

NYCHA MOLD TRAINING

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Building Science for Inspectors – Day 1



Why Are We Here Today?

- Because exposure to excessive moisture and mold is considered a major asthma trigger - IOM 2004, WHO 2009, and NYC DOHMH 2008
- Because the mold problems in NYCHA apartments keep coming back: 1) mold growth conditions are being painted over and paint is mold food; 2) the **Root-Cause** of the moisture conditions has not been identified and corrected.



Photo Source: NY Daily News



Mold and the Asthma Epidemic in NYCHA Housing

- >400,000 low-income residents
- Childhood asthma at epidemic levels (21.8%)
- In 2013, with help from LSAFHS and NRDC, NYCHA residents with asthma file class action lawsuit against NYCHA (Baez case). Residents prevail. Consent decree requires NYCHA to promptly and effectively identify and remediate mold and correct underlying moisture root causes.
- NYCHA violates consent decree – court appoints Special Master

Health Inequity – Asthma in Low-Income Housing

Prevalence, Health Inequity, and Opportunity

Over 24 million Americans have current asthma (7.8% of US population)¹, CT 9.3%²

Over 6 million American children have asthma (8.4% of US population)¹, CT 10.5%²

Wide health disparities in childhood asthma by housing type in NYC³



Private NYC Housing
7% asthma prevalence



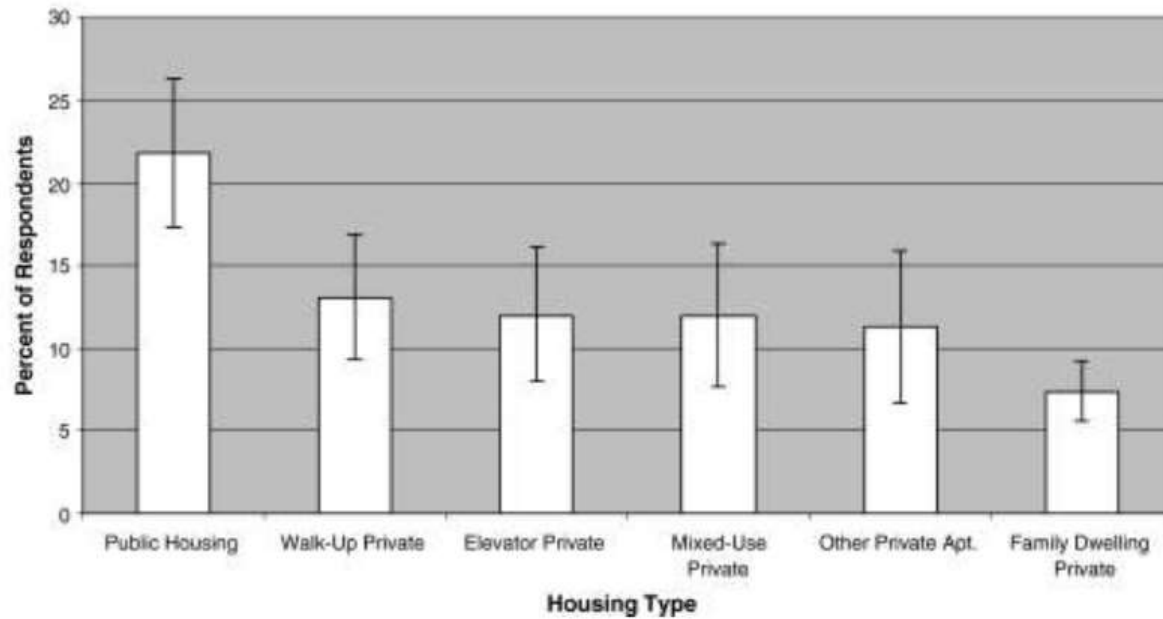
Typical NYC Apartment
12% asthma prevalence



NYC Public Housing
22% asthma prevalence

<https://www.cdc.gov/asthma/mostrecentdata.html>

Asthma Prevalence Data



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Where Does Mold Grow in NYCHA?

- The paint on plaster, concrete, and sheetrock walls/ceilings
- The paper covering of sheetrock walls/ceilings (front/back and top/bottom sides)
- The covering of pipe-wrap insulation in wall cavities
- Bathroom tile grout and caulking
- Kitchen and bathroom cabinetry
- Wood framing materials in wall cavities

Preventing Mold In NYCHA

- Mold growth is always associated with excessive moisture problems.
- How do we **prevent** or **control** excessive moisture and what are the **Root-Causes** of excessive moisture?
- What are the most common Root Causes and how do they lead to excessive moisture?

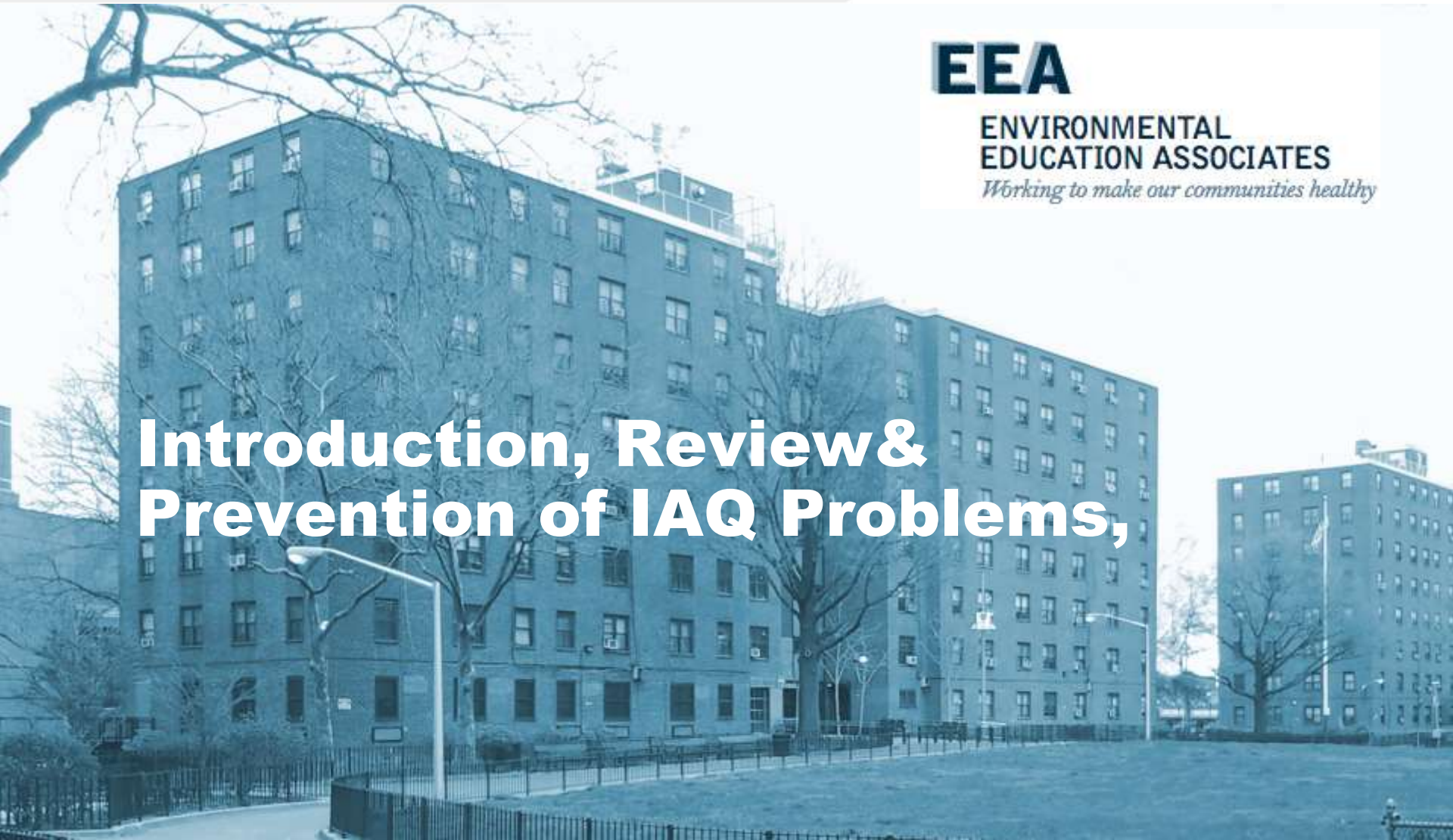
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**Introduction, Review &
Prevention of IAQ Problems,**

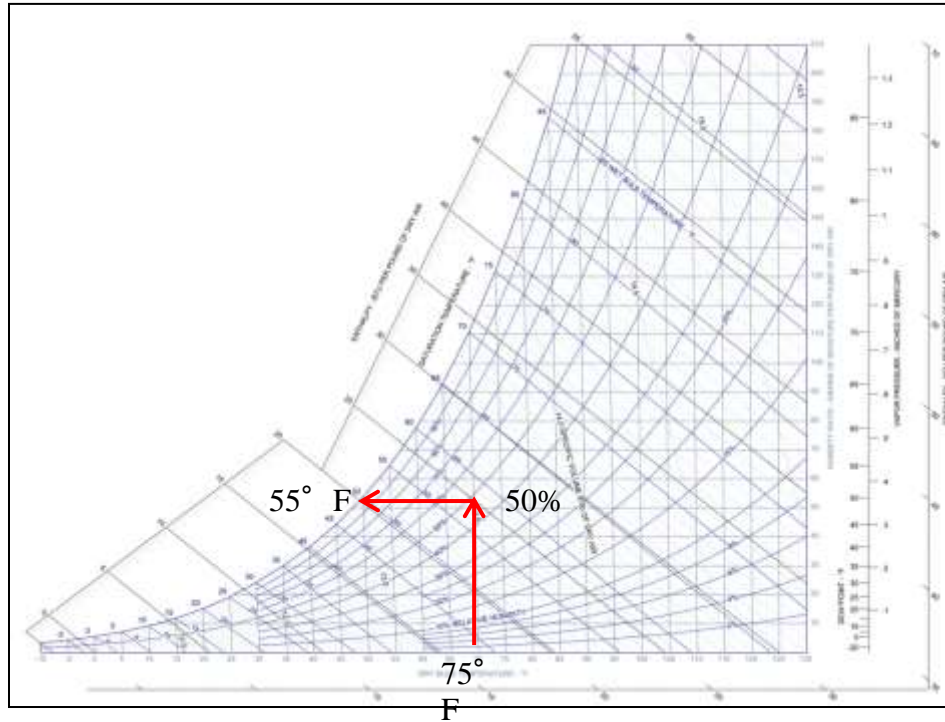


Understanding Condensation



- Why does condensation form on the outside of a cold drink in the summer?
- Dew point!

What is Dew Point?



Warm air can hold more moisture than cold air. The dew point is reached when the air is cooled to the point of saturation (100% Relative Humidity). When this occurs we call it condensation

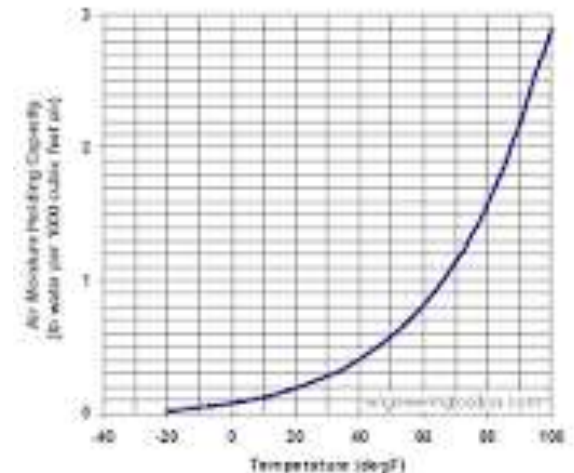
Psychrometric Chart

Relative Humidity

- The amount of moisture in the air at a given temperature, as compared with the amount of moisture the air could hold before reaching saturation at that temperature

Temperature

- As temperature changes, so does the amount of evaporation and moisture, or humidity, in the air.
- Humidity increases as temperatures cool and air approaches its dew points.
- The dew point is the temperature at which the atmosphere becomes saturated, and knowing it is critical to being able to measure humidity.



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Humidity

- Ideal relative humidity (R.H.) should be between 40% - 60%
- Avoid extremes of R.H. (< 20% and > 80%)
- Extremely low R.H. causes:
 - eyes, noses & throats to dry;
 - produces irritations & soreness;
 - increases susceptibility to infection;
 - increases problems associated with static electricity.
- High R.H. causes:
 - high moisture;
 - promotes growth of fungi and mold

Cold Weather Condensation



- Can occur when warm moist interior air contacts cooler surfaces such as windows.
- Condensation forms when the surface temperature is below the dew point temperature for the interior air

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Warm Weather Condensation



- Can occur when warm moist interior air contacts cooler surfaces such as cold water pipes.
- Toilet tanks containing cold water often causes condensation
- Hot showers can cause condensation on “warm” surfaces

Shower Vapor Condensation



How do we Control Condensation?

- Assure that bathrooms are equipped with adequate exhaust ventilation.
 - Clean/uncover bathroom exhaust grills and horizontals.
 - Repair rooftop exhaust fans: belts, motors, seating, timers.
 - Clean and assure proper function of backflow dampers.
- How can residents help control condensation (see Controlling Mold in Your Apartment document):
 - Monitor exhaust ventilation function (tissue trick) and condition of exhaust grill. Notify building maintenance staff when repairs and/or cleaning is needed.
 - Discontinue the use of shower racks/clothes lines above bathtubs.
 - Try to limit the length of shower time. Open bathroom windows and doors after showering.
 - In the summertime, lower humidity levels in your apartment by using an air-conditioner.
 - Improve general ventilation in the apartment by keeping windows open slightly at all times.

Controlling Shower Vapor Condensation - Exhaust Grilles



Controlling Shower Vapor Condensation - Roof Fans



Motor Problems



Improper Seating of Housing



Loose or Broken Belts

Broken timers



Controlling Shower Vapor Condensation - Backflow Dampers



Condensation on Cold Water Pipes In Wall Cavities



Missing insulation on cold water riser



Damaged insulation on cold water riser



Missing insulation on cold water supply t

Conducting Wall-Breaks to Locate the Root-Cause of Excessive Moisture

- When should you conduct a wall-break?
- What should you be looking for?
- How large of an opening should you make and when should you use a borescope?
- Dust control during wall-breaks
 - Standard Procedure Lead Safety for Renovation, Repair, and Painting (SP 040:18:2)
- Lead-based paint
- Asbestos pipe wrap insulation
 - Look carefully, consider suspect ACM to be ACM.

See detailed discussion in Wall Break section on slides 127-136

What's Wrong with this Wall-Break?



What Should Have Been Done Differently?

Toilet Condensation - In Apartment



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Toilet Condensation - From Above



Perimeter Wall Condensation



Moisture Movement

Rule #1

- Liquid water will naturally tend to flow laterally and vertically downward
- It will follow the path of least resistance

Plumbing Leaks/Flooding



Roof Leaks



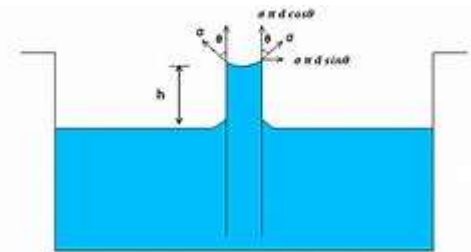
Moisture Movement

Rule #2

- Moisture will enter into porous materials due to capillary action
- A solid piece of wood will draw water up to 350-375 ft. (height of the tallest tree)
- A column of concrete placed in water will draw moisture up to 10 KM or 6 miles.
- [Capillary Action](#)

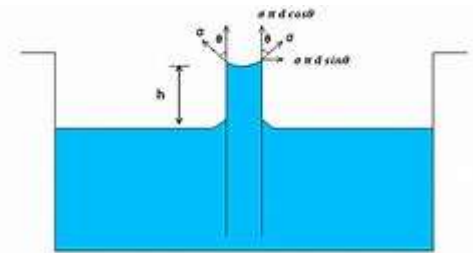
Moisture in Buildings

- Capillary Action - The movement of a liquid along the surface of a solid caused by the greater attraction of the liquid's molecules to the surface of the solid than to each other. The liquid's molecules adhere to the solid surface and also to each other, so that each molecule pulls the next one along. Water moves through the roots of trees or into the pores of a sponge or towel by capillary action.



Moisture in Buildings

- Responsible for movement of groundwater through footing (footers) into concrete wall
- Ring of dampness around base of foundation wall
- Perimeter drains help keep water away from footers



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Moisture in Buildings

- Moisture can be drawn into an opening of 3/16” or less
- If two materials without capillary pores are placed close enough together, they create a capillary pore that can draw moisture.
- How close ?

Moisture in Buildings

- Answer $3/16$ " or less
- || the distance between these two lines

Moisture in Buildings

- Materials like overlapping siding can create capillary gaps
- Capillary rise in wood siding
- Film of water on surface of siding
- Water film draws up between laps of siding by capillary suction
- Building paper
- Sheathing

Façade Leaks



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Moisture Movement #3

- Moisture moves through building materials by **vapor diffusion**
- Vapor diffusion is the movement of moisture in a vapor state as a result of a vapor pressure difference (concentration gradient)

Moisture in Buildings

- **Permeance factor** is a measure of water flow through materials
- Permeance factors (perms) specify the vapor flow in grains of moisture per hour, through one square foot of material surface, at one inch of mercury (1" Hg) of vapor pressure

Moisture in Buildings

Q: How much water can be collected over an entire heating season in most cold climates?

Moisture in Buildings

A: One-third quart of water can be collected by diffusion through a gypsum board without a vapor diffusion retarder. Whereas 30 quarts of water can be collected through air leakage.

Moisture Movement Rule #4

Moisture moves from hot to cold

- Moisture can move through building materials by diffusion or through a hole by air transport

Moisture Movement Rule #5

- Moisture moves from an area of higher air pressure to an area of lower air pressure
- (air transport)

Moisture in Buildings

Stack effect

- Stack effect is caused by warm air rising within a structure
- As warm air rises, it creates a higher air pressure at the ceiling area and forces air out of the building
- As the air leaves, or exfiltrates, it is displaced with outside air that is drawn into the building from the floor area (infiltrates)
- Stack effect can result in up to .5 ACH or 150 cfm in one home

Prevention & Control Measures

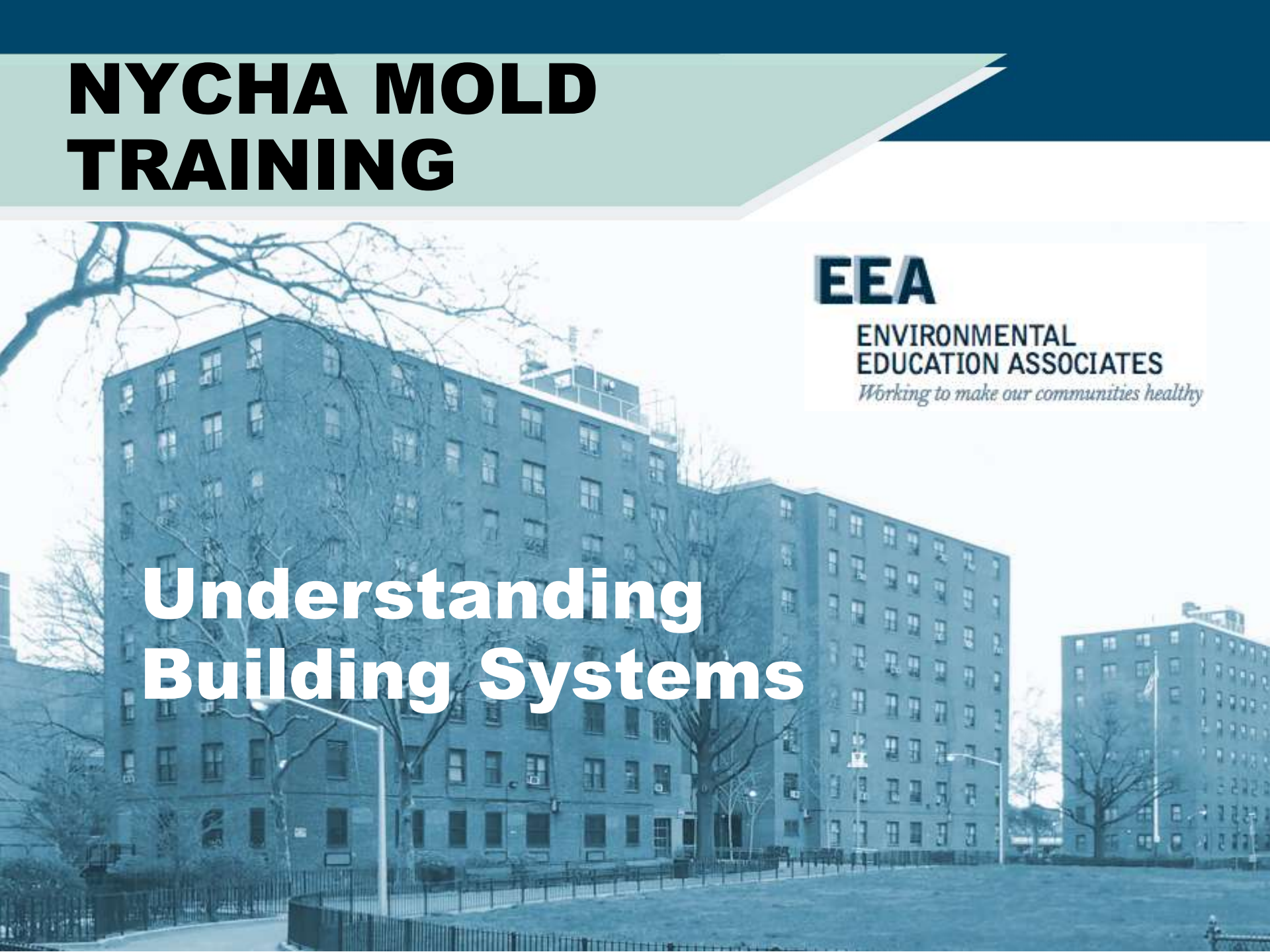
- Inspection, Testing & Maintenance
- Avoid development of contamination
- Safe operating procedures
- Improved Maintenance
- Housekeeping

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Understanding Building Systems

Building Construction

Residential Properties are built according to:

- Design Objectives
- Building Code
- Housing Code
- Permitting Requirements



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NYCHA Developments

- Multi-story
- Similar construction plans
- Similar construction materials
- Similar moisture problems
 - Poor ventilation
 - Condensation
 - Leaks
- Similar capital needs

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**Ventilation &
HVAC**



HVAC

- Heating
- Ventilation
- Air Conditioning



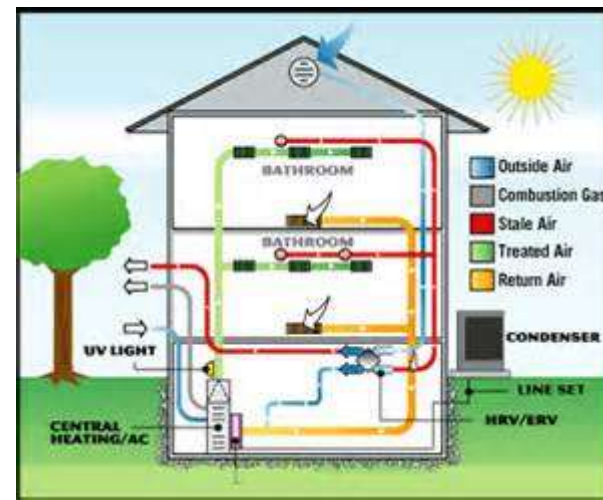
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HVAC Systems Primary Functions

- Temperature Control
 - Cooling
 - Heating
- Humidity Control
 - Humidification
 - Dehumidification
- Air Quality Control
 - Ventilation
 - Cleaning



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Air Movement

- Too little air flow causes stuffy and uncomfortable environment;
- Too much causes draught & excessive cold.
- Internal partitioning & clutter creates “dead spaces”.

