



# Conducting Remote Video Inspections

---

AUGUST 2018



**NATIONAL FIRE  
PROTECTION ASSOCIATION**  
The leading information and knowledge resource  
on fire, electrical and related hazards

This work was developed by the Building Code Development Committee of the NFPA. The Committee is not a balanced body for ANS purposes nor is this work developed in accordance with the Regulations Governing the Development of NFPA Standards. Rather it is some information on the identified subject matter developed by the Committee. This material does not represent the position of NFPA or any of its Technical Committees on this subject matter which is represented solely by the NFPA documents in their entirety. For free access to the complete and most current version of these and all NFPA documents, please go to [nfpa.org/standards](http://nfpa.org/standards). The NFPA makes no warranty or guaranty of the completeness of the information in this material. In using this information, you should rely on your independent judgment and, when appropriate, consult a competent professional and your local authority having jurisdiction.

## ABSTRACT

Remote video inspections (RVIs) offer both the authority having jurisdiction (AHJ) and the permit holder the use of technology to increase the efficiency of the inspection process. This has the potential to benefit both, but it comes with some limitations and risks.

The limitations will likely dictate when an RVI will be used. The risks, which have a direct impact on the efficiency gained, will be assumed. With proper attention and communication, both parties will complete the inspection successfully.

It is important for jurisdictions that allow the use of RVIs to develop rules, policies, and procedures to guide the permit holder and the public. Transparency in procedures will go a long way in the success of these inspection programs.

These considerations in conducting RVIs have been developed by the Building Code Development Committee (BCDC) of the National Fire Protection Association (NFPA) to assist authorities having jurisdiction in the use and conduct of RVIs.

The BCDC is not a Technical Committee within the NFPA standards development process and, therefore, it is not "balanced" in accordance with the Regulations Governing the Development of NFPA Standards. Rather, the BCDC is charged, among other things, with identifying existing needs and emerging issues within the construction code and enforcement community and providing recommendations to NFPA on how it might provide leadership on needs and emerging issues affecting the construction codes enforcement community through position papers such as this one.

The content, opinions, and conclusions in this report are solely those of the authors and do not necessarily represent the views of the NFPA or any of its Technical Committees. NFPA makes no guarantee or warranty for the accuracy or completeness of any information published herein and disclaims liability for personal injury, property and other damages of any nature whatsoever from the use of or reliance on this information. In using this information, you should rely on your independent judgment and, when appropriate, consult a competent professional and your local AHJ.

## AUTHORS

Development of *Conducting Remote Video Inspections* took place as an activity of the BCDC. Members of the BCDC identified the need for the report and worked collaboratively with peers to develop a draft through a task group. The task group then forwarded the draft to the entire committee for further refinement and acceptance. This paper was accepted by a majority of the committee vote in December 2016.

## Building Code Development Committee

(\* denotes Task Group member)

### **Jim Muir, Chair\***

Chief Building Official  
Building Safety Division  
Clark County, Washington

### **Matt Bailey**

Building Official  
Construction Services  
City of Lowell, Arkansas

### **Rick Breeze**

Building Official  
Metropolitan Airports Commission  
Minneapolis, Minnesota

### **Sal DiCristina, Co-Chair**

Construction Code Official  
Rutgers University  
New Brunswick, New Jersey

### **Mark Joiner**

Administrator  
Louisiana Uniform Construction Code Council  
Baton Rouge, Louisiana

### **Robert Kelly\***

Manager  
Department of Permitting Services  
Montgomery County, Maryland

### **Medard Kopczynski, CBO**

City Manager  
City of Keene, New Hampshire

### **Jon Laux**

Senior Inspector/Plans Examiner  
Building Department  
Twin Falls, Idaho

### **Jim Sayers\***

Commercial Plans Examiner  
Clackamas County Building Codes Division  
Oregon City, Oregon

### **Steve Stokes**

Chief Building Official  
Amador County Building Department  
Jackson, California

### **Brian Wert**

President  
Brian Wert Inspection Agency  
Hudson, Wisconsin

### **Jerry Wooldridge\***

Manager, Building and Safety  
Reedy Creek Improvement District  
Lake Buena Vista, Florida

### **NFPA Staff Liaison:**

#### **Raymond B. Bizal, P.E.**

Senior Regional Director  
National Fire Protection Association  
Huntington Beach, California

## INTRODUCTION

Technologies today offer tools that may be used to increase the efficiency of inspection programs. Interest in RVIs by AHJs for construction inspection compliance has prompted this evaluation. While building inspection programs were the primary consideration during the development of these guidelines, RVIs could also apply to fire prevention, property maintenance, and other types of inspections.

RVI programs can benefit the jurisdictions that are using them with savings in travel time, use of vehicles, and other aspects of inspections. The programs can benefit the permit holder and those representing the permit owner with more timely inspections and thereby allow faster resolutions to problems and more flexibility to the construction schedule, increasing the effectiveness and efficiency of inspection programs.

