

## **The Valuation of Towers and Associated Real Property**

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## INTRODUCTION

This guide has been developed in response to the explosive growth in the wireless telecommunications industry and the construction of telecommunications towers. The need for more towers grows as the amount of wireless signal traffic grows as a result of the number of new customers and new services offered such as wireless e-mail and wireless web access. Wireless telecommunications providers are working to expand their network coverage, as the competition in the wireless business is fierce. The need for towers will continue to grow in the near term as new technologies such as high definition television take hold.

Towers will be located in virtually every municipality in New York State and the assessor will have the responsibility to place an accurate estimate of value on the taxable real property at the tower site. This guide was developed to assist the assessor to gain an understanding of the wireless telecommunications tower industry, provide guidance as to the taxability of certain property commonly found at tower sites, how to collect the various components typically found at a tower site, and employ the three approaches to value to arrive at an accurate final estimate of value.

The primary focus of this report is on wireless telecommunications towers, however, the information can be applied to any type of tower located in a municipality. Communication towers may be used to facilitate the transmission of radio, cellular, personal communications services (PCS), microwave, TV, CATV, emergency medical services (EMS), fire and police radio networks, paging, global positioning satellite (GPS), and other signals throughout a communication network. The type of tower and the real property improvements will vary depending on the use of the site.

### **Taxability of Various Types of Telecommunications Property**

Recently, there has been much discussion regarding the taxability of some of the components found at a tower site. The taxability of certain components, particularly antennas and electronic switching equipment, has been controversial and at this time is unsettled. A detailed discussion on this topic, which is excerpted from the *Local Telecommunications Taxes and Fees in New York State, Report to Governor George E. Pataki and The New York State Legislature*, can be found in appendix B of this report. The report is available on the Internet at [www.tax.state.ny.us/statistics](http://www.tax.state.ny.us/statistics). Before a decision is made regarding the taxability of components of a particular tower site, it is advisable to reference the applicable statutes, case law, and other legal opinions in addition to seeking advice from the municipality's legal counsel. The final determination of taxability lies with the local assessor.

## **Wireless Telecommunications Technology**

### **How Cellular Technology Works**

A wireless telecommunications network will include the following components: antenna sites (also referred to as base stations), mobile units (handsets), and mobile telephone switching offices (MTSO). When a call is made on a wireless phone (mobile unit), the message is transmitted by low energy radio signals to the nearest antenna site. The wireless phone requests authorization to make a call. The antenna site checks the phone's mechanical serial number (MSN) and electronic serial number (ESN) to make sure the mobile unit is allowed to use the network. The call is delivered by phone line or by radio signal depending on whether the receiver of the phone call is part of the public switched telephone network (PSTN) or another wireless phone.

Wireless technology uses individual radio frequencies over and over again by dividing a service area into separate geographic zones called cells. Cells can be as small as an individual building or as large as 20 miles across. Each cell is equipped with its own radio transmitter/receiver antenna. Because the system operates at such low power, a frequency can be used to carry a phone conversation in a nearby cell without interference.

When a customer using a wireless phone approaches the boundary of one cell, the wireless network senses that the signal is becoming weak and automatically hands off the call to the antenna in the next cell into which the caller is traveling. This handoff occurs in approximately 400 milliseconds. When subscribers travel beyond their home geographical area, they can still make wireless calls. The wireless carrier in the area where they are traveling provides the service. This is referred to as roaming.

Each wireless antenna is linked to a mobile telephone switching office (MTSO), sometimes called a mobile switching center (MSC). The MTSO controls all of the antenna sites in a region and connects all wireless calls to the "wired" public switched telephone network (PSTN).

### **COMPONENTS OF A TOWER SITE**

ORPS develops cost estimates for various equipment and yard improvement items typically seen at an industrial or utility site. Each improvement is assigned a Uniform Construction Index (UCI) Code similar to an RPS structure code. Each UCI code has a corresponding RPS structure code assigned it.

## **Towers**

Towers can generally be categorized into three major types; guyed, self supporting, and monopole. Typical tower heights will vary between 100 and 250 feet. The type of tower erected will depend on many factors including:

- Topography
- Soil conditions
- Land use and availability
- Tower height required
- Wind loading (maximum forces that may be applied to a structural element by wind)
- Ice loading (maximum forces that may be applied to a structural element by ice)
- Zoning

### **Guyed Tower**

Guyed towers are generally the least costly however they also require the greatest amount of land to erect due to the area needed for the cable guy wire stays. As a result, guyed towers are most often seen in rural or suburban settings where land is not at a premium.

Guyed towers may be constructed with either 3 legs (triangular) or 4 legs. The distance between the tower legs will increase as the height of the tower and wind load increases. Two variables are required when collecting guyed towers;

- Distance between tower legs
- Tower height.

ORPS develops a reproduction cost new (RCN) for guyed towers with distances between the tower legs ranging from 1 to 7 feet and tower heights from 25 to 625 feet.

Below is a list of the guyed towers ORPS provides cost support for and the corresponding UCI Codes:

## **Description**

## **UCI Code**

12 inch Guyed Tower (Triangular)	02790.122
12 inch Guyed Tower (4 leg)	02790.123
24 inch Guyed Tower (Triangular)	02790.124
24 inch Guyed Tower (4 leg)	02790.125
36 inch Guyed Tower (Triangular)	02790.130
32 inch Guyed Tower (Triangular)	02790.132
32 inch Guyed Tower (4 leg)	02790.133
40 inch Guyed Tower (Triangular)	02790.140
40 inch Guyed Tower (4 leg)	02790.141
48 inch Guyed Tower (Triangular)	02790.148
48 inch Guyed Tower (4 leg)	02790.149
54 inch Guyed Tower (Triangular)	02790.154
54 inch Guyed Tower (4 leg)	02790.155
84 inch Guyed Tower (Triangular)	02790.184
84 inch Guyed Tower (4 leg)	02790.185

The base costs include the tower, erection, concrete footings, painting, lighting, platforms, guy wires, and profit and overhead. Description pages and photographs of guyed towers can be found in appendix A.

## **Self Supporting Tower**

Self supporting towers tend to be the most expensive towers to erect. They can be constructed with either three or four legs and are free standing with a lattice frame design. These towers are generally the strongest and can support the largest wind and ice loads of the three tower types.

One variable is required when collecting self supporting towers;

- Tower height

ORPS develops a reproduction cost new (RCN) for self supporting towers with tower heights ranging from 30 to 490 feet.

The ORPS UCI Code for the Self Supporting Tower is 02790.101.

The base costs include the tower, erection, concrete footings, painting, lighting, platforms, and profit and overhead. Description pages and photographs of guyed towers can be found in appendix A.

## **Monopole Tower**

These towers are free standing and are most commonly used in cellular and personal communication service (PCS) applications. They are typically constructed of different diameter steel sections either cylindrical or multi sided in shape. The individual sections are bolted or welded together with the largest diameter sections at the base and each successive section is smaller in diameter.

One variable is required when collecting monopole towers;

- Tower height

ORPS develops a reproduction cost new (RCN) for monopole towers with tower heights ranging from 30 to 490 feet.

The ORPS UCI Code for Monopole Towers is 02790.200

The base costs include the tower, erection, concrete footings, painting, lighting, platforms, and profit and overhead. Description pages and photographs of guyed towers can be found in appendix A.

## **Equipment Shelters**

Equipment shelters found at the base of communication towers are primarily prefabricated structures that are transported to the site although they can also be built on site. The site built equipment shelters are generally wood frame or concrete block construction and are finished to meet the particular function they are serving.

The prefabricated shelters are constructed of steel, fiberglass, or concrete aggregate wall material. They can be installed on steel I-beams, concrete piers or concrete pad. The structures are delivered to the site by truck and installed with a boom truck or crane. They generally have factory installed wiring, HVAC, humidity control, and an exterior generator plug.

One variable is required when collecting equipment sheds;

- Square footage

The ORPS UCI Codes for equipment shelters follows:

## Communication Equipment Shelters – Wood Frame

Equipment Shed – Wood Frame - Pre-assembled	02795.001
Equipment Shed - Wood Frame - Stick Built	02795.002
Equipment Shed - Concrete Block	02795.003
Equipment Shed - Fiberglass	02795.004

## Equipment Shelters –Steel Frame

Equipment Shed - Steel Cabinet – Surface Mounted	02796.001
Equipment Shed - Steel Cabinet with pit	02796.002
Equipment Shed - Steel Frame – Containerized	02796.003
Equipment Shed - Steel Frame – Lightweight Shelter	02796.004
Equipment Shed - Steel Frame - High Strength Shelter	02796.005

The base costs include minor site preparation, concrete pad or piers, delivery and set up for factory built shelters, electric and communication wiring, basic climate control, grounding and lightning protection and profit and overhead. Description pages and photographs of the various type equipment shelters can be found in appendix A.

## Antennas

The antennas and satellite dishes located at tower sites may be taxable real property. These antennas and dishes are essential in the sending and receiving of radio frequency (RF) signals in any communication network. They may be mounted on a tower, building or anchored in concrete. A detailed discussion of the taxable status of various types of telecommunications property, which is excerpted from the Local Telecommunications Taxes and Fees in New York State Report to the Governor, is located in appendix B of this report. In general, cellular and PCS antennas are taxable real property if they are “affixed” to realty. *The test is not simply whether the item (antenna) can be removed without material damage to it or to the realty to which it is affixed. Rather, the test is whether the item (antenna) remains attached to the realty in the normal course of events for its useful life.*

Satellite dishes, which may be seen at Cable Television tower sites, and microwave dishes, commonly located at telecommunication towers may also be taxable real property depending on the type of signal that is transmitted.

RPTL, section 102(12)(i) defines real property as “all lines, wires, poles, supports and inclosures for electrical conductors upon, above and underground used in connection with the transmission or switching of electromagnetic voice, video and data signals between different entities separated by air, street or other public domain, except that such property shall not include: (A) station connections; (B) fire and surveillance alarm system property; (C) such property used in the transmission of news wire services; and (D) such property used in the transmission of news or entertainment radio, television or cable television signals for immediate, delayed or ultimate exhibition to the public, whether or not a fee is charged therefore.” This section makes all “poles,



supports and inclosures” for electrical conductors used in connection with the transmission or switching of electromagnetic voice, video and data signals taxable, it goes on to exclude “such property” used in the transmission of television or cable television signals for immediate, delayed or ultimate exhibition to the public. ORPS has interpreted “such property” to refer to the transmission or switching equipment, not the supports. The foundation, pole, mounting brackets, and collection dish of a satellite dish used to transmit television or cable television signals for immediate, delayed or ultimate exhibition to the public may be taxable. The electronic components of that satellite dish would be excluded from taxation under ORPS interpretation of RPTL, section 102(12)(i).

Before making a determination as to the taxability status of the various antennas and satellite dishes found at a tower site, it is advisable to review the section of the aforementioned report to the Governor that is excerpted and found in appendix B of this report, the applicable statutes, case law, relevant legal opinions, and discuss with the municipality’s legal counsel.

ORPS develops reproduction costs (RCN) for cellular and personal communications service (PCS) antennas, and satellite dishes ranging in size from 1.8 meters to 7.3 meters. The costs for satellite dishes do not include the electronic components associated with the dish as they are generally not taxable.

One variable is required when collecting antennas;

- Diameter or length of dish or antenna

The ORPS UCI codes for antennas and satellite dishes are listed below.

<u>Description</u>	<u>UCI Code</u>
Cellular/PCS Antenna (greater than 4 ft.)	02792.001
Cellular/PCS Antenna (less than 4 ft.)	02792.002
Satellite Dish – Wire Mesh	02792.003
Satellite Dish – Fiberglass	02792.004
Satellite Dish – Average Grade	02792.005
Satellite Dish – High Performance	02792.006

The base costs include the antenna or dish, concrete slab or piers, mounting pole, brackets and other mounting hardware, waveguides installation/activation, and profit and overhead. The description pages and photograph can be found in appendix A.

