



2020 DIGITAL: SAFETY, INNOVATION
& SUSTAINABILITY CONFERENCE

NYC TR8 INSPECTIONS & REPORTING

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PRESENTATION DESCRIPTION

This presentation will describe recommendations to assist third-party (TR8) inspectors in demonstrating compliance with NYC Progress Inspection requirements.

PROGRESS INSPECTIONS

- Progress Inspectors must verify that construction meets the provisions of the approved drawings
- The inspections to be conducted must be detailed in the construction drawings and contractors must allow for time to conduct the inspections
- The Applicant of Record (AOR) may perform the progress inspections for the work they designed
- Progress Inspectors who are not the AOR must satisfy experience qualifications for the work they are inspecting

PROGRESS INSPECTIONS

(continued)

- Supplemental inspectors can work under the direct supervision of a Registered Design Professional and must meet certain experience qualifications for the work they are inspecting – cannot sign TR8 or EN2

PROGRESS INSPECTIONS

Required Documents for Construction Sign-off

- TR8: Technical Report Statement of Responsibility for Energy Code Progress Inspections
 - The progress inspector must certify that all [Progress Inspections](#) noted on the original TR8 and on TR8s filed within any post-approval amendments (PAAs) have been satisfied. The progress inspector must sign and seal the TR8, certifying that inspected work complies with the approved drawings
- EN2: Certification of Conformance with As-Built Energy Analysis
 - The progress inspector(s) must certify on this form that the as-built values for energy in the building match the values in the last-approved [Energy Analysis](#). If they do not, then an as-built energy analysis must be prepared by the applicant of record and the progress inspector(s) must certify on the [EN2 Form](#) that the as-built values for energy in the building match the values in the as-built energy analysis. The as-built energy analysis must be professionally certified and submitted with the EN2 form at sign-off

PROGRESS INSPECTIONS

- Progress inspections for Energy Code compliance are mandated by Section BC 109.3.5. [1 RCNY §5000-01](#). The Energy Code Compliance Rule establishes Department standards for progress inspections during construction

TABLE I – PROGRESS INSPECTIONS FOR ENERGY CODE COMPLIANCE – RESIDENTIAL BUILDINGS
 TABLE II – PROGRESS INSPECTIONS FOR ENERGY CODE COMPLIANCE – COMMERCIAL BUILDINGS

	Inspection/Test	Periodic (minimum)	Reference Standard (See ECC Chapter C6) or Other Criteria	ECC or Other Citation
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Gives a general description of the inspection

Look at the standards and Code sections for more detailed information about what is to be included

- [1 RCNY §101-07](#), the Approved Agencies Rule, describes the qualifications for progress inspectors for Energy Code compliance in Subdivision (c), Paragraph (3)

PROGRESS INSPECTIONS

Requirement for Progress Inspectors

Owners are required to retain registered design professional(s) to perform progress inspections. Such professionals must not have a conflict of interest for the project they are inspecting. Progress inspectors must verify that the construction, as it progresses, conforms to the approved construction drawings.

Preparation for Progress Inspections

When related special inspections are required to be completed before progress inspections are performed, the progress inspector must not perform the progress inspections until they are completed. When construction that must be inspected differs from the approved drawings such that the progress inspection cannot be adequately performed, the progress inspector must wait until the drawings and energy analysis are updated and approved as appropriate before commencing the inspections.

Sampling

Unless otherwise noted in Tables I and/or II of 1 RCNY §5000-01, progress inspectors must inspect at least 15% of the construction work for a given progress inspection and at least one of each unit type – see 1 RCNY §101-07(c)(3)(v)(C)-1 for more information. The progress inspector alone may determine which part(s) of the construction gets inspected.

Phased Progress Inspections

Phased progress inspections are permitted under certain circumstances, including but not limited to inspections for Temporary Certificates of Occupancy or inspections of controls used only seasonally. See 1 RCNY §101-07(c)(3) for more information.

