



Best Practices for Remote Virtual Inspections (RVI)

Introduction to Remote Virtual Inspections

Remote Virtual Inspections (RVI) are a method of inspection that uses technology to allow inspectors or certified Third-Party Inspection Agencies (TPIA) to conduct inspections while not being physically present at the inspection site. RVI have proven to significantly reduce the time of building inspections by requiring only either contractors or homeowners to be located at the job site during the time of inspection. Inspectors attend the inspection remotely and instruct contractors/homeowners on how to deploy the technology so they can observe the site. RVI can be deployed to conduct various inspections. However, the authority having jurisdiction (AHJ) has discretion as to whether an inspection can be conducted remotely. Examples of inspections that may be conducted utilizing RVI include [\(2021 International Building Code \(IBC\) Resource A 5.0 Appendix A: Examples of Potential Activities\)](#):

- Plumbing system repairs or fixture replacements
- Swimming pool excavations.
- Gas line repairs or gas utility clearance.
- HVAC direct replacement or repair.
- Minor residential electrical.
- Miscellaneous repair/exterior repair or upgrades (stucco, windows, etc.).
- Re-roofing/roof covering replacement.
- Water heater or water softener direct replacement.
- New residential plumbing rough-in.
- New residential rough framing inspections.
- Residential rooftop-mounted photovoltaic panel systems.

RVI were initially popularized in response to the ongoing COVID-19 pandemic; jurisdictions use RVI to maintain public health guidelines while conducting building inspections. RVI are, however, advantageous in many ways beyond just protecting public health. They allow inspections to occur when circumstances such as inaccessibility of inspection site, unsafe conditions, and insufficient resources of jurisdictions prevent in-person inspections.

The use of RVI has allowed jurisdictions to save time and money otherwise spent on in-person inspections. Inspectors no longer need to travel to and from construction sites, saving both time and

The City of North Las Vegas piloted its remote virtual inspection program in response to ongoing Covid-19 concerns. In response to the need for inspections from residential and commercial communities, the city was inspired to deploy RVI using similar practices to those used in the City of Tucson. During 12 weeks from March to June 2020, the city of North Las Vegas was able to perform 11,500 inspections under the statewide stay-at-home mandate and has since increased its RVI program. Additional states with jurisdictions currently deploying RVI include California, Florida, Kansas, Maryland, and more.

travel expenses. Likewise, contractors and homeowners also benefit from the time savings of RVI, as they can schedule inspections according to the expanded availability of virtual inspectors. RVI also benefit the building market as a whole, allowing jurisdictions to offer off-site construction as a more readily available option.

RVI allow jurisdictions to encourage and monitor off-site construction practices, which can, in turn, cut costs to homeowners, builders, and jurisdictions associated with on-site construction and inspections. The [ICC/MBI 1205-2021 Standard for Off-site Construction: Inspection and Regulatory Compliance](#) was released in 2021 and provides clarity regarding the deployment of RVI to inspect off-site construction. For more information on how off-site construction is a sustainable alternative to traditional stick-built construction, refer to NEEP’s [Single-Family Off-Site Construction](#).

Remote Virtual Inspection Process



Once an AHJ allows the use of RVI, a standard process is used. First, the customer (meaning the on-site permit holder or contractor for purposes of this document) submits a request for a remote virtual inspection. The request is approved or denied by the AHJ. Before the remote inspection, adequate documentation must be given to the AHJ and presented to the inspector. The customer will schedule the inspection with the AHJ. Following this, the customer prepares the job site before the inspection to minimize any potential disruptions during the scheduled appointment. The on-site portion of the inspection may also be conducted by an approved TPIA or the AHJ's inspection staff, at the discretion of the AHJ. During the appointment, the inspector first verifies the job site location through the live virtual platform. The inspector maintains direct communication with the customer to effectively navigate the job site for inspection. The customer must be adequately prepared to understand the inspector’s instructions and to manage the technology. If the inspector is unable to adequately assess the compliance of any features, an

additional inspection will be required. The follow-up inspection may be scheduled as a remote virtual inspection later, or the AHJ may require an on-site inspection. Some AHJs may allow the inspector to accept photos in place of the live video. The inspection results are then communicated to the permit holder and submitted to the AHJ permit database. Inspections must be lawfully maintained in the database in full compliance with policies, regulations, and codes set by the AHJ. The International Code Council’s [Recommended Practices for Remote Virtual Inspection \(RVI\)](#) serves as a good reference document on the RVI process.

Requesting a Remote Virtual Inspection

Customers must have an active issued permit before requesting a remote inspection. Furthermore, they must provide an electronic signature consenting to the use of remote inspections and remain in compliance with the agreement's terms. Before scheduling a remote virtual inspection with the AHJ, customers must confirm that the inspection requested is approved for review via RVI protocols. When scheduling RVI, customers must request an inspection at least one business day before the requested appointment date. The AHJ sends an inspection confirmation notice to customers, to which customers reply with a signature of consent. Inspectors then provide a time estimate given the type of inspection requested. RVI may require follow-up inspections and should be scheduled in collaboration with inspectors. Prior to the inspection, customers must confirm that their intended use of equipment and software is compatible with the requirements of the AHJ. Examples of such platforms include Microsoft Teams, WebEx, Form OPX, etc.

