

U.S. DEPARTMENT OF  
**ENERGY**

Office of  
ENERGY EFFICIENCY &  
RENEWABLE ENERGY

# Remote Inspections – A tool for the future or a time saving tool for today?

National Energy Codes Conference Seminar Series  
Building Technologies Office

Fall 2020



# NECC Seminar Series Lineup

Catch the entire lineup of sessions weekly—Thursdays @ 1p ET:

- 10/01: Kickoff to the Series
- 10/08: Electronic Permitting
- 10/15: HVAC for Low-Load Homes
- 10/22: Performance-Based Compliance
- 10/29: 2021 IECC Commercial
- **11/05: Remote and Virtual Inspections**
- 11/12: New for ASHRAE Standard 90.1
- 11/19: 2021 IECC Residential
- 12/03: Advanced Technology and Codes
- 12/10: Policies for EE + Resilience
- 12/17: Field Studies in the NW Region

> **Learn more:** [energycodes.gov/2020-building-energy-code-webinar-series](https://energycodes.gov/2020-building-energy-code-webinar-series)

# Audience Poll



**Building Energy Codes**

U.S. DEPARTMENT OF ENERGY



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CODE  
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***DOE Building Energy Code  
Fall Webinar Series  
Remote Virtual Inspections***

November 2020

***Dave Walls***  
***Vice President Business Support Initiatives, ICC***

***Valarie Evans M.C.P.***  
***Building Official***  
***City of North Las Vegas***

***Michelle Britt***  
***Director, Energy Programs, ICC***

- **Today's Presentation**
- **RVI Process**
- **Challenges/Successes**
- **The North Las Vegas Experience**
- **Training**

# REMOTE VIRTUAL INSPECTION - RVI



## WHAT IT IS - Definition

RVI, is a form of visual inspection which uses visual or electronic aids to allow an inspector or team of inspectors to observe products and/or materials from a distance.

## Purpose of the RVI Resources

Jurisdictions looking for way to conduct inspections while minimizing human contact, and travel and need tools for implementing remote inspections.



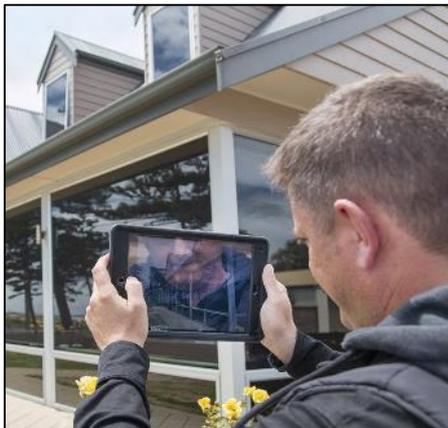
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## Potential Impact on Energy Code Compliance

RVI provides a tool for conducting inspections without travel in large rural areas and provides a tool to increase enforcement with less investment of the code official's time .

# What is RVI?

- A form of visual inspection
  - Uses visual or electronic aids
  - Allows inspectors to observe products and/or materials from a distance



# Why Use RVI?

- Today's phones and tablets have powerful capabilities for real-time, online communication
- Allows construction projects continue forward without impediment
- Allows AHJs to continue providing essential services needed to ensure the safety of the built environment
- Broadly supported by diverse stakeholders

# Key Steps for RVI

## THE KEY STEPS TO A REMOTE VIRTUAL INSPECTION



1

### Scheduling

The customer works with the AHJ to schedule remote virtual inspections and ensure both parties have the required documents and equipment necessary



2

### Customer Preparation

The customer prepares the jobsite and devices as well as minimizes disruptions for remote virtual inspection, ready to cooperate with the inspector when on the call



3

### Jobsite Identification

The inspector makes sure the jobsite is identified on the video display and begins inspection, keeping close communication with the customer



4

### Inspection Results

Results are entered into the AHJ's permit database as soon as RVI is completed and communicated with the customer



5

### Maintaining Records of Inspections

Required inspection records are maintained in accordance with the AHJ's policies, laws, regulations, and applicable codes, and may be subject to disclosure

