Summary

This section contains definitions for the valuation of heavy industrial buildings and structures, oil and gas well resource production equipment, mine resource production equipment and pipelines.

Heavy Industrial Buildings and Structures

The replacement cost new, physical deterioration, functional obsolescence and closure adjustment factor for heavy industrial buildings or structures shall be determined in accordance with the valuation procedures in:

- Chapter 1 – Regulated Property, Section 1.1.7 – Regulated Property, Heavy Industrial Buildings and Structures
- Chapter 3 – Heavy Industrial Improvements; and
- Marshall Valuation Service.

Oil and Gas Well Resource Production Equipment

The replacement cost new, physical deterioration, downtime allowance, and production adjustment factor for oil and gas well resource production equipment shall be determined in accordance with valuation procedures in Chapter 4 - Resource Production Equipment, Section 4.1 - Oil and Gas Well Resource Production Equipment.

Mine Resource Production Equipment

The replacement cost new, physical deterioration, downtime allowance, and downtime adjustment factor for mine resource production equipment shall be determined in accordance with the valuation procedures in Chapter 4 - Resource Production Equipment, Section 4.2 - Mine Resource Production Equipment.

Pipelines

The replacement cost new, physical deterioration, and volume adjustment factor for pipelines shall be determined in accordance with the valuation procedures in Chapter 5 - Pipelines.

Summary

This section contains the valuation procedures for determining the replacement cost new for heavy industrial buildings and structures.

Use of Rate Schedules

Where a rate schedule does not state the units of comparison, the units of comparison are dollars per square foot ($/sq.ft.).

Where a rate schedule does not contain a rate, factor or multiplier for a specific dimension or size, mathematical interpolation of the next highest and next lowest rate, factor or multiplier is used to calculate the required rate, factor or multiplier.

Where a rate schedule contains an extension rate, the extension rate is applied to all units of comparison greater than the next lowest size or dimension.

Measurement of Buildings and Structures

All building and structure measurements are imperial or metric standards. Linear measurements are determined to the nearest half foot.

The floor area of a building or structure or a section of a building or structure includes the interior partitions, elevators, stairways and exterior walls.

The floor area of a building or structure or a section of a building or structure is measured to the outside finished surface of the exterior walls, unless otherwise specified.

Unit of Comparison

The units of comparison should be imperial or their metric equivalent.

The following are the units of comparison and their application for determining the replacement cost new of buildings and structures.

Type	Units of Comparison	Abbreviation
Section Area	Square Feet	sq.ft.
Unit Area	Square Feet	sq.ft.
Floor Area	Square Feet	sq.ft.
Surface Area	Square Feet	sq.ft.
Base Area	Square Feet	sq.ft.
Building Volume	Cubic Feet	cu.ft.
	Bushels	bushels
Tank Volume	Imperial Gallons	imp. gal.
	U.S. Gallons	USG
	Imperial Barrels	barrels
	Cubic Meters	M^3
Bin Volume	Bushels	bushels
Elevator Volume	Bushels	bushels
Structure Volume	Pounds per Hour	lb./hr.
Structure Height	Feet	ft.
Structure Length	Feet	ft.
Perimeter	Feet	ft.
Structural Unit	Unit	unit
Reservoir	Acre Foot	a.f.
	Imperial Gallons	imp. gal.
	U.S. Gallons	USG

General

The replacement cost new of heavy industrial buildings or structures shall be determined by calculating the cost of construction using the calculator method, unit-in-place cost method, segregated cost method or trended original cost method. The methods shall be applied in accordance with the valuation procedures in the Marshall Valuation Service, or in the case of non-standard buildings and structures in Chapter 3 - Heavy Industrial Improvements, Non-standard Buildings and Structures.

Climate Rating

When using the Marshall Valuation Service for the calculator method, the unit-in-place cost method and the segregated cost method, the extreme climate cost adjustments shall be used for heating, ventilation and air conditioning (HVAC).

Calculator Method

The calculator method for determining replacement cost new is used where a heavy industrial building or structure can be classified in accordance with the classification guidelines in the Marshall Valuation Service, Calculator Method or in the case of non-standard buildings and structures in Chapter 3 - Heavy Industrial Improvements, Non-standard Buildings and Structures.

The replacement cost new using the calculator method is determined by application of the following calculation procedure:

1. Determine the occupancy code for the building or structure;
2. Determine the building attributes required to calculate the replacement cost new from the classification and calculation procedures for the specific occupancy code; and
3. Calculate the replacement cost new in accordance with the calculation procedures for the specific occupancy code.

Unit-in-place Cost Method

The unit-in-place cost method for determining replacement cost new shall be used where a specific heavy industrial building or structure attribute cannot be classified in accordance with the classification guidelines for the calculator method, and can be classified in accordance with the unit-in-place classification guidelines, rate schedules, and calculation procedures in the Marshall Valuation Service, Unit-In-Place Costs, Sections 51 to 67.

Where a building or structure cannot be classified in accordance with the classification guidelines for the calculator method, the replacement cost new shall be determined by application of the following calculation procedure:

1. Determine the structural components that comprise the building or structure;
2. Determine the unit-in-place cost for each structural component;
3. Calculate the replacement cost new for each structural component by multiplying the unit-in-place cost by the number of units; and
4. Calculate the replacement cost new of the building or structure by summing the replacement cost new of the structural components.

Segregated Cost Method

The segregated cost method for determining replacement cost new shall be used where a specific heavy industrial building or structure attribute cannot be classified in accordance with the classification guidelines for the calculator method, or the unit-in-place cost method, and can be classified in accordance with the segregated cost classification guidelines, rate schedules, and calculation procedures in the Marshall Valuation Service, Segregated Method.

