

TRINITY CONTAINERS

Worden, Heather

From: Fracassi, Paul
Sent: Thursday, May 31, 2018 11:29 AM
To: Worden, Heather; nick.lee
Subject: Fwd: Trinity Containers - 2018 Cass County BOE Hearing Support and Evidence
Attachments: TRIN ND PT 2018 Cass-593 420 E Main Ave, West Fargo (Cass) RE 02-3920-00....pdf; TRIN ND PT 2018 Cass-593 420 E Main Ave, West Fargo (Cass) RE Marshall &....pdf; TRIN ND PT 2018 Cass-593 420 E Main Ave, West Fargo (Cass) RE 02-0080-00....pdf; TRIN ND PT 2018 Cass-593 420 E Main Ave, West Fargo (Cass) RE 02-0080-00....pdf; TRIN ND PT 2018 Cass-593 420 E Main Ave, West Fargo (Cass) RE 02-0080-00....pdf; TRIN ND PT 2018 Cass-593 420 E Main Ave, West Fargo (Cass) RE 02-3920-00....pdf; TRIN ND PT 2018 Cass-593 420 E Main Ave, West Fargo (Cass) RE 02-0097-00....pdf

Hi,

Attached is the information Trinity Containers is submitting for the board on Monday.

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From: Grider, Brett <Brett.Grider@ryan.com>
Sent: Thursday, May 31, 2018 11:04:41 AM
To: Fracassi, Paul
Subject: Trinity Containers - 2018 Cass County BOE Hearing Support and Evidence

Good Morning Paul,

Thank you again for taking the time to explain the hearing process and briefly go over the current valuation issue for Trinity Containers. Attached are the various work-ups associated with the accounts in questions for your review and submittal.

After discussing the property with Nick Lee at the West Fargo Assessor's Office I made some adjustments which ended up putting the opinion of value right around the initial assessment before adjusting for uniformity in land values and inclusion of external/functional obsolescence. It is our belief that if the current assessments were to be adjusted to include additional obsolescence on the various building improvements that have been vacant for the last few years as well as adjust the various land parcels to the \$/sq.ft. of the largest parcel (02-0097-00010-000) we could close the book on 2018.

Trinity recently shut down a number of facilities across the country due to various economic factors that saw no short-term relief. A number of these specialty facilities have been placed on the open market with little to no willing buyers. They are currently in talks to potentially list this property for roughly \$5-\$6MM.

I know that this is quite a bit of information to process, but please feel free to contact me if you wish to discuss further.

Thank you,

Brett Grider
Senior Consultant, Property Tax Complex
Property Tax - Parent
Ryan
Three Galleria Tower
13155 Noel Road
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Dallas, Texas 75240

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**Reasons for Requested Valuation Change to the Cass County
Board of Equalization for Review of Real Estate Valuation Determination**

**Subject Property: 420 E. Main – West Fargo, ND (Land Accounts)
Account #: 02-02-3920-00020-000 & 02-0080-00030-000**

Thank you for your consideration in this matter.

The real estate land and improvement values at the above referenced address are currently being valued by the West Fargo City Assessor above the true fair market value of Trinity Industries closed special use facility. We believe that the 2018 assessment would be correct and a true representation of the market if additional obsolescence were included to reflect the external factors effecting the real estate. We are requesting that the county consider that external and functional obsolescence are both present at this facility and an additional adjustment of 30% (15% functional and 15% external) be included in the West Fargo City assessments.

Also, we also request that the price per square foot of land be adjusted to reflect the same price per square foot cost of the large land account 02-0097-00010-000. We do agree that land values have risen since the previous re-assessment period, and an increase is warranted, we believe the various parcels of land owned by Trinity Industries should be uniformly valued at the same \$/sq.ft.. The largest parcel of land is currently being assessed at \$0.74 per square foot. We would like for the County to take into consideration that if Trinity Industries were to sell the property today they would sell the land as a whole unit under which the purchase would encompass a single \$/sq.ft. rather than splitting the sale by parcel as the city assessor is indicating.

We accept that \$0.74 per square foot should be applied to each parcel to reflect the West Fargo City assessment of the substantially larger parcel 02-0097-0010-000. Please see our opinion of value for each land account in the value summaries provided using the uniform square foot cost of \$0.74 a square foot.

Below is a summary of the total value that has been proposed by the Henry County Assessor for this account as well as our recommended opinion of fair market value based on the uniform square foot cost of \$0.74 a square foot.

Account #	2018 Henry County Real Estate Value	Ryan Recommended 2018 Fair Market Value
02-3920-00020-000	\$ 11,405,000	\$ 9,020,028
02-0080-00030-000	\$ 972,100	\$ 618,000



**Reasons for Requested Valuation Change to the Cass County
Board of Equalization for Review of Real Estate Valuation Determination**

Subject Property: 420 E. Main – West Fargo, ND (Land Accounts)

Account #: 02-0080-00050-000, 02-0080-00060-000, 02-0097-00010-000, 02-3920-00010-000

Thank you for your consideration in this matter.

The real estate land values at the above referenced address are currently being valued by the West Fargo City Assessor above the true fair market value of the price per square foot of land. Although we do agree that land values have risen since the previous re-assessment period, and an increase is warranted, we believe the various parcels of land owned by Trinity Industries should be uniformly valued at the same \$/sq.ft.. The largest parcel of land is currently being assessed at \$0.74 per square foot. We would like for the County to take into consideration that if Trinity Industries were to sell the property today they would sell the land as a whole unit under which the purchase would encompass a single \$/sq.ft. rather than splitting the sale by parcel as the city assessor is indicating.

We accept that \$0.74 per square foot should be applied to each parcel to reflect the West Fargo City assessment of the substantially larger parcel 02-0097-0010-000. Please see our opinion of value for each land account in the value summaries provided using the uniform square foot cost of \$0.74 a square foot.

Below is a summary of the total value that has been proposed by the Henry County Assessor for this account as well as our recommended opinion of fair market value based on the uniform square foot cost of \$0.74 a square foot.

Account #	2018 Henry County Real Estate Value	Ryan Recommended 2018 Fair Market Value
02-0097-00010-000	\$ 1,632,700	\$ 1,632,700
02-0080-00050-000	\$ 393,400	\$ 293,336
02-0080-00060-000	\$ 443,700	\$ 358,863
02-3920-00010-000	\$ 1,351,100	\$ 710,000



VALUE SUMMARY

County of Cass

Account # 002-02-3920-00020-000

Owner Name Trinity Containers, LLC

Property Address 420 E Main Ave, West Fargo

2018 Appraised Value \$ 11,405,000 \$ 43.12

Indicated Values:	Totals	Per SF
Cost Approach	\$ 9,020,028	\$ 34.10

MARKET VALUE ESTIMATE	\$ 9,020,000	\$ 34.10
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CALCULATOR COST FORM

Square Foot Cost

1 Creator of Survey: Ryan, LLC
 2 Account Number: 02-3920-00020-000
 3 Located at: _____

Date of survey: 1/1/2018
 Owner: Trinity Containers

420 E Main Ave, West Fargo

	Building B2	Building A1	Building B1	Building A2	Building A3
4 Occupancy.....	Heavy Mfg	Light Mfg	Heavy Mfg	Light Mfg	Light Mfg
5 Building Class and Quality.....	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low
6 Exterior Wall.....	Metal	Metal	Metal	Metal	Metal
7 No. of stories & height per story.....	No. 1 Ht. 20	No. 1 Ht. 30	No. 1 Ht. 30	No. 1 Ht. 33	No. 1 Ht. 33
8 Average floor area.....	23,134	6,000	16,000	8,000	10,800
9 Average perimeter.....	630	310	560	360	430
10 Age and condition.....	Age: 43 Cond: Low	Age: 26 Cond: Low	Age: 30 Cond: Low	Age: 25 Cond: Low	Age: 21 Cond: Low
11 Region: Western _____ Central <input checked="" type="checkbox"/> Eastern _____					
12 Climate: Mild _____ Moderate <input checked="" type="checkbox"/> Extreme _____					

	Section 1	Section 2	Section 3	Section 4	Section 5
13 Base Square Foot Cost.....	\$ 76.01	\$ 31.31	\$ 76.01	\$ 31.31	\$ 31.31

SQUARE FOOT REFINEMENTS

14 Heating, cooling, ventilation.....	0.000	0.000	0.000	0.000	0.000
15 Elevator deduction.....	0.000	0.000	0.000	0.000	0.000
16 Miscellaneous	2.150	2.660	2.260	2.410	2.410
17 Total lines 13 through 16	78.16	33.97	78.27	33.72	33.72

HEIGHT AND SIZE REFINEMENTS

18 Number of stories - multiplier.....	1.000	1.000	1.000	1.000	1.000
19 Height per story - multiplier (see line 7).....	1.133	1.382	1.382	1.450	1.450
20 Floor area/perimeter multiplier (see lines 8 and 9).....	0.924	1.040	0.984	1.013	1.019
21 Combined height and size multiplier (Lines 18x19x20)	1.047	1.437	1.360	1.469	1.478

FINAL CALCULATIONS

	Section 1	Section 2	Section 3	Section 4	Section 5
22 Refined square foot cost (Line 17x21).....	\$ 81.83	\$ 48.82	\$ 106.44	\$ 49.53	\$ 49.82
23 Current cost multiplier (Sect. 99, p. 3).....	1.02	1.02	1.02	1.02	1.02
24 Local multiplier (Sect. 99, pp. 5 through 10).....	1.03	1.03	1.03	1.03	1.03
25 Final sq. ft. cost (Line 22 x Line 23 x Line 24).....	\$ 85.97	\$ 51.29	\$ 111.82	\$ 52.04	\$ 52.34
26 Area.....	23,134	6,000	16,000	8,000	10,800
27 Line 25 x Line 26	1,988,724	307,769	1,789,187	416,287	565,316
28 Lump sums).....	See Below for Added Extra Features Value				
29 Replacement Cost (Line 27 + Line 28).....	1,988,724	307,769	1,789,187	416,287	565,316
30 Depreciation % (Section 97).....	75%	58%	45%	55%	42%
31 Economic or Functional Obsolescence % (Section 97).....	30%	30%	30%	30%	30%
32 Total Obsolescence amount (Line 29 x Line 30+31).....	1,939,006	232,058	1,046,675	297,645	308,662
33 Depreciated Cost (Line 29 - Line 30 and 31).....	\$ 49,718	\$ 75,711	\$ 742,513	\$ 118,642	\$ 256,653

TOTAL OF ALL SECTIONS

34 Depreciated Cost \$ 1,243,237 Replacement Cost \$ 5,067,283

Extra Features (FMV) \$ -

Land Value: \$ 488,071

Land Sqft 659,556

Land Value per Sqft \$ 0.74

Total Cost Value: \$ 1,731,309

Price per Sqft \$ 32.58

CALCULATOR COST FORM

Square Foot Cost

1 Creator of Survey: Ryan, LLC
 2 Account Number: 02-3920-00020-000
 3 Located at: _____

Date of survey: 1/1/2018
 Owner: Trinity Containers

420 E Main Ave, West Fargo

	Building A5	Building A6	Building A7	Building A1: Office	Building A4: Office
4 Occupancy.....	Light Mfg	Light Mfg	Light Mfg	Office	Office
5 Building Class and Quality.....	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low	Cls: C Qual: Low
6 Exterior Wall.....	Metal	Metal	Metal	Metal	Brick/Veneer
7 No. of stories & height per story.....	No. 1 Ht. 38	No. 1 Ht. 32	No. 2 Ht. 26	No. 1 Ht. 12	No. 2 Ht. 12
8 Average floor area.....	37,310	135,680	22,176	3,000	2,400
9 Average perimeter.....	1,062	1,572	696	220	200
10 Age and condition.....	Age: 17 Cond: Low	Age: 10 Cond: Low	Age: 18 Cond: Low	Age: 43 Cond: Low	Age: 21 Cond: Low
11 Region: Western _____ Central <input checked="" type="checkbox"/> Eastern _____					
12 Climate: Mild _____ Moderate <input checked="" type="checkbox"/> Extreme _____					

	Section 1	Section 2	Section 3	Section 4	Section 5
13 Base Square Foot Cost.....	\$ 31.31	\$ 31.31	\$ 31.31	\$ 65.50	\$ 76.00

SQUARE FOOT REFINEMENTS

14 Heating, cooling, ventilation.....	0.000	0.000	0.000	0.000	0.000
15 Elevator deduction.....	0.000	0.000	0.000	0.000	0.000
16 Miscellaneous	2.060	1.640	2.150	3.900	4.160
17 Total lines 13 through 15	33.37	32.95	33.46	69.40	80.16

HEIGHT AND SIZE REFINEMENTS

18 Number of stories - multiplier.....	1.000	1.000	1.000	1.000	1.000
19 Height per story - multiplier (see line 7).....	1.575	1.425	1.281	1.000	1.515
20 Floor area/perimeter multiplier (see lines 8 and 9).....	0.945	0.867	0.942	1.018	1.052
21 Combined height and size multiplier (Lines 18x19x20)	1.488	1.235	1.207	1.018	1.594

FINAL CALCULATIONS

	Section 1	Section 2	Section 3	Section 4	Section 5
22 Refined square foot cost (Line 17x21).....	\$ 49.67	\$ 40.71	\$ 40.38	\$ 70.65	\$ 127.76
23 Current cost multiplier (Sect. 99, p. 3).....	1.02	1.02	1.02	0.98	0.99
24 Local multiplier (Sect. 99, pp. 5 through 10).....	1.03	1.03	1.03	1.03	1.01
25 Final sq. ft. cost (Line 22 x Line 23 x Line 24).....	\$ 52.18	\$ 42.77	\$ 42.42	\$ 71.31	\$ 127.74
26 Area.....	37,310	135,680	44,352	3,000	4,800
27 Line 25 x Line 26	1,946,844	5,802,867	1,881,380	213,940	613,174
28 Lump sums.....	See Below for Added Extra Features Value				
29 Replacement Cost (Line 27 + Line 28).....	1,946,844	5,802,867	1,881,380	213,940	613,174
30 Depreciation % (Section 97).....	31%	15%	34%	80%	25%
31 Economic or Functional Obsolescence % (Section 97).....	30%	30%	30%	30%	30%
32 Total Obsolescence amount (Line 29 x Line 30+31).....	784,578	1,131,559	831,570	222,498	199,282
33 Depreciated Cost (Line 29 - Line 30 and 31).....	\$ 1,162,266	\$ 4,671,308	\$ 1,049,810	\$ (8,558)	\$ 413,893

TOTAL OF ALL SECTIONS

34 Depreciated Cost \$ 7,288,719 Replacement Cost \$ 10,458,206

Extra Features (FMV) \$ -

Land Value: \$ -

Land Sqft -

Land Value per Sqft _____

Total Cost Value: \$ 7,288,719

Price per Sqft \$ 33.08



VALUE SUMMARY

County of	<u>Cass</u>		
Account #	<u>02-0080-00030-000</u>		
Owner Name	<u>Trinity Containers, LLC</u>		
Property Address	<u>420 E Main Ave, West Fargo</u>		
2018 Appraised Value	\$	<u>972,100</u>	\$ 28.10
Indicated Values:		Totals	Per SF
Cost Approach	\$	617,947	\$ 17.86
MARKET VALUE ESTIMATE	\$	618,000	\$ 17.86

CALCULATOR COST FORM

Square Foot Cost

1 Creator of Survey: Ryan, LLC Date of survey: 1/1/2018
 2 Account Number: 02-0080-00030-000 Owner: Trinity Containers
 3 Located at: _____ 406 E Main Ave, West Fargo

	Building MTL WHSE	Building A1: Office	Building B2	Building B3
4 Occupancy.....	Warehouse	Office	Light Mfg	Warehouse
5 Building Class and Quality.....	Cls: S Qual: Low	Cls: S Qual: Avg	Cls: S Qual: Avg	Cls: S Qual: Avg
6 Exterior Wall.....	Metal	Metal	Metal	Metal
7 No. of stories & height per story.....	No. 1 Ht. 14	No. 1 Ht. 12	No. 1 Ht. 21	No. 1 Ht. 20
8 Average floor area.....	24,000	1,600	6,000	3,000
9 Average perimeter.....	880	160	320	260
10 Age and condition.....	Age: 59 Cond: Low	Age: 14 Cond: Avg	Age: 14 Cond: Avg	Age: 8 Cond: Avg
11 Region: Western _____ Central <input checked="" type="checkbox"/> Eastern _____				
12 Climate: Mild _____ Moderate <input checked="" type="checkbox"/> Extreme _____				

	Section 1	Section 2	Section 3	Section 4
13 Base Square Foot Cost.....	\$ 25.94	\$ 97.00	\$ 44.05	\$ 37.02

SQUARE FOOT REFINEMENTS

14 Heating, cooling, ventilation.....	0.000	0.000	0.000	0.000
15 Elevator deduction.....	0.000	0.000	0.000	0.000
16 Miscellaneous	2.280	0.000	0.000	0.000
17 Total lines 13 through 15	28.22	97.00	44.05	37.02

HEIGHT AND SIZE REFINEMENTS

18 Number of stories - multiplier.....	1.000	1.000	1.000	1.000
19 Height per story - multiplier (see line 7).....	1.000	1.000	1.150	1.133
20 Floor area/perimeter multiplier (see lines 8 and 9).....	0.977	1.105	1.040	1.182
21 Combined height and size multiplier (Lines 18x19x20)	0.977	1.105	1.196	1.339

FINAL CALCULATIONS

22 Refined square foot cost (Line 17x21).....	\$ 27.57	\$ 107.19	\$ 52.68	\$ 49.58
23 Current cost multiplier (Sect. 99, p. 3).....	1.02	0.98	1.02	1.02
24 Local multiplier (Sect. 99, pp. 5 through 10).....	1.03	1.03	1.03	1.03
25 Final sq. ft. cost (Line 22 x Line 23 x Line 24).....	\$ 28.97	\$ 108.19	\$ 55.35	\$ 52.09
26 Area.....	24,000	1,600	6,000	3,000
27 Line 25 x Line 26	695,185	173,108	332,098	156,258
28 Lump sums).....	See Below for Added Extra Features Value			
29 Replacement Cost (Line 27 + Line 28).....	695,185	173,108	332,098	156,258
30 Depreciation % (Section 97).....	80%	13%	24%	8%
31 Economic or Functional Obsolescence % (Section 97).....	30%	30%	30%	30%
32 Total Obsolescence amount (Line 29 x Line 30+31).....	722,992	29,255	103,614	16,251
33 Depreciated Cost (Line 29 - Line 30 and 31).....	\$ (27,807)	\$ 143,853	\$ 228,483	\$ 140,007

TOTAL OF ALL SECTIONS

34 Depreciated Cost	\$ 484,536	Replacement Cost	\$ 1,356,648
Extra Features (FMV)	\$ -		
Land Value:	\$ 133,411	Land Sqft	180,285
Total Cost Value:	\$ 617,947	Price per Sqft	\$ 17.86
		Land Value per Sqft	\$0.74



VALUE SUMMARY

County of	<u>Cass</u>		
Account #	<u>02-0080-00050-000</u>		
Owner Name	<u>Trinity Containers, LLC</u>		
Property Address	<u>420 E Main Ave, West Fargo</u>		
2018 Appraised Value	\$	<u>393,400</u>	\$ 0.99
Indicated Values:		Totals	Per SF
Cost Approach	\$	293,336	\$ 0.74
MARKET VALUE ESTIMATE	\$	293,000	\$ 1.00



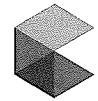
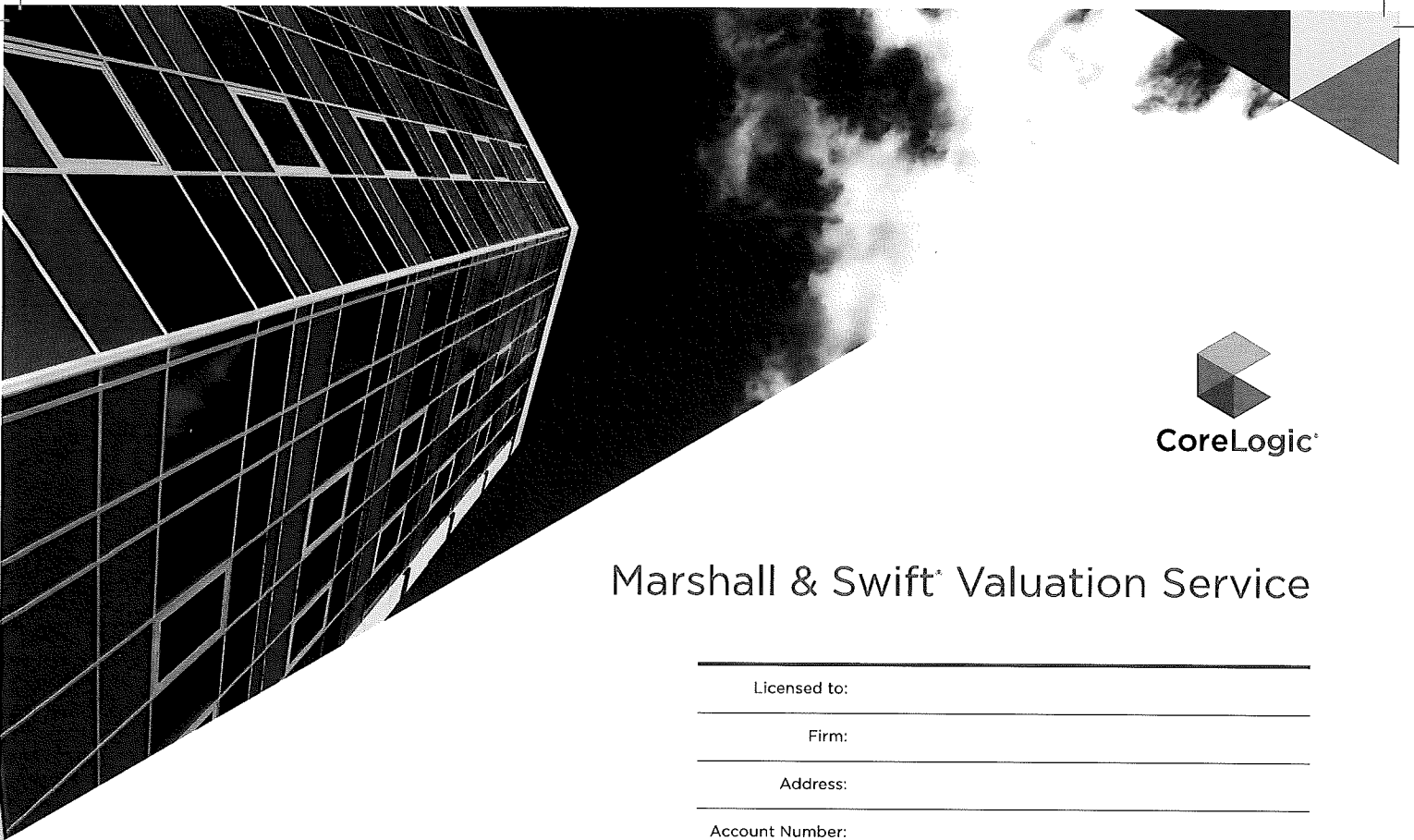
VALUE SUMMARY

County of	<u>Cass</u>		
Account #	<u>02-3920-00010-000</u>		
Owner Name	<u>Trinity Containers, LLC</u>		
Property Address	<u>420 E Main Ave, West Fargo</u>		
2018 Appraised Value	\$	<u>1,351,100</u>	\$ 1.41
Indicated Values:		Totals	Per SF
Cost Approach	\$	709,736	\$ 0.74
MARKET VALUE ESTIMATE	\$	710,000	\$ 0.74



VALUE SUMMARY

County of	<u>Cass</u>		
Account #	<u>02-0097-00010-000</u>		
Owner Name	<u>Trinity Containers, LLC</u>		
Property Address	<u>420 E Main Ave, West Fargo</u>		
2018 Appraised Value	\$	<u>1,632,700</u>	\$ 0.74
Indicated Values:		Totals	Per SF
Cost Approach	\$	1,632,700	\$ 0.74
MARKET VALUE ESTIMATE	\$	1,633,000	\$ 0.74



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CALCULATOR METHOD

INDUSTRIALS, LIGHT MANUFACTURING (494)

CLASS	TYPE	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING, PLUMBING AND MECHANICAL	HEAT	Sq. M.	COST Cu. Ft.	Sq. Ft.
A	Average	Brick on block or tile, concrete or metal panels, storefront entry	Painted walls and ceilings, finished floors and ceilings in offices	*Adequate lighting and plumbing	Hot water	846.80	5.62	78.67
	Low cost	Low-cost brick or block, little fenestration, precast floors	Painted walls, few offices, very plain and open	*Minimum lighting and plumbing	Space heaters	587.07	3.90	54.54
B	Average	Brick, formed concrete, or precast walls, little trim, storefront entry	Painted walls and ceilings, finished floors and ceilings in offices	*Adequate lighting and plumbing	Hot water	796.00	5.28	73.95
	Low cost	Low-cost brick or block, little fenestration, precast floors	Painted walls, few offices, very plain and open	*Minimum lighting and plumbing	Space heaters	548.21	3.64	50.93
C	Good	Bearing walls or frame, brick, concrete panels, good glass storefront	Some finished walls, finished floors and ceilings in offices	Good fluorescent lighting, adequate plumbing	Space heaters	746.38	4.95	69.34
	Average	Light frame or bearing walls, brick, block or tilt-up, some trim	Painted walls and exposed frame, small finished offices	Exposed conduit, fluorescent lighting, adequate plumbing	Space heaters	537.77	3.57	49.96
	Low cost	Very plain, brick, block, or tilt-up, few openings	Small office area, unfinished floors and ceilings	Minimum lighting and plumbing	Space heaters	389.76	2.59	36.21
D	Good	Good frame with stucco or siding, some ornamentation	Some good offices and interior finish	Good lighting, exposed conduit, adequate plumbing	Space heaters	689.43	4.58	64.05
	Average	Wood studs, stucco, wood rafters and sheathing, some trim	Drywall, finished office area, exposed rafters or trusses	Adequate lighting and plumbing	Space heaters	490.41	3.25	45.56
	Low cost	Wood studs or frame, cheap stucco or siding	Unfinished, low-cost slab, small office, minimum code	Minimum lighting and plumbing	Space heaters	351.12	2.33	32.62
DPOLE	Good	Pole frame, metal siding, lined and insulated, some trim, glass entry	Some good offices and interior finish	Good lighting, exposed conduit, adequate plumbing	Space heaters	613.76	4.07	57.02
	Average	Pole frame, metal siding, fully lined and insulated	Finished office area, slab, some floor finish	Adequate lighting and plumbing	Space heaters	439.71	2.92	40.85
	Low cost	Pole frame, metal siding, insulated, few openings	Low-cost slab, few partitions, small office	Minimum code, factory lighting	Space heaters	317.11	2.10	29.46
S	Good	Steel frame, sandwich panels, good glass storefront entry and trim	Some good offices and interior finish	Good lighting, exposed conduit, adequate plumbing	Space heaters	671.67	4.46	62.40
	Average	Steel frame, steel or aluminum siding, some trim	Finished office area, slab, some floor finish	Adequate lighting and plumbing	Space heaters	474.15	3.15	44.05
	Low cost	Light steel frame, steel or aluminum siding, few openings	Low-cost slab, unfinished interior, small office	Minimum code, factory lighting	Space heaters	337.02	2.24	31.31

DOCK-HEIGHT FLOORS – See Page 27.

