Highest Estate Quality Dwellings | R-23 |

Mobile Homes

|                 |      |
|-----------------|------|
| Low Quality     | R-50 |
| Fair Quality    | R-51 |
| Average Quality | R-52 |
| Good Quality    | R-53 |
| Highest Quality | R-54 |

Farm Buildings

|                        |             |
|------------------------|-------------|
| Farm Barns             | 150-151     |
| Other Farm Structures  | 152-156     |
| Post & Frame Buildings | PF157-PF164 |

Semi-Detached Dwellings

|                       |      |
|-----------------------|------|
| Fair Quality          | R-27 |
| Average Quality       | R-28 |
| Above Average Quality | R-29 |
| Good Quality          | R-30 |

Row-Town House

|                       |      |
|-----------------------|------|
| Fair Quality          | R-33 |
| Average Quality       | R-35 |
| Above Average Quality | R-37 |
| Good Quality          | R-39 |

Two-to-Four Family Apartments

|                       |      |
|-----------------------|------|
| Fair Quality          | R-43 |
| Average Quality       | R-45 |
| Above Average Quality | R-47 |
| Good Quality          | R-49 |

## **116. Descriptions and Unit Costs of Different Building Classes**

For each building class, base specifications have been developed including specific descriptions that show distinctions between the building classes. On the basis of the costs of labor and materials provided in the building class specifications, the base unit replacement cost and variations according to area or volume for each typical class have been calculated.

For example, the unit replacement cost for a residential building is expressed in dollars per square foot of floor area. Adjustments (additions or deductions) account for important variations in an individual building from the base specifications, which when totaled together, form the base replacement cost. The building descriptions and their base specifications provide the basis for selecting the building classification and recording other essential information on the property record cards which eventually determines the replacement cost of each building.

The unit replacement costs in this manual are based on average prices of material, labor, and other construction items throughout New Jersey; as of October 1<sup>st</sup>, 2001. Annually, the Division of Taxation publishes cost conversion factors to reflect updates in material costs and labor rates.

## **117. Residential (“R” Series) Building Classifications**

In order to classify residential structures, it is necessary to understand the construction characteristics of the various classes of buildings. The quantity, quality, and types of materials and quality of workmanship determine construction characteristics. Building class is determined by comparing the building characteristics given for each class with the building construction found during physical inspections. Actual value determinations may dictate a shift in class, up or down, as results may demonstrate.

A general description of each building class is as follows:

**CLASS R-12: LOW (POOREST) QUALITY**

This is the lowest cost dwelling unit, providing minimal shelter. Materials and construction methods are of the lowest quality. Plumbing typically includes minimal bathroom and kitchen facilities. Construction methods may not meet today's building standards.

**CLASS R-13: FAIR QUALITY**

This class of dwelling is built with sub-standard quality material having defects. Workmanship is below professional standard of a semi or unskilled caliber. These units typically have wood floors in a portion of the dwelling. Plumbing usually consists of a three-fixture bath and kitchen sink.

**CLASS R-14: BELOW AVERAGE QUALITY**

The dwellings in this class will generally be found with adequate electrical and plumbing rough-ins, but the fixtures are commonly below average quality. The floors will occasionally be of inferior quality hardwood or a mix of hard and softwood. Partitions are dry wall or low-quality plaster. The floors and roof framing are usually less than standard. This class is considered to have the essential conveniences.

**CLASS R-15: AVERAGE QUALITY**

This class of dwelling is almost comparable to one of standard quality or an average of all existing housing. It contains all the conveniences usually found in a standard quality dwelling, but either the materials or workmanship used in the construction of this type of dwelling is slightly less than standard quality to that used in a standard quality dwelling built today.

**CLASS R-16: STANDARD QUALITY**

Dwellings in this class are typical of today's construction, materials, and methods. This class unit meets current building code standards. They are well framed, with rafters and floor joists of standard size and spacing. Plumbing consists of a kitchen sink, dish washer, water heater, laundry facilities and multiple baths. The floors are carpet or

hardwood, but with occasional tile finish. A developer typically builds this class of dwelling on a mass production basis (large-scale residential developments).

#### **CLASS R-17: ABOVE STANDARD QUALITY**

The dwellings in this class have materials and fixtures of above average quality and good workmanship. Plumbing fixtures and fittings are of above average quality. The kitchen has ample built-in cabinets. This class dwelling may have some exterior ornamentation and interior refinements. These units are found in mass-produced, better-grade developments.

#### **CLASS R-18: GOOD QUALITY**

This class dwelling has materials and fixtures of good quality and good workmanship. They are well framed with rafters and joists exceeding minimal standards. The plumbing and heating infrastructures found in these dwellings are of better quality. The floors and walls have better quality materials and finish. These dwellings typically have some exterior ornamental (brick or stone fronts) as well as interior refinements. This class of dwelling may be found in smaller developments. Units have some degree of customization.

#### **CLASS R-19: HIGH QUALITY**

This class includes dwellings of a higher quality than those cited above. Better grade construction, quality materials and workmanship are evident. Good quality plumbing is included, which may also include additional fixtures, such as whirlpool baths or saunas. Interior finish includes cabinets and wood trim of finer woods, including some wood paneling. These units typically show some emphasis on both interior and exterior refinements. This class of dwelling reflects custom housing built from the developer's plans.

#### **CLASS R-20: SUPERIOR QUALITY**

These dwellings use superior quality construction, having a low maintenance exterior of stone, stucco, or brick and with some special architectural highlights. Interior finishes and appointments are superior quality. Heating and cooling units are of superior quality

utilizing multiple zones. Units are typically custom designed by an architect for the property owner.

#### **CLASS R-21: MANSION QUALITY**

This mansion quality class dwelling is based upon a customized architectural design with construction typically supervised by the architect. Workmanship, interior elements and finishes, and exterior ornamentation are high quality. Multiple HVAC units are typical in this class. Some dwellings may have gated or brick/stone entrance ways.

#### **CLASS R-22: ESTATE QUALITY**

This class of dwelling has an excellent quality of construction, being supervised by an architect. These homes are built from detailed architectural plans and written specifications for a custom builder. Workmanship on exterior and interior ornamentation is of very high quality requiring exceptionally skilled craftsmanship. Special engineering and special construction may be needed to support unusual architectural elements. This class may have housing for staff or guests within the same building and a separate service entrance.

#### **CLASS R-23: HIGHEST ESTATE QUALITY**

The dwellings in this class use the highest luxury quality of construction. This dwelling is built for an individual without regard to resale value. Architectural expression may be a major element of the design. Opulence and eccentric details are considered typical in this class. Unusual features such as imported tile, bronze and gilded fixtures, hand carvings, rare woods and stones and works of art are characteristic of this class. This quality of property may contain special structural elements to support special features not typically found in residential construction. Arrangements frequently include separate service entrance areas, housing for staff and guests in separate buildings.

**CLASS R-27, R-28, R-29, R-30:**

**FAIR, AVERAGE, ABOVE AVERAGE AND GOOD QUALITY SEMI-DETACHED RESIDENCES**

These classes are comparable, in quality of materials and workmanship used in their construction, to a single-family residence of the same quality. They differ from the single-family residence in that one or a portion of one of their walls is a party wall.

**CLASS R-33, R-35, R-37, R-39:**

**FAIR, AVERAGE, ABOVE AVERAGE AND GOOD QUALITY ROWHOUSE/TOWNHOUSE**

These classes are comparable, in quality of materials and workmanship used in their construction, to a single-family residence of the same quality. They differ from the single-family residence in that two of their sidewalls are party walls except for the end units, which have one party wall.

**CLASS R-43, R-45, R-47, R-49:**

**FAIR, AVERAGE, ABOVE AVERAGE AND GOOD QUALITY TWO-TO-FOUR FAMILY APARTMENTS**

These classes are comparable, in quality of materials and workmanship used in their construction, to a single-family residence of the same quality. They differ in that they are multi-family dwellings having two-to-four apartments in each building.

**CLASS R-50, R-51, R-52, R-53, R-54:**

**LOW, FAIR, AVERAGE, GOOD AND HIGHEST QUALITY MOBILE HOMES**

Mobile homes are typically towed to the site. The lowest class (R-50) mobile home provides minimal shelter, with low quality material and construction. The quality of material and construction increases as the class progresses to the highest quality class (R-54), which is almost comparable in quality to a prefabricated dwelling.

## **118. Field Procedure for Building Valuation**

The field inspection of each property is the first step used in recording the information necessary for estimating the land and building value. At this inspection, important data in regard to the lot or tract of land, the measurements and classification of buildings, a ground plan sketch of the principal buildings, and descriptive data on the principal accessory buildings on each lot or tract are entered on data collection forms.

The field operations of the appraiser consist of determining and entering all descriptive information about (a) each parcel of land (b) measurements of each principal building and garage or other accessory buildings (c) preparing a sketch of the buildings and other improvements (d) inspecting the building exterior and interior and entering required information on the data collection form as to building type, use, condition, structure construction, heating, plumbing, etc. along with specific data as to quality of the various components.

The appraiser, when inspecting the interior of the building, may request the owner or occupant to accompany them through the building. This will help in assuring expeditious inspection and recording of the desired information.

The necessity of accuracy, thoroughness, and neatness in the preparation of the records for the individual parcels and the buildings cannot be stressed too strongly. The soundness and fairness of the valuation of individual properties cannot be established on the procedures and standards applicable to the appropriate properties alone but must also depend on the accuracy and thoroughness of the inspection and recording of each individual property's data.

## **119. Recording Descriptions and Measurements for Buildings**

As soon as the descriptive material on the land has been completed, the appraiser/assessor proceeds to check the outside measurements and enters information about the principal building, garage and any other accessory buildings or improvements.

The front of each building is measured first. Starting with the right-front corner then, proceeding around each building in clockwise direction to the place of beginning. Measurements are taken along the exterior surface of the ground floor. They should be taken directly on the walls and not from minor projections. Measurements should be read to the nearest foot. Building dimensions are entered on the outline sketch so that each dimension can be read.

Building measurements are entered in the appropriate spaces under “Floor Area Computations”. Irregular shaped buildings are divided into parts with dimensions shown for each part. The building segments can be labeled A, B, C... etc., both on the ground plan sketch and in the “Floor Area Computations”.

Story heights are entered on the sketch; the “B” indicates a basement. For example:

1B, 1/B, 1-B or 1+B is 1 story plus basement

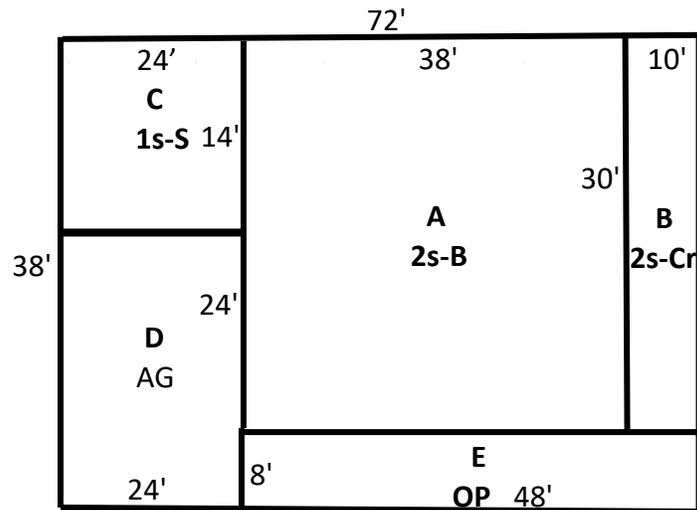
In case two or more different story heights occur in the same building, the different sections are divided by a line. Dimensions and story heights are indicated for each individual section.

Porches are measured, sketched, and identified by the designation “P#1”, “P#2”, etc., on the sketch of the ground plan. Built-in porches and built-in garages are shown on the ground plan sketch with dotted lines with measurements.

## 120. Example of Ground Plan Sketches and Recording Dimensions

The following example shows the method for preparing ground plan sketches and recording dimensions of buildings. Part A is 2 stories high and has a full basement. Part B is 2 stories high over a crawl space. Part C is only 1 story high on a slab. The building also has an open porch (OP) and an attached garage. The dimensions of this building are recorded as follows on the Property Record Card:

### FLOOR AREA COMPUTATIONS

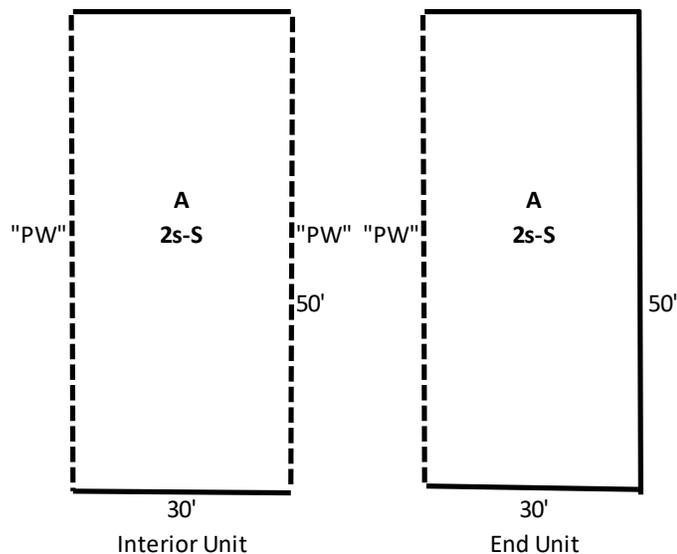


| Segment          | Width | Length | Basement | First | Upper |
|------------------|-------|--------|----------|-------|-------|
| A 2s-B           | 38    | 30     | 1140     | 1140  | 1140  |
| B 2s-Cr          | 10    | 30     |          | 300   | 300   |
| C 1s-S           | 24    | 14     |          | 336   |       |
| Total Floor Area |       |        | 1140     | 1776  | 1440  |
| Attached Items   | Width | Length | Area     |       |       |
| D Att Garage     | 24    | 24     | 576      |       |       |
| E Open Porch     | 48    | 8      | 384      |       |       |

## 121. Recording Party Walls on Sketches

One family semi-detached, duplex, or detached dwellings and rowhouses contain two or more dwelling units which may be owned by more than one owner. The replacement cost schedules are prepared on a unit floor area basis. Therefore, it is necessary for the appraiser to indicate the existence of party walls on the ground plan sketch for individually owned units which are part of the complete buildings. Party or common walls are indicated on the ground sketch with broken lines and letters "PW" along the party wall side or sides.

The following examples illustrate the methods for preparing ground plan sketches for semi-detached and town house dwellings:



## **122. Ground Plan Sketches of Split-Level Residential Buildings**

Split level residential buildings are essentially a combination of one- and two-story buildings with many variations of layout and design. The common difference between a conventional one- and two-story building and the split level is that the second floor of the two-story section of the split level is usually less than a full story height above the one-story level. While the first floor is lower than the level of the one-story section, the net effect is that, while the vertical distance from the one-story level to either level of the two-story portion is less than a full story, the total vertical distance (number of steps) is the same as in a conventional two-story house.

The lower level of a split-level house may be completely finished into living quarters or it may be unfinished with facilities similar to that of a basement. In many instances, a garage comparable to a basement garage is found in the lower level. In other instances, recreation rooms may be developed.

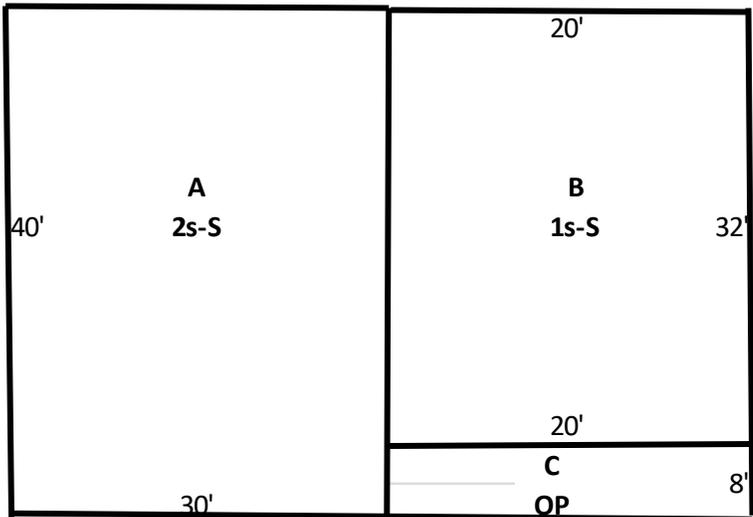
The appraiser must determine and record the story heights and degree of interior finish for each part of the structure at the time of inspection. The building classification will be based on the same factors as in other structures and the calculation of the replacement cost is identical to other buildings of the same class, story height and exterior wall construction.

In order to interpret the proper story height of split-level dwellings, the appraiser need only to visualize the various sections of the building as though each was separate conventional type built with or without a basement. If the lower level is finished for living quarters, that section can be considered as having two stories without a basement. However, if the lower level is finished for use as a garage or recreation room, the section might be considered as having only one-story with a basement and garage.

The following examples illustrate a few of the more common approaches used in determining story height of split-level dwellings.

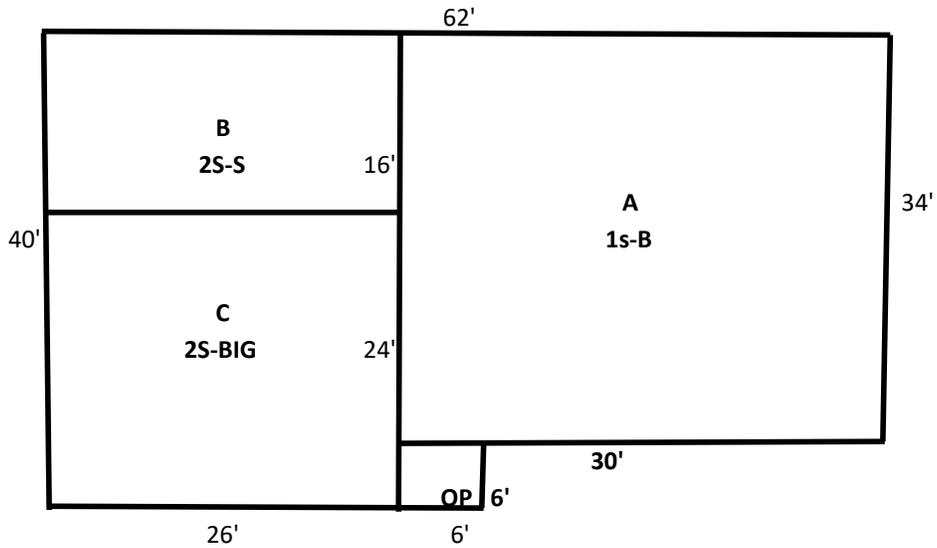


50'



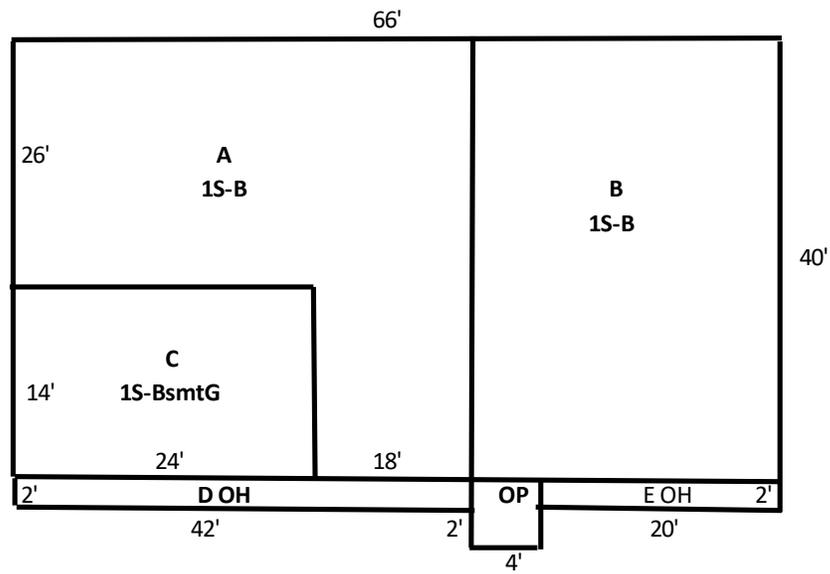
| Segment          | Width | Length | Basement | First | Upper |
|------------------|-------|--------|----------|-------|-------|
| A 2s-S           | 30    | 40     |          | 1200  | 1200  |
| B 1s-Cr          | 20    | 32     |          | 640   |       |
| Total Floor Area |       |        |          | 1840  | 1200  |
| Attached Items   | Width | Length | Area     |       |       |
| C OP             | 20    | 8      | 160      |       |       |

This building is considered as a part one-story and part two-story building. This can be readily appreciated by considering sections A and B to be separate structures. The result is a one-story building for section B and a two-story building for section A. Following this procedure all other considerations are identical to a standard single-family residence.



| Segment          | Width | Length | Basement | First | Upper |
|------------------|-------|--------|----------|-------|-------|
| A 1s-B           | 36    | 34     | 1224     | 1224  |       |
| B 2s-S           | 26    | 16     |          | 416   | 416   |
| C 2s-BIG         | 26    | 24     |          |       | 624   |
| Total Floor Area |       |        | 1224     | 1640  | 1040  |
| Attached Items   | Width | Length | Area     |       |       |
| C BI Garage      | 26    | 24     | 624      |       |       |
| OP               | 6     | 6      | 36       |       |       |

This building is considered as a one-story and two-story building with a built-in garage (BIG). Assuming the building to have a basement under section A, all other considerations are identical to standard single-family residence.



| Segment          | Width | Length | Basement | First | Upper |
|------------------|-------|--------|----------|-------|-------|
| A 1s-B           | 42    | 26     | 1092     | 1092  |       |
|                  | 18    | 14     | 252      | 252   |       |
| B 1s-B           | 24    | 40     | 960      | 960   |       |
| C 1s-BsmtG       | 24    | 14     |          | 336   |       |
| D OH             | 42    | 2      |          | 84    |       |
| E OH             | 20    | 2      |          | 40    |       |
| Total Floor Area |       |        | 2304     | 2764  |       |
| Attached Items   | Width | Length | Area     |       |       |
| C Bsmt Garage    | 24    | 14     | 336      |       |       |
| OP               | 4     | 4      | 16       |       |       |

This type dwelling, known as a Raised Ranch or Bi Level, is considered as a one-story building with a full basement and a basement garage. By visually lowering the floor level

of the first floor, the result is a one-story house with a full basement and basement garage. The additions necessary to adjust for the basement garage are required to complete the calculations of the building.

### **123. Residential Construction Components**

The following is a list of items that should be noted when making a field inspection on a residential property besides a sketch, which allows the assessor to determine the overall square foot living area of the improvement. While some of the items are descriptive in nature, they assist in determining the overall class of the improvement along with the condition and effective age. Other items are directly related to cost values used in the New Jersey Real Property Appraisal Manual as adjustments to base costs.

#### **1. Foundation Type and Material**

Items such as the foundation type, slab, crawlspace, basement, etc. and the material are entered. If the dwelling has a basement, it is noted along with any finished area including the wall, floor, and ceiling finish. The New Jersey Real Property Appraisal Manual base costs assume the structure is constructed on a crawl space. There are adjustments to base cost values for structures built on a slab or a basement. The adjustment for a slab is a negative adjustment whereas an adjustment for a basement is positive adjustment.

#### **2. Structure Characteristics**

Items such as the type of construction, single-family, townhouse, condo, etc., are noted. Design and style, though not essential, is helpful in describing the type of construction such as ranch, cape cod, colonial, etc. The exterior finish is also noted as finishes with brick or stone are an adjustment to base value costs. Exterior condition is used to help in the determination of final condition.

3. Roof Types and Finish

Examples of various roof types are shown in the photos below. Roofing material should also be noted.



Flat



Hip



Gable



Gambrel



Mansard

#### 4. Story Height

In determining the number of stories, "1 story" refers to a building all on one floor level and also any buildings in which the usable second story covers less than 40% of the first story floor area. A "1½ story" building is described as a building in which the roof meets the walls at a point high enough above the ground floor or at an angle steep enough to permit the use of floor area in the half story equivalent to 50% to 80% of the ground floor area. Buildings with over 80% of ground area usable as second floor space are considered as "2 story" buildings. Photos of typical residential buildings are shown below. Dormers add to the usable area of the top story and are considered in determining the story height.



1 Story



1 ½ Story



2 Story



2 ½ Story

## 5. Square Foot Living Area

Square foot living area (SFLA) is calculated from the **exterior** wall dimensions. It includes all finished and heated space above ground level, calculated for each story.

Cathedral ceiling space is also included in the total square foot living area of the story being calculated. For Classes 16-23, apply the cathedral ceiling factor to the total finished area base cost value. When calculating heating and cooling areas, all levels of the cathedral space are included.

## 6. Upper Floors

In buildings with more than two full stories, all upper floors should be added together, and the total square footage placed in the upper floors section of the Property Record Card. The price selected would be the price for the total square footage for upper floors.

For example, in a three-story building with 750 square feet on each floor, the upper floor area will be the total floor area on the second and third floor, i.e., 1,500 square feet. The price selected would be from the upper floors table at 1,500 square feet.

The base cost for half story finished, square foot areas, use the total square footage of the floor below. Only the actual heated and cooled areas should be used when calculating the heating and cooling adjustment to base cost.

## 7. Unfinished Half Story Deductions

If a half story is unfinished, this is adjusted under the unfinished half story adjustment. When making this adjustment, the square footage used should be based on the floor area below the half story and not the usable area in the half story.

8. Attic

All residential classes include an unfinished attic in base cost. This attic is assumed to be an area suitable only for storage space and cannot be realistically converted into usable living area.

9. Expanded Attic

Any area less than a half story, which could realistically be used for living space, should be treated as an expanded attic. The costs for a finished, expanded attic should be applied based on the floor area directly below the expanded attic. Included in the cost are interior finish and exterior structure. For expanded attics that are unfinished, the cost selected should be factored by .50 to adjust for the unfinished area.

10. Dormers

Dormers are an adjustment to base cost. They are valued on a linear foot basis. There are costs for finished and unfinished dormers.

11. Electric

Electric service should be noted. Usually indicated as adequate, limited or none.

12. Interior Finish

The type of interior wall, floor and ceiling finish should be noted along with the viewed condition.

13. Room Count

The different rooms should be counted and noted by floor level. Baths with two fixtures are considered a half bath.

14. Heating and Cooling

The type of heating system and whether the dwelling has central air should be noted. This includes finished basement area and finished attic space. Though not a factor in value, zoned HVAC can be noted.

15. Plumbing Fixtures

Plumbing fixtures are priced by the number of fixtures in a bathroom. There are also costs for kitchen sinks, hot tubs, whirlpool baths, stall showers, laundry tubs and plumbing rough-ins.

16. Built in Appliances

Built in appliances are adjustments to base cost. The base cost includes a stovetop and oven. Other items that can be added include security systems, central vacuums, intercoms, and extra kitchen units.

17. Fireplaces

Fireplaces are noted by the number of and the height in stories.

18. Garages and Carports

An attached garage is defined as a garage with one wall common with the principal building having its own roof. It may be considered as having its own roof even though there is no break in the roofline between the garage roof and the roof principal building. Built-in garages are defined as having garage area built into the first-floor level of the principal building and covered by an upper story that is, or could be, used as living space. A garage is also considered built-in if two full walls are common with the principal building.



Attached Garage



Built-in Garage



Basement Garage



Carport

## 19. Porches

A distinction must be made between porches, which are actually an unfinished portion of the principal building and classified as “built-in” and porches which have their own roof and are attached to the principal buildings. A built-in porch is defined as an area under the main roof of the principal building which is actually an unfinished portion of the principal building. It may have living area above or below it. The following illustrates open and built-in porches:



Open Porch



2 Story Open Porch



2<sup>nd</sup> Floor Built-in Porch



Enclosed Porch

When considering built-in porches, the area of the porch should be included in the floor area calculation for the base cost, as it is under the main roof. The finished area should then be deducted from the base cost.

For open porches that have been screened or enclosed without heating and cooling, the area of the porch should not be included in the floor area calculations. Only the actual living area per floor in the dwelling should be considered to

obtain the base cost. The class of a porch depends on the quality of the materials used in extent of the finish. Typically, the porch class is the same as that of the dwelling, but it can be different.

Any porches, patios or decks attached to the dwelling should be measured as they are priced on a square foot basis.

20. Elevators and Dumbwaiters

Elevators and dumbwaiters should be noted as they are an adjustment to base costs. Elevators and dumbwaiters are priced based on the number of stops and pound capacity.

21. Other Items

Other items such as sheds and pools are measured and recorded. For waterfront properties any bulkheads, pilings and docks/piers are also measured and noted.

## **124. Single-Family Residential Cost Calculations**

The procedures for calculating the cost values using the New Jersey Real Property Appraisal Manual are as follows:

- Determine the appropriate dwelling class of the improvement.
- Calculate the base cost of the improvement by multiplying the square foot of living area per story by the appropriate unit cost.
- Add or deduct for items not included in the base cost from the residential adjustments section by calculating the items cost and applying the appropriate class factor. This includes basements, plumbing, heating/AC, fireplaces, porches, decks, patios, garages, etc.

- Total the base cost and the adjustments to base to arrive at the replacement cost new of the improvement.
- Multiply the replacement cost new by the appropriate cost conversion factor.
- Determine the depreciation from all causes and deduct from the replacement cost new to get the depreciated cost of the improvement.

### **125. Computation Procedures for Semi-Detached Dwellings**

This classification is provided for single ownership of each dwelling unit of a semi-detached dwelling defined as two side-by-side, attached, single-family residences. The base replacement cost is based on the floor area per story of each dwelling unit with a party wall included.

NOTE: Each of the dwelling units of a semi-detached dwelling should be enumerated and computed on separate property record cards, even though the entire dwelling belongs to one owner. This is due to one or more factors that may influence the market value of each of the units. These factors may be remodeling, an addition to one of the units, effective age, etc.

### **126. Row/Townhouses**

The base replacement cost for units of row/townhouses is based on a dwelling unit with two party walls included. This base replacement cost is determined by multiplying the square foot of floor area by the square foot cost per story.

For exterior or end units of row/townhouses, a factor of 1.07 should be applied because the unit costs are based on the interior units which have two party walls, whereas an exterior or end unit has only one-party wall and an outside wall (or its own wall). For this reason, end units have a market value greater than interior units with the same footage.

### **127. Single-Family Residences Converted to Multi-family Use**

Whenever a single-family residence has been converted to multi-family use, it should be enumerated and computed as a single-family residence, then by use of the adjustments provided, adjusted for plumbing and kitchen units over and above those which are found in the single-family residence. Other adjustments should be made in the same manner as those of a single-family residence.

### **128. Two-to-Four Family Apartments**

This classification is provided for those buildings designed and built as two, three or four family apartments, with over and under or side-by-side apartment units and with one owner. For single ownership of each side-by-side unit see semi-detached residences or row/townhouse.

The base replacement cost of two-to-four family apartments is based on two factors: the total number of units and the floor area per story of the building. This base replacement cost is computed by multiplying the floor area per story by the unit cost per square foot of first or upper stories in this classification.

### **129. Mobile Homes**

The base cost schedules are arranged in five mobile home classes:

- Class R-50 - Low Quality
- Class R-51 - Fair Quality
- Class R-52 - Average Quality
- Class R-53 - Good Quality
- Class R-54 - High Quality

All dimensions are exterior measurements excluding the front hitch. The cost schedules do not include the typical costs for personal property items such as furniture, free standing appliances, and draperies. The allowance that has been made for these items

depends upon the quality of the unit. The base costs do include permanently installed built-in cabinets, wardrobes, vanities, appliances, and floor coverings as well as those items listed in base specifications for their respective class.

Most adjustments to the mobile home base specifications can be made from the Mobile Home Adjustment Section. Adjustments for heating and cooling may be secured from the Residential Adjustment Section of the Manual.

Typical delivery costs, set up charges, and all standard items listed in the base specification for each class are included in the base cost schedules. Separate effective age depreciation tables are provided for the mobile home classes. A mobile home situated outside of a mobile home park is taxable as real property.

### **130. Example of a Single-Family Residential Cost Calculation**

The following pages are a demonstration of a residential building cost approach using the New Jersey Real Property Appraisal Manual. The information needed is entered on the sample data collection form.



RESIDENTIAL DATA COLLECTION WORKSHEET "R" SERIES

Block 1 Lot 1 Qual

YEAR BUILT / EFFECTIVE AGE 2019 / 1 BUILDING CLASS 20  
# OF UNITS (MULTIFAMILY)

| Room Count     | B | 1  | 2 | 3 |
|----------------|---|----|---|---|
| Living Room    |   | 1  |   |   |
| Dining Room    |   | 1  |   |   |
| Kitchen        |   | 1  |   |   |
| Baths          | 1 | .5 | 3 |   |
| Bedrooms       |   |    | 6 |   |
| Family Room    |   | 1  |   |   |
| Office/Library |   |    | 1 |   |
| Laundry Room   |   | 1  |   |   |
| Other          | 1 |    |   |   |

| COMMENTS                 |
|--------------------------|
| 40x16 cement patio(pool) |
|                          |
|                          |
|                          |
|                          |
|                          |
|                          |
|                          |
|                          |

PLUMBING (U)

|                          |   |
|--------------------------|---|
| 5FX 5 Fix Bath           | 1 |
| 4FX 4 Fix Bath           |   |
| 3FX 3 Fix Bath           | 3 |
| 2FX 2 Fix Bath           | 1 |
| 1FX Additional Fixture   |   |
| HTW Hot Tub - Wood       |   |
| HTF Hot Tub - Fiberglass |   |
| WP Whirlpool Bath        |   |
| SNS Sauna - Small        |   |
| SNM Sauna - Medium       |   |
| SNL Sauna - Large        |   |
| BD Bidet                 |   |

FIREPLACES (U)

|                       |   |
|-----------------------|---|
| 1FP 1 Sty             |   |
| 1.5FP 1.5 Sty         |   |
| 2FP 2 Sty             | 1 |
| SSFP Same Stack       |   |
| FSFP Freestanding     |   |
| HFFP Heatatator & Fan |   |

BUILT-INS/APPLIANCES (U)

|                                      |   |
|--------------------------------------|---|
| XHF Commercial Exhaust Hood Fan      |   |
| CVS Central Vacuum System            | 1 |
| CMK Commercial Kitchen               |   |
| XKU Extra Kitchen Unit               |   |
| HEV1 Hydraulic Elevator - 750 lbs    |   |
| HEV2 Hydraulic Elevator - 1,000 lbs  |   |
| HEV3 Hydraulic Elevator - 1,500 lbs  |   |
| HEVL Hydraulic Elevator - Add. Level |   |
| EEV1 Electric Elevator - 750 lbs     |   |
| EEV2 Electric Elevator - 1,000 lbs   |   |
| EEV3 Electric Elevator - 1,500 lbs   |   |
| EEVL Electric Elevator - Add. Level  |   |
| DMW2 Dumbwaiter - 2 Levels           |   |
| DMW3 Dumbwaiter - 3 Levels           |   |

HEATING SYSTEM (A)

|                        |   |
|------------------------|---|
| FWF Floor/Wall Furnace |   |
| GHA Gravity Hot Air    |   |
| FHA Forced Air         | 1 |
| HWB HW Baseboard       |   |
| HWR HW Radiator        |   |
| HWS HW Steam           |   |
| EBB Elect. Baseboard   |   |
| RE Radiant Electric    |   |
| RW Radiant Floor Heat  |   |
| HP Heat Pump           |   |
| UH Unit Heater         |   |

AIR CONDITIONING (A)

|                               |   |
|-------------------------------|---|
| ACS Separate Ductwork         |   |
| ACC Combined Ductwork         | 1 |
| Finished Expanded Attic       |   |
| ATU Unfinished Expanded Attic |   |
| DMF Dormer - Finished         |   |
| DMU Dormer - Unfinished       |   |

FINISHED BASEMENT (A)

|                      |      |
|----------------------|------|
| FB Finished Basement | 1620 |
|----------------------|------|

EXTERIOR FINISH (A)

|                  |       |
|------------------|-------|
| PB Partial Brick | 820SF |
| PS Partial Stone |       |

WRITE - IN (A OR U)

|                                    |  |
|------------------------------------|--|
| MISC Misc / Other w/ Override Rate |  |
|------------------------------------|--|

DETACHED ITEMS

|                                |        |
|--------------------------------|--------|
| DG Detached Gargae             |        |
| DC Detached Carport            |        |
| SHU Shed - Unfinished          | 24x12  |
| SHF Shed - Finished            |        |
| PVY BI Pool - Vinyl            | 20x40  |
| PCO BI Pool - Concrete         |        |
| PFG BI Pool - Fiberglass       |        |
| PSP BI Pool - Swim in Place    |        |
| DDK Detached Deck              |        |
| DP Detached Patio              |        |
| GZW Gazebo Wood                |        |
| GZV Gazebo Vinyl               |        |
| DSO Solarium/Sunroom           | 12x24  |
| PVC Paving - Concrete          |        |
| PVA Paving - Asphalt           |        |
| CP Concrete Pilings            |        |
| WP Wood Pilings                |        |
| PS Piling crane site setup fee |        |
| BVA Bulkhead Vinyl - 16 ft     |        |
| BVB Bulkhead Vinyl - 20 ft     |        |
| BWA Bulkhead Wood - 16 ft      | 126FT  |
| BWB Bulkhead Wood - 20ft       |        |
| DOC Dock/Pier                  | 1620SF |

MAIN STRUCTURE

|  |  |
|--|--|
| 1S 1 Story                                 |  |
| 1.5S 1.5 Story                             |  |
| 2S 2 Story                                 |  |
| 2.5S 2.5 Story                             |  |
| 3S 3 Story                                 |  |
| 3.5S 3.5 Story                             |  |
| 1CC 1st Floor w/ Cathedral Ceiling         |  |
| (2,3,4)CC Upper Floor w/ Cathedral Ceiling |  |
| 1UA 1 Story Unfinished Area                |  |
| 1.5UA 1.5 Story Unfinished Area            |  |
| 2UA 2 Story Unfinished Area                |  |
| 2.5UA 2.5 Story Unfinished Area            |  |
| 3UA 3 Story Unfinished Area                |  |
| 3.5UA 3.5 Story Unfinished Area            |  |
| (1,2,3,4)OH Overhangs                      |  |

SKETCH CODES

GARAGE TYPE

|                            |  |
|----------------------------|--|
| BG Basement Garage         |  |
| BIG Built-in Garage        |  |
| AG Attached Garage         |  |
| AC Attached Carport/Canopy |  |
| DG Detached Garage         |  |
| DC Detached Carport        |  |

BASEMENT

|            |  |
|------------|--|
| S Slab     |  |
| C Crawl    |  |
| B Basement |  |

PORCHES/DECKS

|                        |  |
|------------------------|--|
| WDK Wood Deck          |  |
| TDK Trex Deck          |  |
| PT Patio               |  |
| OP Open Porch          |  |
| EP Enclosed Porch      |  |
| GP Glazed Porch        |  |
| BP BI Patio            |  |
| BOP BI Open Porch      |  |
| BEP BI Enclosed Porch  |  |
| BGP BI Glazed Porch    |  |
| SOL Solarium / Sunroom |  |
| STC Stamped Cement     |  |
| PVT Paver Terrace      |  |

OVERALL NET CONDITION

|              |            |
|--------------|------------|
| EX Excellent | FR Fair    |
| VG Very Good | PR Poor    |
| GD Good      | UN Unsound |
| AV Average   |            |



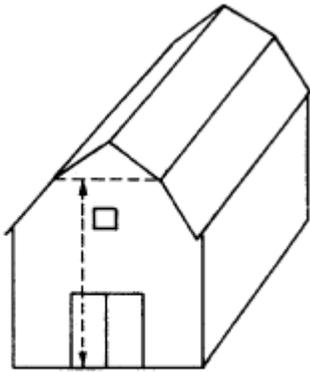
Cost Value Calculations  
 Building Class: 20  
 Built: 2019

| Item                        | SF/Unit | Cost     | Factor | Value            |
|-----------------------------|---------|----------|--------|------------------|
| Base Cost 1st Floor         | 3,248   | 127.76   | 1.00   | 414,964          |
| Base Cost 2nd Floor         | 2,588   | 90.51    | 1.00   | 234,240          |
| Base Cost 1/2 Story         | 624     | 61.46    | 1.00   | 38,351           |
| Basement                    | 2,588   | 10.40    | 1.54   | 41,449           |
| Basement Finish             | 1,620   | 14.22    | 1.30   | 29,947           |
| Face Stone                  | 820     | 25.05    | 1.00   | 20,541           |
| Slab Adjustment             | -624    | 2.91     | 1.95   | -3,541           |
| Heat                        | 8,080   | 2.82     | 1.49   | 33,951           |
| A/C                         | 8,080   | 1.79     | 1.49   | 21,550           |
| 5 Fixture bath              | 1       | 4,095.00 | 1.49   | 6,102            |
| 3 Fixture Bath              | 3       | 2,595.00 | 1.49   | 11,600           |
| 2 Fixture Bath              | 1       | 1,895.00 | 1.49   | 2,824            |
| Central Vacuum              | 1       | 1,700.00 | 1.37   | 2,329            |
| 2 Story F/P                 | 1       | 4,850.00 | 1.60   | 7,760            |
| Open Porch                  | 220     | 13.04    | 1.30   | 3,729            |
| Wood Deck                   | 720     | 5.61     | 1.30   | 5,251            |
| Solarium                    | 288     | 140.00   | 1.30   | 52,416           |
| Cement Patio                | 640     | 5.61     | 1.30   | 4,668            |
| Attached Garage             | 1,040   | 17.89    | 1.58   | 29,397           |
| Vinyl Pool                  | 800     | 31.54    | 1.30   | 32,802           |
| Shed                        | 288     | 18.05    | 1.45   | 7,538            |
| Wood Bulkhead 16 FT         | 126     | 331.00   | 1.00   | 41,706           |
| Wood Dock                   | 1,620   | 22.00    | 1.90   | 67,716           |
| Replacement Cost            |         |          |        | 1,107,289        |
| 2019 Cost Conversion Factor |         |          | x      | 1.74             |
| Total Replacement Cost New  |         |          |        | <u>1,926,682</u> |
| Less Depreciation           |         |          | x      | 0.98             |
| Depreciated Cost            |         |          |        | <u>1,888,149</u> |

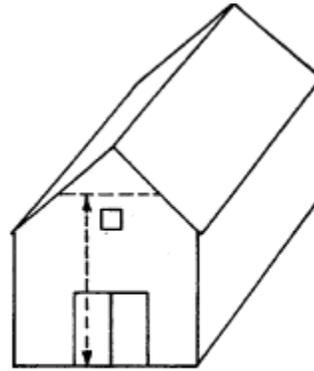
### 131. Farm Buildings

This section includes farm buildings normally found in rural areas. These include the older style wood frame constructed buildings and the newer post and frame style costs. There are no adjustments to base cost for the wood frame style structures required.

While most are valued on a price per square foot, the older style general purpose and dairy barns are based on cost per cubic foot with and without a loft. The following diagrams illustrate a standard procedure to be used in estimating the height of a barn which is multiplied by the ground area to obtain the cubic foot.



Height consideration on gambrel roofs from ground level to a point 2/3 of the distance from the eaves to the peak.



Height consideration on gable roofs from ground level to a point of 1/2 of the distance from the eaves to the peak.



## **132. Depreciation and Obsolescence**

An important step of the cost approach is the estimate of depreciation. Depreciation is the loss in value from all causes. Total depreciation is the difference between an improvement's cost new and its value as of a certain time. Depreciation used in the cost approach applies to the improvement, not the land. All improvements have a certain economic life, which is the total number of years they contribute to the total property value. Depreciation is usually expressed as a percentage of net condition and deducted from 100 percent. There are five recognized methods to measure accrued depreciation typically used in single property appraisals that will be discussed later. Depreciation for mass appraisal is normally estimated by the use of depreciation tables. As improvements age they can suffer from physical deterioration and functional or economic obsolescence. Physical deterioration and functional obsolescence are further broken down into curable and incurable, which is also defined later in this manual.

### **Physical Deterioration**

Physical deterioration is the loss in value due to wear and tear of nature and use. It begins as soon as the improvement is completed. Proper maintenance can slow the process, but it cannot be completely avoided. It can be further broken down into curable and incurable. Curable depreciation is when the value added by a repair equals or exceeds the cost of that repair. Curable depreciation is estimated as the "cost to cure". Examples include broken windows, leaky roof, or new heating unit. Incurable depreciation is when an item is not economical to repair or replace, the cost to repair exceeds the increase in value, or at the time of the appraisal the item is not ready to be replaced. Incurable items are classified as either short lived, items that have a shorter-term life than that of the structure (roof cover, carpets, or appliances), or long-lived items where their economic life is equal to that of the total structures.

### **Functional Obsolescence**

Functional obsolescence is the loss in value due to changes in style, design, demand, and taste, which can be curable or incurable. Functional obsolescence occurs within the boundaries of the property. It can be a deficiency such as only one bathroom when the market calls for two, the need for modernization of an outdated kitchen or bathroom or a super adequacy which exists when the original construction of the improvement has a component in it that exceeds the expectations of the market. When buyers in the market see a loss in utility or functional obsolescence of an improvement the price they offer would be lower due to reduced demand. It is also classified as curable and incurable which depends on if the cost to cure an item is economically feasible at the time of the appraisal.

### **Economic or External Obsolescence**

Economic obsolescence is the loss in utility or value due to factors outside the property's boundaries. These negative influences can cause both the improvement and the land to lose value. Examples can include changes in the highest and best use of the property because of governmental controls or market changes. It can also be because of inadequate services, location near non-harmonious industrial or commercial properties or traffic patterns. Economic obsolescence is always considered incurable.

## **133. Methods of Measuring Depreciation**

Depreciation is measured using five accepted methods. The three direct methods are economic age life, modified economic age life and observed condition or breakdown. These methods involve measuring the depreciation of the property itself and estimating effective age and remaining economic life. The two indirect methods are sales comparison and income capitalization, where sales of comparable properties or income loss are used to measure depreciation.

### Sales Comparison Method

In the sales comparison method, a property's depreciation is determined by the amount of depreciation attributed to similar properties using comparable sales in the market. Recent sales of improved properties of similar age, condition, desirability, and utility are found. The site value is deducted from the sales price to get a value attributed to the improvement. This value is then deducted from the replacement cost new to get an indicated depreciation. Since all improvements do not have the same cost new, the indicated depreciation found should be converted to a percentage before applying it to similar properties. This is done by dividing the depreciation found by the cost new of the comparable sale. This percentage is then deducted from 100% to get the percent good which is applied to the subject's replacement cost to find its depreciated value. This method is mostly used in mass appraisal systems and is reliable because it is market based. The two main disadvantages are (1) it requires a good comparable market data sample (2) the depreciation found is not broken out between physical depreciation and functional and economic obsolescence. For example:

#### Sale Property

|                   |                 |
|-------------------|-----------------|
| Sale Price        | \$300,000       |
| Land Value        | <u>-100,000</u> |
| Improvement Value | \$200,000       |

|                                    |                 |
|------------------------------------|-----------------|
| Replacement Cost New of Comparable | \$240,000       |
| Improvement Value                  | <u>-200,000</u> |
| Indicated Depreciation             | \$40,000        |

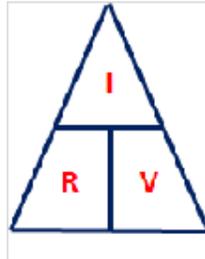
|                                     |                      |
|-------------------------------------|----------------------|
| Depreciation from Market ÷ Cost New | \$40,000 ÷ \$240,000 |
| Indicated Depreciation              | 16.7%                |
| Percent Good                        | 100% - 16.7% = 83.3% |

#### Subject Property

|                                 |                        |
|---------------------------------|------------------------|
| Replacement Cost New of Subject | \$260,000              |
| Percent Good                    | <u>x 83.3%</u>         |
| Improvement Value               | \$216,580              |
| Land Value                      | + <u>\$100,000</u>     |
| Subject Total Value             | \$316,580 or \$316,600 |

### Income Capitalization Method

This method can be helpful with income producing properties. Depreciation is derived by capitalizing the net income of the subject property into a value, deducting the land value, and then comparing it to replacement cost new of the subject. It can be market derived if economic rent and expenses are used. The following is an example of a property with a replacement cost new of \$900,000.



|   |                  |
|---|------------------|
| Gross Income                                    | \$100,000        |
| Less Expenses                                   | <u>- 40,000</u>  |
| Net Operating Income                            | \$ 60,000        |
| Capitalization Rate                             | <u>÷ 7.5%</u>    |
| Indicated Property Value                        | \$800,000        |
| Less Land Value                                 | <u>- 150,000</u> |
| Value to Building                               | \$650,000        |
| <br>  |                  |
| Replacement Cost New                            | \$900,000        |
| Indicated Depreciation (\$900,000 - \$650,000)  | \$250,000        |
| Depreciation percentage (\$250,000 ÷ \$900,000) | .277 or 28%      |

### Economic Age Life Method

The economic age life or straight-line method estimates depreciation by using a percentage of the effective age at time of appraisal divided by the total economic life of an improvement. The resulting percentage is then multiplied by the replacement cost new. This method does not break down the depreciation between physical depreciation and functional and economic obsolescence. It allocates a uniform percentage of loss in value equally over the life of the improvement. Effective age is an estimated number of years of age as indicated by the improvements condition and functional utility compared to actual age. Rehabilitation or renovations tend to decrease the effective age of a property. Usually, effective age is not equal to chronological age.

Economic life is the total number of years the improvement contributes to the property value. It never exceeds the physical life and equals remaining economic life plus effective age. Remaining economic life is the number of years left that an improvement contributes to the total property value. This method uses straight-line depreciation and does not differentiate between the physical life of short- and long-lived components. For example, a 20-year-old house that has been well maintained, an estimated effective age is 10 years. The remaining economic life is estimated to be 60 years and the replacement cost new is \$300,000, the depreciation is calculated as follows:

$$\text{Effective Age} \div \text{Total Economic Life} = \% \text{ of Depreciation}$$

|  |                                    |
|--|------------------------------------|
| Effective Age ÷ Total Economic Life      | $10 \div 70 = 0.14\%$              |
| Depreciation Rate x Replacement Cost New | $0.14 \times \$300,000 = \$42,000$ |
| Depreciated Replacement Cost             | \$258,000                          |

### **Modified Economic Age Life Method**

This method is similar to the economic age-life method except that it takes into consideration the effect of curable physical deterioration and curable functional obsolescence, which once these curable items are fixed or cured will most likely lower the effective age.

### **Observed Condition (Breakdown) Method**

This method is the most complete and accurate way of handling all aspects of depreciation and obsolescence and is not really suitable for mass appraisal purposes. The five categories of depreciation and obsolescence that can be recognized in this method are: curable physical deterioration (deferred maintenance), incurable physical deterioration, curable functional obsolescence, incurable functional obsolescence, and incurable economic obsolescence. Although it is the most complete method, it is rarely used due to its complexity and the amount of time required. The following example shows the steps involved using this method.

The subject property is a 15-year-old dwelling, 2,000 square feet on a slab with one full bathroom, forced hot air heat and central A/C. It is located on a high traffic street in a neighborhood of comparable homes, except comparable homes in this neighborhood have basements and two full baths.

The improvements are in good condition but require exterior painting and new carpets. After the deferred maintenance items are cured it would have an effective age of 10 years. Homes in the area have a total economic life of 60 years.

The roof has an effective age of 15 years and an economic life of 30 years. The furnace has an effective age of 15 years and economic life of 20 years. The cost to build the home is \$175 per square foot and the land value is \$125,000.

The first step is to identify the cost to cure the curable physical deterioration items.

| <u>Item</u>    | <u>RCN</u>     | <u>Cost to Cure</u> |
|----------------|----------------|---------------------|
| Exterior Paint | \$4,000        | \$4,500             |
| New Carpet     | <u>\$3,000</u> | <u>\$3,500</u>      |
|                | \$7,000        | \$8,000             |

Next, the incurable physical deterioration short lived (S-L) items are depreciated.

| <u>Item</u> | <u>RCN</u>      | <u>Effective Age</u> | <u>Econ. Life</u> | <u>% Depreciated</u> | <u>Depreciated Amount</u> |
|-------------|-----------------|----------------------|-------------------|----------------------|---------------------------|
| Roof        | \$20,000        | 15                   | ÷ 30              | = 50%                | \$10,000                  |
| Furnace     | <u>\$ 8,000</u> | 15                   | ÷ 20              | = 75%                | <u>\$ 6,000</u>           |
|             | \$28,000        |                      |                   |                      | \$16,000                  |

Then, the depreciation for incurable physical deterioration long lived (L-L) items is calculated by the age-life method.

|  |                    |
|--|--------------------|
| Replacement Cost New (2,000 sf x \$175)        | \$350,000          |
| Less: RCN Curable Physical Items               | - \$ 7,000         |
| Less: RCN Incurable Physical Short-Lived Items | - <u>\$ 28,000</u> |
| Replacement Cost New of Long-Lived Items       | \$315,000          |

|   |               |
|---|---------------|
| Effective age ÷ Economic Life (10 yrs ÷ 60 yrs = 0.167) | x <u>.167</u> |
| Total Incurable Physical Long-Lived Items               | \$ 52,605     |

Physical Deterioration

|                               |                  |
|-------------------------------|------------------|
| Curable Physical Depreciation | \$8,000          |
| Incurable S-L Depreciation    | \$16,000         |
| Incurable L-L Depreciation    | <u>+\$52,605</u> |
| Total Physical Depreciation   | \$76,605         |

Curable functional obsolescence estimation is the next step in the process. In this example the subject has only one full bath when other houses have two. The cost of adding another bath is \$10,000. If it were added when the house was built, it would have cost \$8,000. In the market it is found that the extra bath would add \$15,000 to the market price of the house. Since the cost to cure is less than the value added it is curable and the functional obsolescence amount is calculated:

|                                    |                  |
|------------------------------------|------------------|
| Cost If Added Now                  | \$ 10,000        |
| Cost If Originally Added           | <u>-\$ 8,000</u> |
| Obsolescence (Excess Cost to Cure) | \$ 2,000         |

Incurable functional obsolescence is addressed next. This step is often done using the market approach with paired sales to find the loss in value attributed to that item in the marketplace. It can also be estimated using the income approach by capitalizing the income loss. From studying the market, it is determined that homes without basements sell for \$20,000 less than those with one. The incurable functional obsolescence is \$20,000.

External obsolescence is the last step in this method and can also be determined by the market or income approaches. Then, it is broken down between the land and the improvement by using the land to improvement value ratio. Depreciation is only on the building portion. In this example, the loss in rent due to being on a street with heavy traffic is \$100 per month. The Gross Rent Multiplier (GRM) is \$100. Rent loss times GRM equals \$10,000. The land ratio is 1:3 (1 part land to 3 parts building for a total of 4 parts). The external obsolescence attributable to the improvement is as follows:

$$\$10,000 \times .75 = \$7,500$$

The final step is to deduct the various depreciation and obsolescence values from the replacement cost new that yields the depreciated cost new. Then, add the estimated land value.

|  |                 |                     |
|--|-----------------|---------------------|
| Replacement Cost New (2000 sf x \$175) |                 | \$ 350,000          |
| Curable Physical Deterioration         | \$ 8,000        |                     |
| Incurable Short-Lived Items            | \$ 16,000       |                     |
| Incurable Long Lived Items             | \$ 52,605       |                     |
| Curable Functional Obsolescence        | \$ 2,000        |                     |
| Incurable Functional Obsolescence      | \$ 20,000       |                     |
| External Obsolescence                  | <u>\$ 7,500</u> |                     |
| Total Depreciation                     | \$ 106,105      | <u>-\$ 106,105</u>  |
| Depreciated Replacement Cost New       |                 | \$ 243,895          |
| Land Value                             |                 | <u>+ \$ 125,000</u> |
| Estimated Value by Cost Approach       |                 | \$ 368,895          |
| Rounded                                |                 | \$ 368,900          |

### **Depreciation Tables**

The five methods to estimate depreciation outlined previously are mainly used in single property appraisal, except possibly the economic age-life method. They are too time consuming and do not lend themselves to mass appraisal applications. For mass appraisal,

depreciation is estimated by using depreciation tables which show the estimated loss in value at certain ages or effective ages. Effective age is an estimate of age taking into consideration the physical condition and functional utility of a structure it may or may not equal actual age. These tables account for physical deterioration and require separate estimates of functional and economic obsolescence. As different types of properties depreciate at different rates, separate tables need to be developed for each type of property.

These depreciation tables use market data in their development. The steps are:

1. Stratify sales by structure type.
2. Deduct the land value and any other improvements to leave just the main structure value.
3. Subtract this structure value from the replacement cost new to get market derived depreciation.
4. Divide market depreciation by replacement cost new to get depreciation percent.
5. Plot these percentages against effective age.
6. Fit a curve to the data.
7. Develop a depreciation table.

Extra care should be taken when estimating the effective age of an improvement that has undergone major alterations, renovations, modernization, or additions as it increases the life expectancy and decreases the effective age of the improvement. It also lowers the effective age from what it was prior to the enhancement. There are three methods to determine the effective age of an improvement that has been altered, renovated, or added to. Each produces substantially the same result but utilizes different information. The method used will depend on what information is available.

1. Multiply the actual age by the cost of renovation and divide by the replacement cost of the building after renovation then subtract that from the actual age. For example, a 20-year-old building was renovated at a cost of \$100,000 and the replacement cost new is calculated at \$400,000, the effective age would be:

$$20 - (20 \times \$100,000 \div \$400,000) = 15 \text{ years effective age}$$

$$20 \text{ years} - 5 \text{ years} = 15 \text{ years effective age}$$

2. Multiply the actual age by the replacement cost before remodeling and then divide that number by the replacement cost after remodeling. A 35-year-old building had a replacement cost before of \$100,000 and after \$220,000, the effective age is calculated:

$$(35 \times \$100,000) \div \$220,000 = 15.9 \text{ years or } 16 \text{ years effective age}$$

3. Estimate the percentage of the improvement that has been renovated times the number of years since the remodeling has been done and add that to the percentage of the improvement times the actual age of the portion not renovated. The effective age of a 50-year-old building was 40% remodeled 5 years ago would be:

$$.40 \times 5\text{yrs} = 2$$

$$\underline{.60} \times 50\text{yrs} = +\underline{30}$$

$$1.00 \qquad 32 \text{ years effective age}$$

The following page is a depreciation table developed for use with the Appraisal Manual for New Jersey Assessors.