### **Generators**

Backup generators are used to ensure an uninterruptible power supply and are common at tower sites. ORPS develops a reproduction cost new (RCN) for diesel engine generators. The output is 3 phase 277/480V, 4 wire and the installed cost includes the diesel engine, generator/alternator, battery charger, controls, exhaust system, fuel tank, and overhead and profit.

One variable is required when collecting a backup generator;

- Kilowatt rating

The ORPS UCI code for the 277/480 Volt diesel engine generator is 16210.300. The description page and photograph can be found in appendix A.

### **Fencing**

Chain link fencing is the most common type of fencing use to protect tower sites. Fencing at towers is predominantly six feet high with three strands of barbed wire above the top rail. ORPS develops a reproduction cost new (RCN) for aluminum and galvanized steel chain link fencing. ORPS pricing is available for chain link fence from 6 – 10 feet high. Base costs include chain link fence, installation, barbed wire triple strands, overhead and profit.

Two variables are required when collecting chain link fencing;

- Height of fence
- Linear feet of fencing

The ORPS UCI codes for the aluminum and galvanized steel chain link fencing is 02830.001 and 02830.002 respectively. The description pages and photograph can be found in appendix A.

### **Clearing and Grubbing**

Clearing and grubbing is done at every tower site to some extent. A driveway from a public access point to the tower and the tower site itself must be cleared in order to provide access and an area to erect the tower and place the various site improvements necessary to operate the communication network. An area between one and three acres is typically cleared depending on the type of tower erected.

Two variables are required when collecting clearing and grubbing;

- Area cleared and grubbed (acres)
- Grade of clearing and grubbing required

The definitions of the 5 grades, which are related to the thickness of the brush and trees at the site, are included in the clearing and grubbing description page found in appendix A of this report. The ORPS UCI code for clearing and grubbing is 02102.000.

## **Gravel - Crushed Stone**

The driveway and the cleared and fenced in area at most tower sites are covered with crushed stone. The crushed stone makes access easier and keeps the vegetation from growing at the site.

ORPS develops a reproduction cost new (RCN) for crushed stone, which requires the collection of cubic yards spread at the site. Crushed stone is generally spread between 4 and 6 inches thick.

One variable is required when collecting crushed stone:

- Cubic yards of stone

The amount of cubic yards is calculated by multiplying the length by the width by the depth of the stone spread at the site. Note: there are 27 cubic feet in 1 cubic yard. The formula for calculating the amount of cubic yards is:

Length x width x height = cubic feet

Cubic feet / 27 = cubic yards

The ORPS UCI code for crushed stone is 02500.100.

The base cost includes the crushed stone, loading on a truck with up to a 20-mile radius, unloading and spreading, and profit and overhead. The description page and photograph of crushed stone is located in the appendix A of this report.

## **Electronic Equipment**

The electronic switching equipment housed in the equipment shelters at the base of telecommunications towers may be taxable if it is determined that the electronic equipment is “affixed” to the realty. If, upon applying the “fixtures test”, it is determined that the electronic equipment is affixed to the realty, it would be appropriate to estimate a market value for the equipment. The value of electronic switching equipment present at a telecommunications tower is extremely variable. Each tower site is unique and the type and amount of electronic switching equipment needed depends on the function and the volume of signal traffic handled at that particular site. Due to the highly unique nature of each tower site, ORPS does not develop costs for electronic switching equipment typically found at telecommunications tower sites. If the equipment is determined to be taxable by the local assessor, costs for this type of equipment may be obtained from the property owner, contractor, building permit, or the equipment manufacturer. The type and quantity of electronic equipment present at the site must also be determined.

## APPROACHES TO VALUE

Tower sites should be valued for assessment purposes in New York State considering all three approaches to value if sufficient data exists to employ each of the approaches. New York courts have been guided by the concept of “specialty property” when determining the appropriate approaches to value. If a particular property is determined to be “specialty property” the Court of Appeals has specified that it must be valued using the reproduction cost approach to valuation. In order for a property to be “specialty property” it must meet certain criteria:

- The property must be uniquely adapted to the business conducted upon it
- The property must be used for a special purpose, which is economically feasible at the time of valuation
- And there must be no market or sales for property being so used.

In the past few years there has been an increasing amount of sales activity involving telecommunications towers. The existence of this active market causes tower sites to be categorized as non-specialty property and therefore all three approaches to value; cost, income, and sales comparison, can be used to arrive at a final value conclusion.

### Cost Approach

The cost approach involves estimating the cost of improvements as if new, an estimated amount of depreciation must then be subtracted from the estimated replacement cost or reproduction cost new. ORPS provides reproduction costs for equipment and yard improvement items. A land value must be estimated and added to the depreciated improvement value to arrive at a total value for the property.

Many tower sites are located on leased land and, as a result, different parties will be responsible for the payment of real estate taxes for the land under the tower site and for the improvements at the tower site. The land used as a tower site may be valued using the sales comparison approach or, if land lease information is available, through the capitalization of ground rent or discounted cash flow analysis.

The reproduction cost new (RCN) of the improvements at a tower site can be estimated using the ORPS equipment and yard improvement costs discussed previously. Alternately, the original construction cost of the improvements can be obtained and trended forward if needed utilizing a recognized cost source such as C.A. Turner Telephone Plant cost indexes or Handy Whitman Public Utility cost indexes. **The most reliable estimate of RCN of the various improvements is the actual cost of construction of that specific tower site.** This is due to the highly specific nature of each tower site and the high variability of the cost of many of the improvements found at a tower site

depending on the nature of the land on which the tower is erected and the communications technology employed at a particular site. Actual costs can be obtained from the building permit application filed at the town building department, from the contractor erecting the tower, and from the tower owner.

As mentioned previously, the taxability of the various components at the tower site must be determined by ascertaining the function of the particular site and by reviewing the applicable statutes, case law, and legal opinions.

ORPS develops a service life for each tower component where a unit cost has been provided. An effective age of each of the tower components must be estimated and physical depreciation can be estimated using an age over service life calculation. The Data Collection and Maintenance of Property Inventories Assessor's Manual has an explanation and guidelines to calculate effective ages and remaining lives of commercial properties in Section 9.00, Pages 11.00-14.00. Functional or external obsolescence, if it exists, must also be estimated to reflect the particular tower site characteristics, technological changes or economic conditions within the wireless communications industry.

Depreciation may also be estimated using market and income data. The sales comparison method of estimating depreciation utilizes recent sales of similar properties. Building residuals, calculated by subtracting land values from sales prices, are subtracted from reproduction cost new to yield accrued depreciation from all sources. Application of the capitalization of income method for estimating depreciation is similar to the sales comparison method except that values based on the income approach are used instead of comparable sales. This method can be useful for income producing properties for which good comparable sales are scarce. Reliability depends on the accuracy of the income data, capitalization methods, and land values used in the analysis.

The total market value of a tower site utilizing the cost approach will be the total RCN of all taxable improvements minus accrued depreciation from all sources plus the market value of the land.

An outline of the components of a cost approach to value is listed below:

Cost Approach to Value.

Land Value

Sales Comparison Approach

Extraction

Capitalization of Ground Rent

Discounted Cash Flow Analysis

## RCN

**Source:** Calculated by use of contractor's estimates, cost manuals, and/or computer programs; same source should be utilized for subject and sales.

**Soft Cost:** Some, but not all, soft costs are built into the RCN estimates from E.H. Boeckh and other cost sources. Additional soft costs are usually included to reflect total development costs. Examples of soft costs include architectural, engineering, accounting, and legal fees. This additional increment varies depending on what costs are accounted for in the RCN estimate, and with the type of project and relative cost of building. Care must be exercised to avoid "double-adding" soft costs that are included in the RCN estimate from E.H. Boeckh or other cost sources.

**Entrepreneurial Incentive:** Represents amount necessary to motivate someone to undertake project; **not** synonymous with builder's profit; can be estimated separately or included with soft costs, but should represent a percentage of total project cost; varies with total project cost and market conditions.

## Depreciation

**Physical Deterioration:** May be estimated based on actual age/expected physical life (with newer structures); itemization of deferred maintenance items can help substantiate physical depreciation estimates

**Functional Obsolescence:** Typical sources include: technological changes, changes in materials used, over-improvement (superadequacy), under-improvement, etc.

**External Obsolescence:** Typical causes include: general economic downturn, loss of major employers, development of new competing properties, etc.

## Sales Comparison Approach

The sales comparison approach is the process in which a market value is derived by analyzing sales of similar properties and comparing these properties to the subject property. Market analysis is done by comparing properties similar to the subject property that have recently been sold, are offered for sale, or are under contract.

Comparative analysis of sales similar to the subject property isolates similarities and differences in the property rights appraised, motivations of buyers and sellers, financing terms, market conditions, size, location, physical features, and economic characteristics. The elements of comparison are tested using market data to estimate which elements affect value and to what degree. Adjustments, derived from the market, are made to the sale prices of the comparable property to estimate the market value of the subject property.

Sales of communication tower sites have occurred in New York as the consolidation of the tower industry has taken place throughout the nation. Large tower aggregators have purchased entire tower networks from the telecommunication companies who chose to focus their energy and capital on developing their wireless networks. Caution must be exercised whenever analyzing a sale of a tower

site that is part of a larger bulk sale of towers. The value of an individual tower is often the allocated portion of the bulk sale price. The allocated value introduces a potential for bias and therefore may have no relation to the actual market value of the individual tower site.

Market transactions of towers are generally complicated and it is often difficult to ascertain all the information needed to properly adjust sales to be used to compare to a subject tower site. The seller of the tower sites may or may not become tenants of the new owner; the seller may retain ownership of the land; the buyer may become an assignee of the land lease; the sale may also include non-realty components such as the purchase of a portion or all of the telecommunications network in addition to the real property at the tower sites. Thus, the market transaction may not represent solely real property values.

A tower sale is more reliable as a comparable sale if the transfer included only one tower site, the details of what transferred was known and any adjustments that were needed could be derived from the market, the sale did not include any non-realty components, and the sale occurred within the subject property's local area or a location adjustment could be derived from the market to adjust the sale for location. **The likelihood of the presence of all these factors is slim, and therefore any market value estimated from the sales comparison approach would be given very little, if any, weight in the reconciliation of market value.**

### **Income Capitalization Approach**

The income capitalization approach to value involves a set of procedures through which a market value is derived for an income producing property by converting its anticipated benefits, in the form of cash flows and reversion, into an indication of present value. This conversion can be accomplished in two ways. Direct capitalization involves capitalizing a single year's income expectancy into an indication of value by using a market derived capitalization rate. Yield capitalization involves discounting each future benefit (annual cash flows and the reversion) at an appropriate yield rate or by developing an overall rate that explicitly reflects the investment's income pattern, value change, and yield rate.

Demand for tower space has exploded in the last five years. Tower aggregators have tower space available for lease and, as such, tower sites can be viewed and valued as any other income producing commercial property. These tower companies lease space on their towers and an area to place an equipment shelter to telecommunications companies who are in the wireless telecommunications or paging business.

Appraisers should avoid attempting to value a tower based on the revenue a tower generates from cellular or PCS calls. Revenue from wireless phone calls or paging services represents income attributable to operating the wireless telecommunications business enterprise from that particular site and is not an indication of the market value of the tower site itself. An income approach to value arrived at by using the income generated from the operation of the cellular network at a particular site will include business value which will need to be isolated and excluded to arrive at a final estimate of value for the taxable real property only.

**The most proper income estimates to value a tower site are the leases for the tower space and the right to place an equipment shelter at the base of the tower. The final estimate of value determined using tower rents represent the value of the tower site only and will not include any business value.**

A tower site may have more than one tenant. The number of tenants a tower is capable of handling will depend on the height of the tower and the wind and ice loads the tower was constructed for. The tenants generally install their antennas or dishes on the tower and may install the cables in waveguides, which act as a conduit for the cable, and install the equipment shelter and all the electronic switching equipment inside the shelter to make the communications network operable.

