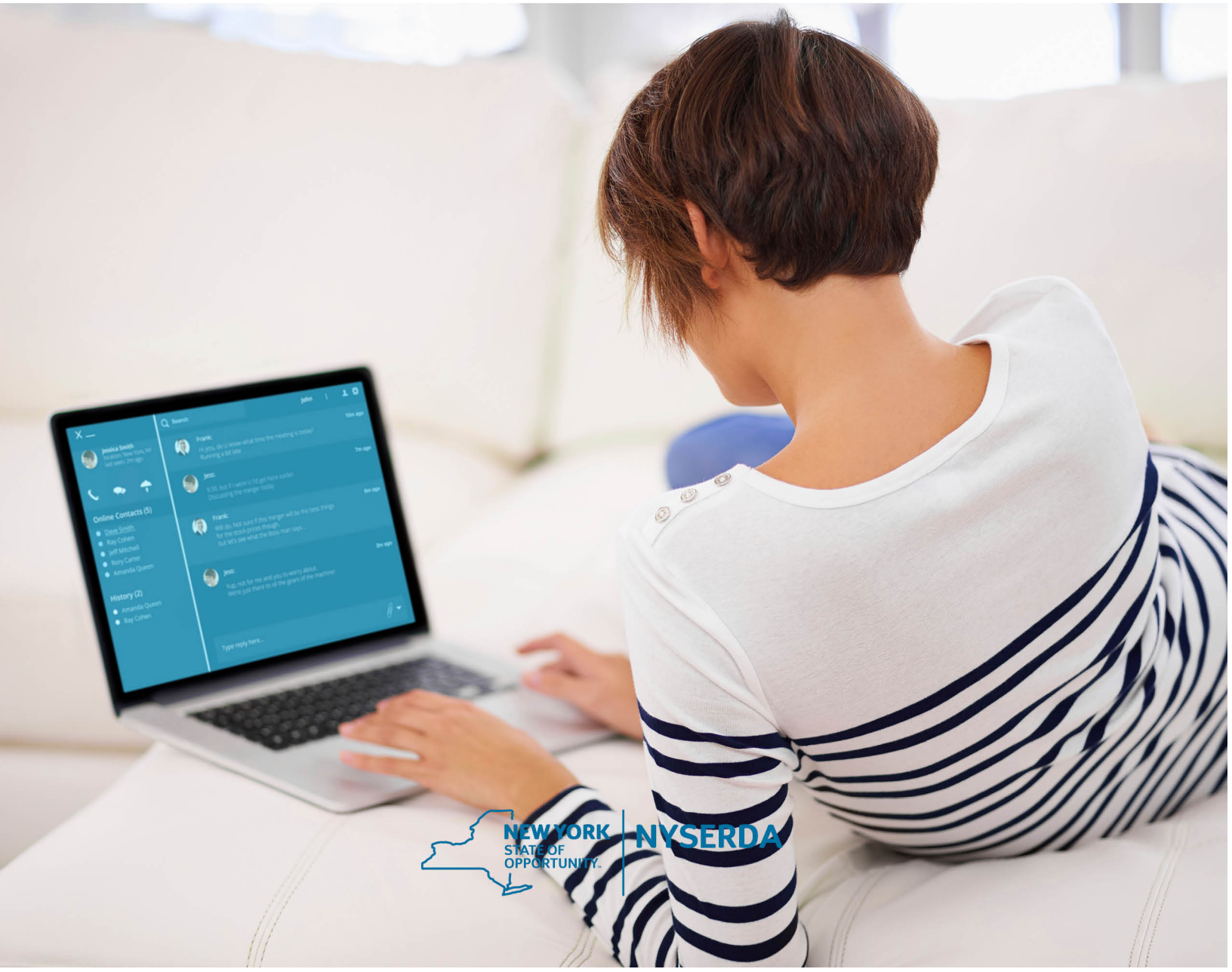
Virtual Audit and Assessment Toolbox

For Consultants and Customers

This document is a guideline for consultants and customers interested in proceeding with Virtual Audits and/or Assessments. Check back for updates as we learn more about the Virtual Audit and Assessment process.

August 2020



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1 Introduction to the Virtual Audit and Assessment (VAA) Toolbox

The VAA Toolbox contains materials to support the process detailed in the VAA Process Manual. Toolbox items are intended to help service providers facilitate the VAA process with their customers. Toolbox items are intended to serve as a starting point, or template, which service providers can then customize to their specific needs and customers.

The full VAA Toolbox includes:

Planning Call Stage
■ Scheduling email template ■ Follow-up email templates ■ Discussion Guide ■ Building Information Form (see Appendix A) ■ VAA Customer Guide (customer-focused fact sheet)
In depth Facility Interview Stage
■ Scheduling email template ■ Follow-up email templates ■ Discussion Guide ■ System Information Form (See Appendix B)
Virtual Walkthrough Stage
■ Scheduling email template ■ Reminder email template ■ Follow up email template ■ Discussion Guide ■ System Information Form (See Appendix B)

2 Planning Call

The purpose of the planning call is to determine whether the customer and its facilities are a good candidate for a VAA. Toolbox items include:

- Scheduling email template
- Follow-up email templates
- Discussion Guide
- Building Information Form (See Appendix A)

2.1 Scheduling Email

Attachments: VAA Customer Guide, Building Information Form

Dear [Name]:

Thank you for your participation in [program name]. We would like to speak with you about performing a virtual audit and assessment at your facility. This energy assessment will provide building-specific energy and cost-saving recommendations focused on [type of assessment (e.g., low-cost operational improvement opportunities / capital improvement opportunities)]. Our energy engineers will work with you and your facility staff to gather information about your building(s), identify potential energy and operational improvements, and provide a written report with recommendations. The attached VAA Customer Guide explains the virtual audit and assessment process. During the planning call, we will:

- Discuss your energy efficiency and operational goals
- Review the virtual audit and assessment process and timeline
- Collect some information from you about the selected building(s)
- Determine whether your building is a good candidate for a virtual audit and assessment
- Identify the building information that may already be available.

If you are interested in starting the process to receive your virtual audit and assessment, please respond to this email with some options of days and times next week you are available for a planning call. We will need a member of the facilities staff familiar with the building's equipment to be on this call, and the call typically takes about 30-45 minutes.

To help us prepare for the call, we urge you to review the attached *VAA Customer Guide*, which gives an overview of how a virtual audit works. Additionally, you may wish to review the attached *Building Information Form* to have a sense of the types of information that we will review on the call.

We look forward to working with you to improve your facility's energy performance. If you have any questions or need additional information, feel free to contact me at [email/phone].

Regards,

[signature block]

2.2 Follow-up Email - Go

If the customer is interested in proceeding and the facility is a good candidate for a VAA, send a Go email.

Attachments: Building Information Form

Dear [Name]:

Thank you for taking the time to speak with us about your facility [today / on <date>]. As we noted during the call, we believe your project is a good candidate for a virtual energy audit and assessment.

