## Department of Local Government Finance

## Cost Approach Problems and Answers with Audio

2024 Level I Tutorials

## Level I - Cost Approach

## Class Problems

For problems 1, 2, and 3, assume the base rate for the lots is $\$ 100$ per front foot.
1.) The standard lot for Neighborhood 1254 is 100 feet by 132 feet. Lot $\# 7$ is 100 feet wide by 175 feet deep. What is the adjusted base rate and the estimated value of the lot?
2.) The standard lot for neighborhood 781 is 100 feet by 150 . Lot $\# 12$ is 125 feet wide by 175 feet deep. What is the adjusted base rate and the estimated value of the lot?
3.) The Standard lot for Neighborhood 832 is 100 feet by 200 feet. Lot $\# 61$ is 100 feet wide by 175 feet deep. What is the adjusted base rate and the estimated value of the lot?

For problems 1, 2, and 3, assume the base rate for the lots is $\$ 100$.
The standard lot for Neighborhood 1254 is 100 feet by 132 feet. Lot $\# 7$ is 100 feet wide by 175 feet deep. What is the 1.) adjusted base rate and the estimated value of the lot?

Look at Table 2-7: The factor for 175 feet on the 132 foot table is 1.12 . Multiply 1.12 by the base rate of $\$ 100$. The new adjusted base rate is now $\$ 112$. Multiply that by the frontage of 100 ( $112 \times 100$ ). The estimated value is $\$ 11,200$.

The standard lot for neighborhood 781 is 100 feet by 150 . Lot $\# 12$ is 125 feet wide by 175 feet deep. What is the adjusted 2.) base rate and the estimated value of the lot?

From Table 2-7: The factor for 175 feet on the 150 foot table is 1.07 . Multiply 1.07 by the base rate of $\$ 100$. The new adjusted base rate is then $\$ 107$. Multiply that by the frontage of 125 feet ( $\$ 107 \times 125$ ). The estimated value is $\$ 13,375$ or $\$ 13,380$ which then rounds to $\$ 13,400$ to the nearest $\$ 100$.

The Standard lot for Neighborhood 832 is 100 feet by 200 feet. Lot $\# 61$ is 100 feet wide by 175 feet deep. What is the 3.) adjusted base rate and the estimated value of the lot?

From Table 2-8: The factor for 175 feet on the 200 foot table is 95 . Multiply .95 by the base rate of $\$ 100$. The new adjusted base rate is $\$ 95$. Multiply that by the frontage of 100 ( $100 \times \$ 95$ ). The estimated value is $\$ 9,500$.

## For problems 4, 5, and 6 use Table 2-11 on Page 57, of Chapter 2

4.) A. 70 acre tract is located in a neighborhood where 1 acre tracts are valued at $\$ 25,000$ per acre. What is the estimated value of this parcel?
5.) A . 94 acre tract is located in a neighborhood where 1 acre tracts are valued at $\$ 55,000$ per acre. What is the estimated value of this parcel?
6.) A. 28 acre tract is located in a neighborhood where 1 acre tracts are valued at $\$ 40,000$ per acre. What is the estimated value of this parcel?
4.) A. 70 acre tract is located in a neighborhood where 1 acre tracts are valued at $\$ 25,000$ per acre. What is the estimated value of this parcel?

Going to Table 2-11, the factor for .70 acres is 1.32. Multiply the factor times the rate per acre and then multiply that answer by the amount of acreage: $1.32 \times \$ 25,000=\$ 33,000 . \$ 33,000$ times $.70=\$ 23,100$. Estimated Value
5.) A . 94 acre tract is located in a neighborhood where 1 acre tracts are valued at $\$ 55,000$ per acre. What is the estimated value of this parcel?

Going to Table 2-11, the factor for .94 acres is 1.06. Multiply the factor times the rate per acre and then multiply that answer by the amount of acreage: $1.06 \times \$ 55,000=\$ 58,300 . \$ 58,300$ times $.94=\$ 54,800$. Estimated Value
6.) A. 28 acre tract is located in a neighborhood where 1 acre tracts are valued at $\$ 40,000$ per acre. What is the estimated value of this parcel?