In order to estimate the value of the tower site employing the direct income capitalization approach the market rent for leasing tower space must be known. Tower rents are extremely location sensitive so the appraiser must be aware of all the tower lease payments in the local area to adequately estimate a market rent for the particular tower that is being valued. The potential gross income of the tower site is estimated by adding the total of all market lease payments from all tenants on the tower.

Vacancy and credit loss will be deducted from the potential gross income to yield the effective gross income of the tower site. This vacancy and credit loss factor should come from the local tower market. Operating expenses are then deducted from the effective gross income, which leaves as a remainder the net operating income of the tower site. Operating expenses would include insurance, maintenance, utilities, management, reserves for replacement, and miscellaneous expenses. The maintenance expense will be for the tower, fencing, and driveway itself as the tenants are responsible for the upkeep of the antennas, shelters, and electronic equipment that they place at the site. The same is true for the reserve for replacement expense. Real estate taxes should be excluded from operating expenses and handled through the use of an effective tax rate, which is added to the overall capitalization rate.

The net operating income is divided by the overall capitalization rate ( $R_o$ ), which yields the market value estimate. The overall capitalization rate must be derived from the local market by analyzing sales of individual towers that were rented at the time of sale. As discussed previously, the sales of individual tower sites with no other factors affecting the sale price are extremely difficult to find. This situation will make the task of overall capitalization rate development equally difficult.

The market value estimate derived from the income approach described above includes the market value of the tower however there may be other taxable real property at the site whose value should be added to the market value estimated using the income approach. The antennas, equipment shelters and electronic equipment are not accounted for in the income approach because the use of this type of property is not included in the lease payment to the tower owner. This type of equipment is purchased and installed by the tenant similar to retail fixtures. Unlike retail fixtures however, this type of property may be determined to be taxable real property after applying the “fixtures test” described in appendix B of the report. If this type of property is determined to be taxable real property, the value of the property should be added to the market value estimated using the income capitalization approach.



**Due to the scarcity of rental data to estimate net operating income and sales data to develop capitalization rates, the market value estimate developed using the income approach would be given very little, if any, weight in the reconciliation of value.**

An outline of the various components of an income approach to value is listed below:

Income Approach to Value.

*I. Potential Gross Income (PGI)*

- a. **Market rents**: If available, these rents are the preferred income basis.
- b. **Actual rents**: may be used if the property is leased, and if the lease reflects typical market terms and conditions. The determination of “typical” market terms is often difficult due to the lack of other rents in the market. Consider multiple years’ profit and loss statements to establish a stabilized income stream.
- c. **Business income**: may be used in the income approach. Cellular towers can have significant positive business value and careful analysis is required. For assessment purposes, the final value estimate must pertain to taxable real estate only. It is preferable to perform the valuation in such a way that business value is excluded from the outset (i.e. using tower rentals and not revenue generated from cellular calls). If business value is present, positive business value is allocated out of the final value estimate, and negative business value is handled through adjustments.
  - i. If business value is present you may:
    1. reduce gross income
    2. reduce net income
    3. Adjust the capitalization rate.
- d. **Industry data**: If used, care must be taken in applying this information. You must consider the characteristics of the markets used in the survey and publications and how they compare to your market.

*II. Effective Gross Income (EGI)*

- a. Market rents or Industry data – reduce the Potential Gross Income (PGI) to Effective Gross Income (EGI) by deducting for vacancy and credit loss.
- b. Actual rent – a deduction for vacancy and credit loss is not appropriate if actual vacancy and credit loss represents the market.
- c. Business income - a deduction for vacancy and credit loss is not appropriate.

*III. Operating Expenses*

- a. Insurance
- b. Utilities
- c. Maintenance
- d. Miscellaneous
- e. Management
- f. Allowance for Replacements – Structural

- g. ***Business Income, if used:*** typically there are more expenses than when market rents or industry data is used, as this reflects expenses pertinent to the business operations as well as the property ownership.
  - a) Cost of Goods Sold
  - b) Payroll
  - c) Utilities
  - d) Insurance
  - e) Telephone
  - f) Maintenance
  - g) Advertising
  - h) Miscellaneous
  - i) Allowance for Replacement – FF&E
  - j) Allowance for Replacement – Structural
  - k) Business Profit – Some allowance to business profit should be included in the expense stream to ensure that net income reflects income attributable to real estate. If business profit is not included as an expense, two alternatives remain: (1) load the cap rate so the final value estimate reflects taxable real estate only, or (2) process net income using a typical cap rate, and allocate business value from the final value estimate.
  - l) Management

#### IV. *Value Estimate*

- a. Capitalization in Perpetuity – value is based on a single year’s net operating income.
- b. Discounted Cash Flow Analysis – value is based on a series of future net cash flow estimates.

#### **Reconciliation of Value**

The reconciliation of value is the analysis of alternative conclusions to arrive at a final estimate of value. The final estimate of value is based on the strength of each of the approaches to value that were employed. The appraiser weighs the relative significance, applicability, and defensibility of each value indication and relies most heavily on the approach that is most appropriate to the appraisal assignment. The accuracy of the data, the conclusions drawn from analyzing the data, and the quantity and sufficiency of evidence collected are all considered when determining a final estimate of value.

Due to a lack of market data regarding towers (valid sales, rents, and expenses), the cost approach is the most accurate and reliable indicator of value for a tower site. The value estimate developed using the cost approach should be given the most weight in the reconciliation of value. The tower market is currently in its infancy, and as the market matures more data will become available which will strengthen the credibility of the market value estimates derived from the sales comparison and income capitalization approaches to value.

# Appendix A

**ITEM DESCRIPTION:**  
**CLEARING AND GRUBBING**

**QUANTITY UNIT:** AC  
**PRIMARY RATING:** 1-5 GRDE  
**SERVICE LIFE:** ND

**GENERAL DESCRIPTION:** All surface objects not designed to remain are cleared and/or grubbed including mowing as required. Stump holes and other holes from which obstructions are removed are backfilled with suitable material and compacted.

<u>UCI CODE</u>	<u>RANGE</u>
02102.000	1-5

**INSTALLED COSTS INCLUDE:**

- (1) Surface objects cleared or grubbed and disposed at dump.
- (2) Solid objects shall be at least 3 ft. below surface.
- (3) Backfill and compaction.
- (4) The five categories above indicate grades of clearing and grubbing depending on the Forestation and grading on site from (1) minimum to (5) heavy.

- |        |   |  |
|--------|---|--|
| *Grade | 1 | <u>Light</u> , trees, 6" diameter, cut and chip. Grub stumps and remove        |
|        | 2 | <u>Light</u> , trees, 8" diameter, cut and chip. Grub stumps and remove        |
|        | 3 | <u>Medium</u> , trees, 10" diameter, cut and chip. Grub stumps and remove      |
|        | 4 | <u>Medium</u> , trees, 12" diameter, cut and chip. Grub stumps and remove      |
|        | 5 | <u>Heavy</u> , trees, up to 16" diameter, cut and chip. Grub stumps and remove |

---

**ITEM DESCRIPTION:**  
**STONE - CRUSHED**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 20-100,020 CY  
**SERVICE LIFE:** ND

---

**GENERAL DESCRIPTION:** Crushed stone or coarse aggregate is mixed with other materials to produce concrete. It is made from stone crushed and screened so that all faces result from fracturing. Coarse aggregate will not pass through a ¼ inch sieve screen.

---

<u>UCI CODE</u>	<u>RANGE</u>
02500.100	20-100,020

---

**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
  - (2) Crushed stone
  - (3) Loaded on truck with delivery to 20 miles radius
-

**ITEM DESCRIPTION:**  
**TOWER – SELF SUPPORTING**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 30-490 FTHT  
**SERVICE LIFE:** 25 years

**GENERAL DESCRIPTION:** Radio and television towers are individually designed for the weather and other loading conditions found in specific locations. Included in the costs are concrete footings, erection, painting, lighting and platforms. Antennas and transmission cables are not included.

**UCI CODE**  
 02790.101

**RANGE**  
 30-490



**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) *Platforms*

**ITEM DESCRIPTION:**  
**TOWER – 12” GUYED RADIO TOWER**  
**(3 LEG & 4 LEG)**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 25-625 FTHT  
**SERVICE LIFE:** 25 years

**GENERAL DESCRIPTION:**

Triangular guyed radio tower for VHG and UHF bands - UCI 02790.1224  
 Legged guyed radio tower for VHG and UHF bands. - UCI 02790.123

<u>UCI CODE</u>	<u>RANGE</u>
02790.122	25-625
02790.123	25-625



**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) Platforms
- (7) Guy wires

**ITEM DESCRIPTION:**

**TOWER – 24” GUYED RADIO TOWER  
(3 LEG & 4 LEG)**

**QUANTITY UNIT:**

EA

**PRIMARY RATING:**

25-900 FTHT

**SERVICE LIFE:**

25 years

**GENERAL DESCRIPTION :**

Triangular guyed radio tower for VHG and UHF bands - UCI#02790.124  
 4 Legged guyed radio tower for VHG and UHF bands - UCI#02790.125

**UCI CODE**

**RANGE**

02790.124

25-900

02790.125

25-900



**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) Platforms
- (7) Guy wires



**ITEM DESCRIPTION:**

**TOWER – 36” GUYED RADIO TOWER  
(3 LEG & 4 LEG)**

**QUANTITY UNIT:** EA

**PRIMARY RATING:** 25-625 FTHT

**SERVICE LIFE:** 25 years

**GENERAL DESCRIPTION:**

Triangular guyed radio tower for VHG and UHF bands - UCI#02790.130  
4 Legged guyed radio tower for VHG and UHF bands - UCI#02790.131

**UCI CODE**

02790.130

02790.131

**RANGE**

25-625

25-625

**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) Platforms
- (7) Guy wires

**ITEM DESCRIPTION:**

**TOWER – 32” GUYED RADIO TOWER  
(3 LEG & 4 LEG)**

**QUANTITY UNIT:** EA

**PRIMARY RATING:** 25-625 FTHT

**SERVICE LIFE:** 25 years

**GENERAL DESCRIPTION:**

Triangular guyed radio tower for VHG and UHF bands - UCI#02790.132  
4 Legged guyed radio tower for VHG and UHF bands - UCI#02790.133

**UCI CODE**

02790.132

02790.133

**RANGE**

25-625

25-625

**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) Platforms
- (7) Guy wires

**ITEM DESCRIPTION:**  
**TOWER – 40” GUYED MICROWAVE**  
**(3 LEG & 4 LEG)**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 25-625 FTHT  
**SERVICE LIFE:** 25 years

**GENERAL DESCRIPTION:**

- Triangular guyed tower 40” microwave - UCI#02790.140
- 4 Legged guyed tower 40” microwave - UCI#02790.141

<u>UCI CODE</u>	<u>RANGE</u>
02790.140	25-625
02790.141	25-625



**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) Platforms
- (7) Guy wires

**ITEM DESCRIPTION:**

**TOWER – 48” GUYED MICROWAVE  
(3 LEG & 4 LEG)**

**QUANTITY UNIT:** EA

**PRIMARY RATING:** 25-600 FTHT

**SERVICE LIFE:** 25 years

**GENERAL DESCRIPTION:**

Triangular guyed radio tower 40” microwave - UCI#02790.148

4 Legged guyed radio tower 40” microwave - UCI#02790.149

**UCI CODE**

02790.148

02790.149

**RANGE**

50-600

50-600

**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) Platforms
- (7) Guy wires

**ITEM DESCRIPTION:**  
**TOWER – 54” GUYED MASTER TV**  
**(3 LEG & 4 LEG)**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 25-625 FTHT  
**SERVICE LIFE:** 25 years

**GENERAL DESCRIPTION:**

- Triangular guyed tower 54” master TV systems - UCI#02790.154
- 4 Legged guyed tower 54” master TV systems - UCI#02790.155

<u>UCI CODE</u>	<u>RANGE</u>
02790.154	25-625
02790.155	25-625



**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) Platforms
- (7) Guy wires

**ITEM DESCRIPTION:**  
**TOWER – 84” GUYED MASTER TV**  
**(3 LEG & 4 LEG)**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 25-625 FTHT  
**SERVICE LIFE:** 25 years

**GENERAL DESCRIPTION:**

- Triangular guyed tower 84” master TV systems - UCI#02790.184
- 4 Legged guyed tower 84” master TV systems - UCI#02790.185

<u>UCI CODE</u>	<u>RANGE</u>
02790.184	25-625
02790.185	25-625



**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) Platforms
- (7) Guy wires

**ITEM DESCRIPTION:**  
**TOWER - MONOPOLE**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 50 - 500 FT HT  
**SERVICE LIFE:** 25 yrs.