# RVI Scheduling

## AHJ Requirements:

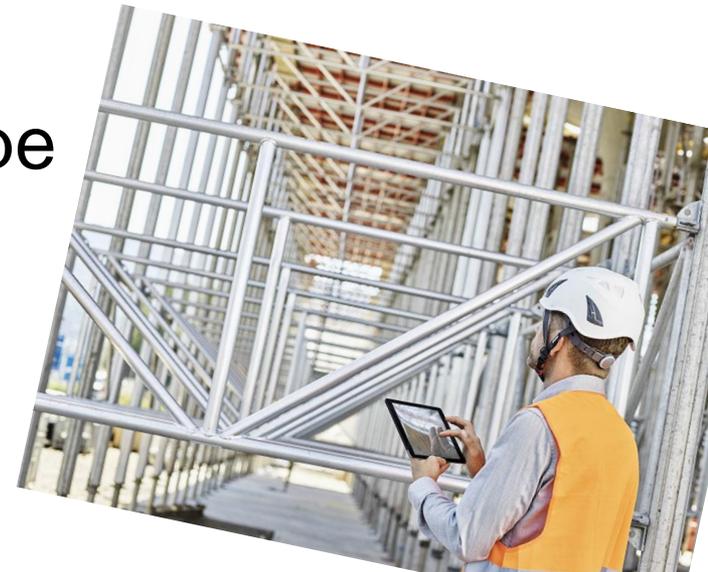
- Require lead time
- Sufficient Time for Type of inspection
- Time slots
- Platform (Facetime, Skype, Google Duo, etc.)
- Confirm qualified inspection type
- Provide confirmation to the customer



# RVI Scheduling

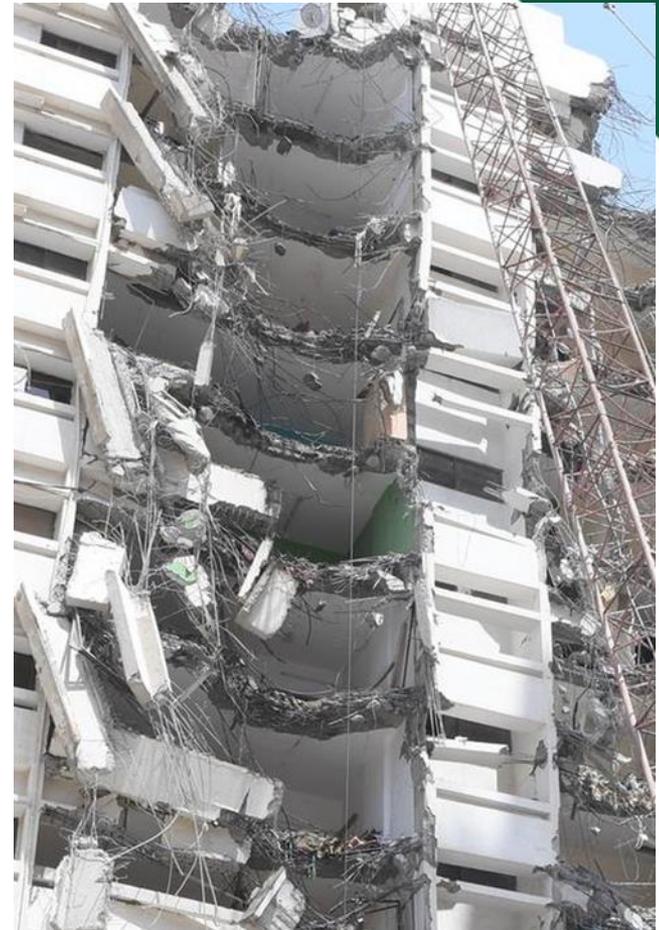
## Customer Requirements:

- Active permit
- Require lead time
- Sufficient Time for Type of inspection
- Confirm Platform (Facetime, Skype, Google Duo, etc.)
- Confirm qualified inspection type
- Confirm with jurisdiction
- Sign consent notice



