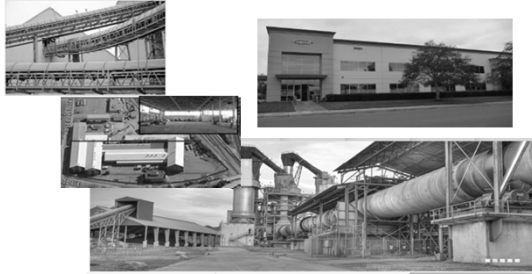


## Industrial Property Appraisal - An Overview



**Dr. William Henry Riley CAE**

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## Seminar Description

- Industrial Property includes a wide variety of property types and assets.
- Not all types are found in every assessing jurisdiction.
- Properties are frequently not the “easy” property type to appraise that appraisers/assessors often believe.
- Seminar serves as an introduction/refresher to industrial property appraisal.
- Subjects included are market analysis, the appraisal process, the three approaches to value, and difficulties involved in industrial property appraisal.

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## PRESENTATION OBJECTIVES

- Understand appraisal standards and how they apply to industrial property appraisal
- Know industrial property types, key definitions and assets and “the industry” involved industrial property appraisal
- Understand market and neighborhood analysis and sources of information in industrial appraisal
- Review the key steps in the appraisal process of industrial property
- Understand the significance of the three approaches in industrial appraisal and their strengths and weaknesses

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## SOURCE MATERIALS

- “Concept Paper – Valuation Issues in Separating Tangible and Intangible Assets” The Appraisal Foundation, Appraisal Practices Board, September 2013
- “Appraising and Analyzing Industrial and Flex Building for Mortgage Underwriting” McKissock Appraisal School – Course 2013
- “Considerations of Functional and Economic Obsolescence in the Assessment of Industrial and Commercial Property” Robert F. Reilly – Journal of Property Tax Assessment & Administration, IAAO 2013
- “General Appraiser Sales Comparison Approach” McKissock Appraisal Schools – Appraisal Course, 2013

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## SOURCE MATERIALS

- Functional Obsolescence: A General Overview – ABA/IPT Advanced Property Tax Seminar – Ken Voss, MAI, SRA, CAE – March 22, 2012
- “General Appraiser Income Approach”, McKissock Appraisal School - Course, 2012
- “Industrial Valuation” McKissock Appraisal School - Course, 2009
- Fundamentals of Industrial Valuation, IAAO, 2007

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## SOURCE MATERIALS

- Appraising Industrial Properties, AI, 2005
- Complete Guide to Appraising Commercial and Industrial Properties, P.C. Robinson ASA, 1980
- A Guide to Appraising Industrial Property, W.M. Shenkel, SRA, SREA, Prentice Hall, 1980
- Encyclopedia of Real Estate Appraising, E.J. Friedman Editor, Prentice Hall, 1978

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## What is Commercial and Industrial Property?

### Definition of 'Commercial Real Estate'

- "Real Property acquired for investment, except apartment houses, housing projects, and other dwelling units, including stores, shops, and recreational facilities connected with them." (Real Estate Appraisal Terminology AI).

## What is Commercial and Industrial Property?

### Definition of 'Commercial Real Estate'

- "Commercial property includes office buildings, industrial property, medical centers, hotels, malls, retail stores, farm, and multifamily housing buildings, warehouses and garages. In many states, residential property containing more than a certain number of units qualifies as commercial property for borrowing and tax purposes" . (Wikipedia)

## What is Commercial and Industrial Property?

- The businesses that occupy commercial real estate usually lease the space. An investor usually owns the building and collects rent from each business that operates there. (Investopedia)
- Property that is used solely for business purposes. Examples of commercial real estate include malls, office parks, restaurants, gas stations, convenience stores and office towers. (Investopedia)

## What is Commercial and Industrial Property?

- Commercial real estate is one of the three primary types of real estate. The other types are residential real estate, which is used for living purposes; and industrial real estate, which is used for manufacturing and production. (Investopedia)

## What is Commercial and Industrial Property?

### Definition of "Industrial Real Estate"

- "Land or land and improvements adaptable for industrial use. Ideally, a combination of land, improvements, and machinery which has been integrated into a functioning unit intended for assembling, processing, and manufacturing of finished or partially finished products from raw materials or fabricated parts, such as, factories; or a similar combination intended for rendering service, such as laundries, dry cleaners, storage warehouse's, or the production of natural resources such as oil wells " (Real Estate Appraisal Terminology, AI).

## What is Commercial and Industrial Property ?

- "Industrial facilities typically manufacture products and some times offer services in conjunction with the products they make." . (IAAO, 2007)
- Industry has always changed with new inventions and innovations. (IAAO, 2007)
- Appraisers of industrial property need to be astute about the changing landscape of manufacturing...economic conditions and market perceptions... to understand worth to investors (IAAO, 2007)

### Classification – Industrial Property?

- General Purpose – readily adapted to alternate uses or users
- Special Purpose - adaptable to alternative uses or users only with difficulty or considerable expense.
- Single Purpose - infrequently possible and rarely practical or feasible to adapt to alternative use or users  
(Real Estate Appraisal Terminology, AI).

### Classification - Industrial Property

Industrial Properties can be:

- Owned by investors – tenant occupied (single or multiple tenants)

Investors own property as investment (anticipated future benefits – income stream)

- Owner occupied

Owner occupants – own as an investment and run their business from the property – income from business (IAAO 2007).

### Forces that affect industrial values

- Globalization, exchange rates, expense of retooling, changing needs and tastes of consumers, costs of raw materials, cost of regulation, etc. (IAAO, 2007)
- Appraiser must be educated about the industry – trade publications, Internet, question property owners, trade organizations, or appraisers experienced in the type of property, construction firms, etc. (IAAO, 2007)

### What is Commercial and Industrial Property?

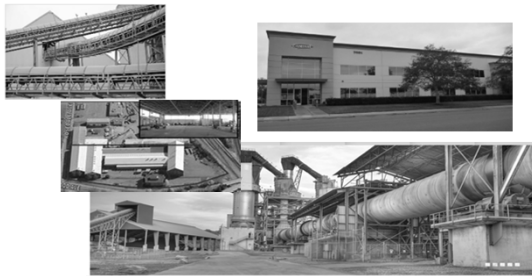
“Industrial Property: Commercial Properties that are used for the purposes of production, manufacturing, or distribution”

(Glossary/Commercial Real Estate Terms – Realtors Commercial Alliance).

So -- What is Industrial Property?

Let's review our title page -

### Industrial Property Appraisal - What does out cover page show?



### Industrial Property Appraisal -



## Industrial Property Appraisal -



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## Industrial Property Appraisal -



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## Industrial Property Appraisal -



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## Industrial Property Appraisal -



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## Introduction

The emphasis in this one day seminar is to give practical knowledge that can be used every time you appraise an industrial building.

Industrial real estate is widely viewed as one of the easiest property types to appraise. This may be true, but it depends on the type of industrial property.

The analytical processes an appraiser goes through vary substantially based on what type of industrial property is being valued.

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## Introduction

What you research, how you research it, and what you look for vary a great deal between a small manufacturing building that serves local businesses and the large warehouse/distribution building serving an entire region.

There are many types of industrial buildings, each serving different types of businesses and providing different functionality. There are warehouse/distribution buildings, manufacturing, flex, and freight forwarding, with a plethora of subcategories within each main category.

## Introduction

In industrial valuation, structures typically fall into two basic categories

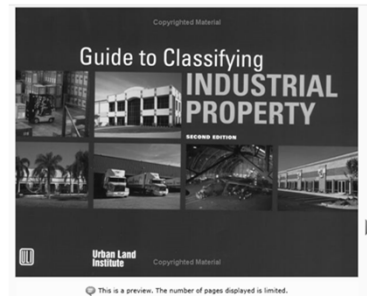
General Use  
Special Use

- General Use can be used for multiple purposes – different uses and processes – can be used for different manufacturing or as warehouses
- Special Use properties are not easily adaptable or modified for alternative uses

## Difficulties in Appraising Industrial Buildings

- Classification of property
- The best source for classifying an industrial property is the aptly named Guide to Classifying Industrial Property by the Urban Land Institute.
- Detailed descriptions of every type of industrial building, as well as photographs and computer aided design cutaway imagery, give you an excellent mental image of the Industrial Buildings.
- Obtained at Urban Land Institute or Amazon.com

## Classification Guide



## Classification Guide

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## Introduction

How you classify affects:

- What items you emphasize in the site description,
- What physical features you focus on in the improvement description,
- What data is relevant in the market analysis section,
- How you view Highest and Best Use
- What comparables you select in the sales comparison and income approaches.
- What adjustments are made to comparables in the appraisal

## Introduction

- You could say that, in one way or another, just about everything in an industrial appraisal depends on how you classify the industrial building.
- While some view industrial real estate as one of the easiest property types to appraise. It is usually the case in newer flex-space warehouse or industrial subdivisions or other industrial properties where the properties are uniform and there is adequate market data to quantify value.
- However in certain property types (manufacturing, distribution and/or warehousing) where there is limited market data, valuation can be difficult.

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## Introduction

Many commercial property types have changed little over the years.

However, this is not true with industrial buildings.

- Ceiling heights have increased,
- sprinkler systems are more prevalent,
- Column spacing has increased, and other changes have come about over many decades.
- Manufacturing processes have changed

This has left many industrial buildings with some form of functional obsolescence, although the degree to which it affects values depends on the market and how well your appraisal skills and instincts bring it out

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## Appraisal Standards

Do the Uniform Standards of Professional Appraisal address the appraisal of Industrial Property? YES

USPAP addresses appraisal, appraisal review, and appraisal consulting. It covers all asset types – real property, personal property, and business valuation including intangible assets.

The core matters addressed in USPAP?

- Do good
- Avoid evil
- When You do something, do it competently

"General Appraisal Income Approach" McKissock 2012 Chapter 1 page

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## Appraisal Standards

Key USPAP sections deal with:

Ethics  
Competency,  
Scope of Work,  
Appraisal Development

All appraisers should be familiar with USPAP including Definitions, Preamble, Rules, Standards 1 and 2 and Standard 6.

2012-2013 USPAP

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## Appraisal Standards

The ETHICS RULE deals with the ethical obligations of the appraiser including conduct, management, and confidentiality. The key goal is that the appraiser must perform assignments with impartiality, objectivity, and independence without accommodation to personal interests

The Competency Rule states that the appraiser must be competent to perform the assignment. If not competent it explains what steps must be taken by the appraiser.

2012-2013 USPAP

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## Appraisal Standards

Competency requires:

- 1. the ability to properly identify the problem to be addressed; and**
- 2. the knowledge and experience to complete the assignment competently; and**
- 3. recognition of, and compliance with, laws and regulations that apply to the appraiser or to the assignment.**

2012-2013 USPAP

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## Appraisal Standards

*Comment:* Competency may apply to factors such as, but not limited to, an appraiser's familiarity with a specific type of property or asset, a market, a geographic area, an intended use, specific laws and regulations, or an analytical method. If such a factor is necessary for an appraiser to develop credible assignment results, the appraiser is responsible for having the competency to address that factor or for following the steps outlined below to satisfy this COMPETENCY RULE.