SPRINKLERS – Systems are not included. Costs should be added from Page 37.

BASEMENTS – See Page 18.

ELEVATORS – Buildings with base costs which include elevators are marked with an asterisk (). If the subject building has no elevators, deduct the following from the base costs for the buildings on this page which are so marked. For buildings not marked or for basement stops, add costs from Page 36.

MEZZANINES – See Page 27.

MULTISTORY BUILDINGS – Add .5% (1/2%) for each story over three, above ground, to all base costs of the building, including basements, but excluding mezzanines.

	Classes A and B	Sq. M.	Sq. Ft.		Sq. M.	Sq. Ft.
	Average	23.57	2.19	Low cost	17.98	1.67

CALCULATOR METHOD

SECTION 14 PAGE 15
February 2016

INDUSTRIALS, HEAVY (PROCESS) MANUFACTURING (495)

CLASS	TYPE	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING, PLUMBING AND MECHANICAL	HEAT	Sq. M.	COST	Sq. Ft.
							Cu. Ft.	
A	Excellent	Heavy structural frame and masonry or concrete walls	Extra heavy floors, partitions and craneways, specialized plant	*Excellent lighting and plumbing, spark-proof fixtures	Hot and chilled water (zoned)	2,612.53	17.34	242.71
	Good	Good curtain walls, good brick and glass, with ornamentation	Finished walls and ceilings, some finished floors, heavy craneways	*Good fluorescent lighting, good plumbing, some extras	Hot and chilled water (zoned)	2,100.92	13.94	195.18
	Average	Face brick, metal panels, industrial glass, ornamentation	Plaster walls, some trim, heavy-duty floors, good offices, craneways	*Good fluorescent lighting, adequate plumbing, locker rooms	Warm and cool air (zoned)	1,608.79	10.68	149.46
	Low cost	Brick on block or tile, concrete or metal panels, little trim	Painted walls and ceilings, heavy-duty floors, open fabrication	*Adequate lighting and plumbing	Hot water	1,250.02	8.30	116.13
B	Excellent	Heavy concrete frame and masonry or concrete walls	Extra heavy floors, partitions and craneways, specialized plant	*Excellent lighting and plumbing, spark-proof fixtures	Hot and chilled water (zoned)	2,511.67	16.67	233.34
	Good	Good curtain walls, good brick and glass, with ornamentation	Finished walls and ceilings, some finished floors, heavy craneways	*Good fluorescent lighting, good plumbing, some extras	Hot and chilled water (zoned)	2,018.90	13.40	187.56
	Average	Face brick, concrete curtain walls, some ornamentation	Plaster walls, some trim, heavy-duty floors, good offices, craneways	*Good fluorescent lighting, adequate plumbing, locker rooms	Warm and cool air (zoned)	1,541.94	10.23	143.25
	Low cost	Brick, formed concrete, or precast walls, little trim	Painted walls and ceilings, heavy-duty floors, open fabrication	*Adequate lighting and plumbing	Hot water	1,195.56	7.93	111.07
C	Good	Heavy steel or concrete frame, good masonry walls	Heavy floors, grating, good partitions and craneways	Good fluorescent lighting, good plumbing, some extras	Warm and cool air (zoned)	1,615.57	10.72	150.09
	Average	Structural frame, brick, concrete panels	Heavy slab floors, offices, stores, some heavy assembly, craneways	Good fluorescent lighting, adequate plumbing, locker rooms	Hot water	1,207.94	8.02	112.22
	Low cost	Steel or glulam frame, brick, block, or tilt-up, some trim	Painted walls and exposed frame, small finished offices, good slab	Exposed conduit, fluorescent lighting, adequate plumbing	Space heaters	870.92	5.78	80.91
C MILL	Good	Mill-type construction, brick walls, wood or steel trusses	Finished walls and ceilings, some floor finish, heavy mill-type floors	*Fluorescent lighting, modernized plumbing	Steam	1,030.33	6.84	95.72
	Average	Mill-type construction, brick walls, wood trusses	Painted walls, few small offices, mill-type floors	*Average lighting and plumbing	Steam	785.13	5.21	72.94
D	Average	Heavy wood frame, wood or stucco siding	Heavy slab or mill-type floors, finished office area, some heavy assembly	Good lighting, adequate plumbing and locker rooms	Space heaters	1,078.45	7.16	100.19
	Low cost	Wood frame, stucco or siding	Finished office area, good slab, some floor finish, open fabrication	Adequate lighting and plumbing	Space heaters	829.69	5.51	77.08
S	Good	Structural steel, heavy steel siding, transite, sandwich panels	Heavy floors, grating, good partitions and craneways	Good fluorescent lighting and plumbing, some extras	Warm and cool air (zoned)	1,510.08	10.02	140.29
	Average	Heavy steel frame, transite or metal siding, sandwich panels	Heavy slab floors, offices, stores, some heavy assembly, craneways	Good lighting, exposed conduit, adequate plumbing, locker rooms	Space heaters	1,070.91	7.11	99.49
	Low cost	Steel frame, steel or aluminum siding, some trim	Finished office area, good slab, some floor finish, open fabrication	Adequate lighting and plumbing	Space heaters	818.17	5.43	76.01

CRANES – Material-handling systems are not included. See Section 58.

DOCK-HEIGHT FLOORS – See Page 27.

BASEMENTS – See Page 18.

MEZZANINES – See Page 27.

MULTISTORY BUILDINGS – Add .5% (1/2%) for each story over three, above ground, to all base costs of the building, including basements, but excluding mezzanines.

SPRINKLERS – Systems are not included. Costs should be added from Page 37.

***ELEVATORS** – Buildings with base costs which include elevators are marked with an asterisk (*). If the subject building has no elevators, deduct the following from the base costs for the buildings on this page which are so marked. For buildings not marked or for basement stops, add costs from Page 36.

Classes A and B & CMILL	Sq. M.	Sq. Ft.	Average	Sq. M.	Sq. Ft.
Excellent	38.97	3.62	24.65	2.29
Good	31.00	2.88	18.62	1.73

CALCULATOR METHOD

STORAGE WAREHOUSES (406)

CLASS	TYPE	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING, PLUMBING AND MECHANICAL	HEAT	Sq. M.	COST Cu. Ft.	Sq. Ft.
A	Good	Ornamental concrete or brick, small office front	Plaster or drywall with partitions, some finished ceilings	*Good lighting, plumbing, adequate restrooms	Hot water	954.66	6.34	88.69
	Average	Brick on block or tile, concrete panels, very plain	Painted walls, few partitions, small offices	*Adequate lighting and plumbing	Space heaters	701.38	4.65	65.16
	Low cost	Low-cost block, tile or concrete	Unfin., small office, few partitions	*Minimum lighting/plumbing	Space heaters	552.09	3.66	51.29
B	Good	Ornamental concrete or brick, small office front	Plaster or drywall with partitions, finished ceilings in most areas	*Good lighting, plumbing, adequate restrooms	Hot water	899.22	5.97	83.54
	Average	Brick on block or tile, concrete panels, very plain	Painted walls, few partitions, small offices	*Adequate lighting and plumbing	Space heaters	654.56	4.34	60.81
	Low cost	Low-cost block, tile or concrete	Unfin., small office, few partitions	*Minimum lighting/plumbing	Space heaters	512.69	3.40	47.63
C	Excellent	Brick, concrete, good facade	Plaster or drywall, partitioned, finished ceilings in most areas	Good lighting and plumbing	Package A.C.	997.28	6.62	92.65
	Good	Steel frame, good brick, block, or tilt-up, tapered girders	Plaster or drywall, some masonry partitions, good offices	Good lighting, adequate plumbing	Space heaters	645.73	4.29	59.99
	Average	Steel or wood frame or bearing walls, brick, block, or tilt-up	Painted walls, finished office, hardened slab	Adequate lighting, low-cost plumbing fixtures	Space heaters	453.59	3.01	42.14
	Low cost	Block, cheap brick, tilt-up, light construction	Unfinished, small office, shell type, minimum code	Minimum lighting and plumbing	Space heaters	320.98	2.13	29.82
C MILL	Good	Mill-type construction, brick walls, wood or steel trusses	Plaster walls, masonry partitions, painted trusses	*Good lighting, adequate plumbing	Steam	882.00	5.85	81.94
	Average	Mill-type construction, brick and block, wood trusses	Painted walls, few partitions, small offices	*Adequate lighting and plumbing	Space heaters	611.72	4.06	56.83
D	Good	Heavy wood frame, wood or stucco siding	Heavy slab or mill-type floors	Good lighting, adequate plumbing	Space heaters	583.84	3.87	54.24
	Average	Stucco on wood frame, wood trusses	Small office, average slab	Adequate lighting, low-cost plumbing fixtures	Space heaters	408.82	2.71	37.98
	Low cost	Stucco or siding on wood	Unfinished, slab, utility type, minimum office	Minimum lighting and plumbing	Space heaters	288.69	1.92	26.82
D POLE	Average	Pole frame, good metal siding, insulated	Small office, some finish, slab	Adequate lighting, little plumbing	Space heaters	350.69	2.33	32.58
	Low cost	Pole frame, metal siding	Unfinished utility type, light slab, minimum office	Minimum lighting and plumbing	Space heaters	248.65	1.65	23.10
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.	903.96	6.00	83.98
	Good	Good steel frame, siding and fenestration	Some good office, interior finish and floor	Good lighting, adequate plumbing	Space heaters	573.72	3.81	53.30
	Average	Rigid steel frame, siding	Small office, average slab	Adequate lighting, low-cost plumbing fixtures	Space heaters	398.48	2.64	37.02
	Low cost	Pre-engineered frame, metal siding	Unfinished utility type, light slab, minimum office	Minimum lighting and plumbing	Space heaters	279.22	1.85	25.94

NOTE: For light commodity storage, see Section 17.

MULTISTORY BUILDINGS – Add .5% (1/2%) for each story, over three above ground, to all base costs of the building, including basements but excluding mezzanines.

SPRINKLERS – Systems are not included. Costs should be added from Page 37.

DOCK-HEIGHT FLOORS – See Page 27.

WAREHOUSE SHELLS – See Page 35.

***ELEVATORS** – Buildings with base costs which include elevators are marked with an asterisk (*). If the subject building has no elevators, deduct the following from the base costs for buildings on this page, which are so marked. For buildings not marked or for basement stops, add costs from Page 36.

	Sq. M.	Sq. Ft.		Sq. M.	Sq. Ft.		Sq. M.	Sq. Ft.	
Good	\$26.59	\$2.47	Average	...	\$21.64	\$2.01	Low Cost .. \$16.68	\$1.55

CALCULATOR METHOD

GARAGES, INDUSTRIALS, LOFTS AND WAREHOUSES FLOOR AREA – PERIMETER MULTIPLIERS

AVERAGE FLOOR AREA		M.	30	38	46	53	61	76	91	107	122	137	152	183	213	244	274	305	M.	AVERAGE FLOOR AREA		
Sq.M.	Sq. Ft.	FT.	100	125	150	175	200	250	300	350	400	450	500	600	700	800	900	1000	FT.	Sq. Ft.	Sq. M.	
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	
650	7,000		---	---	---	---	---	---	1.008	1.040	1.071	1.102	1.132	1.192	1.252	---	---	---		7,000	650	
743	8,000		---	---	---	---	---	---	.984	1.013	1.040	1.068	1.094	1.147	1.199	1.252	---	---		8,000	743	
929	10,000		---	---	---	---	---	---	---	.972	.996	1.019	1.040	1.083	1.125	1.168	1.210	---		10,000	929	
1,115	12,000		---	---	---	---	---	---	---	---	.965	.984	1.003	1.040	1.077	1.112	1.147	1.182		12,000	1,115	
1,301	14,000		---	---	---	---	---	---	---	---	.945	.961	.977	1.008	1.040	1.071	1.102	1.132		14,000	1,301	
1,486	16,000		---	---	---	---	---	---	---	---	---	.943	.957	.984	1.013	1.040	1.068	1.094		16,000	1,486	
1,672	18,000		---	---	---	---	---	---	---	---	---	.929	.942	.967	.991	1.016	1.040	1.065		18,000	1,672	
1,858	20,000		---	---	---	---	---	---	---	---	---	---	.926	.949	.972	.996	1.019	1.040		20,000	1,858	
2,323	25,000		---	---	---	---	---	---	---	---	---	---	.907	.924	.942	.959	.977	.996		25,000	2,323	
2,787	30,000		---	---	---	---	---	---	---	---	---	---	---	.907	.921	.935	.949	.965		30,000	2,787	
3,252	35,000		---	---	---	---	---	---	---	---	---	---	---	---	.896	.907	.919	.932	.945		35,000	3,252
3,716	40,000		---	---	---	---	---	---	---	---	---	---	---	---	---	.899	.907	.916	.926		40,000	3,716
4,181	45,000		---	---	---	---	---	---	---	---	---	---	---	---	---	---	.898	.907	.916		45,000	4,181
4,645	50,000		---	---	---	---	---	---	---	---	---	---	---	---	---	.891	.898	.907	---		50,000	4,645

AVERAGE FLOOR AREA		M.	274	305	335	366	396	427	457	488	518	549	579	610	671	731	792	914	M.	AVERAGE FLOOR AREA	
Sq.M.	Sq. Ft.	FT.	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2200	2400	2600	3000	FT.	Sq. Ft.	Sq. M.
1,858	20,000		1.019	1.040	1.062	1.083	---	---	---	---	---	---	---	---	---	---	---	---		20,000	1,858
2,323	25,000		.977	.996	1.015	1.032	1.049	1.066	---	---	---	---	---	---	---	---	---	---		25,000	2,323
2,787	30,000		.949	.965	.980	.995	1.010	1.025	1.040	---	---	---	---	---	---	---	---	---		30,000	2,787
3,252	35,000		.932	.945	.957	.969	.982	.995	1.008	1.021	---	---	---	---	---	---	---	---		35,000	3,252
3,716	40,000		.916	.926	.937	.949	.961	.972	.984	.995	1.007	1.019	---	---	---	---	---	---		40,000	3,716
4,181	45,000		.907	.916	.926	.935	.945	.955	.965	.975	.985	.995	1.005	1.015	---	---	---	---		45,000	4,181
4,645	50,000		.898	.907	.916	.924	.933	.942	.950	.959	.968	.977	.986	.996	1.015	---	---	---		50,000	4,645
5,574	60,000		.889	.895	.901	.907	.914	.921	.928	.935	.942	.949	.957	.965	.980	.995	---	---		60,000	5,574
6,503	70,000		.877	.884	.890	.896	.902	.907	.913	.919	.925	.932	.939	.945	.957	.969	.982	---		70,000	6,503
7,432	80,000		.869	.875	.881	.887	.893	.898	.903	.907	.911	.916	.921	.926	.937	.949	.961	.984		80,000	7,432
9,290	100,000		---	.863	.868	.872	.877	.882	.887	.891	.895	.899	.903	.907	.916	.924	.933	.950		100,000	9,290
11,148	120,000		---	.856	.859	.863	.867	.871	.875	.879	.883	.887	.891	.895	.901	.907	.914	.928		120,000	11,148
13,006	140,000		---	.851	.854	.857	.860	.863	.867	.871	.874	.877	.880	.884	.890	.896	.902	.913		140,000	13,006
14,864	160,000		---	---	.850	.853	.855	.858	.860	.863	.866	.869	.872	.875	.881	.887	.893	.903		160,000	14,864
16,722	180,000		---	---	.846	.849	.851	.854	.856	.858	.860	.863	.866	.869	.874	.879	.884	.895		180,000	16,722
18,580	200,000		---	---	---	.846	.848	.850	.853	.855	.857	.859	.861	.863	.868	.873	.877	.887		200,000	18,580
20,903	225,000		---	---	---	---	.845	.847	.849	.851	.853	.855	.856	.858	.862	.867	.871	.879		225,000	20,903
23,226	250,000		---	---	---	---	.842	.844	.846	.848	.849	.851	.853	.855	.858	.862	.866	.873		250,000	23,226
25,548	275,000		---	---	---	---	.839	.841	.843	.845	.847	.848	.850	.852	.855	.858	.862	.868		275,000	25,548
27,871	300,000		---	---	---	---	---	.839	.841	.842	.844	.846	.847	.849	.852	.855	.857	.863		300,000	27,871
32,516	350,000		---	---	---	---	---	.835	.836	.839	.840	.841	.843	.845	.847	.850	.853	.857		350,000	32,516
37,161	400,000		---	---	---	---	---	---	.835	.836	.838	.840	.841	.843	.846	.848	.853	---		400,000	37,161
46,451	500,000		---	---	---	---	---	---	.831	.832	.833	.834	.835	.838	.840	.842	.846	---		500,000	46,451

CALCULATOR METHOD

SECTION 14 PAGE 39
February 2016

GARAGES, INDUSTRIALS, LOFTS AND WAREHOUSES FLOOR AREA – PERIMETER MULTIPLIERS

AVERAGE FLOOR AREA			AVERAGE PERIMETER														AVERAGE FLOOR AREA			
Sq.M.	Sq. Ft.	M.	2000	2200	2400	2600	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	M.	Sq. Ft.	Sq. M.
27,871	300,000		.849	.852	.855	.857	.863	.872	.880	----	----	----	----	----	----	----	----		300,000	27,871
32,516	350,000		.845	.847	.850	.853	.857	.863	.871	----	----	----	----	----	----	----	----		350,000	32,516
37,161	400,000		.841	.843	.846	.848	.853	.858	.863	.870	.875	----	----	----	----	----	----		400,000	37,161
46,451	500,000		.835	.838	.840	.842	.846	.850	.855	.859	.863	.868	.873	----	----	----	----		500,000	46,451
55,741	600,000		----	----	----	.837	.841	.845	.849	.853	.856	.859	.863	.867	----	----	----		600,000	55,741
65,032	700,000		----	----	----	----	.836	.841	.845	.848	.851	.854	.857	.860	.863	.867	----		700,000	65,032
74,322	800,000		----	----	----	----	.834	.837	.841	.844	.847	.850	.853	.856	.858	.860	.863		800,000	74,322
83,612	900,000		----	----	----	----	.832	.835	.838	.841	.843	.847	.849	.851	.854	.856	.858		900,000	83,612
92,902	1,000,000		----	----	----	----	.832	.835	.838	.841	.843	.846	.848	.850	.853	.855		1,000,000	92,902	
102,192	1,100,000		----	----	----	----	.831	.833	.835	.839	.841	.843	.846	.848	.850	.852		1,100,000	102,192	
111,483	1,200,000		----	----	----	----	----	.832	.834	.836	.839	.841	.843	.845	.847	.849		1,200,000	111,483	
120,773	1,300,000		----	----	----	----	----	----	.832	.834	.836	.839	.841	.843	.845	.847		1,300,000	120,773	
130,063	1,400,000		----	----	----	----	----	----	.831	.833	.835	.836	.839	.841	.843	.845		1,400,000	130,063	
139,353	1,500,000		----	----	----	----	----	----	.830	.832	.833	.835	.837	.839	.841	.843		1,500,000	139,353	

NOTE: For larger buildings, enter the table by taking half the area and half the perimeter.

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		SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULT.	AVERAGE WALL HEIGHT		SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULT.	AVERAGE WALL HEIGHT		SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULT.
(M.)	(FT.)			(M.)	(FT.)			(M.)	(FT.)		
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 METHOD

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November 2017

OFFICE BUILDINGS (344)

CLASS	TYPE	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING, PLUMBING AND MECHANICAL	HEAT	COST		
						Sq. M.	Cu. Ft.	Sq. Ft.
A	Excellent	Best metal or stone, brick or block backup, solar glass	Plaster, best veneers, vinyl wall coverings, vinyl, terrazzo, carpet	*Luminous ceilings, many outlets, many private restrooms	Hot and chilled water (zoned)	2906.25	22.49	270.00
	Good	Good metal and solar glass, face brick, precast concrete panels	Drywall or plaster, some wall cover, acoustic tile, vinyl tile, carpet	*Good fluorescent, high intensity lighting, good restrooms	Hot and chilled water (zoned)	2303.47	17.83	214.00
	Average	Brick, concrete or metal and glass panels, little trim	Average partitions, acoustic tile, vinyl composition, some extras	*Average intensity fluorescent lighting, average restrooms	Warm and cool air (zoned)	1732.99	13.41	161.00
	Low cost	Minimum-cost walls and fenestration, little trim	Drywall, acoustic ceilings, asphalt tile, few partitions	*Minimum office lighting and plumbing	Warm and cool air (zoned)	1388.54	10.75	129.00
B	Excellent	Best metal or stone, brick or block backup, tinted glass	Plaster, best veneers, vinyl wall coverings, vinyl tile, terrazzo	*Luminous ceilings, many outlets, many private restrooms	Hot and chilled water (zoned)	2852.43	22.07	265.00
	Good	Good metal and solar glass, face brick, precast concrete panels	Drywall/plaster, some wall cover, acoustic tile, vinyl tile, carpet	*Good fluorescent, high intensity lighting, good restrooms	Hot and chilled water (zoned)	2238.89	17.33	208.00
	Average	Brick, concrete or metal and glass panels, little trim	Average partitions, acoustic tile, vinyl composition, some extras	*Average intensity fluorescent lighting, average restrooms	Warm and cool air (zoned)	1679.17	12.99	156.00
	Low cost	Minimum-cost walls and fenestration, little trim	Drywall, acoustic ceilings, asphalt tile, few partitions	*Minimum office lighting and plumbing	Warm and cool air (zoned)	1323.96	10.25	123.00
C	Excellent	Steel frame, masonry and glass, stone ornamentation, top quality	Plaster, paneling, carpet and terrazzo, suspended ceilings	*Best fluorescent ceiling panels, tiled restrooms, good fixtures	Warm and cool air (zoned)	2443.41	18.91	227.00
	Good	Steel frame or bearing walls, brick/conc. panels, some ornamentation	Plaster or drywall, good partitions, acoustic tile, carpet and vinyl	*Good fluorescent lighting, good restrooms and fixtures	Package A.C.	1711.46	13.24	159.00
	Average	Steel or concrete frame, or bearing walls, some trim	Paint, drywall partitions, acoustic tile, vinyl composition	*Fluorescent lighting, adequate outlets and plumbing	Forced air	1216.32	9.41	113.00
	Low cost	Masonry bearing walls, light rafters, very plain	Paint, few low-cost partitions, acoustic tile, asphalt tile	Minimum office lighting and plumbing	Wall furnace	818.06	6.33	76.00
D	Excellent	Studs or steel columns, bar or web joists, brick or stone veneer, EIFS	Best plaster, paneling, carpet and vinyl tile	*Best fluorescent panels, many outlets, good tiled restrooms	Warm and cool air (zoned)	2325.00	17.99	216.00
	Good	Best stucco on good frame, brick or stone trim, good front	Plaster or drywall, good partitions, acoustic tile, carpet and vinyl	*Good fluorescent lighting, good restrooms and fixtures	Package A.C.	1625.35	12.58	151.00
	Average	Stucco or wood siding on wood or steel studs, some trim	Drywall, acoustic tile, low-cost carpet or vinyl composition	*Adequate lighting and plumbing	Forced air	1151.74	8.91	107.00
	Low cost	Light stucco or siding on wood or steel studs, very plain	Drywall, few partitions, acoustic tile, asphalt tile	Minimum lighting and plumbing	Wall furnace	769.62	5.96	71.50
D_{POLE}	Good	Good metal panels, fenestration, some brick or stone trim	Plaster or drywall, good partitions, acoustic tile, carpet and vinyl	*Good fluorescent lighting, good restrooms and fixtures	Package A.C.	1485.42	11.50	138.00
	Average	Pole frame, insulated metal panels, some ornamentation	Drywall, acoustic tile, low-cost carpet or vinyl composition	Adequate lighting and plumbing	Forced air	1017.19	7.87	94.50
	Low cost	Pole frame, finished interior, some insulation	Drywall, few partitions, acoustic tile, asphalt tile	Minimum lighting and plumbing	Wall furnace	688.89	5.33	64.00
S	Good	Good sandwich panels and fenestration, some brick or stone	Plaster or drywall, good partitions, acoustic tile, carpet and vinyl	*Good fluorescent lighting, good restrooms and fixtures	Package A.C.	1517.71	11.75	141.00
	Average	Insulated wall or sandwich panels, adequate fenestration	Drywall, acoustic tile, low-cost carpet or vinyl composition	Adequate lighting and plumbing	Forced air	1044.10	8.08	97.00
	Low cost	Steel or aluminum on light frame, finished interior, some insulation	Drywall, few partitions, acoustic tile, asphalt tile	Minimum lighting and plumbing	Wall furnace	705.04	5.46	65.50

MULTISTORY BUILDINGS – Add .5% (1/2%) for each story, over three, above ground, to all base costs, including basements but excluding mezzanines, up to 30 stories; over 30 add .4% (4/10%) for each additional story.

SPRINKLERS – Systems are not included. Costs should be added from Page 37.

BALCONIES – Exterior balconies see Page 37, or they may be computed from the Segregated Costs.

CANOPIES – For large entrance marquees or carport canopies, see Page 37.

***ELEVATORS** – Base costs of buildings marked with an asterisk (*) include elevator costs. If the subject building has no elevators, deduct the following from the base costs for buildings on this page. See Notes on Page 19.

	Sq. M.	Sq. Ft.	Sq.M.	Sq.Ft
Classes A & B				
Excellent.....	130.78	12.15	Average	60.92 5.66
Good.....	89.13	8.28	Low cost	41.66 3.87
Classes C/D/S			Average	23.90 2.22
Excellent.....	65.98	6.13		
Good.....	39.61	3.68		

CALCULATOR METHOD

OFFICES, MEDICAL AND PUBLIC BUILDINGS FLOOR AREA – PERIMETER MULTIPLIERS

AVERAGE FLOOR AREA			AVERAGE PERIMETER																AVERAGE FLOOR AREA					
Sq. M.	Sq. Ft.	M.	38	46	53	61	76	91	122	152	183	213	244	305	366	427	488	549	610	M.	Sq. Ft.	Sq. M.		
		FT.	125	150	175	200	250	300	400	500	600	700	800	1000	1200	1400	1600	1800	2000	FT.				
93	1,000		1.168	1.235	1.299	1.364	1.494	1.624	1.884	---	---	---	---	---	---	---	---	---	---	---	---	1,000	93	
139	1,500		1.061	1.105	1.146	1.191	1.277	1.364	1.537	---	---	---	---	---	---	---	---	---	---	---	---	1,500	139	
186	2,000		1.007	1.040	1.072	1.105	1.168	1.235	1.364	---	---	---	---	---	---	---	---	---	---	---	---	2,000	186	
232	2,500		---	1.000	1.027	1.052	1.105	1.155	1.259	---	---	---	---	---	---	---	---	---	---	---	---	2,500	232	
279	3,000		---	.975	.997	1.018	1.061	1.105	1.191	---	---	---	---	---	---	---	---	---	---	---	---	3,000	279	
372	4,000		---	---	.958	.975	1.007	1.040	1.105	1.168	---	---	---	---	---	---	---	---	---	---	---	4,000	372	
465	5,000		---	---	.936	.949	.975	1.000	1.052	1.105	1.155	---	---	---	---	---	---	---	---	---	---	5,000	465	
557	6,000		---	---	---	.932	.952	.975	1.018	1.061	1.105	1.146	---	---	---	---	---	---	---	---	---	6,000	557	
743	8,000		---	---	---	---	.926	.942	.975	1.007	1.040	1.072	1.105	---	---	---	---	---	---	---	---	8,000	743	
929	10,000		---	---	---	---	.910	.923	.949	.975	1.000	1.027	1.052	1.105	1.155	---	---	---	---	---	---	10,000	929	
1,115	12,000		---	---	---	---	.910	.932	.952	.975	.997	1.018	1.061	1.105	1.146	---	---	---	---	---	---	12,000	1,115	
1,301	14,000		---	---	---	---	.900	.920	.938	.956	.975	.993	1.030	1.067	1.105	1.140	---	---	---	---	---	14,000	1,301	
1,486	16,000		---	---	---	---	.910	.926	.942	.958	.975	1.007	1.040	1.075	1.105	---	---	---	---	---	---	16,000	1,486	
1,672	18,000		---	---	---	---	.903	.918	.932	.946	.960	.990	1.018	1.046	1.076	1.105	---	---	---	---	---	18,000	1,672	
1,858	20,000		---	---	---	---	---	.910	.923	.936	.949	.975	1.000	1.027	1.052	1.078	1.105	---	---	---	---	20,000	1,858	
2,323	25,000		---	---	---	---	---	.897	.908	.918	.928	.948	.969	.990	1.011	1.032	1.052	---	---	---	---	25,000	2,323	
2,787	30,000		---	---	---	---	---	---	.897	.906	.915	.932	.949	.965	.983	1.000	1.018	---	---	---	---	30,000	2,787	
3,252	35,000		---	---	---	---	---	---	---	.897	.904	.919	.934	.949	.963	.978	.993	---	---	---	---	35,000	3,252	
3,716	40,000		---	---	---	---	---	---	---	.890	.897	.910	.923	.936	.949	.962	.975	---	---	---	---	40,000	3,716	
4,645	50,000		---	---	---	---	---	---	---	---	---	.887	.897	.908	.918	.928	.938	.948	---	---	---	---	50,000	4,645
6,968	75,000		---	---	---	---	---	---	---	---	---	.873	.879	.885	.892	.900	.908	.915	---	---	---	---	75,000	6,968
9,290	100,000		---	---	---	---	---	---	---	---	---	.866	.871	.876	.881	.887	.892	.897	---	---	---	---	100,000	9,290

NOTE: For small buildings, enter the table by doubling the average floor area and doubling the perimeter. For larger buildings, take half the area and half the perimeter.