Preparing for a Remote Virtual Inspection

To prepare for the scheduled appointment, customers must familiarize themselves in advance with the equipment used during the inspection, the planned features of inspection, and the chosen form of communication. Customers are required to have all necessary documentation available on-site. This includes permits, approved plans, and any additional construction documents. Preparing the on-site location ensures the safety of customers and minimizes the potential for on-site disruptions. During the remote inspection, customers must follow all instructions of inspectors.



The on-site location should be walkable and safe from all hazardous obstacles or features. The on-site location should have adequate lighting and all features scheduled for inspection must be readily visible at the time of inspection. Customers should also be ready to identify the features of inspection. To minimize disruptions, the job site should have a high-speed Wi-Fi connection and fully charged devices as approved by the AHJ. Customers are also permitted to use mobile devices. Any devices used in the RVI should have access to a minimum 4G cell signal.

Customers should have access to any necessary tools before the inspection, including flashlights, a stepladder, a tape measure, a GFCI tester, etc. Customers are also encouraged to use a wired or wireless headset device to further minimize any potential disruptions. Customers should discuss any questions or concerns about the necessary tools with inspectors before the inspection date.



Remote Virtual Inspection Protocols

During the inspection, customers should be prepared to point the visual device towards a street view of the job site. Inspectors will verify the job site location and may additionally utilize geotagging services as available. Inspectors will direct customers clearly and concisely, specifying the camera direction and following the inspection order.

General Inspection Protocols and Procedures for Inspectors include:

- **Planning and compliance:** An adequate review of code compliance as relative to inspection plans and documents prior to and during the inspection.
- **Identification:** Inspectors are to direct customers to remotely display identification labels and additional materials of all inspected features. Identification labels may include: Energy Guide labels, model numbers, NFRC stickers, etc.
- **Installation of materials:** Inspectors are to direct customers to remotely display manufacturer's instructions as necessary, which may require additional review of the International Building Code, including the International Energy Conservation Code.
- **Building thermal envelope insulation:** Inspectors will direct customers to show compliant insulation certification, R-value mark, or the R-value as noted in the certification provided by the installer. If the inspection is taking place after drywall is installed, make sure customers take sufficient photos to document the insulation installation prior to sealing the cavity. Energy Rating certificates may also provide the R-Value and grade of the insulation from a TPIA.
- **Blown-in or sprayed roof and ceiling insulation:** Inspectors are to direct customers to show markers in the attic per applicable code requirement. In addition, inspectors are to instruct customers to show the posted insulation certification. The inspector is to verify the information indicated by the certification such as the R-value and installed thickness.

Inspector must be sensitive to the abilities of customers, including sensitivity to mobility, language proficiency, and knowledge regarding RVI. It is encouraged for inspectors to communicate with customers before the inspection date to provide instructions and to further contextualize the inspection process. During the inspection, all features that need additional inspection must be noted and communicated to customers.

Troubleshooting Remote Virtual Inspections

Despite the advantages of RVI, they present some limitations given that their use is relatively new. Both on-site and remote inspections may be subject to inspection barriers such as falsified data, fraudulent inspection processes, and inconsistent inspection methods. There are other barriers that may apply to RVI specifically. For example, the possible lack of a trained professional at the job site may limit the quality of the inspection. There remain important limitations to RVI, namely, the inability to conduct holistic on-site assessments and contextual observations of inspected features. For example, inspectors may be unable to see or identify potential gaps in insulation, or other workmanship flaws. Additionally, camera quality of the selected visual device such as a tablet or smartphone may also serve as a limitation. Technology, software, and transmission quality may not always display clear images or may limit the field of view. One quality control check is for inspectors to always require expanded views of the site/space before a zoom-in view. A second quality control check is a follow-up on-site inspection if inspectors feel this is necessary. To address these limitations, jurisdictions have specific policies detailing what types of installations and features are available for remote inspection. It is highly unlikely that all of a building's inspections will occur through RVI.



Conclusion

For a primer on RVI, NEEP published the blog [Getting Started with Remote Virtual Inspections \(RVI\)](#). For additional information, please reference NEEP's brief on [Remote Virtual Inspections \(RVI\): Challenges and Opportunities](#), published in October 2021. This resource provides research collected through surveys and field interviews that explore the use of RVI and identify associated barriers and opportunities of remote inspections. The findings in the brief outline the various benefits and challenges of RVI. NEEP is developing resources to explain RVI to jurisdictions, code officials, and builders, and coordinating with the International Code Council (ICC) on RVI protocols. RVI are a step forward in their own right, and given the current shortage of code officials, the ability of RVI to make more efficient use of their time is a great advantage. By using RVI prudently in conjunction with on-site inspections, they are an effective tool in quality control on building sites.