# RVI Process Jobsite

- Safe for person handling the device
- Device is fully charged
- Hi Speed wifi or cell service with a strong signal
- Good lighting and visible
- Tools available onsite
- Plans & permit card available



# RVI Process Customer Prep

- Image Quality
- Turn off notification to avoid interruptions
- Minimize jobsite disruptions
  - Background noise
- Be ready to receive the call on time



# RVI Process - Inspection

- Begin video at the street
  - Geotagging/GPS
- Follow directions
- Minimize interruptions



# RVI Process – Inspection Results

- Results entered into system following inspection
- Available for Customer review
  - Inspector may send results electronically
- Corrections noted
  - Schedule reinspection
  - Optional – inspector may permit video of corrections
- Utility tags



# Sample RVI Inspection Types

- Residential and simple commercial
  - Rough-in framing
  - Rough-in plumbing
  - Rough-in mechanical
  - Final
- Re-roofing/roof covering replacement
- Residential rooftop-mounted photovoltaic panel systems
- Miscellaneous repair/exterior repair or upgrades (stucco, windows, etc.)
- Water heater or water softener direct replacement.
- Any other inspection approved by the AHJ



# RVI Inspection Challenges

- Connectivity/Technology
  - Video and/or Audio
- Ensuring correct site location
- Ensuring correct location within the building
- Insufficient data to demonstrate compliance
- Complexity of the project
- Inadequate tools onsite
- Length of time for inspection



# RVI Inspection Positives

- Health and safety benefits
- Customer - Schedule an inspection time
  - Able to plan around schedule
  - Pre-determined length of time for inspection
- Jurisdiction - Eliminates drive time
  - Saves time and resources
  - Reduces GHG



# Jurisdiction Experience



- North Las Vegas, NV
- Valarie Evans

# Welcome to the REMOTE Inspection Program Pre-, During and Post-COVID-19



Valarie Evans M.C.P  
Building Official  
City of North Las Vegas



# REMOTE Inspection Program



Purpose

Setting up Virtual Inspections

Process of Inspection

What the Contractor Needs

Tips, Overcoming Hurdles, Lessons  
Learned



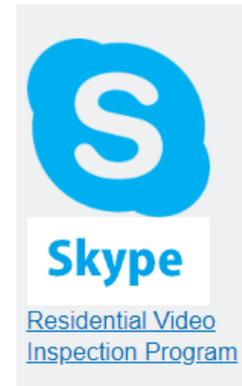
# Pre-COVID-19: Residential Video Inspection Program



## Purpose prior to COVID-19:

The purpose of the City of North Las Vegas Residential Video Inspection Program was initially intended to provide an alternative for eligible residential inspections, including limited re-inspections. The program required the customer to schedule the inspection via an Appointments Plus link on the City web page and to use the Skype app on a minimum 4G smart phone in order to interact with the City Inspector.

North Las Vegas went live with the Residential Video Inspection Program on July 1, 2019.



# During COVID-19: Remote Inspection Program



## Purpose during COVID-19:

The purpose of the City of North Las Vegas Remote Video Inspection is to allow the development community to have continued momentum during the Coronavirus pandemic.

To safeguard the City employees and the public while still performing critical inspections.

There were several families waiting to move into new homes, as well commercial timelines that were dependent on us to maintain.



# Remote Inspection Program



## Setting up virtual inspections:

List of the inspections allowed to be performed remotely.

Determine the method of media used to stream the video i.e.: Skype, FaceTime, Hangouts, Google Duo, Google Meets, Zoom, WebEx.

How is the inspection going to be scheduled?

How is the inspection going to be performed?

How will you follow-up with documents? QAA, Reports, Permits.

Archiving. Are you going to keep the video?



