

BUILDING ENVELOPE CONSULTANTS & TESTING LABORATORY

February 22, 2021

Mr. Michael Shunta Claremont Companies Two Lakeshore Center Bridgewater, MA 02324

Re: Smokestack Observations Residence Inn 370 Congress Street Boston, MA

Dear Mr. Shunta:

Matthew C. Carlton, Todd E. Watson, and Tam Tuong from R. J. Kenney Associates, Inc. (RJK), visited the above-named building on June 6, 2019, to observe the condition of the abandoned circular mass masonry brick smokestack (stack) that penetrates the northeast corner of the roof. RJK was assisted by Sean Whelan Contracting (SWC). SWC provided access to the top of the stack, via aerial lift, and removed brick for evaluation of the condition of the inner wythe and collar joint in the system.

The purpose of the visit was to determine the best course of action for addressing the following conditions:

- Observed water penetration and efflorescence in the occupied spaces below the abandoned stack.
- Vertical cracking and bulging in the abandoned stack above the roof level.

It is concluded that significant deterioration of the brick due to a historic lack of maintenance, as well as specific design characteristics of the stack, mean that the observed water penetration issues are likely to recur. In addition, the stability of this unreinforced masonry structure, which is positioned above and immediately adjacent to a heavily-used sidewalk, cannot be assured. Removal of the chimney and sealing of the roof is recommended.

1. OBSERVATIONS

Observations were made from the roof and from an aerial lift.

- 1.1 General
 - The exposed portion of the stack extends vertically approximately fifteen feet above the roof level at the northeast corner. The stack aligns with the exterior wall at the building's rear right corner, rendering the stack directly above a public sidewalk.

- Along the roofline base, a roof membrane termination flashing has been set into a kerf cut in the horizontal mortar joint.
- The top of the stack is covered with a copper cap that extends vertically down and partially covers an upper concrete band.
- The upper edge of rusticated brick coursing is covered with sloped mortar wash.
- 1.2 Brick
 - The exterior face brick is cracked, spalled, and bulging outward at intermittent locations around the stack. This condition is distinct from that of most of the building's exterior brick, indicating differential maintenance over the building's history.
 - Vertical cracks are visible emanating from the lower portions of the stack towards the top. The cracks are larger towards the center of the stack.
 - A sloped mortar wash installed at a stop in the brick covering towards the top of the stack is cracked and can easily be removed by hand. Portions of the wash are missing.
 - The portion of the stack above the roofline is at least three wythes deep, with an average of every fourth header brick used as a collar tie.
- 1.3 Mortar
 - Multiple spot pointing campaigns have been performed around the stack.
 - The pointing mortar is in poor condition. Approximately 75% of the joints are cracked or missing.
 - Setting mortar was observed by removing several brick just above the roofline and also was observed just behind the pointing mortar. The three wythe depth appeared to be set using a loose lime/sand mix, which possesses limited rigidity, characteristic of deteriorated setting mortar, with a consistency of sand.
 - Setting mortar was damp and could easily be removed by hand pressure.

2. DISCUSSION

The exterior wythe of brick and mortar that comprises the abandoned stack is extensively deteriorated, with mortar wash missing in locations at the top of the stack. It is likely that the mortar wash has fallen to the public sidewalk below. Various futile maintenance campaigns have been performed to the brick and mortar joints, only to exacerbate the structural deterioration currently exhibited. It is likely that the stack will always allow water ingress into the units below, and that any means to repoint the stack will not alleviate the issues on the interior.

Partial removal of the exterior wythe of brick was observed to understand the collar joint condition. The collar joint and setting mortar interior to the stack is a loose lime/sand mix. The mix was

deteriorated, without rigidity or bond strength, and can be easily removed from the system. As a result, inner wythes of brick were found to be easily dislodged with hand pressure. The stack, therefore, has little structural integrity.

Numerous vertical cracks were observed in mortar joints that stair-step through the brick coursing, including cracking through bricks themselves. The nature of the cracking is indicative of radial expansion, a probable result of the freeze/thaw dynamic and likely combined with hygrothermal cycling and building movement in general. Such movement is exacerbated by the soft, absorbent setting mortar.

The exterior of the of brick above the roofline also functions as the interior exposed brick wall in the occupied spaces below. Therefore, any water that penetrates the exterior wythe of brick has a direct path into the occupied spaces below. Given the extensive cracking and separation of the pointing mortar and the spalling and cracked brick, there is no doubt as to the source of water ingress to the interior. The poor condition of the brick is causing extensive efflorescence in the occupied spaces below and has contributed to the deterioration of the setting mortar in the interior wythes of the stack.

The amount of efflorescence emanating from the brick mortar joints on the interior of the building indicates that moisture is bypassing the outer layer of brick, migrating through the vertical cracking, and depositing in the collar joints within the units below. The existing cracks in the exterior brick allow bulk moisture into the system, which compounds damage due to freeze thaw cycles in the cold climate. The moisture expands in volume as it freezes, causing the bricks and mortar bond to break apart.

