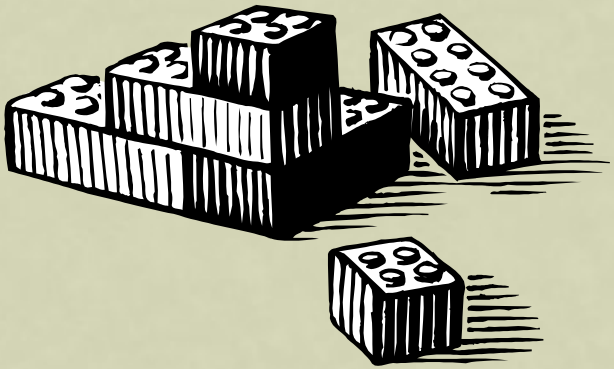


UNDERSTANDING & APPLYING THE COST APPROACH

YOUR DATA IS THE FOUNDATION

CONSTRUCTION

BE FAMILIAR!

CONSTRUCTION

CONSTRUCTION FEATURES
ARCHITECTURAL TRENDS

KEY COMPONENT….INSPECTION!

CONSTRUCTION

CONSTRUCTION CONSIDERATIONS

- MUST HAVE GOOD OBSERVATION TECHNIQUES
- ELIMINATE BIAS
- OPINIONS MUST BE MARKET BASED
- UNDERSTAND APPLICABLE REGULATIONS
- BUILDING CODES

CONSTRUCTION

PLANS AND SPECIFICATIONS

WHAT IS THE DIFFERENCE?

BUILDING CODES
COVENANTS

CONSTRUCTION

CONSTRUCTION CONSIDERATIONS

GROSS LIVING AREA

GROSS BUILDING AREA

GROSS LEASABLE AREA

CONSTRUCTION

CONSTRUCTION CONSIDERATIONS

HOUSE & BUILDING STYLES

NAMES ARE SPECIFIC TO MARKET AND LOCATION IN THE COUNTRY

CONSTRUCTION

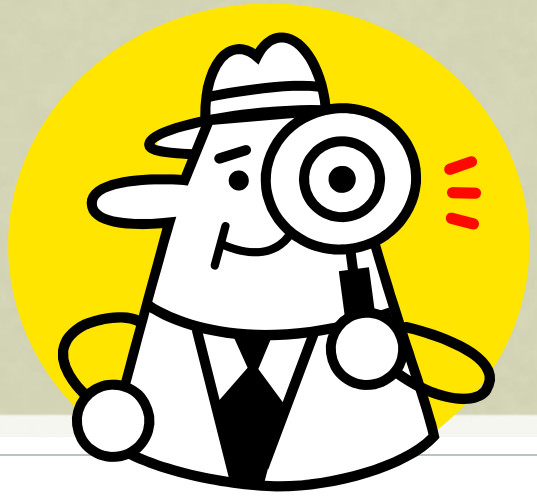
CONSTRUCTION CONSIDERATIONS / IMPORTANT OBSERVATIONS

- LOCATION OF IMPROVEMENTS ON THE SITE
- FOUNDATION
- FRAMING
- WINDOWS AND DOORS
- INTERIOR FINISH – QUALITY AND CONDITION

CONSTRUCTION

CONSTRUCTION CONSIDERATIONS / IMPORTANT OBSERVATIONS

- PLUMBING
- HEATING AND AIR CONDITIONING
- ELECTRICAL
- AMENITIES
- SITE IMPROVEMENTS



DATA COLLECTION

YOU ARE THE INVESTIGATOR

DATA COLLECTION

WHAT IS RELEVANT?

- LOCAL MARKET TRENDS
- ECONOMIC BASE
- NEIGHBORHOOD
- SITE AND IMPROVEMENTS

DATA COLLECTION

WHAT IS RELEVANT?

- LIFE CYCLE
  - GROWTH? STABILIZATION? DECLINE? REVITALIZATION?
- PROXIMITY TO HAZARDS
- CONDITION – DEFERRED MAINTENANCE
- EXTERIOR FEATURES
- INTERIOR FEATURES

DATA COLLECTION

IMPORTANT TO REMEMBER….

APPROACHES TO VALUE ALWAYS LINK!

THE SAME CONSIDERATIONS ARE IN ALL APPROACHES TO VALUE!

DATA COLLECTION

DATA SOURCES

- NATIONAL COST SOURCES
- LOCAL BUILDERS
- APPRAISER'S FILES OR ASSESSMENT RECORDS
- REAL ESTATE AGENTS
- PUBLIC RECORDS PLANNING OR ECONOMIC DEVELOPMENT COUNCILS

DATA COLLECTION

DATA SOURCES

- DEVELOPERS
- APPRAISERS
- INTERNET
- THE PUBLIC
- PROPERTY OWNERS
- BUYERS
- SELLERS

SITE VALUATION

NO IMPROVEMENTS

SITE VALUATION

DEFINITION OF LAND: *The earth's surface, both land and water, and anything that is attached to it whether by the course of nature or human hands; all natural resources in their original state, e.g., mineral deposits, wildlife, timber, fish, water, coal deposits, soil.*

DEFINITION OF SITE: *Land that is improved so that it is ready to be used for a specific purpose.*

SITE VALUATION

Six methods of valuing a site. They are:

- Sales comparison - Comparison with recent sales
- Extraction – Subtracts estimated improvement value to arrive at land value
- Allocation - Uses land-to-value ratios based on improved sale comparables
- Subdivision Development – Subtracts estimated development costs from discounted sale proceeds
- Land Residual – Divides up and capitalizes the income between land and improvements
- Ground Rent Capitalization - Capitalizes income from leased land

* The first method listed is the most commonly used – the sales comparison method.

SITE VALUATION

Possible Site Improvements:

- Roads, curbs, & gutters
- Water, sewer
- Grading and fill
- Drainage
- Site plans & site approval
- Zoning changes
- Permits

* Site is land that is ready to be developed. In other words; Land plus necessary site improvements equals a site!

SITE VALUATION

The more common site adjustments to consider:

- Traffic, cul-de-sac, etc.
- Size
- Shape
- Topography
- Exposure
- Usable area
- Corner location
- Floodplain
- Utilities, Soil conditions, Zoning, Restrictions

SITE VALUATION

HIGHEST AND BEST USE ANALYSIS

- PHYSICALLY POSSIBLE?
- LEGALLY PERMISSABLE?
- ECONOMICALLY FEASIBLE?
- MAXIMALLY PRODUCTIVE?

SITE VALUATION

HIGHEST AND BEST USE ANALYSIS

- AS IF VACANT
- AS IMPROVED

SITE VALUATION

HIGHEST AND BEST USE ANALYSIS

IS MY CONCLUSION REASONABLY PROBABLE?

THE COST APPROACH

HOW DO WE DO IT?

