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Dear Bill,

Please consider our practices and intended procedures as approval for the outlined virtual monitoring plan below. The purpose of this document is to describe what was already done, establish procedures on how we intend on performing remote monitoring if the travel restrictions continue to be in place long term, and pursue DOE approval of these methods.

The following categories will be covered: General technical monitoring supported by the technical tool, assessment and energy audit, work in progress, final inspection, and QCI. This is not intended to cover any programmatic or fiscal monitoring.

There are two sections of this document: virtual monitoring completed, and virtual monitoring procedures. The virtual monitoring completed section describes how we conducted a virtual monitoring for the agency that would require travel. This monitoring did not include a QCI inspection. The virtual monitoring procedures describe how we intend on performing virtual monitoring if DOE approves these procedures, and if travel restrictions continue to be in place for NM.

Section 1: Virtual Monitoring Completed

For our first monitoring, we completed this early to establish safe and effective protocol for future monitoring if needed. Below is a description of how we reviewed the general technical, energy audit, work in progress, and final inspection procedures.

Technical Tool

This was discussed via WebEx point by point as listed on the tool. The agency has key staff at the table, just like they would in person, and are "interviewed" by the technical manager. They are asked about their procedures for each item on the tool. Their responses are documented and compared against actual field performance later in the monitoring. The staff are asked to virtually prove the answers provided such as SDS manuals located in vehicles, tool condition, safety equipment, and other tangible items. All manuals are supplied electronically prior to the meeting and reviewed for consistency with agency answers during the interview.
To keep monitoring distinctively different from training, we do not offer coaching, guidance, or advice when trying to assess an agency's capabilities. The exception to this is when a unique situation is encountered, and the staff member states that the situation in question is something that would normally require outside guidance.

Assessment

The energy auditor first performed an entire assessment on a mobile home covering all the areas that are part of his normal routine. At the end of the assessment, he used his phone to Facetime and contact two WAP staff at MFA. An introduction to the home was presented with basic pieces of information such as age, square footage, fuel source, and general condition of the home. He would be asked to stop and explain things further if one of us had questions. Each of the measures that were to be on the scope of work, later confirmed by an energy audit, was summarized by the energy auditor. All Facetime sessions were recorded but without the sound.

Exterior summary- We showed round the exterior of the home where the following was shown and explained:

- Condition, type, shading, and weatherization needs of windows
- Door condition, type and weatherization needs
- Water heater location, size, BTU capacity, lack of insulation on tank and pipes, test results, and health and safety concerns
- Roof orientation, pitch, material used, and flue penetrations
- Siding ventilation, condition, and type
- Belly type, repair needs, skirting, insulation needs, joist direction.
- Health and safety concerns such as improper dryer vent
- The door used to set up the blower door

Interior summary- Once we were satisfied with viewing the entire exterior of the home, the interior of the home was viewed:

- ASHRAE compliance, how it will be achieved, air flow result of each exhaust fan, and where continuous ventilation will be installed
- Holes in interior walls and ceiling used to determine insulation levels
- Bulb replacement location and wattage
- Showerhead existing GPM, replacement options, and diverter condition
- Refrigerator still being metered, age and condition
- Areas that were identified using the blower door as infiltration
- Blower door set up acknowledging the 25pa prior to 50pa requirement before reaching the pre-number
- Areas of infiltration discovered using the blower door as a guide
- Duct readings and theory why some ducts are higher than others describing his visual inspection of the inside of each duct prior to the duct pressure readings
- Thermostat type and condition

Diagnostic Combustion Testing- the energy auditor explained the following areas of diagnostic testing within the home and his findings:

- Water heater CO levels, spillage, and efficiency
- Kitchen stove CO levels and condition

- Furnace steady state efficiency, CO levels, flame roll out, temperature rise, fan on/off temperature, static pressure, room to room pressure tests, worse case set up, and the need for further testing by HVAC licensed contractor

Client Education- This was conducted prior to the Facetime call. The topics of client education were explained to us after the summary of the house walk through.

Energy Audit Model
Once completed, the Input report and recommended measures were sent by the energy auditor and reviewed and compared with the field findings for accuracy.