At this point, we would like to collect some information from you to help us start the assessing your facility's energy savings potential. Please provide the following information:

Building	**Information Requested**
For example Building 1	List needed information for each building, for example: • Building Information Form • 14 months of electric and gas utility data for all meters/accounts • Site plan and floor plan • Specifications and drawings for replacement boiler • Etc.

Providing the requested information by [today's date + 30 days] will allow us to complete your energy audit in a timely manner. Once we receive this information, we will schedule the in-depth facility interview, where we will discuss:

- Findings of the utility bill analysis [if complete]
- Equipment operations and controls
- Energy systems such as [building envelope, lighting, HVAC, and domestic hot water]
- Operations, maintenance and performance concerns for each system
- Videoconferencing options for the virtual walkthrough

We look forward to working with you to improve your facility's energy performance. If you have any questions or need additional information, feel free to contact me at [email/phone].

Regards,

[signature block]

2.3 Follow-up Email - No-Go

If the customer is not interested in proceeding or is not a good candidate for a VAA– send a No-Go post-screening email.

Attachment: As needed

Dear [Name]:

Thank you for taking the time to speak with us about your facility. As we noted during the call [today / on <date>], we believe that your project is not a good candidate for a virtual energy audit and assessment at this time. When we are once again able to perform full on-site work, we will contact you to see if you would like to proceed with your energy audit and assessment.

Until that time, [enter program/customer-specific information such as required].

Thank you again for your time and attention. If you have any questions or need additional information, feel free to contact me at [phone/email].

Regards,

[signature block]

2.4 Discussion Guide

This guide is intended to assist service providers in having productive conversations with their customers about the VAA process. The planning call is an introductory conversation with the customer to determine their level of interest and ability to participate in the VAA process. It reviews their energy efficiency goals and explains how the VAA can help them achieve those goals. Customer representatives are not expected to have technical information about their facility on-hand. Rather, the planning call is meant to establish the capability and interest of the customer to participate.

The service provider should act as the host of the call and guide the conversation through the agenda. Each conversation is different, and service providers should customize their conversation to the customer and any relevant investor owned utility or other programs the VAA process is being utilized for.

2.4.1 Introductions

1. Introduce the attendees – service provider, customer, etc.
2. Establish the goal of the call

On this call, we will discuss:

- your energy efficiency goals
- the virtual audit and assessment process – how it works and what to expect
- high-level information about your buildings
- determine how to proceed

2.4.2 Customer Energy Efficiency Goals

What are you hoping to achieve in your buildings?

2.4.3 VAA Overview

1. Introduction to Virtual Audit

The virtual audit is a way for us to minimize or eliminate time spent on site. It is a collaborative approach to gathering information about your building that then helps inform our energy assessment.

- We gather data with you using a combination of discussion or interviews, photos, reviewing drawings or other documentation, and finally by a video conference walkthrough of your building.
- Our audits are more effective and accurate the more information we have. Data collection does require help from staff who are knowledgeable about the building, its systems, and how they are operated and controlled. We will also need their help to take around the building using a smart phone or tablet on video.
- We typically do data collection in three stages – first, we start gathering information such as utility bills, drawings, photos, past reports or equipment lists. Second, we have a more in-depth interview via conference call about specific building systems. This call can take up to an hour per building. Third, we have a video walkthrough to guide us through specific spaces and equipment in your building to fill in any gaps. This virtual walkthrough may take up to a day per building (depending on building size and complexity), although we can do it over multiple sessions. We will walk through the building, looking at the following:
    - Building Envelope
    - Cooling and heating plants as well as set points and controls
    - HVAC equipment
    - Hot Water systems
    - Pumps and motors
    - Building automation systems and/or control systems
    - Refrigeration equipment
    - On-site renewable energy systems, where applicable

Although we don't need to go in every room, we will want to see a representative sample of different spaces throughout the buildings

- Is there roof access?
- Are there locked mechanical rooms?

- Once we have all the information in hand, the remainder of the auditing and assessment process is the same - the identification of energy improvements, energy analysis, cost estimates and report writing are not negatively impacted by virtual data collection

2.4.4 Customer Reaction and Interest

Gauge the customer's interest and ability to continue.

- If you are interested in proceeding, the next step would be to complete the Building Information Form. This helps us gather some basic information about your building(s), such as size, age, and types of major energy using equipment. If there is time on this call, we can start filling that out.

2.4.5 Next Steps

- Preliminary scheduling discussion:
  - What is the best general time of day for the assessment? We expect to be on site virtually between 2-3 hours.
- Who will be our primary point of contact for requesting information and scheduling future conversations?
- For the in-depth facility interview and virtual walkthrough, we need to have someone very familiar with the building's mechanical equipment and operations to walk us around the building. Who will this be?
- After this call, we'll send a follow-up email with a request for specific information and summarizing the next steps. Once you provide any final information we may need before going on site, we'll be in touch to schedule the In-depth Facility Interview.
- If time allows, begin working through questions from the building information form.

2.4.6 Wrap Up

- Do you have any questions?
- We would like to develop a plan that meets your needs.
- Please respond to the follow-up email we will be sending, and then we'll be in touch about scheduling the day and time of your assessment.
- Thank you for your time. We are excited to start work on this project.

2.4.7 Communication Tips

- Use "please" and "thank you" liberally. Be detailed in your requests and use a respectful tone.
- Encourage a team effort on the customer side.

- Speak with a comforting tone that the Building Information Form is an easy next step. Ease the customer into this approach.
- Vet their comfort level and work from that level of comfort for performing specific tasks.

3 In-depth Facility Interview

The in-depth facility interview is the first half of performing the virtual audit and takes place prior to the virtual walk-through. The program team should be prepared to document detailed information during this call. At the interview's conclusion, the auditor should be able to:

- Have a full understanding of existing conditions and areas of inquiry
- Have the basis for a preliminary energy improvement list
- Map out the virtual audit

Toolbox items to support the In-depth Facility Interview include:

- Scheduling email template
- Follow-up email templates
- Discussion Guide
- System Information Form (See Appendix B)

3.1 Scheduling Email

Attachments: VAA Customer Guide, System Information Form

Dear [Name]:

Thank you for providing information to support the energy assessment. So far, we have reviewed high-level information about your building(s). The next step is to collect some detailed information about your building systems to support our energy analysis.

During the facility interview, we will review your building's systems in detail. The facility interview will take place over [conference call/video conference], and typically takes up to one hour per building. Attendees from your team should include [as identified in the planning call].

We anticipate needing to set up [#] conference call(s) up to one hour each to review your building(s). Please let me know your team's availability during [time frame, e.g., week of August 1], I will distribute calendar invitations to the team with conference call information.

You may wish to review the attached *System Information Form* to have a sense of the types of information that we will be collecting during the interview.

We look forward to working with you to improve your facility's energy performance. If you have any questions or need additional information, feel free to contact me at [email/phone].

Regards,

[signature block]

3.2 Follow-up Email - Go

If the customer is interested in proceeding and the facility is a good candidate for a VAA, send a Go email.