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multipliers for any variation in average story height from the base of 12 feet (3.66 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 or for a complete facility average, it is better to compute the total cubage and divide by the total square footage of floor area to get an effective height to use.

AVERAGE WALL HEIGHT		SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULTIPLIER	AVERAGE WALL HEIGHT		SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULTIPLIER	AVERAGE WALL HEIGHT		SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULTIPLIER
(M.)	(FT.)			(M.)	(FT.)			(M.)	(FT.)		
2.44	8	.900	1.350	3.96	13	1.023	.944	6.10	20	1.184	.710
2.74	9	.928	1.237	4.27	14	1.046	.897	7.31	24	1.276	.638
3.05	10	.953	1.144	4.57	15	1.069	.855	8.53	28	1.367	.586
3.35	11	.977	1.066	4.88	16	1.092	.819	9.75	32	1.459	.547
3.66	12	1.000 (base)	1.000	5.49	18	1.138	.758	10.97	36	1.552	.517

COST MULTIPLIERS

SECTION 99 PAGE 1
January 2018

CURRENT COST MULTIPLIERS

CURRENT COST MULTIPLIERS (Section 99, Page 3) are the multipliers for bringing costs published on the preceding pages up-to-date. This page is republished monthly and is based primarily on the Building Cost Indexes.

LOCAL MULTIPLIERS

LOCAL MULTIPLIERS (Section 99, Pages 5 thru 10) reflect local cost conditions and are designed to adjust the basic costs to each locality. They are based on weighted labor and material costs, including local sales taxes and the Canadian GST, but do not include any new construction rebate where applicable. Local multipliers apply to all costs in the manual but not to any cost indexes or replacement cost multipliers. The local multipliers, when applied to the total replacement cost, will adjust for variations in component costs as a whole for a particular geographical area. Multipliers may not adequately adjust when applied to specific components or Unit-in-Place costs, e.g., in the case of a specific piece of equipment which may be national in scope requiring no significant localization. For most Unit-in-Place costs, the predominant building or material Class factor can be used (e.g., wood, Class D; masonry, Class C) or an average of all Classes may be appropriate. In some cases, local building problems and practices must be considered. In the best residential neighborhoods, costs are often higher than those for identical construction in a lower-cost neighborhood. These pages are republished every January, April, July and October.

SPECIAL LOCAL CONDITIONS - Normally, smaller cities and suburbs near larger cities fall under the same cost influence as the larger city; however, local wage scales, inspection practices, licenses, codes and fees may vary, and the valuator should consider these possible deviations. Within a large city, costs will often vary by distance from sources of materials, such as ready-mix plants, and the local multipliers apply only to typical conditions prevailing. The state multipliers are merely weighted averages of the various cities and do not have any other significance. They may fit quite closely to many of the cities in the state which are not listed, but some localities may vary appreciably.

SEISMIC AND WIND: In high wind (over 90 mph) and earthquake (zones 2, 3 & 4) prone areas, you can have additional structural elements which will affect the overall building costs. Lifeline structures, such as Hospitals, Governmental and Data Centers must meet stringent building and life safety codes. See Section 85 for further information. Individual components can be priced using the Segregated Method.

NATURAL DISASTERS: Widespread major natural disasters can create isolated materials and/or labor shortages requiring some upward adjustment to the multipliers. Some specific materials, such as roofing, can temporarily increase 30% to 50% or more above normal repair estimates.

ABNORMAL CONTRACTOR'S PROFIT: In areas of high growth, contractors are able to take higher than normal profits due to an increased demand with limited contractors and/or workforce availability.

ABNORMAL SHORTAGES: Temporary supply-demand imbalances caused by events other than major catastrophes, such as factory closures, strikes, inadequate inventories, environmental legislation, trade embargoes, commodities speculation, etc., may require upward adjustment to the multipliers.

NOTE: Even though a particular material or trade may increase dramatically in a short span of time, it may only be a small part of an entire structure, and valuers should use caution.

COMPLEX SITES: Hillside construction will be much more expensive, due to added foundation and sitework. Downtown buildings are usually somewhat more expensive than outlying buildings. Sidewalks must be barricaded or roofed for the protection of pedestrians. Due to the lack of adequate space, material storage and handling is often more costly. Bordering property must often be protected. Such expenses are a part of construction costs.

GREEN BUILDINGS: High performance sustainable construction that is LEED certified can be more expensive, requiring some upward adjustments to the base costs.

WEATHER EXTREMES: Extreme cold, heat or wet weather may require temporary enclosures or covers, or special storage handling and wrapping of materials. Added costs may require some upward adjustment to the multipliers.

REMOTE LOCATIONS: Upward modification of the multipliers is appropriate if a building or other structure is far removed from supplies of labor and material, if its location is accessible with difficulty requiring higher freight charges on material, contains noncompetitive conditions for labor or materials, disproportionate crewing or labor per diem charges, or unusual climatic conditions occur. Examples are island, mountain, desert or resort locations and others not enjoying reasonable and adequate transportation facilities, for which no local modifier has been computed. When using the Mountain and Resort Cottage costs in Section 12, normal erection in remote areas is already included.

QUANTITY OR DEVELOPMENT CONSTRUCTION: There are usually cost savings in quantity or duplicate construction, which may or may not be passed on to the prospective buyer; usually, only part of the savings are passed on. Since costs in this manual will be based to some extent on such construction, the costs may require small, or

no percentage reductions to reflect actual sales conditions in the area. Large industrial projects, using multiple till-up or residential modular construction can have savings double the listed averages.

AMATEUR WORKMANSHIP: All costs in this manual are based on professional labor supervised by a contractor or job foreman. For amateur workmanship or work done by farm or ranch help, costs should be decreased to reflect the proper wage rate and lack of contractor and architectural supervision relative to the quality of the work.

REPAIR AND REMODEL: All costs in this manual are based on new construction. Typical repair work will run 10% to 20% higher because of restricted area, movement of materials, temporary supports, shoring, etc., and other contingencies not encountered in new construction, excluding demolition and removal. For detailed costs we would recommend using our repair and claims products.

MODIFYING ADJUSTMENTS

The following are rough overall percentage ranges to apply for certain unusual conditions, which can be cumulative:

ADD FOR THE FOLLOWING:

Abnormal contractor's profit	5% to 25%
Abnormal shortages	2% to 10%
Complex/congested areas	2% to 5%
Hillside buildings	5% to 20%
Remote areas	5% to 15%
Resort locations	15% to 30%
Weather extremes	2% to 6%
Seismic or high wind	2% to 5%
lifeline occ., high event (Zone 3/4)	5% to 10%

ADDITIONS - CONTINUED

Green Buildings, Commercial	0% to 7%
Residential	3% to 20%

SUBTRACT FOR THE FOLLOWING:

Quantity or Development construction	1% to 5%
Abnormal labor surplus	1% to 5%
Amateur workmanship	15% to 30%
Architects' fee adjustments:	
see discussion below and on Page 2.	

SPECIAL LOCAL MULTIPLIERS

If no multiplier is published for your city or if you desire a check on the published multipliers, we suggest that you send us your local data, and we will compute one for you. Forms for the required data may be obtained by writing, fax or email. See inside front cover for details.

ARCHITECTS' FEES

The architects' fees listed on the next page are based on averages of fees actually charged or recommended. Actual fees, (based on the size of the project, technical difficulty, artistic requirements, and the reputation of the architect and his willingness to accept the assignment), vary greatly, and the estimate of the fee is a matter for the valuator's judgment. Architects' fees will normally include part or all of the following:

1. Plans and specifications including consultations, estimates and engineering studies.
2. General administration and overall supervision of construction, not including superintending construction.
3. Approving payment vouchers to the contractor.
4. Approval and acceptance of completed construction.

Regardless of the size and type of construction, all of these services must be performed by someone. On some projects, the owner or general contractor may supervise. On governmental projects, many services are performed by government employees; however, in replacing the building, the cost of these services, whether performed by the architect or others, must be included.

The architects' fee percentages given here are only a guide. On a simple pre-engineered structure or residence, stock plans and specifications may be purchased for under \$300, plus \$50 for each additional set. On a large housing development, the architect may get full fees for each individual design and payments as low as \$325 per unit for additional uses of the plans, perform work as a corporate employee. Also, many shed, farm and utility buildings are commonly built without plans or from standard plans which can be obtained free, or at a small price. To add a full architects' fee would be unsuitable.

In actual practice, architects' fees are normally based, by contract, either on a percentage of the entire cost, a multiplier of the technical payroll plus incidental expenses, or on a fixed sum plus listed expenses.

In the final analysis, the architect's function, when fully performed, is a proper cost of construction. A well-considered matching of structure to land may enhance the end value by more than the fees involved. However, when poorly performed, the cost of design and drafting work may be wasted and result in functional obsolescence in a brand-new structure. This determination is a matter of judgment.

The average fees listed for buildings do not include fees for design of furniture, built-in equipment or appliances, plant or off-site, utilities or subdivision layout, or other detailed special items designed for a specific trade or personal use.

CURRENT COST MULTIPLIERS

These multipliers bring costs from preceding pages up to date. Also apply Local Multipliers, Section 99, Pages 5 through 10.

CALCULATOR COST SECTIONS

(Effective Date of Cost Pages)	11 (11/16)	12 (8/16)	13 (5/16)	14 (2/16)	15 (11/17)	16 (8/17)	17 (5/17)	18 (2/17)
EASTERN	A	1.06	1.05	1.05	1.03	1.02	1.03	1.05
	B	1.07	1.07	1.05	1.06	1.01	1.02	1.05
	C	1.07	1.06	1.07	1.06	1.04	1.05	1.06
	D	1.06	1.06	1.06	1.05	1.02	1.04	1.04
	S	1.10	1.09	1.07	1.06	1.04	1.04	1.04
CENTRAL	A	1.01	1.00	0.99	1.00	0.97	0.99	1.00
	B	1.01	1.02	1.01	1.01	0.99	0.99	1.00
	C	1.03	1.03	1.03	1.02	0.99	0.98	1.00
	D	1.02	1.03	1.03	1.02	1.01	1.02	1.00
	S	1.00	1.02	1.00	1.02	0.98	1.01	1.01
WESTERN	A	1.01	1.03	1.04	1.05	1.01	1.01	1.02
	B	1.01	1.02	1.05	1.04	1.01	1.03	1.03
	C	1.03	1.05	1.04	1.06	1.01	1.03	1.02
	D	1.05	1.05	1.05	1.06	1.00	1.01	1.05
	S	1.02	1.02	1.05	1.04	1.00	1.04	1.03

SEGREGATED COST SECTIONS

(Effective Date of Cost Pages)	41 (12/16)	42 (9/16)	43 (6/16)	44 (3/16)	45 (12/17)	46 (9/17)	47 (6/17)	48 (3/17)
EASTERN	A	1.06	1.05	1.05	1.03	1.02	1.03	1.05
	B	1.07	1.07	1.05	1.06	1.01	1.02	1.05
	C	1.07	1.06	1.07	1.06	1.04	1.05	1.06
	D	1.06	1.06	1.06	1.05	1.02	1.04	1.04
	S	1.10	1.09	1.07	1.06	1.04	1.04	1.04
CENTRAL	A	1.01	1.00	0.99	1.00	0.97	0.99	1.00
	B	1.01	1.02	1.01	1.01	0.99	0.99	1.00
	C	1.03	1.03	1.03	1.02	0.99	0.98	1.00
	D	1.02	1.03	1.03	1.02	1.01	1.02	1.00
	S	1.00	1.02	1.00	1.02	0.98	0.98	1.01
WESTERN	A	1.01	1.03	1.04	1.05	1.01	1.01	1.02
	B	1.01	1.02	1.05	1.04	1.01	1.03	1.03
	C	1.03	1.05	1.04	1.06	1.01	1.03	1.02
	D	1.05	1.05	1.05	1.06	1.00	1.01	1.05
	S	1.02	1.02	1.05	1.04	1.00	1.04	1.03

UNIT-IN-PLACE COST SECTIONS (51 - 70)

This page supersedes the December 2017 Green Supplement.

Sec. Page	Date	Eastern	Central	Western	Sec. Page	Date	Eastern	Central	Western		
51 - 2-3	(3/17)	Concrete Foundations.....	1.04	1.00	1.03	61 - 1-8	(12/16)	Tanks	1.04	1.03	1.05
51 - 4	(3/17)	Pillings.....	1.06	1.00	1.04	62 - 1	(6/16)	Industrial Pumps & Boilers.....	1.07	0.99	1.08
51 - 7-8	(3/17)	Steel and Concrete Frame.....	1.05	0.99	1.04	62 - 2-3, 6	(6/16)	Piping	1.07	0.99	1.08
51 - 3-7	(3/17)	Wood Foundations, Frame	1.03	1.01	1.06	62 - 4	(6/16)	Electrical Motors	1.07	0.99	1.08
52 - 1-4, 6	(3/17)	Interior Construction.....	1.04	1.02	1.03	62 - 5	(6/16)	Steel Stacks, Chutes.....	1.07	0.99	1.08
52 - 5	(3/17)	Bank Vaults and Equipment	1.06	1.01	1.02	62 - 5	(6/16)	Masonry & Concrete Chimneys..	1.04	1.00	1.06
53 - 1-8	(6/17)	Heating, Cooling & Ventilating....	1.04	1.00	1.03	62 - 6	(6/16)	Compactors, Incinerators.....	1.07	0.99	1.08
53 - 9-12	(6/17)	Plumbing, Fire Protection, etc.....	1.04	0.99	1.04	63 - 1-4	(9/16)	Trailer and Mfg. Housing Parks..	1.03	1.02	1.06
54 - 1-6	(6/17)	Electrical, Security	1.02	1.03	1.01	63 - 5-10	(9/16)	Manufactured Housing.....	1.05	1.04	1.06
55 - 3-7	(8/17)	Wall Costs.....	1.02	0.99	1.03	64 - 1-6	(3/16)	Service Stations, Car Washes....	1.07	1.03	1.03
56 - 1-2	(8/17)	Stained Glass.....	1.03	0.99	1.02	64 - 7-9	(3/16)	Prefabricated Metal Structures ...	1.06	1.01	1.06
56 - 3-6	(8/17)	Storefronts.....	1.03	0.99	1.02	64 - 7-8	(3/16)	Prefab. Wood & Air Structures....	1.05	1.03	1.05
56 - 7	(8/17)	Stonework.....	1.01	1.01	1.04	65 - 1-12	(3/16)	Equipment Costs.....	1.04	1.03	1.03
56 - 8	(8/17)	Columns, Stone & Concrete	1.01	1.01	1.04	66 - 1	(12/17)	Subdivision Costs	1.01	0.98	1.02
56 - 8	(8/17)	Columns, Wood & Aluminum.....	1.02	1.01	1.04	66 - 2-9	(12/17)	Yard Improvements.....	1.01	0.97	1.03
57 - 1-6	(9/17)	Roofs.....	1.02	1.00	1.02	66 - 10-11	(12/17)	Demolition & Remediation	1.00	0.99	1.02
58 - 1	(9/17)	Cold Storage	1.02	0.99	1.03	67 - 1-2	(12/17)	Golf Courses	1.00	1.00	1.01
58 - 2-8	(9/17)	Elevators, Conveying Systems ...	1.02	0.98	1.01	67 - 3-7	(12/17)	Recreational Facilities.....	1.00	0.99	1.02
					70 - 1-20	(1/18)	Green Section.....	1.00	0.99	1.02	

LOCAL MULTIPLIERS

SECTION 99 PAGE 9
January 2018

Apply to costs brought up-to-date from preceding pages. Do not apply to Section 98 or any other indexes.

UNITED STATES

CLASS	A	B	C	D	S	CLASS	A	B	C	D	S	CLASS	A	B	C	D	S
NEW JERSEY	1.29	1.28	1.27	1.27	1.28	Plattsburgh	1.01	0.99	1.01	1.04	1.02	OHIO (Continued)					
Asbury Park	1.19	1.17	1.16	1.17	1.19	Poughkeepsie	1.19	1.19	1.20	1.22	1.20	Lima	0.96	0.97	0.97	0.95	0.97
Atlantic City	1.33	1.31	1.32	1.34	1.33	Rochester	1.10	1.15	1.13	1.12	1.12	Lorain County	1.04	1.05	1.06	1.05	1.06
Bayonne	1.34	1.32	1.30	1.31	1.31	Rome	1.05	1.05	1.05	1.08	1.05	Mansfield	1.00	1.02	0.98	0.98	1.00
Camden	1.24	1.21	1.19	1.19	1.21	Schenectady	1.08	1.08	1.10	1.13	1.11	Marion	1.00	1.02	0.98	0.98	1.00
Clifton	1.31	1.30	1.29	1.29	1.29	Syracuse	1.13	1.12	1.12	1.11	1.13	Middletown	0.94	0.94	0.94	0.95	0.95
East Orange	1.32	1.30	1.29	1.30	1.30	Troy	1.11	1.12	1.14	1.15	1.13	Newark	1.00	1.02	1.00	1.00	1.00
Edison	1.32	1.30	1.29	1.30	1.29	Utica	1.05	1.05	1.06	1.08	1.05	Portsmouth	0.93	0.91	0.91	0.92	0.94
Elizabeth	1.34	1.31	1.30	1.30	1.30	Watertown	1.03	1.02	1.02	1.04	1.02	Springfield	0.97	0.96	0.96	0.98	0.97
Fairlawn	1.32	1.31	1.29	1.30	1.31	NEW YORK CITY AREA	1.45	1.41	1.42	1.44	1.47	Toledo	1.08	1.09	1.08	1.08	1.11
Hackensack	1.32	1.32	1.30	1.30	1.31	Bronx	1.47	1.42	1.44	1.46	1.49	Youngstown	1.09	1.10	1.06	1.04	1.09
Irvington	1.34	1.32	1.32	1.32	1.32	Brooklyn	1.46	1.42	1.43	1.44	1.47	OKLAHOMA	0.92	0.91	0.92	0.91	0.91
Jersey City	1.33	1.32	1.30	1.31	1.31	Manhattan	1.48	1.44	1.44	1.46	1.50	Ardmore	0.95	0.92	0.95	0.92	0.92
Lakewood	1.18	1.17	1.17	1.18	1.18	Nassau County	1.47	1.43	1.43	1.45	1.48	Bartlesville	0.87	0.86	0.87	0.87	0.87
Morristown	1.33	1.31	1.31	1.32	1.32	Orange County	1.30	1.27	1.28	1.28	1.31	Enid	0.93	0.92	0.94	0.94	0.93
New Brunswick	1.32	1.30	1.29	1.30	1.29	Putnam County	1.33	1.28	1.29	1.31	1.33	Lawton	0.88	0.87	0.88	0.86	0.86
Newark	1.35	1.33	1.33	1.34	1.33	Queens	1.46	1.42	1.43	1.44	1.47	Norman	0.96	0.95	0.95	0.94	0.95
Passaic	1.31	1.30	1.29	1.29	1.29	Rockland County	1.33	1.30	1.31	1.32	1.33	Oklahoma City	0.96	0.95	0.95	0.94	0.95
Paterson	1.32	1.31	1.29	1.30	1.31	Staten Island	1.38	1.34	1.33	1.36	1.39	Tulsa	0.91	0.89	0.90	0.91	0.92
Plainfield	1.21	1.19	1.19	1.18	1.19	Suffolk County	1.49	1.46	1.46	1.47	1.50	OREGON	1.09	1.07	1.06	1.05	1.08
Somerville	1.30	1.28	1.28	1.26	1.29	Westchester County	1.34	1.30	1.31	1.33	1.34	Albany	1.09	1.06	1.05	1.03	1.06
Teaneck	1.32	1.32	1.30	1.30	1.30	Yonkers	1.47	1.44	1.44	1.46	1.48	Altamont	1.07	1.04	1.03	1.03	1.07
Trenton	1.29	1.27	1.25	1.26	1.26	NORTH CAROLINA	0.90	0.91	0.90	0.90	0.90	Astoria	1.07	1.07	1.04	1.03	1.06
Vineland	1.20	1.19	1.19	1.20	1.21	Asheville	0.94	0.93	0.92	0.91	0.93	Bend	1.12	1.12	1.12	1.13	1.13
West Orange	1.31	1.29	1.28	1.29	1.28	Charlotte	0.90	0.92	0.91	0.91	0.92	Coos Bay	1.07	1.05	1.04	1.04	1.06
NEW MEXICO	0.95	0.92	0.93	0.93	0.94	Durham	0.95	0.95	0.93	0.93	0.95	Corvallis	1.09	1.06	1.05	1.03	1.05
Alamogordo	0.90	0.88	0.89	0.86	0.89	Fayetteville	0.90	0.92	0.89	0.90	0.89	Eugene	1.14	1.12	1.11	1.10	1.12
Albuquerque	0.92	0.91	0.91	0.90	0.92	Gastonia	0.92	0.92	0.94	0.92	0.93	Grants Pass	1.07	1.04	1.02	1.02	1.07
Carlsbad	0.92	0.89	0.91	0.91	0.90	Goldensboro	0.89	0.90	0.87	0.88	0.89	Klamath Falls	1.06	1.04	1.02	1.02	1.07
Clovis	0.97	0.95	0.95	0.94	0.93	Greensboro	0.89	0.90	0.89	0.89	0.89	Medford	1.08	1.06	1.05	1.05	1.08
Farmington	1.00	0.96	0.96	0.96	0.96	Greenville	0.86	0.88	0.86	0.86	0.86	North Bend	1.07	1.05	1.04	1.05	1.06
Gallup	0.93	0.89	0.90	0.90	0.92	Hickory	0.86	0.87	0.87	0.88	0.86	Pendleton	1.11	1.09	1.08	1.10	1.10
Hobbs	0.90	0.88	0.90	0.90	0.88	Jacksonville	0.87	0.89	0.86	0.86	0.87	Portland	1.12	1.09	1.09	1.08	1.09
Las Cruces	0.94	0.91	0.92	0.91	0.95	Raleigh	0.95	0.95	0.93	0.93	0.95	Roseburg	1.07	1.04	1.01	1.01	1.07
Los Alamos	0.98	0.94	0.97	0.98	0.97	Rocky Mount	0.90	0.91	0.88	0.89	0.89	Salem	1.11	1.10	1.07	1.06	1.07
Portales	0.89	0.87	0.85	0.85	0.86	Wilmington	0.90	0.91	0.90	0.91	0.91	Springfield	1.06	1.03	1.03	1.03	1.06
Roswell	0.99	0.93	0.95	0.94	0.96	Winston-Salem	0.88	0.88	0.88	0.86	0.86	The Dalles	1.13	1.12	1.09	1.08	1.10
Santa Fe	0.97	0.94	0.97	0.96	0.96	NORTH DAKOTA	1.03	1.02	1.02	1.00	1.04	PENNSYLVANIA	1.13	1.12	1.10	1.11	1.11
Taos	1.06	1.03	1.07	1.07	1.06	Bismarck	1.02	1.03	1.01	1.01	1.03	Allentown	1.16	1.18	1.13	1.16	1.11
NEW YORK	1.08	1.08	1.09	1.10	1.09	Fargo	1.01	1.01	1.01	0.98	1.03	Altoona	1.13	1.13	1.10	1.10	1.12
Jamestown	1.04	1.04	1.06	1.05	1.05	Grand Forks	1.02	1.01	1.01	0.99	1.03	Bethlehem	1.13	1.15	1.10	1.13	1.10
Kingston	1.19	1.19	1.19	1.21	1.21	Jamestown	1.02	1.03	1.02	1.00	1.04	Easton	1.11	1.14	1.09	1.11	1.07
Niagara Falls	1.15	1.13	1.13	1.14	1.13	Mandan	1.02	1.03	1.01	1.01	1.03	Erie	1.12	1.12	1.12	1.10	1.10
Albany	1.08	1.09	1.13	1.13	1.11	Minot	1.04	1.02	1.03	1.01	1.05	Harrisburg	1.10	1.08	1.06	1.05	1.08
Amsterdam	1.07	1.08	1.11	1.13	1.09	Williston	1.05	1.03	1.04	1.01	1.06	Johnstown	1.11	1.09	1.09	1.07	1.07
Auburn	1.04	1.03	1.03	1.05	1.04	OHIO	1.01	1.01	1.01	1.00	1.01	Lancaster	1.10	1.08	1.06	1.07	1.07
Binghamton	1.03	1.02	1.01	1.02	1.02	Akron	1.02	1.03	1.03	1.03	1.03	Norristown	1.27	1.25	1.25	1.27	1.25
Buffalo	1.15	1.14	1.17	1.16	1.15	Canton	1.00	1.01	1.00	0.99	1.01	Philadelphia	1.28	1.26	1.26	1.28	1.26
Elmira	1.01	1.00	1.01	1.02	1.01	Cincinnati	0.97	0.99	0.98	0.98	0.99	Pittsburgh	1.14	1.14	1.11	1.11	1.14
Ithaca	1.01	0.99	1.02	1.03	1.00	Cleveland	1.05	1.07	1.07	1.06	1.08	Reading	1.14	1.15	1.11	1.12	1.08
						Columbus	1.02	1.03	1.02	1.01	1.02	Scranton	1.05	1.04	1.04	1.04	1.06
						Dayton	0.97	0.97	0.98	0.99	0.97	State College	1.08	1.06	1.05	1.05	1.06
						East Liverpool	1.08	1.07	1.09	1.06	1.07	Wilkes-Barre	1.05	1.06	1.06	1.04	1.07
						Hamilton	0.94	0.94	0.96	0.95	0.95	Williamsport	1.10	1.06	1.05	1.05	1.10
												York	1.10	1.09	1.07	1.06	1.10

DEPRECIATION

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DEFINITIONS

Depreciation is loss in value due to any cause. It is the difference between the market value of a structural improvement or piece of equipment and its reproduction or replacement cost as of the date of valuation. Depreciation is divided into three general categories, as discussed below.