Work-in-Progress
The agency's QCI inspector used Facetime to contact MFA staff from the vehicle upon arrival of a jobsite where weatherization work was being conducted. This was to simulate us arriving at the site in person and exiting a vehicle to see the workers from the street view prior to closer observations. As with the assessment, the inspector was asked questions, asked to show closer views of areas that we wanted to see, and go back to areas that we did not feel we had a close enough look. We virtually accompanied the inspector through the jobsite viewing the following:

- Outside workstation set up for tool disinfection and hand washing
- PPE that each crew member was wearing and using
- Social distancing or lack of social distancing
- Door being replaced, PPE used, tools used and tool condition
- Water heater being drained for replacement
- Sealing of the ducts per SWS
- Plenum of furnace being cleaned and sealed
- Sheetrock sealing exterior wall infiltration
- Location and use of Field Guide and SDS
- Location of client during work
- Vehicle condition
- Organization of trailer and care of tools
- Staff interaction with each other

Final Inspection
The QCI inspector again Facetimed the two of us from the vehicle so we could observe what he was seeing close as possible. Prior to entering the home, he described his review of the client file and scope of work. The following is what we were able to review:

- Gas leak testing
- Testing of the stove for CO air free and as measured
- Water heater testing for CO and draft, water temperature
- Verification of scope of work including
    - Glass, replacement back and front door replacements, dryer vent replacement, belly insulation, water heater wrap, lack of insulation certification(noted on final),

duct sealing integrity, water heater door, drip leg for water heater and air sealing locations.

- Blower door readings compared with target and pre number
    - With blower door running, he looked for missed air sealing opportunities
- Duct pressure readings
- Installed continuous ventilation ASHRAE fan number
- Ambient CO readings
- Furnace diagnostics
    - Worse case set up, fan on/off temperature, temperature rise and static pressure, CO air free and as measured, room to room pressure balancing, what the inspector would do if the CO were to be higher than the limit, efficiency reading and fan speed.
- Client education and interview was carried out after the Facetime call ended
- The client file was scanned and sent for review to compare with the virtual visit

Section 2: Technical Monitoring Procedures:

Technical Tool

1. A copy of the tool is sent to the agency, so the agency has the opportunity to view the sections of the tool and prepare for the monitoring interview.
    a. This is provided to the agency at least 30 days prior to the monitoring.
    b. Questions regarding the tool are encouraged during this period. This helps the monitors gain insight on what T and TA needs the agency has prior to the monitoring
2. Supporting documents in relation to the tool are provided.
3. Interview is scheduled with the agency involving key technical staff of their choice via WebEx.
    a. Although video is not mandatory, it is preferred.
4. Each item on the tool is discussed with the agency and the responses are recorded on MFA's copy of the tool. Notations are made for areas that stand out and need a deeper look during the virtual field visit.
5. More supporting documentation may be requested depending on the answers.
6. The agency is asked to show the location or condition of tools, vehicles, PPE, or other items.
7. When the interview is complete, the information organized with follow up areas noted for the virtual field visits.
8. If there are already findings or concerns based off the agency's answers and provided information, that will also be documented for the monitoring letter.

Assessment- The agency has a choice of utilizing two staff members virtually showing an entire assessment, or one staff member that provides a virtual summary after the completion of the assessment.

1. The agency selects a client from the waiting list based on priority(ranking) points and location of where the energy auditor is working that week.
2. The client name and address are sent to MFA so that the home could be viewed via Google Earth if available.
3. After a complete assessment of the home, the energy auditor uses a device other than his/her personal cell phone to group video call MFA staff, who also use a separate device that is capable of recording with sound the high points of the visit.
4. The energy auditor shows the monitors using the device the entire home starting from the exterior, discussing all the areas of the home that were assessed and will be addressed and why.
5. Preliminary scope of work is shown and summarized with reasoning behind each item on the scope of work.
6. The diagnostic testing that was performed is described to the monitors with the results of each test.
7. Blower door is briefly run to show key areas of infiltration and gauge readings.
8. Client education during the video call is optional, but the agency must provide how client education was delivered for that visit.
9. The energy auditor is asked to clarify or show more closely areas of question throughout the visit.
10. Safety concerns noted by the monitoring team are communicated immediately to the energy auditor.
11. If it appears there were missed opportunities for energy saving measures or health and safety, it may be the energy auditor did not cover that during the summary and is given a chance to bring up the point in question.
12. Based on the summary, viewing of the home, and discussions with the energy auditor during the visit, a partial determination is made of how effective and complete the energy audit is.
13. The energy auditor enters the information into NEAT or MHEA and sends the input report and recommended measures to the monitors, along with ASHRAE calculations.
14. The monitor reviews the model, notes, the recorded video and compares with the technical tool for conclusion of the assessment monitoring.