The following tabulation represents suggested guides for effective age percentage depreciation tables for different types of building construction. Each building class specification indicates the tables which are applicable to the building class.

| Effective Age In Years | Table D | Table D-1 | Table D-II | Table D-III | Table D-IV | Table D-V | Table D-VI | Table D-VII |
|------------------------|---------|-----------|------------|-------------|------------|-----------|------------|-------------|
| 1                      | 4.0%    | 2.5%      | 2.0%       | 1.5%        | 1.5%       | 1.0%      | 1.0%       | 0.5%        |
| 2                      | 7.0     | 4.5       | 3.5        | 2.5         | 2.5        | 2.0       | 2.0        | 1.5         |
| 3                      | 11.0    | 7.0       | 4.5        | 3.5         | 3.0        | 2.5       | 2.5        | 2.0         |
| 4                      | 16.0    | 9.0       | 6.0        | 4.5         | 4.0        | 3.5       | 3.5        | 3.0         |
| 5                      | 20.0    | 11.0      | 7.0        | 5.5         | 4.5        | 4.0       | 4.0        | 3.5         |
| 6                      | 22.0    | 13.0      | 8.5        | 6.5         | 5.5        | 5.0       | 5.0        | 4.5         |
| 7                      | 27.0    | 15.5      | 10.0       | 8.0         | 6.5        | 6.0       | 5.5        | 5.0         |
| 8                      | 30.0    | 17.5      | 11.0       | 9.0         | 8.0        | 7.0       | 6.5        | 6.0         |
| 9                      | 34.0    | 20.0      | 12.5       | 10.5        | 9.0        | 8.0       | 7.0        | 7.0         |
| 10                     | 37.5    | 22.0      | 14.0       | 11.5        | 10.0       | 9.0       | 8.0        | 7.5         |
| 11                     | 41.0    | 24.0      | 15.5       | 13.0        | 11.0       | 10.0      | 9.0        | 8.0         |
| 12                     | 44.0    | 25.5      | 17.0       | 14.0        | 12.0       | 10.5      | 9.5        | 9.0         |
| 13                     | 47.0    | 27.5      | 18.0       | 15.5        | 13.0       | 11.5      | 10.5       | 9.5         |
| 14                     | 50.0    | 29.0      | 19.5       | 16.5        | 14.0       | 12.5      | 11.0       | 10.0        |
| 15                     | 52.0    | 31.0      | 21.0       | 18.0        | 15.0       | 13.5      | 12.0       | 10.5        |
| 16                     | 54.0    | 33.0      | 22.5       | 19.0        | 16.0       | 14.5      | 13.0       | 11.0        |
| 17                     | 56.0    | 34.5      | 24.0       | 20.5        | 17.5       | 15.5      | 13.5       | 12.0        |
| 18                     | 58.0    | 36.5      | 25.5       | 21.5        | 18.5       | 16.5      | 14.5       | 12.5        |
| 19                     | 60.0    | 38.0      | 27.0       | 23.0        | 20.0       | 17.5      | 15.0       | 13.5        |
| 20                     | 62.0    | 40.0      | 28.5       | 24.0        | 21.0       | 18.5      | 16.0       | 14.0        |
| 21                     | 64.0    | 41.5      | 30.0       | 25.5        | 22.0       | 19.5      | 17.0       | 14.5        |
| 22                     | 65.0    | 43.0      | 32.0       | 27.0        | 23.0       | 20.5      | 17.5       | 15.0        |
| 23                     | 67.0    | 45.0      | 33.5       | 28.0        | 24.5       | 21.5      | 18.5       | 16.0        |
| 24                     | 68.5    | 46.5      | 35.0       | 29.5        | 25.5       | 22.5      | 19.0       | 16.5        |
| 25                     | 70.0    | 48.0      | 36.5       | 31.0        | 26.5       | 23.5      | 20.0       | 17.0        |
| 26                     |         | 49.5      | 38.0       | 32.5        | 28.0       | 24.5      | 21.0       | 18.0        |
| 27                     |         | 51.0      | 39.5       | 34.0        | 29.0       | 25.5      | 22.0       | 19.0        |
| 28                     |         | 52.0      | 41.0       | 35.0        | 30.5       | 26.0      | 23.0       | 20.0        |
| 29                     |         | 53.5      | 42.0       | 36.5        | 32.0       | 27.0      | 24.0       | 21.0        |
| 30                     |         | 55.0      | 43.5       | 38.0        | 33.0       | 28.0      | 25.0       | 22.0        |
| 35                     |         | 61.0      | 49.0       | 44.0        | 38.5       | 33.5      | 29.0       | 26.0        |
| 40                     |         | 65.0      | 54.0       | 47.5        | 43.0       | 37.0      | 33.0       | 30.0        |
| 45                     |         | 68.0      | 58.0       | 50.5        | 44.5       | 38.5      | 34.5       | 31.5        |
| 50                     |         | 70.0      | 62.5       | 53.0        | 45.5       | 39.5      | 35.5       | 32.5        |
| 55                     |         |           | 65.0       | 55.0        | 47.0       | 41.0      | 37.0       | 34.0        |
| 60                     |         |           | 68.0       | 57.0        | 48.0       | 42.0      | 38.0       | 35.0        |
| 65                     |         |           | 70.0       | 59.0        | 49.5       | 43.5      | 39.5       | 36.5        |
| 70                     |         |           |            | 60.5        | 50.5       | 44.5      | 40.5       | 37.5        |
| 75                     |         |           |            | 62.0        | 52.0       | 46.0      | 42.0       | 39.0        |
| 80                     |         |           |            | 63.0        | 53.0       | 47.0      | 43.0       | 40.0        |

Note: Buildings marked Fair Physical Condition increase deduction 5%  
 Poor Physical Condition increase deduction 10%  
 Dilapidated Condition increase deduction 20%  
 Unusable and Beyond Repair increase deduction to total of 90%

## **134. New Jersey Cost Conversion Factor**

### **Introduction**

Since the introduction of the “Real Property Appraisal Manual for New Jersey Assessors”, by the Division of Taxation, this manual has become the uniform statewide standard for appraisal procedures in New Jersey and is the basis for residential valuations used in revaluation and reassessment programs.

Over the years this manual has undergone periodic reviews and revisions enabling it to reflect changes more accurately in construction techniques and building materials. Also, the Division of Taxation publishes annual cost conversion factors which enable the assessor to properly reflect price changes for each building class. The application of these cost conversion factors for specified building types provides a uniform and accurate basis for adjusting the replacement cost of any specific building type at a base year date or any subsequent date.

- **Component Items, Base Units, Prices, and Indexes of October 1975**

The Real Property Appraisal Manual cost index for commercial and wood and masonry farm buildings are based upon the average labor and prices of October 1975, for all twenty-one counties of the State. The October 1975 figures are used as the basis of all building class unit replacement cost for cost conversion. A conversion factor must be applied to adjust the value from the 1975 rate to the last revaluation/reassessment.

- **Component Items, Base Units, Prices and Indexes of October 1998 Farm Post and Frame PF Series**

The Real Property Appraisal Manual cost index for post and frame farm buildings is based upon the average labor and prices of October 1998, for all twenty-one counties of the State. The October 1998 figures are used as the basis of all building class unit replacement cost for cost conversion. A conversion factor must be applied to adjust the value from the 1998 rate to the last revaluation/reassessment.

- Component Items, Base Units, Prices, and Indexes for October 2001 Residential “R” Series

The Appraisal Manual cost index for the “R” Series buildings is based upon the average labor and prices of October 2001, for all twenty-one counties of the State. The conversion factor for this building base unit replacement cost is 1.00 or 100%. As of October 2001, Districts that undertake a revaluation or reassessment subsequent to 2001 should use the cost conversion factor most recently published for the revaluation implementation.

- Billboards

In 2004, a cost section for wood and steel billboards was developed which also has yearly cost conversion factors developed on a statewide basis. These values use a base year of 2004.

**Classification of Building Classes for Cost Conversions**

For the purpose of Cost Conversion Factor, the Division of Taxation has classified each specific building class according to type and construction and grouped them together in order to reflect the various building types, costs of labor and material used in its construction. Conversion Factors are calculated for each of the twenty-one counties for each group or series. Below are the classifications and how the building classes are grouped and listed on the published Cost Conversion Factor Chart.

| RESIDENCES<br>1975 SERIES** |                       |
|-----------------------------|-----------------------|
| WOOD<br>FRAME               | BRICK<br>OR<br>VENEER |
| TABLE<br>R-1                | TABLE<br>R-2          |

| RESIDENCES<br>R-12 - R-54<br>2001 SERIES ** |                       |
|---|-----------------------|
| WOOD<br>FRAME                               | BRICK<br>OR<br>VENEER |
| TABLE<br>RR-1                               | TABLE<br>RR-2         |

| APARTMENTS, HOTELS<br>MOTELS AND<br>OFFICE BUILDINGS |   |
|--|---|
| MASONRY<br>&<br>WOOD<br>101,102<br>103, 145          | STEEL<br>&<br>CONCRETE<br>104, 105<br>106 |
| TABLE<br>C-1   | TABLE<br>C-2                              |

| COMMERCIAL - INDUSTRIAL BUILDINGS |                             |   |                   |
|-----------------------------------|-----------------------------|---|-------------------|
| WOOD<br>FRAME                     | WOOD &<br>MASONRY           | STEEL &<br>MASONRY                        | FIRE<br>RESISTANT |
| 101, 102<br>123, 133              | 103, 124<br>126, 134<br>136 | 105, 107, 108<br>109, 125,127<br>135, 137 | 104, 106          |
| TABLE<br>C-3                      | TABLE<br>C-4                | TABLE<br>C-5                              | TABLE<br>C-6      |

| FARM BUILDINGS                     |                            |
|------------------------------------|----------------------------|
| WOOD &<br>MASONRY<br>WOOD<br>FRAME | POST<br>&<br>FRAME*        |
| 150, 151<br>152, 153<br>154,156    | PF 157<br>-THRU-<br>PF 162 |
| TABLE<br>F-1                       | TABLE<br>F-2               |

To convert or adjust building construction cost to the current local labor and material costs, the appropriate table, as noted above, is used for each respective building class type of construction.

The cost conversion tables have been developed using average quantities and prices of the controlling items of labor and materials for the respective building classes. The measure of importance of each of the controlling items in the respective building classes is represented by a multiplier, which when multiplied by the current cost of the material or labor index, produces the item factor, which reflects the influence of that particular commodity in the total current cost of the buildings of the particular class.

### **Collection of Current Labor and Material Data**

To obtain local current replacement costs for the various building classes in any assessment jurisdiction where property assessment is either being established or being brought up to date, the appraiser obtains the prevailing material and labor prices in his areas as of the current assessment date on the component items listed in the conversion tables.

In developing the cost conversion factors, Property Administration analyzes construction indexes and building material trends with the end view of preparing a simplified procedure for the cost conversion of the “unit in place” replacement costs of all building types in the manual. This detailed analysis takes into account three major components:

1. Average prices of specific foundational building materials;
2. Rates of prevailing labor wages for building construction;
3. Indexes of wholesale prices of plumbing fixtures and brass fittings, structural steel and iron, non-metallic mineral products, heating equipment and floor coverings.

These three components represent seventeen individual price index items as follows: six items for materials, six items for labor and five items for equipment.



## Cost Conversion Factor Data Reference Guide

**NJ DOL**= New Jersey Prevailing Wage Rate

**PPI**= The Producer Price Index

**ENR**= Engineering News Record

| <u>Component</u>                            | <u>Location</u> | <u>Description</u>                                     |
|---|-----------------|--|
| <u>Materials</u>                            |                 |  |
| Ready Mix Concrete                          | ENR             | 20 City Average  |
| ½" Plywood Sheathing                        | PPI             | 831  |
| Dimension Lumber                            | ENR             | 20 City Average (2x4 pine fir & common and 2x8 common) |
| #1 Common Brick                             | ENR             | 20 City Average  |
| Structural Steel Shapes                     | ENR             | 20 City Average  |
| Reinforced Steel Rebar                      | ENR             | 20 City Average  |
| <u>Equipment</u>                            |                 |  |
| Steel Mill Products                         | PPI             | 1017   |
| Non-Metallic Mineral Products               | PPI             | 13 (1300 Series)                                       |
| Plumbing Fixtures and Brass Fittings        | PPI             | 105  |
| Heating Equipment                           | PPI             | 106  |
| Floor Covering                              | PPI             | 123 (1230 Series)                                      |
| <u>Class "A" Labor</u>                      |                 |  |
| Common Laborer                              | NJ DOL          | Journeyman Rate/Hour                                   |
| Carpenter                                   | NJ DOL          | Journeyman Rate/Hour                                   |
| Plumber                                     | NJ DOL          | Journeyman Rate/Hour                                   |
| Electrician                                 | NJ DOL          | Journeyman Rate/Hour                                   |
| Iron Worker                                 | NJ DOL          | Journeyman Rate/Hour                                   |
| Avg of Mason, Roofer, & Sheet Metal Laborer | NJ DOL          | Journeyman Rate/Hour                                   |

Other sources of information include material dealers, building supply houses, contractors, builders, and employment agencies. Labor costs and material prices can be collected from reliable builders and representatives of the various classes of buildings built in the area. Care must be taken to assure that all costs collected are for the same grade, quality, and quantity of material. Data collected that appears to be inconsistent

with other comparable findings, having the same characteristics, should be verified and/or eliminated from further consideration.

When all the cost data has been collected, analyzed, and verified, the averages for each item including the total average labor rates, dimensional lumber, structural steel and reinforcing steel must be calculated for each county. In addition, the collected data for each of the remaining components the current year rates must be divided by the prior year rates to yield a percentage reflecting any increase or decrease for each of the components.

### **Application of Building Replacement Cost Conversion Factors**

The updated total averages and percentages are entered into the final spreadsheet that is issued yearly on or before October 1st to replace the previous year's data. The data is entered and organized according to component items, base units, and price indexes for each respective building class for each county in order to get a statewide average for each component.

Multiplication of the replacement cost by the cost conversion factor for the particular building class gives the current local replacement cost of such building.

Example:

Assume a jurisdiction in Mercer County undergoes a revaluation or reassessment for 2015 they would use the cost conversion factor published October 2014. For example, in Table "Residences R12 - R54 2001 Series Wood Frame" the statewide average is 1.51 or 151%. This factor is multiplied by the base year 2001 Building Replacement Cost as shown on the property record card. The resulting value is the current building replacement cost of the specified property in the particular jurisdiction being reassessed.

These cost conversion factors used for assessment purposes are to be applied uniformly to all similar properties in the district. The following page is an example of the published Building Replacement Cost Conversion Factors and are found on the Taxation website at: [http://www.state.nj.us/treasury/taxation/lpt/building\\_replace\\_cost.shtml](http://www.state.nj.us/treasury/taxation/lpt/building_replace_cost.shtml)

**BUILDING REPLACEMENT COST CONVERSION FACTORS FOR OCTOBER 2014**  
**TO BE APPLIED TO THE REAL PROPERTY APPRAISAL MANUAL FOR NEW JERSEY ASSESSORS**

| COUNTY           | RESIDENCES<br>1975 SERIES** |                       | RESIDENCES<br>R-12 - R-54<br>2001 SERIES** |                       | APARTMENTS, HOTELS<br>MOTELS, & OFFICE<br>BUILDINGS |  | COMMERCIAL - INDUSTRIAL<br>BUILDINGS  |  |   |                               | FARM BUILDINGS  |   |
|------------------|-----------------------------|-----------------------|--|-----------------------|---|--|---------------------------------------|--|---|-------------------------------|---|---|
|                  | WOOD<br>FRAME               | BRICK<br>OR<br>VENEER | WOOD<br>FRAME                              | BRICK<br>OR<br>VENEER | MASONRY<br>& WOOD<br>101, 102<br>103, 145           | STEEL &<br>CONCRETE<br>104, 105<br>106 | WOOD<br>FRAME<br>101, 102<br>123, 133 | WOOD &<br>MASONRY<br>103, 124<br>126, 134<br>136 | STEEL &<br>MASONRY<br>105, 107,<br>108, 109,<br>125, 127,<br>135, 137,<br>138 | FIRE<br>RESISTANT<br>104, 106 | WOOD &<br>MASONRY,<br>WOOD<br>FRAME<br>150<br>THRU<br>156 | POST<br>&<br>FRAME<br>PF 157<br>THRU<br>164 |
|                  | TABLE<br>R-1                | TABLE<br>R-2          | TABLE<br>RR-1                              | TABLE<br>RR-2         | TABLE<br>C-1  | TABLE<br>C-2                           | TABLE<br>C-3                          | TABLE<br>C-4                                     | TABLE<br>C-5  | TABLE<br>C-6                  | TABLE<br>F-1  | TABLE<br>F-2                                |
| Atlantic         | 4.57                        | 4.73                  | 1.47                                       | 1.50                  | 5.28  | 7.44                                   | 4.54                                  | 5.54   | 8.35  | 7.11                          | 5.54  | 1.63  |
| Bergen           | 4.55                        | 4.70                  | 1.50                                       | 1.47                  | 5.43  | 8.08                                   | 4.56                                  | 5.75   | 9.15  | 7.68                          | 5.75  | 1.64  |
| Burlington       | 4.55                        | 4.70                  | 1.49                                       | 1.49                  | 5.26  | 7.46                                   | 4.52                                  | 5.52   | 8.35  | 7.11                          | 5.52  | 1.57  |
| Camden           | 4.54                        | 4.70                  | 1.51                                       | 1.48                  | 5.25  | 7.44                                   | 4.51                                  | 5.51   | 8.34  | 7.11                          | 5.51  | 1.63  |
| Cape May         | 4.55                        | 4.71                  | 1.50                                       | 1.51                  | 5.25  | 7.43                                   | 4.51                                  | 5.52   | 8.34  | 7.09                          | 5.52  | 1.63  |
| Cumberland       | 4.57                        | 4.71                  | 1.50                                       | 1.52                  | 5.26  | 7.43                                   | 4.53                                  | 5.53   | 8.33  | 7.09                          | 5.53  | 1.63  |
| Essex            | 4.55                        | 4.68                  | 1.50                                       | 1.51                  | 5.41  | 8.07                                   | 4.55                                  | 5.73   | 9.14  | 7.67                          | 5.73  | 1.64  |
| Gloucester       | 4.54                        | 4.66                  | 1.49                                       | 1.48                  | 5.24  | 7.43                                   | 4.51                                  | 5.50   | 8.33  | 7.09                          | 5.50  | 1.63  |
| Hudson           | 4.65                        | 4.81                  | 1.55                                       | 1.55                  | 5.52  | 8.16                                   | 4.65                                  | 5.84   | 9.24  | 7.79                          | 5.84  | 1.64  |
| Hunterdon        | 4.57                        | 4.75                  | 1.49                                       | 1.52                  | 5.41  | 8.00                                   | 4.54                                  | 5.73   | 9.08  | 7.59                          | 5.73  | 1.63  |
| Mercer           | 4.57                        | 4.71                  | 1.51                                       | 1.53                  | 5.40  | 8.00                                   | 4.55                                  | 5.72   | 9.07  | 7.59                          | 5.72  | 1.64  |
| Middlesex        | 4.55                        | 4.71                  | 1.52                                       | 1.51                  | 5.42  | 8.05                                   | 4.56                                  | 5.74   | 9.13  | 7.65                          | 5.74  | 1.64  |
| Monmouth         | 4.55                        | 4.69                  | 1.51                                       | 1.51                  | 5.40  | 8.01                                   | 4.53                                  | 5.71   | 9.08  | 7.59                          | 5.71  | 1.64  |
| Morris           | 4.56                        | 4.70                  | 1.51                                       | 1.51                  | 5.39  | 7.99                                   | 4.54                                  | 5.72   | 9.08  | 7.57                          | 5.72  | 1.64  |
| Ocean            | 4.55                        | 4.68                  | 1.51                                       | 1.51                  | 5.27  | 7.52                                   | 4.53                                  | 5.54   | 8.43  | 7.16                          | 5.54  | 1.63  |
| Passaic          | 4.57                        | 4.72                  | 1.54                                       | 1.50                  | 5.46  | 8.12                                   | 4.61                                  | 5.79   | 9.18  | 7.73                          | 5.79  | 1.64  |
| Salem            | 4.55                        | 4.72                  | 1.52                                       | 1.49                  | 5.26  | 7.44                                   | 4.53                                  | 5.52   | 8.34  | 7.10                          | 5.52  | 1.62  |
| Somerset         | 4.56                        | 4.71                  | 1.50                                       | 1.55                  | 5.42  | 8.04                                   | 4.56                                  | 5.74   | 9.11  | 7.62                          | 5.74  | 1.64  |
| Sussex           | 4.59                        | 4.76                  | 1.52                                       | 1.49                  | 5.45  | 8.02                                   | 4.59                                  | 5.76   | 9.11  | 7.61                          | 5.76  | 1.62  |
| Union            | 4.57                        | 4.70                  | 1.54                                       | 1.52                  | 5.43  | 8.06                                   | 4.58                                  | 5.75   | 9.13  | 7.66                          | 5.75  | 1.64  |
| Warren           | 4.47                        | 4.56                  | 1.48                                       | 1.49                  | 5.33  | 7.96                                   | 4.49                                  | 5.65   | 9.03  | 7.54                          | 5.65  | 1.63  |
| State<br>Average | 4.56                        | 4.71                  | 1.51                                       | 1.51                  | 5.36  | 7.82                                   | 4.55                                  | 5.66   | 8.83  | 7.44                          | 5.66  | 1.63  |

NOTE: Union labor rates are used in computing all of the above conversion factors with the exception of the P.F. Series Farm Buildings\*  
 Use table R-1 and R-2 when converting from the 1975 base cost, employ tables RR-1 and RR-2 to convert from the 2001 base year\*\*

\*REVISED: September 2014

### **135. Sales Comparison Approach**

Synonymous with market comparative approach, the sales comparison approach is regarded by appraisers as the most significant and consistently reliable valuation method when properly developed from an adequate sample of market data. Sales comparison involves collecting and analyzing the data, selecting appropriate units of comparison, making reasonable adjustments derived from the market and applying the data to the subject property. Data collection is the accumulation of all types of data, the analysis of the data and the assembly of useful data in suitable form for comparison with other sold properties. The analysis of market data first involves an examination of the available sales sample to determine its adequacy in depth and its significance in relation to the property being appraised.

If the sales sample is too small or is composed of heterogeneous (unlike) properties, the results are likely to be unreliable. Adequate sales samples with homogeneous properties are necessary for proper application of the sales comparison. In addition to the data normally collected on properties, it is necessary to accumulate data that relates to the sale itself. Items such as time of sale, location, conditions of sale, financing, site data and other features pertaining to the property which may have influenced the buyer or seller are gathered and analyzed.

In the adjustment phase, value differences between the comparable sales and the subject property are reconciled by making compensating adjustments for each market and property variable to the comparable sale property. The result of this procedure will be an adjusted value for each comparable property and, when performed for all properties in the same manner, will represent the market value of the subject property. In order to properly compare the subject property with the similar properties which have sold, it is necessary to establish uniform standards for measurement of the differences. The elements of these standards are subject to the judgment of the appraiser and applied uniformly in all comparisons. Adjustments can be either a dollar (lump sum) amount or percentage and are applied to the comparable sale price/comparable property. Adjustments should reflect

the contributory value of an individual item to the total property value rather than its cost. These adjustments should be derived from the market by using paired sales analysis.

After the comparables are properly adjusted for differences to the subject the comparable sales prices show an adjusted value range for the subject property. These values are then analyzed and reconciled into a final value estimate for the subject, relying on the comparable sale with the least number of adjustments and/or least gross dollar amount of adjustments.

The defense of assessed value when challenged in a tax appeal proceeding is based on the market value of the property. The direction of the defense is based on the statutory requirement N.J.S.A. 54:4-23, which, in part, states the assessor must...“determine the full and fair value of real property in the taxing district at such price as, in his judgment it would sell for a fair and bona fide sale by private contract on October 1<sup>st</sup>.” This indicates that the use of the market approach is the primary approach to be used in the defense of assessment appeals.

An adequately prepared sales comparison approach is more readily understood by the general public than the other approaches to value because its logic closely parallels the logic of the typical consumer in the market. In many instances the courts place greater credence upon this valuation method than the cost approach, providing there is sufficient documentation and there has been a proper analysis of the comparable sales.

The following is an example of the sales comparison approach showing adjustments to the comparable properties to arrive at an indication of value for the subject property. Never adjust the subject property. Through data collection and analysis, the following has been found:

| <u>Comparable Property</u> | <u>Adjustment</u>    |
|----------------------------|----------------------|
| Superior to Subject        | Negative or Subtract |
| Inferior to Subject        | Positive or Increase |

### **Subject Property**

The property being appraised as of June 1, 2012 is a two-story colonial style dwelling, built in 2007, in good condition and average functional utility. It is located in a typical neighborhood on a quiet residential street. The lot is typical for the area 150' x 200' rectangular with city water, sewer, and underground electric. The dwelling is 2850 square feet with eight total rooms, four bedrooms three full baths and one-half bath, full unfinished basement, forced hot air heat and central air conditioning. It has a front porch with roof, a rear wood deck, fireplace and a two-car attached garage.

### **Comparable #1**

The property sold February 10, 2012 for \$330,000. It is a two-story colonial style dwelling, built in 2007, in good condition with average functional utility. It is in the same neighborhood as the subject and on a similar residential street. The lot is smaller, 125' x 200', with the same utilities. The dwelling is 2600 square feet, eight rooms, four bedrooms and three full baths, full unfinished basement, forced hot air and central air conditioning. It has a front porch with roof, fireplace and one car attached garage.

### **Comparable #2**

This property sold December 1, 2011 for \$360,000. It is a similar model two story colonial as the subject, built in 2007 in good condition and average functional utility. It is in the same neighborhood and on a similar street as the subject. The lot is 125' x 200' rectangular with all utilities. It is 2850 square feet, eight rooms, four bedrooms, three full baths and one-half baths, full basement with part finished room, forced hot air and central air conditioning. It has a front porch with a roof, rear wood deck and a two-car attached garage.

### **Comparable #3**

The property sold April 15, 2012 for \$320,000. It is a two-story colonial style dwelling, built in 1997, average condition and average functional utility. It is located in a similar type of neighborhood on a traffic street. It is on a 150' x 200' lot with all utilities. The dwelling is 2550 square feet, eight rooms, four bedrooms, three full baths and one-half bath, full unfinished basement, forced hot air and central air conditioning. It has a front porch with roof, rear wood deck, fireplace and attached one car garage.

Through market analysis of similar type properties in the area, the following adjustments have been ascertained:

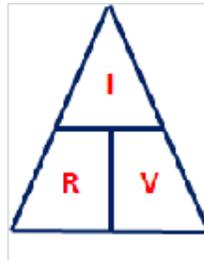
- The adjustment for time due to the increasing market is 6% per year or ½% per month.
- Being on a traffic street shows a \$10,000 decrease in value.
- Lot size is \$200 per front foot.
- Adjustment for age of improvement is \$5,000 for ten years.
- Half baths contributory value is \$3,000.
- Square foot adjustment is \$80 per square foot.
- A part finished basement contributes \$5,000 in value.
- Garages are \$5,000 per car.
- A deck contributes \$4,000 in value.

| ITEM                   | SUBJECT  | COMP#1    | ADJ       | COMP#2      | ADJ       | COMP#3    | ADJ       |
|------------------------|----------|-----------|-----------|-------------|-----------|-----------|-----------|
| SALE PRICE             |          | \$330,000 |           | \$360,000   |           | \$320,000 |           |
| DATE OF SALE           |          | 2/10/2012 | 6,500     | 12/1/2011   | 10,500    | 4/15/2012 | 3,200     |
| LOCATION               | AVG      | AVG       |           | AVG         |           | FAIR      | 10,000    |
| LAND SIZE              | 150X200  | 125X200   | 5,000     | 125X200     | 5,000     | 150X200   |           |
| CONSTRUCTION QUALITY   | AVG      | AVG       |           | AVG         |           | AVG       |           |
| STYLE                  | COLONIAL | COLONIAL  |           | COLONIAL    |           | COLONIAL  |           |
| AGE                    | 5 YEARS  | 5 YEARS   |           | 5 YEARS     |           | 15 YEARS  | 5,000     |
| CONDITION              | GOOD     | GOOD      |           | GOOD        |           | AVG       | 10,000    |
| ROOM COUNT             | 8/4/3.5  | 8/4/2003  | 3,000     | 8/4/3.5     |           | 7/4/3.5   |           |
| LIVING AREA            | 2850 SF  | 2600 SF   | 20,000    | 2850 SF     |           | 2550 SF   | 24,000    |
| BASEMENT               | FULL     | FULL      |           | FULL        |           | FULL      |           |
| BSMT FINISH            | UNFIN    | UNFIN     |           | PART FINISH | -5,000    | UNFIN     |           |
| FUNCTIONAL UTILITY     | AVG      | AVG       |           | AVG         |           | AVG       |           |
| HEAT/AC                | FHA/CENT | FHA/CENT  |           | FHA/CENT    |           | FHA/CENT  |           |
| GARAGE                 | 2 CAR    | 1 CAR     | 5,000     | 2 CAR       |           | 1 CAR     | 5,000     |
| PORCH                  | YES      | YES       |           | YES         |           | YES       |           |
| DECK                   | YES      | NO        | 4,000     | YES         |           | YES       |           |
| FIREPLACE              | 1        | 1         |           | NONE        | 5,000     | 1         |           |
| <b>NET ADJUSTMENT</b>  |          |           | 43,500    |             | 15,500    |           | 57,200    |
| <b>INDICATED VALUE</b> |          |           | \$373,500 |             | \$375,500 |           | \$377,200 |

After adjustments, the value range for the subject property is \$377,200 to \$373,500. Reconciling these value indicators into a final value estimate, comparable #2 was given most weight as it is the same model as the subject and had the least number of and total net adjustments.

### 136. Income Approach

The income approach links a property's income to value by determining the present worth of future net benefits. Much like an investor, three portions of the income stream are considered by this approach: the amount and quality of future income, when it will be received and for how long. A capitalization rate consisting of a return on and a return of investment is then applied to the income to derive a value estimate. In its simplest form,  $\text{Value} = \text{Income} \div \text{Rate}$ .



The line under “I” means to divide.

The line between “R and V” means multiply.

Cover the variable to be solved to get the desired equation.

It is the approach recognized by the courts when defending assessment appeals for income producing properties. The basic steps of the income approach are:

1. Estimate the potential gross income.
2. Deduct allowance for vacancy and rent loss.
3. Add miscellaneous income to get effective gross income.
4. Determine operating expenses and deduct from the effective gross income to arrive at net operating income
5. Select the proper capitalization rate.
6. Determine the capitalization method to be used.
7. Capitalize the net operating income into an indication of value.

### **Potential Gross Income**

The first step is to estimate the potential gross income, which is the annual economic or market rent assuming the property is fully occupied. Economic rent is derived from a survey and analysis of similar use properties in the area. Factors considered when analyzing income include date and terms of the lease, location of property and physical characteristics. Typical units of comparison for income producing properties are price per square foot, price per room, price per apartment, price per space and percentage of gross income. Although rental information is sometimes difficult to obtain, one of the tools an assessor has at their disposal is the Chapter 91 Income and Expense Statements that should be filed annually by owners. When an income producing property is contesting their assessment this information is required or the appeal can be dismissed.

### **Effective Gross Income**

The next step is to determine the effective gross income for the property, which is the potential gross income minus an allowance for vacancy and rent collection loss, plus any miscellaneous income. Miscellaneous income is any other income received other than the actual rent. Since most properties are not fully occupied for their entire life, a deduction is made that reflects the vacancy rate that is likely for the property. This is derived by analyzing the subject and similar use properties and their current and historical vacancy rates. It is usually expressed as a percentage of potential gross income. Collection loss is the loss of money from a tenant's non-payment of rent. This is also arrived at by a study of similar use properties and the property itself. This loss should only include non-payment for occupied units. It is also expressed as a percentage of gross income and usually combined with the vacancy rate. After the total vacancy and collection loss is subtracted from the potential gross income, any miscellaneous income is added to arrive at the effective gross income of the property. Miscellaneous income is income derived from the property other than actual rent such as coin operated laundry, operating fees, etc.

### **Net Operating Income**

Net operating income is the income remaining after deducting allowable expenses from the effective gross income. It is the income that is capitalized to arrive at an indicated value for the property. Analyzing a property's operating statement is a critical step in

determining allowable expenses. They are divided into allowable and non-allowable expenses.

### Expenses

In analyzing operating statements, it is known that all items shown cannot be used for real estate appraisal purposes. Allowable expenses are those that are typical, reasonable, and necessary to maintain the property's ability to produce income and will occur every year. Reported expenses should be compared to expense information for comparable properties to determine if reasonable. A tool used to do this is the operating expense ratio which is found by dividing the total or individual expenses by the effective gross income. When analyzing expenses, determine if the expense is typical for that type of property. Does the expense indicate typical management? Are they consistent on a year-to-year basis? Do they show a relationship to each other and are in line with similar use properties?

Allowable Expenses include:

### Management

This is usually a fee paid to a management company to oversee day-to-day operations and is usually expressed as a percentage of Effective Gross Income.

### Salaries

Wages and benefits paid to employees needed to keep a property rented.

### Utilities

This deduction includes gas, water, electric, sewer, fuel, telephone, and garbage removal.

### Supplies and Materials

Items used in the day-to-day operation.

### Repairs and Maintenance

Costs caused by the physical use of the property.

### Property Taxes

These can be considered as an expense when appraising individual properties. In assessment mass appraisal applications, they are included in the capitalization rate using the effective tax rate. For the assessor, it is included in the capitalization rate.

### Insurance

Cost of insuring the property annually.

### Miscellaneous

Small cost items that do not justify a separate listing.

### Reserves for Replacement

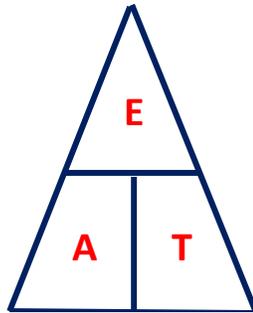
Short lived items that must be replaced before the building reaches the end of its economic life.

### **Improper Expenses**

- Depreciation (recapture rate)
- Debt Service (yield/discount rate)
- Real Estate Taxes (effective tax rate)
  - These items are accounted for in the capitalization rate.
- Capital Improvements
  - This refers to items, such as an addition, made infrequently and are not necessary to maintain the annual income of a property.
- Income Taxes
- Owners Business Expenses
  - These expenses are not necessary to maintain the rental income of the property. They are personal expenses of the owner.

## **Capitalization Rates**

The capitalization rate is often thought of as the rate of return an investor would expect to receive for a certain capital investment. It is comprised of three components: a discount rate, a recapture rate for the improvement and an effective tax rate. The discount rate considers four characteristics of investment: safety, risk, liquidity, and cost of management. The recapture rate is the yearly amount required to provide a return of investment over the time period the investment is held. The third component, when used as part of the cap rate, is the **E**ffective tax rate, which is the general **T**ax rate times the districts level of **A**ssessment (Director's Ratio).



The line under “E” means to divide.

The line between “A and T” means multiply.

When valuing vacant land only the discount rate and effective tax rate are used in the cap rate, as land is a non-wasting asset so there is no recapture rate needed.

## **Discount Rate**

To develop the discount rate there are two recognized methods used, the band of investment method and the market comparison method. The band of investment method consists of the interest rates of first and second mortgages paid by an investor for the type of property being appraised and the anticipated yield or rate of return expected to be received on the equity in the property. The market comparison method is used when there are ample comparable sales with income information of similar use properties available.

### **Band of Investment**

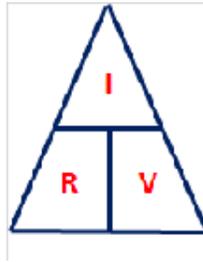
The band of investment method weighs the percent of investment of the debt or mortgage portion and the yield or equity portions which equals 100% of the property value. These percentages are then multiplied by the rate to get a weighted average which is then added to produce the discount portion of the cap rate. For example, \$600,000 can be borrowed on a property worth \$800,000 on a first mortgage; the typical interest rate for this type of property is 6.5%. An additional \$80,000 can be secured on a second mortgage at a rate of 5%. The expected equity yield rate for similar properties in the area is 9%. Given this information the discount portion would be calculated as follows:

|                        | <b><u>Percent of Investment</u></b> | <b><u>Rate</u></b> | <b><u>Weighted Avg.</u></b> |
|------------------------|-------------------------------------|--------------------|-----------------------------|
| <b>First Mortgage</b>  | 0.75%                               | 0.065              | .04875                      |
| <b>Second Mortgage</b> | 0.10%                               | 0.05               | .00500                      |
| <b>Equity</b>          | + <u>0.15%</u>                      | 0.09               | + <u>.01350</u>             |
| <b>Total</b>           | 100%                                |                    | .06725 or 6.73%             |

### **Market Comparison**

Market comparison is a reliable method as it reflects an indicated overall capitalization rate of actual similar use properties in the area. It is arrived at by dividing net operating income by the sales price of the property. For example, a property sold for \$800,000, and the property's net income is \$100,000. The rate in this example would be:

$$\begin{aligned} \text{Net Income} \div \text{Sale Price} &= \text{Ro} \\ \$100,000 \div \$800,000 &= .125 \text{ or } 12.5\% \end{aligned}$$



$V = \text{sale price or property's market value } (V = I \div R)$

$I = \text{net income } (I = V \times R)$

$R = \text{overall capitalization rate } (R = I \div V)$

### **Recapture Rate**

Another part of the capitalization rate is the recapture of capital that is invested in the improvements of a property. This is a portion of the rate that returns to an investor the money equal to the value of the improvement at the end of a specified period of time. The recapture rate only deals with the part of the investment that is attributable to the life of the improvement and does not include the land as that will still have its own value at the end. The two methods are the market comparison and straight-line method.

The market comparison method is almost the same as used to determine the discount rate portion of the cap rate except only the value of the improvement is considered. The basic formula is net operating income less tax dollars and discount dollars which equals the recapture dollars. The recapture dollars are then divided by the improvement value which is the sales price minus the land value. Given a sales price of \$900,000, land value of \$400,000, discount rate of 10% and net operating income after taxes of \$100,000, the recapture rate would be calculated as follows:

|                    |           |                   |
|--------------------|-----------|-------------------|
| Sales Price        |           | \$900,000         |
| Land Value         |           | <u>-\$400,000</u> |
| Building Value     |           | \$500,000         |
| Income after taxes | \$100,000 |                   |
| Discount Rate      | 10%       |                   |

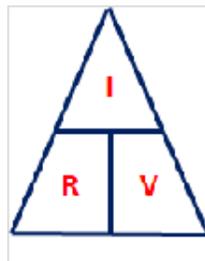
|                                 |   |
|---------------------------------|---|
| Income to satisfy Discount Rate | $\$900,000 \times .10 = \$90,000$       |
| Recapture Income                | $\$100,000 - \$90,000 = \$10,000$       |
| Recapture Rate                  | $\$10,000 \div \$500,000 = 0.02$ or 2 % |

The straight line or economic life method takes into account how many years an investor is willing to have money tied up in a particular property and the length of time banks are willing to make mortgage commitments for the property. An estimate of how long the improvement will add value to the land and produce income needs to be made. The simple formula is 1, divided by the remaining economic life. If a building has an economic life of 40 years, the recapture rate would be 2.5%.

$$1 \div 40 = 0.025 \text{ or } 2.5\%$$

### **137. Capitalization Methods and Techniques**

There are two types of capitalization methods, direct and yield capitalization. Direct capitalization is the method of converting a single year's net income into an estimate of value.



Yield capitalization is the method of converting a series of future income amounts into a present value where future net incomes are discounted at a proper yield rate.

#### **Direct Capitalization**

Direct capitalization converts net income of a property into a value indication using a rate that is arrived at from the actual market. It only takes into consideration a single year income or an average of several years. For example, there are three sales of office

buildings whose net income is known. The net income is divided by the sale price to derive an indicated overall capitalization rate.

| <u>Sale</u> | <u>Net Income</u> | <u>Sale Price</u> | <u>Rate</u> |
|-------------|-------------------|-------------------|-------------|
| 1           | \$53,000          | \$750,000         | .0707       |
| 2           | \$43,400          | \$625,000         | .0694       |
| 3           | \$63,900          | \$875,000         | .0730       |

Based on these three sales, an overall capitalization rate of .07 or 7% can be derived for similar type properties.

Example:

The property under appraisal is a similar type of office building with a net income of \$85,000. The indicated value for the property would be  $\$85,000 \div .07 = \$1,214,285$  or \$1,214,300.

### **Band of Investment Technique**

This method uses the weighted average of the equity and mortgage rates to obtain an overall capitalization rate. A percentage is assigned to each component based on the typical loan to value lending ratio for the particular use property. For example, if the typical policy is to lend 80% of the appraised value, the mortgage part is assigned 80% and the equity 20%. In this method, the mortgage part of the capitalization rate is the lending percentage times the periodic payment factor (found in monthly interest tables Column 6) for the percent and term of the loan times 12. The equity portion takes the remaining percentage times the typical return on investment for similar properties. If property taxes are not included in expenses, the effective tax rate is added to the cap rate.

The following is an example of a commercial property appraised using this method:

A building is 5,400 square feet, the actual rent is \$18 per square foot, market rents are found to range between \$16 and \$19 for similar use buildings in the area. Vacancy and rent loss is found to be 3% of Potential Gross Income. Allowable expenses include

\$2,000 for insurance. Typical management fees for similar properties are 3%, repairs and maintenance 2.5% and replacement reserves 3% of Effective Gross Income. Accounting/legal fees are \$4,000. Tenants pay all utilities. Current mortgage rates are 7% for 25 years and banks are lending 80% of the appraised value. Typical expected equity return is 9% for this type of property.

Mortgage Equity Technique

|  |                |                  |          |
|--|----------------|------------------|----------|
| Potential Gross Income (PGI)           | \$5,400 x \$18 | \$97,200         |          |
| Less vacancy and rent loss @ 3% of PGI |                | <u>-\$ 2,916</u> |          |
| Effective Gross Income (EGI)           |                |                  | \$94,284 |

Less operating expenses:

|                                       |  |         |                  |
|---------------------------------------|--|---------|------------------|
| Insurance                             |  | \$2,000 |                  |
| Management fees @ 3% of EGI           |  | \$2,829 |                  |
| Repairs and maintenance @ 2.5% of EGI |  | \$2,537 |                  |
| Professional fees                     |  | \$4,000 |                  |
| Reserves for replacement @ 3% of EGI  |  | \$2,829 |                  |
| Total operating expenses              |  |         | <u>-\$14,195</u> |
| Net operating income                  |  |         | \$80,089         |

Cap Rate Analysis:

|   |                  |                                    |                          |
|---|------------------|------------------------------------|--------------------------|
| 1) Mortgage: 80% first mortgage @ 7% monthly for 25 years |                  |                                    |                          |
| annual constant .007068 x 12 = .084816                    | 80% x .084816 =  | .0678                              |                          |
| 2) Equity: 20% cash invested with an expected             |                  |                                    |                          |
| return rate of 9%   | 20% x .0900 =    | .0180                              |                          |
| 3) Effective Tax Rate                                     |                  | <u>                    = .0200</u> |                          |
|   | Overall cap rate |                                    | .1058                    |
|   |                  |                                    | Rounded to .106 or 10.6% |

Indicated value via income approach  $\$80,089 \div .106 = \$755,557$  or  $\$755,600$

### **Straight Line and Sinking Fund Capitalization**

Straight line capitalization, the simplest method, should be used when the income is going to decline over the life of the improvement, the tenant is financially average or poor, the lease is month- to- month and the improvement is recaptured equally over its life with the discount received on the remaining balance of the investment.

The sinking fund method produces a higher value than the straight-line method. It should be used when the income is constant, recapture is invested at a safe rate and the discount is received each year on the total original investment in the depreciating asset.

Two commonly used residual methods utilized in straight line capitalization are the building and land residual techniques. The information available and the type of property being appraised determine which method is used.

### **Land Residual**

The land residual is used when the building value is known and is new. Land values are not evident due to a shortage of vacant land comparables; therefore, the land value is unknown. Depreciation and obsolescence should be minimal when applying this technique.

### **Straight Line Capitalization**

Building value \$500,000

Net income before recapture and real estate taxes \$100,000

| <u>Capitalization Rate:</u>                | Building Cap Rate (BCR) | Land Cap Rate (LCR) |
|--|-------------------------|---------------------|
| Discount rate                              | 6.0%                    | 6.0%                |
| Recapture rate (40 years)                  | 2.5%                    |                     |
| Effective tax rate (\$4/hundred 90% ratio) | <u>+3.6%</u>            | <u>+3.6%</u>        |
| Total                                      | 12.1%                   | 9.6%                |

Building value \$500,000 x BCR

|   |                  |
|---|------------------|
| (\$500,000 x .1210) Income attributable to building | <u>-\$60,500</u> |
| Income attributable to land                         | \$39,500         |

Land Income ÷ Land Cap Rate = Land Value

|          |      |           |
|----------|------|-----------|
| \$39,500 | .096 | \$411,458 |
|----------|------|-----------|

|  |                        |
|--|------------------------|
| Land income (\$39,500 ÷ .096 discount rate + land value) | \$411,458              |
| Building value   | <u>+\$500,000</u>      |
| Total value  | \$911,458              |
|  | or \$911,500           |
|  | (round to nearest 100) |

### Building Residual

The building residual technique is utilized when land values can be clearly established and the building is affected by depreciation or obsolescence, therefore the building value is unknown.

### Straight Line Capitalization

Land value = \$250,000

|   |          |
|---|----------|
| Net income before recapture and real estate taxes | \$80,000 |
|---|----------|

Land value x LCR = Land income

|   |                   |
|---|-------------------|
| (\$250,000 x .07) Income attributable to land | <u>- \$17,500</u> |
|---|-------------------|

|                                 |          |
|---------------------------------|----------|
| Income attributable to building | \$62,500 |
|---------------------------------|----------|

#### Capitalization rate:

|   | Building Cap Rate (BCR) | Land Cap Rate (LCR) |
|---|-------------------------|---------------------|
| Discount rate                                 | 5.0%                    | 5.0%                |
| Recapture rate (25 years)                     | 4.0%                    |                     |
| Effective tax rate (\$2/hundred x 100% ratio) | + <u>2.0%</u>           | + <u>2.0%</u>       |
| Total   | 11.0%                   | 7.0%                |

Building income ÷ BCR = Building value

|                                 |           |
|---------------------------------|-----------|
| (\$62,500 ÷ .11) Building value | \$568,182 |
|---------------------------------|-----------|

|            |                   |
|------------|-------------------|
| Land value | <u>+\$250,000</u> |
|------------|-------------------|

|             |           |
|-------------|-----------|
| Total value | \$818,182 |
|-------------|-----------|

or \$818,200

## Compound Interest Tables

**Column 1 Future Worth of \$1 – The growth of a single deposit over a specific time period.**

**Column 2 Future Worth of \$1 per Period – The growth of a series of deposits over a specific time period.**

**Column 3 Sinking Fund Factor – The periodic deposit needed to accumulate a specific sum over a specified time period.**

**Column 4 Reversion Factor – The present worth of a single future payment.**

**Column 5 Present Worth of \$1 per Period – The present worth of a series of future level income payments. Also known as the annuity factor or Inwood coefficient.**

**Column 6 Partial Payment Factor – The periodic payment needed to amortize a loan over a specific number of years.**

### Level Terminal Annuity

When the amount of income does not change over a specific number of years and payments are equally spaced and scheduled. A simple procedure is used to value this type of property where the income payments are multiplied by the present worth of \$1 per period (Column 5). A level income of \$20,000 a year for 10 years at 6% would be calculated as.

$$(\$20,000 \times 7.360087) = \$147,201.74 \text{ or } \$147,200 \text{ rounded}$$

### Level Perpetual Annuity

A property's value and income are expected to stay constant forever over its useful life. This type of income stream can be valued by the income divided by the rate. A property's value that is earning \$20,000 a year at 6% annually would be.

$$\$20,000 \div .06 = \$333,333.33 \text{ or } \$333,300 \text{ rounded}$$

### Variable Annuity with no Reversion

With variable income streams each separate stream is discounted individually and totaling the results. The future worth of 1 (Column 1) for each year is multiplied by that year's income and added to get the value. A property that has a net operating income of \$50,000 in year one, \$52,000 in year 2, \$55,000 in year 3 and \$56,000 in year 4 at a steady rate of 7% would be valued as;

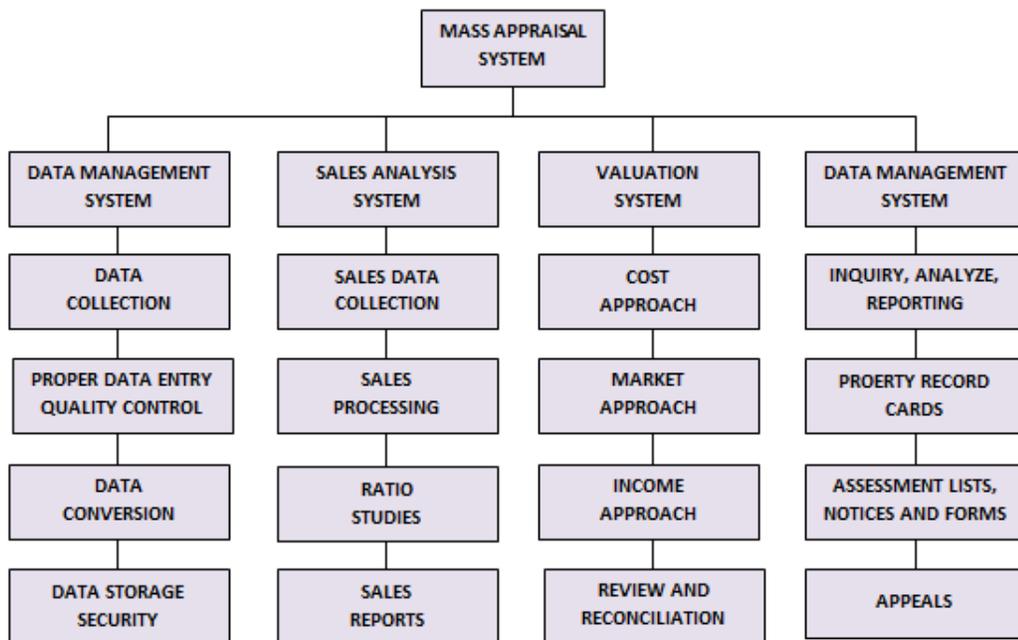
|               |  |
|---------------|--|
| <b>Year 1</b> | <b>\$50,000 x 1.070000 = \$53,500</b>        |
| <b>Year 2</b> | <b>\$52,000 x 1.144900 = \$59,535</b>        |
| <b>Year 3</b> | <b>\$55,000 x 1.225043 = \$67,377</b>        |
| <b>Year 4</b> | <b>\$56,000 x 1.310796 = <u>\$73,405</u></b> |
| <b>Total</b>  | <b>\$253,817</b>                             |

### 138. Mass Appraisal Systems

Mass appraisal, which is done by a Computer Assisted Mass Appraisal system (CAMA), is the systematic appraisal of large groups of property at a given date using standardized procedures and statistical testing. The principles of mass appraisal are similar to those used in an individual appraisal, except they use large quantities of market data to develop market indicators for groups of properties and provide a way to establish and maintain uniform equitable values. Mass appraisal uses equations, tables and schedules called models which are based on the sales comparison approach. Analysis

There are four main areas to a mass appraisal system: 1) data management, 2) sales analysis, 3) valuation and 4) administration. Though each component is a separate system they are interdependent and share information between each other.

#### Mass Appraisal System Components



The data management area is the base of a mass appraisal system. It includes components that allow for data collection, data entry and editing, mapping, data conversion, data storage and security. Property characteristics from this component are used by the valuation and administrative areas.

The sales analysis area has components for sales data collection, sales screening and processing, ratio studies, and sales reports. It uses information from the valuation area for the sales studies and ratio reports.

The valuation area components include mass appraisal models of the cost approach, market approach and income approach along with the ability to review and reconcile the results. The cost approach needs maintenance for cost schedules and equations, depreciation tables and the ability to adjust values to the current market. Market models usually use multiple regression analysis (MRI) and adaptive estimation procedure (AEP), to analyze comparable sales and adjust the values produced to the current market. Income models must be able to develop income multipliers, overall capitalization rates and expense ratios for the different types of commercial properties. The valuation area uses property information from both the data management and sales analysis area.

The administration area includes components to produce the assessment lists, notices, forms, and property record cards. It also should have the ability to inquire, analyze and report on information from the other areas along with having word processing ability. One of the most important components is for assessment appeals, which should also be able to produce any information needed for the defense of an appeal. The administration area uses information from the other three areas.

### **139. Purpose of Mass Appraisal**

Mass appraisal systems are used in revaluations to periodically update all real property values throughout the municipality.

Annually, the Division of Taxation, Property Administration develops ratio studies for all 565 municipalities. A Director's Ratio of less than 85% is one factor that may indicate the need for a revaluation. The primary tool used to develop annual sales ratios is analyzing individual sales to determine if they are arms' length sales, referred to as usable sales for the study.

Revaluation decisions are governed by statute and regulations. Mostly, revaluations are ordered by the County Tax Board, but a municipality may volunteer to conduct a revaluation. All revaluations require planning and resources such as updating the municipal tax map, having the needed staff, budget and having a qualified outside revaluation firm in a timely manner.

Specific action plans can be followed. For example, in New Jersey, the Division of Taxation provides a Plan of Work and monthly reporting as to the revaluations progress to the respective County Tax Board. In the Plan of Work critical activities are documented along with their completion date.

Once all needed data is collected, production of values begins using all the systems and tools of the mass appraisal system. The assessor must monitor the values being developed by the revaluation firm and conduct final ratio checks to accept or modify the new values.

Finally, the assessor can now produce the tax list where he or she is certifying the new values placed on the tax list. Notices of assessment are mailed out specifying appeal rights and informal appeals at the assessor's office can occur.

A good data maintenance program is essential in maintaining values. Periodic inspections occur as a result of receiving copies of building permits, subdivision plans and new deeds. These periodic inspection plans occur through annual reassessment programs. One factor to consider when ordering a revaluation is if the municipality is 10 years or more from its last update of values.

Routine field visits are used to verify changes in properties. Aerial mapping is also available now to assist in inspections for the office. Changes should always be verified with a field visit by the assessor or assessor's staff.

#### **140. Mass Appraisal Statistics**

Sales ratio study is the main tool used to test the accuracy of the results from market calibration of a mass appraisal system. Ratio studies help to identify weaknesses in a mass appraisal systems appraisal performance. The basis for any ratio study in New Jersey is the real property sales system which sends information to the State to promulgate the Director's Table of Equalized Valuations. This file includes all sales recorded at the county for a municipality in a fiscal year cycle. For appraisal purposes all arms' length and open market transactions should be included in the study. Sales that are excluded for the Director's Table can be used in ratio studies; examples are new construction and estate sales. As the ratio derived from these studies show the relation between the assessed value and market value, as of a specific date, they are helpful to show the appraisal and/or assessment level and uniformity of the values produced. As in any ratio study the quantity and quality of the sample available affects the accuracy and reliability of the statistics that are used to measure the assessment level and uniformity.

Typically, assessment level is measured by one of three measures of central tendency: the median, the mean, and the weighted mean.

The median is the exact middle ratio in an array sorted in numerical order. If there are an odd number of ratios, it is the center number; if an even number, it is the average of the two middle ratios. While easy to calculate and understand, it does not consider the effect of extreme outlying ratios.

The mean is the average of the ratios in a sample, or the sum of all the ratios divided by the total number of ratios. Like the median it is easy to calculate in small samples and outliers can skew the results.

The weighted mean is the sum total of appraised or assessed values divided by the sum total of the sales prices. Instead of each of the data points contributing equally to the final average, some data points contribute more than others. It allows the final average number to reflect the relative importance of each number that is being averaged.

The following is an example of the three measures of appraisal level:

| <u>Sale Number</u> | <u>Assessed Value</u> | <u>Sales Price</u> | <u>Ratio</u> |
|--------------------|-----------------------|--------------------|--------------|
| 1                  | \$ 120,000            | \$ 175,000         | .6857        |
| 2                  | \$ 240,000            | \$ 310,000         | .7742        |
| 3                  | \$ 290,000            | \$ 350,000         | .8286        |
| 4                  | \$ 300,000            | \$ 320,000         | .9375        |
| 5                  | <u>\$ 250,000</u>     | <u>\$ 255,000</u>  | <u>.9804</u> |
|                    | \$1,200,000           | \$1,410,000        | 4.2064       |

**Median** - .8286

**Mean** -  $4.2064 \div 5 = .8413$

**Weighted Mean** -  $\$1,200,000 \div \$1,410,000 = .85106$  or .8511

Uniformity of assessments in a mass appraisal system are usually segmented within groups of properties that are broken down by use type and then within neighborhood areas or value control sectors (VCS). The main goal is to obtain uniformity within a specific group and between similar groups of properties. The objective is to achieve an appraisal level as close to 100% of market value as possible, with uniformity within neighborhoods or VCS's also being important. The common standard for uniformity is that the various neighborhoods appraised value level should fall within 5% of the overall appraisal level for the municipality. The accepted measures of uniformity include range, average absolute deviation, coefficient of dispersion, standard deviation, coefficient of variation and the price related differential.

Range is the difference between the highest and lowest ratios in the sample. Higher ranges may indicate low uniformity but can be deceiving as sample outliers are used to find the range. For this reason, it does not consider every ratio in the sample.

Average Absolute Deviation is the difference between each ratio of a sample and the median ratio of that sample. It is calculated by subtracting the median from each ratio, summing these values, and dividing by the number of ratios in the sample. One of the disadvantages of using average absolute deviation is that it measures uniformity as a raw percentage rather than in relative terms.

Coefficient of Deviation (sometimes known as Coefficient of Dispersion) is the most widely used measure of uniformity. It is calculated by taking the average of the absolute deviation of ratios about the median divided by the median ratio shown as a percentage. The lower the percentage is, the greater the uniformity of appraised values. Coefficients of Deviation of 15% or less are indicative of acceptable appraisal uniformity. Lower Coefficients of Deviation show good appraisal uniformity.

Standard Deviation is different from the Coefficient of Deviation because it shows how tightly all the various ratios are clustered around the mean versus the median. It is calculated by subtracting the mean from each ratio, squaring the resulting differences, then sum the squared differences. Then divide the sum of the squared differences by the number in the sample minus one to find the variance of the ratios. Finally, compute the square root of the variance to arrive at the standard of deviation. A lower standard deviation indicates that appraised values are closer to the norm and thus indicate better assessment uniformity.

