

Canopy Framing Investigation Pike Plan Restoration Project Wall Street and North Front Street Kingston, New York

Prepared for:

CITY OF KINGSTON 420 Broadway Kingston, New York 12401

Prepared by:

C.T. MALE ASSOCIATES 50 Century Hill Drive Latham, New York 12110 (518) 786-7400 FAX (518) 786-7299

C.T. Male Project No. 15.5150

Unauthorized alteration or addition to this document is a violation of the New York State Education Law.

CANOPY FRAMING INVESTIGATION PIKE PLAN RESTORATION PROJECT KINGSTON, NEW YORK

Table of Contents

1.0	INTRODUCTION		2
2.0	OBSERVATIONS AND RECOMMENDATIONS		2
	2.1	Typical Observations	3
	2.2	31 North Front Street	
	2.3	53 North Front Street	5
	2.4	54 North Front Street	6
	2.5	300 Wall Street	7
	2.6	319 Wall Street	8
	2.7	323 Wall Street	9
3.0	CON	NCLUSION	11
APPI	ENDIC	CES	
Appendix A		A Ashokan Architecture & Planning PLLC Drawings A117, A A113, A104, and A107, Showing Framing Investigation Location	
Appendix B		B Photographs from March 31 and April 7, 2017 Site Visits	

1.0 INTRODUCTION

C.T. Male Associates Engineering, Surveying, Architecture & Landscape Architecture, D.P.C. (C.T. Male Associates) was retained by the City of Kingston (City) to perform an investigation of select portions of the canopy framing above the sidewalks on North Front Street and Wall Street, known as the Pike Plan, in the Uptown Business District of Kingston. In accordance with our proposal to the City dated February 22, 2016, the scope of our services for this investigation included the following items:

- Identify six (6) representative areas for the City to perform removals of existing finish materials to expose existing canopy framing.
- Visually observe existing conditions of the canopy framing after the finish materials are removed.
- Analyze typical structural elements and determine their load carrying capacities.
- Identify other observed structural deficiencies.
- Provide general recommendations for repairs or corrective actions.

The results of our investigation are presented below.

2.0 OBSERVATIONS AND RECOMMENDATIONS

C.T. Male Associates conducted site visits on March 31 and April 7, 2017 to observe the structural conditions of the exposed existing canopy framing at the following locations:

- 31 North Front Street
- 53 North Front Street
- 54 North Front Street
- 300 Wall Street
- 319 Wall Street
- 323 Wall Street

Existing finish materials were removed by the City prior to our site visits. Our observations and recommendations are presented below.

2.1 Typical Observations

Unless noted otherwise, typical canopy framing components and construction observed at the six (6) locations investigated are as indicated below:

- 1. Rafters: 2x6 wood roof rafters spaced at 16" on-center. Rafters that were not interrupted or modified by the installation of the skylights are typically structurally adequate; however, many connections and support conditions associated with the rafters are not structurally adequate, as described within this report.
- 2. Skylight Framing: The long sides of skylights were framed with (2) 2x6's that frame into (2) 2x6 headers at the short sides of the skylights, which were typically connected by face-nailing or toe-nailing.
- 3. Gutters were typically supported by 2x6 ceiling joists from the original roof construction. Where original ceiling joists were cut out in order to raise the ceiling to the underside of sloped rafters, the ceiling joist tails were left in place to support the gutters.
- 4. Sheathing at the roof and gutters was plywood.
- 5. The construction of ledgers to the building and headers away from the building varied.
- 6. Uplift connectors: Uplift connectors were typically Simpson H2.5A connectors fastening rafters to the header. Typically, two or three sheetrock screws were used at each end of the connector, which is not an acceptable means of fastening by the manufacturer. The tops of posts typically did not have any uplift connectors to the headers.
- 7. Finishes: Ceilings were tongue-and-groove bead boards typically fastened to 1x3 sleepers. Trim at skylights and around the header was typically 1x material, with plywood in some locations.

2.2 31 North Front Street

The 31 North Front Street canopy framing is continuous with the canopies in front of 33 and 35 North Front Street. The roof is sloped at approximately 4 inches per foot. The skylight in front of 31 North Front Street has a rough opening between structural members that is 13' long x 3'-6" wide. Our observations and recommendations for this location are presented below:

1. The header between posts is a W10x12 or similar sized steel beam spanning 18'-9'' at its longest span. 2x10's are bolted to the beam with $(2) \frac{1}{4}$ diameter bolts at 4'-0'' on-center.

Recommendations: None.

2. There is no direct connection between the steel header and the posts.

Recommendations: Design and install an uplift connection at each post.

3. The 2x6 rafters and the (2) 2x6 skylight headers do not bear on the steel beam header. They appear to be face nailed into the 2x6 horizontal members, which were the original ceiling joists before the ceiling was raised.

