

## Unit II

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<b>COURSE TITLE</b>	Building Design for Homeland Security	<b>TIME</b>	75 minutes
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<b>UNIT TITLE</b>	Asset Value Assessment
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<b>OBJECTIVES</b>	<ol style="list-style-type: none"><li>1. Identify the assets of a building or site that can be affected by a threat or hazard</li><li>2. Explain the components used to determine the value of an asset</li><li>3. Determine the critical assets of a building or site</li><li>4. Provide a numerical rating for the asset and justify the basis for the rating</li></ol>
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<b>SCOPE</b>	<p>The following topics will be covered in this unit:</p> <ol style="list-style-type: none"><li>1. The core functions and critical infrastructure listed on the threat-vulnerability matrix.</li><li>2. Various approaches to determine asset value – FEMA, Department of Defense, Department of Justice, and Veterans Affairs.</li><li>3. A rating scale and how to use it to determine an asset value.</li><li>4. Activity: Identify the assets to consider in the Case Study and determine the asset value for each asset of interest.</li></ol>
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<b>REFERENCES</b>	<ol style="list-style-type: none"><li>1. FEMA 426, <i>Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings</i>, pages 1-10 to 1-14</li><li>2. FEMA 452, <i>Risk Assessment: A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings</i>, pages 2-1 to 2-26</li><li>3. Case Study – Appendix S: Suburban, Hazardville Information Company</li><li>4. Student Manual, Unit II (S) (info only – not in SM)</li><li>5. Unit II (S) visuals (info only – not in SM)</li></ol>
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<b>REQUIREMENTS</b>	<ol style="list-style-type: none"><li>1. FEMA 426, <i>Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings</i> (one per student)</li><li>2. FEMA 452, <i>Risk Assessment: A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings</i> (one per student)</li><li>3. Instructor Guide, Unit II</li><li>4. Student Manual Suburban Case Study (one per student)</li><li>5. Overhead projector or computer display unit</li></ol>
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6. Unit II visuals
  7. Risk Matrix poster and box of dry-erase markers (one per team)
  8. Chart paper, easel, and markers (one per team)

<b>UNIT II (S) OUTLINE</b>	<u>Time</u>	<u>Page</u>
II. Asset Value Assessment	75 minutes	IG II-1
1. Unit Objectives and Assessment Process	10 minutes	IG II-5
2. Identification of Assets	5 minutes	IG II-7
3. Asset Value Rating	10 minutes	IG II-8
4. Summary and Student Activity	5 minutes	IG II-11
5. Activity: Asset Value Ratings (Version <b>A Suburban</b> ) [35 minutes for students, 10 minutes for instructor review]	45 minutes	IG II-A-13
6. Activity: Asset Value Ratings (Version <b>B Urban</b> ) [35 minutes for students, 10 minutes for instructor review]	45 minutes	IG-II-B-19

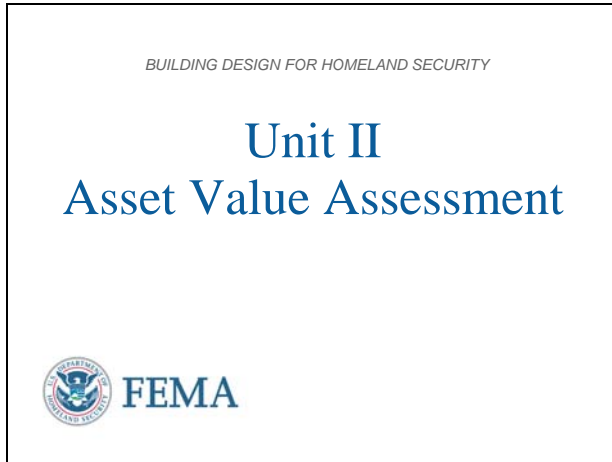
## PREPARING TO TEACH THIS UNIT

- **Tailoring Content to the Local Area:** This is a generic instruction unit that does not have any specific capability for linking to the Local Area. However, Local Area discussion may be generated as students have specific situations for which they would like to determine asset value. Also, the determination of asset value rating is subjective because this course was designed for small organizations with few decision makers or levels of decision making. Large organizations would need a more objective approach to asset value rating so that the ratings of different people would be comparable, which does not occur in small organizations.
- **Optional Activity:** There are no optional activities in this unit.
- **Activity:** The students will apply the techniques of asset identification and asset value rating to the Case Study in order to identify and rate the assets found in the Case Study. The students will have to quickly scan the Case Study information with the specific intent of determining assets and their value to the organization. Reading the selected Case Study prior to the class greatly helps in performing this activity.
- Refer students to their Student Manuals for worksheets and activities.