An RVI can be considered a physical inspection, for all intents and purposes, and as such scheduling, coordinating, documenting, and processing can mirror the regular inspection process. The more that the RVI mirrors a traditional inspection, the more it will be accepted.

Due to the benefits to both the inspection agency and the permit holder, it is anticipated that RVIs will occur more frequently and become customary for certain types of inspections. With that in mind, these guidelines offer thought for anyone beginning to take advantage of RVI programs.

## ADMINISTRATIVE ISSUES

The jurisdiction likely has the same authority to conduct video inspections that it has for in-person inspections. For jurisdictions conducting RVIs, a policy should be in place outlining the rules for these inspections, which may include scheduling RVIs and the types of inspections that are allowed.

Flexibility should be shown in choosing to perform RVIs on a case-by-case basis. Scheduling certainly is discretionary, but it should not be discriminatory. Allowing one permit applicant over another for a similar type of inspection is likely inappropriate.

Permit, plan review, and inspection software should be reviewed to ensure that video inspection requests can be accommodated, and RVIs should be similar to traditional means of inspection.

The accepted format of an RVI should be established and can include, for example, applications such as Skype and FaceTime. Remote inspections should be conducted live to allow the AHJ to direct the inspection. Live inspections also allow for discussions on construction methods and compliance issues. Prerecorded inspections do not allow the inspector to direct the inspection, which could hinder confirmation of compliance.

If the RVI involves the use of Unmanned Aerial Vehicles (UAVs), such as drones, the UAV operator must understand and comply with all the regulations that apply to operating such a vehicle.

At times inspectors may take and keep photos for the record. It is up to the jurisdiction to decide how much information must be maintained in an inspection record; however, each state and jurisdiction has rules defining a public record and the method and time frame for retention of its contents.

There are a number of video streaming services currently available. The most common are Skype and FaceTime, but any web-based meeting service can be used. Also, permit management software might have specialized features. Voice communication can be via video software applications or by telephone.

## REQUESTS FOR REMOTE VIDEO INSPECTIONS

Video inspection could be requested by permit holder or by their designee. Decisions by the AHJ on whether to allow an RVI should be based on policies established by the jurisdiction. Not all types of inspections may be appropriate for RVI, so it should be understood that the AHJ will determine on a case-by-case basis whether an RVI will be allowed. Thus, the AHJ has the authority to approve the use of an RVI and determines whether it is appropriate or not.

Conversely, the AHJ may also suggest the use of an RVI. The permit holder has the ability to opt for an on-site inspection.

As with any inspection request, the permit holder must contact the jurisdiction for an inspection appointment. The jurisdiction may make available a list of predetermined types of inspections that are allowed or not allowed for RVI. A list of inspections not allowed will likely curb the number of RVI requests that would not be approved.

Scheduled inspections can be efficient for both parties but may not be necessary. An inspector could allow requests for RVI during their day, specifically on work that had been inspected previously and for which corrections are easily evaluated by video.

## INSPECTION FEES

There does not appear to be any reason to change traditional inspection fees. Most jurisdictions have fee structures that incorporate plan reviews, external agency's fees, and most include the inspection cost in the permit fee. AHJs may want to establish special fees for video inspections as they determine necessary.

Although there may be efficiencies by reduced transportation and travel time, the jurisdiction is still providing the inspection service. This includes providing the certifications, training, expertise, and professional development needed for the inspectors in addition to a review of the video and any storage requirements for the video. The jurisdiction may also have staff on location to operate the cameras for a certified inspector who is off location.

RVIs also require the same support as on-site inspections for scheduling, maintaining records of completion of the inspection, maintenance of local code requirements, and other administrative services that accompany such inspections.

If the jurisdiction's inspection fees are based on the cost of providing services, then it is the responsibility of the jurisdiction to evaluate the budget impact of providing RVI services. Fee schedules could be adjusted accordingly.

## REMOTE VIDEO INSPECTION PROCESS

The camera must be operated by the permit holder or jurisdictional staff on location at the direction of the inspector. The inspector must have the ability to communicate directly with the camera or UAV operator to perform a thorough inspection. This will help ensure that all aspects of the work are observed to the satisfaction of the inspector.

The response needed by the remote inspector might include verification of the dimensions of the work being inspected. This can be done easily by the camera operator or another person on-site with a tape measure or known dimensional object.

The person who performed the work being inspected should be available to answer questions about the work.

State and local requirements should be followed the same way they are for in-person inspections. The only difference with an RVI is that the inspector is viewing and conducting the inspection remotely. Inspectors must be qualified based on state or local requirements to conduct different types of remote inspections.

An RVI can be considered a physical inspection, and as such, scheduling, coordinating, documenting, and processing can mirror the regular inspection process, or it can be modified from the standard as preferred. The more that the RVI mirrors a traditional inspection, the more likely it will be accepted.