Attachments: Building Information Form

Dear [Name]: Thank you for participating in the facility interview [today / on <date>], where we gathered detailed information about your building systems to support our energy analysis. The next step is the virtual walkthrough, where we will tour your facility together, in real time, to observe your building's systems and operations.

[Optional, where missing information] As noted during the walkthrough, we will need the following information to proceed with your energy analysis [*or other deliverable*]:

Building	Information Requested

In the meantime, we will continue to prepare a walkthrough plan. If you have any questions, please contact me at [email/phone].

Regards,

[signature block]

3.3 Follow-up Email - No-Go

If the customer chooses to not proceed with the VAA at this point, send a no-go email.

Attachments: As needed

Dear [Name]:

Thank you for taking the time to speak with us about your facility. We understand that you would prefer to not continue with the virtual audit process at this time.

When we are able to perform full on-site work, we will contact you to see if you would like to proceed with your energy audit and assessment. Until that time, [enter program/customer-specific information such as required].

Thank you again for your time and attention. If you have any questions or need additional information, feel free to contact me at [email/phone].

Regards,

[signature block]

3.4 Discussion Guide

1. Introduce the attendees – service provider, customer, etc.
2. If recording the call, receive permission to do so.
3. Goal of the call:
    - Today we will be gathering more detailed information to understand the systems that are in your building and how they are operated and controlled.
    - You may have seen the System Information Form that we sent via email. We will be walking through that form, system-by-system.
    - We will also talk about technology options for the virtual walkthrough, as well as scheduling that time.
4. Review request for information
    - To date, we have received the following items: [list as appropriate]
    - We are awaiting the receipt of: [list as appropriate]. Are you having any issues with finding that information?
5. Utility Data Analysis (optional)

    [If the utility data analysis has been completed, review the results of that analysis and explain how those result relate to the questions that we will be asking about their systems.]

6. System Information Form

    Use the System Information Form as a guide, but note that:

    - Unique buildings or systems may require additional questions.
    - Navigate the discussion based on answers to previous questions. Aside from obvious questions about the equipment itself, ask additional questions about the system.

    For example, when asking about heating systems:

    - If there is a hot water heating system, ask questions about an OAT reset, does the return water temperature go below 130ºF, are there 2-way or 3-way valves in the system, etc.
    - If there is a steam system, ask questions about steam traps (is there a maintenance program?), are radiators controlled by manual valves or TRVs, etc.
    - If all heating is provided by RTUs, ask if they have economizers or if any serve a large area with DCV, ask if the supply fans have VFDs, how they are controlled, etc.
        - Review building operation details (per unique area/use)
        - Review information about energy systems at their sites:
            - HVAC system type (packaged Dx, chilled water, hot water, unit ventilators, split ACs, etc.)
            - Lighting system type (fluorescent T8, LED, HID, etc.)
            - Presence of a building energy management systems
            - Other energy intensive systems (data center, pool, well pump, etc.)

- Interview site contact for items related to equipment operation, equipment controls and strategies, schedules, etc.
- Review operations and maintenance concerns (for each system)
- Review other pertinent information

7. Technology Options
    - Discuss technology options for the Virtual Walkthrough. Suggest scheduling a test run to identify bugs in the chosen platform.
8. Next Steps
    - Optional but encouraged: test run of technology applications to identify bugs or problems.
    - Identify dates/times for the virtual walkthrough.
    - Follow up any missing or required information.

3.4.1 Communication Tips

- Use "please" and "thank you" liberally. Be detailed in your requests and use a respectful tone.
- Be careful of using acronyms or technical jargon. Not all customers will have the same level of expertise and knowledge of shorthand energy engineering terminology. For example, say air handling unit rather than AHU.
- Some customers may not have a high degree of knowledge about their building systems and may become frustrated if they cannot answer the service provider's questions. Maintain a positive conversation and try not to make the customer feel as if they are under interrogation.

4 Virtual Walkthrough

The virtual walkthrough is the second half of performing the virtual audit, with the first half being the In-depth Facility Interview. The service provider should be prepared to document detailed information during this call. At the walkthrough's conclusion, the auditor should:

- Have documentation of existing equipment and systems
- Have the data needed to perform energy calculations and modeling

Toolbox items to support the virtual walkthrough include:

- Scheduling email template
- Reminder email template
- Discussion Guide
- System Information Form (See Appendix B)
- Follow up email template

4.1 Scheduling Email

Service providers may wish to use this email as the follow-up to the Facility Interview.

Attachments: System Information Form [blank or partially completed from the facility interview]

Dear [Name]:

Thank you for participating in the facility interview [today / on <date>], where we gathered detailed information about your building systems to support our energy analysis. The next step is the virtual walkthrough, where we will tour your facility together, in real time, to observe your building's systems and operations.

Your virtual walkthrough is scheduled for [dates/times]. We will be using [video platform] to facilitate the walkthrough. Prior to the walkthrough, we will hold a test of the [video platform] on [date/time]. I will be sending calendar invitations for these events separately.

Please plan to have the following available at the start of the virtual walkthrough:

- Personal protection equipment, as needed
- Comfortable walking shoes
- Fully charged smartphone/device
- Room keys (if required for accessing areas of the building or meter locations)
- Tools to open HVAC units to see the motor
- External battery for smartphone/device, if available
- Flashlight and tape measure

- Liquids for hydration

You may also wish to review the attached *System Information Form* to have a sense of the type of information that we have already gathered [*or* will be gathering].

Additionally, the New York State Energy Research and Development Authority (NYSERDA) encourages you to review COVID-related building operation guidelines published by New York State, ASHRAE, and other trusted sources, as applicable, to inform their analysis and efficiency measure recommendations. Links to these resources are included in the following bulleted list, along with a link to the FlexTech Program Indoor Air Quality (IAQ) effort, which is focused on the evaluation of filtration, ventilation, and building operation optimization measures as well as Ultraviolet Germicidal Irradiation (UVGI) in response to the COVID-19 crisis.

- New York State: https://forward.ny.gov/
- ASHRAE: https://www.ashrae.org/technical-resources/resources
- FlexTech Program IAQ Effort: https://www.nyserda.ny.gov/All-Programs/Programs/FlexTech-Program/Indoor-Air-Quality

We look forward to working with you to improve your facility's energy performance. If you have any questions or need additional information, feel free to contact me at [email/phone].

Regards,

[signature block]

4.2 Reminder Email

Attachments: System Information Form [partially completed from the facility interview]

Dear [Name]:

This is a reminder that your virtual walkthrough is scheduled for [dates/times]. We will be using [video platform] to facilitate the walkthrough. Prior to the walkthrough, we will hold a test of the [video platform] on [date/time].

Please plan to have the following available at the start of the virtual walkthrough:

- Personal protection equipment, as needed
- Comfortable walking shoes
- Fully charged smartphone/device
- Room keys (if required for accessing areas of the building or meter locations)
- Tools to open HVAC units to see the motor
- External battery for smartphone/device, if available
- Flashlight and tape measure
- Liquids for hydration

You may also wish to review the attached *System Information Form* to have a sense of the types of information that we have already gathered [*or* will be gathering].