1. **Physical** depreciation is loss in value due to physical deterioration.
2. **Functional** or technical obsolescence is loss in value due to lack of utility or desirability of part or all of the property, inherent to the improvement or equipment. Thus a new structure or piece of equipment may suffer obsolescence when built.
3. **External**, locational or economic obsolescence is loss in value due to causes outside the property and independent of it, and is not directly included in the tables.

Effective age of a property is its age as compared with other properties performing like functions. It is the actual age less the age which has been taken off by face-lifting, structural reconstruction, removal of functional inadequacies, modernization of equipment, etc. It is an age which reflects a true remaining life for the property, taking into account the typical life expectancy of buildings or equipment of its class and its usage. It is a matter of judgment, taking all factors, current and those anticipated in the immediate future, into consideration. Effective age on older structures may best be calculated by establishing a remaining life which, subtracted from a typical life expectancy, will result in an appropriate effective age with which to work. Effective age can fluctuate year by year or remain somewhat stable in the absence of any major renewals or excessive deterioration.

Extended life expectancy is the increased life expectancy due to seasoning and proven ability to exist. Just as a person will have a total normal life expectancy at birth which increases as he grows older, so it is with structures and equipment.

Remaining life is the normal remaining life expectation. It is the length of time the structure may be expected to continue to perform its function economically at the date of the appraisal. This does not imply a straight-line expiration, particularly for mortgage purposes, since normal recurring maintenance and renewal of replaceable items will continue to contribute toward an extended life expectancy. This extended life process is accomplished by use of effective age as the sliding scale and not by continually lengthening the typical life expectancy as the structure ages chronologically.

Percent good equals 100% less the percentage of cost represented by depreciation. It is the present value of the structure or equipment at the time of appraisal, divided by its replacement cost.

APPROACHES TO DEPRECIATION

The simplest and, in past years, a widely used accounting-type concept of depreciation, particularly with individual short-lived components, is the straight-line (age/life) approach. A life expectancy is estimated and a constant annual percentage (equal wear or serviceability each year) is taken for depreciation so that at the end of that life the depreciation equals 100% of the initial cost. This linear approach is simple and easy to use but does not represent reality in most cases since time is not the only factor affecting depreciation and it fails to recognize any value-in-use. The passage of time may not in itself create additional depreciation if the property or component is well maintained and functionally sound.

While age is a critical factor, the best approach to the physical depreciation estimate is a combination of age and condition. The observed condition of each component subject to wear is estimated relative to new condition. A major replaceable component, such as a HVAC system under heavy loading in a hot, humid climate, can wear out quite rapidly, shortening the life expectancy before replacement, while many other portions of a structure, such as excavations, foundations, and concrete exterior walls, wear out slowly if at all. Such long-lived portions often represent a major portion of the total reproduction cost and if still functional will contribute toward an extended life expectancy. Physical depreciation cannot be considered a straight-line deduction from reproduction cost, since necessary and normal maintenance can offset, retard and, in some cases, even eliminate deterioration.

Another approach to depreciation was called the mid-life theory. This takes into account that most buildings depreciate little during the first few years. When it becomes evident that the buildings are no longer new, even though they are adequately maintained, the maintenance expenses rise, rentals tend to decrease and the building depreciates faster. After a number of years, they reach the period called mid-life, at which time, if the buildings are structurally sound and properly maintained, the depreciation remains constant. The mid-life theory suffers from the fact that maintenance expenses on the average building continue to go up in order to maintain the same appearance and utility, and at any age, certain building features may suffer from obsolescence.

These concepts lead to a third theory, the extended life concept, which starts with the hypothesis that buildings age in much the same manner as people and that the older they get, the greater is their total life expectancy. This concept recognizes that a building is in the prime of life before

mid-life and that the road is downhill after that, but that correction of deficiencies may lower the effective age and lengthen the remaining life. This recurring revitalization process periodically reverses a continuous progression down the effective age scale, reducing the indicated depreciation percentage as components are renewed throughout the life-span of the building. This nonlinear approach accounts for a greater present value or slower depreciation rate in the early years as compared to the later years when diminishing serviceability and higher maintenance can accelerate depreciation.

EXPLANATION OF DEPRECIATION TABLES

The general depreciation tables in this section were developed from actual case studies of sales and market value appraisals and formed the basis of the extended life theory which encompasses a remaining life and effective age approach. From confirmed sales prices the land value was deducted to obtain a building residual, and the replacement cost of the building was computed. The difference between the replacement cost new of the building and the residual sales price of the building was divided by the replacement cost new, to give the market depreciation in percentage. A similar procedure was followed with the market value appraisals, always excluding those observed cases having excessive obsolescence.

The data was then collated by type of construction and usage, plotted with similar typical total life expectancies, with curves computed for the groupings, for which sufficient data was available, for statistical reliability. From these curves, a matching family of empirical mathematical curves was found, from which the depreciation for any initial (when new) life expectancy could be computed under normal market conditions.

A check of equipment depreciation by similar procedures showed that portions of the family of curves, which was used for nonresidential properties, were suitable as an indicator of that depreciation.

Churches were found to fit in the depreciation category of residential structures, and those tables should therefore be used. Motels, hotels and larger apartments are included in the nonresidential tables, while small apartments or multiples are residential in nature. The division between residential and nonresidential depreciation appears to lie in the usage, whether operated solely for income or for amenities.

Thus, a hotel operated commercially would be expected to fit into the commercial family of curves, but if the same building were operated as a private club, its normal depreciation would be expected to follow the residential curve. The proper curve to use is therefore a matter of judgment on the part of the appraiser, considering the usage and the type of return normally expected, whether cash, equity or intangible amenities.

USE OF THE DEPRECIATION TABLES (See Example on page 22)

1. Note from your inspection the overall and/or individual condition, severity of use, utility and remaining life of all building or equipment components.
2. Determine the true age of the structure or equipment.
3. Compare with like properties and study the effect of, or the lack or need of, typical maintenance or any modernization or major repair to determine the effective age.
4. Check the tables and discussion on Pages 10 through 21 for the recommended initial typical (normal) useful life of the occupancy, component or piece of equipment and for any further modification before establishing an appropriate life.
5. Check the properties listed in each depreciation table to see which to use. (Page 24, Non-residential; Page 25, Residential; Page 26, Fixtures and Equipment.)
6. Enter the proper table choosing a typical life expectancy and effective age and read off the normal depreciation, or use the remaining life expectancy as an aid as described below.
7. Note any excessive obsolescence that may require special consideration separate from the normal depreciation developed from the tables. (Review Pages 2 and 3.)

REMAINING LIFE TABLES

The remaining life tables are based on mortality tables derived from studies of building and equipment, discarding all cases of mortality due to excessive obsolescence. Their primary mission is to provide an easy way for the appraiser to determine the normal remaining life expectancy of buildings for use in the capitalization process, using the effective age and the typical life expectancy.

Many times, the remaining life expectancy of a building or piece of equipment can be established more readily than the effective age. The Remaining Life Table on the right side of each depreciation page may then be entered with the remaining life in the proper typical life column and the effective age read off at the left, or the appraiser may move straight across to the left side of the page and read the depreciation directly.

DEPRECIATION

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FUNCTIONAL INDICATORS (Continued)

Some of the external factors affecting the extent of functional obsolescence are:

1. Code Requirements – Most current building codes or zoning for conforming use, height, stories, area, setback, building separation, size/mansionization, energy equivalency tradeoffs, etc., OSHA, fire and life safety, etc. compliance (see below).
2. Fire Protection Requirements – Proper rating, detection for life safety and security, signaling controls, communications, signage, standpipe, sprinklers, extinguishers, hydrants, vents, draft curtains, fans, pumps, door and smoke controls, standby power, emergency phones, appropriate exits, overhang, balcony and deck exposures, stairways, roofing classification, safety or double glazing, fire doors and shutters, etc.
3. Handicapped Requirements – ADA compliance, barrier-free design, parking, ramps, automatic entry, door, hallway widths, markings, signage, alarms, service, cabinet and railing heights, drinking fountains, grab bars, exposed hot-water piping, handicap fixtures, turnaround space, elevator controls, cab size, lifts, etc.
4. Environmental – EPA, wetlands and air quality compliance, water, soil, radon, asbestos, UREA formaldehyde foam insulation, PCBs, CFCs, high-voltage lines, halon, heavy metal or lead contamination, runoff, emissions or sediment containment, detection and testing, septic tanks, leach fields, demolition constraints, disposal or remediation. Evidence of leakage, absence of plants or animals, sick or stressed plants or animals, discolored soil or water, surface sheens and noxious odors, presence of discarded batteries, abandoned wells, sumps, tanks, barrels or other containers of fertilizer, pesticides and herbicides, paints and thinners, heating oil, petroleum or other hazardous chemical substances.
5. Weather Extremes – Appropriate insulation levels, heat gain or loss, shading, passive or active alternatives, energy equivalency tradeoffs, window treatment, glass strength, proper trusses, size, spacing, pitch and drainage for rain and snow loading, proper flashings and penetrations, proper connections for hurricane wind forces, uplift exposure, operable shutters, impact glazing.
6. Earthquakes – Appropriate bracing, connections to structural shell or foundation, shear walls, storefront facade or parapet, overhang exposure, irregular shape, framing stress, torsion, distance from other structures for pounding, etc.

External Obsolescence is a change in the value of a property, usually negative but can be an enhancement, caused by forces outside the property itself, and is not included directly in the tables that follow. It can be divided into two types, locational and economic. Locational factors are generally incurable and may affect only a small area, while economic factors can cover a wide geographic area and may be only temporary and reversible. Different types of property, residential or commercial, will be affected differently by these external forces. For example, it is desirable or advantageous for a manufacturing plant to be situated close to a railroad spur; conversely, it is a disadvantage for a residential property to be located close to that same spur. Close proximity to a major highway is generally much more beneficial for an apartment complex than a single-family residence, etc. Any abnormal, isolated or temporary cases of external obsolescence, usually computed separately, can be measured by market abstraction and capitalization of the imputed loss or gain, which generally affects land values first, then the improvements, by changing the possible uses and altering remaining life.

EXTERNAL INDICATORS

When considering the extent of external obsolescence, pay particular attention to the following indicators in the immediate vicinity, marketing area or community as a whole:

1. Physical Factors – Proximity of desirable or unattractive natural or artificial features or barriers, general neighborhood maturity, conformity, deterioration, rehabilitation or static character, known cleanup sites, fumes, noise, traffic or flight patterns, nuisances, graffiti, waste dump, swamp, toxic industry, electromagnetic fields, brush area, lack of view or landscaping, floodplain, dam inundation area, drainage, water table, sinkholes, fault or seismic zones, soil types, cut and fill, liquefaction, landslides, etc. local ecosystem endangered species, habitat areas.
2. Economic – Demand/supply imbalance, saturation or monopoly, competition or alternatives, market share, industry or major plant relocation, employment development and growth patterns, downsizing, utility and insurance rates, availability of funds or terms, labor and materials, interest rates, vacancy, building rates, general inflation or deflation rates, tenant ratings, length of time on market or lease up or absorption, income streams and returns, changing consumer habits, purchasing power, property association or government forces, zoning, land use, air rights, legal nonconformity, permit, taxing and assessment policies and bureaucracy or other limiting conditions or restrictions.

3. Infrastructure – Surrounding highest and best use; availability, quality and source of utilities; public services; fire stations, staffed or volunteer; distance from hydrants; street improvements; traffic patterns; emergency response, evacuation routes; public parking, transportation and shipping facilities; retail; recreation; education facilities, etc.

General condition ratings can be assigned to the improvement to assist in the development of an appropriate effective age based on observed condition, utility and age. The better the overall condition, the younger or lower the effective age, which lowers the percentage and amount of depreciation. Condition is an integral part in measuring the degree at which items subject to depreciation have been maintained. Applying any additional condition modifier once the effective age has been established based on condition would be redundant.

Effective age will change as conditions fluctuate, determined by the amount of observed deterioration and obsolescence at the date of the appraisal. Over the life of a structure, you could expect the condition rating and effective age to move up and back down the effective age scale many times over. During the mid-life cycles, the effective age will drift upward at a relatively slow pace, assuming normal maintenance, for longer periods of time than at any other period over the structure's entire life span. With each evaluation, the effective age choice must be reconsidered based on the actual conditions encountered at the current date, taking into account any changes that may have taken place since the last appraisal. Neglect or weather extremes could have accelerated condition and age, while major repairs will correct deficiencies to a like-new condition, lowering the effective age and starting the cycle all over again. Operating extremes, such as abrupt increases or decreases in plant or equipment activity from normal or designed usage or excessive rental turnover can certainly impact the rate of wear and tear and maintenance performed.

Certain industries such as fast food, hotels, markets, and other retail chains which are highly competitive and responsive to rapidly changing consumer tastes and/or investor holding periods, may require frequent major renovations and fixture change-outs in search of market share. Consequently, excessive functional and separate economic obsolescence rates that move much faster than normal physical deterioration, may require special consideration, depending on the value sought, before establishing an appropriate effective age and/or typical life expectancy with which to work. Due to the unique character of certain outdoor recreational facilities like golf courses, special attention should be paid to the possible shorter lives of individual land improvements which are subject not only to the constant exposure of the elements, but to the wear and tear from selective use or play. The functionality, composition and age or maturity of the various features that make up each improvement or golf hole can also have a great effect on a facility's maintenance, operational and reserve schedules and expenses, which in turn affect condition, usability or playability and ultimately, depreciation.

CONDITION RATING INDICATORS

Excellent Condition – All items that can normally be repaired or refinished have recently been corrected, such as new roofing, paint, furnace overhaul, state-of-the-art components, etc. With no functional inadequacies of any consequence and all major short-lived components in like-new condition, the overall effective age has been substantially reduced upon complete revitalization of the structure regardless of the actual chronological age.

Very Good Condition – All items well maintained, many having been overhauled and repaired as they've shown signs of wear, increasing the life expectancy and lowering the effective age, with little deterioration or obsolescence evident and a high degree of utility.

Good Condition – No obvious maintenance required, but neither is everything new. Appearance and utility are above the standard, and the overall effective age will be lower than the typical property.

Average Condition – Some evidence of deferred maintenance and normal obsolescence with age in that a few minor repairs are needed, along with some refinishing. But with all major components still functional and contributing toward an extended life expectancy, effective age and utility are standard for like properties of its class and usage.

Fair Condition (Badly Worn) – Much repair needed. Many items need refinishing or overhauling, deferred maintenance obvious, inadequate building utility and services all shortening the life expectancy and increasing the effective age.

Poor Condition (Worn Out) – Repair and overhaul needed on painted surfaces, roofing, plumbing, heating, numerous functional inadequacies, substandard utilities, etc. (found only in extraordinary circumstances). Excessive deferred maintenance and abuse, limited value-in-use, approaching abandonment or major reconstruction; reuse or change in occupancy is imminent. Effective age is near the end of the scale regardless of the actual chronological age.

LIFE EXPECTANCY GUIDELINES

TYPICAL BUILDING LIVES

OCCUPANCY	CLASS	A	B	C	D	S	OCCUPANCY	CLASS	A	B	C	D	S
SECTIONS 14 & 44, GARAGES, INDUSTRIALS AND WAREHOUSES							SECTIONS 14 & 44, GARAGES, INDUSTRIALS AND WAREHOUSES (Continued)						
Armories, good and excellent		---	---	55	50	---	Industrials, manufacturing, heavy, good and excellent		60	60	55	---	50
average		---	---	50	40	40	low cost and average		55	55	50	45	45
Automotive service centers, good		---	---	45	40	40	light, good		50	50	45	40	40
average		---	---	40	35	35	average		50	50	40	35	35
low cost		---	---	35	30	30	low cost		45	45	40	35	35
Broadcasting facilities, good and excellent		55	55	50	45	45	Laboratory buildings, good and excellent		55	55	50	45	45
average		50	50	45	40	40	low cost and average		50	50	45	40	40
low cost		45	45	40	35	35	Lofts, excellent		60	60	---	---	---
Cold storage facilities, excellent		---	---	50	---	45	average and good		55	55	50	40	40
average and good		50	50	45	40	40	low cost		50	50	40	35	---
low cost and fair		---	---	40	35	35	Mini-lube garages, good and excellent		---	---	40	35	35
Complete auto dealerships, good and excellent		50	50	45	40	40	low cost and average		---	---	35	30	30
average		45	45	40	35	35	Mini-warehouses, low and high rise, good		---	---	45	40	40
low cost		---	---	35	30	30	average		45	45	40	35	35
Computer centers, good and excellent		50	50	45	40	40	low cost		---	---	35	30	30
low cost and average		45	45	40	35	35	Parking structures/parkades, good		45	45	---	---	---
Creameries, good		---	---	45	45	45	low cost and average		40	40	---	---	35
average		45	45	35	30	30	cheap		---	---	---	---	30
low cost		---	---	25	20	20	Passenger terminals, very good and excellent		45	45	40	40	---
Garages, municipal service, excellent		---	---	45	---	40	average and good		40	40	35	35	35
average and good		---	---	40	35	35	low cost and fair		35	35	30	30	30
Service and repair garages, good and excellent		---	---	40	35	35	control towers, good		35	35	---	---	---
low cost and average		40	40	35	30	30	average		30	30	---	---	---
Service garage sheds, good		---	---	35	30	30	low cost		25	25	---	---	---
low cost and average		---	---	30	25	25	Post offices, main and branch, good and excellent		60	60	55	50	50
Storage, average		45	45	40	35	35	low cost and average		55	55	50	45	45
Hangars, maintenance, excellent		---	---	45	---	40	mail processing facilities, good		---	---	50	---	45
good		---	---	40	---	40	average		50	50	45	---	40
average		---	---	40	35	35	Showrooms, good and excellent		50	50	45	40	40
low cost		---	---	35	30	30	average		45	45	40	35	35
Storage, excellent		---	---	40	---	40	low cost		---	---	35	30	30
good		---	---	40	---	35	Transit warehouses, average and good		---	---	45	40	40
average		---	---	35	30	30	Underground parking garages, average		45	45	---	---	---
low cost		---	---	30	30	30	Warehouses, distribution, good and excellent		55	55	50	45	45
cheap		---	---	20	20	20	average		50	50	45	40	40
T-hangars, average		---	---	30	---	30	low cost		---	---	40	35	35
low cost		---	---	20	20	20	Storage and mega storage, excellent		---	---	50	---	45
Industrial flex-mall buildings, average and good		---	---	50	40	40	average and good		50	50	45	40	40
low cost		---	---	40	35	35	cheap and low cost		45	45	40	35	35
Industrials, engineering, good and excellent		55	55	50	45	45	Miscellaneous buildings, excellent		60	60	55	45	45
average		50	50	45	40	40	average and good		55	55	50	40	40
low cost		50	50	40	35	35	low cost		50	50	40	35	35
		---	---	---	---	---	Misc. structures, shipping docks		---	---	---	40	40
		---	---	---	---	---	loading docks, excellent		---	---	---	35	35
		---	---	---	---	---	average and good		---	---	---	30	30
		---	---	---	---	---	low cost		---	---	---	25	25

LIFE EXPECTANCY GUIDELINES

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TYPICAL BUILDING LIVES

OCCUPANCY	CLASS	A	B	C	D	S	OCCUPANCY	CLASS	A	B	C	D	S
SECTIONS 15 & 45, BANKS, OFFICES AND PUBLIC BUILDINGS							SECTIONS 16 & 46, CHURCHES, THEATERS AND AUDITORIUMS						
Atriums, good and excellent		60	60	55	50	50	Arcade buildings, good and excellent				45	40	----
average		55	55	50	45	45	average				40	35	35
Banks, branch and central, good and excellent		60	60	55	50	50	low cost				35	30	30
average		55	55	50	45	45	Auditoriums, excellent		55	55	50	45	----
low cost		50	50	45	40	40	average and good		50	50	45	40	40
mini, drive-up, good and excellent		55	55	50	45	45	low cost				40	35	35
low cost and average		50	50	45	40	40	Bowling centers, good and excellent				40	35	35
Convalescent hospitals, good and excellent		50	50	45	40	----	low cost and average				35	30	30
low cost and average		45	45	40	35	35	Casinos, very good				50	----	----
Dispensaries and urgent care, good		50	50	40	35	35	good				45	40	----
average		45	45	35	30	30	average				40	35	35
Fire stations, staffed, good, very good and excellent		50	50	45	40	40	low cost				35	30	30
low cost and average		45	45	40	35	35	Churches, sanctuaries, narthexes, classrooms, excellent		60	60	60	50	----
volunteer, good		----	----	40	35	35	good		60	60	50	45	45
low cost and average		40	40	35	30	30	average		50	50	45	40	40
General hospitals, good and excellent		50	50	45	40	----	cheap and low cost				40	35	35
low cost and average		45	45	40	35	35	Community recreation centers, good and excellent		50	50	45	40	40
Governmental buildings, good and excellent		60	60	55	50	----	low cost and average		45	45	40	35	35
low cost and average		55	55	50	40	40	Convention centers, good and excellent		55	55	50	45	----
Community service buildings, excellent		----	----	55	50	----	average		50	50	45	40	40
average and good		55	55	50	40	40	low cost		45	45	40	35	35
low cost		50	50	45	35	35	Fellowship halls, good and excellent		50	50	45	40	40
Jails, correctional facilities, good and excellent		55	55	45	40	----	low cost and average		45	45	40	35	35
low cost and average		50	50	40	35	35	cheap				30	30	30
Police stations, good and excellent		55	55	50	45	----	Fitness centers, good and excellent		50	50	45	40	40
average		50	50	45	40	----	average		45	45	40	35	35
low cost		45	45	40	----	----	Fraternal buildings, excellent		55	55	50	45	----
Kennels, very good and excellent		----	----	45	40	----	good		50	50	45	40	----
average and good		----	----	40	35	35	average		45	45	40	35	35
low cost		----	----	35	30	30	low cost				35	30	30
cheap		----	----	25	20	20	Handball/racquetball clubs, good				45	40	40
Medical offices, good and excellent		50	50	45	40	40	average				40	35	35
low cost and average		45	45	40	35	35	Indoor tennis clubs, good				45	40	40
Dental clinics, good and excellent		----	----	45	40	40	average				40	35	35
low cost and average		----	----	40	35	35	low cost				35	30	30
Offices, good and excellent		60	60	55	50	50	Museums, good and excellent		60	60	55	50	----
average		55	55	50	45	45	average		55	55	50	45	----
low cost		50	50	45	40	40	low cost				40	35	35
Outpatient (surgical) centers, good and excellent		50	50	45	40	----	Pavilions, excellent				50	45	----
low cost and average		45	45	40	35	35	very good				45	40	----
Parking levels, excellent		60	60	----	----	----	good				40	35	----
good		55	55	50	50	50	fair and average				35	30	30
average		50	50	45	45	45	low cost				30	25	25
low cost		30	30	25	25	25	cheap				25	20	20
cheap		25	25	20	20	20	Skating rinks, good and excellent		50	50	45	40	40
Public libraries, good, very good and excellent		60	60	55	50	50	average		45	45	40	35	35
average		55	55	50	45	45	low cost				35	30	30
low cost		----	----	45	40	40	Theaters, live-stage presentation, good and excellent		50	50	45	40	----
Veterinary hospitals, excellent		----	----	45	40	----	fair and average		45	45	45	40	40
average and good		45	45	40	35	35	low cost				40	35	35
low cost		----	----	35	30	30	Motion picture/cinema, very good and excellent		50	50	45	40	----
Misc. buildings: firing ranges, good and excellent		----	----	45	40	40	average and good		45	45	40	35	35
low cost and average		----	----	40	35	35	low cost and fair				35	30	30
							Visitor centers, good and excellent		55	55	50	45	----
							average		50	50	45	40	40
							low cost				40	35	35

DEPRECIATION – COMMERCIAL PROPERTIES

EFFECTIVE AGE IN YEARS	TYPICAL LIFE EXPECTANCY IN YEARS										EFFECTIVE AGE IN YEARS	TYPICAL LIFE EXPECTANCY IN YEARS									
	70	60	55	50	45	40	35	30	25	20		70	60	55	50	45	40	35	30	25	20
	DEPRECIATION – PERCENTAGE											REMAINING LIFE EXPECTANCY – YEARS									
1	0	0	0	0	1	1	1	2	2	3	1	69	59	54	49	44	39	34	29	24	19
2	0	1	1	1	1	2	2	3	5	7	2	68	58	53	48	43	38	33	28	23	18
3	0	1	1	1	2	3	4	5	7	10	3	67	57	52	47	42	37	32	27	22	17
4	1	1	1	2	3	4	5	7	10	14	4	66	56	51	46	41	36	31	26	21	16
5	1	1	2	3	4	5	6	9	13	18	5	65	55	50	45	40	35	30	25	20	15
6	1	2	2	3	4	6	8	11	16	22	6	64	54	49	44	39	34	29	24	19	14
7	1	2	3	4	5	7	10	14	19	26	7	63	53	48	43	38	33	28	23	18	13
8	1	2	3	5	6	8	11	16	22	30	8	62	52	47	42	37	32	27	22	17	12
9	2	3	4	5	7	10	13	18	25	35	9	61	51	46	41	36	31	26	21	16	11
10	2	3	4	6	8	11	15	21	29	40	10	60	50	45	40	35	30	25	20	15	10
11	2	4	5	7	9	13	17	24	32	45	11	59	49	44	39	34	29	24	19	14	9
12	2	4	6	8	10	14	19	26	36	50	12	58	48	43	38	33	28	23	18	13	8
13	2	5	6	9	12	16	22	29	40	55	13	57	47	42	37	32	27	22	17	12	7
14	3	5	7	10	13	18	24	32	44	60	14	56	46	41	36	31	26	21	16	11	6
15	3	6	8	11	14	20	26	35	48	65	15	55	45	40	35	30	25	20	15	10	5
16	3	7	9	12	16	22	28	39	52	69	16	54	44	39	34	29	24	19	14	9	4
17	4	7	10	13	18	24	31	42	56	73	17	53	43	38	33	28	23	18	13	8	4
18	4	8	11	14	19	26	34	46	60	76	18	52	42	37	32	27	22	17	12	7	3
19	4	9	12	16	21	28	36	49	64	78	19	51	41	36	31	26	21	16	11	6	2
20	5	9	13	17	23	30	39	53	68	79	20	50	40	35	30	25	20	15	10	5	2
21	5	10	14	18	25	32	42	57	71	80	21	49	39	34	29	24	19	14	9	5	2
22	6	11	15	20	27	35	45	60	73		22	48	38	33	28	23	18	13	8	4	
23	6	12	16	21	29	37	48	63	75		23	47	37	32	27	22	17	12	7	3	
24	7	13	17	23	31	40	52	66	77		24	46	36	31	26	21	16	11	6	3	
25	7	14	19	25	33	43	55	69	79		25	45	35	30	25	20	15	10	6	2	
26	8	15	20	27	35	46	58	72	80		26	44	34	29	24	19	14	9	5	2	
27	9	16	21	28	37	49	61	75			27	43	33	28	23	18	13	8	4		
28	9	17	23	30	40	52	64	77			28	42	32	27	22	17	12	7	4		
29	10	18	24	32	42	54	68	78			29	41	31	26	21	16	11	7	3		
30	11	20	26	34	45	57	72	79			30	40	30	25	20	15	10	6	3		
32	13	22	30	38	50	62	75	80			32	38	28	23	18	13	8	5	2		
34	15	25	34	43	55	68	77				34	36	26	21	16	11	7	4			
36	17	28	38	48	61	73	79				36	34	24	19	14	10	6	3			
38	19	32	42	53	67	77	80				38	32	22	17	12	8	5	2			
40	21	35	46	59	72	79					40	30	20	15	10	7	4				
42	25	39	51	65	75	80					42	28	18	13	9	6	3				
44	28	43	56	70	77						44	26	16	12	8	5					
46	31	48	60	74	78						46	24	14	10	7	4					
48	34	53	64	77	79						48	22	13	9	6	3					
50	38	58	68	79	80						50	20	11	8	5	3					
55	48	67	75	80							55	16	8	6	3						
60	57	74	78								60	12	6	4							
65	65	78	80								65	9	4	3							
70	71	80									70	7	3								
75	75										75	5									
80	78										80	4									

PROPERTIES INCLUDED

Section 11 All apartments, hotels, resorts
 Section 12 Motels, lodges, large multiples & resorts
 Section 13 All
 Section 14 All
 Section 15 All except libraries
 Section 16 All except churches and fraternal bldgs.
 Section 17 All commercial and industrial uses
 Section 18 None
 Section 64 All commercial and industrial uses
 For lives less than 20 years, see Page 18.