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## Appraisal Standards

*If an appraiser determines he or she is not competent prior to accepting an assignment, the appraiser must:*

- 1. disclose the lack of knowledge and/or experience to the client before accepting the assignment;**
- 2. take all steps necessary or appropriate to complete the assignment competently; and**
- 3. describe, in the report, the lack of knowledge and/or experience and the steps taken to complete the assignment competently.**

2012-2013 USPAP

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## Appraisal Standards

*Comment:* Competency can be acquired in various ways, including, but not limited to, personal study by the appraiser, association with an appraiser reasonably believed to have the necessary knowledge and/or experience, or retention of others who possess the necessary knowledge and/or experience.

*In an assignment where geographic competency is necessary, an appraiser who is not familiar with the relevant market characteristics must acquire an understanding necessary to produce credible assignment results for the specific property type and market involved.*

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## Appraisal Standards

### Scope of Work Rule

*The scope of work indicates what the appraiser did and used - the steps taken, materials reviewed, investigations and calculations performed, and such - to solve the assignment's appraisal problem.*

*The appraiser's scope of work must be described and should clearly explain to the intended users that the appraiser performed a professional and reliable appraisal in accordance with the requirements of the appraisal assignment and that the scope of work employed*

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## Appraisal Standards

### Scope of Work Rule

*For each appraisal, appraisal review, and appraisal consulting assignment, an appraiser must:*

- 1. identify the problem to be solved;**
- 2. determine and perform the scope of work necessary to develop credible assignment results; and**
- 3. disclose the scope of work in the report.**

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## Appraisal Standards

*An appraiser must properly identify the problem to be solved in order to determine the appropriate scope of work. The appraiser must be prepared to demonstrate that the scope of work is sufficient to produce credible assignment results.*

*Comment:* Scope of work includes, but is not limited to:

- the extent to which the property is identified;
- the extent to which tangible property is inspected;
- the type and extent of data researched; and
- the type and extent of analyses applied to arrive at opinions or conclusions.

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## Appraisal Standards

Appraisers have broad flexibility and significant responsibility in determining the appropriate scope of work for an appraisal, appraisal review, and appraisal consulting assignment.

Credible assignment results require support by relevant evidence and logic. The credibility of assignment results is always measured in the context of the intended use.

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## Appraisal Standards

### STANDARD 1: REAL PROPERTY APPRAISAL, DEVELOPMENT

*In developing a real property appraisal, an appraiser must identify the problem to be solved, determine the scope of work necessary to solve the problem, and correctly complete research and analyses necessary to produce a credible appraisal.*

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## Appraisal Standards

Comment: STANDARD 1 is directed toward the substantive aspects of developing a credible appraisal of real property. The requirements set forth in STANDARD 1 follow the appraisal development process in the order of topics addressed and can be used by appraisers and the users of appraisal services as a convenient checklist.

1-1 (a) states that an appraiser must:

*“Be aware of, understand, and correctly employ those recognized methods and techniques that are necessary to produce a credible appraisal.”*

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## USPAP – Assessors & Industrial Appraisal

- USPAP governs appraisal
- Assessors should perform ethically
- Assessors should be competent
- Competency
  - Needed to identify the problem to be solved
  - Requires knowledge and experience
  - If not competent must take certain steps
- Assessors must perform a scope of work
  - Identify the problem
  - Perform a Scope of Work to produce creditable assignment results

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## Importance of USPAP to Assessors in Industrial Appraisal?

Assessor must:

- *identify the problem to be solved,*
- *determine the scope of work necessary to solve the problem, and*
- *correctly complete research and analyses necessary to produce a credible appraisal.*
- *“Be aware of, understand, and correctly employ those recognized methods and techniques that are necessary to produce a credible appraisal.”*

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## Importance of USPAP to Assessors in Industrial Appraisal?

- As we have seen and will see industrial property consists of many property types and uses.
- While appraisal methods and techniques are similar, the assessor must be familiar with the various property types industry and property type involved with each appraisal (competency)
- Industrial property types may be common in certain assessing jurisdictions, while other properties may be limited, or even non-existent.
- The assessor must become competent in each property type and do research for market information outside of the assessing jurisdiction, state, or country

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## Appraisal Process

Table 1. Six steps in the appraisal process under Standards 1, 2, and 6

Step 1. Definition of the Problem						Standard Rule 1-2 Standard Rule 6-1
Identify client and other intended use	Identify the intended use	Identify effective value date	Identify the type and definition of value	Identify relevant characteristics of the property	Assignment conditions <sup>a</sup> Extraordinary assumptions Hypothetical conditions	
Step 2. Scope of Work						Competency Rule Scope of Work Rule

Following the Trail: Guide to USPAP for Assessors, F&E IAAO April 2012 p

## Appraisal Process

Step 3. Data Collection and Analysis		Standard Rule 1-3 Standard Rule 6-3
Market Analysis Demand studies Supply studies Marketability studies	Highest and Best Use Analysis Site as though vacant Ideal improvement Property as improved	
Step 4. Application of the Approaches to Value		Standard Rule 1-4 Standard Rules 6-4, 6-5, and 6-6
Cost	Sales Comparison	Income Capitalization

Following the Trail: Guide to USPAP for Assessors, F&E IAAO April 2012 p

## Appraisal Process

Step 5. Reconciliation of Value Indicators and Final Value Opinion	Standard Rule 1-6 Standard Rule 6-7
Step 6. Report of Defined Value Opinions	Standard 2 Standard Rules 6-8 and 6-9

<sup>a</sup> Assignment conditions also include jurisdictional exceptions, assumptions, and limiting conditions

Following the Trail: Guide to USPAP for Assessors, F&E IAAO April 2012 p

## Types of Industrial Property

- There are many types of industrial properties
- Can include both vacant land and improved properties, and include:
  - Warehouse
  - Distribution
  - Manufacturing
  - Flex
  - Freight forwarding
  - Industrial parks
  - Data switch centers
- Can be single tenant, multi-tenant, owner-occupied
- Manufacturing can include a wide variety of operations and industries (products, quarry and mining, petroleum)

Appraising Industrial and Flex Buildings Mortgage Underwriting 2010 Chapter 1

## Types of Industrial Property

Industrial Property Types could have Sub-categories

Warehouses can include:

- Regional Warehouse
- Bulk Warehouse
- Heavy Distribution

Manufacturing can include

- Heavy Manufacturing – heavy equipment, machinery, steel, auto, petroleum, quarry
- Light Manufacturing
- High-Tech
- Food processing and refrigerated plants

Operating Businesses

## Key Terms

Definitions that relate to the valuation, descriptions and, leasing of industrial and flex style buildings.

**Fee Simple Estate:** "The most complete form of private ownership (of real property) is the fee simple interest or fee simple estate, i.e., absolute ownership unencumbered by any other interest or estate subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power and escheat"

(The Appraisal of Real Estate, Thirteenth Edition. Chicago, IL: Appraisal Institute, 2008, p. 111).

The owner's interest in the real property is not encumbered by anything except the foregoing, a rare situation in today's world

Appraising Industrial and Flex Buildings Mortgage Underwriting 2010 Chapter 1

## Key Terms

**Leased Fee Estate:** A leased fee estate, sometimes referred to as the leased fee interest, is the lessor's or landlord's ownership interest in real property that is leased or that you assume will be leased for valuation purposes. The lease(s) encumbers the "fee simple estate," or title, of the owner's or lessor's property. A leased fee estate is different from the definition above of a "fee simple estate."

Many real estate practitioners, including some professional appraisers, use the term "fee simple" when they really mean "leased fee" when analyzing a property that is or will be leased. The lease(s) is in control of the property or a portion of the property until it expires or is terminated and the owner/lessor's interest is subject to the terms of the lease(s).

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## Key Terms

A lease is effectively an encumbrance or lien on the fee simple estate. Be careful not to confuse the two definitions.

**Leasehold Estate:** A leasehold estate is the tenant or lessee's interest or "rights" in the real property created by the terms of its lease. Also some buildings are built on land that is leased.

**National Tenant:** a nationally recognized "name" company and/or one that may also be considered a "credit tenant" as defined below

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## Key Terms

**Local Tenant:** Usually, this term is applied to other companies that are not of national stature. Typically, they are locally based, owned and operated businesses. Some are solely single location businesses operated by their owners. Others may be larger, locally owned and lease and/or operate out of a few locations in their community or region. However, the term is also loosely applied to non-national size tenants, even if they are a readily recognized regional concern.

**Credit Tenant:** A company that possesses the size, history and financial strength to have been formally rated as "investment grade" or higher by one of the major rating agencies "Standard & Poor's, Moody's or Fitch.

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## Pre Appraisal List & Inspection

- In most ways, the skills you use in inspecting office buildings, apartments, and other property types will serve you well when inspecting an industrial building.
- Unlike these other common commercial property types, though, there are many unique physical aspects of industrial buildings that require additional inspection abilities.
- This topic is so large and diverse that an entire book could be written on it. A better use of our time is to discuss the major areas of an industrial building you should describe, evaluate, and consider adjusting in your appraisal.

\* Industrial Valuation - McKissock 2010 Chapter 3

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## Pre Appraisal List & Inspection

- Determine Correct Contacts
- Research past appraisals,
- Explore the Company's Web site
- Request Most Recent Company Annual Report
- Request Asset List
- Research the Machinery and Equipment
- Request Blueprints of the Facility
- Research Contaminants that are typical for the industry
- Determine necessary safety equipment
- Plan your team and inspection

\* Fundamentals of Industrial Valuations IAAO 2007

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## Pre Appraisal List & Inspection

- Research industry – new methods, techniques
- Research building costs, property sales, income and expense,
- Develop Check list for inspection – property record
- Get the overall "picture" of the property – Google Earth
- Take Photographs
- Document key points of building characteristics (i.e. ceiling height – clear span, bay size, floor thickness and load bearing capacity, etc. – see building characteristics following)

\* Industrial Valuation - McKissock 2010 Chapter 3

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## Construction Characteristics

### General Construction and Design\*

Characteristics to look for when inspecting, describing or analyzing an industrial or flex style building (or building plans) to develop an opinion of the overall building quality.

\* Appraising Industrial and Flex Buildings Mortgage Underwriting 2010 Chapter

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## Construction Characteristics

### Common Areas:

- Areas of a multi-tenant industrial or flex style facilities that, basically, are not occupied as leased space by tenants but are areas that were created as part of a facility's design and are integral and necessary to serve the needs of the facility.
- Such areas can include interior atriums, halls, walkways and corridors, roof, exterior walls, public common area lavatories (as opposed to in-unit lavatories), parking lots, driveways, sidewalks, lawn areas and similar.
- Typically, common area items are applicable to multi-tenant flex style buildings than to multi-tenant industrial buildings.

Appraising Industrial and Flex Buildings Mortgage Underwriting 2010 Chapter

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## Construction Characteristics

### Underground Storage Tanks (USTs):

Many industrial buildings feature underground/and or above ground liquid storage tanks that contain a variety of environmentally sensitive liquids that, among others, include gasoline, diesel fuel, heating oil and cleaning fluids. This can include chemicals and liquids used in manufacturing processes.

