Participant Workbook

Property Maintenance for Managers

CAM
CERTIFIED APARTMENT MANAGER®

NAA
NATIONAL APARTMENT ASSOCIATION
Education Institute

April 2017

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For over 40 years, the National Apartment Association and NAA Education Institute have offered the Certified Apartment Manager (CAM) credential to enhance the knowledge and skills of apartment management professionals. NAAEI recently rewrote the CAM program after conducting a job task analysis and validating the knowledge and skills required for community management competency. Alexandra Jackiw, CAPS, CPM, past NAA Chairman and past NAAEI President, served as the lead CAM subject matter expert. She also pilot tested CAM at the Triangle Apartment Association in Raleigh, NC and the Apartment Association of Greater Orlando. Alex worked tirelessly to take CAM to the next level. Of particular note is the case study she developed that is woven throughout the CAM program. The NAAEI Board of Directors and NAAEI staff recognize and thank Alex for the hundreds of volunteer hours she spent developing the 2016 edition of CAM.

Stephanie Puryear-Helling
NAAEI President

Maureen Lambe, CAE,
NAAEI Executive Vice President

SUBJECT MATTER EXPERTS

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Lead Subject Matter Expert
Alexandra Jackiw, CAPS, CPM, NAAEI Faculty
President of Milhaus Management, LLC

Facilitation Consultant
Susan E. Weston, CAM, CAPS, NAAEI Faculty
The Susan Weston Company

Key Contributors

Clio Barker, CAPS, NALP
Associated Management

Mike Beirne
The Kamson Corporation

Greg Cerbana, CAPS
Weidner Apartment Homes

Cindy Clare, CPM
Kettler Management, Inc.

Robin Flagler, CAPS
Kettler Management, Inc.

Tami Fossum, CAPS
Blue Ridge Property Management

Rosemary Goss, Ph.D.
Virginia Tech

Kim Hurd, NALP, CAM, CAPS
Milhause Management, LLC

Tammy Longo, CAM
Community Housing Partners Corporation

Char McCurdy, ARM, CAPS
Madera Residential

Barbara O'Steen,
Greystar Real Estate Partners Llc

Mary Pacini, CPM
Chancellor Properties, Inc.

Debbie Phillips, Ph.D., CPM
The Quadrillion

Rhonda Puryear, CAM
Management Services Corporation

Stephanie Puryear-Helling, CAM, CAPS
Greystar

Terry Ragland, CAM, CAPS
Blue Ridge Property Management

Jackie Ramstedt, CAM, CAPS
Ramstedt Enterprises Inc

Paul Rhodes, CAMT
NAAEI

Arianna Royster,
Borger Management

Vicki Sharp, NALP, CAPS, CDPM
The Sharp Solution

Susan Sherfield, CPM
Mercy Housing

Jodi Spurrell, CAPS
Milstone Management

Melissa White, NALP,
Balfour Beatty Communities

Scott Wilkerson
Ginkgo Residential

Joy Zalaznick, NALP
Kettler Management, Inc.

Certified Apartment Manager (CAM)
NAA Education Institute
4300 Wilson Blvd, Suite 400
Arlington, VA 22203
(703)-518-6141
education@naahq.org
www.naahq.org

Property Maintenance for Managers

Participant Workbook

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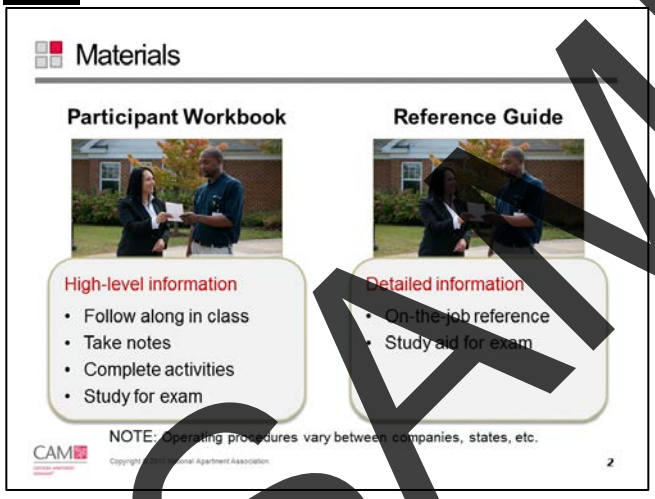

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A CAM's Role

A CAM is ultimately responsibility for the property's effective functioning including maintenance operations. Maintenance refers to the upkeep and repair of property and equipment.

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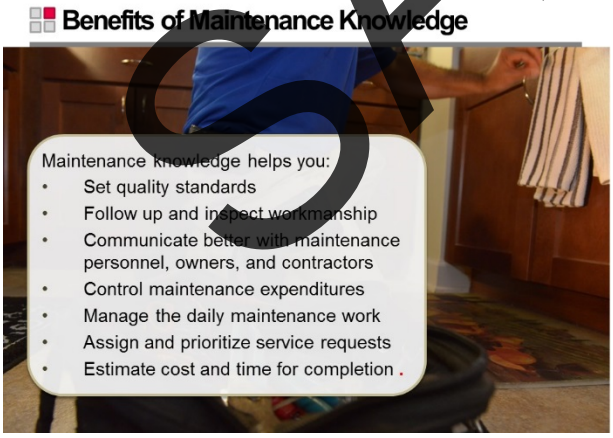

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Types of Maintenance Part I

Exterior

- Repairing or replacing items to keep building and landscape areas in excellent condition
- Examples
  - Lighting
  - Fencing
  - Driveways
  - Doors/windows

Interior

- Repairing or replacing items to keep building and amenity interiors in excellent condition
- Examples
  - Walls, ceilings
  - Electrical and plumbing
  - Safety
  - Cabinets

Make Ready

- Repairing or replacing items to make a unit "market ready"
- Examples
  - Move-out review
  - Mechanicals
  - Fixtures and appliances
  - Painting, flooring
  - Cleaning

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Types of Maintenance – Part II

Capital

- Managing the addition or repair of large, non-recurring property expenditures that add to the "useful life" of a property.
- Includes the supervision and recordkeeping for capital installations

Moisture Management

- Managing maintenance issues related to water damage, moisture infiltration, visible mold or musty odors.
- Ensures meeting lender and regulatory requirements for such incidents.

Preventative

- A proactive approach to protect and maintain the value of a property
- A scheduled approach to limiting deferred maintenance meeting regulatory inspection requirements

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Reference: Types of Maintenance

See the Participant Workbook for more information about each of the **Types of Maintenance**. .

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Types of Maintenance

Types of Maintenance

You will oversee the Maintenance Supervisor or Service Manager, but the Maintenance Supervisor or Service Manager is responsible for the "market-ready" condition of a property.

Type of Maintenance	Description	What is Included	
Exterior	Repairing or replacing items to keep building *exteriors* in excellent condition	• Landscape irrigation • Exterior lighting • Siding and roofs • Fences and retaining walls • Drives and parking lots • Sidewalks and other concrete surfaces • Trash enclosures • Doors and windows	

Interior	Repairing or replacing items to keep building *interiors* in excellent condition	• Walls, ceilings, windows, floors
		• Safety components
		  o Smoke/CO detectors
		  o Fire extinguishers
		• Doors, cabinets, counter tops
		• Electrical and mechanical
		• Appliances, plumbing, HVAC	

Make Ready	Repairing or replacing items to make a unit "market ready" and meet the expectations of prospective residents	1. Pre-inspection 2. Trash removal 3. Pest control 4. Mechanical systems – electrical, plumbing, appliances, HVAC 5. Retrofits & rehab items 6. Drywall, doors, windows, screens, locks, cabinets, counters, vanities	7. Shelving, towel racks, ceiling fans 8. Storage rooms, pantries 9. Painting, caulking 10. Flooring 11. Drains, sinks, tubs, showers 12. Post-inspection 13. Final cleaning and welcome gift

Type of Maintenance	Description	What is Included
Capital Expenditure Projects	Large, non-recurring property expenditures that add to the "useful life" of a property Note: Depreciated over an expected life rather than a single year and are not used to calculate NOI	Non-recurring expenses, such as: • Replacing a roof • Painting buildings • Repaving a parking lot • Adding a swimming pool
Preventative	A proactive approach to protect and maintain the value of property. It maintains the property so deferred projects do not overwhelm staff and helps meet requirements for inspection set by authorities.	All aspects of interior and exterior areas of a property.
Moisture Management Plan	A plan outlining how to deal with maintenance issues related to water damage, moisture infiltration, visible mold, or musty/moldy odors • Many lenders and insurance carriers require properties to have a plan • Treat issues of this type as emergencies and follow a specific protocol • Know what actions to take for water damaged materials	• Carpet, backing and pad • Ceiling tiles • Cellulose insulation • Fiberglass insulation • Concrete or cinderblock surfaces • Hard surface, porous flooring (linoleum, ceramic tile, vinyl) • Non-porous hard surfaces (plastics and metals) • Upholstered furniture • Wallboard (drywall and gypsum board) • Window drapes • Wood surface

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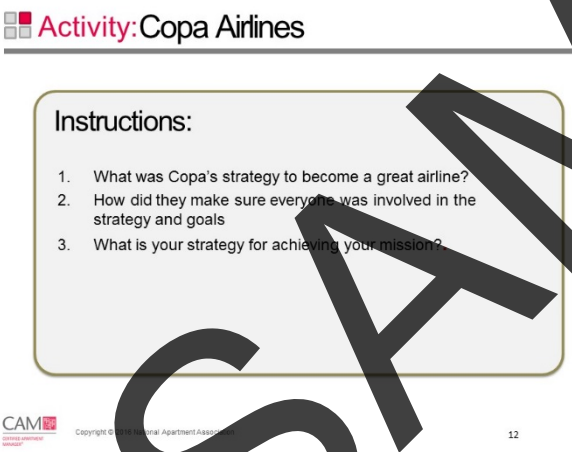

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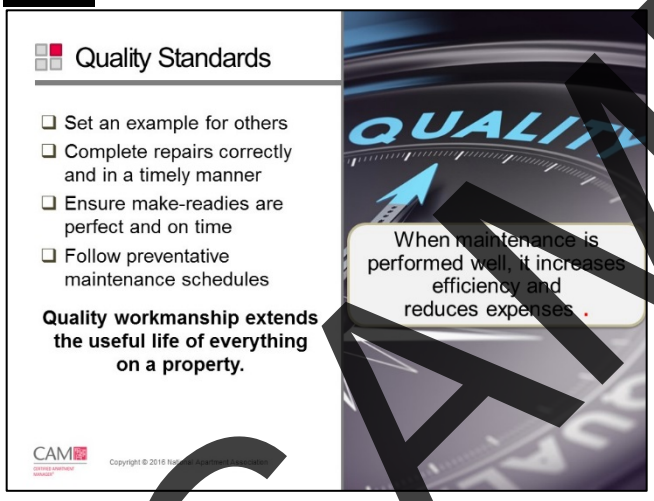

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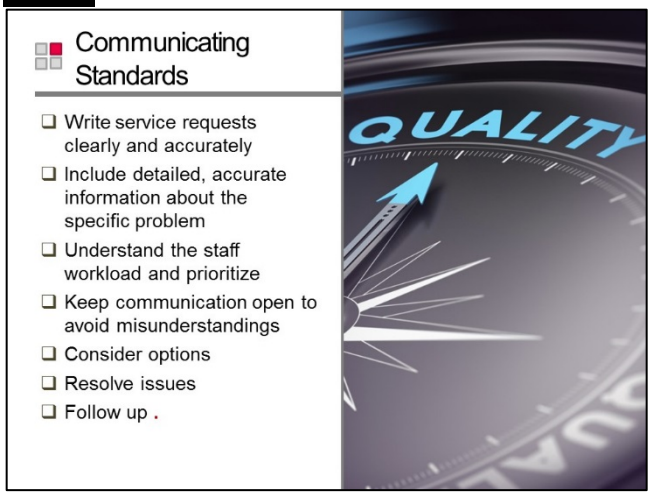

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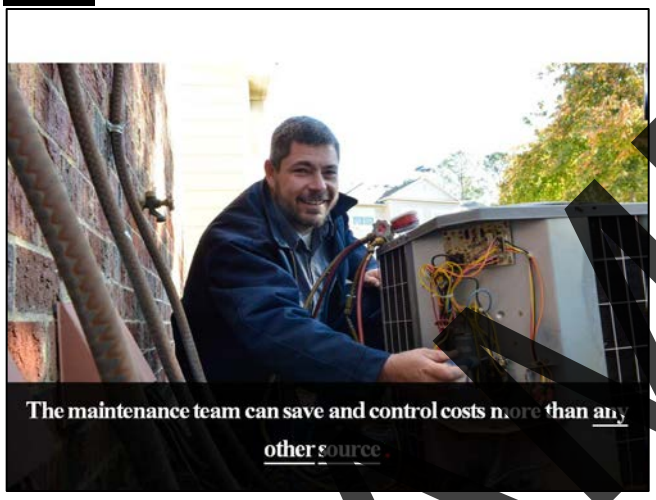

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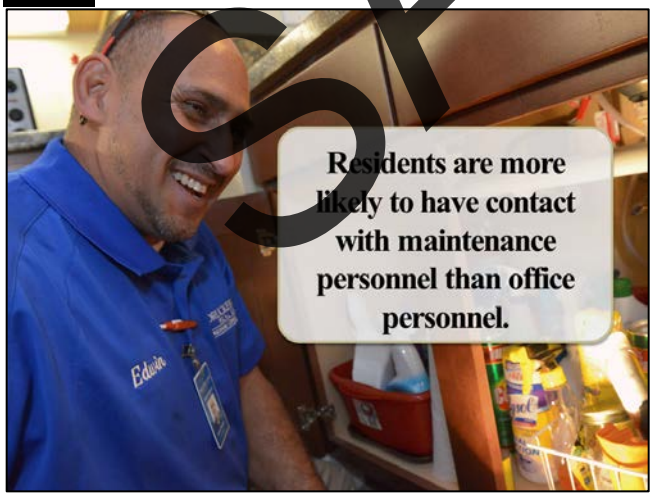

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Maintenance Personnel

- ❑ Increase efficiency
- ❑ Control and reduce expenses
- ❑ Minimize risk and liability
- ❑ Preserve the asset
- ❑ Keep a preventive maintenance program to extend the life of:
  - Equipment
  - Fixtures
  - Structures

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CAM Responsibilities

- ❑ Keep current with laws & regulations
- ❑ Oversee safety & emergencies
- ❑ Maintain records & required certificates
- ❑ Conduct inspections
- ❑ Hire qualified technicians
- ❑ Know when to use a contractor
- ❑ Understand basic contracts
- ❑ Prepare and monitor budgets
- ❑ Plan for capital expenses
- ❑ Set maintenance up for success .

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Reference: CAM Responsibilities

See the Participant Workbook for a summary of **CAM Responsibilities.**

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CAM Responsibilities

- Keep current with new laws and regulations that impact the property, particularly those relating to safety for residents and staff.
- Maintain records and required certificates (occupancy, elevators, swimming pools, etc.) for the property. This includes the Environmental Protection Agency (EPA) certification for working with refrigerants and Certified Pool Operator (CPO) where required.
- Understand the maintenance repairs necessary to ensure that all OSHA, local and state safe workplace requirements are met.
- Conduct inspections.
- Oversee safety issues and emergencies.
- Hire qualified maintenance technicians and evaluate their performance.
- Know when to use a contractor, and how to write a job specification and conduct a bidding process.
- Understand basic contracts.
- Prepare and monitor budgets.
- Plan for capital expenses.
- Set maintenance up for success.