THE COST APPROACH

BASIC PRINCIPLE:

The basic principle underlying the cost approach is the **principle of substitution.** This principle is defined as:

The appraisal principle that states that when several similar or commensurate commodities, goods, or services are available, the one with the lowest price will attract the greatest demand and widest distribution. This is the primary principle upon which the cost and sales comparison approaches are based.

Translation: "Why should I pay more than $200,000 for your property, when I can build another one just as good for $200,000?"

THE COST APPROACH

REPRODUCTION COST:

AN EXACT DUPLICATE – USED WITH NEW CONSTRUCTION, PROPOSED IMPROVEMENTS AND HISTORICAL PROPERTIES

REPLACEMENT COST:

THE COST TO CONSTRUCT THE PROPERTY IMPROVEMENTS WITH THE SAME DESIGN AND UTILITY.

THE COST APPROACH

THE STEPS

1. VALUE THE SITE
2. ESTIMATE THE COST NEW OF THE IMPROVEMENTS
3. ESTIMATE THE DEPRECIATION AND SUBTRACT FROM THE COST NEW
4. ADD DEPRECIATED VALUE OF SITE IMPROVEMENTS TO THE VALUE OF THE LAND TO ARRIVE AT THE OPINION OF VALUE BASED ON THE COST APPROACH

THE COST APPROACH

RELATED COSTS

- DIRECT COSTS (Hard costs)
- INDIRECT COSTS (Soft costs)

THE COST APPROACH

DIRECT COSTS (EASIER TO IDENTIFY)

- LABOR
- SITE PREPERATION
- BUILDING MATERIALS
- ELECTRICAL, SEWER, WATER
- EQUIPMENT RENTAL
- CONTRACTOR PROFIT AND OVERHEAD

THE COST APPROACH

INDIRECT COSTS

- ARCHITECT'S FEES & ENGINEER'S FEES
- SURVEYOR'S FEES AND LEGAL FEES
- APPRAISAL FEES
- BUILDING PERMITS AND LICENSES
- INSURANCE
- INTEREST AND TAXES
- SELLING EXPENSES

THE COST APPROACH

COST APPROACH METHODS

- QUANTITY SURVEY METHOD
- UNIT COST OR UNIT IN PLACE METHOD
- SQUARE FOOT OR CUBIC FOOT METHOD
- COMPARATIVE COST METHOD
- INDEX METHOD/TRENDING

THE COST APPROACH

- Applicability – The cost approach is most applicable when:
  - A lack of market activity precludes the use of the sales comparison approach
  - The property is not typically income producing and the income capitalization approach is not pertinent
  - The building improvements are new or relatively new
  - The land value is well supported
  - The improvements represent the highest and best use of the land as though vacant
  - Estimating the use value of special purpose properties
  - The appraisal requires that land and improvements be valued separately; such as for insurance or accounting purposes
  - Land value is a significant portion of the overall value; such as with agricultural properties

THE COST APPROACH

- Non-Applicability – The situations in which the cost approach is **least** applicable:
  - The depreciation is a type that is more difficult to estimate
  - Data is scarce or lacking to estimate the amount of entrepreneurial profit
  - Data is scarce or lacking to estimate the land value
  - The interest valued is anything other than fee simple – adjustments must be made

THE COST APPROACH

EXAMPLE

THE COST APPROACH

THE SUBJECT'S SITE

- LOCATED ON A MODERATELY TRAVELED ROADWAY
- ZONING: RURAL RESIDENTIAL
- ZONE C – FLOOD INSURANCE RATE MAP 250337-0002-B
- RECTANGULAR SITE – 1 ACRE /150' OF FRONTAGE
- SOIL – CANTON FINE SANDY LOAM / HINCKLEY SANDY LOAM
- PRIVATE WELL, PRIVATE SEWER, ELECTRICAL SERVICE
- PAVED DRIVEWAY, SHRUBBERY BODERING THE DWELLING & SPORADIC TREE PLANTINGS

THE COST APPROACH

THE SUBJECT'S SITE

THE SUBJECT SITE IS ADEQUATE IN SIZE AND SERVICES FOR SIMILAR HOMES AND SITES IN THE NEIGHBORHOOD. BASED UPON THE UNITED STATES DEPARTMENT OF AGRICULTURE, THE SOIL ON THE SUBJECT'S SITE SERVES AN ON-SITE SEWERAGE SYSTEM WELL. THE SITE IS SITUATED ON A RESIDENTIAL STREET WITH MODERATE TRAFFIC VOLUME. AN INSPECTION OF THE SURFACE OF THE SITE REVEALED NO STORAGE OF HAZARDOUS MATERIALS. THE APPRAISER IS NOT QUALIFIED TO DETECT THE PRESENCE OF MATERIALS, WHICH MIGHT BE HAZARDOUS. NO CERTIFICATION REGARDING THE PRESENCE OR ABSENCE OF HAZARDOUS MATERIALS IS MADE BY THE APPRAISER AND IF THE PRESENCE OF SUCH MATERIALS IS FOUND, THE OPINION OF VALUE PROVIDED IN THIS REPORT IS SUBJECT TO CHANGE. THE SUBJECT IS LOCATED IN AN AREA OF MINIMAL FLOODING WITH GRADUAL SLOPING FROM THE STREET AND IS COHESIVE TO ITS SURROUNDED USES OF THE NEIGHBORHOOD.

OPINION OF SITE VALUE BASED ON VACANT LAND SALES ANALYSIS

$67,500

THE COST APPROACH

THE IMPROVEMENT

THE COST APPROACH

THE IMPROVEMENT

- 2 STORY COLONIAL/ SINGLE FAMILY DWELLING
- ACTUAL AGE 2005 / EFFECTIVE AGE 2006
- EXTERIOR
  - WOOD FRAMING
  - VINYL SIDING
  - STEEL DOORS
  - GABLE ROOF / ASPHALT SHINGLE
  - FIBERGLASS INSULATION
  - ALUMINUM GUTTERS & DOWNSPOUTS
  - VINYL DOUBLE HUNG WINDOWS
  - REAR DECK / OPEN FRONT PORCH
  - GOOD CONDITION

THE COST APPROACH

THE IMPROVEMENT

- INTERIOR
  - FLOORING - HARDWOOD, WALL TO WALL CARPETING, CERAMIC TILE
  - CEILINGS AND WALLS - DRYWALL AND PLASTER
  - HARDWOOD CABINETRY
  - GRANITE COUNTERS
  - HARDWOOD VANITIES WITH MARBLE TOPS
  - PAINTED WOOD TRIM AND ACCENTS
  - GOOD CONDITION
  - FIREPLACE
  - WHIRLPOOL TUB