PROGRESS INSPECTIONS

Helpful Links

- [2011 - 2014 NYC Energy Conservation Code Progress Inspections Comparison Table](#)
- [2016 - 2020 NYC Energy Conservation Code Progress Inspections Comparison Table](#)



2020 NYC Energy Conservation Code

2016 – 2020 PROGRESS INSPECTIONS COMPARISON CHART

RESIDENTIAL BUILDINGS

#	2016 Code Progress Inspection on TR8	2016 Code Section	Table Reference	2020 Code Progress Inspection on TR8	2020 Code Section	Table Reference
Envelope Inspections						
1.	Protection of exposed foundation insulation	R303.2.1	IA1	Protection of exposed foundation insulation	R303.2.1	IA1
2.	Insulation placement and R-values	R303.1, R303.1.1, R303.1.2, R402.1, R402.2, R402.4.2.2, Table 402.4.1.1, R402.4.4, R402.6	IA2	Insulation placement and R-values	R303.1, R303.2, R402.1.2, R402.2, Table 402.4.1.1, R402.4.4, R402.6	IA2
3.	Fenestration U-factor and product rating	R303.1, R303.1.3, R402.1, R402.3, R402.5	IA3	<i>Fenestration and door U-factor and product ratings^M</i>	R303.1, R303.1.3, R402.1, R402.3, R402.5	IA3
4.	Fenestration air leakage	R402.4.3	IA4	Fenestration air leakage	R402.4.3	IA4
5.	Fenestration areas	R402.3	IA5	Fenestration areas	R402.3	IA5
6.	Air sealing and insulation – visual inspection	R402.4.1, R402.4.4, R402.4.5, R402.4.6	IA6	<i>Air barrier – visual inspection^M</i>	R402.4.1, R402.4.4, R402.4.5, R402.4.6	IA6
7.	Air sealing and insulation – testing	R402.4.1.2	IA7	<i>Air barrier – testing^M</i>	R402.4.1.2, R402.4.1.3	IA7
Mechanical and Plumbing Inspections						
8.	Fireplaces	R402.4.2, BC 2111, MC Chapters 7, 8, 9; FGC Chapter 6	IB1	Fireplaces	R402.4.2, BC 2111, MC Chapters 7, 8, 9; FGC Chapter 6	IB1
9.	Shutoff dampers	R403.6, R403.8, C403, C404	IB2	<i>Ventilation and air distribution system^M</i>	R403.6, R403.8, C403, C404	IB2
10.	HVAC and service water heating equipment	R403, C403, C404	IB3	<i>HVAC-R and service water heating equipment^M</i>	R403.7, R403.8, R403.10, R403.11, R403.12, C403, C404	IB3
11.	HVAC and service water heating system controls	R403, C403, C404	IB4	<i>HVAC-R and service water heating system controls^M</i>	R403.1, R403.2, R403.5, C403, C404	IB4

Notes: • Table references can be found in 1RCNY §5000-01, Tables I and II
 • ***Bolded italics*** indicate a 2020 NYCECC code change

• ^M indicates a modified inspection
 • ^{NEW} indicates a new inspection



PROGRESS INSPECTIONS

- What if there is conflict between the Table I/II and the TR8 Statement of Responsibility?
- What if you, the inspector, believe that an inspection is missing?
 - Notify the Owner and Applicant of Record of the inconsistency.
 - Request that it be corrected.

In the end...

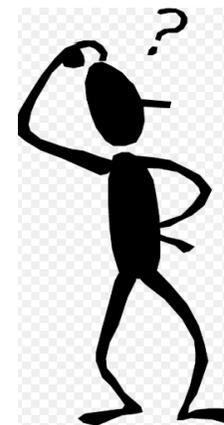
- The EN2 references the approved energy analysis so Table I/II on the approved EN page is the approved inspection list.

PROGRESS INSPECTIONS

What if non-compliant conditions are found that are not addressed by the approved construction documents?

For Example...

- You, the inspector, know that a space requires daylight controls but the approved drawings don't show them.
- Can you certify that inspection?