Coefficient of Variation (COV) is a tool used to compare the appraisal levels between different groups of properties. It is calculated by dividing the standard deviation by the mean, assessment sales ratio, and multiplying by 100. The closer the COV is to 0, the more stable the sales group, provided there are a sufficient number of sales. It is also a good measure of uniformity.

Price Related Differential (PRD) is a statistic for measuring the regressivity or progressivity of assessment. It measures inequities between high and low value properties within a group such as a neighborhood. When high value properties are undervalued compared to the low value properties, the values are considered regressive. When high

value properties are overvalued, it is progressive. A PRD of 1.00 indicates no bias between the low and high value properties. A lower PRD indicates progressivity, while a high PRD indicates regressivity. The accepted range is between .98 and 1.03 as long as the sample size is large enough. It is calculated by dividing the mean by the weighted mean.

The following shows the calculation of the six measures of uniformity using the same five sales shown for the measures of appraisal level:

**Range**

| <u>Sale Number</u> | <u>Assessed Value</u> | <u>Sales Price</u> | <u>Ratio</u> |
|--------------------|-----------------------|--------------------|--------------|
| 1                  | \$ 120,000            | \$ 175,000         | .6857        |
| 2                  | \$ 240,000            | \$ 310,000         | .7742        |
| 3                  | \$ 290,000            | \$ 350,000         | .8286        |
| 4                  | \$ 300,000            | \$ 320,000         | .9375        |
| 5                  | <u>\$ 250,000</u>     | <u>\$ 255,000</u>  | <u>.9804</u> |
|                    | \$1,200,000           | \$1,410,000        | 4.2064       |

**Range** - .6857 to .9804

**Average Absolute Deviation**

| <u>Sale Number</u> | <u>Ratio</u> | <u>Absolute Difference from Median (.8286)</u> |
|--------------------|--------------|--|
| 1                  | .6857        | .1429  |
| 2                  | .7742        | .0544  |
| 3                  | .8286        | .0000  |
| 4                  | .9375        | .1089  |
| 5                  | .9804        | <u>.1518</u>                                   |
|                    |              | .4580  |

**Average Absolute Deviation** -  $.4580 \div 5 = .0916$

### Coefficient of Deviation

| <u>Sale Number</u> | <u>Ratio</u> | <u>Absolute Difference from Median (.8286)</u> |
|--------------------|--------------|--|
| 1                  | .6857        | .1429  |
| 2                  | .7742        | .0544  |
| 3                  | .8286        | .0000  |
| 4                  | .9375        | .1089  |
| 5                  | .9804        | <u>.1518</u>                                   |
|                    |              | .4580  |

Average Absolute Deviation -  $.4580 \div 5 = .0916$

Median - .8286

**Coefficient of Deviation** -  $.0916 \div .8286 \times 100 = 11.054$

### Standard Deviation

| <u>Sale Number</u> | <u>Ratio</u> | <u>Difference from Mean (.8413)</u> | <u>Difference Squared</u> |
|--------------------|--------------|-------------------------------------|---------------------------|
| 1                  | .6857        | .1556                               | .0242                     |
| 2                  | .7742        | .0671                               | .0045                     |
| 3                  | .8286        | .0127                               | .0002                     |
| 4                  | .9375        | .0962                               | .0093                     |
| 5                  | <u>.9804</u> | <u>.1391</u>                        | <u>.0193</u>              |
|                    | 4.2064       | .4707                               | .0575                     |

Mean -  $4.2064 \div 5 = .8413$

Variance -  $.0575 \div 4 = .0144$

$n - 1$

$5 - 1 = 4$

**Standard Deviation** - Square Root of  $.0144 = .1200$

### Coefficient of Variation

| <u>Sale Number</u> | <u>Ratio</u> | <u>Difference from Mean</u> | <u>Difference Squared</u> |
|--------------------|--------------|-----------------------------|---------------------------|
| 1                  | .6857        | .1556                       | .0242                     |
| 2                  | .7742        | .0671                       | .0045                     |
| 3                  | .8286        | .0127                       | .0002                     |
| 4                  | .9375        | .0962                       | .0093                     |
| 5                  | <u>.9804</u> | <u>.1391</u>                | <u>.0193</u>              |
|                    | 4.2064       | .4707                       | .0575                     |

Mean -  $4.2064 \div 5 = .8413$

Variance -  $.0575 \div 4 = .0144$

Standard Deviation - Square Root of  $.0144 = .1200$

**Coefficient of Variation** -  $.1200 \div .8413 \times 100 = 14.2636$

### Price Related Differential

| <u>Sale Number</u> | <u>Assessed Value</u> | <u>Sales Price</u> | <u>Ratio</u> |
|--------------------|-----------------------|--------------------|--------------|
| 1                  | \$ 120,000            | \$ 175,000         | .6857        |
| 2                  | \$ 240,000            | \$ 310,000         | .7742        |
| 3                  | \$ 290,000            | \$ 350,000         | .8286        |
| 4                  | \$ 300,000            | \$ 320,000         | .9375        |
| 5                  | <u>\$ 250,000</u>     | <u>\$ 255,000</u>  | <u>.9804</u> |
|                    | \$1,200,000           | \$1,410,000        | 4.2064       |

Mean -  $4.2064 \div 5 = .8413$

Weighted Mean -  $\$1,200,000 \div \$1,410,000 = .8511$

**Price Related Differential** -  $.8413 \div .8511 = .9885$

#### **141. Residential “R” Series Base Cost Values Class R-12 to R-49**

This section contains the base cost values for single-family, rowhouse, townhouses, semi-detached residences, and two-to-four family dwellings. These costs are based upon material and labor costs prevailing in New Jersey as of October 2001. Specifications are written to provide for the valuation for most residential properties found throughout the State utilizing replacement costs.

Adjustments to base costs for the residential “R” series are found in Section 142. Cost Conversion Factors for any year other than 2001, must be applied to convert to another Base Year. These factors are published yearly and are found on the Division of Taxation website at: [http://www.state.nj.us/treasury/taxation/lpt/building\\_replace\\_cost.shtml](http://www.state.nj.us/treasury/taxation/lpt/building_replace_cost.shtml)

**R-12 Single Family Residence**

*Class R-12 Typical Photographs*



**CLASS R-12: SINGLE FAMILY RESIDENCE & CABINS**

**LOW QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. ROOF – Wood frame, medium pitch, sheathing with low quality composition or wood shingles.</li> <li>2. FOUNDATION – Masonry or stone, perimeter wall or wood piers.</li> <li>3. BASEMENT – None</li> <li>4. STRUCTURE –<br/>Exterior Walls – Wood frame, low quality wood or composition sheathing, poor quality shingles, siding or equivalent.<br/>Interior Finish – Low quality drywall or wallboard on walls, partitions and ceilings.<br/>Minimum number of closets and kitchen cabinets.</li> <li>5. FLOORS – Frame, wood joists, subfloor with low quality wood finish or equivalent (i.e. – concrete slab on grade with low quality finish).</li> <li>6. HEATING – None</li> </ol> | <ol style="list-style-type: none"> <li>7. PLUMBING – One three – fixture bath.</li> <li>8. LIGHTING – Low quality fixtures and minimum number of outlets.</li> <li>9. BUILT-INS / APPLIANCES – Low quality range and oven.</li> <li>10. FIREPLACE – None</li> <li>11. ATTIC - Unfinished</li> <li>12. PORCHES AND DECKS – None</li> <li>13. GARAGES – None</li> <li>14. OTHER ITEMS – None</li> </ol> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 200          | -           | 42.15       | 22.75      | 700          | 49.88       | 27.35       | 15.40      |
| 250          | -           | 38.01       | 20.68      | 750          | 48.57       | 26.97       | 15.21      |
| 300          | -           | 35.24       | 19.32      | 800          | 47.43       | 26.61       | 15.05      |
| 350          | -           | 33.25       | 18.34      | 850          | 46.42       | 26.31       | 14.88      |
| 400          | 64.68       | 31.78       | 17.60      | 900          | 45.50       | 26.04       | 14.78      |
| 450          | 60.84       | 30.64       | 17.03      | 950          | 44.71       | 25.80       | 14.64      |
| 500          | 57.77       | 29.71       | 16.57      | 1000         | 43.97       | 25.58       | 14.53      |
| 550          | 55.26       | 28.95       | 16.22      | 1100         | 42.72       | 25.20       | 14.34      |
| 600          | 53.17       | 28.33       | 15.92      | 1200         | 41.69       | 24.87       | 14.20      |
| 650          | 51.40       | 27.81       | 15.65      | 1300         | 40.79       | 24.60       | 14.07      |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-13 Typical Photographs*

**R-13 Single Family Residence**



**CLASS R-13: SINGLE FAMILY RESIDENCE**

**FAIR QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1. ROOF – Wood frame, medium pitch, sheathing with fair quality composition or wood shingles.</p> <p>2. FOUNDATION – Masonry or stone, perimeter wall or wood piers.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, fair quality wood or composition sheathing, fair quality shingles, siding or equivalent.<br/>Interior Finish – Fair quality drywall or plaster on walls, partitions and ceilings.<br/>Softwood doors and trim. Minimum number of closets and kitchen cabinets.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with fair quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three – fixture bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8. LIGHTING – Fair quality fixtures and moderate number of outlets.</p> <p>9. BUILT-INS / APPLIANCES – One fair quality range and oven.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft.<br>Area | First<br>Story | Upper<br>Story | Half<br>Story | Sq. Ft.<br>Area | First<br>Story | Upper<br>Story | Half<br>Story |
|-----------------|----------------|----------------|---------------|-----------------|----------------|----------------|---------------|
| 200             | -              | 50.58          | 27.29         | 750             | 58.28          | 32.35          | 18.26         |
| 250             | -              | 45.60          | 24.82         | 800             | 56.90          | 31.92          | 18.04         |
| 300             | -              | 42.28          | 23.18         | 850             | 55.67          | 31.56          | 17.88         |
| 350             | -              | 39.92          | 22.01         | 900             | 54.61          | 31.24          | 17.71         |
| 400             | 77.60          | 38.15          | 21.11         | 950             | 53.63          | 30.94          | 17.55         |
| 450             | 73.00          | 36.76          | 20.43         | 1000            | 52.76          | 30.69          | 17.44         |
| 500             | 69.33          | 35.65          | 19.89         | 1100            | 51.26          | 30.23          | 17.20         |
| 550             | 66.31          | 34.75          | 19.46         | 1200            | 50.01          | 29.85          | 17.03         |
| 600             | 63.81          | 34.01          | 19.07         | 1300            | 48.95          | 29.55          | 16.87         |
| 650             | 61.69          | 33.36          | 18.75         | 1400            | 48.03          | 29.28          | 16.73         |
| 700             | 59.86          | 32.82          | 18.48         |                 |                |                |               |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-14 Typical Photographs*

*R-14 Single Family Residence*



**CLASS R-14: SINGLE FAMILY RESIDENCE**

**BELOW AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1. ROOF – Wood frame, medium pitch, wood sheathing with below average quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, below average quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Moderate number of closets and kitchen cabinets.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with below average finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three – fixture bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8. LIGHTING – Adequate number of below average quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – One below average quality range and oven.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 200          | -           | 54.77       | 29.55      | 800          | 61.63       | 34.58       | 19.56      |
| 250          | -           | 49.39       | 26.88      | 850          | 60.32       | 34.20       | 19.35      |
| 300          | -           | 45.82       | 25.11      | 900          | 59.15       | 33.85       | 19.18      |
| 350          |             | 43.24       | 23.84      | 950          | 58.09       | 33.52       | 19.02      |
| 400          | -           | 41.33       | 22.88      | 1000         | 57.17       | 33.25       | 18.88      |
| 450          | -           | 39.84       | 22.15      | 1100         | 55.54       | 32.76       | 18.64      |
| 500          | 75.10       | 38.64       | 21.55      | 1200         | 54.18       | 32.35       | 18.45      |
| 550          | 71.83       | 37.66       | 21.06      | 1300         | 53.03       | 32.00       | 18.26      |
| 600          | 69.11       | 36.84       | 20.65      | 1400         | 52.03       | 31.70       | 18.12      |
| 650          | 66.83       | 36.13       | 20.33      | 1600         | 50.42       | 31.21       | 17.88      |
| 700          | 64.84       | 35.56       | 20.03      | 1800         | 49.20       | 30.86       | 17.69      |
| 750          | 63.13       | 35.05       | 19.78      |              |             |             |            |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-15 Typical Photographs*

**R-15 Single Family Residence**



**CLASS R-15: SINGLE FAMILY RESIDENCE**

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| <p>1. ROOF – Wood frame, medium pitch, wood sheathing, average quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, average quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Adequate number of closets and kitchen cabinets.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with average quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One and one half bath, one three fixture bath, and one two fixture bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8. LIGHTING – Adequate number of average quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – One average quality range and oven.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 200          | -           | 60.22       | 32.49      | 850          | 66.28       | 37.58       | 21.28      |
| 250          | -           | 54.28       | 29.55      | 900          | 65.00       | 37.20       | 21.09      |
| 300          | -           | 50.34       | 27.59      | 950          | 63.86       | 36.84       | 20.90      |
| 350          | -           | 47.51       | 26.20      | 1000         | 62.80       | 36.54       | 20.76      |
| 400          | -           | 45.41       | 25.14      | 1100         | 61.03       | 36.00       | 20.49      |
| 450          | -           | 43.75       | 24.33      | 1200         | 59.54       | 35.54       | 20.27      |
| 500          | 82.53       | 42.45       | 23.67      | 1300         | 58.26       | 35.16       | 20.08      |
| 550          | 78.94       | 41.36       | 23.16      | 1400         | 57.17       | 34.83       | 19.92      |
| 600          | 75.94       | 40.49       | 22.72      | 1600         | 55.43       | 34.31       | 19.65      |
| 650          | 73.41       | 39.73       | 22.34      | 1800         | 54.04       | 33.90       | 19.46      |
| 700          | 71.26       | 39.07       | 22.01      | 2000         | 52.95       | 33.58       | 19.29      |
| 750          | 69.39       | 38.50       | 21.74      | 2200         | 52.05       | 33.31       | 19.16      |
| 800          | 67.75       | 38.01       | 21.50      | 2400         | 51.32       | 33.09       | 19.05      |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-IV  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-V  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-16 Typical Photographs*

*R-16 Single Family Residence*



**CLASS R-16: SINGLE FAMILY RESIDENCE**

**STANDARD QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1. ROOF – Wood frame, medium pitch, wood sheathing, standard quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, standard quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Adequate number of closets and kitchen cabinets, standard quality ceramic tile or equivalent wainscoting in bath.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with standard quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – Two three - fixture, and one two fixture bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8. LIGHTING – Adequate number and standard quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – One standard quality range and oven.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story \$ | Upper Story \$ | Half Story \$ | Sq. Ft. Area | First Story \$ | Upper Story \$ | Half Story \$ |
|--------------|----------------|----------------|---------------|--------------|----------------|----------------|---------------|
| 200          | -              | 68.62          | 37.03         | 950          | 72.79          | 42.01          | 23.84         |
| 250          | -              | 61.88          | 33.69         | 1000         | 71.62          | 41.63          | 23.65         |
| 300          | -              | 57.39          | 31.45         | 1100         | 69.58          | 41.03          | 23.35         |
| 350          | -              | 54.18          | 29.85         | 1200         | 67.86          | 40.52          | 23.10         |
| 400          | -              | 51.75          | 29.22         | 1300         | 66.42          | 40.08          | 22.88         |
| 450          | -              | 49.90          | 27.75         | 1400         | 65.20          | 39.73          | 22.69         |
| 500          | -              | 48.38          | 26.99         | 1600         | 63.18          | 39.10          | 22.39         |
| 550          | -              | 47.15          | 26.39         | 1800         | 61.63          | 38.64          | 22.18         |
| 600          | 86.58          | 46.15          | 25.88         | 2000         | 60.38          | 38.26          | 21.99         |
| 650          | 83.70          | 45.28          | 25.47         | 2200         | 59.35          | 37.96          | 21.85         |
| 700          | 81.22          | 44.54          | 25.09         | 2400         | 58.50          | 37.71          | 21.71         |
| 750          | 79.10          | 43.89          | 24.76         | 2600         | 57.77          | 37.50          | 21.60         |
| 800          | 77.22          | 43.32          | 24.49         | 2800         | 57.17          | 37.30          | 21.52         |
| 850          | 75.56          | 42.83          | 24.24         | 3000         | 56.62          | 37.14          | 21.44         |
| 900          | 74.09          | 42.39          | 24.03         | 3500         | 56.08          | 36.98          | 21.36         |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-IV  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-V  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-17 Typical Photographs*

**R-17 Single Family Residence**



**CLASS R-17: SINGLE FAMILY RESIDENCE**

**ABOVE STANDARD QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1 ROOF – Wood frame, medium pitch, wood sheathing, above standard quality composition shingles or equivalent.</p> <p>2 FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3 BASEMENT – None</p> <p>4 STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, above standard quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Adequate number of closets and kitchen cabinets, above standard quality ceramic tile or equivalent wainscoting in bath.</p> <p>5 FLOORS – Frame, wood joists, adequate for span and load. Subfloor with above standard quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6 HEATING – None</p> | <p>7 PLUMBING – Two three - fixture, and one two fixture bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8 LIGHTING – Above average number and quality fixtures and outlets.</p> <p>9 BUILT-INS / APPLIANCES – One above standard quality range and oven.</p> <p>10 FIREPLACE – None</p> <p>11 ATTIC - Unfinished</p> <p>12 PORCHES AND DECKS – None</p> <p>13 GARAGES – None</p> <p>14 OTHER ITEMS – None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 200          | -           | 82.47       | 44.48      | 1000         | 86.03       | 50.03       | 28.44      |
| 250          | -           | 74.35       | 40.48      | 1100         | 83.58       | 49.31       | 28.05      |
| 300          | -           | 68.97       | 37.80      | 1200         | 81.53       | 48.68       | 27.75      |
| 350          | -           | 65.10       | 35.89      | 1300         | 79.82       | 48.18       | 27.50      |
| 400          | -           | 62.21       | 34.46      | 1400         | 78.33       | 47.71       | 27.28      |
| 450          | -           | 59.94       | 33.33      | 1600         | 75.93       | 46.99       | 26.92      |
| 500          | -           | 58.15       | 32.44      | 1800         | 74.05       | 46.44       | 26.64      |
| 550          | -           | 56.68       | 31.72      | 2000         | 72.53       | 46.00       | 26.42      |
| 600          | -           | 55.44       | 31.12      | 2200         | 71.32       | 45.61       | 26.23      |
| 650          | -           | 54.39       | 30.59      | 2400         | 70.13       | 45.31       | 26.09      |
| 700          | -           | 53.51       | 30.15      | 2600         | 69.44       | 45.06       | 25.95      |
| 750          | -           | 52.74       | 29.76      | 2800         | 68.69       | 44.84       | 25.84      |
| 800          | 92.80       | 52.07       | 29.43      | 3000         | 68.03       | 44.65       | 25.76      |
| 850          | 90.81       | 51.47       | 29.13      | 3500         | 66.76       | 44.26       | 25.57      |
| 900          | 89.04       | 50.94       | 28.88      | 4000         | 66.13       | 44.06       | 25.47      |
| 950          | 87.47       | 50.47       | 28.63      |              |             |             |            |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-IV  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-V  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-18 Typical Photographs*

**R-18 Single Family Residence**



**CLASS R-18: SINGLE FAMILY RESIDENCE**

**GOOD QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |   |
|--|---|
| <p>1 ROOF – Wood frame, medium pitch, wood sheathing, good quality composition shingles or equivalent.</p> <p>2 FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3 BASEMENT – None</p> <p>4 STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, good quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Good quality drywall or plaster on walls, partitions and ceilings. Hardwood doors and trims. Ample number of closets and kitchen cabinets, good quality ceramic tile or equivalent wainscoting in bath.</p> <p>5 FLOORS – Frame, wood joists, more than span and load. Subfloor with good quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6 HEATING – None</p> | <p>7 PLUMBING – Two three - fixture, and one two fixture bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8 LIGHTING – Ample quantity of good quality fixtures and outlets.</p> <p>9 BUILT-INS / APPLIANCES – One good quality range and oven.</p> <p>10 FIREPLACE – None</p> <p>11 ATTIC - Unfinished</p> <p>12 PORCHES AND DECKS – None</p> <p>13 GARAGES – None</p> <p>14 OTHER ITEMS – None</p> |
|--|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft.<br>Area | First<br>Story | Upper<br>Story | Half<br>Story | Sq. Ft.<br>Area | First<br>Story | Upper<br>Story | Half<br>Story |
|-----------------|----------------|----------------|---------------|-----------------|----------------|----------------|---------------|
| 200             | -              | 101.82         | 54.92         | 1000            | 106.25         | 61.79          | 35.11         |
| 250             | -              | 91.82          | 49.97         | 1100            | 103.21         | 60.88          | 34.66         |
| 300             | -              | 85.14          | 46.68         | 1200            | 100.69         | 60.12          | 34.26         |
| 350             | -              | 80.37          | 44.32         | 1300            | 98.55          | 59.49          | 33.95         |
| 400             | -              | 76.79          | 42.53         | 1400            | 96.71          | 58.92          | 33.69         |
| 450             | -              | 74.04          | 41.17         | 1600            | 93.75          | 58.04          | 33.24         |
| 500             | -              | 71.79          | 40.06         | 1800            | 91.42          | 57.33          | 32.90         |
| 550             | -              | 69.97          | 39.15         | 2000            | 89.58          | 56.79          | 32.61         |
| 600             | -              | 68.47          | 38.41         | 2200            | 88.07          | 56.34          | 32.39         |
| 650             | -              | 67.19          | 37.79         | 2400            | 86.79          | 55.94          | 32.22         |
| 700             | -              | 66.08          | 37.22         | 2600            | 85.71          | 55.63          | 32.05         |
| 750             | -              | 65.12          | 36.76         | 2800            | 84.80          | 55.34          | 31.90         |
| 800             | -              | 64.29          | 36.34         | 3000            | 84.01          | 55.12          | 31.79         |
| 850             | -              | 63.55          | 35.97         | 3500            | 82.42          | 54.63          | 31.56         |
| 900             | -              | 62.90          | 35.65         | 4000            | 81.22          | 54.29          | 31.39         |
| 950             | -              | 62.30          | 35.37         |                 |                |                |               |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-IV  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-V  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-19 Typical Photographs*

***R-19 Single Family Residence***



**CLASS R-19: SINGLE FAMILY RESIDENCE**

**HIGH QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1 ROOF – Wood frame, medium pitch, wood sheathing, high quality composition shingles or equivalent.</p> <p>2 FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3 BASEMENT – None</p> <p>4 STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, high quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – High quality drywall or plaster on walls, partitions and ceilings. Hardwood doors and trims. Ample number of closets and kitchen cabinets. High quality ceramic tile or equivalent wainscoting in bath.</p> <p>5 FLOORS – Frame, wood joists, adequate for span and load. Subfloor with high quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6 HEATING – None</p> | <p>7 PLUMBING – Two three - fixture, and one two fixture bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8 LIGHTING – Substantial quantity of high quality fixtures and outlets.</p> <p>9 BUILT-INS / APPLIANCES – One high quality range and oven.</p> <p>10 FIREPLACE – None</p> <p>11 ATTIC - Unfinished</p> <p>12 PORCHES AND DECKS – None</p> <p>13 GARAGES – None</p> <p>14 OTHER ITEMS – None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 200          | -           | 124.48      | 67.16      | 1100         | -           | 74.41       | 42.37      |
| 250          | -           | 112.25      | 61.09      | 1200         | -           | 73.49       | 41.90      |
| 300          | -           | 104.08      | 57.06      | 1300         | -           | 72.69       | 41.51      |
| 350          | -           | 98.25       | 54.16      | 1400         | 118.23      | 72.04       | 41.19      |
| 400          | -           | 93.89       | 52.00      | 1600         | 114.59      | 70.95       | 40.62      |
| 450          | -           | 90.49       | 50.31      | 1800         | 111.75      | 70.09       | 40.21      |
| 500          | -           | 87.76       | 48.97      | 2000         | 109.50      | 69.41       | 39.88      |
| 550          | -           | 85.54       | 47.88      | 2200         | 107.63      | 68.84       | 39.65      |
| 600          | -           | 83.68       | 46.96      | 2400         | 106.09      | 68.40       | 39.38      |
| 650          | -           | 82.11       | 46.16      | 2600         | 104.79      | 67.98       | 39.17      |
| 700          | -           | 80.78       | 45.51      | 2800         | 103.72      | 67.66       | 39.03      |
| 750          | -           | 79.50       | 44.92      | 3000         | 102.69      | 67.36       | 38.88      |
| 800          | -           | 78.58       | 44.42      | 3500         | 100.76      | 66.80       | 38.58      |
| 850          | -           | 77.70       | 43.97      | 4000         | 99.31       | 66.36       | 38.37      |
| 900          | -           | 76.90       | 43.59      | 4500         | 98.16       | 66.00       | 38.20      |
| 950          | -           | 76.19       | 43.23      | 5000         | 97.22       | 65.71       | 38.05      |
| 1000         | -           | 75.54       | 42.90      |              |             |             |            |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-IV  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-V  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-20 Typical Photographs*

***R-20 Single Family Residence***



**CLASS R-20: SINGLE FAMILY RESIDENCE**

**SUPERIOR QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |  |
|--|--|
| <p>1 ROOF – Wood frame, medium pitch, wood sheathing, superior quality composition shingles or equivalent.</p> <p>2 FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3 BASEMENT – None</p> <p>4 STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, superior quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Superior quality drywall or plaster on walls, partitions and ceilings. Hardwood doors and trims. Ample number of superior closets and kitchen cabinets, superior quality ceramic tile or equivalent wainscoting.</p> <p>5 FLOORS – Frame, wood joists more than adequate span and load. Subfloor with superior quality finish of hardwood, carpet, tile or equivalent.</p> | <p>6 HEATING – None</p> <p>7 PLUMBING – Two three - fixture, and one half fixture bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8 LIGHTING – Substantial quantity of superior quality fixtures and outlets.</p> <p>9 BUILT-INS / APPLIANCES – One superior quality range and oven.</p> <p>10 FIREPLACE – None</p> <p>11 ATTIC - Unfinished</p> <p>12 PORCHES AND DECKS – None</p> <p>13 GARAGES – None</p> <p>14 OTHER ITEMS – None</p> |
|--|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
|              | \$          | \$          | \$         |              | \$          | \$          | \$         |
| 200          | -           | 165.73      | 89.41      | 1200         | -           | 97.84       | 55.78      |
| 250          | -           | 149.45      | 81.33      | 1300         | -           | 96.78       | 55.27      |
| 300          | -           | 138.57      | 75.96      | 1400         | 149.91      | 95.91       | 54.83      |
| 350          | -           | 130.80      | 72.10      | 1600         | 145.30      | 94.45       | 54.09      |
| 400          | -           | 125.00      | 69.22      | 1800         | 141.69      | 93.31       | 53.53      |
| 450          | -           | 120.47      | 66.98      | 2000         | 138.84      | 92.40       | 53.10      |
| 500          | -           | 116.84      | 65.20      | 2200         | 136.47      | 91.65       | 52.78      |
| 550          | -           | 113.89      | 63.74      | 2400         | 134.52      | 91.06       | 52.43      |
| 600          | -           | 111.40      | 62.52      | 2600         | 132.87      | 90.51       | 52.15      |
| 650          | -           | 109.31      | 61.46      | 2800         | 131.52      | 90.08       | 51.96      |
| 700          | -           | 107.54      | 60.59      | 3000         | 130.20      | 89.68       | 51.76      |
| 750          | -           | 105.85      | 59.80      | 3500         | 127.76      | 88.93       | 51.37      |
| 800          | -           | 104.62      | 59.13      | 4000         | 125.92      | 88.34       | 51.09      |
| 850          | -           | 103.44      | 58.54      | 4500         | 124.46      | 87.87       | 50.85      |
| 900          | -           | 102.38      | 58.03      | 5000         | 123.27      | 87.49       | 50.65      |
| 950          | -           | 101.40      | 57.55      |              |             |             |            |
| 1000         | -           | 100.56      | 57.12      |              |             |             |            |
| 1100         | -           | 99.07       | 56.41      |              |             |             |            |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-IV  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-V  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-21 Typical Photographs*

**R-21 Single Family Residence**



**CLASS R-21: SINGLE FAMILY RESIDENCE**  
**MANSSION QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |   |
|--|---|
| <p>1. ROOF – Wood frame, medium pitch, sheathing, excellent quality composition shingles, shakes or equivalent (i.e. –slate, copper, etc.)</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>         Exterior Walls – Masonry or wood frame and sheathing, excellent quality shingles, aluminum siding, brick, stone or equivalent with copper or equivalent gutters and downspouts.<br/>         Interior Finish – Excellent quality hardwood or plaster on walls, partitions and ceilings. Custom Hardwood doors and trims. Ample number of closets and kitchen cabinets with superior hardware. Excellent quality marble, ceramic tile, or equivalent wainscoting.</p> <p>5. FLOORS – Frame, wood or steel joists, more than adequate for span and load. Subfloor with excellent quality finish of hardwood, carpet, terrazzo, slate, marble, tile, or equivalent.</p> | <p>6. HEATING – None</p> <p>7. PLUMBING – Two three – fixture baths and one half bath, kitchen sink, water heater, laundry- tub and one rough-in.</p> <p>8. LIGHTING – Substantial quantity of excellent quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – Excellent quality kitchen appliances.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES/CARRIAGE HOUSES – None</p> <p>14. OTHER ITEMS – None</p> |
|--|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 500          | -           | 165.10      | 92.13      | 1800         | 191.11      | 131.85      | 75.64      |
| 550          | -           | 160.92      | 90.07      | 2000         | 187.26      | 130.56      | 75.03      |
| 600          | -           | 157.41      | 88.34      | 2200         | 184.07      | 129.51      | 74.58      |
| 650          | -           | 154.46      | 86.84      | 2400         | 181.44      | 128.67      | 74.08      |
| 700          | -           | 151.95      | 85.61      | 2600         | 179.21      | 127.89      | 73.69      |
| 750          | -           | 149.56      | 84.50      | 2800         | 177.38      | 127.28      | 73.41      |
| 800          | -           | 147.83      | 83.55      | 3000         | 175.61      | 126.72      | 73.14      |
| 850          | -           | 146.16      | 82.72      | 3500         | 172.32      | 125.66      | 72.58      |
| 900          | -           | 144.66      | 81.99      | 4000         | 169.84      | 124.83      | 72.19      |
| 950          | -           | 143.38      | 81.32      | 4500         | 167.86      | 124.16      | 71.86      |
| 1000         | -           | 142.09      | 80.71      | 5000         | 166.27      | 123.62      | 71.58      |
| 1100         | -           | 139.98      | 79.71      | 5500         | 164.68      | 123.07      | 71.31      |
| 1200         | -           | 138.25      | 78.82      | 6000         | 163.12      | 122.53      | 71.04      |
| 1300         | -           | 136.75      | 78.09      | 6500         | 161.56      | 122.00      | 70.77      |
| 1400         | 202.20      | 135.52      | 77.48      | 7000         | 160.02      | 121.46      | 70.50      |
| 1600         | 195.97      | 133.46      | 76.42      | 7500         | 158.50      | 120.93      | 70.23      |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-IV  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-V  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-22 Typical Photographs*

***R-22 Single Family Residence***



**CLASS R-22: SINGLE FAMILY RESIDENCE**

**ESTATE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |  |
|--|--|
| <p>1. ROOF – Wood frame, medium to steep pitch sheathing, extraordinary quality composition shingles, shakes or equivalent (i.e. –slate, copper, etc.)</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Masonry or wood frame and sheathing, extraordinary quality shingles, aluminum siding, brick, stone or equivalent with copper or equivalent gutters and down-spouts.<br/>Interior Finish – Extraordinary quality hardwood or plaster on walls, partitions and ceilings. Custom Hardwood doors and trims. Ample number of closets and kitchen cabinets with superior hardware. Extraordinary quality marble, ceramic tile, or equivalent wainscoting.</p> <p>5. FLOORS – Frame, wood or steel joists, more than adequate for span and load. Subfloor with extraordinary quality finished flooring of hardwood, carpet, terrazzo, slate, marble, tile, or equivalent.</p> | <p>6. HEATING – None</p> <p>7. PLUMBING – Two three – fixture baths and one half bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8. LIGHTING – Substantial quantity of extraordinary quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – Extraordinary quality kitchen appliances.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES/CARRIAGE HOUSES – None</p> <p>14. OTHER ITEMS – None</p> |
|--|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 500          | -           | 217.62      | 121.44     | 1800         | 240.95      | 173.79      | 99.71      |
| 550          | -           | 212.11      | 118.72     | 2000         | 236.10      | 172.10      | 98.90      |
| 600          | -           | 207.49      | 116.45     | 2200         | 232.07      | 170.70      | 98.31      |
| 650          | -           | 203.60      | 114.46     | 2400         | 228.75      | 169.60      | 97.65      |
| 700          | -           | 200.29      | 112.85     | 2600         | 225.94      | 168.57      | 97.14      |
| 750          | -           | 197.13      | 111.38     | 2800         | 223.65      | 167.77      | 96.77      |
| 800          | -           | 194.86      | 110.13     | 3000         | 221.41      | 167.03      | 96.40      |
| 850          | -           | 192.66      | 109.03     | 3500         | 217.26      | 165.64      | 95.67      |
| 900          | -           | 190.67      | 108.08     | 4000         | 214.13      | 164.54      | 95.15      |
| 950          | -           | 188.99      | 107.19     | 4500         | 211.64      | 163.65      | 94.71      |
| 1000         | -           | 187.30      | 106.39     | 5000         | 209.63      | 162.94      | 94.35      |
| 1100         | -           | 184.51      | 105.07     | 5500         | 207.63      | 162.22      | 93.99      |
| 1200         | -           | 182.23      | 103.89     | 6000         | 205.66      | 161.51      | 93.64      |
| 1300         | -           | 180.25      | 102.94     | 6500         | 203.70      | 160.81      | 93.28      |
| 1400         | 254.93      | 178.63      | 102.13     | 7000         | 201.76      | 160.10      | 92.93      |
| 1600         | 247.08      | 175.92      | 100.73     | 7500         | 199.84      | 159.40      | 92.57      |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-IV  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-V  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-23 Typical Photographs*

***R-23 Single Family Residence***



**CLASS R-23: SINGLE FAMILY RESIDENCE**

**HIGHEST ESTATE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |  |
|--|--|
| <p>1. ROOF – W Wood frame, medium to steep pitch, sheathing, extraordinary quality composition shingles, shakes or equivalent ( i.e. - slate, copper )</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Masonry or wood frame and sheathing, highest quality shingles, aluminum siding, brick, stone or equivalent with copper or equivalent gutters and down-spouts.<br/>Interior Finish – Highest quality hardwood or plaster on walls, partitions and ceilings. Custom Hardwood doors and trims. Ample number of closets and kitchen cabinets with superior hardware. Highest quality marble, ceramic tile, or equivalent wainscoting.</p> <p>5. FLOORS – Frame, wood or steel joists, more than adequate for span and load. Subfloor with highest quality finished flooring of hardwood, carpet, terrazzo, slate, marble, tile, or equivalent.</p> | <p>6. HEATING – None</p> <p>7. PLUMBING – Two three – fixture baths and one half bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8. LIGHTING – Substantial quantity of highest quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – Highest quality kitchen appliances.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES/CARRIAGE HOUSES – None</p> <p>14. OTHER ITEMS – None</p> |
|--|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 500          | -           | 357.02      | 199.23     | 1800         | 334.25      | 285.11      | 163.57     |
| 550          | -           | 347.99      | 194.77     | 2000         | 327.52      | 282.34      | 162.25     |
| 600          | -           | 340.40      | 191.04     | 2200         | 321.94      | 280.05      | 161.29     |
| 650          | -           | 334.01      | 187.78     | 2400         | 317.34      | 278.24      | 160.20     |
| 700          | -           | 328.59      | 185.13     | 2600         | 313.44      | 276.56      | 159.36     |
| 750          | -           | 323.41      | 182.73     | 2800         | 310.25      | 275.23      | 158.76     |
| 800          | -           | 319.68      | 180.68     | 3000         | 307.15      | 274.03      | 158.15     |
| 850          | -           | 316.07      | 178.87     | 3500         | 301.40      | 271.74      | 156.95     |
| 900          | -           | 312.81      | 177.31     | 4000         | 297.06      | 269.93      | 156.11     |
| 950          | -           | 310.05      | 175.86     | 4500         | 293.60      | 268.49      | 155.38     |
| 1000         | -           | 307.27      | 174.53     | 5000         | 290.81      | 267.31      | 154.79     |
| 1100         | -           | 302.70      | 172.37     | 5500         | 288.04      | 266.14      | 154.20     |
| 1200         | -           | 298.96      | 170.44     | 6000         | 285.30      | 264.97      | 153.62     |
| 1300         | -           | 295.71      | 168.87     | 6500         | 282.58      | 263.81      | 153.03     |
| 1400         | 353.65      | 293.06      | 167.55     | 7000         | 279.89      | 262.66      | 152.45     |
| 1600         | 342.76      | 288.60      | 165.26     | 7500         | 277.23      | 261.51      | 151.87     |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-IV  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-V  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

**R-27 Semi-Detached Residence**

**Class R-27 Typical Photographs**



**CLASS R-27: SEMI- DETACHED RESIDENCE**

**FAIR QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| <p>1. ROOF – Wood frame, medium pitch, sheathing with fair quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry or stone, perimeter wall or wood piers.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, fair quality wood or composition sheathing, fair quality shingles, siding or equivalent.<br/>Interior Finish – Fair quality drywall or wallboard on walls, partitions and ceilings.<br/>Minimum number of closets and kitchen cabinets.</p> <p>5. FLOORS – Frame, wood joists, subfloor with fair quality wood finish or equivalent (i.e. – concrete slab on grade with fair quality finish).</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three – fixture bath.</p> <p>8. LIGHTING – Fair quality fixtures and minimum number of outlets.</p> <p>9. BUILT-INS / APPLIANCES – Fair quality range and oven.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 200          | 75.36       | 39.74       | 22.26      | 800          | 45.54       | 28.78       | 16.12      |
| 300          | 62.10       | 34.86       | 19.53      | 900          | 44.41       | 28.38       | 15.88      |
| 400          | 55.46       | 32.43       | 18.18      | 1000         | 43.55       | 28.07       | 15.69      |
| 500          | 51.50       | 30.99       | 17.35      | 1200         | 42.20       | 27.58       | 15.45      |
| 600          | 48.83       | 30.00       | 16.80      | 1500         | 40.88       | 27.09       | 15.17      |
| 700          | 46.96       | 29.33       | 16.40      |              |             |             |            |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-28 Typical Photographs*

*R-28 Semi-Detached Residence*



**CLASS R-28: SEMI - DETACHED RESIDENCE**

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| <p>1. ROOF – Wood frame, medium pitch, wood sheathing, average quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, average quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Adequate number of closets and kitchen cabinets.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with average quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One and one half bath, one three fixture bath, and one two fixture bath, kitchen sink, water heater, laundry-tub and one rough-in.</p> <p>8. LIGHTING – Adequate number of average quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – One average quality range and oven.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 200          | -           | 56.75       | 31.78      | 900          | 63.45       | 40.54       | 22.69      |
| 300          | 88.69       | 49.81       | 27.88      | 1000         | 62.19       | 40.08       | 22.42      |
| 400          | 79.23       | 46.34       | 25.95      | 1200         | 60.28       | 39.40       | 22.05      |
| 500          | 73.55       | 44.25       | 24.78      | 1500         | 58.38       | 38.69       | 21.68      |
| 600          | 69.77       | 42.87       | 23.98      | 2000         | 56.51       | 38.02       | 21.28      |
| 700          | 67.07       | 41.89       | 23.43      | 2500         | 55.37       | 37.59       | 21.04      |
| 800          | 65.04       | 41.12       | 23.03      |              |             |             |            |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-29 Typical Photographs*

**R-29 Semi-Detached Residence**



**CLASS R-29: SEMI - DETACHED RESIDENCE**

**ABOVE AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| <p>1. ROOF – Wood frame, medium pitch, wood sheathing, above average quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, above average quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Adequate number of closets and kitchen cabinets.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with above average quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One and one half bath, one three fixture bath, and one two fixture bath, kitchen sink, water heater, laundry tub and one rough-in.</p> <p>8. LIGHTING – Adequate number of above average quality fixtures and minimum number of outlets.</p> <p>9. BUILT-INS / APPLIANCES – Above average quality range and oven.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 200          | -           | 76.62       | 42.90      | 900          | 85.65       | 54.73       | 30.65      |
| 300          | -           | 67.25       | 37.65      | 1000         | 83.96       | 54.11       | 30.28      |
| 400          | -           | 62.56       | 35.04      | 1200         | 81.38       | 53.19       | 29.76      |
| 500          | 99.29       | 59.73       | 33.44      | 1500         | 78.80       | 52.24       | 29.27      |
| 600          | 94.19       | 57.89       | 32.37      | 2000         | 76.28       | 51.32       | 28.74      |
| 700          | 90.53       | 56.54       | 31.63      | 2500         | 74.75       | 50.73       | 28.41      |
| 800          | 87.80       | 55.52       | 31.11      |              |             |             |            |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-30 Typical Photographs*

**R-30 Semi-Detached Residence**



**CLASS R-30: SEMI - DETACHED RESIDENCE**

**GOOD QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |  |
|--|--|
| <p>1. ROOF – Wood frame, medium pitch, wood sheathing, good quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, good quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Soft wood doors and trims. Adequate number of closets and kitchen cabinets.</p> <p>5. FLOORS – Frame, wood joists, more than adequate for span and load. Subfloor with good quality finished flooring of hardwood, softwood, carpet, vinyl or tile.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three fixture bath, and one two fixture bath, kitchen sink, water heater, laundry tub and one rough- in.</p> <p>8. LIGHTING – Adequate number of good quality fixtures and minimum number of outlets.</p> <p>9. BUILT-INS / APPLIANCES – Good quality range and oven.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|--|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story | Upper Story | Half Story | Sq. Ft. Area | First Story | Upper Story | Half Story |
|--------------|-------------|-------------|------------|--------------|-------------|-------------|------------|
| 200          | -           | 103.44      | 57.92      | 900          | 115.63      | 73.88       | 41.38      |
| 300          | -           | 90.79       | 50.83      | 1000         | 113.35      | 73.05       | 40.88      |
| 400          | -           | 84.45       | 47.30      | 1200         | 109.87      | 71.81       | 40.17      |
| 500          | 134.04      | 80.64       | 45.15      | 1500         | 106.38      | 70.52       | 39.51      |
| 600          | 127.15      | 78.15       | 43.70      | 2000         | 102.98      | 69.28       | 38.81      |
| 700          | 122.22      | 76.33       | 42.70      | 2500         | 100.91      | 68.49       | 38.35      |
| 800          | 118.53      | 74.96       | 42.00      | 3000         | 99.50       | 67.99       | 38.06      |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-33 Typical Photographs*

**R-33 Row / Townhouse Residence**



**CLASS R-33: ROW / TOWNHOUSE RESIDENCE**

**FAIR QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1. ROOF – Wood frame, medium pitch, wood sheathing, fair quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, fair quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Adequate number of closets and kitchen cabinets, fair quality ceramic tile or equivalent wainscoting in bath.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with fair quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three - fixture bath, per dwelling unit.</p> <p>8. LIGHTING – Fair quality fixtures and a minimum number of outlets.</p> <p>9. BUILT-INS / APPLIANCES – Fair quality range and oven.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story \$ | Upper Story \$ | Sq. Ft. Area | First Story \$ | Upper Story \$ |
|--------------|----------------|----------------|--------------|----------------|----------------|
| 300          | 56.66          | 27.24          | 1000         | 40.48          | 22.91          |
| 400          | 50.89          | 25.70          | 1100         | 39.86          | 22.76          |
| 500          | 47.42          | 24.75          | 1200         | 39.34          | 22.60          |
| 600          | 45.11          | 24.14          | 1400         | 38.51          | 22.39          |
| 700          | 43.45          | 23.68          | 1600         | 37.87          | 22.20          |
| 800          | 42.23          | 23.37          | 1800         | 37.40          | 22.08          |
| 900          | 41.24          | 23.12          | 2000         | 37.01          | 21.96          |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-35 Typical Photographs*

**R-35 Row / Townhouse Residence**



**CLASS R-35: ROW / TOWNHOUSE RESIDENCE**

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1. ROOF – Wood frame, medium pitch, wood sheathing, average quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, average quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Adequate number of closets and kitchen cabinets, average quality ceramic tile or equivalent wainscoting in bath.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with average quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three - fixture bath, per dwelling unit</p> <p>8. LIGHTING – Adequate number of average quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – One average quality range and oven per dwelling unit.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story \$ | Upper Story \$ | Sq. Ft. Area | First Story \$ | Upper Story \$ |
|--------------|----------------|----------------|--------------|----------------|----------------|
| 300          | 80.95          | 38.91          | 1200         | 56.20          | 32.28          |
| 400          | 72.69          | 36.70          | 1400         | 55.00          | 31.97          |
| 500          | 67.75          | 35.38          | 1600         | 54.11          | 31.72          |
| 600          | 64.43          | 34.49          | 1800         | 53.44          | 31.54          |
| 700          | 62.10          | 33.84          | 2000         | 52.88          | 31.39          |
| 800          | 60.31          | 33.38          | 2200         | 52.45          | 31.26          |
| 900          | 58.93          | 33.01          | 2400         | 52.05          | 31.17          |
| 1000         | 57.83          | 32.74          | 2600         | 51.75          | 31.08          |
| 1100         | 56.94          | 32.49          |              |                |                |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-37 Typical Photographs*

**R-37 Row / Townhouse Residence**



**CLASS R-37: ROW / TOWNHOUSE RESIDENCE**

**ABOVE AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| <p>1. ROOF – Wood frame, medium pitch, wood sheathing, above average quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, above average quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Adequate number of closets and kitchen cabinets, above average quality ceramic tile or equivalent wainscoting in bath.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with above average quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three - fixture bath, kitchen sink, water heater, and laundry per dwelling unit.</p> <p>8. LIGHTING – More than adequate number of above average quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – One above average quality range and oven per dwelling unit.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story \$ | Upper Story \$ | Sq. Ft. Area | First Story \$ | Upper Story \$ |
|--------------|----------------|----------------|--------------|----------------|----------------|
| 300          | 109.30         | 52.51          | 1400         | 74.26          | 43.15          |
| 400          | 98.12          | 49.54          | 1600         | 73.06          | 42.84          |
| 500          | 91.45          | 47.75          | 1800         | 72.14          | 42.56          |
| 600          | 86.97          | 46.56          | 2000         | 71.40          | 42.38          |
| 700          | 83.84          | 45.70          | 2200         | 70.82          | 42.20          |
| 800          | 81.41          | 45.67          | 2400         | 70.26          | 42.07          |
| 900          | 79.57          | 44.56          | 2600         | 69.87          | 41.95          |
| 1000         | 78.06          | 44.19          | 3000         | 69.19          | 41.77          |
| 1100         | 76.87          | 43.85          | 3400         | 68.64          | 41.64          |
| 1200         | 75.88          | 43.58          |              |                |                |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-39 Typical Photographs*

**R-39 Row / Townhouse Residence**



**CLASS R-39: ROW / TOWNHOUSE RESIDENCE**

**GOOD QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |  |
|--|--|
| <p>1. ROOF – Wood frame, medium to steep pitch, wood sheathing, good quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter walls or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, good quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trims. Adequate number of closets and kitchen cabinets, good quality ceramic tile or equivalent wainscoting in bath.</p> <p>5. FLOORS – Frame, wood joists, adequate for span and load. Subfloor with good quality finished flooring of hardwood, softwood, carpet, vinyl or tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three - fixture bath, kitchen sink, water heater, and laundry-tub per dwelling unit.</p> <p>8. LIGHTING – More than adequate number of good quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – One good quality range and oven per dwelling unit.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|--|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | First Story \$ | Upper Story \$ | Sq. Ft. Area | First Story \$ | Upper Story \$ |
|--------------|----------------|----------------|--------------|----------------|----------------|
| 300          | 147.55         | 70.89          | 1400         | 100.25         | 58.25          |
| 400          | 132.46         | 66.87          | 1600         | 98.63          | 57.83          |
| 500          | 123.46         | 64.47          | 1800         | 97.39          | 57.46          |
| 600          | 117.41         | 62.85          | 2000         | 96.39          | 57.21          |
| 700          | 113.18         | 61.69          | 2200         | 95.60          | 56.96          |
| 800          | 109.91         | 61.65          | 2400         | 94.86          | 56.80          |
| 900          | 107.42         | 60.16          | 2600         | 94.32          | 56.63          |
| 1000         | 105.39         | 59.66          | 3000         | 93.41          | 56.38          |
| 1100         | 103.77         | 59.20          | 3400         | 92.66          | 56.22          |
| 1200         | 102.44         | 58.83          |              |                |                |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-43 Typical Photographs*

***R-43 Two to Four Family Apartments***



**CLASS R-43: TWO TO FOUR FAMILY APARTMENTS**

**FAIR QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1. ROOF – Wood frame, medium pitch, sheathing with fair quality composition shingles.</p> <p>2. FOUNDATION – Masonry or stone, perimeter wall or wood piers.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, fair quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trim.<br/>Adequate number of closets and kitchen cabinets in each apartment.</p> <p>5. FLOORS – Frame, wood joists adequate for span and load. Subfloor with fair quality finished flooring or hardwood, softwood, carpet, linoleum, tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three – fixture bath. per apartment.</p> <p>8. LIGHTING – Fair quality fixtures and minimum number of outlets.</p> <p>9. BUILT-INS / APPLIANCES – Fair quality range and oven per apartment.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | Number of Units | First Story | Upper Story | Sq. Ft. Area | Number of Units | First Story | Upper Story |
|--------------|-----------------|-------------|-------------|--------------|-----------------|-------------|-------------|
| 800          | 2               | 59.98       | 33.72       | 2000         | 2               | 46.86       | 29.67       |
| 800          | 3               | 66.98       | 37.53       | 2000         | 3               | 52.33       | 33.14       |
| 800          | 4               | 72.26       | 40.54       | 2000         | 4               | 56.57       | 35.81       |
| 1000         | 2               | 55.59       | 32.37       | 2500         | 2               | 45.11       | 29.14       |
| 1000         | 3               | 62.10       | 36.05       | 2500         | 3               | 50.36       | 32.58       |
| 1000         | 4               | 67.04       | 38.94       | 2500         | 4               | 54.45       | 35.16       |
| 1200         | 2               | 52.70       | 31.48       | 3000         | 2               | 43.98       | 28.78       |
| 1200         | 3               | 58.84       | 34.52       | 3000         | 3               | 49.04       | 32.18       |
| 1200         | 4               | 63.54       | 37.90       | 3000         | 4               | 53.07       | 34.73       |
| 1400         | 2               | 50.61       | 30.83       | 3500         | 2               | 43.12       | 28.50       |
| 1400         | 3               | 56.51       | 34.40       | 3500         | 3               | 48.12       | 31.91       |
| 1400         | 4               | 61.05       | 37.16       | 3500         | 4               | 52.05       | 34.43       |
| 1600         | 2               | 49.04       | 30.34       | 4000         | 2               | 42.50       | 28.31       |
| 1600         | 3               | 54.79       | 33.87       | 4000         | 3               | 47.45       | 31.69       |
| 1600         | 4               | 59.18       | 36.58       | 4000         | 4               | 51.22       | 34.21       |
| 1800         | 2               | 47.85       | 29.97       | 4500         | 2               | 42.01       | 28.19       |
| 1800         | 3               | 53.40       | 33.44       | 4500         | 3               | 46.89       | 31.54       |
| 1800         | 4               | 57.73       | 36.15       | 4500         | 4               | 50.64       | 34.06       |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-45 Typical Photographs*

*R-45 Two to Four Family Apartments*



**CLASS R-45: TWO TO FOUR FAMILY APARTMENTS**

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |  |
|--|--|
| <p>1. ROOF – Wood frame, medium pitch, sheathing with average quality shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter wall or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, average quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Drywall or plaster on walls, partitions and ceilings. Softwood doors and trim.<br/>Adequate number of closets and kitchen cabinets in each apartment.</p> <p>5. FLOORS – Frame, wood joists adequate for span and load. Subfloor with average quality finished flooring or hardwood, softwood, carpet, linoleum, tile, etc.</p> <p>6. HEATING – None</p> | <p>7. PLUMBING – One three – fixture bath. kitchen sink, water heater and laundry facilities per apartment.</p> <p>8. LIGHTING – Adequate number of average quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – One average quality range and oven per apartment.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|--|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | Number of Units | First Story | Upper Story | Sq. Ft. Area | Number of Units | First Story | Upper Story |
|--------------|-----------------|-------------|-------------|--------------|-----------------|-------------|-------------|
| 800          | 2               | 85.65       | 48.18       | 2500         | 2               | 64.46       | 41.61       |
| 800          | 3               | 95.69       | 53.59       | 2500         | 3               | 71.95       | 46.53       |
| 800          | 4               | 103.25      | 57.89       | 2500         | 4               | 77.79       | 50.24       |
| 1000         | 2               | 79.42       | 46.25       | 3000         | 2               | 62.80       | 41.12       |
| 1000         | 3               | 88.72       | 51.50       | 3000         | 3               | 70.08       | 45.97       |
| 1000         | 4               | 95.75       | 55.65       | 3000         | 4               | 75.79       | 49.63       |
| 1200         | 2               | 75.27       | 44.96       | 3500         | 2               | 61.60       | 40.72       |
| 1200         | 3               | 84.05       | 50.12       | 3500         | 3               | 68.76       | 45.57       |
| 1200         | 4               | 90.78       | 54.14       | 3500         | 4               | 74.38       | 49.20       |
| 1400         | 2               | 72.29       | 44.04       | 4000         | 2               | 60.71       | 40.45       |
| 1400         | 3               | 80.74       | 49.14       | 4000         | 3               | 67.78       | 45.27       |
| 1400         | 4               | 87.22       | 53.07       | 4000         | 4               | 73.18       | 48.89       |
| 1600         | 2               | 70.05       | 43.36       | 4500         | 2               | 60.01       | 40.26       |
| 1600         | 3               | 78.25       | 48.40       | 4500         | 3               | 66.98       | 45.05       |
| 1600         | 4               | 84.54       | 52.27       | 4500         | 4               | 72.35       | 48.64       |
| 1800         | 2               | 68.33       | 42.81       | 5000         | 2               | 59.49       | 40.08       |
| 1800         | 3               | 76.28       | 47.78       | 5000         | 3               | 66.36       | 44.87       |
| 1800         | 4               | 82.46       | 51.65       | 5000         | 4               | 71.68       | 48.43       |
| 2000         | 2               | 66.95       | 42.38       | 6000         | 2               | 58.66       | 39.83       |
| 2000         | 3               | 74.75       | 47.35       | 6000         | 3               | 65.44       | 44.59       |
| 2000         | 4               | 80.80       | 51.13       | 6000         | 4               | 70.69       | 48.12       |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*R-47 Two to Four Family Apartments*

*Class R-47 Typical Photographs*



**CLASS R-47: TWO TO FOUR FAMILY APARTMENTS**

**ABOVE AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. ROOF – Wood frame, medium pitch, sheathing with above average quality shingles or equivalent (I.e. -low grade slate, etc. )</li> <li>2. FOUNDATION – Masonry perimeter wall or equivalent.</li> <li>3. BASEMENT – None</li> <li>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, above average quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish –Above average quality drywall or plaster on walls, partitions and ceilings. Hardwood doors and trim. More than adequate number of closets and kitchen cabinets. Above average quality ceramic tile or equivalent wainscoting in bath.</li> <li>5. FLOORS – Frame, wood joists more adequate for span and load. Subfloor with above average quality finished flooring or hardwood, softwood, carpet, tile or equivalent.</li> <li>6. HEATING – None</li> </ol> | <ol style="list-style-type: none"> <li>7. PLUMBING – One three – fixture bath, kitchen sink, water heater and laundry facilities per apartment.</li> <li>8. LIGHTING – More than adequate number of above average quality fixtures and outlets.</li> <li>9. BUILT-INS / APPLIANCES – One above average quality range and oven per apartment.</li> <li>10. FIREPLACE – None</li> <li>11. ATTIC - Unfinished</li> <li>12. PORCHES AND DECKS – None</li> <li>13. GARAGES – None</li> <li>14. OTHER ITEMS – None</li> </ol> |
|--|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | Number of Units | First Story | Upper Story | Sq. Ft. Area | Number of Units | First Story | Upper Story |
|--------------|-----------------|-------------|-------------|--------------|-----------------|-------------|-------------|
| 800          | 2               | 115.62      | 65.04       | 3000         | 2               | 84.79       | 55.52       |
| 800          | 3               | 129.20      | 72.35       | 3000         | 3               | 94.62       | 62.06       |
| 800          | 4               | 139.39      | 78.16       | 3000         | 4               | 102.33      | 67.01       |
| 1000         | 2               | 107.21      | 62.43       | 3500         | 2               | 83.16       | 54.97       |
| 1000         | 3               | 119.77      | 69.53       | 3500         | 3               | 92.84       | 61.51       |
| 1000         | 4               | 129.26      | 75.12       | 3500         | 4               | 100.42      | 66.43       |
| 1200         | 2               | 101.62      | 60.68       | 4000         | 2               | 81.96       | 54.60       |
| 1200         | 3               | 113.47      | 67.65       | 4000         | 3               | 91.49       | 61.11       |
| 1200         | 4               | 122.56      | 73.09       | 4000         | 4               | 98.79       | 66.00       |
| 1400         | 2               | 97.60       | 59.45       | 4500         | 2               | 81.01       | 54.36       |
| 1400         | 3               | 108.99      | 66.33       | 4500         | 3               | 90.41       | 60.81       |
| 1400         | 4               | 117.74      | 71.65       | 4500         | 4               | 97.69       | 65.66       |
| 1600         | 2               | 94.56       | 58.53       | 5000         | 2               | 80.31       | 54.11       |
| 1600         | 3               | 105.64      | 65.35       | 5000         | 3               | 89.58       | 60.56       |
| 1600         | 4               | 114.15      | 70.57       | 5000         | 4               | 96.77       | 65.38       |
| 1800         | 2               | 92.25       | 57.80       | 6000         | 2               | 79.20       | 53.77       |
| 1800         | 3               | 102.97      | 64.49       | 6000         | 3               | 88.35       | 60.19       |
| 1800         | 4               | 111.32      | 69.74       | 6000         | 4               | 95.45       | 64.95       |
| 2000         | 2               | 90.38       | 57.21       | 7000         | 2               | 78.37       | 53.50       |
| 2000         | 3               | 100.91      | 63.94       | 7000         | 3               | 87.46       | 59.85       |
| 2000         | 4               | 109.08      | 69.04       | 7000         | 4               | 94.49       | 64.58       |
| 2500         | 2               | 87.03       | 56.17       | 8000         | 2               | 77.79       | 53.28       |
| 2500         | 3               | 97.14       | 62.80       | 8000         | 3               | 86.76       | 59.67       |
| 2500         | 4               | 105.03      | 67.84       | 8000         | 4               | 93.76       | 64.52       |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section Cost Adjustment Factors: Brick 1.15, Stone 1.30  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

*Class R-49 Typical Photographs*

*R-49 Two to Four Family Apartments*



**CLASS R-49: TWO TO FOUR FAMILY APARTMENTS**

**GOOD QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| <p>1. ROOF – Wood frame, medium to steep pitch, wood sheathing, good quality composition shingles or equivalent.</p> <p>2. FOUNDATION – Masonry perimeter wall or equivalent.</p> <p>3. BASEMENT – None</p> <p>4. STRUCTURE –<br/>Exterior Walls – Wood frame, wood or composition sheathing, good quality shingles, aluminum siding or equivalent with gutters and downspouts.<br/>Interior Finish – Good quality drywall or plaster on walls, partitions and ceilings. Hardwood doors and trim.<br/>More than adequate number of closets and kitchen cabinets. Good quality ceramic tile or equivalent wainscoting in bath.</p> <p>5. FLOORS – Frame, wood joists more adequate for span and load. Subfloor with good quality finished flooring or hardwood, softwood, carpet, tile or equivalent.</p> <p>6. HEATING - None</p> | <p>7. PLUMBING – One three – fixture bath, kitchen sink, water heater and laundry facilities per apartment.</p> <p>8. LIGHTING – More than adequate number of good quality fixtures and outlets.</p> <p>9. BUILT-INS / APPLIANCES – One good quality range and oven per apartment.</p> <p>10. FIREPLACE – None</p> <p>11. ATTIC - Unfinished</p> <p>12. PORCHES AND DECKS – None</p> <p>13. GARAGES – None</p> <p>14. OTHER ITEMS – None</p> |
|---|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft. Area | Number of Units | First Story | Upper Story | Sq. Ft. Area | Number of Units | First Story | Upper Story |
|--------------|-----------------|-------------|-------------|--------------|-----------------|-------------|-------------|
| 800          | 2               | 141.06      | 79.35       | 3000         | 2               | 103.44      | 67.74       |
| 800          | 3               | 157.62      | 88.27       | 3000         | 3               | 115.43      | 75.72       |
| 800          | 4               | 170.06      | 95.35       | 3000         | 4               | 124.84      | 81.75       |
| 1000         | 2               | 130.79      | 76.17       | 3500         | 2               | 101.46      | 67.06       |
| 1000         | 3               | 146.12      | 84.82       | 3500         | 3               | 113.26      | 75.04       |
| 1000         | 4               | 157.70      | 91.64       | 3500         | 4               | 122.51      | 81.04       |
| 1200         | 2               | 123.98      | 74.03       | 4000         | 2               | 100.00      | 66.61       |
| 1200         | 3               | 138.44      | 82.54       | 4000         | 3               | 111.61      | 74.56       |
| 1200         | 4               | 149.53      | 89.17       | 4000         | 4               | 120.53      | 80.51       |
| 1400         | 2               | 119.07      | 72.53       | 4500         | 2               | 98.84       | 66.32       |
| 1400         | 3               | 132.97      | 80.93       | 4500         | 3               | 110.30      | 74.18       |
| 1400         | 4               | 143.65      | 87.41       | 4500         | 4               | 119.18      | 80.10       |
| 1600         | 2               | 115.36      | 71.41       | 5000         | 2               | 97.97       | 66.02       |
| 1600         | 3               | 128.88      | 79.73       | 5000         | 3               | 109.29      | 73.88       |
| 1600         | 4               | 139.26      | 86.10       | 5000         | 4               | 118.06      | 79.77       |
| 1800         | 2               | 112.55      | 70.51       | 6000         | 2               | 96.63       | 65.60       |
| 1800         | 3               | 125.62      | 78.68       | 6000         | 3               | 107.79      | 73.43       |
| 1800         | 4               | 135.81      | 85.09       | 6000         | 4               | 116.44      | 79.24       |
| 2000         | 2               | 110.26      | 69.80       | 7000         | 2               | 95.61       | 65.27       |
| 2000         | 3               | 123.11      | 78.00       | 7000         | 3               | 106.70      | 73.02       |
| 2000         | 4               | 133.08      | 84.22       | 7000         | 4               | 115.28      | 78.79       |
| 2500         | 2               | 106.18      | 68.53       | 8000         | 2               | 94.90       | 65.00       |
| 2500         | 3               | 118.51      | 76.62       | 8000         | 3               | 105.84      | 72.80       |
| 2500         | 4               | 128.13      | 82.76       | 8000         | 4               | 114.38      | 78.72       |

NOTE: Depreciation Schedules for Frame Wall Types – Section 150 Table D-III  
 Depreciation Schedules for Masonry Wall Types – Section 150 Table D-IV  
 For Cost Conversion Factors – See "R" Series Section 157  
 Adjustments to base specifications – Section 142  
 Cost Adjustment Factors: Brick 1.15, Stone 1.30

## **142. Residential Adjustments to Base Costs**

This section contains the Residential R-Series Adjustments to Base Cost. As with the Base Costs these adjustments are as of October 2001 and a Cost Conversion Factor must be applied for any other Base Year.