- Direct students to the appropriate page (Unit #) in the Student Manual.
- Instruct the students to read the activity instructions found in the Student Manual. Note that this Student Activity provides asset value ratings that the students must determine agreement with and rationale for the given asset value rating.
- Explain that the asset value ratings determined by the team must be transferred to the Risk Matrix poster.
- Tell students how long they have to work on the requirements.
- While students are working, all instructors should closely observe the groups' process and progress. If any groups are struggling, immediately assist them by clarifying the assignment and providing as much help as is necessary for the groups to complete the requirement in the allotted time. Also, monitor each group for full participation of all members. For example, ask any student who is not fully engaged a question that requires his/her viewpoint to be presented to the group.
- At the end of the working period, reconvene the class.
- After the students have completed the assignment, “walk through” the activity with the students during the plenary session. Call on different teams to provide the answer(s) for each question. Then simply ask if anyone disagrees. If the answer is correct and no one disagrees, state that the answer is correct and move on to the next requirement. If there is disagreement, allow some discussion of rationale, provide the “school solution” and move on.
- If time is short, simply provide the “school solution” and ask for questions. Do not end the activity without ensuring that students know if their answers are correct or at least on the right track.
- Ask for and answer questions.

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VISUAL II-1



**Introduction and Unit Overview**

This is Unit II, Asset Value Assessment. This section will describe how to perform an asset value assessment (the first step in the assessment process), to identify people and asset values categorized as core functions and core infrastructure. Key to this process is interviewing stakeholders including owners, facility staff, and tenants.

VISUAL II-2

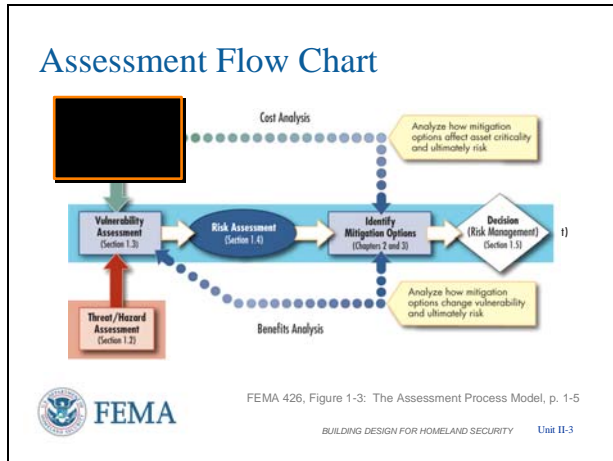


**Unit Objectives**

At the end of this unit, the students should be able to:

1. Identify the assets of a building or site that can be affected by a threat or hazard.
2. Explain the components used to determine the value of an asset.
3. Determine the critical assets of a building or site.
4. Provide a numerical rating for the asset and justify the basis for the rating.

VISUAL II-3



Assessment Flow Chart

Reviewing the Assessment Flow Chart, the first step in the risk assessment process is to determine asset value.

An asset is anything you want to protect because of its value, its need to maintain business continuity, and/or its difficulty in replacing within a required timeline.

VISUAL II-4

### Definition of Risk

Risk is a combination of:

- The probability that an event will occur, and
- The consequences of its occurrence

**Asset** - A resource of value requiring protection. An asset can be tangible, such as buildings, facilities, equipment, activities, operations, and information; or intangible, such as processes or a company's information and reputation.

	Low Risk	Medium Risk	High Risk
Risk Factors Total	1-40	41-175	> 176

Risk = Asset Value x Threat Rating x Vulnerability Rating

Infrastructure	Function
Replacement/Repair	People
Loss of Use	

FEMA 426, Table 1-19: Total Risk Color Code, p. 1-38  
BUILDING DESIGN FOR HOMELAND SECURITY Unit II-4

Risk

Risk can be defined as the potential for loss of or damage to an asset. It takes into account the **value of an asset**, the **threats or hazards** that potentially impact the asset, and the **vulnerability** of the asset to the threat or hazard.


Values can be assigned to these three components of risk to provide a risk rating.


In general terms, asset value can be considered the replacement cost for infrastructure and equipment. It can include lost profit to a business or lost capability to a mission that results in greater damage and loss to that asset and other assets.

VISUAL II-5

**People and Asset Value**

**Asset Value** - The degree of debilitating impact that would be caused by the incapacity or destruction of an asset.



 FEMA

BUILDING DESIGN FOR HOMELAND SECURITY Unit II-5

**People and Asset Value**

Understanding asset criticality is comparable to strategic planning in that the building owner should understand the mission of the organization, the resources that are used to perform that mission, how those resources interface with one another to achieve goals, and how the organization would cope or maintain business continuity if the asset(s) were lost.

People are a building's most critical asset.


**Exam Questions #A1 and B2**

VISUAL II-6


**Identification of a Building's Assets**


**Two Step Process**

**Step 1:** Define and understand a building's core functions and processes



**Step 2:** Identify site and building infrastructure and systems



 FEMA

BUILDING DESIGN FOR HOMELAND SECURITY Unit II-6

**Identification of a Building's Assets**

Identifying a building's critical assets is accomplished in a two-step process.

Step 1: Define and understand a building's core functions and processes.