**GENERAL DESCRIPTION:** Monopole Tower is constructed of slip jointed all welded tubes. These towers are most commonly used in cellular telephone applications.

**UCI CODE**      **RANGE**  
 02790.200      50-500 FT.



**INSTALLED COST INCLUDES:**

- (1) Profit overhead
- (2) Concrete footings
- (3) Erection
- (4) Painting
- (5) Lighting
- (6) Safety climb
- (7) Platforms

---

**ITEM DESCRIPTION:**  
**CELLULAR ANTENNA**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 1 FT – 16 FT  
**SERVICE LIFE:** 20 years

---

**GENERAL DESCRIPTION:** Drum Shaped Antenna – Cellular antenna includes low beam – shaping feed, shielded reflector with RF absorbers including vertical tower mount. Panel antenna – dual, top mounted, omni directional antennas, which are in each other operatives are mounted on the tower.

---

<u>UCI CODE</u>	<u>RANGE</u>
02792.001	(Less than 4 ft.)
02792.002	(Greater than 4 ft.)



---

**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
  - (2) Antennas
  - (3) Vertical tower mount
  - (4) Brackets and hardware
  - (4) Cables
  - (5) Activation
-



---

**ITEM DESCRIPTION:**  
Satellite Dish - Wire Mesh

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 1.8 Meter – 7.3 Meter  
**SERVICE LIFE:** 35 years

---

**GENERAL DESCRIPTION:** Aluminum mesh satellite dish. Used for C/KU Bands. Dish is mounted on a Galvanized frame, mounted to a 2.5 to 4.5 inch diameter pole anchored in concrete. Some dishes may be tower mounted or building mounted

---

UCI CODE  
02792.003

RANGE



---

**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
  - (2) Concrete slab or piers(s)
  - (3) Mounting pole
  - (4) Stressed Galvanized with intermediate ring and stainless steel clips
  - (5) Center plate secured to frame mount
  - (6) Quad feed support
  - (7) Wiring for illumination and heating (other electronics are personal property)
-

---

**ITEM DESCRIPTION:**  
Satellite Dish – Fiberglass

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 1.8 Meter – 5.0 Meter  
**SERVICE LIFE:** 35 years

---

**GENERAL DESCRIPTION:** Solid fiberglass satellite dish used for commercial/residential application. Dish is mounted on a Galvanized frame mounted to 2.5 to 4.5 inch diameter pole anchored in concrete. Some dishes may be tower mounted or building mounted.

---

UCI CODE  
02792.004

RANGE



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**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Concrete slab or piers
- (3) Mounting pole
- (4) Galvanized frame
- (5) Quad feed support
- (6) Wiring for illumination and heating

**ITEM DESCRIPTION:**

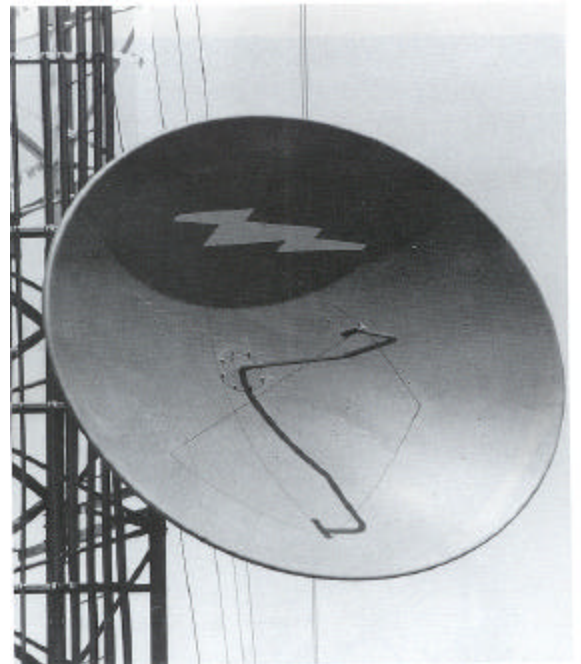
Satellite Dish – Average Grade

**QUANTITY UNIT:** EA**PRIMARY RATING:** 1.8 Meter – 9.3 Meters**SERVICE LIFE:** 35 years

**GENERAL DESCRIPTION:** These large diameter dish used for. C/KU band, receiving/transmitting or both. These dishes are adjusted either manually/automatically.

**UCI CODE**

02792.005

**RANGE****INSTALLED COSTS INCLUDE:**

- (1) Profit overhead
- (2) Concrete Slab
- (3) Erection
- (4) All required installation mountings, and reflectors

**ITEM DESCRIPTION:**  
**Satellite Dish Wire - High Performance**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 2 Meter – 7.3 Meter  
**SERVICE LIFE:** 35 years

**GENERAL DESCRIPTION:** These high performance satellite dish are precision – formed aluminum reflector hot dipped Galvanized steel, high tensile friction type and stainless steel hardware extended system operation. These dishes are used for C/KU band, receiving/transmitting, or for both. These dishes are adjusted manually/automatically.

**UCI CODE**  
 02792.006

**RANGE**



**INSTALLED COSTS INCLUDE:**

- (1) Profit overhead
- (2) Concrete Slab
- (3) Erection
- (4) All required installation, mountings, and reflectors

---

**ITEM DESCRIPTION:****Equipment Shed - Wood Frame Pre-assembled****QUANTITY UNIT:** EA**PRIMARY RATING:** 30 - 800 SF**SERVICE LIFE:** 20 yrs

---

**GENERAL DESCRIPTION:** Economy pre-assembled sheds with wood walls, floor, minimal finish; May have peak or shed roof covered with shingles, roll rubber or tin. These buildings are sold at lumberyards and discount stores. Owners provide their own custom fit-up and utilities for particular end uses. Use this model to value used truck bodies and small mobile homes.

---

**UCI CODE****RANGE**

02795.001

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**INSTALLED COST INCLUDES:**

- (1) Minor site preparation and landscaping;
  - (2) Concrete pad or piers;
  - (3) Delivery and set-up for factory built shelters;
  - (4) Electric & communication wiring;
  - (5) Basic climate control;
  - (6) Profit and overhead.
-

**ITEM DESCRIPTION:****Equipment Shed - Wood Frame - Stick Built****QUANTITY UNIT:** EA**PRIMARY RATING:** 30 - 800 SF**SERVICE LIFE:** 20 yrs

**GENERAL DESCRIPTION:** Economy stick-built building on concrete pad or piers; Walls & roof are plywood on 2 x4's or 2 x 6's on 16" centers; may be painted or have inexpensive exterior siding; Roof may be peak, shed, or flat, covered with asphalt shingles, roll rubber or tin. Owners provide their own custom fit-up and utilities for particular end uses.

**UCI CODE**

02795.002

**RANGE****INSTALLED COST INCLUDES:**

- (1) Minor site preparation and landscaping;
- (2) Concrete pad or piers;
- (3) Delivery and set-up for factory built shelters;
- (4) Electric & communication wiring;
- (5) Basic climate control;
- (6) Profit and overhead.

**ITEM DESCRIPTION:****Equipment Shed - Concrete Block****QUANTITY UNIT:** EA**PRIMARY RATING:** 30 - 800 SF**SERVICE LIFE:** 20 yrs.

**GENERAL DESCRIPTION:** Economy building with concrete block walls, wood or economy metal roof framing; May or may not have interior 2 x 4 stud walls; other characteristics like Model

**UCI CODE**

02795.003

**RANGE****INSTALLED COST INCLUDES:**

- (1) Minor site preparation and landscaping;
- (2) Concrete pad or piers;
- (3) Delivery and set-up for factory built shelters;
- (4) Electric & communication wiring;
- (5) Basic climate control;
- (6) Profit and overhead.

**ITEM DESCRIPTION:**  
**Equipment Shed – Fiberglass**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 30 - 800 SF  
**SERVICE LIFE:** 20 yrs.

**GENERAL DESCRIPTION:** Pre-assembled factory-built shelter with fiberglass skin; Shelter is built on structural steel skid with lift holes; may be bolted to concrete pad or piers on site; Factory installed electric utilities, climate control, misc. wiring, and exterior generator plug.

**UCI CODE**      **RANGE**  
 02795.004



**INSTALLED COST INCLUDES:**

- (1) Minor site preparation and landscaping;
- (2) Concrete pad or piers;
- (3) Delivery and set-up for factory built shelters;
- (4) Electric & communication wiring;
- (5) Basic climate control;
- (6) Profit and overhead.



**ITEM DESCRIPTION:**  
**Equipment Shed- Steel Cabinet - Surface Mounted**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 30 - 800 SF  
**SERVICE LIFE:** 25 yrs.

**GENERAL DESCRIPTION:** Steel Cabinet - Surface Mounted. Steel cabinet, weatherproof, concrete pad mounted, usually 3 to 6 feet tall, not designed for personnel entry. Usually contains non-temperature sensitive electronic gear, and is usually found near communications towers and underground cable splices.

**UCI CODE**      **RANGE**  
 02796.001



**INSTALLED COST INCLUDES:**

- (1) Minor site preparation and landscaping;
- (2) Concrete pad or piers;
- (3) Delivery and set-up for factory built shelters;
- (4) Electric & communication wiring;
- (5) Basic climate control;
- (6) Profit and overhead.

**ITEM DESCRIPTION****Equipment Shed- Steel Cabinet with Pit****QUANTITY UNIT:** EA**PRIMARY RATING:** 30 - 800 SF**SERVICE LIFE:** 25 yrs.

**GENERAL DESCRIPTION:** Steel cabinet, low profile- 3 to 4 feet above ground, mounted on shallow concrete pit or “basement”, allowing sufficient height for personnel entry. Includes factory installed electric utilities, climate control, miscellaneous wiring, and exterior generator plug.

**UCI CODE**

02796.002

**RANGE****INSTALLED COST INCLUDES:**

- (1) Minor site preparation and landscaping;
- (2) Concrete pad or piers;
- (3) Delivery and set-up for factory built shelters;
- (4) Electric & communication wiring;
- (5) Basic climate control;
- (6) Profit and overhead.

**ITEM DESCRIPTION:****Equipment Shed- Steel Frame – Containerized****QUANTITY UNIT:** EA**PRIMARY RATING:** 30 - 800 SF**SERVICE LIFE:** 25 yrs.

**GENERAL DESCRIPTION: Steel Shelter – Containerized.** Factory built containerized steel shelter, delivered to site by truck. Includes factory installed electric utilities, climate control, miscellaneous wiring, and exterior generator plug. Use this model to value cargo boxes converted to equipment shelter use.

**UCI CODE**

02796.003

**RANGE****INSTALLED COST INCLUDES:**

- (1) Minor site preparation and landscaping;
- (2) Concrete pad or piers;
- (3) Delivery and set-up for factory built shelters;
- (4) Electric & communication wiring;
- (5) Basic climate control;
- (6) Profit and overhead.