Water has been funneled through the stack deteriorating the bonding agents of the setting mortar within the inner wythes of brick. The setting mortar was easily dislodged from the inner wythes of brick with hand pressure. The outward movement of the brick has exacerbated over time, due to futile attempts to point the open joints when maintenance operations deemed it necessary. A holistic approach to the stack repair should have been programmed decades ago that included consolidation of the setting mortar to structurally bind together the inner wythes of brick, in order to maintain the bond and strength of the entire system. At this point in the service life of the abandoned stack, it is not likely that the condition of the stack can be remediated in a long-term durable manner.

There is evidence that the missing mortar wash has fallen from the building. This is because the internal binding mechanics are no longer functioning.

To eliminate the ongoing structural deterioration, the water penetration into the occupied spaces beneath the stack, and any falling hazard to the sidewalk directly below, complete removal of the disused chimney structure above the roof line is recommended.

3. RECOMMENDATIONS

To eliminate the interior water penetration and resulting efflorescence problem in the guest rooms and alleviate ongoing structural deterioration of the abandoned stack, it is recommended that the bricks be dismantled down to the roof line.

It is recommended that the efflorescence on the building interior be cleaned from the brick surface. Once cleaned, the efflorescence should not return and the aesthetic appeal of the historic brick on the interior can be enjoyed.

Mr. Michael Shunta Re: 370 Congress Street Boston, MA February 22, 2021 Page 4 of 4

Repair specifics outlined below:

Brick Removal

- Remove brick from the roofline up.
- Remove cementitious parging from the top of the brick curb that abuts the smokestack.
- Install framing and roof sheathing, as necessary to close off the smokestack penetration. Match adjacent roof deck construction.
- Apply new thermoplastic roof membrane over brick curb and roof sheathing, interface with existing roof membrane. Terminate with edge flashing to match the existing cornice. Terminate the roof membrane to the horizontal flashing leg.

The recommended scope of work will require the erection of pipe staging from grade to the top of the stack, in order to provide safe access for the masonry contractor to perform their work.

If you have any questions or require additional information, please do not hesitate to contact our office.

Respectfully submitted,

R. J. KENNEY ASSOCIATES, INC.

Matthew C. Carlton, AIA, LEED AP Director of Building Enclosure Design

MCC/mb/ek

Attachments: Detailed Photographs RJK Chimney Details

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Figure 1

Callouts:

Comments:

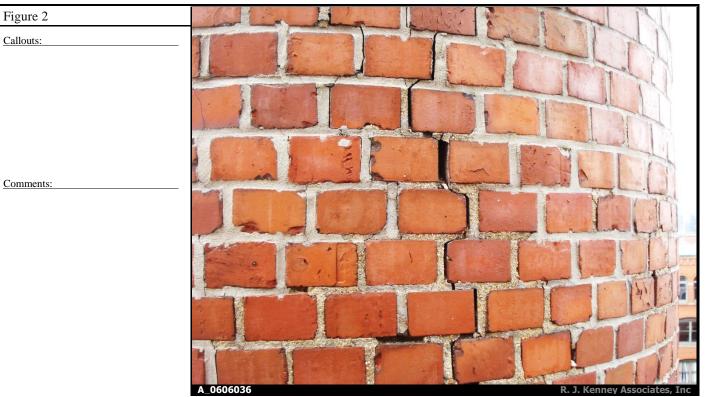
Q462 - 370 Congress Stree Smokestack Observations Author: MCC Report Date: 2/22/2021

Detailed Photographs



Title:

Northeast Rear Corner Stack



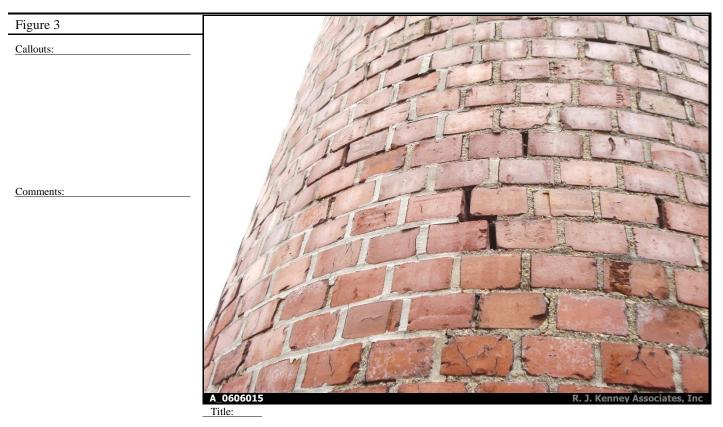
Title:

Typical Radial Separation Condition



Q462 - 370 Congress Stree Smokestack Observations Author: MCC Report Date: 2/22/2021