Step 2: Identify site and building infrastructure and systems:

- Critical components/assets
- Critical information systems and data
- Life safety systems and safe haven areas
- Security areas

**Exam Questions #A2 and B1**

VISUAL II-7


### Asset Value

**Core Functions**

- Primary services or outputs
- Critical activities
- Identify customers
- Inputs from external organizations

**Critical Infrastructure**

- Injuries or deaths related to lifelines
- Effect on core functions
- Existence of backups
- Availability of replacements
- Critical support lifelines
- Critical or sensitive information



BUILDING DESIGN FOR HOMELAND SECURITY Unit II-7

**Asset Value**

The objective in the initial step is to determine the core functions for the building that will enable it to continue to operate or provide services after an attack. This focuses the assessment team on the key areas of the building. Factors include:

- What are the primary services?
- What critical activities take place at the building?
- Who are the building’s occupants and visitors?

To help evaluate and rank critical infrastructure, consider the following factors:

- Injuries or deaths related to critical infrastructure damage
- Effect on core functions
- Existence of backups, systems redundancy
- Availability of replacements
- Critical support lifelines
- Critical or sensitive information


VISUAL II-8

### Asset Value Rating

Asset Value		
Very High	10	Very High – Loss or damage of the building’s assets would have exceptionally grave consequences, such as extensive loss of life, widespread severe injuries, or total loss of primary services core processes, and functions.
High	8-9	High – Loss or damage of the building’s assets would have grave consequences, such as loss of life, severe injuries, loss primary services or major loss of core processes and functions for an extended period of time.
Medium High	7	Medium High – Loss or damage of the building’s assets would have serious consequences, such as serious injuries or impairment of core processes and functions for an extended period of time.

**Key elements**

- Loss of assets and/or people would have grave, serious, moderate, or negligible consequences or impact



FEMA 426, Adaptation of Table 1-1: Asset Value Scale, p. 1-13  
BUILDING DESIGN FOR HOMELAND SECURITY Unit II-8

**Quantifying Asset Value**

After a building’s assets requiring protection have been identified, they are assigned a value. The asset value is the degree of debilitating impact that would be caused by the incapacity or destruction of the building’s assets.

**FEMA 426** uses a combination of a seven-level linguistic scale and a ten-point numeric scale.

- **Very High** – Loss or damage of the asset would have exceptionally grave consequences, such as extensive loss of life, widespread severe injuries, or total loss of primary services, core processes, and functions.




VISUAL II-9

**Asset Value Rating (continued)**

Asset Value		
Medium	5-6	Medium – Loss or damage of the building’s assets would have moderate to serious consequences, such as injuries or impairment of core functions and processes.
Medium Low	4	Medium Low – Loss or damage of the building’s assets would have moderate consequences, such as minor injuries or minor impairment of core functions and processes
Low	2-3	Low – Loss or damage of the building’s assets would have minor consequences or impact, such as a slight impact on core functions and processes for a short period of time.
Very Low	1	Very Low – Loss or damage of the building’s assets would have negligible consequences or impact.

Key elements

- Loss of assets and/or people would have grave, serious, moderate, or negligible consequences or impact



FEMA 426, Adaptation of Table 1-1: Asset Value Scale, p. 1-13  
BUILDING DESIGN FOR HOMELAND SECURITY Unit II-9

- **High** – Loss or damage of the asset would have grave consequences, such as loss of life, severe injuries, and loss of primary services.
- **Medium High** – Loss or damage of the asset would have serious consequences, such as serious injuries, or impairment of core processes and functions for an extended period of time.

**Quantifying Asset Value (continued)**


At the other end of the scale we have:

- **Medium** – Loss or damage of the asset would have moderate to serious consequences.
- **Medium Low** – Loss or damage of the asset would have moderate consequences, such as minor injuries, or minor impairment of core functions and processes.
- **Low** – Loss or damage of the asset would have minor consequences or impact.
- **Very Low** – Loss or damage of the asset would have negligible consequences or impact.

VISUAL II-10

**Asset Value Notional Example**

Asset	Value	Numeric Value
Site	Medium Low	4
Architectural	Medium	5
Structural Systems	High	8
Envelope Systems	Medium High	7
Utility Systems	Medium High	7
Mechanical Systems	Medium High	7
Plumbing and Gas Systems	Medium	5
Electrical Systems	Medium High	7
Fire Alarm Systems	High	9
IT/Communications Systems	High	8



FEMA 426, Table 1-2: Nominal Building Asset Value Assessment, p. 1-14  
BUILDING DESIGN FOR HOMELAND SECURITY Unit II-10

**Asset Value Notional Example**


The key assets for this notional example by system are listed and an asset value rating is entered into the site critical infrastructures matrix.

HVAC mechanical systems in most buildings will likely be medium high (7).