Appraising Industrial and Flex Buildings Mortgage Underwriting 2010 Chapter

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## Construction Characteristics

- The majority of industrial buildings are basically rectangular shaped
- Virtually all are one-story buildings with one, two or occasionally three-story office areas
- Office areas can be located within the building or attached as an appendage
- **Shapes:** For ease of multi-tenant leasing, a rectangular shape is most efficient and most cost-effective to build

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## Construction Characteristics

- **Foundation:** Typically, the foundation is cinder or concrete block on concrete footings. Some foundations are poured concrete
- **Frame:** Virtually all building frames are steel, with steel beam supported metal roof decking or panels. Very small buildings can have a masonry frame. Older and smaller building may have wood framing.
- **Column Spacing:** 25' x 40' is very typical. 40' x 40' is better. Spacing varies and can be a concern based on a tenant's planned use of the space.
- **Height :** "Clear height" is important as it defines the operating area available (inventory systems) as opposed to ridge height or eave height

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## Construction Characteristics

### Exterior Walls:

**All Masonry:** Many buildings have all masonry exterior walls comprised of painted cinder or concrete block or a combination that includes "fluted block" or "split face block." Some can be pre-formed masonry "tilt-up" panels. Often the office front is comprised of the more attractive materials for aesthetic purposes with the other two sides and back featuring painted or even unpainted masonry or exposed block.

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## Construction Characteristics

### Exterior Walls:

**Metal Panel:** Many buildings (often referred to as "Butler" buildings) feature insulated metal panel exterior walls. These buildings typically have a block foundation and masonry or block exterior walls up to between 4' and 8' above ground with vertical painted insulated metal panel walls above. Because they are metal panels that can be painted with any color.

Some lending institutions resist financing metal panel buildings.

## Construction Characteristics

**Floors:** Floors are virtually always poured and reinforced concrete. Floor thickness and weight load can be important depending upon the intended use. 4" to 6" with heavy equipment requiring 18" to 36"

**Roof:** Most roofs are flat. Some are moderately sloping and some are a modified "gable" or "A" style. Metal buildings generally have insulated metal panel roofs that are "A" or gable style with a steel frame support system. Skylights can be featured and are more typically found when this type of roof is featured.

## Construction Characteristics

Flat roofs can be built up (e.g., torch down hot tar bituminous material over decking), but the more modern flat roofs are a glued down rubber membrane type over steel beam supported steel decking. You may occasionally find an old industrial building with a flat or sloped roof that is wood truss supported.

To see some examples and learn more about rubber (membrane) roofs go to:

[www.Carlisle syntec.com/index.cfm?act=epdm\\_roofing\\_systems](http://www.Carlisle syntec.com/index.cfm?act=epdm_roofing_systems).

To see some examples and learn more about "torch down" bituminous roofing (for flat roofs), go to

<http://www.dovecontractinghomes.com/>.

## Construction Characteristics

Rubber (membrane) roofs go to [www.Carlislesyntec.com/index.cfm?act=epdm\\_roofing\\_systems](http://www.Carlislesyntec.com/index.cfm?act=epdm_roofing_systems)



## Construction Characteristics

"torch down" bituminous roofing (for flat roofs), Search "torch down bituminous roofing"

A screenshot of the RSL Roofing Solutions LLC website. The header includes the company name 'RSL ROOFING SOLUTIONS LLC' and a phone number '708 430 8030'. The main content area is titled 'Roofing Problems? meet Roofing Solutions' and features a large image of a building with a flat roof. Below this, there is a 'Systems List' with bullet points for 'Thermoplastic Single-Ply', 'Modified Bitumen Built-Up', and 'Liquid Coatings'. There is also an 'On This Page' section with links to 'Overview of Modified Systems', 'APP &amp; SBS Modified Bitumen', and 'Seams'. The main text area is titled 'Systems - Modified Bitumen Roofing' and contains an 'Overview' section with detailed text about the benefits of modified bitumen roofing, such as its hybrid construction, factory-controlled environment, and superior performance in various climates.

## Construction Characteristics

### Metal Roofs

[www.Centimark.com/roofsystems/metal/metal.html](http://www.Centimark.com/roofsystems/metal/metal.html).

A screenshot of the Centimark website. The header features the company name 'CENTIMARK' and navigation links for 'Home', 'About Us', 'Roof Systems', 'Service &amp; Maintenance', 'Sustainability', 'Financing', 'Media', and 'Contact Us'. The main content area is titled 'Metal Roofs' and includes a large image of a building with a metal roof. Below this, there is a 'Metal Roofs' section with detailed text about the benefits of metal roofing, such as its long life, low maintenance, and superior performance in various climates. There is also a 'Metal Roofs' section with a list of products and a 'Metal Roofs' section with a list of services.

## Construction Characteristics

### Roof Warranties:

- Securing a warranty for more than 10 years has progressively become more difficult during the last 15 years. It is extremely difficult to secure one for more than 15 years.
- A 20 year warranty is very rare. The more reliable warranties come from the manufacturer not just the installer, as history has demonstrated that smaller roofing companies are known for going out of business to avoid honoring warranties.
- This warranty information applies to virtually all commercial buildings except multi-family. For analysis purposes, it is always good to learn the age and condition of the roof, the remaining length of the roof warranty, what it covers, and the issuer for any building you are analyzing.

## Construction Characteristics

### Roof Height:

**Flat Roof** 16' to as much as 45' feet (and occasionally higher). The "under beam" height, i.e., the clear height from the floor to the underside of the steel beams supporting the roof is the most important concern for stacking purposes. Typical heights under beam are 18' to 26'.

The higher ceilings allow for "higher stacking" of product and storage racks, some of which have mechanical product retrievers and conveyor belt systems. If the roof slightly slopes, it will be 1' to 4' higher on one side than the other to facilitate runoff.

## Construction Characteristics

### Roof Height:

**Gabled or "A" Roof:** It is rare (and usually very small) industrial building that will feature a wood frame, shingle over plywood residential style roof. Most industrial buildings with an "A" style roof are metal insulated panel type over steel frame. Ceiling heights will vary by building but most are typically 18' at the edge inclining to about 22' "under beam" in the center.

## Construction Characteristics

**Office Finish:** Most office areas are similar to standard office buildings. They feature windows in the exterior wall(s) and painted drywall interior walls over steel or wood studs. Ceilings are "drop in" grid type with acoustical tile interspersed with lighting panels and HVAC air diffusers. Floor coverings are either carpet, vinyl or ceramic tile, wood or a combination. Interior doors are usually hollow core wood type. If the office area is contained within the building, the "outside" or interior back wall of the office area that is exposed to the warehouse area is usually just painted drywall.

## Construction Characteristics

**Warehouse Area Finish:** Usually, the warehouse area finish is either painted or unpainted exposed block, insulated metal panels or painted drywall with unfinished floors and exposed ceilings. Lighting can vary from incandescent "high hats" to high or lower suspended lighting depending upon the "candle lamp power," at "work table top" level required by the tenant.

## Construction Characteristics

**Party Walls:** Party walls vary by local code, developer/owner attitude and tenant requirements. They run "floor to ceiling" to divide and separate tenant areas. Some are masonry (painted block), while some are painted drywall over steel studs. Some are insulated, and some are not. Often times they are required by the local fire code to meet a minimum "burn" (through) time, such as requiring a wall to have a one hour burn rating.

## Construction Characteristics

**Party Walls:** When constructed of cinder or concrete block, pre-located "knock out panels" are often installed. They are usually 8' by 8' door-like areas. If a tenant desires to lease an adjoining space, or if two adjoining tenants are replaced by one larger tenant, the "knock out" panels are easily removed to permit traffic flow between the adjoining units without having to remove the entire party wall, which, based on future leasing, if removed, would need to be reinstalled. The ease and nominal cost of creating pass through doorways in a drywall over steel stud party wall obviates the need for pre-installed "knock outs."

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## Construction Characteristics

**Office HVAC:** Modern buildings usually feature electric, central forced air combination heat and air conditioning units, and heat pumps. Most often the HVAC ducts are located in the ceilings of the office areas. Other systems can be a combination of gas or oil fired hot water baseboard heat with electric (ceiling ducted) forced air, air conditioning. Older buildings can have a variety of systems, including radiators and through-window or through-wall air conditioners. It is important to know what type of energy is used for both and if the office area is air conditioned.

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## Construction Characteristics

### Warehouse HVAC:

**Heat:** Most unfinished warehouse/industrial space is heated by "space heaters" that are suspended from the beams that support the roof or are mounted near the roof on the steel columns that support the roof. They can be oil, electric or gas fired and all are fan blown to circulate the heated air through the warehouse.

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## Construction Characteristics

### Warehouse HVAC:

**Air Conditioning:** Some warehouse areas are also air conditioned. A variety of systems exist.

Most typical are a ducted, forced air electrically powered system with rooftop or outside pad mounted compressors. Others include free standing floor units that chill the air and blow the chilled air out into the space. Because warehouse space that is **not** air conditioned is the norm in many areas, it is significant when warehouse space **is** air conditioned.

It should be noted and should also be reflected in a higher rent than for comparable non-air conditioned warehouse space. It adds value and enhances marketing.

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## Construction Characteristics

**Skylights:** Many buildings feature skylights in the warehouse area roof designed to minimize electric lighting costs during daylight hours.

**Utilities:** Some or all utilities, i.e., gas, electric, oil, public water and sewer, private water and sewer, can be featured. Public water and sewer is preferred. Many lenders will not make a loan on a facility that does not have public water and sewer, although the concern of well and/or septic is not as great for a warehouse with a limited number of employees as it is for a multi-tenant office building.

In a rural location, the lack of public water and sewer may be accepted as "standard."

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## Construction Characteristics

**Lavatories:** The number and type of lavatories is often impacted by the size of a building and its individual tenant areas.

While "unisex" facilities can be acceptable, larger buildings typically have separate men's and women's facilities in both the office and industrial/warehouse areas of each tenant's space.

Common area lavatories, while extremely rare, are occasionally found in multi-tenant buildings.

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## Construction Characteristics

### Truck Loading - Tailgate Height:

- A building's truck loading docks that are "tailgate height" means that the dock floor (i.e., the building's floor) is typically approximately 4' above grade and is generally in line with the typical height of a tractor-trailer truck trailer's floor.
- Overhead doors are typically 8' x 8' or 8 x 10. If a building's floor was built "on grade" (at ground level) tailgate height, loading is often accomplished by an excavated "down gradient" ramp allowing trucks to back down so that their trailer floor height is in line with the floor height of the building. A raised outside loading platform with a ramp down to an "on grade" building can accomplish the same.

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## Construction Characteristics

### Truck Loading -

**On Grade:** Typically, the floor level of a building is "on grade" when its floor level is in line with the surface of the ground. Its overhead doors are typically 8' x 8'. No dock shelters, load levelers or restraints are required.

**Drive In:** Larger, garage-type drive-in doors are provided when an occupant desires inside building truck loading. If a building is above grade, an up ramp is provided.

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## Construction Characteristics

### Truck Loading -

#### Drive In On Grade:



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## Key Terms

### Truck Loading - Dock Shelters, Levelers and Restraints:

**Dock Shelters:** Buildings concerned with utility costs and loss of HVAC through open truck dock doors will feature "dock shelters." These are shrouds that are mounted on the outside wall of the overhead truck door area.

They basically surround the trailer when it is docked at the loading door and "seal" the trailer to the building, minimizing HVAC loss.

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## Key Terms

### Bollards and Bumpers:

**Dock Bumpers:** Dock bumpers are hard rubber appendages that are installed on the lower portion of the exterior face of a tailgate height loading dock wall to keep a trailer from slamming into a dock and damaging a building.

To see photographs and to learn more about truck dock bumpers, go to [www.uline.com](http://www.uline.com)  
Search dock bumpers

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## Key Terms

### Truck Loading -

**Restraints:** Restraints are mechanical "arms" mounted on the lower portion of a loading dock's exterior wall, below the building's floor level or load leveler. They swing up and lock the lower bar of the back of a trailer to keep it from rolling away from the dock while loading is in process. Such restraints are used in lieu of tire blocks.