Additionally, the New York State Energy Research and Development Authority (NYSERDA) encourages Program participants to review COVID-related building operation guidelines published by New York State, ASHRAE and other trusted sources, as applicable, to inform their analysis and efficiency measure recommendations. Links to these resources are included below along with a link to the FlexTech Program Indoor Air Quality (IAQ) effort, which is focused on the evaluation of filtration, ventilation, and building operation optimization measures as well as Ultraviolet Germicidal Irradiation (UVGI) in response to the COVID-19 crisis.

- New York State: https://forward.ny.gov/
- ASHRAE: https://www.ashrae.org/technical-resources/resources
- FlexTech Program IAQ Effort: https://www.nyserda.ny.gov/All-Programs/Programs/FlexTech-Program/Indoor-Air-Quality

We look forward to speaking with you soon. If you have any questions or need additional information, feel free to contact me at [email/phone].

Regards,

[signature block]

4.3 Follow-up Email

Attachments: As needed

Dear [Name]:

Thank you for participating in the virtual walkthrough [today / on <date>]. Now that we have collected detailed information about your building's systems and operations, we can proceed with completing the energy analysis [*or other deliverable*].

As noted during the walkthrough, we will need the following information to proceed with your energy analysis [*or other deliverable*]:

Building	Information Requested

Electronic files can be [insert chosen delivery method]. Receiving this information by [date] will allow us to proceed swiftly with completing your analysis. We anticipate completing the [deliverable name] within [30 days] of having this information on hand.

Thank you for the time and effort that you contributed to this project. If you have any questions or need additional information, feel free to contact me at [email/phone].

Regards,

[signature block]

4.4 Discussion Guide

1. Introduction: Overview of plan for the day.
    - Since we have gotten so much information for you, a lot of what we will be doing is spot checking, but for some areas, (mechanical rooms, pool rooms, server rooms, the kitchen, the roof, etc.) we are going to do a more in-depth walk-through. Since these areas have high-energy use, we want to look at mostly every piece of equipment, what it serves, how it operates, and what controls it. In general, we are not too concerned about electrical information, but more of what heats and cools the electrical rooms and such.
    - Please make sure we are moving at a pace you are comfortable with, and if there is anything you would like to do or add to what we are planning, please feel free to add whenever. Also, since you are doing all the legwork, please let us know whenever you would like to take a break, especially if you happen to be feeling tired or uncomfortable with any task. If you are uncomfortable at any time, please let us know, and we will figure out a better way to do it or we can work around it.
    - When we enter each room, we require an overall shot of the room, the lighting system, and the energy using system. We also want details of certain areas and systems, and we will let you know what they are as we walk through.
    - [*Review the suggested walkthrough route.]* Do you have any questions or suggestions about the route?
    - While you go through the building, we will follow you around using the floor plans you provided.
2. Safety Briefing
    - Are there any safety concerns on your end?
    - Just some general tips from it:
        - Move slowly and carefully through the building
        - Communicate any concerns you may have at any point during the virtual audit
        - Stay focused on where you're walking and keep an eye out for potential hazards
        - Take breaks when needed
3. General Review
    - Do we have permission to record the video you are sharing with us for purpose of the audit? We are only using it for audit purposes and will not share it with anyone.
    - We are also going to be taking screenshots throughout, so if we ask you to focus on something, focus for about ~5-10 seconds to let us get the shot. We will let you know if we need to retake it.
    - Please feel free to make suggestions about how to proceed through the building
    - Also feel free to ask questions as we go.

4. Space 1 [repeat as necessary for additional space types, for example classroom or office]
    - First, we require an overall shot of the room. Please stand at the entrance or at a corner of the room and give us a slow panoramic view of the space.
    - *Lighting:* Next, we typically focus on lighting; please provide an overall view of the lighting system. Could you now go up to a particular fixture in order to see it in more detail? How many different types of lighting technology are in this room?
        - First, we can help you to identify the different types of lights if you are unsure.
        - Tips: When working with tube type fixtures, the fluorescent number T_ refers to the diameters of the tube per 12 inches. So, a T8 is 8/12 inches, a T5 is 5/12 inches, and a 12 is 12/12 inches, so a T12 lamp has the widest diameter while a T5 has the smallest.
        - Another tip is, if you are unsure if a tube type lamp is LED or not, look at the end of the tube where it connects to the ballast and if its plastic, it's more likely LED and if metal, it's more likely fluorescent. You can also use your phone camera to see if a fixture has a magnetic ballast which is common for T12 lamp fixtures.
    - How many lights are there of a specific lighting technology; for example, how many 4'2 lamp T8 fixtures are there? What type of lighting is there pendent mounted, surface mounted, recessed? What controls the various lights in the room: occupancy sensor, wall switch, day light dimming controls?
    - *HVAC:* Next in this room, we want to focus on what heats and cools the space: is there a window AC, a UV served by the boilers, an airduct served by a rooftop unit? What controls this? If it's an RTU or central system, are there individual controls per room? Can they be scheduled by thermostats in the room or through the BMS?
    - *Plug loads:* After looking though HVAC, we want to focus on the other various energy using systems in the room such as plug loads: is there a smart board or projector, printers, computers, laptops, laptop carts, coffee machines, mini fridges? Any other energy intensive equipment in the room?
    - *Faucet flow rate:* Is there a sink? Do you know the flow rate of the sink?
        - You can tell by turning the sink on and seeing how much water comes out at a time. If you look at the faucet aerator where the water flows out of, you may see a number rating in GPM, if low-flow could be around .5-1 GPM, if high-flow could be 2.2 GPM.
5. Restroom
    - *Lighting:* First collect lighting inventory and overview of whole room, then move onto system details.
    - *HVAC:* Inquire into what heats and cools the space, if the unit is within the room collect nameplate data.
    - *Flow Rates:* In restrooms, we are mostly concerned with the various flow rates of the toilets, urinals, showerheads and sinks. To start with, the flow rate of a sink can be

determined by the faucet aerator, which is the section the water flows out of at the end of the faucet. This can be determined by turning on the sink and seeing how quickly the water flows out of the spigot. It may also say the flor rate on the small ring on the faucet aerator. Can you let us take a picture of the water as it flows out of the spigot? How many sinks are there in the restroom with this flow rate? The flow rate of the toilets may be printed right on the top of the toilet in GPM, how many toilets are there? Flow rate of the showerheads? How many are there? Flow rate of the urinals? How many are there?