VISUAL II-11

**Critical Functions**

Function	Cyber attack	Armed attack (single gunman)	Vehicle bomb	CBR attack
<b>Administration</b>				
Asset Value	5	5	5	5
Threat Rating				
Vulnerability Rating				
<b>Engineering</b>				
Asset Value	8	8	8	8
Threat Rating				
Vulnerability Rating				


 FEMA 426, Adaptation of Table 1-20: Site Functional Pre-Assessment Screening Matrix, p. 1-38  
BUILDING DESIGN FOR HOMELAND SECURITY Unit II-11

Note: The Asset Value under the Administration and Engineering functions is highlighted. A medium value rating (6) is assigned to the Administration function asset value because they are a small part of the total organization, but important to the organization for continuity of business and profit. A high Asset Value rating (8) was assigned for the Engineering Function as they account for over half of the organization and are considered the core of the business for the company.

VISUAL II-12

**Critical Infrastructure**

Infrastructure	Cyber attack	Armed attack (single gunman)	Vehicle bomb	CBR attack
<b>Site</b>				
Asset Value	4	4	4	4
Threat Rating				
Vulnerability Rating				
<b>Structural Systems</b>				
Asset Value	8	8	8	8
Threat Rating				
Vulnerability Rating				

 FEMA 426, Adaptation of Table 1-21: Site Infrastructure Systems Pre-Assessment Screening Matrix, p. 1-39  
BUILDING DESIGN FOR HOMELAND SECURITY Unit II-12

**Critical Functions Matrix**

List functions down the left side and threats across the top.

In general, the asset value for a given function is the same for all threats and the matrix helps to identify the primary functions in a quantitative form. The functions matrix is people oriented and is subjective, but the completed matrix should provide a guide to vulnerabilities and risks. An organization with few administrative staff, but with a large engineering group, is used in this example.

Note the value is the same for all threat pairs. It does not matter how the asset is lost. The asset value reflects the impact to the people and organization should the asset be lost, damaged, or degraded.

**Critical Infrastructure Matrix**

List infrastructure down the left side and threats across the top.

Note that the value is the same for all threat pairs to reflect the economic and organization impact losses that could occur over time should the critical infrastructure be lost, degraded, or damaged due to any threat tactic.

**INSTRUCTOR NOTES**

**CONTENT/ACTIVITY**

Note: The Asset Value rating under the Site and Structural Systems is highlighted. A medium low Asset Value rating (4) could be an initial value for a site infrastructure that has a well-defined and protected perimeter and economic replacement costs that are acceptable. A high Asset Value rating (8) could be an initial value for a Structural System in a multi-story that is subject to progressive collapse and cannot be replaced.

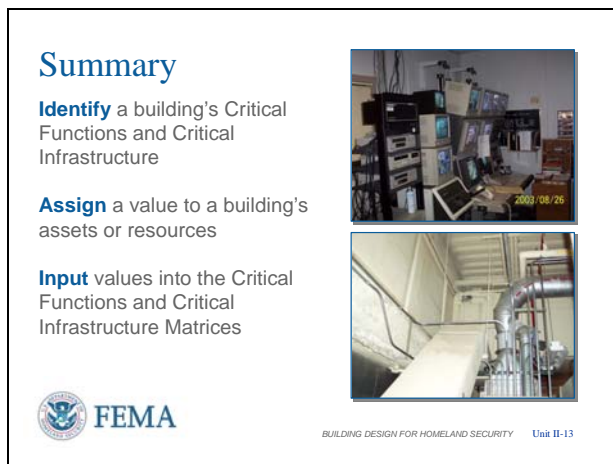
**VISUAL II-13**

**Summary**

**Identify** a building's Critical Functions and Critical Infrastructure

**Assign** a value to a building's assets or resources

**Input** values into the Critical Functions and Critical Infrastructure Matrices



BUILDING DESIGN FOR HOMELAND SECURITY Unit II-13

**Summary**

- Identify a building's Critical Functions and Critical Infrastructure
- Assign a value to a building's assets or resources
- Insert values into the Critical Functions and the Critical Infrastructure Matrices [Risk Matrix poster, manual spreadsheet, electronic spreadsheet, or risk assessment database]

**VISUAL II-14**

**Unit II Case Study Activity**

**Asset Value Ratings**

**Background**

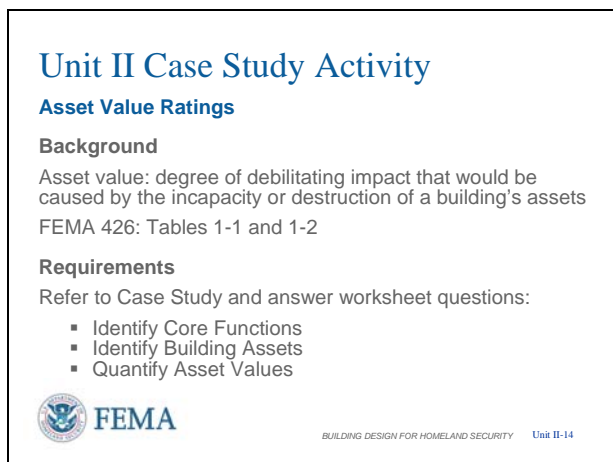
Asset value: degree of debilitating impact that would be caused by the incapacity or destruction of a building's assets

FEMA 426: Tables 1-1 and 1-2

**Requirements**

Refer to Case Study and answer worksheet questions:

- Identify Core Functions
- Identify Building Assets
- Quantify Asset Values



BUILDING DESIGN FOR HOMELAND SECURITY Unit II-14

**Student Activity**

Asset value is the degree of debilitating impact that would be caused by the incapacity or destruction of a building's assets.