Going to Table 2-11, the factor for . 28 acres is 1.91. Multiply the factor times the rate per acre and then multiply that answer by the amount of acreage: $1.91 \times \$ 40,000=\$ 76,400 . \$ 76,400$ times $.28=\$ 21,400$. Estimated Value
7.) Commercial/Industrial land that is held for future investment should be classified as what land type?
8.) Fill in the blank: $\qquad$ factors are applied to base rates to account for atypical conditions such as adverse topography, excess frontage, and other conditions.
7.) Commercial/Industrial land that is held for future investment should be classfied as what land type?

Chapter 2, page 62 shows that this should be classified as Usable Undeveloped - Type 13
8.) Fill in the blank: $\qquad$ factors are applied to base rates to account for atypical conditions such as adverse topography, excess frontage, and other conditions.

Influence factors account for atypical conditions such as adverse topography, excess frontage, shape or size, misimprovement, and other influences on the land.

Let's begin by reviewing how to calculate Agricultural land from our Example on slide 76.
For this example there is a 40 acre tract to be valued. 18.22 acres have a soil productivity factor of 0.89. 4.05 acres have a productivity factor of 0.89 .4 .86 acres have a productivity factor of 0.77 and the remaining 12.87 acres have a productivity factor of 1.11. You are to arrive at the Land Value rounded to the nearest $\$ 100$. All of the acres are tillable (Land Type 4). The base rate of farmland for this example is $\$ 1,900$.

Agricultural PRC

| tatic |  | Farm / Classified Land ( + ) | \$71,900 |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| clining |  | Total TTV | \$71,900 |  |  |  |  |  |
|  | $\begin{array}{\|l\|} \hline \text { ASSESSED } \\ \text { VALUE } \end{array}$ | Adj. Res. Land | \$0 |  |  |  |  |  |
| ighted |  | Adj. Res. Imp. (+) | 0 |  |  |  |  |  |
|  |  | Ag. Excess Land (+) | \$0 |  |  |  |  |  |
|  |  | Non-Res. Imp. (+) | 0 |  |  |  |  |  |
|  |  | Farm / Classified Land ( + ) | \$71,900 |  |  |  |  |  |
|  |  | Total Av | \$71.900 |  |  |  |  |  |
|  |  |  | LAND | DATA AND CO | OMPUTATIONS |  |  |  |



For problems 9, 10, and 11, assume a Homesite value of \$10,000, an excess acreage value of \$2,500 per acre and a farmland value of $\$ 1,900$ per acre with a productivity factor of 1.05.
9.) A residential parcel contains 4 acres and is vacant. What is the estimated value of this parcel?
10.) A residential parcel contains 10 acres and has a dwelling. Seven of the acres are being farmed. What is the estimated value of this parcel?
11.) A residential parcel contains 5 acres and has no dwelling. It is being farmed until construction on a new home starts. What is the estimated value of this parcel?

For problems 9, 10, and 11, assume a Homesite value of $\$ 10,000$, an excess acreage value of $\$ 2,500$ per acre and a farmland value of $\$ 1,900$ per acre with a productivity factor of 1.05.
9.) A residential parcel contains 4 acres and is vacant. What is the estimated value of this parcel?

Since this parcel is vacant, you multiply the excess acreage rate of $\$ 2,500$ by the number of acres. ( $\$ 2,500 \times 4$ ). The estimated value of the parcel is \$10,000.
10.)