## **TYPES OF RVIs**

The types of inspections that would be appropriate or inappropriate for an RVI must be considered by the AHJ on a case-by-case basis. However, experienced inspectors may be able to generally determine them in advance.

For example, framing and plumbing rough-in inspections would not be appropriate for RVIs because of the complexity and extensive amount of inspection likely needed. But many reinspections may be appropriate to address the items corrected. Water heater installations would usually be appropriate for an RVI.

Jurisdictions may find it useful to develop lists for types of inspections that generally are or are not appropriate for RVIs.

## **VERIFICATION OF INSPECTION LOCATION**

Many job sites are similar, particularly in residential subdivisions where multiple homes are under construction. This makes it important to ensure that the RVI is taking place at the correct location.

One way to verify the location is to begin the RVI on the exterior of the building, for example, starting at the nearest intersection and moving down the street to the correct lot. It can be verified by the inspector using the site plan and subdivision plan. If the location is the third lot from the corner, then the inspector can follow as the permit holder walks down the street, stopping in front of the correct lot. From there, the video continues into the building to the location of the required inspection.

If the building is identifiable by an address, showing the address marking may be sufficient, but that is up to the inspector to decide.

Geolocation from a mapping tool could be used for site verification as long as the verification is conducted on a live video stream.

In addition to verifying the proper lot or building, it is also important to verify the proper location of the inspection within the building or property. For example, if a certain type of hardware is used in multiple locations within a building and only one location is needing inspection, the location of the RVI is important and should be verified. This can be done by starting the inspection at an identifiable location within the building and following it to the proper location.

It is easy to see that properly identifying the location is the responsibility of both the permit holder and the remote inspector. Correction notices that speak to specific locations are as important as

the permit holder showing clearly the location in the video. Inspectors can also use lumber crayons to mark locations in a manner that they will recognize their “mark” during an RVI.

## **PLANS AND SPECIFICATIONS**

Prior to the scheduled inspection time, it is necessary, in many cases, for both the permit holder and the inspector to have the approved plans and associated documents available for access during the inspection. Questions may arise during the inspection that require referring to the approved documents, just as during traditional inspections.

An important step in the inspection process is when an inspector opens up the plans upon arrival at the job site to verify dimension, spacing, number of items, etc. During an RVI, this step can be even more important due to the partial disconnect by performing the inspection remotely.

## **LIMITATIONS**

As with any inspection, the remote inspector maintains the right to request that conditions for the inspection be reasonable. In the case of an RVI, if the Internet connection, lighting, picture quality, access, or other conditions are not conducive to a reliable inspection, it may be rescheduled or changed to a site inspection. The RVI may be called off due to the quality of the work and too many corrections identified.

## **INSPECTION SIGN-OFF**

The sign-off process does not usually have an on-site component; the process may be only electronically available or a jurisdiction could offer to issue other documentation in the form of email, fax, mail, or delivery to the site at the next inspection. Documentation would follow the usual process and detail of an on-site inspection.

## **MAINTAINING RECORDS**

A recording of the RVI may not be required. Jurisdictions must decide whether to maintain a copy of the video used in the RVI based on local laws and regulations including open record laws and other considerations.

There is no precedence to maintaining the recording of the video file. As with a traditional inspection, there may be no reason to photograph the approved work because the inspection record of completion should suffice. But there may be cases when the AHJ wants to maintain photos or videos.

Inspection verification is an endorsement from the inspector that an inspection has been completed satisfactorily. If an inspection item is not satisfactory, then further action will be identified and transmitted to the permit holder for correction.

## **USE OF UNMANNED AERIAL VEHICLES (UAVS)**

The use of UAVs has advantages for any challenging inspection sites due to size, terrain, height, etc. The same considerations apply to an RVI conducted with a camera mounted on a UAV as with a handheld camera.

Other local, state, and federal rules may apply. For the operation of UAV, Federal Aviation Administration rules must be followed. Such rules may dictate who can operate the vehicle, how high the vehicle may fly, and how close to buildings the vehicle is allowed to approach.

For more information, see “SMART Fire Fighting: The Use of Unmanned Aircraft Systems in the Fire Service,” development of which was sponsored by the NFPA Responder Forum in 2015.

## **CONCLUSION**

RVI offers both jurisdictions and permit holders the opportunity to use technology to increase the efficiency of the inspection process, which has the potential to benefit both — but it comes with some limitations and risks.

The limitations will likely dictate when an RVI will be performed. The risks, which have a direct impact on the efficiency gained, will be assumed. Even if an RVI is called off for any reason, it may be worth the risk. With proper attention and communication, both parties may complete the inspection successfully.

It is important for jurisdictions that allow the use of RVIs to develop rules, policies, and procedures to provide expectations to the permit holders. The transparency in procedures for the AHJ will go a long way in the success of these inspection programs.