Detailed Photographs



Typical Stack Condition



Title:

Deteriorated Wash and Bricks at Top of Stack



Figure 5
Callouts:

Comments:

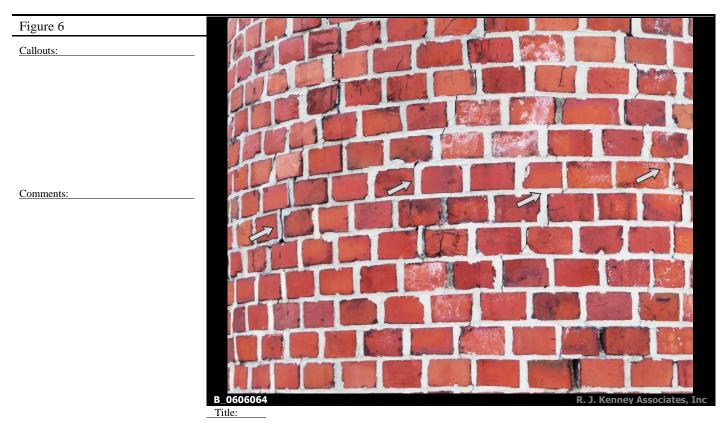
Q462 - 370 Congress Stree Smokestack Observations Author: MCC Report Date: 2/22/2021

Detailed Photographs



Title:

Top of Stack Cracked and Displaced



Various Vertical Step Cracks

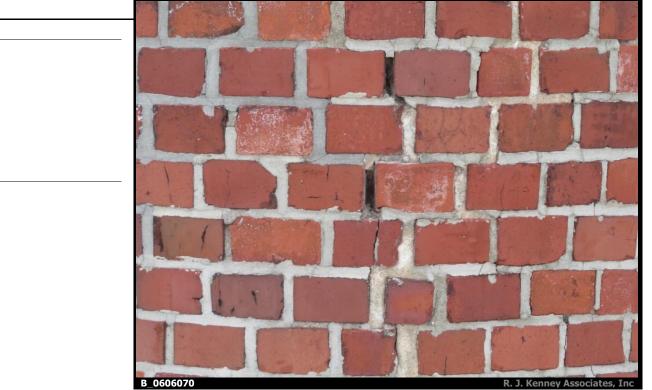


Figure 7 Callouts:

Comments:

Q462 - 370 Congress Stree Smokestack Observations Author: MCC Report Date: 2/22/2021

Detailed Photographs



Title:

Various Mortar Pointing and Open Joints



Title:

Test Cut



Q462 - 370 Congress Stree Smokestack Observations Author: MCC Report Date: 2/22/2021

Detailed Photographs



Setting Mortar at Test Cut is a Sand Consistency

RJK PROJECT Q462:

CHIMNEY DEMOLITION

370 CONGRESS STREET BOSTON, **MA** 02210

INDEX:

G0-01	COVER
G0-02	CODES/LEGEND
A-100	EXISTING ROOF PLAN
A-101	PROPOSED ROOF PLAN
A-200	ELEVATION
A-500	SECTION AND DETAILS



GENERAL NOTES:

- VISUAL EXAMINATION OF EXPOSED CONDITIONS.
- DRAWINGS.

- COMPLY WITH THE RULES AND REGULATIONS APPLICABLE TO THE CITY OF BOSTON, THE STATE OF MASSACHUSETTS, OSHA, AND AUTHORITIES HAVING
- JURISDICTION.
- AUTHORITY THAT BEAR ON THE PERFORMANCE OF THE WORK.
- SUBMIT DEMOLITION AND CONSTRUCTION SCHEDULES TO THE OWNER FOR APPROVAL PRIOR TO BEGINNING DEMOLITION. 11 PRECAUTIONS AND SAFETY PROGRAMS IN CONNECTION WITH THE PROJECT.
- 12. ONLY STORE MATERIAL IN AREAS PROVIDED BY THE OWNER.
- LAWS AND REGULATIONS. 15 OWNER
- RETURN DAMAGED AREAS TO ORIGINAL CONDITIONS. 17
- LANDSCAPING AND BE REQUIRED TO REPAIR OR REPLACE AS NECESSARY.

IN ADVANCE AND APPROVED BY THE OWNER. **SCOPE OF WORK:**

THE WORK INCLUDES ALL MISCELLANEOUS COSTS ASSOCIATED WITH COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, ACCESS TO THE WORK, CLEANUP, DUST CONTROL, NOISE CONTROL, LAYOUT, EQUIPMENT, WASTE DISPOSAL, DOCUMENTATION, CUTTING AND PATCHING, OBSTRUCTION REMOVAL AND REPLACEMENT, ETC. THE WORK INCLUDES THE WORK OF ALL TRADES REQUIRED AND ALL LABOR, EQUIPMENT, MATERIALS, AND SUPERVISION NECESSARY AND INCIDENTAL TO THE WORK INDICATED. THE FOLLOWING DESCRIPTION OF THE WORK REPRESENTS A BRIEF SUMMARY OF THE PROJECT AND MAY NOT BE COMPLETE. THE NEW ROOF SYSTEM SHALL CONFORM TO THE CURRENT EDITION OF THE MA BUILDING CODE, AS INDICATED HEREIN.