PROGRESS INSPECTIONS



TR8: Technical Report Statement of Responsibility for Energy Code Progress Inspections

- Notify the Owner and Applicant of Record of the non-compliant condition.
- Request amended drawings and that the non-compliant condition be corrected.
- Recommend re-inspection.

PROGRESS INSPECTIONS



TR8: Technical Report Statement of Responsibility for Energy Code Progress Inspections

Only a Registered Design Professional may sign the TR8 and EN2 forms.

6 Inspection Applicant's Certification of Completion

- I have completed the items specified herein and certify the following *(check one only)*:
 - All work performed substantially conforms to approved construction documents and has been performed in accordance with applicable provisions of the New York City Energy Conservation Code and other designated rules and regulations.
 - All work performed substantially conforms to approved construction documents and has been performed in accordance with applicable provisions of the New York City Energy Conservation Code and other designated rules and regulations, except as indicated in the attached report.

I am aware of the additional sanctions imposed on false filings by §28-211.1.2 of the Administrative Code.

This is where you can highlight that there are items that do not conform to the approved construction documents or point out omissions

PROGRESS INSPECTIONS



EN2: As Built Energy Analysis

This form must be typewritten and submitted in person to the Certificate of Occupancy Division's Borough Office where energy analysis was reviewed.

3 As Built Information *P.E./R.A. responsible for progress inspections, choose one below and sign/seal.*

- The as-built conditions of the completed building conform to the originally approved energy analysis and do not require a revised energy analysis.
- The energy analysis has been revised according to one of the statements below:
 - Attached is a revised energy analysis, prepared, signed and sealed by the registered design professional who prepared the previously submitted and approved energy analysis. The as-built conditions of the completed building conform to this revised energy analysis.
 - The last revised energy analysis was submitted and approved as a post approval amendment on _____(date). The as-built conditions of the completed building conform to this revised energy analysis.

EN2 states that as-built conditions conform to approved documents.

TR8 REPORTS

Requests for TR8 Reports from the Department

The Department of Buildings may ask for TR8 reports for the following reasons:

- Random TR8 audit (i.e. blower door testing)
- To clear a violation
- To accept a Discretionary Item placed by a plan examiner
- As part of a Pilot program

AUDITS

You've been selected for audit. . .

What documentation does an auditor need in order to verify that your report is valid and complete?

1 RCNY §101-07(c)(3) Approved Agencies Rule – Progress Inspectors
UPDATED

Found here:

<https://www1.nyc.gov/site/buildings/codes/energy-conservation-code.page>

But. . .

The more supporting documentation you provide, the better able your auditor is to understand and approve your reports.

AUDITS

What will the Sustainability Enforcement auditors look for?

The job of the auditor is to verify that:

- TR8 inspector visited the site.
- All applicable inspections, as identified in the approved Table I or Table II on the approved energy analysis and in the TR8 Statement of Responsibility, have been carried out.
- All relevant conditions related to those inspections have been verified.

AUDITS

What will the Sustainability Enforcement auditors look for?

The job of the auditor is to verify that *(continued)*

- Any deficiencies in the work have been identified and remedial action recommended.
- If applicable, the energy analysis has been amended to correspond to as-built conditions and it demonstrates compliance.
- Built conditions are in conformance or have been amended to bring them into conformance with the approved documents.

AUDITS VERIFICATION

What will help the auditor verify that your report is complete and valid?

Clear photo documentation :

CONTEXT: Is it the right building?

DATE-STAMPED: Was the photo taken at the time of inspection ?

LABELED: What does the photo demonstrate?

How does it show compliance?



Continuous Exterior Insulation

Is this a compliant installation?

TR8: REPORT COMPLETION

Is your report complete?

The auditor will compare your reports to the approved documents. Did you address everything that is applicable?

- Are the approved drawing dates indicated so that the auditor knows that you have referred to the most recent approved set?
- Do you provide photo documentation? Are the photos date-stamped and labeled so that the auditor can tell what is being shown?
- Is there a clear description of HOW conditions comply? 'OK' or 'Complies' is not sufficient.
- Are deficiencies identified? Remedial actions suggested? Remedial actions verified as completed?

