**Comment/Explanation\*:***Include your justification for your proposed change to the draft standard below.*
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In review for alignment with the ANSI 301 insulation inspection remote inspection protocols there were several comments in blue below in chapter’s 1-4. The two standards are not completely allaigned but thought I would submit the ideas incases the committee was interested inmaking 1450 a bit more broad.

**Proposed Change to the Draft Standard\***
*Use “strikethrough” and “underline” formatting to indicate all proposed changes. Changes must be shown with “hard-formatting” strikethrough and underline, not “track changes”.*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DRAFT PDS-01

ICC/RESNET 1450-202x Remote Virtual Inspections

CHAPTER 1

APPLICATION AND ADMINISTRATION

SECTION 101

GENERAL

**101.1 Purpose.** The provisions of this document are intended to establish national standards for performing *remote virtual inspection*s for energy program or code compliance and/or building verification of the installation of program or code requirements necessary to achieve water use and energy ~~efficiency~~ performance. This standard will provide criteria for *remote virtual inspection*s conducted by performance Approved third party inspection agencies, Energy R~~r~~aters and inspection staff tasked with verifying specific aspects of construction and site compliance for new and existing property for applicable energy and water-related codes, laws and regulations. These standards lay out an optional alternative inspection process.

The ICC/RESNET 1450 standard addresses the use of *remote virtual inspection*s to verify water use performance as determined by ANSI/RESNET/ICC 850 and to verify energy performance as determined by ANSI/RESNET/ICC 301 and ANSI/RESNET/ICC 380.

**101.2 Scope.** This standard is applicable to all one- and two-family dwellings and to dwelling units in residential buildings three stories or less in height above grade plane.

CHAPTER 2

DEFINITIONS

SECTION 201

GENERAL

**201.1 General.** The following terms and acronyms have specific meanings as used in this Standard. In the event that definitions given herein differ from definitions given elsewhere, the definitions given herein shall govern.

**201.2 Interchangeability and undefined terms.** Unless stated otherwise, the terms and words in Section 202 shall have the meanings indicated therein. Words used in the present tense include the future, words in the masculine gender include the feminine and neuter, and singular and plural are interchangeable. Terms not defined in Section 202 shall have ordinary accepted meanings such as the context implies.

SECTION 202

DEFINITIONS

**IN-FIELD REPRESENTATIVE.** An individual or entity engaged by the owner or the owner’s authorized agent to coordinate aspects of the inspection, as determined by the authority having jurisdiction.

**INSPECTION AGENCY.**  An established and recognized agency that is regularly engaged in conducting tests and furnishing inspection services where such agency has been approved by the authority having jurisdiction.

**INSPECTION DEVICE.** A device such as a smartphone, tablet or drone utilized to perform remote inspection. [[1]](#footnote-1)

**INSPECTOR.** A qualified person employed, retained or authorized by the authority having jurisdiction and having the competence necessary to inspect or verify a particular item for compliance and provide direction in the performance of a remote virtual inspection.

**NOTICE OF VIOLATION.** A notice of violation or order on the person responsible for the erection, construction, alteration, extension, repair, moving, removal, demolition or occupancy of a building or structure in violation of the provisions of the adopted code or standard, or in violation of a permit or certificate issued under the provisions of the adopted code or standard. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.

**REMOTE VIRTUAL INSPECTION.** The application of remote visualization technologies and processes to the inspection, certification, auditing and diagnosis of building design, operation or performance to document compliance with the requirements of code or program.

**REQUESTER.** The individual or entity making a request for the provision of documents or inspections.

**REQUIRED ITEMS.** Items and conditions to be verified as identified by the applicable code, program, or standard.

CHAPTER 3

GENERAL PROCEDURES FOR REMOTE VIRTUAL INSPECTIONS

SECTION 301

PRIOR TO SCHEDULING REMOTE VIRTUAL INSPECTIONS

**301.1 Confirmation of approval for remote virtual inspection.** Confirm that the scope of work for the requested inspection is approved for *remote virtual inspection*.

