

### **Department of Local Government Finance**

# Cost Approach Problem and Answer Packet

2025 Level II Tutorials



• A commercial building contains a total of 5,200 square feet. Of this total, 3,900 square feet of the area has a wall height of 16 feet. The remaining 1,300 square feet of the area has a wall height of 14 feet. What is the average wall height for this structure?





- 3,900 divided by 5,200 = 75%
- 1,300 divided by 5,200 = 25%
- 16' x .75 = 12'
- 14' x .25 = 3.5'
- 12'+ 3.5' = 15.5' rounded to 16 ft.





• A commercial building measures 200 feet by 500 feet. What is the PAR of this structure?





- 200 + 200 + 500 + 500 = 1,400 (perimeter)
- 200 x 500 = 100,000
- 1,400 divided by 100,000 = .014
- 0.014 x 100 = 1.4 or a PAR of 1





- A structure has 2,500 square feet of area of which 1,500 square feet is general office and 1,000 square feet is utility storage area. The walls of the structure are Type 1. The building measures 100 feet by 25 feet.
- Figure the adjusted base rate for this structure using the GCM schedule.





- Step 1 Figure the PAR
  - 100 + 100 + 25 + 25 = 250
  - 100 x 25 = 2,500
  - 250 divided by 2,500 = 0.10 x 100 = 10





- Step 2 Percentage of each use
  - 1,500 divided by 2,500 = 60% (General Office)
  - 1,000 divided by 2,500 = 40% (Utility Storage)





- Step 3 Go to appropriate Schedule in Appendix G and select the correct base rates.
  - General office \$162.57
  - Utility storage \$ 96.63





- Step 4 Figure adjusted rates for each use.
  - $$162.57 \times .60 = $97.54$
  - \$ 96.63 x .40 = \$38.65





- Figure new adjusted base rate by adding the individual rates together.
  - \$97.54 + \$38.65 = \$136.19





- A fire-resistant building with exterior walls of brick measures 100' x 180'. Twenty-five percent of the building is used as industrial office space, and the remainder of the building is used as light warehousing. The office space has a wall height of 12 feet and the warehouse space has a wall height of 18 feet.
- What is the average wall height?
- What is the adjusted base rate?





- Area: 100 x 180 = 18,000 sq. ft
- Perimeter: 100+100+180+180 = 560 linear feet
- 560/18,000 = .03 x 100 = PAR 3
- 12' x 25% = 3'
- 18' x 75% = 13.50'



- 3' + 13.50' = 16.5' rounded to 17' so the average wall height is 17 feet.
- Since the office walls are 12 feet, you need to make a positive 5-foot adjustment on it.
- Since the warehouse walls are 18 feet, you need to make a negative 1-foot adjustment on it.





- Industrial Office: base rate is \$103.13, adjustment is 5' x \$2.02 for a total of \$113.23.
- Light Warehouse: base rate is \$64.88, minus adjustment of 1' x \$1.14 for a total of \$63.74.





- \$113.23 x 25% = \$28.31
- \$63.74 x 75% = \$47.81
- \$28.31 + \$47.81 = adjusted rate of \$76.12 for the building.





When you are using an average wall height, you must take into ulletconsideration the original wall heights of each part of the building and make wall height adjustments as necessary to the base rate.





 A structure has 3,000 square feet of area, of which 1,800 square feet is fire resistant. The remainder of the building is constructed with fireproof steel. The PAR is 8. The exterior walls are Type 1. The building is used as a bank. What is the amount of adjustment, per square foot, necessary to account for the fireproof steel framing?





- 1,200 square feet / 3,000 square feet = 40%
- Fireproof steel frame adjustment: \$14.11 x 40% = \$5.64





- A parking lot of 20,000 square feet is paved with 2 inches of asphalt over an 8-inch base. It is located in Greene County and is in average condition with a quality grade of C-1.
- It has 200 linear feet of metal guardrail on one side, which is also in average condition, with a quality grade of C. Both were installed in 1993.
- What is the total true tax improvement value?