AUDIT EXAMPLES

IIA2 Insulation placement and R-values:

- Are R-values marked on all installed insulation products?
- Do all R-values conform to the approved construction documents for ALL envelope conditions?
- What are the proposed vs. installed values for:
 - Roofs/terraces
 - Walls
 - Foundations
 - Slab-on-grade slab edges
 - Balcony thermal breaks
 - Walls and ceilings of a gas meter room or vented mechanical room
 - Floors over space outside the thermal boundary or outside air

AUDIT EXAMPLES

IIB3 HVAC-R and Service Water Heating Equipment:

- Does the quantity, output capacity, and efficiency of heating, cooling, and hot water heating units match the schedules and floor plans? **What was installed?**
- Are economizer(s) provided in cooling system(s) as per approved drawings? **If so, what controls are provided?**
- Is energy recovery ventilation installed per approved drawings? **What is the proposed vs. installed minimum recovery effectiveness?**
- Does the maximum hot water supply pipe length from the nearest source of heated water (hot water heater, building risers, circulating system piping, or heat trace system) comply with the maximum permitted pipe length as indicated on the approved drawings? **What was found?**

AUDIT EXAMPLES

IIC5 Lighting Controls:

- If the building has residential units, do the installed light fixtures have a minimum of 75% high-efficacy lamps? **What is the %?**
- Are ALL applicable control types installed in non-dwelling unit spaces per the approved plans and schedules? **What are they?**
 - Manual
 - Occupant sensors?
 - Auto time switches?
 - Daylight zone controls?
 - Sleeping unit (hotel/motel) controls?
 - Exterior lighting?
- What functions should they have and how was functionality confirmed?

AUDITS: COMPLETE & VALID REPORTS

What else will help the auditor verify that your report is complete and valid?

Other forms of documentation

- Spray foam installer's certificate (C303.1.1)
- Test report accompanied by an invoice documenting that the product was purchased for that job
- Product literature accompanied by an invoice
(product literature and test reports alone do not document what was actually installed)
- Anything that you feel supports your assertion of compliance, AND your stamp, indicating you wrote the report or reviewed and take responsibility for the report.