- **Table 1-1 on Page 1-13 of FEMA 426** provides an **Asset Value Scale** to quantify asset value, as well as definitions of the ratings.
- **Table 1-2 on page 1-14 of FEMA 426** provides a format to summarize the value of the major categories of a building's assets.

Refer participants to **FEMA 426** and the Unit

**Activity Requirements**

**INSTRUCTOR NOTES**

**CONTENT/ACTIVITY**

II Student Activity for the Selected Case Study (A or B) in the Student Manual.

Members of the instructor staff should be available to answer questions and assist groups as needed.

At the end of 35 minutes, reconvene the class and facilitate group reporting.

Allow 10 minutes for the plenary session.

Keep in mind that there are no incorrect answers. It is more important to be able to clearly explain and support the underlying rationale for the values that have been assigned. Also it has been proven that 7 people working effectively as a group can achieve genius level in their consensus response.

- Working in previously assigned small groups, refer to the Case Study Student Activity (Version A for Suburban or Version B for Urban) and answer the worksheet questions.

Take 35 minutes to complete this activity. Solutions will be reviewed in plenary group.

**Transition**

Unit III will cover Threat / Hazard Assessment and Unit IV will cover Vulnerability Assessment to continue the risk assessment process.

**UNIT II-A CASE STUDY ACTIVITY:  
ASSET VALUE RATINGS  
(Suburban Version)**

Asset value is the degree of debilitating impact that would be caused by the incapacity or destruction of a building's assets. **Page 1-13 of FEMA 426** provides an Asset Value Scale (**Table 1-1**) to quantify asset value, as well as definitions of the ratings. **Table 1-2 on page 1-14 of FEMA 426** provides a format to summarize the value of the major categories of a building's assets. **FEMA 452, pages 2-17 to 2-19** provide additional information.

**Requirements**

Refer to the Appendix S Case Study to determine answers to the following questions:

The first question below has the answer provided as an **example**. The other questions have the pages identified where the answers may be found.

**Identifying Building Core Functions**

1. What are Hazardville Information Company's (HIC) primary services or outputs? [Page A-1]

*IT services support for over 20 private and government organizations/clients. HIC supports over 1,000 users and over 100 applications as a primary data center and as a disaster recovery backup site to include field technicians and help desk. Many clients depend on HIC's ability to provide real time IT support, on a 24 x 7 basis. Others rely on the company's IT backup services.*

2. What critical functions/activities take place at HIC? [Page A-23 to Page A-26]

*Computer-based data processing, storage, and disaster recovery. Wired/wireless networking, information technology and communications.*

3. Who are the building's occupants and visitors? [Page A-1 to Page A-2]

*HIC employees and clients; business park neighbors are a mix of government and commercial organizations. HIC has over 130 employees and approximately 80 to 100 employees in the building at any given time. Visitors are vendors and clients. Clients include Fortune 500 companies, national and regional banks and credit unions, a major airline, large prime defense contractors, and government agencies, including one classified client.*

4. What inputs from external organizations are required for HIC's success? [Page A-1 to Page A-2 and Page A-11 to Page A-26]

*Utilities and communications supplies/vendors; hardware and software applications vendors; client data and support.*

### Identifying Building Assets and Quantifying Asset Value Ratings

Use the following process to complete the following tables -- HIC Critical Functions Asset Value Ratings and HIC Critical Infrastructure Asset Value Ratings

1. Refer to **Table 1-1 in FEMA 426** and the associated value descriptions for the ratings listed below
  - Very High (10)
  - High (8-9)
  - Medium High (7)
  - Medium (5-6)
  - Medium Low (4)
  - Low (2-3)
  - Very Low (1)
2. Consider the questions on **page 1-11 in FEMA 426** as you rate HIC's assets.
3. Refer to **Table 1-2 in FEMA 426, Nominal Building Asset Value Assessment** and use the descriptions of these asset categories as found in the Appendix S Case Study to focus the rating. Another approach is to use an asset value rating of 5 (mid-range) and do a pair-wise comparison to each asset category as the process continues, raising or lowering the rating from 5 as the team compares asset value inputs collected from the Appendix S Case Study.

**NOTE 1:** The first two rows in both tables are completed as **examples**. Nominal ratings are provided in all other asset categories.