SEGREGATED COST METHOD

GARAGES, INDUSTRIALS, LOFTS AND WAREHOUSES

PLUMBING – Apply Table I to total floor area. Use Table II or Section 53 for more detail.
TABLE I – Typical cost ranges.

	1	2	3	4
Armories	4.70	6.79	9.78	14.10
Automotive centers	2.73	4.06	6.03	8.95
Auto dealerships, complete	2.78	4.16	6.21	9.27
Broadcasting facilities	2.95	4.33	6.37	9.36
Cold storage facilities	1.10	1.96	3.23	5.15
Computer centers	4.55	6.01	7.93	10.45
Creameries	5.60	8.85	13.70	21.00
Garages, minilube	5.27	8.43	13.15	20.25
service, lower qualities	2.04	3.42	5.48	8.55
higher qualities (incl. municipal service centers)	3.43	5.60	8.83	13.65
service shed	0.30	0.44	0.66	0.99
storage	1.34	2.05	3.12	4.71
underground parking	1.47	1.89	2.43	3.13
Hangers, storage	0.59	1.20	2.13	3.51
maintenance and offices	2.01	3.63	6.05	9.66
Industrials, manufacturing, light	1.48	2.42	3.83	5.92
heavy	5.34	6.42	7.72	9.29
engineering and research	3.80	5.54	8.09	11.80
laboratories	14.65	21.15	30.50	44.25
Lofts	1.97	3.59	6.02	9.63
flex buildings	1.59	2.67	4.27	6.66
miniwarehouses	0.33	0.89	1.72	2.98
high-rise facilities	0.53	1.14	2.05	3.41
parking structures, parkades	0.61	1.19	2.06	3.37
passenger terminals	6.71	9.88	14.55	21.35
post offices, branch	3.65	4.92	6.62	8.92
main	4.12	5.77	8.09	11.35
processing facilities	4.53	6.27	8.68	12.00
showrooms	4.02	5.66	7.96	11.20
T-hangers	0.42	0.71	1.14	1.78
Warehouses, storage	0.87	1.57	2.62	4.18
distribution	2.27	3.41	5.11	7.65
mega storage/distribution	0.30	0.64	1.14	1.89
transit	3.36	4.36	5.66	7.35

TABLE II – ALTERNATE METHOD – Apply to total number of fixtures. Do not use these costs if Table I is used.

Cost per fixture	2,650.00	3,750.00	5,350.00	7,600.00
Cost per tap or drain without fixture	510.00	655.00	840.00	1,090.00

SPRINKLERS – Apply to sprinklered area. Costs include all piping for ordinary-hazard occupancies but do not include tanks. For extra-hazard occupancies, such as hangers, add 15% to the costs below. For supplemental in-rack systems, add 30% to 100% per level. For early-suppression, fast-response system, add \$.50 plus \$1.00 – \$1.48 for pumps. Chemical systems: see Section 53. For further discussion, see Sections 14 and 40.

Area	1	2	3	4
2,500 square feet	2.96	3.94	5.26	7.00
5,000	2.66	3.52	4.65	6.16
10,000	2.41	3.16	4.14	5.42
15,000	2.26	2.95	3.85	5.03
20,000	2.15	2.79	3.64	4.74
30,000	2.03	2.63	3.41	4.40
40,000	1.94	2.51	3.23	4.17
50,000	1.89	2.42	3.12	4.00
60,000	1.83	2.34	3.01	3.85
80,000	1.75	2.23	2.85	3.65
100,000	1.70	2.17	2.76	3.52

SPRINKLERS (Continued)

	1	2	3	4
125,000 square feet	1.64	2.08	2.65	3.37
150,000	1.59	2.02	2.57	3.26
200,000	1.53	1.94	2.45	3.10
250,000	1.48	1.86	2.35	2.96
300,000	1.44	1.81	2.27	2.84
400,000	1.39	1.74	2.17	2.70
600,000	1.29	1.61	2.01	2.52
800,000	1.24	1.55	1.93	2.40
1,000,000	1.19	1.48	1.84	2.29

HEATING, COOLING AND VENTILATING – Apply to total floor area.

Add or deduct 3% for each foot of variation in average story height from 14' base.

Costs are given for gas-fired heating surfaces. Add or deduct as follows for other fuels.

Oil-fired +7% Coal, stoker +7% Coal, hand-fired -2%

For Passenger Terminals, Research Labs and Cold Storage Buildings, use costs in Section 14.

Heating Only

Electric cable or baseboard	2.62	3.40	4.41	5.73
radiant panels	2.49	2.97	3.53	4.21
Electric wall heaters (including FWA)	1.37	1.63	1.95	2.33
Forced air	2.99	3.86	5.00	6.47
Hot water, baseboard or radiators	4.84	6.45	8.59	11.45
radiant floor	4.69	6.47	8.90	12.25
Radiant heat, gas, suspended	1.45	1.97	2.68	3.65
Space heaters, gas, with fan	1.21	1.68	2.35	3.26
steam coil, with boiler	2.05	2.67	3.46	4.49
steam coil, without boiler	1.45	1.95	2.62	3.52
Steam radiator, with boiler	4.62	5.98	7.72	9.99
without boiler	3.72	4.94	6.55	8.70
Wall or floor furnace	1.45	1.77	2.15	2.62

Heating and Cooling

Zoned A.C., hot and chilled water	12.55	16.60	21.90	29.00
warm and cooled air	7.24	9.67	12.95	17.25
Package heating and cooling, short ducts	5.51	7.26	9.56	12.60
Heat-pump system	5.93	8.22	11.40	15.80
add for ground-loop heat source	1.53	2.22	3.23	4.69
Individual thru-wall heat pump	2.57	3.52	4.84	6.63

Cooling Only

Evaporative coolers	2.57	3.07	3.68	4.40
Refrigerated air conditioning only, zoned system	4.97	6.41	8.24	10.65
package unit, short ducts	3.52	4.44	5.59	7.04
Ventilation only, with ducts & blowers	0.90	1.16	1.48	1.89

MISCELLANEOUS – Apply to square feet of floor area of described laminar flow coverage.

These costs vary greatly and the following typical cost ranges should be used with caution.

Clean rooms, class 100,000 to 10,000	164.00	221.00	293.00	390.00
class 1,000 to 100	493.00	590.00	715.00	855.00
class 100 to 10	820.00	1,430.00	2,320.00	3,675.00



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CALCULATOR METHOD

INDUSTRIALS, LIGHT MANUFACTURING (494)

CLASS	TYPE	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING, PLUMBING AND MECHANICAL	HEAT	Sq. M.	COST Cu. Ft.	Sq. Ft.
A	Average	Brick on block or tile, concrete or metal panels, storefront entry	Painted walls and ceilings, finished floors and ceilings in offices	*Adequate lighting and plumbing	Hot water	846.80	5.62	78.67
	Low cost	Low-cost brick or block, little fenestration, precast floors	Painted walls, few offices, very plain and open	*Minimum lighting and plumbing	Space heaters	587.07	3.90	54.54
B	Average	Brick, formed concrete, or precast walls, little trim, storefront entry	Painted walls and ceilings, finished floors and ceilings in offices	*Adequate lighting and plumbing	Hot water	796.00	5.28	73.95
	Low cost	Low-cost brick or block, little fenestration, precast floors	Painted walls, few offices, very plain and open	*Minimum lighting and plumbing	Space heaters	548.21	3.64	50.93
C	Good	Bearing walls or frame, brick, concrete panels, good glass storefront	Some finished walls, finished floors and ceilings in offices	Good fluorescent lighting, adequate plumbing	Space heaters	746.38	4.95	69.34
	Average	Light frame or bearing walls, brick, block or tilt-up, some trim	Painted walls and exposed frame, small finished offices	Exposed conduit, fluorescent lighting, adequate plumbing	Space heaters	537.77	3.57	49.96
	Low cost	Very plain, brick, block, or tilt-up, few openings	Small office area, unfinished floors and ceilings	Minimum lighting and plumbing	Space heaters	389.76	2.59	36.21
D	Good	Good frame with stucco or siding, some ornamentation	Some good offices and interior finish	Good lighting, exposed conduit, adequate plumbing	Space heaters	689.43	4.58	64.05
	Average	Wood studs, stucco, wood rafters and sheathing, some trim	Drywall, finished office area, exposed rafters or trusses	Adequate lighting and plumbing	Space heaters	490.41	3.25	45.56
	Low cost	Wood studs or frame, cheap stucco or siding	Unfinished, low-cost slab, small office, minimum code	Minimum lighting and plumbing	Space heaters	351.12	2.33	32.62
DPOLE	Good	Pole frame, metal siding, lined and insulated, some trim, glass entry	Some good offices and interior finish	Good lighting, exposed conduit, adequate plumbing	Space heaters	613.76	4.07	57.02
	Average	Pole frame, metal siding, fully lined and insulated	Finished office area, slab, some floor finish	Adequate lighting and plumbing	Space heaters	439.71	2.92	40.85
	Low cost	Pole frame, metal siding, insulated, few openings	Low-cost slab, few partitions, small office	Minimum code, factory lighting	Space heaters	317.11	2.10	29.46
S	Good	Steel frame, sandwich panels, good glass storefront entry and trim	Some good offices and interior finish	Good lighting, exposed conduit, adequate plumbing	Space heaters	671.67	4.46	62.40
	Average	Steel frame, steel or aluminum siding, some trim	Finished office area, slab, some floor finish	Adequate lighting and plumbing	Space heaters	474.15	3.15	44.05
	Low cost	Light steel frame, steel or aluminum siding, few openings	Low-cost slab, unfinished interior, small office	Minimum code, factory lighting	Space heaters	337.02	2.24	31.31

DOCK-HEIGHT FLOORS – See Page 27.

SPRINKLERS – Systems are not included. Costs should be added from Page 37.

BASEMENTS – See Page 18.

***ELEVATORS** – Buildings with base costs which include elevators are marked with an asterisk (*). If the subject building has no elevators, deduct the following from the base costs for the buildings on this page which are so marked. For buildings not marked or for basement stops, add costs from Page 36.

MEZZANINES – See Page 27.

MULTISTORY BUILDINGS – Add .5% (1/2%) for each story over three, above ground, to all base costs of the building, including basements, but excluding mezzanines.

Classes A and B	Sq. M.	Sq. Ft.	Sq. M.	Sq. Ft.
Average	23.57	2.19	Low cost	17.98 1.67

CALCULATOR METHOD

INDUSTRIALS, HEAVY (PROCESS) MANUFACTURING (495)

CLASS	TYPE	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING, PLUMBING AND MECHANICAL	HEAT	Sq. M.	COST Cu. Ft.	Sq. Ft.
A	Excellent	Heavy structural frame and masonry or concrete walls	Extra heavy floors, partitions and craneways, specialized plant	*Excellent lighting and plumbing, spark-proof fixtures	Hot and chilled water (zoned)	2,612.53	17.34	242.71
	Good	Good curtain walls, good brick and glass, with ornamentation	Finished walls and ceilings, some finished floors, heavy craneways	*Good fluorescent lighting, good plumbing, some extras	Hot and chilled water (zoned)	2,100.92	13.94	195.18
	Average	Face brick, metal panels, industrial glass, ornamentation	Plaster walls, some trim, heavy-duty floors, good offices, craneways	*Good fluorescent lighting, adequate plumbing, locker rooms	Warm and cool air (zoned)	1,608.79	10.68	149.46
	Low cost	Brick on block or tile, concrete or metal panels, little trim	Painted walls and ceilings, heavy-duty floors, open fabrication	*Adequate lighting and plumbing	Hot water	1,250.02	8.30	116.13
B	Excellent	Heavy concrete frame and masonry or concrete walls	Extra heavy floors, partitions and craneways, specialized plant	*Excellent lighting and plumbing, spark-proof fixtures	Hot and chilled water (zoned)	2,511.67	16.67	233.34
	Good	Good curtain walls, good brick and glass, with ornamentation	Finished walls and ceilings, some finished floors, heavy craneways	*Good fluorescent lighting, good plumbing, some extras	Hot and chilled water (zoned)	2,018.90	13.40	187.56
	Average	Face brick, concrete curtain walls, some ornamentation	Plaster walls, some trim, heavy-duty floors, good offices, craneways	*Good fluorescent lighting, adequate plumbing, locker rooms	Warm and cool air (zoned)	1,541.94	10.23	143.25
	Low cost	Brick, formed concrete, or precast walls, little trim	Painted walls and ceilings, heavy-duty floors, open fabrication	*Adequate lighting and plumbing	Hot water	1,195.56	7.93	111.07
C	Good	Heavy steel or concrete frame, good masonry walls	Heavy floors, grating, good partitions and craneways	Good fluorescent lighting, good plumbing, some extras	Warm and cool air (zoned)	1,615.57	10.72	150.09
	Average	Structural frame, brick, concrete panels	Heavy slab floors, offices, stores, some heavy assembly, craneways	Good fluorescent lighting, adequate plumbing, locker rooms	Hot water	1,207.94	8.02	112.22
	Low cost	Steel or glulam frame, brick, block, or tilt-up, some trim	Painted walls and exposed frame, small finished offices, good slab	Exposed conduit, fluorescent lighting, adequate plumbing	Space heaters	870.92	5.78	80.91
C_{MILL}	Good	Mill-type construction, brick walls, wood or steel trusses	Finished walls and ceilings, some floor finish, heavy mill-type floors	*Fluorescent lighting, modernized plumbing	Steam	1,030.33	6.84	95.72
	Average	Mill-type construction, brick walls, wood trusses	Painted walls, few small offices, mill-type floors	*Average lighting and plumbing	Steam	785.13	5.21	72.94
D	Average	Heavy wood frame, wood or stucco siding	Heavy slab or mill-type floors, finished office area, some heavy assembly	Good lighting, adequate plumbing and locker rooms	Space heaters	1,078.45	7.16	100.19
	Low cost	Wood frame, stucco or siding	Finished office area, good slab, some floor finish, open fabrication	Adequate lighting and plumbing	Space heaters	829.69	5.51	77.08
S	Good	Structural steel, heavy steel siding, transite, sandwich panels	Heavy floors, grating, good partitions and craneways	Good fluorescent lighting and plumbing, some extras	Warm and cool air (zoned)	1,510.08	10.02	140.29
	Average	Heavy steel frame, transite or metal siding, sandwich panels	Heavy slab floors, offices, stores, some heavy assembly, craneways	Good lighting, exposed conduit, adequate plumbing, locker rooms	Space heaters	1,070.91	7.11	99.49
	Low cost	Steel frame, steel or aluminum siding, some trim	Finished office area, good slab, some floor finish, open fabrication	Adequate lighting and plumbing	Space heaters	818.17	5.43	76.01

CRANES – Material-handling systems are not included. See Section 58.

DOCK-HEIGHT FLOORS – See Page 27.

BASEMENTS – See Page 18.

MEZZANINES – See Page 27.

MULTISTORY BUILDINGS – Add .5% (1/2%) for each story over three, above ground, to all base costs of the building, including basements, but excluding mezzanines.

SPRINKLERS – Systems are not included. Costs should be added from Page 37.

***ELEVATORS** – Buildings with base costs which include elevators are marked with an asterisk (*). If the subject building has no elevators, deduct the following from the base costs for the buildings on this page which are so marked. For buildings not marked or for basement stops, add costs from Page 36.

Classes A and B & C _{MILL}	Sq. M.	Sq. Ft.	Average	Sq. M.	Sq. Ft.
Excellent	38.97	3.62	Low	18.62	1.73
Good	31.00	2.88			

CALCULATOR METHOD

STORAGE WAREHOUSES (406)

CLASS	TYPE	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING, PLUMBING AND MECHANICAL	HEAT	Sq. M.	COST Cu. Ft.	Sq. Ft.
A	Good	Ornamental concrete or brick, small office front	Plaster or drywall with partitions, some finished ceilings	*Good lighting, plumbing, adequate restrooms	Hot water	954.66	6.34	88.69
	Average	Brick on block or tile, concrete panels, very plain	Painted walls, few partitions, small offices	*Adequate lighting and plumbing	Space heaters	701.38	4.65	65.16
	Low cost	Low-cost block, tile or concrete	Unfin., small office, few partitions	*Minimum lighting/plumbing	Space heaters	552.09	3.66	51.29
B	Good	Ornamental concrete or brick, small office front	Plaster or drywall with partitions, finished ceilings in most areas	*Good lighting, plumbing, adequate restrooms	Hot water	899.22	5.97	83.54
	Average	Brick on block or tile, concrete panels, very plain	Painted walls, few partitions, small offices	*Adequate lighting and plumbing	Space heaters	654.56	4.34	60.81
	Low cost	Low-cost block, tile or concrete	Unfin., small office, few partitions	*Minimum lighting/plumbing	Space heaters	512.69	3.40	47.63
C	Excellent	Brick, concrete, good facade	Plaster or drywall, partitioned, finished ceilings in most areas	Good lighting and plumbing	Package A.C.	997.28	6.62	92.65
	Good	Steel frame, good brick, block, or tilt-up, tapered girders	Plaster or drywall, some masonry partitions, good offices	Good lighting, adequate plumbing	Space heaters	645.73	4.29	59.99
	Average	Steel or wood frame or bearing walls, brick, block, or tilt-up	Painted walls, finished office, hardened slab	Adequate lighting, low-cost plumbing fixtures	Space heaters	453.59	3.01	42.14
	Low cost	Block, cheap brick, tilt-up, light construction	Unfinished, small office, shell type, minimum code	Minimum lighting and plumbing	Space heaters	320.98	2.13	29.82
C_{MILL}	Good	Mill-type construction, brick walls, wood or steel trusses	Plaster walls, masonry partitions, painted trusses	*Good lighting, adequate plumbing	Steam	882.00	5.85	81.94
	Average	Mill-type construction, brick and block, wood trusses	Painted walls, few partitions, small offices	*Adequate lighting and plumbing	Space heaters	611.72	4.06	56.83
D	Good	Heavy wood frame, wood or stucco siding	Heavy slab or mill-type floors	Good lighting, adequate plumbing	Space heaters	583.84	3.87	54.24
	Average	Stucco on wood frame, wood trusses	Small office, average slab	Adequate lighting, low-cost plumbing fixtures	Space heaters	408.82	2.71	37.98
	Low cost	Stucco or siding on wood	Unfinished, slab, utility type, minimum office	Minimum lighting and plumbing	Space heaters	288.69	1.92	26.82
D_{POLE}	Average	Pole frame, good metal siding, insulated	Small office, some finish, slab	Adequate lighting, little plumbing	Space heaters	350.69	2.33	32.58
	Low cost	Pole frame, metal siding	Unfinished utility type, light slab, minimum office	Minimum lighting and plumbing	Space heaters	248.65	1.65	23.10
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.	903.96	6.00	83.98
	Good	Good steel frame, siding and fenestration	Some good office, interior finish and floor	Good lighting, adequate plumbing	Space heaters	573.72	3.81	53.30
	Average	Rigid steel frame, siding	Small office, average slab	Adequate lighting, low-cost plumbing fixtures	Space heaters	398.48	2.64	37.02
	Low cost	Pre-engineered frame, metal siding	Unfinished utility type, light slab, minimum office	Minimum lighting and plumbing	Space heaters	279.22	1.85	25.94

NOTE: For light commodity storage, see Section 17.

MULTISTORY BUILDINGS – Add .5% (1/2%) for each story, over three above ground, to all base costs of the building, including basements but excluding mezzanines.

SPRINKLERS – Systems are not included. Costs should be added from Page 37.

DOCK-HEIGHT FLOORS – See Page 27.

WAREHOUSE SHELLS – See Page 35.

***ELEVATORS** – Buildings with base costs which include elevators are marked with an asterisk (*). If the subject building has no elevators, deduct the following from the base costs for buildings on this page, which are so marked. For buildings not marked or for basement stops, add costs from Page 36.

	Sq. M.	Sq. Ft.	Sq. M.	Sq. Ft.	Sq. M.	Sq. Ft.		
Good	\$26.59	\$2.47	Average . . .	\$21.64	\$2.01	Low Cost . .	\$16.68	\$1.55

CALCULATOR METHOD

GARAGES, INDUSTRIALS, LOFTS AND WAREHOUSES FLOOR AREA – PERIMETER MULTIPLIERS

AVERAGE FLOOR AREA		M. FT.	AVERAGE PERIMETER																AVERAGE FLOOR AREA		
Sq.M.	Sq. Ft.		30	38	46	53	61	76	91	107	122	137	152	183	213	244	274	305	Sq. Ft.	Sq. M.	
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	
650	7,000		---	---	---	---	---	---	1.008	1.040	1.071	1.102	1.132	1.192	1.252	---	---	---	7,000	650	
743	8,000		---	---	---	---	---	.984	1.013	1.040	1.068	1.094	1.147	1.199	1.252	---	---	---	8,000	743	
929	10,000		---	---	---	---	---	---	.972	.996	1.019	1.040	1.083	1.125	1.168	1.210	---	---	10,000	929	
1,115	12,000		---	---	---	---	---	---	---	.965	.984	1.003	1.040	1.077	1.112	1.147	1.182	---	12,000	1,115	
1,301	14,000		---	---	---	---	---	---	---	.945	.961	.977	1.008	1.040	1.071	1.102	1.132	---	14,000	1,301	
1,486	16,000		---	---	---	---	---	---	---	---	.943	.957	.984	1.013	1.040	1.068	1.094	---	16,000	1,486	
1,672	18,000		---	---	---	---	---	---	---	---	.929	.942	.967	.991	1.016	1.040	1.065	---	18,000	1,672	
1,858	20,000		---	---	---	---	---	---	---	---	---	.926	.949	.972	.996	1.019	1.040	---	20,000	1,858	
2,323	25,000		---	---	---	---	---	---	---	---	---	---	.907	.924	.942	.959	.977	.996	---	25,000	2,323
2,787	30,000		---	---	---	---	---	---	---	---	---	---	---	.907	.921	.935	.949	.965	---	30,000	2,787
3,252	35,000		---	---	---	---	---	---	---	---	---	---	---	.896	.907	.919	.932	.945	---	35,000	3,252
3,716	40,000		---	---	---	---	---	---	---	---	---	---	---	---	.899	.907	.916	.926	---	40,000	3,716
4,181	45,000		---	---	---	---	---	---	---	---	---	---	---	---	---	.898	.907	.916	---	45,000	4,181
4,645	50,000		---	---	---	---	---	---	---	---	---	---	---	---	---	.891	.898	.907	---	50,000	4,645

AVERAGE FLOOR AREA		M. FT.	AVERAGE PERIMETER																AVERAGE FLOOR AREA	
Sq.M.	Sq. Ft.		274	305	335	366	396	427	457	488	518	549	579	610	671	731	792	914	Sq. Ft.	Sq. M.
1,858	20,000		1.019	1.040	1.062	1.083	---	---	---	---	---	---	---	---	---	---	---	---	20,000	1,858
2,323	25,000		.977	.996	1.015	1.032	1.049	1.066	---	---	---	---	---	---	---	---	---	---	25,000	2,323
2,787	30,000		.949	.965	.980	.995	1.010	1.025	1.040	---	---	---	---	---	---	---	---	---	30,000	2,787
3,252	35,000		.932	.945	.957	.969	.982	.995	1.008	1.021	---	---	---	---	---	---	---	---	35,000	3,252
3,716	40,000		.916	.926	.937	.949	.961	.972	.984	.995	1.007	1.019	---	---	---	---	---	---	40,000	3,716
4,181	45,000		.907	.916	.926	.935	.945	.955	.965	.975	.985	.995	1.005	1.015	---	---	---	---	45,000	4,181
4,645	50,000		.898	.907	.916	.924	.933	.942	.950	.959	.968	.977	.986	.996	1.015	---	---	---	50,000	4,645
5,574	60,000		.889	.895	.901	.907	.914	.921	.928	.935	.942	.949	.957	.965	.980	.995	---	---	60,000	5,574
6,503	70,000		.877	.884	.890	.896	.902	.907	.913	.919	.925	.932	.939	.945	.957	.969	.982	---	70,000	6,503
7,432	80,000		.869	.875	.881	.887	.893	.898	.903	.907	.911	.916	.921	.926	.937	.949	.961	.984	80,000	7,432
9,290	100,000		---	.863	.868	.872	.877	.882	.887	.891	.895	.899	.903	.907	.916	.924	.933	.950	100,000	9,290
11,148	120,000		---	.856	.859	.863	.867	.871	.875	.879	.883	.887	.891	.895	.901	.907	.914	.928	120,000	11,148
13,006	140,000		---	.851	.854	.857	.860	.863	.867	.871	.874	.877	.880	.884	.890	.896	.902	.913	140,000	13,006
14,864	160,000		---	---	.850	.853	.855	.858	.860	.863	.866	.869	.872	.875	.881	.887	.893	.903	160,000	14,864
16,722	180,000		---	---	.846	.849	.851	.854	.856	.858	.860	.863	.866	.869	.874	.879	.884	.895	180,000	16,722
18,580	200,000		---	---	---	.846	.848	.850	.853	.855	.857	.859	.861	.863	.868	.873	.877	.887	200,000	18,580
20,903	225,000		---	---	---	---	.845	.847	.849	.851	.853	.855	.856	.858	.862	.867	.871	.879	225,000	20,903
23,226	250,000		---	---	---	---	.842	.844	.846	.848	.849	.851	.853	.855	.858	.862	.866	.873	250,000	23,226
25,548	275,000		---	---	---	---	.839	.841	.843	.845	.847	.848	.850	.852	.855	.858	.862	.868	275,000	25,548
27,871	300,000		---	---	---	---	---	.839	.841	.843	.844	.846	.847	.849	.852	.855	.857	.863	300,000	27,871
32,516	350,000		---	---	---	---	---	.835	.836	.839	.840	.841	.843	.845	.847	.850	.853	.857	350,000	32,516
37,161	400,000		---	---	---	---	---	---	.835	.836	.838	.840	.841	.843	.846	.848	.853	---	400,000	37,161
46,451	500,000		---	---	---	---	---	---	.831	.832	.833	.834	.835	.838	.840	.842	.846	---	500,000	46,451

CALCULATOR METHOD

GARAGES, INDUSTRIALS, LOFTS AND WAREHOUSES FLOOR AREA – PERIMETER MULTIPLIERS

AVERAGE FLOOR AREA			AVERAGE PERIMETER															AVERAGE FLOOR AREA		
Sq. M.	Sq. Ft.	M. FT.	610	671	731	792	914	1067	1219	1372	1524	1676	1829	1981	2133	2286	2438	M. FT.	Sq. Ft.	Sq. M.
			2000	2200	2400	2600	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000			
27,871	300,000		.849	.852	.855	.857	.863	.872	.880	---	---	---	---	---	---	---	---		300,000	27,871
32,516	350,000		.845	.847	.850	.853	.857	.863	.871	---	---	---	---	---	---	---	---		350,000	32,516
37,161	400,000		.841	.843	.846	.848	.853	.858	.863	.870	.875	---	---	---	---	---	---		400,000	37,161
46,451	500,000		.835	.838	.840	.842	.846	.850	.855	.859	.863	.868	.873	---	---	---	---		500,000	46,451
55,741	600,000		---	---	---	.837	.841	.845	.849	.853	.856	.859	.863	.867	---	---	---		600,000	55,741
65,032	700,000		---	---	---	---	.836	.841	.845	.848	.851	.854	.857	.860	.863	.867	---		700,000	65,032
74,322	800,000		---	---	---	---	.834	.837	.841	.844	.847	.850	.853	.856	.858	.860	.863		800,000	74,322
83,612	900,000		---	---	---	---	.832	.835	.838	.841	.843	.847	.849	.851	.854	.856	.858		900,000	83,612
92,902	1,000,000		---	---	---	---	---	.832	.835	.838	.841	.843	.846	.848	.850	.853	.855		1,000,000	92,902
102,192	1,100,000		---	---	---	---	---	.831	.833	.835	.839	.841	.843	.846	.848	.850	.852		1,100,000	102,192
111,483	1,200,000		---	---	---	---	---	.832	.834	.836	.839	.841	.843	.845	.847	.849			1,200,000	111,483
120,773	1,300,000		---	---	---	---	---	---	.832	.834	.836	.839	.841	.843	.845	.847			1,300,000	120,773
130,063	1,400,000		---	---	---	---	---	---	.831	.833	.835	.836	.839	.841	.843	.845			1,400,000	130,063
139,353	1,500,000		---	---	---	---	---	---	.830	.832	.833	.835	.837	.839	.841	.843			1,500,000	139,353

NOTE: For larger buildings, enter the table by taking half the area and half the perimeter.