AIR SEALING TEST INSPECTION REPORTS: IA7 & IIA7

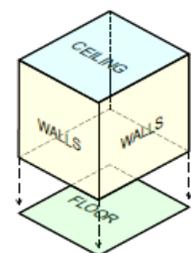
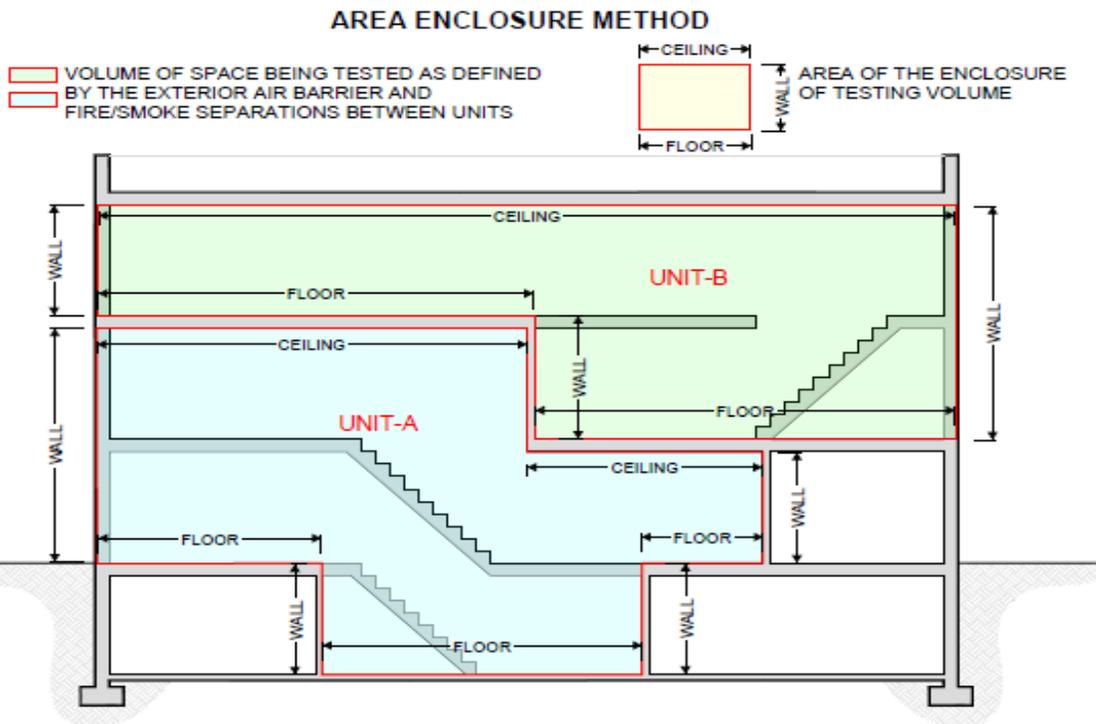
IA7	Air leakage – testing: Testing shall be performed in accordance with section ECC R402.4.1.2 or R402.4.1.3 and shall be accepted if the building meets the requirements detailed in such section. Test results shall be retained in accordance with the provisions of Title 28. Testing must be performed by a third-party independent of the contractor and acceptable to the department.	Prior to final construction inspection	RESNET/ICC 380; <u>ASTM E779</u> ; ASTM 1827; ANSI/BOMA Z65.1; Approved construction documents	R402.4.1.2, R402.4.1.3
IIA7	Air barrier testing: Testing shall be performed in accordance with section ECC C402.5.1.3.1 or ASHRAE 90.1 section 5.4.3.1.3. and shall be accepted if the building meets the requirements detailed in such section. Test results shall be retained in accordance with the provisions of Title 28. Testing must be performed by a third-party independent of the contractor and acceptable to the department.	As required during construction, or prior to final construction inspection	Approved construction documents; ASTM E 779, ANSI/BOMA Z65.1, <u>ASTM E3158</u> , RESNET/ICC 380	C402.5, C402.5.1.3, C406; ASHRAE 90.1 – 5.4.3.1.3, 5.9, Appendix I

Gives better guidance for large building testing



ENCLOSURE AREA

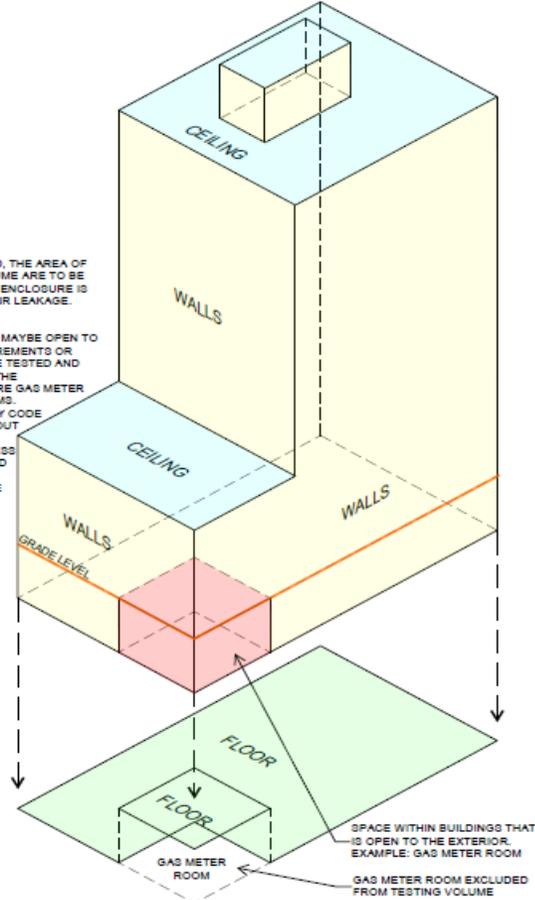
- Enclosure area is defined by
 - Where did they seal? Coordinate with the AOR.
 - Add up all the surfaces.