THE COST APPROACH

THE IMPROVEMENT

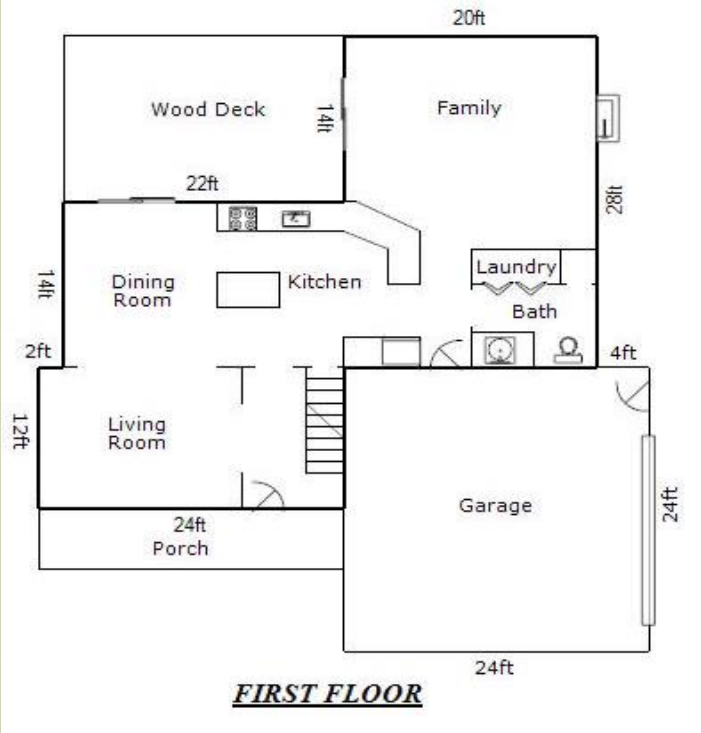
- BASEMENT
  - CONCRETE FLOOR
  - CONCRETE WALLS
  - OPEN JOIST CEILING
  - WALKOUT TO REAR YARD
  - GOOD CONDITION
- MECHANICAL SYSTEMS
  - FORCED HOT AIR HEATING SYSTEM FUELED BY OIL
  - CENTRAL AIR CONDITIONING
  - 200 AMP CIRCUIT BREAKER SERVICE
  - TWO AND ONE HALF BATHS WITH COPPER PIPING

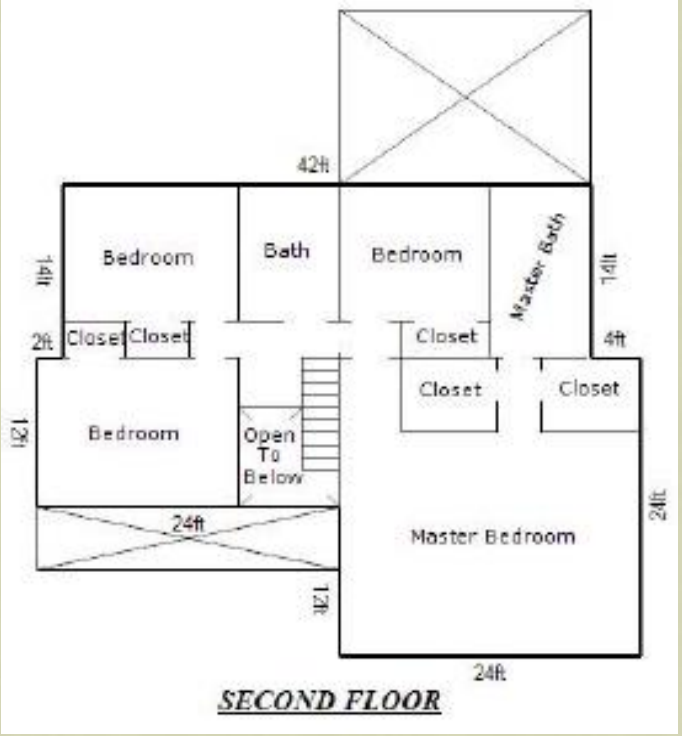
THE COST APPROACH

THE SUBJECT'S IMPROVEMENT

THE SUBJECT IMPROVEMENT IS A TWO STORY COLONIAL STYLE SINGLE FAMILY DWELLING BUILT IN 2005. THE EXTERIOR IS WELL MAINTAINED WITH VINYL SIDING, AN ASPHALT SHINGLED ROOF, VINYL DOUBLE HUNG WINDOWS, ALUMINUM GUTTERS AND DOWNSPOUTS, A REAR DECK AND AN OPEN PORCH AT ITS FRONT ENTRANCE. THE INTERIOR CONSISTS OF HARDWOOD FLOORING, WALL TO WALL CARPETING, CERAMIC TILE FLOORING, PLASTERED WALLS AND CEILINGS, PAINTED WOOD TRIM AND GOOD QUALITY LIGHTING FIXTURES. THE SUBJECT HAS EIGHT ROOMS, FOUR BEDROOMS AND TWO AND ONE HALF BATHROOMS. THE KITCHEN AND BATHROOMS ARE MODERN WITH HARDWOOD CABINETRY, CERAMIC TILE FLOORING, GRANITE COUNTERS, HARDWOOD VANITIES WITH MARBLE TOPS AND GOOD QUALITY FIXTURES. THE SUBJECT HAS A FUNCTIONAL FLOOR PLAN, ADEQUATE STORAGE SPACE AND AN UNFINISHED WALKOUT BASEMENT THAT HOUSES THE MECHANICAL SYSTEMS. IT IS CONSIDERED TO BE IN GOOD CONDITION AND OF GOOD QUALITY OF CONSTRUCTION.

THE COST APPROACH





THE SKETCH

THE COST APPROACH

Living Area		Area Calculation				
First Floor	1156 ft²	First Floor				x 1.00 = 1156 ft²
Second Floor	1452 ft²	Δ	12ft x	2ft x	0.50 =	12 ft²
		Δ	14ft x	20ft x	0.50 =	140 ft²
		Δ	24.41ft x	28ft x	0.41 =	280 ft²
		Δ	24.41ft x	20ft x	0.29 =	140 ft²
		Δ	24ft x	12.17ft x	0.49 =	144 ft²
		Δ	12ft x	25.06ft x	0.44 =	132 ft²
		Δ	14ft x	22ft x	0.50 =	154 ft²
		Δ	14ft x	22ft x	0.50 =	154 ft²
		Second Floor				x 1.00 = 1452 ft²
		Δ	12ft x	2ft x	0.50 =	12 ft²
		Δ	4ft x	24ft x	0.50 =	48 ft²
		Δ	24ft x	12.17ft x	0.49 =	144 ft²
		Δ	24ft x	12ft x	0.50 =	144 ft²
		Δ	24.33ft x	26.83ft x	0.40 =	264 ft²
		Δ	14ft x	23.32ft x	0.43 =	140 ft²
		Δ	25.06ft x	14ft x	0.44 =	154 ft²
Total Living Area (rounded):	2608 ft²	Δ	34.06ft x	42ft x	0.38 =	546.00 ft²