Residential class factors may be applied to all classes of structures in the residential section and to the average grade costs in the residential adjustments section. The factors which apply are clearly indicated under each heading of the Adjustments Section and are repeated in tabular form here for comparison purposes and identification.

| PROPERTY CLASS     | Class R-12 | Class R-13 | Class R-14 | Class R-15 | Class R-16 | Class R-17 | Class R-18 | Class R-19 | Class R-20 | Class R-21 | Class R-22 | Class R-23 |
|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|                    |            |            |            | Class 27   | Class 28   | Class 29   | Class 30   |            |            |            |            |            |
|                    |            |            |            | Class 33   | Class 35   | Class 37   | Class 39   |            |            |            |            |            |
|                    |            |            |            | Class 43   | Class 45   | Class 47   | Class 49   |            |            |            |            |            |
| PRINCIPAL BUILDING | 0.51       | 0.70       | 0.84       | 0.91       | 1.00       | 1.14       | 1.35       | 1.62       | 1.90       | 2.08       | 2.28       | 2.51       |
| ROOF               | 0.51       | 0.70       | 0.84       | 0.91       | 1.00       | 1.14       | 1.35       | 1.62       | 1.90       | 2.08       | 2.28       | 2.51       |
| FOUNDATION         | 0.51       | 0.70       | 0.84       | 0.91       | 1.00       | 1.14       | 1.35       | 1.62       | 1.90       | 2.08       | 2.28       | 2.51       |
| BASEMENT           | 0.76       | 0.85       | 0.93       | 0.97       | 1.00       | 1.15       | 1.32       | 1.44       | 1.54       | 1.68       | 1.85       | 2.04       |
| BASEMENT FINISH    | 0.55       | 0.70       | 0.85       | 0.92       | 1.00       | 1.15       | 1.30       | 1.30       | 1.30       | 1.42       | 1.56       | 1.72       |
| UNFINISHED AREAS   | 0.48       | 0.67       | 0.82       | 0.91       | 1.00       | 1.14       | 1.35       | 1.62       | 1.90       | 2.08       | 2.28       | 2.51       |
| FULL BRICK         | 1.15       | 1.15       | 1.15       | 1.15       | 1.15       | 1.15       | 1.15       | 1.15       | 1.15       | 1.21       | 1.27       | 1.33       |
| FULL STONE         | 1.30       | 1.30       | 1.30       | 1.30       | 1.30       | 1.30       | 1.30       | 1.30       | 1.30       | 1.37       | 1.43       | 1.50       |
| FLOORS SLAB        | 0.82       | 0.82       | 0.82       | 0.91       | 1.00       | 1.14       | 1.35       | 1.62       | 1.95       | 2.13       | 2.34       | 2.58       |
| HEATING/COOLING    | 0.69       | 0.82       | 0.95       | 1.00       | 1.00       | 1.12       | 1.15       | 1.30       | 1.49       | 1.63       | 1.79       | 1.97       |
| PLUMBING           | 0.69       | 0.82       | 0.95       | 1.00       | 1.00       | 1.12       | 1.15       | 1.30       | 1.49       | 1.63       | 1.79       | 1.97       |
| B.I. APPLIANCES    | 0.67       | 0.67       | 0.67       | 1.00       | 1.00       | 1.00       | 1.25       | 1.31       | 1.37       | 1.50       | 1.65       | 1.81       |
| FIREPLACES         | 0.90       | 0.90       | 0.95       | 0.95       | 1.00       | 1.15       | 1.30       | 1.45       | 1.60       | 1.75       | 1.92       | 2.12       |
| ATTIC FINISH       | 0.70       | 0.88       | 0.93       | 0.97       | 1.00       | 1.15       | 1.30       | 1.30       | 1.34       | 1.46       | 1.61       | 1.77       |
| PORCHES / DECKS    | 0.55       | 0.70       | 0.85       | 0.92       | 1.00       | 1.15       | 1.30       | 1.30       | 1.30       | 1.42       | 1.56       | 1.72       |
| SOLARIUMS          | -          | -          | -          | -          | 1.00       | 1.15       | 1.22       | 1.30       | 1.36       | 1.49       | 1.63       | 1.80       |
| ADDITIONAL KITCHEN | -          | -          | -          | -          | 1.00       | 1.12       | 1.25       | 1.31       | 1.37       | 1.50       | 1.65       | 1.81       |
| GARAGES            | 0.52       | 0.66       | 0.85       | 0.93       | 1.00       | 1.13       | 1.24       | 1.39       | 1.58       | 1.73       | 1.90       | 2.09       |
| CARPORTS/CANOPIES  | 0.59       | 0.78       | 0.92       | 0.96       | 1.00       | 1.06       | 1.10       | 1.13       | 1.19       | 1.30       | 1.43       | 1.57       |
| SHEDS              | 0.56       | 0.78       | 0.78       | 0.89       | 1.00       | 1.20       | 1.20       | 1.45       | 1.45       | 1.58       | 1.74       | 1.92       |
| SHED FINISH        | 1.00       | 1.00       | 1.00       | 1.00       | 1.00       | 1.20       | 1.20       | 1.45       | 1.45       | 1.58       | 1.74       | 1.92       |
| SWIMMING POOLS     | 0.56       | 0.78       | 0.78       | 0.89       | 1.00       | 1.20       | 1.20       | 1.45       | 1.30       | 1.42       | 1.56       | 1.72       |
| BULKHEADS / DOCKS  | 0.51       | 0.70       | 0.84       | 0.91       | 1.00       | 1.14       | 1.35       | 1.62       | 1.90       | 2.08       | 2.28       | 2.51       |
| PAVING             | 0.70       | 0.70       | 0.85       | 1.00       | 1.00       | 1.00       | 1.15       | 1.30       | 1.00       | 1.09       | 1.20       | 1.32       |
| SPECIAL EQUIPMENT  | -          | -          | -          | -          | -          | 1.00       | 1.00       | 1.00       | 1.12       | 1.15       | 1.27       | 1.39       |

Since the unit cost of all residential classes are based on frame construction, to adjust for full brick or full stone, the factors for brick or stone must be applied to the base cost of the class structure.

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**RESIDENTIAL BUILDINGS  
ADJUSTMENTS TO BASE COSTS**

1. ROOF - Included in base specifications - no adjustments necessary.
  
2. FOUNDATION - Included in base specifications - no adjustments necessary.
  
3. BASEMENT - Base cost per square foot floor area.

| Square Foot Area | 3.01 Basement | 3.02 Basement Finish |
|------------------|---------------|----------------------|
| 200              | \$20.17       | \$19.53              |
| 300              | \$16.62       | \$17.50              |
| 400              | \$14.86       | \$16.50              |
| 500              | \$13.80       | \$15.89              |
| 600              | \$13.10       | \$15.50              |
| 700              | \$12.59       | \$15.19              |
| 800              | \$12.22       | \$14.98              |
| 900              | \$11.92       | \$14.80              |
| 1000             | \$11.68       | \$14.68              |
| 1200             | \$11.31       | \$14.47              |
| 1400             | \$11.07       | \$14.35              |
| 1600             | \$10.89       | \$14.22              |
| 1800             | \$10.74       | \$14.13              |
| 2000             | \$10.61       | \$14.07              |
| 2500 & over      | \$10.40       | \$13.95              |

NOTE: Basement base cost average grade - multiply by class factor for adjustment.

NOTE: Basement finish base cost average grade - multiply by class factor for adjustment.

| CLASS FACTORS* |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Unfin          | 0.76 | 0.85 | 0.93 | 0.97 | 1.00 | 1.15 | 1.32 | 1.44 | 1.54 | 1.68 | 1.85 | 2.04 |
| Fin            | 0.55 | 0.70 | 0.85 | 0.92 | 1.00 | 1.15 | 1.30 | 1.30 | 1.30 | 1.42 | 1.56 | 1.72 |

\* For building classes R-27 thru R-49, See Residential Specification pages

4. STRUCTURE

Unfinished Area - Base cost (deduct) per square foot floor area unfinished.

4.01 Unfinished Area

4.02 Unfinished Area (Based on square foot floor area below unfinished section)

| Square Foot Area | 4.01 Full Story | 4.02 Half Story |
|------------------|-----------------|-----------------|
| 200              | 11.10           | 7.40            |
| 300              | 9.10            | 6.07            |
| 400              | 8.10            | 5.40            |
| 500              | 7.50            | 5.00            |
| 600              | 7.10            | 4.73            |
| 700              | 6.81            | 4.54            |
| 800              | 6.60            | 4.40            |
| 900              | 6.43            | 4.29            |
| 1000             | 6.30            | 4.20            |
| 1200             | 6.10            | 4.07            |
| 1400             | 5.95            | 3.97            |
| 1600             | 5.85            | 3.90            |
| 2000             | 5.70            | 3.80            |
| 2500             | 5.58            | 3.72            |
| 3500 & over      | 5.44            | 3.63            |

Unfinished Areas - Base cost average grade - multiply by class factor for adjustment.

| CLASS FACTOR* |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class         | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor        | 0.48 | 0.67 | 0.82 | 0.91 | 1    | 1.14 | 1.35 | 1.62 | 1.9  | 2.08 | 2.28 | 2.51 |

4.03 Partial Brick      &      4.04 Partial Stone      Base cost per square foot wall area.

| Square Foot Area |       | Class |       |       |       |       |       |       |       |       |       |       |       |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                  |       | R-12  | R-13  | R-14  | R-15  | R-16  | R-17  | R-18  | R-19  | R-20  | R-21  | R-22  | R-23  |
| 100              | Brick | 7.43  | 8.29  | 9.15  | 10.01 | 10.87 | 11.73 | 12.59 | 13.45 | 14.31 | 15.17 | 16.03 | 17.15 |
|                  | Stone | 13.34 | 14.86 | 16.38 | 17.90 | 19.42 | 20.94 | 22.46 | 23.98 | 25.50 | 27.02 | 28.54 | 30.06 |
| 200              | Brick | 7.28  | 8.14  | 9.00  | 9.86  | 10.72 | 11.58 | 12.44 | 13.30 | 14.16 | 15.02 | 15.88 | 16.81 |
|                  | Stone | 13.19 | 14.71 | 16.23 | 17.75 | 19.27 | 20.79 | 22.31 | 23.83 | 25.35 | 26.87 | 28.39 | 29.91 |
| 400              | Brick | 7.13  | 7.98  | 8.83  | 9.68  | 10.53 | 11.38 | 12.23 | 13.08 | 13.93 | 14.78 | 15.63 | 16.48 |
|                  | Stone | 13.04 | 14.56 | 16.08 | 17.60 | 19.12 | 20.64 | 22.16 | 23.68 | 25.20 | 26.72 | 28.24 | 29.76 |
| 600              | Brick | 7.06  | 7.91  | 8.76  | 9.61  | 10.46 | 11.31 | 12.16 | 13.01 | 13.86 | 14.71 | 15.56 | 16.41 |
|                  | Stone | 12.96 | 14.48 | 16.00 | 17.52 | 19.04 | 20.56 | 22.08 | 23.60 | 25.12 | 26.64 | 28.16 | 29.68 |
| 800 & over       | Brick | 6.99  | 7.84  | 8.69  | 9.54  | 10.39 | 11.24 | 12.09 | 12.94 | 13.79 | 14.64 | 15.49 | 16.34 |
|                  | Stone | 12.89 | 14.41 | 15.93 | 17.45 | 18.97 | 20.49 | 22.01 | 23.53 | 25.05 | 26.57 | 28.09 | 29.61 |

\* Factors for building classes R-27 thru R-49, See Residential Specification Pages.

#### 4.05 CATHEDRAL CEILINGS

Factor to be applied to total finished square foot area base cost per level.  
Typically, dwellings that are classified R-12 to R-15 will not contain a cathedral ceiling.

| Square Foot Area of Cathedral Ceiling | Class        |              |
|---------------------------------------|--------------|--------------|
|                                       | R-16 to R-19 | R-19 to R-23 |
| 0-150 Square Feet                     | 0.99         | 0.99         |
| 151 - 300 Square Feet                 | 0.97         | 0.98         |
| 301 + Square Feet                     | 0.94         | 0.96         |

5. FLOOR

5.01 Concrete Slab Floor -

Base cost per square foot area - deduct following costs.

|                      | <u>Square Foot Area</u> |        |        |        |        |        |        |        |  |
|----------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--|
|                      | 400                     | 500    | 600    | 700    | 800    | 1200   | 1800   |        |  |
|                      |                         |        |        |        |        |        |        | & over |  |
| Cost per square foot | \$3.82                  | \$3.28 | \$2.91 | \$2.67 | \$2.49 | \$2.03 | \$1.73 |        |  |

Concrete Slab Floors Factors - Multiply by class factor for adjustment.

| CLASS FACTORS* |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor         | 0.82 | 0.82 | 0.82 | 0.91 | 1    | 1.14 | 1.35 | 1.62 | 1.95 | 2.13 | 2.34 | 2.58 |

\* Factors for building classes R-27 thru R-49, see Residential Specification pages

6. HEATING AND COOLING - Base cost per square foot floor area.

| <u>Type</u>  | <u>Square Foot Heated/Cooled</u> |      |      |      |      |      |      |      |
|--|----------------------------------|------|------|------|------|------|------|------|
|  | 400                              | 600  | 800  | 1000 | 1200 | 1600 | 2000 | 2400 |
| <u>6.01</u> Floor or wall furnace                                  | 3.43                             | 2.85 | 2.58 | 2.40 | 2.27 | 2.15 | 2.06 | 2.00 |
| <u>6.02</u> Gravity hot air  | 3.43                             | 2.86 | 2.58 | 2.40 | 2.27 | 2.15 | 2.06 | 2.00 |
| <u>6.03</u> Forced hot air   | 4.70                             | 3.94 | 3.58 | 3.34 | 3.18 | 3.00 | 2.88 | 2.82 |
| <u>6.04</u> Hot water baseboard                                    | 6.25                             | 5.28 | 4.76 | 4.55 | 4.25 | 4.00 | 3.85 | 3.76 |
| <u>6.05</u> Hot water or steam                                     | 7.58                             | 6.31 | 5.70 | 5.31 | 5.06 | 4.73 | 4.55 | 4.43 |
| <u>6.06</u> Electric baseboard                                     | 3.43                             | 2.85 | 2.58 | 2.40 | 2.27 | 2.15 | 2.06 | 2.00 |
| <u>6.07</u> Radiant electric                                       | 3.43                             | 2.85 | 2.58 | 2.40 | 2.27 | 2.15 | 2.06 | 2.00 |
| <u>6.08</u> Heat pump  | 10.83                            | 8.31 | 7.04 | 6.28 | 5.76 | 5.16 | 4.76 | 4.52 |
| <u>6.09</u> Central cooling system<br>(Added to heating duct work) | 6.22                             | 4.46 | 3.58 | 3.03 | 2.67 | 2.24 | 1.97 | 1.79 |
| <u>6.10</u> Central cooling system<br>(with own duct work)         | 7.28                             | 5.55 | 4.55 | 3.94 | 3.55 | 3.03 | 2.73 | 2.52 |

Heating/Cooling - Base cost - Average grade - Multiply by class factor for adjustment

| CLASS FACTORS* |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor         | 0.69 | 0.82 | 0.95 | 1.00 | 1.00 | 1.12 | 1.15 | 1.30 | 1.49 | 1.63 | 1.79 | 1.97 |

\* Factors for building classes R-27 thru R-49, see Residential Specification pages

7. PLUMBING - Base cost per fixture - and to or deduct from base specifications.

| Type   | Cost    | Type                       | Cost     |
|--|---------|----------------------------|----------|
| <u>7.01</u> 4 Fixture bath                           | \$3,185 | <u>7.11</u> Kitchen sink   | \$805    |
| <u>7.02</u> 3 Fixture bath                           | \$2,595 | <u>7.12</u> Laundry tub    | \$635    |
| <u>7.03</u> 2 Fixture bath                           | \$1,895 | <u>7.13</u> Water heater   | \$750    |
| <u>7.04</u> Bathtub                                  | \$1,110 | <u>7.14</u> Rough-in       | \$380    |
| <u>7.05</u> Shower over tub                          | \$235   | <u>7.15</u> Floor drain    | \$370    |
| <u>7.06</u> One piece fiberglass tub                 | \$1,315 | <u>7.16</u> Sump pump      | \$420    |
| <u>7.07</u> Whirlpool bath                           | \$3,295 | <u>7.17</u> Hot tubs       |          |
| <u>7.08</u> Stall shower with glass doors, tile base | \$1,245 | Wood 6' diameter           | \$4,890  |
| <u>7.09</u> Bidet                                    | \$1,180 | Fiberglass 8' diameter     | \$6,600  |
| <u>7.10</u> Single fixture                           | \$910   | <u>7.18</u> Sauna - small  | \$7,035  |
|  |         | <u>7.19</u> Sauna - medium | \$10,560 |
|  |         | <u>7.20</u> Sauna - large  | \$19,070 |

Plumbing base cost - average grade - multiply by class factor for adjustment.

| CLASS FACTORS* |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor         | 0.69 | 0.82 | 0.95 | 1.00 | 1.00 | 1.12 | 1.15 | 1.30 | 1.49 | 1.63 | 1.79 | 1.97 |

\*Factors for building classes R-27 thru R-49, see Residential Specification pages

8. ELECTRICAL - Included in base specifications - no adjustments necessary.

9. BUILT-INS/ APPLIANCES - Base cost per each.

| Type                              | Cost    | Type                                      | Cost    |
|-----------------------------------|---------|---|---------|
| <u>9.01</u> Range top oven        | \$1,700 | <u>9.08</u> Electronic oven               | \$4,790 |
| <u>9.02</u> Drop-in range         | \$1,455 | <u>9.09</u> Food center power unit        | \$365   |
| <u>9.03</u> Dishwasher            | \$1,335 | <u>9.10</u> Free standing range and oven  | \$1,275 |
| <u>9.04</u> Garbage disposal      | \$365   | <u>9.11</u> Extra kitchen unit            | \$3,485 |
| <u>9.05</u> Exhaust hood and fan  | \$365   | <u>9.12</u> Electronic garage door opener | \$460   |
| <u>9.06</u> Intercom system       | \$970   | <u>9.13</u> Security system               | \$1,350 |
| <u>9.07</u> Central vacuum system | \$1,700 |   |         |

Built-ins/Appliances - Base cost is average grade - multiply factor for adjustment to specific grade.

| CLASS FACTORS* |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor         | 0.67 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.25 | 1.31 | 1.37 | 1.50 | 1.65 | 1.81 |

10. FIREPLACES - Base cost per unit

| Type  | Cost    |
|---|---------|
| <u>10.01</u> One-story stack                | \$4,245 |
| <u>10.02</u> One and one-half story stack   | \$4,550 |
| <u>10.03</u> Two story stack                | \$4,850 |
| <u>10.04</u> Second fireplace on same stack | \$1,605 |
| <u>10.05</u> Free standing fireplace        | \$3,505 |
| <u>10.06</u> Heatilator and fan             | \$605   |

Fireplace - Base cost - average grade - multiply by class factor for adjustment.

| CLASS FACTORS* |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor         | 0.90 | 0.90 | 0.95 | 0.95 | 1.00 | 1.15 | 1.30 | 1.45 | 1.60 | 1.75 | 1.92 | 2.12 |

\* Factors for building classes R-27 thru R-49, See Residential Specification pages.

11. EXPANDED ATTIC & DORMERS (See Note)

11.01 Expanded Attic - Base cost per square foot floor area directly below.

|                  |       |       |       |       |       |             |
|------------------|-------|-------|-------|-------|-------|-------------|
| <u>Area</u>      | 200   | 300   | 400   | 500   | 600   | 700         |
| Cost per Sq. Ft. | 14.71 | 12.74 | 11.68 | 11.07 | 10.61 | 10.31       |
| <u>Area</u>      | 800   | 900   | 1000  | 1200  | 1600  | 2000 & over |
| Cost per Sq. Ft. | 10.16 | 10.01 | 9.86  | 9.55  | 9.40  | 9.25        |

Dormers and Expanded Attic - Base cost - average grade, multiply by class factor for adjustment.

11.02 Dormers - Base cost per lineal foot.

| Size                | Up to 8' | 9' to 19' | 20' to 30' | Over 30' |
|---------------------|----------|-----------|------------|----------|
| Cost per Lineal Ft. | \$136    | \$129     | \$123      | \$118    |

NOTE: If Attic or Dormer area is unfinished multiply above cost by 0.50.

| CLASS FACTORS* |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor         | 0.7  | 0.88 | 0.93 | 0.97 | 1    | 1.15 | 1.3  | 1.3  | 1.34 | 1.46 | 1.61 | 1.77 |

\* Factors for building classes R-27 thru R-49, See Residential Specification pages.

12. PORCHES AND DECKS - Base cost per square foot floor area.

| Type                        | Square Foot Area |       |       |       |       |       |            |
|-----------------------------|------------------|-------|-------|-------|-------|-------|------------|
|                             | 20               | 40    | 60    | 80    | 100   | 200   | 500 & over |
| <u>12.01</u> Deck or patio  | 15.01            | 10.01 | 8.49  | 7.58  | 7.13  | 6.22  | 5.61       |
| <u>12.02</u> Open porch     | 32.91            | 21.84 | 18.20 | 16.38 | 15.32 | 13.04 | 11.68      |
| <u>12.03</u> Enclosed porch | 81.13            | 54.14 | 45.04 | 40.49 | 37.91 | 32.45 | 29.27      |

Porches and Deck/Patios - Base cost - average grade multiply by class factor for adjustments.

12.04 Solariums \$140 per Sq. Ft., includes foundation and floor

| CLASS FACTORS* |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor         | 0.55 | 0.70 | 0.85 | 0.92 | 1.00 | 1.15 | 1.30 | 1.30 | 1.30 | 1.42 | 1.56 | 1.72 |

13. GARAGE

Attached Garages and Carports/Canopies - Base cost per square foot floor area.

| Type                                 | Square Foot Area |       |       |       |       |       |              |
|--------------------------------------|------------------|-------|-------|-------|-------|-------|--------------|
|                                      | 200              | 300   | 400   | 500   | 600   | 700   | 800 and over |
| <u>13.01</u> Basement garage         | 12.28            | 9.86  | 8.64  | 7.89  | 7.43  | 6.98  | 6.82         |
| <u>13.02</u> Attached garage         | 26.99            | 23.05 | 20.93 | 19.71 | 18.96 | 18.35 | 17.89        |
| <u>13.03</u> Attached carport-canopy | 7.89             | 6.98  | 6.52  | 6.22  | 6.07  | 5.91  | 5.76         |

| CLASS FACTORS--GARAGES* |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class                   | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor                  | 0.52 | 0.66 | 0.85 | 0.93 | 1.00 | 1.13 | 1.24 | 1.39 | 1.58 | 1.73 | 1.90 | 2.09 |

Garages - Base cost are average grade - multiply by class factor for adjustment.

| CLASS FACTORS--CARPORTS & CANOPIES* |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class                               | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor                              | 0.59 | 0.78 | 0.92 | 0.96 | 1.00 | 1.06 | 1.10 | 1.13 | 1.19 | 1.30 | 1.43 | 1.57 |

Carports/Canopies - Base cost are average grade - multiply by class factor for adjustment.

\* Class factors for building classes R-27 thru R-49, see Building Class Spec sheet.

14. OTHER ITEMS

Detached Garages and Carports - Base cost per square foot floor area.

| Type                           | Sq. Ft Area |       |       |       |       |       |            |
|--------------------------------|-------------|-------|-------|-------|-------|-------|------------|
|                                | 200         | 300   | 400   | 500   | 600   | 700   | 800 & Over |
| 14.01 Detached garage          | 31.39       | 26.23 | 23.66 | 22.14 | 21.08 | 20.47 | 19.86      |
| 14.02 Detached Carport/ canopy | 9.25        | 8.19  | 7.73  | 7.43  | 7.13  | 6.98  | 6.82       |

Detached Garage - Base cost average grade - multiply by class factor for adjustments

| CLASS FACTOR--DETACHED GARAGE* |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class                          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor                         | 0.52 | 0.66 | 0.85 | 0.93 | 1    | 1.13 | 1.24 | 1.39 | 1.58 | 1.73 | 1.9  | 2.09 |

Brick Factor - 1.15

Stone Factor - 1.30

Detached Carport/ Canopy - base cost average grade - multiply by class factor for adjustment

| CLASS FACTOR--DETACHED CARPORT/CANOPY* |      |      |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|------|------|------|------|
| Class                                  | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor                                 | 0.59 | 0.78 | 0.92 | 0.96 | 1    | 1.06 | 1.1  | 1.13 | 1.19 | 1.3  | 1.43 | 1.57 |

14.03 Shed Construction

| Sq. Ft.<br>Area | First<br>Story | Second<br>Story | Half<br>Story | 14.04 <u>Shed Finish</u> |                    |
|-----------------|----------------|-----------------|---------------|--------------------------|--------------------|
|                 |                |                 |               | Full Story<br>Area       | Half Story<br>Area |
| 80              | 26.99          | 13.04           | 8.95          | 27.60                    | 18.50              |
| 100             | 24.57          | 11.83           | 8.04          | 24.57                    | 16.53              |
| 120             | 22.90          | 11.07           | 7.58          | 22.59                    | 15.16              |
| 140             | 21.84          | 10.46           | 7.13          | 21.08                    | 14.10              |
| 160             | 20.93          | 10.01           | 6.82          | 20.02                    | 13.34              |
| 180             | 20.17          | 9.70            | 6.67          | 19.11                    | 12.74              |
| 200             | 19.71          | 9.40            | 6.52          | 18.50                    | 12.28              |
| 300             | 18.05          | 8.64            | 5.91          | 16.38                    | 10.92              |
| 400             | 17.14          | 8.19            | 5.61          | 15.32                    | 10.31              |
| 600             | 16.38          | 7.89            | 5.46          | 14.41                    | 9.55               |
| 800 & Over      | 15.92          | 7.73            | 5.31          | 13.80                    | 9.33               |

Sheds and Shed Finish - Base cost per square foot floor area.

Sheds and Shed Finish - Base cost average grade - multiply by class factor for adjustment.

| CLASS FACTORS* |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Class          | R-12 | R-13 | R-14 | R-15 | R-16 | R-17 | R-18 | R-19 | R-20 | R-21 | R-22 | R-23 |
| Factor         | 0.56 | 0.78 | 0.78 | 0.89 | 1.00 | 1.20 | 1.20 | 1.45 | 1.45 | 1.58 | 1.74 | 1.92 |

NOTE - Shed finish can also be applied to detached garage when interior is finished.

\* For building classes R-27 thru R-49, see building class spec sheet.

14. OTHER ITEMS (continued)

14.05 Swimming Pools - Base cost per square foot of surface area. Cost includes excavation, filter system, piping, coping and ladder.

| Sq. Ft. Area | 300   | 400   | 500   | 600   | 700   | 800 & over |
|--------------|-------|-------|-------|-------|-------|------------|
| Cost/Sq. Ft. | 51.86 | 43.67 | 38.82 | 35.64 | 33.36 | 31.54      |

Swimming Pools - Base cost average quality - for differences in quality, multiply square foot cost by Quality Factor. Factors that affect Quality are type of construction, workmanship and/or shape of pool.

| Quality | Low | Fair | Average | Good | High |
|---------|-----|------|---------|------|------|
| Factor  | 0.6 | 0.75 | 1.00    | 1.30 | 1.90 |

14.06 & 14.07 Paving - Base cost per square foot pavement area.

|       | Type     | Cost per Sq. Ft. |
|-------|----------|------------------|
| 14.06 | Concrete | \$3.18           |
| 14.07 | Asphalt  | \$2.12           |

15. SPECIAL EQUIPMENT

PASSENGER ELEVATOR--Two Levels

| Capacity        | 750 Lbs. | 1,000 Lbs. | 1,500 Lbs. | Ea. Additional Level |
|-----------------|----------|------------|------------|----------------------|
| 15.01 Hydraulic | 30,000   | 35,000     | 40,000     | 5,000                |
| 15.02 Electric  | 22,000   | 28,000     | 34,500     | 3,500                |

DUMBWAITER

|  | 2-Levels | 3-Levels |
|--|----------|----------|
| 15.03 Hydraulic or electric, 75 to 100 lbs. Capacity | 5,800    | 7,250    |

16. SPECIAL STRUCTURAL ELEMENTS

PILINGS

Add to items 16.01 & 16.02 a crane site set up fee of \$1150.

16.01 12" Concrete filled steel tube-----\$21.00 per lineal foot

NOTE: A typical piling is 30 ft. long.

16.02 10" to 12" (butt) treated wood piling-----\$12.50 per lineal foot

NOTE: A typical wood piling is 35 ft. long with a 8" tip and 10" to 12" butt.

MARINE BULKHEAD

|                    | <u>Depth</u><br><u>16 Ft.</u> | <u>Depth</u><br><u>20 Ft.</u> |
|--------------------|-------------------------------|-------------------------------|
| <u>16.03</u> Vinyl | \$375 per LF.                 | \$500 per LF.                 |
| <u>16.04</u> Wood  | \$331 per LF.                 | \$441 per LF.                 |

Typical width is 12 inches.

MARINE DOCKS / PIER\*

16.05 Wood pilings with wood decking           \$22 per Sq. Ft.

\*Multiply by Class Factor for adjustment, See Residential Specification Pages.

**143. Mobile Home Base Costs R-50 to R-54 and Adjustments to Base**

This section includes the Base Costs and Adjustments to Base Costs for Mobile Home type dwellings. All costs are as of October 2001 and Cost Conversion Factors must be used for any other Base Year.

*Class R-50 Typical Photographs*

*R-50 Mobile Home*



**CLASS R-50: MOBILE HOME**

**LOW QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| <p>1. ROOF – Flat or low pitch with metal or composition roofing material of low quality.</p> <p>2. STRUCTURE – 6 1/2' to 7' high ceiling.</p> <p>Exterior Walls – Aluminum siding of light gauge and low quality on walls 2" to 3" thick.</p> <p>Interior Finish – Painted plywood, composition board or plywood panels of low quality. Softwood door and trim. Minimum number of closets and kitchen cabinets.</p> <p>3. DOOR AND WINDOWS - Low quality wood doors and minimum number of windows with small openings.</p> | <p>4. FLOORS - Floor joists with a plywood or particle board subfloor. Floor covering of low grade linoleum and/or carpeting.</p> <p>5. HEATING - Minimal forced hot air heating unit with straight-line ducts.</p> <p>6. PLUMBING - One low quality three fixture bathroom, small hot water heater and kitchen sink.</p> <p>7. LIGHTING - Minimal number of low quality fixtures and outlets.</p> <p>8. BUILT-INS/APPLIANCES - Low quality range and oven.</p> <p>9. OTHER ITEMS - None</p> |
|---|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft.<br>Area | 8'    | 10'   | 12'   |
|-----------------|-------|-------|-------|
| 150             | 53.11 | -     | -     |
| 200             | 47.65 | -     | -     |
| 250             | 44.39 | -     | -     |
| 300             | 42.18 | 43.69 | -     |
| 350             | 40.65 | 42.12 | -     |
| 400             | 39.48 | 40.95 | 34.41 |
| 450             | -     | 40.06 | 32.94 |
| 500             | -     | 39.33 | 31.77 |
| 550             | -     | 38.71 | 30.82 |
| 600             | -     | 38.25 | 29.99 |
| 650             | -     | 37.79 | 29.35 |
| 700             | -     | 37.48 | 28.80 |
| 750             | -     | 37.15 | 28.27 |
| 800             | -     | -     | 27.81 |
| 850             | -     | -     | 27.45 |
| 900             | -     | -     | 27.11 |

NOTE: For Cost Conversion Factors, Table RR-1, See "R" Series, section 157  
Adjustments to base specifications – this section

*Class R-51 Typical Photographs*

*R-51 Mobile Home*



**CLASS R-51: MOBILE HOME**  
**FAIR QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1. ROOF – Flat or low pitch with metal or composition roofing material of fair quality.</p> <p>2. STRUCTURE – 7' to 7 1/2' high ceilings.</p> <p>Exterior Walls – Aluminum siding of light gauge and fair quality on walls 2" to 3" thick.</p> <p>Interior Finish – Painted plywood, composition board or plywood panels of fair quality. Softwood door and trim. Minimum number of closets and kitchen cabinets.</p> <p>3. DOOR AND WINDOWS - Fair quality wood or metal clad doors and adequate number of windows with small openings.</p> | <p>4. FLOORS - Floor joists with a plywood or particle board subfloor. Floor covering of fair grade linoleum and/or carpeting.</p> <p>5. HEATING - Standard forced hot air heating unit with straight-line ducts.</p> <p>6. PLUMBING - One fair grade three fixture bathroom, hot water heater and kitchen sink.</p> <p>7. LIGHTING - Minimal number of fair quality fixtures and outlets.</p> <p>8. BUILT-INS/APPLIANCES - Fair quality range and oven.</p> <p>9. OTHER ITEMS - None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft.<br>Area | 10 Feet | 12 Feet | 14 Feet |
|-----------------|---------|---------|---------|
| 300             | 52.40   | -       | -       |
| 350             | 50.53   | -       | -       |
| 400             | 49.15   | 41.32   | -       |
| 450             | 48.08   | 39.54   | -       |
| 500             | 47.19   | 38.13   | 44.79   |
| 550             | 46.30   | 36.96   | 44.18   |
| 600             | 45.90   | 36.04   | 43.62   |
| 650             | 45.37   | 35.21   | 43.13   |
| 700             | 44.94   | 34.51   | 42.73   |
| 750             | 44.58   | 33.92   | 42.40   |
| 800             | -       | 33.40   | 42.12   |
| 850             | -       | 32.91   | 41.84   |
| 900             | -       | 32.51   | 41.60   |
| 950             | -       | -       | 41.41   |
| 1000            | -       | -       | 41.20   |
| 1050            | -       | -       | 41.05   |
| 1100            | -       | -       | 40.89   |
| 1150            | -       | -       | -       |
| 1200            | -       | -       | -       |
| 1250            | -       | -       | -       |
| 1300            | -       | -       | -       |
| 1400            | -       | -       | -       |
| 1500            | -       | -       | -       |

NOTE: For Cost Conversion Factors, Table RR-1, See "R" Series, section 157  
 Adjustments to base specifications – this section

*Class R-52 Typical Photographs*

*R-52 Mobile Home*



**CLASS R-52: MOBILE HOME**

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1. ROOF – Flat or gable with metal roof or shingles of average quality.</p> <p>2. STRUCTURE – 7' to 7 1/2' high ceilings.</p> <p>Exterior Walls – Enameled aluminum siding of medium gauge on insulated walls 3" to 4" thick. Double studding and headers over doors and large window openings.</p> <p>Interior Finish – Wood paneling of average quality on most interior walls. Softwood doors and trim. Adequate number of closets and kitchen cabinets.</p> <p>3. DOOR AND WINDOWS - Average grade metal clad doors and adequate fenestration.</p> | <p>4. FLOORS - Floor joists with a plywood or particle board subfloor. Floor covering of average grade seamless vinyl and carpeting.</p> <p>5. HEATING - Standard forced hot air heating unit with straightline or minimum branched ducting with adequate number of registers.</p> <p>6. PLUMBING - One average grade three fixture bathroom, hot water heater and kitchen sink.</p> <p>7. LIGHTING - Adequate number of average quality lighting fixtures and outlets.</p> <p>8. BUILT-INS/APPLIANCES - Average quality range and oven.</p> <p>9. OTHER ITEMS - None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft.<br>Area | 10 Feet | 12 Feet | 14 Feet | 16 Feet | 20 Feet | 24 Feet | 28 Feet |
|-----------------|---------|---------|---------|---------|---------|---------|---------|
| 500             | 52.44   | 42.37   | 49.76   | -       | -       | -       | -       |
| 550             | 51.64   | 41.08   | 49.09   | -       | -       | -       | -       |
| 600             | 50.99   | 40.03   | 48.48   | 51.21   | -       | -       | -       |
| 650             | 50.41   | 39.11   | 47.92   | 50.67   | -       | -       | -       |
| 700             | 49.95   | 38.34   | 47.49   | 50.19   | -       | -       | -       |
| 750             | 49.55   | 37.70   | 47.09   | 49.73   | -       | -       | -       |
| 800             | -       | 37.12   | 46.79   | 49.31   | 54.89   | 53.76   | -       |
| 850             | -       | 36.56   | 46.48   | 48.76   | 54.06   | 52.59   | -       |
| 900             | -       | 36.10   | 46.23   | 48.30   | 53.36   | 51.55   | -       |
| 950             | -       | -       | 46.02   | 47.87   | 52.68   | 50.59   | -       |
| 1000            | -       | -       | 45.77   | 47.54   | 52.25   | 49.76   | -       |
| 1050            | -       | -       | 45.62   | 47.14   | 51.58   | 49.00   | 50.44   |
| 1100            | -       | -       | 45.44   | 46.81   | 51.08   | 48.32   | 49.43   |
| 1150            | -       | -       | -       | 46.15   | 50.62   | 47.71   | 48.48   |
| 1200            | -       | -       | -       | 45.52   | 50.23   | 47.09   | 47.65   |
| 1250            | -       | -       | -       | -       | 49.86   | 46.60   | 46.85   |
| 1300            | -       | -       | -       | -       | 49.55   | 46.08   | 46.17   |
| 1400            | -       | -       | -       | -       | 48.94   | 45.22   | 45.47   |
| 1500            | -       | -       | -       | -       | 48.35   | 44.48   | 44.33   |
| 1600            | -       | -       | -       | -       | -       | 43.81   | 43.32   |
| 1700            | -       | -       | -       | -       | -       | 43.23   | 42.43   |
| 1800            | -       | -       | -       | -       | -       | 42.70   | 41.63   |
| 2000            | -       | -       | -       | -       | -       | -       | 39.73   |

NOTE: For Cost Conversion Factors, Table RR-1, See "R" Series, section 157  
Adjustments to base specifications – this section

*Class R-53 Typical Photographs*

*R-53 Mobile Home*



**CLASS R-53: MOBILE HOME**

**GOOD QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |  |  |
|--|--|
| <p>1. ROOF – Flat or gable roof with composition shingles of good quality.</p> <p>2. STRUCTURE – 7 1/2' to 8' high ceilings.<br/>Living room may include cathedral type ceilings.</p> <p>Exterior Walls – Enameled aluminum siding of medium gauge on insulated walls 4" thick. Double studding and headers over doors and large window openings.</p> <p>Interior Finish – Wood paneling of good quality on most interior walls. Softwood doors and trim. More than adequate number of good quality closets and kitchen cabinets.</p> <p>3. DOOR AND WINDOWS - Good grade metal clad doors and adequate fenestration. Some bay, picture or louvered windows.</p> | <p>4. FLOORS - Floor joists with a plywood or particle board subfloor. Floor covering of good grade seamless vinyl and carpeting.</p> <p>5. HEATING - Standard forced hot air heating unit with large capacity ducts, cold air returns and branched ducting.</p> <p>6. PLUMBING - One good grade three fixture bathroom, hot water heater and kitchen sink.</p> <p>7. LIGHTING - Adequate number of good quality lighting fixtures and outlets.</p> <p>8. BUILT-INS/APPLIANCES - Good quality range and oven.</p> <p>9. OTHER ITEMS - None</p> |
|--|--|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft.<br>Area | 12 Feet | 14 Feet | 16 Feet | 20 Feet | 24 Feet | 28 Feet |
|-----------------|---------|---------|---------|---------|---------|---------|
| 400             | 50.47   | -       | -       | -       | -       | -       |
| 450             | 48.32   | -       | -       | -       | -       | -       |
| 500             | 46.60   | 54.77   | 57.64   | -       | -       | -       |
| 550             | 45.16   | 54.00   | 56.96   | -       | -       | -       |
| 600             | 44.02   | 53.30   | 56.31   | -       | -       | -       |
| 650             | 43.01   | 52.74   | 55.74   | -       | -       | -       |
| 700             | 42.18   | 52.25   | 55.20   | -       | -       | -       |
| 750             | 41.48   | 51.82   | 54.70   | -       | -       | -       |
| 800             | 40.80   | 51.45   | 54.23   | 60.36   | 59.13   | -       |
| 850             | 40.25   | 51.15   | 53.65   | 59.47   | 57.84   | -       |
| 900             | 39.73   | 50.84   | 53.11   | 58.67   | 56.70   | -       |
| 950             | -       | 50.62   | 52.65   | 57.93   | 55.66   | -       |
| 1000            | -       | 50.38   | 52.31   | 57.47   | 54.77   | 55.47   |
| 1050            | -       | 50.16   | 51.85   | 56.73   | 53.91   | 54.37   |
| 1100            | -       | 49.98   | 51.50   | 56.21   | 53.14   | 53.33   |
| 1150            | -       | -       | 50.76   | 55.69   | 52.47   | 52.40   |
| 1200            | -       | -       | 50.08   | 55.26   | 51.82   | 52.10   |
| 1250            | -       | -       | -       | 54.86   | 51.27   | 50.78   |
| 1300            | -       | -       | -       | 54.49   | 50.69   | 50.01   |
| 1400            | -       | -       | -       | 53.82   | 49.73   | 48.75   |
| 1500            | -       | -       | -       | 53.20   | 48.94   | 47.65   |

NOTE: For Cost Conversion Factors, Table RR-1, See "R" Series, section 157

Adjustments to base specifications – this section

*Class R-54 Typical Photographs*

**R-54 Mobile Home**



**CLASS R-54: MOBILE HOME**

**HIGHEST QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS FOR CLASS**

- |   |   |
|---|---|
| <p>1. ROOF – Flat or gable roof with composition shingles of highest quality.</p> <p>2. STRUCTURE – 7 1/2' to 8' high ceilings. Living room, dining room and kitchen may include cathedral type ceilings.</p> <p>Exterior Walls – Enameled aluminum siding of heavy gauge on insulated walls 4" thick. Double studding and headers over doors and large window openings.</p> <p>Interior Finish – Wood paneling of simulated brick or stone paneling of high quality. Hardwood doors and trim. Substantial number of highest quality closets and kitchen cabinets.</p> <p>3. DOOR AND WINDOWS - Conventional home doors throughout. Selective use of bay, picture or louvered windows in living room, dining room and kitchen area.</p> | <p>4. FLOORS - Floor joists with plywood or particle board subfloor. Floor covering of heavy duty vinyl and highest quality carpeting.</p> <p>5. HEATING - Standard forced hot air heating unit with large capacity ducts, cold air returns and branched ducting.</p> <p>6. PLUMBING - One highest quality three fixture bathroom, hot water heater and kitchen sink.</p> <p>7. LIGHTING - Substantial number of highest quality lighting fixtures and outlets.</p> <p>8. BUILT-INS/APPLIANCES - Highest quality range and oven.</p> <p>9. OTHER ITEMS - None</p> |
|---|---|

**BASE COST PER SQUARE FOOT FLOOR AREA**

| Sq. Ft.<br>Area | 14 Feet | 16 Feet | 20 Feet | 24 Feet | 28 Feet |
|-----------------|---------|---------|---------|---------|---------|
| 600             | 58.15   | -       | -       | -       | -       |
| 650             | 57.53   | 62.59   | -       | -       | -       |
| 700             | 57.01   | 61.97   | 68.25   | -       | -       |
| 750             | 56.52   | 61.33   | 66.99   | -       | -       |
| 800             | 56.15   | 60.75   | 65.85   | -       | -       |
| 850             | 55.78   | 59.90   | 64.84   | -       | -       |
| 900             | 55.44   | 59.17   | 64.04   | 61.86   | -       |
| 950             | 55.23   | 58.50   | 63.21   | 60.72   | -       |
| 1000            | 54.92   | 57.95   | 62.51   | 59.71   | 60.54   |
| 1050            | 54.74   | 57.44   | 61.89   | 58.79   | 59.31   |
| 1100            | 54.52   | 56.95   | 61.31   | 57.99   | 58.18   |
| 1150            | -       | 56.57   | 60.76   | 57.22   | 57.41   |
| 1200            | -       | 56.18   | 60.26   | 56.52   | 56.21   |
| 1250            | -       | -       | 59.83   | 55.90   | 55.38   |
| 1300            | -       | -       | 59.44   | 55.29   | 54.58   |
| 1400            | -       | -       | 58.70   | 54.28   | 53.20   |
| 1500            | -       | -       | 58.02   | 53.39   | 51.98   |
| 1600            | -       | -       | -       | 52.56   | 50.90   |
| 1700            | -       | -       | -       | 51.88   | 49.95   |
| 1800            | -       | -       | -       | 51.27   | 49.12   |
| 2000            | -       | -       | -       | -       | 47.71   |

NOTE: For Cost Conversion Factors, Table RR-1, See "R" Series, section 157  
Adjustments to Adjustments to base specifications – this section

## MOBILE HOME ADJUSTMENTS

20. **PLUMBING** - Base cost per fixture - add to, or deduct from specifications.

|      |                | <u>LOW</u><br><u>QUALITY</u> | <u>FAIR</u><br><u>QUALITY</u> | <u>AVERAGE</u><br><u>QUALITY</u> | <u>GOOD</u><br><u>QUALITY</u> | <u>HIGH</u><br><u>QUALITY</u> |
|------|----------------|------------------------------|-------------------------------|----------------------------------|-------------------------------|-------------------------------|
| 20.1 | 4 Fixture      | \$1003                       | \$1203                        | \$1338                           | \$1473                        | \$1605                        |
| 20.2 | 3 Fixture      | 779                          | 936                           | 1040                             | 1145                          | 1249                          |
| 20.3 | 2 Fixture      | 528                          | 632                           | 703                              | 773                           | 844                           |
| 20.4 | Single Fixture | 338                          | 402                           | 448                              | 494                           | 537                           |

21. **BUILT-INS / APPLIANCES**

|       |                            | <u>LOW</u><br><u>QUALITY</u> | <u>AVERAGE</u><br><u>QUALITY</u> | <u>HIGH</u><br><u>QUALITY</u> |
|-------|----------------------------|------------------------------|----------------------------------|-------------------------------|
| 21.1  | Free standing range & oven | \$706                        | \$1010                           | \$1350                        |
| 21.2  | Drop-in range              | 635                          | 908                              | 1228                          |
| 21.3  | Oven                       | 429                          | 614                              | 828                           |
| 21.4  | Counter top range          | 276                          | 396                              | 534                           |
| 21.5  | Microwave oven, built-in   | 669                          | 954                              | 1289                          |
| 21.6  | Exhaust hood, fan & light  | 224                          | 319                              | 429                           |
| 21.7  | Dishwasher                 | 669                          | 954                              | 1289                          |
| 21.8  | Garbage disposal           | 168                          | 242                              | 328                           |
| 21.9  | Am-Fm Intercom             | 343                          | 491                              | 663                           |
| 21.10 | Trash Compactor            | 537                          | 767                              | 1037                          |
| 21.11 | Fireplace                  | 1381                         | 1974                             | 2664                          |

22. **OPTIONAL ITEMS (ALL COSTS PER SQUARE FOOT, EXCEPT AS NOTED)**

|       |   | <u>LOW</u><br><u>QUALITY</u> | <u>AVERAGE</u><br><u>QUALITY</u> | <u>HIGH</u><br><u>QUALITY</u> |
|-------|---|------------------------------|----------------------------------|-------------------------------|
| 22.1  | Patio covers                              | \$ 3.68                      | \$ 5.24                          | \$ 6.29                       |
| 22.2  | Carports                                  | 6.04                         | 8.65                             | 10.37                         |
| 22.3  | Storage sheds - wood                      | 10.34                        | 14.79                            | 17.74                         |
| 22.4  | Storage sheds - metal                     | 7.21                         | 10.31                            | 12.37                         |
| 22.5  | Screened porches                          | 8.07                         | 11.54                            | 13.84                         |
| 22.6  | Enclosed porches                          | 10.77                        | 15.38                            | 18.45                         |
| 22.7  | Redwood deck                              | 4.85                         | 6.90                             | 8.28                          |
| 22.8  | Skirting - aluminum per lineal ft.        | 3.37                         | 4.81                             | 5.77                          |
| 22.9  | Skirting - vinyl per lineal ft.           | 3.13                         | 4.48                             | 5.37                          |
| 22.10 | Skirting - simulated stone per lineal ft. | 4.60                         | 6.56                             | 7.88                          |
| 22.11 | Masonry foundation wall                   | 7.06                         | 7.98                             | 9.36                          |
| 22.12 | Central Air Conditioning per square foot  | 1.65                         | 2.40                             | 2.76                          |

#### **144. Farm Building Specifications and Cost Section**

This section of the New Jersey Real Property Appraisal Manual was revised in 1998 to include changes in construction techniques and building materials for farm buildings. Pre-engineered post and frame structures have replaced the traditional masonry and wood structures due to their cost effectiveness in construction. For the original traditional building costs, class 150 through class 156, no changes have been made to this section. Structures of this type, in most cases, will require significant functional and economic obsolescence, and if warranted, physical depreciation.

This section added includes replacement cost values using current construction material and methods for post and frame style buildings. These are the “PF” series which encompass categories 157 through 163. The post and frame cost tables and adjustment sections are based on local material and labor costs prevailing throughout New Jersey as of October 1998. Also, a section covering Greenhouses and/or Seed Starting Houses is included in this section. While historically these structures were addressed in the commercial portion of the Appraisal Manual, updated values are now provided for farm-based buildings. Square foot costs are current as of October 1998 and the cost conversion factor of F-2 is to be employed when appraising these building.

In the appraisal of farm buildings, the assessor must be familiar with all the recent legal and statutory rules governing the taxation of farm structures. Of particular concern in this area are the “single use” structures, which are exempt from taxation. N.J.S.A. 54:4-23.12 defines a single use agricultural or horticultural facility which is exempt from taxation. All other structures, whether used for agricultural or horticultural purposes, residential use or otherwise, must be valued, and taxed by the same standards applicable to all other taxable structures in the taxing district.

## **The Business Retention Act**

P.L. 1992, c24, "The Business Retention Act", amends the description of local taxable property to reaffirm the Legislature's regularly stated position of excluding machinery, apparatus and equipment used or held for use in business from local taxation.

The law amends subsection b. of N.J.S.A. 54:4-1 to specify that items of machinery, apparatus or equipment used in the conduct of a business are defined as personal property regardless of the class or type of real property to which such items may be affixed. Such items are defined as locally taxable real property only if they constitute a structure, as defined in the law, or are primarily used to enable a structure to support, shelter, contain, enclose, or house persons or property. Examples of machinery, apparatus or equipment which enable a structure to house persons or property, and which are therefore locally taxable, include central heating or air conditioning systems, elevators, suspended ceilings, affixed partitions, plumbing and plumbing fixtures connected to a plumbing system, overhead lighting, sprinkler systems, piping and electric wiring up to the point of connection with a manufacturing process within the structure and a central hot water system or the boiler primarily used to supply it.

### **54:4 1.15 Definitions - Business Retention Act**

"Machinery, apparatus or equipment" means any machine, device, mechanism, instrument, tool, tank, or item of tangible personal property used or held for use in business.

"Production process" means the process commencing with the introduction of raw materials or components into a systematic series of manufacturing, assembling, refining, or processing operations and ceasing when the product is in the form in which it will be sold to the ultimate consumer.

"Structure" means any assemblage of building or construction materials fixed in place for the primary purpose of supporting, sheltering, containing, enclosing, or housing persons or property.

"Used or held for use in business" means any item of machinery, apparatus or equipment used or held for use in a business transaction, activity or occupation conducted for profit in New Jersey.

#### **54:4-23.12. Valuation, assessment, and taxation of structures**

All structures, which are located on land in agricultural or horticultural use and the farmhouse and the land on which the farmhouse is located, together with the additional land used in connection therewith, shall be valued, assessed and taxed by the same standards, methods and procedures as other taxable structures and other land in the taxing district, regardless of the fact that the land is being valued, assessed and taxed pursuant to P.L.1964, c. 48 (C. 54:4-23.1 et seq.); provided, however, that the term "structures" shall not include "single-use agricultural or horticultural facilities." As used in this act, "single-use agricultural or horticultural facility" means property employed in farming operations and commonly used for either storage or growing, which is designed or constructed so as to be readily dismantled and is of a type which can be marketed or sold separately from the farmland and buildings and shall include, but not be limited to, temporary demountable plastic covered framework made up of portable parts with no permanent under-structures or related apparatus, commonly known as seed starting plastic greenhouses, or other readily dismantled silos, greenhouses, grain bins, manure handling equipment and impoundment's, but shall not include a structure that encloses a space within its walls used for housing, shelter, or working, office or sales space, whether or not removable.