A residential parcel contains 10 acres and has a dwelling. Seven of the acres are being farmed. What is the estimated value of this parcel?

| A |  |  |  |  |  |  |  | C |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Land Type | Soil ID | Meas Acres | Prod Factor | Base Rate | Adj Rate | Ext Value | Infl Factor | Land Value |
| 4 | RAH 1 | 7 | 1.05 | $\$ 1,900$ | $\$ 1,995$ | $\$ 13,970$ |  |  |
|  |  |  |  |  |  |  |  |  |


| acre for <br> homesite | 1 |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :---: | :---: | :---: | :---: |
| 2 acres excess |  | 2 |  |  | $\$ 10,000$ | $\$ 10,000$ |  |
|  |  |  |  |  |  |  |  |

B TIMES C EQUALS D
A TIMES D EQUALS E
11.)

A residential parcel contains 5 acres, and has no dwelling. It is being farmed until construction on a new home starts. What is the estimated value of this parcel?

| Land Type | Soil ID | Meas Acres | Prod Factor | Base Rate | Adj Rate | Ext Value | Infl Factor | Land Value |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4 | RAH1 | 5 | 1.05 | $\$ 1,900$ | $\$ 1,995$ | $\$ 9,980$ |  | $\$ 9,980$ |
|  |  |  |  |  |  |  |  | $\$ 0$ |


| Homesite |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :---: |
| Excess Acres |  |  |  |  |  |
| GRAND TOTAL |  |  |  |  | $\$ 0$ |

## Level I-Cost Approach

Practice Problem \# 2

## Farm Ground Pricing

You are given the following information: You are valuing a 183 acre tract. There are 7 acres with a productivity factor of 1.04 . 10 acres with productivity factor of .91 .30 acres with a productivity factor of 1.07. 4 acres with a productivity factor of .96 and the remaining 132 acres has a productivity factor of 1.02. You are to arrive at the Land Value rounded to the nearest $\$ 100$. All of the acres are tillable. The base rate of farmland for this problem is $\$ 1,900$.

| Land Type | Soil I.D. | Measured <br> Acres | Productivity <br> Factor | Base Rate | Adjusted Rate | Extended <br> Value | Influence <br> Factor | Land Value |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :--- |

Level I - Cost Approach
Practice Problem \# 2 Answer

Farm Ground Pricing

|  | A | B | C | D | E |  | F |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Land Type | Measured Acres | Productivity Factor | Base Rate | Adjusted Rate | Extended Value | Influence Factor | Land Value |
| 4 | 7.00 | 1.04 | \$1,900 | \$1,976 | \$13,830 |  | \$13,830 |
| 4 | 10.00 | 0.91 | \$1,900 | \$1,729 | \$17,290 |  | \$17,290 |
| 4 | 30.00 | 1.07 | \$1,900 | \$2,033 | \$60,990 |  | \$60,990 |
| 4 | 4.00 | 0.96 | \$1,900 | \$1,824 | \$7,300 |  | \$7,300 |
| 4 | 132.00 | 1.02 | \$1,900 | \$1,938 | \$255,820 |  | \$255,820 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Supplemental Card |  |  |  |  | Supplemental Card |  |  |
| Measured Acreage | 183.00 |  |  |  | LAND VALUE |  | \$355,200 |

F IS ROUNDED TO THE NEAREST
\$10.00
B TIMES C EQUALS D
A TIMES D EQUALS E

Section 10


NW1/4 NE1/4 SE1/4 OF SECTION 10 READ DESCRIPTION FROM RIGHT TO LEFT ALL 4 QUARTERS EQUALS 640 ACRES
1.) HOW MANY ACRES IN THE ABOVE DESCRIPTION?
2.) HOW MANY SQ. FT. IN THE ABOVE DESCRIPTION?



NW1/4 NE1/4 SE1/4 OF SECTION 10 READ DESCRIPTION FROM RIGHT TO LEFT

ALL 4 QUARTERS EQUALS 640 ACRES
1.) HOW MANY ACRES IN THE ABOVE DESCRIPTION?
2.) HOW MANY SQ. FT. IN THE ABOVE DESCRIPTION?