SELECTIVE DEMOLITION:

REMOVE ALL EXISTING ROOF ASSEMBLIES TO EXPOSE THE EXISTING STRUCTURAL ROOF DECK. DISPOSE OF DEBRIS IN A LEGAL MANNER, OFF SITE, AS REQUIRED BY FEDERAL, STATE, AND LOCAL ORDINANCES. DO NOT REMOVE MORE ROOFING THAN CAN BE REPLACED AND MADE WATERTIGHT IN A SINGLE WORKING DAY. COORDINATE THE INSTALLATION OF THE NEW ROOFING AND FLASHING WORK TO KEEP THE BUILDING WATERTIGHT AT ALL TIMES AND TO AVOID DAMAGE TO FINISHED WORK AND INTERIOR FINISHES.

REMOVE EXISTING METAL EDGE FLASHING AND PARAPET COPING AND PROVIDE NEW TO MATCH EXISTING. SAFELY CONDUCT DEBRIS TO TRUCKS OR APPROVED CONTAINERS ON THE GROUND. DO NOT STORE DEBRIS ON SITE AT ANY TIME. DO NOT THROW DEBRIS FROM THE ROOF OR SCAFFOLDING.

TEMPORARILY DISCONNECT AND REATTACH EQUIPMENT: TEMPORARILY DISCONNECT AND REATTACH EQUIPMENT, PLUMBING, AND ELECTRICAL FIXTURES AND CONDUITS WHERE NEEDED TO ACCOMMODATE ROOFING AND NEW FLASHING INSTALLATION AS SHOWN ON THE DRAWINGS. PERFORM MECHANICAL, ELECTRICAL, AND PLUMBING WORK REQUIRED TO DISCONNECT AND RECONNECT HVAC EQUIPMENT, RELOCATE SERVICE LINES, AND REATTACH EQUIPMENT AND PIPING. THE GENERAL CONTRACTOR'S SUPERINTENDENT MUST BE ON SITE WHEN EQUIPMENT IS BEING DISCONNECTED AND

RECONNECTED.

PERFORM MECHANICAL, ELECTRICAL, DUCT, AND PLUMBING WORK WITH LICENSED MECHANICS FOR NECESSARY REMOVAL, STORAGE, AND REINSTALLATION OF ROOFTOP EQUIPMENT. PROVIDE THE OWNER WITH REASONABLE ADVANCED NOTICE OF SHUTDOWNS AND CONFORM TO THE SCHEDULING REQUIREMENTS OF THE OWNER. TEST AND VERIFY THE EQUIPMENT OPERATION BEFORE AND AFTER SHUTDOWN.

PROTECTION:

PROVIDE ALL NECESSARY TEMPORARY PROTECTION MEASURES REQUIRED TO PROTECT PEDESTRIANS AND BUILDING OCCUPANTS FROM HAZARDS AROUND THE PROJECT SITE, INCLUDING POLICE DETAIL THAT MAY BE NEEDED FOR DELIVERIES. PROVIDE ALL NECESSARY TEMPORARY PROTECTION MEASURES REQUIRED TO PROTECT ADJACENT ROOFS FROM DAMAGE DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY SAFETY MEASURES AND PRECAUTIONS AT THE SITE TO PROTECT PEDESTRIANS AND BUILDING OCCUPANTS AROUND THE WORK SITE.

ROUGH CARPENTRY:

PROVIDE PRESSURE-TREATED BLOCKING AND PLYWOOD AS REQUIRED BY THE MEMBRANE MANUFACTURER AND AS INDICATED IN THE DRAWINGS. LOCATIONS ARE GENERALLY AS FOLLOWS: ROOF EDGE CONDITIONS, HVAC EQUIPMENT SLEEPER DETAIL, BASE-FLASHING-TO-RISING-WALL CONDITIONS, AND SCUPPER LOCATIONS (IF REQUIRED).

ROOFING MEMBRANE:

PROVIDE A NEW FULLY ADHERED, .060 EPDM ROOFING MEMBRANE AND FLASHING SYSTEM. PROVIDE NEW SELF-ADHERING VAPOR BARRIER ON PREPARED ½ INCH DECK BOARD, MINIMUM REQUIRED CONTINUOUS POLYISOCYANURATE INSULATION, COVER BOARD, EPDM MEMBRANE, AND ASSOCIATED BASE FLASHING AS SHOWN ON THE DRAWINGS. PROVIDE TAPERED INSULATION AS NECESSARY TO ACHIEVE MINIMUM SLOPE, AS DETERMINED BY LEVEL SURVEY.