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		SQUARE FOOT OR SQUARE METER MULTIPLIER		CUBIC FOOT MULT.		AVERAGE WALL HEIGHT		SQUARE FOOT OR SQUARE METER MULTIPLIER		CUBIC FOOT MULT.	
(M.)	(FT.)			(M.)	(FT.)			(M.)	(FT.)		
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 METHOD

OFFICE BUILDINGS (344)

CLASS	TYPE	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING, PLUMBING AND MECHANICAL	HEAT	Sq. M.	COST Cu. Ft.	Sq. Ft.
A	Excellent	Best metal or stone, brick or block backup, solar glass	Plaster, best veneers, vinyl wall coverings, vinyl, terrazzo, carpet	*Luminous ceilings, many outlets, many private restrooms	Hot and chilled water (zoned)	2906.25	22.49	270.00
	Good	Good metal and solar glass, face brick, precast concrete panels	Drywall or plaster, some wall cover, acoustic tile, vinyl tile, carpet	*Good fluorescent, high intensity lighting, good restrooms	Hot and chilled water (zoned)	2303.47	17.83	214.00
	Average	Brick, concrete or metal and glass panels, little trim	Average partitions, acoustic tile, vinyl composition, some extras	*Average intensity fluorescent lighting, average restrooms	Warm and cool air (zoned)	1732.99	13.41	161.00
	Low cost	Minimum-cost walls and fenestration, little trim	Drywall, acoustic ceilings, asphalt tile, few partitions	*Minimum office lighting and plumbing	Warm and cool air (zoned)	1388.54	10.75	129.00
B	Excellent	Best metal or stone, brick or block backup, tinted glass	Plaster, best veneers, vinyl wall coverings, vinyl tile, terrazzo	*Luminous ceilings, many outlets, many private restrooms	Hot and chilled water (zoned)	2852.43	22.07	265.00
	Good	Good metal and solar glass, face brick, precast concrete panels	Drywall/plaster, some wall cover, acoustic tile, vinyl tile, carpet	*Good fluorescent, high intensity lighting, good restrooms	Hot and chilled water (zoned)	2238.89	17.33	208.00
	Average	Brick, concrete or metal and glass panels, little trim	Average partitions, acoustic tile, vinyl composition, some extras	*Average intensity fluorescent lighting, average restrooms	Warm and cool air (zoned)	1679.17	12.99	156.00
	Low cost	Minimum-cost walls and fenestration, little trim	Drywall, acoustic ceilings, asphalt tile, few partitions	*Minimum office lighting and plumbing	Warm and cool air (zoned)	1323.96	10.25	123.00
C	Excellent	Steel frame, masonry and glass, stone ornamentation, top quality	Plaster, paneling, carpet and terrazzo, suspended ceilings	*Best fluorescent ceiling panels, tiled restrooms, good fixtures	Warm and cool air (zoned)	2443.41	18.91	227.00
	Good	Steel frame or bearing walls, brick/conc. panels, some ornamentation	Plaster or drywall, good partitions, acoustic tile, carpet and vinyl	*Good fluorescent lighting, good restrooms and fixtures	Package A.C.	1711.46	13.24	159.00
	Average	Steel or concrete frame, or bearing walls, some trim	Paint, drywall partitions, acoustic tile, vinyl composition	*Fluorescent lighting, adequate outlets and plumbing	Forced air	1216.32	9.41	113.00
	Low cost	Masonry bearing walls, light rafters, very plain	Paint, few low-cost partitions, acoustic tile, asphalt tile	Minimum office lighting and plumbing	Wall furnace	818.06	6.33	76.00
D	Excellent	Studs or steel columns, bar or web joists, brick or stone veneer, EIFS	Best plaster, paneling, carpet and vinyl tile	*Fluorescent panels, many outlets, good tiled restrooms	Warm and cool air (zoned)	2325.00	17.99	216.00
	Good	Best stucco on good frame, brick or stone trim, good front	Plaster or drywall, good partitions, acoustic tile, carpet and vinyl	*Good fluorescent lighting, good restrooms and fixtures	Package A.C.	1625.35	12.58	151.00
	Average	Stucco or wood siding on wood or steel studs, some trim	Drywall, acoustic tile, low-cost carpet or vinyl composition	*Adequate lighting and plumbing	Forced air	1151.74	8.91	107.00
	Low cost	Light stucco or siding on wood or steel studs, very plain	Drywall, few partitions, acoustic tile, asphalt tile	Minimum lighting and plumbing	Wall furnace	769.62	5.96	71.50
DPOLE	Good	Good metal panels, fenestration, some brick or stone trim	Plaster or drywall, good partitions, acoustic tile, carpet and vinyl	*Good fluorescent lighting, good restrooms and fixtures	Package A.C.	1485.42	11.50	138.00
	Average	Pole frame, insulated metal panels, some ornamentation	Drywall, acoustic tile, low-cost carpet or vinyl composition	Adequate lighting and plumbing	Forced air	1017.19	7.87	94.50
	Low cost	Pole frame, finished interior, some insulation	Drywall, few partitions, acoustic tile, asphalt tile	Minimum lighting and plumbing	Wall furnace	688.89	5.33	64.00
S	Good	Good sandwich panels and fenestration, some brick or stone	Plaster or drywall, good partitions, acoustic tile, carpet and vinyl	*Good fluorescent lighting, good restrooms and fixtures	Package A.C.	1517.71	11.75	141.00
	Average	Insulated wall or sandwich panels, adequate fenestration	Drywall, acoustic tile, low-cost carpet or vinyl composition	Adequate lighting and plumbing	Forced air	1044.10	8.08	97.00
	Low cost	Steel or aluminum on light frame, finished interior, some insulation	Drywall, few partitions, acoustic tile, asphalt tile	Minimum lighting and plumbing	Wall furnace	705.04	5.46	65.50

MULTISTORY BUILDINGS – Add .5% (1/2%) for each story, over three, above ground, to all base costs, including basements but excluding mezzanines, up to 30 stories; over 30 add .4% (4/10%) for each additional story.

SPRINKLERS – Systems are not included. Costs should be added from Page 37.

BALCONIES – Exterior balconies see Page 37, or they may be computed from the Segregated Costs.

CANOPIES – For large entrance marquees or carport canopies, see Page 37.

***ELEVATORS** – Base costs of buildings marked with an asterisk (*) include elevator costs. If the subject building has no elevators, deduct the following from the base costs for buildings on this page. See Notes on Page 19.

		Sq. M.	Sq. Ft.		Sq.M.	Sq.Ft
Classes A & B	Excellent.....	130.78	12.15	Average	60.92	5.66
	Good.....	89.13	8.28	Low cost	41.66	3.87
Classes C/D/S	Excellent.....	65.98	6.13	Average	23.90	2.22
	Good.....	39.61	3.68			

CALCULATOR METHOD

OFFICES, MEDICAL AND PUBLIC BUILDINGS FLOOR AREA – PERIMETER MULTIPLIERS

AVERAGE FLOOR AREA			AVERAGE PERIMETER																	AVERAGE FLOOR AREA		
Sq. M.	Sq. Ft.	M. FT.	38	46	53	61	76	91	122	152	183	213	244	305	366	427	488	549	610	M. FT.	Sq. Ft.	Sq. M.
93	1,000		1.168	1.235	1.299	1.364	1.494	1.624	1.884	---	---	---	---	---	---	---	---	---	---		1,000	93
139	1,500		1.061	1.105	1.146	1.191	1.277	1.364	1.537	---	---	---	---	---	---	---	---	---	---		1,500	139
186	2,000		1.007	1.040	1.072	1.105	1.168	1.235	1.364	---	---	---	---	---	---	---	---	---	---		2,000	186
232	2,500		---	1.000	1.027	1.052	1.105	1.155	1.259	---	---	---	---	---	---	---	---	---	---		2,500	232
279	3,000		---	.975	.997	1.018	1.061	1.105	1.191	---	---	---	---	---	---	---	---	---	---		3,000	279
372	4,000		---	---	.958	.975	1.007	1.040	1.105	1.168	---	---	---	---	---	---	---	---	---		4,000	372
465	5,000		---	---	.936	.949	.975	1.000	1.052	1.105	1.155	---	---	---	---	---	---	---	---		5,000	465
557	6,000		---	---	---	.932	.952	.975	1.018	1.061	1.105	1.146	---	---	---	---	---	---	---		6,000	557
743	8,000		---	---	---	---	.926	.942	.975	1.007	1.040	1.072	1.105	---	---	---	---	---	---		8,000	743
929	10,000		---	---	---	---	.910	.923	.949	.975	1.000	1.027	1.052	1.105	1.155	---	---	---	---		10,000	929
1,115	12,000		---	---	---	---	.910	.932	.952	.975	.997	1.018	1.061	1.105	1.146	---	---	---	---		12,000	1,115
1,301	14,000		---	---	---	---	.900	.920	.938	.956	.975	.993	1.030	1.067	1.105	1.140	---	---	---		14,000	1,301
1,486	16,000		---	---	---	---	.910	.926	.942	.958	.975	1.007	1.040	1.075	1.105	---	---	---	---		16,000	1,486
1,672	18,000		---	---	---	---	.903	.918	.932	.946	.960	.990	1.018	1.046	1.076	1.105	---	---	---		18,000	1,672
1,858	20,000		---	---	---	---	.910	.923	.936	.949	.975	1.000	1.027	1.052	1.078	1.105	---	---	---		20,000	1,858
2,323	25,000		---	---	---	---	.897	.908	.918	.928	.948	.969	.990	1.011	1.032	1.052	---	---	---		25,000	2,323
2,787	30,000		---	---	---	---	.897	.906	.915	.932	.949	.965	.983	1.000	1.018	---	---	---	---		30,000	2,787
3,252	35,000		---	---	---	---	.897	.904	.919	.934	.949	.963	.978	.993	---	---	---	---	---		35,000	3,252
3,716	40,000		---	---	---	---	.890	.897	.910	.923	.936	.949	.962	.975	---	---	---	---	---		40,000	3,716
4,645	50,000		---	---	---	---	.887	.887	.897	.908	.918	.928	.938	.948	---	---	---	---	---		50,000	4,645
6,968	75,000		---	---	---	---	.873	.873	.879	.885	.892	.900	.908	.915	---	---	---	---	---		75,000	6,968
9,290	100,000		---	---	---	---	.866	.866	.871	.876	.881	.887	.892	.897	---	---	---	---	---		100,000	9,290

NOTE: For small buildings, enter the table by doubling the average floor area and doubling the perimeter. For larger buildings, take half the area and half the perimeter.

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multipliers for any variation in average story height from the base of 12 feet (3.66 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 or for a complete facility average, it is better to compute the total cubage and divide by the total square footage of floor area to get an effective height to use.

AVERAGE WALL HEIGHT		SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULTIPLIER	AVERAGE WALL HEIGHT		SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULTIPLIER	AVERAGE WALL HEIGHT		SQUARE FOOT OR SQUARE METER MULTIPLIER	CUBIC FOOT MULTIPLIER
(M.)	(FT.)			(M.)	(FT.)			(M.)	(FT.)		
2.44	8	.900	1.350	3.96	13	1.023	.944	6.10	20	1.184	.710
2.74	9	.928	1.237	4.27	14	1.046	.897	7.31	24	1.276	.638
3.05	10	.953	1.144	4.57	15	1.069	.855	8.53	28	1.367	.586
3.35	11	.977	1.066	4.88	16	1.092	.819	9.75	32	1.459	.547
3.66	12	1.000 (base)	1.000	5.49	18	1.138	.758	10.97	36	1.552	.517

CURRENT COST MULTIPLIERS

CURRENT COST MULTIPLIERS (Section 99, Page 3) are the multipliers for bringing costs published on the preceding pages up-to-date. This page is republished monthly and is based primarily on the Building Cost Indexes.

LOCAL MULTIPLIERS

LOCAL MULTIPLIERS (Section 99, Pages 5 thru 10) reflect local cost conditions and are designed to adjust the basic costs to each locality. They are based on weighted labor and material costs, including local sales taxes and the Canadian GST, but do not include any new construction rebate where applicable. Local multipliers apply to all costs in the manual but not to any cost indexes or replacement cost multipliers. The local multipliers, when applied to the total replacement cost, will adjust for variations in component costs as a whole for a particular geographical area. Multipliers may not adequately adjust when applied to specific components or Unit-in-Place costs, e.g., in the case of a specific piece of equipment which may be national in scope requiring no significant localization. For most Unit-in-Place costs, the predominant building or material Class factor can be used (e.g., wood, Class D; masonry, Class C) or an average of all Classes may be appropriate. In some cases, local building problems and practices must be considered. In the best residential neighborhoods, costs are often higher than those for identical construction in a lower-cost neighborhood. These pages are republished every January, April, July and October.

SPECIAL LOCAL CONDITIONS: Normally, smaller cities and suburbs near larger cities fall under the same cost influence as the larger city; however, local wage scales, inspection practices, licenses, codes and fees may vary, and the valuator should consider these possible deviations. Within a large city, costs will often vary by distance from sources of materials, such as ready-mix plants, and the local multipliers apply only to typical conditions prevailing. The state multipliers are merely weighted averages of the various cities and do not have any other significance. They may fit quite closely to many of the cities in the state which are not listed, but some localities may vary appreciably.

SEISMIC AND WIND: In high wind (over 90 mph) and earthquake (zones 2, 3 & 4) prone areas, you can have additional structural elements which will affect the overall building costs. Lifeline structures, such as Hospitals, Governmental and Data Centers must meet stringent building and life safety codes. See Section 85 for further information. Individual components can be priced using the Segregated Method.

NATURAL DISASTERS: Widespread major natural disasters can create isolated materials and/or labor shortages requiring some upward adjustment to the multipliers. Some specific materials, such as roofing, can temporarily increase 30% to 50% or more above normal repair estimates.

ABNORMAL CONTRACTOR'S PROFIT: In areas of high growth, contractors are able to take higher than normal profits due to an increased demand with limited contractors and/or workforce availability.

ABNORMAL SHORTAGES: Temporary supply-demand imbalances caused by events other than major catastrophes, such as factory closures, strikes, inadequate inventories, environmental legislation, trade embargoes, commodities speculation, etc., may require upward adjustment to the multipliers.

NOTE: *Even though a particular material or trade may increase dramatically in a short span of time, it may only be a small part of an entire structure, and valuers should use caution.*

COMPLEX SITES: Hillside construction will be much more expensive, due to added foundation and sitework. Downtown buildings are usually somewhat more expensive than outlying buildings. Sidewalks must be barricaded or roofed for the protection of pedestrians. Due to the lack of adequate space, material storage and handling is often more costly. Bordering property must often be protected. Such expenses are a part of construction costs.

GREEN BUILDINGS: High performance sustainable construction that is LEED certified can be more expensive, requiring some upward adjustments to the base costs.

WEATHER EXTREMES: Extreme cold, heat or wet weather may require temporary enclosures or covers, or special storage handling and wrapping of materials. Added costs may require some upward adjustment to the multipliers.

REMOTE LOCATIONS: Upward modification of the multipliers is appropriate if a building or other structure is far removed from supplies of labor and material, if its location is accessible with difficulty requiring higher freight charges on material, contains noncompetitive conditions for labor or materials, disproportionate crewing or labor per diem charges, or unusual climatic conditions occur. Examples are island, mountain, desert or resort locations and others not enjoying reasonable and adequate transportation facilities, for which no local modifier has been computed. When using the Mountain and Resort Cottage costs in Section 12, normal erection in remote areas is already included.

QUANTITY OR DEVELOPMENT CONSTRUCTION: There are usually cost savings in quantity or duplicate construction, which may or may not be passed on to the prospective buyer; usually, only part of the savings are passed on. Since costs in this manual will be based to some extent on such construction, the costs may require small, or

no percentage reductions to reflect actual sales conditions in the area. Large industrial projects, using multiple tilt-up or residential modular construction can have savings double the listed averages.

AMATEUR WORKMANSHIP: All costs in this manual are based on professional labor supervised by a contractor or job foreman. For amateur workmanship or work done by farm or ranch help, costs should be decreased to reflect the proper wage rate and lack of contractor and architectural supervision relative to the quality of the work.

REPAIR AND REMODEL: All costs in this manual are based on new construction. Typical repair work will run 10% to 20% higher because of restricted area, movement of materials, temporary supports, shoring, etc., and other contingencies not encountered in new construction, excluding demolition and removal. For detailed costs we would recommend using our repair and claims products.

MODIFYING ADJUSTMENTS

The following are rough overall percentage ranges to apply for certain unusual conditions, which can be cumulative:

ADD FOR THE FOLLOWING:

Abnormal contractor's profit	5%	to	25%
Abnormal shortages	2%	to	10%
Complex/congested areas	2%	to	5%
Hillside buildings	5%	to	20%
Remote areas	5%	to	15%
Resort locations	15%	to	30%
Weather extremes	2%	to	6%
Seismic or high wind	2%	to	5%
lifeline occ., high event (Zone 3/4)	5%	to	10%

ADDITIONS – CONTINUED

Green Buildings, Commercial	0%	to	7%
Residential	3%	to	20%

SUBTRACT FOR THE FOLLOWING:

Quantity or Development construction	1%	to	5%
Abnormal labor surplus	1%	to	5%
Amateur workmanship	15%	to	30%
Architects' fee adjustments: see discussion below and on Page 2.			

SPECIAL LOCAL MULTIPLIERS

If no multiplier is published for your city or if you desire a check on the published multipliers, we suggest that you send us your local data, and we will compute one for you. Forms for the required data may be obtained by writing, fax or email. See inside front cover for details.

ARCHITECTS' FEES

The architects' fees listed on the next page are based on averages of fees actually charged or recommended. Actual fees, (based on the size of the project, technical difficulty, artistic requirements, and the reputation of the architect and his willingness to accept the assignment), vary greatly, and the estimate of the fee is a matter for the valuator's judgment. Architects' fees will normally include part or all of the following:

1. Plans and specifications including consultations, estimates and engineering studies.
2. General administration and overall supervision of construction, not including superintending construction.
3. Approving payment vouchers to the contractor.
4. Approval and acceptance of completed construction.

Regardless of the size and type of construction, all of these services must be performed by someone. On some projects, the owner or general contractor may supervise. On governmental projects, many services are performed by government employees; however, in replacing the building, the cost of these services, whether performed by the architect or others, must be included.

The architects' fee percentages given here are only a guide. On a simple pre-engineered structure or residence, stock plans and specifications may be purchased for under \$300, plus \$50 for each additional set. On a large housing development, the architect may get full fees for each individual design and payments as low as \$325 per unit for additional uses of the plans, perform work as a corporate employee. Also, many shed, farm and utility buildings are commonly built without plans or from standard plans which can be obtained free, or at a small price. To add a full architects' fee would be unsuitable.

In actual practice, architects' fees are normally based, by contract, either on a percentage of the entire cost, a multiplier of the technical payroll plus incidental expenses, or on a fixed sum plus listed expenses.

In the final analysis, the architect's function, when fully performed, is a proper cost of construction. A well-considered matching of structure to land may enhance the end value by more than the fees involved. However, when poorly performed, the cost of design and drafting work may be wasted and result in functional obsolescence in a brand-new structure. This determination is a matter of judgment.

The average fees listed for buildings do not include fees for design of furniture, built-in equipment or appliances, plant or off-site, utilities or subdivision layout, or other detailed special items designed for a specific trade or personal use.

These multipliers bring costs from preceding pages up to date. Also apply Local Multipliers, Section 99, Pages 5 through 10.

CALCULATOR COST SECTIONS

SEGREGATED COST SECTIONS

(Effective Date of Cost Pages)	11	12	13	14	15	16	17	18	
	(11/16)	(8/16)	(5/16)	(2/16)	(11/17)	(8/17)	(5/17)	(2/17)	
EASTERN	A	1.06	1.05	1.05	1.03	1.02	1.03	1.05	1.07
	B	1.07	1.07	1.05	1.06	1.01	1.02	1.05	1.07
	C	1.07	1.06	1.07	1.06	1.04	1.05	1.06	1.05
	D	1.06	1.06	1.06	1.05	1.02	1.04	1.04	1.05
	S	1.10	1.09	1.07	1.06	1.04	1.04	1.04	1.08
CENTRAL	A	1.01	1.00	0.99	1.00	0.97	0.99	1.00	1.00
	B	1.01	1.02	1.01	1.01	0.99	0.99	0.99	1.00
	C	1.03	1.03	1.03	1.02	0.99	0.98	1.00	1.01
	D	1.02	1.03	1.03	1.02	1.01	1.02	1.00	1.02
	S	1.00	1.02	1.00	1.02	0.98	0.98	1.01	1.01
WESTERN	A	1.01	1.03	1.04	1.05	1.01	1.01	1.02	1.01
	B	1.01	1.02	1.05	1.04	1.01	1.03	1.03	1.01
	C	1.03	1.05	1.04	1.06	1.01	1.03	1.02	1.05
	D	1.05	1.05	1.05	1.06	1.00	1.01	1.05	1.04
	S	1.02	1.02	1.05	1.04	1.00	1.04	1.03	1.01

(Effective Date of Cost Pages)	41	42	43	44	45	46	47	48	
	(12/16)	(9/16)	(6/16)	(3/16)	(12/17)	(9/17)	(6/17)	(3/17)	
EASTERN	A	1.06	1.05	1.05	1.03	1.02	1.03	1.05	1.07
	B	1.07	1.07	1.05	1.06	1.01	1.02	1.05	1.07
	C	1.07	1.06	1.07	1.06	1.04	1.05	1.06	1.05
	D	1.06	1.06	1.06	1.05	1.02	1.04	1.04	1.05
	S	1.10	1.09	1.07	1.06	1.04	1.04	1.04	1.08
CENTRAL	A	1.01	1.00	0.99	1.00	0.97	0.99	1.00	1.00
	B	1.01	1.02	1.01	1.01	0.99	0.99	0.99	1.00
	C	1.03	1.03	1.03	1.02	0.99	0.98	1.00	1.01
	D	1.02	1.03	1.03	1.02	1.01	1.02	1.00	1.02
	S	1.00	1.02	1.00	1.02	0.98	0.98	1.01	1.01
WESTERN	A	1.01	1.03	1.04	1.05	1.01	1.01	1.02	1.01
	B	1.01	1.02	1.05	1.04	1.01	1.03	1.03	1.01
	C	1.03	1.05	1.04	1.06	1.01	1.03	1.02	1.05
	D	1.05	1.05	1.05	1.06	1.00	1.01	1.05	1.04
	S	1.02	1.02	1.05	1.04	1.00	1.04	1.03	1.01

UNIT-IN-PLACE COST SECTIONS (51 – 70)

This page supersedes the December 2017 Green Supplement.

Sec.	Page	Date		Eastern	Central	Western	Sec.	Page	Date		Eastern	Central	Western
51 -	2-3	(3/17)	Concrete Foundations.....	1.04	1.00	1.03	61 -	1-8	(12/16)	Tanks	1.04	1.03	1.05
51 -	4	(3/17)	Pilings.....	1.06	1.00	1.04	62 -	1	(6/16)	Industrial Pumps & Boilers.....	1.07	0.99	1.08
51 -	7-8	(3/17)	Steel and Concrete Frame.....	1.05	0.99	1.04	62 -	2-3, 6	(6/16)	Piping	1.07	0.99	1.08
51 -	3,7	(3/17)	Wood Foundations, Frame	1.03	1.01	1.06	62 -	4	(6/16)	Electrical Motors	1.07	0.99	1.08
52 -	1-4, 6	(3/17)	Interior Construction.....	1.04	1.02	1.03	62 -	5	(6/16)	Steel Stacks, Chutes.....	1.07	0.99	1.08
52 -	5	(3/17)	Bank Vaults and Equipment	1.06	1.01	1.02	62 -	5	(6/16)	Masonry & Concrete Chimneys..	1.04	1.00	1.06
53 -	1-8	(6/17)	Heating, Cooling & Ventilating	1.04	1.00	1.03	62 -	6	(6/16)	Compactors, Incinerators.....	1.07	0.99	1.08
53 -	9-12	(6/17)	Plumbing, Fire Protection, etc.....	1.04	0.99	1.04	63 -	1-4	(9/16)	Trailer and Mfg. Housing Parks..	1.03	1.02	1.06
54 -	1-6	(6/17)	Electrical, Security	1.02	1.03	1.01	63 -	5-10	(9/16)	Manufactured Housing.....	1.05	1.04	1.06
55 -	3-7	(8/17)	Wall Costs.....	1.02	0.99	1.03	64 -	1-6	(3/16)	Service Stations, Car Washes	1.07	1.03	1.03
56 -	1-2	(8/17)	Stained Glass.....	1.03	0.99	1.02	64 -	7-9	(3/16)	Prefabricated Metal Structures ...	1.06	1.01	1.06
56 -	3-6	(8/17)	Storefronts.....	1.03	0.99	1.02	64 -	7-8	(3/16)	Prefab. Wood & Air Structures....	1.05	1.03	1.05
56 -	7	(8/17)	Stonework	1.01	1.01	1.04	65 -	1-12	(3/16)	Equipment Costs.....	1.04	1.03	1.03
56 -	8	(8/17)	Columns, Stone & Concrete	1.01	1.01	1.04	66 -	1	(12/17)	Subdivision Costs	1.01	0.98	1.02
56 -	8	(8/17)	Columns, Wood & Aluminum.....	1.02	1.01	1.04	66 -	2-9	(12/17)	Yard Improvements.....	1.01	0.97	1.03
57 -	1-6	(9/17)	Roofs.....	1.02	1.00	1.02	66 -	10-11	(12/17)	Demolition & Remediation	1.00	0.99	1.02
58 -	1	(9/17)	Cold Storage	1.02	0.99	1.03	67 -	1-2	(12/17)	Golf Courses	1.00	1.00	1.01
58 -	2-8	(9/17)	Elevators, Conveying Systems ...	1.02	0.98	1.01	67 -	3-7	(12/17)	Recreational Facilities.....	1.00	0.99	1.02
							70 -	1-20	(1/18)	Green Section	1.00	0.99	1.02

LOCAL MULTIPLIERS

Apply to costs brought up-to-date from preceding pages. Do not apply to Section 98 or any other indexes.