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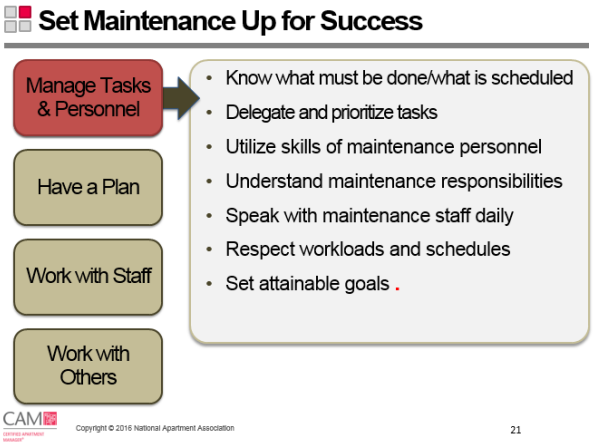

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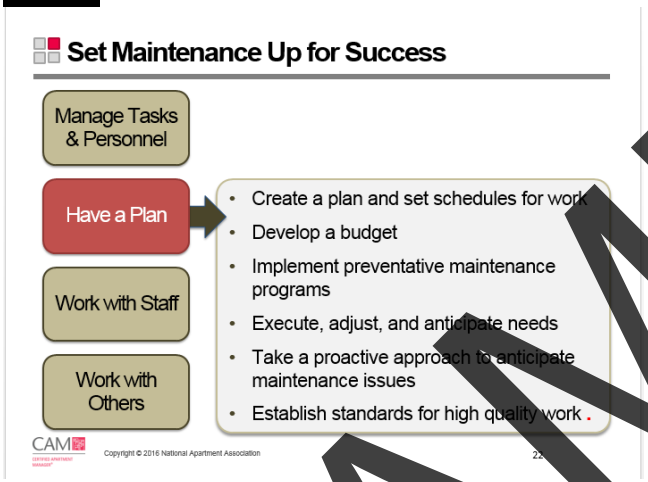

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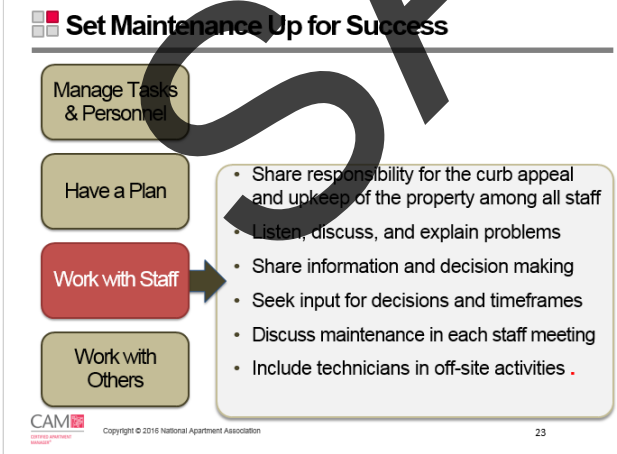

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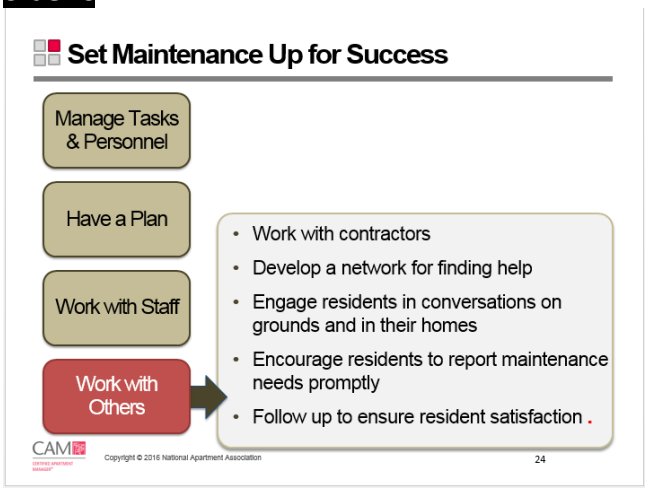

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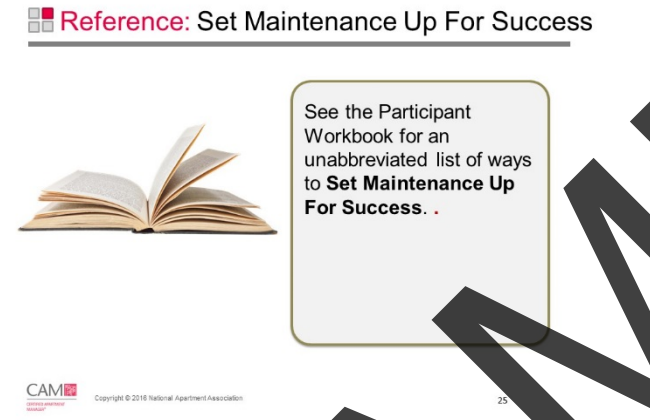

Set Maintenance Up for Success

Manage Tasks & Personnel	• Know what maintenance work must be done • Know what is scheduled for the day • Work with the maintenance supervisor to assign responsibilities; delegate tasks and prioritize tasks • Work closely with and utilize skills of the maintenance supervisor or service manager • Understand the duties/responsibilities of maintenance personnel • Speak with the maintenance supervisor or staff daily • Respect workloads and schedules • Schedule 20% of day for supervisor • Set attainable goals
Have a Plan	• Create a plan (daily, weekly and long term) • Work with your maintenance supervisor to set schedules for daily, weekly, monthly and overtime maintenance work • Develop a budget • Work with your supervising office to plan and implement preventative maintenance programs • Execute, adjust, and anticipate needs • Take a proactive approach to anticipate maintenance issues; "Fix it before it breaks" • Make decisions • Establish a standard for high quality work; "Inspect what you expect"
Work with Staff	• Inform the staff that maintenance and curb appeal is everyone's responsibility, not just maintenance personnel • Everyone is responsible for the appearance and upkeep of the property • Listen, discuss and/or explain specific problems • Share information and decision making • Seek input for possible decisions and timeframes • Discuss maintenance in every staff meeting – even if it is only a brief update or praise for everyone's effort • Include service technicians in off-site activities such as community service and job fairs
Work with Others	• Work with contractors • Develop a network for finding help: schools, temp employees, contractors, vendors • Engage residents in conversations on grounds and in their homes • Encourage residents to report maintenance needs promptly before they become more costly repairs or emergencies – not just when rent is due • Follow up to make sure repairs were completed and the resident is satisfied

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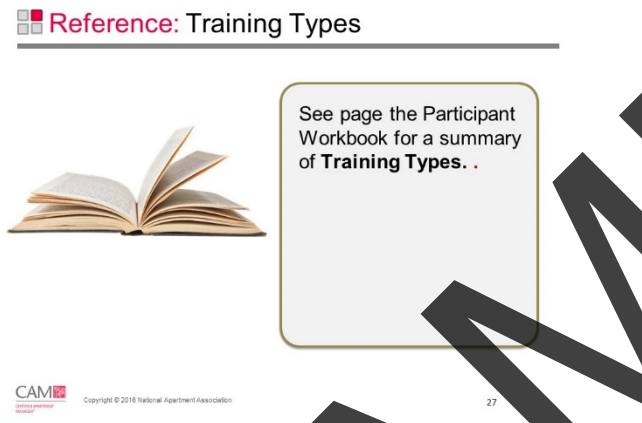

Training Types

General Training	Office Staff
• Provide training opportunities & professional development • Cross train regularly	• Staff must take accurate, detailed service requests • Getting work done right the first time: o Saves time & money • Increases resident satisfaction
Technician Training	**CAMT**

• Increases:
  o Maintenance personnel's skills
  o Productivity
  o Employee job satisfaction
  o Resident satisfaction
  o Work finished correctly the first time
• Reduces:
  o Maintenance expenses
  o Wasted time
  o Employee & resident turnover
  o Service call backs
• Include technicians in reward, incentive and recognition programs
• Encourage relationships with technicians at other properties
• Include technicians in mystery shopping assignments
	CAMT training:
	• Consists of seven courses.
	• Is an introduction for new maintenance professionals or a refresher for more experienced maintenance technicians.
	• Gives professionals the knowledge and tools necessary to run an effective maintenance operation.
	• Is accredited by the American National Standards Institute (ANSI), a private non-profit organization that administers and coordinates the U.S. voluntary standardization and conformity assessment system.
	Prerequisites for the Certification:
	• One year of apartment or rental housing maintenance experience
	• Successful completion of the seven courses and online content
	• Meeting all examination requirements within 24 months of declaring candidacy for CAMT
	
	CAMT provides the knowledge and tools necessary to run an effective maintenance operation.
	
	For more information:
	http://www.naahq.org/learn/education/designation-programs

Maintenance Technicians who increase their skill levels and accept greater responsibility create a stronger team and potentially add greater value to the property.

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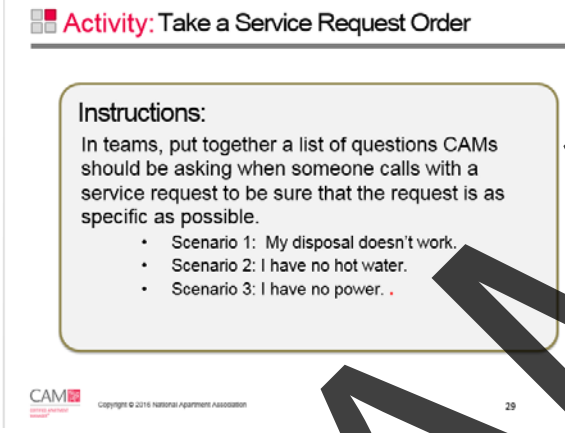

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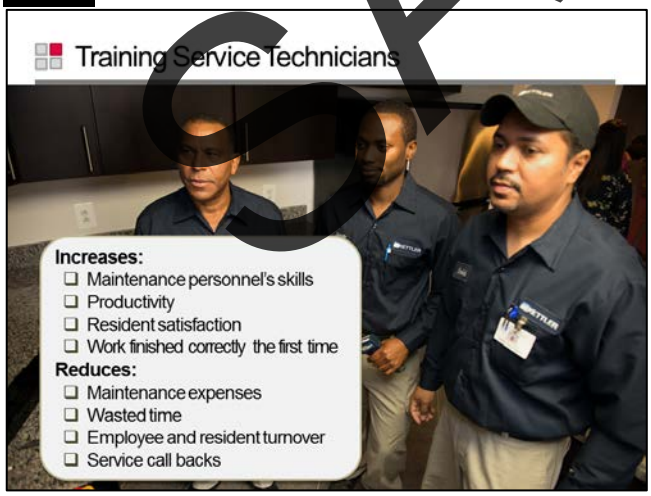

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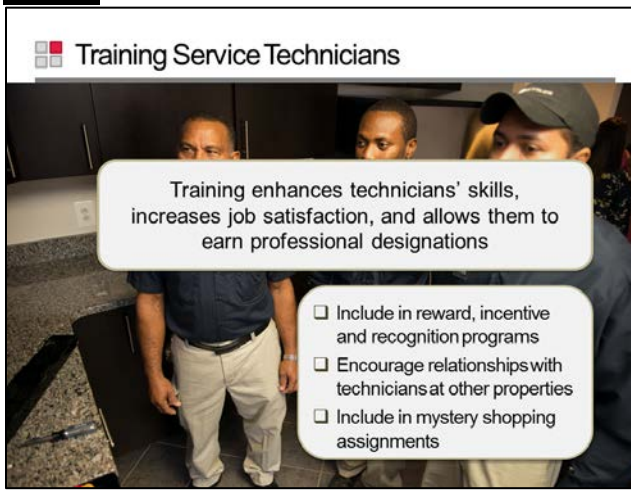

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CAMT Modules

Technical

- Electrical Maintenance and Repair
- Plumbing Maintenance and Repair
- Heating, Ventilation and A/C (HVAC) Maintenance and Repair
- Appliance Maintenance and Repair
- Interior and Exterior Maintenance and Repair

Non-Technical

- A Day in the Life of a Maintenance Technician
- Welcome to the Industry
- Customer Service
- Teamwork
- Time & Project Management
- Money Matters
- Documentation & Paperwork
- Maintenance & Emergencies
- Safety and Compliance

www.naahq.org/education/designationprograms

CAMT provides the knowledge and tools necessary to run an effective maintenance operation .

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Taking Better Service Requests

Before Service

- ❑ Resident name & address
- ❑ Date and time of request
- ❑ Work requested
- ❑ Permission to enter
- ❑ Name of service technician assigned

After Service

- ❑ Description of completed work
- ❑ Action taken
- ❑ Follow-up needed (if any)
- ❑ Estimate of cost incurred
- ❑ Amount of time spent
- ❑ Resident follow-up call or post-inspection
- ❑ Resident survey card provided

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Reference: Service Requests

See page the Participant Workbook for a sample **Service Request Form Template** and a list of **Information Needed in Service Requests**. .

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Service Request Form Template

Property Name: _____
Date: _____
Time: _____
Taken By: _____

Apartment Number: _____
Resident Name: _____
Resident Phone Number: _____

Entry Permission: _____

Specific Problem/Work Requested: _____

Assigned to: _____

Date: _____

Recommendations/Comments: _____

Action Taken
Completed: _____
Temporary Repairs: _____
Parts Replaced: _____
Parts on Order: _____
Time In: _____ Time out: _____

Completed by: _____

Resident Charge/Subcontractor Cost: _____

Resident Called Back: _____

Comments: _____

Information Needed in Service Requests

Many properties enter service request information online and in some cases the request is also transmitted electronically to the maintenance technician's mobile phone.

Some service request forms or software programs automatically provide multiple copies. This is useful to give one copy to the resident, one to your supervisor, and one to file in the resident and/or unit file.

Before Service	After Service
• Resident name & address • Date and time of request • Work requested • Permission to enter • Name of service technician assigned	• Description of work completed • Action taken • Follow-up needed (if any) • Estimate of cost incurred • Amount of time spent • Resident follow-up call or post-inspection • Resident survey card provided

Hiring Maintenance Personnel

Hiring maintenance personnel may be delegated to the Maintenance Supervisor or Service Manager, but you are ultimately responsible for employee performance.

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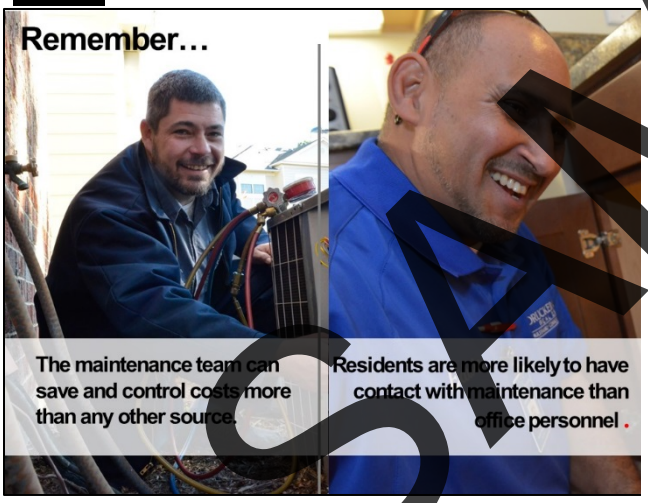

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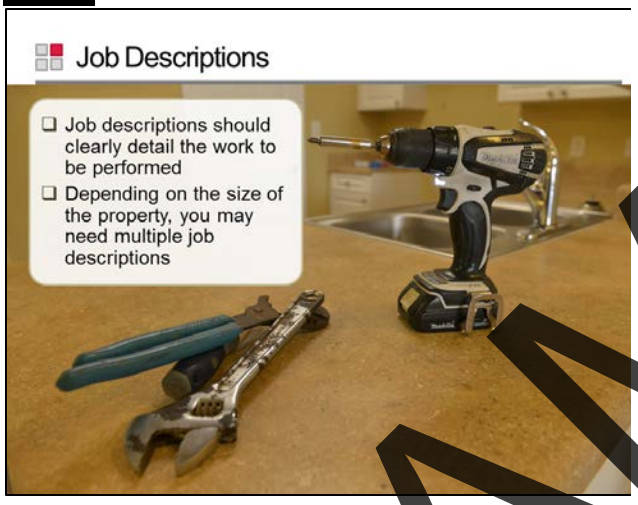

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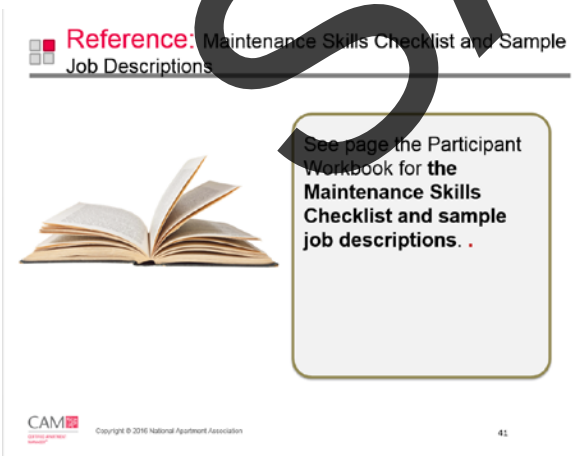

Hiring Maintenance Technicians

During the hiring process, you should:

- Use a Maintenance Skills Checklist during the interview to identify the candidate's skills
- Review the job description to ensure skills match the job to be performed
- Check applicants' references, criminal background, driving record
- Conduct drug tests

Maintenance Skills Checklist

Skill		Experience level		
		None	Some	Expert
Electrical	Rewire shorted fixtures.			
	Replace circuit breaker.			
	Operate testing meter.			
Plumbing	Replace washers.			
	Replace faucet and handles.			
	Repair ball cock assemblies.			
	Install new ball cock assemblies.			
	Remove and replace trap.			
	Remove and install/reseal toilet.			
	Solder and replace pipes.			
Hot water heaters and circulating pumps	General maintenance.			
	Install water heater.			
	Oil circulating pump.			
	Install circulating pump.			
	Flush out water heaters.			
	Replace thermocouple, heating elements.			
Furnaces/wall heaters	Replace filters.			
	Clean filters.			
	Replace gas valve.			
	Check/test gas valve.			
	Replace fan motor.			
	Check/test pilot generator.			
Appliances	Install oven element.			
	Install stove element.			
	Rewire stove (partial).			
	Install oven timer.			
	Install oven thermostat.			
	Recharge refrigerant.			
Garbage disposal	Free jammed garbage disposal.			
	Replace gasket.			

	Disassemble and reassemble.			
	Rewire.			
	Install new disposal.			
Dishwasher	Remove impeller.			
	Install new pump.			
	Adjust timer.			
	Install new timer.			
	Install new dishwasher.			
Ceilings and walls	Repair wallboard and prepare for painting.			
	Install new wallboard.			
	Acoustic spraying.			
Flooring	Repair sub floor.			
	Replace sub floor.			
	Install tile.			
	Repair carpet with patches.			
Locks/Doors	Install deadbolt.			
	Replace lock cylinders.			
	Install a door jamb.			
	Hang new door.			
Pools	Backwashing.			
	Disassemble/assemble filter.			
	Clean—vacuum.			
	Replace heater.			
	Balance chemicals.			
	Replace shutoff valve.			
Sprinklers	Adjust sprinkler heads.			
	Replace sprinkler heads.			
Landscaping	Trim and prune.			
	Fertilizing.			
Glass/windows	Glass cutting.			
	Glass installation.			
Screening	Repair with patches.			
	Rescreen windows/patio doors.			

Job Descriptions

Maintenance Supervisor

Principal Objective of the Position: This position is the senior level maintenance person on site and is responsible for the overall maintenance of the site including planning, coordinating, budgeting, organizing and maintaining the physical needs of the site. This person will perform and direct other maintenance personnel in the repair and maintenance of HVAC systems, electrical/mechanical systems, plumbing, grounds, structural elements, mechanical equipment and refurbishment of apartments. The Maintenance Supervisor, under the direction of the Property Manager, generates satisfactory cash flow, positive resident relations and optimal resident retention.