Trended Original Cost Method

The trended original cost method for determining replacement cost new shall be used where a specific heavy industrial building or structural attribute cannot be classified in accordance with the classification guidelines for the calculator method, the unit-in-place cost method or the segregated cost method.

Both direct costs and indirect costs shall be included where the replacement cost new of a heavy industrial building or structure is determined by the trended original cost method.

Direct costs shall include all labour and materials; site preparation, grading and excavation for the foundation; and connection of utilities that are directly related to the building or structure.

Indirect costs related to the building or structure shall include architectural and engineering fees, permits and plans; survey fees, net sales taxes, service charges and interest on building funds during construction; building supervision and overhead costs, contractor's profit, worker's compensation and unemployment insurance costs; fire and liability insurance, temporary equipment and facilities, and security charges related to the construction of the building or structure.

Costs excluded from the determination of replacement cost new by the trended original cost method are as follows:

- land improvement costs, subdivision and development costs, studies for the project, appraisal or other consulting fees, including:
    - costs related to the purchase or assembly of land and related legal fees, and
    - property taxes, demolition, storm drain charges or rough site grading;
- financing discounts or bonuses, start-up costs, feasibility overhead, and fixture and equipment purchases;
- site improvement costs such as signs, landscaping, paving, walls, lighting, swimming pools or other recreational facilities;
- off site costs including roads, streets and other infrastructure, acreage and subdivision development fees, connection charges, environmental impact or other assessments;
- furnishings, fixtures or equipment not included in the general building contract;
- marketing or real estate expenses to create occupancy; and
- costs considered specialized tenant improvements.

The replacement cost new for heavy industrial buildings and structures using the trended original cost method is determined by application of the following calculation procedure:

1. Determine the original construction cost of the building or structure;
2. Determine the direct and indirect costs requiring an adjustment;
3. Determine the comparative cost factor (see Document 3.1.5) for commercial buildings required to adjust construction costs to January 1, 2015; and
4. Calculate the replacement cost new of the building or structure by adjusting the original construction cost for any direct or indirect costs requiring adjustment and multiplying the adjusted original construction cost by the comparative cost index.

Summary

This section contains the calculation procedures used to calculate the assessed value for heavy industrial buildings and structures after the Replacement Cost New (RCN) has been determined.

Heavy Industrial Buildings and Structures

The following calculation procedure shall be used for heavy industrial buildings and structures.

Description	Document No.	Page No.
(a) Replacement Cost New (RCN)	3.1.2	1-4
(b) Cost Factor	3.1.4	1
(c) RCN x Cost Factor = a x b		
(d) RCN Less Physical Deterioration = c x (1-(d_1 x d_2)) d_1. Physical Deterioration d_2. Condition Rating	 3.1.8 3.1.8	 1-4 5-6
(e) RCN Less Physical Deterioration, Functional Obsolescence and Closure Adjustment Factor = (d -(d x e_1)) x e_2 e_1. Functional Obsolescence Factor e_2. Closure Adjustment Factor	 3.1.9 3.1.10	 1 1
(f) Assessed Value = e		

Oil & Gas Well Buildings and Structures

The following calculation procedure shall be used for oil and gas well buildings on an oil or gas well site.

Description	Document No.	Page No.
(a) Replacement Cost New (RCN)	3.1.2	1-4
(b) Cost Factor	3.1.4	1
(c) RCN x Cost Factor = a x b		
(d) RCN Less Physical Deterioration = c x (1- d_1) d_1. Physical Deterioration	 3.1.8	 1-4
(e) RCN Less Physical Deterioration and Production Adjustment Factor = d x e_1 e_1. Production Adjustment Factor	 4.1.1	 3-5
(f) Assessed Value = e		

Description

This section contains the valuation procedures for determining the cost factor for all heavy industrial buildings and structures.

Cost Factor Formula

The cost factor is calculated by the following formula:

Cost Factor = Current Cost Multiplier x Local Multiplier x Saskatchewan Cost Factor

Marshall Valuation Service Commercial Current Cost Multipliers

Calculator Method
When using the calculator method use the Marshall Valuation Service current cost multipliers in Section 99 (Current and Local Cost Multipliers), page 3, Current Cost Multipliers, Calculator Cost Sections, Central, dated 10/2014.

Segregated Method
When using the segregated method use the Marshall Valuation Service current cost multipliers in Section 99 (Current and Local Cost Multipliers), page 3, Current Cost Multipliers, Segregated Cost Sections, Central, dated 10/2014.

Unit-in-place Method
When using the unit-in-place method use the Marshall Valuation Service current cost multipliers in Section 99 (Current and Local Cost Multipliers), page 3, Current Cost Multipliers, Unit-In-Place Cost Sections 51 to 67, Central, dated 10/2014.

Marshall Valuation Service Commercial Local Multipliers

Apply the Marshall Valuation Service local multipliers from Section 99 (Current and Local Cost Multipliers), page 5, Local Multipliers, Canada, Saskatchewan, dated 10/2014.

The Canadian Tax Removal adjustment in Section 99, page 5, shall not be applied in the determination of Replacement Cost New (RCN) and Assessed values in Saskatchewan.

Saskatchewan Cost Factor

The Saskatchewan Cost Factor is 1.10.

Cost Factor

The Cost Factor (Current Cost Multiplier x Local Multiplier x Saskatchewan Cost Factor) for the following building and structures is 1.00:

- Oil & Gas Well Tanks (S880)
- Oil & Gas Well Buildings (S881)
- Conveyor Gallery (S933)

Description

This section contains the valuation procedures for determining the comparative cost factor for heavy industrial buildings and structures.