Work-in-Progress

1. A client is selected from homes that have been assessed with materials and supplies on hand.
    a. It is preferred this be a home with multiple measures being installed to gain a wider understanding of the agency's overall field practices.
    b. Name and address are sent to MFA ahead of time to help prepare.
2. Once the agency's staff has unloaded their equipment and started work, a representative contact the MFA monitoring team for a group video call.
    a. This occurs from the vehicle to obtain street view.
3. The monitoring team observe the staff working from the street view and approach with the person operating the device the staff and tour the job site.

    a. The person operating the device should be familiar with that home's scope of work to know what areas of the home to view.
    b. It will be requested that the tour is slowed with closer zooms on areas the monitors need to see with more detail.
4. Each worker starting with the crew leader is asked what he or she is working on and how they are doing it. The video operator does not hand the device to the worker and keeps the 6' distance.
5. The monitoring team views the condition of the vehicles, tools, and insulation trailer.
6. The monitoring team also asks about and view safety equipment, location of PPE, SDS manuals, and Field Guides.
7. Specific areas of work in progress are compared against Field Guides and SWS.
8. General OSHA compliance and safety practices are observed.
9. Safety violations or concerns are immediately brought up and communicated to the crew leader.
10. If it appears something is being missed, or not addressed properly, the team is given a chance to explain the reasoning behind why.
11. The notes and video are later reviewed and compared to the technical tool for conclusion of the work in progress monitoring.

Final Inspection

1. A completed unit that needs a final QCI is selected and the client file is sent to MFA staff electronically.
2. The monitors view the contents of the file and views the home via Google Earth if available. Notes are made in preparation.
3. Two people from the agency are present for the final inspection. The two video call the MFA monitoring team from the vehicle when arrived.
    a. One is the QCI who conducts the inspection, and the other holds the device for very clear and focused zooming on the inspection that is being done.
    b. The QCI must focus on the final inspection and not the device so that the procedures can be accurately observed.
    c. The QCI describes each activity like they would during a proctored field exam.
4. Everything that the final inspector would normally do is completed and video streamed.
5. The monitors will ask the team of inspectors to slow down, stop, explain, or show a closer shot of certain measures.
6. The diagnostic testing is highly important, and the camera must be angled to clearly see the meters, gauges, location of testing, and appliance operation. It is assumed this will take the most time of the inspection.
7. Safety concerns noted by the monitoring team will be communicated immediately to the inspection team.
8. The agency may have more than one device on hand as a back up if the first one battery life is not long enough to support the entire final inspection.
9. As the final inspection is ending, the monitoring team gives the inspectors an opportunity to address anything they might have missed.

10. If it appears the home is being left in an unsafe manner, the monitoring team alerts the inspectors so that can be corrected, and notations are made for the monitoring letter.
11. Observations are made about how the inspectors addressed problems with the work or missed opportunities.
12. The final inspection visit is compared to the client file, and technical tool for consistency as the final inspection procedures are concluded.

QCI

General provisions

1. The MFA QCI certificate holding person selects a completed unit based off desk monitoring or a random unit and communicates to the agency that the unit has been chosen for a QCI visit.
2. The agency scans and sends the entire client file to MFA.
3. The client file is reviewed, studied, compared with completed unit information obtained during desk monitoring, materials within invoices are compared to Appendix A if possible, and specific notes are made for areas of the home that need to be viewed more closely.
4. The agency, the client, and MFA agree on a time for the QCI to happen.
5. Two people from the agency arrive at the home and video call the MFA monitoring team from the vehicle. One person from the agency must possess a QCI certificate.
6. The monitoring team then directs the agency's inspection team to begin the inspection process following BPI protocols.
7. The field QCI and MFA QCI are working in tangent to complete the inspection, however, the monitoring team is in control of the inspection and responsible for viewing the testing, scope of work verification, and post client interview. The field inspectors are at times acting as extensions of the monitoring team.
8. In addition to the client file containing the work order, the MFA monitoring team has the NM Technical Standards, NM Field Guide, SWS, BPI Technical Standards, BPI QCI Field Guide, and DOE guidance readily available for comparison and reference.
9. The remote virtual QCI is recorded with clear sound and video.

Health and Safety Testing

1. The remote monitors ask the inspection team to dawn **N95 masks and other PPE** before entering the home.
2. Inspection team is reminded or instructed to turn on their **personal CO meters** and show it on the video.
3. **Blower door is set up** for initial COVID purge of home and client is informed of the process that will be taking place at the home. The house must be set up for blower door with the combustion appliances. The proper set up is verified by the monitor. If possible, for efficiency reasons, a CFM 50 reading may be obtained.
4. The inspectors give the home **a pre-sanitation wipe down** for all commonly touched surfaces.