6. Mechanical Rooms

- For the various mechanical rooms, we would like to do a virtual audit of them all—any room with central HVAC equipment, boilers, domestic hot water heaters, pumps, elevator motors, motors, etc.
- *Lighting:* First collect lighting inventory and overview of whole room, then move onto system details.
- *HVAC:* Inquire into what heats and cools the space, if the unit is within the room collect nameplate data.
- *System Overview*: For any system we would like to see an overview of the system including the piping run to and from it. Please stand back far enough and pan slowly over the system, try to include the boilers, the pumps serving the system, and the piping involved. Is the piping in good condition? Is it fully insulated?
- *Boilers:* Next, we want more detail about the different sub-sections of the system. Can you go up to a boiler closer to get an overall view of just the boiler itself? Can you see a control or display panel? Does it show any temperature readings? Do you know if this boiler in condensing or non-condensing? Is it natural gas-fired? Are there boiler controls in the room/is the boiler mainly controlled by the BMS? Do you know the typical supply or return water temperatures? Can you show us the nameplate on the boiler? It is typically on the back or side of the boiler. What is the make and model of the boiler? What is the capacity of the boiler? This is usually in MBH or BTU/Hr. Does it state if there is a blower motor or an efficiency? We want this information for all the boilers in the room/building. Are the boilers setup in a lead/lag fashion? Do you use both boilers at the same time on very cold days?
- *Motors:* Are there heating hot water pumps connected to the boiler? Can you give us an overview of the pump(s)? Can you move in closer and get a photo of the nameplate on the pump? What is the make/model? HP? RPM? Open/closed? What are the controls for this pump? Is there a VFD? Do these pumps run in a lead/lag fashion? Are there any other motors connected to the heating hot water system in this room? Pumps to supply the boilers, to circulate water through them, combustion air fans?
- *General/End-Use:* Is there a temperature gauge anywhere in this system like the supply or return piping? Is there an inspection certificate posted anywhere? These can typically be found on the wall of the boiler room. What does this boiler serve: UVs, AHU, RTU, FCU, CUH, etc.?

7. Specialized Space: DHW Room/System:
    - *Lighting:* First collect lighting inventory and overview of whole room, then move onto system details.
    - *HVAC:* Inquire into what heats and cools the space, if the unit is within the room collect nameplate data.
    - *System Overview:* Is there a specific area of the building this DHW system serves? What kind of system is it: tankless water heater, boiler serving storage tank, indirect water heater, storage tank water heater? Is it gas-fired or electric?
    - *DHW System:* Please allow us to get an overview of the system by panning slowly over the system including pumps, piping, and the main pieces of equipment. Is the pipe insulation in good condition? Are there any areas that are missing pipe insulation? Do you know the temperature water is typically supplied by this system? Are there thermometers anywhere reading the supply water temperature? Can you move closer to the system to allow us to take a picture of the DHW heater itself? Can you find the equipment's nameplate? What is the manufacturer, model number, capacity, volume of the tank? Is this DHW heater tied into the BMS? Is the supply temperature controlled by the BMS?
    - *Motors:* Is there a water circulation pump? Can you take a photo of it? Can you find the nameplate? Take a photo. Is the manufacturer, model, hp, rpm, efficiency, open/closed on it? What controls this pump? Is it on a timer or does it always run?
8. Specialized Space: Electrical Room:
    - *Lighting:* First collect lighting inventory and overview of whole room, then move onto system details.
    - *HVAC:* What heats and cools this room? Is there a dedicated unit used to serve this room? Is in in the room? If it is a split system AC or HP, do you see the indoor section of the unit either on the wall or on the ceiling? Can you get a photo of this? Does this unit have a nameplate? Is there a manufacturer and model number on it? Do you know which outdoor unit this matches up with? Is there a capacity on this unit? How is this unit controlled: room thermostats or BMS?
    - *Sub-meters:* Are there any sub-meters in this room or in the building? Do you know what specific area is it metering? Can you take a few pictures of the meter?
    - *Timeclock:* Are there any timeclocks in these rooms? These are used to control the exterior lighting. Can you open the timeclock? Can you get close, so we can take a photo?
9. Specialized Space: Elevator Room:
    - *Lighting:* First collect lighting inventory and overview of whole room, then move onto system details.
    - *HVAC:* Inquire into what heats and cools the space, if the unit is within the room collect nameplate data.

- *Elevator Motors:* How many elevators are in this building? Can you show us an overview of the elevator motor system? Do you see a nameplate? Can you let us take a photo? Does it say the manufacturer, model number, HP, RPM, etc.? How often is this elevator used daily?

10. Specialized Space: Kitchen
    - *Lighting:* First, collect lighting inventory and overview of whole room, then move onto system details.
    - *HVAC:* Inquire about what heats and cools the space, if the unit is within the room collect nameplate data.
    - *Kitchen Hood:* Is there a kitchen hood in this space? What is the HP of the fan? What are the controls? Does it have a VFD? Does it have a sensor that turns it on when it senses heat or is it more like an on/off switch?
    - *MAU:* Is there a make-up air unit that serves this space? Do you know anything about this unit? Does it heat or cool the space or just bring in outside air (usually heating only)? What controls it? Does it only run when the exhaust fan runs?
    - *Food Service:* What type of cooking equipment is present in the space? Is it electric or gas fired? Can you give a panoramic view of the various cooking equipment (get overall count of different types of equipment)? We are going to want to list the various equipment, along with the make and model if available. Go to each individual piece of equipment so we can get a picture of it. Do you see a nameplate on the equipment? Does it say the make and model number? How often is this equipment used (meals per day)? Do this for each piece of cooking equipment.
    - *Refrigeration Equipment:* What are the different types of refrigeration equipment in the kitchen: stand-up refrigerators/freezers, chests, walk-ins? How many of each piece of equipment is there? Please provide a picture of each piece of equipment. If you open the door, there may be a nameplate on the inside of the unit. Can you see if there is and if it lists the make and model? Can I get a photo of this? Is there a temperature reading for this piece of equipment anywhere?
    - *Walk-ins:* Do they lock from the outside? Can I get an overall picture of the walk-in(s)? Are they refrigerators or freezers? Is there a temperature gauge for any of these? Can you go into each walk-in and point the camera at the fans toward the back of the unit? These are evaporator fans, how many are there? Do you know if they have smart controls? Do you know if there is electric defrost for the evaporator coils? Do you see a nameplate on the evaporator fans? Do you see one on the door frame as you walk in? Are their manufacturer or model numbers? Can we take a photo of them if there are? For this we collect Total Compressor Capacity, Total Evaporator Fan Quantity, Evaporator Fan Motor Technology (electronically commutated or permanent split capacitor), Total Evaporator Fan Load (W), Total Electric Defrost Load (W), and if the evaporator fan or electric defrost has controls. This information isn't always given straightforward, but we can look things up based on the manufacturer and model number.

- *Ice Machine:* Are there any ice machines in the kitchen? Can I get an overall picture of the unit? Does it make batches of ice or continuous use? Is there a nameplate? Can we get a photo of it? Does it say the make/model? Do you know how much ice is used in pounds per day?
- *Dishwasher:* Is there a dishwasher? Can you show us an overview of it? Can you see if there is a nameplate on the dishwasher? Can we take a photo? Can you read off the manufacturer/model number? Do you know which DHW serves this dishwasher? Is it gas-fired or electric? Is there a booster water heater? Can you find it for a picture? Is there a nameplate available? Manufacturer/model number? Does it say the rating of it? It's usually in kW.
- *Plug Loads:* Are there any general plug loads in the space: microwaves, coffee machines, toasters?