Application

Where the replacement cost new for heavy industrial buildings and structures is determined by the trended original cost method, the comparative cost factor shall be applied to adjust the original construction cost to January 1, 2015.

The trended original cost method is used where a specific building or structural attribute cannot be classified in accordance with the classification guidelines for the calculator method, the unit-in-place cost method or the segregated cost method.

Comparative Cost Factor

Year	Class				
	A	B	C	D	S
	Fireproofed Steel Frame	Reinforced Concrete Frame	Masonry Bearing Walls	Wood Frame	Metal Frame
2014 & newer					
2013					
2012					
2011					
2010					
2009					
2008					
2007					
2006					
2005					
2004					
2003					
2002					
2001					
2000					
1999					
1998					
1997					
1996					
1995					
1994					
1993					
1992					
1991					
1990					
1989					
1988					

Year	Class				
	A	B	C	D	S
	Fireproofed Steel Frame	Reinforced Concrete Frame	Masonry Bearing Walls	Wood Frame	Metal Frame
1987					
1986					
1985					
1984					
1983					
1982					
1981					
1980					
1979					
1978					
1977					
1976					
1975					
1974					

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Description

This section contains the valuation procedures for determining building height adjustments for various types of heavy industrial buildings.

Application

Building height adjustments that may be applied are:

- storey height;
- section height; and
- building height (total number of storeys).

Storey Height

Storey height is the vertical height of the exterior wall, which is measured as follows:

- in a flat roof one storey building, the vertical distance from the top of the floor to the top of the roof;
- in a slant roof building, the average vertical distance from the floor to the top of the roof;
- in a one storey standard gable roof building, the vertical distance from the top of the floor to the top of the exterior wall;
- in a multi-storey building, the vertical distance from the top of the floor to the top of the next floor above; and
- for non-standard or high pitched roofs, by dividing the cubic volume of the building section by the area of the building.

Where the storey height varies from the standard storey height for the building, a storey height factor shall be applied.

The standard storey height and the storey height factor are specified in the structural components and adjustments sections for the specific occupancy codes to which they apply.

Section Height

Section height is the number of storeys in a section of a building, where each storey is constructed to the same construction standard.

Building Height (Total Number of Storeys)

Building height is the total number of storeys for all portions of a building that are attached vertically, excluding below ground portions such as basements. The building height factor shall be applied to all storeys including below ground portions.

The units of measure for building height shall be the number of storeys.

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Web Site: http://www.sama.sk.ca

Building Height (Total Number of Storeys)	Factor	Building Height (Total Number of Storeys)	Factor
1		26	
2		27	
3		28	
4		29	
5		30	
6		31	
7		32	
8		33	
9		34	
10		35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		≥ 50	

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Description

This section contains the valuation procedures for determining incomplete construction adjustments for various types of heavy industrial buildings and structures.

Application

The incomplete construction adjustment shall be used to adjust the replacement cost new of buildings or structures that are under construction.

Where the base rate is adjusted for a missing building component, an incomplete construction adjustment for the missing component shall not be included in the calculation of replacement cost new.

Where a building is under construction and the base rate is not adjusted for a missing component, the incomplete construction factor shall be determined using the following formula:

$$\text{Incomplete Construction Factor} = \frac{\text{(Total Construction Cost – Costs Incurred to Date)}}{\text{Total Construction Cost}}$$

Summary

This section contains the valuation procedures for determining the amount of physical deterioration for heavy industrial buildings and structures.

Application

Physical deterioration is the loss in value from replacement cost new due to wear and tear, decay and structural defects caused by the forces of nature.

Some causes of physical deterioration are normal use, breakage, neglect, infestation of insects, dry rot, moisture, and climatic elements. The occurrence of physical deterioration is dependent on the quality of the workmanship and materials used to construct the building or structure, and the use, abuse and general maintenance of the building or structure since its construction.

Formulas, Rules and Principles

The physical deterioration and condition rating schedules account for all curable and incurable physical deterioration and normal functional obsolescence not accounted for in the replacement cost new of the building or structure.

No additional allowance shall be made for physical deterioration except as may be accounted for in the calculation of the production adjustment factor for oil and gas well site buildings and structures.

Where the total percentage amount of physical deterioration is equal to or greater than the replacement cost new of the building or structure, the amount of physical deterioration is 99 percent.

Physical deterioration may be determined by the age-life method or lifetime method.

Age-Life Method

The age-life method is used where the actual or effective age of the building or structure is known or can be estimated, and the condition of the building or structure can be determined or estimated.

‘Actual age’ is the number of years elapsed since an original structure was built.

‘Effective age’ is the typical age of structures equivalent to the one in question with respect to condition and utility and reflects the remaining economic life of the building or structure. Effective age can be either shorter or longer than actual age.

‘Economic life’, with respect to a building or structure, means the period during which a given building or structure is expected to contribute (positively) to the value of the total property. This period is typically shorter than the period during which the improvement could be left on the property, that is, its physical life. Renovation, remodelling, or rehabilitation can extend a building's physical life and can have an effect on its remaining economic life.

The amount of physical deterioration is determined by application of the following calculation procedure:

1. Determine the normal life expectancy for the class and type of building or structure;
2. Determine the effective age and the percentage amount of deterioration for the class and type of building or structure using the physical deterioration schedules;
3. Determine the condition and condition factor using the condition rating schedule; and
4. Calculate the total percentage amount of physical deterioration by multiplying the amount of physical deterioration from the physical deterioration schedule by the condition factor from the condition rating schedule.

Lifetime Method

The amount of physical deterioration by the lifetime method for heavy industrial buildings and structures is 40%. The condition rating is 1.0.