TRANSITION TO EXISTING, ADJACENT EPDM ROOFING AS SHOWN ON THE DRAWINGS. COORDINATE WITH THE ENGINEER AND ROOFING MANUFACTURER FOR INSPECTIONS DURING INSTALLATION OF THE ROOF SYSTEM. PROVIDE ALL NECESSARY TEMPORARY SUPPORTS FOR THE MECHANICAL EQUIPMENT, CONDUIT, ETC., CURRENTLY BEARING ON THE ROOF SURFACE. PROTECT EXPOSED EDGES OF NEW ROOFING EACH NIGHT TO PREVENT WATER INTRUSION UNDER NEW ROOFING AND INSULATION.

SHEET METAL FLASHING:

PROVIDE NEW .040 INCH ALUMINUM FLASHING AS REQUIRED IN COLOR SIMILAR TO EXISTING AND AS CHOSEN BY OWNER. PROVIDE CONTINUOUS HOOK STRIPS ON ALL FASCIA AND ON BOTH SIDES OF THE PARAPET COPING. REMOVE EXISTING AND PROVIDE NEW FLASHING FOR ALL EDGE FLASHING, MISCELLANEOUS FLASHING, FLASHING TRANSITIONS, TERMINATIONS, AND DOORS REQUIRED TO REPLACE ROOFING, AS SHOWN ON THE DRAWINGS.

INFORMATION SHOWN REGARDING EXISTING STRUCTURE USED IN THE DEVELOPMENT OF THESE DRAWINGS AND NOTES HAS BEEN BASED UPON A LIMITED WHERE A DETAIL IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL LIKE OR SIMILAR CONDITIONS, EVEN THOUGH NOT SPECIFICALLY MARKED ON THE

PROVIDE NECESSARY PROTECTION/CONTAINMENT AND SAFE AND LEGAL DISPOSAL MEASURES PER APPLICABLE LAWS TO COMPLETE THE WORK. VERIFY DIMENSIONS AND CONDITIONS BEFORE ORDERING MATERIALS; NOTIFY RJK OF ANY VARIATION FROM DRAWINGS. DO NOT SCALE DRAWINGS. DIMENSIONS SHOWN ON THE DRAWINGS ARE TAKEN FROM ORIGINAL BUILDING DESIGN DOCUMENTS OR FROM SPOT FIELD MEASUREMENTS DURING INVESTIGATION. DIMENSIONS SHOWN ARE APPROXIMATE AND ARE PROVIDED FOR INFORMATION ONLY. VERIFY EXISTING CONDITIONS AT THE JOB SITE PRIOR TO STARTING THE WORK, AND IMMEDIATELY NOTIFY RJK OF ANY DISCREPANCIES, OMISSIONS, OR OTHER CONDITIONS THAT MAY AFFECT THE SCOPE OF WORK PRIOR TO BEGINNING REPAIRS RELATED TO THE NOTED CONDITIONS.

LEAVE INTACT AND UNDISTURBED ELEMENTS THAT ARE TO REMAIN. EXISTING FACILITIES AND SERVICES SHALL REMAIN IN USE DURING REPAIR WORK. FURNISH AND PAY FOR LABOR, MATERIALS, AND EQUIPMENT AS REQUIRED TO COMPLETE THE WORK. SECURE AND PAY FOR PERMITS, LICENSES, AND GOVERNMENT FEES AS REQUIRED. COMPLY WITH CODES, ORDINANCES, RULES, REGULATIONS, ORDERS, AND OTHER LEGAL REQUIREMENTS OF PUBLIC

CONTRACTOR HAS SOLE CONTROL OVER CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND SCHEDULING PROCEDURES AND SAFETY LIMIT ON-SITE STORAGE OF MATERIALS TO THOSE AREAS IDENTIFIED BY THE OWNER. DO NOT UNREASONABLY ENCUMBER THE SITE WITH MATERIALS OR EQUIPMENT. DO NOT LOAD THE STRUCTURE WITH WEIGHT THAT WILL ENDANGER THE STRUCTURE. ASSUME FULL RESPONSIBILITY FOR THE PROTECTION AND SAFEKEEPING OF PRODUCTS STORED ON THE PREMISES. MOVE STORED MATERIAL OR PRODUCTS THAT INTERFERE WITH THE OPERATIONS OF THE FACILITY.