**ITEM DESCRIPTION:****Equipment Shed - Steel Frame Light Weight Shelter****QUANTITY UNIT:** EA**PRIMARY RATING:** 30 - 800 SF**SERVICE LIFE:** 25 yrs.

**GENERAL DESCRIPTION: Light Weight Steel Frame Shelter.** Pre-assembled factory-built shelter with aggregate walls (small decorative stones set in concrete); Shelter is built on structural steel skid with lift holes; delivered to site on flat bed truck, usually unloaded with forklift; may be bolted to concrete pad or piers on site; Includes factory installed electric utilities, climate control, misc. wiring, and exterior generator plug

**UCI CODE**

02796.004

**RANGE****INSTALLED COST INCLUDES:**

- (1) Minor site preparation and landscaping;
- (2) Concrete pad or piers;
- (3) Delivery and set-up for factory built shelters;
- (4) Electric & communication wiring;
- (5) Basic climate control;
- (6) Profit and overhead.

**ITEM DESCRIPTION:****Equipment Shed - Steel Frame High Strength Shelter****QUANTITY UNIT:** EA**PRIMARY RATING:** 30 - 800 SF**SERVICE LIFE:** 25 yrs.

**GENERAL DESCRIPTION:** Visually similar to 02796.004, except 1)-other masonry finishes can be substituted for aggregate walls, 2)-there is no visible structural steel skid, and 3)-exterior walls have at least four “cast-in permanent lifting devices” so shelter can be lifted off the truck on to its pad or piers. Shelter is factory built to withstand earthquakes, and flying debris. Includes factory installed electric utilities, climate control, misc. wiring, and exterior generator plug.

**UCI CODE**

02796.005

**RANGE****INSTALLED COST INCLUDES:**

- (1) Minor site preparation and landscaping;
- (2) Concrete pad or piers;
- (3) Delivery and set-up for factory built shelters;
- (4) Electric & communication wiring;
- (5) Basic climate control;
- (6) Profit and overhead.

---

**ITEM DESCRIPTION:**  
**FENCE - CHAIN LINK (ALUMINUM)**

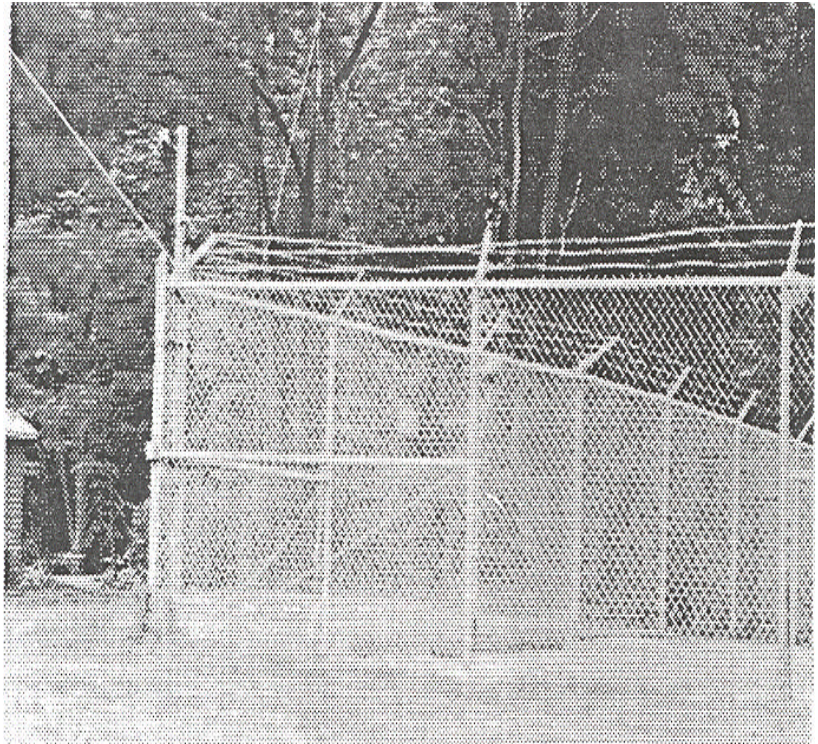
**QUANTITY UNIT:** LF  
**PRIMARY RATING:** 6 - 10 FTHT  
**SERVICE LIFE:** 35 years

---

**GENERAL DESCRIPTION:** Chain link aluminum industrial fence plus 3 strands of barbed wire, 2" line post at 10' O.C. with 1 5/8" top rail.

---

<u>UCI CODE</u>	<u>RANGE</u>
02830.001	6 - 10



---

**INSTALLED COSTS INCLUDE:**

- (1) Aluminum chain link fence
- (2) Barbed wire triple strains
- (3) Overhead and profit

---

<b>ITEM DESCRIPTION:</b>	<b>QUANTITY UNIT:</b>	<b>LF</b>
<b>FENCE - CHAIN LINK (GALAVNIZED STEEL)</b>	<b>PRIMARY RATING:</b>	<b>3 - 13 FTHT</b>
	<b>SERVICE LIFE:</b>	<b>35 years</b>

---

**GENERAL DESCRIPTION:** Fence – Chain link wire galvanized steel with 3 strands of barbed wire, 2” line post at 10’ O.C. with 1 5/8” top rail.

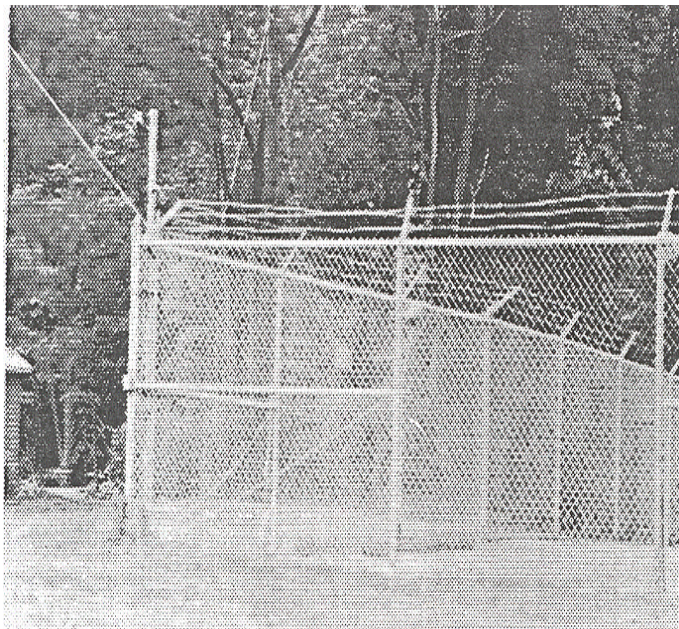
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UCI CODE

02830.002

RANGE

3 - 13




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**INSTALLED COSTS INCLUDE:**

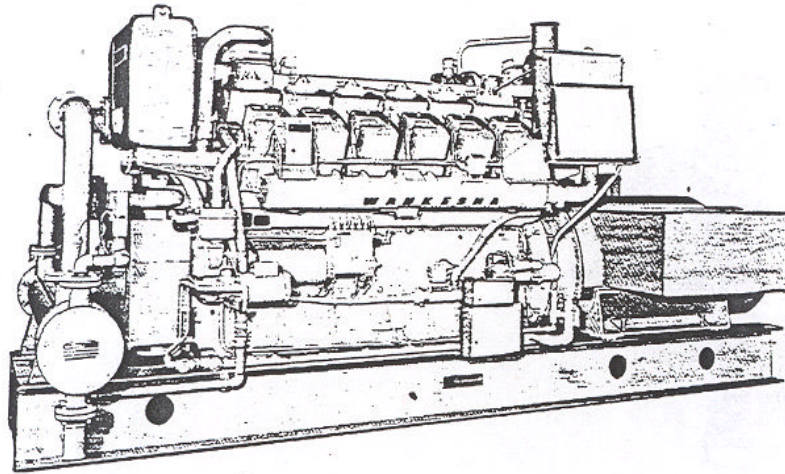
- (1) Profit and overhead
  - (2) Line posts
  - (3) Corner posts
  - (4) Braces
  - (5) Rails
  - (6) Mesh
  - (7) Gate Allowance
-

**ITEM DESCRIPTION:**  
**GENERATOR – DIESEL ENGINE**  
**(277/480 VOLT)**

**QUANTITY UNIT:** EA  
**PRIMARY RATING:** 12 – 1,012 KW  
**SERVICE LIFE:** 25 year

**GENERAL DESCRIPTION:** Diesel driven generator including fuel tank, exhaust system, battery, charger and controls. Output is 3 phase 277/480V, 4 wire.

<u>UCI CODE</u>	<u>RANGE</u>
16210.300	12 – 1,012



**INSTALLED COSTS INCLUDE:**

- (1) Profit and overhead
- (2) Diesel
- (3) Generator/alternator
- (4) Controls
- (5) Fuel tank
- (6) Battery charger
- (7) Exhaust system

\* 1 KW = 1.341 HP

\*\* 1 KW = KVA x .80 (Power Factor)



## **Appendix B**

## Excerpted from Local Telecommunications Taxes and Fees in New York State

## Taxation of Utility Property

**Assessment**

In 33 of the other states, all public utility system property is assessed by an agency of state government for property tax purposes.<sup>13</sup> An additional nine states divide the assessment responsibility between state and local government, virtually always according to property type (e.g., telecommunications vs. pipelines), with the remainder providing for assessment by local government only. New York, however, is unique in that “special franchises” granted to utility companies to place their property on, under, or over the public way are State-assessed while all other utility property is locally assessed.

In practice, utility property is one of the most complex property types from a valuation standpoint. The difficulty it may pose for most of New York’s local assessors is recognized in the statutes insofar as they provide for both county-supplied and state-supplied advisory appraisals for complex parcels. These appraisals are made available to localities conducting reassessment programs but are not binding on them. An exception is New York City, which has sufficient specialized staff to assess utility equipment without State assistance. New York State’s approach thus contrasts markedly with the state-level assessment approach used in other states under which the state assessment is binding on the local government.

The standard methodology that has been used by states, referred to as the “unitary approach,” involves the following steps:

- \* valuation of a given utility company’s entire property base;
- \* removal from this figure of any non-taxable property (e.g., personal property) and “non-system” property (e.g., office buildings);
- \* determination of the share of the total value appropriately allocable to the taxing state; and
- \* distribution of the total value in the state to individual local governments.

Alternatively, a state could, in theory, perform the assessment function centrally but not adopt the unitary approach, choosing instead to determine an independent value for the property component in each municipality without determining the unitary value of a company’s entire property complement. This latter approach, which is found in a few, primarily Northeastern states, is essentially the one used in New York for special franchise property. However, it is not applied to utility property located on private land in New York because, as already discussed, such property is locally assessed.

The available techniques for determining value are the “comparable sales,” “income,” and “cost” approaches. Under comparable sales, recent sales of similar properties are used to determine the value of the property being assessed. In the past, when generating plants were rarely sold, the standard comparable sales approach had limited relevance. The income approach is based on the idea that the value of the property reflects the income it can earn in the future. The adding-up of future property income, discounted (capitalized) to its present value, determines what the property is worth at the present time.

The cost approach focuses on the construction cost of improvements when they were first built (original cost), what they would cost to build today (reproduction cost), or the cost of replacement with the lowest cost structure of having the same or better performance characteristics (replacement cost). Under any application of the cost approach, the estimated amount of depreciation must be subtracted from the estimated construction cost in determining value, and a land value, usually determined through comparable sales, must be added to the improvement value to produce a total value for the parcel. The depreciation component can be large for some properties, and it is often difficult to quantify as it must include not only physical deterioration but also functional and economic obsolescence. These latter factors are reflective of not only the plant's particular characteristics but also external factors such as technological change and economic conditions in the industry.