The lifetime method is used for the following heavy industrial buildings and structures:

Non-standard heavy industrial buildings and structures:

1. Marshall Valuation Service

    - Secure Storage Shed: Section 17, page 25
    - Farm Storage: Section 17, pages 54 to 55
    - Tanks: Section 61
    - Miscellaneous Industrial Costs: Section 62, pages 5 to 6

2. SAMA's 2015 Cost Guide

    - Chapter 7: Commercial Tanks and Reservoirs
    - Chapter 8: Commercial Cylindrical Bin (S840)
    - Chapter 8: Commercial Hopper Bin (S841)
    - Chapter 8: Utility Bin (S842)
    - Chapter 8: Utility Hopper Bin (S843)
    - Chapter 9: Stack (S852)
    - Chapter 9: Incinerator (S853)
    - Chapter 9: Mill Incinerator (S854)
    - Chapter 9: Brick Incinerator (S855)
    - Chapter 9: Tower (S860)
    - Chapter 9: Guyed Tower (S861)

3. Saskatchewan Assessment Manual (2015 Base Year)

    - Chapter 3: Oil and Gas Well Tanks (S880)
    - Chapter 3: Oil and Gas Well Buildings (S881)
    - Chapter 3: Utility Tunnel (S932)

Commercial Building and Structure Physical Deterioration Schedule

Use the physical deterioration schedule in the Marshall and Swift Valuation Service Section 97, Depreciation – Commercial Properties dated October 2012 except for occupancy codes that use a life expectancy from the Specified Commercial Building Life Expectancy Table.

Properties built in 2015 or newer are assigned an effective age of '0'.

For commercial buildings and structures, the following construction classes are used to assign life expectancies from the Specified Commercial Building Life Expectancy Table. The class of construction is the basic subdivision in the Marshall Valuation Service, dividing all buildings into basic cost groups by type of framing.

Construction Class	Construction Class Description
C	Concrete Frame (Masonry) Exterior Wall
D	Wood Frame Exterior Wall
P	Pole Frame Exterior Wall
S	Steel Frame Exterior Wall
W	Steel Frame Exterior Slant Wall

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Specified Commercial Building Life Expectancy Table

Occupancy Code	Occupancy Description	Const. Class	Construction Quality			
			Low Cost	Average	Good	Excellent
104	Commodity Warehouse	C				
		D				
		P				
		S				
		W				
123	Seed Processing Storage	D				
		P				
		S				
339	Lumber Storage Shed	D				
		P				
		S				
390	Lumber Storage Building	D				
		P				
		S				
391	Material Storage Building	C				
		D				
		P				
		S				
		W				
420	Bulk Fertilizer Storage	C				
		D				
		P				
		S				
468	Material Storage Shed	C				
		D				
		P				
		S				
		W				
471	Light Commercial Utility Building	C				
		D				
		P				
		S				
		W				
554	Shed Office Structure	C				
		D				
		P				
		S				
555	Light Commercial Quonset	D				
		P				
		S				
556	Bulk Oil Storage	D				
		P				
		S				

Condition Rating Schedule

The condition of buildings and structures is determined by taking into consideration the remaining economic life of both short-lived and long-lived items.

Short-lived items have a shorter life than the basic structure, for example roofing, interior finish, floor coverings, heating system and plumbing fixtures.

Long-lived items are in the basic structure of the building and are not usually replaced during the economic life of the building. Long-lived items include such things as the foundation, frame, floor and roof structure, piping, heat ducts, insulation and electrical wiring.

The condition factor for heavy industrial buildings and structures is determined by application of the following condition rating schedule:

Condition Rating	Description	Condition Factor
Excellent	Remodelling: Extensive remodelling has occurred in recent years. No functional inadequacies of any consequence. Long-lived items: Long-lived items have had good maintenance, remodelling, or renovation where necessary. Maintenance: Above normal regular general maintenance has occurred. All items that can normally be repaired or refinished have recently been corrected. Short-lived items: All major short-lived items are in like-new condition.	0.5
Superior	Remodelling: Some remodelling has occurred in recent years. Little evidence of functional obsolescence and a high degree of utility. Long-lived items: Long-lived items have had good maintenance, remodelling or renovation where necessary. Maintenance: Above normal regular general maintenance has occurred. Short-lived items: Most major short-lived items are in like-new condition.	0.6
Very Good	Remodelling: Some remodelling has occurred since construction of the original building. Little evidence of functional obsolescence and a high degree of utility. Long-lived items: Long-lived items have been repaired where necessary. No visible evidence of deterioration. Maintenance: Normal regular general maintenance has occurred. Many items have been overhauled and repaired as they've shown signs of wear. Short-lived items: Many of the major short-lived items are in like-new condition, while others are well maintained and some may require minor repair.	0.7
Good	Remodelling: Utility is above the standard. Long-lived items: Long-lived items have been repaired where necessary. Maintenance: Normal regular general maintenance has occurred. No obvious maintenance required. Short-lived items: A few major short-lived items are in like-new condition, while others are well maintained and some may require minor repair.	0.8