11. Specialized Space: Pool
    - *Pool:* Can we get an overall photo of the room? Are there any humidity issues in the pool room?
    - *Lighting:* First, collect lighting inventory and overview of whole room, then move onto system details. What are the lighting controls here? What controls the lights within the pool? Are there any lighting level issues?
    - *HVAC:* What heats and cools the space? If the unit is within the room collect nameplate data.
12. Specialized Space: Pool Mechanical Room:
    - *Lighting:* First, collect lighting inventory and overview of whole room, then move onto system details.
    - *HVAC:* Inquire into what heats and cools the space, if the unit is within the room collect nameplate data.
    - *System Overview:* First, we want to see an overview of the system, including the piping, motors, heating/cooling equipment. Please do a slow panoramic view of the system. What kinds of equipment are involved in this system: pumps, filters, dehumidification, heating?
    - *Pool Heating:* Is the dehumidification or heating unit located in this room? If so, can you get an overview of the system? Could you tell me some information about this system and how it works? What controls this system: is there a control panel in the room/per piece of equipment/ is it all done through the buildings BMS? What is the manufacturer of this unit? Can you find the nameplate and let us take a photo? Manufacturer, model, capacity, efficiency? Gas-fired or electric?
    - *Motors:* Please let us see an overview of the pumping system. Hot Water pumps? Filter pumps? What is the primary purpose of these pumps? Is the pipe insulation in good condition? Does it cover all necessary areas? Can you move closer to a specific pump and

get a photo of the nameplate? What is the Make, Model, HP, RPM, Open/Closed? What controls these pumps? Do they have VFDs? Are they on a set schedule through the BMS?

13. Specialized Space: Gymnasium
    - *Lighting:* First collect lighting inventory and overview of whole room, then move onto system details. What are the lighting controls here?
    - *HVAC:* Inquire into what heats and cools the space, if the unit is within the room collect nameplate data.
    - *Plug loads:* Is there any exercise equipment in the room? What types of different equipment? Can we take an overall picture of the equipment? What are the quantities of the different types of equipment? Are there any nameplates on this equipment? Is there a make/model? How often is it used?
    - *Locker Rooms:* Are there locker rooms? How often are they used?
        - *Flow Rates:* Are there showers? How many showers are there? How often are they used? What is the flow rate of these showers? Do you know what DHW heater serves the locker rooms?
14. Specialized Space: Cafeteria/Dining Hall
    - *Lighting:* First collect lighting inventory and overview of whole room, then move onto system details. What are the lighting controls here?
    - *HVAC:* Inquire into what heats and cools the space, if the unit is within the room collect nameplate data.
    - *Use/ Plug Loads:* How often is this space used? Typical hours? Is there any equipment in here such as refrigerators, vending machines, microwaves? Any other energy intensive equipment?
15. Specialized Space: Fitness Room
    - *Lighting:* First collect lighting inventory and overview of whole room, then move onto system details.
    - *HVAC:* Inquire about what heats and cools the space, if the unit is within the room collect nameplate data.
    - *Plug Loads:* Is there any exercise equipment in the room? What types of different equipment? Can we take an overall picture of the equipment? What are the quantities of the different types of equipment? Are there any nameplates on this equipment? Is there a make/model? How often is it used?
    - *Room Use:* How often is this room used?
16. Specialized Space: Shop Room
    - *Lighting:* First, collect lighting inventory and overview of whole room, then move onto system details.

- *HVAC:* Inquire into what heats and cools the space, if the unit is within the room collect nameplate data.
- *Shop Equipment:* What kind of equipment is in this room? How often is it used? Can I see a general overview of the equipment? What are the quantities of the various equipment? Are there nameplates on the equipment? Can we get a photo of them? Is there a make, model, and/or wattage listed?
- *Air Compressor:* Is there an air compressor? What is it used for? Is it variable or constant speed/pressure? Can we get an overall photo of it? How often is it used? How many motors are there? Is there a nameplate on the air compressor or the motors? Does it show the make, model, HP, RPM, open/closed?

17. Specialized Space: Data Center/Server Room

- *Lighting:* First, collect lighting inventory and overview of whole room, then move onto system details.
- *Overall:* How big is the data center (SF)? Is there a graphic display on the server boxes (PDU) that shows load, kWh? What does this serve: IT equipment, lighting, cooling?
- *HVAC:* What heats and cools this room? Is there a dedicated unit used to serve this room? Is in in the room? If it is a split system AC or HP, do you see the indoor section of the unit either on the wall or on the ceiling? Can you get a photo of this? Does this unit have a nameplate? Is there a manufacturer and model number on it? Do you know which outdoor unit this matches up with? Is there a capacity on this unit? How is this unit controlled: room thermostats or BMS?
    - Is cooling tied to central system or dedicated cooling unit(s)?

18. Roof

- *Comfort:* Now we want to go onto the roof. Are you comfortable doing that today? Would another day be better? How is the weather where you are? Do you have any concerns with going on the roof?
- *Safety:* Make sure when you climb the ladder, there is always three points of contact on the ladder at every time. Take your time getting up there.
- *Overview:* Once on a roof, please do a general panoramic view of the roof. Are there any systems you would like to focus on or start off with? What should we expect to see on the roof? Outdoor condensing units? RTUs? Split systems? EFs? Condensers serving the walk-ins?
- *Roof Envelope:* What is the material of the roof? Is it flat? What is the condition? Can we take a general photo?
- *Walk-Through Plan*: First, we want to figure out where you are starting on the roof. So, we are going to want to go through all the equipment on the roof and get data from each piece of equipment. We typically make a plan of how we will walk through the roof to make sure that nothing is missed. Is there a certain way you think would work best? Please let us

know if you want to take a break at any point or have anything to add. Also feel free to fill in where the equipment serves if you know at any point if you know.

- *RTUs:* Can you get an overall picture of the unit? Do you know what area this unit serves? Does this unit have gas service as well as electric? Do you know if this unit has DX coils for cooling and a gas-fired furnace for heating? Is there electric heating? Can you walk around the unit with the camera we can see the whole piece of equipment? Watch your step.
    - Do you see a nameplate anywhere on the unit? Can you get close so that we can take a photo? Collect make/model, capacity, efficiency, supply and exhaust fan data. Is there an economizer on this unit? Is it a CV or VAV unit? Do the fans have VFDs? What controls this unit? The BMS/ individual thermostats? Can we open this unit up (to see the motor/VFD)?
- *Split systems/HPs:* Can you get an overall picture of the unit? Do you know what area this unit serves? Does this unit heat and cool or only cool? Can you walk around the unit with the camera so we can see the whole piece of equipment? Watch your step.
    - Do you see a nameplate anywhere on the unit? Can you get close so we can take a photo? Collect make/model, capacity, efficiency. What controls this unit? The BMS/ individual thermostats?
- *Exhaust fans:* Do you know what area this exhaust fan serves? Can we get a photo of it? Do you see a photo of the nameplate? Do you see the make/model, HP, RPM, open/closed? Do you know if this EF has a VFD? Do you know what controls the fan? Start stop?