Requirements:

Training/Education

- High School Diploma or equivalent
- Valid Driver's License and reliable private transportation
- EPA Designation/Certification

Experience/Skills

- Three years progressive maintenance/repair of HVAC, mechanical, electrical, plumbing and grounds maintenance in multi-family or commercial property
- Supervisory and training experience desired
- Good oral and written communication skills
- Math proficiency sufficient to assist in budget preparation, expense monitoring and other maintenance needs
- Knowledge of Equal Housing Opportunity (EHO) requirements and applicable program regulations

Special Requirements

- Ability to lift up to 100 pounds
- Ability to operate a two-axle motor vehicle
- Ability to maintain 24-hour, on-call status
- Ability to operate all necessary tools/equipment to perform the essential functions of the position
- Demonstrated experience and working knowledge of OSHA standards and other environmental safety standards
- Ability to perform a variety of duties in all types of weather

Essential Functions:

- Schedules, assigns and/or performs all maintenance functions, including responsibility to complete service requests within 24 hours and refurbish vacant units within five (5) business days or less

- Supervises, guides and schedules training, when necessary of all maintenance personnel in the maintenance and repair of HVAC systems, electrical systems, mechanical stems, plumbing, grounds, structural elements, motor vehicles and equipment
- Completes move-in and move-out inspections
- Supervises and/or performs all work related to maintenance of the property's curb appeal
- Implements cleaning and maintenance programs for grounds, office/clubhouse, common areas and work areas
- Schedules and performs regular inspections of all grounds, structures and systems and corrects problems, if any
- Supervises and provides or schedules training for employee use of company equipment and/or vehicle
- Assists in the maintenance portion of the overall property budget and ensures that all maintenance operating expenses remain within the existing budget
- Develop and implement an inventory control program along with a preventative maintenance program
- Responsible for expenditures within company guidelines
- Directs and supervises the day-to-day administrative operations of the maintenance functions including the scheduling and assignment of work, submission of reports and paperwork (invoices, time sheets, new hire/termination information, employee counseling and evaluations) and record keeping functions in a timely manner, including sanding/salting and smoke detector battery replacement logs.
- Purchases all maintenance supplies and materials in a cost-effective and efficient manner
- Prepares request for quotes and work scopes and follows company procedure in obtaining bids on purchases or work to be performed
- Conducts inspections of contracted work - checking for the quality and conformance with specifications and costs
- Submits timely reporting of any property loss on liability related incidents to the insurance company
- Submits timely reporting of any work related injuries to the workers' compensation insurance company
- Complies with all local, state and federal regulations as well as all company policies and procedures
- Completes other duties as assigned by supervisor

Assistant Maintenance Supervisor

Principal Objective of the Position: The *Assistant Maintenance Supervisor* assists the Maintenance Supervisor with the overall maintenance functions of the property. This includes repairs and maintenance of all mechanical, electrical equipment, plumbing fixtures, structural facilities, and grounds of the property. The Assistant Maintenance Supervisor works toward the common goals of satisfactory cash flow, positive resident relations, and optimal resident retention.

Requirements:

Training/Education

- High School Diploma or equivalent
- Valid Driver's License
- EPA Designation/Certification

Experience/Skills

- Minimum two years of demonstrated experience in the maintenance and repair of mechanical and electrical systems, plumbing and grounds keeping
- Good oral and written communication skills
- Knowledge of Equal Housing Opportunity (EHO) requirements and applicable program regulations

Special Requirements

- Ability to lift up to 100 pounds
- Ability to operate a two-axle motor vehicle
- Ability to maintain 24-hour, on-call status
- Ability to operate all necessary tools/equipment to perform the essential functions of the position
- Demonstrated experience and working knowledge of OSHA standards and other environmental safety standards
- Ability to perform a variety of duties in all types of weather

Essential Functions:

- Polices grounds as first task daily and throughout day, as needed
- Receives service work orders, performs required work within the established time frames to ensure service is within 24 hours
- Refurbishes vacant units within five (5) working days or less
- Completes painting, cleaning, grounds work, etc. as directed
- Completes move-in and move-out inspections, as directed by supervisor
- Operates various mechanical or electrical equipment or garden tools
- Completes preventative maintenance and housekeeping inspections of apartment units
- Assists with administrative duties, such as maintaining inventory control and making recommendations for purchases
- Is able to perform the duties of the Maintenance Supervisor in his/her absence
- Submits timely reporting of any property loss on liability related incidents to the insurance company
- Submits timely reporting of any work related injuries to the workers' compensation insurance company
- Complies with all local, state and federal regulations as well as all company policies and procedures
- Completes other duties as assigned

Groundskeeper

Principal Objective of Position: The Groundskeeper maintains the grounds of the property and works towards the common goals of satisfactory cash flow, positive resident relations and optimal resident retention.

Requirements:

Training/Education

- High School Diploma or equivalent
- Valid Driver's License preferred

Experience Desired

- Oral and written communication skills
- Knowledge of Equal Housing Opportunity (EHO) requirements and applicable program regulations

Special Requirements

- Ability to operate a two-axle motor vehicle
- Must be able to lift up to 100 pounds
- Ability to operate all necessary tools to perform the essential functions of the position
- Demonstrated experience and working knowledge of OSHA standards and other environmental safety standards
- Ability to perform a variety of duties in all types of weather

Essential Functions:

- Polices grounds as first task daily and throughout day, as needed
- Completes grounds work as needed
- Plants, prunes, weeds, seeds or removes foliage, shrubs, trees or grasses or other grounds work, as requested
- Operates various mechanical or electrical equipment or garden tools
- Completes other duties as assigned by supervisor

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Maintenance Technician Skill Levels

Entry-Level
- Basic knowledge of tools
- Interior make ready
- Basic electric
- Communication and organizational skills
- Willingness & ability to learn new skills
- CPO

Mid-Level
- CAMT or equal
- Troubleshooting
- Lock & key security
- Carpentry & drywall
- Read and explain diagrams
- EPA if required
- Emergency on call
- Plumbing: toilets, faucets, fixtures, etc.
- Basic computer skills

Senior/ Supervisor
- Budgeting skills
- Building codes
- Ability to train others
- Research
- Accountability and mentoring
- Understand property management and leasing reports .

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Reference: Skills Levels

See page the Participant Workbook for an unabbreviated **list of Maintenance Technician Skill Levels**.

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Maintenance Technician Skill Levels

This is a list of examples and is NOT a comprehensive list.

Entry-Level skills	Mid-Level skills	Senior/ Supervisory skills
• Basic knowledge of tools • Interior make-ready skills including minor painting • Basic electric: changing light bulbs, testing outlets and switches • Follows directions well and understands safety requirements • Good communication and organizational skills • Willingness and ability to learn new skills • Certified Pool/Spa Operator	• CAMT or equal • Legibility in writing • Repair/replacement of building components • Troubleshooting • Familiarity with appliances • Lock and key security • Interior repair including carpentry and drywall • Electrical: ohms low, meter • Read and explain diagrams • EPA if required • Ability to perform emergency on-call visits • Plumbing: toilets, faucets, fixtures, drains • Basic computer skills	• Budgeting skills • Building codes • Ability to train others • Research • Accountability and mentoring • Read and understand property management and hearing reports

Additional Considerations	

• Number of years and type of experience
• Formal education
• Training in industry designations
• Experience working with contractors and suppliers
• Ability to take/give directions
• Ability to maintain schedules
• Computer skills
	• Administrative skills such as:
	  o Organizing and prioritizing
	  o Time management
	  o Record keeping
	  o Communication skills
	• Professional attitude and appearance

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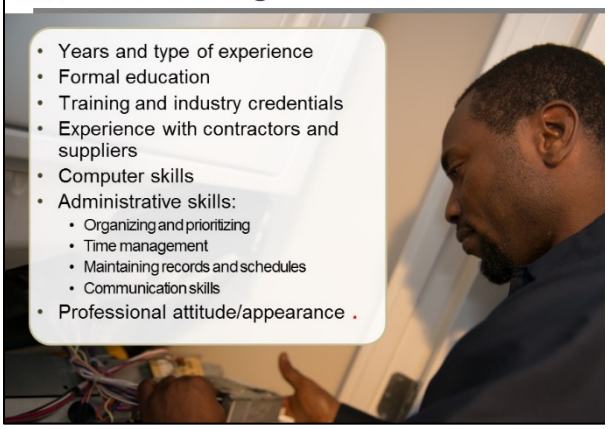
Additional Hiring Considerations



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Activity: Hiring a Maintenance Supervisor

Instructions:

There is a vacancy for the Maintenance Supervisor position at Creekwood.

In teams, use the Creekwood Property Information and Site Staffing Plan to assess the strengths and weaknesses of your assigned candidate:

- Jerry J
- Jody B
- Alex K .

Maintenance Supervisor Candidate Profiles

Jerry J is a 54 year old experienced maintenance supervisor. He has worked in the industry for a small owner with multiple small properties for 18 years. He has complete buying authority and is responsible for parts and supplies that he keeps in his truck as he goes from property to property. He has not maintained a shop or physical inventory at any location. From time to time he has worked with a helper but is a one-man-show most of the time. The owner has a reputation in the community for not paying her bills and being slow on responding to maintenance. Jerry is often frustrated with this and at long last he has decided to make a change.

Jody B is a 37 year old female with a variety of experience in the industry. She has come up through the ranks, starting in the industry 12 years ago as a maid. She attended some leasing classes, but decided that wasn't for her. She has worked for three companies in her twelve years. She was promoted in the last two years to supervisor on a 300-unit property but has struggled with the staff accepting her as the lead. She is a team-oriented leader and likes to build consensus but gets frustrated when she is unsuccessful at earning trust. Maintenance staff turnover is up. The companies she has worked for have encouraged her education and she holds a variety of permits and licenses and is currently taking HVAC licensing classes at the local community college.

Alex K is a 28 year old maintenance technician on a 785 unit property. He has worked there for 3 years after leaving his cousin's busy home repair business. He had worked for 10 years with his cousin, starting while in high school and learning maintenance skills on the job. He is a strong technician and continually presses for new skills and learning. He steps into the supervisor role when the lead is absent or not around. The property manager sees him as a growing asset. At this community, computerized work orders and parts ordering are in place, which suits Alex just fine. He is tech-savvy and actively teaches others on staff how to adopt the new technology. While friendly, he stays focused on his work and some residents have mentioned he seems almost rushed and robotic when he is providing service.

Administering Service Requests

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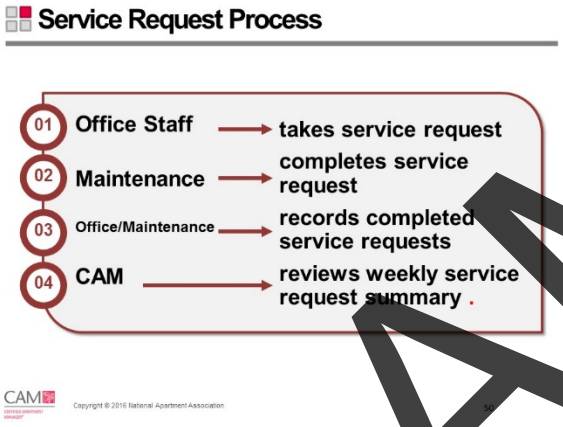

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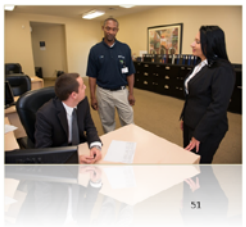
Administering Service Requests – Purpose

Administering the service request process helps you:

- Assess each staff member's skills
- Match the work with the correct skill set
- Complete performance appraisals
- Plan preventative maintenance
- Identify trends
- Plan budgets

Service request forms can be completed on paper or electronically using maintenance software .



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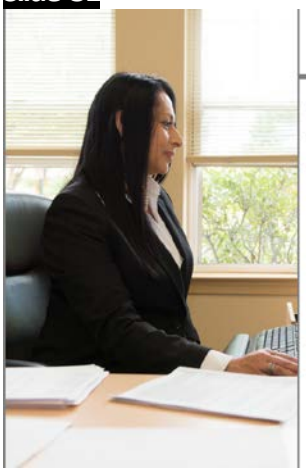

Reviewing Service Requests

- Preventative maintenance needs
- Possible capital expenditures
- Trends:
  - Large number of requests in a particular unit
  - Patterns of repeated requests of a specific type
  - Construction defects
  - Deteriorated infrastructure
  - Poor workmanship
- Budget implications
- Duration of typical repairs .

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Reviewing Service Request Summaries

- When requests occur
- Types of requests received
- Who needs services
- Average turnaround time
- Status of vacant residences
- Cost of service or repair
- Technician work performance
- Planning maintenance & repairs
- Training and/or adding staff .

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Reference: Service Requests

See the Participant Workbook for a summary of **Information in Service Request Summaries.** .

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Information in Service Request Summaries

The type of information the Service Request Summary should include if maintained for:

Each Maintenance Technician	The Property
• Name and job title • Number of service requests completed • Types of work performed • Total number of hours worked • Space for comments	Total number of service requests: • Received • Completed and pending • That needed parts • Remaining from previous week Total number of: • Follow-up calls/inspections made • Emergencies handled • Make-readies cleaned, painted, repaired and completed • Preventative maintenance tasks completed • Hours worked

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Service Request Summaries By Technician

- Name and job title
- Number of service requests completed
- Types of work performed
- Total number of hours worked
- Space for comments .

CAM CERTIFIED APARTMENT MANAGER

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Service Request Summaries By Property

Total number of requests:

- Received
- Completed and pending
- That needed parts
- From previous week

Total number of:

- Follow-up calls
- Inspections made
- Emergencies handled
- Make-readies completed
- Preventative maintenance tasks completed
- Hours worked .

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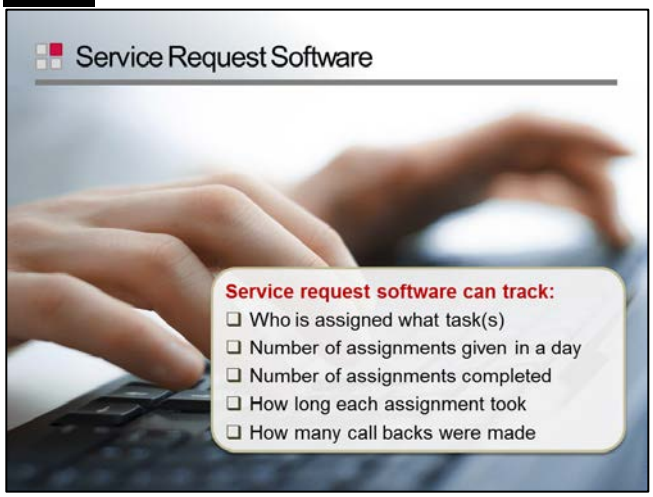

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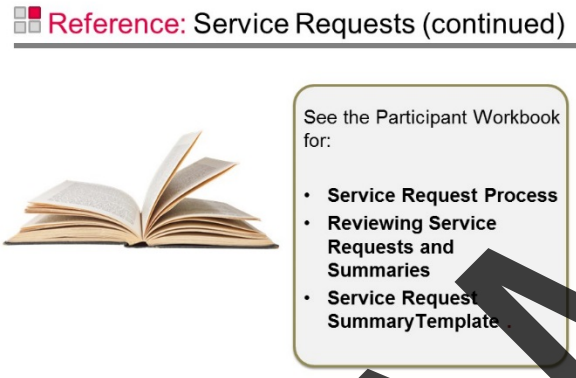

Service Request Process

1. Office staff takes a service request.
2. Maintenance staff completes the service request.
3. The CAM reviews & summarizes service requests.
4. The CAM reviews weekly service request summary.

Reviewing Service Requests and Service Request Summaries

When reviewing Service Requests and Service Request Summaries, you will look for the following:

Reviewing Service Requests	Reviewing Service Request Summaries

• Preventative maintenance needs
• Possible capital expenditures
• Trends such as:
  o Large number of requests in a particular unit
  o Patterns of repeated requests of a specific type
  o Construction defects
  o Deteriorated infrastructure
  o Poor workmanship on previous service
• Budget implications
• Duration of typical repairs
	• When requests occur
	• Types of requests received
	• Who needs services
	• Average turnaround time
	• Status of vacant residences
	• Cost of service or repair
	• Technician work performance records
	• Planning maintenance & repairs
	• Training and/or adding staff

Service Request Summary Template

Property: _____

Date: _____

Employee	Title	# Work Orders Completed	Total Time	Comments

Work Requests

SERVICE REQUESTS	MAKE-READY
Total received for week.	Total painted.
Total completed.	Total maintenance completed.
Pending from previous week.	Total cleaned.
Pending from current week.	Total completed.
Holding for parts.	
Total all work requests.	
Emergencies Handled	Total Vacancies

Service Request Follow-up

Apt #	Resident	# of SRs	Follow-up Date	Response/Result

Managing Inventory

Standard Inventory includes items that are used frequently. When tools or parts are available, maintenance and repair efficiency increases. Purchasing materials and managing inventory contributes to the Net Operating Income and consequently adds value.