- Since the square footage of the parking lot is 20,000, the base rate is \$2.57, and then you add \$0.40 for the 3" of base, so you start with a rate of \$2.97. However, the lot is a C-1 grade, so you need to account for that.
- \$2.97 x 0.95 = \$2.82 for our base rate.
- Now you need to account for the location multiplier, 0.91, so
  \$2.82 x 0.91 = \$2.57 (our adjusted rate)





- You take  $2.57 \times 20,000 = 51,400$  for the replacement cost.
- Next is the depreciation. The lot is 32 years old and in average  $\bullet$ condition, so the depreciation percentage is 80%.
- $$51,400 \times .80 = $41,120 \text{ and } $51,400 $41,120 = $10,280$ remainder value
- Or \$51,400 x .20 = \$10,280 remainder value



- Taking the remainder value to the nearest \$100, our asphalt has a true tax value of \$10,300.
- The guardrail has a base rate of \$23.76, and since it is a C grade, you do not have to make any grade adjustment.
- You do need to make the adjustment for the location. Taking the 0.91 x \$23.76, gives you an adjusted rate of \$21.62.
- Then just take the 200 linear feet x \$21.62 = \$4,320.





- Looking up the depreciation for the guard rail, it is also 80%, so \$4,320 x .80 and subtracting (or .20 and not subtracting, whichever is easier for you) gives us a remainder value for the guard rail of \$860, rounded to \$900 for the true tax value.
- Adding our paving to the guardrail amount, you should have a total true tax improvement value of \$11,200.



Walls	Roofing		IS																					
Brick	Built - up	Level II Cost Approach										Cir	<u>cle One</u> -	$\rightarrow$	1 or A			2 or B	3 or C			4 or D		
Stone	Metal	ł	-			PPIO	acri					Pricing	key						_					
Erame or Metal	Shindle	Class Brohlom # 6										S. F. Area	<u>Porimete</u>	r					-					
C.B. or Tile	Grinigio	4		Class Problem # 6																				
	Insulation	1								of Units						1								
		Greene County ICM - 91%										Average	unitsizo											
Framing B											Floor Line Line Date Line Date Line Date										11	Data		
Wood loist	<u> </u>	1	c. +	_	*		+	_				Bacom	ont		Hgt.	Kale	Hgt.	Кате	ngı.	Rate		Hgt.	Rate	
Fire Resistant		Paving 20,000 sq	I. ft. \$2.5	-/+	\$.40 for 3 " b	ase =	\$2.97					1c+	CITC											
Fire Proof Steel					40.00 I		~ ~ ~					2nd							-					
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Tile or Carpet		└─└─┤Guard Rail = \$23.76 X 91% = \$21.62 X 200 = \$4,320, round to nea									st	Wall Hgi	nt. Adj.	±			_		-					
Finish Type B											Base Pri	ce												
Unfinished                       \$10 = \$4,320 X .20 = \$860 rounded to the nearest \$100 = \$900.											B. P. A. %	Ď												
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Finished Open		ł		Unit Fini	sh																			
Finished Divided		4										Interior:							-					
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Office		4										Lighting	vvalis											
Apartment		1												Heating/Air Cond.					1					
		1										Sprinkle	r											
Vacant or Aband.		1																						
Heating & Air Condi	tioning	4								S. F. Price														
No Heating		4																						
Central Warm Air	++++	4								Dlumbing								-						
Hot Water or Steam		1		Prumping																				
Unit Heating		Actual Age			32							Special F	eatures											
		Eff age 32										Exterior Features												
Central Air		Life Expectancy			10							TOTAL BA	ASE											
Package or Unit Air												Location Multiplier												
Sprinkler		1										Grade Fa	ctor											
Plumbing Fixtures	# TF	1										Replacement Cost												
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Half Bath		ł																						
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Extra Fixtures		4																						
Other Fixtures	0	SPECIAL FEATU	JRES									SUMMA	ARY OF IM	IPRO	VEME	NTS								
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semi-circular 36"	+ $-$	4	∣ ⊦	22	Guara Rail		IVITI		1993		AV	\$23.76		91%	\$21.	02	200	\$4,320	80%	586U			\$900	
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4' long, 4 man		1		05														1	1					
8' lone, 8 man				06															1					
Shower-Column				07																				
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Semi-circular, 3 per			+	<u>19</u>						$\vdash$									+		$\vdash$			
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Corner, 2 per				14																				
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Gang Shower Heads		4	I F	16																				
Drinking Fountains			<b>├</b>	17																				
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### **Class Problem #7**