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## Key Terms

### Truck Loading –

**Load Levelers:** Many buildings with tailgate height loading will feature "load levelers."

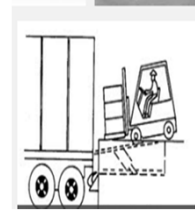
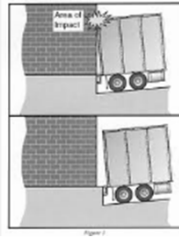
These are heavy-duty metal ramps built into a building's loading dock floor that can be adjusted up or down to meet a trailer's floor height. They allow for a smoother movement of product between the trailer and building.

## Construction Characteristics

### Truck Loading –

Restraint/bumper

Load Leveler



## Construction Characteristics

### Truck Loading – Plumbing Supply



## Construction Characteristics

### Truck Loading – Manufacturing.



## Construction Characteristics

### Truck Loading – inside



## Construction Characteristics

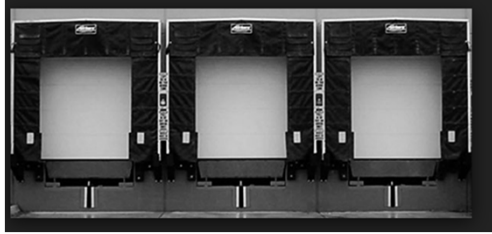
### Truck Loading – Manufacturing.





## Construction Characteristics

**Truck Loading** – Manufacturing – note insulation border and load levelers



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## Construction Characteristics

**"Saw tooth"** designed tailgate height loading docks to accommodate limited truck-turning area between the building and the site's border.

**Truck Loading** – "Saw tooth" configuration



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## Construction Characteristics

**Truck Loading** – Manufacturing.



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## Construction Characteristics

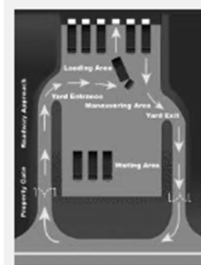
**Truck Loading** – Open Dock and Load Levelers



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## Construction Characteristics

**Truck Loading** – configuration



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## Construction Characteristics

**Truck Turning:** Most truck trailers are described as **"60' rigs."** The trailer is approximately 53' long (typically 8' x 53'), and the truck or cab adds another 7' or more to the overall length. An ideal, minimum truck-turning distance (loading dock to edge of blacktop) is 90', although less can work.

When the distance is much shorter, some buildings feature a "saw-tooth-like" designed loading area that minimizes the truck-turning area - especially on a site where a building is close to its border or to another building or object.

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## Construction Characteristics

Kelly Dock Planning – 4 Front Engineered Solutions – Kelly  
www.kelleycompany.com - downloads for dock planning



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## Construction Characteristics

DOCK PLANNING  
S T A N D A R D S



Let's look at this document

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## Construction Characteristics

### Bollards and Bumpers:

**Dock Bollards:** Dock bollards are round, heavy gauge steel pipes that are usually filled with concrete and installed vertically in and above the ground next to truck-loading docks to prevent a trailer from hitting and damaging the building when a truck is backing into a loading dock.

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## Construction Characteristics

**Parking:** The paved and striped parking areas required by industrial buildings vary by local code. A good "rule of thumb" is to allow four spaces for every 1,000 square feet of finished office area and between ½ and 1 space for every 1,000 square feet of unfinished warehouse area.

This can be beneficially supplemented by on-street parking and, if available, should be considered. Highly mechanized buildings with minimal staff can support a lesser number of spaces.

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## Construction Characteristics

**Roof and Wall Vents:** Many large, non-air conditioned industrial buildings feature circular roof vents that allow rising warm air to escape naturally through a roof and allow cool air to be circulated into a building. Some buildings also feature large, through-the-wall exhaust fans.

www.Windmaster.com

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## Construction Characteristics

**Sprinklers/Extinguishers:** Virtually all industrial buildings are sprinkled with either a "wet" or "dry" below-ceiling mounted pipe delivery system.

In addition, depending upon local codes, required fire extinguishers are typically mounted on the steel columns that support the roof and at locations that provide overlapping coverage areas. When inspecting a property, look for these items.

## Construction Characteristics

**Interior Stairs:** If a building has a second-floor office (depending on local codes and ADA compliance), it will need to have two stairways and/or an elevator and stairway to provide a minimum of "two ways out" from the second-floor office areas.

If a building features a one-story office within the building, many times the interior "roof" of the office area is used for storage and needs to be accessible via a stairway.

## Construction Characteristics

**Mezzanines:** If a building features a one-story office within the building, the "roof" of the office will often be used as open mezzanine-type space and will require proper access.

Occasionally, you will find an industrial building that also features a formal mezzanine area along one or more of its interior walls.

Depending upon its use, you may or may not decide to include such area as part of the building's gross and "lease-able" areas.

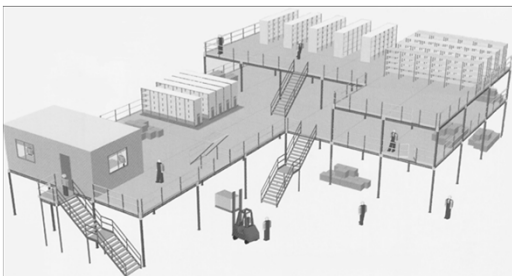
## Construction Characteristics

### Mezzanines



## Construction Characteristics

### Mezzanines



## Construction Characteristics

**Special Items:** Customized items that can be found in industrial buildings include:

**Flat Floors:** These "super" flat (concrete) floors are required for high-ceiling buildings (e.g. 40' or higher clear under beam) when high racks for stacking product will be used by the occupant. They are expensive to create. Usually a rent premium is charged by the lessor to cover the extra cost.

Go to -- [www.polishedconcrete.in](http://www.polishedconcrete.in)

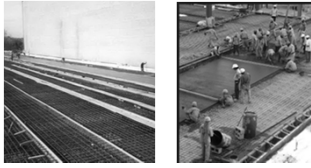
and

Real Estate Investor - The Skinny on Super Flat Floors

[www.nreionline.com](http://www.nreionline.com)

## Construction Characteristics

### Supper Flat Floors:



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## Construction Characteristics

**Special Items:** Customized items that can be found in industrial buildings include:

**Freezers/Refrigerators/Bakeries:** Usually, a rent premium is charged for one or more of these features. Also, freezers typically require thicker floors



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## Construction Characteristics

### Storage Systems



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## Construction Characteristics

**Showers/Special Bathrooms:** These are rare, but a rent premium is usually charged if they are required by a tenant.

**Built-in Overhead Cranes:** When attached to a building, while these are technically "equipment" and not real property (as they can be removed), they are a special feature. A rent premium is charged for their inclusion.

However, the steel framing upon which they operate is normally part of the building improvement which is often more than needed to support the building.

(functional obsolescence item as over improvement if included in building cost)

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## Construction Characteristics

### Built-in Overhead Cranes



Overhead Cranes- Three Rivers Crane, Inc.



TRC Cranes are built to CMAA Class C, D & E specifications using Aesop® Winger® and Harrington Crane Components as well as Custom Designed Profiles & Drive Packages. All cranes meet ANSI Safety Standards for our industry.  
Capacities up to 75 Ton and spans to 300'-0"

- Standard and custom-engineered application
- From design, fabrication & assembly, to installation & field load testing
- Single girder and double girder
- Underhung and top-running
- Single and double leg garrises
- Electric and air powered
- Hazardous environments
- Motion control applications
- Magnets and special below-the-hook lifting devices
- "State of the art" frequency drives as well as traditional contactor control packages
- Economical remote control systems
- Custom controls for high duty cycle AC & DC power supplies
- TRC cranes can also be supplied as Lowviten® Patented Track cranes for rugged, higher duty cycle applications

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## Construction Characteristics

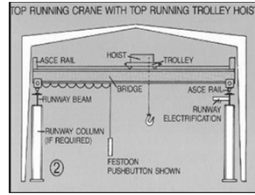
### Built-in Overhead Cranes



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## Construction Characteristics

### Built-in Overhead Cranes



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## Key Terms

**Railway Sidings and Loading Doors:** Some buildings require railcar loading access. The railway siding can be installed close to and along an outside wall or even inside a building. The latter prevents loss of HVAC.

The floor height of these buildings is about 4' to align with the height of the floor level of a rail car.

Overhead doors match the side-door opening of the rail car. Dock shelters are not available to seal the rail car to the exterior loading door of a building to prevent HVAC loss. Rail sidings are an expensive special feature - a rent premium is secured for their inclusion.

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## Key Terms

### Railway Sidings and Loading Doors



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## Key Terms

### Railway Sidings and Loading Doors



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## Industrial Tanks



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## Silos



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## Industrial Property

The most flexible design for industrial buildings, and the one with the greatest appeal on the open market, is a one story, square or nearly square structure that complies with all local building codes.

Combination of old and new industrial space may create substantial functional obsolescence for the new construction less than its cost to the value of the whole

Layout should allow operations to be efficient.

- Receiving on one side of building
- Manufacturing in the middle, and
- Shipping on the other side of the building

Appraisal of Real Estate 13<sup>th</sup> Edition, AI – p259

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## Industrial Property

Special features include

- Sprinklers and standpipe
- Scales
- Loading Docks – loading dock levelers, balusters
- Cranes and Crane ways.
- Refrigeration areas
- Conveyor systems
- Process piping (compressed air, water, gas,)
- Power wiring
- Employee lockers and lunchrooms

These features may be standards in some industries, but may not be in others

Appraisal of Real Estate 13<sup>th</sup> Edition, AI – p259

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## Flex Buildings

**Flex Style Buildings:** This term means "flexibly designed." These multi-tenant designed buildings are virtually all one-story structures. Their design and appearance are more like an office building than an industrial building and intended to permit inclusion of much more finished office space than the typical 5 to 15 percent finished office area that industrial or warehouse buildings feature.

They have the built-in "flexibility" of accommodating a small or large percentage of finished office space (up to 100 percent) to meet the different tenants requirements. Their under beam ceiling heights are typically less than 20 feet, generally 14 to 18 feet.

Appraising Industrial and Flex Buildings Mortgage Underwriting 2010 Chapter

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## Flex Buildings

- Their office areas and tenant entrances are in the front of the building with "on grade" truck loading doors in the back. Their "industrial" space is more like "shop space" as most are leased to smaller space users
- While many of these are not rectangular shaped, the design and "flex" concept works best for rectangular shaped buildings with tenant areas that are "straight through" (front to the back).
- Most flex buildings (pre-construction) start with the concept that 50 percent of the tenant space will be finished as office and 50 percent will be unfinished as industrial, warehouse or "shop" space. Very often, more than 50 percent office area is created ultimately. As you will see later in the course, the amount of office space in these buildings impacts lender thinking, rental income, value and financing.