1. Confirm the team's Asset Value Rating for each category [agree, raise, or lower the indicated rating]
2. Provide Rationale for each rating [whether changed or unchanged]
3. Enter asset value rating on the Risk Matrix

**NOTE 2:** Consult **Table 1-22, pages 1-46 to 1-92, in FEMA 426**. Look at the content of the questions to understand the various infrastructure asset categories. For example, Utility Systems apply to all utilities outside the 3-foot drip line of the building (from the source to the building, but primarily on the site), while Mechanical, Plumbing, Gas, Electrical, Fire Alarm, Communications, and Information Technology Systems are inside the 3-foot drip line of the building.

**HIC Critical Functions Asset Value Ratings**

<b>Asset</b>	<b>Value</b>	<b>Numeric Value</b>	<b>Rationale</b>
1. Administration	<i>Medium-Low</i>	4	<i>Redundancy and staff skills that can be replaced. Senior managers and financial systems in the same area increase value. Low to medium economic cost to replace. Can impair in the long term core functions and processes.</i>
2. Engineering / IT Technicians	<i>High</i>	8	<i>Staff skills require specialized expertise, but can be replaced. Key equipment and resources needed for 24/7 ops. High economic cost to replace. Can impact core functions and processes for extended period of time.</i>
3. Loading Dock / Warehouse	<i>Medium-Low</i>	4	<i>Single point of entry into the interior for major shipping and receiving. Low to medium economic cost to replace. Can use other entryways in interim for most items. Minor impairment of core functions and processes.</i>
4. Data Center	<i>Very High</i>	10	<i>Primary function and organization critical. Many key staff and critical equipment. Very high economic cost to replace. Vital for 24/7 operation. Total loss of primary services, core processes, and functions possible.</i>
5. Communications	<i>High</i>	9	<i>Primary function and organization critical. A few key staff and critical equipment. High economic cost to replace. Needed for 24/7 operation. Major affect on primary services and core functions and processes for extended period of time.</i>
6. Security	<i>Medium High</i>	7	<i>Access and monitoring systems, security records, and location make the function critical to the organization. Needed due to client requirements. Medium economic cost to replace. Serious impairment of</i>

			<i>primary services, core processes, and functions for extended period of time.</i>
7. Housekeeping	<i>Very Low</i>	<i>1</i>	<i>Easily replaced, no critical skills or equipment. Minimal cost to replace. Many workarounds, thus negligible consequences or impact.</i>

**HIC Critical Infrastructure Asset Value Ratings**

<b>Asset</b>	<b>Value</b>	<b>Numeric Value</b>	<b>Rationale</b>
1. Site	<i>Medium-Low</i>	<i>4</i>	<i>HIC does not own building or site, but location is critical to access and support to clients. Cost is \$10 - \$20 per square foot which indicates other office complexes in area are competitive. Moderate consequences or minor impairment of core processes and functions if must move from site.</i>
2. Architectural	<i>Medium</i>	<i>5</i>	<i>Signage and business office information couple the building to other park tenants (geographically clustered, centralized). Nothing overly descriptive that requires the use of this building, but moderate to severe consequences or impairment if lost. Limited architectural flexibility either exterior or interior.</i>
3. Structural Systems	<i>Medium-Low</i>	<i>4</i>	<i>Relatively strong and flexible two-story building using standard construction will not experience progressive collapse. Building is small enough that anything affecting the structural system is affecting all other systems to a greater extent. Loss of structural systems will have moderate consequences or minor impairment of core functions and processes. Walls are capable of bearing load and workarounds available (shoring) if any structural problem occurs.</i>



4. Envelope Systems	<i>Medium</i>	5	<i>Fairly tight envelope, newer construction, CBR agents not likely to penetrate into interior through wall cracks or roof gaps without longer contact time. Over 50 percent of exterior surface is glazing on front and one-third of the side where glazing exists. Loss of any envelope system will have moderate to serious consequences or impairment of core functions and processes mainly due to environmental effects—weather entering building. Workarounds (plywood, plastic sheathing) possible.</i>
5. Utility Systems	<i>Medium</i>	5	<i>Well protected and buried, but single lines. Backups already planned or in-place makes loss of utility systems less important. Commercial utilities have high reliability in area.</i>
6. Mechanical Systems	<i>High</i>	8	<i>Single HVAC system supports multiple HVAC Air Handling Units and interior spaces. High economic cost to replace. Loss of business revenue. Limited workarounds due to location of HVAC load within building.</i>
7. Plumbing and Gas Systems	<i>Medium</i>	6	<i>Wet pipe sprinkler system and hand-held extinguishers are means of fire protection in this 24/7 operation. Natural gas provides some humidity control for core processes but workarounds (portable dehumidifiers) possible. Water for cooling tower makeup is critical to support core processes, but workarounds (water tanker) possible. Moderate to serious consequences or impairment of core functions and processes if lost.</i>
8. Electrical Systems	<i>High</i>	8	<i>Single-point vulnerability and organization critical. High economic cost to replace. Loss of business revenue. Commercial utility with backup generator required to meet 24/7</i>