The Director of the Division of Taxation shall adopt, in consultation with the Secretary of Agriculture and in accordance with the "Administrative Procedure Act," P.L.1968, c. 410 (C. 52:14B-1 et seq.), rules and regulations establishing criteria for the assessment of all farm structures.

In the valuation and assessment of farm structures the assessor shall consider those indications of value which such structures have under the same value applicable to all other real property. Assessors shall take into consideration the following criteria for the establishment of value:

Cost less depreciation: Based on the premise that the cost new of the structure is the highest possible value. Costs may include in addition to materials and labor, architect, engineering and permit fees, surveys, and site improvement costs. Deducted from the highest possible value are accrued depreciation, physical deterioration, and functional and economic obsolescence.

Alteration to existing structures: The cost of alterations or modernization to an existing farm structure does not necessarily add to building value. Where major alterations or modernization definitely increases or adds to the value of the farm structure, the percentage appreciation is determined by estimating the probable increase in sales value or the increase in remaining economic life of the building.

Specialized nature of building use: Farm structures are designed and built for specific production uses. Knowledge of building types, construction quality, useful life and utilization is important in determining value. Comparisons should be made with like structures.

Depreciation: The physical condition of agricultural buildings should be compared to the near perfect condition of similar new buildings, based on inspection of all components. A depreciation schedule for farm structures shall be used in the assessment of the physical condition of a building.

Obsolescence: This is loss of value due to internal or external deficiencies. Functional obsolescence is loss in value due to the inability of the structure to adequately perform the function it was intended for. Functional obsolescence would result if a building has limited contribution to a farming operation by being technologically obsolete, such as a dairy barn with 30 stall stanchions when today's standard is larger, free stall structures with milking parlors, or being unusable for the purpose for which it was built.

Economic obsolescence of a structure with a specialized agriculture use is loss in value as a result of impairment in utility and desirability caused by factors outside the properties boundaries. For example, dairy farming has generally been unprofitable for New Jersey Farmers, therefore farm structures design for milk production have limited value even though said structures are physically usable.

Municipal zoning: Ordinances or codes may limit the use of a farm structure to agricultural purposes. Consideration should be given to the permitted uses of a structure. The proximity of a farm structure to a farm dwelling shall also be considered since the valuation of both buildings may be adversely impacted.

CLASS 150 GENERAL PURPOSE BARNs

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS**

|                     |   |                 |  |
|---------------------|---|-----------------|--|
| 1) Roof:            | Gable or Gambrel, Composition Shingle or Equivalent     | 5) Floors:      | Part Concrete, Part Dirt, Hayloft with Wood Flooring |
| 2) Foundations:     | Masonry Walls or Equivalent                             | 6) Plumbing:    | Minimum Number of Outlets Water                      |
| 3) Exterior Walls:  | Wood Siding on Wood Frame, Concrete Block or equivalent | 7) Lighting:    | None   |
| 4) Interior Finish: | Stall Partitions, Feed Storage and Equipment Rooms      | 8) Other Items: | None   |

**BASE COST PER CUBIC FOOT**

|               |               |               |               |               |               |                |                |
|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|
| <u>10,000</u> | <u>15,000</u> | <u>20,000</u> | <u>30,000</u> | <u>50,000</u> | <u>75,000</u> | <u>100,000</u> | <u>150,000</u> |
| \$0.45        | \$0.40        | \$0.35        | \$0.35        | \$0.35        | \$0.30        | \$0.30         | \$0.30         |

For Low Quality, multiply by .75

For High Quality, multiply by 1.30

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-1

Adjustments to Base Specifications: None

**CLASS 151 LIVESTOCK BARNs**

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS**

|                     |   |                 |  |
|---------------------|---|-----------------|--|
| 1) Roof:            | Gable or Gambrel, Wood Shingle or Equivalent            | 5) Floors:      | Concrete Slab or Equivalent                    |
| 2) Foundations:     | Masonry Walls or Equivalent                             | 6) Plumbing:    | Adequate Number of Outlets Water               |
| 3) Exterior Walls:  | Concrete Block, Wood Siding on Wood Frame or Equivalent | 7) Lighting:    | Conduit Wiring with Minimum Number of Fixtures |
| 4) Interior Finish: | Stanchion and Stalls, Feed Room and Storage Rooms       | 8) Other Items: | None   |

**BASE COST PER CUBIC FOOT**

Without Loft

|               |               |               |               |               |               |                |                |
|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|
| <u>10,000</u> | <u>15,000</u> | <u>20,000</u> | <u>30,000</u> | <u>50,000</u> | <u>75,000</u> | <u>100,000</u> | <u>150,000</u> |
| \$0.70        | \$0.65        | \$0.60        | \$0.60        | \$0.55        | \$0.55        | \$0.50         | \$0.50         |

With Loft

|               |               |               |               |               |               |                |                |
|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|
| <u>10,000</u> | <u>15,000</u> | <u>20,000</u> | <u>30,000</u> | <u>50,000</u> | <u>75,000</u> | <u>100,000</u> | <u>150,000</u> |
| \$1.10        | \$1.00        | \$0.95        | \$0.90        | \$0.85        | \$0.80        | \$0.80         | \$0.75         |

For Low Quality, multiply by .70

For High Quality, multiply by 1.40

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-1

Adjustments to Base Specifications: None

CLASS 152 FARM SHED AND OUTBUILDINGS

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS**

|                     |  |                 |  |
|---------------------|--|-----------------|--|
| 1) Roof:            | Gable or Shed Type,<br>Composition Shingle or Equivalent   | 5) Floors:      | Concrete Slab or<br>Softwood                         |
| 2) Foundations:     | Masonry Walls or Equivalent                                | 6) Plumbing:    | None   |
| 3) Exterior Walls:  | Wood Siding on Wood Frame,<br>Concrete Block or equivalent | 7) Lighting:    | Conduit Wiring with<br>Minimum Number of<br>Fixtures |
| 4) Interior Finish: | None   | 8) Other Items: | None   |

**BASE COST PER SQUARE FOOT GROUND AREA**

|            |            |            |            |            |              |              |              |
|------------|------------|------------|------------|------------|--------------|--------------|--------------|
| <u>100</u> | <u>150</u> | <u>200</u> | <u>400</u> | <u>600</u> | <u>1,000</u> | <u>2,000</u> | <u>3,000</u> |
| \$7.75     | \$6.75     | \$6.50     | \$6.00     | \$5.55     | \$5.40       | \$5.40       | \$4.70       |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-1

Adjustments to Base Specifications: None

**CLASS 153 POLE BARNS/EQUIPMENT SHEDS**

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS**

|                     |  |                 |   |
|---------------------|--|-----------------|---|
| 1) Roof:            | Gable or Shed Type,<br>Metal or Aluminum on Wood Frame | 5) Floors:      | None  |
| 2) Foundations:     | Creosoted Poles  | 6) Plumbing:    | None  |
| 3) Exterior Walls:  | Corrugated Metal or<br>Aluminum on Wood Framing        | 7) Lighting:    | Conduit Wiring with Minimum<br>Number of Fixtures |
| 4) Interior Finish: | None   | 8) Other Items: | None  |

**BASE COST PER SQUARE FOOT GROUND AREA**

|            |              |              |              |              |              |              |              |              |
|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <u>500</u> | <u>1,000</u> | <u>1,500</u> | <u>2,000</u> | <u>2,500</u> | <u>3,000</u> | <u>3,500</u> | <u>4,000</u> | <u>5,000</u> |
| \$4.65     | \$4.15       | \$3.85       | \$3.75       | \$3.65       | \$3.60       | \$3.55       | \$3.50       | \$3.45       |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-1

Adjustments to Base Specifications: None

**CLASS 154 HORSE STABLES**

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS**

|                     |  |                 |   |
|---------------------|--|-----------------|---|
| 1) Roof:            | Gable or Shed Type,<br>Average Quality Roofing   | 5) Floors:      | Concrete Slab or Wood in<br>Storage Rooms         |
| 2) Foundations:     | Masonry Walls or Equivalent  | 6) Plumbing:    | Water Outlets Only                                |
| 3) Exterior Walls:  | Stucco on Wall or Block,<br>Wood Siding on Wood Frame,<br>Concrete Block or Equivalent | 7) Lighting:    | Conduit Wiring with<br>Minimum Number of Fixtures |
| 4) Interior Finish: | Storage Rooms, Wood or Concrete<br>Block Stall Partitions                              | 8) Other Items: | None  |

**BASE COST PER SQUARE FOOT GROUND AREA**

|              |              |              |              |              |              |               |               |               |
|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| <u>1,000</u> | <u>2,000</u> | <u>3,000</u> | <u>4,000</u> | <u>5,000</u> | <u>7,500</u> | <u>10,000</u> | <u>12,500</u> | <u>15,000</u> |
| \$9.85       | \$8.75       | \$8.25       | \$7.90       | \$7.75       | \$7.60       | \$7.50        | \$7.20        | \$7.00        |

For Low Quality, multiply by .55

For High Quality, multiply by 1.50

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-1

Adjustments to Base Specifications: None

CLASS 155 POULTRY HOUSES

**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

**BASE SPECIFICATIONS**

|                     |   |                 |  |
|---------------------|---|-----------------|--|
| 1) Roof:            | Gable or Shed Type, Composition Shingle Roofing or Equivalent Insulated | 5) Floors:      | First Floor, Concrete Slab; Upper Floor, Wood  |
| 2) Foundations:     | Masonry Walls or Equivalent   | 6) Plumbing:    | Water Outlets Only                             |
| 3) Exterior Walls:  | Wood Siding on Wood Frame, Concrete Block or Equivalent                 | 7) Lighting:    | Conduit Wiring with Minimum Number of Fixtures |
| 4) Interior Finish: | Minimum Partitioning  | 8) Other Items: | None   |

**BASE COST PER SQUARE FOOT GROUND AREA**

| Number of<br>Stories | <u>500</u> | <u>1,000</u> | <u>2,000</u> | <u>3,000</u> | <u>4,000</u> | <u>5,000</u> | <u>10,000</u> | <u>20,000</u> |
|----------------------|------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
| 1                    | \$7.80     | \$7.25       | \$6.45       | \$6.15       | \$6.00       | \$5.90       | \$5.60        | \$5.50        |
| 2                    | \$15.20    | \$13.65      | \$12.95      | \$11.70      | \$11.40      | \$11.20      | \$10.65       | \$10.45       |

For Low Quality, multiply by .70

For High Quality, multiply by 1.35

**NOTES:**

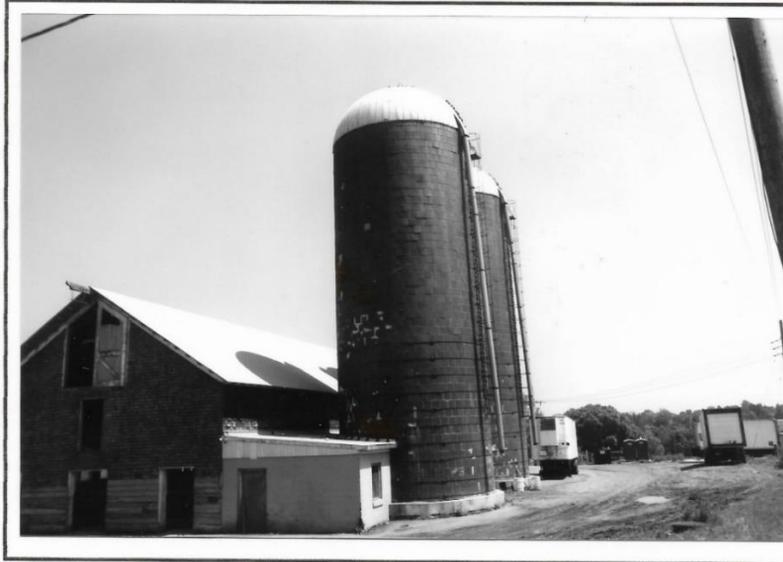
Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-1

Adjustments to Base Specifications: None

CLASS 156A FARM SILOS



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

|                    |                                       |                     |      |
|--------------------|---------------------------------------|---------------------|------|
| 1) Roof:           | None                                  | 5) Interior Finish: | None |
| 2) Foundation:     | Concrete Wall and Footing             | 6) Plumbing:        | None |
| 3) Exterior Walls: | Clay Tile or Poured in Place Concrete | 7) Lighting:        | None |
| 4) Floors:         | Concrete Slab or Equivalent           | 8) Other Items:     | None |

**BASE COST**

**Base Height 28 Feet:**

|               |         |         |         |         |         |         |         |         |         |         |
|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Diameter      | 10'     | 12'     | 14'     | 16'     | 18'     | 20'     | 22'     | 26'     | 30'     | 36'     |
| Circumference | 31'     | 38'     | 44'     | 50'     | 57'     | 63'     | 69'     | 82'     | 94'     | 113'    |
| Wall type A   | \$2,560 | \$3,085 | \$3,600 | \$4,115 | \$4,635 | \$5,160 | \$5,695 | \$6,765 | \$7,820 | \$9,315 |

**Add or Deduct for each 2' Variation in Height"**

|             |       |       |       |       |       |       |       |       |       |       |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Wall type A | \$115 | \$140 | \$160 | \$185 | \$205 | \$230 | \$255 | \$305 | \$350 | \$415 |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|

**Additions:**

|  |       |       |       |        |       |       |         |         |         |         |
|--|-------|-------|-------|--------|-------|-------|---------|---------|---------|---------|
| Steel Roof                             | \$455 | \$550 | \$640 | \$730  | \$825 | \$920 | \$1,015 | \$1,205 | \$1,309 | \$1,655 |
| Add for Steel or Wood Chute per Foot - |       |       |       | \$7.50 |       |       |         |         |         |         |
| Tile per Foot -                        |       |       |       | \$8.50 |       |       |         |         |         |         |
| Add for Lining per Square Foot -       |       |       |       | \$1.20 |       |       |         |         |         |         |

**Notes:**

Depreciation Schedules all wall types - Section 150 Table D-III  
 Cost Conversion Factors- Section 157 Table F-1  
 Adjustments to Base Specifications: None

CLASS 156C FARM SILOS



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**

|                    |                            |                     |      |
|--------------------|----------------------------|---------------------|------|
| 1) Roof:           | None                       | 5) Interior Finish: | None |
| 2) Foundation:     | Concrete Pad or Equivalent | 6) Plumbing:        | None |
| 3) Exterior Walls: | Steel                      | 7) Lighting:        | None |
| 4) Floors:         | None                       | 8) Other Items:     | None |

---

**These structures are not assessable for Real Property Taxation Purposes.**

These silos are not permanently affixed, they rest on concrete pads and can be easily removed without damage to the structure or to the real property. Under the guidelines of P.L. 1993, c.251 (S-15) these structures are exempted under the single purpose agricultural or horticultural use criteria. As such, they must be a single use; must be for storage or growing of an agricultural or horticultural commodity; designed or constructed so as to be readily dismantled; and can be marketed or sold separately from the farmland buildings.

CLASS PF 157 STALL BARN



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**  
**BASE SPECIFICATIONS**

- |                     |  |                 |      |
|---------------------|--|-----------------|------|
| 1) Roof:            | Gable or Gambel, Average Quality Roofing, "Rigid" Insulation | 6) Floors:      | None |
| 2) Foundation:      | Treated Poles  | 7) Plumbing:    | None |
| 3) Exterior Walls:  | Steel, Two (2) Sliding Doors                                 | 8) Lighting:    | None |
| 4) Interior Finish: | None   | 9) Other Items: | None |
| 5) Height:          | 9-10 Ft.   |                 |      |

---

**BASE COST PER S/F**

|              |              |              |              |               |               |
|--------------|--------------|--------------|--------------|---------------|---------------|
| <u>1,000</u> | <u>2,500</u> | <u>5,000</u> | <u>7,500</u> | <u>10,000</u> | <u>15,000</u> |
| 11.03        | 8.06         | 7.14         | 6.81         | 6.42          | 6.24          |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

---

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-2

Adjustments to Base Specifications: This Section

CLASS PF 158 HORSE RIDING ARENAS



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**  
**BASE SPECIFICATIONS**

- |                     |   |                 |      |
|---------------------|---|-----------------|------|
| 1) Roof:            | Gable or Gambel, Average Quality Roofing, 1' "Rigid" Insulation | 6) Floors:      | None |
| 2) Foundation:      | Treated Poles   | 7) Plumbing:    | None |
| 3) Exterior Walls:  | Steel, Two (2) Sliding Doors, One (1) Entry Door                | 8) Lighting:    | None |
| 4) Interior Finish: | None  | 9) Other Items: | None |
| 5) Height:          | 15 Ft.  |                 |      |

**BASE COST PER S/F**

|              |              |               |               |               |
|--------------|--------------|---------------|---------------|---------------|
| <u>5,000</u> | <u>7,500</u> | <u>10,000</u> | <u>15,000</u> | <u>20,000</u> |
| 7.52         | 7.11         | 7.13          | 7.23          | 6.92          |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-2

Adjustments to Base Specifications: This Section

CLASS PF 159 HORSE TURN OUT SHEDS



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**  
**BASE SPECIFICATIONS**

- |                     |   |                 |      |
|---------------------|---|-----------------|------|
| 1) Roof:            | Gable, Average Quality Roofing, No Insulation | 6) Floors:      | None |
| 2) Foundation:      | Treated Poles                                 | 7) Plumbing:    | None |
| 3) Exterior Walls:  | Wood, One (1) Side Open                       | 8) Lighting:    | None |
| 4) Interior Finish: | Wood Kick Board Liner - 5 Ft High             | 9) Other Items: | None |
| 5) Height:          | 9 Ft.   |                 |      |

---

**BASE COST PER S/F**

|            |            |            |            |            |
|------------|------------|------------|------------|------------|
| <u>144</u> | <u>288</u> | <u>432</u> | <u>576</u> | <u>720</u> |
| 18.41      | 14.71      | 11.07      | 9.90       | 8.94       |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

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For Fully Enclosed Shed Add \$0.95/SF Wall Area

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-2

Adjustments to Base Specifications: This Section

CLASS PF 160 GENERAL PURPOSE/HAY BARNS



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**  
**BASE SPECIFICATIONS**

|                     |  |                 |      |
|---------------------|--|-----------------|------|
| 1) Roof:            | Gable, Average Quality Roofing,<br>Ridge Vent, Vented Overhang,<br>No Insulation | 5) Floors:      | None |
| 2) Foundation:      | Treated Poles  | 6) Plumbing:    | None |
| 3) Exterior Walls:  | Steel, One (1) Sliding Doors,<br>One (1) Entry Door                              | 7) Lighting:    | None |
| 4) Interior Finish: | None   | 8) Other Items: | None |

**BASE COST PER S/F**

| <u>SIDEWALL HT.</u> | <u>5.000</u> | <u>7.500</u> | <u>10.000</u> | <u>15.000</u> | <u>20.000</u> |
|---------------------|--------------|--------------|---------------|---------------|---------------|
| 16'                 | 6.73         | 6.52         | 5.99          | 6.09          | 5.80          |
| 20'                 | 7.58         | 7.25         | 6.65          | 6.72          | 6.39          |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-2

Adjustments to Base Specifications: This Section

CLASS PF 161 LIVESTOCK BARN WITH STORAGE



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**  
**BASE SPECIFICATIONS**

- |                     |  |                 |      |
|---------------------|--|-----------------|------|
| 1) Roof:            | Gambrel, Average Quality Roofing,<br>1' Rigid Insulation | 5) Floors:      | None |
| 2) Foundation:      | Treated Poles  | 6) Plumbing:    | None |
| 3) Exterior Walls:  | Steel, Two (2) Sliding Doors,<br>One (1) Entry Door      | 7) Lighting:    | None |
| 4) Interior Finish: | None   | 8) Other Items: | None |

**BASE COST PER S/F**

| <u>SIDEWALL HT.</u> | <u>2,500</u> | <u>5,000</u> | <u>7,500</u> | <u>10,000</u> | <u>15,000</u> | <u>20,000</u> |
|---------------------|--------------|--------------|--------------|---------------|---------------|---------------|
| 10'                 | 10.90        | 10.04        | 9.47         | 9.63          | 9.45          | 9.17          |
| 14'                 | 12.26        | 11.20        | 10.59        | 10.62         | 10.40         | 10.08         |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-2

Adjustments to Base Specifications: This Section

CLASS PF 162 POULTRY BARNs



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**  
**BASE SPECIFICATIONS**

|                     |  |                 |      |
|---------------------|--|-----------------|------|
| 1) Roof:            | Gable, Average Quality Roofing,<br>1' Rigid Insulation | 5) Floors:      | None |
| 2) Foundation:      | Masonry & Treated Poles                                | 6) Plumbing:    | None |
| 3) Exterior Walls:  | Steel, Two (2) Sliding Doors,<br>One (1) Entry Door    | 7) Lighting:    | None |
| 4) Interior Finish: | None   | 8) Other Items: | None |

**BASE COST PER S/F**

| <u>SIDEWALL HT.</u> | <u>2,500</u> | <u>5,000</u> | <u>7,500</u> | <u>10,000</u> | <u>15,000</u> | <u>20,000</u> |
|---------------------|--------------|--------------|--------------|---------------|---------------|---------------|
| 10'                 | 8.19         | 7.12         | 6.94         | 7.07          | 7.18          | 6.91          |
| 14'                 | 9.32         | 8.05         | 7.68         | 7.56          | 7.83          | 7.51          |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-2

Adjustments to Base Specifications: This Section

CLASS PF 163 POLE BARN



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**  
**BASE SPECIFICATIONS**

|                     |  |                 |      |
|---------------------|--|-----------------|------|
| 1) Roof:            | Gable, Average Quality Roofing,<br>No Insulation   | 5) Floors:      | None |
| 2) Foundation:      | Treated Poles                                      | 6) Plumbing:    | None |
| 3) Exterior Walls:  | Steel, One (1) Sliding Door,<br>One (1) Entry Door | 7) Lighting:    | None |
| 4) Interior Finish: | None   | 8) Other Items: | None |

**BASE COST PER S/F**

| <u>SIDEWALL HT.</u> | <u>1,000</u> | <u>2,500</u> | <u>5,000</u> | <u>7,500</u> | <u>10,000</u> | <u>15,000</u> | <u>20,000</u> |
|---------------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| 10'                 | 8.65         | 6.85         | 5.88         | 5.75         | 5.78          | 5.91          | 5.68          |
| 14'                 | 10.25        | 7.81         | 6.65         | 6.58         | 6.36          | 6.45          | 6.18          |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

**NOTES:**

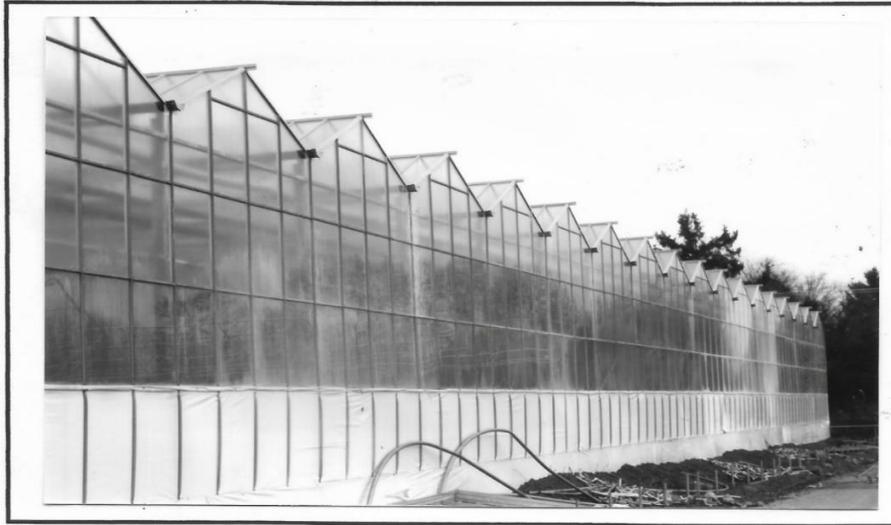
Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-2

Adjustments to Base Specifications: This Section

CLASS GH 164 GREEN HOUSES



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**  
**BASE SPECIFICATIONS**

- |                |   |              |                                    |
|----------------|---|--------------|------------------------------------|
| 1) Frame:      | Steel with Glass Walls and Roof<br>Not Readily De-mountable | 4) Floors:   | None                               |
| 2) Foundation: | Concrete/Masonry or Equivalent                              | 5) Plumbing: | Minimum Number of<br>Water Outlets |
| 3) Heating:    | See GH164-02 Series   | 6) Lighting: | Minimum Number of<br>Fixtures      |

**BASE COST PER S/F**

| <u>CLASS</u>           | <u>1,000</u> | <u>1,500</u> | <u>2,000</u> | <u>3,000</u> | <u>4,000</u> | <u>5,000</u> | <u>10,000</u> |
|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| GH164-01<br>(Unheated) | 27.09        | 22.57        | 20.33        | 18.05        | 16.95        | 16.24        | 14.90         |
| GH164-02<br>(Heated)   | 35.52        | 27.40        | 24.82        | 22.27        | 20.98        | 20.22        | 18.68         |

For Low Quality, multiply by .75

For High Quality, multiply by 1.25

**ADJUSTMENTS TO BASE PER SQUARE FOOT OF FLOOR AREA**

| <u>ITEM</u>                                 | <u>LOW</u> | <u>AVERAGE</u> | <u>HIGH</u> |
|---|------------|----------------|-------------|
| Wood Flooring                               | 2.60       | 5.07           | 7.78        |
| Concrete Flooring                           | 1.53       | 3.07           | 4.60        |
| Crushed Stone<br>(\$0.16/SF at 1 inch deep) | 0.16       | 0.16           | 0.16        |

**NOTES:**

Depreciation Schedules - section 150

For High Quality - Table D-III, Average Quality - Table D-II, Low Quality Table D-I

Cost Conversion Factors- Section 157 Table F-2

CLASS GH 0000 TEMPORARY SEED/GREEN HOUSES



**AVERAGE QUALITY MATERIALS AND WORKMANSHIP**  
**BASE SPECIFICATIONS**

- |                |   |            |                 |
|----------------|---|------------|-----------------|
| 1) Frame:      | De-Mountable Temporary Metal<br>or Wood Frame | 3) Floors: | None            |
| 2) Foundation: | None  | 4) Cover:  | Plastic Covered |

---

**These structures are not assessable for Real Property Taxation Purposes**

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Under Chapter 70 Laws of 1979 regarding seed starting plastic greenhouses and Chapter 251 Laws of 1993 pertaining to single purpose / use agriculture buildings, these buildings are not assessable locally. These protective coverings are designed or constructed to be readily dismantled. Included are the temporary de-mountable seed starting plastic greenhouses comprised of plastic covered framework of portable parts with no permanent under structures.

## AGRICULTURAL ADJUSTMENTS TO BASE

*For Low Quality multiply cost by 0.75  
For High Quality multiply cost by 1.25*

| <u>ID CODE</u> | <u>DOORS</u> | <u>AVERAGE</u> |
|----------------|--------------|----------------|
| PF1            | FULL DUTCH   | \$569          |
| PF2            | HALF DUTCH   | \$406          |
| PF3            | SLIDING      | \$722          |
| PF4            | ENTRY        | \$396          |
| PF5            | VENT         | \$378          |
| PF6            | OVERHEAD     | \$8.25/SF      |

| <u>ID CODE</u> | <u>FLOORS</u>           | <u>AVERAGE</u> |
|----------------|-------------------------|----------------|
|                | CONCRETE                |                |
| PF7            | 4 inches REINFORCED     | \$2.41/SF      |
| PF8            | 6 inches REINFORCED     | \$2.88/SF      |
| PF9            | STONE (per 1 inch deep) | \$0.16/SF      |

| <u>ID CODE</u> | <u>WINDOWS</u>      | <u>AVERAGE</u> |
|----------------|---------------------|----------------|
| PF10           | STANDARD            | \$170          |
| PF11           | WITH BAR PROTECTION | \$265          |

| <u>ID CODE</u> | <u>EQUESTRIAN EQUIPMENT</u> | <u>AVERAGE</u> |
|----------------|-----------------------------|----------------|
| PF12           | WASHROOM                    | \$1,233        |
| PF13           | TACK ROOM                   | \$1,492        |
| PF14           | FEED ROOM                   | \$1,492        |

**NOTE:** Cost based on an average size of 10 x 12

| <u>ID CODE</u> | <u>EQUESTRIAN STALL</u> | <u>AVERAGE</u> |
|----------------|-------------------------|----------------|
| PF15           | 10 x 10                 | \$993          |
| PF16           | 10 x 12                 | \$1,102        |
| PF17           | 12 x 12                 | \$1,224        |
| PF18           | STIRRUP GUARDS          | \$12.67/LF     |
| PF19           | SIDE WALL CURTAINS      | \$5.30/SF      |

| <u>ID CODE</u> | <u>LIGHTING</u>   | <u>AVERAGE</u> |
|----------------|-------------------|----------------|
| PF20           | TRANSLUCENT PANEL | \$1.03/SF      |
| PF21           | WALL or CEILING   | \$5.68/LF      |

| <u>ID CODE</u> | <u>ELECTRICAL</u> | <u>AVERAGE</u> |
|----------------|-------------------|----------------|
| PF22           | Per Outlet        | \$45           |
| PF23           | Service Panel     | \$300 - \$700  |

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| <u>ID CODE</u> | <u>PLUMBING</u>      | <u>AVERAGE</u> |
|----------------|----------------------|----------------|
| PF24           | COLD WATER TAP       | \$780          |
| PF25           | COLD & HOT WATER TAP | \$1,260        |
| PF26           | FLOOR DRAIN          | \$180          |
| PF27           | UTILITY TUB          | \$225          |

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| <u>ID CODE</u> | <u>HEATING</u>                                 |                        |
|----------------|--|------------------------|
| PF28           | SPACE HEAT,<br>MINIMUM INDUSTRIAL UNIT HEATERS | \$0.50 - \$1.25 PER SF |

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| <u>ID CODE</u> | <u>INSULATION</u>       | <u>AVERAGE</u> |
|----------------|-------------------------|----------------|
| PF29           | RIGID BOARD 1/2 inch    | \$0.72/SF      |
| PF30           | FIBERGLASS              | \$0.60/SF      |
| PF31           | 9 inch FIBERGLASS STEEL |                |
| PF32           | INTERIOR CEILING        | \$2.42/SF      |

---

| <u>ID CODE</u> | <u>MISCELLANEOUS ITEMS</u>                                 | <u>AVERAGE</u> |
|----------------|--|----------------|
| PF33           | STORAGE LOFTS  | \$3.05/SF      |
| PF34           | ROOF SHINGLES (standard 25 years)                          | \$1.05/SF      |
| PF35           | <u>DEDUCT FOR MISSING WALL</u><br>COST PER SF OF WALL AREA | \$0.95/SF      |

| <u>ID CODE</u> | <u>EXTERIOR SIDING (Per SF of Wall Area)</u> | <u>AVERAGE</u> |
|----------------|--|----------------|
| PF36           | T-111 SIDING or EQUIVALENT                   | \$0.90/SF      |
| PF37           | CEDAR SIDING or EQUIVALENT                   | \$2.26/SF      |
| PF38           | WHITE PINE SIDING or EQUIVALENT              | \$1.75/SF      |

| <u>ID CODE</u> | <u>INTERIOR OFFICE FINISH</u> | <u>AVERAGE</u> |
|----------------|-------------------------------|----------------|
| PF39           | AVERAGE QUALITY               | \$11.99/SF     |

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## **An introduction to estimating the replacement cost of an existing Livestock Barn, Class 151**

The purpose of this demonstration appraisal is to review the cost valuation techniques applicable to the assessment of older type farm buildings that an assessor encounters in reassessment programs. The scope of this report is limited to the cost approach for building replacement value using the original type specifications provided in this handbook.

The steps in the cost approach to the building value are as follows:

- 
- ◇ Estimate the replacement cost new of the improvements using the Class 151 cost specifications.
  - ◇ Estimate functional depreciation by comparing the replacement cost of the original building to the cost of the alternate structure derived through the PF 161 series buildings. The difference between the replacement cost and the substitution cost from the PF series building is the functional depreciation attributable to the dairy barn.
  - ◇ Deduct the functional depreciation from the new replacement cost calculated for the Class 151 building.
  - ◇ Estimate depreciation from all sources, physical, economic and deduct all accrued depreciation from the improvements to arrive at a present-day depreciated cost.
- 

The first step listed above (Estimate Reproduction Cost New of the Improvements) is of major concern in this report. This cost is done in a detailed manner to promote an understanding of the Appraisal Manual and demonstrate its uniform application throughout New Jersey.

Class 151 includes all farm buildings having a structural frame of wood with exterior wall of wood and/or concrete block or wood on frame or equivalent. Buildings in this class have a masonry foundation or equal with a concrete slab as the floor.

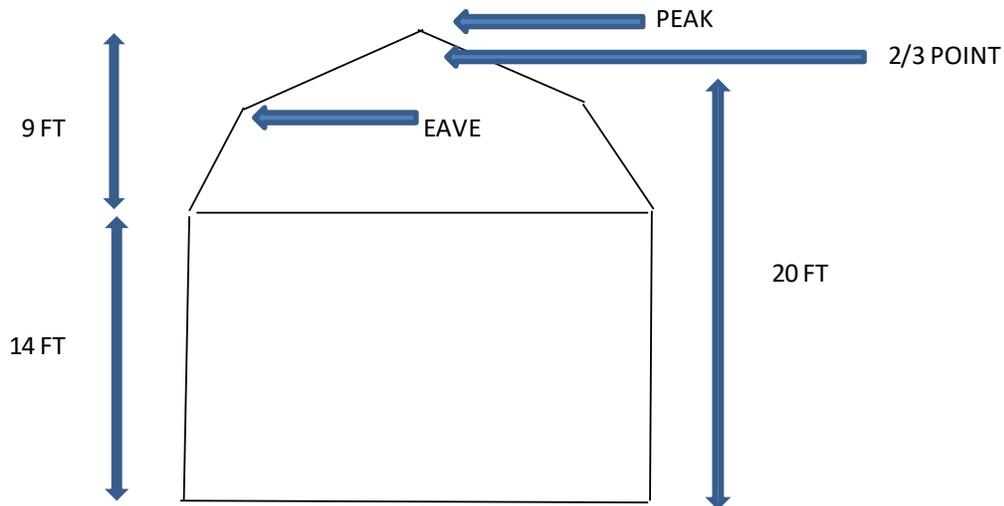
The base specifications for this demonstration of a Class 151 are found in the Farm Building Section of the Real Property Appraisal Manual.

For purposes of this demonstration the cost conversion factor of 4.79 for farm buildings series 150 through 156 is found on the 2012 cost conversion table.

## Procedure for a Livestock Building Appraisal

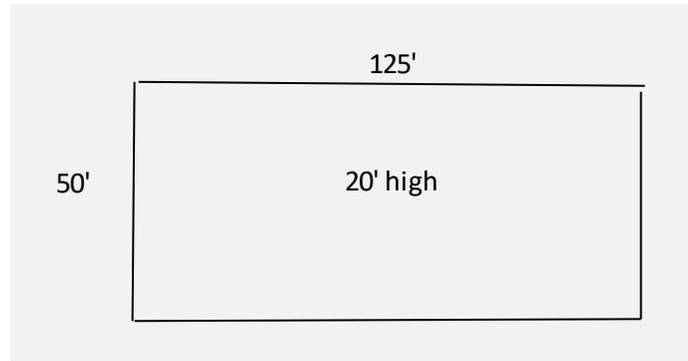
The base area replacement cost given for this Class 151 is determined in the following manner:

- 1) Measure and calculate the square footage of ground area.
- 2) Establish the standard height factor to be used. In this type of livestock barn with storage and a gambrel roof, the unit cost is based on cubic foot calculations with or without a loft. The building height is determined through the following procedure. The height component is calculated by adding the side wall elevation with two thirds (2/3) of the roof height from the eaves to the roof peak.



For the subject building the width of 50 X 125 of length = 6,250 square feet of floor area. Using a height factor of twenty (20) feet (14' (wall) + 6' (roof)) multiplied by the ground area results in a building volume of 125,000 cubic feet. Note: See step #5

- 3) Sketch the building dimensions using a floor view and noting the height profile. Clearly label all the dimensions to ensure accuracy in the area calculations.



- 3) In the note section of the property record card describe the structure, list the building materials, quality of construction, the year built, the observed physical condition and all relevant information that may affect its value.

| NOTES:   |
|--|
| Livestock Barn<br>Wood Frame, Gambrel Roof, Wood Siding,<br>Cement Floor, Unfinished Storage Loft<br>5 Water Outlets, Minimum Electric<br>Built 1943, Normal Condition |

5) Using the building dimensions derived from the example, calculate the building area, and apply the unit costs, quality factors and cost conversion factor to arrive at the RCN (Replacement Cost New) value of \$479,000. In this demonstration physical curable and incurable depreciation is estimated by using the AGE / LIFE method. The structure is 40 years old, in average condition and has a typical economic life of 60 years.

$$50' \times 125' \times 20' = 125,000 \text{ Cubic feet}$$

$$125,000 \times \$ .80 = \$100,000$$

$$\$100,000 \times 4.79 \text{ (2012 CCF)} = \$479,000$$

$$40 \text{ years actual} \div 60 \text{ years economic} = 67\% \text{ physical depreciation}$$

$$\text{Replacement Cost New } (\$479,000) \times .67 = \$320,930 \text{ physical depreciation}$$

|                            |                    |
|----------------------------|--------------------|
| Replacement Cost New       | \$479,000          |
| Less physical depreciation | <u>- \$320,930</u> |
| RCNLD                      | \$158,070          |

6) Functional obsolescence in the subject property was extracted by comparing the cost new of a traditional 151 livestock barn to a PF series 161. As defined functional obsolescence is an element of accrued depreciation: a defect caused by a flaw in the structure, material, or design of the building. The subject building costs out new at \$479,000 in contrast to a PF series of \$86,099. This change in design, building techniques and construction materials reflects the 70% adjustment made for functional depreciation. As per the following example a basic PF 161 livestock barn of 50' X 125' was modified with the additions to base specifications to reflect current day replacement structure for the traditional class 151 building.

|                                  |               |
|----------------------------------|---------------|
| PF 161 cost (14 ft. high):       |               |
| Base Cost 6250 x \$10.59 =       | \$66,187      |
| Additions:                       |               |
| 4" Concrete Floor 625 x \$2.41 = | \$15,062      |
| Plumbing Fixtures 5 x \$780 =    | \$ 3,900      |
| Lights and Outlets 10 x \$45 =   | \$ 450        |
| Electric Panel 1 x \$500         | <u>\$ 500</u> |
| RCNLD                            | \$86,099      |
| 2012 Cost Conversion Factor      | <u>x 1.65</u> |
|                                  | \$142,063     |

|                                   |                    |
|-----------------------------------|--------------------|
| Class 151 Reproduction cost new   | \$479,000          |
| Class PF 161 Replacement cost new | <u>- \$142,063</u> |
|                                   | \$336,937          |

$$\$336,937 \div \$479,000 = 70\% \text{ functional obsolescence}$$

$$\text{RCNLD } \$158,070 \times .70 = \$110,649 \text{ Deduction for functional obsolescence}$$

7) In the subject demonstration a 15% adjustment was made for economic obsolescence. Economic obsolescence as defined is an element of accrued depreciation; an incurable defect caused by negative influences outside the property itself. When an Assessor can measure and justify an adjustment for loss in value due to external conditions, then a factor for economic obsolescence is warranted. For example, the decline in demand for dairy barns due to the general diminution of dairy farms in New Jersey was reflected in the above adjustment of economic obsolescence.

$$\$110,649 \times .85 = \$94,051.65 \text{ or } \$94,052 \text{ Final Cost Value}$$

## **145. Valuation of Green Buildings**

Green buildings are buildings with high performance energy systems, create led of a carbon footprint, may be built using recycled materials and are environmentally friendly. They are often made using modular construction and utilize geothermal systems, solar panels, and the like. The Appraisal Institute has information on these buildings for valuation purposes.

A structure is rated green using the LEED point system and involves testing the equipment to verify that it is performing according to the design intent. Items that need to be commissioned include, HVAC, electrical. Plumbing and renewable energy. Design review is done at this time, particularly looking at exterior enclosures. The project must also have an operations and maintenance plan to keep the building running efficiently.

Interesting facts:

The Bullitt Centre, Seattle, Washington is one of the greatest commercial buildings in the entire world. It derives 100% of its power from renewable energy.

The Empire State Building, New York City, New York was renovated in 2011. \$550 million was put into the renovations, including all 6,514 of its glass windows, to make it greener. In 2011 it earned an LEED Gold Certification. Energy uses and expenses save about 4.4 million annually and within the next 10 years will reduce its carbon footprint by over 100,000 tons.

## **146. Billboard Specifications and Cost Section**

This section contains the specifications and cost values for Billboard structures Class 201 to 207. These costs are based upon material and labor costs prevailing in New Jersey as of October 2005. Cost Conversion Factors for any year other than 2005, must be applied to convert to another Base Year. These factors are published yearly and are found on the Division of Taxation website at:

[http://www.state.nj.us/treasury/taxation/lpt/building\\_replace\\_cost.shtml](http://www.state.nj.us/treasury/taxation/lpt/building_replace_cost.shtml)

**REPORTING THE VALUE OF BILLBOARD STRUCTURES NJ PROPERTY TAX SYSTEM**

Beginning with the 2005 Tax Year, billboards structures should be listed as separate line items on the tax list. The line item needs to be referenced to the same and block lot as the land on which the billboard structure is attached.

To facilitate the identification of billboards and record the value of the billboard structures, the NJ Property Tax System has added a qualification code to identify billboard structures. The new qualification code is:

|                     |              |   |
|---------------------|--------------|---|
| <b>3 characters</b> | <b>Alpha</b> | <b>Numeric</b>  |
| <b>BNN</b>          | <b>B</b>     | <b>(NN) 0 through 99</b>  |
|                     |              | to accommodate more than one billboard structure on a Block and Lot |

**The three characters are mandatory in the Qualification Code.**

For identification purposes, billboards should be identified by the block and lot numbers assigned to the land on which the billboard is located and the qualification code "B" followed by the numeric 01, 02, 03 etc.

Qualification Code for one billboard would be B01. The assessment is reported as an improvement value only.

(The qualification code "BNN" is to be added to each block and lot, in the same fashion as "QFARM" is used to identify qualified farmland).

Reporting billboard structures requires the assessor to: ESTABLISH A NEW LINE ITEM with the block and lot and the qualification code: "BNN".

Mandatory Field to Establish a New Line Item for a Billboard Structure:

| <b>Field Name</b>     | <b>Field Description</b>   | <b>Property</b> |
|-----------------------|--|-----------------|
| Identification        | Block, Lot, and Qualification Code "BNN"   |                 |
| Building Description  | Construction Class from the Appraisal Manual   |                 |
| Additional Lot        | Name of Billboard Company and Permit Number  |                 |
| Property Class        | 4A   |                 |
| Owner                 | The billboard structure should be assessed to the owner of record * of the block and lot upon which it is located. |                 |
| Mailing Address       |  |                 |
| City, State, Zip Code | * A billboard on exempt public property may be subject to assessment and treatment as a leasehold.                 |                 |
| Property Location     | same as mother lot   |                 |
| Land Value            | "0" (zero)   |                 |
| Improvement Value     | Value of Billboard Structure   |                 |
| Net Taxable Value     | Value of Billboard Structure   |                 |

## ASSESSMENT OF BILLBOARDS

### **BILLBOARDS ARE DEFINED AS REAL PROPERTY**

The passing of Chapter 42, Public Laws of 2004 classifies billboards as real property, "An outdoor advertising sign, required to be permitted pursuant to the "Roadside Sign Control and Outdoor Advertising Act" PL 1991 C 413 (C.27:5-5 et seq), its other constituent parts, and the foundation, if any, to which the supporting structure is attached are deemed to be real property."

In accordance with the New Jersey Constitution, billboards, which are now defined as real property, are to be assessed at the "same standard of value" as all real property (constitutional exception of qualified farmland). Billboards may be taxable or exempt in accordance with preexisting state law.

### **BILLBOARDS VERSUS ON-PREMISE SIGNS**

The key to determining if a billboard is assessable (*under C 42 PL 2004*) is whether the sign is subject to the permit process administered by the NJ Department of Transportation. While billboards are by definition "off-premise outdoor advertising signs" which advertise a business, product, or activity at another site or location, a billboard will occasionally provide advertisement for an on-site business or product. In contrast, an on-site sign is not required to have a permit issued by the NJ Department of Transportation and the sign always advertises a business or activity occurring on the same site or location as the sign. Off-site advertising structures are required to have a permit issued by the New Jersey Department of Transportation. A record of outdoor advertising permits is available from the Outdoor Advertising Section, Department of Transportation.

### **AN INTRODUCTION TO BILLBOARDS**

An outdoor advertising sign in the form of a billboard consists of at least one display panel (face) and supporting framework. Billboards may be freestanding, mounted to buildings, or attached to other structures. Billboards are either static display or digital display. Modern billboards conform to engineering standards and are constructed of steel, while older billboard structures are made of wood or angle iron frames. A billboard may be smaller than the permitted size. This allows for the legal addition of a cutout or extension within the square foot envelope of the permitted area. Billboards vary in display position and size, but the industry standard display faces include:

#### Static Display

|                     |          |                   |            |
|---------------------|----------|-------------------|------------|
| 12 feet x 25 feet   | (300 SF) | 14 feet X 48 feet | (672 SF)   |
| 10.5 feet X 36 feet | (378 SF) | 16 feet X 60 feet | (960 SF)   |
| 12 feet X 40 feet   | (480 SF) | 20 feet X 50 feet | (1,000 SF) |

#### Digital Display

|                              |          |
|------------------------------|----------|
| 10 feet x 21 feet (viewable) | (210 SF) |
| 10 feet x 36 feet (viewable) | (360 SF) |
| 12 feet x 42 feet (viewable) | (504 SF) |
| 13 feet x 47 feet (viewable) | (611 SF) |

For both static and digital displays, typical arrangements of display faces include: single face, back-to-back or V-build, side-by-side, stacked, and tri-build configurations.

Billboard companies enter into sales contracts for advertising space on their billboards. Advertisements are designed and/or produced by a billboard company or an advertising agency in response to client specifications. Advertising space is often marketed for a group of billboards rather than for a single billboard. Group sales are called "showings." Showings are based on demographic information and are designed to target a market with a specified level of advertising exposure. The advertising client has no interest in the real property. Billboard sites are typically leased from an unrelated third party who owns the land or structure to which the billboard is affixed. The owner of the site generally has no interest in the billboard structure. A billboard site, the land or structure upon which a billboard is situated, is generally limited to an area large enough to accommodate the billboard structure, foundation and provide for service and maintenance. The "line of sight" is a consideration in viewing a billboard location.

## **VALUING BILLBOARD STRUCTURES**

As with the appraisal of other real property for local property tax purposes, the three accepted approaches to value (income, sales comparison, and replacement cost less depreciation) are applicable to the valuation of billboard structures.

The market or sales comparison approach requires verifiable accurate sales information of individual billboards. Outdoor advertising structures are generally sold in bulk and the transfers include ongoing concern and host agreements. These transfers typically are not recorded on filed deeds; therefore, it may be difficult to obtain information on the sale of billboards. When information becomes available, an allocation of the sales price for billboard structures may be necessary.

The income approach requires net operating income/economic rent to be capitalized into a value for a specific property. While the rental income from a ground lease may be capitalized into a value, the income realized from the sale of advertising space is business income that is subject to other taxes in New Jersey. If the income approach is used, economic rent must be applied. Therefore, careful consideration and accurate income analysis must be made or the income approach will not yield reliable results.

The cost approach provides an efficient methodology to uniformly value billboard structures. The replacement cost less depreciation avoids the complicated allocation process and other issues associated with the income and market approaches. The cost approach may be applied uniformly and it is suitable for computer assisted mass appraisal (CAMA) applications. The data contained in this manual is based on information extracted from material costs, labor, and other integral components of billboard construction. Digital displays have a much shorter life than static displays, having an effective life of eight (8) years. Digital displays suffer from early physical deterioration as display clarity and brightness diminish, requiring replacement after eight years of operation. Effective age depreciation tables are provided to assist assessors in estimating loss in value due to age, elements and wear affecting the value of outdoor advertising signs.

## **LIMITING CONDITIONS WHEN VALUING BILLBOARDS**

The total assessed value for an improved property in New Jersey is displayed as two components: a land assessment and an improvement assessment. The legislation that determined that billboards are real property placed a limiting condition on valuation of a billboard site. If the site is already classified as qualified farmland, the value must remain as qualified farmland. In order to have uniform reporting of billboard values, all billboard improvement values will be reported separately from the land (site) value.

Location must be considered in assessing billboard sites. The impact of location on the income that a particular billboard location generates may be considered. This impact results from the "traffic count" or "exposure" that a particular location provides. Although a higher traffic count has little to do with the value of a billboard structure, the location may impact on land value. In assessing billboard property, any value attributable to location must be assigned to the land and not to the billboard improvement.

The billboard permit required by Department of Transportation is an intangible asset that is necessary for the beneficial and productive use of billboard property. However, this use permit is an intangible asset, which is not assessable as real property. Any value attributable to the use permit and sale of advertising should not be included in the assessed value of the billboard property.

## **DEFINING AND CLASSIFYING BILLBOARD STRUCTURES FOR ASSESSMENT PURPOSES**

For assessment purposes, billboards are grouped into five structural categories based on the building materials used and the underlying support system. The five categories include wood, steel frame, multi-mast steel, monopole, and building/roof mount.

At a minimum each billboard includes the following:

### **CLASS 201 WOOD STRUCTURE**

This class of billboards is constructed with wood post or pole supports with dimensional lumber as the secondary support (A frame) with a wood or metal catwalk and a single display panel. Supports may be imbedded in the ground. There may be a foundation of concrete or gravel. Lighting, if present, is either fluorescent or mercury vapor.

### **CLASS 202 STEEL A-FRAME STRUCTURE**

This class of billboards is constructed with angle iron or steel supports with metal framing, catwalk, and a single display panel. Supports may be imbedded in the ground. There may be a foundation of concrete or gravel. Lighting, if present, is either fluorescent or mercury vapor.

### **CLASS 203 MULTI-MAST STRUCTURE**

This class of billboards is constructed with steel pole, I beam or equivalent as primary support, with a catwalk, and a single display panel. Lighting is fluorescent or mercury vapor.

### **CLASS 204 MONOPOLE**

This class of billboards is constructed with tubular steel support (of various circumferences), tubular steel framing, metal catwalk and a single display panel. The foundation is concrete. Lighting is florescent or mercury vapor.

### **CLASS 205 ROOF/FASCIA MOUNTED**

This class of billboards is non-pole mounted. The display panel is mounted with roof and/or fascia mounting brackets. Lighting is fluorescent or mercury vapor.

### **CLASS 206 MONOPOLE DIGITAL**

This class of billboards is constructed with tubular steel support (of various circumferences), tubular steel framing, metal catwalk and a single digital display panel. The foundation is concrete. Lighting is florescent or mercury vapor.

### **CLASS 207 ROOF/FASCIA MOUNTED DIGITAL**

This class of billboards is non-pole mounted. The digital display panel is mounted with roof and/or fascia mounting brackets. Lighting is fluorescent or mercury vapor.

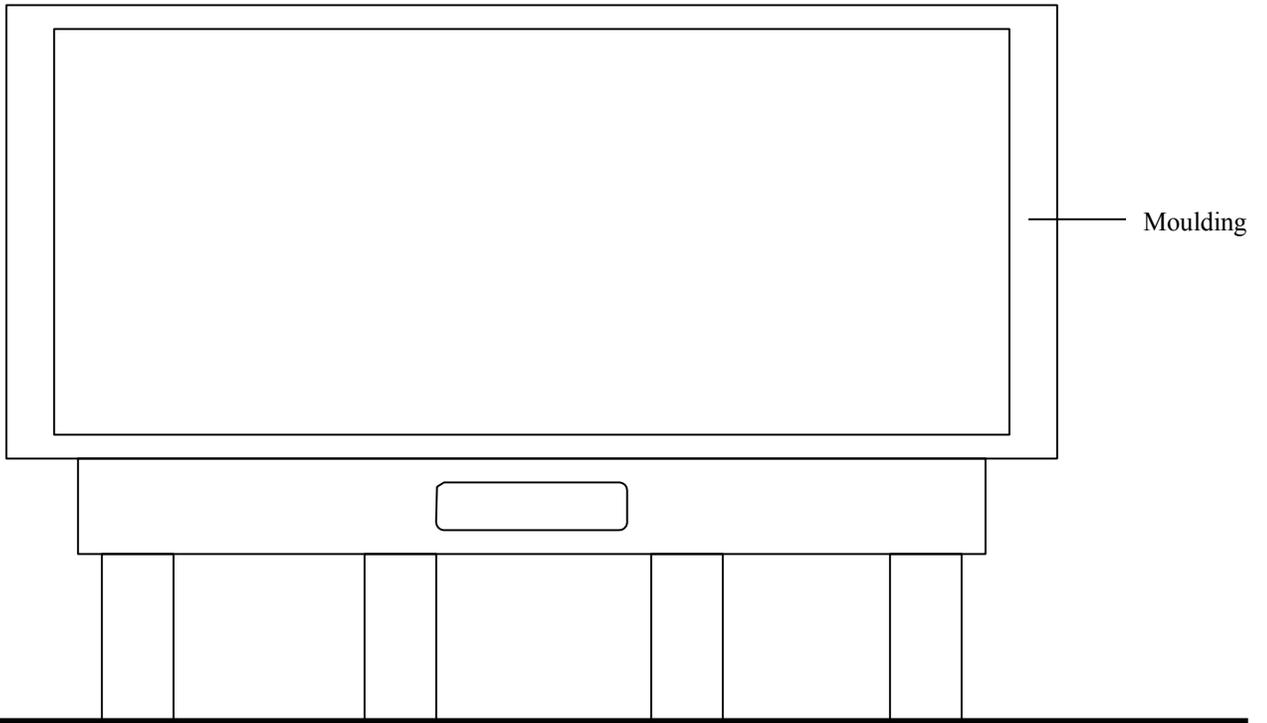
## **BILLBOARD DESIGNS AND CONSTRUCTION COSTS**

The following pages \* contain diagrams of various billboard designs, layouts and construction types along with base costs, photographs, class specifications, adjustments to base costs, and depreciation schedules. Also included are a sample data collection sheet and a cost calculation work sheet. The cost factors are based on information as of October 1, 2004 for use in the 2005 tax year. Municipalities with base years other than 2005 need to apply the Director's Ratio to adjust values to the date of their last reassessment or revaluation.