NW 1/4 NE 1/4 SE 1/4
1.) 10 Acres
2.) 435,600 Square Feet

## For depth table calculations

## Chapter 2

| First | Determine what the standard depth is. |
| :--- | :--- |
| Second | Find that table |
| Third | Find the factor in that table that relates to the depth of the lot you are pricing |
| Fourth | Take that factor and multiply it times the front foot price that is given to you |
| Fifth | This gives you the adjusted rate |
| Sixth | Take this times the front foot of the lot you are pricing |
| Seventh | This gives you the price of the lot |

Example:
Standard lot size is $125 \times 132$
Lot we are pricing is $125 \times 150$
Front foot price is $\$ 150$
Adjusted front foot price is
Lot value is

For depth table calculations
Chapter 2

| First | Determine what the standard depth is. | 132' |
| :--- | :--- | :--- |
| Second | Find that table <br> Find the factor in that table that relates to the <br> depth of the lot you are pricing <br> Take that factor and multiply it times the front foot <br> price that is given to you <br> This gives you the adjusted rate <br> Third | Take this times the front foot of the lot you are <br> pricing <br> This gives you the price <br> of the lot |

Example:
Standard lot size is $125 \times 132$
Lot we are pricing is $125 \times 150$
Front foot price is $\$ 150$
Adjusted front foot price
is
\$159
Lot value is $\quad \$ 19,875$

Cost Approach
Practice Problem \# 6 House \# 1
Additional Square Foot Calculation Problems


|  | Sq. Feet | Value |
| :--- | ---: | ---: |
| 1 sFr |  |  |
| B |  |  |
| FrG |  |  |
| OFP |  |  |
| Wddk |  |  |
|  |  |  |
|  |  |  |
| TOTAL |  | $\$ 0$ |

Cost Approach
Practice Problem \# 6 House \# 1 Answer
Additional Square Foot Calculation Problems


|  | Sq. Feet | Value |
| :--- | ---: | ---: |
| 1sFr | 1,480 | $\$ 100,900$ |
| B | 1,480 | $\$ 33,900$ |
| FrG | 884 | $\$ 25,000$ |
| OFP | 110 | $\$ 4,900$ |
| WddK | 240 | $\$ 4,200$ |
|  |  |  |
|  |  |  |
| TOTAL |  | $\$ 168,900$ |


| $30 \times 42=1,260+10 \times 22=220$ for total first story c | 1480 |
| :--- | :--- |
| same for basement | 1480 |
| $24 \times 24=576$ |  |
| $14 \times 22=308$ for a total square footage of | 884 |
| $5 \times 22=110$ for a total square footage of | 110 |
| $8 \times 30=240$ for a total square footage of | 240 |

Practice Problem \# 6 House \# 2
Additional Square Foot Calculation Problems


|  | Sq. Feet | Value |
| :--- | ---: | ---: |
| 1 sFr |  |  |
| B |  |  |
| FrG |  |  |
| Conc $P$ |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| TOTAL |  | $\$ 0$ |

Practice Problem \# 6 House \# 2 Answer Additional Square Foot Calculation Problems


|  | Sq. Feet | Value |
| :--- | ---: | ---: |
| 1sFr | 1,576 | $\$ 105,100$ |
| B | 1,288 | $\$ 31,500$ |
| FrG | 624 | $\$ 18,600$ |
| Conc P | 352 | $\$ 1,900$ |
|  |  |  |
|  |  |  |
|  |  |  |
| TOTAL |  | $\$ 157,100$ |

```
46 < 28=1,288+
24 X 12 = 288 for a total square footage of 1,576
46\times28=1,288 (For the Basement)
24\times26=624
16\times22=352
```