Webex Meetings



# Pre-COVID-19: Residential Video Inspection Program



## Types of Inspections:

- Rooftop Solar
- Aluminum Patio Cover
- Water Heater
- Water Softener
- Plumbing Re-Pipe
- Gas Line Extension for BBQ and Fire Pits
- A/C Change out
- Attic FAU
- Main Line Water Repair
- Electrical Service Change
- Electric Car Chargers and Storage Systems
- Spa Circuit
- Detached Storage Sheds not to Exceed 600 Sq. Feet

**Note: If for any reason the Inspector is not able to complete the inspection via the Residential Video Inspection Program, every effort will be made to route a field inspector to complete the inspection the same day. If this is not possible, the inspector will schedule a field inspection for the next business day.**



# During COVID-19: Remote Inspection Program



## Inspections:

All inspections to be performed via video means.  
11,500 inspections performed

No in-person inspections (staff working from home).  
12 weeks from March to June 2020

Photos allowed when approved by the jurisdiction,  
provide enough photos to allow for a complete  
inspection.

Documents sent via email PDF (third party daily  
reports, final reports, approved revisions etc.).



# Pre-COVID-19: Residential Video Inspection Program



Residential scopes **greatly benefit the homeowners**, as they do not have to take off time or wait for inspections.

Benefit to contractors to potentially only make one trip to job site.

No wasted travel time for inspectors.

The Current procedure requires the work to be completed first, and then the inspection is scheduled for the following day. **For this program to benefit, we must be able to perform the remote inspection after the work is complete, before covers are re-installed, ladders put away, and before the contractor leaves the site.** This may necessitate a shift in how and when inspections are scheduled. A remote inspection after the contractor leaves the site, lessens the benefit for the customers, but still has merit.

Appointment software like **Appointments Plus** used by City of North Vegas.



# Pre-COVID-19: Residential Video Inspection Program



CITY OF NORTH LAS VEGAS .COM

Home Appointments

### Appointment Locator

Select Scope Of Work  
Rooftop Solar

Date  
October 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Welcome to our online reservation system!

In consideration of inspection through the Residential Video Inspection Program, I, hereby agree to protect, defend, indemnify, and hold harmless the City of North Las Vegas, and its officers, representatives, managers and employees, against any and all claims, demands, awards, suits, judgment, liabilities, losses or damages arising out of, or being in any way connected with the design, construction and/or code compliance review for the referenced project.

The obligation should not be construed to negate, waive or otherwise reduce any other right or obligation of indemnity that may exist in the favor of the City of North Las Vegas.

It is further understood and agreed that if there are any defects or errors in the installed system discovered while using the video inspection program, I will remove or correct any and all components that do not conform to any code or other legal requirements.

For more information on how to prepare for a remote video inspection, please [click here](#).

To get started, please use the drop down menus on the left.



CITY OF NORTH LAS VEGAS .COM

Home Appointments

### Appointment Locator

Select Scope Of Work  
Rooftop Solar

Date  
October 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

### Select Appointment Time

Thursday, October 17, 2019	8:00am	Book it
Thursday, October 17, 2019	8:20am	Book it
Thursday, October 17, 2019	8:40am	Book it
Thursday, October 17, 2019	9:00am	Book it
Thursday, October 17, 2019	9:20am	Book it
Thursday, October 17, 2019	9:40am	Book it
Thursday, October 17, 2019	10:00am	Book it
Thursday, October 17, 2019	10:20am	Book it
Thursday, October 17, 2019	10:40am	Book it
Thursday, October 17, 2019	12:00pm	Book it

Next

# Pre-COVID-19: Residential Video Inspection Program



CITY OF NORTH LAS VEGAS .COM

Home Appointments

### Appointment Locator

Select Scope Of Work  
Rooftop Solar

Date  
October 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

### Selected Appointment

Scope Of Work: Rooftop Solar  
Date: Thursday, October 17, 2019  
Start Time: 8:20am

Please complete the following information.