GROSS LIVING AREA CALCULATIONS

THE COST APPROACH

HIGHEST AND BEST USE

- AFTER PROPERLY WEIGHING THE FOUR PRINCIPLES OF HIGHEST AND BEST USE, IT IS DETERMINED THAT A SINGLE FAMILY BUILDING LOT IS THE SUBJECT'S HIGHEST AND BEST USE AS IF VACANT
- AFTER PROPERLY WEIGHING THE FOUR PRINCIPLES OF HIGHEST AND BEST USE, IT IS DETERMINED THAT THE CURRENT USE IS THE SUBJECT'S HIGHEST AND BEST USE AS IMPROVED

THE COST APPROACH

LET'S RECAP

- ✓ STEP 1 - VALUE THE SITE ($67,500)
- ❑ STEP 2 - VALUE THE COST NEW OF THE IMPROVEMENTS
- ❑ STEP 3 - ESTIMATE THE DEPRECIATION AND SUBTRACT FROM THE COST NEW
- ❑ STEP 4 - ADD DEPRECIATED VALUE OF SITE IMPROVEMENTS TO THE VALUE OF THE LAND TO ARRIVE AT THE OPINION OF VALUE BASED ON THE COST APPROACH

WHAT HAVE WE DONE?

STEP 2 –

VALUE THE COST NEW OF THE IMPROVEMENTS USING MARSHALL & SWIFT COST HANDBOOK

SQUARE FOOT APPRAISAL FORM

For subscribers using the RESIDENTIAL COST HANDBOOK

Form 1007 (1991)

Appraisal for M.A.A.O.
Property owner Joseph M. Sena & Others
Address 345 New Boston Road
Appraiser William B. Mitchell
City Sturbridge State/Province MA
Zip/Postal Code 01566 Date 08-16-2010

TYPE
- [x] Single Family
- [ ] Multiple
- [ ] Town House
- [ ] Row House
- [ ] Manufactured
- [ ] _____ Cabin, Dome, etc.

FLOOR AREA
1st 1156
2nd 1452
3rd _____
Total 2608

QUALITY
- [ ] Low
- [ ] Fair
- [ ] Average
- [x] Good
- [ ] Very Good
- [ ] Excellent

HIGH VALUE
- [ ] Class I
- [ ] Class II
- [ ] Class III
- [ ] Class IV

STYLE
- [x] No. Stories 2
- [ ] Bi-level
- [ ] Split Level
- [ ] 11/2 story-Fin.
- [ ] 11/2 story-Unf.
- [ ] 21/2 story-Fin.
- [ ] 21/2 story-Unf.
- [ ] End Row
- [ ] Inside Row

INTERIOR WALL
HEIGHT N/A
NUMBER OF MULTIPLE
UNITS N/A

EXTERIOR WALLS
- [ ] Hardboard/Plywood
- [ ] Stucco
- [x] Siding or Shingle
- [ ] Masonry Veneer
- [ ] Common Brick
- [ ] Face Brick or Stone
- [ ] Concrete Block

MANUFACTURED HOUSING WALLS
- [ ] Alum., Ribbed
- [ ] Lap Siding
- [ ] Hardboard
- [ ] Plywood

ROOFCOVER
- [x] Built-Up or Comp. Shingle
- [ ] Wood Shingle or Shake
- [ ] Clay Tile
- [ ] Concrete Tile
- [ ] Slate
- [ ] Metal _____ (Style or Type)

NUMBER OF PLUMBING
Fixtures 11
Rough-in 2

BASEMENT AREA
Unf. 1156
Fin. 0

BALCONY AREA N/A
PORCH BRZWY. AREA
(a) 120
(b) 308

GARAGE TYPE
- [ ] Detached
- [ ] Attached
- [x] Built-in
- [ ] Subterranean
- [ ] Carport _____ (Gable, Shed or Flat)

GARAGE AREA 576

AGE 5 CONDITION Good CLIMATE: Mild [ ] Moderate [ ] Extreme [x] REGION: Western [ ] Central [ ] Eastern [x]

		Factor	Quantity	Cost		Extension
1.	COMPUTE RESIDENCE BASIC COST: (Wall Height Factor X Floor Area X Selected Sq.Ft.Cost)	1.00	2608	80.11	$	208,927.00
	SQUARE FOOT ADJUSTMENTS: Specify type, quality, condition, age, etc.				+ -	
2.	Roofing		2608	.68	-	1,773.00
3.	Subfloor					
4.	Floor Cover		2608	9.80	+	25,558.00
5.	Plaster Interior		2608	4.25	+	11,084.00
6.	Heating/Cooling		2608	2.08	+	5,425.00
7.	Energy Adjustment		2608	1.76	+	4,590.00
8.	Foundation		2608	3.53	+	9,206.00
	LUMP SUM ADJUSTMENTS: Specify type, quality, condition, age, etc.					
9.	Plumbing		1	590		590.00
10.	Fireplaces		1	5,075		5,075.00
11.	Built-in Appliances		6	3,185		3,185.00
12.	Miscellaneous (Dormers)					
13.	SUBTOTAL ADJ. RESIDENCE COST: Line 1 plus or minus Lines 2-12				$	271,867.00
14.	BASEMENT, UNFINISHED	1.00	1156	22.93	+	26,507.00
15.	Add for basement interior finish					
16.	Add for basement outside entrance		1	2,325	+	2,325.00
17.	Add for basement garage: Single [ ] Double [ ]					
18.	PORCH/BREEZEWAY, describe Open Front Porch		120	41.20	+	4,944.00
19.	Rear Wood Deck		308	13.35	+	4,112.00
20.	SUBTOTAL RESIDENCE COST: Total of Lines 13-19				$	309,755.00
21.	GARAGE OR CARPORT - sq. ft. area x selected sq. ft. cost		576	24.02	+	13,836.00
22.	Miscellaneous (roofing adjustment)					
23.	SUBTOTAL GARAGE COST: Line 21 plus or minus Line 22				$	13,836.00
24.	SUBTOTAL OF ALL BUILDING IMPROVEMENTS: Sum of Lines 20 and 23				$	323,591.00
25.	Current Cost Multiplier .99 X Local Multiplier 1.12				X	1.11
26.	TOTAL BUILDING COST NEW: Line 24 x 25				$	359,591.00
27.	Depreciation: Physical and functional Life Exp. 60 Eff. Age 56 Deduction 6.67 % of Line 26					(23,958.00)
28	Economic and/or Excessive Functional Obsolescence					(71,837.00)
29	Depreciated cost of building improvements: Line 26 less Lines 27 and 28					263,391.00
30.	Yard improvements cost: List, total, apply multiplier and depreciate on reverse side				$	34,895.00
31.	Miscellaneous: (Landscaping) If local cost, do not apply any multipliers					
32.	Lot or land value					67,500.00
33.	**TOTAL INDICATED VALUE:** Total of Lines 29-32				$	365,786.00