The existence of alternative methods to determine value (which, not surprisingly, may produce significantly different results), together with the lack of detailed statutory valuation requirements, has led to litigation. New York's courts, stepping in to specify the right approach in a particular instance, have been guided by a central concept of "specialty property." The Court of Appeals has established what constitutes a specialty and how it is to be valued: it must be uniquely adapted to the business conducted upon it; it must be used for a special purpose which is economically feasible at the time of valuation; and there must be no market or sales for property being so used. Once property is determined to be a specialty, it must be valued using the reproduction cost approach to valuation.<sup>14</sup>

Most utility properties, by their very nature, are designed for a special purpose and, because utilities have traditionally been regulated entities for which there has not been a market, the property has consequently been classified as specialty property. For example, in Brooklyn Union Gas v. State Board of Equalization and Assessment, the tangible component of special franchises was held to be "specialty property" and thus had to be assessed using the reproduction cost method rather than the capitalized net earnings approach that the company sought.<sup>15</sup> In Tenneco v. Town of Cazenovia, a natural gas pipeline located on a private land easement was found to be specialty property and the net earnings approach was again rejected.<sup>16</sup> More recently (1994), in Long Island Lighting Company v. Assessor for Town of Brookhaven, a non-operating nuclear power plant was found to be specialty property and was therefore to be assessed using the reproduction cost method.<sup>17</sup>

### **Tax Collection**

As with assessment, tax collection in New York is similarly localized. The general rule is that school taxes are billed in September and county/town taxes in January. Cities and villages have a wide variety of fiscal dates and billing schedules.

Taxes are usually due in a lump sum, but various installment payment arrangements exist. Under RPTL Section 972, a county can opt to become the tax collection agency for member municipalities, and can establish a system of installment payments. Counties have the option under Section 928-a to allow the cities, towns, and/or villages within their boundaries to accept partial or installment payments of taxes. School districts are also allowed to establish installment payment systems under RPTL Sections 1326 and 1326-a. In the "Big 5" cities, which do not have independent school districts, city and school taxes are part of the same levy and are billed in installments.

Under Sections 906 and 930, any "...railroad, telegraph, telephone, electric, gas, water or pipeline corporation..." may request a list of parcels and tax payments due to a county and make a single payment in satisfaction of this county tax liability.

Taxable Status of Various  
Types of  
Telecommunications  
Property

As a general rule, all real property is taxable unless specifically exempted (RPTL §300). Real property includes land and things affixed to the land. The courts have addressed the issue of fixity by reference to such considerations as the permanency of the installation, the extent to which it would normally remain attached to the realty for its useful life, and the extent that the fixture is applied to the purpose of the real property in question. Real property also includes "special franchises," which are the rights of utility companies, including telecommunications firms, to place equipment in the public right-of-way. For telecommunications equipment, the taxable status will often depend also upon the ownership and/or the type of telecommunication involved. The views of the New York State Office of Real Property services, based on interpretation of the statutes, case law, and relevant legal opinions are set forth below.

According to RPTL Section 102 "Real property," "property" or "land" mean and include:

- (a) Land itself, above and under water, including trees and undergrowth thereon and mines, minerals, quarries and fossils in and under the same, except mines belonging to the State;
- (b) Buildings and other articles and structures, substructures and superstructures erected upon, under or above the land, or affixed thereto.

Special provisions apply to telecommunications property, in which case the terms "real property," "property" or "land" mean and include:

"(d) When owned by a telephone company all telephone and telegraph lines, wires, poles, supports and inclosures for electrical conductors upon, above and underground. For purposes of this paragraph the term "real property" shall not include station connections and the term "telephone company" shall mean a company subject to regulation by the public service commission which provides, to the general public within its local exchange area, non-cellular switched local exchange telephone service at the points of origination and termination of the signal."

"(i) When owned by other than a telephone company as such term is defined in paragraph (d) hereof, all lines, wires, poles, supports and inclosures for electrical conductors upon, above and underground used in connection with the transmission or switching of electromagnetic voice, video and data signals between different entities separated by air, street or other public domain, except that such property shall not include: (A) station connections; (B) fire and surveillance alarm system property; (C) such property used in the transmission of news wire services; and

(D) such property used in the transmission of news or entertainment radio, television or cable television signals for immediate, delayed or ultimate exhibition to the public, whether or not a fee is charged therefor.”

### Significant Amendments

*Chapter 416 of the Laws of 1987* added the definitions quoted above in paragraphs 102(12)(d) and (i). The legislation removed from taxation certain central office equipment of regulated telephone companies. The removal was accomplished through a phase-out schedule, which ended in 1991.

*Chapter 676 of the Laws of 1995* excluded central office equipment from the definition of special franchise property, requiring that the “... term special franchise shall not include central office equipment or station equipment (except public telephone terminal equipment) which first appears on assessment rolls prepared on the basis of taxable status dates occurring on or after October first, nineteen hundred ninety-five and which is owned by a telephone company as defined in paragraph (d) of subdivision twelve of this section, or owned by a telephone corporation as defined in subdivision seventeen of section two of the public service law and certified by the public service commission under section ninety-nine of such law, nor shall it include property of a municipal corporation, public benefit corporation or special district, nor shall it include a crossing less than two hundred fifty feet in length of a public street, highway, water or other public place outside a city or village, unless such crossing be the continuation of an occupancy of another public street, highway, water or other public place.”

### Cable Television Property

In 1985, Section 102(12) of the RPTL was modified by the Legislature to exclude certain cable television equipment from the definition of taxable real property. That cable television equipment located on privately owned land was classified as personal property, and thus became exempt. However, the definition of special franchise property contained in Section 102(17) was not changed, and cable television equipment located in public rights-of-way therefore continues to be taxable real property.

### Television and Radio Towers

Questions have been raised concerning television and radio towers, particularly in recent years. The towers themselves are taxable as “supports” for equipment pursuant to §102(12)(i). The electronic equipment used in the transmission of television and radio signals are excluded from the definition of real property in that paragraph and thus are not taxable. Some radio station towers are not merely structures to which equipment is affixed but rather are directly involved in the transmission of signals. These towers are thus also specifically excluded from the definition of realty.

Generally, equipment used in the transmission or switching of electromagnetic voice, video and data signals, which is not owned by a phone company as defined in 102(12)(d) (see above), should be analyzed pursuant to the provisions of 102(12)(i). While this section appears to make taxable all such equipment, it does exclude four items: (A) station connections; (B) fire and surveillance alarm system property; (C) such property used in the transmission of news wire services; and (D) such property used in the

transmission of news or entertainment radio, television or cable television signals for immediate, delayed or ultimate exhibition to the public, whether or not a fee is charged therefor.

A literal reading of the statute is the best way to classify broadcasting towers. If the tower is not “actually used in the transmission of radio signals” but rather, is merely a support for equipment, it should be classified as real property. However, if the tower is actually used in transmitting the signal it would be excluded by the language of RPTL Section 102(12)(i)(D). If a tower actually acts as an antenna, and the radio signal is transmitted through the tower itself, the tower then meets the other requirements of 102(12)(i)(D), then the tower would not be taxable.

In most situations, absent specific inclusion or exclusion from the statute sections discussed above, a determination of taxable status of tower-like structures under 102(12)(b) will entail the so called “fixtures test.” The Court of Appeals, in its landmark decision in *Metromedia, Inc. v. Tax Commission*, 60 N.Y.2d 85, 455 N.E.2d 1252, 468 N.Y.S.2d 457 (1983) recited the test for whether such improvements or “fixtures” are to be considered real property for real property taxation purposes. In reaching its decision, the Court noted the common law test used for determining whether a particular item is a “fixture;” i.e., the item must:

- \* be actually annexed to the real property or something appurtenant thereto;
- \* be applied to the use or purpose of the real property; and
- \* be intended as a permanent accession thereto.

### Summary

As a general principle, all real property is taxable unless specifically exempted (RPTL §300). Real property includes land and things affixed to the land. Where there is no specific inclusion or exclusion, the general provisions of §102(12)(b) apply. To determine whether an improvement is real pursuant to §102(12)(b), the question is whether it is “affixed” to realty. The test is not simply whether the structure can be removed without material damage to it or to the realty to which it is affixed. Rather, the test is whether the structure remains attached to the realty in the normal course of events for its useful life.

While equipment of cable television companies that is located on privately owned property is considered personal property and thus exempt from taxation, that located in the public right-of-way is considered part of the special franchise in question and is thus taxable real property.

The status of cellular towers is the same whether they are owned by a local service provider or another entity. In either case, the tower itself is a support. The equipment shed at the base is an enclosure. The electronic equipment is neither specifically included or excluded.

Therefore, its taxable status is determined by the fixtures tests – is it affixed to the realty and left there in the normal course of business.

Some radio station towers are not merely structures to which equipment is affixed but rather are directly involved in the transmission of signals. These towers are thus specifically excluded from the definition of real property.

#### **Other Views on Cellular Towers and Related Equipment**

Some representatives of the telecommunications industry have disputed the conclusions of the Office of Real Property Services, outlined above, regarding cellular antennae, support towers, and enclosures used to shelter the electronic equipment associated with cellular towers. They argue that cellular towers and/or associated equipment are not taxable under New York Law. The arguments they make are the following:

*(1) cellular towers and associated equipment are excluded from taxation by a statutory change enacted in 1987*

Chapter 416 of the Laws of 1987 exempted from taxation certain “central office equipment” owned by telephone companies regulated by the Public Service Commission (PSC), and switching and transmission equipment owned by other telecommunications companies not regulated by the PSC. The removal was accomplished through a phase-out schedule which ended in 1991. Thus, after the phase-out was completed, there was no statutory provision that explicitly directed that such equipment should continue to be treated by local assessors as real property. Some industry representatives believe that the Legislature intended to exempt cellular telephone towers and associated equipment when Chapter 416 was enacted.

*(2) only towers used as supports for transmission equipment should be considered real property*

Based on trial court decisions relating to radio and television broadcasting towers, they argue that cellular towers are only taxable when their purpose is to support transmission equipment. They maintain that when the towers are also used as antennae, through which signals are broadcast, they should be excluded from taxation under RPTL Section 102(12)(I)(D).

*(3) when the “ fixtures test” is applied by the courts to cellular telephone equipment, they conclude that it is not taxable real property*

Several trial court decisions with different results are cited as examples of courts finding that the property in question is not taxable.<sup>18</sup> Also raised in relation to the “fixtures test” is the issue that, since assessors apply it on a case-by-case basis, different conclusions can be reached on what is said to be the same or similar types of property.<sup>19</sup>

# Appendix C



### Cell Tower Example

A telecommunications tower is located somewhere in Onondaga County along a busy thoroughfare and is owned by AAA Tower Company. The tower is a 180 foot, three legged self supporting tower that was constructed 4 years ago. This example will illustrate the use of the three approaches to value and the reconciliation. The facts regarding the tower and the tower market in the follow: Assume that after consulting with attorneys and performing the fixtures test, it has been determined that the antennas located on the tower and the equipment shelters on the site are taxable real property.

**Note: This example is for illustrative purposes only. Any similarity to reality is purely coincidental.**

#### Tower Site

180 foot self supporting tower  
 actual age - 4 years  
 effective age – 4 years  
 clearing and grubbing – 1 acre, grade 1 clearing and grubbing  
 fencing – 800 linear feet of 6 foot aluminum chain link fencing  
 crushed stone – 800 cubic yards  
 equipment shelter – 360 square foot lightweight steel frame shelter  
 equipment shelter – 240 square foot lightweight steel frame shelter  
 equipment shelter – 80 square foot steel cabinet – surface mounted  
 antennas – 27 mounted rectangular cellular antennas (less than 4 feet)

#### Income information

Three wireless provider tenants  
 Rents – 2 @ \$900/ mo., 1 @ \$750mo.  
 Expenses –

Utilities	2%
Insurance	4%
Maintenance	3%
Management	4%
Reserves for Replacement	3%
Miscellaneous	1%

Effective Tax Rate – 2.5%  
 Overall Capitalization Rate – 10.5%

The rents are for the right to occupy space on the tower and place an equipment shed at the base of the tower. The leases are at the market and therefore the value of the leasehold interest will be equivalent to the value of the fee simple interest. No adjustments for business value need to be made with this type of lease.