**301.2 Participation and consent agreement.** Where required by the *inspection agency*, a virtual inspection participation and consent agreement shall be provided. *(See sample in Appendix A.)* The property owner or their authorized representative shall:

1. Consent to the use and requirements of the *remote virtual inspection* procedures.
2. Acknowledge responsibility for the safety of the *in-field representative* during the *remote virtual inspection*.
3. Consent to the complete and unfettered use of the resulting videos and photos for the *remote virtual inspection* by the *inspection agency*.
4. Recordings and files are subject to public record retention and disclosure laws.
5. Confirm that the site and inspection items made available are truthful and accurately represent the project.
6. Acknowledge responsibility for compliance with all codes and standards applicable to the project.
7. Acknowledge that participation in the remote inspection program is voluntary unless required by the Authority Having Jurisdiction.
8. Acknowledge that the decision to perform and complete the *remote virtual inspection* is at the sole discretion of the *inspection agency*.
9. Release liability towards the *inspection agency* related to use of *remote virtual inspection* procedures.

**301.3 Confirmation of minimum site conditions.** Prior to final scheduling of a *remote virtual inspection*, confirm that the minimum site conditions for *remote virtual inspection*s as established hereafter in Section 302 ‘SITE CONDITIONS FOR REMOTE VIRTUAL INSPECTIONS’ are met.

**301.4 Request to schedule inspection.** The *requester* and/or *in-field representative* shall submit the request to schedule a *remote virtual inspection* utilizing the *inspection agency’s* approved site inspection scheduling procedure and format.

**301.5 Information to be provided by requester.** The *remote virtual inspection requester* shall provide the address, permit number (if applicable), type of inspection, and number of requested inspections if more than one is needed or being requested (e.g., frame reinspection and insulation inspection).

**301.5.1.** When multiple inspections are performed using the remote virtual inspection procedures, the most restrictive guidance on time allocation, expectations and quality assurance shall apply.

**301.6 Age requirement of inspection requester.** Onsite representatives of the *remote virtual inspection* *requester* must be at least 18 years old or accompanied by an adult for the *remote virtual inspection* to be performed.

**301.7 Approved third party inspection agencies.** When not provided by the AHJ staff, all remote virtual inspections shall be conducted by AHJ approved third party inspection agencies as defined within the International Energy Conservation Code.

SECTION 302

SITE CONDITIONS FOR REMOTE VIRTUAL INSPECTIONS

**302.1 Safety conditions of job site.** The jobsite shall be clean and safe for the individual(s) using the *inspection device* during the *remote virtual inspection*.

**302.2. Connectivity.** The jobsite shall have adequate high-speed Internet/Wi-Fi connectivity or cellular service.

**302.2.1.** A repeater or other device that strengthens the transmitting signal within the jobsite may be required. If the signal is too weak, the inspection may be discontinued by the *inspector*.

**302.2.2.** At the *inspector*’s discretion, in areas within the jobsite where there is an insufficient Internet/Wi-Fi signal or cell service, the *in-field representative* may take video and/ or photos and provide those to the *inspector* for evaluation.

Photos and/or Video-Photos or video and provide evidence showing the full insulation installation in sufficient detail to confirm full coverage and proper installation including 100% of all areas specified for insulation. Photos shall be geotagged and dated, videos shall include a site perspective showing the specific location and surrounding area. When used to comply with ANSI 301 Appendix a Detail photos/video footage are required to provide the ability to determine is insulation is properly installed in accordance with Appendix A.

**302.3 Onsite recording.** Where onsite recording is required by the *inspection agency*, the *requester* or their *in-field representative* shall ensure the *inspection device* shall have sufficient integral or removeable memory for the inspection time length and specified video resolution.

**302.4 Availability of tools.** Any necessary tools, as determined by the type of requested *remote virtual inspection*, shall be readily available to the *in-field representative*.

**302.4.1.**The *inspection device* shall be fully charged and have a suitably charged backup power supply (e.g., battery pack).

**302.4.2.** It is the responsibility of the *requester*s to ensure that a flashlight, tape measure, level, step ladder, testing equipment, extending pole for the *inspection device*, or other specific tools that may be specified at the time of scheduling a *remote virtual inspection*, be provided onsite. Alternatively, the AHJ may use an approved third party inspection agency.