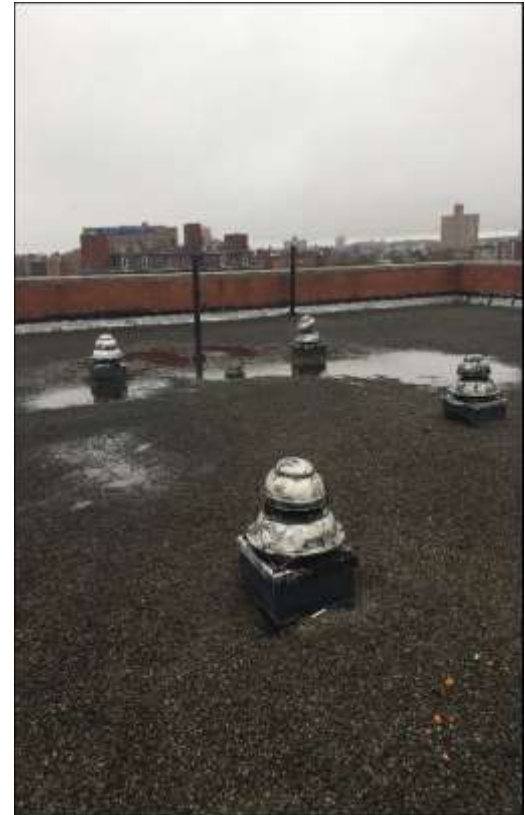
[Ventilation Basics 1](#)

[Ventilation Basics 2](#)



NYCHA & Ventilation - Guiding Questions

- Why is ventilation important?
- How is it achieved in NYCHA buildings (and others)?
- What are the most common problems?
- What are some best practices for resolving these problems?



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Purpose of Exhaust Ventilation

To remove pollutants at their source:

- Kitchens; Cooking grease, water vapor, gas, CO
- Bathrooms; Moisture = Mold
- To provide adequate fresh air to a space
- Required by NYC Building Code



Ventilation

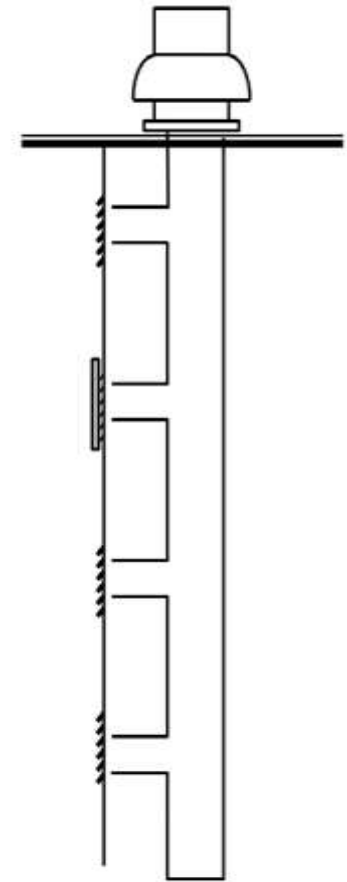
- **Natural Ventilation**
 - Operable window
- **Central Exhaust Rooftop Fans**
 - Vertical shafts
 - Horizontal takeoffs
 - Wall or ceiling grilles
- **In-line fans**
 - Small fan in the duct
 - Most energy efficient
- **Continuous vs. Intermittent**

Evaluating The Ventilation System

- Does the building have a ventilation system?
- Is the system on all the time?
- Is the system continuous or does it go on and off during the day?
- Does each room have a vent?
- Are the vents supplying or removing air?

Ventilation Central Exhaust

- 65% of NYCHA homes have mechanical ventilation in bathrooms
- Approximately 114,000 units
- In the process of updating these numbers for more accuracy



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Examples of Exhaust Ventilation



Steps for Initial Inspection

1. Generate inspection work order

Maximo will generate a roof fan IN (Inspection Work Order) for each building to the craft of SUPT (Property Maintenance Supervisor). **This work order will be a paper ticket and will transition to the handheld in the future.** On the Inspection Tab, there will be a series of tasks listed with questions.

Ventilation Systems

Grill & duct build up is common and fungal growth can attach to that debris. While we do not remove registers and air vents we must ensure that we visually verify that debris and dust has not accumulated in the ducting and providing a growth platform for mold.



Functioning Roof Fan



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Steps for Initial Inspection

2. Override fan timers

NYCHA's new policy is that roof fans must be operating 24 hours a day. The PMS must override the fan timers to ensure fans are operating continuously.

a. On the inspection work order, Task 10, Question 1 asks whether the fan timers have been overridden to allow them to operate on continuously. This is a mandatory question in the inspection work order.

b. The PMS is required to locate and bypass the existing roof fan timer(s) by removing the Off Pin and then tripping the Override or Bypass Switch (see supplemental section). Timers can be in a basement or a roof top distribution room.

c. After the timers are bypassed, the PMS must secure the timer cover. The PMS should also attach a sign to indicate that the timer has been bypassed. (Staff may create their own sign or use the one attached to this notice.)

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Steps for Initial Inspection

4. Ensure fans are operational

The PMS must physically inspect each roof fan and confirm airflow from base of fan housing. The results must be recorded in the Inspection work order.

a. Task 20, Question 2 will ask whether a specific fan is operational. If the fan is not operational and requires repairs, staff should enter an “unsatisfactory” result in Maximo. This will automatically create a child work order for each inoperative roof fan. This should be repeated for each of the roof fans on the building.

Steps for Initial Inspection

5. Repair roof fans that are not operating properly
 - a. Information on roof fan repairs is provided in Section Y below.
 - b. Staff may need to use a vendor for repairs.
 - c. Once the roof fan has been repaired and is operational, the PMS should enter a CAT (Corrective Action Taken) in Maximo to create a Closed Child Work Order.

Fan Maintenance and Repair - Note!

The predominant fans installed throughout the NYCHA portfolio were manufactured by Greenheck and are Direct (model NYD) or Belt Drive driven (model NYB). For complete manufacturer's maintenance recommendations and troubleshooting, please refer to Greenheck fan info in the Appendix.

Fan Drives



Direct Drive



**Belt
Driven**



???

Fan Maintenance and Repair – Critical Items

To determine fan model number if manufacturer name plate is illegible or missing:

1. Review Development Blueprints or QWEB for Heating and Ventilation Plans (see examples below).

Instructions for accessing QWEB are attached with this guidance.

2. Refer to the Greenheck Catalog sheet which lists the fan Curb Dimensions. See Table 1 on page 2, column A, which will narrow your choices.

Fan Maintenance and Repair – Critical Items

To determine Motor HP and RPM:

1. Motor is to be sized correctly for Horse Power and RPM as per original specifications.
2. Review Development Blueprints or QWEB for Heating and Ventilation Plans.
3. Refer to Greenheck Catalog Performance Data (pages 3-4 of the Greenheck catalog – see Appendix).

Fan Maintenance and Repair – Critical Items

Below are the steps you should follow to ensure that fans are operating correctly.

1. All bolts must be installed by connecting the base plate to fan housing. This will decrease vibration/noise issues. Rubber isolators (double studded) that are worn out must be replaced, as this will also cause vibration/noise issues.
2. Individual fan disconnect switch must be equipped with the correct size fuse.
3. Belts must be properly installed and tensioned.

Fan Belt Maintenance

Fan Maintenance and Repair – Critical Items

4. Impeller to Inlet Cone (venturi) must have correct overlap and must be centered properly (See fan Info Sheet Figure 2).
5. Belt Driven Models- Impeller Shaft bearings must be properly greased.
 - a. Pulleys must be properly aligned.
6. All roof fans are equipped with a Backdraft Damper which must operate freely.
 - a. Clean using a HEPA vacuum if excessively dirty.
 - b. Only use a Dry Lubricant (graphite or molybdenum disulfide based product) on the Pivot points.

Process Detail for Ongoing Monthly Inspection

- Maximo will generate a monthly inspection work order for roof fans. Developments will be required to do the inspections monthly and to repair any defective roof fans within 21 days by utilizing either in-house staff or a vendor.
- Staff should follow the same steps as the initial inspection described above, although once the timer has been bypassed, staff do not have to adjust it again unless there is a problem.

Ventilation Program Progress – **NEW**

- Roof fan installation complete
- Roof fan inspection Standard Procedure (SP 050:21:1) in place 7 30 21
- 40 CFM increase on average as a result of the clean vents initiative
- 62,000 out of 86,000 units have vents cleaned.
- Fire damper project in the works.
- **Video link**

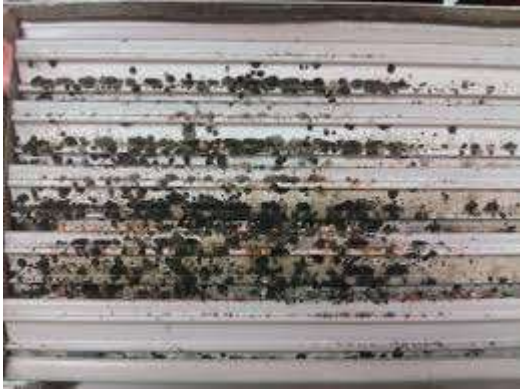
Air Conditioning



- NYCHA residential units do not have central air conditioning
- Window units account for efforts to cool spaces



Problem - Air Conditioning



- Leaking or poorly installed AC units can result in water damage and mold contamination in the unit and on adjacent building materials

Solution – Air Conditioning

- Install according to the manufacturers instructions
- Remove obstructions to drainage
- Clean with an anti-microbial cleaner
- Change filters on a regular basis



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Root Cause Review



Root Causes - Sealant Related Issues

1. Sealant Related Issues - Issues that can be resolved by removing and replacing old caulking.

iWM Selection

iWM Description

- **Caulking DML (Maintenance)** Caulking DML (Maintenance) should be selected when mold, water damage, or wet conditions are found in a bathroom or adjacent room due to water penetrating through missing or damaged areas of the bathtub/shower caulking.
- **Grouting DML (Bricklayer)** Grouting DML (Bricklayer) should be selected when mold, water damage, or wet conditions are found in a bathroom or adjacent room due to water penetrating through missing or damaged areas in the shower/bathtub grouting resulting in the need to replace tiles.
- **Grouting DML (Plasterer)** Grouting DML (Plasterer) should be selected when mold, water damage, or moisture is found in a bathroom or adjacent room due to water penetrating through missing or damaged areas of in the shower/bathtub grouting requiring a Carpenter's corrective action prior to a Plasterer's replacement/installation of grout.
- **Grouting/ Caulking DML (Plasterer)** Grouting/ Caulking DML (Plasterer) should be selected when moisture is regularly accumulating around a bathtub due to a lack of caulking or grouting (e.g. grout chipping, tiles falling).
- **Grouting/ Caulking DML (Bricklayer)** Grouting/ Caulking DML (Bricklayer) should be selected when mold is found in the areas where there is missing mortar or caulking which allows water to penetrate into the building.

Root Causes – Leak Issues

2. Leak Issues – Issues caused by a leak other than an sealant issue.

iWM Selection

iWM Description

- **Leak Around Window**
Leak Around Window should be selected when there is mold, water damage, or wet conditions around the window due to lack of sealant around the window, thereby causing water to penetrate.
- **Leak From Above - Previously Identified ***
Leak From Above - Previously Identified should be selected when the root cause or remediation work for the mold, water damage, or wet condition had been identified or abated by Property Maintenance staff or Skilled Trades on a prior work order.
- **Leak Through Façade**
Leak Through Façade should be selected when mold, water damage, or wet condition are caused by water penetration through a crack or damaged/missing mortar on an exterior wall.
- **Leak From Above/Beside - Investigate**
Leak from Above/Beside Investigate should be selected when there is visible mold, water damage, or wet conditions caused by an active leak from a unit above or beside the unit with a mold condition.
- **Plumbing Leak - In Unit**
Plumbing Leak- In Unit should be selected when the mold, water damage, or wet condition is caused by a pipe leaking within the wall cavity. A wall-break will be required to diagnose this problem.

Root Causes – Leak Issues (*cont'd*)

2. Leak Issues – Issues caused by a leak other than an sealant issue.

iWM Selection

iWM Description

- **Roof Leak - Non Capital**

Roof Leak-Non-Capital should be selected when the mold, water damage, or wet condition is caused by a leak from the roof and a replacement or repair of a portion of the roof would be required.
- **Sink Supply Line Leak**

Sink Supply Line Leak should be selected when the mold, water damage, or wet condition is caused by a leak in the supply line.
- **Sink Waste Line Leak**

Sink Waste Line Leak should be selected when the mold, water damage, or wet condition is caused by a leak(s) in the waste line.
- **Toilet Leak**

Toilet Leak should be selected when the mold condition, water damage, or wet condition is caused by an active leak coming from the toilet.

Root Causes – Resident-Caused

3. Resident-Caused – Issues that can be prevented due to adjustments to resident education and behavior.

iWM Selection

- Resident - Caused (Code 1)

iWM Description

Resident-Caused by little of no ventilation during or after a shower. Resident is to leave the window open after a shower to air out the room.

- Resident - Caused (Code 2)

Resident-Caused by improper installation of a dishwasher. Contact property management to submit an APPLIANCE AGREEMENT: AIR CONDITIONER/DISHWASHER/FREEZER/WASHING MACHINE (CLOTHES) and resident is responsible to have it installed correctly.

- Resident - Caused (Code 3)

Resident-Caused by improper installation of a washing machine. Contact property management to submit an APPLIANCE AGREEMENT: AIR CONDITIONER/DISHWASHER/FREEZER/WASHING MACHINE (CLOTHES) and resident is responsible to have it installed correctly.

Root Causes – Resident-Caused (*continued*)

3. Resident-Caused – Issues that can be prevented due to adjustments to resident education and behavior.

iWM Selection

iWM Description

- **Resident -Caused (Code 4)** Resident-Caused by blocking or covering a vent. Resident will need to uncover the vent to allow for air circulation.
- **Resident -Caused (Code 5)** Resident-Caused by improper installation of a clothing dryer. Contact property management to submit an APPLIANCE AGREEMENT: AIR CONDITIONER/DISHWASHER/FREEZER/WASHING MACHINE (CLOTHES) and resident is responsible to have it installed correctly.
- **Resident -Caused (Code 6) *** Resident-Caused by other actions. Mold Busters Education will be needed for resident for future prevention of mold. A mandatory inspection will be needed to find the exact reason(s). Notes describing the situation and two (2) pictures are required: One (1) clear close-up picture is required and one (1) clear wide perspective, showing the entire situation.

Root Causes – Ventilation

4. Ventilation – Issues that are a result of inoperable roof fans and/or lateral duct issues.

iWM Selection

- **Roof Fan Out Of Order**
- **Vent Clogged/ Covered**
- **Window Inoperable**

iWM Description

Roof Fan Out of Order should be selected when the mold condition is the result of inadequate exhaust ventilation due to an out of order roof fan. This is confirmed following an inspection of the roof fan.

Inadequate Exhaust Ventilation - Vent Clogged/Covered should be selected when the mold is the result of inadequate exhaust ventilation due to the exhaust grill and/or lateral ductwork being clogged with dust or otherwise obstructed.

Windows Inoperable should be selected when the mold condition is caused because of lack of ventilation due to the window's inability to open.

Root Causes – Other Issues

5. Other – Issue(s) are being caused due to reasons outside of the four categories listed previously.

iWM Selection

iWM Description

Bathtub Shower Issues

Bathtub Shower Issues should be selected when the cause of mold, water damage, or wet conditions is related to the following issues: bathtub missing, faucet leaking, faucet running, faucet dripping etc.

Pipe Insulation DML

Pipe Insulation DML should be selected when the mold, water damage, or wet condition is caused by damaged or missing pipe insulation resulting in condensation (or sweating) on pipe surfaces. A wall-break will be required to diagnose this problem.

Toilet Bowl/ Tank Needs Barrier

Toilet Bowl/Toilet Tank Needs Barrier should be selected when the surface of the toilet tank is in direct contact with the surface of the wall, allowing condensation to transfer across surfaces.

Tub Surround DML

Tub Surround DML should be selected mold, water damage, or wet conditions are found in a bathroom or adjacent room due to water penetrating through missing or damaged areas of the tub surround that require repair or replacement.

Other *

Other - should be selected if the root cause is not listed or not evident through the standard assessment practices. A detailed explanation of visible conditions is required.

Break

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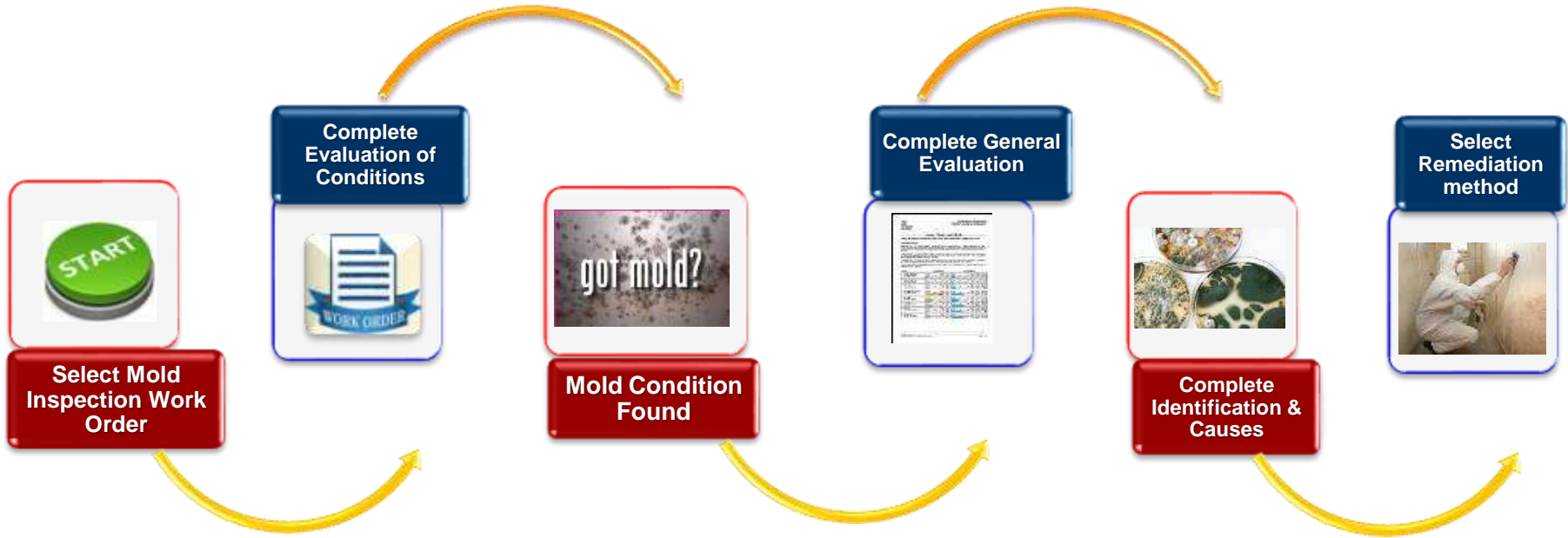
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IWM APP REVIEW



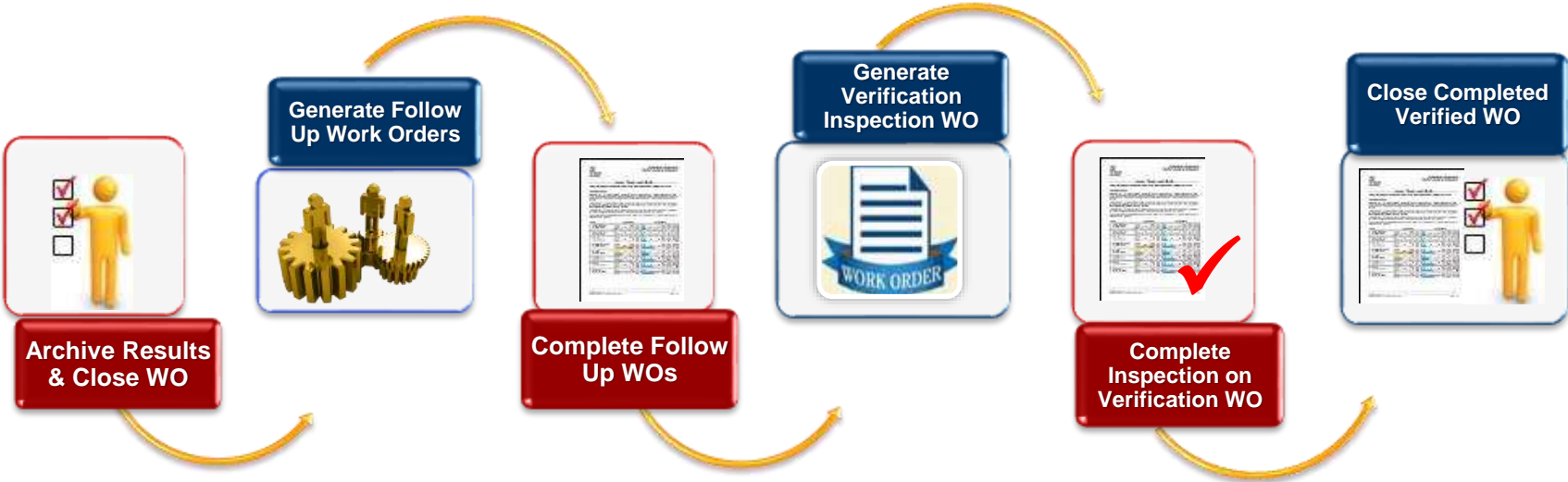
MOLD/MILDEW WO Workflow - (Continued)

Mold is Found ...Doing the Work (Part 1)...