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			<i>requirements.</i>
9. Fire Alarm Systems	<i>Medium</i>	5	<i>Wet pipe sprinkler system and hand-held extinguishers are only means of fire protection. Fire alarm system provides additional coverage – heat and smoke detectors. Nearby fire department has connection to alarm. Moderate to serious consequences or impairment of core functions or processes if lost. Workarounds (roving fire watchmen) possible.</i>
10. IT / Communications Systems	<i>High</i>	9	<i>Single-point vulnerability and organization critical. High economic cost to replace, <u>but replaceable</u>. Loss of business revenue. Loss of primary services or major loss of core processes and functions for an extended period.</i>

**UNIT II-B CASE STUDY ACTIVITY:  
ASSET VALUE RATING  
(Urban Version)**

Asset value is the degree of debilitating impact that would be caused by the incapacity or destruction of a building's assets. **Page 1-13 of FEMA 426** provides an Asset Value Scale (**Table 1-1**) to quantify asset value, as well as definitions of the ratings. **Table 1-2 on page 1-14 of FEMA 426** provides a format to summarize the value of the major categories of a building's assets. **FEMA 452, pages 2-17 to 2-19** provide additional information.

**Requirements**

Refer to the Appendix B Case Study to determine answers to the following questions:

The first question is answered below as an **example**.

**Identifying Building Core Functions**

1. What are HazardCorp (HZC) Building's primary services or outputs associated with its providing office rental space? [Pages B-3, B-10]

*Building Management provides security (access control and physical), coordination of emergency actions, operation and maintenance of emergency response / life safety systems, underground parking, loading dock security and coordination for supply trucks, vendors, and trash supporting the tenants. Inspection of mail, packages, and equipment using x-ray and other equipment before distributing to tenants within the building and to other agencies within 2 blocks. Utilities, along with emergency backups; and vertical transportation (elevators and stairs).*

2. What critical functions / activities take place at HZC to support the goals of the building management and goals of the building tenants? [Pages B-18 to B-26]

*Fire protection (water supply and fire detection), access control and physical security, emergency response, reliable utilities with backups, and secure / speedy movement of materials and supplies between loading dock and tenant locations.*

3. Who are the building's occupants and visitors? [Pages B-1, B-12]

*Building occupancy (tenants and staff) is estimated to be 8,000 people at any given moment. The tenants include Federal, State, and local agencies; along with financial, insurance, and banking companies. These agencies and companies have daily visitors to transact business. In addition, the first floor lobby and retail spaces can have an additional 1,000 people depending upon time of day, which includes meeting rooms that are available on the second and third floors. Building occupants / tenants use the*

*underground parking as well as the general public who may have no other link to the building.*

4. What inputs from external organizations are required for HZC's success?  
[Pages B-18 to B-26]

*Utilities and communications supplies/vendors; building systems hardware and software applications vendors; understanding of individual tenant requirements in regards to security and emergency response and coordination with local municipal emergency response. Also, armored cars/trucks for cash and valuables movement, messengers to and from to move packages, and the proverbial pizza delivery for late night work among tenants.*

### Identifying Building Assets and Quantifying Asset Values

Use the following process to complete the following tables -- HZC Critical Functions Asset Value Rating and HZC Critical Infrastructure Asset Value Rating

1. Refer to **Table 1-1 in FEMA 426** and the associated value descriptions for the ratings listed below
  - Very High (10)
  - High (8-9)
  - Medium High (7)
  - Medium (5-6)
  - Medium Low (4)
  - Low (2-3)
  - Very Low (1)
2. Consider the questions on **page 1-11 in FEMA 426** and as you rate HZC's assets.
3. Refer to **Table 1-2 in FEMA 426, Nominal Building Asset Value Assessment** and use the descriptions of these asset categories as found in the Appendix B Case Study to focus the rating. Another approach is to use an asset value rating of 5 (mid-range) and do a pair-wise comparison to each asset category as the process continues, raising or lowering the rating from 5 as the team compares asset value inputs collected from the Appendix B Case Study.

**NOTE 1:** The first rows in both tables are completed as **examples**. Nominal ratings are provided in all other asset categories. Confirm the team's Value and Numeric Value rating for each category and provide Rationale for each rating. Enter information on the following worksheets and on the Risk Matrix poster.

**NOTE 2:** Consult **Table 1-22, pages 1-46 to 1-92, in FEMA 426**. Look at the content of the questions to understand the various infrastructure asset categories. For example, Utility Systems apply to all utilities outside the 3-foot drip line of the building (from

the source to the building, but primarily on the site), while Mechanical, Plumbing, Gas, Electrical, Fire Alarm, Communications, and Information Technology Systems are inside the 3-foot drip line of the building.