- This is a fast-food restaurant built on a slab in Carroll County in 2005. It contains 1,902 square feet and has a perimeter of 202 linear feet. It also has a commercial heating/air conditioning package that heats and cools the entire 1,902 square feet. It is a quality grade of C and is in average condition. The exterior walls are brick.
- There is 18,000 square feet of asphalt paving on a 2" over 8" base. It was put down at the same time as the construction date of the building. It is a quality grade of C +1 and is in average condition.
- What is the total improvement value of this property?



Walls		K00	fing			IM	PROVEMEN	DAT	AAN	ID CC	DMPUT	AII	ONS	C			1		2 a # D	-	2			1 a # D
Stone		Built	- up	4		Le	vel II Cost	Appro	oach	1				Driging V	<u>cie One</u> -	->			∠ or B		3 or C		2	+ or D
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Frame or Metal	-	Shin	gle	i Cla	ass Pro	oble	em # 7 Ans	wer (	Back	k of	PRC)			Effective	Perimeter	r	1,902							
C.B. or Tile			5						-		-			P. A. R.		•								
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Finished Open	_	$\vdash$	++	4										Unit Fini	sn					-				
	B			4										Interior I	Finish									
Store		П		1										Div /Pin	Walls					+				
Office														Lighting	w ans									
Apartment		ГŤ		1										Heating/	Air Cond.					1				
				1										Sprinkler										
Vacant or Aband.														-										
Heating & Air C	onc	litioi	ning	4										S. F. Pric	e		<u>\$199.5</u>	2						
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Hot Water or Steam	_	++	++	4										Plumbing	<u>y</u>					-				
Unit Heating		$\vdash$	++	4										Special F	Features					+				
Control Air	-	++	++	Actual Age	20									TOTAT	RASE		\$270.40	20		+				
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Other Fixtures				SPECIAL FEA	TURES									SUMMA	RYOFI	MPR	OVEMEN	TS						
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Circular 36"						Ш	Use	Height	Type	Grade	Const.	Age	Cond.	Base Rate	гeatures	L/M	Aaj. Kate	Size or Area	Cost	Depr.	Value	Depr.	Irue	e rax value
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Corner, 2 per						14																		
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Drinking Fountains	s					17																		
Refrigerated Water Coolers	;			4		18		L					L											
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Emergency Shower/eye Wash	+			4															Total True Ta	ix Impro	ovement Val	ue	Ş1	33,400
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# Practice Problem #1

- The Walgreen company owns and operates a drug store which was constructed in LaGrange County. The building has 15,400 square feet with a perimeter of 450 feet. The drug store was built in 2013. The building is fire resistant construction and is wall type #1. The interior finish meets the criteria of the GCM General Retail model. There are a total of five commercial plumbing fixtures in the building. The building is totally sprinkled and has an average quality attached commercial canopy of 900 square feet. It has been determined the building is in average condition and is classified as a C+1 quality grade. The drug store is frame constructed.
- There is a 28,000 square feet asphalt paved parking area surrounding the building. It was constructed when the building was built and the asphalt is 2" on 5" base. The asphalt paving is C quality grade and is in average condition.
- What is the total true tax value of the improvements?