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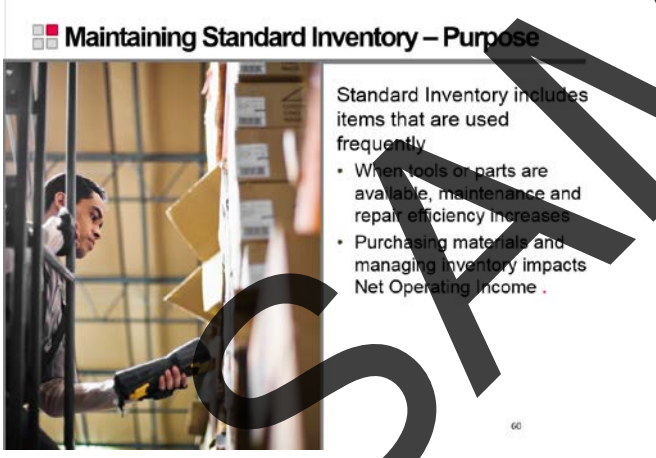

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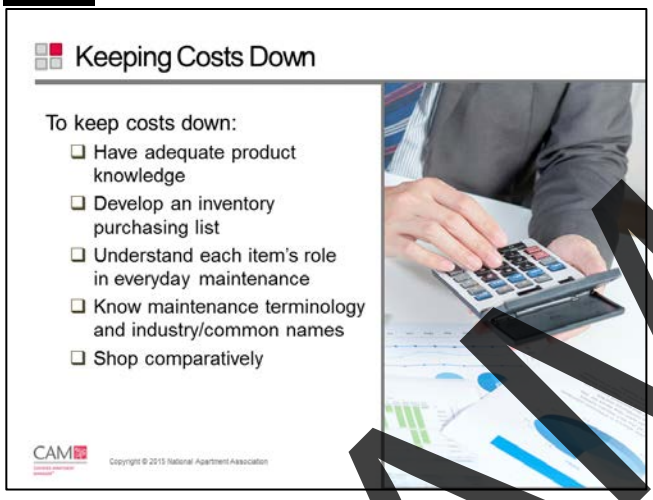

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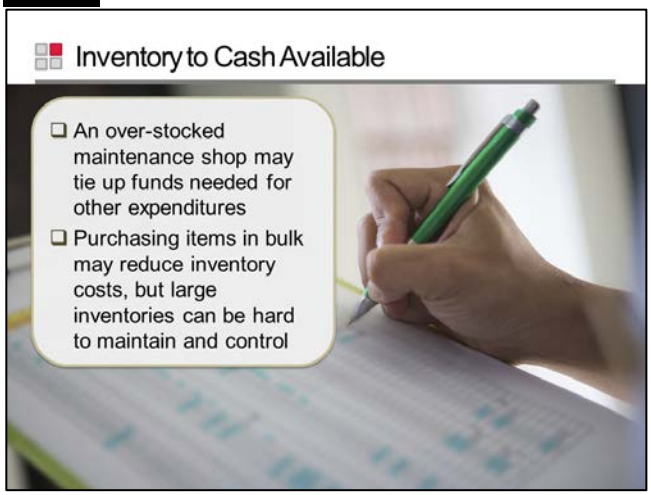

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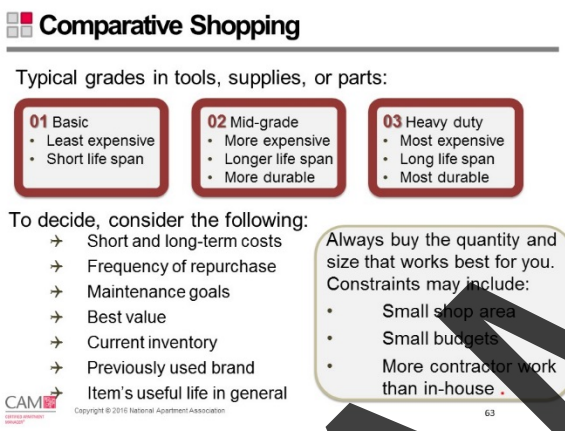

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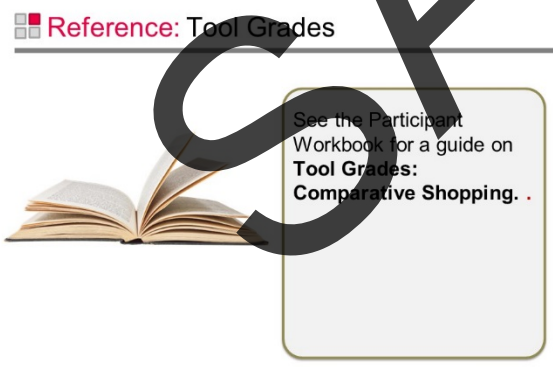

Tool Grades: Comparative Shopping

Always buy the quantity and size that works best for you. Constraints may include:

- Small shop area
- Small budgets
- More contractor work than in-house

Basic	Mid-grade	Heavy duty
• Least expensive • Short life span	• More expensive • Longer life span • More durable	• Most expensive • Long life span • Most durable

To make purchasing decisions for inventory, consider the following:

- Short and long-term costs
- Frequency of repurchase
- Maintenance goals
- Best value
- Current inventory
- Previously used brand
- Item's useful life in general

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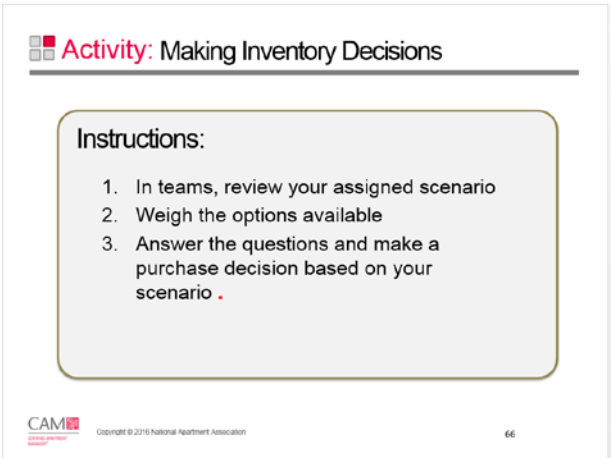

Scenario 1

You recently took over management of a property that had virtually no inventory in place. Basic parts and supplies need to be purchased. The new owner has restricted the amount of money she will commit to this effort – the costs of purchase and a few surprise conditions have made money tight. The property will undergo a retrofit focusing on energy-saving fixtures and green materials. Your ability to buy these items will depend greatly on the staff's ability to lease apartments selling the green aspect and getting top market rents. Your maintenance team which you brought with you is experienced and has made inventory purchases before. What supplies would you buy first and how would you build an inventory of energy saving components while on a strict spending limit?

Scenario 2

Your 30-year old asset has been running fairly smoothly. It requires ongoing maintenance and a reliable inventory of frequently used parts and supplies. This older property never had a stand-alone shop. There is an outbuilding that houses exterior maintenance items and could be cleaned out to offer a little more space, but the shop and inventory have been kept in a down-unit. The owner has now authorized funds to get that down unit back on line since the markets are so good and it can be rented. Consequently, you need to relocate and re-think your supplies and inventory. A steady supply of basic materials is essential, but what options will work now? The office building onsite offers a little space in the break room area, but not enough for bins and a work bench.

Scenario 3

Your property is for sale. The owners have assured everyone that they will be offered nearby transfers and stay with the firm. This has taken a lot of fear away!! The challenge is, now that the property is listed, the owner has cut back on purchasing and maintaining a working inventory AND also backed off the quality-level of replacement parts and supplies, including paints, cleaning supplies and fixtures. The financial statement will focus on strong NOI and that means reducing expenses. How can you help in this effort without finding yourself and your team constantly telling residents "the part is on order"? Where can you limit inventory size with the least impact and how will you move forward on ensuring that you can complete work orders and preventative maintenance? What will you say to residents who notice the smaller or lower quality fixture or bulb you use?

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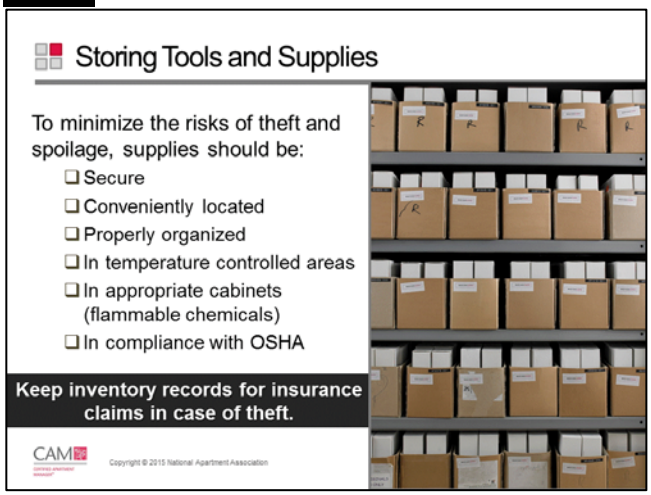

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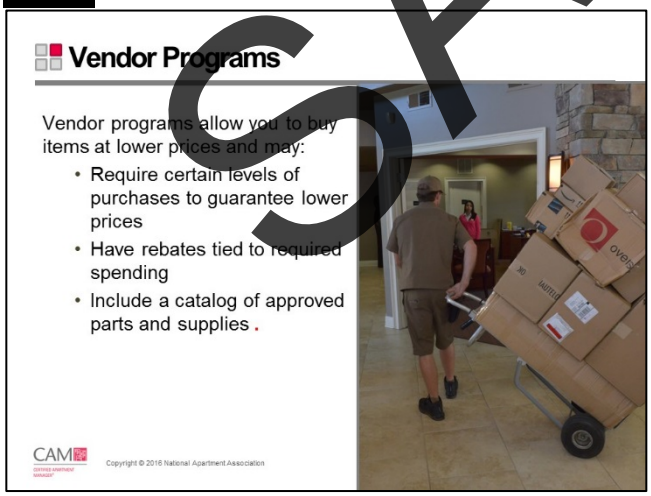

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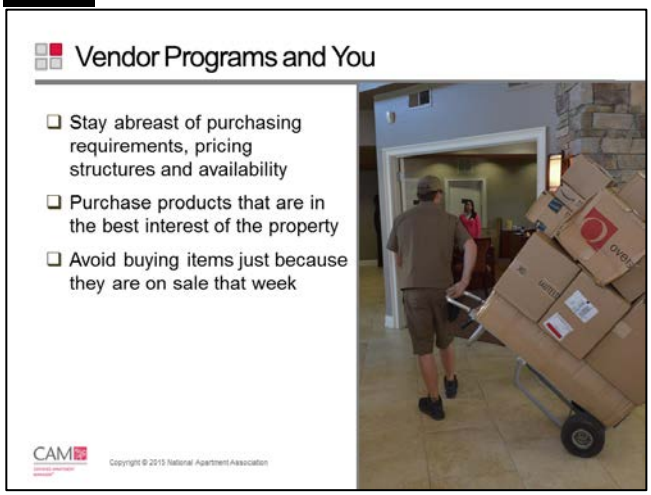

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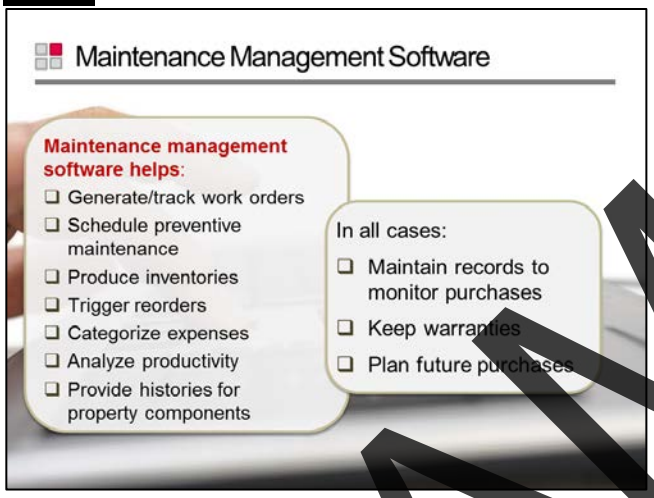

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Emergency Supplies

Emergency items should be listed in the property emergency plan.

Depending on the property type, items might include:

- Plywood to board up openings
- Visqueen to protect roofs
- Fire Extinguisher
- Generator
- Caution tape
- Temporary fencing .

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Contractors and Vendors

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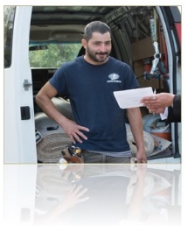
Contractors and Vendors

Vendor
A vendor is a third party company that offers products and/or services to the maintenance function. A service vendor may perform regularly recurring weekly or monthly maintenance tasks.

Contractor
A contractor is a person or company hired to perform specific services or complete specific jobs not performed by your maintenance team.

Many companies use these two identifiers interchangeably



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Preferred Vendors Programs

Your property may have preferred vendors you're required to use

- May provide rebates and/or special discounts
- Ensure everyone uses specified vendors .

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Reasons to Hire a Contractor

Staff Unable
- ❑ Shortage of staff
- ❑ Specialized skills
- ❑ Specialized equipment

Save Money
- ❑ Cheaper materials or supplies
- ❑ Lower total cost of labor

Need Documents
- ❑ Licenses or permits required
- ❑ Defer liability
- ❑ Obtain a warranty .

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Typical Contractor and Vendor Services

Contractors may be used for single-event large jobs **or** recurring weekly or monthly maintenance:

- Pool maintenance
- Landscaping
- Pest control
- Interior painting
- Housekeeping
- Carpet maintenance
- Snow removal .

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Reference: Hiring a Contractor or Vendor

See the Participant Workbook for a list of **Reasons to Hire a Contractor,** including a summary of the **Benefits to Hiring a Contractor**. .

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Reasons to Hire a Contractor

Staff Unable to Complete Task	Save Money	Need Documentation

• Shortage of staff
  o Illness
  o Vacation
  o Termination
• Specialized skills
  o Parking lot repairs/resurfacing
  o Roofing
  o Landscaping
• Specialized equipment
  o Backhoes
  o Welding equipment
	• Cheaper materials or supplies
	  o Purchased wholesale or bulk
	• Lower total cost of labor
	  o Special insurance
	  o Licensing fees
	  o Payroll taxes
		• Licenses or permits required
		  o Electrical work
		  o Plumbing work
		• Defer liability
		• Obtain a warranty

Benefits to Hiring a Contractor
• Specialized skills and tools • Quality-based experience • Avoiding expenses for purchasing and maintaining specialized equipment • The maintenance staff can continue to meet daily service needs and preventative maintenance schedule; not distracted from day-to-day tasks • The contractor handles required licenses, permits and insurance • Safeguards warranty issues • It may provide faster, more accurate, timely, and complete work product

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Benefits to Hiring Contractors

- Specialized skills and tools
- Quality-based experience
- Avoid expenses for specialized equipment
- Maintenance not distracted from day-to-day tasks
- Handles licenses, permits, insurance, warranties, etc. .

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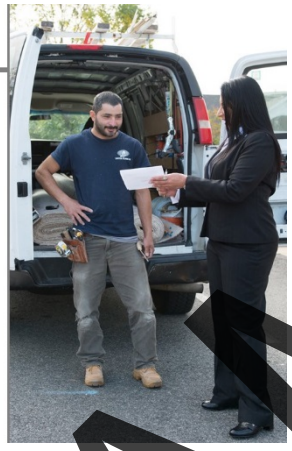
Finding a Contractor

- Referrals
- Review who did prior work
- Local apartment association
- Better Business Bureau
- Newspapers
- Trade magazines
- Ask:
  - Other communities or management companies
  - Other contractors
  - Suppliers: lumber yards, paint companies
  - Utility companies .



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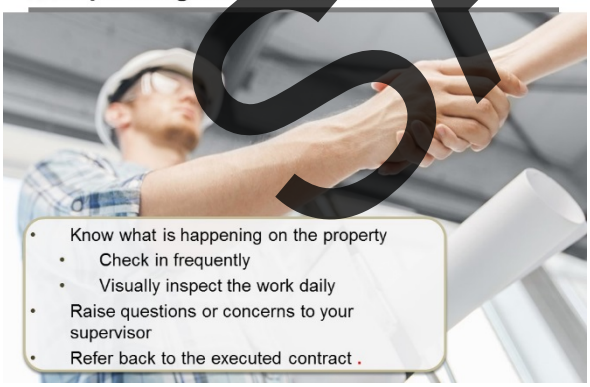
Supervising a Contractor's Work



- Know what is happening on the property
  - Check in frequently
  - Visually inspect the work daily
- Raise questions or concerns to your supervisor
- Refer back to the executed contract .

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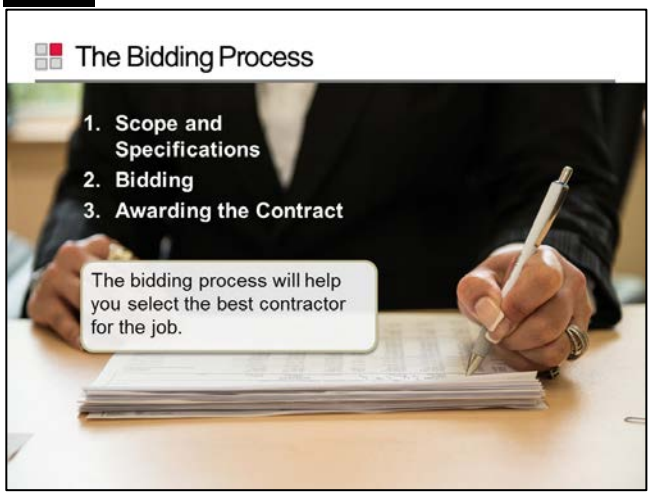

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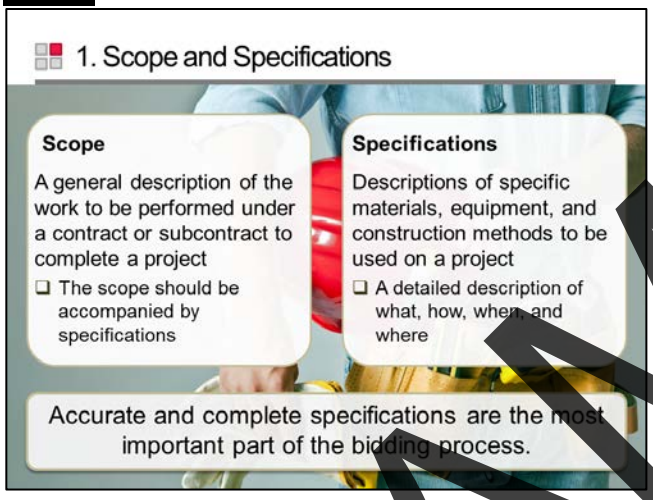

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Reference: Bidding

See the Participant Workbook for:

- A summary of **The Bidding Process**
- A summary of **Scope and Specifications**
- An unabbreviated list of specifications

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The Bidding Process

The bidding process will help you select the best contractor for the job.