TAKE WATER AND ELECTRICITY ONLY FROM AREAS IDENTIFIED BY THE OWNER. TOILET FACILITIES IN THE BUILDING SHALL NOT BE USED BY WORKERS. PROVIDE AND MAINTAIN REQUIRED DUST BARRIERS, CANOPIES, BARRICADES, PROTECTION AND WARNING LIGHTS IN GOOD CONDITION UNTIL THE COMPLETION OF THE WORK REQUIRING SUCH PROTECTION AND THEN REMOVE THE SAME. CANOPIES AND BARRICADES SHALL COMPLY WITH FEDERAL, STATE, AND LOCAL

MAINTAIN PREMISES FREE FROM ACCUMULATIONS OF WASTE MATERIAL AND RUBBISH. REMOVE AND DISPOSE OF IN A PROPER MANNER (OFF-SITE) EXISTING MATERIAL REMOVED FROM THE BUILDING DURING THE COURSE OF THE WORK ON A DAILY BASIS. REMOVAL AND DISPOSAL SHALL BE SATISFACTORY TO THE

PROTECT GROUNDS AND LANDSCAPING WHEN PERFORMING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO GROUNDS AND COORDINATE USE OF PREMISES UNDER THE DIRECTION OF THE OWNER. THE OWNER RETAINS RIGHTS TO MAINTAIN AND OPERATE THE PROPERTY, INCLUDING

ACCESS TO OTHER CONTRACTORS WHO MAY BE ON SITE WORKING UNDER SEPARATE CONTRACTS. CONTRACTORS' WORK SHALL NOT PROHIBIT SUCH ACTIVITY. DO NOT BLOCK EXISTING MEANS OF EGRESS. MAINTAIN SAFE ACCESS TO AND EGRESS FROM THE BUILDING AT ALL TIMES. TEMPORARY DISRUPTIONS TO THE USE OF ADJACENT BUILDINGS, INCLUDING NOISE, DUST, AND DISRUPTION OF UTILITIES, SHALL BE COORDINATED A MINIMUM OF 48 HOURS

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CODE REQUIREMENTS:

2015 INTERNATIONAL EXISTING BUILDING CODE (IEBC) 2015 INTERNATIONAL BUILDING CODE (IBC) 2015 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

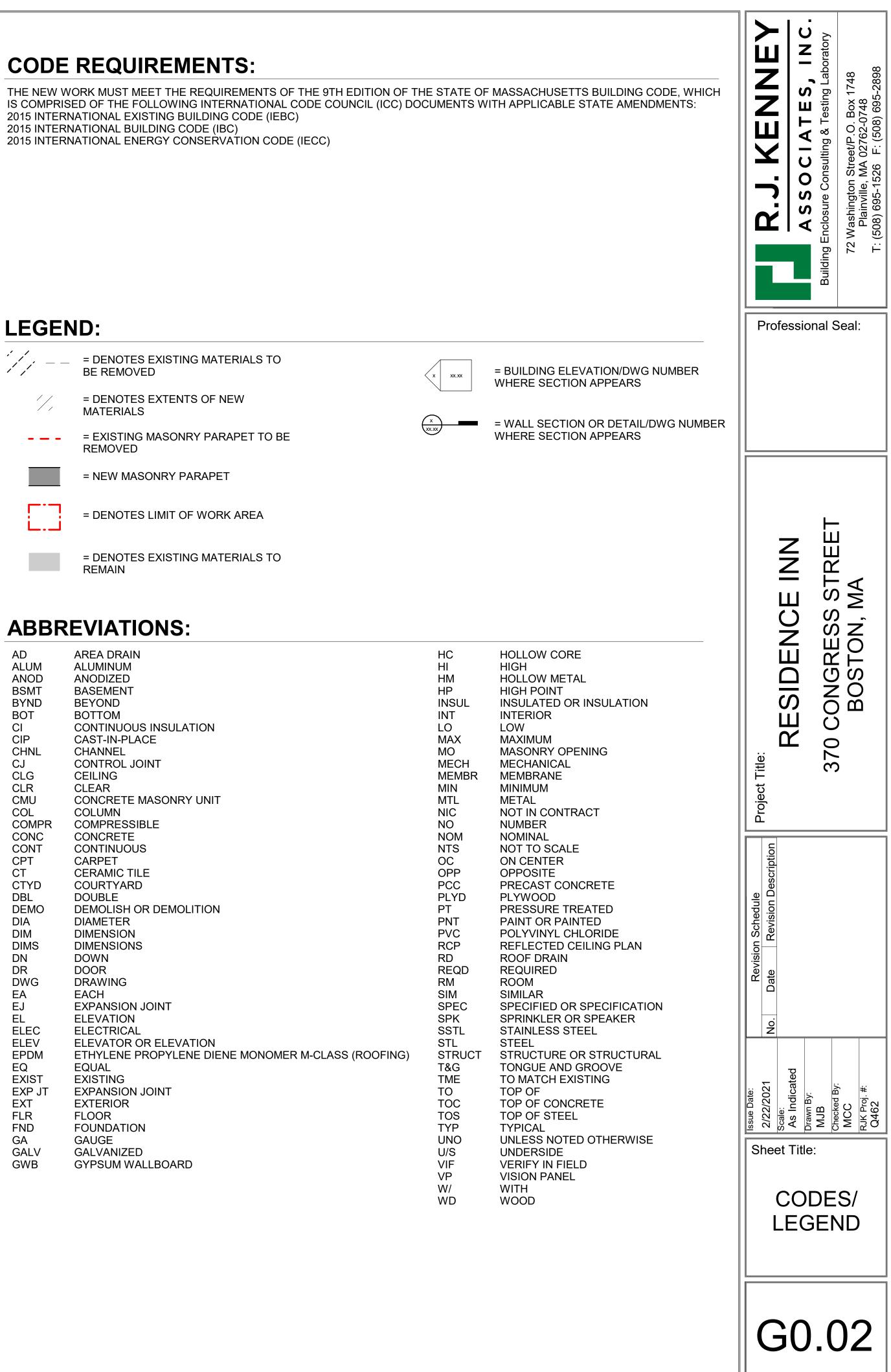
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	= NEW MASONRY PARAPET
	= DENOTES LIMIT OF WORK AREA
	= DENOTES EXISTING MATERIALS TO