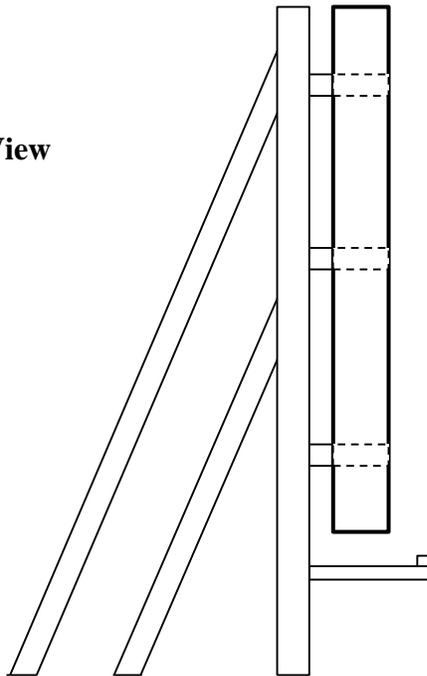
### **\*WORKS CITED**

"Guidelines for the Assessment of Billboard Properties." State of California, Board of Equalization: 2002.  
International Association of Assessing Officers. "The Valuation of Outdoor Advertising Structures." *Assessment Digest*, Volume 13, Number 4, 1991  
Seelhorst, Glenn R. *Land Use and Leasing Issues*: 2004  
State of New York, Office of Real Property Services. *Assessor's Manual*: 2003  
State of North Carolina, Department of Revenue. *Billboard Structures Valuation Guide*: 1999, Rpt. 2003.  
State of Washington, Department of Revenue. "Personal Property Valuation Schedules." 1999  
Wright, Jeffrey and Paul Wright. *Billboard Appraisal: The Valuation of Off-Premise Advertising Signs*. United States of America, 2001

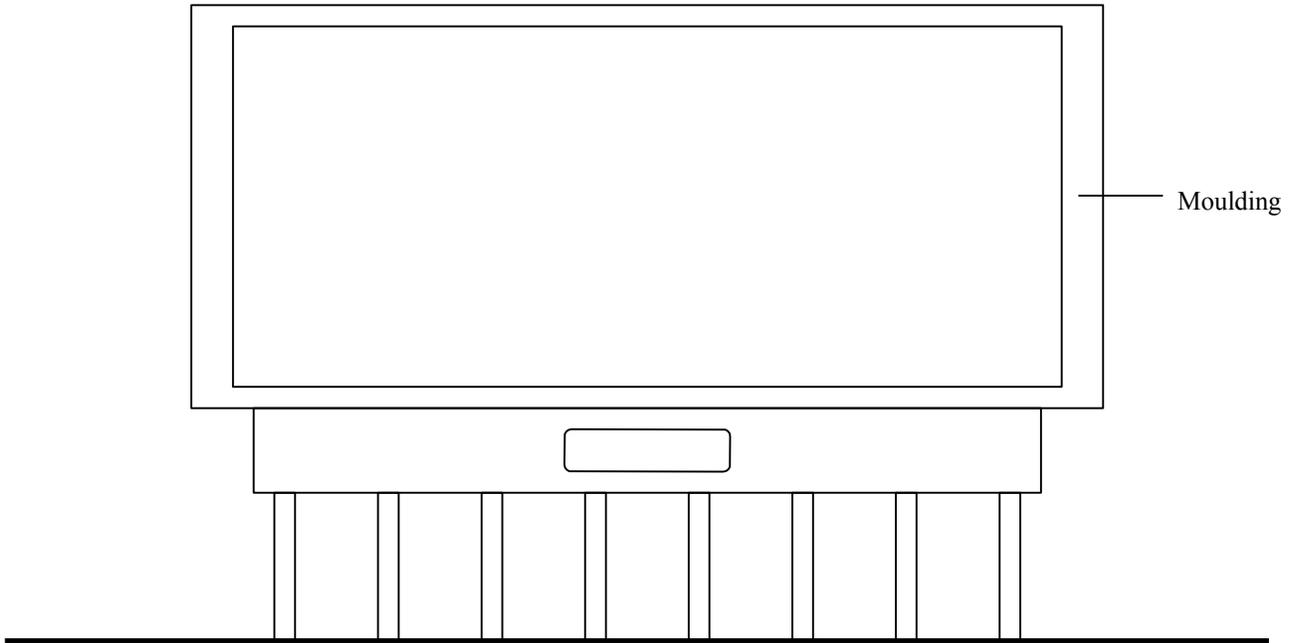
## Illustrations of Wooden Billboards



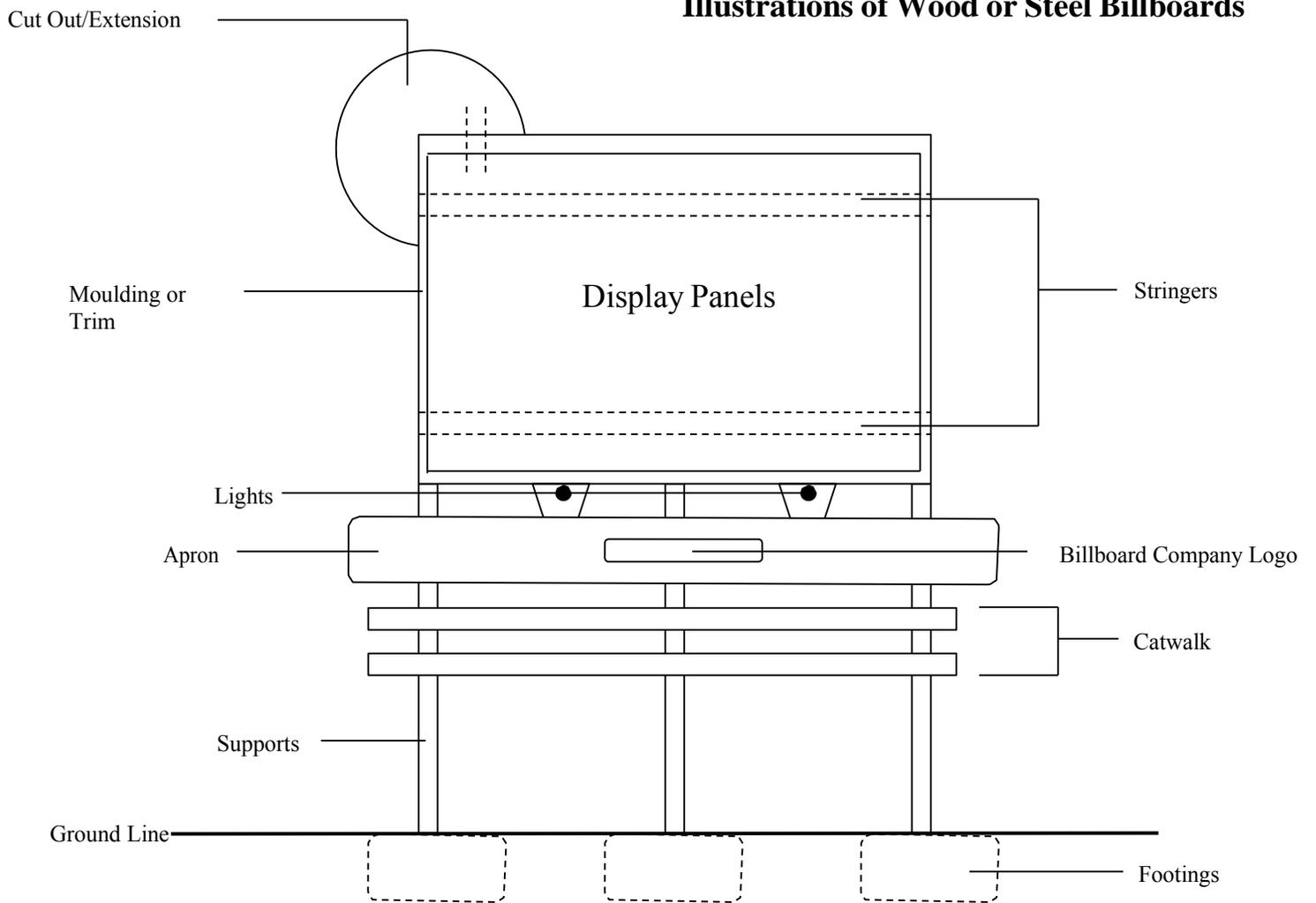
**Wooden Billboard Side View**



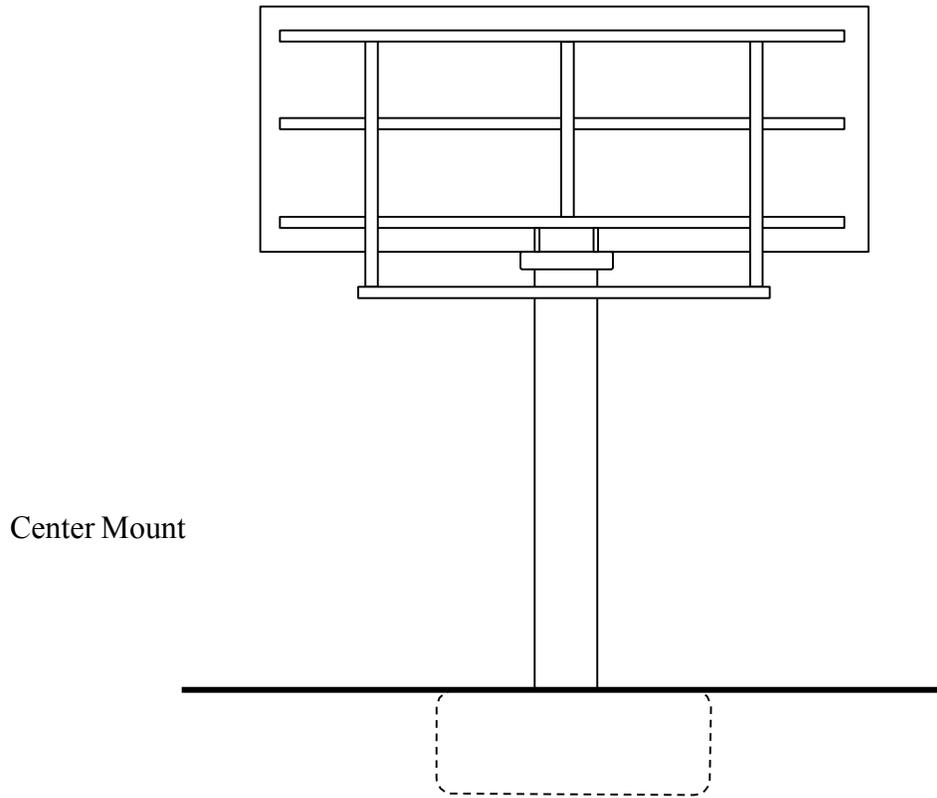
## Illustrations of Steel Billboard



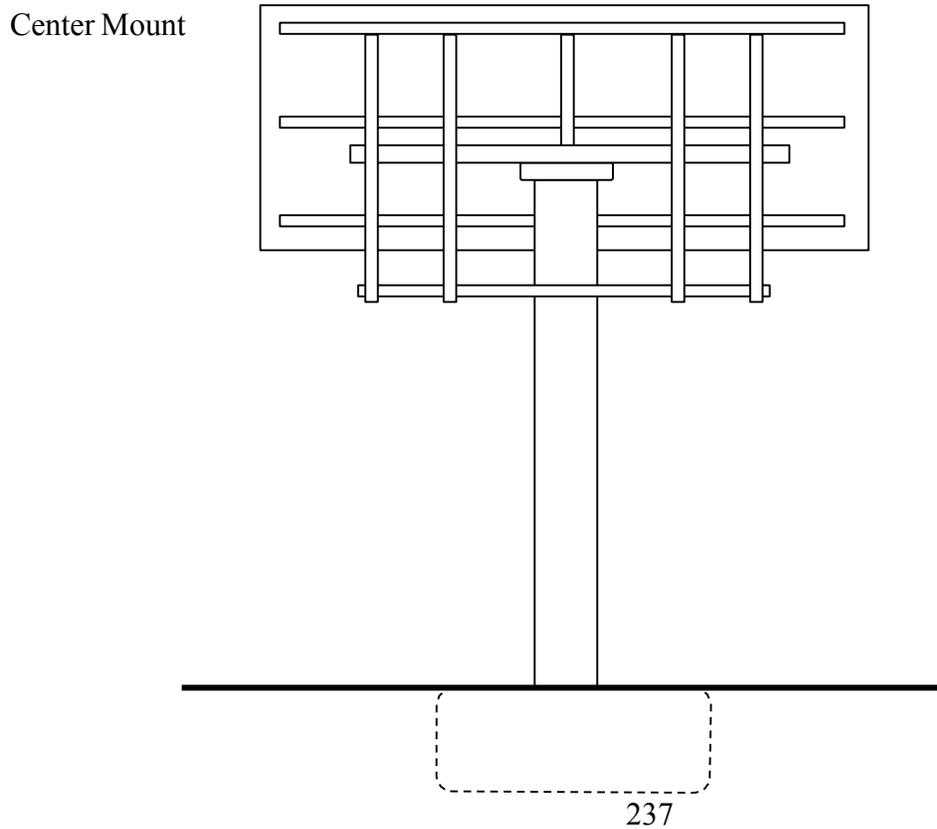
## Illustrations of Wood or Steel Billboards



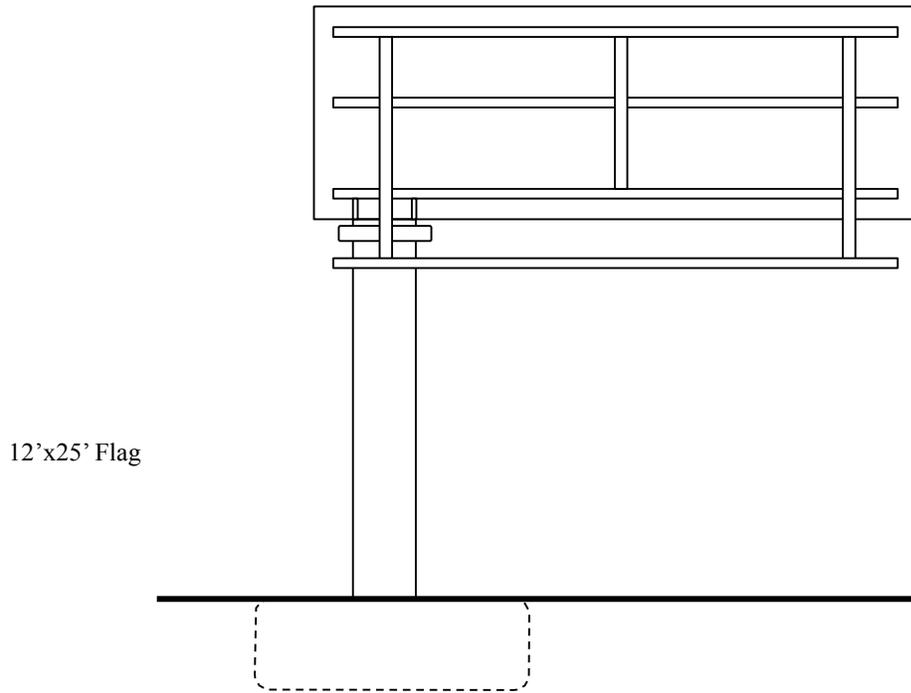
## Illustrations of Monopole Billboard Construction



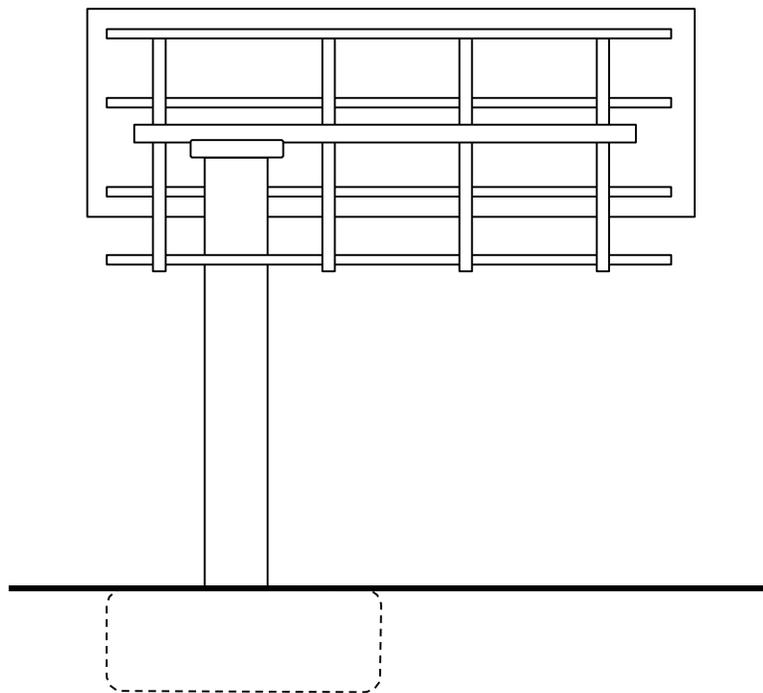
## Illustrations of Monopole Billboard Construction Back View



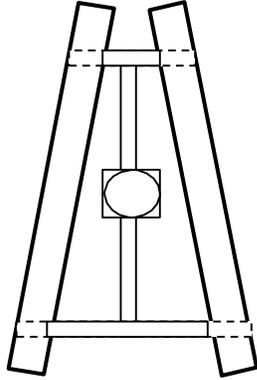
## Illustrations of Monopole Billboard Construction



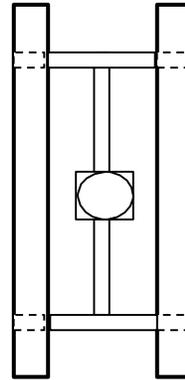
## Illustrations of Monopole Billboard Construction Back View



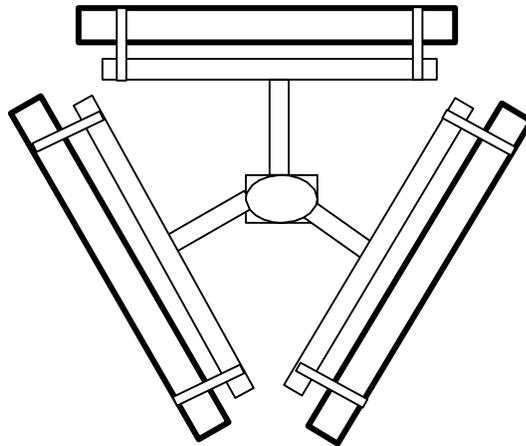
# Illustrations of Monopole Billboard Construction Top view



The V Face



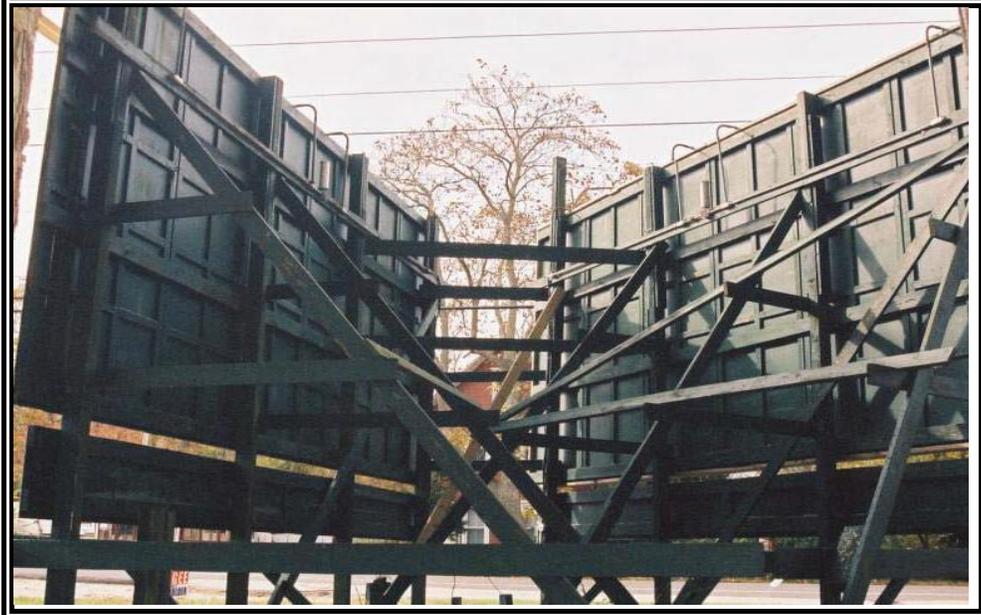
Double Face



12'x25' Triangle

*Class 201 Wood Structure Billboards*

*Class 201 Wood Structure Billboards*



**CLASS 201 WOOD STRUCTURE BILLBOARDS**

**BASE SPECIFICATIONS FOR CLASS**

- |  |  |
|--|--|
| 1. STRUCTURE - Wood support post or poles.       | 5. APRON - Included in Base  |
| 2. FOUNDATION – embedded in ground or equivalent | 6. LIGHTING - Included in Base   |
| 3. PLATFORM OR CATWALK - Included in Base        | 7. ADDITIONAL PANELS - None<br>For additional panels see Adjustments to Base |
| 4. PANELS - Included in Base.                    | 8. OTHER ITEMS - None  |

**BASE COST PER SQUARE FOOT OF SIGN AREA**

| Sq. Ft. Area | <u>SINGLE FACE</u> |
|--------------|--------------------|
| 300          | \$ 25.50           |
| 378          | \$ 23.80           |
| 480          | \$ 23.43           |
| 672          | \$ 22.76           |
| 960          | ****               |
| 1000+        | ****               |

**ADJUSTMENTS TO BASE COSTS**

**ADDITIONAL DISPLAY PANELS:**

Due to structural nature of wood billboards, when valuing side by side, V built, or back to back the cost should be double that of a single face billboard.

**LIGHTING: (per fixture)**

**AVERAGE**

**\$545.00**

NOTE: Depreciation Schedules for Billboards – 20 year wood

## Class 202 Steel (A Frame) Structure Billboards

# Class 202 Steel (A Frame) Structure Billboards



**CLASS 202 STEEL (A FRAME) STRUCTURE BILLBOARDS**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| <p>1. STRUCTURE - Steel, angle iron or equivalent as primary support.</p> <p>2. FOUNDATION – embedded in ground or equivalent</p> <p>3. PLATFORM OR CATWALK - Included in Base</p> <p>4. PANELS - Included in Base.</p> | <p>5. APRON - Included in Base</p> <p>6. LIGHTING - Included in Base</p> <p>7. ADDITIONAL PANELS - None<br/>For additional panels see Adjustments to Base</p> <p>8. OTHER ITEMS - None</p> |
|---|--|

**BASE COST PER SQUARE FOOT OF SIGN AREA**

| Sq. Ft. Area | <u>SINGLE FACE</u> | <u>BACK/BACK</u> | <u>SIDE X SIDE</u> | <u>V - BUILT</u> |
|--------------|--------------------|------------------|--------------------|------------------|
| 300          | \$ 46.50           | \$ 63.00         | * SEE              | * SEE            |
| 378          | \$ 44.04           | \$ 61.90         | COMMENTS           | COMMENTS         |
| 480          | ****               | ****             |                    |                  |
| 672          | ****               | ****             |                    |                  |
| 960          | ****               | ****             |                    |                  |
| 1000+        | ****               | ****             |                    |                  |

**ADJUSTMENTS TO BASE COSTS**

**ADDITIONAL DISPLAY PANELS**

Due to structural nature of both the Side by Side and V - Built billboards, when valuing the cost should be double that of a single face billboard.

**LIGHTING: (per fixture)**

**AVERAGE**

**\$545.00**

NOTE: Depreciation Schedules for Billboards – 40 year steel

*Class 203 Steel (Multi Mast) Structure Billboards*

**Class 203 Steel (Multi Mast) Structure Billboards**



**CLASS 203 STEEL (Multi mast) STRUCTURE BILLBOARDS**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| <p>1. STRUCTURE - Steel pole, I beam or equivalent as primary support.</p> <p>2. FOUNDATION – Cement/Gravel or equivalent</p> <p>3. PLATFORM OR CATWALK - Included in Base</p> <p>4. PANELS - Included In Base.</p> | <p>5. APRON - Included in Base</p> <p>6. LIGHTING - Included in Base</p> <p>7. ADDITIONAL PANELS - None<br/>For additional panels see Adjustments to Base</p> <p>8. OTHER ITEMS - None</p> |
|---|--|

**BASE COST PER SQUARE FOOT OF SIGN AREA**

| <b>25 FT. HEIGHT</b> |                    |                  |                    |                  |
|----------------------|--------------------|------------------|--------------------|------------------|
| Sq. Ft. Area         | <u>SINGLE FACE</u> | <u>BACK/BACK</u> | <u>SIDE X SIDE</u> | <u>V - BUILT</u> |
| 300                  | \$ 46.50           | \$ 63.00         | * SEE              | * SEE            |
| 378                  | \$ 44.04           | \$ 61.90         | COMMENTS           | COMMENTS         |
| 480                  | \$ 40.31           | ****             |                    |                  |
| 672                  | \$ 34.15           | ****             |                    |                  |
| 960                  | ****               | ****             |                    |                  |
| 1000+                | ****               | ****             |                    |                  |
| <b>40 FT. HEIGHT</b> |                    |                  |                    |                  |
| Sq. Ft. Area         | <u>SINGLE FACE</u> | <u>BACK/BACK</u> | <u>SIDE X SIDE</u> | <u>V - BUILT</u> |
| 300                  | \$ 51.67           | \$ 75.00         | * SEE              | * SEE            |
| 378                  | \$ 48.94           | \$ 71.42         | COMMENTS           | COMMENTS         |
| 480                  | \$ 44.79           | \$ 63.75         |                    |                  |
| 672                  | \$ 37.95           | \$ 53.57         |                    |                  |
| 960                  | ****               | ****             |                    |                  |
| 1000+                | ****               | ****             |                    |                  |

**ADJUSTMENTS TO BASE COSTS**

**ADDITIONAL DISPLAY PANELS**

Due to structural nature of both the Side by Side and V - Built billboard, when valuing the cost should be double that of a single face billboard.

**LIGHTING (per fixture)**

**AVERAGE**

\$545.00

NOTE: Depreciation Schedules for Billboards – 40 year steel

Class 204 Monopole Structure Billboards



**CLASS 204 MONOPOLE STRUCTURE BILLBOARDS**

**BASE SPECIFICATIONS FOR CLASS**

- |  |  |
|--|--|
| 1. STRUCTURE - Tubular steel supports.       | 5. APRON - Included in Base              |
| 2. FOUNDATION – Poured concrete.             | 6.LIGHTING - Included in Base            |
| 3. PLATFORM OR CATWALK - Included<br>in Base | 7. ADDITIONAL PANELS - Included in Base. |
| 4.PANELS - Included in Base.                 | 8. OTHER ITEMS - None                    |

**BASE COST PER SQUARE FOOT OF SIGN AREA (40 ft. HIGH)**

| Sq. Ft.<br>Area | <u>SINGLE PANEL</u> | <u>V - BUILT &amp; BACK TO BACK</u> | <u>TRI - BUILT</u> |
|-----------------|---------------------|-------------------------------------|--------------------|
| 300             | \$ 60.00            | \$ 78.00                            | \$ 147.32          |
| 378             | \$ 57.14            | \$ 67.38                            | \$ 147.32          |
| 480             | \$ 57.19            | \$ 66.56                            | \$ 147.32          |
| 672             | \$ 79.69            | \$ 86.12                            | \$ 147.32          |
| 960             | \$ 64.69            | \$ 69.38                            | \$ 147.32          |
| 1000+           | \$ 67.50            | \$ 72.00                            | \$ 147.32          |

**ADJUSTMENTS TO BASE COSTS**

**HEIGHT FACTOR:**

|      |      |
|------|------|
| 70'  | 1.36 |
| 100' | 1.6  |

**DESIGN FACTOR**

|           |      |
|-----------|------|
| Part Flag | 1.07 |
| Full Flag | 1.15 |

**LIGHTING: (per fixture)**

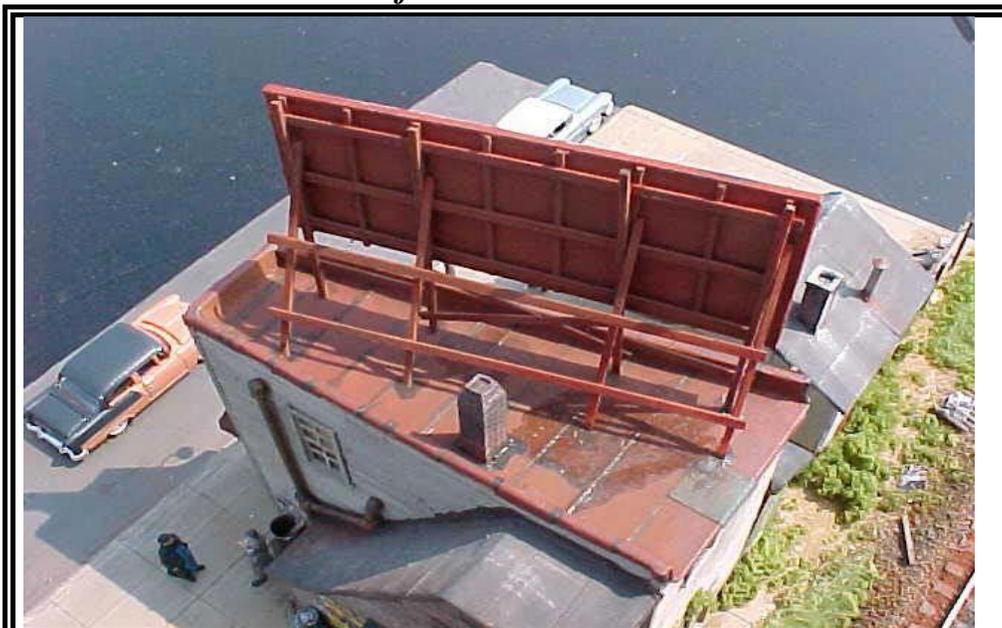
**AVERAGE**

\$545.00

NOTE: Depreciation Schedules for Billboards – 40 year steel

*Class 205 Roof/Fascia Mounted Billboard*

*Class 205 Roof/Fascia Mounted Billboard*



**CLASS 205 ROOF / FASCIA MOUNTED BILLBOARD**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| 1. STRUCTURE - Mounted on roof or side of building. | 5. APRON - Included in Base              |
| 2. FOUNDATION – None                                | 6. LIGHTING - Included in Base           |
| 3. PLATFORM OR CATWALK - Included<br>in Base        | 7. ADDITIONAL PANELS - Included in Base. |
| 4. PANELS - Included in Base.                       | 8. OTHER ITEMS - None                    |

**BASE COST OF SIGN**

AVERAGE COST INSTALLED:      \$17,000. PER PANEL

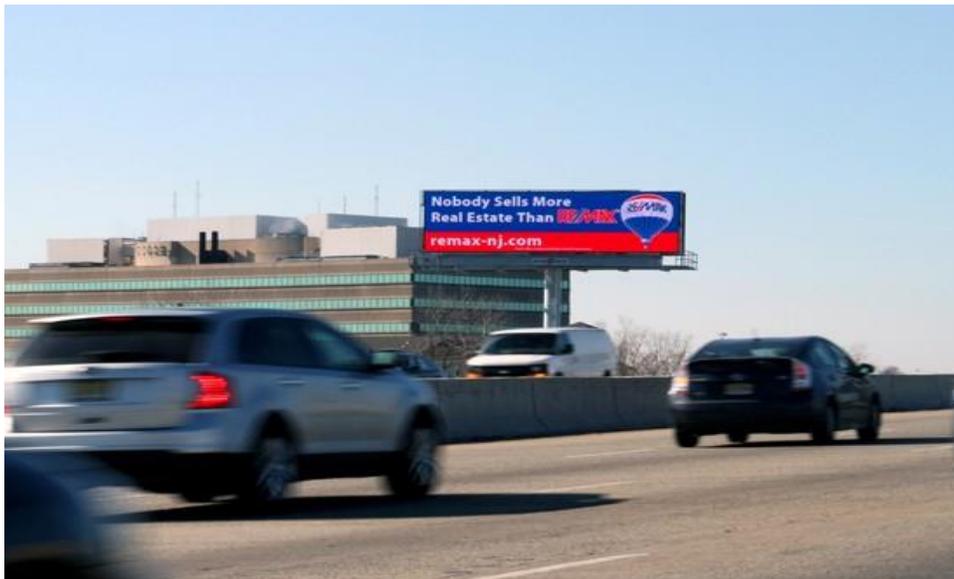
**ADJUSTMENTS TO BASE COSTS**

|                                |                |
|--------------------------------|----------------|
| <u>LIGHTING: (per fixture)</u> | <u>AVERAGE</u> |
|                                | \$545.00       |

NOTE: Depreciation Schedules for Billboards – 40 year steel

*Class 206 Monopole Digital Billboard*

**Class 206 Monopole Digital Billboard**



**CLASS 206 DIGITAL MONOPOLE STRUCTURE BILLBOARDS**

**BASE SPECIFICATIONS FOR CLASS**

- |   |  |
|---|--|
| 1. STRUCTURE - Tubular steel supports.    | 5. APRON - Included in Base              |
| 2. FOUNDATION - Poured concrete.          | 6. LIGHTING - None                       |
| 3. PLATFORM OR CATWALK - Included in Base | 7. ADDITIONAL PANELS - Included in Base. |
| 4. PANELS - Included in Base.             | 8. OTHER ITEMS - None                    |

**BASE COST PER SQUARE FOOT OF SIGN AREA (40 ft. HIGH)**

| <u>Sq. Ft. AREA</u> | <u>SINGLE PANEL per SF of Face Area</u> | <u>V - BUILT &amp; BACK TO BACK (Applied to Total Face Area)</u> | <u>TRI - BUILT</u>  |
|---------------------|---|--|---------------------|
| 210                 | \$201.45                                | \$175.95   | Not Applicable (NA) |
| 390                 | \$179.00                                | \$152.50   | NA                  |
| 504                 | \$179.95                                | \$154.06   | NA                  |
| 611                 | \$183.37                                | \$151.58   | NA                  |

**ADJUSTMENTS TO BASE COSTS**

HEIGHT FACTOR

70'      1.36  
100'     1.6

DESIGN FACTOR

Part Flag      1.07  
Full Flag      1.15

Asian Import Display Factor - .80

LIGHTING: (per fixture)  
NA

AVERAGE  
\$0

NOTE: Depreciation Schedules for Billboards – 40 year digital

*Class 207 Roof/Fascia Mounted Digital Billboard*

**Class 207 Roof/Fascia Mounted Digital**



**CLASS 207 DIGITAL ROOF / FASCIA DIGITAL MOUNTED BILLBOARD**

**BASE SPECIFICATIONS FOR CLASS**

- |  |   |
|--|---|
| 1. STRUCTURE - Mounted on roof or side of building | 5. APRON – Not Applicable               |
| 2. FOUNDATION — None                               | 6. LIGHTING – Not Applicable            |
| 3. PLATFORM OR CATWALK - Included<br>in Base       | 7. ADDITIONAL PANELS - Included in Base |
| 4. PANELS - Included in Base                       | 8. OTHER ITEMS - None                   |

**BASE COST OF SIGN**

AVERAGE COST INSTALLED:      \$55,200.00 PER PANEL

**ADJUSTMENTS TO BASE COSTS**

|                                |                |
|--------------------------------|----------------|
| <u>LIGHTING: (per fixture)</u> | <u>AVERAGE</u> |
| Not Applicable                 |                |

Asian Import Display Factor - .80

NOTE: Depreciation Schedules for Billboards — 40 year digital

**DEPRECIATION SCHEDULE**  
**(effective age)**

| <b><u>AGE (in years)</u></b> | <b><u>20 year life (wood)</u></b> | <b><u>40 year life (steel)</u></b> | <b><u>40 year life (digital)</u></b> |
|------------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| <b><u>1</u></b>              | <b><u>95%</u></b>                 | <b><u>97.50%</u></b>               | <b><u>90.10%</u></b>                 |
| <b><u>2</u></b>              | <b><u>90%</u></b>                 | <b><u>95.00%</u></b>               | <b><u>80.20%</u></b>                 |
| <b><u>3</u></b>              | <b><u>85%</u></b>                 | <b><u>92.50%</u></b>               | <b><u>70.30%</u></b>                 |
| <b><u>4</u></b>              | <b><u>80%</u></b>                 | <b><u>90.00%</u></b>               | <b><u>60.40%</u></b>                 |
| <b><u>5</u></b>              | <b><u>75%</u></b>                 | <b><u>87.50%</u></b>               | <b><u>50.50%</u></b>                 |
| <b><u>6</u></b>              | <b><u>70%</u></b>                 | <b><u>85.00%</u></b>               | <b><u>40.60%</u></b>                 |
| <b><u>7</u></b>              | <b><u>65%</u></b>                 | <b><u>82.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>8</u></b>              | <b><u>60%</u></b>                 | <b><u>80.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>9</u></b>              | <b><u>55%</u></b>                 | <b><u>77.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>10</u></b>             | <b><u>50%</u></b>                 | <b><u>75.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>11</u></b>             | <b><u>45%</u></b>                 | <b><u>72.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>12</u></b>             | <b><u>40%</u></b>                 | <b><u>70.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>13</u></b>             | <b><u>35%</u></b>                 | <b><u>67.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>14</u></b>             | <b><u>35%</u></b>                 | <b><u>65.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>15</u></b>             | <b><u>35%</u></b>                 | <b><u>62.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>16</u></b>             | <b><u>35%</u></b>                 | <b><u>60.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>17</u></b>             | <b><u>35%</u></b>                 | <b><u>57.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>18</u></b>             | <b><u>35%</u></b>                 | <b><u>55.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>19</u></b>             | <b><u>35%</u></b>                 | <b><u>52.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>20</u></b>             | <b><u>35%</u></b>                 | <b><u>50.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>21</u></b>             |                                   | <b><u>47.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>22</u></b>             |                                   | <b><u>45.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>23</u></b>             |                                   | <b><u>42.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>24</u></b>             |                                   | <b><u>40.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>25</u></b>             |                                   | <b><u>37.50%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>26</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>27</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>28</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>29</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>30</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>31</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>32</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>33</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>34</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>35</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>36</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>37</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>38</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>39</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |
| <b><u>40</u></b>             |                                   | <b><u>35.00%</u></b>               | <b><u>30.70%</u></b>                 |

## BILLBOARD DEFINITIONS

**Catwalk:** Platform located underneath the sign face, either in front or in back, used as a support for the maintenance crew.

**Centermount:** Monopole structure in which the supporting column is affixed to the center of the display panel.

**Display Face (panels):** The flat area normally rectangular in shape where the advertisement is displayed.

**Double-Sided:** A Billboard structure that has two display panels, which are parallel to each other facing in opposite directions.

**Extension:** When part of the advertisements extends beyond the display face in order to create better impact.

**Flag Mount:** Monopole structure in which the supporting column is affixed to the left or right of the center of the display panel.

**Footings:** Concrete used to solidify the structure upright in the ground.

**Illumination:** Light fixtures that allow the advertisements to be more visible.

**Lease Cost:** Costs associated in obtaining a lease site.

**Molding:** Decorative trim covering the perimeter of the display face.

**Reflectors:** Copy material that reflects light to aid visibility in hours of darkness when illumination is not present on the billboard structure.

**Single-Sided:** Billboard structure that has a single display panel facing only one direction.

**Stackmount:** A billboard structure in which multiple display panels are set above one another.

**Stringers:** Wood or steel braces attached to the back of the sign that support the structure aka: cross members.

**Triangle:** A billboard structure having three display panels arranged in the shape of a triangle with each panel facing in a different direction.

**Uprights:** Vertical posts, pipes or beams, mounted into the ground keeping the sign erect.

**“V”-Shape:** A billboard structure having two display panels that are not parallel to each other, facing in opposite directions.

Date Collected: \_\_\_\_\_

By: \_\_\_\_\_

**Billboard Data Collection Form**

County: \_\_\_\_\_ Municipality: \_\_\_\_\_

Address: \_\_\_\_\_ Block / Lot \_\_\_\_\_

Tax Map Pg: \_\_\_\_\_ Zoning: \_\_\_\_\_ Application # \_\_\_\_\_

Property Owner \_\_\_\_\_

Date of Sale: \_\_\_\_\_ Sale Price: \_\_\_\_\_ Book/Page: \_\_\_\_\_

\*If available

\*Grantor: \_\_\_\_\_ \*Grantee: \_\_\_\_\_

\*Lease Date: \_\_\_\_\_ \*Lease Price: \_\_\_\_\_

\*Lessor: \_\_\_\_\_ \*Lessee: \_\_\_\_\_

\*Terms: \_\_\_\_\_

**Billboard Description**

Type: Wood Frame Steel Frame Monopole Digital

# of Display Surfaces: \_\_\_\_\_ Height: \_\_\_\_\_ S.F. Area: \_\_\_\_\_

Additional Improvements: Lighted Animated Revolving Aprons Platforms

Road Location: East West South North

Sign View: Northbound Southbound Eastbound Westbound

Age: \_\_\_\_\_ Road Characteristic: \_\_\_\_\_

Landmarks: \_\_\_\_\_

Comments: \_\_\_\_\_

## Billboard Valuation Worksheet

- (1) Name of Company \_\_\_\_\_ (2) Date \_\_\_\_\_
- (3) Number \_\_\_\_\_
- (4) Location of Structure \_\_\_\_\_
- (5) DOT Application Number \_\_\_\_\_  
(Five Digit Number)
- (6) Owner of Real Property \_\_\_\_\_
- (7) Original construction date \_\_\_\_\_ (8) Age (in years) \_\_\_\_\_
- (9) Construction (Wood, Steel, Monopole, Monopole Digital, Roof/Fascia Digital) \_\_\_\_\_ Class \_\_\_\_\_
- (10) Style: Single, Side-By-Side, Back-to-Back, V Build, Tri-Build, Stack
- (11) Height: \_\_\_\_\_
- (12) Number of display faces \_\_\_\_\_
- (13) Display Panel Size: 1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_ 4) \_\_\_\_\_
- (14) Illumination: Yes  No

|   |       |   |                            |                             |     |
|---|-------|---|----------------------------|-----------------------------|-----|
| Base price per square foot                | _____ | x | _____                      | square feet = _____         | (A) |
| Additional Display Panels                 | _____ | x | _____                      | per surface = _____         | (B) |
|   |       |   |                            | Base structure cost = _____ | (C) |
|   |       |   |                            | (add A & B)                 |     |
| Height Factor Adjustment                  |       |   |                            | _____                       | (D) |
| Design Factor Adjustment                  |       |   |                            | _____                       | (E) |
| Cost Conversion Factor                    |       |   |                            | _____                       | (F) |
|   |       |   | Replacement Cost New (RCN) | _____                       | (G) |
| Less Depreciation                         |       |   |                            | _____                       | (H) |
| Total Depreciated Billboard Value         |       |   |                            | _____                       | (I) |
| Director's Ratio (October 1 Pre-Tax Year) |       |   |                            | _____                       | (J) |
| Adjusted Assessed Value                   |       |   |                            | _____                       | (K) |
|   |       |   |                            | (I x J = K)                 |     |

## 147. Cell Towers



### VALUING CELL TOWERS

#### Real Property

The tower, equipment buildings and other site improvements, such as paving or fences, should be valued by the cost approach. The best indicator would be the actual cost to construct. Costs for these items can be found in several nationally recognized cost manuals.

#### Personal Property

The antennas attached to a tower may be considered personal property. In this situation, the leases of the antennas should not be considered when valuing the property; these leases are part of the business and are not part of the real property.

#### Land Lease

The property owner typically receives the ground rent; this is where the income stream is most visible. Capitalizing the net income at an appropriate capitalization rate and attributing that value to the land is a direct and unencumbered method. Any additional value attributable to the land lease must be assigned to the land value and not to the cell tower improvement.

## EXCEPTIONS

Under N.J.S.A 27:23-12 “The New Jersey Turnpike Authority has the statutory authority to allow cellular telephone companies to lease turnpike property for the installation of cellular equipment without destroying its exemption from local property tax.” As per an Attorney General’s opinion 99-0103 “Leases of county or municipal property by cell companies does not destroy the properties exemption under N.J.S.A 54:4-3.3 because the cellular equipment serves a public purpose under statute.”

## TAX LIST IDENTIFICATION

The cell tower portion is designated on the tax list as a separate line item using the same block and lot as the mother lot it is situated on with the qualifier code “T”. It can include the land value which is attributable to the added value from the cell tower land lease and the improvement value of the tower itself.

## COURT CASES

There are two court cases related to the taxability of towers though not specific to cell towers.

16 N.J. Tax 29 (Emmis Broadcasting Corp of NY v. East Rutherford) the courts found that the tower itself broadcasts the radio signal and that the tower is exempt.

230 N.J. Super. 530; (NYT Cable v. The Borough of Audubon), the courts found that the tower was real property under the real versus personal property three prong injury test N.J.S.A 54:4-1. However, the antennas and dish equipment attached were considered business personal property.

The FCC Act of 1996 limits the ability of municipalities to prevent construction of cell towers. Through zoning they can provide for a legal non-conforming use which runs with the land and not the improvements to accommodate cell towers.

## 148. Renewable Energy Systems



### DEFINITION

Renewable Energy Systems is defined as “any equipment that is part of, or added to, a residential, commercial, industrial or mixed use building as an accessory use, and that produces renewable energy onsite to provide all or a portion of the electrical, heating, cooling, or general energy needs of that building...”.

### RESIDENTIAL AND COMMERCIAL (P.L. 2008 Chapter 90, N.J.S.A. 54:4-3.13a-g)

The chapter 90 exemption encompasses all residential & commercial properties, which include the following: solar panels (photo voltaic), wind, biomass, geothermal, hydropower, fuel cells, wave & tidal action system and non-electric solar thermal. EPA requires that biomass systems meet the highest standards & minimizes any impacts.

A CRES application is required to be filed with the construction officer and finalized with the assessor. The system must be an “accessory use” and provide all or a portion of the electrical, heating, cooling, or energy needs of the building.

The exemption is for the renewable energy system only and is for the tax year following the year in which it was granted. It is designated on the tax list by the limited exemption code “Y”. The value of the renewable energy system is equal to the value of the improvements with the system, minus the value of the improvements without the system.

#### FARMLAND ASSESSED PROPERTY (P.L. 2009 Chapter 213 N.J.S.A 4-3.113a-g)

The Chapter 213 exemption is limited to farmland assessed properties, which include the following: solar panels (photo voltaic), wind, biomass, geothermal, hydropower, fuel cells, wave & tidal action system and non-electric solar thermal. EPA requires that biomass systems meet the highest standards & minimizes any impacts.

It is reported to the assessor on the annual FA-1 form application (filed for annual farm assessment). It must operate on land that was in the preceding year and is currently part of an operating farm. The power or heat is to be used to power the farm. The ratio of land used to generate this energy vs. farmland is 1 to 5 acres (That is a ratio of .17 or 1 divided by 6). Note there must be greater than 5 acres for the exemption. The system shall not take up more than 10 acres of farmland and produce no more than 2 megawatts. No income from the sale of the power may be used towards gross income sales receipts for farmland qualification. For solar, the property under the panel can be used for shade crops or grazing pasture where practical.

Biomass systems plans are to be filed with the Soil Conservation District (county extension) and the EPA requires that biomass systems meet the highest standards & minimizes any impacts. Installations in Pinelands are subject to the regulation of the Pinelands Protection Act and anything biomass needs approval from the Department of Agriculture.

It is designated on the tax list by the limited exemption code “Y”. The value of the renewable energy system is equal to the value of the improvements with the system, minus the value of the improvements without the system.

## COMMERCIAL SOLAR FARMS

### DEFINITION

The use of solar voltaic panels to generate electric energy that is usually sold directly to power companies and not used “on site”. The definition of a solar farm is not based on the number of panels or energy generated, but on the purpose of the energy. Energy generated by a solar farm is typically sold to energy companies, rather than end-users. The site typically is vacant land and not qualified farmland assessed property. If one is constructed on farmland the site will lose farmland assessment.

### VALUATION

At the time of this writing there have been no legislation or tax court cases that offer guidance in the valuation in these type properties. It is typically considered that the solar panels are bolted onto the supporting system, are removable and considered personal property by the real vs. personal property three prong injury test found in the N.J.S.A. 54:4-1.

The support equipment (steel poles, racking system) and other site improvements are considered real property and should be valued by the cost approach. One indicator of value would be the actual cost to construct minus the cost of the panels. Any value from the real property should be shown in the improvement value.

The property owner typically receives the ground rent; this is where the income stream is most visible. Capitalizing the net income at an appropriate capitalization rate and attributing that value to the land is a direct and unencumbered method. Any additional value attributable to the land lease must be assigned to the land value and not to the improvement value.

## **149. Valuation and Contaminated Properties**

Contamination may have an effect on the valuation of real property.

- Asbestos
- Nuclear facilities
- Radon
- Noise pollution
- Mold
- Drug labs
- Groundwater contamination
- Leaking underground storage tanks
- Air pollution
- Chinese drywall

Once contamination is discovered, the assessor needs to understand the extent of the problem. Once the extent is determined, the next steps are to figure out what the cost to cure is and how long the cure will take. There are legal costs, ongoing costs to cure and monitoring the cleanup.

Often, once a property has been contaminated there is still a stigma that can cause a lower valuation than the market normally provides. An example is buying the home where Charles Manson murdered several people. Someone had committed suicide in the home. Also, value losses occur in areas where sink holes are prevalent, such as Florida. Fracking may be a negative threat to home values.

## 150. Depreciation Tables

### EFFECTIVE AGE DEPRECIATION DEDUCTION TABLE

The following tabulation representation suggested guides for effective age percentage depreciation tables for different types of building construction. Each building class specification indicates the tables which are applicable to the class.

| EFFECTIVE<br>AGE IN<br>YEARS | TABLE<br>D | TABLE<br>D-I | TABLE<br>D-II | TABLE<br>D-III | TABLE<br>D-IV | TABLE<br>D-V | TABLE<br>D-VI | TABLE<br>D-VII |
|------------------------------|------------|--------------|---------------|----------------|---------------|--------------|---------------|----------------|
| 1                            | 4.0%       | 2.5%         | 2.0%          | 1.5%           | 1.5%          | 1.0%         | 1.0%          | 0.5%           |
| 2                            | 7.0        | 4.5          | 3.5           | 2.5            | 2.5           | 2.0          | 2.0           | 1.5            |
| 3                            | 11.0       | 7.0          | 4.5           | 3.5            | 3.0           | 2.5          | 2.5           | 2.0            |
| 4                            | 16.0       | 9.0          | 6.0           | 4.5            | 4.0           | 3.5          | 3.5           | 3.0            |
| 5                            | 20.0       | 11.0         | 7.0           | 5.5            | 4.5           | 4.0          | 4.0           | 3.5            |
| 6                            | 22.0       | 13.0         | 8.5           | 6.5            | 5.5           | 5.0          | 5.0           | 4.5            |
| 7                            | 27.0       | 15.5         | 10.0          | 8.0            | 6.5           | 6.0          | 5.5           | 5.0            |
| 8                            | 30.0       | 17.5         | 11.0          | 9.0            | 8.0           | 7.0          | 6.5           | 6.0            |
| 9                            | 34.0       | 20.0         | 12.5          | 10.5           | 9.0           | 8.0          | 7.0           | 7.0            |
| 10                           | 37.5       | 22.0         | 14.0          | 11.5           | 10.0          | 9.0          | 8.0           | 7.5            |
| 11                           | 41.0       | 24.0         | 15.5          | 13.0           | 11.0          | 10.0         | 9.0           | 8.0            |
| 12                           | 44.0       | 25.5         | 17.0          | 14.0           | 12.0          | 10.5         | 9.5           | 9.0            |
| 13                           | 47.0       | 27.5         | 18.0          | 15.5           | 13.0          | 11.5         | 10.5          | 9.5            |
| 14                           | 50.0       | 29.5         | 19.5          | 16.5           | 14.0          | 12.5         | 11.0          | 10.5           |
| 15                           | 52.0       | 31.0         | 21.0          | 18.0           | 15.0          | 13.5         | 12.0          | 10.5           |
| 16                           | 54.0       | 33.0         | 22.5          | 19.0           | 16.0          | 14.5         | 13.0          | 11.0           |
| 17                           | 56.0       | 34.5         | 24.0          | 20.5           | 17.5          | 15.5         | 13.5          | 12.0           |
| 18                           | 58.0       | 36.5         | 25.5          | 21.5           | 18.5          | 16.5         | 14.5          | 12.5           |
| 19                           | 60.0       | 38.0         | 27.0          | 23.0           | 20.0          | 17.5         | 15.0          | 13.5           |
| 20                           | 62.0       | 40.0         | 28.5          | 24.0           | 21.0          | 18.5         | 16.0          | 14.0           |
| 21                           | 64.0       | 41.5         | 30.0          | 25.5           | 22.0          | 19.5         | 17.0          | 14.5           |
| 22                           | 65.0       | 43.0         | 32.0          | 27.0           | 23.0          | 20.5         | 17.5          | 15.0           |
| 23                           | 67.0       | 45.0         | 33.5          | 28.0           | 24.5          | 21.5         | 18.5          | 16.0           |
| 24                           | 68.5       | 46.5         | 35.0          | 29.5           | 25.5          | 22.5         | 19.0          | 16.5           |
| 25                           | 70.0       | 48.0         | 36.5          | 31.0           | 26.5          | 23.5         | 20.0          | 17.0           |
| 26                           | 71.5       | 49.5         | 38.0          | 32.5           | 28.0          | 24.5         | 21.0          | 18.0           |
| 27                           | 73.0       | 51.0         | 39.5          | 34.0           | 29.0          | 25.5         | 22.0          | 19.0           |
| 28                           | 74.5       | 52.0         | 41.0          | 35.0           | 30.5          | 26.0         | 23.0          | 20.0           |
| 29                           | 76.0       | 53.5         | 42.0          | 36.5           | 32.0          | 27.0         | 24.0          | 21.0           |
| 30                           | 77.5       | 55.0         | 43.5          | 38.0           | 33.0          | 28.0         | 25.0          | 22.0           |
| 35                           |            | 61.0         | 49.0          | 44.0           | 38.5          | 33.5         | 29.0          | 26.0           |
| 40                           |            | 65.0         | 54.0          | 47.5           | 43.0          | 37.0         | 33.0          | 30.0           |
| 45                           |            | 68.0         | 58.0          | 50.5           | 44.5          | 38.5         | 34.5          | 31.5           |
| 50                           |            | 70.0         | 62.5          | 53.0           | 45.5          | 39.5         | 35.5          | 32.5           |
| 55                           |            | 72.0         | 65.0          | 55.0           | 47.0          | 41.0         | 37.0          | 34.0           |
| 60                           |            | 74.0         | 63.0          | 57.0           | 48.0          | 42.0         | 38.0          | 35.0           |
| 65                           |            | 76.0         | 70.0          | 59.0           | 49.5          | 43.5         | 39.5          | 36.5           |
| 70                           |            | 78.0         | 73.5          | 60.5           | 50.5          | 44.5         | 40.5          | 37.5           |
| 75                           |            |              | 75.5          | 62.0           | 52.0          | 46.0         | 42.0          | 39.0           |
| 80                           |            |              | 78.0          | 63.0           | 53.0          | 47.0         | 43.0          | 40.0           |

NOTE: Building marked Fair Physical Condition increase deduction 5%  
 Poor Physical Condition increase deduction 10%  
 Dilapidated Condition increase deduction 20.0%  
 Unusable and Beyond Repair increase deduction to total of 90%

DEPRECIATION

TYPICAL MOBILE HOME EFFECTIVE AGE DEPRECIATION TABLES

| <u>EFFECTIVE AGE</u> | <u>LOW</u> | <u>FAIR</u> | <u>AVERAGE</u> | <u>GOOD</u> | <u>HIGH</u> |
|----------------------|------------|-------------|----------------|-------------|-------------|
| 1                    | 5.5%       | 5.0%        | 4.5%           | 4.0%        | 3.0%        |
| 2                    | 9.5%       | 8.5%        | 7.5%           | 6.5%        | 5.0%        |
| 3                    | 14.5%      | 13.0%       | 11.5%          | 9.5%        | 8.0%        |
| 4                    | 20.0%      | 17.5%       | 16.0%          | 12.5%       | 11.0%       |
| 5                    | 25.0%      | 21.5%       | 20.0%          | 16.0%       | 14.0%       |
| 6                    | 27.5%      | 24.0%       | 22.0%          | 17.5%       | 15.0%       |
| 7                    | 34.0%      | 29.0%       | 27.0%          | 22.0%       | 19.0%       |
| 8                    | 38.0%      | 33.0%       | 30.0%          | 24.5%       | 21.0%       |
| 9                    | 43.0%      | 37.5%       | 34.0%          | 28.0%       | 24.0%       |
| 10                   | 47.0%      | 40.5%       | 37.5%          | 30.5%       | 26.0%       |
| 11                   | 51.0%      | 44.0%       | 41.0%          | 34.0%       | 29.0%       |
| 12                   | 55.0%      | 48.0%       | 44.0%          | 36.5%       | 31.0%       |
| 13                   | 59.0%      | 51.0%       | 47.0%          | 39.0%       | 33.0%       |
| 14                   | 62.5%      | 54.5%       | 50.0%          | 41.5%       | 35.0%       |
| 15                   | 65.0%      | 57.0%       | 52.0%          | 43.0%       | 36.0%       |
| 16                   | 67.5%      | 59.0%       | 54.0%          | 45.0%       | 38.0%       |
| 17                   | 70.0%      | 61.0%       | 56.0%          | 46.5%       | 39.0%       |
| 18                   | 72.0%      | 62.5%       | 58.0%          | 48.5%       | 41.0%       |
| 19                   | 74.0%      | 65.0%       | 60.0%          | 50.0%       | 42.0%       |
| 20                   | 75.0%      | 67.5%       | 62.0%          | 51.5%       | 43.0%       |
| 21                   | -          | 70.0%       | 64.0%          | 53.0%       | 45.0%       |
| 22                   | -          | 71.0%       | 65.0%          | 54.0%       | 46.0%       |
| 23                   | -          | 72.5%       | 67.0%          | 55.5%       | 47.0%       |
| 24                   | -          | 74.0%       | 68.5%          | 57.0%       | 48.0%       |
| 25                   | -          | 75.0%       | 70.0%          | 58.5%       | 49.0%       |
| 30                   | -          | -           | -              | 63.0%       | 53.0%       |
| 35                   | -          | -           | -              | 70.0%       | 56.0%       |
| 40                   | -          | -           | -              | -           | 59.5%       |
| 45                   | -          | -           | -              | -           | 63.0%       |
| 50                   | -          | -           | -              | -           | 66.5%       |

# 151. Land Depth Factor Tables

Residential and Apartment Depth Factor Tables  
Standard Depth

| <u>Depth in Feet</u> | <u>100'</u> | <u>125'</u> | <u>150'</u> | <u>175'</u> | <u>200'</u> | <u>300'</u> | <u>400'</u> |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 5                    | .10         | .10         | .10         | .10         | .10         | .02         | .02         |
| 10                   | .18         | .16         | .16         | .14         | .14         | .05         | .04         |
| 15                   | .26         | .22         | .20         | .18         | .18         | .07         | .06         |
| 20                   | .33         | .28         | .24         | .22         | .22         | .10         | .08         |
| 25                   | .40         | .34         | .28         | .26         | .25         | .12         | .10         |
| 30                   | .47         | .40         | .32         | .30         | .28         | .16         | .12         |
| 35                   | .53         | .45         | .36         | .34         | .31         | .18         | .14         |
| 40                   | .59         | .50         | .40         | .38         | .34         | .21         | .16         |
| 45                   | .65         | .54         | .44         | .42         | .37         | .24         | .18         |
| 50                   | .70         | .58         | .48         | .46         | .40         | .26         | .20         |
| 55                   | .75         | .62         | .52         | .49         | .43         | .29         | .22         |
| 60                   | .79         | .66         | .56         | .52         | .46         | .32         | .24         |
| 65                   | .83         | .70         | .60         | .55         | .49         | .34         | .26         |
| 70                   | .87         | .74         | .64         | .58         | .52         | .37         | .28         |
| 75                   | .90         | .78         | .68         | .61         | .55         | .40         | .30         |
| 80                   | .92         | .81         | .72         | .64         | .58         | .42         | .32         |
| 85                   | .94         | .84         | .75         | .67         | .61         | .44         | .34         |
| 90                   | .96         | .86         | .78         | .70         | .64         | .46         | .36         |
| 95                   | .98         | .88         | .81         | .73         | .67         | .48         | .38         |
| 100                  | 1.00        | .90         | .84         | .76         | .70         | .50         | .40         |
| 105                  | 1.02        | .92         | .87         | .79         | .72         | .52         | .42         |
| 110                  | 1.04        | .94         | .89         | .81         | .74         | .53         | .43         |
| 115                  | 1.06        | .96         | .91         | .84         | .76         | .55         | .45         |
| 120                  | 1.08        | .98         | .93         | .86         | .78         | .58         | .46         |
| 125                  | 1.10        | 1.00        | .95         | .88         | .80         | .60         | .47         |
| 130                  | 1.12        | 1.02        | .96         | .90         | .82         | .61         | .49         |
| 135                  | 1.14        | 1.04        | .97         | .92         | .84         | .63         | .50         |
| 140                  | 1.15        | 1.06        | .98         | .93         | .86         | .65         | .52         |
| 145                  | 1.16        | 1.08        | .99         | .94         | .88         | .67         | .53         |
| 150                  | 1.17        | 1.10        | 1.00        | .95         | .90         | .70         | .55         |
| 155                  | 1.18        | 1.12        | 1.01        | .96         | .91         | .71         | .56         |
| 160                  | 1.19        | 1.14        | 1.02        | .97         | .92         | .72         | .58         |
| 165                  | 1.20        | 1.15        | 1.03        | .98         | .93         | .74         | .60         |
| 170                  | 1.21        | 1.16        | 1.04        | .99         | .94         | .75         | .61         |
| 175                  | 1.22        | 1.17        | 1.05        | 1.00        | .95         | .77         | .63         |
| 180                  | 1.23        | 1.18        | 1.06        | 1.01        | .96         | .78         | .64         |
| 185                  | 1.24        | 1.19        | 1.07        | 1.02        | .97         | .80         | .65         |
| 190                  | 1.25        | 1.20        | 1.08        | 1.03        | .98         | .81         | .67         |
| 195                  | 1.26        | 1.21        | 1.09        | 1.04        | .99         | .83         | .68         |
| 200                  | 1.27        | 1.22        | 1.10        | 1.05        | 1.00        | .84         | .70         |
| 250                  | 1.30        | 1.25        | 1.15        | 1.10        | 1.06        | .93         | .80         |
| 300                  | 1.32        | 1.27        | 1.20        | 1.14        | 1.10        | 1.00        | .90         |
| 350                  | 1.34        | 1.29        | 1.24        | 1.18        | 1.13        | 1.05        | .95         |
| 400                  | 1.36        | 1.31        | 1.26        | 1.21        | 1.16        | 1.08        | 1.00        |
| 450                  | 1.38        | 1.33        | 1.28        | 1.23        | 1.18        | 1.10        | 1.04        |
| 500                  | 1.40        | 1.35        | 1.30        | 1.25        | 1.20        | 1.11        | 1.05        |

Add .02 for Each 50 ft. over 500.