Step 1: Scope and Specifications	Step 2: Bidding	Step 3: Awarding the contract
Identify the scope and specifications for the project. • Outline specific tasks & deadlines. • Write detailed job specifications. • Always present all bidders with the same specifications to get comparable results. • Accurate and complete job specifications are the most important part of the process.	Solicit bids from at least three separate contractors. • Do not share details with other contractors who may wish to bid. • Advise staff to keep information confidential. • Set the standard for quality. • Look for the best results, not just the least expensive; the cheapest is not necessarily the best.	Always check references before accepting a bid or signing a contract. • Check local references so you can visually inspect the work. • Check the Better Business Bureau for complaints.

Scope and Specifications

Scope	Specifications
A general description of the work to be performed under a contract or subcontract to complete a project • It must contain detailed job specifications. o The job specification purpose is to clearly define expectations so a contractor knows what to do and what you want. • Always present all bidders with the same specifications to get comparable results. • Consider hiring a consultant to determine the scope of the work.	Descriptions of specific materials, equipment, and construction methods to be used on a project • They are a detailed description of what, how, when, and where. • They must be accurate and complete. • They are the most important part of the bidding process. **Detailed specifications include:**

Detailed description work	Start and end of a work day
Preparation and application	Clean up and how often
Specific materials and equipment	Proper removal and disposal of old materials
Location of the job – maps & site plans may be needed	How to handle problems found during work
Timeframe for completion	List of references
Licenses and permits	OSHA requirements
Insurance, warranties, guarantees	Fair Housing training
Payment schedules	Contacts: phone, text, email

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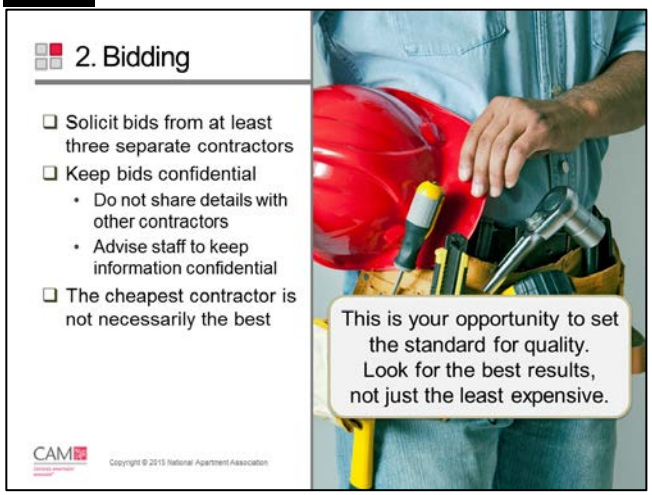

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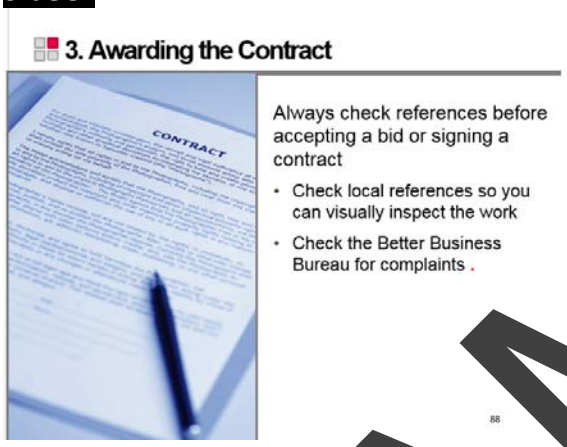

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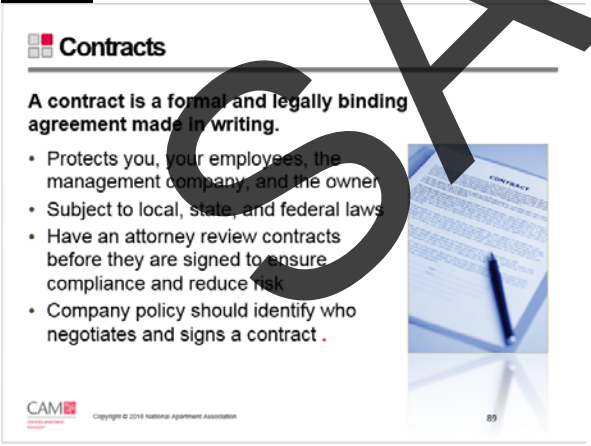

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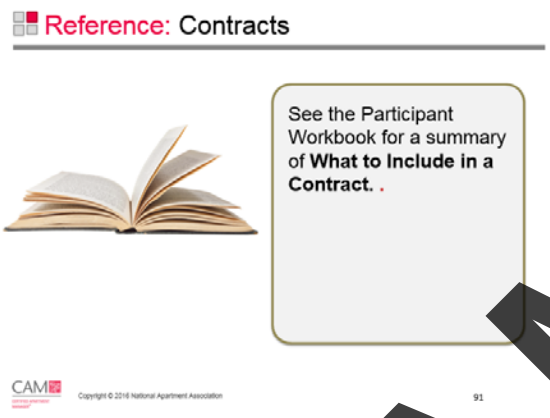

What to Include in a Contract

A contract is a formal and legally binding agreement made in writing. You may enter into a contract with a contractor for property maintenance and improvements. All contracts are subject to local, state, and federal laws. An attorney should review contracts before they are signed to ensure compliance and reduce risk. A CAM may not be the person to sign the contract; company policy should identify who negotiates and signs the contract; a company supervisor or owner may need to sign.

Included in a Contract	Included in Vendor Agreement
• The scope and nature of the work to be performed • Detailed specifications • Start and completion dates • A remedies and cancellation clause • A hold-harmless clause • Proof of workers' compensation • Proof of comprehensive general liability insurance • Total cost of work • A payment schedule, outlining retainage fees * • List of subcontractors, if any, being used on the project • Performance penalties, if applicable *Note: A retainage fee is a percentage of the contractor's payment (usually 10%) that is held by the property or the management company for a specific time period (usually 30 days) after the job is completed. The purpose is to guarantee the completion of the work and cover any defects in the workmanship.	• Detailed specifications • Does the vendor supply goods alone, or goods and services? • Who will get the bill – management or owner? • Will payments be processed from invoices or statements? • Will payment be made within 30 days? • Who has to approve invoices? Are there approval limits? • Will employees be prohibited from accepting gifts or favors from vendors? • Will vendors be required to complete a W-9 and submit a valid certificate of insurance prior to beginning work? • Will the vendor be responsible for damage he causes, including water intrusion that causes mold? • Will the vendor be held responsible for screening its employees & their conduct while on your property? • Will vendors be required to meet your fair housing, drug-free, weapon-free workplace policies? • Will vendors be asked to use utilities prudently? • Contact information • Communication protocol

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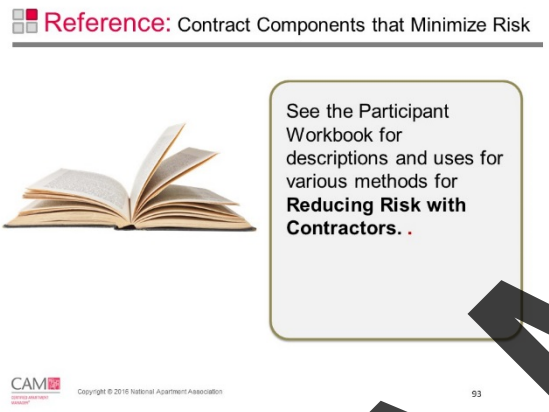

Reducing Risk with Contractors

Formal vendor policies should be set and a list of vendors that will be providing materials should be included with the contract documents.

	Description	When/Why it is used	Paperwork
Lien Waivers	A signed and notarized document that waives all claims against the property or the management company from the contractor, his employees, his subcontractors and his material suppliers	To ensure the contractor, vendor, their employees, their subcontractors and their material suppliers cannot file a claim, lawsuit or lien (legal claim) , against the property for non-payment	Requiring lien waivers from subcontractors working for the general contractor is a good business practice. • Local laws may require lien waivers to be filed with county or city agencies.
Multiple Payee Payments	Making disbursement checks payable to both the contractor and his supplier	Ensures both parties are paid, protects against mechanical or material liens on a property and prevents future disputes • May be used after contract is signed when contractor is unable to meet obligations to vendors	This is outlined in the draw schedule. • If used after a contract is signed it is not included in the draw schedule.
Payment & Performance Bonds	A bond issued by an insurance company or bank to guarantee satisfactory completion of a project	Companies may require the contractor to furnish bonds ensuring both the price and the performance of his work • Usually required by lenders or contractors in new construction • Are required in some states for large jobs	Copies of the bonds are attached to the contract, if required.
Certificates of Insurance	Proof of Insurance for liability and Workers' Compensation Insurance for contractor employees	Protects the property, owner, & management company from liability due to injury claims or property damage caused by contractor negligence • Sometimes an owner may obtain insurance on behalf of a contractor and add the expense to the total cost of the contract.	Third-party service companies can track certificates to ensure accuracy and manage expiration dates for insurance coverage.

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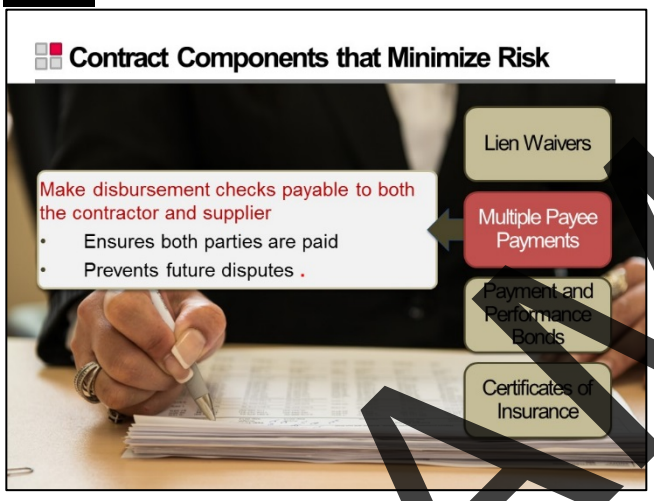

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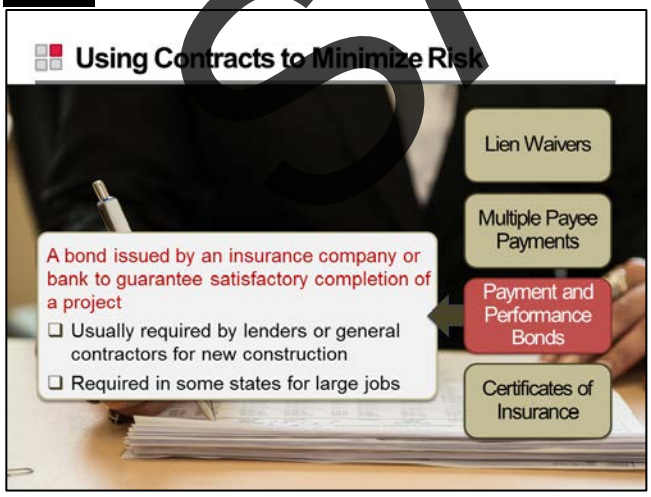

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Inspections

Property inspections are the ongoing evaluation of the condition of the buildings, grounds, and common areas on a property. Property inspections provide excellent training opportunities for staff.

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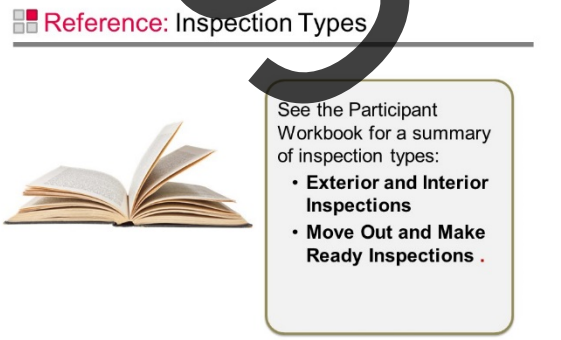

Exterior and Interior Inspections

Maintenance includes inspecting, repairing, or replacing items to keep building exteriors or interiors in excellent condition.

Exterior Inspections	Interior Inspections

• Property grounds
• Stairways, balconies, breezeways
• Utility buildings
• Trash & mail areas
• Carports & garages
• Pools, ponds, water features
• Parking lots & sidewalks
• Tennis courts, playgrounds, spas, volleyball & picnic areas
• Fences and lighting
• Areas with ADA & FHA implications
	• Office & clubhouse
	• Interior hallways
	• Cleaning & janitorial areas
	• Trash rooms and storage areas
	• Amenities & common areas
	  o Business centers
	  o Fitness centers
	  o Laundry rooms
	• Occupied units
	• Units to 'make ready'

Move Out and Make Ready Inspections

Move Out Inspections	Make Ready Inspections

Each unit must be inspected at move-out to determine the scope of the make-ready process and identify:
• Potential charges from previous residency
  o Compare condition against move-in inspection
• Possible physical damage
• Working condition of major equipment
  o Turn on appliances, exhaust fans, disposal,
  o Check required components of detectors, locks, doors, windows, etc.
• Retrofit or rehab work needed
• Contractor involvement and the scope of work
• Preventative maintenance needed
	Inspecting units to ensure market readiness. This includes:
	• Pre-inspection to identify maintenance and make-ready tasks needed
	• Post-inspection to ensure work was completed and the unit is ready to show
	• Work with your maintenance and housekeeping staffs to develop sound and efficient make-ready plans to meet the expectations of prospective residents

The Maintenance Supervisor or Service Manager typically monitors the move out and make ready processes.	

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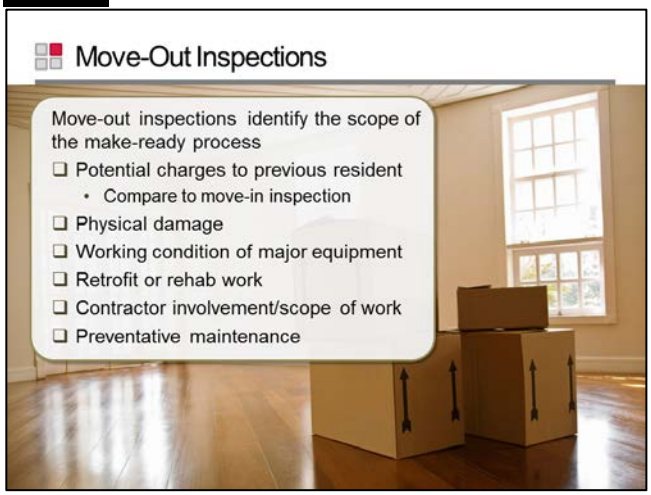

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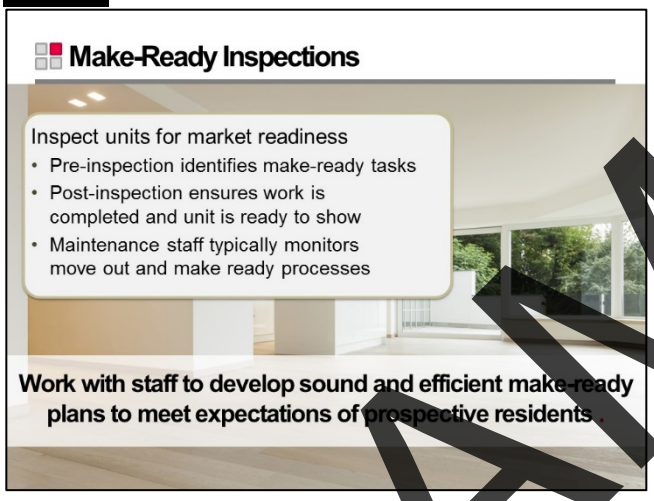

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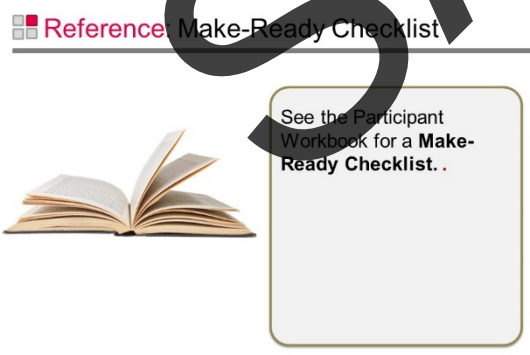

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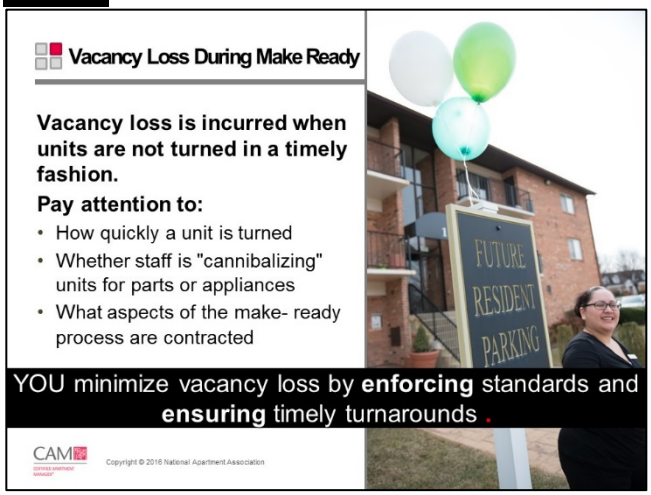

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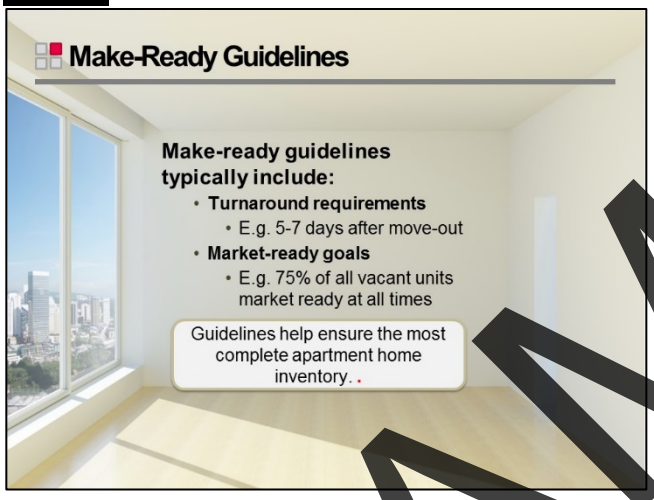

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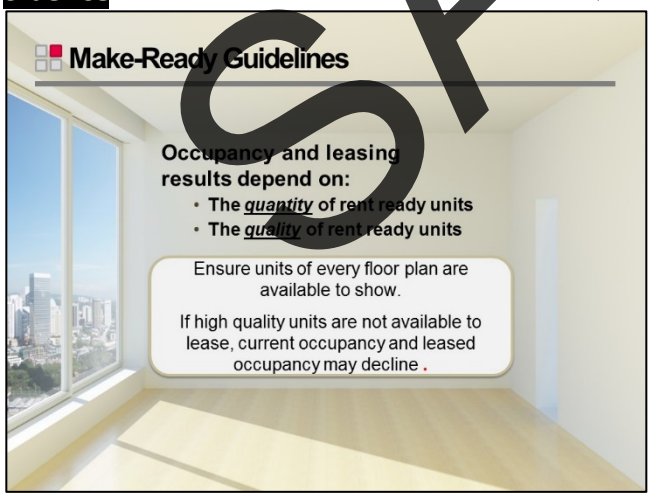

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Reference: Vacancy Loss and Guidelines

See the Participant Workbook for a summary of **Vacancy loss** and **Vacancy Guidelines.**.