Condition Rating	Description	Condition Factor
Above Average	Remodelling: Building is substantially in its original state. Long-lived items: Most long-lived items have been repaired where necessary. Maintenance: Normal regular general maintenance has occurred. Short-lived items: A few major short-lived items are in like-new condition, while others are well maintained and some may require minor repair.	0.9
Average	Irrespective of the following description, new or recently built buildings are considered to be in average condition. Remodelling: Building is substantially in its original state. Utility is standard for properties with a similar class and usage. Long-lived items: Most long-lived items have been repaired where necessary. Maintenance: Normal regular general maintenance has occurred. May have some evidence of deferred maintenance as a few minor repairs and refinishing are needed. Short-lived items: A few major short-lived items may require repair or replacement, while others will not require replacement in the short term.	1.0
Below Average (Badly Worn)	Remodelling: Building is substantially in its original state. Inadequate building utility and services. Long-lived items: Lack of maintenance of long-lived items has resulted in structural decay and defects. Maintenance: Deferred general maintenance is apparent. Much repair is needed. Short-lived items: Some major short-lived items require repair or replacement, while others show noticeable wear.	1.15
Poor (Worn Out)	Remodelling: Building is substantially in its original state. Usually contains numerous functional inadequacies. Long-lived items: Lack of maintenance of long-lived items has resulted in structural decay and defects that cannot be economically repaired. Maintenance: General maintenance has been neglected. Short-lived items: Most short-lived items need major repairs or replacement.	1.3

Summary

This section contains the valuation procedures for determining the amount of functional obsolescence for heavy industrial buildings and structures.

Formulas, Rules and Principles

Functional obsolescence is the loss in value from replacement cost new less physical deterioration due to the inability of the building or structure to adequately perform the function for which it is used.

Functional obsolescence is caused by changes in demand, design and technology that result in a loss in the utility of the building or structure.

No allowance shall be made for functional obsolescence except as may be accounted for in the calculation of functional obsolescence and the calculation of the replacement cost new less physical deterioration.

Functional obsolescence is any functional obsolescence not accounted for in the replacement cost new less physical deterioration. Where there is no functional obsolescence attributed to a building or structure the functional obsolescence factor shall be 1.0.

Functional obsolescence not accounted for in the replacement cost new less physical deterioration shall be accounted for in accordance with the replacement cost method or comparable unit method.

Replacement Cost Method

The amount of obsolescence shall be determined from the replacement cost of a substitute building or structure.

The amount of functional obsolescence shall be determined by application of the following calculation procedure:

1. Determine the replacement cost new less physical deterioration of the building or structure with the functional obsolescence;
2. Determine the replacement cost new less physical deterioration of a substitute building or structure without the obsolescence; and
3. Calculate the functional obsolescence factor by dividing the replacement cost new less physical deterioration of the substitute building or structure by the replacement cost new less physical deterioration of the building or structure with the functional obsolescence.

Comparable Unit Method

The comparable unit method may be used where there is insufficient information to establish functional obsolescence by the replacement cost method. The amount of functional obsolescence shall be determined by comparison to other comparable buildings or structures.

The amount of functional obsolescence shall be determined by application of the following formula:

$FUNCT_{SUB} = FUNCT_{COMP}$

where: $FUNCT_{SUB}$ = functional obsolescence for the subject building or structure
$FUNCT_{COMP}$ = functional obsolescence for the comparable buildings and structures

Summary

This section contains the procedures for determining the closure adjustment factor for heavy industrial buildings and structures.

Description

The closure adjustment factor shall account for all of the loss in value due to a complete closure of a heavy industrial property.

Application

The closure adjustment factor for heavy industrial buildings and structures shall be determined by the schedule of rates method.

Schedule of Rates Method

1. The closure adjustment factor shall only be applied to heavy industrial buildings and structures.
2. The closure adjustment factor shall only be applied where the processes included in the "heavy industrial property" definition have been completely shut down and the entire property is no longer in operation for at least 12, 24 or 36 consecutive months in the year preceding the assessment roll year to which the assessment relates. The schedule of adjustments is as follows:

Factor	Consecutive months of closure
0.75	12
0.50	24
0.25	36

3. The closure adjustment factor shall not be applied in the following circumstances:
   - To any closed portion or unused area of an operating heavy industrial property;
   - For the reduced production output or reduced operating time of a heavy industrial property;
   - To a heavy industrial property that is under construction;
   - For closure of a heavy industrial property caused by an expansion, upgrade, renovation or labour dispute.
4. The closure adjustment factor of 0.25 shall be applied where a heavy industrial property is permanently closed and all equipment is removed by January 1 of the assessment roll year to which the assessment relates. Prior to making this adjustment, written confirmation is required from the property owner or senior executive representing the owner indicating the property is permanently closed.
5. Properties qualifying for the closure adjustment factor which have functional obsolescence applied shall have the closure adjustment factor adjusted so the combined reduction (functional obsolescence and closure adjustment factor) does not exceed 75% of replacement cost new less depreciation (RCNLD) of the heavy industrial buildings and structures.

Summary

This section contains the rate schedules and calculation procedures for heavy industrial buildings and structures that are not to be valued using the Marshall Valuation Service.

Definition

Non-standard heavy industrial buildings and structures include the following:

1. Located in this chapter:
    - Oil & Gas Well Tanks (S880)
    - Oil & Gas Well Buildings (S881)
    - Utility Tunnel (S932)
    - Conveyor Gallery (S933)
    - Industrial Pipe Rack (S935)
2. Occupancy Codes located in Chapters 7, 8 and 9 of SAMA's 2015 Cost Guide.

Rates and Calculation Procedures

SAMA's 2015 Cost Guide is to be used to value the occupancy codes located at a heavy industrial property and found in Chapters 7, 8 and 9 of SAMA's 2015 Cost Guide.

Occupancy Description

Tanks may be of various construction and design depending on their particular requirement. They may be steel, either welded or bolted together, fibreglass or concrete. They may be open-topped or closed, cone-bottom or flat, and surface or buried.