MOLD/MILDEW WO Workflow - (Continued)

Mold is Found ...Doing the Work (Part 2)...



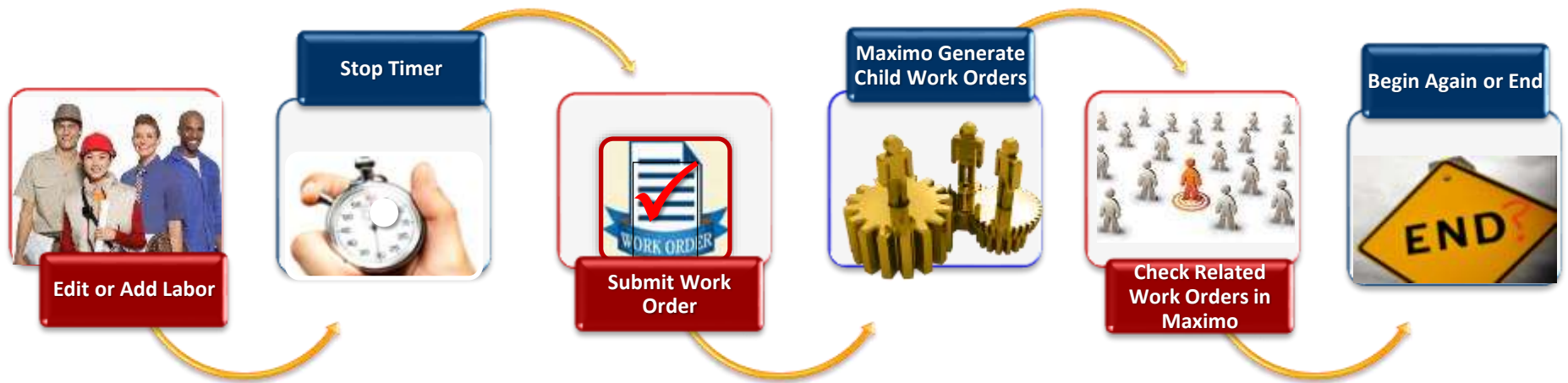
Work Order Workflow

Doing the work...



Work Order Workflow

Ending the work...



MOLD/MILDEW WO Workflow

NO Mold was Found...

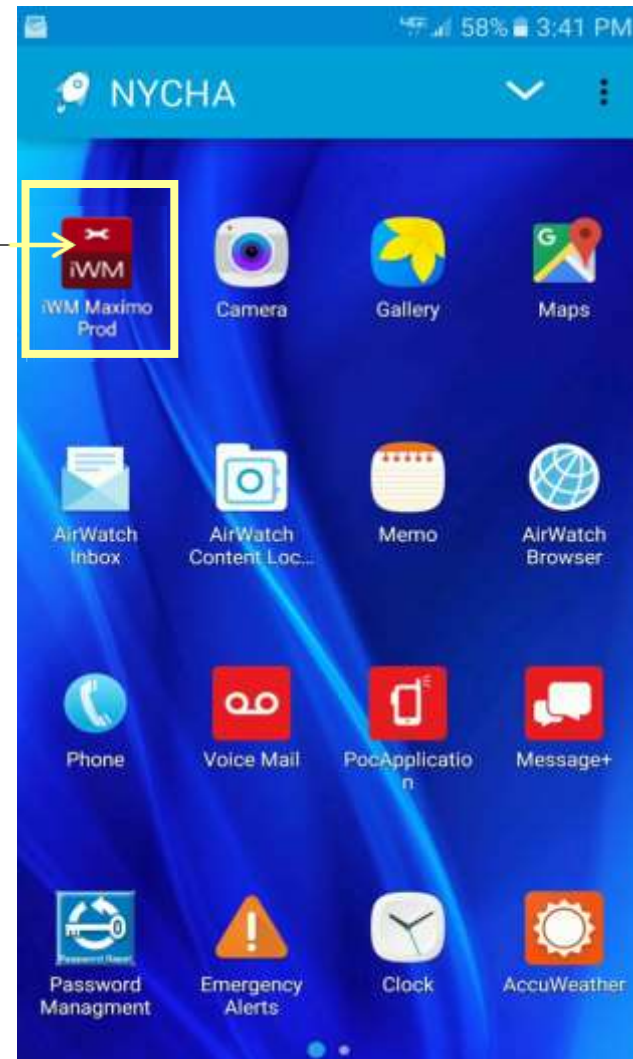


Launch the iWM Application

1

Tap on the **Work Management** Application to access the Log In screen.

1



Log In To iWM Application

1 Enter **User Name** and **Password**

2 Tap **LOGIN**

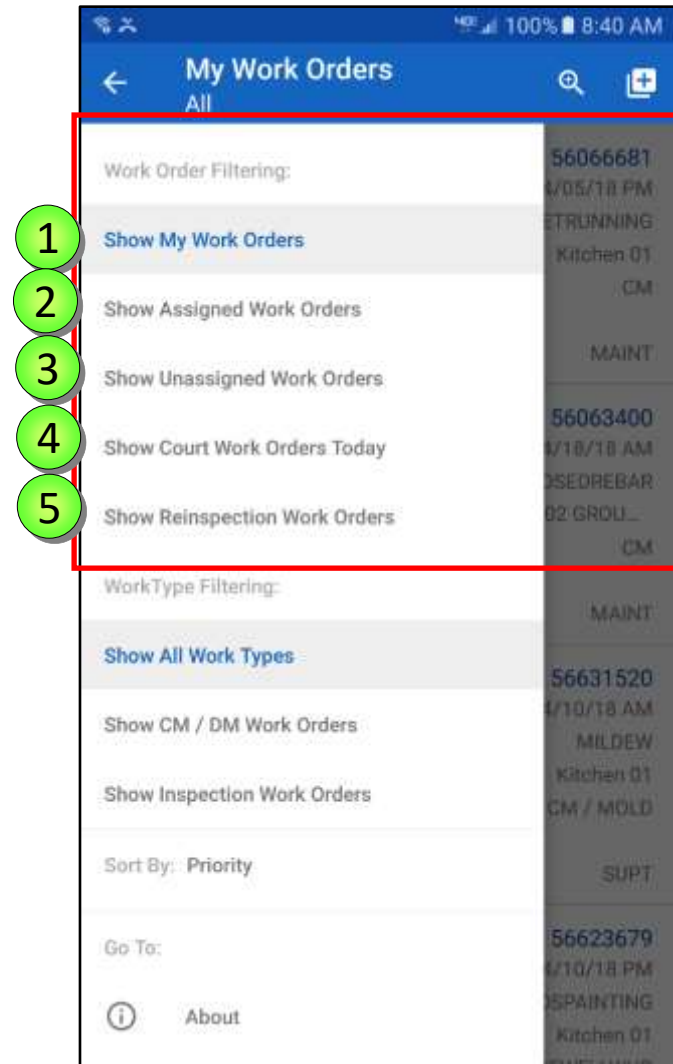
* It is the same User Name and Password as **Maximo**, and Your Computer.

NOTE: Make sure you are in an area that has good cell service.



Menu

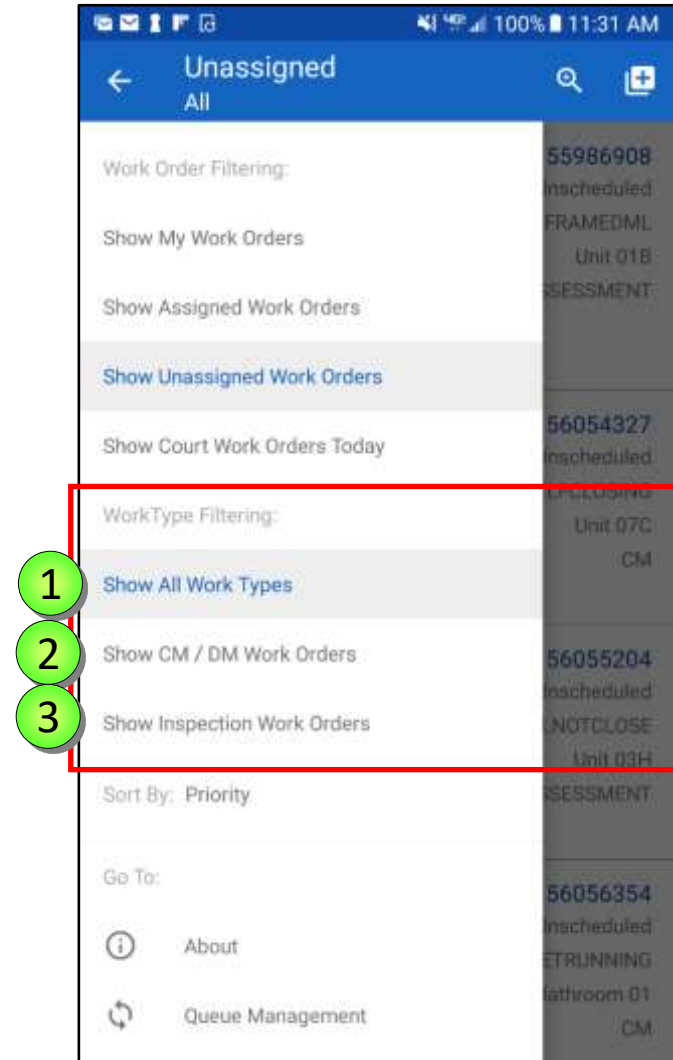
- 1 Show My Work Orders:** Shows open WOs assigned to the user who is logged-in.
- 2 Show Assigned Work Orders:** Shows Open WOs that are assigned to other users in the user's area (Development or Borough)
- 3 Show Unassigned Work Orders:** Shows Open WOs that are not assigned to any person.
- 4 Show Court Work Orders Today:** Shows Open WOs where resident has an appointment for today.
- 5 Show Reinspection Work Orders:** Shows all automatically generated WOs as a result of the completed QA Mold Inspection.



Viewing Work Orders - Types

Work Orders can be filtered and sorted by Work Order type, there is no default.

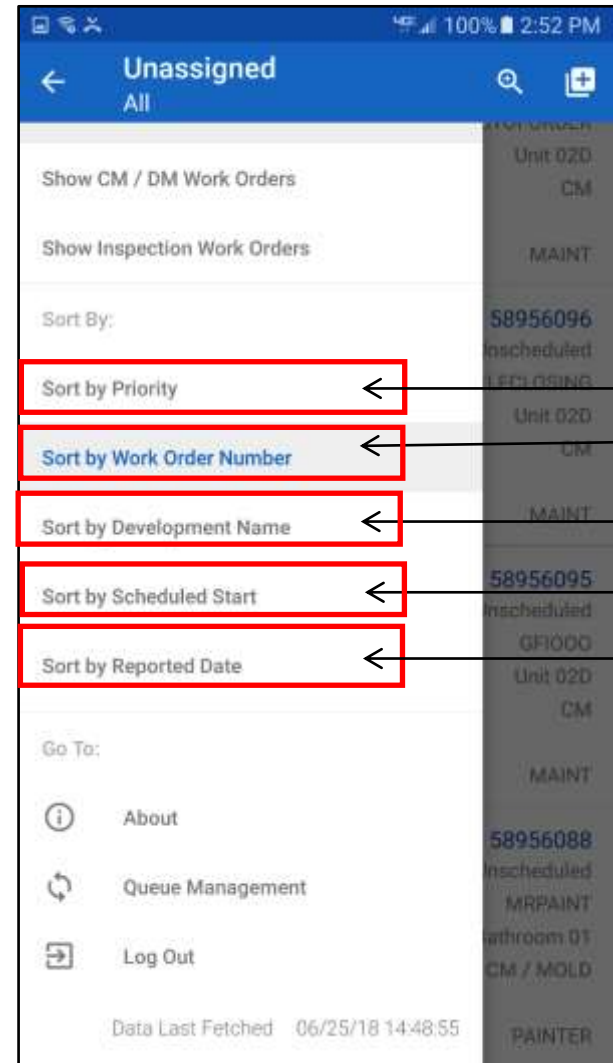
- 1 **Show All Work Types** displays all open Work Orders for the Development.
- 2 **Show CM / DM Work Orders** displays all **Corrective Maintenance** and **Deferred Maintenance** Work Orders.
- 3 **Show Inspection Work Orders** displays all the **Inspection** Work Orders.



How to View Work Orders - Sorting


The **Menu** is displayed. There are five options in which to sort your Work Orders:

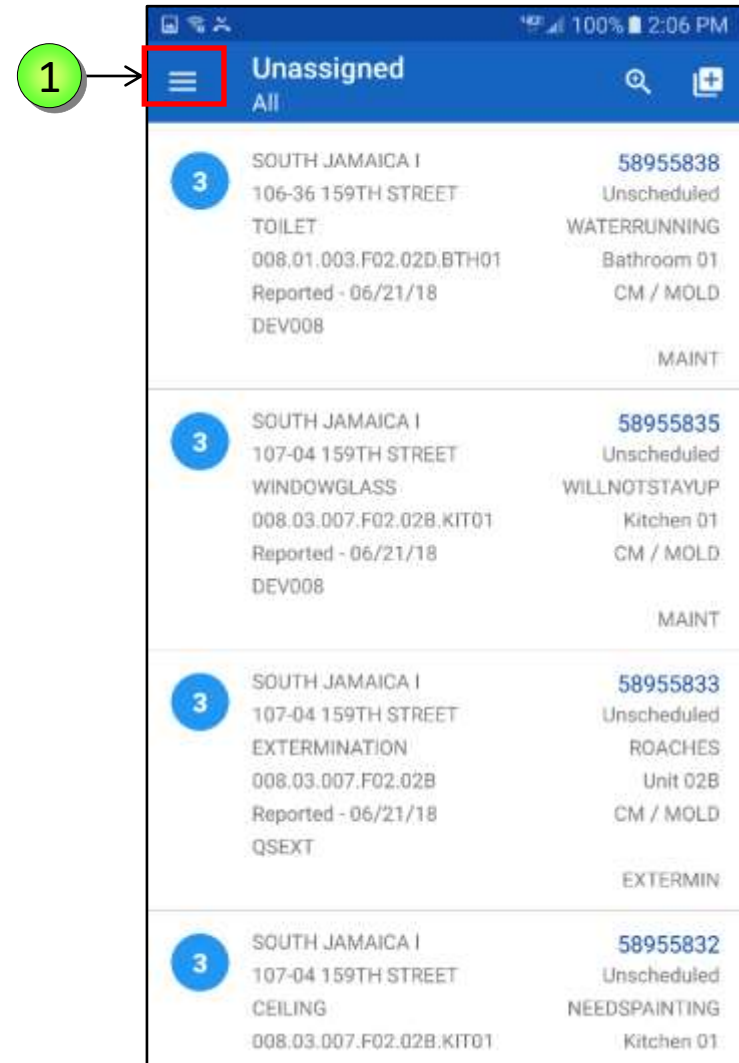
- 1 **Sort by Priority** defaults Work Orders based upon Priority level, with highest priorities first.
- 2 **Sort by Work Order Number** sorts the Work Orders in a descending order.
- 3 **Sort By Development Name** sorts the Work Orders by **Development** name in descending order.
- 4 **Sort by Scheduled Start** sorts Work Orders based on the Date and Time the work is scheduled to begin.
- 5 **Sort by Reported Date** sorts Work Orders based on the **Dates** the complaint was made.




Viewing Work Orders

All of the WOs that you'll always see are in the user's area/location (**Borough Wide Development** / Managed BY).

1 Tap  the **Menu** Button to go to the **Menu** in order to sort the list of **Unassigned Work Orders** in a different way.

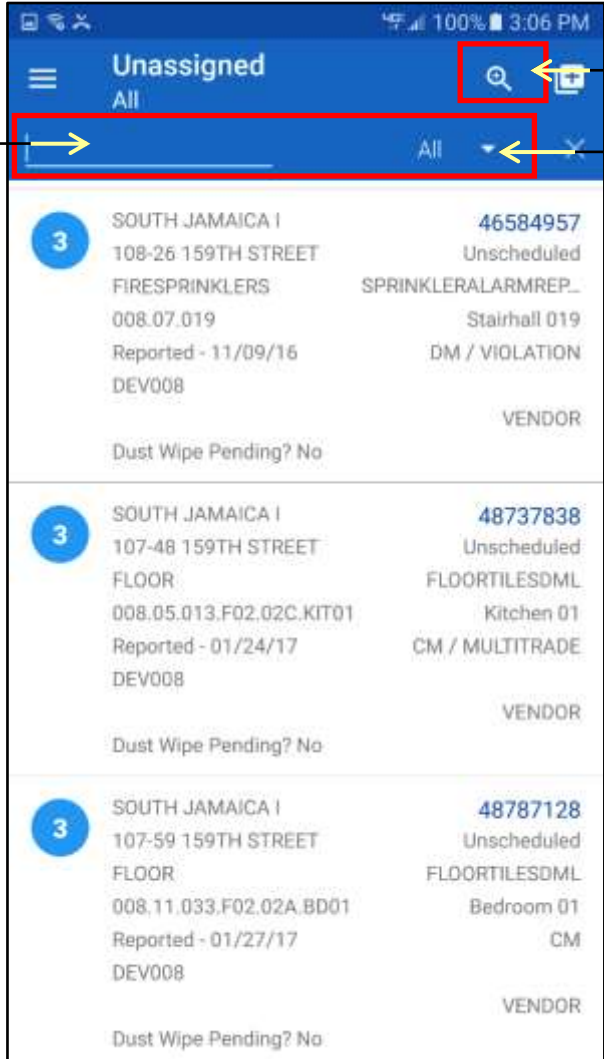


How To Search For Work Orders

1 You can search for Work Orders by tapping on the **small magnifying glass** 

2 The default search criteria is **ALL** where you can use the keyboard and type a Work Order number to search for.

3 Use the keyboard and start typing the **first few numbers** of a WO and the system displays all the Work Orders that start or begin with these numbers.