Appraising Industrial and Flex Buildings Mortgage Underwriting - 2010

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## Industrial vs. Flex

Building size

- Flex buildings typically contain 10,000 to 60,000 # with most between 20,000 and 50,000 #
- Industrial building are various shapes and contain 100,000 to 1,000,000 #

Building height

- Flex buildings are mostly 14' to 18' clear height under beam
- Industrial building are mostly 22' to 44' clear under beam

Construction

- Flex buildings are mostly an "attractive" masonry construction along front and the office area and have more distinctive office areas, as compared to industrial buildings

Loading docks

- Flex buildings are mostly on grade while industrial properties vary in these features (as we have seen previously)

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## Industrial vs. Flex

Differences in how flex space rents are quoted vs. industrial space (discussion regards net rent)

Industrial buildings – typically contain 5 to 15% office but the entire space is rented on a flat # basis (i.e. between \$3.50 and \$ 5.00 fully net – for office and shop space combined. The rent is only increased for amortizing cost of finishing additional office (over 15%)

Flex buildings – designed to accommodate 50% or more office space. Rents are quoted are a blended rate – one rent is assigned to office area and on rate is assigned to shop or warehouse area. It is important that the analysts understand how the rent is quoted and the current rents for each type of space

Appraising Industrial and Flex Buildings Mortgage Underwriting 2010 Chapter

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## Market Analysis

Understand market and neighborhood analysis and sources of information in industrial appraisal

### Step 3. Data Collection and Analysis

**Market Analysis**  
Demand studies  
Supply studies  
Marketability studies

**Highest and Best Use Analysis**  
Site as though vacant  
Ideal improvement  
Property as improved

Standard Rule 1-3  
Standard Rule 6-3

## Market Analysis

You can research your multiple listing service, CoStar, or Loop Net to provide direct support for your opinions. (CoStar Property has a variety of reports you can print that show you all this and more.)

- Number of active for-sale listings by quarter (usually shown over a one- to two-year period)
- Number of sold listings by quarter
- Number of withdrawn listings by quarter
- Number of active for-rent listings by quarter
- Number of withdrawn for-rent listings by quarter
- Range and average sale prices by quarter
- Range and average rental rates by quarter
- Any type of comparison of average rental rates for buildings that have some form of functional obsolescence to help isolate an adjustment in the valuation section

## Market Analysis – Loop Net

6218 Rosedale Ave  
Baltimore, MD  
Industrial Property for Lease: 6218 Rosedale Ave, Baltimore, MD 21214  
Price: \$100,000  
10,000 SF  
For Sale

Highlandtown Formerly Barons Curtains & Awning  
Baltimore, MD  
Front Bay  
Baltimore, MD  
Price: \$675,000  
22,000 SF  
Warehouse

Knightsbridge Business Park  
Annapolis, MD  
Price: \$3,500,000  
18,472 SF  
Warehouse

Bagg C  
Baltimore, MD  
Price: \$4,495,000  
13,000 SF  
Warehouse

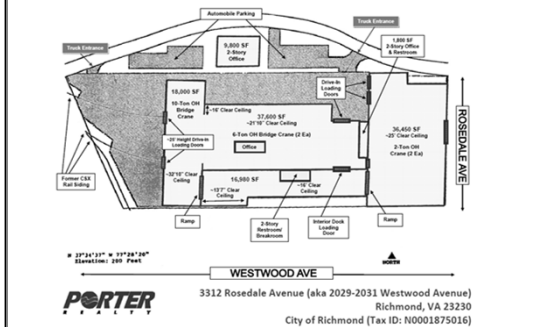
3304 Williams Ave  
Baltimore, MD  
Price: \$900,000  
14,000 SF  
Warehouse

For Sale Or For Lease 310 South County Street  
Baltimore, MD  
Price Not Disclosed  
30,000 SF  
Warehouse

## Market Analysis

Type	Sale Listings	Lease Listings
Multifamily	16	N/A
Industrial	26	60
Land	43	1
Office	60	172
Retail	69	103

## Market Analysis



## Market Analysis

### Market Analysis

- The appraiser gives indication of supply and demand factors that affect the market for the subject property
- Is a necessary first step in Highest and Best Use Analysis
- Two general levels of market analysis
  - Broad market without focusing on specific property
  - Study of market conditions as they relate to a specific property

## Market Analysis

Uses of Market Analysis in:

- Cost approach – support market condition adjustments to land comparables, economic obsolescence, and entrepreneurial incentive
- Sales comparison approach – to explain trends in price levels, to support market condition adjustments, estimates of exposure and marketing time
- Income approach – to support estimated rents, vacancy, expenses, and capitalization rates

Appraisal of Real Estate 13<sup>th</sup> Edition, AI – Student Reference Manual p131

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## Market Analysis

Characteristics of Real Estate Markets – Industrial

- Manufacturing – Data on this property type is usually old and may require an adjustment for market conditions. Brokers or chambers of commerce usually perform market analysis for manufacturing facilities. It is secondary data, but it is usually fairly accurate.
- Warehousing – because warehouse properties are often build speculatively, market analysis is of primary importance in the valuation for these properties. Warehouse markets are notorious for being undersupplied or oversupplied depending on economic conditions

Appraisal of Real Estate 13<sup>th</sup> Edition, AI – Student Reference Manual p131

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## Market Analysis

Characteristics of Real Estate Markets – Industrial

- Distribution – The market for distribution space is also out of balance often and requires good market analysis to ensure accurate value opinions.

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## Market Analysis

Characteristics of Real Estate Markets – Industrial

- Special Purpose Properties – In some market data relating to special purpose properties is not organized, and market analysis is difficult.
- These properties are so specialized that there are few buyers and sellers, and the market analysis is statistically insignificant because of a lack of data.
- In many special purpose properties, there is not active resale market and a change in use is required to develop an opinion of market value. Market analysis will then focus on the property use that is economically viable and has a resale market

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## Industrial Districts

- Industry is often the engine of economic growth in a community.
- Governmental and public/private economic development efforts are often targeted at manufacturing and industrial that may bring jobs to the area.
- Districts range from heavy industry- steel plants, foundries, chemical companies, to assembly, distribution and other “clean” operations
- In most urban areas, heavy industry and light industry districts are established by zoning ordinances, which may limit uses and place controls on air pollution, noise levels and outdoor operations.

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## Industrial Districts

- Economic incentives. Incentives are the missing adjustment in many appraisal reports and are a “make or break” in many large industrial building situations.
- In older manufacturing and warehouse districts, obsolete, multistory, elevator buildings are typical and parking and expansion areas are limited.
- Newer manufacturing and industrial parks usually consist of one-story buildings with greater ceiling heights than were typical previously.
- Each district has a value pattern that reflects the market’s reaction to its location and the characteristics of its sites and improvements.

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## Industrial Districts

- Environmental liabilities incurred in industrial properties are complex than those that affect other property types.
- Storage Tanks are often present for a broad range of chemicals.
- The presents of PCB's and asbestos is widespread
- Long term contamination tends to be more severe and clean up costs can be high.

## Industrial Districts

### Defining Characteristics

- Cluster of related industrial concerns (i.e. manufacturer and its suppliers)

### Sub districts

- Manufacturing Facilities
- Research and development facilities/science parks
- Warehouse/distribution facilities

## Industrial Districts

### Value influences

- Nature of the district ( distribution, manufacturing, R&D etc.)
- Availability of labor
- Transportation facilities
- Availability of raw materials
- Distribution facilities
- Political climate
- Availability of utilities and energy
- Effect of environmental controls

## Approaches to Value

Step 4. Application of the Approaches to Value			Standard Rule 1-4 Standard Rules 6-4, 6-5, and 6-6
Cost	Sales Comparison	Income Capitalization	

## Approaches to Value

This seminar will not detail the steps and methods and techniques of each of the three traditional approaches to value.

These approaches to value are:

- Cost
- Sales Comparison
- Income

We will review key points of the approaches in the industrial property valuation

## Cost Approach

### Cost approach

$$\begin{aligned} &+ \text{Replacement Cost New (or Reproduction Cost New)} \\ &- \text{Depreciation (loss in value from all causes)} \\ &= \text{Improvement Value} \\ &+ \text{Land value} \\ &= \text{Total Property Value} \end{aligned}$$

Cost new estimates can be derived from commercial costs services such as:

- Marshall and Swift Valuation Services
- R.S. Mean Company

Courses are offered in the use of these manuals

See Fundamentals of Industrial Valuation IAAO – Appendix Cost Data

## Cost Approach

Caveat regarding the Cost Approach

For General Purpose Buildings – the cost approach may be the least accurate approach provided there are sales of similar properties for alternative uses or there are rentals of such properties (value in exchange vs. value in use)

For Special Use Buildings – the cost approach may be a primary approach if adequate comparable sales do not exist or there is not rental data

## Cost Approach

Site valuation in cost approach

- + Cost of utilities
- + Development costs
- + Cost of land
- = Site Value

Cost of Utilities - (sewer, water, storm drainage)

Cost of Development (engineering, land survey, soil survey, land preparation, clearing, leveling)

Cost of Land – From sales - lets discuss excess land

## Cost Approach

Building Costs

The screenshot shows the Marshall & Swift website interface. At the top, there's a navigation bar with 'HOME', 'CATALOG', 'BUILDING COST DATA', 'SERVICE & SUPPORT', 'INDUSTRY NEWS', 'EDUCATION', and 'ABOUT US'. A search bar is visible. The main content area features a large banner for 'NEW PROPERTY RISK DATA' with a 'CLICK BANNER TO LEARN MORE' button. Below the banner, there are several sections: 'Commercial Solutions' with a 'Click Here to See Our Great List' button, 'Residential Solutions', and 'Featured Products' including 'Market & Rent Survey', 'Market & Rent Survey', and 'Market & Rent Survey'. The footer contains contact information and a copyright notice for 2012.

## Cost Approach

Building Costs

The screenshot shows the RSMMeans website interface. At the top, there's a navigation bar with 'HOME', 'RSMMEANS ONLINE', 'RSMMEANS BOOKS', 'RSMMEANS ONLINE', 'RSMMEANS BOOKS', 'RSMMEANS ONLINE', and 'RSMMEANS BOOKS'. A search bar is visible. The main content area features a large banner for 'Accuracy—anywhere' with a 'Learn more' button. Below the banner, there are several sections: 'Product Selection Tool', 'RSMMeans Online', and 'RSMMeans Books'. The footer contains contact information and a copyright notice for 2012.

## Cost Approach

Depreciation – loss in value from all causes

- Physical Deterioration – Curable and Incurable - (wear and tear)
- Functional Obsolescence  
Curable and Incurable – (In bldg. – design or style)
- External Obsolescence – (Economic) – outside property
  - Locational (neighborhood)
  - Market Conditions

## Cost Approach

Depreciation – loss in value from all causes

### Methods of Measuring Depreciation

#### Indirect

- Sales Comparison (market extraction)
- Capitalization of Income

#### Direct

- Economic Age-Life
- Modified Economic Age Life
- Observed Condition (Breakdown)

### Indicators of economic obsolescence

- Subject property income approach is less than the cost approach
- Subject property market value approach is less than the cost approach
- When in recent years, taxpayers (property owners) have experienced decreasing
  - revenue
  - profitability
  - cash flow years
  - product pricing
  - profit margin

### Indicators of economic obsolescence

- When in recent years, taxpayers (property owner) INDUSTRY have experienced decreasing
  - revenue
  - profitability
  - cash flow years
  - product pricing
  - profit margin
  - returns on investment
- Taxpayer and/or industry competition has been increasing in recent years

### Sales Comparison

$$MV_S = S_C + ADJ_C$$

**MV<sub>S</sub>** = Market Value of subject property  
**S<sub>C</sub>** = Comparable Sales  
**ADJ<sub>C</sub>** = Adjustment to comparables

### Sales Comparison

COMPARABLE SALES DATA	SUBJECT	COMP 1
Figure 2.11	N/A	\$ - 3,900,000
Sale Price	N/A	\$ - 3,900,000
Address	883 Appleton Rd	4200 NW Walnut Rd
City/State	Vancouver, WA	Vancouver, WA
Assessor Parcel Number	22098300	24398000
Ownership Type	Fee Simple	Fee Simple
Verification	N/A	J. Smith
Grantor	N/A	Herring Corp.
Grantee	N/A	Asian Hoops I
Total Sale	67,000	58,000
Price per Sq. Ft.	N/A	\$ 87.24
ADJUSTMENTS		
Financing	N/A	Cost to seller
Sale Contingencies	N/A	remodel office
Personal Property	None	None
Built in M & E	None	None
Sale Date	N/A	3/20/05
Location	Average	Similar
Year Built	1992	1970
Commercial Value	No	No
% Office	12%	4%
% Manufacturing	75%	77%
% Warehouse	13%	7%
Total	100%	100%
Miscellaneous	No	No
Land Size in Acres	0	0
Land Size in Square Feet	217,800	217,800
Land to Building Ratio	3.25	3.76
Excess Land	No	No
Condition	24	24
Type Construction	Conc. Tilt-up	Conc. Tilt-up
Condition	Average	Inferior
Zoning	Light Ind	Light Ind
Sanitarians	Yest/No	Yest/No
Misc.	None	None
Other Adjustments		90,000
Adjusted Sale Price		3,990,000
Adjusted Price per Sq. Ft.		\$ 87.24
VALUE CALCULATION		
Price Per Square Foot Estimate	\$ 87.24	
Size of Subject Building	45,500	
Value Calculation	\$ 4,306,680	

### Sales Comparison

Units of comparison and adjustments

Typical units of comparison value per #, value per space, value per acre.