Structural Components

Lap Welded Steel Stock Tanks:

Volume (barrels)	Rate ($/tank)	
	Open Top	Closed Top
≤ 50	13,920	16,700
70	18,420	21,790
90	21,970	25,840
100	22,750	26,580
150	29,140	32,390
200	33,440	36,810
210	38,040	39,750
250	39,560	41,440
300	41,010	43,030
400	57,430	60,300
500	54,800	57,520
750	61,870	64,840
1,000	66,340	81,560
5,000	403,960	424,490
10,000	688,840	724,000
20,000	1,223,570	1,328,340
50,000	2,426,240	2,551,020
≥ 100,000	4,502,390	4,734,040

Rates include:

- lap welded steel
- clean out door
- fittings
- installation
- standard deck
- secondary containment
- flanges and valves
- base
- flat bottom
- 300 ft. Of pipe
- foundation band

Rates do not include insulation and heater.

Galvanized and Bolted Painted Stock Tanks:

Volume (barrels)	Rate ($/tank)					
	Galvanized			Bolted Painted		
	Open Top	Cone Deck & Bottom	Flat Bottom	Open Top	Cone Deck & Bottom	Flat Bottom
≤ 100	17,900	19,200	19,840	16,480	20,230	17,820
200	23,140	27,930	28,940	21,290	29,250	25,910
250	24,690	36,490	34,220	23,170	32,360	30,410
500L (low)	32,840	49,700	47,050	28,480	42,510	40,290
500H (high)	42,700	45,280	44,600	36,920	39,080	38,780
750	47,140	56,210	49,700	40,030	56,180	52,040
1,000L (low)	55,830	81,690	66,900	49,430	69,330	58,700
1,000H (high)	55,010	58,660	58,530	43,870	49,430	49,400
1,500	76,030	87,560	82,590	62,210	75,760	70,290
2,000	96,620	109,000	102,920	77,050	93,770	86,850
≥ 5,000	166,990	188,410	177,700	154,410	187,410	173,710

Rates include:

- thief hatch and vacuum valve
- 20 in. dome with cover
- tank flanges and valves
- base
- secondary containment
- flush type extended clean out door
- inside ladder
- foundation bands
- installation

Open Top Plastic Stock Tanks:

Volume (barrels)	Rate ($/tank)
≤ 100	18,080
200	22,540
250	26,830
500L (low)	40,700
500H (high)	33,420
750	39,400
1,000L (low)	54,180
1,000H (high)	51,490
1,500	70,070
2,000	83,950
≥ 5,000	167,900

Rates include:
- thief hatch and vacuum valve
- 20 in. dome with cover
- tank flanges and valves
- base
- flush type extended clean out door
- inside ladder
- foundation bands
- secondary containment
- installation

In-Ground Steel, Fibreglass or Concrete Tanks:

Volume (barrels)	Rate ($/tank)	
	Closed Top	Open Top
≤ 50	16,220	12,950
100	24,010	19,480
200	33,690	29,170
300	45,380	36,960
400	53,180	43,450
500	59,090	48,630
750	82,350	67,640
1,000	106,360	87,610
1,500	174,500	142,690
2,000	193,230	159,160
≥ 3,000	260,740	213,970
Rates include: - pipes - valves - fittings - installation		

Chemical Storage Tanks:

Volume (imp. gal.)	Rate ($/tank)
≤ 65	1,420
100	1,650
150	1,910
200	2,240
250	2,680
500	3,560
1,000	6,510
2,000	10,300
≥ 3,000	13,330
Rates include: - tank - valves - fittings - stand - pipes - installation	

Fibreglass Vertical Closed Top Tanks:

Volume (barrels)	Volume (M^3)	Height (ft.) x Width (ft.)	Rate ($/tank)
≤ 90	14.3	8.0 x 10	22,780
100	15.9	8.5 x 10	24,010
140	22.3	10.0 x 10	26,990
150	23.9	10.5 x 10	27,600
200	31.8	11.0 x 11	31,300
210	33.4	11.5 x 11	32,890
300	47.7	11.5 x 16	40,870
400	63.6	11.5 x 21	49,590
500	79.5	11.5 x 27	65,340
750	119.2	15.5 x 22	95,320
≥ 1,000	158.9	15.5 x 30	109,850
Rates include: - tank - secondary containment - freight - installation			

Fibreglass Horizontal Tanks:

Volume (barrels)	Volume (M^3)	Rate ($/tank)
≤ 100	15.9	39,500
150	23.9	53,940
≥ 200	31.8	63,520
Rates include: - tank - secondary containment - freight - installation		

Fibreglass Open Top Tanks:

Volume (barrels)	Volume (M^3)	Rate ($/tank)
≤ 90	14.3	21,390
100	15.9	21,820
140	22.3	23,840
≥ 210	33.4	30,830
Rates include: - tank - secondary containment - freight - installation		

Open Top Plastic Pop Tanks:

Volume (barrels)	Rate ($/tank)
40	3,010
120	8,040
Rates include: - tank - secondary containment - freight - installation	

Propane Vessels (Gas Bullets):

Volume (USG)	Rate ($/tank)
≤ 500	12,750
1,000	16,900
2,000	28,980
6,500	70,980
9,000	85,380
12,000	104,920
15,000	123,440
20,000	154,300
30,000	216,020
45,000	309,110
60,000	400,390
≥ 90,000	588,130
Values include: - painted tank - concrete piers - saddles - installation	

Insulation and Lining:

Volume (barrels)	Rate ($/tank)		
	Urethane	Fibreglass c/w Metal Wrap	Epoxy
≤ 50	1,090	3,970	7,650
65	1,160	5,110	9,490
90	1,610	6,210	12,490
100	1,610	6,790	13,500
165	2,190	10,170	19,970
200	2,570	11,870	13,080
210	2,730	12,420	24,500
240	3,220	14,140	27,930
300	4,290	16,990	35,210
400	4,860	19,810	38,970
500	5,410	22,100	43,400
750	7,590	30,570	60,980
1,000	8,070	33,410	66,630
1,500	10,810	46,430	91,910
2,000	11,880	49,790	98,450
3,000	16,210	66,800	131,860
4,000	18,900	79,800	157,800
5,000	22,190	92,840	183,810
≥ 10,000	35,740	99,050	196,810

Stairways, Walkways and Stiles:

Description	Rate ($/unit)
Stairways	3,600
Walkways	6,700
Stiles	3,670

Tank Gauges:

Description	Rate ($/unit)
Electronic - Gauge Head Assembly (dial type) - Hi-low transmitter	9,030 2,830
Floating - Gauge Board Assembly (target type) - Hi-low float assembly	6,430 1,490
Liquid Level Seal (sour gas application)	3,200

Tank Heaters:

Description	Rate ($/unit)
U-Fire Tubes 6"	23,310
U-Fire Tubes 10"	26,890
Straight Fire Tube or Electric	15,150
Rates include: - stack - flame arrestor - burner - installation	

Calculation Procedure

Description	Document No.	Page No.
(a) Base Rate	3.2.2	1-7
(b) Additional Features = (b_1 + b_2 + b_3 + b_4)	3.2.2	
b_1. Insulation and Lining	3.2.2	8
b_2. Stairways, Walkways and Stiles	3.2.2	8
b_3. Tank Gauges	3.2.2	9
b_4. Tank Heaters	3.2.2	9
(c) Replacement Cost New = a + b		

Description

Oil and gas well buildings are metal and wood sheds used to house or shelter the fixtures, machinery, tools and other appliances, and field offices.

Structural Components

Wood Sheds:

Area (sq.ft)	Rate ($/sq.ft.)					
	Frame	Lining & Insulation	Floor	Heating	Electrical	Total
≤ 50	119.60	22.35	13.75	13.60	29.50	198.80
100	111.00	18.70	13.75	13.40	29.20	186.05
200	101.80	16.45	13.75	16.00	28.25	176.20
300	89.10	14.00	13.75	20.40	27.55	164.80
400	77.70	12.10	13.75	20.30	26.90	150.70
500	70.35	10.95	13.75	18.70	25.80	139.50
600	67.10	10.40	13.75	16.45	24.95	132.60
700	66.00	10.10	13.75	15.20	24.15	129.20
800	65.20	9.95	13.75	14.20	23.25	126.30
900	64.30	9.75	13.75	13.05	22.30	123.15
1,000	63.65	9.60	13.75	11.65	21.25	119.85
1,100	62.75	9.55	13.75	10.45	20.40	116.85
1,200	62.45	9.40	13.75	9.65	19.30	114.50
1,300	62.05	9.35	13.75	9.05	18.70	112.90
1,400	61.55	9.25	13.75	8.50	17.75	110.75
1,500	61.10	9.20	13.75	8.30	16.55	108.85
1,600	61.10	9.15	13.75	7.95	16.10	108.00
1,700	61.10	9.15	13.75	7.35	15.20	106.50
1,800	60.65	9.15	13.75	7.15	14.45	105.10
1,900	60.40	9.15	13.75	7.05	13.50	103.80
2,000	60.25	9.05	13.75	6.80	12.80	102.65
2,100	60.10	9.05	13.75	6.70	12.25	101.85
2,200	59.85	8.95	13.75	6.25	11.45	100.20
2,300	59.50	8.90	13.75	6.15	10.80	99.00
2,400	59.00	8.90	13.75	6.00	9.95	97.55
2,500	58.85	8.85	13.75	5.90	9.20	96.55
2,600	58.40	8.85	13.75	5.80	8.40	95.15
2,700	58.30	8.80	13.75	5.65	7.70	94.20
2,800	58.20	8.75	13.75	5.55	7.05	93.25
2,900	58.10	8.70	13.75	5.45	6.30	92.20
3,000	58.00	8.60	13.75	5.35	5.50	91.20
3,100	57.95	8.55	13.75	5.20	4.65	90.10
3,200	57.55	8.50	13.75	5.20	4.40	89.45
> 3,200	53.10	7.90	13.75	2.50	3.85	81.05

Rates include:

- walls and roof with 2"x4" studs at 16" o.c.
- good siding and asphalt shingles
- 2 standard walk-in doors with panic hardware
- plywood or equivalent sheathing
- adequate electrical service
- 2 standard windows

Metal Shed:

Area (sq.ft.)	Rate ($/sq.ft.)						
	Frame	Steel Frame	Lining & Insulation	Floor	Heating	Electrical	Total
≤ 100	47.05	11.90	15.25	9.05	7.60	16.15	106.95
500	41.10	11.90	14.10	9.05	6.10	14.20	96.50
700	33.15	11.90	14.05	9.05	3.95	13.25	85.40
1,000	31.60	11.80	12.45	9.05	3.05	11.90	79.90
1,300	28.15	11.65	11.85	9.05	2.25	10.65	73.65
≥ 1,800	26.50	13.25	11.00	9.05	1.80	9.05	70.70

Field Office:

Area (sq.ft.)	Rate ($/sq.ft.)	Area (sq.ft.)	Rate ($/sq.ft.)
≤ 100	161.00	500	108.25
150	136.05	550	105.15
200	123.55	600	102.60
250	117.90	700	98.65
300	113.35	800	95.25
350	112.60	1,000	89.00
400	112.25	1,200	83.90
450	110.55	> 4,000	74.80
Rates include: Standard mobile unit with blocking and adequate electrical and heating. Typical brand names are Atco and Prebilt.			