3

Unassigned
All

1

2

3

3	SOUTH JAMAICA I 108-26 159TH STREET FIRESPRINKLERS 008.07.019 Reported - 11/09/16 DEV008	46584957 Unscheduled SPRINKLERALARMREP.. Stairhall 019 DM / VIOLATION VENDOR
3	SOUTH JAMAICA I 107-48 159TH STREET FLOOR 008.05.013.F02.02C.KIT01 Reported - 01/24/17 DEV008	48737838 Unscheduled FLOORTILESDML Kitchen 01 CM / MULTITRADE VENDOR
3	SOUTH JAMAICA I 107-59 159TH STREET FLOOR 008.11.033.F02.02A.BD01 Reported - 01/27/17 DEV008	48787128 Unscheduled FLOORTILESDML Bedroom 01 CM VENDOR

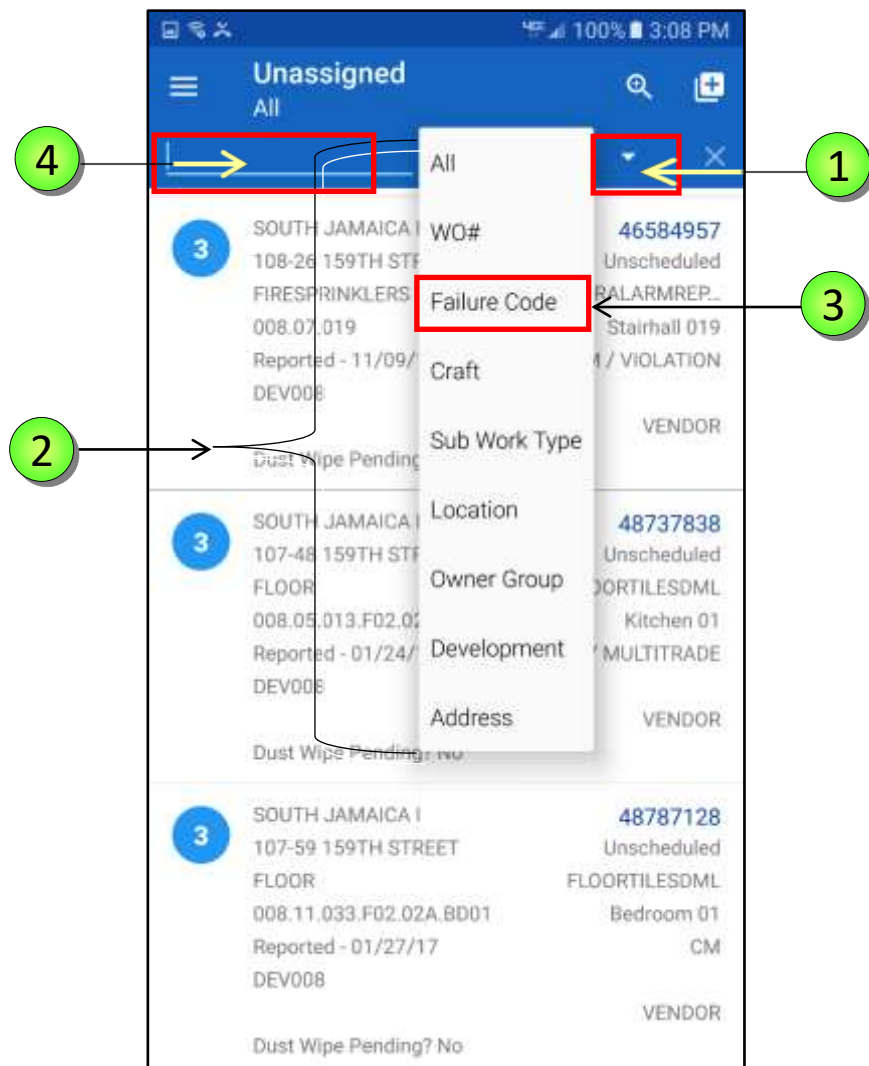
How To Search For Work Orders

1 To search for more criteria, tap on the **down arrow** and a list displays with all available search options.

2 You can search by **ALL, Work Order Number, Failure Code, Craft, Sub Work Type, Location, Owner Group, Development, and Address**. Select the search option you wish to explore and type a new search criteria.

3 Tap on **Failure Code** and use the keyboard and start typing for this example, **door**.

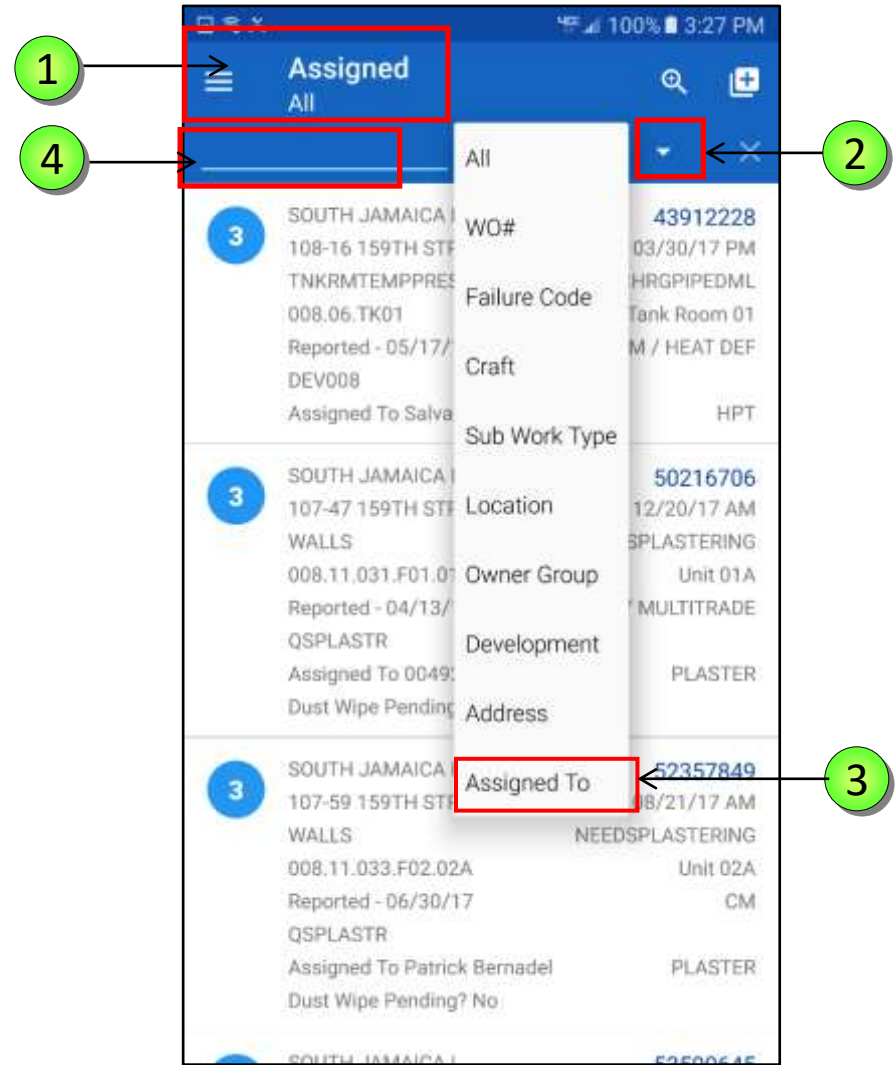
4 The system displays all the WOs with this criteria.



How To Search For Work Orders – ONLY Supervisors

- 1 Tap **Show Assigned Work Orders** from the **Menu** screen.
- 2 To search for a particular worker assignment, tap on the **down arrow** ▼ and a list displays with all available search options.
- 3 Select **Assigned To** search option from the criteria list.
- 4 Type the worker name on the keyboard, then tap **DONE** on the keyboard. The system displays all the Work Orders assigned to this worker.

NOTE: The **Assigned To** option **ONLY** appears when **Show Assigned Worker Orders** is selected. You can only search for one name at a time.



Viewing Related Work Orders

1

Related Work Order - An open Work Order for the same apartment and non-apartment locations display.

WO# 58957603

DETAILS WORK LOGS COMM LOGS MATERIALS AT

Work Order: 58957603 ASSIGN

Description: Mold Inspection Kitchen

Location: 008.01.003.F03.03A.KIT01 Kitchen 01

Related Work Orders >
There are 2 related Work Orders

Parent Work Order: None

Assigned To: Nobody

Address: 106-36 159TH STREET

START WORK TIME

1

Viewing Related Work Orders – (Continued)

1 After viewing the **Related Work Order** listing, tap the device **back arrow** → the **Work Order Details** screen redisplay.



1

Mold Work Orders Process - Inspection

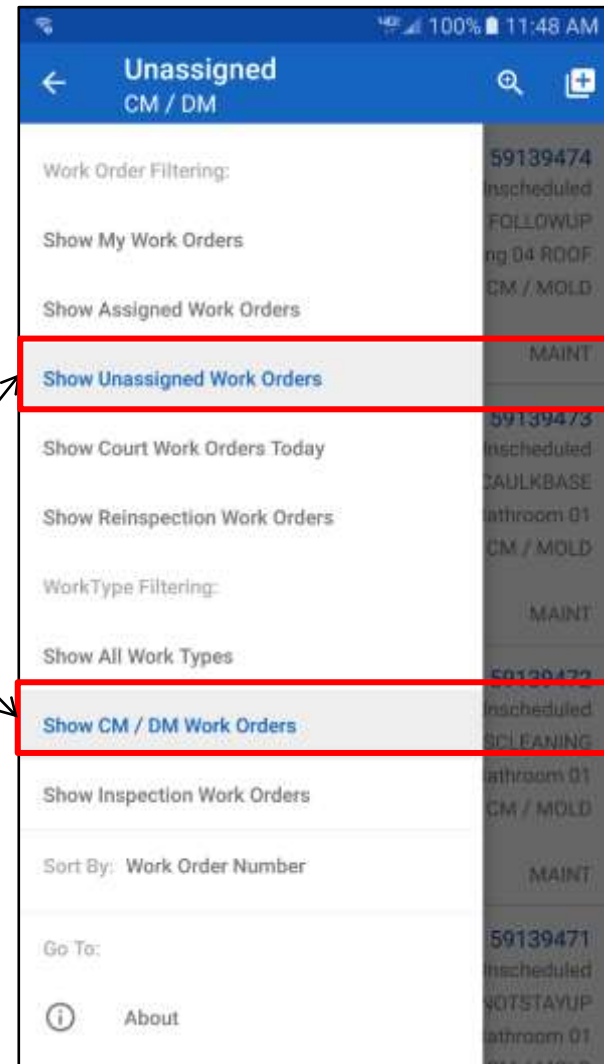
The first **Parent Work Order** appears in:

1

- **Show Unassigned Work Orders**
- **Show CM /DM Work Orders**

NOTE: If the Work Order is assigned to a worker it will appear in **Show Assigned Work Orders** or **Show My Work Orders**.

1



Mold Work Orders Process - QA

The first **QA Work Order** appears in:

1

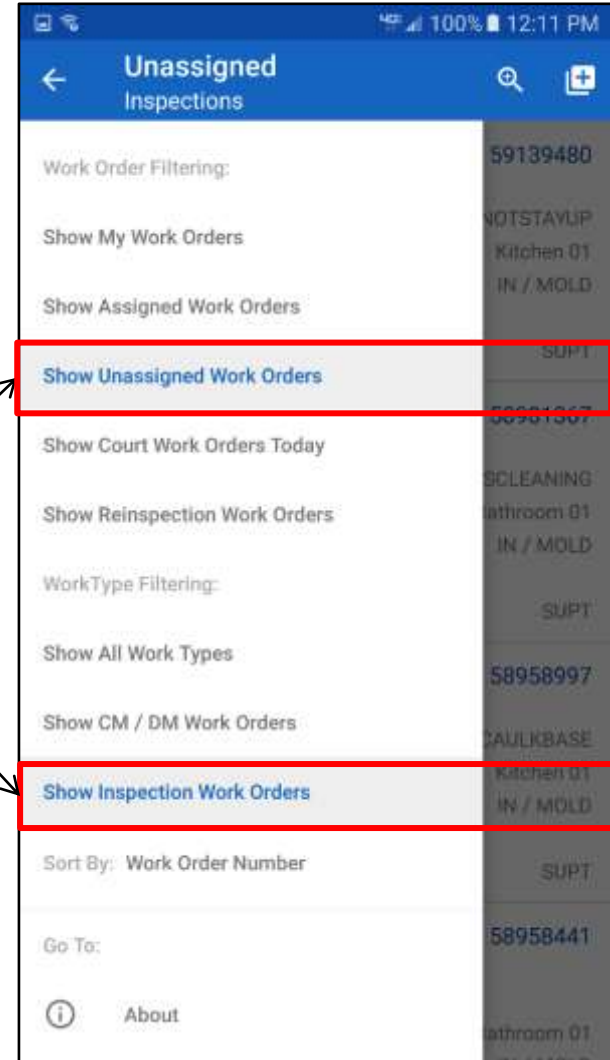
- **Show Unassigned Work Orders**
- **Show Inspection Work Orders**

NOTE: The **QA Work Order** is automatically generated in **Maximo 25-days**, and the new **Target Start Date** will be set to **30 days** after the last Child Work Order is closed (or **25-days** after the mold inspection gets closed if no children are created).

The **Target Finish Date** is set to **15 days** after the **Target Start Date**.

If either **Target Start Date** or **Target Finish Date** fall on a weekend or a holiday, then **next business day**.

1



Mold Re-Inspection Work Orders Process

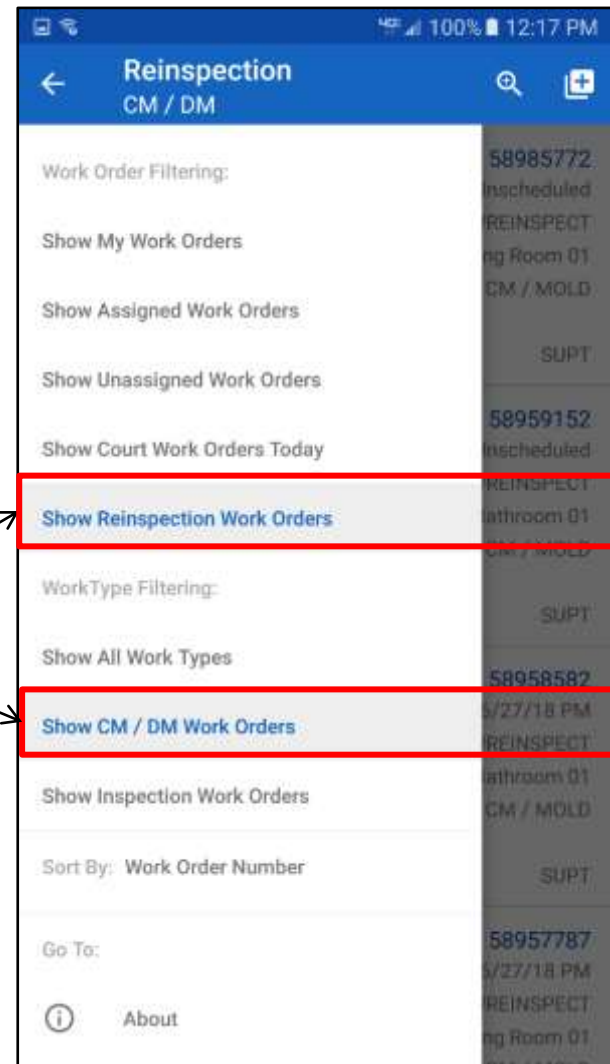
The first **Re-Inspection Work Order** appears in:

1

- Show Reinspection Work Orders
- Show CM / DM Work Orders

NOTE: Maximo creates the **Re-Inspection Work Order** **immediately** and the person who submits the QA Work Order, should see the **Reinspection Work Order** on his device and right there and then **complete** and **submit Re-Inspection results**.

1



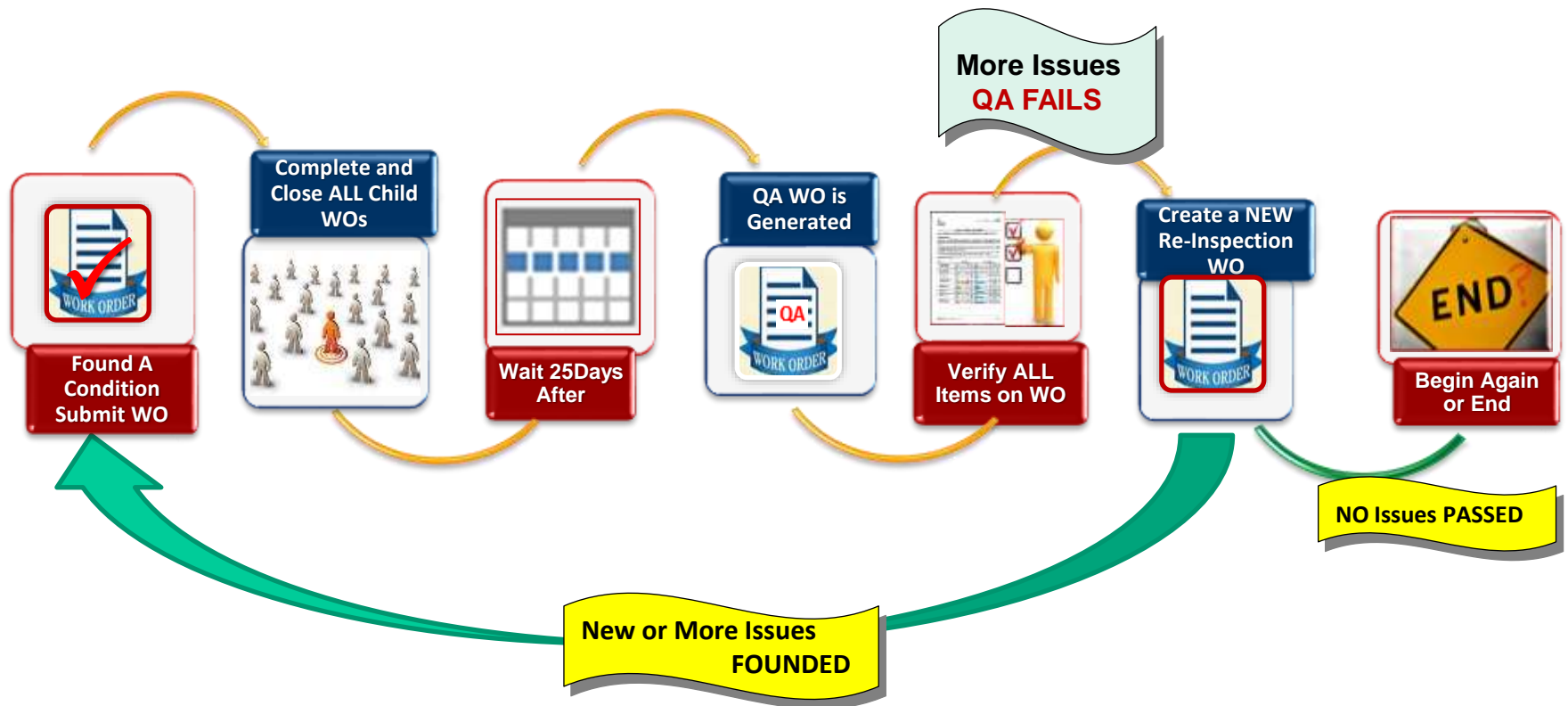
QA: MOLD/MILDEW WO Workflow

NO Mold was Found...

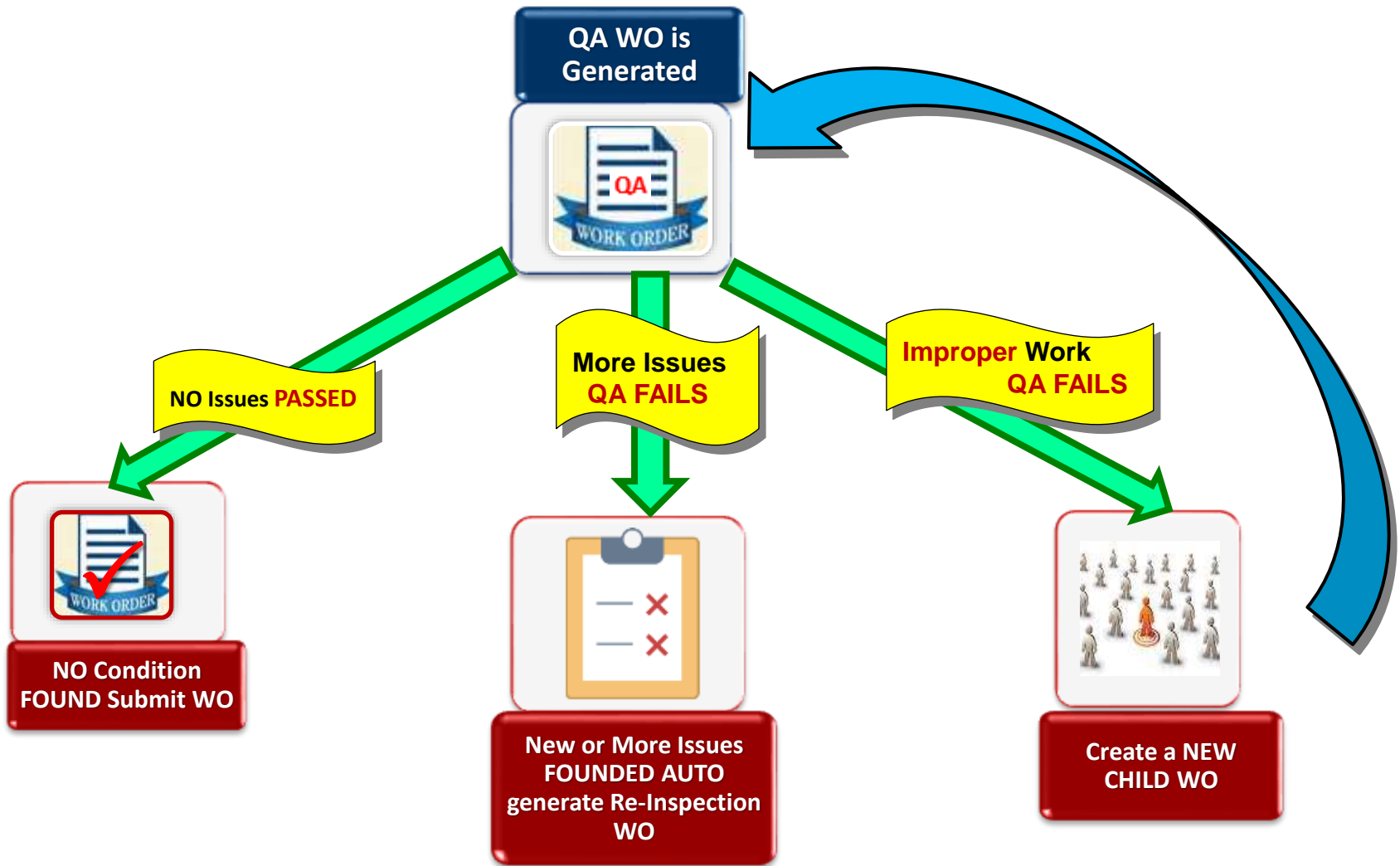


QA and Re-Inspection Work Order Workflow

Mold was Found...