FORM 1007

See back of page for sketch and computations

STEP 2 –

VALUE THE COST NEW OF THE IMPROVEMENTS USING MARSHALL & SWIFT COST HANDBOOK

	MISCELLANEOUS CALCULATIONS (LUMP Sums-Apply Appropriate Multipliers)	QUANTITY	UNIT COST	LUMP SUM EXTENSION	DEPRECIATION AGE/LIFE %		TOTAL
34.	2,400 Square Foot Driveway	2,400					$6,120.00
35.	Soil Preperation	39,000					$9,360.00
36.	Hydroseeded Lawn	39,000					$5,850.00
37.	Shrubbery	5					$222.50
38.	Trees	2					$1,230.00
39.	2,000 Gallon Septic Tank	1					$3,350.00
40.	Leaching Lines	180					$10,801.00
41.	Backfill Leaching Lines	720					$936.00
42.	Deep Well with 1 1/2 HP Pump	1					$5,200.00
43.	120 Gallon Water Tank	1					$335.00

NOTES AND COMPUTATIONS

Total Cost of Yard Improvements = $33,684.00
$33,684.00 x 1.11 Multiplier = $37,389.00
$37,389.00 x .0667 = $2,494.00 Depreciation
$37,389.00 - $2,494 (Depreciation) = $34,895.00

FORM 1007 1991

* U.S.GPO. 1993-0-756-979-60053

THE COST APPROACH

DWELLING REPRODUCTION COST:

2,608 SQUARE FEET X $100.85
= $263,017

BASEMENT REPRODUCTION COST:

1,156 SQUARE FEET X $ 24.94
= $ 28,832

ITEMIZED LUMP SUM ADJUSTMENTS:

BUILT-IN APPLIANCES, FIREPLACE, DECK,
PORCH AND EXTRA ROUGH-IN PLUMBING FIXTURE = $17,906

BUILT-IN GARAGE REPRODUCTION COST:

576 SQUARE FEET X $24.02
= $ 13,836

SUBTOTAL OF ALL BUILDING IMPROVEMENTS NEW:
$323,591

APPLY CURRENT AND LOCAL COST MULTIPLIERS:

(0.99 CURRENT X 1.12 LOCAL = 1.11) X
1.11

TOTAL ESTIMATED REPRODUCTION COST NEW = $359,186

THE COST APPROACH

LET'S RECAP

- ✓ STEP 1 - VALUE THE SITE ($67,500)
- ✓ STEP 2 - VALUE THE COST NEW OF THE IMPROVEMENTS ($ 359,186)
- ❑ STEP 3 - ESTIMATE THE DEPRECIATION AND SUBTRACT FROM THE COST NEW
- ❑ STEP 4 - ADD DEPRECIATED VALUE OF SITE IMPROVEMENTS TO THE VALUE OF THE LAND TO ARRIVE AT THE OPINION OF VALUE BASED ON THE COST APPROACH

THE COST APPROACH

DEPRECIATION

- PHYSICAL – Attributed to deterioration of improvements due to time and use. This is evidenced by wear and tear, decay, structural defects and damage.
- FUNCTIONAL – Attributed to obsolescence resulting from inadequacies such as inefficient floor plan or technologically dated materials, and to super adequacies that cost more to produce than they contribute to value.
- EXTERNAL - Depreciation attributed to locational and economic obsolescence, which is the result of changes that are external to the property, but impact value nevertheless. Neighborhood transformation, inharmonious land use, adverse zoning changes, general recessionary economy, etc. can negatively impact the market value of real estate.

THE COST APPROACH

PHYSICAL

AGE/LIFE METHOD –

EFFECTIVE AGE / LIFE EXPECTANCY = % OF PHYSICAL DEPRECIATION

THIS METHOD ASSUMES THAT THE LIFE EXPECTANCY OF A STRUCTURE TO BE SIXTY YEARS.

SUMMARY OF THE SUBJECT IMPROVEMENTS:

- ACTUAL AGE = 5 YEARS
- EFFECTIVE AGE = 1-5 YEARS
- APPLIANCES = 5 YEARS OLD
- HEATING/COOLING SYSTEM = 5 YEARS OLD
- ROOF = 5 YEARS OLD
- WOOD DECK/PORCH = 5 YEARS OLD

THE COST APPROACH

PHYSICAL

BASED ON THE PREVIOUS NOTED DATA, AN INSPECTION OF THE SUBJECT, THE OBSERVATION OF THE SUBJECT'S NEIGHBORHOOD AND RESEARCH OF THE MARKET AREA, THE SUBJECT IS ESTIMATED TO HAVE AN EFFECTIVE AGE OF FOUR YEARS.

AGE/LIFE CALCULATION

4 YEARS EFFECTIVE AGE /

60 YEARS OF LIFE EXPECTANCY =

6.67% PHYSICAL DEPRECIATION

THE COST APPROACH

FUNCTIONAL

NO FUNCTIONAL DEPRECIATION IS NOTED

EXTERNAL/LOCATIONAL DEPRECIATION

ACCORDING TO FOUR COMPARABLE SALES SIMILAR TO THE SUBJECT, A MODERATELY TRAVELED ROADWAY APPEARS TO NEGATIVELY IMPACT THE MARKET VALUE OF AN IMPROVED PROPERTY. THE APPRAISER ANALYZED A MATCHED PAIRED ANALYSIS BETWEEN COMPARABLE SALE 1 AND THE REMAINING COMPARABLE SALES 2-4. AFTER ADJUSTING THE SALES PRICES OF COMPARABLE SALES 2-4 AS COMPARED TO COMPARABLE SALE 1, THESE ARE THE DIFFERENCES IN SALES PRICES:

$76,515 (COMPARABLE SALE 2 VS. COMPARABLE SALE 1)
$73,900 (COMPARABLE SALE 3 VS. COMPARABLE SALE 1)
$76,750 (COMPARABLE SALE 4 VS. COMPARABLE SALE 1)

THE COST APPROACH

EXTERNAL/LOCATIONAL

AFTER CONSIDERING THAT ALL SALES ARE WITHIN A REASONABLE PERIOD OF TIME, IT IS APPARENT THAT THE TYPICAL BUYER RECOGNIZES AN ADJUSTMENT OF $75,000 OR APPROXIMATELY 20% OF THE SALES PRICE FOR LOCATION ON A MODERATELY TRAVELED ROADWAY VERSUS A QUIET SUBDIVISION STREET LOCATION.

BASED ON THIS MATCHED PAIRED ANALYSIS OF IMPROVED SALES, EXTERNAL DEPRECIATION CAN BE ESTIMATED AT 20.0%.