## Level I - Cost Approach <br> Dwelling/Yard Structures

1.) You are assessing a basement of 1,500 square feet. Of the total, 850 square feet is finished space. What amount would you put on the property record card to reflect the assessment for the basement?
2.) A 1,400 square foot one-story frame house has two increments of brick on the front. What base price would you put on the property record card for the home?
3.) A brick home has 2,500 square feet on the first floor and 1,750 square feet on the second floor. You also have an unfinished basement of 2,500 square feet. What base prices would you record on the property record card for each floor? What would be the subtotal for the base prices?
4.) On January 1, a dwelling is not complete. When you do your field work, you discover that the house is complete to the point where the owners are ready to install the plumbing fixtures, floor coverings and light fixtures. You have calculated a remainder value for this home of $\$ 195,700$. Since it is not finished, what value would you place on the property record card for this home?
1.) 1500 square foot basement. 850 square feet is finished. price for 1500 square foot basement unfinished PLUS \$34,200
price for 850 square feet of finish in basement \$26,100
Appendix C, Schedule A
2.) 1400 square foot one story frame house with two
\$97,900 increments of brick.
Value for increment and home
Chapter 3, page26 for brick increment explanation
Appendix C, page 2 for value
3.) Brick two story home

2500 square feet on first floor
\$163,300
1750 square feet on second floor
\$69,900
2500 square feet unfinished basement \$49,000
Appendix C, Schedule A
4.) Ready to install plumbing fixtures

RCN of home \$195,700
percent complete Appendix C, Schedule A. 1 83\% \$162,431
Round
5.) A home has a basement recreation room that has flooring and ceiling finish. It occupies 968 square feet. What value will you put on the property record card for the basement recreation room?
6.) Using the square footage from problem 3 above, how much would you add on the property record card for air conditioning?
7.) A house has 2 full baths and 2 half baths. How much will you show on the property record card for plumbing?
8.) The house in problem 3 has an attached brick garage that is 20 feet $X 22$ feet. What amount will you show on the property record card for this garage?
\# 5.) Basement Rec Room with ceiling \& floor finish968 square feetRec Room Value$\$ 4,700$
This is a Rec Room 1--Chapter 3, Page 28-Table 3-11\# 6.) Add for $A / C$ based on Problem 3 square footage2500 square feet on first floor\$5,400
1750 square feet on second floor ..... \$2,700Total A/C\$8,100
Appendix C, Schedule C, Page 6
\# 7.) What needs to be added for plumbing for house in \#3?
2 full baths 3 fixtures in each one $=$
6 Base Price Includes 1 Full bath, Kitchen Sink \& Water Heater
2 half bath 2 fixtures in each one=
1 kitchen sink 1 fixture allowed
1 water heater 1 fixture allowed
Less number allowed in pricing in App C
Number of fixtures to add for
Price to add from App C, Schedule D, page 7


So you know you have:
3 Fixtures $=$
2 Half Baths Extra
2 Fixtures =
12 Number of fixtures to add for
\$5,600
\$8,100

Total value to add 7 fixtures $\mathrm{X} \$ 800$
\# 8.) Attached Brick Garage for House in \# 3
20 by 22
440 square feet
Value to add for Garage From App C, Sch. E.2, page 7
9.) The house in problem 3 also has a brick patio that contains 650 square feet, an open masonry porch of 348 square feet and a stoop of 80 square feet. What amount will you show on the property record card?
10.) A quality grade factor of $B-1$ is what percent?
11.) You are trying to determine the value of a detached frame garage that measures 30 feet by 50 feet. It is a Grade $C-1$. What is the base rate for the garage? It is in Elkhart County. What is the adjusted base rate?
12.) A dwelling is 12 years old, has a Quality Grade of $\mathrm{C}+2$, and is in Average condition. What is the depreciation percentage for this dwelling? If the dwelling has an RCN of \$210,500, what is its Remainder Value? Round your answer to the nearest \$10.
\# 9.) House in problem has exterior features: BrP 650 sq ft , OMP $348 \mathrm{sq} \mathrm{ft}, \& \mathrm{MStp} 80 \mathrm{sq} \mathrm{ft}$ Brick Patio 650 square feet - Schedule only goes to 400 sq ft