**New User**

\* Indicates required field

\* First Name

\* Last Name

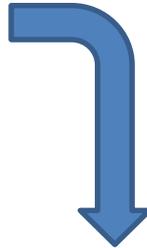
\* Home or Business Address

\* JOB SITE ADDRESS  Job site address MUST match address on permit

\* Cell Phone

\* Email

\* SKYPE ID



\* Permit #

Special Instructions

**Finalize Appointment**

© The City of North Las Vegas  
Powered by Appointment-Plus

Are you a European Union citizen? If yes, please read our [GDPR fact sheet](#)



# Remote Inspection Program



## What the contractor/customer needs:

1. 4G Wireless service -  
Ensure inspection location and smart phone or tablet has minimum 4G connectivity.
2. Media account i.e.: Skype, FaceTime, Google Duo, Google Meet, Hangouts, Zoom.
3. Prior to scheduled inspection time, ensure all necessary tools based on type of inspection are readily available. For example: tape measure, level, GFCI tester, flashlight, step ladder, etc.



# Pre-COVID-19: Residential Video Inspection Program Process



## 1. Prepare to receive the Skype call:

- Must be at least 18 years old or with an adult to perform the video inspection.
- Ensure smart phone or tablet is fully charged.
- Respond to Skype call from Inspector.
- Be prepared to accept video call at scheduled time.
- Have all required tools as necessary for inspection.
- Turn off notifications that may interrupt the Skype call.
  - This is an important step, because notifications can freeze Skype and will cause delays to the inspection and a possible failed inspection.
- Use ear buds with a microphone to improve communication.
- Set phone so that you have the small screen view of what the inspector sees:
  1. Tap the Skype screen to access the tool bar.
  2. Tap the camera icon.
  3. In the small view the inspector sees, tap the reverse camera icon.

## 2. Start inspection:

- Begin inspection at street view looking at the structure.
- The address must be shown in the initial view.
- Follow the direction of the inspector.
- Walk inspection in a clockwise direction horizontally then bottom to top vertically (if more than one floor).
- Make notes of any corrections.

## 3. Inspection results:

- Inspector will inform you if the inspection receives a pass, partial or fail.
- The inspector will update the permitting system with the results at the completion of the Skype call.



# During COVID-19: Remote Inspection Program Process



## 1. Inspector gets schedule at home via VPN or other means

- Inspector calls each contact to schedule inspection, gives time window, and agrees on media platform.
- Some inspectors have contractor/customer text them when they are on project site.
- Inspector allots a minimum amount of time to perform inspection.
- Inspector lets customer know they may be performing an inspection when their time slot occurs and will call them back when finished.
- Inspector gets all documents electronically or via video at the time of the inspection.

## 2. Start Inspection

- Inspector validates permit information.
- Inspector accesses all documentation.
- Inspector guides the inspection process.
- Contractor/customer follows direction of the inspector.



# Post-COVID-19: Remote Inspection Program



## Tips, Overcoming Hurdles, Lessons Learned

Contact information of contractor/customer is imperative.

Utility reconnections

Getting Plans downloaded for projects inspectors go to regularly.

Get contractors to think like an inspector.

Filter all inspections to Appointments plus or another scheduling platform so the customer can choose the inspection



Changes will continue to occur AS THE PROCESS GROWS.



# Post-COVID-19: Remote Inspection Program



## When life returns to “normal”

Identify efficiencies that were created due to Covid-19.

Increase program guidelines to allow for more inspections via video.

- Commercial scopes
- Home Builders

Identify the projects where an in-person inspection is most critical.

Follow up on projects that may have needed a closer look.

**There is no pain in change itself, there is only pain in resistance to change.**



# Residential Scopes Added

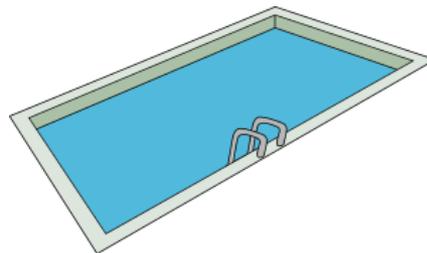


## Gazebos

Residential Room Additions not to Exceed 600 square feet (where the permit is obtained by a licensed contractor) including the energy compliance provisions

## Residential Swimming Pools

Privacy Masonry Walls (interlocking without soils retention)



# Single Family Subdivisions



Underground Electrical  
Gypsum Board (that is not a part of a fire-resistive-rated assembly or shear assembly)

Exterior Lath

Gas Tag

Electric Tag

Privacy Masonry Wall (interlocking without soils retention)