ABBREVIATIONS:

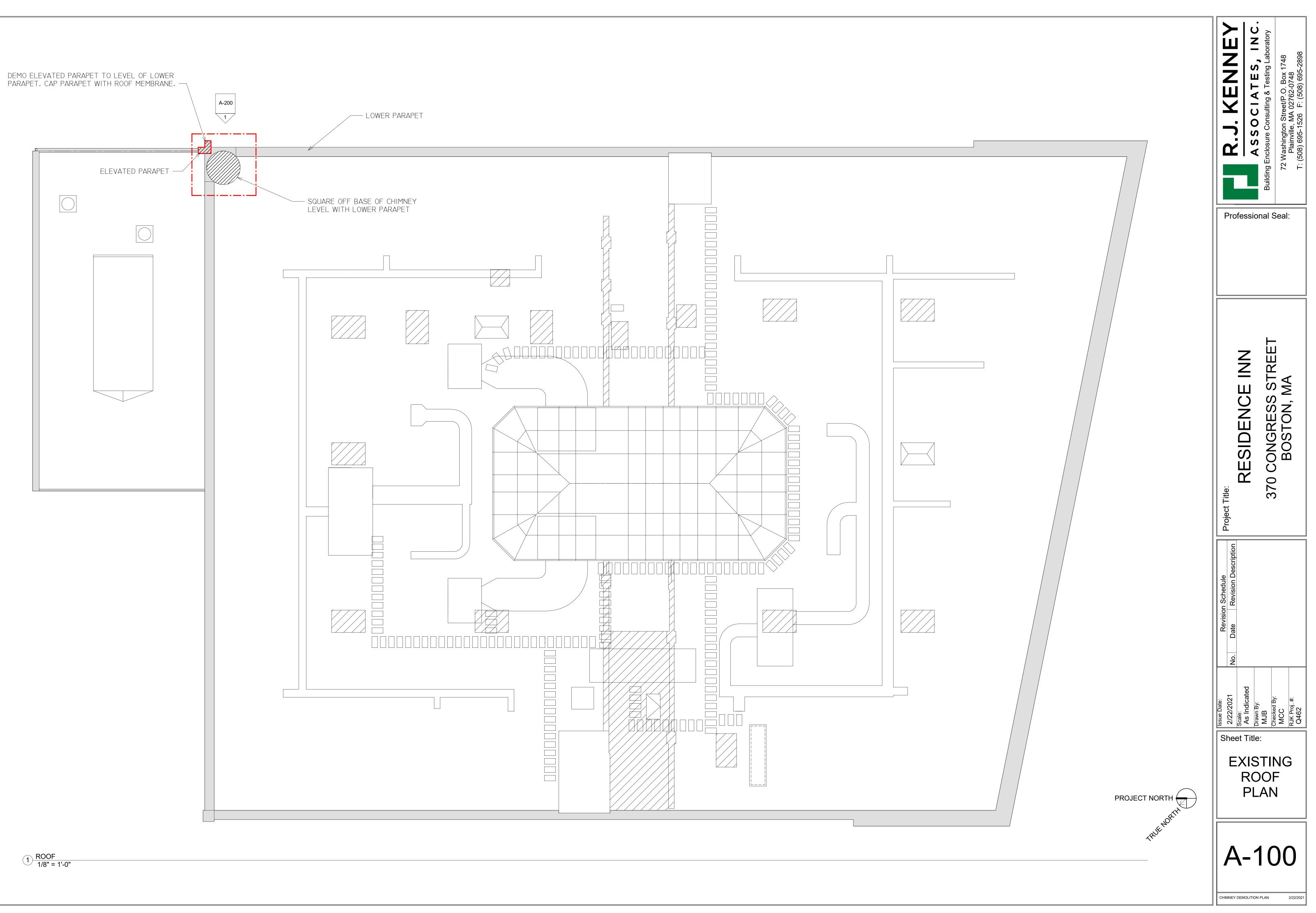
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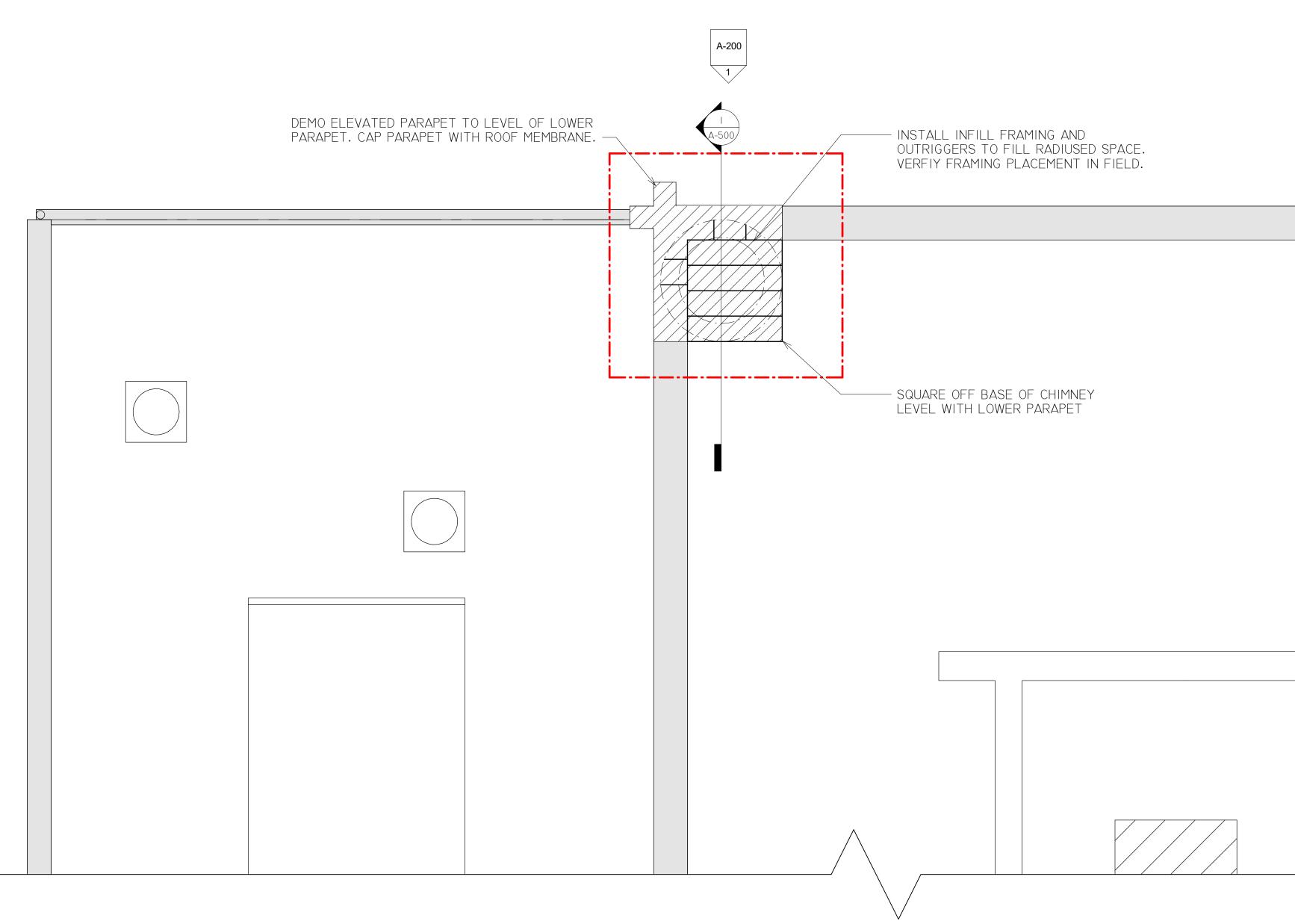
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CHIMNEY DEMOLITION PLAN

2/22/2021





2 ROOF Copy 1 1/4" = 1'-0"

	Contractions of the second structure of the second str
	Project Title: RESIDENCE INN 370 CONGRESS STREET BOSTON, MA
PROJECT NORTH	Issue Date: Issue Date: 2/22/2021 No. Revision Schedule 2/22/2021 No. Date Scale: As Indicated No. Drawn By: M.B M.B MuB M.B M.B MuB M.B M.B MCC M.B M.C MCC M.B M.C MCC M.B M.B MCC M.B M.B MCC M.B M.C MCC M.C M.C <

1 EAST ELEVATION 1/4" = 1'-0"