Adjustments (comparable to subject) can be developed by

- Developed by paired sales
- Capitalized income loss

The elements of comparison are the basis of this approach, and they will vary according to the type of building, and what property characteristics are value-significant to buyers. This will vary according to location.

### Sales Comparison

Analyze and Compare the differences between the construction characteristics of the subject with the characteristics of each comparable sale.

Key characteristics to be compared are those construction characteristics that we discussed earlier in the course.

In addition to comparing size, age, condition, construction type, land to building ratio, the appraiser should compare construction characteristics.

## Sales Comparison

- In addition to comparing size, age, condition, construction type, land to building ratio, the appraiser should also compare construction characteristics for the type of property being appraised to those of the comparable sales.
- Construction characteristics (as discussed earlier) may include:
  - Wall construction
  - Foundation
  - Floors
  - Frame
  - Column spacing
  - Ceiling height
  - Roof
  - Office Finish
  - Plumbing
  - HVAC

## Sales Comparison

- Truck loading
- Loading docks
- Parking
- Truck turning
- Sprinklers
- Mezzanines
- Super flat floors
- Overhead cranes
- Refrigeration/freezers
- Food preparation
- Conveyor systems
- Process piping
- Compressed air systems
- Power wiring
- Employee lockers
- Tanks
- Railway sidings

## Sales Comparison

No.	Location	Age/ Sale Date	Land/Bldg Ratio	Building Size	Office Percent	Wall Height	Price	Price/SF	Even Age	Condition	Office Quality%	Const. Type	Net Misc. Adj.	Adj. SF	
1	1422 Rathbone Rd	1980 Feb-07	3.96:1	90,000	14	20	\$4,222,000	\$46.91	3	2		4	4	5	\$ 41.91
2	84229 Wellesley Ln.	1991 Mar-07	2.63:1	41,072	9.06	24	\$1,875,000	\$45.65				4	2	2	\$ 43.65
3	8402 Carmen St.	1996 Jan-07	2.8:1	59,903	10	20	\$2,500,000	\$41.22	-2	-3		4	2	1	\$ 44.22
4	20044 Allen Rd.	1970 Jun-07	2.94:1	129,434	9.19	24	\$5,200,000	\$40.17	5	1			4	2	\$ 42.17
5	NE 24th St.	1980 Dec-07	3.5:1	60,000	10.8	24	\$2,752,000	\$45.87	3			4	-2	-3	\$ 42.87
6	0719 Patrick Rd.	1991 Apr-07	2.35:1	80,747	8	24	\$3,700,000	\$45.92				-2	-3	-5	\$ 45.92
SUBJECT PROPERTY COMPARISON:															
Wiget Machinery Co.		1990	3.1 (8):1	104,000											
				Unadjusted price per square foot	\$ 44										
				Indicated straightened value	\$4,576,000										
				Adj. adjusted excess land	495,840										
				Total site	\$5,074,840										

## Sales Comparison

Often industrial properties are not highly comparable due to the differences in relevant characteristics.

Calculate a unadjusted sales price per sq. ft.

Adjust comparable sales for highly comparable items – time of sale, size, ceiling height, % office and then calculate an adjusted sales price per sq. ft.

Then compare and adjust for items other items

Often the appraiser will not have a “solid” market comparison properties to develop a market adjustment and will have to use a percent adjustment supported by logic.

One way to do this is to make % adjustments (+ or -) for clear differences and “bracket” the subject if possible.

## Sales Comparison

Appraiser/analyst must exercise care when

- Sale of a industrial business property is of the going concern
- Does the sale include personal property?
- Does the sale include intangible property?
- Since the assessor values real estate and personal property – the assessor may have to adjust the industrial property sale for personality – so that it is not “taxed” twice.
- Let’s discuss the Appraisal Practices Boards recent study – we will look at the concept paper.

## Sales Comparison

THE APPRAISAL FOUNDATION  
 Authorized by Congress as the Source of Appraisal  
 Standards and Appraiser Qualifications

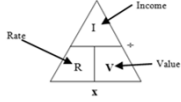
### FOUNDATION NEWS

The Appraisal Practices Board (APB) has issued the following document:  
**Concept Paper – Valuation Issues in Separating Tangible and Intangible Assets**  
 Link: <https://appraisalfoundation.sharefile.com/d/5a556d8878cc45ea9>  
 Written comments/input requested by **October 31, 2013**  
 Send Comments to [APBComments@appraisalfoundation.org](mailto:APBComments@appraisalfoundation.org)  
**Questions?** Please contact [Staci Steward](mailto:Staci.Steward@appraisalfoundation.org), Practices Administrator

For more information on the APB, please view the following videos:  
[The Appraisal Practices Board: Its Role and Function](#)

## Income Approach

**IRV = Income divided by Rate = Value**



$$MV = I \div R$$

or

$$MV = NOI \div OAR$$

## Income Approach

Analyze and Compare the differences in rental income between comparables and subject comparing construction characteristics

Key characteristics to be compared are those construction characteristics that we discussed earlier in the course.

Certain industrial properties are routinely rented while others are not – thus the income approach may or may not be applicable.

## Income Approach

In addition to comparing size, age, condition, construction type, land to building ratio, the appraiser should also compare rental rates for properties with different property construction characteristics. Construction characteristics (as discussed earlier) may include:

- Wall construction
- Foundation
- Floors
- Frame
- Column spacing
- Ceiling height
- Roof
- Office Finish
- Plumbing
- HVAC

## Sales Comparison

- Truck loading
- Loading docks
- Parking
- Truck turning
- Sprinklers
- Mezzanines
- Super flat floors
- Overhead cranes
- Refrigeration/freezers
- Food preparation
- Conveyor systems
- Process piping
- Compressed air systems
- Power wiring
- Employee lockers
- Tanks
- Railway sidings

## Income Approach

Often a rental premium is paid for:

- Superior office finish
- Super flat floors
- Food preparation areas
- Employee lockers area
- Certain ceiling heights
- Certain piping or wiring
- Railroad siding
- Water access
- Being close to transportation centers
- Being close to population centers

## Income Approach

INCOME APPROACH			
OWNER/OCCUPANT	Active Building		
LOCATION	Ridgely		
VALUATION DATE	November 2005		
USE	Office/warehouse		
Land at \$100,000 value			
POTENTIAL GROSS INCOME			
	SF AREA	Monthly (NNN) RENT PER SF	ANNUAL (NNN) RENT
	200,000	0.35	\$840,000
	5,000	1.00	\$50,000
	2,000	0.60	\$120,000
	3,000	0.90	\$270,000
TOTAL			\$1,730,000
EFFECTIVE GROSS INCOME			
POTENTIAL GROSS INCOME			\$1,730,000
Less VACUOL LOSS		5.00%	(\$87,750)
EFFECTIVE GROSS INCOME			\$1,642,250
EXPENSES			
EFFECTIVE GROSS INCOME			\$1,642,250
Less MAINT, MGMT & INSURANCE		5.00%	(\$82,113)
NET OPERATING INCOME			\$1,560,137
IMPROVEMENT VALUE			
NET OPERATING INCOME			\$1,560,137
CAPITALIZED AT AN OVERALL RATE		8.00%	\$195,017
TOTAL CAPITALIZED VALUE			\$1,365,120
Less REMAINDERS VALUE			(\$100,000)
IMPROVEMENT VALUE			\$1,265,120
INCLUDES LAND			\$100,000
TOTAL IMPROVEMENT, LAND AND SURPLUS LAND VALUE			\$1,365,120

### Difficulties in Appraising Industrial Buildings

- Not basing analysis on the type of property being appraised – distribution, manufacturing, flex, freight forwarding, and a plethora of subcategories within each
- Not understanding how building design stratifies the market for a property, thereby causing poor comparable selection.
- Valuing a property by rote and being complacent.
- Not obtaining support for adjustments or opinions industrial brokers.

### Difficulties in Appraising Industrial Buildings

- Submarkets react differently to physical characteristics in an industrial building. Here are a few examples:
  - Adjacent submarkets may react differently to ceiling height. Low height buildings in one submarket are not viewed by market participants as obsolete; in another, anything below 18 feet clear is obsolete.
  - The manufacturing market may not care about sprinklers, but the warehouse market, where products are stored in abundance, will.
  - Refrigeration is highly prized in food warehousing markets, but in others it is super adequate and not viewed as contributing to market value.

### Difficulties in Appraising Industrial Buildings

Thinking inside the box is all too easy, but further research can provide meaningful support for a different perspective.

Some places where new appraisal ideas are exchanged include:

- Appraiser forums
- Appraisal journals
- Industrial periodicals
- Amazon.com and Urban Land Institute for books on industrial design and use

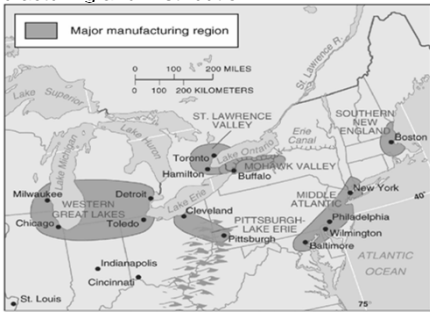
### Industrial Regions

Manufacturing and distribution



### Manufacturing Regions

Manufacturing and Distribution



### Problems: Large vs. Small Industrial Buildings

- Economic incentives can “make or break” the financial feasibility of large industrial buildings.
- They have a large trade radius (region), often encompassing an entire region of the country - this makes market delineation difficult.
- Because of their sheer size, large buildings are excellent candidates for multiple tenancies. Not all leases will have linear prices per square foot, nor do they have the same operating expense structure.

### **Problems - Large vs. Small Industrial Building**

- Large warehouse condominiums are a different market from smaller industrial condominiums;
  - this is especially true with bulk warehouses that require high ceiling heights and sprinklers, and have a higher cost of construction that is reflected in their sale prices per square foot.
- Industrial plants are separate from other industrial uses for a host of reasons, including design, physical depreciation, expensive machinery and equipment, interdependency with the local economy, etc.