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Make Ready Checklist

NAA NATIONAL APARTMENT ASSOCIATION Education Institute

Date: _____ **Unit:** _____

Technician Initials: _____

Living Room	OK	Fix	Initials
Signage/Number			
Door Viewer			
Door Finish			
Lock Set			
Frame/Threshold			
Wall Switches			
Door Stop			
Walls			
Ceiling			
Receptacles			
Baseboards			
Windows			
Window Locks			
Lights			
Thermostat			
Vents			
Cable Connection			
Water Heaters			
Preventive Maint.			

Kitchen	OK	Fix	Initials
Walls			
Floors/Vinyl			
Ceiling			
Lights			
Receptacles			
GFCI			
Cabinets			
Drawers			
Counters			
Caulking			
Sink			
Faucet			
Disposal			
Plumbing			
Dishwasher			
Refrigerator			
Range			
Hood			
Microwave			
Vents			
Baseboard			
Ref. Coils, Clean			
Paint			
A/C			
Heating			
Vinyl			
Aerator			
Preventive Maint.			

Blinds	OK	Fix	Initials
Cords			
Guides			
Slats			
Screens			

Bathrooms	OK	Fix	Initials
Receptacles/GFCI			
Lights			
Walls			
Tile			
Ceiling			
Floor			
Toilet Mechanics			
Toilet Seat			
Shower Head			
Tub Spout			
Tub Stopper			
Mixer Valve			
Grout/Caulking			
Shower Doors			
Sink			
Aerator			
P-Trap			
TP Holder			
Towel Bar			
Faucet			
Exhaust Fan			
Mirror			
Medicine Cabinet			
Preventive Maint.			

Bedrooms	OK	Fix	Initials
Walls			
Ceiling			
Baseboard			
Receptacles			
Closet Doors			
Closet Shelves			
Window/Locks			
Doors/Handles			
Preventive Maint.			

Mandatory Items	OK	Fix	Initials
Entry Door Lock			
Window Locks			
Slider Lock			
Storage Lock			
Fire Alarm			
Fire Extinguisher			
Garage Door Opener			
A/C Filter			
Hood Filter			
Sub Panel			
Porch Lighting			
Preventive Maint.			
Stove Anti-tip Device			

Note: *Shaded tasks may be performed after move-in. Talk with your supervisor to see what your company allows.*

Vacancy

You must minimize vacancy loss by ensuring standards and timely turnarounds. Vacancy guidelines help ensure maximum effort and focus on the most complete apartment home inventory.

Vacancy Loss	Vacancy Guidelines

• Do not allowing maintenance staff to "cannibalize" units for parts or appliances
• Weigh the benefits of contracting certain aspects of unit turns vs. doing them in-house, e.g. painting, carpet cleaning, unit cleaning.
• Ensure that there are enough units of every unit type available to show.
• Many companies establish standard turnaround time requirements.
  o Example: 5-7 working days following the day of move-out.
	Vacancy guidelines typically include:
	• Standard turnaround time requirements
	  o E.g. 5-7 working days after move-out
	• Market-ready goals
	  o E.g. 75% of all vacant units market ready at all times.
	• Targets help ensure maximum effort and focus on the most complete apartment home inventory.
	
	Occupancy level and leasing results depend on:
	• The *quantity* of rent ready units
	• The *quality* of each of those apartment homes
	• If high quality units in sufficient quantities are not available to lease at all times, current occupancy and your leased occupancy will decline.

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Protecting the Asset

Actions taken to prevent damage to a property's physical structures, grounds, and amenities

- Paint wood surfaces to protect wood
- Seal asphalt cracks to prevent deterioration
- Repair roofs and bad decking
- Maintain landscaping through fertilization, pruning, and watering .

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Limiting Deferred Maintenance

Upkeep that is deferred or incomplete; frequently has direct impact on asset preservation

- Results when a property does not have enough cash for repairs
- Creates even higher vacancy .

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Inspection Impact on Budgets

Property inspections provide information needed to prepare budgets

- Priorities:
  1. Potential liability of safety issues
  2. Asset preservation projects
  3. Retrofits/enhancements that result in increased revenue or decreased costs
  4. Things needed to remain competitive .

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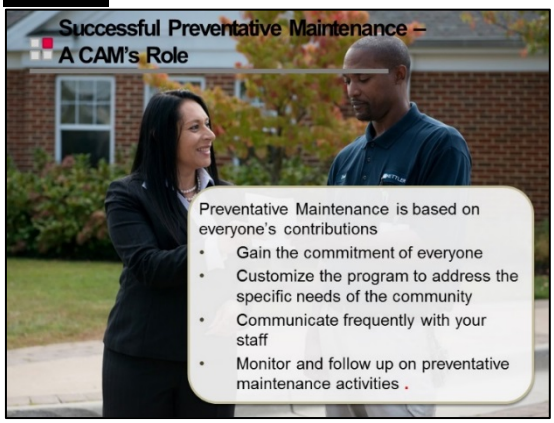

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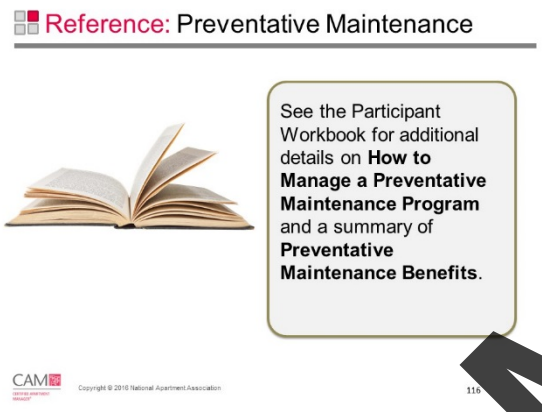

How to Manage a Preventative Maintenance Program

Preventative Maintenance is based on everyone's contributions; however, you are ultimately responsible for its success.

Action	Details
Gain the commitment of everyone.	• Involve your staff in planning, scheduling, and implementing your preventative maintenance program. • Review the PM plan with your staff and discuss everyone's assignment. • Lead by example.
Customize your program to address the specific needs of your apartment community.	• Consider all aspects of the community: o Owner's goals o Type of equipment used and frequency of use o Property size, age and geographical region o Residents' profile and special needs o Staff and resources o Seasonal issues (needs in summer and winter) o Budget
Communicate frequently with your staff.	• Keep staff informed of maintenance activities. • Encourage your staff to keep one another informed. • Provide staff with access to PM information. • Implement preventative maintenance as a team effort. • Review the budget with the entire staff. • Emphasize the value of PM and the staff's involvement.
Monitor and follow up on PM activities.	• Keep track of maintenance work records. • Make sure work is inspected. • Ensure action items are completed by the deadline. • Review PM activities on a regular basis.

Preventative Maintenance Benefits

Many properties suffer physically and economically as a result of an inadequate preventative maintenance program.

Identifies	Increases	Reduces
• Problem areas early • Potential resident problems o Damage, housekeeping issues, overcrowding, hoarding, un-reported pets	• The value of the property • Resident satisfaction and retention • The useful life of fixtures and equipment	• Risk • Expenses • Service requests • Unexpected problems • Frequency of normal problems becoming more costly

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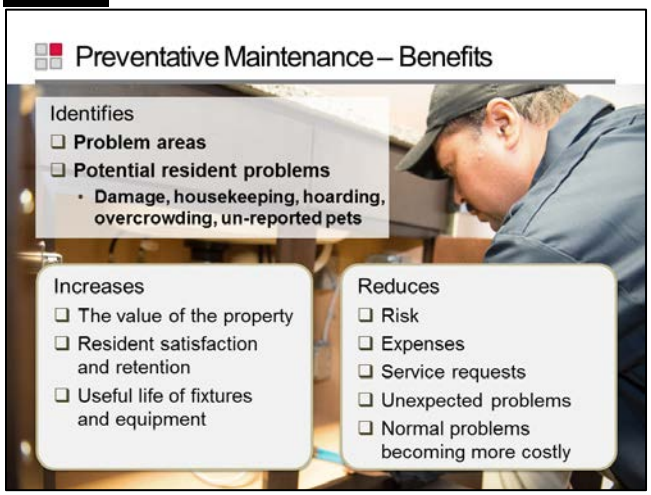

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5-Step Preventative Maintenance Program

Step	Description
1. Conduct Inspections	• Successful programs begin with a thorough inspection of the property. • To support a team approach, ask staff to take part in inspections.

2. Take Inventory	• Develop or update an inventory list of all items.
	• Walk through the property and note equipment, structural components, landscaping condition.
	• Keep inventory records.
	  o Insurance companies will request this in case of theft.
	  o Include maintenance manuals and warranties.
	• Consider engraving the property name on tools and equipment.

3. Identify Tasks	• Identify items subject to preventative maintenance. • Establish the tasks needed to maintain the items.
4. Establish Frequency	• Establish the frequency to complete tasks: daily, weekly, quarterly, etc.

5. Create a Schedule	• Include:
	  o List of items that are subject to regular maintenance
	  o Scheduled date for maintenance
	  o Seasonal maintenance
	• Review procedures in maintenance manuals to identify additional needs.
	• Use a Tickler file.

Examples of items that should be included in a preventative maintenance program:			
AC coils	Caulking	Exterior surfaces	Roofs
Fences	Chimneys	Exterior walls	Screens
AC condenser	Clubhouse & models	Foundations/buildings	Sewers/drains
Fire extinguishers	Common areas	Furnace and A/C filters	Signage
Balconies	Culverts	Gutters	Smoke alarms
Blower motors	Curb/sidewalks	Landscaping	Sprinkler systems
Boilers	Downspouts	Lighting	Stairs/Handrails
Gutters	Electric panel/switches	Plumbing/fixture	Water heaters
Carpentry	Entry gates	Pools	Carpeting

Records to Keep in a Preventative Maintenance File

- Preventative maintenance schedule
- Equipment and warranty information
  - Serial/model number
  - Date of purchase
  - Warranty
  - Manufacturers' maintenance requirements
- Termite and pest control inspection records
- Preventative maintenance needs
- Records of maintenance actions
- Staff information
- Name of person who performed the work
- Length of time it took to complete the work
- Manager's notes

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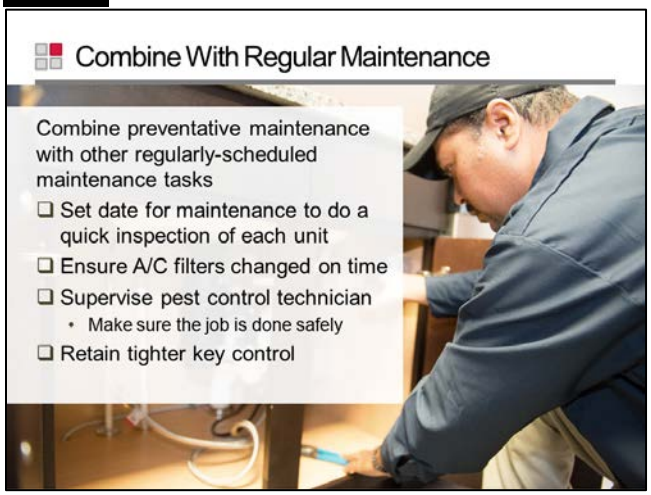

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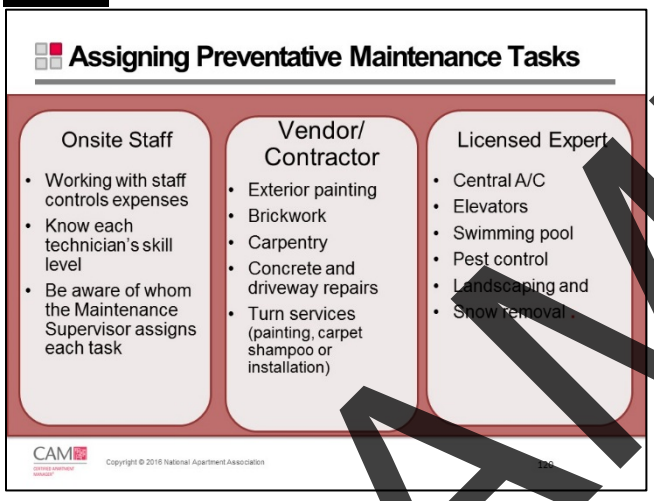

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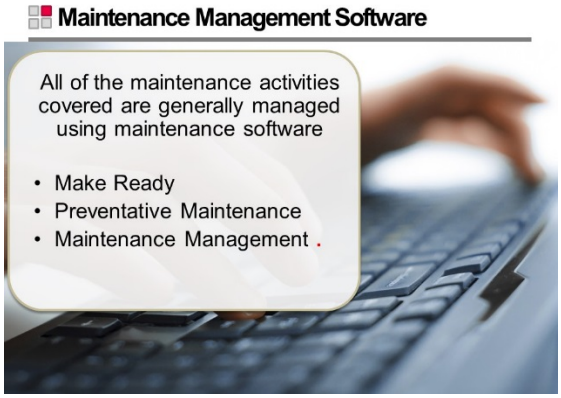

Conservation and Green Properties

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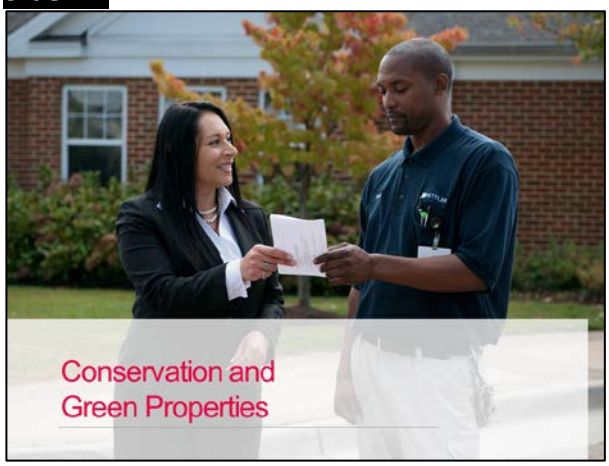

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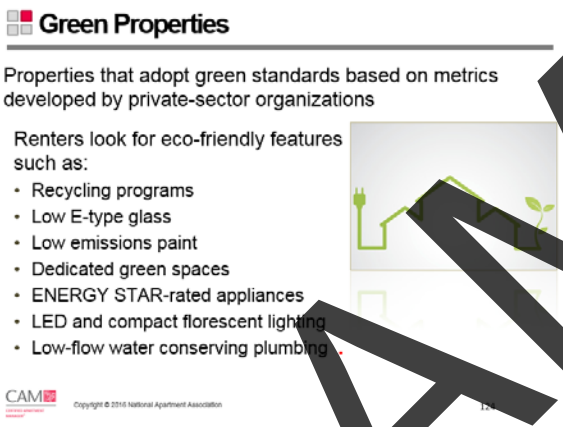

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Reference: Green Practices

See the Participant Workbook for more information about Green Practices:

- **Energy Efficiency Best Practices**
- **Self-Assessment Energy Audit Guide**
- **Indoor Environmental Quality**
- **Resource Efficiency**
- **Water Efficiency .**

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Activity: Creekwood Slow Water Leaks

Instructions:

In groups, use your case study materials to:

- Determine the amount of water and money saved by replacing the showerheads at Creekwood.
- Calculate the "payback period" on a retrofit.
- Determine its cost effectiveness. .