19. Building Overview

- We would like to see the more common areas of the building including the lobbies, vestibules, and hallways.
    - Please allow us to take a general overview photo of these areas.
    - Please explain the lighting in the spaces, what controls the lighting. First, collect lighting inventory and overview of whole room, then move onto system details.
    - HVAC details as well.
- Next, we want to look at the exterior of the building, as well as the exterior doors, and windows to outside.
    - What is the condition/detail about these pieces?
    - Windows: operable/fixed? Tinted/clear? Condition? single/double pane? Collect photos of this.
    - Doors: material? Condition? weather stripping? Collect photos of this.
    - Envelope: what is the façade for each face of the building/main walls? At least entrance area (photo for front page) What is the supporting structure underneath? Can we take photos of this?
- Audit Potential

- End with discussion of potential improvements as seen during the audit:
- Thank them for their time, go over next steps for analysis, let them know will be in touch with any questions
- Process Overview: Analysis, draft and final reports, Program overview from program administrator (if applicable)
- Are there any questions?

4.4.1 Communication Tips

Use "please" and "thank you" liberally. Be detailed in your requests and use a respectful tone, for example:

- "Please take an overall photo of this room first."
- Discuss the unit
  - Is this unit operating well? What condition is it in?
  - When was it installed?
  - How is it controlled?
- "Walk up to the air handling unit and take a photo of the unit overall"
- "Please take a photo of that unit Tag that says "AHU-1"
- "See the nameplate on the "right-hand side"? Please take a close up."
  - Is the photo in focus?
  - Can you read the model number?
  - Did the photo include the capacity rating(s)? You should see input and/or output in MBh or Btu/hr
  - Did the photo include the motor hp?
  - Can you take a photo of the motor nameplate?
    - Be careful of the moving belt.
    - What year was it installed?
    - How old is the motor?

Appendix A: Building Information Form

Contact Information

Enter the contact information for the staff who will be involved in the energy audit process (e.g., Building Operations Manager or Facility Director, electrician, HVAC lead, site engineer, maintenance staff, etc.)

Name	Title/Role	Phone	Email
Example: John/Jane Doe	*Facility Director*	*(555) 555-1212*	*jdoe@company.com*

Staff and Information Availability

Staff Availability

Do you have staff with knowledge about your building system operation to assist us with gathering detailed?

Are staff willing and able to:

- Participate an in-depth facility interview via conference call?
- Walk us through the lighting, HVAC and/or entire building?
- Provide photos of facility rooms, equipment and nameplates?
- Assist with a Building Management System screenshare (if applicable)?
- Able to download and use Microsoft Teams or another video conferencing application?

Will staff have access to:

- WiFi or cellular 4G/LTE internet access?
- Smartphone, mobile device and/or a digital camera?
- What type of mobile device (iPhone, Samsung, Tablet, etc.)?
- Printer/Scanner?

Does staff have familiarity with sending electronic files via email/DropBox, etc.?

Electronic Building Drawing Availability	Yes/No	Notes
Are floor plans or general fire escape plans available?		
Can you provide a list of major equipment? • If no, are you (or your colleagues) able to generally describe major equipment? ○ *(Use space to right or attach a separate document.)*		*(Example: one electric chiller, eight roof top units (RTUs), two condensing hot water boilers, etc.)*
Are mechanical drawings available? Example: heating and cooling equipment layouts and lists		
Are electrical drawings available? Example: Lighting plans, lists of lighting fixtures, electrical wiring, and panel boxes		
Are architectural drawings available? Example: Walls, roofs, and floors		
Are plumbing drawings available? Example: Hot water heaters and piping		
Were previous energy audits or architectural/engineering studies performed? • If yes, did the facility undergo major renovations or equipment replacement after that energy audit?		
Does the site have a Building Energy Management System (BMS)? • If yes, can it be accessed remotely? • If yes, can our auditor be granted access to collect data? • If yes, can HVAC staff access BMS on site and provide graphic snapshots of data such as equipment lists, areas served, operating schedules, temperature setpoints, etc.		
Does the site have roof top equipment?		

Electronic Building Drawing Availability	Yes/No	Notes
• If yes, is facility staff willing to go on the roof and take photos of equipment & nameplates?		
Is facility staff (electrician and/or HVAC) personnel able to provide detailed equipment field notes, if given data collection forms?		
What are your critical operations and maintenance concerns or areas of interest? (Ex: lighting, heating, cooling, controls, etc.)		

Building Inventory

Complete the following form for all buildings, including as much information as possible. This list should include all buildings that will be included in the energy audit. A building is defined as a standalone structure. Add additional pages for each building as needed.

Building Number	*Example*	Building 1
Building Name	*ABC Middle School*	
Building Address	*1 Main Street*	
City	*Albany*	
Zip Code	*12203*	
Building Type		
Year Built		
Year of Last Renovation *(if applicable)*		
Size of Building (square feet)		
# of Floors		
# of Occupants / Employees	*200*	*(If a school facility, include staff and student occupancy separately)*
Days and *Hours* Occupied Per Week	*M-F, 8 a.m.-4 p.m.*	

Building Number	*Example*	Building 1
Open Weekends?		*(Yes / No)*
# of Months Operated		*(If a school facility, unless operational with full student enrollment 12 months/year, insert 10 in this column)*
Solar Panels On Site?		*(Yes / No or Describe)*
# of Computers		
Commercial Cooking Facilities?		*(Yes / No)*
# of Walk-In Refrigerators / Freezers		
Swimming Pool?		*(Yes / No)*
Is parking lot lighting included in your electric bill?		*(Yes / No) If Yes, see below.*
If "Yes" to the above, enter approximate size of parking lot		*(Square Feet)*
Commercial Laundry On-Site?		*(Yes / No)*
Other Energy-Intensive Equipment	*Outdoor pool*	*(Describe where applicable)*
Other Facility Information		

Appendix B: System Information Form

This system information form is intended to support the Virtual Audit and Assessment (VAA) process' In-depth Facility Interview. Service providers may wish to use this data collection form to guide their conversation with the customer about individual building systems.

Not all questions are relevant to every building. Follow-up questions should be dictated by the answers to the previous. Ask enough to have a clear picture of what type of systems/equipment are at the site(s) and their current level of control. Some information may need to be confirmed during the actual Virtual Walkthrough.

General	
% Heated	
% Cooled	
Building Occupancy If school building: Classroom hours? After school programs? Custodial/Maintenance hours? Weekend/Summer hours? Any larger areas with extended hours? Gym or Auditorium Media Center or Library Pool (If they answer yes to any of these, keep in mind when asking about lighting and HVAC controls)	
PV system? - Are the panels owned or leased? - Array size and PPA agreement? - Do we have the generation data coinciding with the utility data period? - Bidirectional meter? - Any previous solar PV studies?	
Backup generator – Used for anything other than emergency power?	
Any Plans for Remodeling or Construction? Any Plans for Change in Facility Operation?	