**Sales Information**

There have been two sales of telecommunications towers in the area within the past year. Sale One occurred 10 months ago and is located 1 mile from the subject property on the same thoroughfare and is a 4 year old, 200 foot monopole tower which sold for \$225,000. Sale Two is a five year old, 180 foot self supporting tower located 10 miles from the subject property along a less heavily traveled road. This sale occurred last month for \$160,000. Both sales had three wireless tenants at the time of sale and the transaction prices included only the towers, land and site improvements. Sale one was designed for much heavier wind loads than the subject property and therefore is capable of handling one additional wireless tenant. The sale prices did not include the improvements owned by the tenants (antennas, equipment shelters, etc.). The tower market is appreciating at approximately 12% annually.

**Cost Approach**

	<u>RCN</u>	<u>Eff. Age</u>	<u>Percent Good</u>	<u>RCNLD</u>
Self Supporting Tower UCI Code 02790.101 180 feet Service life – 25 yr.	\$109,500	4	84%	\$91,980
Clearing and Grubbing UCI Code 02102.000 1 acre, Grade 1 – light (trees 6” diameter and less) Service Life - non-dep.	\$1,456	NA	100%	\$1,456
Gravel-Crushed Stone UCI Code 02500.100 807 cubic yds. Service Life – non-dep.	\$19,392	NA	100%	\$19,392
Chain Link Fence UCI Code 02830.001 800 linear feet 6 feet high Service Life – 35 yr.	\$12,216	4	89%	\$10,872
Steel Cabinet UCI Code 02796.001 80 square ft. Service Life – 25 yr.	\$4,800	4	84%	\$4,032
Equipment Shed Steel Frame Lightweight Shelter UCI Code 02796.004 360 square ft. Service Life – 25 yr.	\$37,800	4	84%	\$31,752
Equipment Shed Steel Frame Lightweight Shelter UCI Code 02796.004 240 square ft. Service Life – 25 yr.	\$24,000	4	84%	\$20,160
Cellular/PCS Antenna Less than 4 ft. UCI Code 02792.002 27 antennae Service Life – 20 yr.	\$54,000	4	80%	\$43,200

Total RCNLD of all taxable improvements	\$222,844
Land Value	<u>\$ 55,000</u>
Total Market Value of Taxable Improvements	\$277,844
	Rounded to <b>\$277,800</b>

**Income Capitalization Approach**

Potential Gross Income (PGI)	\$30,600
Vacancy and credit loss (V&C) 3%	<u>(\$ 918)</u>
Effective Gross Income (EGI)	\$29,682

**Operating Expenses 17%**

Utilities	\$ 595
Insurance	\$1,187
Maintenance	\$ 890
Management	\$1,187
Reserves for Rep.	\$ 890
Miscellaneous	\$ 297

Total Operating Expenses	<u>(\$ 5,046)</u>
Net Operating Income (NOI)	\$24,636

Overall Capitalization Rate	10.5%
Effective Tax Rate	<u>2.5%</u>
	13%

NOI / Overall Capitalization Rate = Market Value Estimate

**\$24,636 / 13% = \$189,508**

The market value derived from this approach does not include certain taxable improvements (the three equipment shelters and the antennas) as they are not included in the rent and are placed on the site by the tenants. The value of these taxable improvements at the site must be added to the value derived by the income approach to value.

Market value of tower and land	\$189,508
RCNLD of Equipment Shelters	\$ 4,032
	\$ 31,752
	\$ 20,160
RCNLD of antennas	<u>\$ 43,200</u>
Total Market Value of Taxable Improvements	\$288,652
	Rounded to <b>\$288,700</b>

**Sales Comparison Approach**Market Data Grid

	<u>Subject</u>	<u>Sale 1</u>	<u>Sale 2</u>
Sale Price	-----	\$225,000	\$160,000
Size	-----	200 ft.	180 ft.
Sale price/ft.	-----	\$1,125	\$889
Real Property Rights Conveyed	-----	Fee Simple	Fee Simple
Adjusted Price / ft.	-----	\$1,125	\$889
Adjustment for Financing	-----	0	0
Conditions of sale Adjustment	-----	Market 0	Market 0
Adjusted price /ft.	-----	\$1,125	\$889
Market Conditions Adjustment	-----	-10 mos. +10%	-1 mo. +1%
<u>Adjusted Price / ft.</u>	-----	<u>\$1,238</u>	<u>\$898</u>
Location Adjustment		Similar 0	Inferior +10%
Land Adjustment	1.00 ac. -----	1.25 ac. -5%	.50 ac. +10%
Land Improvements Adjustment	gravel drive -----	dirt drive +5%	paved drive -10%
Age Adjustment	4 yrs.	4 yrs. 0	5 yrs. 0
Design Capacity Adjustment	Average	Heavy Duty -20%	Average 0
Size (ft.) Adjustment	180	200 0	180 0
<u>Total Net Adjustment</u>		<u>-20%</u>	<u>+10%</u>
Adjusted Price /ft.		\$990	\$988

Based on the two sales, a value of \$990 per foot was chosen for the subject tower property. The market value estimate of the tower and the site using the sales comparison approach is \$178,200.

$$\$990 / \text{ft.} \times 180 \text{ feet} = \mathbf{\$178,200}$$

The market value derived from this approach does not include certain taxable improvements (the three equipment shelters and the antennas) as they were not considered in the sales of the two towers and are owned by the tenants leasing tower space on the two towers that sold. The value of these taxable improvements at the subject site must be added to the value derived by the sales comparison approach to value.

Market value estimate of tower and land	\$178,200
RCNLD of Equipment Shelters	\$ 4,032
	\$ 31,752
	\$ 20,160
RCNLD of antennas	<u>\$ 43,200</u>
Total Market Value of Taxable Improvements	\$277,344
	Rounded to <b>\$277,300</b>

### **Reconciliation of Value**

The three approaches to value yielded the following estimates of market value:

Cost Approach	\$277,800
Income Capitalization Approach	\$288,700
Sales Comparison Approach	\$277,300

Based on the amount and reliability of the data used in each of the three approaches most weight is placed on the cost approach and the final market value of all taxable improvements is **\$277,500**.

## **Appendix D**

**Wireless Technology**

The wireless telecommunications industry is limited to 45 megahertz (MHz) of spectrum bandwidth, which without frequency reuse would limit each cellular carrier to 396 frequencies or voice channels. In order to increase calling capacity, these low power antenna sites reuse frequencies on the radio spectrum. The manner in which wireless providers organize, or configure their cells is an important factor in increasing frequency reuse and establishing an area's calling capacity.

- Analog cellular operates in the 800 MHz frequency range and is available across 95 percent of the United States. Analog cellular service sends a voice through the air using continuous radio waves. As the voice signal travels through the air it gets weaker with distance. Equipment in the cellular network returns the signal to its original strength, or amplifies it. This technology is the predominant system in use today. The operating system (air interface) for analog is called Advanced Mobile Phone Service (AMPS). A variation on AMPS is narrow band advanced mobile phone service, or NAMPS, which uses a narrower bandwidth and has greater data capabilities.
- Digital cellular service shares the 800 MHz frequency band with analog and is quickly becoming available where analog service is offered. Digital transmissions convert voice signals into the ones and zeros of computer code. Unlike analog transmissions that are sent out as a continuously varying electrical signal in the shape of a wave, digital transmissions are a combination of on and off pulses of electricity. Several incompatible air interfaces are used to implement digital cellular networks, including Code Division Multiple Access (CDMA) and Time Division Multiple Access (TDMA).
- CDMA is also known as spread spectrum technology because it uses a low power signal that is spread across a wide bandwidth. With CDMA, a phone call is assigned a code, which identifies it to the correct receiving phone. The identifying code and the low power signal allow a large number of calls to be carried simultaneously on the same group of channels.
- TDMA is a digital air interface technology designed to increase channel capacity by chopping the signal into pieces and assigning each one to a different time slot, each lasting a fraction of a second. Using TDMA, a single channel can be used to handle simultaneous calls.



- Global System for Mobile Communications (GSM) is a type of TDMA digital wireless network that has encryption features. GSM is rapidly being deployed worldwide and is the standard in Europe and most of Asia at 900 MHz. In the U.S., carriers are deploying GSM at 1900 MHz, making GSM phones sold in the U.S. incompatible with European and Asian GSM phones and vice versa.
- Personal Communications Services (PCS) is an all digital service specifically designed for U.S. operations and is available in metropolitan areas. PCS is a term coined by the Federal Communications Commission (FCC) to describe a digital, two way, wireless telecommunications system licensed to operate between 1850 – 1990 MHz. PCS is capable of increased call capacity. PCS networks employ CDMA, TDMA, or GSM technology
- Enhanced Specialized Mobile Radio (ESMR) service is also a digital service, formed by the application of digital systems to traditional dispatch specialized mobile radio service spectrum, in the 800 and 900 MHz bands. Examples of companies using a traditional dispatch specialized mobile radio service would include a local taxi service or a plumbing and heating contractor. By aggregating this spectrum, and applying a cellular-like digital network, an ESMR company is able to provide a cellular or PCS-like voice and data messaging service.

# **Appendix E**

**NEW YORK STATE ASSEMBLY**  
**New York State Consolidated Laws**

**Real Property Tax**

ARTICLE I  
SHORT TITLE; DEFINITIONS

Section 100. Short title.

102. Definitions.

S 100. Short title. This chapter shall be known as the "Real Property Tax Law" and may be cited as "RPTL".

S 102. Definitions. When used in this chapter, unless otherwise expressly stated or unless the context otherwise requires:

1. "Assessing unit" means: (a) a city, town, or county with the power to assess real property, unless the city, town or county is part of a consolidated assessing unit;  
(b) a consolidated assessing unit; or  
(c) a village as provided in section fourteen hundred two of this chapter.
2. "Assessment" means a determination made by assessors of (1) the valuation of real property, including the valuation of exempt real property and (2) whether or not real property is subject to taxation or special ad valorem levies.
3. "Assessors" mean an elected or appointed officer or body of officers charged by law with the duty of assessing real property in an assessing unit for the purposes of taxation or special ad valorem levies, for county, city, town, village, school district or special district purposes.
4. "Board of assessment review" means the body of officers as constituted by subdivision one of section five hundred twenty-three of this chapter and, in the case of villages, by subdivision one of section fourteen hundred eight of this chapter which is empowered to hear and determine complaints in relation to assessments.
- 4-a. "Chief executive officer" means (a) in the case of cities, the mayor, except in cities having a city manager in which case it shall mean the city manager, (b) in the case of villages, the mayor and (c) in the case of towns, the supervisor.
5. "Collecting officer" means an elected or appointed officer of any municipal corporation or special district authorized by law to receive and collect taxes, special ad valorem levies or special assessments.
6. "Comptroller" means the state comptroller.
- 6-a. "Consolidated assessing unit" means an assessing unit established pursuant to article sixteen of this chapter.
7. "County equalization agency" means the board of supervisors, commissioners of equalization or other county agency authorized by this chapter or any other law to establish county equalization rates.
8. "County equalization rate" means the percentage of full value at which taxable real property in a city or town is assessed as determined by a county equalization agency for purposes of apportioning county real property taxes.
9. "County treasurer" means the chief fiscal officer of a county charged by law with performing the duties of treasurer, by whatever name known or called.