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Creekwood Slow Water Leaks Activity

Creekwood has 122 apartment homes. The cost of water is $.20 per 100 gallons and, on the average, two showers are taken per day. In each apartment the estimated length of shower is 5 minutes. The existing showerhead allows water to flow at a rate of seven (7) gallons per minute; a new showerhead allows water to flow at a rate of 2.5 gallons per minute.

The Problem

What are the cost AND energy savings of replacing the existing showerhead with a new showerhead?

Water Usage

Use the following formulas to calculate water usage in gallons per day.

Existing showerhead:_____gallons per day (122 apts X 2 showers per day X 5 minutes per shower at 7 gpm)

New showerhead:_____gallons per day (122 apts X 2 showers per day X 5 minutes per shower at 2.5 gpm)

Water Saved

Use the following formulas to calculate the water saved, in gallons

Savings per day: _____gallons (Existing showerhead usage – new showerhead usage)

Savings per year: _____gallons (Gallons saved per day X 365 days)

Money Saved

Use the following formula to calculate the money saved, in dollars per year

Savings per year: _____ (gallons saved per year X $0.20/100 gallons)

Rate of Return on investment for showerheads

Use the following formulas to calculate the rate of return on investment for purchasing new showerheads for all units in this community

Cost of new showerheads: $40.00 each

Cost of showerheads for all units: _____

Savings on water bill the first year _____

Number of years to payoff cost of showerheads

Wrap Up

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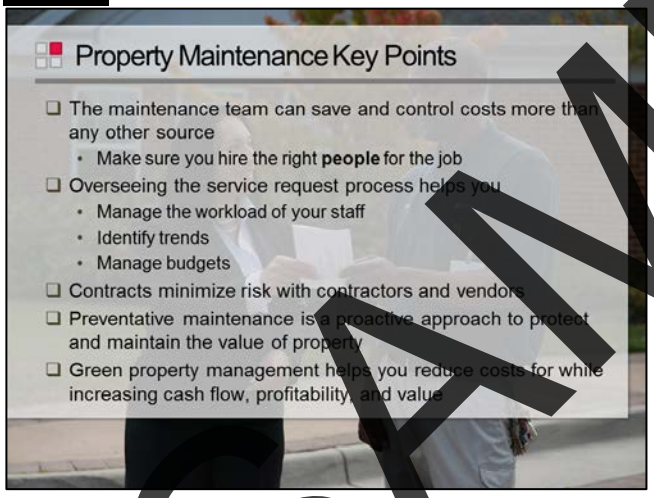

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Knowledge Check Answers

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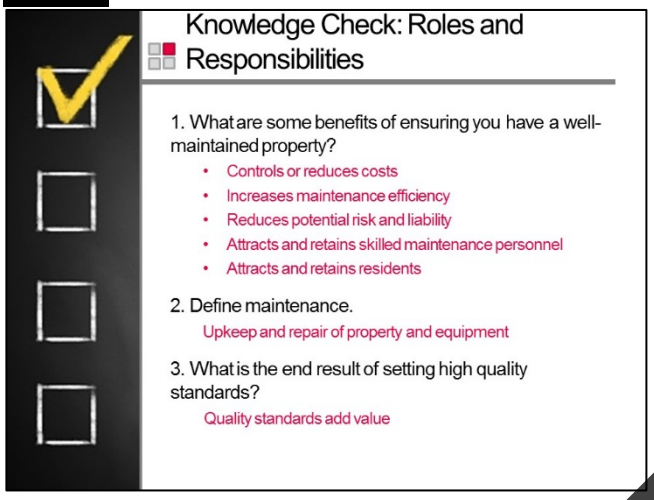

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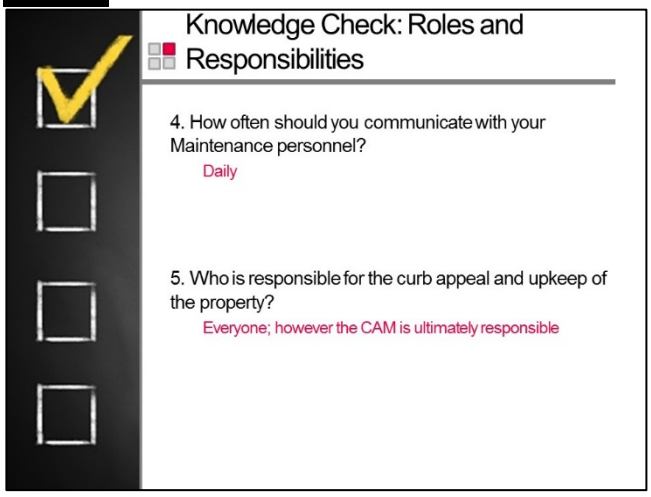

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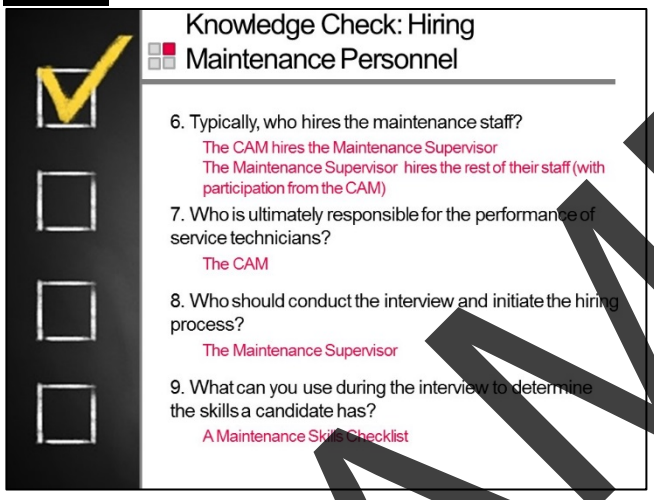

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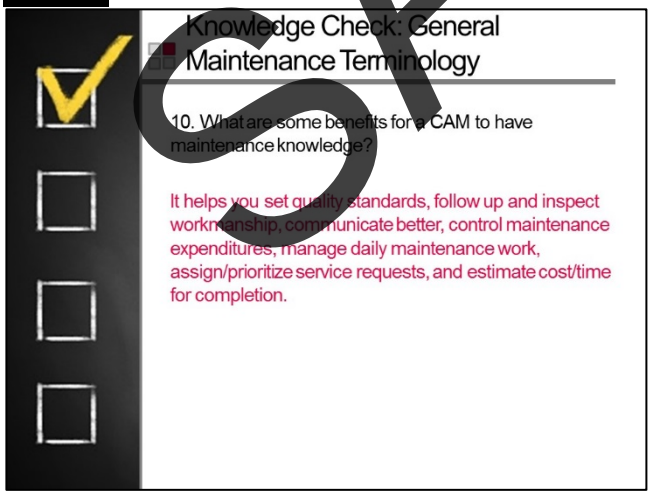

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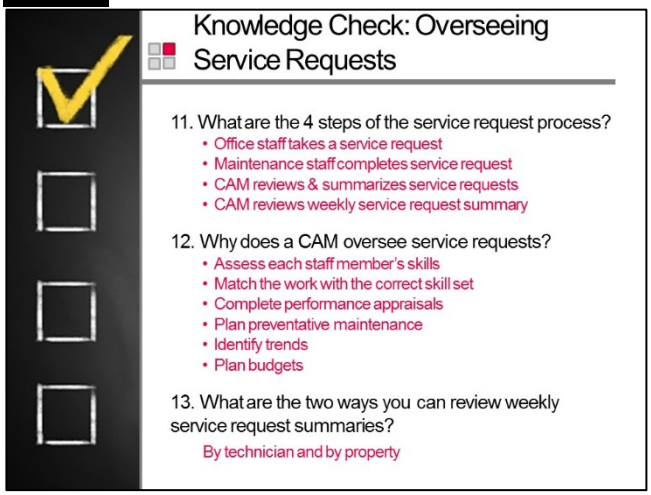

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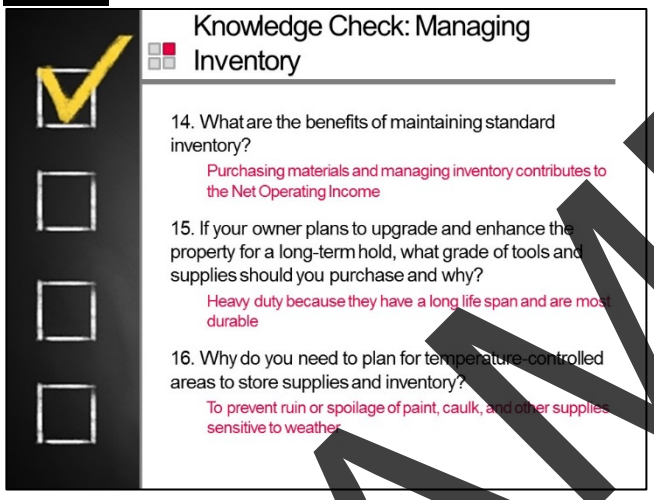

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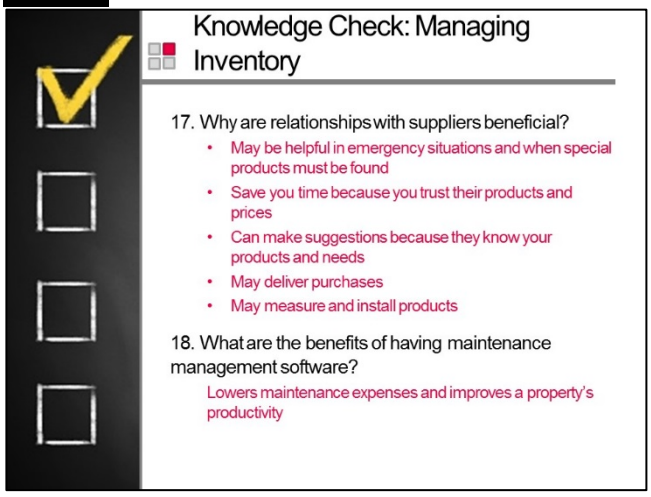

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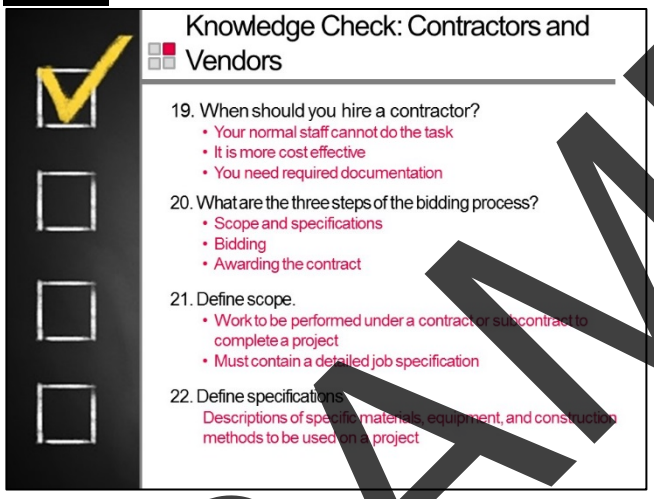

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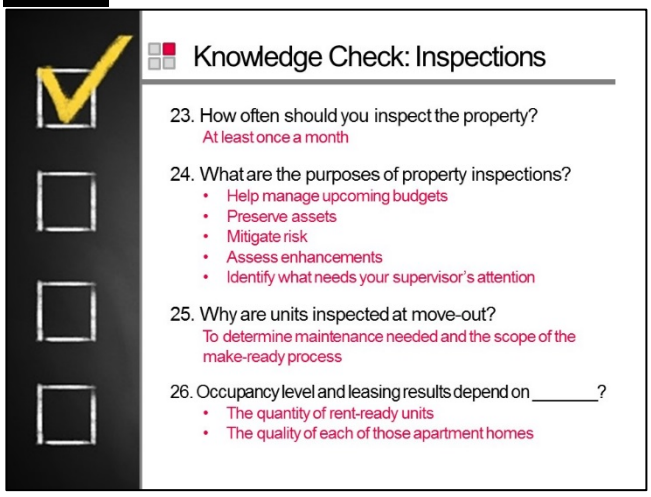

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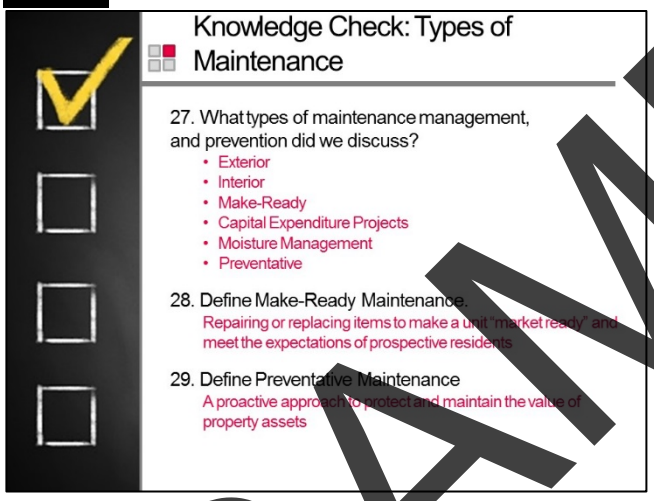

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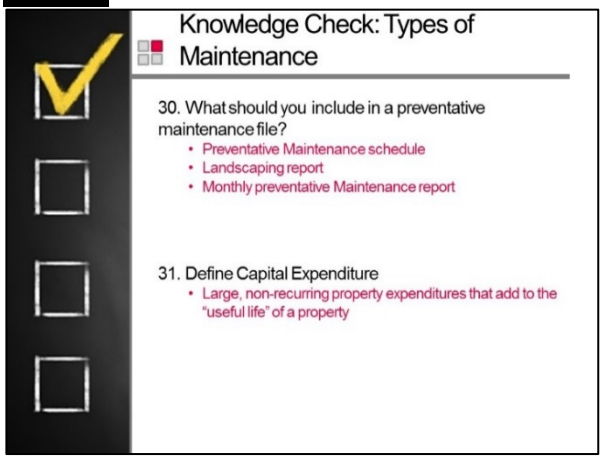

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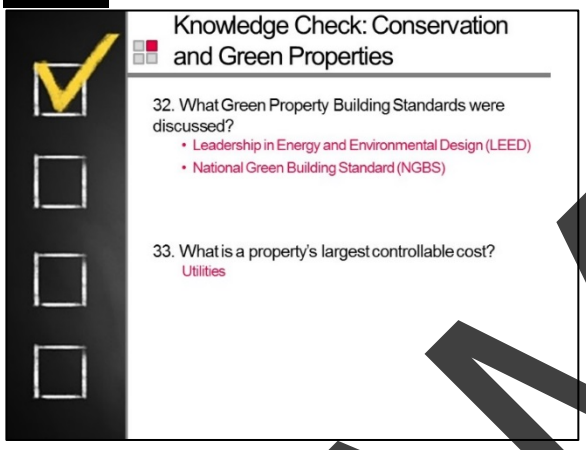

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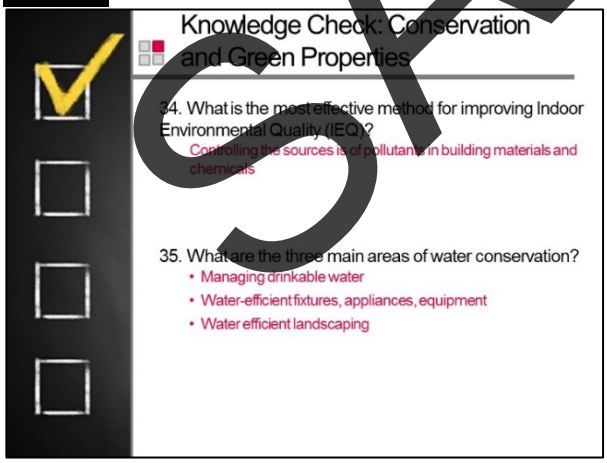

Green Practice Reference Materials

Energy Efficiency Best Practices

Reduce energy consumption by 5-20% without a significant capital investment.

Best Practice	Description
Set Goals	The goal should be written, clearly defined, and measurable.
Track Performance	Track utility usage to monitor progress toward energy goal.
Weatherization	Weatherization checklists should be created for each season. Basic weatherization measures include insulating walls, crawl spaces, and attics; sealing and weather-stripping around window and door frames; and sealing duct systems. Check insulation adequacy; add more to save money.
Operations and Maintenance	Improve operations and maintenance practices by regularly checking and maintaining equipment to ensure its functioning efficiently. Optimize start-up time, power-down time, and equipment sequencing. Revise janitorial practices to reduce the hours that lights are turned on each day. Perform monthly maintenance of heating and cooling equipment to guarantee efficient operation throughout the year. Review and emphasize the financial and environmental results of a preventative maintenance program for major systems and components.
Lighting	Replace all incandescent bulbs, floodlights, and decorative spotlights with ENERGY STAR qualified LED bulbs. Replacing one 60 watt incandescent bulb with a 10-watt LED bulb will save $150 in energy costs over the LED's lifetime. ENERGY STAR qualified LEDs are rigorously tested to ensure that they will last their 25,000+ average hour life.
Change Air Filters	Inspect, clean, or change air filters every month. A dirty filter wastes energy by slowing airflow and making the system work harder. You should be familiar with the location, sizes, and types of air filters required for your system. Also consider upgrading standard filters to MERV 8 or higher pleated filters. These filters improve indoor air quality by removing finer particulate matter than standard fiberglass air filters and reduce your maintenance budget due to their 3 month life-span compared to the 1 month life-span of standard fiberglass air filters.
Install Programmable Thermostats	Installing a programmable thermostat is one of the easiest ways to save energy and efficiently manage cooling and heating. Install programmable/set back thermostats in offices, clubhouses, fitness centers, and laundries. Install locked covers and set the desired temperature levels for the various times of the day.