**HZC Critical Functions Asset Value Ratings**

Asset	Value	Numeric Value	Rationale
1. Administration	Medium High	7	While there may be some redundancy and staff skills that can be easily replaced, the Building Management administration keeps the building humming and loss of some or all administration staff would have serious consequences or impair core processes and functions for an extended period of time. Low to medium economic cost to replace, depending upon individual function.
2. Engineering / IT Technicians	High	8	Due to the complexity of building operations, including computer systems for Supervisory Control and Data Acquisition, Electronic Security Systems (CCTV and access control), Energy Management and Control Systems, etc., the loss of this function in whole or in part can result in severe loss of primary services or major loss of core processes and functions for an extended period of time. Interim workarounds include manufacturer's / technical service firms for each individual system. Moderately high economic cost to replace based upon skill sets sought.
3. Loading Dock / Warehouse	Medium	5	Large amounts of mail, packages, supplies, furniture, materials, etc. are processed through the loading dock and adjoining mailroom. This single point of entry into the building cannot be handled easily through other entrances without moderate to serious consequences or impairment of core functions and processes -- Building Management support of tenants. Workarounds

			available which impact the first floor. Moderate economic cost to replace.
4. Data Center	High	8	For Building Management to support the tenants, the building data center must handle all building functions for the operations and maintenance of equipment, energy conservation, utilities, backup systems, etc. If these systems are lost for an extended period of time there will be grave consequences with loss of primary services or major loss of core processes and functions. Initial and future economic losses will far exceed the value of these systems, their maintenance, and replacement.
5. Communications	High	8	As with the Data Center, a 50-story building requires reliable communications to function, especially those associated with life safety. This is a core process of Building Management supporting tenants. Extended loss of communications, while workarounds (cell phones, alternate circuits) are available, result in large economic losses that may not be replaceable.
6. Security	Medium Low	4	The security provided by Building Management is limited to access control and criminal threat (alarms and CCTV monitoring), at least initially during this assessment. Tenants requiring higher levels of security provide it themselves. After assessment, security mitigation measures may increase the asset value of security systems due to increased support to tenants.
7. Housekeeping	Low	2	While this function can be easily replaced and requires no critical skills or equipment, the Building Management support to tenants requires an acceptable level of cleanliness due to the high number of visitors to the building. Much trash can be generated by 9,000 people

			over a day.
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**HZC Critical Infrastructure Asset Value Ratings**

Asset	Value	Numeric Value	Rationale
1. Site	Medium	5	Building owner has a large investment in the building and site. Loss of access to site by Building Management, but more so tenants, would have rippling economic impact. Because only parking and some fuel storage is underground, and site is relatively small, the building and its functions will have moderate to serious consequences and impairment of core functions and processes supporting the tenants.
2. Architectural	Medium High	7	Locations of functions within the building and their proximity to high risk areas, like the lobby, loading dock, and streets place a high value on where functions are placed in the building and how they can be protected. Architectural placement has serious consequences and impact upon core processes and functions over an extended period of time.
3. Structural Systems	High	8	A 50-story building can exist only because of the structural system supports it. An incident affecting the structural systems on any floor can affect all other floors. Loss of even a small portion of the structural system can have grave consequences in this case, impacting everything in the building.
4. Envelope Systems	Medium High	7	The envelope system keeps the weather out and the conditioned air in. If the envelope was lost, there are workarounds to temporarily patch the situation, but depending upon the curtain wall design, the windows may have to be replaced from the <u>outside</u> on all floors which

			would be at great expense with minimal impact on tenants OR from the <u>inside</u> which would impact tenants to a greater extent or cost additional for working during non-business hours.
5. Utility Systems	High	8	For a 50-story high rise utilities are a necessity to make rentable office space inhabitable. While short term workarounds may allow some operations, loss of critical utilities usually results in the execution of COOP (Continuity of Operations Plans) for major tenants. The loss of business revenue for HZC would be very significant.
6. Mechanical Systems	High	8	For similar reasons as in Utility Systems above, Building Systems are equally important and necessary for occupancy. This is especially true for air conditioning of equipment and people.
7. Plumbing and Gas Systems	High	8	For similar reasons as in Utility Systems above, Building Systems are equally important and necessary for occupancy. Water Systems that support sanitation and fire protection are must haves when occupying a high rise.
8. Electrical Systems	High	8	For similar reasons as in Utility Systems above, Building Systems are equally important and necessary for occupancy. Electrical Systems for lights, equipment, environmental control, and elevators make inhabiting the upper floors of a high-rise possible.
9. Fire Alarm Systems	Medium Low	4	While necessary for occupancy of a high-rise, there are workarounds (manpower intensive) that can be done for weeks without requiring evacuation of building, especially since it has a water sprinkler system and 24/7 occupancy of the Security Operations Center / Fire Control Center.



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Unit II-B: Asset Value Assessment

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10. IT / Communications Systems	High	8	For similar reasons as in Utility Systems above, Building Systems are equally important and necessary for occupancy. Data and Communications cannot be out of operation for short time periods, without resulting in significant economic impact.

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