UNITED STATES

CLASS	A	B	C	D	S	CLASS	A	B	C	D	S	CLASS	A	B	C	D	S
NEW JERSEY	1.29	1.28	1.27	1.27	1.28	Plattsburgh	1.01	0.99	1.01	1.04	1.02	OHIO (Continued)					
Asbury Park	1.19	1.17	1.16	1.17	1.19	Poughkeepsie	1.19	1.19	1.20	1.22	1.20	Lima	0.96	0.97	0.97	0.95	0.97
Atlantic City	1.33	1.31	1.32	1.34	1.33	Rochester	1.10	1.15	1.13	1.12	1.12	Lorain County	1.04	1.05	1.06	1.05	1.06
Bayonne	1.34	1.32	1.30	1.31	1.31	Rome	1.05	1.05	1.05	1.08	1.05	Mansfield	1.00	1.02	0.98	0.98	1.00
Camden	1.24	1.21	1.19	1.19	1.21	Schenectady	1.08	1.08	1.10	1.13	1.11	Marion	1.00	1.02	0.98	0.98	1.00
Clifton	1.31	1.30	1.29	1.29	1.29	Syracuse	1.13	1.12	1.12	1.11	1.13	Middletown	0.94	0.94	0.94	0.95	0.95
East Orange	1.32	1.30	1.29	1.30	1.30	Troy	1.11	1.12	1.14	1.15	1.13	Newark	1.00	1.02	1.00	1.00	1.00
Edison	1.32	1.30	1.29	1.30	1.29	Utica	1.05	1.05	1.06	1.08	1.05	Portsmouth	0.93	0.91	0.91	0.92	0.94
Elizabeth	1.34	1.31	1.30	1.30	1.30	Watertown	1.03	1.02	1.02	1.04	1.02	Springfield	0.97	0.96	0.96	0.98	0.97
Fairlawn	1.32	1.31	1.29	1.30	1.31	NEW YORK CITY AREA	1.45	1.41	1.42	1.44	1.47	Toledo	1.08	1.09	1.08	1.08	1.11
Hackensack	1.32	1.32	1.30	1.30	1.31	Bronx	1.47	1.42	1.44	1.46	1.49	Youngstown	1.09	1.10	1.06	1.04	1.09
Irvington	1.34	1.32	1.32	1.32	1.32	Brooklyn	1.46	1.42	1.43	1.44	1.47	OKLAHOMA	0.92	0.91	0.92	0.91	0.91
Jersey City	1.33	1.32	1.30	1.31	1.31	Manhattan	1.48	1.44	1.44	1.46	1.50	Ardmore	0.95	0.92	0.95	0.92	0.92
Lakewood	1.18	1.17	1.17	1.18	1.18	Nassau County	1.47	1.43	1.43	1.45	1.48	Bartlesville	0.87	0.86	0.87	0.87	0.87
Morristown	1.33	1.31	1.31	1.32	1.32	Orange County	1.30	1.27	1.28	1.28	1.31	Enid	0.93	0.92	0.94	0.94	0.93
New Brunswick	1.32	1.30	1.29	1.30	1.29	Putnam County	1.33	1.28	1.29	1.31	1.33	Lawton	0.88	0.87	0.88	0.86	0.86
Newark	1.35	1.33	1.33	1.34	1.33	Queens	1.46	1.42	1.43	1.44	1.47	Norman	0.96	0.95	0.95	0.94	0.95
Passaic	1.31	1.30	1.29	1.29	1.29	Rockland County	1.33	1.30	1.31	1.32	1.33	Oklahoma City	0.96	0.95	0.95	0.94	0.95
Paterson	1.32	1.31	1.29	1.30	1.31	Staten Island	1.38	1.34	1.33	1.36	1.39	Tulsa	0.91	0.89	0.90	0.91	0.92
Plainfield	1.21	1.19	1.19	1.18	1.19	Suffolk County	1.49	1.46	1.46	1.47	1.50	OREGON	1.09	1.07	1.06	1.05	1.08
Somerville	1.30	1.28	1.28	1.26	1.29	Westchester County	1.34	1.30	1.31	1.33	1.34	Albany	1.09	1.06	1.05	1.03	1.06
Teaneck	1.32	1.32	1.30	1.30	1.30	Yonkers	1.47	1.44	1.44	1.46	1.48	Altamont	1.07	1.04	1.03	1.03	1.07
Trenton	1.29	1.27	1.25	1.26	1.26	NORTH CAROLINA	0.90	0.91	0.90	0.90	0.90	Astoria	1.07	1.07	1.04	1.03	1.06
Vineland	1.20	1.19	1.19	1.20	1.21	Asheville	0.94	0.93	0.92	0.91	0.93	Bend	1.12	1.12	1.12	1.13	1.13
West Orange	1.31	1.29	1.28	1.29	1.28	Charlotte	0.90	0.92	0.91	0.91	0.92	Coos Bay	1.07	1.05	1.04	1.04	1.06
NEW MEXICO	0.95	0.92	0.93	0.93	0.94	Durham	0.95	0.95	0.93	0.93	0.95	Corvallis	1.09	1.06	1.05	1.03	1.05
Alamogordo	0.90	0.88	0.89	0.86	0.89	Fayetteville	0.90	0.92	0.89	0.90	0.89	Eugene	1.14	1.12	1.11	1.10	1.12
Albuquerque	0.92	0.91	0.91	0.90	0.92	Gastonia	0.92	0.92	0.94	0.92	0.93	Grants Pass	1.07	1.04	1.02	1.02	1.07
Carlsbad	0.92	0.89	0.91	0.91	0.90	Goldensboro	0.89	0.90	0.87	0.88	0.89	Klamath Falls	1.06	1.04	1.02	1.02	1.07
Clovis	0.97	0.95	0.95	0.94	0.93	Greensboro	0.89	0.90	0.89	0.89	0.89	Medford	1.08	1.06	1.05	1.05	1.08
Farmington	1.00	0.96	0.96	0.96	0.96	Greenville	0.86	0.88	0.86	0.86	0.86	North Bend	1.07	1.05	1.04	1.05	1.06
Gallup	0.93	0.89	0.90	0.90	0.92	Hickory	0.86	0.87	0.87	0.88	0.86	Pendleton	1.11	1.09	1.08	1.10	1.10
Hobbs	0.90	0.88	0.90	0.90	0.88	Jacksonville	0.87	0.89	0.86	0.86	0.87	Portland	1.12	1.09	1.09	1.08	1.09
Las Cruces	0.94	0.91	0.92	0.91	0.95	Raleigh	0.95	0.95	0.93	0.93	0.95	Roseburg	1.07	1.04	1.01	1.01	1.07
Los Alamos	0.98	0.94	0.97	0.98	0.97	Rocky Mount	0.90	0.91	0.88	0.89	0.89	Salem	1.11	1.10	1.07	1.06	1.07
Portales	0.89	0.87	0.85	0.85	0.86	Wilmington	0.90	0.91	0.90	0.91	0.91	Springfield	1.06	1.03	1.03	1.03	1.06
Roswell	0.99	0.93	0.95	0.94	0.96	Winston-Salem	0.88	0.88	0.88	0.86	0.86	The Dalles	1.13	1.12	1.09	1.08	1.10
Santa Fe	0.97	0.94	0.97	0.96	0.96	NORTH DAKOTA	1.03	1.02	1.02	1.00	1.04	PENNSYLVANIA	1.13	1.12	1.10	1.11	1.11
Taos	1.06	1.03	1.07	1.07	1.06	Bismarck	1.02	1.03	1.01	1.01	1.03	Allentown	1.16	1.18	1.13	1.16	1.11
NEW YORK	1.08	1.08	1.09	1.10	1.09	Fargo	1.01	1.01	1.01	0.98	1.03	Altoona	1.13	1.13	1.10	1.10	1.12
Jamestown	1.04	1.04	1.06	1.05	1.05	Grand Forks	1.02	1.01	1.01	0.99	1.03	Bethlehem	1.13	1.15	1.10	1.13	1.10
Kingston	1.19	1.19	1.19	1.21	1.21	Jamestown	1.02	1.03	1.02	1.00	1.04	Easton	1.11	1.14	1.09	1.11	1.07
Niagara Falls	1.15	1.13	1.13	1.14	1.13	Mandan	1.02	1.03	1.01	1.01	1.03	Erie	1.12	1.12	1.12	1.10	1.10
Albany	1.08	1.09	1.13	1.13	1.11	Minot	1.04	1.02	1.03	1.01	1.05	Harrisburg	1.10	1.08	1.06	1.05	1.08
Amsterdam	1.07	1.08	1.11	1.13	1.09	Williston	1.05	1.03	1.04	1.01	1.06	Johnstown	1.11	1.09	1.09	1.07	1.07
Auburn	1.04	1.03	1.03	1.05	1.04	OHIO	1.01	1.01	1.01	1.00	1.01	Lancaster	1.10	1.08	1.06	1.07	1.07
Binghamton	1.03	1.02	1.01	1.02	1.02	Akron	1.02	1.03	1.03	1.03	1.03	Norristown	1.27	1.25	1.25	1.27	1.25
Buffalo	1.15	1.14	1.17	1.16	1.15	Canton	1.00	1.01	1.00	0.99	1.01	Philadelphia	1.28	1.26	1.26	1.28	1.26
Elmira	1.01	1.00	1.01	1.02	1.01	Cincinnati	0.97	0.99	0.98	0.98	0.99	Pittsburgh	1.14	1.14	1.11	1.11	1.14
Ithaca	1.01	0.99	1.02	1.03	1.00	Cleveland	1.05	1.07	1.07	1.06	1.08	Reading	1.14	1.15	1.11	1.12	1.08
						Columbus	1.02	1.03	1.02	1.01	1.02	Scranton	1.05	1.04	1.04	1.04	1.06
						Dayton	0.97	0.97	0.98	0.99	0.97	State College	1.08	1.06	1.05	1.05	1.06
						East Liverpool	1.08	1.07	1.09	1.06	1.07	Wilkes-Barre	1.05	1.06	1.06	1.04	1.07
						Hamilton	0.94	0.94	0.96	0.95	0.95	Williamsport	1.10	1.06	1.05	1.05	1.10
												York	1.10	1.09	1.07	1.06	1.10

DEFINITIONS

Depreciation is loss in value due to any cause. It is the difference between the market value of a structural improvement or piece of equipment and its reproduction or replacement cost as of the date of valuation. Depreciation is divided into three general categories, as discussed below.

1. **Physical** depreciation is loss in value due to physical deterioration.
2. **Functional** or technical obsolescence is loss in value due to lack of utility or desirability of part or all of the property, inherent to the improvement or equipment. Thus a new structure or piece of equipment may suffer obsolescence when built.
3. **External**, locational or economic obsolescence is loss in value due to causes outside the property and independent of it, and is not directly included in the tables.

Effective age of a property is its age as compared with other properties performing like functions. It is the actual age less the age which has been taken off by face-lifting, structural reconstruction, removal of functional inadequacies, modernization of equipment, etc. It is an age which reflects a true remaining life for the property, taking into account the typical life expectancy of buildings or equipment of its class and its usage. It is a matter of judgment, taking all factors, current and those anticipated in the immediate future, into consideration. Effective age on older structures may best be calculated by establishing a remaining life which, subtracted from a typical life expectancy, will result in an appropriate effective age with which to work. Effective age can fluctuate year by year or remain somewhat stable in the absence of any major renewals or excessive deterioration.

Extended life expectancy is the increased life expectancy due to seasoning and proven ability to exist. Just as a person will have a total normal life expectancy at birth which increases as he grows older, so it is with structures and equipment.

Remaining life is the normal remaining life expectation. It is the length of time the structure may be expected to continue to perform its function economically at the date of the appraisal. This does not imply a straight-line expiration, particularly for mortgage purposes, since normal recurring maintenance and renewal of replaceable items will continue to contribute toward an extended life expectancy. This extended life process is accomplished by use of effective age as the sliding scale and not by continually lengthening the typical life expectancy as the structure ages chronologically.

Percent good equals 100% less the percentage of cost represented by depreciation. It is the present value of the structure or equipment at the time of appraisal, divided by its replacement cost.

APPROACHES TO DEPRECIATION

The simplest and, in past years, a widely used accounting-type concept of depreciation, particularly with individual short-lived components, is the straight-line (age/life) approach. A life expectancy is estimated and a constant annual percentage (equal wear or serviceability each year) is taken for depreciation so that at the end of that life the depreciation equals 100% of the initial cost. This linear approach is simple and easy to use but does not represent reality in most cases since time is not the only factor affecting depreciation and it fails to recognize any value-in-use. The passage of time may not in itself create additional depreciation if the property or component is well maintained and functionally sound.

While age is a critical factor, the best approach to the physical depreciation estimate is a combination of age and condition. The observed condition of each component subject to wear is estimated relative to new condition. A major replaceable component, such as a HVAC system under heavy loading in a hot, humid climate, can wear out quite rapidly, shortening the life expectancy before replacement, while many other portions of a structure, such as excavations, foundations, and concrete exterior walls, wear out slowly if at all. Such long-lived portions often represent a major portion of the total reproduction cost and if still functional will contribute toward an extended life expectancy. Physical depreciation cannot be considered a straight-line deduction from reproduction cost, since necessary and normal maintenance can offset, retard and, in some cases, even eliminate deterioration.

Another approach to depreciation was called the mid-life theory. This takes into account that most buildings depreciate little during the first few years. When it becomes evident that the buildings are no longer new, even though they are adequately maintained, the maintenance expenses rise, rentals tend to decrease and the building depreciates faster. After a number of years, they reach the period called mid-life, at which time, if the buildings are structurally sound and properly maintained, the depreciation remains constant. The mid-life theory suffers from the fact that maintenance expenses on the average building continue to go up in order to maintain the same appearance and utility, and at any age, certain building features may suffer from obsolescence.

These concepts lead to a third theory, the extended life concept, which starts with the hypothesis that buildings age in much the same manner as people and that the older they get, the greater is their total life expectancy. This concept recognizes that a building is in the prime of life before

mid-life and that the road is downhill after that, but that correction of deficiencies may lower the effective age and lengthen the remaining life. This recurring revitalization process periodically reverses a continuous progression down the effective age scale, reducing the indicated depreciation percentage as components are renewed throughout the life-span of the building. This nonlinear approach accounts for a greater present value or slower depreciation rate in the early years as compared to the later years when diminishing serviceability and higher maintenance can accelerate depreciation.

EXPLANATION OF DEPRECIATION TABLES

The general depreciation tables in this section were developed from actual case studies of sales and market value appraisals and formed the basis of the extended life theory which encompasses a remaining life and effective age approach. From confirmed sales prices the land value was deducted to obtain a building residual, and the replacement cost of the building was computed. The difference between the replacement cost new of the building and the residual sales price of the building was divided by the replacement cost new, to give the market depreciation in percentage. A similar procedure was followed with the market value appraisals, always excluding those observed cases having excessive obsolescence.

The data was then collated by type of construction and usage, plotted with similar typical total life expectancies, with curves computed for the groupings, for which sufficient data was available, for statistical reliability. From these curves, a matching family of empirical mathematical curves was found, from which the depreciation for any initial (when new) life expectancy could be computed under normal market conditions.

A check of equipment depreciation by similar procedures showed that portions of the family of curves, which was used for nonresidential properties, were suitable as an indicator of that depreciation.

Churches were found to fit in the depreciation category of residential structures, and those tables should therefore be used. Motels, hotels and larger apartments are included in the nonresidential tables, while small apartments or multiples are residential in nature. The division between residential and nonresidential depreciation appears to lie in the usage, whether operated solely for income or for amenities.

Thus, a hotel operated commercially would be expected to fit into the commercial family of curves, but if the same building were operated as a private club, its normal depreciation would be expected to follow the residential curve. The proper curve to use is therefore a matter of judgment on the part of the appraiser, considering the usage and the type of return normally expected, whether cash, equity or intangible amenities.

USE OF THE DEPRECIATION TABLES (See Example on page 22)

1. Note from your inspection the overall and/or individual condition, severity of use, utility and remaining life of all building or equipment components.
2. Determine the true age of the structure or equipment.
3. Compare with like properties and study the effect of, or the lack or need of, typical maintenance or any modernization or major repair to determine the effective age.
4. Check the tables and discussion on Pages 10 through 21 for the recommended initial typical (normal) useful life of the occupancy, component or piece of equipment and for any further modification before establishing an appropriate life.
5. Check the properties listed in each depreciation table to see which to use. (Page 24, Non-residential; Page 25, Residential; Page 26, Fixtures and Equipment.)
6. Enter the proper table choosing a typical life expectancy and effective age and read off the normal depreciation, or use the remaining life expectancy as an aid as described below.
7. Note any excessive obsolescence that may require special consideration separate from the normal depreciation developed from the tables. (Review Pages 2 and 3.)

REMAINING LIFE TABLES

The remaining life tables are based on mortality tables derived from studies of building and equipment, discarding all cases of mortality due to excessive obsolescence. Their primary mission is to provide an easy way for the appraiser to determine the normal remaining life expectancy of buildings for use in the capitalization process, using the effective age and the typical life expectancy.

Many times, the remaining life expectancy of a building or piece of equipment can be established more readily than the effective age. The Remaining Life Table on the right side of each depreciation page may then be entered with the remaining life in the proper typical life column and the effective age read off at the left, or the appraiser may move straight across to the left side of the page and read the depreciation directly.

FUNCTIONAL INDICATORS (Continued)

Some of the external factors affecting the extent of functional obsolescence are:

1. Code Requirements – Most current building codes or zoning for conforming use, height, stories, area, setback, building separation, size/mansionization, energy equivalency tradeoffs, etc., OSHA, fire and life safety, etc. compliance (see below).
2. Fire Protection Requirements – Proper rating, detection for life safety and security, signaling controls, communications, signage, standpipe, sprinklers, extinguishers, hydrants, vents, draft curtains, fans, pumps, door and smoke controls, standby power, emergency phones, appropriate exits, overhang, balcony and deck exposures, stairways, roofing classification, safety or double glazing, fire doors and shutters, etc.
3. Handicapped Requirements – ADA compliance, barrier-free design, parking, ramps, automatic entry, door, hallway widths, markings, signage, alarms, service, cabinet and railing heights, drinking fountains, grab bars, exposed hot-water piping, handicap fixtures, turnaround space, elevator controls, cab size, lifts, etc.
4. Environmental – EPA, wetlands and air quality compliance, water, soil, radon, asbestos, UREA formaldehyde foam insulation, PCBs, CFCs, high-voltage lines, halon, heavy metal or lead contamination, runoff, emissions or sediment containment, detection and testing, septic tanks, leach fields, demolition constraints, disposal or remediation, Evidence of leakage, absence of plants or animals, sick or stressed plants or animals, discolored soil or water, surface sheens and noxious odors, presence of discarded batteries, abandoned wells, sumps, tanks, barrels or other containers of fertilizer, pesticides and herbicides, paints and thinners, heating oil, petroleum or other hazardous chemical substances.
5. Weather Extremes – Appropriate insulation levels, heat gain or loss, shading, passive or active alternatives, energy equivalency tradeoffs, window treatment, glass strength, proper trusses, size, spacing, pitch and drainage for rain and snow loading, proper flashings and penetrations, proper connections for hurricane wind forces, uplift exposure, operable shutters, impact glazing.
6. Earthquakes – Appropriate bracing, connections to structural shell or foundation, shear walls, storefront facade or parapet, overhang exposure, irregular shape, framing stress, torsion, distance from other structures for pounding, etc.

External Obsolescence is a change in the value of a property, usually negative but can be an enhancement, caused by forces outside the property itself, and is not included directly in the tables that follow. It can be divided into two types, locational and economic. Locational factors are generally incurable and may affect only a small area, while economic factors can cover a wide geographic area and may be only temporary and reversible. Different types of property, residential or commercial, will be affected differently by these external forces. For example, it is desirable or advantageous for a manufacturing plant to be situated close to a railroad spur; conversely, it is a disadvantage for a residential property to be located close to that same spur. Close proximity to a major highway is generally much more beneficial for an apartment complex than a single-family residence, etc. Any abnormal, isolated or temporary cases of external obsolescence, usually computed separately, can be measured by market abstraction and capitalization of the imputed loss or gain, which generally affects land values first, then the improvements, by changing the possible uses and altering remaining life.

EXTERNAL INDICATORS

When considering the extent of external obsolescence, pay particular attention to the following indicators in the immediate vicinity, marketing area or community as a whole:

1. Physical Factors – Proximity of desirable or unattractive natural or artificial features or barriers, general neighborhood maturity, conformity, deterioration, rehabilitation or static character, known cleanup sites, fumes, noise, traffic or flight patterns, nuisances, graffiti, waste dump, swamp, toxic industry, electromagnetic fields, brush area, lack of view or landscaping, floodplain, dam inundation area, drainage, water table, sinkholes, fault or seismic zones, soil types, cut and fill, liquefaction, landslides, etc. local ecosystem, endangered species, habitat areas.
2. Economic – Demand/supply imbalance, saturation or monopoly, competition or alternatives, market share, industry or major plant relocation, employment development and growth patterns, downsizing, utility and insurance rates, availability of funds or terms, labor and materials, interest rates, vacancy, building rates, general inflation or deflation rates, tenant ratings, length of time on market or lease up or absorption, income streams and returns, changing consumer habits, purchasing power, property association or government forces, zoning, land use, air rights, legal nonconformity, permit, taxing and assessment policies and bureaucracy or other limiting conditions or restrictions.

3. Infrastructure – Surrounding highest and best use; availability, quality and source of utilities; public services; fire stations, staffed or volunteer; distance from hydrants; street improvements; traffic patterns; emergency response, evacuation routes; public parking, transportation and shipping facilities; retail; recreation; education facilities, etc.

General condition ratings can be assigned to the improvement to assist in the development of an appropriate effective age based on observed condition, utility and age. The better the overall condition, the younger or lower the effective age, which lowers the percentage and amount of depreciation. Condition is an integral part in measuring the degree at which items subject to depreciation have been maintained. Applying any additional condition modifier once the effective age has been established based on condition would be redundant.

Effective age will change as conditions fluctuate, determined by the amount of observed deterioration and obsolescence at the date of the appraisal. Over the life of a structure, you could expect the condition rating and effective age to move up and back down the effective age scale many times over. During the mid-life cycles, the effective age will drift upward at a relatively slow pace, assuming normal maintenance, for longer periods of time than at any other period over the structure's entire life span. With each evaluation, the effective age choice must be reconsidered based on the actual conditions encountered at the current date, taking into account any changes that may have taken place since the last appraisal. Neglect or weather extremes could have accelerated condition and age, while major repairs will correct deficiencies to a like-new condition, lowering the effective age and starting the cycle all over again. Operating extremes, such as abrupt increases or decreases in plant or equipment activity from normal or designed usage or excessive rental turnover can certainly impact the rate of wear and tear and maintenance performed.

Certain industries such as fast food, hotels, markets, and other retail chains which are highly competitive and responsive to rapidly changing consumer tastes and/or investor holding periods, may require frequent major renovations and fixture change-outs in search of market share. Consequently, excessive functional and separate economic obsolescence rates that move much faster than normal physical deterioration, may require special consideration, depending on the value sought, before establishing an appropriate effective age and/or typical life expectancy with which to work. Due to the unique character of certain outdoor recreational facilities like golf courses, special attention should be paid to the possible shorter lives of individual land improvements which are subject not only to the constant exposure of the elements, but to the wear and tear from selective use or play. The functionality, composition and age or maturity of the various features that make up each improvement or golf hole can also have a great effect on a facility's maintenance, operational and reserve schedules and expenses, which in turn affect condition, usability or playability and ultimately, depreciation.

CONDITION RATING INDICATORS

Excellent Condition – All items that can normally be repaired or refinished have recently been corrected, such as new roofing, paint, furnace overhaul, state-of-the-art components, etc. With no functional inadequacies of any consequence and all major short-lived components in like-new condition, the overall effective age has been substantially reduced upon complete revitalization of the structure regardless of the actual chronological age.

Very Good Condition – All items well maintained, many having been overhauled and repaired as they've shown signs of wear, increasing the life expectancy and lowering the effective age, with little deterioration or obsolescence evident and a high degree of utility.

Good Condition – No obvious maintenance required, but neither is everything new. Appearance and utility are above the standard, and the overall effective age will be lower than the typical property.

Average Condition – Some evidence of deferred maintenance and normal obsolescence with age in that a few minor repairs are needed, along with some refinishing. But with all major components still functional and contributing toward an extended life expectancy, effective age and utility are standard for like properties of its class and usage.

Fair Condition (Badly Worn) – Much repair needed. Many items need refinishing or overhauling, deferred maintenance obvious, inadequate building utility and services all shortening the life expectancy and increasing the effective age.

Poor Condition (Worn Out) – Repair and overhaul needed on painted surfaces, roofing, plumbing, heating, numerous functional inadequacies, substandard utilities, etc. (found only in extraordinary circumstances). Excessive deferred maintenance and abuse, limited value-in-use, approaching abandonment or major reconstruction; reuse or change in occupancy is imminent. Effective age is near the end of the scale regardless of the actual chronological age.