Different Paths for QA ...



Mold Work Orders Process - QA

1

The first **QA Work Order** appears in:

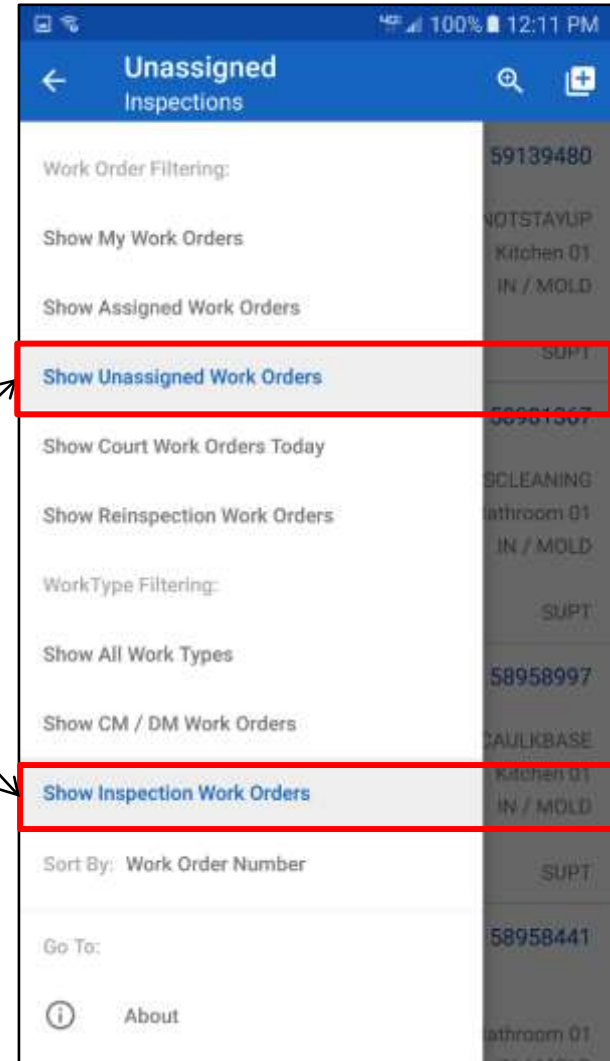
- **Show Unassigned Work Orders**
- **Show Inspection Work Orders**

NOTE: The **QA Work Order** is automatically generated in **Maximo 25-days**, and the new **Target Start Date** will be set to **30 days** after the last Child Work Order is closed (or **25-days** after the mold inspection gets closed if no children are created).

The **Target Finish Date** is set to **15 days** after the **Target Start Date**.

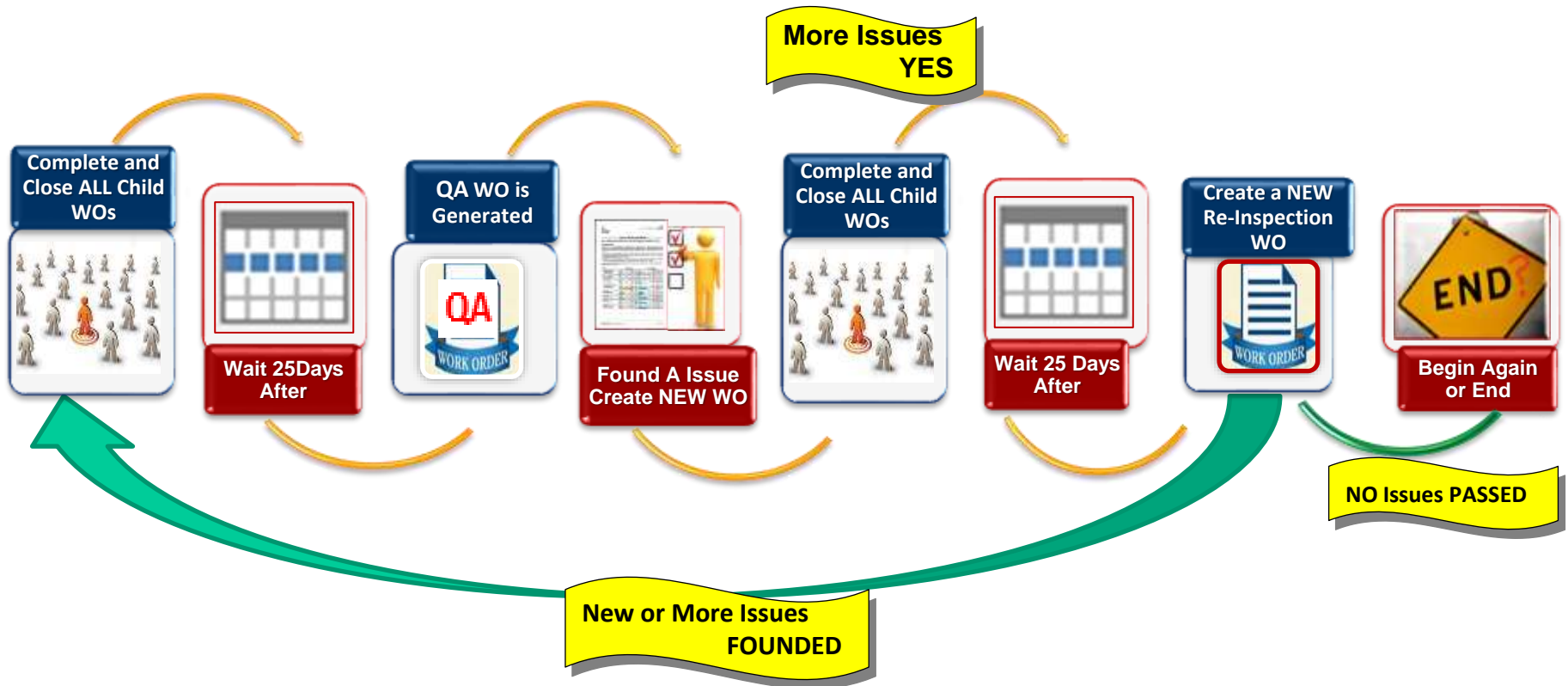
If either **Target Start Date** or **Target Finish Date** fall on a weekend or a holiday, then **next business day**.

1



Re-Inspection Work Order Cycle Workflow

Mold was Found...



Re-Inspection Work Order

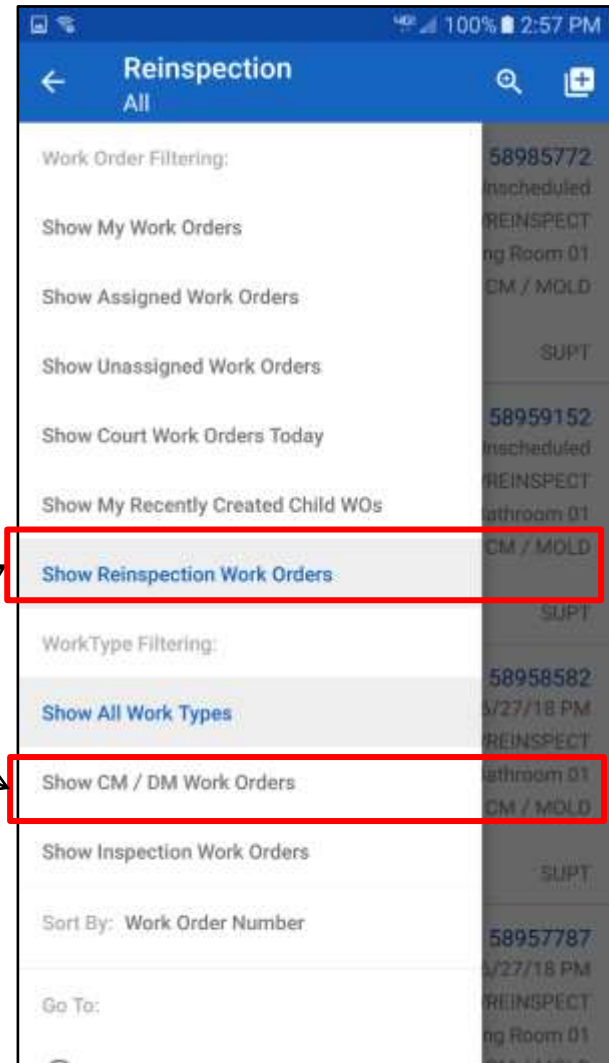
The Re-Inspection Work Order is **autogenerated** if you answer **YES** to one of the first 3 questions on the QA (**Evaluation of Conditions**).

It's a new parent WO that is auto-related to the QA (and the first original inspection).

1

The **Re-Inspection Work Order** appears in **Show Reinspection Work Orders** and **Show CM/DM Work Orders**.

1



Creating Child and Parent Work Orders Manually

**Instruction to create a Child and Parent Work Orders
NOT related to Mold**

Create a Child Work Order

1 Parent Work Order Number

Default Location

1

Parent Work Order
58957603

Description
Enter description

Location
008.01.003.F03.03A.KIT01

Asset
Please select...

Work Type
Please select...

Sub Work Type
Please select...

Failure Class
Please select...

Creating the Child Work Order - (Continued)

1 Enter a **Description**.

To enter a **Long Description**, tap below the **Long Description** field and type a long description.

2 Tap **DONE**



Creating the Child Work Order - (Continued)

1 The **Description** has been added to the Child Work Order.

Tap on **Location** if the Child WO is going to be created for a different location within the apartment or even outside the apartment.

2 Tap on **Location**


Scroll **Down** for more selections to add this **Child WO**.

1

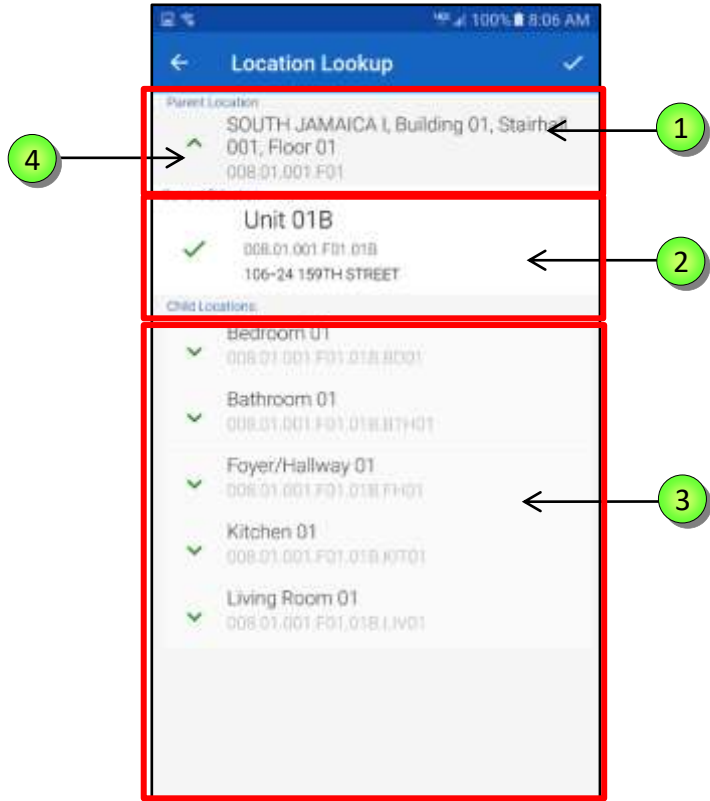
2

Creating the Child Work Order - (Continued)

1 The **Location Lookup** displays the following locations:
2 **Parent Work Order Location**
3 **Current Location**
3 Different **Child Locations** to choose from.

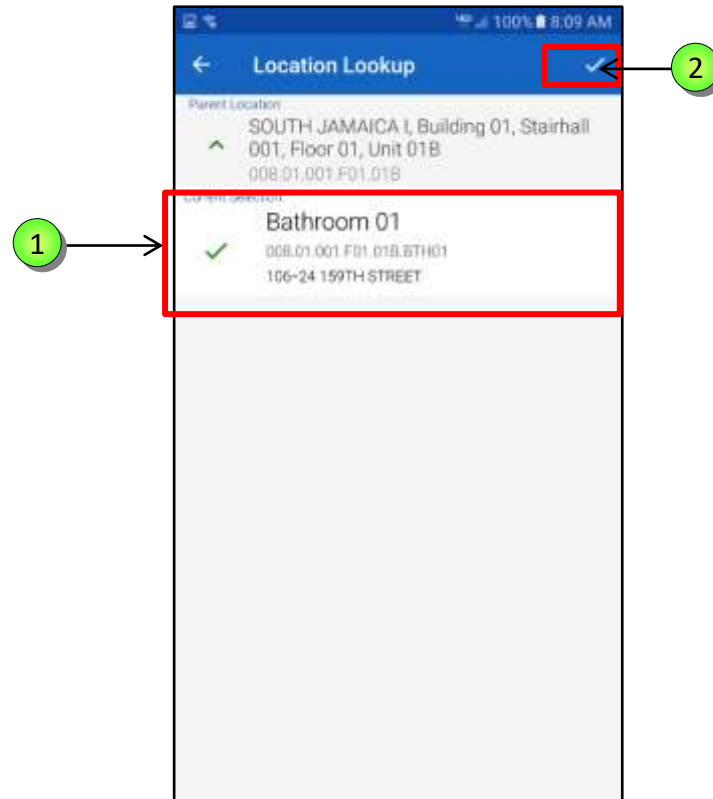
4 Tap on  below the **Parent Location**. It displays all of the rooms in that particular apartment.

Select and tap on the **Location** you want.



Creating the Child Work Order - (Continued)

- 1 Tap on the selected location for this **Child Work Order** again.
- 2 Tap on ✓ the **check mark**.



Creating the Child Work Order - (Continued)

Add selections for each of these fields:

- **Failure Class**
- **Problem Code**
- **Craft**

1 Tap **Failure Class**

100% 8:03 AM

← Create Child Work Order DONE

008.01.001.F01.01B.BTH01
Bathroom 01

Asset
Please select...

Work Type
Please select...

Sub Work Type
Please select...

Failure Class
Please select...

Problem Code
Please select...

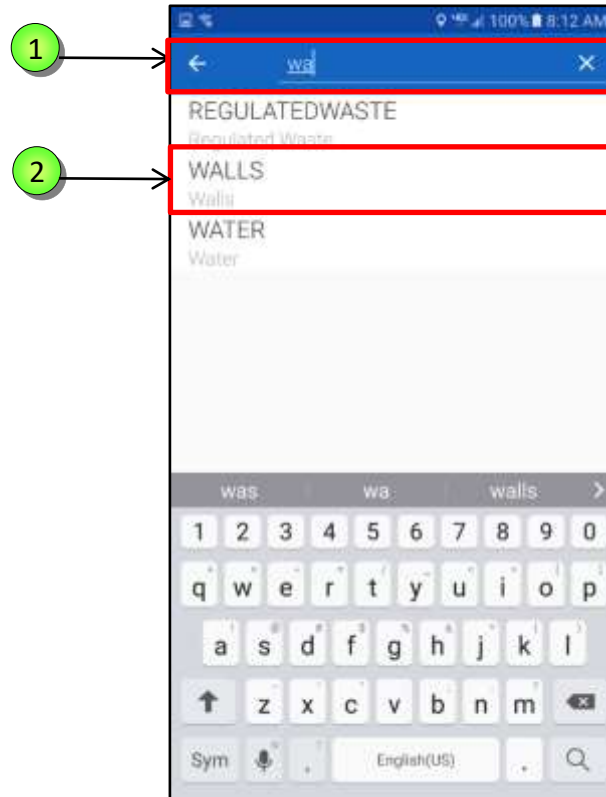
Craft
Please select...

Creating the Child Work Order - (Continued)



1 Tap on the **Search** icon.

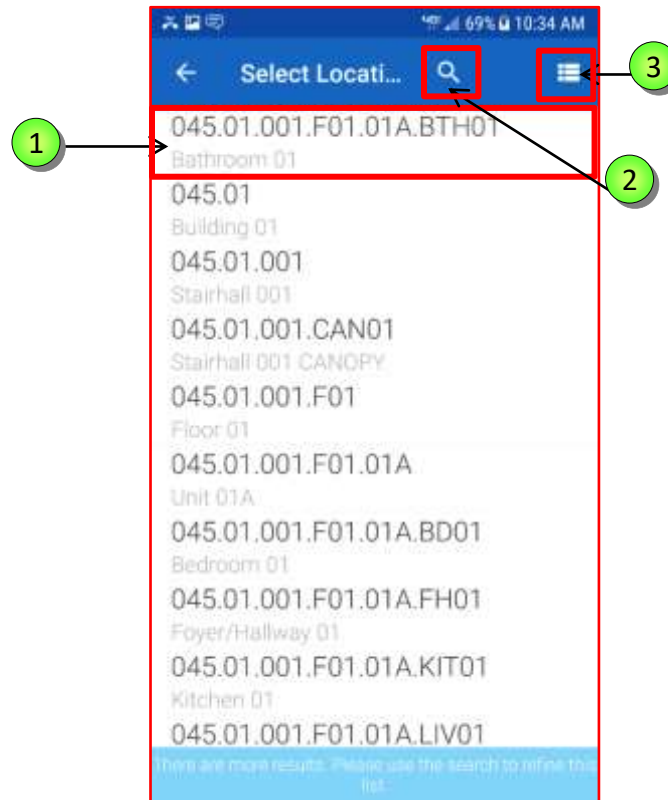
Type the first few letters of the **Failure Class**. The system will filter out the list and display a shorter list to choose from.

2 Tap **PIPES**



Creating the Child Work Order - (Continued)

- 1 The default **Location** appears on the top of the screen. You can select the appropriate location by one of the following methods:
- 2 Tap the **Search** icon  and type the preferred **Location String** or scroll down and select the **Location** you want.
- 3 Tap on **Location Lookup** button  and select the desired **Location**.



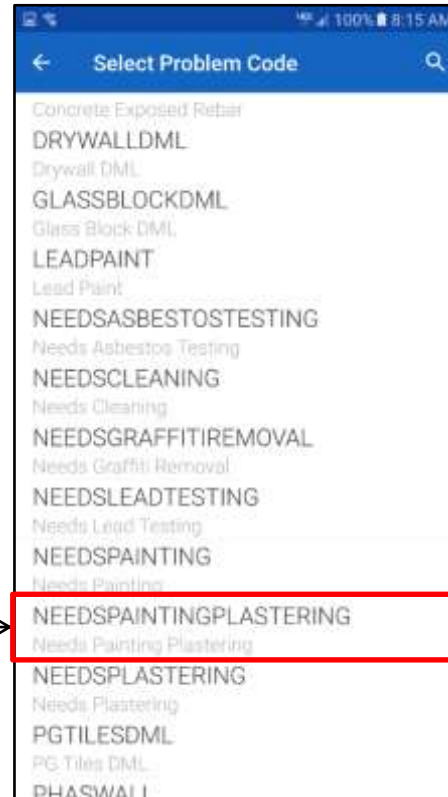
Creating the Child Work Order - (Continued)

1 Select and tap **Problem Code**.

The screenshot shows the 'Create Child Work Order' screen in a mobile application. The top bar is blue with a back arrow and the text 'Create Child Work Order' and 'DONE'. Below the bar, there are several fields, each with a magnifying glass icon on the left. The first field is '008.01.001.F01.01A.BTH01' with 'Bathroom 01' below it. The second field is 'Asset' with 'Please select...' below it. The third field is 'Work Type' with 'Please select...' below it. The fourth field is 'Sub Work Type' with 'Please select...' below it. The fifth field is 'Failure Class' with 'WALLS' below it and 'Walls' in smaller text below that. The sixth field is 'Problem Code' with 'Please select...' below it. The seventh field is 'Craft' with 'Please select...' below it. A red rectangular box highlights the 'Problem Code' field. To the left of the box, a green circle with the number '1' has an arrow pointing to the right edge of the box.

Creating the Child Work Order - (Continued)

- 1 Select a **Problem Code** from the list.



Creating the Child Work Order - (Continued)

1 Tap to select **Craft**.

100% 8:17 AM

← Create Child Work Order DONE

Asset
Please select...

Work Type
Please select...

Sub Work Type
Please select...

Failure Class
WALLS
Walls

Problem Code
NEEDSPAINTINGPLASTERING
Needs Painting Plastering

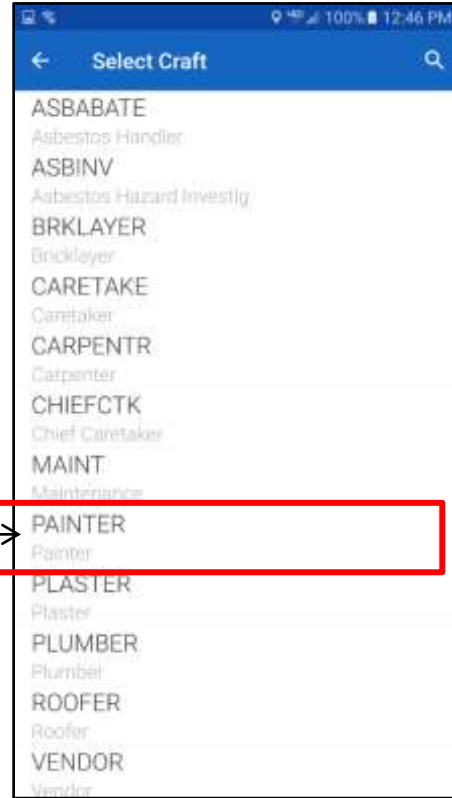
1 → Craft
Please select...

Responsible Scheduler
Please select...