Commercial Depth Factor Tables

Standard Depth

| <u>Depth in Feet</u> | <u>100'</u> | <u>125'</u> | <u>150'</u> | <u>200'</u> | <u>250'</u> |
|----------------------|-------------|-------------|-------------|-------------|-------------|
| 5                    | .15         | .12         | .10         | .10         | .10         |
| 10                   | .25         | .21         | .18         | .15         | .14         |
| 15                   | .34         | .29         | .25         | .20         | .18         |
| 20                   | .42         | .36         | .31         | .25         | .22         |
| 25                   | .50         | .43         | .36         | .30         | .26         |
| 30                   | .58         | .50         | .41         | .34         | .30         |
| 35                   | .63         | .55         | .46         | .38         | .34         |
| 40                   | .68         | .59         | .50         | .42         | .38         |
| 45                   | .72         | .63         | .54         | .46         | .41         |
| 50                   | .75         | .66         | .58         | .50         | .44         |
| 55                   | .78         | .69         | .62         | .54         | .47         |
| 60                   | .81         | .72         | .66         | .57         | .49         |
| 65                   | .84         | .75         | .69         | .60         | .51         |
| 70                   | .87         | .78         | .72         | .63         | .53         |
| 75                   | .90         | .80         | .74         | .65         | .55         |
| 80                   | .92         | .82         | .76         | .67         | .57         |
| 85                   | .94         | .84         | .78         | .69         | .59         |
| 90                   | .96         | .86         | .80         | .71         | .61         |
| 95                   | .98         | .88         | .82         | .73         | .63         |
| 100                  | 1.00        | .90         | .84         | .75         | .65         |
| 105                  | 1.02        | .92         | .86         | .77         | .67         |
| 110                  | 1.04        | .94         | .88         | .79         | .69         |
| 115                  | 1.06        | .96         | .90         | .81         | .71         |
| 120                  | 1.08        | .98         | .92         | .83         | .73         |
| 125                  | 1.10        | 1.00        | .94         | .85         | .75         |
| 130                  | 1.12        | 1.02        | .96         | .86         | .77         |
| 135                  | 1.14        | 1.04        | .97         | .87         | .79         |
| 140                  | 1.16        | 1.06        | .98         | .88         | .80         |
| 145                  | 1.18        | 1.08        | .99         | .89         | .81         |
| 150                  | 1.20        | 1.10        | 1.00        | .90         | .82         |
| 155                  | 1.22        | 1.12        | 1.01        | .91         | .83         |
| 160                  | 1.24        | 1.14        | 1.02        | .92         | .84         |
| 165                  | 1.26        | 1.16        | 1.03        | .93         | .85         |
| 170                  | 1.28        | 1.18        | 1.04        | .94         | .86         |
| 175                  | 1.30        | 1.20        | 1.05        | .95         | .87         |
| 180                  | 1.32        | 1.21        | 1.06        | .96         | .88         |
| 185                  | 1.33        | 1.22        | 1.07        | .97         | .89         |
| 190                  | 1.34        | 1.23        | 1.08        | .98         | .90         |
| 195                  | 1.35        | 1.24        | 1.09        | .99         | .91         |
| 200                  | 1.36        | 1.25        | 1.10        | 1.00        | .92         |
| 250                  | 1.39        | 1.28        | 1.15        | 1.05        | 1.00        |
| 300                  | 1.42        | 1.31        | 1.18        | 1.07        | 1.02        |
| 350                  | 1.44        | 1.34        | 1.21        | 1.09        | 1.04        |
| 400                  | 1.46        | 1.36        | 1.24        | 1.11        | 1.06        |
| 450                  | 1.48        | 1.38        | 1.27        | 1.13        | 1.08        |
| 500                  | 1.50        | 1.40        | 1.30        | 1.15        | 1.10        |

Add .02 for each 50 ft. over 500.

## 152. Glossary

This is a selected list of appraisal and building terms which assessing officials and their staff may encounter in their work. It is not, therefore, a complete list of terms used in appraisal and building construction. Some terms have been omitted because their meanings are common knowledge; others have been omitted because it is believed they will seldom, if ever, be encountered; and some have been shortened for ease of review.

|                      |   |
|----------------------|---|
| Abstraction Method   | A method to estimate land value when there is a lack of vacant land sales, by subtracting improvement costs from the total sales price.                   |
| Accessory building   | A building subordinate to and used in conjunction with a principal or main building Accessory buildings include barns, cribs, sheds, and private garages. |
| Age-Life Method      | Method of estimating accrued physical depreciation which is a function of the actual age of the improvement and the estimated economic age.               |
| Anticipation         | Appraisal principle which states value is created from the expectation of future benefits received.   |
| Anchor Bolt          | A bolt embedded in a building foundation for use in fastening the building superstructure to the foundation.  |
| Accrued Depreciation | The total depreciation from all sources that effect property value.   |
| Allocation Method    | A method to value land by using a typical ratio of land to building value.  |

|                          |  |
|--------------------------|--|
| Apron                    | The wood trim beneath a windowsill; also applied to concrete or blacktop area adjoining a building or loading dock.  |
| Appraisal Process        | The systematic collection, analysis, and processing of data that leads to a well-reasoned estimate of value.   |
| Appreciation             | Increase in value of a property.   |
| Arable Land              | Any land suitable for cultivation.   |
| Arm's length transaction | A sale of property on the open market, between a willing buyer and a willing seller, and there is no force or compulsion.  |
| Ashlar                   | Cut stone laid in a definite pattern but seldom in regular courses.  |
| Average Deviation        | The average deviation of a data set is the sum of the total difference of all the ratios in a sample from the median, divided by the total number of samples`.   |
| Balance                  | Appraisal principle that states markets move toward a state of equilibrium after a change to one of the elements of supply and demand.   |
| Balloon Framing          | Frame construction in which studs are fastened together in such a manner as to form a continuous or single piece from floor to roof rather than using heavy timbers joined by mortises and tenons. Commonly used in barns. |

|                   |  |
|-------------------|--|
| Baluster          | A small pillar or column supporting a coping or handrail.  |
| Balustrade        | An ornamental railing or parapet made of coping or a handrail and balusters. A trim board at the floor line of an interior wall.       |
| Baseboard         | A narrow piece of lumber commonly used to cover a seam between two boards.   |
| Batten            | A principal division or compartment of a building marked off by columns, pillars, or similar.  |
| Bay Window        | A window forming a recess in a room, and projecting beyond the regular exterior walls of a building.                                   |
| Beam              | A principal horizontal load bearing structural member of a building.   |
| Bowstring Truss   | A roof or floor support having the form of a bow or arch.  |
| Building Residual | A technique used to value property by discounting the income attributable to the building and adding that to the estimated land value. |
| Bundle of Rights  | The rights of a property owner to use, sell, lease, enter or leave, give away, or refuse any of these rights.                          |
| Buttress          | A support built into and projecting from a masonry exterior wall to give additional strength to the wall.                              |
| BX Wiring         | Electrical cable in flexible metal conduit.  |

|                           |  |
|---------------------------|--|
| CAMA                      | Computer assisted mass appraisal, uses statistical analysis to estimate values.  |
| Calibration               | The adjustment of variables used in a mass appraisal model.  |
| Capitalization            | Converting anticipated income and rate of return into an estimate of value.  |
| Capitalization Rate       | The rate used to convert income into an estimate of value.   |
| Carrara Glass             | Heavy exterior structural glass commonly colored black.  |
| Casement                  | A hinged window frame commonly made so the window will open outward.   |
| Change                    | The appraisal principle was a change in social and economic forces affect supply and demand which influences market value. |
| Chimney                   | An upright shaft of a fireproof enclosure for disposing of smoke or waste gas. A chimney may contain one or more flues.    |
| Clapboard                 | Exterior wall wood siding with one edge thicker than the other. Also called lap siding.                                    |
| Coefficient of Dispersion | The average deviation of a set of numbers from the   |

median, expressed as a percentage.

|                          |  |
|--------------------------|--|
| Coefficient of Variation | The standard deviation expressed as a percentage of the mean.  |
| Column                   | A heavy upright structural member carrying a buildings weight.   |
| Comparable               | Recently sold properties that are similar to the property being appraised.   |
| Competition              | the appraisal principle that states profits breeds competition.  |
| Conduit                  | A pipe or tube enclosing electrical wires, also a pipe or tunnel carrying water or enclosing pipes.  |
| Conformity               | The appraisal principle that the maximum value is achieved when there is a degree of homogeneity within a neighborhood.  |
| Contribution             | The appraisal principle that the value of an individual component is measured by its value contribution to the whole property rather than its individual cost. |
| Conversion Factor        | A multiplier used to bring costs and valuations into conformity with established standards as of a specified date.   |
| Coping                   | The top covering of an exterior wall, commonly masonry, to give the wall a finished appearance and to shed water.  |

|                      |   |
|----------------------|---|
| Cornice              | An ornamental projection at the top of exterior wall of a building.   |
| Cost Approach        | One of the three approaches to value that uses replacement costs less depreciation plus a land value to arrive at a final value estimate.                   |
| Course               | A continuous horizontal layer of stone, brick, or other building material of uniform thickness in a building.   |
| Curable Depreciation | Depreciation that can be cured by maintenance or remodeling.  |
| Curtain Wall         | A wall that does not support any of the building weight other than its own weight. A curtain wall may be removed, and the building frame would still stand. |
| Deferred Maintenance | Repairs normally made to a property but were not which increases the depreciation of that improvement.  |
| Dependent Variable   | A variable, that its value is dependent upon other variables.   |
| Depreciation         | The difference between the value of a building (or other improvement) and the cost of replacement new as of the date of appraisal.                          |
| Direct Costs         | Costs for labor and material that usually includes builders overhead and profit.  |
| Discount Rate        | The rate on return an investor requires to discount future income to its present worth.   |

|                        |   |
|------------------------|---|
| Drop Siding            | Tongue and groove wood siding forming a weather tight wall used as sheathing and siding.  |
| Drywall                | Interior wall constructed of material other than plaster, such as wallboard, fiberboard, plywood, or other similar material.  |
| Easement               | A right that may be exercised by the public or individuals on, over or through the lands of others.   |
| Economic Life          | The period of time an improvement contributes to the total value of a property.   |
| Economic Obsolescence  | Loss of value from influences outside the property.   |
| Economic Rent          | The rent a property should command if it is ready and available to rent. Also known as market rent.   |
| Economies of Scale     | An appraisal theory which states the larger an item is the less it should cost to build.  |
| Effective Age          | Computed or estimated age caused by modernization or alterations, which increase the life expectancy of the building or by adverse conditions which decrease the life expectancy of the building. |
| Effective Gross Income | Potential rent less vacancy and collection loss plus miscellaneous income.  |

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|---------------------------|---|
| Effective Tax Rate        | The general or nominal tax rate times the districts level of assessment.  |
| Eminent Domain            | The right of a governmental body to take over private property for the public good.   |
| Encroachment              | A building, part of a building, or obstruction which intrudes upon or invades a highway or sidewalk or trespasses upon the property of another: any intrusion upon another property.  |
| Enhancement               | Increase in value due to improvements.  |
| Escheat                   | A states right to take over property upon the death of the owner when there are no heirs or a will providing for the disposition of the property.   |
| Excess Land               | The portion of land that is more than needed to support the highest and best use of a property.   |
| Expense Ratio             | Ratio of expenses to effective gross income.  |
| Exposed Beam Construction | A type of construction in which the roof is supported by heavy structural timbers rather than conventional rafters and in which the roof supports are exposed to the interior. This type of construction gives a rustic appearance. |
| Externalities             | The appraisal principle that states the four major forces (social, economic, physical/environmental, and governmental) outside the property influences its value.   |

|                         |   |
|-------------------------|---|
| Firewall                | A wall constructed of fire-resistant material to prevent the spread of fire within a building or between buildings. Exterior fire walls commonly extend above the roof of the building. |
| Fixed Costs             | Costs that do not vary with levels of production.   |
| Flashing                | Strips (usually metal) used at roof openings to waterproof roof joints.   |
| Flexi core              | A hollow-core precast-reinforced concrete plank.  |
| Flue                    | The lining of a chimney, commonly tile or metal.  |
| Forces of Value         | Forces that effect value are: Physical, Economic, Political, and Social.  |
| Front Foot              | A piece of land one foot wide abutting a street or highway and extending back the full depth of the parcel.   |
| Functional Obsolescence | The loss in value from factors within the property such as changes in tastes, standards, or preferences.  |
| Furring                 | Thin strips of wood, metal, or brick fastened to a wall or beam to level a surface for lathing, plastering, attaching an additional surface, or for making an air space.                |
| General Data            | Information is information that is common to many properties.   |

|                         |  |
|-------------------------|--|
| Girder                  | A structural member supported at both ends and designed to carry a load.   |
| Ground Area             | Total area of enclosed portion of a building computed from exterior measurements taken at top of foundation.       |
| Gross Income Multiplier | The ratio of sale price to gross income. The factor that gross income is multiplied by to obtain a value estimate. |
| Gross Rent Multiplier   | The ratio of sales price to gross rent. The factor that grosses rent is multiplied by to obtain a value estimate.  |
| Gunite                  | Concrete blown into place by compressed air.   |
| Header                  | A layer of brick or stone in a building wall with the short face to the front.                                     |
| Highest and Best Use    | Most profitable use that is legal, physically possible, and financially feasible.                                  |
| Holding Period          | Amount of time an investor will own a property before selling it.  |
| Improvement             | Any addition to the land that increases its value, includes building or site improvements.                         |
| Income Approach         | The approach to value that capitalizes anticipated benefits of owning property into a value estimate.              |
| Income Stream           | The payments an owner receives over the life of the investment.  |

|                               |   |
|-------------------------------|---|
| Increasing/Decreasing Returns | The appraisal principle that states that as units are added a point is reached where adding more will not contribute to the overall value compared to the cost for that unit. |
| Independent Variable          | A variable in a CAMA program whose value is not determined by other variables.  |
| Jamb                          | The upright side of a doorway, window, or fireplace.  |
| Joist                         | Timber to which flooring or ceiling laths are fastened.   |
| Land Ratio                    | Ratio of land area to building area.  |
| Level of Assessment           | The overall ratio of assessed values to sale prices.  |
| Lintel                        | Horizontal piece of timber, stone, or metal over doorway or window supporting the wall above the doorway or window.   |
| Load Bearing Wall             | A wall that supports its own weight and also the floor and walls above it.  |
| Louver                        | A ventilator built of slats slanted so as to admit air but to prevent water, snow, and other foreign objects from entering the opening. The slats may be movable or rigid.    |
| Market Approach               | Approach to value that estimates a properties appraised value using comparable sales, adjusted for differences.   |

|                        |  |
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| Market Value           | The price a willing buyer will pay and a willing seller will accept. The buyer and seller must be entirely independent of each other and neither compelled to buy or sell. |
| Market Rent            | The prevailing rent other comparable properties are getting for similar space.   |
| Mass Appraisal         | The valuing of a group of properties using standard methods and statistical testing.   |
| Mean                   | The sum of all values in a set divided by the number of samples.   |
| Median                 | The midpoint or middle value in a set of numbers.  |
| Mill Type Construction | Heavy appearing structure with masonry load bearing walls, heavy wood framing, and heavy plank or laminated flooring.  |
| Mode                   | The number in a set of values that appears the most.   |
| Model                  | Words or equations that explain the relationship between values or sales prices and supply and demand variables, used in mass appraisal.                                   |
| Monitor Roof           | A comparatively small roof structure built on the main roof to provide light and ventilation. Monitor roofs are found mostly in barns, sheds, and industrial buildings.    |
| Mortice                | A rectangular hole in one piece of wood cut to receive a projection on another piece, so <i>as</i> to form a joint.  |

|                       |   |
|-----------------------|---|
| Mud Sill Foundation.  | A foundation constructed of heavy timbers laid on the ground.   |
| Mullion               | The upright divider between windowpanes, or a series of joined doors, or panels.  |
| Neighborhood          | A contiguous set of individual properties that share similar physical, economic, and governmental characteristics.  |
| Neighborhood Clusters | The combining of neighborhood groups that a single set of comparable sales selection criteria and adjustments of sales prices can be applied.   |
| Neighborhood Group    | The assignment of noncontiguous neighborhoods with similar characteristics together for modeling and sales ratio studies.   |
| Net Operating Income  | Income left after deducting operating expenses.   |
| Newel Post            | The post at the foot of a stairway, or in a winding stairway. The central post around which the stairway winds.   |
| Obsolescence          | Loss in property value due to causes other than physical deterioration such as becoming out of date, excess of supply over demand, or loss in desirability and use for the specific type of property. |
| Operating Expenses    | Expenses needed to maintain the income stream for a property.   |

|                       |  |
|-----------------------|--|
| Opportunity Cost      | The appraisal principal that states money allocated for a certain use cannot be used for another purpose.  |
| Overall Rate          | The capitalization rate for land and building that includes the appropriate discount rate, recapture rate, and effective tax rate.                                       |
| Over-Improvement      | A building having a value in excess of that which the value of the land on which it is built justifies.  |
| Parapet               | A low wall at the edge of a roof, balcony, or terrace.   |
| Parcel                | A single piece of land under one ownership that can be conveyed separately.  |
| Party Wall            | A wall common to or separating two buildings.  |
| Parquet Floor         | Flooring consisting of wood blocks laid in adhesive material in systematic (commonly colored) patterns.  |
| Patio                 | An outside floor area, without roof, constructed of brick, tile, stone, slate, or other similar material, usually adjoining a house, and used as an outdoor living area. |
| Percent Good          | A value estimate, expressed as a percentage of the replacement cost less depreciation from all types has been deducted.  |
| Physical Depreciation | The loss in value due to wear and tear of an improvement.  |
| Pier                  | Blocks of concrete. Stone or wood used in lieu of a foundation wall to support a building.   |

|                            |   |
|----------------------------|---|
| Pilaster                   | An upright column or pillar projecting from an exterior wall to provide added support to the wall particularly at points of load concentration.                             |
| Pole Building              | A building in which poles are placed upright in the ground and serve as the foundation and as the framework of the building.  |
| Potential Gross Income     | The income from rent and all other sources a property can generate.   |
| Price Related Differential | The Mean divided by the weighted mean. Used to measure assessment progressivity or regressivity.  |
| Principal Building         | A main building such <i>as</i> a residence, apartment building, motel, commercial or industrial building.   |
| Property Record Card       | Computerized record or card on which description and measurements of each parcel of land and buildings thereon are recorded, and the valuation of the property is computed. |
| Property Residual          | A technique used to value property discounting anticipated income attributable to the property and then adding it to the present worth of the reversion.                    |
| Quantity Survey Method     | A method of estimating the cost of a structure by itemizing of all labor and material costs by component, plus all indirect costs are added to find a cost value.           |
| Rafter                     | A beam, usually sloping, supports a roof.   |

|                          |  |
|--------------------------|--|
| Ramp                     | An inclined runway or walkway.   |
| Range                    | The difference between the high and low values in a sample.  |
| Real Estate              | The land and improvements and the right to own or use them.  |
| Real Property            | The land and any objects attached to the land in a permanent manner such as buildings, trees etc., and the rights inherent in ownership.   |
| Remaining Economic Life  | Years left in the economic life of an improvement as of the date of appraisal.   |
| Replacement Cost         | The cost of constructing an improvement having the same utility at current prices, material, standards, design, and layout.  |
| Reproduction Cost        | The cost to construct an exact duplicate at today's prices that have the same characteristics and using the same materials, standards design layout and quality of the original improvement. |
| Reserves for Replacement | An allowance for replacement of short-lived items in the income approach.  |
| Reversion                | Property value at the end of a holding period.   |
| Riser                    | Upright part of a stair step.  |

|                  |  |
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| Romex Wiring     | Electrical cable in flexible non-metallic conduit.   |
| Sales Ratio      | The ratio between a sale price and the assessed or appraised value of a property.  |
| Sash             | A frame for holding panes of glass in a window or door.  |
| Sheathing        | The inner covering placed next to the studding or rafters of the walls or roof.  |
| Sheetrock        | Trade name for drywall sheets with a gypsum base and paper covering.   |
| Siding           | Finished exterior wall of a frame building.  |
| Sash             | The bottom horizontal member of a window or door,  |
| Sleeper          | Strips of lumber fastened to the sub-floor for fastening finished flooring to and for providing a dead air space beneath the flooring. |
| Span             | The horizontal distance between supports. As for an arch or roof.  |
| Spandrel         | The triangular space between the curves of an arch and the straight-line construction above the curves.                                |
| Specific Data    | Information that is specific to the subject property or comparables.   |
| Sprinkler System | A fire protection system consisting of overhead water pipes and nozzles so installed and regulated that water is sprayed               |

automatically over the protected area when the temperature in the area reached a predetermined point.

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|------------------------------|---|
| Standard Deviation           | The result of subtracting the mean from each value in a set, squaring those and adding them, then dividing them by the number of samples in the set minus 1 and taking the square root of that number. It measures the dispersion of a set of data from its mean. |
| Stile                        | Upright piece in the frame of a door or window.   |
| Straight Line Capitalization | A technique that estimates a value by dividing net income by a capitalization rate which is comprised of a discount rate, the reciprocal of remaining economic life and effective tax rate.   |
| Studding                     | Upright framework to which walls of a building are attached.  |
| Subfloor                     | Rough flooring laid on floor joists to form a base for finished flooring.   |
| Substitution                 | The appraisal principal where a buyer will pay no more for a property than the cost of acquiring an equally desirable property.   |
| Substructure                 | The part of a building below the top of the foundation.   |
| Superstructure               | The part of a building above the top of the foundation.   |

|                      |  |
|----------------------|--|
| Super Adequacy       | An item whose cost exceeds its value.  |
| Surplus Productivity | The income left after the costs of land, labor, capital, and management have been satisfied.   |
| Suspended Ceiling    | A ceiling hung below the ceiling joists.   |
| Tax Map              | A map showing all lots and tracts of land in their relative size, shape, and location. Also known as plat map, or property location map.   |
| Tenon                | The end of a piece of wood cut so as to fit into a hole in another piece of wood, and so form a joint.   |
| Terrace              | An outside floor area, without roof; constructed of concrete, brick tile, stone, slate, or other similar material, usually adjoining a house and used as an outdoor living area. Same as a patio.            |
| Through Lot          | A lot abutting two parallel, or approximately parallel streets.  |
| Tilt-up Construction | Concrete exterior wall construction in which precast reinforced concrete sections are lifted into position in the wall. This type of construction is sometimes found in commercial and industrial buildings. |
| Tongue and Groove    | Lumber (usually flooring or siding) or other building material in which one edge has a projecting tongue and the   |

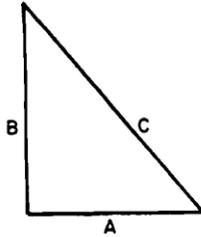
opposite edge has a groove that fits over the tongue of matching material to form a locked joint.

|                   |  |
|-------------------|--|
| Tract             | A single piece of land under one ownership. Can be a lot or acreage. Same as a parcel.   |
| Transom           | A low window opening above a door or another window.   |
| Tread             | The top, or horizontal, part of a stair step.  |
| Trending          | Adjusting a variable value to compensate for increases or decreases in the market over time.   |
| Truss             | A series of beams, bars and similar structural members assembled into an open web pattern to support a roof or floor, itself supported at both ends.         |
| Under Improvement | A building having value less than that which the value of the land on which it is built justifies.   |
| Unit Foot Value   | The value of a piece of land one foot wide abutting a street or highway and extending back from the front the standard lot depth.                            |
| Unit Front Foot   | A piece of land one foot wide abutting a street or highway and extending back from the front the standard lot depth.   |
| Unit Heater       | A complete heating unit, without ducts, for heating the area in which it is located, such as a room or other part less than the complete area of a building. |

|                      |  |
|----------------------|--|
| Unit in Place Method | A cost estimate where all the direct and indirect costs of each component are combined to arrive at a cost value.  |
| Unit Land Value Map  | A map showing the value of land per unit front foot, square foot, or acre in an assessment area.   |
| Value                | The present worth of future benefits of owning property.   |
| VCS                  | Value Control Sector, a group of properties with similar physical, economic and governmental characteristics defined for mass appraisal modeling.  |
| Wainscot             | The lower part of an interior wall (approximately four feet high) when finished different from the remainder of the wall, as with tile.  |
| Wall Board           | An interior wall and ceiling fiber material cut into sheets for use in place of plaster.   |
| Wall Ratio           | The relationship of the exterior walls (perimeter) to the ground area of the building. The wall ratio is used for determining the base unit cost of commercial and industrial buildings and is found by dividing the square feet of the building ground area by the perimeter of the exterior walls. |

## 153. Area and Volume Formulas

### AREA AND VOLUME FORMULAS



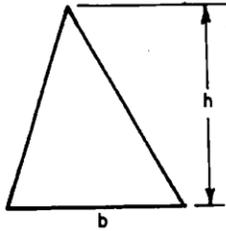
#### Rule of Right Triangle

- Square of hypotenuse of a right triangle is equal to the sum of the squares of other two sides.
- Square of one side equals square of hypotenuse minus square of other side.

$$C^2 \text{ equals } A^2 \text{ plus } B^2$$

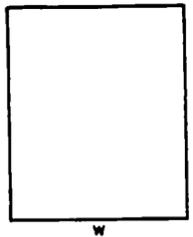
$$A^2 \text{ equals } C^2 \text{ minus } B^2$$

$$B^2 \text{ equals } C^2 \text{ minus } A^2$$



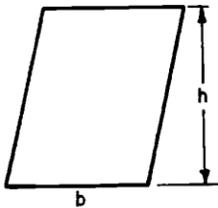
#### Triangle

Area equals 1/2 the product of base and altitude  
 $A = 1/2 (bh)$



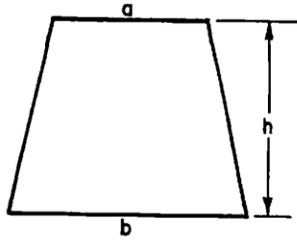
#### Rectangles and Squares

Area equals the product of length and width  
 $A = lw$



#### Parallelograms

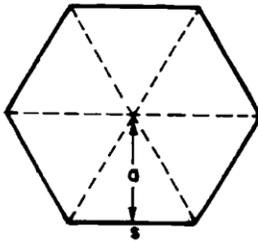
Area equals the product of base and altitude  
 $A = bh$



Trapezoid

Area equals the product of the height and 1/2 the sum of the bases.

$$A = \frac{a + b}{2} \times h$$

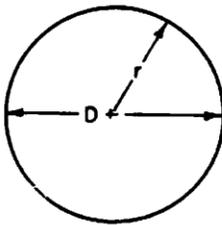


Hexagon

Area equals 3 times the product of apothem and 1 side.

$$A = 3as$$

NOTE: Divide hexagon into triangles.



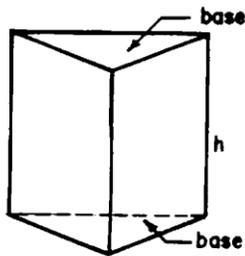
Circle

Area equals the product of  $\pi$  (3.1416) and radius squared.

$$A = \pi r^2 \text{ or } .7854D^2$$

Circumference equals the product of  $\pi$  and diameter.

$$C = \pi D \text{ or } C = 2\pi r$$

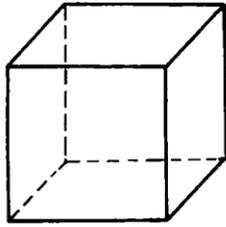


Prism

Lateral area equals the perimeter of the base times the height.

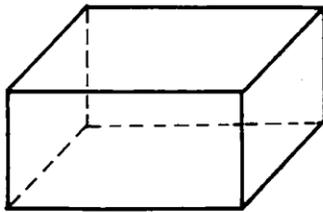
Total area equals the combined area of lateral faces and the bases.

Volume of any prism equals the area of base times altitude.



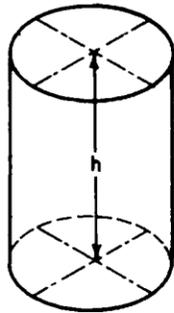
Cube

Total area equals 6 times the square of one edge.  
Volume equals area of the base times altitude.



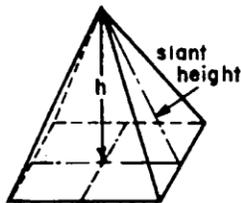
Rectangular Solid

Lateral area equals the perimeter of the base times the height.  
Total area equals combined area of lateral faces and the bases.  
Volume equals area of base times altitude.



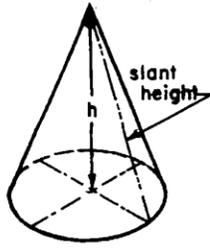
Cylinder

Lateral area equals the circumference of base times height.  
Volume equals the area of its base times altitude.



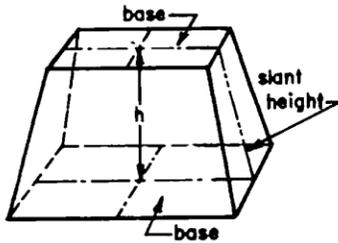
Pyramid

A solid whose base is a polygram and sides are triangles and meet in common point to form the vertex.  
Lateral area is equal to the perimeter of base x 1/2 slant height.  
Volume is 1/3 the base area x altitude.



Cone

A solid whose base is a circle and whose surface tapers to a point called vertex or top. May be considered a pyramid with an unlimited number of sides.  
 The lateral area equals the circumference of base x 1/2 slant height.  
 Volume equals 1/3 of the product of the base area and altitude.



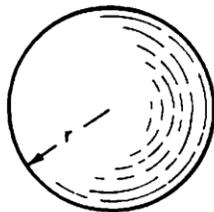
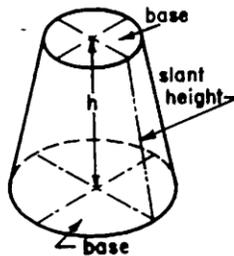
Frustums

Lateral area of a frustum of a right pyramid equals one half of the sum of the perimeters of two bases times the slant height.

Lateral area of a frustum of a cone is found by multiplying one-half the sum of the circumference of the two bases by the slant height.

Total area of a frustum is the sum of lateral area and the two bases.

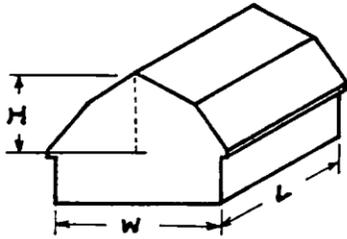
For volume of a frustum take sum of the areas of the two bases; to this add the square root of the product of the areas of the two bases, multiply result by 1/3 of the altitude.



Sphere

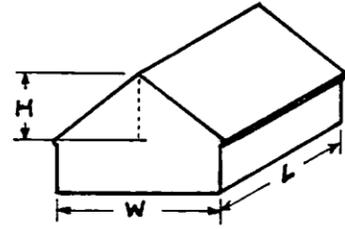
(A solid bounded by a curved surface, every point equally distant from the center.)  
 Surface of a sphere equals  $\pi$  times the square of the diameter.  
 Volume of a sphere equals the area of the surface times 1/3 of the radius.  
 Circumference is the same as that of a circle.

ROOF VOLUME FORMULAS



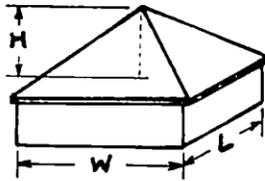
GAMBREL ROOF  

$$\frac{W \times L \times H \times 2}{3}$$



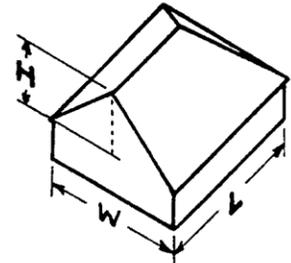
GABLE ROOF  

$$\frac{W \times L \times H}{2}$$



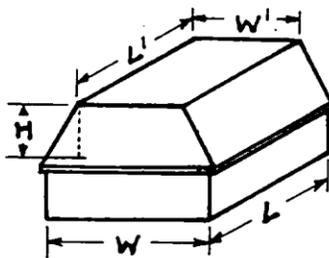
PYRAMID ROOF  

$$\frac{W \times L \times H}{3}$$



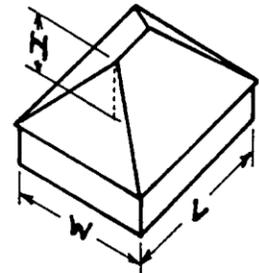
SINGLE HIP ROOF  

$$\frac{W \times L \times H}{2} - \frac{W \times L \times H}{6}$$



MANSARD ROOF  

$$\left[ (W \times L) + (W' \times L') \right] \times \frac{H}{2}$$



DOUBLE HIP ROOF  

$$\frac{W \times L \times H}{2} - \frac{W \times L \times H}{3}$$

NOTE:

All heights (H) are measured from the upper side of attic floor joist to the peak.

All widths and lengths are outside measurements.

## 154. Units of Measurements

Tables of Weights and Measures and Other Information Which May Be Helpful to the Assessor

### Linear Measure

|           |   |  |
|-----------|---|--|
| 1 Foot    | = | 12 inches  |
| 1 Yard    | = | 3 feet - 36 inches                               |
| 1 Rod     | = | 5 1/2 yards - 16 1/2 feet                        |
| 1 Furlong | = | 40 rods - 220 yards - 660 feet                   |
| 1 Mile    | = | 8 furlongs - 320 rods - 1,760 yards - 5,280 feet |

### Surveyor's Linear Measure

|           |   |                              |
|-----------|---|------------------------------|
| 1 Link    | = | 7.92 inches                  |
| 1 Rod     | = | 25 links                     |
| 1 Chain   | = | 4 rods - 100 links - 66 feet |
| 1 Furlong | = | 10 chains                    |
| 1 Mile    | = | 8 furlongs - 80 chains       |

### Square Measure

|               |   |   |
|---------------|---|---|
| 1 Square Foot | = | 144 sq. inches  |
| 1 Square Yard | = | 9 sq. feet - 1,296 sq. inches                         |
| 1 Square Rod  | = | 1 pole or perch - 30 1/4 sq. yards - 272 1/4 sq. feet |
| 1 Rood        | = | 40 sq. rods   |
| 1 Acre        | = | 160 sq. rods - 4,840 sq. yards - 43,560 sq. feet      |
| 1 Square Mile | = | 640 acres   |

### Surveyor's Square Measure

|                |   |               |
|----------------|---|---------------|
| 1 Square Rod   | = | 526 sq. links |
| 1 Square Chain | = | 16 sq. rods   |
| 1 Acre         | = | 10 sq. chains |
| 1 Square Mile  | = | 640 acres     |

### Cubic Measure

|                    |   |                                  |
|--------------------|---|----------------------------------|
| 1 Cubic Foot       | = | 1,728 cu. inches - 7,481 gallons |
| 1 Cubic Yard       | = | 27 cu. feet                      |
| 1 Cord Foot        | = | 16 cu. feet                      |
| 1 Cord of Wood     | = | 8 cord feet - 128 cu. feet       |
| 1 Perch of Masonry | = | 24 3/4 cu. feet                  |
| 1 Bushel           | = | 1.2445 cu. feet                  |

### Angles and Arcs

|                 |   |                           |
|-----------------|---|---------------------------|
| 1 Minute        | = | .60 seconds               |
| 1 Degree        | = | 60 minutes                |
| 1 Right Angle   | = | 90 degrees - 1 quadrant   |
| 1 Circumference | = | 360 degrees - 4 quadrants |

### Board Measure

|              |   |   |
|--------------|---|---|
| 1 Board Foot | = | length in feet x width in feet x thickness in inches. |
|--------------|---|---|

Measurements in General Use:

1 link is 7.92 inches  
1 foot is 12 inches  
1 yard is 3 feet or 36 inches  
1 rod is 16 1/2 feet, 5 1/2 yards or 25 links  
1 surveyors chain is 66 feet, or 4 rods, or 100 links  
1 furlong is 660 feet, or 40 rods  
1 mile is 8 furlongs, 320 rods, 80 chains or 5,280 feet  
1 square rod is 272 1/4 square feet or 30 1/4 square yards  
1 acre contains 43,560 square feet  
1 acre contains 160 square rods

A span is 9 inches  
A hand - horse measurement - is 4 inches  
A knot - nautical - is 6,080.27 feet  
A fathom - nautical - is 6 feet  
A stone is 14 pounds

A square acre is approximately 208.7 feet on each side  
1 acre is about 8 rods by 20 rods, or any two combinations of rods whose product is 160.

Simple Formula Converting Square Feet to Acres:

Multiply by 23 and point off 6 places  
Example: 1500 ft. x 2050 ft. = 3,075,000 sq. ft. x 23 = 70.73 acres  
(This method is not exact but is useful for rough calculations)

To Find Capacity of Cylindrical Tanks Standing on End:

To find the capacity of cubic feet of a tapered round tank or other object: See "Volume of Frustrum".

To find the capacity of a cylindrical tank in gallons:  
Multiply area of base ( $\pi r^2$ ) by height of tank to obtain capacity in cubic feet.  
Multiply capacity in cubic feet by 7.481 gallons per cubic foot.

Board Measure:

Multiply thickness in inches by width in inches, divide product by 12 and multiply result by the length in feet. The result is board measure content.

Conversion factors for converting lineal feet of lumber into board feet.

Example:

50 - 2" x 10"s 20' long

50 x 20' = 1000 lineal feet

2" x 10" = 20 sq. inches - 12 = 1.667 board feet x 1000 lineal feet equals 1,667 board feet.

UNITS OF LENGTH INTERNATIONAL MEASURE\*

| Units          | Inches        | Feet         | Yards        |
|----------------|---------------|--------------|--------------|
| 1 inch =       | <u>1</u>      | 0.083 333 33 | 0.027 777 78 |
| 1 foot =       | <u>12</u>     | <u>1</u>     | 0.033 333 3  |
| 1 yard =       | <u>36</u>     | <u>3</u>     | <u>1</u>     |
| 1 mile =       | <u>63 360</u> | <u>5280</u>  | <u>1760</u>  |
| 1 centimeter = | 0.393 700 78  | 0.032 808 40 | 0.010 936 13 |
| 1 meter =      | 39.370 08     | 3.280 840    | 1.093 613    |

| Units          | Miles             | Centimeters      | Meters          |
|----------------|-------------------|------------------|-----------------|
| 1 inch =       | 0.000 015 782 83  | <u>2.54</u>      | <u>0.025 4</u>  |
| 1 foot =       | 0.000 189 393 9   | <u>30.48</u>     | <u>0.304 8</u>  |
| 1 yard =       | 0.000 568 181 8   | <u>91.44</u>     | <u>0.914 4</u>  |
| 1 mile =       | <u>1</u>          | <u>160 934.4</u> | <u>1609.344</u> |
| 1 centimeter = | 0.000 006 213 712 | <u>1</u>         | <u>0.01</u>     |
| 1 meter =      | 0.000 621 371 2   | <u>100</u>       | <u>1</u>        |

UNITS OF LENGTH SURVEY MEASURE\*

| Units     | Links       | Feet        | Rods         | Chains       |
|-----------|-------------|-------------|--------------|--------------|
| 1 link =  | <u>1</u>    | <u>0.66</u> | 0.04         | <u>0.01</u>  |
| 1 foot =  | 1.515 152   | <u>1</u>    | 0.050 606 06 | 0.015 151 52 |
| 1 rod =   | <u>25</u>   | <u>16.5</u> | <u>1</u>     | <u>0.25</u>  |
| 1 chain = | <u>100</u>  | <u>66</u>   | <u>4</u>     | <u>1</u>     |
| 1 mile =  | <u>8000</u> | <u>5280</u> | <u>320</u>   | <u>80</u>    |
| 1 meter = | 4.970 960   | 3.280 833   | 0.198 838 4  | 0.049 709 60 |

| Units     | Miles           | Meters      |
|-----------|-----------------|-------------|
| 1 link =  | 0.000 125       | 0.201 168 4 |
| 1 foot =  | 0.000 189 393 9 | 0.304 800 6 |
| 1 rod =   | 0.003 125       | 5.029 210   |
| 1 chain = | 0.0125          | 20.116 84   |
| 1 mile =  | <u>1</u>        | 1609.347    |
| 1 meter = | 0.000 621 369 9 | <u>1</u>    |

\* One survey foot = 1.000.002 international feet  
 One survey mile = 1.000.002 international mile

UNITS OF VOLUME

| Units                | Cubic Inches  | Cubic Feet       | Cubic Yards       |
|----------------------|---------------|------------------|-------------------|
| 1 cubic inch =       | <u>1</u>      | 0.000 578 703 7  | 0.000 021 433 47  |
| 1 cubic foot =       | <u>1728</u>   | <u>1</u>         | 0.037 037 04      |
| 1 cubic yard =       | <u>46 656</u> | <u>27</u>        | <u>1</u>          |
| 1 cubic centimeter = | 0.061 023 74  | 0.000 035 314 67 | 0.000 001 307 951 |
| 1 cubic decimeter =  | 61.023 74     | 0.035 314 67     | 0.001 307 951     |
| 1 cubic meter =      | 61 023.74     | 35.314 67        | 1.307 951         |

| Units                | Cubic Centimeters | Cubic Decimeters | Cubic Meters      |
|----------------------|-------------------|------------------|-------------------|
| 1 cubic inch =       | 16.387 064        | 0.016 387 064    | 0.000 016 387 064 |
| 1 cubic foot =       | 28 316.846 592    | 28.316 846 592   | 0.028 316 846 592 |
| 1 cubic yard =       | 764 554.857 984   | 764.554 857 984  | 0.764 554 857 984 |
| 1 cubic centimeter = | <u>1</u>          | <u>0.001</u>     | <u>0.000 001</u>  |
| 1 cubic decimeter =  | <u>1 000</u>      | <u>1</u>         | <u>0.001</u>      |
| 1 cubic meter =      | <u>1 000 000</u>  | <u>1000</u>      | <u>1</u>          |

ALL UNDERLINED FIGURES ARE EXACT.

UNITS OF AREA INTERNATIONAL MEASURE\*

| Units              | Square Inches        | Square Feet   | Square Yards    |
|--------------------|----------------------|---------------|-----------------|
| 1 sq. inch =       | <u>1</u>             | 0.006 944 444 | 0.000 771 604 9 |
| 1 sq. foot =       | <u>144</u>           | <u>1</u>      | 0.111 111 1     |
| 1 sq. yard =       | <u>1296</u>          | <u>9</u>      | <u>1</u>        |
| 1 sq. mile =       | <u>4 014 189 600</u> | 27 878 400    | 3 097 600       |
| 1 sq. centimeter = | 0.155 000 3          | 0.001 076 391 | 0.000 119 599 0 |
| 1 sq. meter =      | 1550.003             | 10.763 91     | 1.195 990       |

| Units              | Square Miles             | Sq. Centimeters   | Sq. Meters        |
|--------------------|--------------------------|-------------------|-------------------|
| 1 sq. inch =       | 0.000 000 000 249 097 7  | <u>6.451 6</u>    | 0.000 645 16      |
| 1 sq. foot =       | 0.000 000 035 870 06     | <u>929.030 4</u>  | 0.092 903 04      |
| 1 sq. yard =       | 0.000 000 322 830 6      | <u>8361.273 6</u> | 0.836 127 36      |
| 1 sq. mile =       | <u>1</u>                 | 25 899 881 103.36 | 2 589 988.110 336 |
| 1 sq. centimeter = | 0.000 000 000 038 610 22 | <u>1</u>          | 0.000 1           |
| 1 sq. meter =      | 0.000 000 386 102 1      | <u>10 000</u>     | <u>1</u>          |

UNITS OF AREA SURVEY MEASURE\*

| Units         | Square Feet       | Square Rods    | Square Chains   | Acres            |
|---------------|-------------------|----------------|-----------------|------------------|
| 1 sq. foot =  | <u>1</u>          | 0.003 673 095  | 0.000 229 568 4 | 0.000 022 956 84 |
| 1 sq. rod =   | <u>272.25</u>     | <u>1</u>       | 0.062 5         | 0.006 25         |
| 1 sq. chain = | <u>4 356</u>      | <u>16</u>      | <u>1</u>        | <u>0.1</u>       |
| 1 sq. acre =  | <u>43 560</u>     | <u>160</u>     | <u>10</u>       | <u>1</u>         |
| 1 sq. mile =  | <u>27 878 400</u> | <u>102 400</u> | <u>6400</u>     | <u>640</u>       |
| 1 sq. meter = | 10.763 87         | 0.039 536 70   | 0.002 471 004   | 0.000 247 104 4  |
| 1 hectare =   | 107 638.7         | 395.367 0      | 24.710 44       | 2.471 044        |

UNITS OF AREA SURVEY MEASURE\*

| Units         | Square Miles         | Square Meters |
|---------------|----------------------|---------------|
| 1 sq. foot =  | 0.000 000 035 870 06 | 0.092 903 41  |
| 1 sq. rod =   | 0.000 009 765 625    | 25.292 95     |
| 1 sq. chain = | <u>0.000 156 25</u>  | 404.687 3     |
| 1 acre =      | <u>0.001 562 5</u>   | 4 046.873     |
| 1 sq. mile =  | <u>1</u>             | 2 589 998     |
| 1 sq. meter = | 0.000 000 386 100 6  | <u>1</u>      |
| 1 hectare =   | 0.003 861 006        | <u>10 000</u> |

| Units         | Hectares          |
|---------------|-------------------|
| 1 sq. foot =  | 0.000 009 290 341 |
| 1 sq. rod =   | 0.002 529 295     |
| 1 sq. chain = | 0.040 468 73      |
| 1 acre =      | 0.404 687 3       |
| 1 sq. mile =  | 258.999 8         |
| 1 sq. meter = | <u>0.000 1</u>    |
| 1 hectare =   | <u>1</u>          |

\* One square survey foot = 1.000 004 square international feet  
 One square survey mile = 1.000 004 square international mile

ALL UNDERLINED FIGURES ARE EXACT.

Table for the Conversion of Lineal Feet into Board Feet

|           |                 |                 |
|-----------|-----------------|-----------------|
| 2" x 4"   | (1 lineal foot) | .667 board feet |
| 3" x 4"   | "               | 1.000 " "       |
| 2" x 6"   | "               | 1.000 " "       |
| 2" x 8"   | "               | 1.333 " "       |
| 2" x 10"  | "               | 1.667 " "       |
| 2" x 12"  | "               | 2.000 " "       |
| 2" x 14"  | "               | 2.333 " "       |
| 2" x 16"  | "               | 2.667 " "       |
| 3" x 6"   | "               | 1.500 " "       |
| 4" x 6"   | "               | 2.000 " "       |
| 4" x 8"   | "               | 2.667 " "       |
| 4" x 10"  | "               | 3.333 " "       |
| 4" x 12"  | "               | 4.000 " "       |
| 6" x 6"   | "               | 3.000 " "       |
| 6" x 8"   | "               | 5.000 " "       |
| 10" x 12" | "               | 10.000 " "      |
| 12" x 12" | "               | 12.000 " "      |

MENSURATION PRINCIPLES

Plane figure - A plane surface bounded by either straight or curved lines and having no thickness.

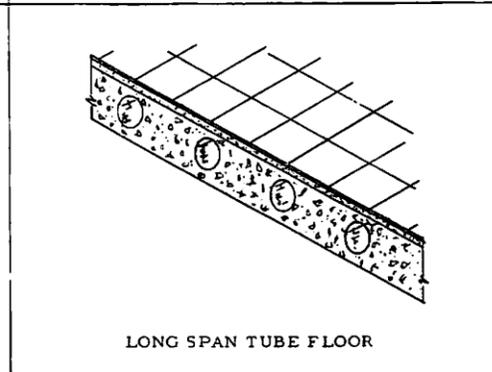
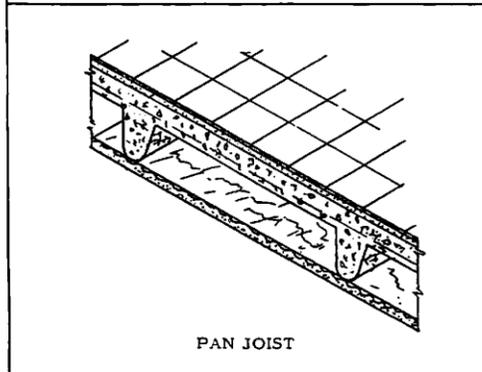
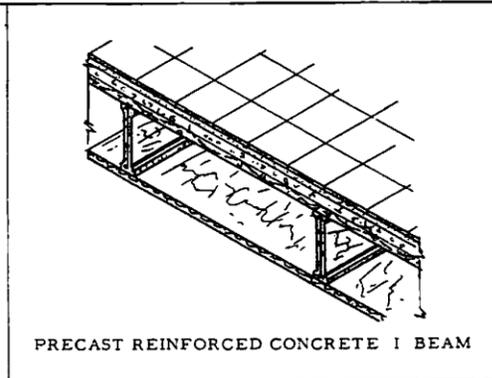
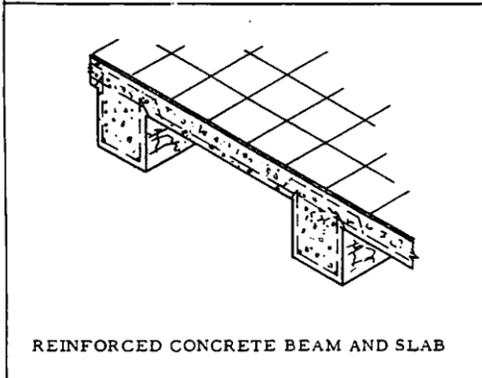
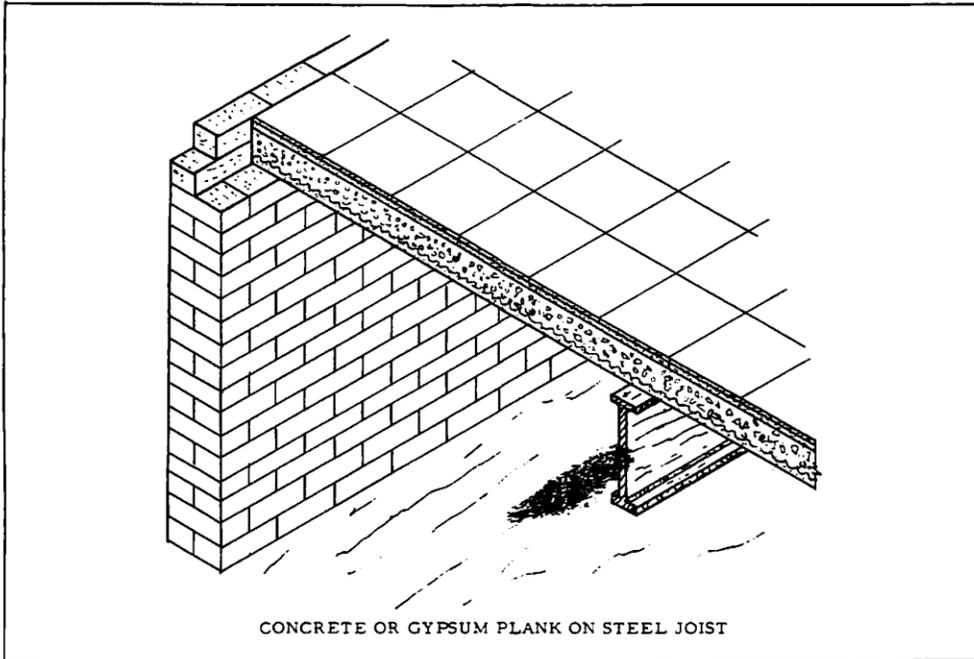
Solid - A body, such as a barrel, building, etc.

Square measure - Area calculation requiring only two dimensions, length and width.

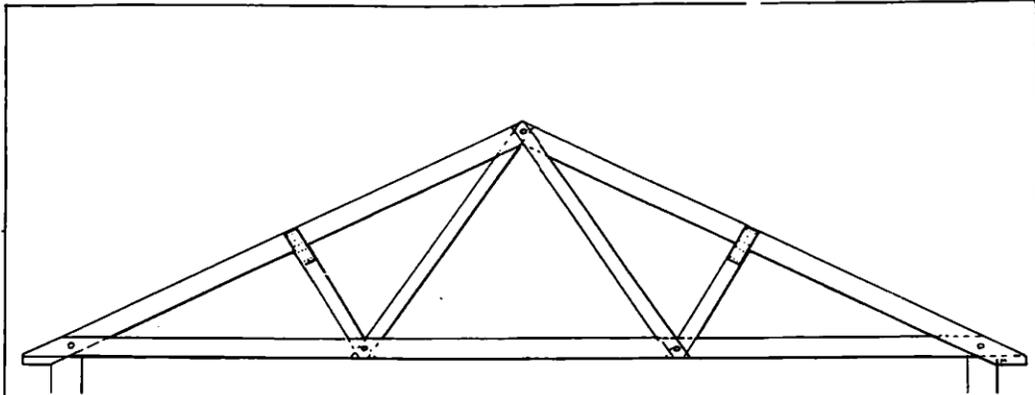
Cubic measure - Cubic or cubage means volume and gives size in terms of its bulk. Calculation requires 3 dimensions, length x width x depth or height or thickness.