LIFE EXPECTANCY GUIDELINES

TYPICAL BUILDING LIVES

OCCUPANCY	CLASS	A	B	C	D	S	OCCUPANCY	CLASS	A	B	C	D	S
SECTIONS 14 & 44, GARAGES, INDUSTRIALS AND WAREHOUSES							SECTIONS 14 & 44, GARAGES, INDUSTRIALS AND WAREHOUSES (Continued)						
Armories, good and excellent		----	----	55	50	----	Industrials, manufacturing, heavy, good and excellent		60	60	55	----	50
average		----	----	50	40	40	low cost and average		55	55	50	45	45
Automotive service centers, good		----	----	45	40	40	light, good		50	50	45	40	40
average		----	----	40	35	35	average		50	50	40	35	35
low cost		----	----	35	30	30	low cost		45	45	40	35	35
Broadcasting facilities, good and excellent		55	55	50	45	45	Laboratory buildings, good and excellent		55	55	50	45	45
average		50	50	45	40	40	low cost and average		50	50	45	40	40
low cost		45	45	40	35	35	Lofts, excellent		60	60	----	----	----
Cold storage facilities, excellent		----	----	50	----	45	average and good		55	55	50	40	40
average and good		50	50	45	40	40	low cost		50	50	40	35	----
low cost and fair		----	----	40	35	35	Mini-lube garages, good and excellent		----	----	40	35	35
Complete auto dealerships, good and excellent		50	50	45	40	40	low cost and average		----	----	35	30	30
average		45	45	40	35	35	Mini-warehouses, low and high rise, good		----	----	45	40	40
low cost		----	----	35	30	30	average		45	45	40	35	35
Computer centers, good and excellent		50	50	45	40	40	low cost		----	----	35	30	30
low cost and average		45	45	40	35	35	Parking structures/parkades, good		45	45	----	----	----
Creameries, good		----	----	45	45	45	low cost and average		40	40	----	----	35
average		45	45	35	30	30	cheap		----	----	----	----	30
low cost		----	----	25	20	20	Passenger terminals, very good and excellent		45	45	40	40	----
Garages, municipal service, excellent		----	----	45	----	40	average and good		40	40	35	35	35
average and good		----	----	40	35	35	low cost and fair		35	35	30	30	30
Service and repair garages, good and excellent		----	----	40	35	35	control towers, good		35	35	----	----	----
low cost and average		40	40	35	30	30	average		30	30	----	----	----
Service garage sheds, good		----	----	35	30	30	low cost		25	25	----	----	----
low cost and average		----	----	30	25	25	Post offices, main and branch, good and excellent		60	60	55	50	50
Storage, average		45	45	40	35	35	low cost and average		55	55	50	45	45
Hangars, maintenance, excellent		----	----	45	----	40	mail processing facilities, good		----	----	50	----	45
good		----	----	40	----	40	average		50	50	45	----	40
average		----	----	40	35	35	Showrooms, good and excellent		50	50	45	40	40
low cost		----	----	35	30	30	average		45	45	40	35	35
Storage, excellent		----	----	40	----	40	low cost		----	----	35	30	30
good		----	----	40	----	35	Transit warehouses, average and good		----	----	45	40	40
average		----	----	35	30	30	Underground parking garages, average		45	45	----	----	----
low cost		----	----	30	30	30	Warehouses, distribution, good and excellent		55	55	50	45	45
cheap		----	----	----	20	20	average		50	50	45	40	40
T-hangars, average		----	----	30	----	30	low cost		----	----	40	35	35
low cost		----	----	----	20	20	Storage and mega storage, excellent		----	----	50	----	45
Industrial flex-mall buildings, average and good		----	----	50	40	40	average and good		50	50	45	40	40
low cost		----	----	40	35	35	cheap and low cost		45	45	40	35	35
Industrials, engineering, good and excellent		55	55	50	45	45	Miscellaneous buildings, excellent		60	60	55	45	45
average		50	50	45	40	40	average and good		55	55	50	40	40
low cost		50	50	40	35	35	low cost		50	50	40	35	35
							Misc. structures, shipping docks		----	----	----	40	40
							loading docks, excellent		----	----	----	35	35
							average and good		----	----	----	30	30
							low cost		----	----	----	25	25

LIFE EXPECTANCY GUIDELINES

TYPICAL BUILDING LIVES

OCCUPANCY	CLASS	A	B	C	D	S	OCCUPANCY	CLASS	A	B	C	D	S
SECTIONS 15 & 45, BANKS, OFFICES AND PUBLIC BUILDINGS							SECTIONS 16 & 46, CHURCHES, THEATERS AND AUDITORIUMS						
Atriums, good and excellent		60	60	55	50	50	Arcade buildings, good and excellent		----	----	45	40	----
average		55	55	50	45	45	average		----	----	40	35	35
Banks, branch and central, good and excellent		60	60	55	50	50	low cost		----	----	35	30	30
average		55	55	50	45	45	Auditoriums, excellent		55	55	50	45	----
low cost		50	50	45	40	40	average and good		50	50	45	40	40
mini, drive-up, good and excellent		55	55	50	45	45	low cost		----	----	40	35	35
low cost and average		50	50	45	40	40	Bowling centers, good and excellent		----	----	40	35	35
Convalescent hospitals, good and excellent		50	50	45	40	----	low cost and average		----	----	35	30	30
low cost and average		45	45	40	35	35	Casinos, very good		----	----	50	----	----
Dispensaries and urgent care, good		50	50	40	35	35	good		----	----	45	40	----
average		45	45	35	30	30	average		----	----	40	35	35
Fire stations, staffed, good, very good and excellent		50	50	45	40	40	low cost		----	----	35	30	30
low cost and average		45	45	40	35	35	Churches, sanctuaries, narthexes, classrooms, excellent		60	60	60	50	----
volunteer, good		----	----	40	35	35	good		60	60	50	45	45
low cost and average		40	40	35	30	30	average		50	50	45	40	40
General hospitals, good and excellent		50	50	45	40	----	cheap and low cost		----	----	40	35	35
low cost and average		45	45	40	35	35	Community recreation centers, good and excellent		50	50	45	40	40
Governmental buildings, good and excellent		60	60	55	50	----	low cost and average		45	45	40	35	35
low cost and average		55	55	50	40	40	Convention centers, good and excellent		55	55	50	45	----
Community service buildings, excellent		----	----	55	50	----	average		50	50	45	40	40
average and good		55	55	50	40	40	low cost		45	45	40	35	35
low cost		50	50	45	35	35	Fellowship halls, good and excellent		50	50	45	40	40
Jails, correctional facilities, good and excellent		55	55	45	40	----	low cost and average		45	45	40	35	35
low cost and average		50	50	40	35	35	cheap		----	----	30	30	30
Police stations, good and excellent		55	55	50	45	----	Fitness centers, good and excellent		50	50	45	40	40
average		50	50	45	40	----	average		45	45	40	35	35
low cost		45	45	40	----	----	Fraternal buildings, excellent		55	55	50	45	----
Kennels, very good and excellent		----	----	45	40	----	good		50	50	45	40	----
average and good		----	----	40	35	35	average		45	45	40	35	35
low cost		----	----	35	30	30	low cost		----	----	35	30	30
cheap		----	----	25	20	20	Handball/racquetball clubs, good		----	----	45	40	40
Medical offices, good and excellent		50	50	45	40	40	average		----	----	40	35	35
low cost and average		45	45	40	35	35	Indoor tennis clubs, good		----	----	45	40	40
Dental clinics, good and excellent		----	----	45	40	40	average		----	----	40	35	35
low cost and average		----	----	40	35	35	low cost		----	----	35	30	30
Offices, good and excellent		60	60	55	50	50	Museums, good and excellent		60	60	55	50	----
average		55	55	50	45	45	average		55	55	50	45	----
low cost		50	50	45	40	40	low cost		----	----	40	35	35
Outpatient (surgical) centers, good and excellent		50	50	45	40	----	Pavillions, excellent		----	----	50	45	----
low cost and average		45	45	40	35	35	very good		----	----	45	40	----
Parking levels, excellent		60	60	----	----	----	good		----	----	40	35	----
good		55	55	50	50	50	fair and average		----	----	35	30	30
average		50	50	45	45	45	low cost		----	----	30	25	25
low cost		30	30	25	25	25	cheap		----	----	25	20	20
cheap		25	25	20	20	20	Skating rinks, good and excellent		50	50	45	40	40
Public libraries, good, very good and excellent		60	60	55	50	50	average		45	45	40	35	35
average		55	55	50	45	45	low cost		----	----	35	30	30
low cost		----	----	45	40	40	Theaters, live-stage presentation, good and excellent		50	50	45	40	----
Veterinary hospitals, excellent		----	----	45	40	----	fair and average		45	45	45	40	40
average and good		45	45	40	35	35	low cost		----	----	40	35	35
low cost		----	----	35	30	30	Motion picture/cinema, very good and excellent		50	50	45	40	----
Misc. buildings: firing ranges, good and excellent		----	----	45	40	40	average and good		45	45	40	35	35
low cost and average		----	----	40	35	35	low cost and fair		----	----	35	30	30
							Visitor centers, good and excellent		55	55	50	45	----
							average		50	50	45	40	40
							low cost		----	----	40	35	35

DEPRECIATION – COMMERCIAL PROPERTIES

EFFECTIVE AGE IN YEARS	TYPICAL LIFE EXPECTANCY IN YEARS									
	70	60	55	50	45	40	35	30	25	20
	DEPRECIATION – PERCENTAGE									
1	0	0	0	0	1	1	1	2	2	3
2	0	1	1	1	1	2	2	3	5	7
3	0	1	1	1	2	3	4	5	7	10
4	1	1	1	2	3	4	5	7	10	14
5	1	1	2	3	4	5	6	9	13	18
6	1	2	2	3	4	6	8	11	16	22
7	1	2	3	4	5	7	10	14	19	26
8	1	2	3	5	6	8	11	16	22	30
9	2	3	4	5	7	10	13	18	25	35
10	2	3	4	6	8	11	15	21	29	40
11	2	4	5	7	9	13	17	24	32	45
12	2	4	6	8	10	14	19	26	36	50
13	2	5	6	9	12	16	22	29	40	55
14	3	5	7	10	13	18	24	32	44	60
15	3	6	8	11	14	20	26	35	48	65
16	3	7	9	12	16	22	28	39	52	69
17	4	7	10	13	18	24	31	42	56	73
18	4	8	11	14	19	26	34	46	60	76
19	4	9	12	16	21	28	36	49	64	78
20	5	9	13	17	23	30	39	53	68	79
21	5	10	14	18	25	32	42	57	71	80
22	6	11	15	20	27	35	45	60	73	
23	6	12	16	21	29	37	48	63	75	
24	7	13	17	23	31	40	52	66	77	
25	7	14	19	25	33	43	55	69	79	
26	8	15	20	27	35	46	58	72	80	
27	9	16	21	28	37	49	61	75		
28	9	17	23	30	40	52	64	77		
29	10	18	24	32	42	54	68	78		
30	11	20	26	34	45	57	72	79		
32	13	22	30	38	50	62	75	80		
34	15	25	34	43	55	68	77			
36	17	28	38	48	61	73	79			
38	19	32	42	53	67	77	80			
40	21	35	46	59	72	79				
42	25	39	51	65	75	80				
44	28	43	56	70	77					
46	31	48	60	74	78					
48	34	53	64	77	79					
50	38	58	68	79	80					
55	48	67	75	80						
60	57	74	78							
65	65	78	80							
70	71	80								
75	75									
80	78									

EFFECTIVE AGE IN YEARS	TYPICAL LIFE EXPECTANCY IN YEARS									
	70	60	55	50	45	40	35	30	25	20
	REMAINING LIFE EXPECTANCY – YEARS									
1	69	59	54	49	44	39	34	29	24	19
2	68	58	53	48	43	38	33	28	23	18
3	67	57	52	47	42	37	32	27	22	17
4	66	56	51	46	41	36	31	26	21	16
5	65	55	50	45	40	35	30	25	20	15
6	64	54	49	44	39	34	29	24	19	14
7	63	53	48	43	38	33	28	23	18	13
8	62	52	47	42	37	32	27	22	17	12
9	61	51	46	41	36	31	26	21	16	11
10	60	50	45	40	35	30	25	20	15	10
11	59	49	44	39	34	29	24	19	14	9
12	58	48	43	38	33	28	23	18	13	8
13	57	47	42	37	32	27	22	17	12	7
14	56	46	41	36	31	26	21	16	11	6
15	55	45	40	35	30	25	20	15	10	5
16	54	44	39	34	29	24	19	14	9	4
17	53	43	38	33	28	23	18	13	8	4
18	52	42	37	32	27	22	17	12	7	3
19	51	41	36	31	26	21	16	11	6	2
20	50	40	35	30	25	20	15	10	5	2
21	49	39	34	29	24	19	14	9	5	2
22	48	38	33	28	23	18	13	8	4	
23	47	37	32	27	22	17	12	7	3	
24	46	36	31	26	21	16	11	6	3	
25	45	35	30	25	20	15	10	6	2	
26	44	34	29	24	19	14	9	5	2	
27	43	33	28	23	18	13	8	4		
28	42	32	27	22	17	12	7	4		
29	41	31	26	21	16	11	7	3		
30	40	30	25	20	15	10	6	3		
32	38	28	23	18	13	8	5	2		
34	36	26	21	16	11	7	4			
36	34	24	19	14	10	6	3			
38	32	22	17	12	8	5	2			
40	30	20	15	10	7	4				
42	28	18	13	9	6	3				
44	26	16	12	8	5					
46	24	14	10	7	4					
48	22	13	9	6	3					
50	20	11	8	5	3					
55	16	8	6	3						
60	12	6	4							
65	9	4	3							
70	7	3								
75	5									
80	4									

PROPERTIES INCLUDED

Section 11 All apartments, hotels, resorts
 Section 12 Motels, lodges, large multiples & resorts
 Section 13 All
 Section 14 All
 Section 15 All except libraries
 Section 16 All except churches and fraternal bldgs.
 Section 17 All commercial and industrial uses
 Section 18 None
 Section 64 All commercial and industrial uses
 For lives less than 20 years, see Page 18.



VALUE SUMMARY

County of Cass

Account # 002-02-3920-00020-000

Owner Name Trinity Containers, LLC

Property Address 420 E Main Ave, West Fargo

2018 Appraised Value \$ 11,405,000 \$ 43.12

Indicated Values:	Totals	Per SF
Cost Approach	\$ 9,020,028	\$ 34.10

MARKET VALUE ESTIMATE	\$ 9,020,000	\$ 34.10
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CALCULATOR COST FORM

Square Foot Cost

1 Creator of Survey: Ryan, LLC
 2 Account Number: 02-3920-00020-000
 3 Located at: _____

Date of survey: 1/1/2018
 Owner: Trinity Containers

420 E Main Ave, West Fargo

	Building B2	Building A1	Building B1	Building A2	Building A3
4 Occupancy.....	Heavy Mfg	Light Mfg	Heavy Mfg	Light Mfg	Light Mfg
5 Building Class and Quality.....	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low
6 Exterior Wall.....	Metal	Metal	Metal	Metal	Metal
7 No. of stories & height per story.....	No. 1 Ht. 20	No. 1 Ht. 30	No. 1 Ht. 30	No. 1 Ht. 33	No. 1 Ht. 33
8 Average floor area.....	23,134	6,000	16,000	8,000	10,800
9 Average perimeter.....	630	310	560	360	430
10 Age and condition.....	Age: 43 Cond: Low	Age: 26 Cond: Low	Age: 30 Cond: Low	Age: 25 Cond: Low	Age: 21 Cond: Low
11 Region: Western _____ Central <input checked="" type="checkbox"/> Eastern _____					
12 Climate: Mild _____ Moderate <input checked="" type="checkbox"/> Extreme _____					

	Section 1	Section 2	Section 3	Section 4	Section 5
13 Base Square Foot Cost.....	\$ 76.01	\$ 31.31	\$ 76.01	\$ 31.31	\$ 31.31

SQUARE FOOT REFINEMENTS

14 Heating, cooling, ventilation.....	0.000	0.000	0.000	0.000	0.000
15 Elevator deduction.....	0.000	0.000	0.000	0.000	0.000
16 Miscellaneous	2.150	2.660	2.260	2.410	2.410
17 Total lines 13 through 15.....	78.16	33.97	78.27	33.72	33.72

HEIGHT AND SIZE REFINEMENTS

18 Number of stories - multiplier.....	1.000	1.000	1.000	1.000	1.000
19 Height per story - multiplier (see line 7).....	1.133	1.382	1.382	1.450	1.450
20 Floor area/perimeter multiplier (see lines 8 and 9).....	0.924	1.040	0.984	1.013	1.019
21 Combined height and size multiplier (Lines 18x19x20).....	1.047	1.437	1.360	1.469	1.478

FINAL CALCULATIONS

	Section 1	Section 2	Section 3	Section 4	Section 5
22 Refined square foot cost (Line 17x21).....	\$ 81.83	\$ 48.82	\$ 106.44	\$ 49.53	\$ 49.82
23 Current cost multiplier (Sect. 99, p. 3).....	1.02	1.02	1.02	1.02	1.02
24 Local multiplier (Sect. 99, pp. 5 through 10).....	1.03	1.03	1.03	1.03	1.03
25 Final sq. ft. cost (Line 22 x Line 23 x Line 24).....	\$ 85.97	\$ 51.29	\$ 111.82	\$ 52.04	\$ 52.34
26 Area.....	23,134	6,000	16,000	8,000	10,800
27 Line 25 x Line 26	1,988,724	307,769	1,789,187	416,287	565,316
28 Lump sums).....	See Below for Added Extra Features Value				
29 Replacement Cost (Line 27 + Line 28).....	1,988,724	307,769	1,789,187	416,287	565,316
30 Depreciation % (Section 97).....	75%	58%	45%	55%	42%
31 Economic or Functional Obsolescence % (Section 97).....	30%	30%	30%	30%	30%
32 Total Obsolescence amount (Line 29 x Line 30+31).....	1,939,006	232,058	1,046,675	297,645	308,662
33 Depreciated Cost (Line 29 - Line 30 and 31).....	\$ 49,718	\$ 75,711	\$ 742,513	\$ 118,642	\$ 256,653

TOTAL OF ALL SECTIONS

34 Depreciated Cost	\$ 1,243,237	TOTAL OF ALL SECTIONS	Replacement Cost	\$ 5,067,283	
Extra Features (FMV)	\$ -				
Land Value:	\$ 488,071	Land Sqft	659,556	Land Value per Sqft	\$ 0.74
Total Cost Value:	\$ 1,731,309	Price per Sqft	\$ 32.58		

CALCULATOR COST FORM

Square Foot Cost

1 Creator of Survey: Ryan, LLC
 2 Account Number: 02-3920-00020-000
 3 Located at: _____

Date of survey: 1/1/2018
 Owner: Trinity Containers

420 E Main Ave, West Fargo

	Building A5	Building A6	Building A7	Building A1: Office	Building A4: Office
4 Occupancy.....	Light Mfg	Light Mfg	Light Mfg	Office	Office
5 Building Class and Quality.....	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low	Cls: S Qual: Low	Cls: C Qual: Low
6 Exterior Wall.....	Metal	Metal	Metal	Metal	Brick/Veneer
7 No. of stories & height per story.....	No. 1 Ht. 38	No. 1 Ht. 32	No. 2 Ht. 26	No. 1 Ht. 12	No. 2 Ht. 12
8 Average floor area.....	37,310	135,680	22,176	3,000	2,400
9 Average perimeter.....	1,062	1,572	696	220	200
10 Age and condition.....	Age: 17 Cond: Low	Age: 10 Cond: Low	Age: 18 Cond: Low	Age: 43 Cond: Low	Age: 21 Cond: Low
11 Region: Western _____ Central <input checked="" type="checkbox"/> Eastern _____					
12 Climate: Mild _____ Moderate <input checked="" type="checkbox"/> Extreme _____					

	Section 1	Section 2	Section 3	Section 4	Section 5
13 Base Square Foot Cost.....	\$ 31.31	\$ 31.31	\$ 31.31	\$ 65.50	\$ 76.00

SQUARE FOOT REFINEMENTS

14 Heating, cooling, ventilation.....	0.000	0.000	0.000	0.000	0.000
15 Elevator deduction.....	0.000	0.000	0.000	0.000	0.000
16 Miscellaneous.....	2.060	1.640	2.150	3.900	4.160
17 Total lines 13 through 15.....	33.37	32.95	33.46	69.40	80.16

HEIGHT AND SIZE REFINEMENTS

18 Number of stories - multiplier.....	1.000	1.000	1.000	1.000	1.000
19 Height per story - multiplier (see line 7).....	1.575	1.425	1.281	1.000	1.515
20 Floor area/perimeter multiplier (see lines 8 and 9).....	0.945	0.867	0.942	1.018	1.052
21 Combined height and size multiplier (Lines 18x19x20).....	1.488	1.235	1.207	1.018	1.594

FINAL CALCULATIONS

	Section 1	Section 2	Section 3	Section 4	Section 5
22 Refined square foot cost (Line 17x21).....	\$ 49.67	\$ 40.71	\$ 40.38	\$ 70.65	\$ 127.76
23 Current cost multiplier (Sect. 99, p. 3).....	1.02	1.02	1.02	0.98	0.99
24 Local multiplier (Sect. 99, pp. 5 through 10).....	1.03	1.03	1.03	1.03	1.01
25 Final sq. ft. cost (Line 22 x Line 23 x Line 24).....	\$ 52.18	\$ 42.77	\$ 42.42	\$ 71.31	\$ 127.74
26 Area.....	37,310	135,680	44,352	3,000	4,800
27 Line 25 x Line 26.....	1,946,844	5,802,867	1,881,380	213,940	613,174
28 Lump sums).....	See Below for Added Extra Features Value				
29 Replacement Cost (Line 27 + Line 28).....	1,946,844	5,802,867	1,881,380	213,940	613,174
30 Depreciation % (Section 97).....	31%	15%	34%	80%	25%
31 Economic or Functional Obsolescence % (Section 97).....	30%	30%	30%	30%	30%
32 Total Obsolescence amount (Line 29 x Line 30+31).....	784,578	1,131,559	831,570	222,498	199,282
33 Depreciated Cost (Line 29 - Line 30 and 31).....	\$ 1,162,266	\$ 4,671,308	\$ 1,049,810	\$ (8,558)	\$ 413,893

TOTAL OF ALL SECTIONS

34 Depreciated Cost	\$ 7,288,719	Replacement Cost	\$ 10,458,206
Extra Features (FMV)	\$ -	Land Sqft	-
Land Value:	\$ -	Land Value per Sqft	_____
Total Cost Value:	\$ 7,288,719	Price per Sqft	\$ 33.08



VALUE SUMMARY

County of	Cass		
Account #	02-0080-00030-000		
Owner Name	Trinity Containers, LLC		
Property Address	420 E Main Ave, West Fargo		
2018 Appraised Value	\$	972,100	\$ 28.10
Indicated Values:		Totals	Per SF
Cost Approach	\$	617,947	\$ 17.86
MARKET VALUE ESTIMATE	\$	618,000	\$ 17.86

CALCULATOR COST FORM

Square Foot Cost

1 Creator of Survey: Ryan, LLC
 2 Account Number: 02-0080-00030-000
 3 Located at: _____

Date of survey: 1/1/2018
 Owner: Trinity Containers

406 E Main Ave, West Fargo

	Building MTL WHSE	Building A1: Office	Building B2	Building B3
4 Occupancy.....	Warehouse	Office	Light Mfg	Warehouse
5 Building Class and Quality.....	Cls: S Qual: Low	Cls: S Qual: Avg	Cls: S Qual: Avg	Cls: S Qual: Avg
6 Exterior Wall.....	Metal	Metal	Metal	Metal
7 No. of stories & height per story.....	No. 1 Ht. 14	No. 1 Ht. 12	No. 1 Ht. 21	No. 1 Ht. 20
8 Average floor area.....	24,000	1,600	6,000	3,000
9 Average perimeter.....	880	160	320	260
10 Age and condition.....	Age: 59 Cond: Low	Age: 14 Cond: Avg	Age: 14 Cond: Avg	Age: 8 Cond: Avg
11 Region: Western _____ Central <input checked="" type="checkbox"/> Eastern _____				
12 Climate: Mild _____ Moderate <input checked="" type="checkbox"/> Extreme _____				

	Section 1	Section 2	Section 3	Section 4
13 Base Square Foot Cost.....	\$ 25.94	\$ 97.00	\$ 44.05	\$ 37.02

SQUARE FOOT REFINEMENTS

14 Heating, cooling, ventilation.....	0.000	0.000	0.000	0.000
15 Elevator deduction.....	0.000	0.000	0.000	0.000
16 Miscellaneous	2.280	0.000	0.000	0.000
17 Total lines 13 through 15	28.22	97.00	44.05	37.02

HEIGHT AND SIZE REFINEMENTS

18 Number of stories - multiplier.....	1.000	1.000	1.000	1.000
19 Height per story - multiplier (see line 7).....	1.000	1.000	1.150	1.133
20 Floor area/perimeter multiplier (see lines 8 and 9).....	0.977	1.105	1.040	1.182
21 Combined height and size multiplier (Lines 18x19x20)	0.977	1.105	1.196	1.339

FINAL CALCULATIONS

	Section 1	Section 2	Section 3	Section 4
22 Refined square foot cost (Line 17x21).....	\$ 27.57	\$ 107.19	\$ 52.68	\$ 49.58
23 Current cost multiplier (Sect. 99, p. 3).....	1.02	0.98	1.02	1.02
24 Local multiplier (Sect. 99, pp. 5 through 10).....	1.03	1.03	1.03	1.03
25 Final sq. ft. cost (Line 22 x Line 23 x Line 24).....	\$ 28.97	\$ 108.19	\$ 55.35	\$ 52.09
26 Area.....	24,000	1,600	6,000	3,000
27 Line 25 x Line 26	695,185	173,108	332,098	156,258
28 Lump sums).....	See Below for Added Extra Features Value			
29 Replacement Cost (Line 27 + Line 28).....	695,185	173,108	332,098	156,258
30 Depreciation % (Section 97).....	80%	13%	24%	8%
31 Economic or Functional Obsolescence % (Section 97).....	30%	30%	30%	30%
32 Total Obsolescence amount (Line 29 x Line 30+31).....	722,992	29,255	103,614	16,251
33 Depreciated Cost (Line 29 - Line 30 and 31).....	\$ (27,807)	\$ 143,853	\$ 228,483	\$ 140,007

	TOTAL OF ALL SECTIONS		Replacement Cost	\$ 1,356,648
34 Depreciated Cost	<u>\$ 484,536</u>			
Extra Features (FMV)	<u>\$ -</u>			
Land Value:	<u>\$ 133,411</u>	Land Sqft	<u>180,285</u>	Land Value per Sqft <u>\$0.74</u>
Total Cost Value:	<u>\$ 617,947</u>	Price per Sqft	<u>\$ 17.86</u>	



VALUE SUMMARY

County of Cass

Account # 02-0080-00050-000

Owner Name Trinity Containers, LLC

Property Address 420 E Main Ave, West Fargo

2018 Appraised Value \$ 393,400 \$ 0.99

Indicated Values:	Totals	Per SF
Cost Approach	\$ 293,336	\$ 0.74

MARKET VALUE ESTIMATE	\$ 293,000	\$ 1.00
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VALUE SUMMARY

County of Cass

Account # 02-0080-00060-000

Owner Name Trinity Containers, LLC

Property Address 420 E Main Ave, West Fargo

2018 Appraised Value \$ 443,700 \$ 1.36

Indicated Values:	Totals	Per SF
Cost Approach (Land)	\$ 241,563	\$ 0.74
Cost Approach (Pavement)	\$ 117,300	\$ 0.36

MARKET VALUE ESTIMATE	\$ 358,863	\$ 1.10
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VALUE SUMMARY

County of Cass

Account # 02-0097-00010-000

Owner Name Trinity Containers, LLC

Property Address 420 E Main Ave, West Fargo

2018 Appraised Value \$ 1,632,700 \$ 0.74

Indicated Values:	Totals	Per SF
Cost Approach	\$ 1,632,700	\$ 0.74

MARKET VALUE ESTIMATE	\$ 1,633,000	\$ 0.74
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VALUE SUMMARY

County of Cass

Account # 02-3920-00010-000

Owner Name Trinity Containers, LLC

Property Address 420 E Main Ave, West Fargo

2018 Appraised Value \$ 1,351,100 \$ 1.41

Indicated Values:	Totals	Per SF
Cost Approach	\$ 709,736	\$ 0.74

MARKET VALUE ESTIMATE	\$ 710,000	\$ 0.74
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