Best Practice	Description
Use Equipment Automatic Controls	Review and adjust any on-off controls such as programmable and mechanical time clock settings, set points, lighting photocells, and occupancy sensors.
Reduces Standby Power	Standby power or "phantom load" refers to the electrical power consumed by electronic appliances while they are switched off or in a standby mode. Simple methods to reduce standby power: • The easiest way is simply to unplug the unused devices. • Replace battery-powered devices, such as cordless phones, with corded alternatives. • Use a power bar such as a Smart Strip. The Smart Strip monitors power consumption and can sense the difference when computers and similar devices are on or off. Upon sensing an "off" mode, it shuts off the power, eliminating the idle current.
Repair Leaks	Repairing leaks will save both water and energy for hot water heating.
Seal and Insulate Duct Systems	The Department of Energy (DOE) notes sealing ducts can improve efficiency by 20%.Focus first on sealing and insulating ducts that run through unheated spaces such as attics, crawlspaces, basements, and garages. Start by sealing seams with duct tape before wrapping with insulation.
Tune-Up HVAC, Boilers, and Building Systems	Building equipment should be tuned up annually, just as you would tune up an automobile to get the best performance. Clean HVAC coils, evaporator, and condensers annually. Change filters quarterly. Turn off water heaters at the breaker.
Lower Swimming Pool and Hot Tub Temperature Settings	The American Red Cross recommends 78 F as the optimal swimming pool temperature. This adjustment can mean significant savings for pools typically set to 80F and higher. Try setting hot tubs to 96F during hotter months and no higher than 102F during cooler months.
Use Ceiling Fans	Utilize existing ceiling fans (or install ENERGY STAR qualified ceiling fans) to reduce the need for air conditioning. Ceiling fans cool people not rooms, so if a room is not occupied, the ceiling fans should be turned off to save energy. In the summer months, the blades should turn counterclockwise to create a direct breeze toward the floor. In the winter, the blades should turn clockwise to push warm air at the ceiling toward the floor.

Best Practice	Description
Install Lighting Controls	Turn off lights when not in use or when natural daylight is sufficient. This can reduce lighting expenses by 10 to 40 percent. Some of the more common types of controls are: • Manual Dimming • Photo Sensors • Occupancy Sensors • Clock Switches or Timers
Better Manage Vacant Units	Effective measures for vacant units include turning off breakers when feasible, turning heating and cooling off or to a minimal temperature setting, adjusting refrigerators and freezers to their warmest settings, and turning off water heaters. Review vacant unit bills to identify unnecessary water, and energy use. Frequently walk through vacant units to ensure lights and thermostats are off and windows and blinds are closed.
Minimize Heating and Cooling Load	Install weather stripping on doors and windows to eliminate drafts and air leakage. Use window shades, tinting, films, or blinds to reduce heat again in the summer (and heat loss in the winter). When weather is temperate, open windows rather than using mechanical heating or cooling equipment. Use shades and blinds to control direct sun through windows in both summer and winter to prevent or encourage heat gain. Control direct sun through windows depending on the season and local climate. During cooling season, block direct heat gain from the sun shining through glass on the east and especially west sides of the facility.
Heating, Ventilation, Air Conditioning (HVAC)	HVAC systems can account for 40% to 60% of the energy used in commercial and residential buildings. Prior to upgrading HVAC equipment, reduce building heating and cooling loads and complete an energy analysis to select the most efficient, cost-effective equipment: 1) Select ENERGY STAR qualified equipment with high-efficiency rating. 2) Install multi-stage compressors. 3) Install an economizer to cool the building when outdoor air is cooler than indoor air. 4) Properly size equipment and ducts to reduce energy waste. 5) Properly install equipment. Improper installation can reduce HVAC efficiency by up to 30% and shorten the equipment's life.
Water Heating	Water heating is a large component of the total energy consumption of a building. Water conservation strategies include: • Repair leaking faucets and supply lines. • Replace standard fixtures with high-efficiency faucets and shower heads. • Retrofit existing fixtures with aerators. • Install pressure reduces to restrict water pressure and flow rate. • Install demand-controlled water circulators to save water and energy by eliminating the wait for hot water.

Best Practice	Description
Educate Employees and Be Diligent	• Educate employees and building occupants about how their behaviors affect energy use. • Ensure that team members from every department are trained in the importance of energy management and basic energy-saving practices. Hold staff meetings on energy use, costs, objectives, and employee responsibilities. • Educate staff about how their behaviors affect energy use. Some teams have created energy patrols to monitor and inform others when energy is wasted. • Develop an energy team and assign responsibilities to pursue energy efficiency in all departments. • Install energy monitors for common areas to help staff and residents understand the energy that is consumed, and how their actions can positively and negatively impact consumption.
Irrigation Systems	Regularly check (weekly in season) the property's irrigation system. Check clock functioning that controls time of day and amount of water. Make sure rain sensors work so you are not watering when it is raining. Perform monthly inspections looking for leaks, broken heads, misaligned nozzles, and missing valve box lids. Consider landscaping that requires little or no water.
Conduct a Self-Assessment Energy Audit	Identify obvious defects that contribute to energy waste.
Retrofitting	Replace worn, less efficient parts and equipment with newer energy saving models

Self-Assessment Energy Audit Guide

- ❑ Check for indoor air leaks, such as gaps along the baseboard or edge of the flooring and at junctures of the walls and ceiling.
- ❑ Check for gaps around pipes and wires, electrical outlets, foundation seals, and mail slots.
- ❑ Check to see if the caulking and weather stripping are applied properly, have no gaps or cracks, and are in good condition.
- ❑ Inspect windows and doors for air leaks:
  - ❑ Check for rattling frames.
  - ❑ Check for daylight around door or window frames.
  - ❑ Check the storm windows to see that they fit and are not broken.
- ❑ On the outside, inspect all areas where two different building materials meet:
  - ❑ All exterior corners
  - ❑ Where siding, brick, stucco meet
  - ❑ Areas where the foundation and the bottom of exterior brick or siding meet
  - ❑ Check for holes or penetrations for faucets, pipes, electrical outlets, and wiring.
- ❑ Check for cracks and holes in the mortar, foundation, and siding.
- ❑ Check the exterior caulking around doors and windows, and see whether exterior storm doors and primary doors seal tightly.
- ❑ Check to see that areas above condition spaces (attics) have adequate insulation.
- ❑ Check to see that the attic hatch is insulated and has weather sealing.
- ❑ Determine whether openings for items such as pipes, ductwork, and chimneys are sealed.
- ❑ Check to see if there is a vapor barrier under the attic insulation:
  - ❑ The vapor barrier might be tarpaper, Kraft paper attached to fiberglass batts, or a plastic sheet.
  - ❑ If there does not appear to be a vapor barrier, you might consider painting the interior ceilings with vapor barrier paint. This reduces the amount of water vapor that can pass through the ceiling.
  - ❑ Large amounts of moisture can reduce the effectiveness of insulation and promote structural damage.
- ❑ Make sure that the attic vents are not blocked by insulation.
- ❑ Check exterior walls for insulation by removing outlet cover plates:
- ❑ Make sure the circuit breaker is turned off and the outlet is not "hot" before removing the cover plate.
- ❑ Check to see if unheated areas under the living area flooring are insulated.
- ❑ Check to see if foundation walls in heated basements are insulated.
- ❑ Check to see if water heater, hot water pipes, and furnace ducts are insulated.
- ❑ Have a professional check and clean HVAC equipment once a year.
- ❑ Check filters and replace them as recommended by the manufacturer:
  - ❑ Generally, filters should be changed once every month, especially during periods of high usage.
- ❑ Check ductwork for dirty streaks near seams; these indicate air leaks.
- ❑ Check for insulation on any ducts or pipes that travel through unheated spaces.

Indoor Environmental Quality (IEQ)

Pollutants in building materials and chemicals diminish Indoor Environmental Quality (IEQ). Controlling the sources is the most effective method for improving IEQ.

Pollutant	Description	Health Effects	To Reduce Exposure
Asbestos	A mineral fiber once used for insulation and as a fire retardant. Found in older homes, in ceilings, floor tiles, or wrapped pipes	Lung cancer, mesothelioma, and asbestosis	• Do not cut, rip, or sand asbestos-containing materials • Use a certified contractor if asbestos will be disturbed or requires removal
Biological Contaminants	Includes bacteria, molds, mildew, and viruses can be distributed through buildings by central air systems.	Exacerbation of allergies and asthma; the extent and severity is unpredictable	• Route exhaust fans to outdoors • Control level of building moisture • Tear out building absorbent materials if wet for 24 hours or more • Do not install porous materials in areas exposed to moisture
Carbon Monoxide, Nitrogen Dioxide, and Particles	Burning fuels creates carbon monoxide and nitrogen dioxide.	If proper venting is blocked, the invisible gas can build up and cause headaches, dizziness, or nausea and even death.	• Ventilate to outdoors • Use carbon monoxide (CO) detectors • Keep burners properly adjusted, flame should burn blue • Never use a gas stove to heat a space • Annually inspect furnaces, flues, chimneys
Carpeting	New carpet, adhesives and padding can be a source of chemical emissions	See VOCs	• Ask the installer to air out the carpet in a well-ventilated area. Most fumes evaporate in 48-72 hours • Use proper ventilation equipment during and after installation • Specify use of low-emission adhesives • Specify carpet with the Carpet and Rug Institute's (CRI) Green Label

Pollutant	Description	Health Effects	To Reduce Exposure
Environmental Tobacco Smoke (ETS)	Often referred to as "secondhand smoke." Exhaled smoke from burning a cigarette, cigar, or the tobacco in a pipe.	Cancer, respiratory infections, and asthma	• Do not permit smoking indoors • If smoking is permitted indoors, designate a sealed smoking area • Do not allow smoking outside near entrances, windows or air-intakes
Pesticides	A substance used for destroying insects	Poisoning or death; a reported 79,000 children were involved in pesticide poisonings or exposures in 1990.	• Use non-chemical pest control (traps) • If unneeded do not store in the home • Use only as directed • Ventilate areas well after use • Dispose of safely
Lead	Exposure can come through air, drinking water, food, lead-based paint, and contaminated soil. Most common exposure on a property is in lead-based paint and water pipes with lead solder at the joints.	Poisoning and serious disabilities, especially in children. Lead affects practically all systems within the body.	• Leave lead-based paint undisturbed if it is in good condition • Do not sand, burn off, or remove paint that may contain lead • Find out about lead in drinking water • Adhere to EPA guidelines
Radon	A cancer-causing radioactive gas you can't see, smell, or taste; generally found in soil and basements	Lung cancer	• Test for it; purchase a kit or have a test completed by certified professional • Seal crawl spaces and ventilate air
Volatile organic compounds (VOCs)	Ingredients in household products including paints, varnishes, wax, household adhesives, sealants, cleaners, disinfectants, etc.	Each chemical can cause different health effects. Common symptoms include headaches, nausea, vomiting, dizziness, increased risk of liver, kidney, & central nervous system damage, and cancer.	• Use only as directed • Ventilate areas well after use • Dispose of safely

For more information on environmental pollutants and steps you can take to reduce exposure visit the EPA: An Introduction to Indoor Air Quality/Improving Indoor Air Quality at www.epa.gov/iaq/is-imprv.html.

Resource Efficiency

Wasted resources are lost profits. Green buildings reduce waste, reuse materials, buy green products, and recycle.

Goal	Description
Commit to Conserving Resources	• Set and communicate conservation and recycling goals. You are more likely to achieve goals if they are written, clearly defined, measurable, and communicated. • Educate staff and tenants on the need for conservation practices. • Designate a staff member or committee to champion your conservation goals. • Include conservation practices in operating procedures / performance expectations. • Start a suggestion and incentive system to encourage conservation practices. • Start a "conservation" column in your building's newsletter. • Use signs and placards that promote conservation and recycling habits.
Buy Green	Green Product Identification Systems label or certify green products. National Organizations include: • **ENERGY STAR Qualified** –A joint program of the EPA and the DOE; products in over sixty categories are eligible. • **Green Seal** – Certifies building materials, cleaning supplies, paper products, fleet vehicle maintenance products, etc. • **The Forest Stewardship Council (FSC)** - Certifies that wood and paper products were created with minimal damage to forest ecology and neighboring local economies. • **Green Label** – a program from the Carpet and Rug Institute (CRI) to test carpeting, cushions, and adhesives to identify products with low emissions of VOCs. • **GREENGUARD** – Certifies products in many categories including bedding, building materials, cleaning products, office equipment, and furniture. • **EcoLogo** – Certifies products in a large variety of categories; recognized worldwide. • **Green-e** – Offers certification and verification of renewable energy and greenhouse gas mitigation products. • **Builder's Challenge** – Voluntary program that allows homebuilders to more easily differentiate their high performing homes through a standardized energy rating system. • **Enterprise Green Communities** –An organization that promotes ways to build homes and plan neighborhoods with efficient operations, resource conservation, energy efficiency, etc. • **WaterSense** – a partnership program by the EPA; the WaterSense label signifies that products are 20% or more water efficient than average products in that category. • **Green Star** – a designer and manufacturer of eco-friendly LED lighting systems to communities and businesses. These systems may complete a Life Cycle Assessment (LCA) or similar evaluation to determine the relative "greenness" of a material or product. In a strict sense, an LCA is a quantitative analysis of the economic and environmental impact of a product over its entire life cycle.

Goal	Description
Independent Third-Party Verification	Products may go through certification based on widely recognized standards established by: • American National Standards Institute (ANSI) • International Organization for Standards (ISO) • American Society for Testing and Materials (ASTM) In addition to green product labeling, look for products with characteristics such as: • Labeled "low VOC" or "zero VOC" • Have identifiable postindustrial and postconsumer recycled content. • Made from natural, plentiful, or renewable materials • Resource-efficient manufacturing to minimize material, energy, and water waste • Materials extracted and manufactured locally • Materials salvaged, refurbished, or remanufactured such as old doors, flooring, and concrete • Can be easily dismantled and reused or recycled • Recycled or recyclable product packaging • More durable than similar conventional products
Reduce Office Waste	• Turn off lights and computers when not in use. • Reduce paper use; print less and print double-sided copies. • Cancel unread magazine subscriptions and newsletters. • Skip bottled water; bring a reusable water bottle to work. • Use durable, reusable products rather than single-use materials. • When ordering supplies, ask if surplus or unused materials can be returned. o Be cautious ordering large quantities to receive a discount; you may only use a portion. • Reuse common items such as file folders and envelopes. • Eliminate unnecessary products. • Reduce e-waste - keep cell phones, computers, and other electronics as long as possible.
Recycle	Make recycling as easy as possible for tenants: • Place recycling bins near trash bins • Ensure accessibility to persons with disabilities • Clearly label recycling bins • Keep recycling areas and containers clean and free of odors • Monitor for pests

Water Efficiency

Goal	Description
Water-efficient Fixtures, Appliances, Equipment, and Systems	Current water-efficient fixtures, appliances, and equipment provide equal or superior performance. • Ultra Low-Flow Fixtures –Can save 20% or more water. o Select ones with an EPA WaterSense label which shows water efficiency and flow. • High Efficiency Toilets (HETs) – Use 20% less water than the current federal standard. • Bathroom Faucets – Low-flow faucets can save 30% on water use. • Low-Flow Urinals–Replacing inefficient fixtures can save between 1.0 and 4.5 gallons per flush. • Waterless Urinals –uses oil-based fluid and a disposable cartridge to maintain sanitary trap. • Low-Flow Showerheads –Can save nearly 25% water and 300 kWh of electricity annually.

Water Efficient Landscape	Create an attractive, water efficient landscape by using water-conserving techniques such as:
	• Drip systems – Water is applied directly to the roots of plants, uses 30- 50% less water than sprinkler systems.
	• Moisture and Rain Sensors –Override an automatic irrigation controller's "on" signal when sufficient rain has fallen or soils are moist.
	• Hydrozone – Group plants by water needs to reduce over- and under-watering of plants.
	• Minimize Turf –Some varieties of turf require 40" of water a year. Instead, plant a drought-tolerant grass such as buffalo grass, which requires ½" of water per week.
	• Use a mulching mower; set blades at three inches to reduce amount of water.
	• Soil Preparation – A well-drained soil, defined as one that can absorb a half inch of water or more per hour, helps plants set deep roots to take advantage of deep water and nutrients.
	• Composting – Proper soil amendments can either help a soil drain faster or more slowly.
	• Mulch – Spreading mulch on top of soil significantly reduces the evaporation of water.
	• Xeriscaping –Landscaping with slow-growing, drought-tolerant plants whose deep root systems maximize water use while requiring less surface watering.
	  o Use indigenous plants or those from areas with similar climates.
	  o Reduces the amount of trimming and waste removal, fertilizer, and pest control.

Water Conservation Practices	Make a concerted effort to affect water usage behaviors. Share these ideas with tenants: • Only run dishwasher when full. If washing by hand, use a tub; don't run water continuously. • Shorten showers, even by one or two minutes. • Turn off faucets while brushing teeth or shaving. • Use a broom instead of a hose to clean driveways and sidewalks. • While you wait for hot water, capture the flow in a watering can to use later on houseplants. • Adjust water levels in the washing machine to match the size of the load. • Don't run the hose to wash a car. Use a bucket for rinsing, followed by a *quick* hose rinse. • Reduce outdoor water use by watering the lawn early in the morning or late in the evening.

Learn more about saving water with EPA WaterSense program by visiting: www.epa.gov/watersense/.

National Apartment Association Education Institute
4300 Wilson Blvd, Suite 400
Arlington, VA 22203
703-518-6141 | www.naahq.org

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