Walls	Roofing			IMP	ROVEMENT	DATA	AN	D COI	MPU	TAT	IONS							-				
Brick	Built - up				A tost II Cost A	nnro	ach					Cu	<u>cle One</u>	$\rightarrow$	l or A	A .	2 or B	_	3 or C		4	4 or D
Stone	Metal	4		LCV		PPIO	ucii					Pricing K	ley		GCM Gen R	etail		<u> </u>				
Concrete	Slate / Tile	Pract	ice Pro	obl	em #1 (Wa	lgree	n's E	)rug	Sto	re)		S. F. Are	<u>a</u>		15,400	)						
C R or Tilo	Shingle	-				.9.00				,		Effective	Perimete	r	430			-				
C.B. Of The	Inculation	4										P. A. K.	ofImita		<u> </u>			-				
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Eroming P		-										<u>Average</u>	unit size		II at Do	to II-+	Data	Hat	Data		Hat	Data
Wood Joint		HPlumbing - \$1,600 x 5 = \$8,000											- ent		Hgt. Ka	le Hgt	Kate	пgı.	Rate	;	Hgt.	Kate
Wood Joist		0 , ,											ent		C 0 1	20	-	-				
Fire Resistant															201	.89		-				
Reinf Concrete																		-				
Flooring P																		-				
Concrete	1111											401										
Wood												Frame A	di E	+1								
Tile or Carnet						-						Wall Ho	at Adi	<u>+</u> 1								
Finish Type B		Canopy - Ş2	28.06 :	x 90	)0 = \$25,25	0						Base Price	<u>n. Auj. j</u>		\$81.80	a 👘						
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Semifinished		1										Sub-tota	1		\$81.80	à		1				
Finished Open	++++	1										Unit Fini	sh			<u> </u>		1				
Finished Divided		1											~ • •		1			1				
Use B		1										Interior F	Finish		1			1				
Store		1										Div./Pin	Walls		1			1				
Office		1										Lighting			1			1				
Apartment		1										Heating/	Air Cond		1							
												Sprinkler			\$3.53							
Vacant or Aband.		1																				
Heating & Air Con	nditioning	1										S. F. Pric	e		\$85.42	2						
No Heating		1										Area			15,400	)						
Central WarmAir												Subtota	ıl		\$1,315,4	70						
Hot Water or Steam												Plumbing	<u>y</u>		\$8,000	)						
Unit Heating												Special F	eatures		\$25.25	0						
												Exterior I	Features									
Central Air												TOTAL	BASE		\$1,348,7	20						
Package or Unit Air												Location	Multiplic	er	94%							
Sprinkler		Actua	l age		12							Grade Fa	ctor		105%							
Diversion of Firsternes	<i>#</i> <b>TE</b>											D 1	Cart		¢1 221 1	00						
Plumbing Fixtures	# 1 <b>F</b>												nent Cost		\$1,331,1	90						
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Extra Fixtures	TOTAL	4																				
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Other Fixtures		SPECIAL FEA	I URES		1	<u>C</u> (			V	T.C.		SUMM	AKYOF	UVIPI	KUVEMEN	115	D 1	N.	n : 1			
wasn Fountain G/	<u>r es ss</u>	Description	Value	ID	Use	Storv	Const.	Grade	Year	Eff	Cond.	Base Rate	Features	L/M	Adj. Rate	Size or Area	Replacement	Norm.	Remainder	Obsol	True	e Tax Value
Circular 36"	+ +	4		F		Height	Type		Const.	Age					,		Cost	Depr.	value	Depr.	-	
Circular 54"				01	GCM Gen Retail	1	Fr	C+1	2013		Av						\$1,331,190	14%	\$1,144,820		\$1	,144,800
Semi-circular 36"				02																		
semi-circular 54"		1		03	Paving	2"/5"	Asph	С	2013		Av	<u>\$2</u> .57		94%	\$2.42	28000	\$67.760	80%	\$13,550		5	513,600
Industrial Gang S	Sinks			04				~														
4' long, 4 man				05																		
8' lone, 8 man				06																		
Shower-Column		<u> </u>		07																		
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semi-circular, 3 per				09																		
Corner, 2 per				10																		
Shower Multi-Sta	all			11																		
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Corner, 2 per		]		14																		
	No. Fixtures			15																		
Gang Shower Heads		4		16			L											L				
Drinking Fountains				17			L										1	<u> </u>				
Refrigerated Water Coolers		4		18			ļ					L					1	<u> </u>				
with Hot & Cold Water				Dat	a Collector / I	Jate					Appr	aiser / Da	ite					_			<b>.</b>	
Emergency Shower/eye Wash		4		1														x Impro	Ş1,	158,400		
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