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### **Pitfalls- Special Purpose Industrial Buildings**

- There is a synergistic relationship between the building and its equipment. Sometimes the building is designed around the equipment and its use.
- For example, the power capacity of the building and the location of heavy-duty electrical outlets depend on the equipment that will be used in the facility and where it is placed.
- There may be no demand for the improvements “as they sit”, yet they contribute toward a multimillion dollar special purpose building operation.

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### **Pitfalls- Special Purpose Industrial Buildings**

- There may be no adaptive reuse of the improvements (i.e., they cannot be converted into any other use that generates a positive return on investment).
- Items necessary for the operation of the existing business are super adequate and contribute nothing toward value for any other purpose. Using a cost approach would overvalue their contributions.
- Such super adequate items can amount to as much as 50 percent or more of the cost of the building. Market participants view them as “business value.”

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### **Pitfalls- Special Purpose Industrial Buildings**

- Items necessary for the operation of the existing business are super adequate and contribute nothing toward value for any other purpose.
- Gathering data is often very difficult due to the specialized nature of the facility. Just look at data need requests posted in various forums to see how many appraisers face this problem.

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### **Pitfalls- Special Purpose Industrial Buildings**

- The flow of materials through a special purpose industrial building is sometimes more important than the facility itself.
- An example - a food warehouse, processing and distribution facility where product must flow from the refrigerated end of the building over to processing and from there to the opposite end of the building where it is loaded and shipped at the loading docks.

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### **Pitfalls- Special Purpose Industrial Buildings**

- Current zoning may be such that there is no chance that the same use could be replicated elsewhere in an area or even region, making the facility unique.
  - slaughterhouse industrial building – no one wants one anywhere near their neighborhood, and the zoning will specifically exclude this as an allowable use in recognition of this fact.
- There may be no local demand for a special purpose industrial property, but high demand at a national level.

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### Functional Obsolescence Industrial Buildings

- Sometimes functional obsolescence in one market may not be viewed as such by the market next door.
- There may be no such thing as functional obsolescence in a “hot” market. For a buyer simply to obtain a building that is virtually the only one available in the desired area is enough.
- In these instances, buyers do not pay any less to get a building with one or a few “problems.”

### Functional Obsolescence Industrial Buildings

- Functional obsolescence is always measured in the eye of the beholder.
- Super adequacy, a form of functional obsolescence, is viewed by many market participants as “business value.”
- If they built the building, they most likely never expected the market to pay them back the cost of the building in the short term. The cost premium for super adequacy is reflected in investment value, not market value.

### Functional Obsolescence Industrial Buildings

- You may believe functional obsolescence is present in your subject, yet measuring it is another thing entirely. Paired sales are sometimes possible, but only in homogeneous markets with large numbers of industrial properties in the same size range for the building and land.
- If the property does not fit into what is present in an industrial subdivision, the odds are further reduced that you will be able to find suitable paired sales to support an adjustment.

### Functional Obsolescence Industrial Buildings

- Lenders do not like qualitative adjustments (+/-) and strongly prefer quantitative adjustments (+5%, -10%, etc.).
- That is not the way industrial markets work, because industrial market participants do not act that way.
- Relative (qualitative) thinking prevails.
- Qualitative adjustments imply a degree of precision that is simply not there in the real world.

### Functional Utility Manufacturing Plants

- Industries that involve bulky or volatile materials and products have specialized equipment and building design – thus few potential users
- Food processing and certain manufacturing industries require high levels of cleanliness – “clean rooms” – may not contribute as much value as the cost to construct if used for alternative uses.
- Buildings used for light manufacturing and processing have fewer limitations and greater appeal in market.

### Functional Utility Warehouse

Storage and Distribution facilities range from simple cubicles (mini-warehouse) to huge regional warehouses

Optimal functional utility includes adequate:

- access
- open areas
- ceiling height
- floor load capacity
- humidify, heat and air controls,
- shipping and receiving facilities
- fire protection
- protection from elements



### Functional Utility Warehouse

Primary consideration in warehouse location is access

- just in time inventory,
- wide variety of vehicles,
- cargo containers,
- airport
- seaport terminals
- rail

Trucking - most common means of transport  
loading docks and dock areas must be designed with adequate flexibility

Forklifts, conveyor belts and automatically guided vehicle conveyor systems are frequently used

### Warehouse – Location

Primary consideration in warehouse location is access

- Just in time inventory,
- wide variety of vehicles,
- cargo containers,
- airport
- seaport terminals
- rail

Trucking most common means of transport  
loading docks and dock areas must be designed with adequate flexibility

Forklifts, conveyor belts and automatically guided vehicle conveyor systems are frequently used

### Warehouse – Location BWI



### Warehouse – Location BWI



### Functional Utility Warehouse

Pallets and portable platforms are used for moving and storing materials in most distribution operations

- Ceiling heights should accommodate stacking of an ideal number of pallets
- Newly constructed building maybe more efficient than older buildings

Because wide spans provide greatest flexibility, square structures are generally most cost effective

Sprinkler systems are needed in warehouses where flammable goods are stored. Fire systems can be wet or dry using water or chemicals.

### Functional Utility of Industrial Property

**Surplus Land** – In new construction surplus land on the site is frequently allocated for future expansion – Know how to determine if surplus land is present.

**Clear Span** – Anywhere from 21 to 35 feet; many smaller warehouses can be operated with clear span of 15 to 20 feet, but higher ceilings may be standard

**Percentage of Office** – Varies widely depending on operation. If potential alternate uses of existing space do not require as much – excess may be an over improvement

## Functional Utility of Industrial Property

**Loading Facilities** – Multiple load facilities can reduce delays in both incoming deliveries and outgoing orders. Overhead doors are less efficient loading facilities than loading docks, dock-high floors and truck wells can be problems

**Floor thickness and loading capacity** – Typically 5 to 8 inch of reinforced concrete. Live-load capacity- the ability to support moving or movable objects in the building at a certain weight is a minimum 125 pounds (PSF) per square foot for light warehouse and manufacturing while 250 PSF for heavy warehouses  
Appraisal of Real Estate, 13<sup>th</sup> edition, AI p 260

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## Functional Utility of Industrial Property

**Power service** – Manufacturing plants generally require more electrical service than warehouses

**Land to Building or Floor Area Ratio** – Typically, 2.5 to 3.5 land to building area; older facilities have ratios from 1.2 to 2.5. The land to building ratio must allow plenty of space for parking, truck maneuvering, yard storage, and expansion. Floor area ratio (FAR) is also know as building to land ratio.

Appraisal of Real Estate, 13<sup>th</sup> edition, AI p 260

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## Functional Utility of Industrial Property

**Size to typical building size** – Big Box warehouses can be significantly larger than competitive buildings in the market. The cost of reconfiguring a large industrial building for multitenant use is a measure of functional inutility

**Slope and access to site** – Steep inclines can reduce loading efficiency

Appraisal of Real Estate, 13<sup>th</sup> edition, AI p 260

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## Depreciation of Industrial Property

- Several of the source references address functional and economic obsolescence in industrial property
- Two key references are:

“Considerations of Functional and Economic Obsolescence in the Assessment of Industrial and Commercial Property” Robert F. Reilly

“Functional Obsolescence: A General Overview” Ken Voss

(See Slide 4 & 5 for source reference)

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## Depreciation of Industrial Property

In “Considerations of Functional and Economic Obsolescence in the Assessment of Industrial and Commercial Property”, Robert F. Reilly discusses several key concepts regarding industrial appraisal:

- Assessors use the three approaches to value industrial property
- Often general industrial property is rented and/or bought and sold allowing assessors to use the sales comparison approach, income approach, and cost approach.
- However, special purpose industrial property are seldom rented or bought and sold especially for the current specific use.

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## Depreciation of Industrial Property

- When special purpose industrial property do rent or sell, it is often for an alternative use. (Value in exchange).
- Assessor’s typically value special purpose industrial property solely by the cost approach to value
- Because of the lack of rental and sales data of (and the complexity of) special purpose properties, the assessor must be creative in estimating depreciation via indirect methods:
  - Abstraction Method (Sales Comparison), or
  - Income Method

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## Depreciation of Industrial Property

- Similarly, the assessor must employ the direct methods of estimating depreciation for the special purpose industrial property in the cost approach.

Direct Methods are:

- Economic Age-Life
- Modified Economic Age Life
- Observed Condition (Breakdown)

- These methods essentially only deal with physical deterioration and not functional and/or locational obsolescence

## Depreciation of Industrial Property

- The assessor is challenged with estimating Functional and/or External (Market Condition) Obsolescence without having property sales or income and expense information to develop indirect indications of functional or locational obsolescence
- Robert Reilly's article on functional obsolescence in industrial appraisal gives suggestions for quantifying functional or locational obsolescence when assessors are using the cost approach to value in valuing special purpose industrial property.
- Many of the causes of functional or external obsolescence are quantified on a comparative basis

## External Obsolescence of Industrial Property

Economic analysis on comparative basis considers

1. Current property owner results vs. historical property owner results
2. Current property owner results vs. planned or budgeted results
3. Current property owner results vs. specific comparative properties
4. Current property owner results vs. industry average results

## External Obsolescence of Industrial Property

External Obsolescence is loss in value from factors external to the property –

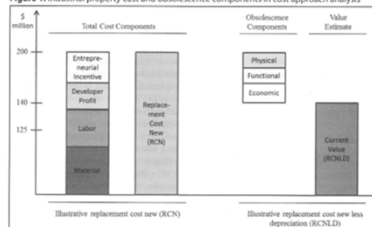
- 1/ market conditions in area or industry or
- 2/ adverse conditions near the property

Some common comparisons for estimating external obsolescence are:

1. Actual margins, returns, units, or prices vs. historical margins, returns, units, or prices
2. Actual margins, returns, units, or prices vs. budgeted margins, returns, units, or prices
3. Actual rates of return vs. required rates of return (9.e. cost of capital)
4. Actual results vs. benchmark results from comparable property or industry average

## Depreciation of Industrial Property

Figure 1. Industrial property cost and obsolescence components in cost approach analysis



## Functional Obsolescence of Industrial Property

Common indications of functional obsolescence include:

1. Excess operating and /or maintenance costs
2. Excess capacity and /or excess capital costs
3. Structural and /or capacity super-adequacies or inadequacies

## Functional Obsolescence of Industrial Property

Methods to quantify Functional Obsolescence

1. Capitalizing the property's excess operating costs over the properties expected remaining useful economic life
2. Reducing the property's super adequacy cost measurement by the amount of capital costs related to the excess capacity, or
3. Estimating the amount of capital required to cure the functional deficiency or structural/capacity inadequacy

Robert F. Reilly, Assessment Journal pg.51

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## Functional Utility of Industrial Property

Table 1 – Alpha has functional problem with its building - 2 story special purpose building. Business process for current operations is only 1<sup>st</sup> Floor – 2<sup>nd</sup> story is idle and not used.

- Remaining useful life of building is 20 years. It cost \$2,000,000 per year to maintain, insure, secure and otherwise keep idle the unused portion of the improvement.
- Appropriate Capitalization Rate is 10%
- Assessor estimates that the RCNLD (before Functional Obs.) is \$ 120,000,000

To estimate Functional Obsolescence, the assessor would use the capitalized excess operating cost method given the present value annuity factor of 8.5136 based on 20 year.