Creating the Child Work Order – (Continued)

1

Select Craft



Creating the Child Work Order – (Continued)

- 1 Review your selections for this Child WO.
- 2 Tap **DONE**

Asset
Please select...

Work Type
Please select...

Sub Work Type
Please select...

Failure Class
WALLS
Walls

Problem Code
NEEDSPAINTINGPLASTERING
Needs Painting Plastering

Craft
PAINTER
Painter

Responsible Scheduler
Please select...

DONE

Submitting the Work Order – (Continued)

After the Child Work Order is Created...

When all required fields are entered, the Child WO will successfully close.

1 Tap **SUBMIT INSP / UPDATE WO STATUS**



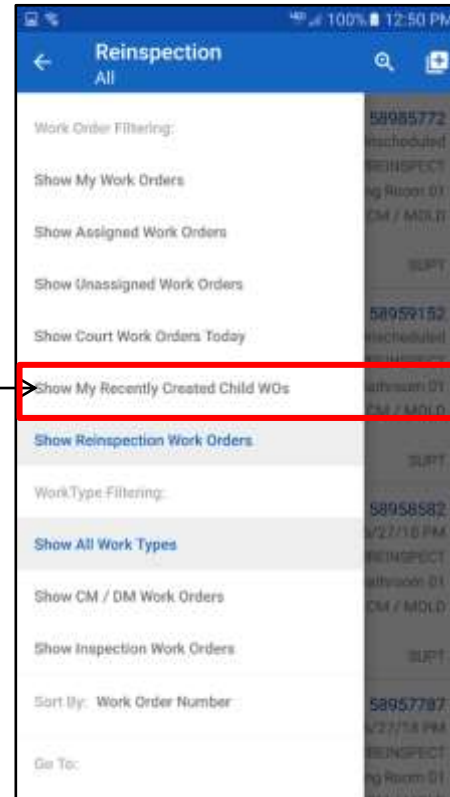
Recently Create Child Work Order

1

When you create a Child Work Order on your device, it gets successfully created, it will show up on a new list in **“Show My Recently Created Child WOs”**


NOTE: This category will be removed from your list every night so it will not overload your device. However the ticket is still in the system and could be processed as appropriate.


1



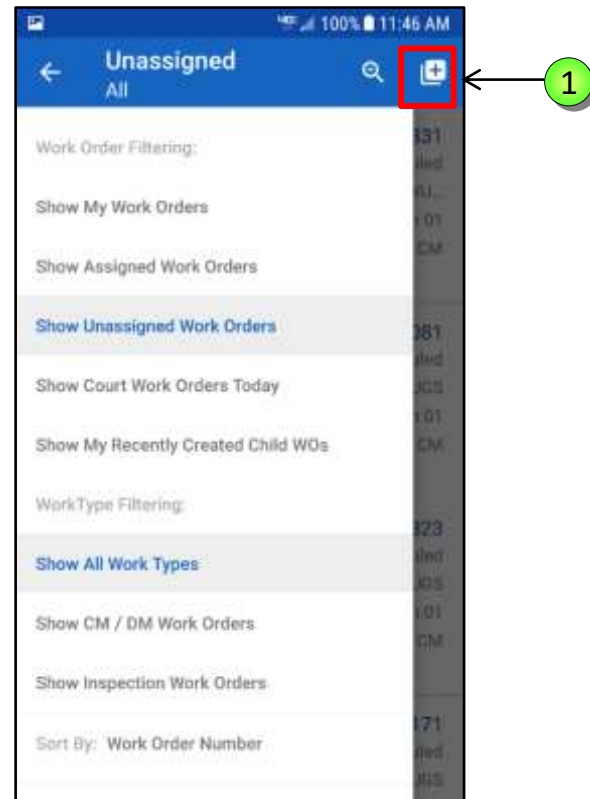
Creating A Parent Work Order

Parent Work Orders can be created from any location, apartments as well as a non-apartment location like a boiler room, a tank room.

From the Work Order list screen tap  on the upper right-hand corner icon.

Tap on 

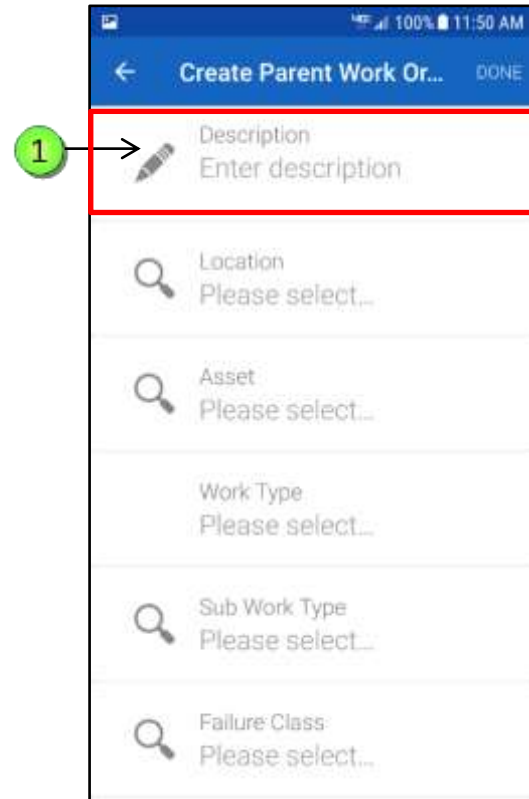
NOTE: Work Orders generated will not be duplicated, **Maximo** will not allow duplication.



Type A Description For The Work Order

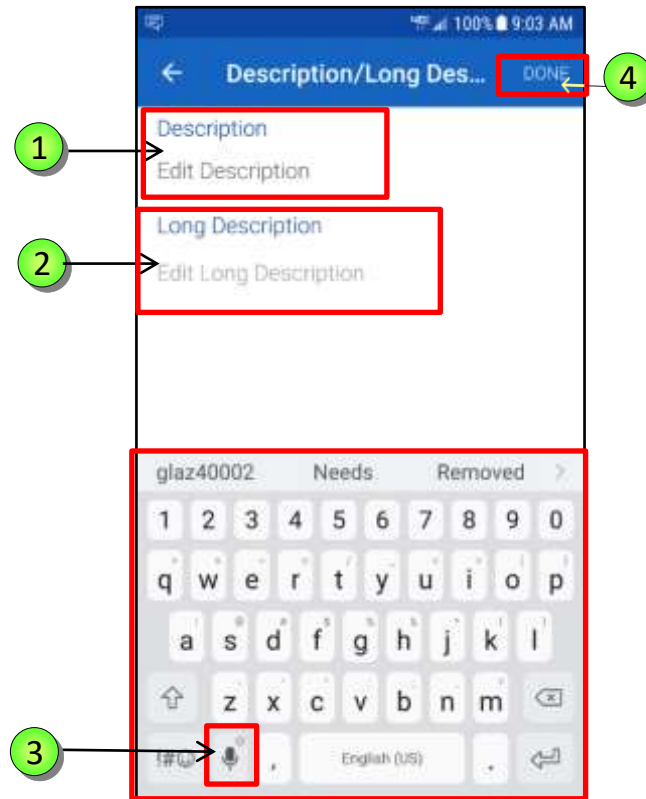
The only form needed to create a Parent Work Order.

1 Tap on the **Description** field
The **Description** screen displays.



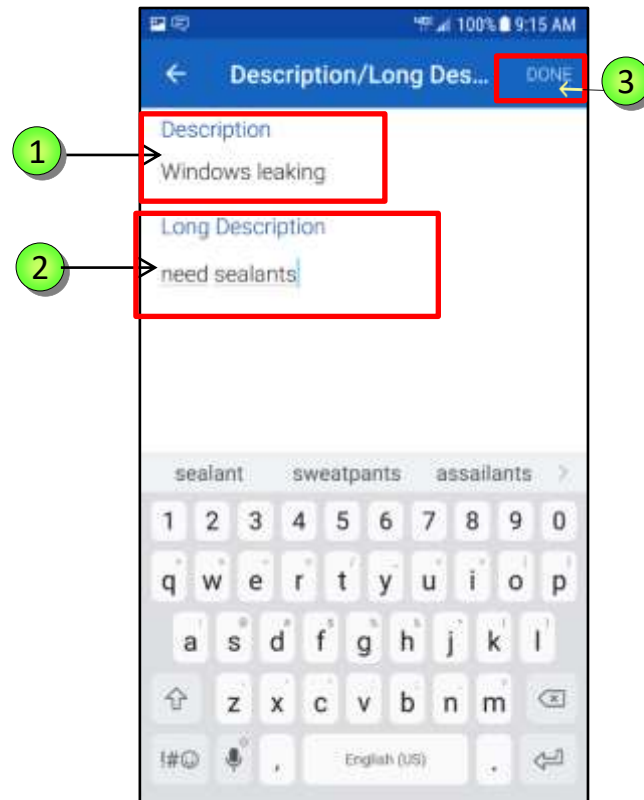
Type A Description For The Work Order – (Continued)

- 1 Type a brief description in the **Description**. This is **mandatory** and appears on the Work Order header.
 - 2 Tap **Long Description** and type a summary of work done.
 - 3 Tap on the “**microdevice**” by “holding down the little gear ⚙” on the bottom left of the keyboard and select the microphone icon and speak to dictate what will be typed.
- NOTE:** Once it is used the system will remember the last time icon used and keep it selected.
- 4 Tap **DONE**



Type A Description For The Work Order – (Continued)

- 1 Type a brief description in the **Description**. This is **mandatory** and appears on the Work Order header.
- 2 Tap **Long Description** and type a summary of work done.
- 3 Tap **DONE**



Choosing A Location

You can choose any **Location**, apartments as well as a non-apartment location (within your **Development**).



1

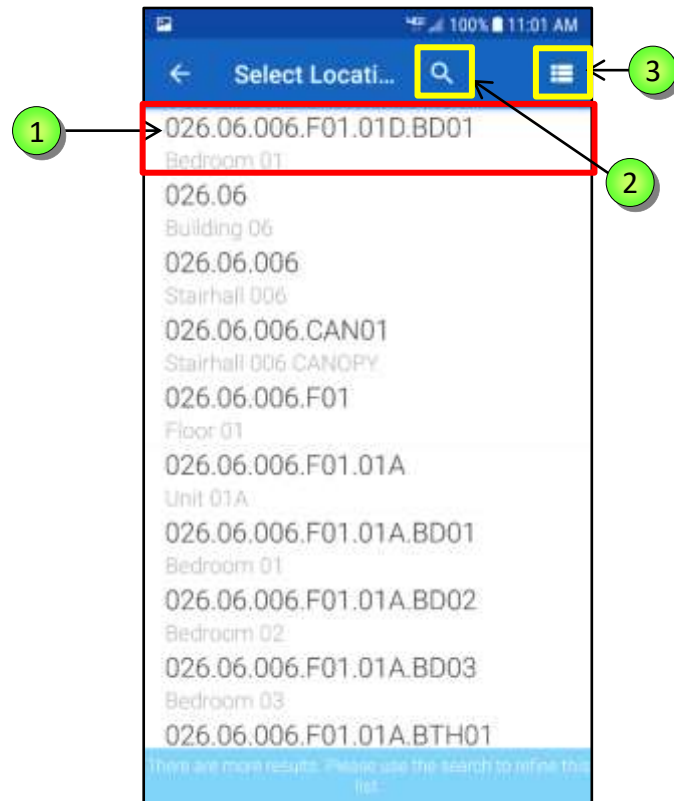
Tap on the **Location** field

The screenshot shows a mobile application interface for creating a parent work order. The title bar at the top is blue and contains a back arrow, the text 'Create Parent Work Or...', and a 'DONE' button. Below the title bar, there are several input fields, each with a magnifying glass icon to its left. The first field is 'Description' with the value 'Windows leaking'. The second field is 'Location' with the value 'Please select...'. This 'Location' field is highlighted with a red rectangular border, and a green circle with the number '2' and an arrow points to it. Below the 'Location' field are three more fields: 'Asset' (Please select...), 'Work Type' (Please select...), 'Sub Work Type' (Please select...), and 'Failure Class' (Please select...).


2

Choosing A Location - (Continued)

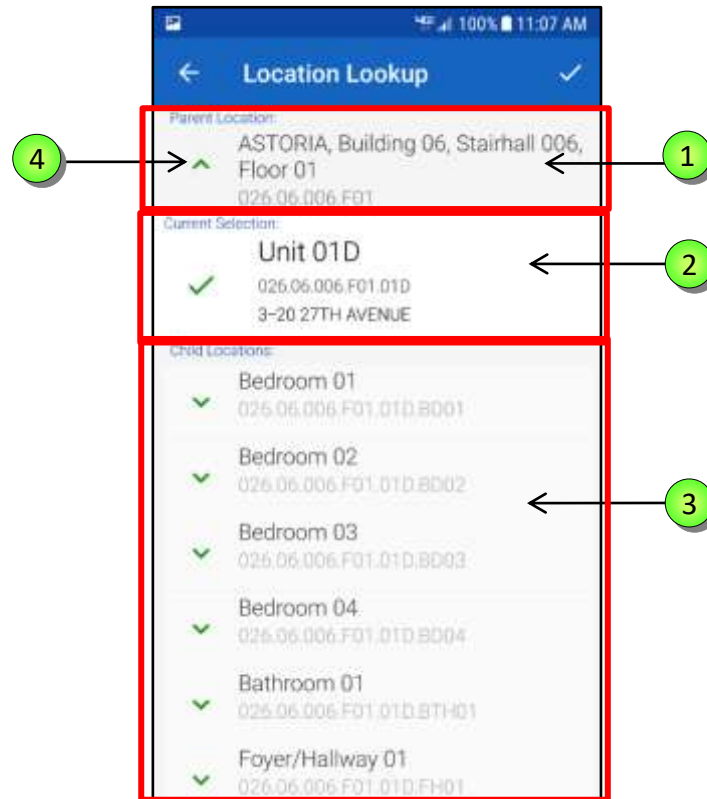
- 1 The default **Location** appears on the top of the screen. You can select the appropriate location by one of the following methods:
- 2 Tap the **Search** icon  and type the preferred **Location String** or scroll down and select the **Location** you want.
- 3 Tap on **Location Lookup** button  and select the desired **Location**.



Choosing A Location - (Continued)

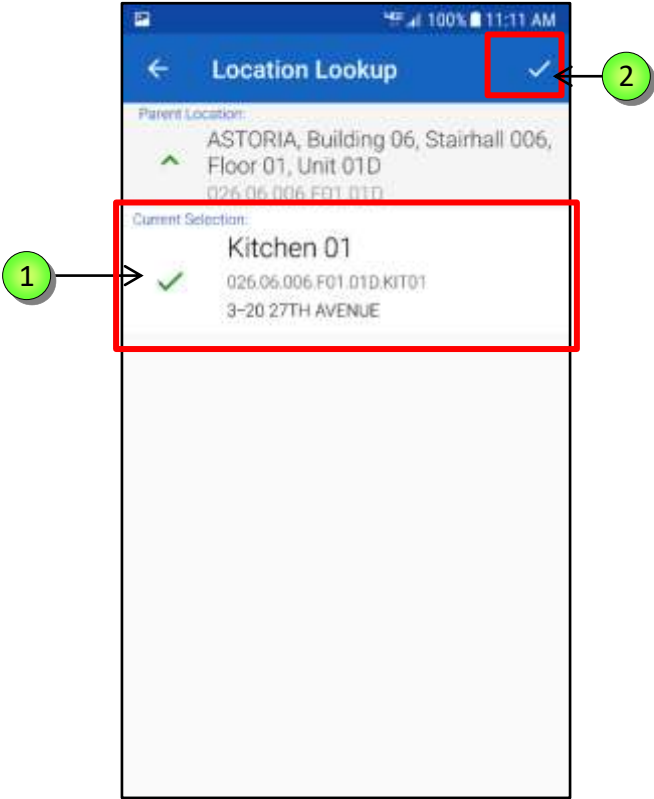
- The **Location Lookup** displays the following locations:
- 1 **Parent Work Order Location**
 - 2 **Current Location**
 - 3 Different **Parent Locations** to choose from.
 - 4 Tap on  below the **Parent Location**. It displays all of the rooms in that particular apartment.

Select and tap on the **Location** you want.



Choosing A Location - (Continued)

- 1 Tap on the selected location for this **Parent Work Order** again.
- 2 Tap on ✓ the **check mark**.



Creating a Parent Work Order – (Continued)

1 Choose **Failure Class**, **Problem Code**, and **Craft**.

Follow the same steps discussed earlier in creating Child Work Order.

The screenshot shows a mobile application interface for creating a parent work order. The title bar at the top reads "Create Parent Work Order" with a back arrow on the left and "DONE" on the right. The status bar at the very top shows signal strength, 100% battery, and 8:40 AM. The form contains the following fields:

- Location: 008.01.001.F01.01A.BD01 (with a magnifying glass icon) and "Bedroom 01" below it.
- Asset: Please select...
- Work Type: Please select...
- Sub Work Type: Please select...
- Failure Class: Please select...
- Problem Code: Please select...
- Craft: Please select...

A red rectangular box highlights the last three fields (Failure Class, Problem Code, and Craft). A green circle containing the number "1" is positioned to the left of the box, with three arrows pointing from it to the Failure Class, Problem Code, and Craft fields respectively.

Creating a Parent Work Order – (Continued)

1 Review all of the **Parent Work Order** information.

2 Tap **DONE**

NOTE: Work Orders generated will not be duplicated, **Maximo** will not allow duplication

The screenshot displays the 'Create Parent Work Order' screen in a mobile application. The top bar is blue with a back arrow and the text 'Create Parent Work Order'. A 'DONE' button is in the top right corner, highlighted with a red box and a green circle '2'. The form contains the following fields:

- Asset: 008.01.001.F01.01A.BD01 (Bedroom 01)
- Asset: Please select...
- Work Type: Please select...
- Sub Work Type: Please select...
- Failure Class: WINDOWGLASS (Window Glass)
- Problem Code: HARDTOOPENCLOSE (Hard to Open/Close)
- Craft: GLAZIER (Glazier)

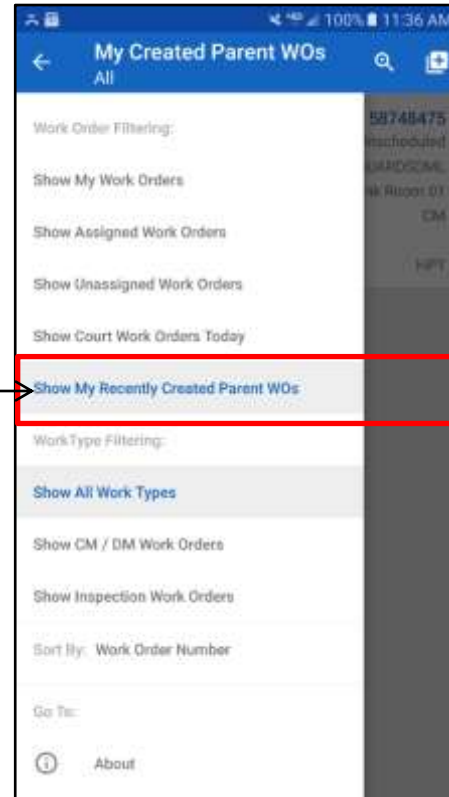
The 'Failure Class', 'Problem Code', and 'Craft' fields are grouped in a red box, with arrows pointing to them from a green circle '1'.

Creating a Parent Work Order

After a Parent Work Order has been successfully created (meaning that it was sent and successfully created in **Maximo**), it will appear in a new list called “**Show My Recently Created Parent Work Orders**”

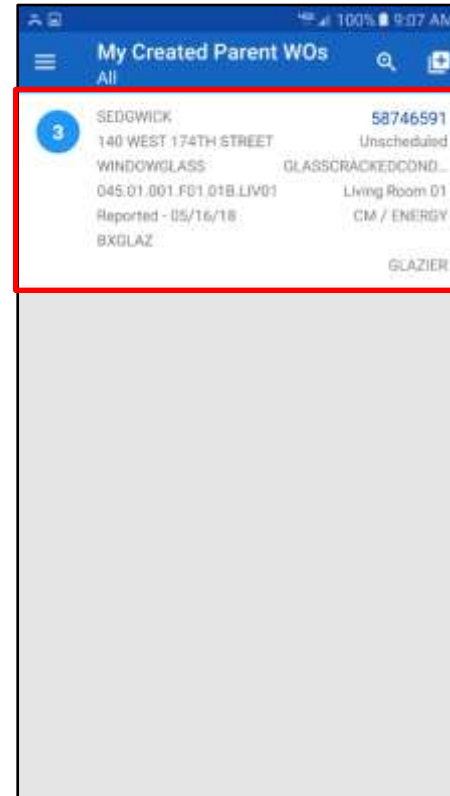
1 Tap on **Show My Recently Created Parent WOs**

1



Creating a Parent Work Order – (Continued)

Any Duplication cannot be created for **same Location, Failure Class, Problem Code and Craft.**



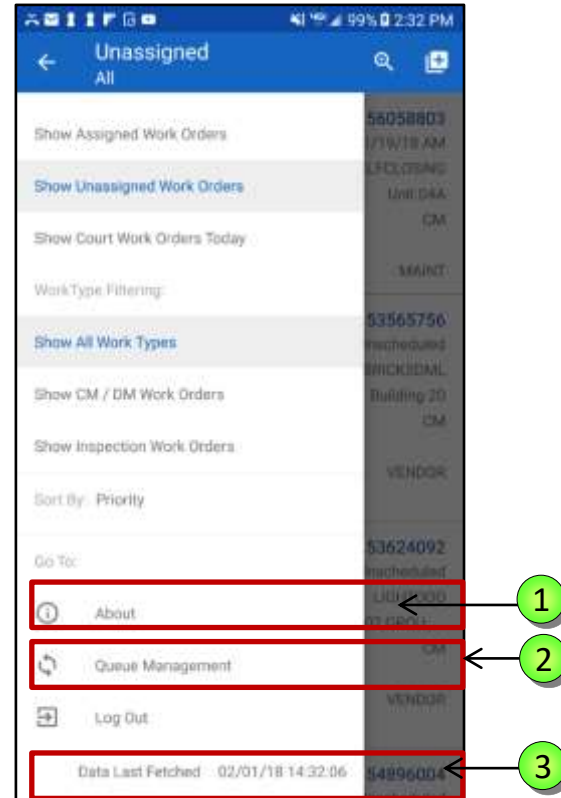
Troubleshooting - Menu Button - (Continued)

The **Menu** is displayed.