5. **Combustion gas leak testing** is conducted per BPI Technical Standards by the monitor directing the field inspector to angle the device in such a way that all the joints on the meter, propane tank, and lines to each appliance are clearly seen. The receiving volume on the device must be loud enough for the remote monitors to hear when there are leaks detected when the inspection team performs the testing.
6. As the blower door continues to purge, the **exterior of the home** is inspected for health and safety issues. If the scope of work contains items that occurred on the exterior, they are verified by the monitors at this time for quality and completion.
7. **Appliance conditions** are shown on the video clearly so the remote monitor can ask the field inspector to zoom in on flues, or any part of the combustion appliance the monitoring wants to view more closely.
8. The monitoring team constantly reminds the field inspectors the need to **check ambient CO** with their personal meters and combustion analyzer.
9. **CAZ and worse case set up** is conducted by the inspection team at the direction of the monitors. If the monitoring team is unable to determine from the client file what worse case conditions should be, the inspectors are asked to review areas of the home that would help make that determination such as location of dryer and exhaust fans.
   The manometer set up and all testing instruments used must be clearly seen by the monitors.
10. Testing must include **all combustion appliance** in the home.
11. **Spillage, CO testing, and other required tests (room to room, temperature rise,etc.)** are conducted at the appropriate times, locations, and with the correctly set up instruments; all shown clearly on the recorded video for each appliance located in the CAZ.
12. **Kitchen oven/stove** is inspected and tested at steady state by the inspection team at the direction of the monitors, following BPI protocol.
13. **Health and safety concerns** are communicated immediately, and recommendations made according to BPI action levels by the monitoring team.

Scope of work/Work Order Verification

1. The inspection team show the monitors each item on the **scope of work** and allow the monitors time to visually inspect that from the video and compare with client file notes and invoices.
2. **Each installed measure** is inspected until the monitors are satisfied that they have obtained enough information about the **quality** of work compared to SWS and Field Guides to move on to the next measure.
3. **Re-works** or missing items will be communicated to the inspectors and recorded by the monitors.

Diagnostic Testing

1. After the monitors have confirmed the inspectors have set the appliances to pilot, obtained a baseline reading, and set the remainder of the house up for testing, the blower

door still set up from the earlier purge, is used to **obtain a CFM 50 depressurization reading**.

a. This is the only part of the monitoring where one of the two field inspectors are in the home. The inspector in the home will need to operate the video device and obtain the blower door reading at the same time.
    i. If the CFM 50 reading is significantly below the number recorded on the final inspection, the inspector and monitor will first verify the proper set up of blower door and gauges. The fan will then be shut down and the home is rechecked for open windows and doors.
        1. As the fan is shut down, all the items on the work order that pertain to air sealing/infiltration, are verified by the monitors with the inspection team.
    ii. Duct pressure pan and zonal readings are obtained as the blower door is running at CFM 50 and shown clearly to the monitor.
    iii. Once the monitors are satisfied that all the required tests have been completed, the blower door fan is turned off, and the other inspector may re-enter the building.
b. The home and appliances are restored back to normal and verified by the monitors. Discrepancies with numbers are discussed and recorded.

2. **ASHRAE Fan flow numbers** and pressure differential from fan to house are obtained using the proper manometer set up, verified by the monitors. Numbers are compared to the client file numbers. If the fan settings need to be adjusted due to varying blower door readings or faulty initial calculations, they are adjusted at this time by the inspectors to the correct settings.

Closing of QCI

1. The inspectors and MFA discuss the visit and review everything that was completed to ensure the home is left in a safe condition.
2. Once the inspectors have removed the equipment from the home, there is **a post sanitation wipe down** of all commonly touched surfaces by the inspectors.
3. The **client is interviewed** on video held by the inspector where verification of client education occurs, and any questions are answered by the monitors. Under no circumstances will the client be allowed to handle the device or other items.
4. The inspection team **sanitize their tools** outside of the client home and secure them in the agency vehicle.
5. The **monitors compare the recorded video** with their notes, client file, and make determination on re-works, whether the home passes or fails, findings, concerns, and T and TA that may be needed by the agency.

Virtual Monitoring Approval Request

We are requesting approval for the procedures described in this document. If there is more information that would help DOE gain more clarity on how this will be performed, we will be happy to provide it to you. Thank you for your consideration of this request.

Sincerely,

Troy Cucchiara
NM Energy$mart
Green Initiatives Manager

MFA