# 155. Construction Illustrations

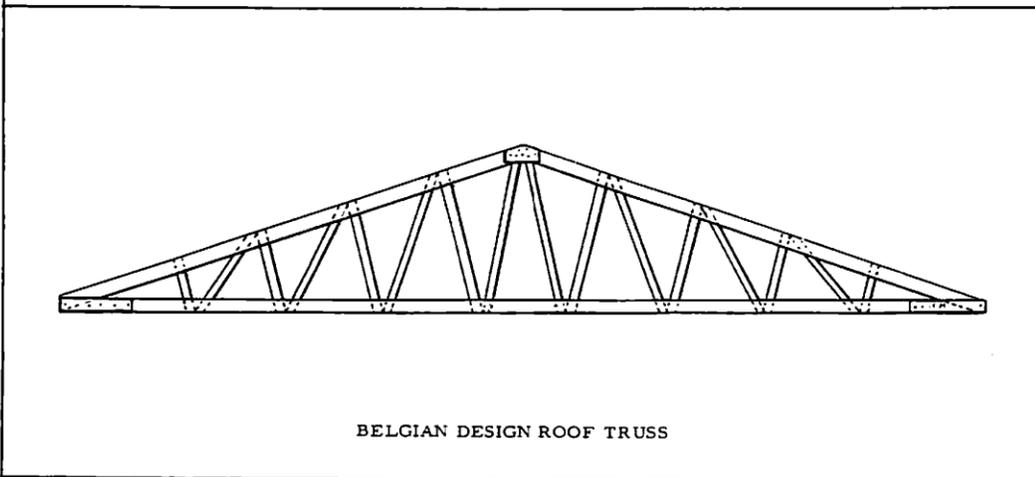
## ILLUSTRATIONS FLOORS



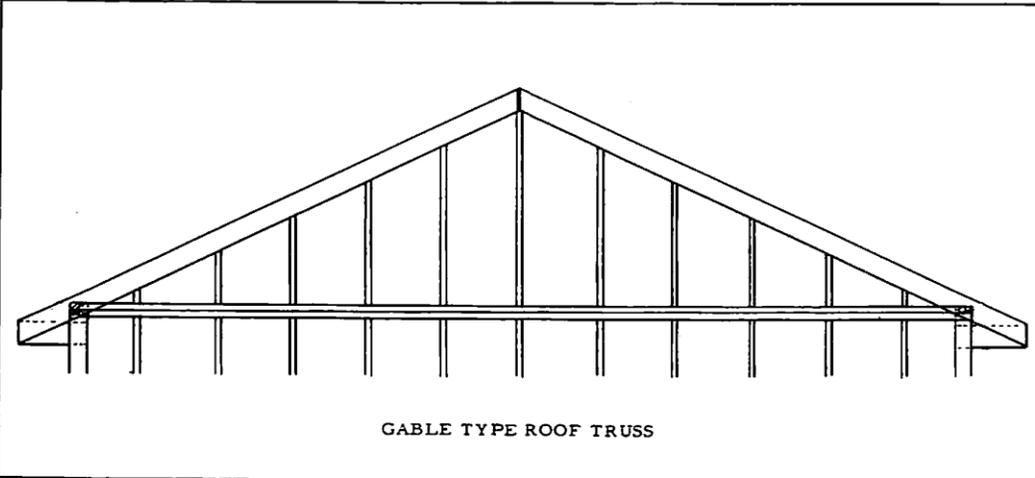
RESIDENTIAL TRUSSES



BOLTED ROOF TRUSS

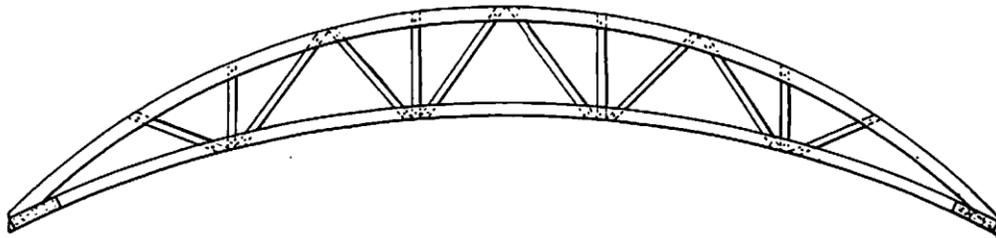


BELGIAN DESIGN ROOF TRUSS

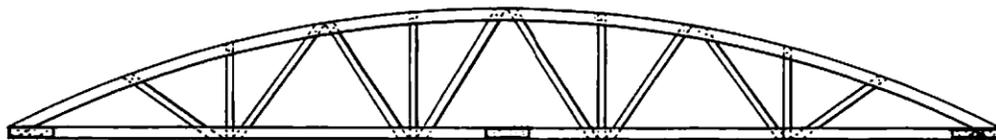


GABLE TYPE ROOF TRUSS

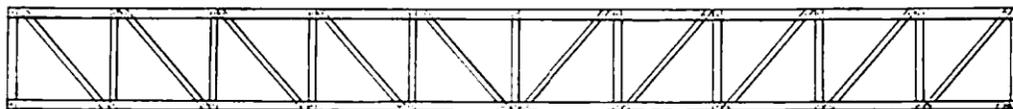
COMMERCIAL TRUSSES



CRESENT DESIGN ROOF TRUSS

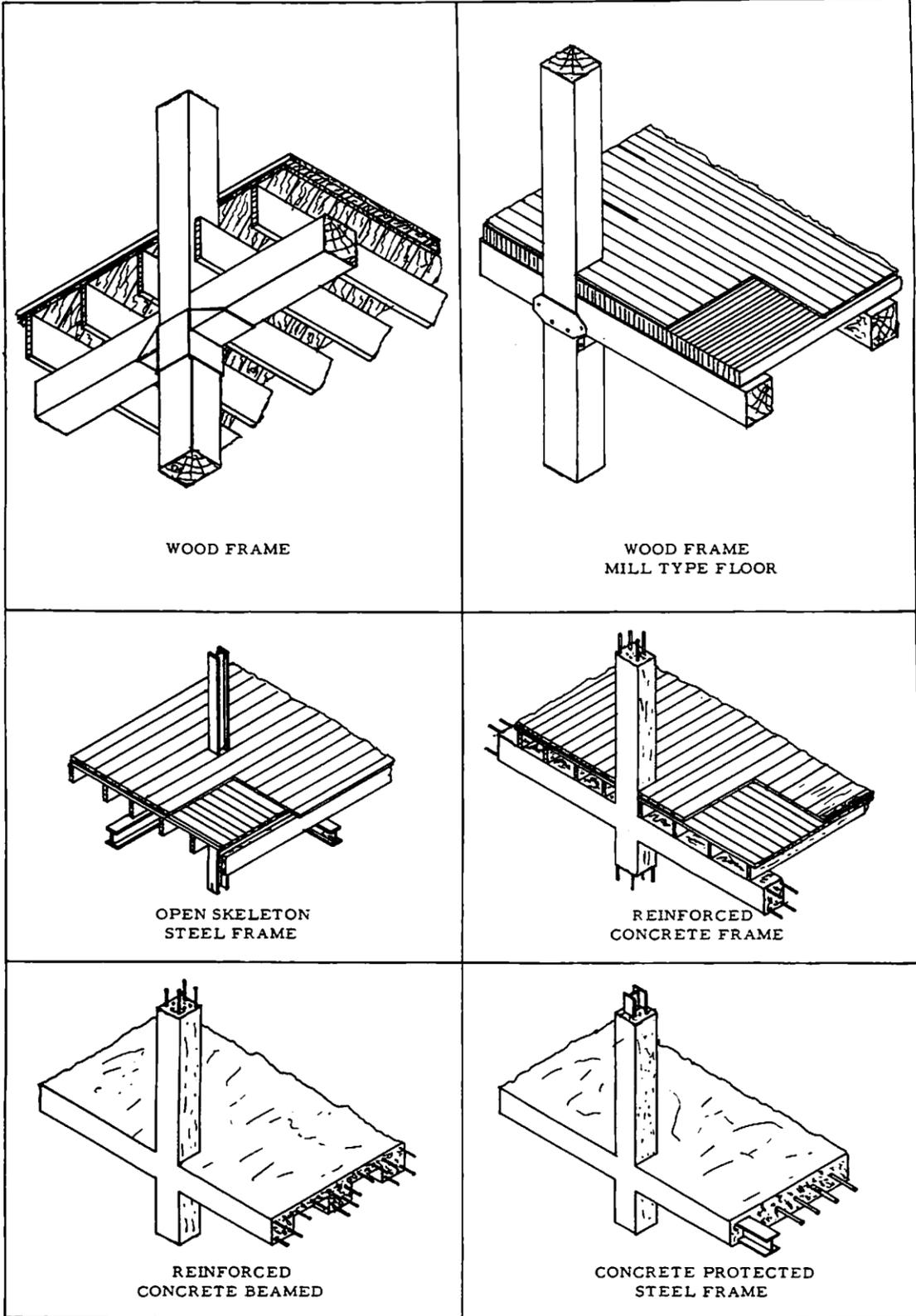


BOWSTRING ROOF TRUSS



FLAT TOP OR HOWE DESIGN ROOF TRUSS

FRAMING



## 156. Compound Interest Tables

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4%

### ANNUAL TABLE

4%

| YEARS | 1             | 2                        | 3                   | 4                    | 5                            | 6               |
|-------|---------------|--------------------------|---------------------|----------------------|------------------------------|-----------------|
|       | AMOUNT OF ONE | AMOUNT OF ONE PER PERIOD | SINKING FUND FACTOR | PRESENT WORTH OF ONE | PRESENT WORTH ONE PER PERIOD | PARTIAL PAYMENT |
| 1     | 1.040 000     | 1.000 000                | 1.000 000           | .961 538             | .961 538                     | 1.040 000       |
| 2     | 1.081 600     | 2.040 000                | .490 196            | .924 556             | 1.886 095                    | .530 196        |
| 3     | 1.124 864     | 3.121 600                | .320 349            | .888 996             | 2.715 091                    | .380 349        |
| 4     | 1.169 859     | 4.246 464                | .235 490            | .854 804             | 3.429 895                    | .275 490        |
| 5     | 1.216 653     | 5.416 323                | .184 627            | .821 927             | 4.451 822                    | .224 627        |
| 6     | 1.265 319     | 6.632 975                | .150 762            | .790 315             | 5.242 137                    | .190 762        |
| 7     | 1.315 932     | 7.898 294                | .126 610            | .759 918             | 6.002 055                    | .166 610        |
| 8     | 1.368 569     | 9.214 226                | .108 528            | .730 690             | 6.732 745                    | .148 528        |
| 9     | 1.423 312     | 10.582 795               | .094 493            | .702 587             | 7.435 332                    | .134 493        |
| 10    | 1.480 244     | 12.006 107               | .083 291            | .675 564             | 8.110 896                    | .123 291        |
| 11    | 1.539 454     | 13.486 351               | .074 149            | .649 581             | 8.760 477                    | .114 149        |
| 12    | 1.601 032     | 15.025 805               | .066 552            | .624 597             | 9.385 074                    | .106 552        |
| 13    | 1.665 074     | 16.626 838               | .060 144            | .600 574             | 9.985 648                    | .100 144        |
| 14    | 1.731 676     | 18.291 911               | .054 669            | .577 475             | 10.563 123                   | .094 669        |
| 15    | 1.800 944     | 20.023 588               | .049 941            | .555 265             | 11.118 387                   | .089 941        |
| 16    | 1.872 981     | 21.824 531               | .045 820            | .533 908             | 11.652 296                   | .085 820        |
| 17    | 1.947 900     | 23.697 512               | .042 199            | .513 373             | 12.165 669                   | .082 199        |
| 18    | 2.025 817     | 25.645 413               | .038 993            | .493 628             | 12.659 297                   | .078 993        |
| 19    | 2.106 849     | 27.671 229               | .036 139            | .474 642             | 13.133 939                   | .076 139        |
| 20    | 2.191 123     | 29.778 079               | .033 582            | .456 387             | 13.590 326                   | .073 582        |
| 21    | 2.278 768     | 31.969 202               | .031 280            | .438 834             | 14.029 150                   | .071 280        |
| 22    | 2.369 919     | 34.247 970               | .029 199            | .421 955             | 14.451 115                   | .069 199        |
| 23    | 2.464 716     | 36.617 889               | .027 309            | .405 726             | 14.856 842                   | .067 309        |
| 24    | 2.563 304     | 39.082 604               | .025 587            | .390 121             | 15.246 963                   | .065 587        |
| 25    | 2.665 836     | 41.645 908               | .024 012            | .375 117             | 15.622 080                   | .064 012        |
| 26    | 2.772 470     | 44.311 745               | .022 567            | .360 689             | 15.982 769                   | .062 567        |
| 27    | 2.883 369     | 47.084 214               | .021 239            | .346 817             | 16.329 586                   | .061 239        |
| 28    | 2.998 703     | 49.967 583               | .020 013            | .333 477             | 16.663 063                   | .060 013        |
| 29    | 3.118 651     | 52.966 286               | .018 880            | .320 651             | 16.983 715                   | .058 880        |
| 30    | 3.243 398     | 56.084 936               | .017 830            | .308 319             | 17.292 033                   | .057 830        |
| 31    | 3.373 133     | 59.328 335               | .016 855            | .296 460             | 17.586 494                   | .056 855        |
| 32    | 3.508 059     | 62.701 469               | .015 949            | .285 058             | 17.873 551                   | .055 949        |
| 33    | 3.648 381     | 66.209 527               | .015 104            | .274 094             | 18.147 646                   | .055 104        |
| 34    | 3.794 316     | 69.857 909               | .014 315            | .263 552             | 18.411 198                   | .054 315        |
| 35    | 3.946 089     | 73.652 225               | .013 577            | .253 415             | 18.664 613                   | .053 577        |
| 36    | 4.103 933     | 77.595 314               | .012 887            | .243 669             | 18.908 282                   | .052 887        |
| 37    | 4.268 090     | 81.702 246               | .012 240            | .234 297             | 19.142 579                   | .052 240        |
| 38    | 4.438 813     | 85.970 336               | .011 632            | .225 285             | 19.367 864                   | .051 632        |
| 39    | 4.616 366     | 90.409 150               | .011 061            | .216 621             | 19.584 485                   | .051 061        |
| 40    | 4.801 021     | 95.025 516               | .010 523            | .208 289             | 19.792 774                   | .050 523        |
| 41    | 4.993 061     | 99.826 536               | .010 017            | .200 278             | 19.993 052                   | .050 017        |
| 42    | 5.192 784     | 104.819 598              | .009 540            | .192 575             | 20.185 627                   | .049 540        |
| 43    | 5.400 495     | 110.012 382              | .009 090            | .185 168             | 20.370 795                   | .049 090        |
| 44    | 5.616 515     | 115.412 877              | .008 665            | .178 046             | 20.548 841                   | .048 665        |
| 45    | 5.841 176     | 121.029 392              | .008 262            | .171 198             | 20.720 040                   | .048 262        |
| 46    | 6.074 823     | 126.870 568              | .007 887            | .164 614             | 20.884 654                   | .047 887        |
| 47    | 6.317 816     | 132.945 190              | .007 527            | .158 281             | 21.042 936                   | .047 527        |
| 48    | 6.570 578     | 139.263 206              | .007 181            | .152 195             | 21.195 131                   | .047 181        |
| 49    | 6.833 347     | 145.833 734              | .006 851            | .146 341             | 21.341 412                   | .046 851        |
| 50    | 7.106 681     | 152.667 084              | .006 550            | .140 713             | 21.482 185                   | .046 550        |
| 51    | 7.390 951     | 159.773 767              | .006 259            | .135 301             | 21.617 485                   | .046 259        |
| 52    | 7.686 589     | 167.164 718              | .005 982            | .130 097             | 21.747 582                   | .045 982        |
| 53    | 7.994 052     | 174.851 306              | .005 719            | .125 093             | 21.872 675                   | .045 719        |
| 54    | 8.313 814     | 182.845 359              | .005 469            | .120 282             | 21.992 957                   | .045 469        |
| 55    | 8.646 367     | 191.159 173              | .005 231            | .115 656             | 22.108 612                   | .045 231        |
| 56    | 8.992 222     | 199.805 540              | .005 005            | .111 207             | 22.219 819                   | .045 005        |
| 57    | 9.351 910     | 208.797 762              | .004 789            | .106 930             | 22.326 749                   | .044 789        |
| 58    | 9.725 987     | 218.149 672              | .004 584            | .102 817             | 22.429 567                   | .044 584        |
| 59    | 10.115 026    | 227.875 659              | .004 388            | .098 863             | 22.528 430                   | .044 388        |
| 60    | 10.519 627    | 237.990 685              | .004 202            | .095 060             | 22.623 490                   | .044 202        |

$$S^n = (1+i)^n \quad S_m = \frac{S^n}{i} \quad | \quad 1/S_m = \frac{i}{S^n} \quad | \quad V^n = \frac{1}{S^n} \quad | \quad A_m = \frac{1 - 1/S^n}{i} \quad | \quad \frac{1}{A_m} = \frac{i}{1 - 1/S^n}$$

5%

ANNUAL TABLE

5% 6%

ANNUAL TABLE

6%

| YEARS | 5%            |                          |                     |                      |                              |                 | 6%            |                          |                     |                      |                              |                 |
|-------|---------------|--------------------------|---------------------|----------------------|------------------------------|-----------------|---------------|--------------------------|---------------------|----------------------|------------------------------|-----------------|
|       | AMOUNT OF ONE | AMOUNT OF ONE PER PERIOD | SINKING FUND FACTOR | PRESENT WORTH OF ONE | PRESENT WORTH ONE PER PERIOD | PARTIAL PAYMENT | AMOUNT OF ONE | AMOUNT OF ONE PER PERIOD | SINKING FUND FACTOR | PRESENT WORTH OF ONE | PRESENT WORTH ONE PER PERIOD | PARTIAL PAYMENT |
| 1     | 1.050 000     | 1.000 000                | 1.000 000           | .952 381             | .952 381                     | 1.050 000       | 1.000 000     | 1.000 000                | .943 396            | .943 396             | 1.050 000                    |                 |
| 2     | 1.102 500     | 2.050 000                | .487 805            | .907 029             | .859 410                     | .537 805        | 1.123 600     | 2.060 000                | .485 410            | .485 410             | .564 396                     |                 |
| 3     | 1.151 625     | 3.152 500                | .317 209            | .863 839             | 2.723 248                    | .837 209        | 1.191 016     | 3.183 600                | .314 110            | .314 110             | .837 209                     |                 |
| 4     | 1.215 208     | 4.310 125                | .202 012            | .822 002             | 3.545 931                    | .732 012        | 1.262 477     | 4.314 616                | .202 591            | .202 591             | .732 012                     |                 |
| 5     | 1.276 282     | 5.525 631                | .160 975            | .783 526             | 4.329 417                    | .282 915        | 1.338 226     | 5.637 093                | .177 396            | .177 396             | .282 915                     |                 |
| 6     | 1.340 096     | 6.801 913                | .147 017            | .746 215             | 5.075 692                    | .197 017        | 1.418 519     | 6.975 319                | .143 335            | .143 335             | .197 017                     |                 |
| 7     | 1.407 100     | 8.142 008                | .122 820            | .710 681             | 5.786 331                    | .172 820        | 1.501 630     | 8.393 838                | .119 335            | .119 335             | .172 820                     |                 |
| 8     | 1.477 455     | 9.549 109                | .104 722            | .676 839             | 6.463 213                    | .154 722        | 1.593 848     | 9.897 468                | .101 036            | .101 036             | .154 722                     |                 |
| 9     | 1.551 328     | 11.026 564               | .090 690            | .644 609             | 7.107 822                    | .140 690        | 1.689 419     | 11.491 316               | .087 022            | .087 022             | .140 690                     |                 |
| 10    | 1.628 895     | 12.577 893               | .079 505            | .613 913             | 7.721 735                    | .129 505        | 1.790 848     | 13.180 795               | .075 868            | .075 868             | .129 505                     |                 |
| 11    | 1.710 339     | 14.206 787               | .070 389            | .586 639             | 8.306 415                    | .120 389        | 1.899 789     | 14.971 643               | .066 793            | .066 793             | .120 389                     |                 |
| 12    | 1.795 856     | 15.917 127               | .062 825            | .556 837             | 8.869 757                    | .112 825        | 2.015 928     | 16.728 138               | .059 647            | .059 647             | .112 825                     |                 |
| 13    | 1.885 649     | 17.712 983               | .056 556            | .530 321             | 9.393 513                    | .106 556        | 2.142 928     | 18.562 138               | .053 513            | .053 513             | .106 556                     |                 |
| 14    | 1.979 932     | 19.598 632               | .051 024            | .505 068             | 9.898 641                    | .101 024        | 2.280 940     | 20.475 066               | .048 285            | .048 285             | .101 024                     |                 |
| 15    | 2.078 928     | 21.578 564               | .046 342            | .481 017             | 10.379 658                   | .096 342        | 2.436 558     | 23.475 970               | .044 285            | .044 285             | .096 342                     |                 |
| 16    | 2.182 875     | 23.657 492               | .042 270            | .458 112             | 10.837 770                   | .092 270        | 2.600 352     | 25.672 528               | .039 646            | .039 646             | .092 270                     |                 |
| 17    | 2.292 618     | 25.837 365               | .038 679            | .436 571             | 11.274 066                   | .088 679        | 2.782 800     | 28.212 880               | .036 445            | .036 445             | .088 679                     |                 |
| 18    | 2.407 150     | 28.117 305               | .035 524            | .416 271             | 11.689 543                   | .085 524        | 2.985 300     | 31.005 653               | .033 737            | .033 737             | .085 524                     |                 |
| 19    | 2.526 950     | 30.519 004               | .032 746            | .396 754             | 12.085 331                   | .082 746        | 3.207 135     | 34.062 591               | .031 013            | .031 013             | .082 746                     |                 |
| 20    | 2.653 298     | 33.045 954               | .030 243            | .378 889             | 12.462 210                   | .080 243        | 3.449 811     | 37.418 512               | .028 185            | .028 185             | .080 243                     |                 |
| 21    | 2.785 963     | 35.719 252               | .027 996            | .362 942             | 12.821 153                   | .077 996        | 3.709 564     | 41.184 512               | .025 005            | .025 005             | .077 996                     |                 |
| 22    | 2.925 261     | 38.505 214               | .025 911            | .348 850             | 13.163 003                   | .075 911        | 3.983 537     | 45.392 250               | .022 046            | .022 046             | .075 911                     |                 |
| 23    | 3.071 524     | 41.430 475               | .024 117            | .335 571             | 13.488 574                   | .074 117        | 4.272 800     | 49.995 028               | .019 679            | .019 679             | .074 117                     |                 |
| 24    | 3.224 355     | 44.502 475               | .022 561            | .323 068             | 13.808 642                   | .072 561        | 4.578 135     | 54.958 511               | .017 619            | .017 619             | .072 561                     |                 |
| 25    | 3.383 359     | 47.721 099               | .021 199            | .311 099             | 14.123 451                   | .071 199        | 4.899 811     | 60.244 512               | .015 827            | .015 827             | .071 199                     |                 |
| 26    | 3.555 673     | 51.113 454               | .019 954            | .299 564             | 14.435 185                   | .069 954        | 5.239 383     | 65.915 383               | .014 304            | .014 304             | .069 954                     |                 |
| 27    | 3.733 456     | 54.669 126               | .018 292            | .288 848             | 14.738 034                   | .068 292        | 5.599 136     | 72.008 786               | .012 997            | .012 997             | .068 292                     |                 |
| 28    | 3.920 129     | 58.402 593               | .016 123            | .278 094             | 15.032 123                   | .066 123        | 5.978 136     | 78.578 136               | .011 851            | .011 851             | .066 123                     |                 |
| 29    | 4.116 136     | 62.332 712               | .014 046            | .268 946             | 15.317 474                   | .064 046        | 6.376 511     | 85.678 136               | .010 827            | .010 827             | .064 046                     |                 |
| 30    | 4.321 942     | 66.438 848               | .011 051            | .260 377             | 15.592 451                   | .062 051        | 6.794 383     | 93.359 786               | .009 979            | .009 979             | .062 051                     |                 |
| 31    | 4.538 039     | 70.760 790               | .014 132            | .252 809             | 15.859 359                   | .060 132        | 7.232 255     | 101.678 136              | .009 255            | .009 255             | .060 132                     |                 |
| 32    | 4.764 941     | 75.298 879               | .011 280            | .245 241             | 16.118 611                   | .058 280        | 7.690 136     | 110.678 136              | .008 611            | .008 611             | .058 280                     |                 |
| 33    | 5.003 189     | 80.063 771               | .012 490            | .238 671             | 16.370 569                   | .056 490        | 8.168 011     | 120.359 786              | .008 011            | .008 011             | .056 490                     |                 |
| 34    | 5.253 348     | 85.066 959               | .011 755            | .232 104             | 16.612 904                   | .054 755        | 8.666 883     | 130.786 136              | .007 490            | .007 490             | .054 755                     |                 |
| 35    | 5.516 015     | 90.320 307               | .011 072            | .226 537             | 16.834 194                   | .053 072        | 9.186 755     | 142.011 136              | .007 011            | .007 011             | .053 072                     |                 |
| 36    | 5.791 816     | 95.836 323               | .010 634            | .221 017             | 17.046 852                   | .051 634        | 9.730 628     | 154.181 136              | .006 628            | .006 628             | .051 634                     |                 |
| 37    | 6.081 406     | 101.628 359              | .010 280            | .215 446             | 17.249 886                   | .050 280        | 10.299 500    | 167.359 786              | .006 359            | .006 359             | .050 280                     |                 |
| 38    | 6.385 471     | 107.709 566              | .009 980            | .210 881             | 17.444 886                   | .049 980        | 10.892 375    | 181.678 136              | .006 136            | .006 136             | .049 980                     |                 |
| 39    | 6.704 751     | 114.095 023              | .009 765            | .206 317             | 17.632 010                   | .049 765        | 11.509 250    | 197.200 136              | .006 010            | .006 010             | .049 765                     |                 |
| 40    | 7.039 989     | 120.799 774              | .009 608            | .202 746             | 17.812 010                   | .048 608        | 12.139 125    | 214.011 136              | .006 010            | .006 010             | .048 608                     |                 |
| 41    | 7.391 988     | 127.839 763              | .009 500            | .200 270             | 17.979 368                   | .047 500        | 12.792 125    | 232.250 136              | .006 010            | .006 010             | .047 500                     |                 |
| 42    | 7.761 888     | 135.231 751              | .009 395            | .197 793             | 18.142 208                   | .046 395        | 13.476 000    | 252.000 136              | .006 010            | .006 010             | .046 395                     |                 |
| 43    | 8.151 550     | 142.985 739              | .009 293            | .195 317             | 18.300 455                   | .045 293        | 14.186 875    | 273.359 786              | .006 010            | .006 010             | .045 293                     |                 |
| 44    | 8.557 150     | 151.143 006              | .009 194            | .192 842             | 18.454 010                   | .044 194        | 14.920 628    | 296.359 786              | .006 010            | .006 010             | .044 194                     |                 |
| 45    | 8.985 008     | 159.700 156              | .009 100            | .190 367             | 18.603 242                   | .043 100        | 15.679 500    | 321.000 136              | .006 010            | .006 010             | .043 100                     |                 |
| 46    | 9.436 258     | 168.685 164              | .009 020            | .187 892             | 18.746 066                   | .042 020        | 16.459 375    | 347.359 786              | .006 010            | .006 010             | .042 020                     |                 |
| 47    | 9.905 971     | 178.119 422              | .008 944            | .185 417             | 18.880 010                   | .041 944        | 17.269 250    | 375.678 136              | .006 010            | .006 010             | .041 944                     |                 |
| 48    | 10.401 270    | 188.025 393              | .008 871            | .182 942             | 18.999 158                   | .041 871        | 18.109 125    | 406.000 136              | .006 010            | .006 010             | .041 871                     |                 |
| 49    | 10.923 233    | 198.426 863              | .008 800            | .180 467             | 19.104 010                   | .041 800        | 18.979 000    | 438.359 786              | .006 010            | .006 010             | .041 800                     |                 |
| 50    | 11.471 400    | 209.347 936              | .008 730            | .178 010             | 19.204 923                   | .041 730        | 19.879 875    | 472.750 136              | .006 010            | .006 010             | .041 730                     |                 |
| 51    | 12.044 770    | 220.815 396              | .008 661            | .175 563             | 19.299 977                   | .041 661        | 20.809 750    | 509.200 136              | .006 010            | .006 010             | .041 661                     |                 |
| 52    | 12.642 808    | 232.856 165              | .008 596            | .173 116             | 19.389 977                   | .041 596        | 21.769 625    | 547.750 136              | .006 010            | .006 010             | .041 596                     |                 |
| 53    | 13.274 949    | 245.498 974              | .008 534            | .170 669             | 19.475 010                   | .041 534        | 22.759 500    | 588.359 786              | .006 010            | .006 010             | .041 534                     |                 |
| 54    | 13.938 631    | 258.773 922              | .008 474            | .168 233             | 19.556 010                   | .041 474        | 23.779 375    | 631.000 136              | .006 010            | .006 010             | .041 474                     |                 |
| 55    | 14.633 631    | 272.712 618              | .008 417            | .165 800             | 19.632 923                   | .041 417        | 24.829 250    | 675.750 136              | .006 010            | .006 010             | .041 417                     |                 |
| 56    | 15.367 412    | 287.348 249              | .008 363            | .163 375             | 19.705 977                   | .041 363        | 25.909 125    | 722.625 136              | .006 010            | .006 010             | .041 363                     |                 |
| 57    | 16.135 781    | 302.715 662              | .008 311            | .160 948             | 19.775 010                   | .041 311        | 27.019 000    | 771.750 136              | .006 010            | .006 010             | .041 311                     |                 |
| 58    | 16.942 572    | 318.851 445              | .008 261            | .158 521             | 19.840 010                   | .041 261        | 28.159 875    | 823.250 136              | .006 010            | .006 010             | .041 261                     |                 |
| 59    | 17.789 701    | 335.794 017              | .008 212            | .156 100             | 19.899 977                   | .041 212        | 29.329 750    | 877.000 136              | .006 010            | .006 010             | .041 212                     |                 |
| 60    | 18.679 186    | 353.503 718              | .008 165            | .153 683             | 19.954 977                   | .041 165        | 30.529 625    | 933.250 136              | .006 010            | .006 010             | .041 165                     |                 |

7%

ANNUAL TABLE

7% 8%

ANNUAL TABLE

8%

EFFECTIVE RATE 8% BASE 1.08

| YEARS | 7% 8%         |                          |                     |                      |                              |                 | 8%            |                          |                     |                      |                              |                 |
|-------|---------------|--------------------------|---------------------|----------------------|------------------------------|-----------------|---------------|--------------------------|---------------------|----------------------|------------------------------|-----------------|
|       | 1             | 2                        | 3                   | 4                    | 5                            | 6               | 1             | 2                        | 3                   | 4                    | 5                            | 6               |
|       | AMOUNT OF ONE | AMOUNT OF ONE PER PERIOD | SINKING FUND FACTOR | PRESENT WORTH OF ONE | PRESENT WORTH ONE PER PERIOD | PARTIAL PAYMENT | AMOUNT OF ONE | AMOUNT OF ONE PER PERIOD | SINKING FUND FACTOR | PRESENT WORTH OF ONE | PRESENT WORTH ONE PER PERIOD | PARTIAL PAYMENT |
| 1     | 1.070 000     | 1.000 000                | 1.000 000           | .934 519             | .934 519                     | 1.070 000       | 1.080 000     | 1.000 000                | .925 926            | .925 926             | 1.080 000                    |                 |
| 2     | 1.144 900     | 2.070 000                | .483 092            | .873 439             | 1.808 000                    | 1.573 000       | 1.259 712     | 2.080 000                | .857 339            | 1.783 265            | 1.560 769                    |                 |
| 3     | 1.270 752     | 3.216 900                | .315 252            | .815 689             | 2.624 216                    | 2.481 952       | 1.460 489     | 3.246 000                | .793 832            | 2.571 097            | 2.301 921                    |                 |
| 4     | 1.402 552     | 4.750 739                | .173 891            | .712 986             | 3.210 191                    | 3.243 691       | 1.469 328     | 4.508 112                | .735 030            | 3.332 127            | 3.051 921                    |                 |
| 5     | 1.500 730     | 6.753 291                | .119 796            | .666 342             | 3.766 540                    | 3.766 540       | 1.586 874     | 6.235 929                | .630 170            | 4.022 880            | 3.716 315                    |                 |
| 6     | 1.605 781     | 8.654 021                | .115 553            | .622 750             | 4.389 289                    | 4.389 289       | 1.733 874     | 8.512 823                | .583 070            | 4.706 370            | 4.402 070                    |                 |
| 7     | 1.718 186     | 10.459 803               | .097 488            | .582 009             | 5.071 299                    | 4.861 488       | 1.899 005     | 10.512 624               | .540 269            | 5.406 639            | 5.087 269                    |                 |
| 8     | 1.838 131     | 12.177 248               | .073 378            | .538 349             | 5.815 432                    | 4.613 378       | 2.088 005     | 12.583 558               | .500 249            | 6.126 888            | 5.787 249                    |                 |
| 9     | 1.964 615     | 13.818 468               | .049 795            | .493 795             | 6.623 382                    | 4.381 795       | 2.298 925     | 14.666 562               | .463 193            | 6.871 081            | 6.502 925                    |                 |
| 10    | 2.104 852     | 15.383 599               | .026 357            | .445 093             | 7.498 674                    | 4.133 599       | 2.531 639     | 16.645 687               | .428 082            | 7.648 082            | 7.231 639                    |                 |
| 11    | 2.252 192     | 17.088 651               | .005 907            | .444 012             | 8.442 686                    | 3.857 651       | 2.797 654     | 18.977 176               | .397 498            | 8.442 686            | 7.977 654                    |                 |
| 12    | 2.409 845     | 20.140 643               | .009 651            | .414 964             | 9.466 649                    | 3.557 643       | 3.091 267     | 21.312 920               | .370 461            | 9.312 920            | 8.732 920                    |                 |
| 13    | 2.578 514     | 22.550 488               | .044 345            | .387 817             | 10.549 648                   | 3.243 488       | 3.398 925     | 23.752 114               | .346 242            | 10.268 925           | 9.508 925                    |                 |
| 14    | 2.759 032     | 25.329 022               | .039 795            | .362 446             | 11.691 914                   | 2.911 914       | 3.662 169     | 26.297 684               | .324 242            | 11.248 169           | 10.297 684                   |                 |
| 15    | 2.952 164     | 28.488 054               | .035 858            | .338 735             | 12.898 649                   | 2.548 649       | 3.898 925     | 28.912 920               | .302 925            | 11.912 920           | 11.082 920                   |                 |
| 16    | 3.158 815     | 30.840 217               | .032 425            | .316 574             | 14.168 649                   | 2.208 649       | 4.108 925     | 30.724 216               | .281 649            | 12.648 649           | 11.882 925                   |                 |
| 17    | 3.379 912     | 33.399 033               | .029 413            | .295 864             | 15.498 649                   | 1.888 649       | 4.298 925     | 32.724 216               | .261 649            | 13.448 649           | 12.702 925                   |                 |
| 18    | 3.616 528     | 36.178 965               | .026 753            | .276 508             | 16.888 649                   | 1.648 649       | 4.468 925     | 34.912 920               | .242 925            | 14.298 649           | 13.648 649                   |                 |
| 19    | 3.869 684     | 40.195 492               | .024 393            | .258 419             | 18.328 649                   | 1.468 649       | 4.618 925     | 37.352 920               | .224 925            | 15.198 649           | 14.598 649                   |                 |
| 20    | 4.140 582     | 44.465 370               | .022 289            | .241 513             | 19.818 649                   | 1.328 649       | 4.748 925     | 39.972 920               | .208 925            | 16.138 649           | 15.578 649                   |                 |
| 21    | 4.430 492     | 49.005 170               | .020 488            | .226 488             | 21.448 649                   | 1.218 649       | 4.858 925     | 42.648 649               | .194 925            | 17.118 649           | 16.588 649                   |                 |
| 22    | 4.740 510     | 53.912 141               | .018 714            | .213 947             | 23.218 649                   | 1.128 649       | 4.948 925     | 45.468 649               | .182 925            | 18.138 649           | 17.638 649                   |                 |
| 23    | 5.072 367     | 59.176 671               | .017 189            | .203 649             | 25.128 649                   | 1.048 649       | 5.018 925     | 48.418 649               | .172 925            | 19.198 649           | 18.728 649                   |                 |
| 24    | 5.427 433     | 64.824 038               | .015 811            | .194 249             | 27.168 649                   | 1.008 649       | 5.068 925     | 51.498 649               | .164 925            | 20.298 649           | 19.858 649                   |                 |
| 25    | 5.807 353     | 70.976 470               | .014 561            | .187 195             | 29.418 649                   | 1.008 649       | 5.098 925     | 54.718 649               | .158 925            | 21.428 649           | 20.998 649                   |                 |
| 26    | 6.213 868     | 77.683 823               | .013 426            | .181 930             | 31.868 649                   | 1.008 649       | 5.098 925     | 58.168 649               | .154 925            | 22.598 649           | 22.168 649                   |                 |
| 27    | 6.648 257     | 84.976 096               | .012 402            | .177 411             | 34.418 649                   | 1.008 649       | 5.068 925     | 61.848 649               | .151 925            | 23.808 649           | 23.368 649                   |                 |
| 28    | 7.112 555     | 92.766 286               | .011 566            | .173 367             | 37.168 649                   | 1.008 649       | 5.008 925     | 65.768 649               | .149 925            | 25.148 649           | 24.598 649                   |                 |
| 29    | 7.612 255     | 101.076 411              | .010 889            | .170 797             | 40.118 649                   | 1.008 649       | 4.918 925     | 70.018 649               | .148 925            | 26.518 649           | 25.848 649                   |                 |
| 30    | 8.145 113     | 110.218 154              | .009 797            | .168 411             | 43.268 649                   | 1.008 649       | 4.798 925     | 74.598 649               | .148 925            | 27.918 649           | 27.118 649                   |                 |
| 31    | 8.715 271     | 120.218 425              | .008 713            | .167 235             | 46.618 649                   | 1.008 649       | 4.648 925     | 79.418 649               | .148 925            | 29.348 649           | 28.418 649                   |                 |
| 32    | 9.325 340     | 131.076 425              | .007 408            | .166 909             | 50.168 649                   | 1.008 649       | 4.468 925     | 84.468 649               | .148 925            | 30.808 649           | 29.748 649                   |                 |
| 33    | 9.978 114     | 142.828 765              | .006 234            | .166 603             | 53.918 649                   | 1.008 649       | 4.248 925     | 89.748 649               | .148 925            | 32.298 649           | 31.168 649                   |                 |
| 34    | 10.676 581    | 155.518 618              | .005 387            | .166 508             | 57.968 649                   | 1.008 649       | 3.988 925     | 95.268 649               | .148 925            | 33.818 649           | 32.618 649                   |                 |
| 35    | 11.423 942    | 169.193 460              | .004 715            | .166 535             | 62.318 649                   | 1.008 649       | 3.688 925     | 101.018 649              | .148 925            | 35.368 649           | 34.018 649                   |                 |
| 36    | 12.223 618    | 183.913 402              | .004 237            | .166 809             | 66.968 649                   | 1.008 649       | 3.348 925     | 107.018 649              | .148 925            | 36.948 649           | 35.418 649                   |                 |
| 37    | 13.079 211    | 199.661 020              | .003 795            | .167 457             | 71.918 649                   | 1.008 649       | 2.968 925     | 113.268 649              | .148 925            | 38.548 649           | 36.818 649                   |                 |
| 38    | 13.994 820    | 216.540 292              | .003 387            | .168 208             | 77.168 649                   | 1.008 649       | 2.548 925     | 119.768 649              | .148 925            | 40.168 649           | 37.718 649                   |                 |
| 39    | 14.974 458    | 234.663 112              | .002 908            | .169 068             | 82.718 649                   | 1.008 649       | 2.088 925     | 126.518 649              | .148 925            | 41.818 649           | 38.618 649                   |                 |
| 40    | 16.022 610    | 254.009 570              | .002 346            | .169 936             | 88.468 649                   | 1.008 649       | 1.588 925     | 133.518 649              | .148 925            | 43.498 649           | 39.518 649                   |                 |
| 41    | 17.144 257    | 274.676 240              | .001 714            | .170 811             | 94.418 649                   | 1.008 649       | 1.048 925     | 140.768 649              | .148 925            | 45.208 649           | 40.418 649                   |                 |
| 42    | 18.344 355    | 296.676 696              | .001 016            | .171 691             | 100.668 649                  | 1.008 649       | .468 925      | 148.268 649              | .148 925            | 46.948 649           | 41.318 649                   |                 |
| 43    | 19.628 460    | 319.918 851              | .000 258            | .172 574             | 107.418 649                  | 1.008 649       | .048 925      | 156.018 649              | .148 925            | 48.708 649           | 42.218 649                   |                 |
| 44    | 20.994 820    | 344.418 618              | .000 311            | .173 461             | 114.868 649                  | 1.008 649       | .048 925      | 164.018 649              | .148 925            | 50.588 649           | 43.118 649                   |                 |
| 45    | 22.442 623    | 370.176 240              | .000 260            | .174 351             | 123.018 649                  | 1.008 649       | .048 925      | 172.268 649              | .148 925            | 52.498 649           | 44.018 649                   |                 |
| 46    | 23.972 910    | 397.198 096              | .000 199            | .175 244             | 131.868 649                  | 1.008 649       | .048 925      | 180.768 649              | .148 925            | 54.418 649           | 44.918 649                   |                 |
| 47    | 25.584 570    | 425.498 112              | .000 128            | .176 141             | 141.418 649                  | 1.008 649       | .048 925      | 189.518 649              | .148 925            | 56.348 649           | 45.818 649                   |                 |
| 48    | 27.278 010    | 454.976 464              | .000 048            | .177 041             | 151.668 649                  | 1.008 649       | .048 925      | 198.518 649              | .148 925            | 58.288 649           | 46.718 649                   |                 |
| 49    | 29.054 210    | 485.648 240              | .000 000            | .177 941             | 162.518 649                  | 1.008 649       | .048 925      | 207.768 649              | .148 925            | 60.248 649           | 47.618 649                   |                 |
| 50    | 30.922 010    | 517.418 464              | .000 000            | .178 841             | 173.968 649                  | 1.008 649       | .048 925      | 217.268 649              | .148 925            | 62.218 649           | 48.518 649                   |                 |
| 51    | 31.872 623    | 549.376 240              | .000 000            | .179 741             | 185.918 649                  | 1.008 649       | .048 925      | 226.968 649              | .148 925            | 64.168 649           | 49.418 649                   |                 |
| 52    | 32.904 172    | 581.518 464              | .000 000            | .180 641             | 198.468 649                  | 1.008 649       | .048 925      | 236.868 649              | .148 925            | 66.098 649           | 50.318 649                   |                 |
| 53    | 34.018 615    | 613.848 240              | .000 000            | .181 541             | 211.618 649                  | 1.008 649       | .048 925      | 246.968 649              | .148 925            | 68.018 649           | 51.218 649                   |                 |
| 54    | 35.214 051    | 647.376 464              | .000 000            | .182 441             | 225.368 649                  | 1.008 649       | .048 925      | 257.268 649              | .148 925            | 70.018 649           | 52.118 649                   |                 |
| 55    | 36.491 481    | 682.118 649              | .000 000            | .183 341             | 239.718 649                  | 1.008 649       | .048 925      | 267.768 649              | .148 925            | 72.098 649           | 53.018 649                   |                 |
| 56    | 37.850 912    | 718.076 464              | .000 000            | .184 241             | 254.668 649                  | 1.008 649       | .048 925      | 278.468 649              | .148 925            | 74.248 649           | 53.918 649                   |                 |
| 57    | 39.292 345    | 754.248 240              | .000 000            | .185 141             | 270.218 649                  | 1.008 649       | .048 925      | 289.268 649              | .148 925            | 76.468 649           | 54.818 649                   |                 |
| 58    | 40.816 778    | 791.618 464              | .000 000            | .186 041             | 286.468 649                  | 1.008 649       | .048 925      | 300.268 649              | .148 925            | 78.748 649           | 55.718 649                   |                 |
| 59    | 42.424 211    | 830.298 649              | .000 000            | .186 941             | 303.418 649                  | 1.008 649       | .048 925      | 311.468 649              | .148 925            | 81.098 649           | 56.618 649                   |                 |
| 60    | 44.116 645    | 870.298 649              | .000 000            | .187 841             | 321.168 649                  | 1.008 649       | .048 925      | 322.968 649              | .148 925            | 83.518 649           | 57.518 649                   |                 |



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ANNUAL TABLE

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ANNUAL TABLE

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| YEARS | 1          | 2           | 3           | 4           | 5           | 6           | 1          | 2           | 3           | 4           | 5           | 6           | 1          | 2           | 3           | 4           | 5           | 6           |
|-------|------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|
| 1     | 1-110 000  | 1-000 000   | 900 901     | 800 901     | 700 901     | 600 901     | 1-120 000  | 1-000 000   | 900 000     | 800 000     | 700 000     | 600 000     | 1-120 000  | 1-000 000   | 900 000     | 800 000     | 700 000     | 600 000     |
| 2     | 1-232 000  | 2-110 000   | 1-712 521   | 1-412 521   | 1-112 521   | 812 521     | 1-254 000  | 2-120 000   | 1-712 521   | 1-412 521   | 1-112 521   | 812 521     | 1-254 000  | 2-120 000   | 1-712 521   | 1-412 521   | 1-112 521   | 812 521     |
| 3     | 1-367 631  | 3-142 000   | 2-499 213   | 2-199 213   | 1-899 213   | 799 213     | 1-409 928  | 3-174 400   | 2-499 213   | 1-899 213   | 799 213     | 699 213     | 1-409 928  | 3-174 400   | 2-499 213   | 1-899 213   | 799 213     | 699 213     |
| 4     | 1-518 070  | 4-297 731   | 3-402 446   | 3-102 446   | 2-802 446   | 702 446     | 1-573 519  | 4-479 328   | 3-402 446   | 2-802 446   | 1-802 446   | 802 446     | 1-573 519  | 4-479 328   | 3-402 446   | 2-802 446   | 1-802 446   | 802 446     |
| 5     | 1-685 058  | 6-227 801   | 5-293 451   | 4-693 451   | 4-093 451   | 3-493 451   | 1-762 342  | 6-352 847   | 5-293 451   | 4-693 451   | 4-093 451   | 3-493 451   | 1-762 342  | 6-352 847   | 5-293 451   | 4-693 451   | 4-093 451   | 3-493 451   |
| 6     | 1-870 415  | 7-912 860   | 6-720 538   | 5-920 538   | 5-120 538   | 4-320 538   | 1-973 823  | 8-115 189   | 7-215 189   | 6-415 189   | 5-615 189   | 4-815 189   | 1-973 823  | 8-115 189   | 7-215 189   | 6-415 189   | 5-615 189   | 4-815 189   |
| 7     | 2-076 160  | 9-783 274   | 8-421 215   | 7-421 215   | 6-421 215   | 5-421 215   | 2-210 681  | 10-089 012  | 9-089 012   | 8-089 012   | 7-089 012   | 6-089 012   | 2-210 681  | 10-089 012  | 9-089 012   | 8-089 012   | 7-089 012   | 6-089 012   |
| 8     | 2-304 538  | 11-859 434  | 10-326 526  | 9-326 526   | 8-326 526   | 7-326 526   | 2-415 963  | 12-299 693  | 11-299 693  | 10-299 693  | 9-299 693   | 8-299 693   | 2-415 963  | 12-299 693  | 11-299 693  | 10-299 693  | 9-299 693   | 8-299 693   |
| 9     | 2-558 037  | 14-163 972  | 12-469 607  | 11-469 607  | 10-469 607  | 9-469 607   | 2-713 079  | 16-775 656  | 15-775 656  | 14-775 656  | 13-775 656  | 12-775 656  | 2-713 079  | 16-775 656  | 15-775 656  | 14-775 656  | 13-775 656  | 12-775 656  |
| 10    | 2-839 421  | 16-722 009  | 14-829 801  | 13-829 801  | 12-829 801  | 11-829 801  | 3-105 848  | 17-548 735  | 16-548 735  | 15-548 735  | 14-548 735  | 13-548 735  | 3-105 848  | 17-548 735  | 16-548 735  | 15-548 735  | 14-548 735  | 13-548 735  |
| 11    | 3-151 357  | 19-561 430  | 17-469 171  | 16-469 171  | 15-469 171  | 14-469 171  | 3-478 550  | 20-654 583  | 19-654 583  | 18-654 583  | 17-654 583  | 16-654 583  | 3-478 550  | 20-654 583  | 19-654 583  | 18-654 583  | 17-654 583  | 16-654 583  |
| 12    | 3-491 457  | 22-711 180  | 20-469 171  | 19-469 171  | 18-469 171  | 17-469 171  | 3-895 976  | 24-133 133  | 23-133 133  | 22-133 133  | 21-133 133  | 20-133 133  | 3-895 976  | 24-133 133  | 23-133 133  | 22-133 133  | 21-133 133  | 20-133 133  |
| 13    | 3-883 280  | 26-211 618  | 23-826 526  | 22-826 526  | 21-826 526  | 20-826 526  | 4-363 493  | 28-029 109  | 27-029 109  | 26-029 109  | 25-029 109  | 24-029 109  | 4-363 493  | 28-029 109  | 27-029 109  | 26-029 109  | 25-029 109  | 24-029 109  |
| 14    | 4-310 441  | 30-094 918  | 27-595 044  | 26-595 044  | 25-595 044  | 24-595 044  | 4-881 112  | 32-392 402  | 31-392 402  | 30-392 402  | 29-392 402  | 28-392 402  | 4-881 112  | 32-392 402  | 31-392 402  | 30-392 402  | 29-392 402  | 28-392 402  |
| 15    | 4-784 569  | 34-405 359  | 31-900 065  | 30-900 065  | 29-900 065  | 28-900 065  | 5-473 566  | 37-279 715  | 36-279 715  | 35-279 715  | 34-279 715  | 33-279 715  | 5-473 566  | 37-279 715  | 36-279 715  | 35-279 715  | 34-279 715  | 33-279 715  |
| 16    | 5-310 894  | 39-189 948  | 36-400 517  | 35-400 517  | 34-400 517  | 33-400 517  | 6-130 394  | 42-753 280  | 41-753 280  | 40-753 280  | 39-753 280  | 38-753 280  | 6-130 394  | 42-753 280  | 41-753 280  | 40-753 280  | 39-753 280  | 38-753 280  |
| 17    | 5-895 293  | 44-306 974  | 41-517 132  | 40-517 132  | 39-517 132  | 38-517 132  | 6-846 041  | 48-883 474  | 47-883 474  | 46-883 474  | 45-883 474  | 44-883 474  | 6-846 041  | 48-883 474  | 47-883 474  | 46-883 474  | 45-883 474  | 44-883 474  |
| 18    | 6-536 744  | 50-074 884  | 47-185 184  | 46-185 184  | 45-185 184  | 44-185 184  | 7-619 294  | 55-749 615  | 54-749 615  | 53-749 615  | 52-749 615  | 51-749 615  | 7-619 294  | 55-749 615  | 54-749 615  | 53-749 615  | 52-749 615  | 51-749 615  |
| 19    | 7-243 344  | 56-919 488  | 53-900 065  | 52-900 065  | 51-900 065  | 50-900 065  | 8-546 793  | 63-439 681  | 62-439 681  | 61-439 681  | 60-439 681  | 59-439 681  | 8-546 793  | 63-439 681  | 62-439 681  | 61-439 681  | 60-439 681  | 59-439 681  |
| 20    | 8-022 312  | 64-202 832  | 61-174 745  | 60-174 745  | 59-174 745  | 58-174 745  | 9-636 293  | 72-052 442  | 71-052 442  | 70-052 442  | 69-052 442  | 68-052 442  | 9-636 293  | 72-052 442  | 71-052 442  | 70-052 442  | 69-052 442  | 68-052 442  |
| 21    | 8-889 166  | 72-265 144  | 69-111 742  | 68-111 742  | 67-111 742  | 66-111 742  | 10-883 848 | 81-698 736  | 80-698 736  | 79-698 736  | 78-698 736  | 77-698 736  | 10-883 848 | 81-698 736  | 80-698 736  | 79-698 736  | 78-698 736  | 77-698 736  |
| 22    | 9-733 374  | 81-214 309  | 78-900 669  | 77-900 669  | 76-900 669  | 75-900 669  | 12-159 349 | 92-402 894  | 91-402 894  | 90-402 894  | 89-402 894  | 88-402 894  | 12-159 349 | 92-402 894  | 91-402 894  | 90-402 894  | 89-402 894  | 88-402 894  |
| 23    | 10-556 591 | 90-174 084  | 87-749 822  | 86-749 822  | 85-749 822  | 84-749 822  | 14-178 629 | 104-202 894 | 103-202 894 | 102-202 894 | 101-202 894 | 100-202 894 | 14-178 629 | 104-202 894 | 103-202 894 | 102-202 894 | 101-202 894 | 100-202 894 |
| 24    | 11-368 464 | 104-413 307 | 101-900 065 | 100-900 065 | 99-900 065  | 98-900 065  | 17-000 064 | 118-155 870 | 117-155 870 | 116-155 870 | 115-155 870 | 114-155 870 | 17-000 064 | 118-155 870 | 117-155 870 | 116-155 870 | 115-155 870 | 114-155 870 |
| 25    | 12-169 851 | 119-020 878 | 116-400 517 | 115-400 517 | 114-400 517 | 113-400 517 | 20-000 064 | 133-333 870 | 132-333 870 | 131-333 870 | 130-333 870 | 129-333 870 | 20-000 064 | 133-333 870 | 132-333 870 | 131-333 870 | 130-333 870 | 129-333 870 |
| 26    | 13-069 851 | 134-078 636 | 131-669 822 | 130-669 822 | 129-669 822 | 128-669 822 | 23-000 064 | 150-333 934 | 149-333 934 | 148-333 934 | 147-333 934 | 146-333 934 | 23-000 064 | 150-333 934 | 149-333 934 | 148-333 934 | 147-333 934 | 146-333 934 |
| 27    | 14-069 851 | 149-817 286 | 147-269 822 | 146-269 822 | 145-269 822 | 144-269 822 | 26-000 064 | 169-333 934 | 168-333 934 | 167-333 934 | 166-333 934 | 165-333 934 | 26-000 064 | 169-333 934 | 168-333 934 | 167-333 934 | 166-333 934 | 165-333 934 |
| 28    | 15-169 851 | 166-020 878 | 164-333 934 | 163-333 934 | 162-333 934 | 161-333 934 | 29-000 064 | 190-333 934 | 189-333 934 | 188-333 934 | 187-333 934 | 186-333 934 | 29-000 064 | 190-333 934 | 189-333 934 | 188-333 934 | 187-333 934 | 186-333 934 |
| 29    | 16-369 851 | 184-020 878 | 182-333 934 | 181-333 934 | 180-333 934 | 179-333 934 | 32-000 064 | 213-333 934 | 212-333 934 | 211-333 934 | 210-333 934 | 209-333 934 | 32-000 064 | 213-333 934 | 212-333 934 | 211-333 934 | 210-333 934 | 209-333 934 |
| 30    | 17-669 851 | 203-020 878 | 201-333 934 | 200-333 934 | 199-333 934 | 198-333 934 | 35-000 064 | 238-333 934 | 237-333 934 | 236-333 934 | 235-333 934 | 234-333 934 | 35-000 064 | 238-333 934 | 237-333 934 | 236-333 934 | 235-333 934 | 234-333 934 |
| 31    | 19-069 851 | 223-020 878 | 221-333 934 | 220-333 934 | 219-333 934 | 218-333 934 | 38-000 064 | 264-333 934 | 263-333 934 | 262-333 934 | 261-333 934 | 260-333 934 | 38-000 064 | 264-333 934 | 263-333 934 | 262-333 934 | 261-333 934 | 260-333 934 |
| 32    | 20-569 851 | 244-020 878 | 242-333 934 | 241-333 934 | 240-333 934 | 239-333 934 | 41-000 064 | 291-333 934 | 290-333 934 | 289-333 934 | 288-333 934 | 287-333 934 | 41-000 064 | 291-333 934 | 290-333 934 | 289-333 934 | 288-333 934 | 287-333 934 |
| 33    | 22-169 851 | 266-020 878 | 264-333 934 | 263-333 934 | 262-333 934 | 261-333 934 | 44-000 064 | 319-333 934 | 318-333 934 | 317-333 934 | 316-333 934 | 315-333 934 | 44-000 064 | 319-333 934 | 318-333 934 | 317-333 934 | 316-333 934 | 315-333 934 |
| 34    | 23-869 851 | 289-020 878 | 287-333 934 | 286-333 934 | 285-333 934 | 284-333 934 | 47-000 064 | 348-333 934 | 347-333 934 | 346-333 934 | 345-333 934 | 344-333 934 | 47-000 064 | 348-333 934 | 347-333 934 | 346-333 934 | 345-333 934 | 344-333 934 |
| 35    | 25-669 851 | 313-020 878 | 311-333 934 | 310-333 934 | 309-333 934 | 308-333 934 | 50-000 064 | 378-333 934 | 377-333 934 | 376-333 934 | 375-333 934 | 374-333 934 | 50-000 064 | 378-333 934 | 377-333 934 | 376-333 934 | 375-333 934 | 374-333 934 |
| 36    | 27-569 851 | 338-020 878 | 336-333 934 | 335-333 934 | 334-333 934 | 333-333 934 | 53-000 064 | 409-333 934 | 408-333 934 | 407-333 934 | 406-333 934 | 405-333 934 | 53-000 064 | 409-333 934 | 408-333 934 | 407-333 934 | 406-333 934 | 405-333 934 |
| 37    | 29-569 851 | 364-020 878 | 362-333 934 | 361-333 934 | 360-333 934 | 359-333 934 | 56-000 064 | 441-333 934 | 440-333 934 | 439-333 934 | 438-333 934 | 437-333 934 | 56-000 064 | 441-333 934 | 440-333 934 | 439-333 934 | 438-333 934 | 437-333 934 |
| 38    | 31-669 851 | 391-020 878 | 389-333 934 | 388-333 934 | 387-333 934 | 386-333 934 | 59-000 064 | 474-333 934 | 473-333 934 | 472-333 934 | 471-333 934 | 470-333 934 | 59-000 064 | 474-333 934 | 473-333 934 | 472-333 934 | 471-333 934 | 470-333 934 |
| 39    | 33-869 851 | 419-020 878 | 417-333 934 | 416-333 934 | 415-333 934 | 414-333 934 | 62-000 064 | 508-333 934 | 507-333 934 | 506-333 934 | 505-333 934 | 504-333 934 | 62-000 064 | 508-333 934 | 507-333 934 | 506-333 934 | 505-333 934 | 504-333 934 |
| 40    | 36-169 851 | 448-020 878 | 446-333 934 | 445-333 934 |             |             |            |             |             |             |             |             |            |             |             |             |             |             |

## **157. Cost Conversion Tables**

Cost conversion tables for residential, commercial and farm structures can be found on the Division of Taxation's website at:

[http://www.state.nj.us/treasury/taxation/lpt/building\\_replace\\_cost.shtml](http://www.state.nj.us/treasury/taxation/lpt/building_replace_cost.shtml)

Group of Building Classes for Construction Cost Conversion

In order to reflect the variations in quantities and costs of building labor and material used in the construction of buildings classified according to type and construction, each specific building class has been classified and listed under the following building cost conversion groups.

Classification of Typical Building Classes Under Cost Conversion Groups

| Class of Building | Type of Building |                    |             |                    |               |                   |
|-------------------|------------------|--------------------|-------------|--------------------|---------------|-------------------|
|                   | <u>Frame</u>     | <u>Brick-Stone</u> | <u>Apt.</u> | <u>Hotel-Motel</u> | <u>Office</u> | <u>Comm-Indus</u> |
| R-12              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-13              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-14              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-15              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-16              | RR-1             | RR-1               | -           | -                  | -             | -                 |
| R-17              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-18              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-19              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-20              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-21              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-23              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-27              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-28              | RR-1             | RR-1               | -           | -                  | -             | -                 |
| R-29              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-30              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-33              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-35              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-37              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-39              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-43              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-45              | RR-1             | RR-1               | -           | -                  | -             | -                 |
| R-47              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-49              | RR-1             | RR-2               | -           | -                  | -             | -                 |
| R-50              | RR-1             | -                  | -           | -                  | -             | -                 |
| R-51              | RR-1             | -                  | -           | -                  | -             | -                 |
| R-52              | RR-1             | -                  | -           | -                  | -             | -                 |
| R-53              | RR-1             | -                  | -           | -                  | -             | -                 |
| R-54              | RR-1             | -                  | -           | -                  | -             | -                 |
| 101               | -                | -                  | C-1         | C-1                | C-1           | C-3               |
| 102               | -                | -                  | C-1         | C-1                | C-1           | C-3               |
| 103               | -                | -                  | C-1         | C-1                | C-1           | C-4               |
| 104               | -                | -                  | C-2         | C-2                | C-2           | C-6               |

Classification of Typical Building Classes Under Cost Conversion Groups (con't)

| Class of Building | Type of Building |                    |             |                    |               |                   |
|-------------------|------------------|--------------------|-------------|--------------------|---------------|-------------------|
|                   | <u>Frame</u>     | <u>Brick-Stone</u> | <u>Apt.</u> | <u>Hotel-Motel</u> | <u>Office</u> | <u>Comm-Indus</u> |
| 105               | -                | -                  | C-2         | C-2                | C-2           | C-5               |
| 106               | -                | -                  | C-2         | C-2                | C-2           | C-6               |
| 107               | -                | -                  | -           | -                  | -             | C-5               |
| 108               | -                | -                  | -           | -                  | -             | C-5               |
| 109               | -                | -                  | -           | -                  | -             | C-5               |
| 123               | -                | -                  | -           | -                  | -             | C-3               |
| 124               | -                | -                  | -           | -                  | -             | C-4               |
| 125               | -                | -                  | -           | -                  | -             | C-5               |
| 126               | -                | -                  | -           | -                  | -             | C-4               |
| 127               | -                | -                  | -           | -                  | -             | C-5               |
| 133               | -                | -                  | -           | -                  | -             | C-3               |
| 134               | -                | -                  | -           | -                  | -             | C-4               |
| 135               | -                | -                  | -           | -                  | -             | C-5               |
| 136               | -                | -                  | -           | -                  | -             | C-4               |
| 137               | -                | -                  | -           | -                  | -             | C-5               |
| 145               | -                | -                  | C-1         | -                  | -             | -                 |
| 150               | R-1              | R-2                | -           | -                  | -             | -                 |
| 151               | R-1              | R-2                | -           | -                  | -             | -                 |
| 152               | R-1              | R-2                | -           | -                  | -             | -                 |
| 153               | R-1              | R-2                | -           | -                  | -             | -                 |
| 154               | R-1              | R-1                | -           | -                  | -             | -                 |
| 155               | R-1              | R-2                | -           | -                  | -             | -                 |
| 156               | R-1              | R-2                | -           | -                  | -             | -                 |