Miscellaneous Buildings:

Description	Units of Comparison	Rate ($/sq.ft.)
Fibreglass wellhead shelters	Floor area	110.10
Pump shacks	Floor area	115.80
Utilodor insulated pipe enclosure	Surface area	9.35

Adjustments

Storey Height:

Height (ft.)	Factor
8	0.92
10	1.00
12	1.08
14	1.16
16	1.24
18	1.32
20	1.40
≥ 22	1.48

Doors:

Description	Rate ($/unit)
Walk-in Door	1,840
Overhead Door	2,480
Window	990
Plumbing (3 fixtures)	3,780

Calculation Procedure

Description	Document No.	Page No.
(a) Base Rate = (a_1 + a_2 + a_3 + a_4 + a_5 + a_6)		
a_1. Frame Rate	3.2.3	1-2
a_2. Steel Frame Rate	3.2.3	2
a_3. Insulation and Lining Rate	3.2.3	1-2
a_4. Floor Rate	3.2.3	1-2
a_5. Heating Rate	3.2.3	1-2
a_6. Electrical Rate	3.2.3	1-2
(b) Section Area		
(c) Value Subtotal = a x b		
(d) Storey Height Factor	3.2.3	3
(e) Additional Features = (±e_1)		
e_1. Door Adjustment	3.2.3	3
(f) Replacement Cost New = (c x d) ± e		

Occupancy Description

Utility tunnels carry utilities between buildings. The rates vary depending on wall thickness.

The rates include reinforced concrete walls, roof and floor.

Structural Components

Utility Tunnel:

Class	Description	Rate ($/cu.ft.)
A	7" - 10" concrete wall	23.72
B	5" - 7" concrete wall	20.44
C	3" - 5" concrete wall	17.25

Electrical and Mechanical Installations:

Description	Rate ($/cu.ft.)
Electrical	4.81
Heating	2.85
Sprinkler	4.14

Calculation Procedure

Description	Document No.	Page No.
(a) Structure Rate = (a_1 + a_2 + a_3 + a_4)		
a_1. Base Rate	3.2.4	1
a_2. Electrical Rate	3.2.4	1
a_3. Heating Rate	3.2.4	1
a_4. Sprinkler Rate	3.2.4	1
(b) Building Volume	3.1.2	1-2
(c) Value Subtotal = a x b		
(d) Incomplete Construction Factor	3.1.7	1
(e) Replacement Cost New = c- (c x d)		

Occupancy Description

A conveyor gallery is a structure primarily found in processing operations used for enclosing conveyor belting that interconnects various buildings.

Rates are based on completely installed units including typical wall, roof, floor, and support structure where designated by type.

Structural Components

Conveyor Gallery:

Type	Class	Life Expectancy (Years)	Rate ($/cu.ft.)
Elevated (ELEV)	A	40	24.07
Elevated (ELEV)	B	35	19.78
Elevated (ELEV)	C	35	15.47
Surface (SURF)	A	40	20.63
Surface (SURF)	B	35	16.34
Surface (SURF)	C	35	12.90
Suspended (SUSP)	A	40	20.63
Suspended (SUSP)	B	35	16.34
Suspended (SUSP)	C	35	12.90

Electrical and Mechanical Installations:

Description	Rate ($/cu.ft.)
Electrical	4.81
Heating	2.85
Sprinkler	4.14

Calculation Procedure

Description	Document No.	Page No.
(a) Structure Rate = (a_1 + a_2 + a_3 + a_4)		
a_1. Base Rate	3.2.5	1
a_2. Electrical Rate	3.2.5	1
a_3. Heating Rate	3.2.5	1
a_4. Sprinkler Rate	3.2.5	1
(b) Building Volume	3.1.2	1-2
(c) Value Subtotal = a x b		
(d) Incomplete Construction Factor	3.1.7	1
(e) Replacement Cost New = c- (c x d)		

Elevated

Occupancy Description

Pipe racks are supporting structures for overhead piping and wiring.

Structural Components

Frame:

Type	Class	Description	Life Expectancy	Base Rate ($/sq.ft.)
5	AA-Excellent	Heavy steel frame	45	17.55
	A-Good	Good steel frame	40	13.46
	B-Average	Average structural steel frame	35	10.35
	C-Low Cost	Light structural steel frame or post	35	7.96

Adjustments

Standard Storey Height: 8 feet
Incomplete Construction: See Doc. No. 3.1.7

Storey Height:

Height (ft.)	Factor	Height (ft.)	Factor	Height (ft.)	Factor
6.00		18.00		55.00	
7.00		19.00		60.00	
8.00		20.00		65.00	
9.00		22.00		70.00	
10.00		24.00		75.00	
11.00		26.00		80.00	
12.00		28.00		85.00	
13.00		30.00		90.00	
14.00		35.00		95.00	
15.00		40.00		100.00	
16.00		45.00		150.00	
17.00		50.00		> 200.00	
See General Rules, Doc. No. 3.1.6					

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Calculation Procedure

Description	Document No.	Page No.
(a) Structure Rate = (a_1)		
a_1. Base Rate	3.2.6	1
(b) Section Area	3.1.2	1-2
(c) Adjusted Building Height Factor = c_1 x c_2 x c_3		
c_1. Storey Height Factor	3.2.6	1
c_2. Total Number of Storeys Factor	3.1.6	2
c_3. Number of Storeys	3.1.6	1
(d) Value Subtotal = a x b x c		
(e) Incomplete Construction Factor	3.1.7	1
(f) Replacement Cost New = d – (d x e)		

Class S (5) Excellent Quality (AA)

Class S (5) Good Quality (A)

Class S (5) Average Quality (B)