Robert F. Reilly, Assessment Journal pg.50

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## Functional Utility of Industrial Property

**Table 1.** Alpha Manufacturing Company cost approach analysis—Manufacturing plant functional obsolescence as of January 1, 2012

Capitalized Excess Operating Cost Approach Analysis		
Site and improvements RCNLD (before functional obsolescence)		\$120,000,000
Less: Functional obsolescence		
annual excess operating cost	\$2,000,000	
× present value of annuity factor	× 8.5136	
= capitalized excess operating costs	\$17,027,200	– 17,027,200
Equals: RCNLD less functional obsolescence		\$102,972,800
Cost approach value indication (rounded)		\$103,000,000

Robert F. Reilly, Assessment Journal pg.50

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## External Obsolescence of Industrial Property

Methods to quantify External Obsolescence

1. Capitalization of income method
2. Paired Sales
3. Market Extraction

Consider Capitalization of Income shortfall method:

- Given: Beta Company has special purpose facility
- Beta Companies market derived cost of capital is 12.5%
- Market operations of the company - net operating income at the current property is 10%
- RCNLD (before economic Obsolescence is \$600,000,000

Robert F. Reilly, Assessment Journal pg.51

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## Locational Obsolescence of Industrial Property

**Table 2.** Beta Company—Special purpose property cost approach economic obsolescence indication

Comparative Financial Performance Metrics Capitalization of Income Shortfall Method	
Market-derived Beta Company required rate of return (i.e., yield capitalization discount rate)	12.5%
Less: Actual ROI earned on the property operations	– 10.0%
Equals: Income shortfall return measure (based on the shortfall of the performance metric)	2.5%
Divided by: Market-derived required rate of return	÷ 12.5%
Equals: Economic obsolescence indication (i.e., 2.5% return shortfall divided by 12.5% required return)	20.0%

Robert F. Reilly, Assessment Journal pg.51

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## Functional Utility of Industrial Property

**Table 3.** Beta Company—Special purpose property cost approach analysis and value conclusion as of January 1, 2012

Beta property RCNLD (before economic obsolescence)	\$600,000,000
Less: Economic obsolescence at 20% (i.e., \$600,000,000 RCNLD × 20% economic obsolescence)	– 120,000,000
Equals: Beta property cost approach value	\$480,000,000

Robert F. Reilly, Assessment Journal 2113 pg.51

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## External Obsolescence in Industrial Property

Table 4 – illustrates a economic obsolescence comparative analysis in a cost approach. It compares Gamma Corporation subject property current vs. historic earnings (4 years), net cash flow, net income margin, return on total assets, return on net assets, 5 year revenue growth, 5 year compound net cash flow growth and average sales price per unit.

The resulting metric's can be used to develop an indication of economic obsolescence (-19%)

Robert F. Reilly, Assessment Journal 2113 pg.56

Table 4. Gamma Corporation cost approach analysis—Subject property economic obsolescence of January 1, 2012

Subject Property Financial and Operational Metrics	Average of 2007-2010	For Year ended 12/31/11	Percentage Difference
Earnings Before Interest and Taxes (EBIT) profit margin	24.0%	20.0%	-16.7%
Net cash flow margin	12.0%	10.0%	-16.7%
Pre-tax net income margin	15.0%	12.0%	-20.0%
EBIT return on total assets	16.0%	14.0%	-12.5%
EBIT return on net assets	20.0%	16.0%	-20.0%
5-year compound revenue growth rate	6.5%	4.5%	-30.8%
5-year compound net cash flow growth rate	7.5%	5.5%	-26.7%
Average sales price per unit sold	\$1,200	\$1,000	-16.7%
Mean percent decline in Gamma metrics			-19.5%
Median percent decline in Gamma metrics			-18.4%
Trimmed mean percent decline in Gamma metrics			-18.0%
Selected economic obsolescence indication			-19.5%

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## Industrial Property

### Warehouse systems



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## Industrial Property

### Warehouse systems



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## Industrial Property

### Warehouse systems



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## Industrial Property

### Warehouse systems



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## Industrial Property

### Truck Loading – Manufacturing.



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# Industrial Property

## Tilt Up Concrete Buildings .



**PCA Buildings**  
Tilt-Up Concrete

**Tilt-Up Concrete**  
Building concrete structures on-site.

**Building Process**  
When building with tilt-up, the site is prepared, walls are cast on-site on the formwork, and forms are removed and reused on other buildings. This is a very fast and efficient way to build. The forms can be used for multiple buildings, and their ability to be able to withstand crane and/or hoisting loads makes them ideal for construction of commercial and industrial buildings. The panels can be finished in myriad ways, offering aesthetic flexibility.

**Building Process**  
One of the most visible benefits of tilt-up concrete construction is speed. Wall panels are often placed while the rest of the building systems are designed, and building can begin work quickly, saving time to construct. Tilt-up structures also offer all the energy efficiency, strength, and durability long associated with concrete.

**Sustainability**  
Tilt-up is widely recognized as an environmentally friendly construction method. The overall use of tilt-up, from the steel formwork to the concrete, is highly efficient. The reuse of tilt-up forms and the fact that the concrete is cast on-site and cured in place means that there is no need for large amounts of concrete to be transported to the site. The fact that tilt-up buildings can be finished in myriad ways, with panels that are easy to move, makes them an ideal choice for many applications.

**Industry Resources**  
PCA offers a number of resources for many aspects of tilt-up construction, including design, engineering, placement, maintenance, and more.

# Key Terms

## Truck Loading – Cox's Creek – Copper Processing



**MARYLAND**  
Department of the Environment

**Facts About...**  
Cox Creek Refining  
(MD-456)

**Site Location**  
The Cox Creek Refining Company (CCRC) is a 167-acre site located at 1000 Kembo Road, Foreman's Corner, Anne Arundel County, Maryland. The property is located in an industrial area in Anne Arundel County just south of the Baltimore City line. The CCRC site was bordered on the east by the Patuxent River, on the north by SCM Chemicals (MD-009), on the south by a Maryland Port Authority dredge spoil disposal area and on the west by the railroad. The site topography is generally flat with a gradual slope towards the Patuxent River. The geographic coordinates of the site are 76°32'30" west longitude by 39°11'55" north latitude.

**Site History**  
The facility was used for copper refining and the manufacturing of copper wire and rod from 1959 until 1995. The facility was constructed by Kennecott Refining Company who operated it until 1986. In 1986 the plant was acquired by the Cox Creek Refining Corporation who continued to manufacture copper wire and rod until 1995. In April 1997, the Maryland Port Administration (MPA) acquired the property.

**Environmental Investigations**  
The Maryland Department of the Environment (MDE) has been involved with the site since 1991 through RCRA-implemented efforts to improve hazardous waste conditions at the site. Environmental assessments of the property have indicated extensive on-site contamination by inorganic substances including lead, copper, chromium, and arsenic.

# Industrial Property

## Copper Processing Facility



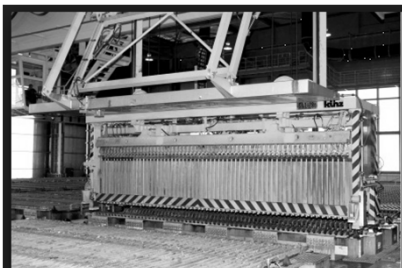
# Industrial Property

## Copper Processing Facility.



# Industrial Property

## Copper Processing Facility



# Industrial Property

## Copper Processing Facility



## Industrial Property

### Steel Facility



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## Industrial Property

### Steel Facility



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## Industrial Property

### Lockheed Martin Aircraft Production .



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## Industrial Property

### Boeing Aircraft - Everett Washington .



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## Industrial Property

### Ship Yard Facilities



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## Industrial Property

### Ship Yard Facilities



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## Industrial Property

### Ship Yard Facilities



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## Northrop Grumman plans to close Avondale shipyard, sell entire shipbuilding sector

Published: Tuesday, July 23, 2010, 4:57 PM Updated: Tuesday, July 23, 2010, 9:43 PM

By Dan Martang, Press-Register

11 people recommend this. Sign up to see what your friends recommend.

Comment 7 Share 1 Know 1 Post 1



(Three Photos File Photo)  
The Northrop Grumman shipyard in Avondale, La., has been working on projects like the LPD for the U.S. Navy, Northrop Grumman on Tuesday, July 23, 2010, announced plans to close the shipyard.

Northrop Grumman Corp. will close its Avondale, La., shipyard in 2013 and likely part with its entire shipbuilding sector, the company announced Tuesday.

Future Gulf Coast shipbuilding will be consolidated in its Mississippi facilities, Los Angeles-based Northrop Grumman said in a press release.

"Recognizing our company's long-term strategic priorities, we foresee little synergy between shipbuilding and our other businesses," Wes Bush, chief executive officer and president, said in a news release. "It is now appropriate to explore separating shipbuilding from Northrop Grumman."

The Avondale shipyard employs about 4,600 people. Northrop Grumman employs about 11,000 people in its Pascagoula shipyard, including 2,450 Alabama residents.

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## Industrial Property

### BMW USA - Spartanburg SC



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### BMW USA – Spartanburg SC



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## Industrial Property

### Reuse in industrial districts

**SILO POINT**

HISTORY THE TOWER FLOOR PLANS SKY LOUNGE FEATURES/AMENITIES LOCATION VIEWS DEVELOPER AGACITY INSIDE

**IN ADDITION**

- CONTROLLED-ACCESS GARAGE
- WIFI HOTSPOTS
- GROCERY DELIVERY
- DOOR-TO-DOOR DRY CLEANING & SHOE SHINING
- ON-SITE RESTAURANT PRIVITY SEATING
- CAR DETAILING
- AIRPORT TRANSPORTATION
- PET PAMPERING
- UMBRELLAS ALWAYS AT HAND

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## Industrial Property

### Reuse in industrial districts

HISTORY THE TOWER FLOOR PLANS SKY LOUNGE FEATURES/AMENITIES LOCATION VIEWS DEVELOPER AGACITY INSIDE

**INSIDE THE CITY. OUTSIDE THE ORDINARY.**

**Featured Event at Silo Point**  
Pints and Pinstripes

**[INSIDE THE CITY. OUTSIDE THE ORDINARY.]**  
Constructed in 1923, Silo Point was the largest and fastest gain elevator in the world. Today, the 24-story tower soars above Baltimore's harbor, allowing 360° views of the city skyline and designating an innovative era in residential living.

With over 238 spectacular residential units, an exclusive 19th floor Sky Lounge, state-of-the-art Fitness and Wellness Center, ground floor restaurants and retail, and access to everything that the surrounding Locust Point and Federal Hill neighborhoods have to offer, these homes present an urban lifestyle beyond the ordinary.

WATCH VIDEO

VIMEO

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## Industrial Property

### Reuse in industrial districts

**SILO POINT**

HISTORY THE TOWER FLOOR PLANS SKY LOUNGE FEATURES/AMENITIES LOCATION VIEWS DEVELOPER AGACITY INSIDE

Silo Point presents industrial-modern luxury living. With privileges and possibilities as wide open as the expansive floor plans and dramatic views.

**OVERSIZED TERRACES**  
A rare amenity.  
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## Silo Point



## Summary

We reviewed:

- what industrial property is and is not
- how appraisal standards are involved in industrial appraisal
- construction characteristics of industrial property; key definitions and assets; and how “industry” must be considered in industrial property appraisal
- market and neighborhood analysis and sources of information in industrial appraisal
- the significance of the three approaches in industrial and their strengths and weaknesses

## Summary

- the difficulties of appraising industrial properties
- what must be considered in estimating depreciation used in the cost approach to value of industrial property
- Similarities and dissimilarity of large vs. small industrial property

**The End**

**Hope you enjoyed the presentation**