**302.5 Construction plans and documentation.** The approved, stamped set of construction plans by the jurisdiction shall be available onsite. If applicable, a permit card, inspection checklist or other necessary documents shall be available onsite. The *in-field representative* shall ensure that all data for *required items* subject to visual inspection, where not available to the *inspection agency* beforehand, are collected. The *requester* is responsible for ensuring the appropriate documentation is submitted to the *inspector* at the conclusion of the *remote virtual inspection*.

**302.6 Visibility of construction components.** All construction components that are applicable to the requested inspection shall be visible at the time of the *remote virtual inspection*. These features shall be captured by video in sufficient and clear detail to allow for evaluation by the *inspector*.

302.6.1 Photos and/or Video-Photos or video shall provide evidence showing the full insulation installation in sufficient detail to confirm full coverage and proper installation including 100% of all areas specified for insulation. Photos shall be geotagged and dated, videos shall include a site perspective showing the specific location and surrounding area.

When using remote virtual inspection for ANSI Standard 301 Appendix A Detail photos/video footage shall be required to ensure the ability to determine if insulation has been installed properly in accordance with Appendix A.

**302.7 Lighting.** Adequate lighting shall be provided to all areas of the inspection site for which the *remote virtual inspection* shall be performed. A secondary or directional light source, in addition to the light from the *inspection device*, may be necessary.

**302.8 Area to be clear of obstructions.** The area to be inspected shall be clear of any obstructions that may interfere with the *inspector*’s view.

**302.9 Discretion of inspector or in-field representative to require in-person building site inspection.**

**302.9.1 Discretion of inspector.** Where conditions exist that may impact the proper assessment of site compliance, at the *inspector*’s discretion, an in-person building site inspection may be required and conducted at a future date.

**302.9.2 Discretion of in-field representative.** Where conditions exist that may impact the proper assessment of site compliance or personal safety, at the *in-field representative*’s discretion, an in-person building site inspection may be requested and conducted at a future date.

SECTION 303

OFFICE CONDITIONS FOR REMOTE VIRTUAL INSPECTIONS

**303.1 Allocation of adequate time by inspector.** The *inspector* shall allocate adequate time for the inspection type and jobsite.

**303.2 Verification of site by GPS/geotagging.** Where required by the *inspector*, location shall be verified through GPS/Geotagging where the service is applicable.

SECTION 304

PROCEDURE FOR IN-FIELD PORTION OF REMOTE VIRTUAL INSPECTIONS

**304.1 Preparation of inspection device.** The device lens and screens shall be clean for maximum clarity.

**304.2 Use of headphones or earphones.** Headphones or earphones shall be used by the *in-field representative* when necessary to improve communication.

**304.3 Initiation of inspection; secondary points of contact.** The *remote virtual inspection* shall be initiated by the *inspector* at the scheduled time and include a secondary point of contact for both the *inspector* and the *in-field representative*.

**304.4 Deactivation of device notifications.** The *In-field representative* shall deactivate *inspection device* notifications during the *remote virtual inspection*.

**304.5 Minimization of background noise.** All participants shall ensure background noise is kept to a minimum so it will not interfere with communications and instructions.

**304.6 Inspection orientation; visibility of address.** Begin inspection at the street looking at the structure with the address or other required jobsite identification in the display. The *in-field representative* shall begin *remote virtual inspection* from the outside with an elevation view (front) of the building. The address must be visible in the initial view.

**304.6.1 all photos and videos shall be geotagged.**

**304.6.2.** If street number is too small to see from a full elevation view, the *in-field representative* shall either walk or zoom the camera lens up to the street number sign until clearly visible to the *inspector*.

**304.6.3.** If there is no street number signage installed on the house, a building permit, lot/block signage or other identification posted on-site shall be captured with the video camera to establish that the *in-field representative* is at the correct location.

**304.6.4.** For multifamily dwellings, the video shall capture the approach from the respective elevation view up to the dwelling unit that is being inspected.

**304.7 Allowance of adequate time.** The *in-field representative* and *inspector* shall allow adequate time for the inspection type as site specifics and inspections vary in time to complete.

**304.8 Pace of inspection.** The *inspector* shall set the pace of the inspection.

**304.9 Duties of requester and in-field representative.** The *requester* and *in-field representative* shall observe and perform the following:

1. Document any items that require correction. The *inspector* shall discuss each of the items with the *in-field representative*.
2. Take and send pictures or videos of paperwork from the inspection or other items requested by the *inspector*.