Near the bottom of the **Home Screen** list are 3 Items that may help to Troubleshoot your Device.

- 1 **About** - Provides confirmation of which version of iWM your device is using.
- 2 **Queue Management** - Lists Items currently in your Queue.
- 3 **Data Last Fetched** - Displays the last Date and Time the Data was updated.


- 1 Tap on **About**

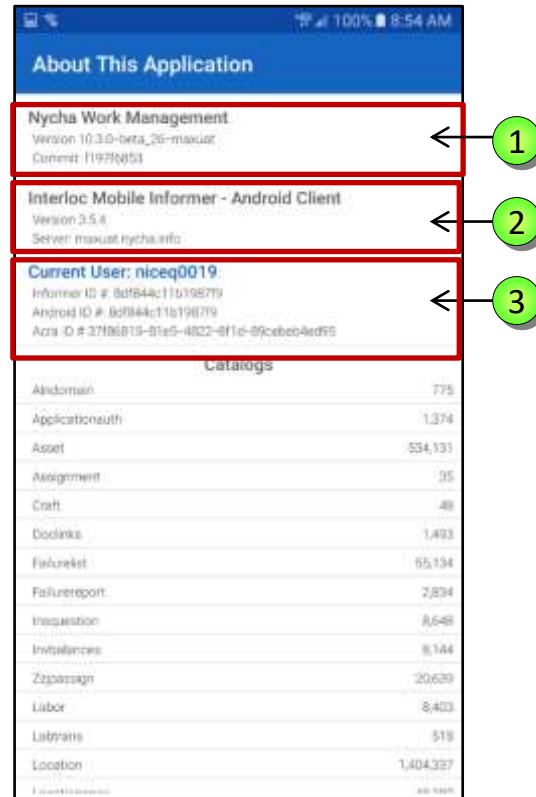


Troubleshooting - About

If there is a problem with your device, the information in **About This Application** may help the **Help Desk Associate** in troubleshooting your issue including:

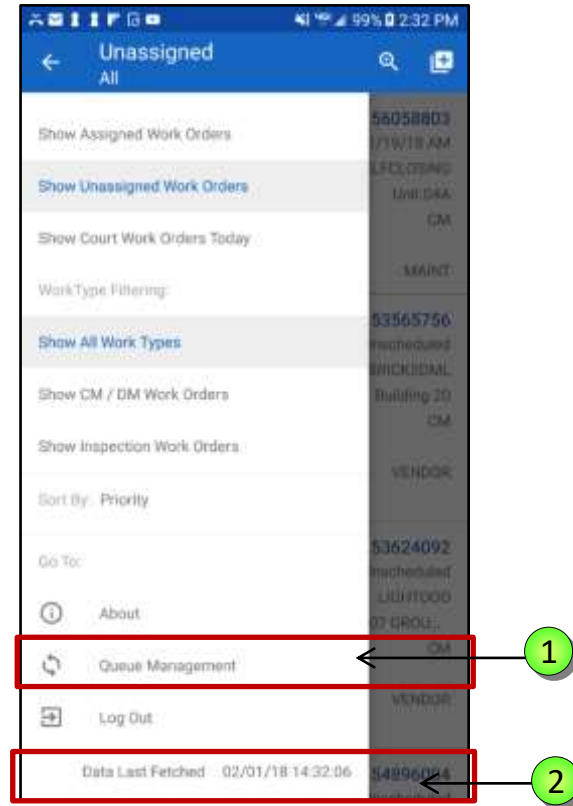
- 1 What **Version** of iWM your device is using
- 2 Your **Server** connection
- 3 Your **ID** information

Tap on **backward arrow**  to go to **Main Menu**




Troubleshooting - Queue Management

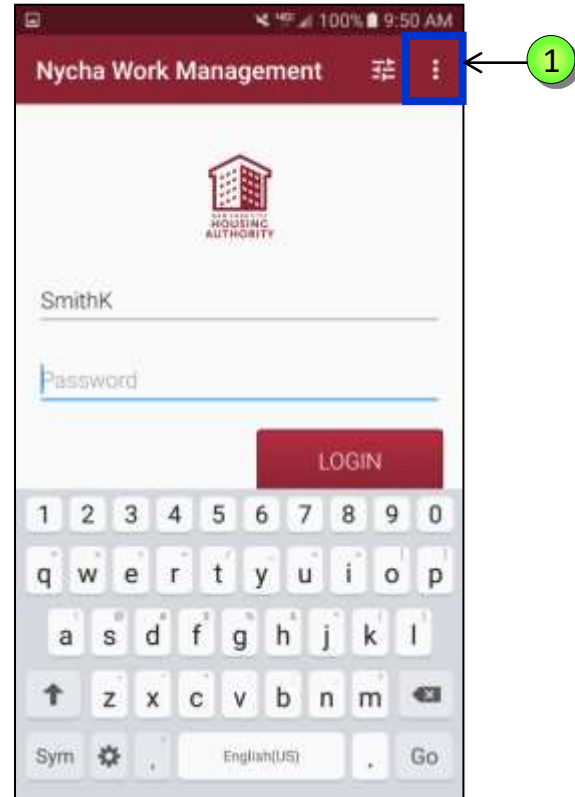
- 1 Tap on **Queue Management** to display your Queue.
- 2 **Data Last Fetched** – Displays the last Date and Time the Data was updated from **Maximo**.



Communicating with the Help Desk

Easily communicate with the **Help Desk** by sending your logs. Mobile send logs to a public location for **AirWatch**.

- 1 You can now send device logs (when requested by help desk) easily by going to the app Login screen, tapping the **three dots**  on the top right corner and selecting **Send Logs**.

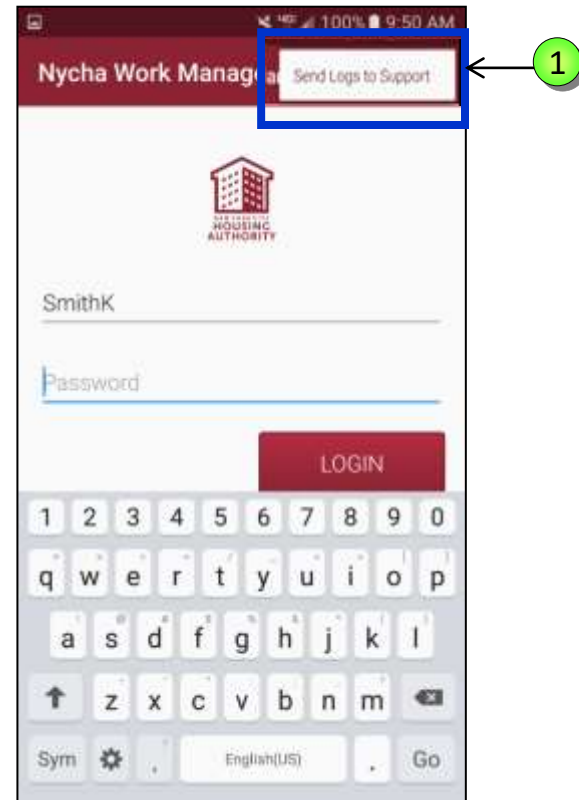


Communicating with the Help Desk - (continued)

1 This will automatically open your email and the Service Desk email address will be automatically populated in the To field.

Tap **SEND** to send the email with the logs. This will help with issue resolution of devices.

NOTE: This should only be done when IT requests logs.



Login to your NYCHA Email Account

AirWatch Inbox is NYCHA's mobile app for Email Inbox, Contacts, and Calendar. .

- 1 Tap the **AirWatch Inbox** app

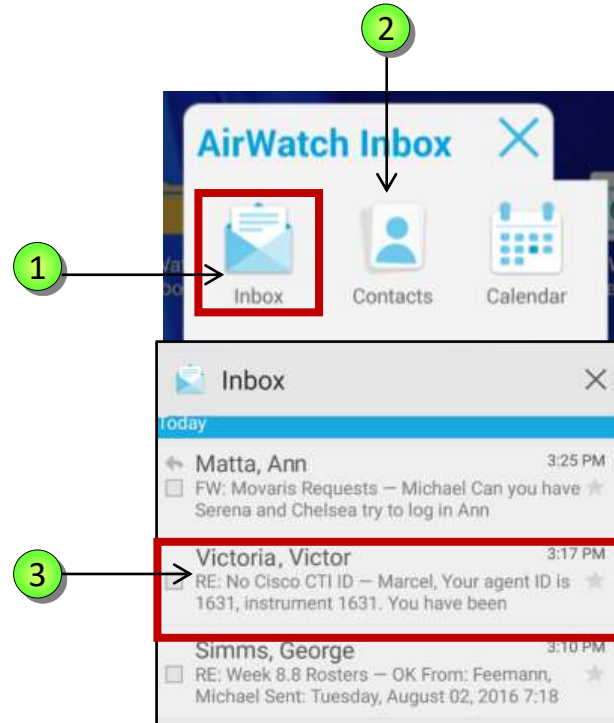


Login to your NYCHA Email Account – (Continued)




- 1 The **AirWatch Inbox** displays your choices: **Inbox**, **Contacts**, or **Calendar**.
- 2

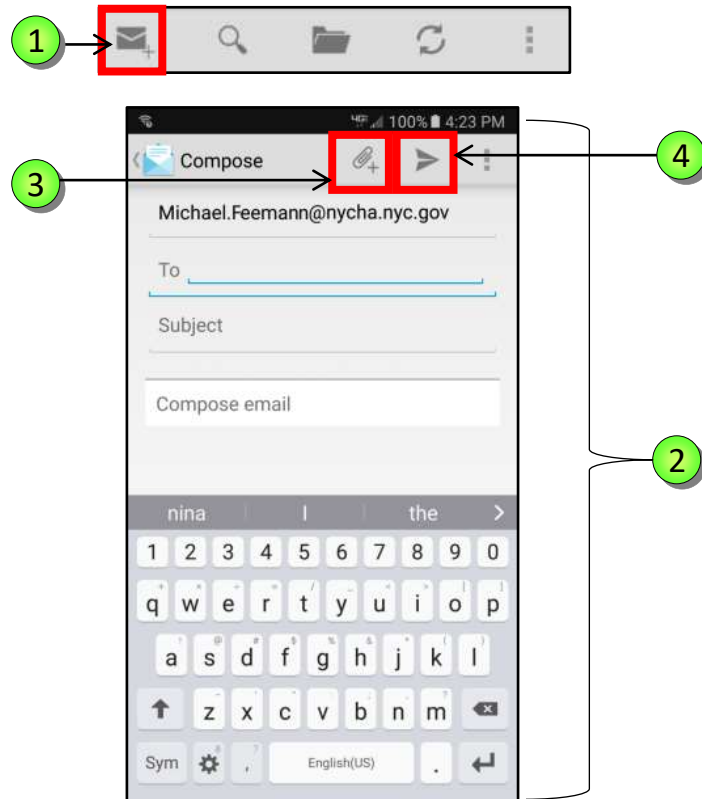
Tap **Inbox**

- 3 Your **Inbox** displays. Tap a message to display it for reading, forwarding, and/or replying.






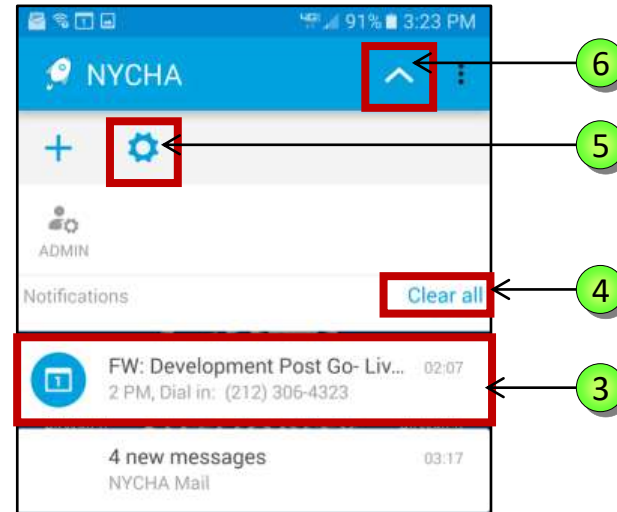
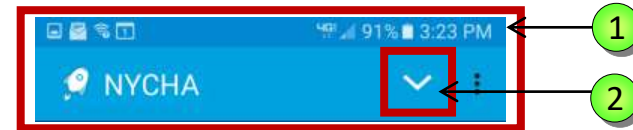
Composing an email message

- 1 To compose a new email message, tap on the **envelope** icon. 
- 2 The **Compose** Email form displays. Enter the email address where you are sending your message, the subject, and then compose your email message.
- 3 Tap the paper clip icon  to **attach** a picture or document.
- 4 Tap  to **send**.



Notifications and Settings

- 1 When you receive new notifications, indicator icons appear on the status bar. To see more information about the icons, open Notifications and view the details.
- 2 To open the **Notifications**, tap the **downward**  pointing arrow.
- 3 Tap a notice to open it.
- 4 To clear your notifications, tap **CLEAR ALL**.
- 5 Tap the **Settings icon**  to open the device settings.
- 6 To close **Notifications**, tap the **upward**  pointing arrow.



Indicator Icons and Wildcard

1 **Indicator icons** appear on the **Status Bar** at the top of the device screen.

Here are some of the most common icons and their meaning.

If the item does not get displayed when searching, enter part of the item description followed by % (**wildcard**)



Icon	Meaning
	No Signal
	Signal Strength
	Network Indicator
	Call in progress
	Missed call
	Emergency alert
	Battery Power Level

Building Science - Inspector

Practical Exercises & Simulation

Mold Inspection Work Orders – CM

Kitchen 1 Issues

Mold in Bathroom

Apartment 2 Kitchen

Mold QA Work Orders – IN

Kitchen 01

Bathroom 01

Kitchen 02

Mold Re-Inspection Work Orders – CM

Kitchen 01

Bathroom 01

Kitchen 02

NYCHA MOLD TRAINING UPDATE

**Performance
Deficiencies**

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Quality Assurance Deficiencies

- As a result of a quality assurance review, NYCHA has found a small group of staff performance shortfall when it comes to mold inspections and remediation.

Inspectors Performance Shortfalls

- failure to use/properly use each of the Mold Busters tools during the inspection process (particularly Testo kit and app)
- failure to conduct a complete mold inspection (meaning accounting for all 3 indicators: signs of visible mold, water damage, moisture reading)
- failure to make accurate entries (square footage of mold)
- failure to use/properly use borescope to inspect wall cavities

Remediators Performance Shortfalls

- failure to use/properly use the anemometer and Testo app to measure exhaust vent output (bathrooms and kitchens)
- failure to use mold resistant paint as required based on the remediation methods and development construction
- failure to check/confirm that pipes are properly insulated when checking for excessive moisture/leaks in wall cavities
- failure to use/properly use the borescope to inspect wall cavities
- failure to ensure mold impacted surfaces are
 - 1. cleaned with the appropriate detergent solution/fungicide cleaner
 - 2. completely dry prior to moving forward in the mold remediation process.

End of Day

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Building Science for Inspectors – Day 2

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**Work Area
Preparation**

SP 040:18:2 , Lead Safety for RRP – Site Prep

In apartments, discuss the following with the resident:

- Extent of containment needed
- How the containment area will be prepared
- Advise residents not to enter the containment area until after clean-up
- Direct residents not to allow children to enter any area in which plastic sheeting is being used or stored due to the risk of suffocation

Overview of Containment

- The goal of containment is to limit the spread of mold throughout the building in order to minimize the exposure of remediators and building occupants to mold.
- The larger the contaminated area, and the greater the possibility that someone will be exposed to mold, the greater the need for containment.



Preparing the Work Area

- Pre-cleaning
- Remove objects
- Installation of critical barriers / Isolation Barriers
- Plasticizing Surfaces
- Installing doorway flap

EPA Guidelines for Containment

Two types of containment are described in EPA's mold remediation guidance:

- **Limited-** Limited containment is generally used for areas involving between 10 and 100 square feet of mold contamination.
- **Full containment-** is used when areas larger than 100 square feet are to be remediated or in cases where it is likely that mold could be spread throughout the building during remediation

Limited Containment

- A single layer of 6-mil fire-retardant polyethylene sheeting enclosing the moldy area.
- Access to the contained area is through a slit entry covered by a flap on the outside of the containment area.
- containment is generally recommended for areas involving 10 to 100 square feet of mold contamination.



Limited Containment

- In small areas, the polyethylene sheeting can be secured to the floor and ceiling with duct tape. In other areas, a frame of aluminum or wooden studs can be built to hold the polyethylene sheeting.



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Limited Containment

- All supply and air vents, doors, and pipe chases in the containment area must be sealed with polyethylene sheeting to minimize the spread of mold and mold spores to other areas of the building. Stairs should also be sealed if a riser is missing or open.

Installation of Critical Barriers



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Work Area Prep

- Pre-clean and install critical barriers
- Barriers are constructed to seal off all openings and penetrations to the work area
- Barriers to be constructed of 6 ml fire-retardant poly sealed with duct tape

Warning Signs

- Shall be displayed at all accessible entrances to remediation areas
- Should be in the language of the local population
- Should only be removed after final clean



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Preparing the Work Area

- Pre-clean and remove all movable objects using a HEPA-filtered vacuum and or wet cleaning



SP 040:18:2 , Lead Safety for RRP – Site Prep

- Secure the apartment and/or work area against unauthorized entry.
- Move all objects out of the room, if possible.

Preparing the Work Area



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SP 040:18:2 , Lead Safety for RRP – Site Prep

- Cover all items which were not moved from the work area with one layer of disposable polyethylene sheeting.

The sheeting must be taped together with duct tape, and taped to the floors or bottom of the walls or baseboards, to form a continuous barrier to the penetration of dust.

Installation of Floor Poly



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Work Area Prep

- If you are working in a development with known lead-based paint or lead components polyethylene sheets should cover all horizontal surfaces in the room where the repairs occur.
- The entrance door should also be covered and weighted at the base to prevent dust from entering other rooms.



Installation of Wall Poly



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Work Area Prep

- Regulated abatement area must be cleaned (HEPA vac and/or wet methods)
 - Methods that raise dust are prohibited
- Pre-cleaning intended for preparation work only!
 - No disturbance of visible mold until containment is established

Installation of Critical Barriers



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Non-Movable Items

- Items which can't be moved must be cleaned, covered and sealed with a layer of 6 ml poly to protect them from damage and contamination

Clean Up

- Once the temporary wall closure is complete, use a HEPA-filter vacuum to remove dust, then wet wipe the work area using a clean rag or moistened towel to remove any remaining dust.
- If you suspect lead is present, use a clean rag or moistened towel with lead-specific detergent to wipe down the work area.

Work Area Prep

The time invested in prepping the work area is easily regained during the clean-up phase.

Mold Remediation – Containment Barrier

Work Area Prep

- Hands – On: Prepare an enclosure fro containing mold contamination

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Wall Breaks

Wall Breaks

- When opening a wall to perform or prepare for repairs, staff must take the necessary precautions to protect residents and staff from mold, asbestos, and lead.
- This guidance details the steps staff must take before, during, and after the wall break. Instructions on temporary wall closures are also included in this guidance; temporary wall closures are an important customer service practice that must be implemented until permanent repairs can be completed.
- Maintenance workers, bricklayers, carpenters, plumbers, plasterers and roofers are responsible for performing repairs that require wall breaks, and are responsible for following the below guidance.

Asbestos Pipe Insulation



ACM Pipe insulation

- Asbestos containing thermal system insulation (TSI) may be present in wall cavities.
- Avoid disturbing and contact Tech Services if TSI is disturbed or must be disturbed

Work Area Prep

After determining that a wall break must be performed, staff must immediately obtain the necessary supplies before proceeding with repairs.

Supplies include, but are not limited to:

- 6 mil polyethylene sheets
- duct tape
- a spray bottle
- a sheet of pre-cut Masonite

Precautions while performing repairs; Temporary Wall Closure

- Where possible, score painted walls with a utility knife or use a pry bar or chisel to open a glazed wall. Sawing and drilling should be avoided, if possible, as they produce significantly more dust and make containment and clean up more difficult.
- The wall opening should measure 1' by 1' when done for exploratory purposes (e.g., locating a leak), 2' by 2' for smaller repairs, and 4' by 4' for larger repairs.
- By opening the wall according to these standard sizes, staff can quickly and easily create a temporary closure using pre-cut Masonite. Developments should maintain a stock of Masonite cut in these sizes to fit the standard wall opening.

Precautions while performing repairs; Temporary Wall Closure

- Staff **must** make a temporary closure over the opening so that residents are not left with an open wall until final repairs can be completed. Staff should place a pre-cut Masonite sheet over the opening and screw in to secure it. The edges should be covered with duct tape to seal it.