AREA ENCLOSURE

AREA OF ENCLOSURE
ONCE THE TEST VOLUME IS IDENTIFIED, THE AREA OF THE SURFACES ENCLOSING THIS VOLUME ARE TO BE ADDED TOGETHER. THIS AREA OF THE ENCLOSURE IS THEN USED TO DETERMINE THE MAX AIR LEAKAGE.

SPACES OPEN TO THE EXTERIOR
CERTAIN SPACES WITHIN A BUILDINGS MAYBE OPEN TO THE OUTSIDE EITHER BY CODE REQUIREMENTS OR DESIGN. SUCH SPACES WOULD NOT BE TESTED AND THEREFORE MUST BE TAKEN OUT OF THE CALCULATIONS. TYPICAL EXAMPLES ARE GAS METER ROOMS, GARAGES, MECHANICAL ROOMS
-GAS METER ROOMS ARE REQUIRED BY CODE TO BE VENTED TO THE OUTSIDE WITHOUT THE USE OF A DAMPER.
-MECHANICAL ROOMS ARE BECOME LESS COMMON AS PROFESSIONALS STARTED FOLLOWING DAMPER REQUIREMENTS.
-PARKING GARAGE CAN BE WITHIN THE TESTING VOLUME, IT RELIES ON THE DESIGN OF THE APPLICANT.



Spaces outside the thermal boundary should not be included.

AUDIT IS YOUR REPORT BEING AUDITED?

- Send the enclosure area diagrams and calculations to your auditor.
- Auditors will help you verify that the area or volume calculations are valid.
- Send to: airsealing@buildings.nyc.gov
- Make sure the correct area or volume is entered in the testing software or manometer.



Photos of the screen are a good way to document the test results.



IIA7- AIR SEALING TESTING

Commercial Energy Code

It's more complicated...

REFERENCES

- ASTM E3158 gives good guidance for setup (Table I) and compensating for weather and other factors such as height.
- U.S Army Corps of Engineers Air Leakage Test Protocol for Measuring Air Leakage in Buildings (based on ASTM E779).

TR8 INSPECTIONS

Coming soon. . .

AIR LEAKAGE & TESTING VERIFICATION WEBINAR

What should you, the TR8 inspector, watch out for when observing a big building test?

- Set-up procedures
- Problems you might encounter
- What to verify
- What to include in your report

COMING SOON...

Reference Guides

- <https://www1.nyc.gov/site/buildings/codes/energy-conservation-code.page>

Guidelines

- Simplified summary of ASTM E3158
- Additional set-up procedures to verify
- Reporting recommendations

For questions, email Airsealing@buildings.nyc.gov

AIR BARRIER CONTINUITY PLAN

What is it?

“..... shall test or inspect each type of unique air barrier joint or seam in the building envelope for continuity and defects.”

In the 2016 NYCECC, it was either IIA6 or IIA7, or a combination of both.

Updated RCNY §5000-01 Table II : IIA8 Air Barrier Continuity Plan (ABC Plan) testing:

“Each unique air barrier joint or seam shall be tested or inspected for compliance.”

AIR BARRIER CONTINUITY PLAN

The Air Barrier Continuity Plan is a set of instructions to the TR8 inspector, provided by the Applicant of Record:

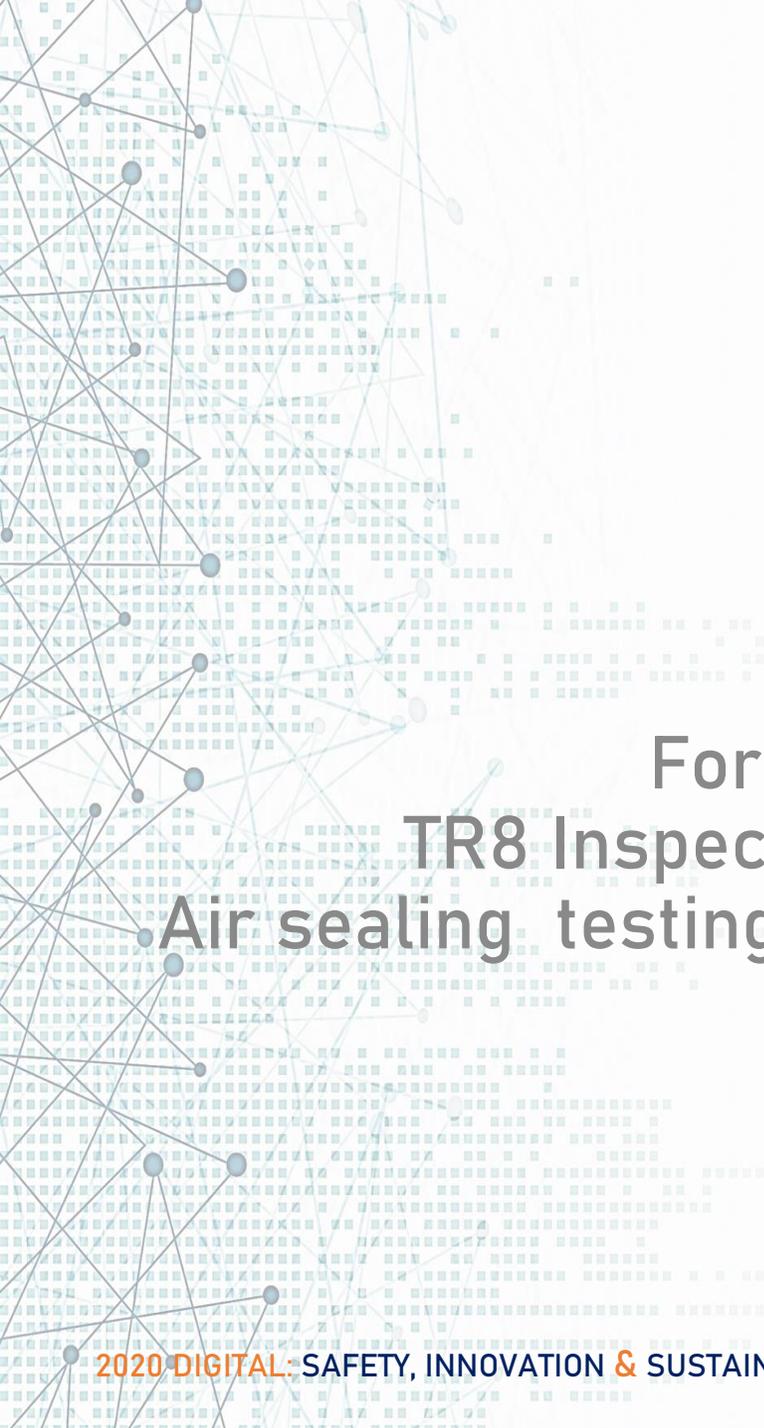
For Example

- Details- what areas of the building are to be tested or inspected?
- Specs- what are you looking for? Materials? Installation method? Testing standard?
- Sampling rate- how many examples of the joint or seam should be verified?
- Quality control- what degree of imperfection is acceptable?
- Report Guidelines
 - Photos
 - Test reports
 - Deficiencies found
 - Remedial action recommendation(s)
 - Verification of remedial action taken

TR8 REPORT COMPLETION

Is your report complete? If you, the inspector, don't feel that you've been given enough guidance, ask the Applicant:

- Do the air barrier material and sealants meet the specs? **Proposed vs Found**
- Is continuity, profile conformity, and adhesion maintained? **How was this verified?**
- What type and % of flaws is permitted by the ABC Plan? **What was found?**
- Were all applicable joint and seam locations, as indicated in the ABC Plan, verified? **What locations? How were they to be sealed? What was found?**
 - Parapets
 - Floor perimeters
 - Transitions between materials
 - Corners
 - Seams and penetrations in the air barrier
 - Seismic drift joints



THANK YOU!

For further technical questions email:

TR8 Inspections - TR8inspections@buildings.nyc.gov

Air sealing testing and/or ABC Plan - airsealing@buildings.nyc.gov