THE COST APPROACH

STEP 3 - ESTIMATE THE DEPRECIATION AND SUBTRACT FROM THE COST NEW

TOTAL ESTIMATED REPRODUCTION COST NEW = $359,186

LESS 6.67 % PHYSICAL DEPRECIATION: - $ 23,958

LESS 20.0 % EXTERNAL DEPRECIATION: - $ 67,046

TOTAL AFTER DEPRECIATION = $268,182

THE COST APPROACH

LET'S RECAP

- ✓STEP 1 - VALUE THE SITE ($67,500)
- ✓STEP 2 - VALUE THE COST NEW OF THE IMPROVEMENTS ($ 359,186)
- ✓STEP 3 - ESTIMATE THE DEPRECIATION AND SUBTRACT FROM THE COST NEW
- ❑STEP 4 - ADD DEPRECIATED VALUE OF SITE IMPROVEMENTS TO THE VALUE OF THE LAND TO ARRIVE AT THE OPINION OF VALUE BASED ON THE COST APPROACH

THE COST APPROACH

STEP 4 - ADD DEPRECIATED VALUE OF SITE IMPROVEMENTS TO THE VALUE OF THE LAND TO ARRIVE AT THE OPINION OF VALUE BASED ON THE COST APPROACH

COST NEW AFTER DEPRECIATION	=	$268,182
AS-IS VALUE OF SITE IMPROVEMENTS:	+	$34,895
OPINION OF MARKET VALUE OF SITE:	+	$67,500

INDICATED VALUE BY COST APPROACH: = $370,577

THE COST APPROACH

COMMERCIAL WAREHOUSE EXAMPLE

THE COST APPROACH

THE SUBJECT'S SITE

- LOCATED ON AN INTERIOR/SECONDARY ROADWAY
- MINIMAL TRAFFIC
- ZONING: BG-3 (BUSINESS GENERAL)
- NOT LOCATED IN A FLOOD HAZARD ZONE
- LEVEL RECTANGULAR SITE – 9,050 SF / 50' OF FRONTAGE
- GOOD EXPOSURE AND DRAINAGE
- ALL PUBLIC UTILITIES AVAILABLE
- PARTIALLY ASPHALT PAVED LOT

THE COST APPROACH

THE SUBJECT'S SITE

THE SUBJECT SITE IS ADEQUATE IN SIZE AND SERVICES FOR SIMILAR BUILDINGS AND SITES IN THE AREA. THE SITE IS SITUATED ON A MIXED COMMERCIAL/RESIDENTIAL STREET WITH MINIMAL TRAFFIC VOLUME. AN INSPECTION OF THE SURFACE OF THE SITE REVEALED NO STORAGE OF HAZARDOUS MATERIALS. THE APPRAISER IS NOT QUALIFIED TO DETECT THE PRESENCE OF MATERIALS, WHICH MIGHT BE HAZARDOUS. NO CERTIFICATION REGARDING THE PRESENCE OR ABSENCE OF HAZARDOUS MATERIALS IS MADE BY THE APPRAISER AND IF THE PRESENCE OF SUCH MATERIALS IS FOUND, THE OPINION OF VALUE PROVIDED IN THIS REPORT IS SUBJECT TO CHANGE. THE SUBJECT IS LOCATED IN AN AREA OF MINIMAL FLOODING WITH GRADUAL SLOPING FROM THE STREET AND IS COHESIVE TO ITS SURROUNDED USES OF THE NEIGHBORHOOD.

OPINION OF SITE VALUE BASED ON VACANT LAND SALES ANALYSIS

$72,000

THE COST APPROACH

THE COST APPROACH

THE IMPROVEMENT

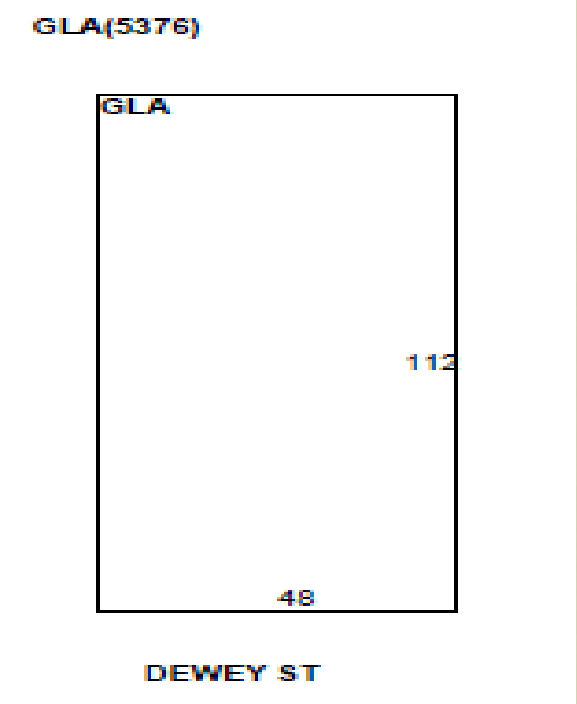
- 1 STORY COMMERCIAL WAREHOUSE STYLE BUILDING
- ACTUAL AGE 1995 / EFFECTIVE AGE 2006
- EXTERIOR
  - FRAME TYPE: METAL FRAME
  - METAL/CONCRETE BLOCK SIDING
  - 2 – OVERHEAD 12‘ DOORS
  - SLIGHTLY PITCHED STEEL FRAMED ROOF / METAL ROOF COVER
  - AVERAGE EXTERIOR QUALITY
  - 16’ WALL HEIGHT
  - AVERAGE OVERALL CONDITION

THE COST APPROACH

THE IMPROVEMENT

- INTERIOR
  - FLOORING – FINISHED CONCRETE, VINYL TILES
  - CEILINGS AND WALLS – STEEL TRUSSES & METAL/DRYWALL
  - FINISHED MEZZANINE AREA / 960 SF
  - AVERAGE INTERIOR QUALITY
  - AVERAGE CONDITION
- MECHANICAL SYSTEMS
  - HEAT/AC - SPACE HEATER / NO CENTRAL AC
  - 200 AMP CIRCUIT BREAKER SERVICE
  - AVERAGE PLUMBING

THE COST APPROACH



THE SKETCH

THE COST APPROACH

HIGHEST AND BEST USE

- AFTER PROPERLY WEIGHING THE FOUR PRINCIPLES OF HIGHEST AND BEST USE, IT IS DETERMINED THAT A COMMERCIAL BUILDING LOT IS THE SUBJECT'S HIGHEST AND BEST USE AS IF VACANT
- AFTER PROPERLY WEIGHING THE FOUR PRINCIPLES OF HIGHEST AND BEST USE, IT IS DETERMINED THAT THE CURRENT USE IS THE SUBJECT'S HIGHEST AND BEST USE AS IMPROVED

THE COST APPROACH

LET'S RECAP

- ✓ STEP 1 - VALUE THE SITE ($72,000)
- ❑ STEP 2 - VALUE THE COST NEW OF THE IMPROVEMENTS
- ❑ STEP 3 - ESTIMATE THE DEPRECIATION AND SUBTRACT FROM THE COST NEW
- ❑ STEP 4 - ADD DEPRECIATED VALUE OF SITE IMPROVEMENTS TO THE VALUE OF THE LAND TO ARRIVE AT THE OPINION OF VALUE BASED ON THE COST APPROACH

WHAT HAVE WE DONE?