Precautions while performing repairs; Temporary Wall Closure

- When the wall opening is performed on a tub wall, staff must waterproof the temporary Masonite closure. Use a new piece of polyethylene sheeting to cover the affected wall from the side and top edges to the tub ledge and extend 12 inches past the corner onto the adjacent wall, securing all edges with duct tape.
- Carefully cut an opening for the tub spout and shower controls, and tape down edges as thoroughly as possible.

Precautions while performing repairs; Temporary Wall Closure – Note!

- Staff are required to detail that a wall opening has been performed on a tub wall in the notes section of the work order. The subsequent permanent repairs must be expedited in order to prevent potential damage to apartments below. To do so, staff must also notify the development supervisor(s), who will inform the Planning Unit that the follow-up work order must be prioritized.

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**Cleaning
Exhaust Vents**

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Common Problems: Exhaust Grill



Dirty



Closed



Not sealed

Common Problems: Duct Shaft



Blocked

Dirty

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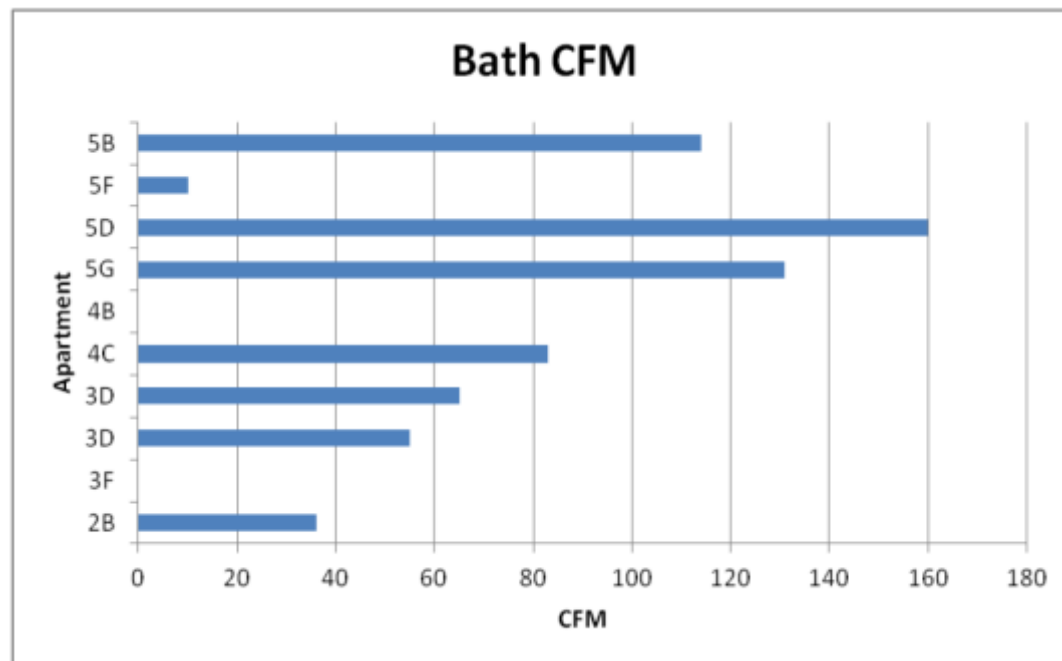
Common Problems Imbalance

Over-ventilation

- Wastes energy

Under-ventilation

- Leads to poor IAQ and possible mold



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Solutions: Ventilation Upgrades!

- Clean duct shafts/branches
- Clean or replace exhaust grilles



Instructions for Cleaning Horizontal Vent Ductwork

When cleaning horizontal vent ductwork from inside the apartment, employees:

- (1) Remove the face of the grill to the vertical shaft and HEPA-vacuum the grill and the interior and exterior of the horizontal vent ductwork.
- (2) Must use caution when cleaning the fire damper inside the ductwork.



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Pipe Insulation

Background

- When performing repairs that require a wall break and/or repairs to water/ fire system piping or heat supply lines, NYCHA has the opportunity to quickly and efficiently retrofit piping with insulation in accordance with New York City code.1
- This Interim Guidance provides information on how to inspect and install insulation when a wall break has been performed in the course of completing a repair.
- Maintenance workers, bricklayers, carpenters, plumbers, plasterers and roofers are responsible for conducting repairs that require wall breaks and/or repairs to water piping. Thus, maintenance workers and the aforementioned trades will be responsible for following the below guidance.

Process Details

For repairs requiring a wall containing pipes to be opened, maintenance and applicable skilled trades staff are instructed to inspect pipes, valves and fittings exposed for the presence of insulation.

- apartment repairs - staff must inspect all domestic water pipes for insulation
- public space - staff must inspect water/ fire system piping or heat supply lines affected by the repair
- All new piping (other than waste, vent piping and heat return lines) must be insulated and any repairs that require removal of insulation must include replacing the removed insulation

Asbestos Pipe Insulation



ACM Pipe insulation

- Asbestos containing thermal system insulation (TSI) may be present in wall cavities.
- Inspector should inspect all risers, t's and fittings both in the area and distal from the wall opening

Process Details

- If there is no insulation present, staff must install insulation on all pipes, valves and fittings exposed and accessible as a result of the wall break.
- Where possible, one-inch thick insulation should be installed. If pipe spacing prevents one-inch insulation to be installed, half-inch thick insulation should be installed.

Process Details

- Owens Corning ASJ Max insulation of both sizes and related materials (or other manufactured insulation approved by Supply Chain Operations) will be available in the development storeroom for maintenance and skilled trades staff to install on water pipes of various sizes.
- The full list of insulation and related materials is included in Appendix A.
- Should they not be available in the development storeroom at the time of the appointment, staff should make a temporary closure to the wall opening using Masonite until the material is obtained at which point work may resume. **(Please follow Interim Guidance for Wall Breaks)**

Process Details

- Maintenance workers and applicable skilled trades staff are responsible for fully inspecting the pipes exposed and accessible after the wall is opened.
- Should they find these pipes lack insulation, they must install the insulation during the course of the repair. Staff should consult the manufacturer's installation instructions for additional information.
- Staff issued with a handheld device must take a photo of the installed insulation once they have completed the installation, select the appropriate insulation remedy codes and attach the photo to the work order in Maximo.

Process Details

- If staff finds that insulation is ripped, damaged or unsecured, staff should remove what remains of the old insulation, and then install insulation around all pipes, valves and fittings that are exposed and accessible as a result of the repair.
- In the event staff suspects existing insulation may contain asbestos, they are to report it to the development and follow the existing process for testing and abatement. Once insulation has been tested and/or abated, staff should resume installation as outlined above.

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Process Details

- Superintendents, assistant superintendents, and skilled trades supervisors are responsible for ensuring that maintenance and skilled trades staff have properly inspected pipes and installed insulation and adhered to policy and procedure outlined in this interim guidance.
- Superintendents and supervisors should review the work orders where insulation has been installed and view the attached photos to evaluate the installation.
- Additionally, superintendents and development staff are responsible for ensuring that an adequate supply of insulation is in stock, monitoring the supply, and ordering additional insulation, when necessary.

Toilet Supply Line



- Condensation on uninsulated toilet supply line can lead to moisture on walls and floors

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**Cleanup & Quality
Assurance**



Cleanup Method

- **Method 1:** Wet vacuum (in the case of porous materials, some mold spores/fragments will remain in the material but will not grow if the material is completely dried). Steam cleaning may be an alternative for carpets and some upholstered furniture.
- **Method 2:** Damp-wipe surfaces with plain water or with water and detergent solution (except wood – use wood floor cleaner); scrub as needed.
- **Method 3:** High-efficiency particulate air (HEPA) vacuum after the material has been thoroughly dried. Dispose of the contents of the HEPA vacuum in well-sealed plastic bags.
- **Method 4:** Discard – Remove water-damaged materials and seal in plastic bags while inside of containment, if present. Dispose of as normal waste. HEPA vacuum area after it is dried.

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Cleaning Methods

- HEPA vacuum surfaces
- Damp-wipe & dry
- HEPA vacuum surfaces again
- Discard in plastic as C&D waste
- HEPA vacuum entire work area

THE PERIODIC TABLE

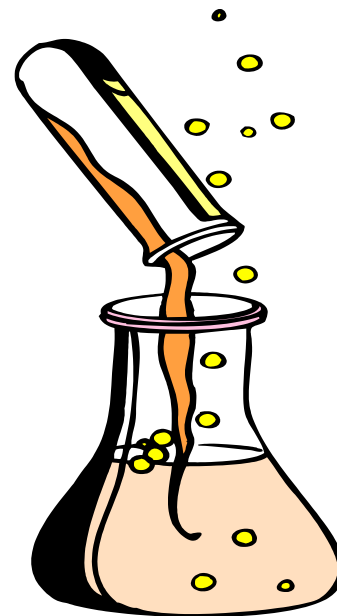
H ₁	
Li ₃	
Na ₁₁	
K ₁₉	
Rb ₃₇	
Cs ₅₅	
Fr ₈₇	



He	Ne	Ar	Kr	Xe	Rn												
H	Li	Be	B	C	N	O	F	Ne									
Na	Mg	Al	Si	P	S	Cl	Ar										
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Pu	Am	Cm	Bk	Cf	Es	Fm	Mendelevium
Fr	Ra	Ac	Rf	Mn	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Mendelevium	Nobelium	Lr	

Fungicides/ Fungistats

- Sodium Tetraborate
- Quaternary Ammonium Compounds
- Other Disinfectants
- NYCHA Products



Sodium Tetraborate:



- Advantages
 - Cheap
 - Effective
 - All natural
 - Readily available

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Quaternary Ammonium Compounds



- Advantages
 - Excellent Cleaner
 - Effective in organic soil
 - Mildewstatic properties
 - Safe
- Disadvantages
 - Need to keep using until the mold's food source or water is eliminated

Other Disinfectants

- Advantages
 - Effective mildewstat
 - Low toxicity
 - Readily available
 - Inexpensive
- Disadvantages
 - Not a fungicide
 - Dilution factors
 - Not commercial



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Fosters 40-80



- Use as a disinfectant, sanitizer, cleaner, fungicide, deodorizer, virucide and germicide.
- Kills a large variety of microbes within minutes.
- Contains surfactants to help clean and remove residue.
- Designed for use in water damage restoration situations.

NYCHA Product - **Cleaner**

Micro Bio-Wash Cleaner

- NYCHA Approved mold cleaner - HA# 0806938344
- Staff must follow directions
- Use correct dilution
- Allow adequate dwell time
- Safe for use on washable surfaces



NYCHA Product - Cleaner

Micro Biowash

ENVIROCHEM

425 Whitehead Avenue
South River, NJ 08882
Phone—732-238-6700
Fax—732-238-5390

GENERAL DESCRIPTION: MICROBIOWASH is a uniquely designed cleaner. MICROBIOWASH is an enzyme enriched product that will not only clean washable surfaces and eliminate odors, but with the biological residual, its action will continue between uses. A concentrated solution of bacterial spores produce enzymes to digest proteins, greases and fats and wipe-out odors. MICROBIOWASH is safe to use on any washable surface. No rinsing is required. A pleasant residual odor is left after using MICROBIOWASH.

PROPERTIES:

Chemical composition..... Synthetic soil cutting
and soil suspending agent; penetrating agents;
water conditioning agents.
Appearance..... Pink liquid
pH..... 6.1
Specific Gravity..... 1.019 (9.4 pounds per gallon)
Stability..... 1 Year @ Ambient Temperature
Wetting Ability..... Excellent
Foaming..... Low to Moderate
Solubility..... Complete and Fast

USE DIRECTIONS:

GENERAL

This product is ideal for cleaning concrete, ceramic floors, quarry tile, grout and brick. It is recommended for use in food service areas, schools, restaurants, hotels, nursing homes, restrooms and shower rooms. MICROBIOWASH leaves surfaces brightened and sparkling clean. May be applied with auto scrubber, mop, brush, pump sprayer or pressure washer.
For best results, remove excess soil. Slight agitation may be necessary. Rinse thoroughly with clean water as needed.

For Light Duty Cleaning: Use 1 to 2 ounces of product per gallon of water.

For Medium Duty Cleaning: Use 3 to 4 ounces of product per gallon of water.

For Grease, Oil and other Heavy Duty Cleaning: Use 6 to 8 ounces of product per gallon of water.

Garbage trucks and cans: For best results, spray on at day's end. Rinse before using next day.

MICROBIOWASH can be used safely on any surface not harmed by water alone: including concrete, carpet, grout, wood, stainless steel, Formica, vinyl, porcelain, and linoleum.

HANDLING PRECAUTIONS:

CAUTION: WARNING

KEEP OUT OF REACH OF CHILDREN.

Undiluted, this product may cause skin irritation or damage to the eyes. Harmful if swallowed. Avoid contact with skin, eyes and clothing. Do not take internally. Avoid all contact with open wounds. In case of contact with eyes, flood repeatedly with water and call physician. Avoid contamination of food.

Keep out of reach of children. Rubber gloves should be worn when using this product. For professional use only.

DO NOT USE ON FOOD CONTACT SURFACES.

PACKAGING:

4x1 gallon, 5 gallons, 55 gallon drums

Seller makes no warranty, expressed or implied, concerning the use of this product other than indicated on the label. Buyer assumes all risk of use and/or handling of this material when such use and/or handling is contrary to label instructions.



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NYCHA Product - Disinfectant

Shockwave RTU

- NYCHA Approved mold disinfectant – HA# 080657583
- Staff must follow directions
- No dilution
- Apply product with a cloth, sponge or other suitable applicator until surface is thoroughly wet.
- Wait 10 minutes, and wipe dry or air dry.



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NYCHA Product - Disinfectant

ShockWave™ RTU

Disinfectant/Sanitizer/Cleaner/Fungicide

Product Description

8316

ShockWaveRTU is an EPA registered disinfectant, sanitizer and cleaner designed specifically for mold remediation contractors. ShockWaveRTU is designed to meet all your disinfecting, sanitizing, cleaning, and deodorizing needs. ShockWaveRTU is strong enough to be used in a hospital or medical environment, and has been specifically formulated to be used on both porous and non-porous materials. ShockWaveRTU is a powerful ready-to-use quaternary ammonium chloride blend, which is ideal for use when clean water is not readily available or for any situation where a ready-to-use formula is required.

ShockWaveRTU has over 120 organism kill claims including *Aspergillus niger*, *Penicillium spinulosum*, *E. coli*, *Salmonella*, HIV, Hepatitis-B, Herpes, Poliovirus, and many other pathogenic and environmental microbial organisms.

Application Information

WATER DAMAGE RESTORATION: This product is particularly suitable for use in water damage restoration situations to sanitize against odor causing bacteria on the following porous and semi-porous materials: carpets, carpet cushion, subfloors, drywall, trim and frame lumber, tackless strip and paneling. Use as supplied, saturate affected materials with enough product to remain wet for at least 10 minutes. Use proper ventilation.

DISINFECT/CLEAN/DEODORIZE: Pre-clean all heavily soiled surfaces prior to product application. To clean, deodorize, and disinfect apply product with a cloth, sponge or other suitable applicator until surface is thoroughly wet. Wait 10 minutes, and wipe dry or air dry. Do not use on glasses, dishes or utensils.

FUNGICIDAL: Kills Trichophyton mentagrophytes on hard nonporous surfaces. Spray solution making sure to wet all surfaces completely. Wait 10 minutes, then remove excess liquid or allow to air dry.

DEODORIZER: This product deodorizes garbage storage areas, empty garbage bins and cans, exterior surfaces of toilet bowls and any other odor-causing areas. Spray solution making sure to wet all surfaces completely. Allow to air dry.

FIRST AID

Skin: Remove contaminated clothing. Flush affected areas with large quantities of water. Seek medical attention if irritation persists.

Eyes: Flush with large quantities of water, holding eyelids open. Seek medical attention.

Inhalation: Remove victim to fresh air and monitor. Seek medical attention if symptoms persist.

Ingestion: Give large quantities of water. Seek medical attention immediately.

CAUTION!

KEEP OUT OF REACH OF CHILDREN. Do not take internally. Close container after each use.

Keep from freezing.

Store between 40°F (4.5°C) and 90°F (32°C)

24 hour Emergency "CHEM-TEL" -
800.255.3924

Properties

Product Specifications

Active Ingredient: Quaternary Ammonium Chloride
Color: Clear Blue
Odor: Fresh Linen
Foam: 0
Flash Point: >200°F
pH: 11.7
Shelf Life: 36 Months Min.
(Original Sealed Container)
Calculated VOC: 0 grams/liter

Testing

EPA Registration Number: 61178-2-73884
EPA Est. Number: 8325-PA-01

Available Package Sizes

1 gallon containers (4/case)
5 gallon containers

ShockWaveRTU contributes toward satisfying IEQ Credit 3.3 under LEED-EB by complying with "California Code of Regulations maximum allowable VOC levels for disinfectants".



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Follow Manufacturer's Directions for all

- Use the right dilution
- Use the right application
- Change solution when recommended
- Avoid cross-contamination







Take Your
Cleaning
Count:
Wash
Lead
Out!







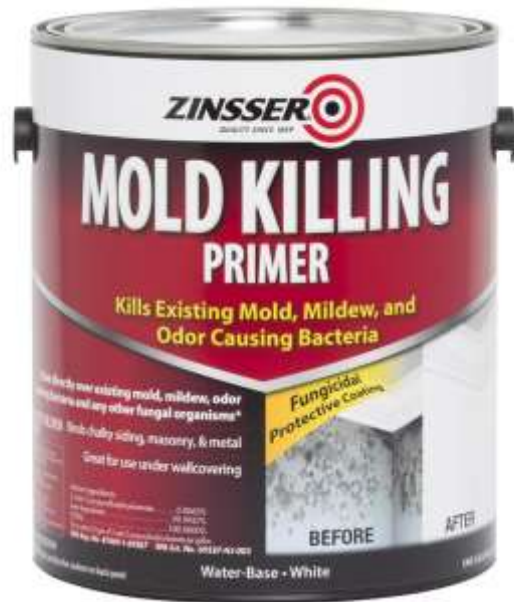


Cleaning Methods

- You can clean without disinfecting
- You can NOT disinfect without cleaning



Mold Resistant Paint



- Applied after surfaces are cleaned, disinfected & dry
Apply per manufacturers instructions

Anti-microbial coatings

- Used to treat building materials prone to mold growth
- Applied to framing and drywall, among other substrates during new construction or after remediation
- Long term protection against mold and mildew growth.

NYCHA Products

- Fosters 40-50 Anti-Microbial Coating



Disposal

- Removal of Containment Materials
 - 6 mil Contractor bags
 - Goose-neck sealed
 - Decontaminated
 - Taken directly to secure container



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Quality Assurance Inspections

- Maximo automatically generates a quality assurance inspection work order twenty-five (25) days after the last child work order is closed for all apartments where a mold, water damage, or moisture (i.e. a wet measurement) condition was identified during the inspection. The target start date is automatically populated as 30 days after the last child work order closed and the target end date is populated as 45 days after the last child work order closed.
- Once the quality assurance inspection work order is generated, property management staff contacts the resident and schedules the quality assurance inspection to take place between 30-45 days after the last child work order is closed. See Section VIII.A.3 for the process to schedule appointments.

Quality Assurance Inspections

Inspecting for Mold, Water Damage, and Moisture

The Inspector:

- Visually inspects for mold any wall, floor, ceiling, or component identified in the initial inspection as having mold and records the results in the handheld device.
- Visually inspects for water damage any wall, floor, ceiling, or component identified in the initial inspection as having water damage and records the results in the handheld device.
- Uses the moisture meter to measure for subsurface moisture any, wall, floor, ceiling, or component that measured wet during the initial inspection and records the results in the handheld device.

Quality Assurance Inspections

If all work was satisfactorily completed:

- The inspector completes the quality assurance inspection by taking photo(s) of the inspection area free of mold, water damage, and/or moisture and uploading the photo(s) into Maximo.

If any work was not satisfactorily completed:

The inspector:

- Immediately creates a child work order in Maximo.
- Takes and uploads a photograph of the unsatisfactory work into Maximo if the work is visible in the apartment.
- Closes the existing quality assurance inspection work order.
- Follows up with supervisor of the staff person(s) who performed the work to report the unsatisfactory work and ensure the work is completed.

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Simulation

- Building Sciences

NYCHA MOLD TRAINING

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**Outputs, Reports,
and Record Keeping**

Outputs

- Mold in NYCHA apartments is remediated and the root causes are identified and corrected within the allowable timeframes.
- Mold recurrence is reduced

Performance Reporting

NYCHA shall centrally assign:

Staff to review reports to identify developments with:

- High parent mold work order completion time frames.
- High rates of unfounded mold work orders.
- High reoccurrence rates for mold work orders.

Performance Reporting

NYCHA shall centrally assign:

Supervisory staff trained in mold inspections to:

- Visit developments and inspect randomly selected apartments with high rates of unfounded or reoccurring (as applicable) mold work orders.
- Report findings on the underlying issue, i.e. a building system and/or mold inspection and remediation process issue.
- Provide follow up recommendations to the neighborhood administrator.

Performance Reporting

- For building system issues, the supervisory staff may, for example, recommend additional repairs.
- For process issues, the neighborhood administrator follows up with the property manager and property maintenance supervisor to address the process issue which could include providing additional training, reviewing key accountabilities, or providing progressive discipline.

Reports

- Operations reports to be developed with the independent data analyst

Record Keeping

- The IT Business Solutions Technology Department's Maximo Team retains electronically created and stored completed work orders for at least seven (7) years

Building Sciences

- Questions, Comments & Discussion

Knowledge Assessment

- Thanks for your participation!
- Questions & comments
 - training@environmentaleducation.com
 - 888436 8338

Have a great day!