- 9-a. "Infant" or "minor" means a person who has not attained the age of eighteen years.
10. "Municipal corporation" means a county, city, town, village or school district.
11. "Parcel" means a separately assessed lot, parcel, piece or portion of real property, except publicly owned bridges and land used for street, road, highway or parkway purposes. A parcel shall not be bisected by a municipal corporation boundary line except that in a special assessing unit a parcel may be bisected by a school district or village boundary line.
12. "Real property", "property" or "land" mean and include:
- (a) Land itself, above and under water, including trees and under-growth thereon and mines, minerals, quarries and fossils in and under the same, except mines belonging to the state;
  - (b) Buildings and other articles and structures, substructures and superstructures erected upon, under or above the land, or affixed there to, including bridges and wharves and piers and the value of the right to collect wharfage, crantage or dockage thereon;
  - (c) Surface, underground or elevated railroads, and railroad structures, substructures and superstructures, tracks and the metal thereon, branches, switches and other fixtures permitted or authorized to be made, laid or placed in, upon, above or under any public or private street or place;
  - (d) When owned by a telephone company all telephone and telegraph lines, wires, poles, supports and inclosures for electrical conductors upon, above and underground. For purposes of this paragraph the term "real property" shall not include station connections and the term "telephone company" shall mean a company subject to regulation by the public service commission which provides, to the general public within its local exchange area, non-cellular switched local exchange telephone service at the points of origination and termination of the signal.
  - (e) Mains, pipes and tanks permitted or authorized to be made, laid or placed in, upon, above or under any public or private street or place for conducting steam, heat, water, oil, electricity or any property, substance or product capable of transportation or conveyance therein or that is protected thereby;
  - (f) Boilers, ventilating apparatus, elevators, plumbing, heating, lighting and power generating apparatus, shafting other than counter-shafting and equipment for the distribution of heat, light, power, gases and liquids, but shall not include movable machinery or equipment consisting of structures or erections to the operation of which machinery is essential, owned by a corporation taxable under article nine-a of the tax law, used for trade or manufacture and not essential for the support of the building, structure or superstructure, and removable without material injury thereto;
  - (g) Forms of housing adaptable to motivation by a power connected thereto, commonly called "trailers" or "mobile homes", which are or can be used for residential, business, commercial or office purposes, except those (1) located within the boundaries of an assessing unit for less than sixty days or (2) unoccupied and for sale. The value of any trailer or mobile home shall be included in the assessment of the land on which it is located; provided, however, that if either the trailer or mobile home or the land on which it is located is entitled to any exemption pursuant to article four of this chapter, other than the exemption authorized by section four hundred twenty-five of this chapter, such trailer or mobile home shall be separately assessed in the name of the owner thereof;

(h) Special franchises as defined in subdivision seventeen of this section.

(i) When owned by other than a telephone company as such term is defined in paragraph (d) hereof, all lines, wires, poles, supports and inclosures for electrical conductors upon, above and underground used in connection with the transmission or switching of electromagnetic voice, video and data signals between different entities separated by air, street or other public domain, except that such property shall not include: (A) station connections; (B) fire and surveillance alarm system property; (C) such property used in the transmission of news wire services; and (D) such property used in the transmission of news or entertainment radio, television or cable television signals for immediate, delayed or ultimate exhibition to the public, whether or not a fee is charged therefor.

12-a. "Revaluation", "reassessment" or "update" means a systematic review of the assessments of all locally assessed properties, valued as of the valuation date of the assessment roll containing those assessments, to attain compliance with the standard of assessment set forth in subdivision two of section three hundred five of this chapter.

13. "School authorities" mean the board of education, trustees or corresponding officers, whether one or more, of a school district.

14. "Special ad valorem levy" means a charge imposed upon benefited real property in the same manner and at the same time as taxes for municipal purposes to defray the cost, including operation and maintenance, of a special district improvement or service, but not including any charge imposed by or on behalf of a city or village.

15. "Special assessment" means a charge imposed upon benefited real property in proportion to the benefit received by such property to defray the cost, including operation and maintenance, of a special district improvement or service or of a special improvement or service, but does not include a special ad valorem levy.

16. "Special district" means a town or county improvement district, district corporation or other district established for the purpose of carrying on, performing or financing one or more improvements or services intended to benefit the health, welfare, safety or convenience of the inhabitants of such district or to benefit the real property within such district, and in which real property is subject to special ad valorem levies or special assessments for the purposes for which such district was established.

17. "Special franchise" means the franchise, right, authority or permission to construct, maintain or operate in, under, above, upon or through any public street, highway, water or other public place mains, pipes, tanks, conduits, wires or transformers, with their appurtenances, for conducting water, steam, light, power, electricity, gas or other substance. For purposes of assessment and taxation a special franchise shall include the value of the tangible property situated in, under, above, upon or through any public street, highway, water or other public place in connection therewith. The term special franchise shall not include central office equipment or station equipment (except public telephone terminal equipment) which first appears on assessment rolls prepared on the basis of taxable status dates occurring on or after October first, nineteen hundred ninety-five and which is owned by a telephone company as defined in paragraph (d) of subdivision twelve of this section, or owned by a telephone corporation as defined in subdivision seventeen of section two of the public service law and certified by the public service commission under section ninety-nine of such law, nor shall it include property of a municipal corporation, public benefit corporation or special district, nor shall it include a crossing less than two hundred fifty feet in length of a public street, highway, water or other public place outside a city or village, unless such crossing be the continuation of an occupancy of another public street, highway, water or other public place.

18. "State board" or "board" means the state board of real property services.
19. "State equalization rate" means the percentage of full value at which taxable real property in a county, city, town or village is assessed as determined by the state board.
20. "Tax" or "taxation" means a charge imposed upon real property by or on behalf of a county, city, town, village or school district for municipal or school district purposes, but does not include a special ad valorem levy or a special assessment. The term "tax" or "taxes" as used in articles five, nine, ten and eleven of this chapter shall for levy and collection purposes include special ad valorem levies.
21. "Tax lien" means an unpaid tax, special ad valorem levy, special assessment or other charge imposed upon real property by or on behalf of a municipal corporation or special district which is an encumbrance on real property, whether or not evidenced by a written instrument.

# Appendix F

## Glossary of Terms

<b>Aggregators, Tower:</b>	Aggregators in general are those who develop sites for others' use, and may or may not be in the same business as its tenants/lessees. Tower Aggregators are those who have jumped all the hurdles of the permitting, siting and placement process, have built a communications tower.
<b>AMPS: (Advanced Mobile Phone System)</b>	This is the first generation analog service that originally popularized cellular service. This system is gradually disappearing as digital systems become more popular with providers and subscribers.
<b>BS: (Base Station)</b>	With regard to wireless telecommunications, refers to the site where the wireless antenna and transmitting/receiving equipment are located.
<b>CDMA: (Code Division Multiple Access)</b>	A technology developed by Qualcomm that let multiple cellular phone calls occur on the same frequency, without interfacing with each other. The call is broken up and mixed with other signals. Each signal contains a unique identifying code. The network directs each signal to the proper location based on this unique code.
<b>Cell Site:</b>	The physical location where the wireless tower is position.
<b>Cell:</b>	A geographic area that is a subdivision of the entire wireless coverage area. Each cell has its own tower which transmits and receives wireless telephone signals in its own limited coverage area.
<b>Cellular Operating System:</b>	A group of cells connected to a single wireless telephone switch. The system utilizes advanced computer technology and switching equipment to monitor signal strength and to switch calls from tower to tower without dropping a call.
<b>Channel:</b>	A communication link through which information is transmitted
<b>Coverage Area:</b>	The geographic area served by a wireless system. Once you have traveled outside of your coverage area, your wireless phone will automatically indicate "roaming" or "no service".
<b>Coverage:</b>	The physical areas in which a cellular service provider offers service.
<b>Crosstalk:</b>	When more than one conversation can be heard during a call.



<b>Dead Spot:</b>	An area within a cell where service is not available. Usually caused by mountainous terrain which blocks the signals to or from the cell tower. Dead spots may also occur in tunnels and indoor parking garages. Excessive foliage or electronic interference can also cause dead spots.
<b>Dropped Call:</b>	A call terminated by something other than the calling or called party.
<b>Dual-Mode:</b>	A wireless phone that will work with both digital and analog systems.
<b>Duplex:</b>	Two-way voice communication occurring simultaneously on one line. Used most often with hands free telephone operation.
<b>EMS:</b>	Emergency Medical Service; in this context a radio frequency limited to use by hospitals, ambulances, and emergency medical personnel.
<b>ESMR: (Enhanced Specialized Mobile Radio)</b>	Digital wireless technology formed by the application of digital systems to traditional dispatch specialized mobile radio service spectrum in the 800 and 900 MHZ bands. Service provided includes PCS – like voice as well as data messaging and two way communication service.
<b>ESN: (Electronic Serial Number)</b>	Whenever you make a call on a cellular phone, the cellular tower handling your phone call will check your phone’s electronic serial number and mechanical serial number in order to verify that the phone is authorized to use the network.
<b>Gain:</b>	The process of increasing the strength of a signal, such as increasing the volume on your wireless phone.
<b>GPS:</b>	Global Positioning System: Technology that allows, anybody at ground level with the appropriate electronic gear can access a satellite based system and locate themselves on a map in any given area of the earth’s surface.
<b>GSM: (Global System for Mobile Communications)</b>	Currently the most widely used type of cellular service in the world. It is used primarily in Europe but is also popular in other parts of the world.
<b>Handoff:</b>	The act of transferring a wireless signal from one cell site to another.

<b>IDEN:</b> <b>(Integrated Digital Enhanced Network)</b> The Valuation of Towers	A type of enhanced specialized mobile radio service (ESMR) providing wireless telecommunication service, alphanumeric paging, and 2-way radio service.	8/2/01
<b>Landline:</b>	The term traditionally used for your home or office phone system.	
<b>Load:</b>	Loads are the external forces acting on a structure stresses are the internal forces that resist the loads. When used in connection with Tower design, wind loads are maximum forces that may be applied to a structural element by wind. Similarly ice or snow load are maximum forces that may be applied by snow or ice accumulation. The higher the wind, ice and snow loads a tower is designed for the more antennas and satellite dishes may be hung from the tower.	
<b>MS:</b> <b>(Mobile Station)</b>	With regard to wireless telecommunications, refers to the wireless handset (phone).	
<b>MSA:</b>	Mobile Service Area.	
<b>MSN:</b> <b>(Mechanical Serial Number)</b>	As with the electronic serial number, the cellular tower checks the mechanical serial number to verify that the phone is authorized to use that network.	
<b>Paging:</b>	Electronic messaging system whereby one dials a phone number on any phone. The dialed phone answers mechanically, and the caller can leave a voice message, or punch phone buttons on a non-rotary phone and leave a numerical message. The called party is made aware that a message awaits on the <b>pager</b> (message receiving device), and may retrieve the message immediately, or at a later time.	
<b>PCS:</b>	Personal Communications System/Service; digital wireless telephone.	
<b>PCS:</b> <b>(Personal Communications Services)</b>	PCS is a general term for digital cellular services. PCS allows subscribers extra features, such a caller ID and voice mail. GSM, TDMA, and CDMA are all examples of PCS services.	
<b>Roaming:</b>	Roaming lets a cellular phone user connect to a cellular network even if he or she is outside his or her “home” coverage area. The phone will detect whatever cellular network is available and use that service instead.	
<b>TDMA:</b> <b>(Time Division Multiple Access)</b>	Technology similar to CDMA. It allows multiple calls to be made on the same frequency without interference. The different calls are broken up, and the data is sent at slightly different intervals. The data is then reassembled when it reaches its destination.	

- TV:** Analog television signal from large traditional tower; may now include digital signals, broadcast from satellites or from antennae mounted on communications towers.
- UCI Code:** Uniform Construction Index Code. A numerical classification system for categorizing construction materials, processes and equipment.
- WAP:  
(Wireless Application  
Protocol)** This product defines the specifications that let users access information from the Internet with wireless handheld devices, such as cellular phones.
- Waveguide:** A rectangular, circular or elliptical tube through which radio waves are transmitted.