THE COST APPROACH

* THE REPLACEMENT COST NEW ESTIMATES ARE AS FOLLOWS:

- BUILDING OCCUPANCY: Commercial Warehouse
- BUILDING CLASS: "S"
- QUALITY: Average
- EXTERIOR WALLS: Metal
- NUMBER OF STORIES: One
- HEIGHT: 16 Feet
- FLOOR AREA: 5,376 square feet
- PERIMETER: 320 linear feet
- EFFECTIVE AGE: 8 years
- REGION: Eastern United States
- CLIMATE: Moderate

"Commercial Warehouse"

13 Dewey Street, Worcester, MA

(Cost Approach to Value Calculations)

*(Average Class "S" Commercial Garage/Storage Warehouse)

Base Square Foot Cost:					$36.29
*HEIGHT AND SIZE REFINEMENTS:					
Local Multiplier……..……		1.1300	(Sec.99,pg.8)		
Current Cost Multiplier……..		1.0300	(Sec.99,pg.3)		
Perimeter Multiplier……		1.0812	(Sec.14,pg.38)		
Story Height Multiplier……..		1.0410	(Sec.14,pg.39)		
COMBINED MULTIPLIER:		1.3100			
*SQUARE FOOT REFINEMENTS:					
Sprinkler System:					$0.00
Elevator(s):					$0.00
Space Heat:				+	$2.05
	(Adj. SF Cost New)				$38.34
	(Combined Multiplier)			x	1.3100
	(Refined Cost New P/SF)				$50.23
*FINAL CALCULATIONS:					
Final Replacement Cost New P/SF:					$50.23
Area of Building / SF:				x	5,376
	(Total Estimated Cost New)				$270,012
*LUMP SUM ADJUSTMENTS:					
Finished Mezzanine Area: (960sf x $20.35=)				+	$19,536
	(Total Replacement Cost New)				$289,548

*LESS DEPRECIATION: (Actual Age=53yrs./1960)

(Physical Depre.=	Physical	Functional	External		
Eff. Age / Econ. Life)	$57,910	0	0	$57,910	(Less Total Depr.)
8 40					
= 20%					

*SUMMARY:				
Depreciated Replacement Cost New:			$231,639	
"As Is" Value of Site Improvements:		+	$5,000	
Est. Site Value: (9,050sf x $10.61psf /.75 adj.)		+	$72,000	(Rounded)
*INDICATED VALUE BY COST APPROACH:			$308,639	
(Rounded to Nearest $1,000)			$309,000	

COST APPROACH – BASE RATES & MULTIPLIERS

S	Excellent	Heavy steel frame, insulated panels, good facade	Plaster or drywall, partitioned, finished ceilings in most areas	Good lighting and plumbing	Package A.C.	885.34	5.88	82.25
	Good	Good steel frame, siding and fenestration	Some good office, interior finish and floor	Good lighting, adequate plumbing	Space heaters	562.31	3.73	52.24
	Average	Rigid steel frame, siding	Small office, average slab	Adequate lighting, low-cost plumbing fixtures	Space heaters	390.63	2.59	36.29
	Low cost	Pre-engineered frame, metal siding	Unfinished utility type, light slab, minimum office	Minimum lighting and plumbing	Space heaters	273.73	1.82	25.43

GARAGES, INDUSTRIALS, LOFTS AND WAREHOUSES

FLOOR AREA – PERIMETER MULTIPLIERS

AVERAGE FLOOR AREA		M.	AVERAGE PERIMETER															M.	AVERAGE FLOOR AREA	
Sq.M.	Sq. Ft.	FT.	30	38	46	53	61	76	91	107	122	137	152	183	213	244	274	305	FT.	Sq. Ft.	Sq. M.
			100	125	150	175	200	250	300	350	400	450	500	600	700	800	900	1000			
93	1,000		1.252	1.360	1.468	1.576	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		1,000	93
139	1,500		1.112	1.182	1.252	1.323	1.395	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		1,500	139
186	2,000		-----	1.095	1.147	1.199	1.252	1.360	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		2,000	186
232	2,500		-----	-----	1.083	1.125	1.168	1.252	1.340	1.430	-----	-----	-----	-----	-----	-----	-----	-----		2,500	232
279	3,000		-----	-----	-----	1.077	1.112	1.182	1.252	1.323	1.395	-----	-----	-----	-----	-----	-----	-----		3,000	279
372	4,000		-----	-----	-----	1.013	1.040	1.094	1.147	1.199	1.252	1.306	-----	-----	-----	-----	-----	-----		4,000	372
465	5,000		-----	-----	-----	-----	.996	1.040	1.083	1.125	1.168	1.210	1.252	-----	-----	-----	-----	-----		5,000	465
557	6,000		-----	-----	-----	-----	-----	1.004	1.040	1.077	1.112	1.147	1.182	1.252	-----	-----	-----	-----		6,000	557

STORY HEIGHT MULTIPLIERS

Multiply the base cost by the following multipliers for any variation in average story height from the base of 14 feet (4.27 meters). For extremely high-pitched roofs (see Section 10), use the height of the eaves plus one-half the height from the eaves to the ridge as the effective height.

In some buildings it is better to compute the total volume and divide by the total square feet of floor area to get an effective height to use.