**304.10 Communication of inspection results.** The *inspector* shall communicate during the virtual inspection whether the inspection has passed or failed, and which items need correction prior to reinspection. The inspection information will be provided using the contact information listed in the permit record.

**304.11 Exposure of areas needing corrections prior to reinspection.** Any work identified by the *inspector* needing corrections shall remain exposed until the corrections are verified by reinspection.

 **Exception:** Where the *inspector* permits the work to be covered.

**304.12 Reinspection fees.** Reinspection fees may apply in accordance with jurisdiction policies.

SECTION 305

PROCEDURE FOR CANCELLATION AND RESCHEDULING OF REMOTE VIRTUAL INSPECTIONS

**305.1 Health and safety concerns.** The *requester*, the *inspector* and the *in-field representative* have the right and responsibility to call out any identified health and safety concerns that could put the *in-field representative* at risk. If such risks are present at the location, appropriate safety protocols shall be followed and, where necessary, the *remote virtual inspection* shall be rescheduled.

**305.2 Conditions preventing full review of required items.** In the event that conditions prevent the completion of a full review of the available *required items*, the *inspector* may, at their discretion, cancel the *remote virtual inspection* event and require supplemental in-person or *remote virtual inspection*(s). Such conditions may include loss of connectivity, battery failure and poor sound/visual quality.

SECTION 306

PROCEDURE FOR DOCUMENTING REMOTE VIRTUAL INSPECTIONS

**306.1 Recording of inspection results.** Results of the inspection shall be entered into the *inspection agency*’s permit and project database after the virtual inspection is completed.

**306.2 Submission of documentation of required corrections in lieu of reinspection.** The *inspector* may, subject to agency policy, allow the permit holder or *in-field representative* to submit video(s), photo(s) or other documentation of required corrections for approval in lieu of a reinspection.

1. When used of the purposes of an RESNET Energy Rating Virtual inspection video footage shall be attended, directed, or recorded by the Rater/RFI. The recording may be of the entire virtual inspection or screen shots taken during the inspection but shall be in enough detail to ensure photo documentation requirements found in ANSI 301 Appendix B have been met. The RESNET Certified Energy Rater is solely responsible for the data that is used from remote virtual inspection in the RESNET accredited software.

**306.3 Notation of remote virtual inspection process.** The inspection shall be noted as having been performed using the *remote virtual inspection* process.

**306.4 Required information for communications and inspection records.** All communications and inspection records shall include appropriate contact information, subject address and permit or project number.

**306.5 Indication of inspection approval or failure.** Inspection results indicating approval or failure of the inspection shall be made available to the permit holder or project representative in accordance with the *inspection agency’s* procedures.

**306.6 Notice of violation for required corrections.** Any required corrections shall be provided with a *notice of violation*.

**306.7 Inspections resulting in utility service connection approval.** For inspections resulting in utility service connection approval, the *inspector* shall work directly with the utility provider to communicate such approval.

**306.8 Additional fee(s) for reinspection(s).** Additional fee(s) for reinspection(s) shall be determined in accordance with the *inspection agency*’s procedures.

**306.9 Scheduling of reinspection or additional inspection.** Scheduling a reinspection or the next progressive inspection needed shall be based on availability of the inspection staff.

**306.10 Maintenance and retention of inspection records.** All inspection records shall be managed and maintained in accordance with the jurisdiction’s retention policies, laws, regulations and codes.

**306.11 Public record disclosure of inspection records.** Inspection records in their entirety may become subject to public record disclosure, therein waiving privacy or copyright restrictions. These records include but are not limited to the following:

1. Permit application and related information
2. Plans and construction documents
3. Correction notices and inspection records
4. Live video recordings (maintained in accordance with the jurisdiction’s policies and procedures)
5. Videos or photographs provided by *requester* (maintained in accordance with the jurisdiction’s policies and procedures)
6. As-built plans and documentation

306.12 The inspector shall comply with documentation of Required Items as required by applicable standards, including the photo requirements set forth in Appendix B of ANSI/RESNET/ICC 301. Photo documentation requirements can be met in ~~three~~ Four ways:

1. Video recordings
2. Screenshot taken by the *inspector* during the *remote virtual inspection*
3. Photos provided to supplement the *remote virtual inspection*
4. Photos and/or Video-Photos or video evidence showing the full insulation installation in sufficient detail to confirm full coverage and proper installation including 100% of all areas specified for insulation. Photos shall be geotagged and dated, videos shall include a site perspective showing the specific location and surrounding area. Detail photos/video footage are required which provide all inspection items as detailed in Appendix A based on insulation type
	1. Thickness of the insulation by including a ruler measurement in several locations.
	2. Depth of the insulation installation by including a tape measurement in several locations.
	3. Depth of extension below grade of ultraviolet protection by including a tape measurement in several locations.
	4. R-Value of the insulation by ensuring the Manufacturer’s R-Value label is included for several insulated areas, or the Manufacturer’s data sheet for the specific insulation product is provided.
	5. Details of all air and water sealing at insulation joints, penetrations and/or obstructions.
	6. Details of all repairs to damaged areas.
5. Remote Built or Panelized and delivered to site-Manufactured Housing using successful IPIA Inspections shall be considered as an acceptable alternative for the remote virtual inspections where the manufacturer of the remote built or panelized component includes the on-site inspection procedures for insulation details and requirements in ANSI 301 Appendix A and B in their DAPIA packages, which are used by IPIAs for their factory inspections. In this case, the R-Value shall be recorded as the component manufacturer’s determined R-Value and the insulation installation shall be determined to be Properly Installed (PI) or Not Properly Installed (NPI) in accordance with ANSI 301 Appendix A.

CHAPTER 4

SPECIFIC PROCEDURES FOR REMOTE VIRTUAL INSPECTIONS

SECTION 401

REMOTE VIRTUAL Inspections for Energy Efficiency Code Compliance

**401.1 Optional items.** *Remote virtual inspection*s for energy code compliance ~~shall~~ may include the following:

1. Reinspection to verify correction of in-field-identified violations, where appropriate.
2. Visual inspection of air barrier, air sealing and insulation installation and associated components identified within the *International Energy Conservation Code* or *International Residential Code or* the inspection shall comply with documentation of Required Items as required by applicable codes or standards, including the photo requirements set forth in Appendix B of ANSI/RESNET/ICC 301.
3. Visual inspection of components identified to confirm the building thermal envelope complies with claimed R-values and manufacturer’s installation, International Energy Conservation Code, building program, ANSI/RESNET/ICC 301 or other standards requirements as submitted in the approved design.
4. Visual confirmation of fenestration U-factor, solar heat gain coefficient, visible transmittance and air leakage requirements.
5. Visual confirmation of HVAC and service water heating systems including equipment efficiency ratings, duct and pipe insulation values, duct system and pipe locations, duct system sealing and controls.
6. Visual confirmation of lighting equipment and controls.
7. Visual inspection of any required certificate(s) as specified in the *International Energy Conservation Code* or *International Residential Code*.

SECTION 402

REMOTE VIRTUAL Inspections for Water Use Efficiency and Performance Standard Compliance

**402.1 Optional items.** *Remote virtual inspection*s for water use efficiency compliance may include the following:

1. Reinspection to verify correction of in-field identified violations.
2. Visual inspection of components identified as specified in the approved design.
3. Visual confirmation of water fixtures, appliances, water distribution systems and associated flow rates as approved in the design documents.
4. Visual confirmation of outdoor water systems as specified in the approved design.
5. Visual confirmation of service water pressure testing and/or documentation.
6. At the *inspector*’s discretion, the *in-field representative* may perform fixture flow rate testing.
7. At the *inspector*’s discretion, the *in-field representative* may perform service water pressure testing.

SECTION 403

Procedures for Remote Virtual Inspection Quality Assurance

**403.1 Policy and procedures for remote virtual inspections**. The authority having jurisdiction shall establish a policy and procedures for remote virtual inspections for quality control/assurance of the remote inspection processes.

1. (Informative Note) In the U.S., Drones (Unmanned Aircraft Systems) are regulated by the Department of Transportation, Federal Aviation Administration (FAA). For jurisdictions in the United States, check with the FAA on the latest regulations for the operation of small, unmanned aircraft systems. *For jurisdictions outside the United States, check with governmental agencies that regulate the use of drones within the jurisdiction.* [↑](#footnote-ref-1)