Brick Patio: $\quad 650$ sq ft -400 sq ft $=250$ sq ft left

$$
250 \text { is rounded to nearest } 100=300
$$

$$
\text { Per } 100 \text { add } \$ 1,200=3 \times \$ 1,200
$$

Total Brick Patio
Open Masonry Porch 348 square feet
Stoop, 80 square feet
All values come from App C, Sch E.2, page 9
\# 10.) Quality grade factor of $B-1$ is what percent? App C, Schedule F, page 9 at the bottom
\# 11.) Detached Frame Garage
30 by 50
Grade C-1
Base Rate -?
Elkhart

| 1500 square feet$\$ 22.81$ <br> $95 \%$ |  |
| :--- | ---: |
|  | $\$ 21.67$ |
| L/M $=.92$ | $92.00 \%$ |

Adjusted base rate - ?
App C, Schedule G.1, Page 10
\# 12.) A dwelling is 12 years old, has a Quality Grade of $C+2$, and is in Average condition
Appendix B, C Grade Chart, page 11
Dwelling has an RCN of
\$210,500
Deprciation \%
11\%
Depreciation \$ Amount
\$23,155
Remainder Value (Rounded to nearest \$10)

## Level I - Cost Approach

## Practice Problem \# 1

You are valuing a detached garage. The following information is given to you. What total improvement value will you provide?

```
Detached Frame Garage 600 square feet
Grade C-1
Location Multiplier Wells County 0.93
Neighborhood Factor 0.93
Age 69 Years
Condition Fair
```

Detached Frame Garage ..... 600 square feet
GradeC-1
Location Multiplier Wells County ..... 0.93
Neighborhood Factor ..... 0.93
Age69 Years
Condition ..... Fair

## Calculate Base Rate

| Det. Garage Base Price (Schedule G.1) $=$ | $\mathbf{\$ 3 1 . 4 8}$ |
| :--- | :--- |
| C-1 Quality Grade Factor | x $95 \%$ |
| BASE RATE | $\mathbf{\$ 2 9 . 9 1}$ |


| SUMMARY OF NON-RESIDENTIALIMPROVEMENTS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ID | Use | Storv Het. | Const. Tvise | Grade | $\begin{array}{\|l\|l\|} \hline \text { Year } \\ \text { Const. } \end{array}$ | $\begin{array}{\|c} \hline \text { Eff } \\ \text { Age } \end{array}$ | Cond. | Base Rate | Features | L/M | Adj. Rate | Size or Area | $\begin{array}{\|c} \text { Replacement } \\ \text { Cost } \\ \hline \end{array}$ | Total Depr. | Remainder Value | $\begin{array}{\|c\|} \hline \% \\ \text { Comp } \\ \hline \end{array}$ | Nhbd Factor | Improvement Value |
| 01 | Det Gar | 1.0 | Fr | C-1 |  | 69 | Fair | \$29.91 |  | 0.93 | \$27.81 | 600 | \$16,690 | 47\% | \$8,850 |  | 0.93 | \$8,200 |

This house is in Pulaski County. It is a frame house that is 100 years old. It is in good condition with a B-1 Grade. The neighborhood factor is 1.01 . The house contains 1,173 square feet and has one bath. It has central air. There is an open frame porch of 149 square feet. There is a detached concrete block garage that measures 22 feet by 20 feet. It is 32 years old and is a grade C+1 in average condition.

What is the total improvement value?


This brick 2 story home is located in Vermillion County. It is 29 years old. It is in average condition and graded a C. The neighborhood factor is 1.03 . The house contains 2,329 square feet on the first floor and 1,209 square feet in the full upper story. There is a finished basement of 1,925 square feet. The home also has an open frame porch of 312 square feet, a brick patio of 466 square feet, and a wood deck of 594 square feet. The house has four full baths and central air conditioning throughout. There is one masonry fireplace with one opening. There is also an attached brick garage that is 24 by 24 . There is also a detached brick garage that measures 20 feet by 30 feet. It was just built and is in good condition with a grade of B-1.

What is the total improvement value?


## Level I Cost Approach

- This concludes the cost approach tutorial and is a reminder that should you have questions you can email these questions to the Department.
- Please send emails to Level1@dlgf.in.gov