AVERAGE WALL HEIGHT (M.)	AVERAGE WALL HEIGHT (FT.)	SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULT.	AVERAGE WALL HEIGHT (M.)	AVERAGE WALL HEIGHT (FT.)	SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULT.	AVERAGE WALL HEIGHT (M.)	AVERAGE WALL HEIGHT (FT.)	SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULT.
2.44	8	.885	1.567	7.31	24	1.231	.718	16.76	55	2.075	.528
3.05	10	.921	1.289	7.92	26	1.281	.690	18.29	60	2.225	.519
3.66	12	.960	1.120	8.53	28	1.331	.666	21.33	70	2.530	.506
4.27	14	1.000 (base)	1.000	9.14	30	1.382	.645	24.38	80	2.845	.498
4.88	16	1.041	.911	10.67	35	1.515	.606	27.43	90	3.161	.492
5.49	18	1.086	.844	12.19	40	1.650	.577	30.48	100	3.461	.485
6.10	20	1.133	.794	13.72	45	1.788	.556	33.52	110	3.738	.476
6.71	22	1.181	.752	15.24	50	1.930	.540	36.57	120	3.977	.464

CALCULATOR COST SECTIONS

(Effective Date of Cost Pages)		11 (11/12)	12 (8/14)	13 (5/14)	14 (2/14)	15 (11/13)	16 (8/13)	17 (5/13)	18 (2/13)
EASTERN	A	1.07	1.02	1.02	1.02	1.04	1.04	1.06	1.08
	B	1.08	1.03	1.02	1.04	1.01	1.03	1.05	1.08
	C	1.07	1.01	1.03	1.03	1.05	1.06	1.07	1.06
	D	1.08	1.02	1.02	1.02	1.03	1.05	1.05	1.06
	S	1.07	1.04	1.03	1.03	1.04	1.03	1.03	1.07
CENTRAL	A	1.03	.97	.97	.99	.99	1.00	1.01	1.02
	B	1.03	.98	.98	.99	1.00	.99	.99	1.01
	C	1.03	.98	.99	.99	1.00	.99	1.01	1.03
	D	1.05	.99	.99	1.00	1.02	1.03	1.01	1.04
	S	1.00	.98	.96	.99	.99	.98	1.01	1.01
WESTERN	A	1.03	1.00	1.02	1.04	1.03	1.02	1.03	1.02
	B	1.03	.98	1.03	1.02	1.02	1.03	1.03	1.02
	C	1.03	1.00	1.00	1.03	1.02	1.03	1.02	1.06
	D	1.08	1.00	1.01	1.03	1.01	1.01	1.06	1.05
	S	1.01	.98	1.01	1.01	1.00	1.03	1.03	1.01

LOCAL MULTIPLIERS

CLASS	A	B	C	D	S
MASSACHUSETTS	1.16	1.17	1.17	1.17	1.14
Boston	1.30	1.30	1.31	1.30	1.27
Cape Cod	1.19	1.19	1.20	1.20	1.16
Fall River	1.17	1.17	1.19	1.18	1.15
Holyoke	1.12	1.11	1.14	1.13	1.10
Lawrence	1.19	1.19	1.20	1.20	1.15
Lowell	1.20	1.19	1.20	1.20	1.16
Lynn	1.24	1.23	1.23	1.23	1.20
Methuen	1.20	1.17	1.20	1.22	1.16
Natick	1.22	1.21	1.22	1.24	1.19
New Bedford	1.18	1.19	1.19	1.19	1.16
Pittsfield	1.07	1.07	1.08	1.09	1.06
Springfield	1.16	1.16	1.18	1.16	1.15
Worcester	1.13	1.12	1.13	1.14	1.13

THE COST APPROACH

LET'S RECAP

- ✓ STEP 1 - VALUE THE SITE ($72,000)
- ✓ STEP 2 - VALUE THE COST NEW OF THE IMPROVEMENTS ($ 289,548)
- ❑ STEP 3 - ESTIMATE THE DEPRECIATION AND SUBTRACT FROM THE COST NEW
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THE COST APPROACH

DEPRECIATION

- PHYSICAL – Attributed to deterioration of improvements due to time and use. This is evidenced by wear and tear, decay, structural defects and damage.
- FUNCTIONAL – Attributed to obsolescence resulting from inadequacies such as inefficient floor plan or technologically dated materials, and to super adequacies that cost more to produce than they contribute to value.
- EXTERNAL - Depreciation attributed to locational and economic obsolescence, which is the result of changes that are external to the property, but impact value nevertheless. Neighborhood transformation, inharmonious land use, adverse zoning changes, general recessionary economy, etc. can negatively impact the market value of real estate.

THE COST APPROACH

PHYSICAL

AGE/LIFE METHOD –

EFFECTIVE AGE / LIFE EXPECTANCY = % OF PHYSICAL DEPRECIATION

THIS METHOD ASSUMES THAT THE LIFE EXPECTANCY OF A STRUCTURE TO BE FORTY YEARS.

SUMMARY OF THE SUBJECT IMPROVEMENTS:

- ACTUAL AGE = 19 YEARS
- EFFECTIVE AGE = 8 YEARS
- ALL OTHER BUILDING COMPONENTS ARE = 19 YEARS OLD

THE COST APPROACH

PHYSICAL

BASED ON THE PREVIOUS NOTED DATA, AN INSPECTION OF THE SUBJECT, THE OBSERVATION OF THE SUBJECT'S NEIGHBORHOOD AND RESEARCH OF THE MARKET AREA, THE SUBJECT IS ESTIMATED TO HAVE AN EFFECTIVE AGE OF EIGHT YEARS.

AGE/LIFE CALCULATION

8 YEARS EFFECTIVE AGE /

40 YEARS OF LIFE EXPECTANCY =

20% PHYSICAL DEPRECIATION

THE COST APPROACH

FUNCTIONAL DEPRECIATION

NO FUNCTIONAL DEPRECIATION NOTED

EXTERNAL DEPRECIATION

NO ECONOMIC/LOCATIONAL DEPRECIATION NOTED

THE COST APPROACH

STEP 3 - ESTIMATE THE DEPRECIATION AND SUBTRACT FROM THE COST NEW

TOTAL ESTIMATED REPRODUCTION COST NEW = $289,548

LESS 20 % PHYSICAL DEPRECIATION: - $57,910

LESS 0 % FUNCTIONAL/EXTERNAL DEPRECIATION: - $-0-

TOTAL AFTER DEPRECIATION =$231,639 (ROUNDED)

THE COST APPROACH

LET'S RECAP

- ✓ STEP 1 - VALUE THE SITE ($72,000)
- ✓ STEP 2 - VALUE THE COST NEW OF THE IMPROVEMENTS ($ 289,548)
- ✓ STEP 3 - ESTIMATE THE DEPRECIATION AND SUBTRACT FROM THE COST NEW (-$57,910)
- ❑ STEP 4 - ADD DEPRECIATED VALUE OF SITE IMPROVEMENTS TO THE VALUE OF THE LAND TO ARRIVE AT THE OPINION OF VALUE BASED ON THE COST APPROACH

THE COST APPROACH

STEP 4 - ADD DEPRECIATED VALUE OF SITE IMPROVEMENTS TO THE VALUE OF THE LAND TO ARRIVE AT THE OPINION OF VALUE BASED ON THE COST APPROACH:

COST NEW AFTER DEPRECIATION	=	$231,639
AS-IS VALUE OF SITE IMPROVEMENTS:	+	$ 5,000
OPINION OF MARKET VALUE OF SITE:	+	$72,000

INDICATED VALUE BY COST APPROACH: = $309,000 (ROUNDED)

THANK YOU

Worcester County Assessors Association
SERVING SIXTY CITIES AND TOWNS

John H. Valade, MAA

William B. Mitchell, RMA, MAA