Residential Subdivision Signs



# Commercial



Wall Mounted Signs  
Monument Signs  
Cell Tower Antenna Co-Location  
Temporary Generators  
Simple Mechanical, Plumbing, and Electrical  
Gate AVI  
Wrought Iron Fence  
On-Site Utilities



# Commercial



Fire Rehab  
Garage to Sales Office  
Temporary Construction Trailers  
Tenant Improvements of B & M  
Occupancies not to Exceed 3000 Square  
Feet



Sprinkler Rough/Final up to (5) Heads with  
Approval Letter

Sprinkler Hydrostatic Test

Sprinkler System (Dry) 24 Hour Air Test

Standpipe Hydrostatic Test

Underground Hydrostatic Test

Fire Alarm 24 Hour Battery Test



## Medical Gas Pressure Test

Fire Final Tenant Improvements of B & M Occupancies not to Exceed 3000 Square Feet

Fire Business License of a B & M Occupancies not to Exceed 3000 Square Feet

# Remote Inspection Program



# Thank you



**Valarie Evans M.C.P**

**Building Official**

**City of North Las Vegas**

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**702-633-1580**



# RVI Inspection Education

## Training

- The RVI process
- The various video platforms/software
- Communication skills

## Training for Customers

- Job site expectations
- Scheduling protocols

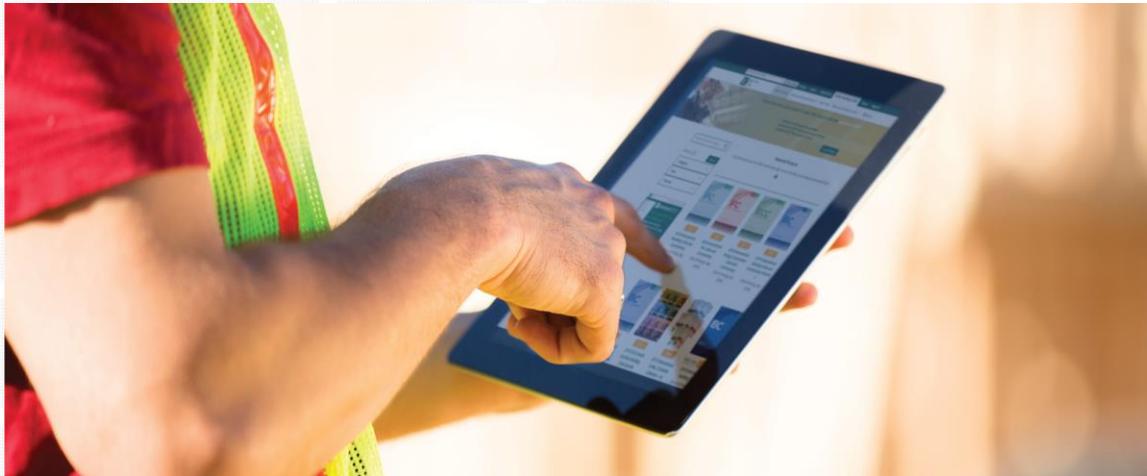


# RVI Resources

- ✓ [ICC Coronavirus Response Webpage](https://www.iccsafe.org/advocacy/coronavirus-response-center/)  
(<https://www.iccsafe.org/advocacy/coronavirus-response-center/> )



# RVI - Software



- Municipity
- Inspected.com
- Oracle
- Blitzz
- Others

# RVI – Additional Jurisdictions



- [Alexandria, Virginia](#)
- [Arlington County, Virginia](#)
- [City of Austin, Texas](#)
- [City of Fort Collins, Colorado](#)
- [North Carolina Code Officials Qualification Board](#)
- [North Carolina Department of Insurance](#)
- [North Las Vegas](#)
- [Los Angeles County Video Inspection Process and Inspection Guide for PV Systems For One- and Two-Family Dwellings](#)
- [City of Los Angeles Department of Building and Safety Virtual Inspection Program](#)
- Many others around the country

# Thank You



## Dave Walls

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# THANK YOU!



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