General	
Any Planned/Required Equipment Replacement? Any Previous Energy Studies? Any Previous Energy Projects Implemented? Any Environmental Issues we should be aware of?	
* What are your critical operation and maintenance (O&M) concerns or areas of interest?	

Building Envelope	
Exterior Wall • Type: (CMU, brick, poured concrete, stone) • Condition?	
Windows • Type? (double pane/single pane, tinted/clear glass, operable/fixed, frame metal/wood/vinyl) • Condition? • Caulked/Sealed?	
Roof • Type? (flat/pitched, steel trusses) • Condition? • Insulated/uninsulated • Finish? (Color Membrane/Gravel pebbles/Metal Decking)	
Doors • Condition? • Type: (Wood / Metal / Glass) • Frame: (Metal / Wood) • Weather-stripping?	
Operations and maintenance concerns Potential energy improvements	

Lighting	
Interior (general) • Technologies: (LED, T8, T12, T5, CFL, INC, etc.) • Fixture types: (recessed troffer, wrap fixtures, recessed can fixtures, continuous row pendant mounted fixtures, etc.)	
High Bay Fixtures • Technologies: (MH, HPS, MV, T5HO, T8, LED, etc.)	
Controls • Wall switches, Key switches, Occupancy sensors, day light dimming, None, etc.	
Exterior (building mounted) • Technologies: (LED, MH, HPS, MV, CFL, etc.) • Fixture types: (Wall pack fixtures, under canopy, flood fixtures, recessed cans, etc.)	
Exterior Controls • Timeclock? Photocells? None?	
Parking Lot Lighting • Is it on the main electric meter? • Parking lot size(s) in sq. ft.? • Types of fixtures? (Cobrahead Pole mounted lights, wallpacks, flood lights) • Type of technology? (HPS, MH, MV, LED, etc.) • Controls • Timeclock? Photocells? None?	
Operations and maintenance concerns • Potential energy improvements	

Central Heating Systems	
Hot Water Systems • Type(s): Steam, Hot Water, Electric? • Year Installed? Condition? • Number of Boilers? Condensing or non-condensing? • Does return water temp <130degF? • # HWPs? VFDs or Constant Speed? • Year Installed? • Two- or three-way valves? • Terminal Units: Radiators, UVs, FCUs, AHU Coils? • Are the pipes insulated? Operation/Control? • Boiler Configuration: Lead-lag, manual, BMS? • Hot Water System Control? • OAT Reset or Constant Temperature?	
Steam Systems • Heat exchanger (steam to hot water)? • Number of Boilers? • Year Installed? Condition? • Steam Pressure at Boiler (psig)? • Boiler Configuration: Lead-lag, manual, BMS? • Steam Trap Condition? Last survey/replacement? • Terminal Unit Valves: Manual or TRVs? • Are the pipes insulated?	
Operations and maintenance concerns Potential energy improvements	

Central Cooling System	
Chilled Water System • Chiller Type: Centrifugal, Screw, Absorption, etc. • Year Installed? Condition? • Number of Chillers? • Chilled Water System enabled OAT? • Capacity (tons)? • # CHWPs? VFDs or Constant Speed? • Year Installed? • Two- or three-way valves? • Terminal Units: Radiators, UVs, FCUs, AHU Coils? • Are the pipes insulated? • Cooling Tower? (Open/Closed) • VFD on Fan(s)? HP of fans? • Uses Glycol? Operation/Control? • Chiller Configuration: Lead-lag, manual, BMS? • Condenser Water or OAT Reset Control?	
Operations and maintenance concerns Potential energy improvements	

Unitary HVAC	
Roof Top Units • Number of RTUs? Areas Served? Year Installed? • Packaged Units? (Gas Fired Furnace & DX Cooling) • Heating/Cooling Only Units? • Are they equipped with economizers? • Are they single or multizone? • Constant or Variable Air Volume? • Supply Fan HP? VFDs or Constant Speed? • Return or Exhaust Fans? Operation/Control? • Programmable Tstat, Manual Tstat, BMS • DCV? • % OA?	
Unitary HVAC • Types? Area Served? Year Installed? • Window ACs, Split AC systems, Heat pumps, FCUs • Stand-alone Furnaces, Infrared heaters, UHs, CUHs Operation/Control?	
Air Handling Units • Number of AHUs? • Areas Served? • Year Installed? • Chilled water coils or DX coils? • Hot water or steam Coils? • Is there a reheat system? • Are they single or multizone? • VAV or CV systems? • Supply fan HP? VFDs or constant speed?	

Unitary HVAC	
Return or Exhaust Fans? • Operation/Control? • Programmable Tstat, Manual Tstat, BMS • DCV? • % OA?	
Make Up Air Units • Number of MUAs? • Areas served? • Year installed? • Gas-fired stand-alone furnaces? • Supply fan HP? VFDs or constant speed? • Return or exhaust Fans? Operation/Control? • Programmable/manual Tstat, BMS • 100% OA?	
Unit Ventilators • Hot water, steam, chilled water coils? • Do any of the UVs provide cooling? • Supply Fan HP? Operation/Control? • On/Off, Programmable Tstat, Manual Tstat, BMS	
Operations and maintenance concerns Potential energy improvements	

HVAC Control Systems	
Types of Controls • BMS? • Pneumatic System? • Timers? • DCV? Temperature Set Points • Occupied Cooling and Heating setpoints? • Unoccupied Cooling and Heating setpoints?	
Operations and maintenance concerns Potential energy improvements	

Domestic Hot Water	
• Fuel Source? • Type: Storage tank water heater (Condensing or Non-Condensing), Instantaneous, HX from main boiler plant? • Storage tank temp? Tank volume? Capacity? • Are the pipes insulated?	
Operations & maintenance concerns Potential energy improvements	

Specialized Systems	
Pool • Indoor/Outdoor? • How is it heated? • Do you have a pool cover? • Pool water temperature maintained? • Space temp and humidity maintained? • Operating Schedule? (year round?) • How is the Natatorium conditioned? • (i.e., RTU, ERU, etc.)	
Commercial Kitchens • Kitchen Hood? Kitchen size in sq. ft.? • Supply Fan HP? VFDs or Constant Speed? • Year Installed? • Use (High, Med, Low) or Number of meals a day? • Dishwasher? • Booster Water Heater? Gas or Electric? Cooking Equipment • Rack ovens, griddles, steamers, fryers, warmers, convection ovens • Year Installed?	

Specialized Systems	
Refrigeration Equipment • Standup refrigerators/freezers? • Refrigerators chests? • Walk-in coolers/freezers? • Ice machines? • Year Installed?	
Plug Load • General café (microwaves, coffee machines, toaster, residential type refrigerators) ? • Office Equipment (desktop computers & printers, copiers, water coolers, mini fridges)? • Vending machines? Control or no control? • Shop equipment? • Other?	
Other • General Description • Operating Schedule • Controls • Condition	
Operations and maintenance concerns Potential energy improvements	

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