Recommendations: Provide wood bearing for rafters and headers.

4. At the 13' long skylight, the 13' long (2) 2x6 skylight framing members are stressed to 144% and 169% of allowable capacity. Headers at the short sides of the skylights are stressed to 102% of allowable capacity.

Recommendations: Replace framing around 13' skylight (and 12' skylight at 35 North Front Street) with structurally adequate members and connections between members.

5. Hold-down ties are missing at the skylight headers and are inadequately fastened to the typical rafters.

Recommendations: Design and install structurally adequate hold-downs at the headers and rafters. Use fasteners approved by the hold-down manufacturer.

6. There is a 2x6 ledger at the building wall, and rafters are toe-nailed to the ledger. For framing conditions like this, rafters should have joist hangers to the ledger. Additionally, over a 4' visible length of the ledger, no fasteners to the building were observed.

Recommendations: Add joist hangers from the rafters to the ledger. Determine the actual fasteners from the ledger to the existing building and have an engineer design a structurally adequate detail to fasten the ledger to the building wall.

2.3 53 North Front Street

Roof framing at this location consists of horizontal 2x6 roof rafters with a ripped down 2x6 above providing an approximately 5/8" per foot slope to the roof. Sleepers for the ceiling boards are 2x4's, not 1x3's. Typical framing is in accordance with Section 2.1, with the following additional observations at the exposed portions of the ceiling:

1. The header between posts is a (3) 2x12 header spanning 11'-2''. The header is stressed to 131% of capacity.

Recommendations: Design and install a structurally adequate replacement header or reinforcements to the existing header.

2. There is no direct connection between the header and the posts.

Recommendations: Design and install an uplift connection at each post.

3. No hold-down ties were observed tying roof rafters to the header.

Recommendations: Provide hold-down connectors at all rafters and skylight headers.

4. Rafters bear on a 2x4 + 2x12 ledger. Fastening from the ledger to the building (brick) could not be verified. Rafters are toe-nailed to the ledger.

Recommendations: Determine existing attachment details at building. Design and install structurally adequate attachments to the existing building.

5. There is no blocking at the building between the rafters. In their current configuration, the joists are liable to roll.

Recommendations: Install 2x10 blocking between the rafters at the brick wall.

6. At the 9' long skylights, the 9' long (2) 2x6 skylight framing members are stressed to 120% and 151% of allowable capacity. Headers at the short sides of the skylights are stressed to 251% of allowable capacity.

Recommendations: Replace framing around skylights with structurally adequate members and connections between members.

2.4 54 North Front Street

Roof framing at this location consists of 2x6 roof rafters at an approximately 3 inch per foot slope. Typical framing is in accordance with Section 2.1, with the following additional observations at the exposed portions of the ceiling:

1. The header between posts is a (2) 2x12 header spanning 10′-8″. The header is structurally adequate.

Recommendations: None.

2. There is no direct connection between the header and the posts.

Recommendations: Design and install an uplift connection at each post.

3. 2x6 rafters do not bear on the (2) 2x12 header. They appear to be face-nailed into the 2x6 horizontal members, which were the original ceiling joists before the ceiling was raised.

Recommendations: Provide wood bearing for rafters.

4. Hold-down ties are missing at the skylight headers and are inadequately fastened to the typical rafters.

Recommendations: Design and install structurally adequate hold-downs at the headers and rafters. Use fasteners approved by the hold-down manufacturer.

5. Rafters are toe-nailed into a 2x8 ledger which is directly against the existing brick wall of the building. No fasteners to the building were visible over the 48" portion of the ledger that was exposed. As such, the ledger-to-building connection is likely structurally inadequate.

Recommendations: Design and install additional fasteners to the existing brick building. Add joist hangers from the rafters to the ledger.

6. (2) 2x6 framing around skylights is structurally acceptable.

Recommendations: None.

2.5 300 Wall Street

Roof framing at this location consists of horizontal 2x6 roof rafters with a ripped down 2x6 above providing an approximately 3/8" per foot slope to the roof. Typical framing is in accordance with Section 2.1, with the following additional observations at the exposed portions of the ceiling:

1. The header between posts is a (3) 2x12 header spanning 23′-10″, which has some visible deterioration due to water damage. The header is stressed to 288% of its original capacity, not considering any reduction in capacity due to deterioration.

Recommendations: Design and install a structurally adequate replacement header with a proper uplift connection to the existing posts. Given the level of overstress at this location, replacement of this header should be a priority. We would recommend that this header be replaced, or at least be temporarily shored with additional supports, before snow can accumulate on the roof.

2. Rafters bear on a (2) 2x12 ledger at the existing building wall and are toe-nailed down. Fastening from the ledger to the building (brick) could not be verified without further removals, which may have reduced the capacity of the roof.

Recommendations: Determine existing attachment details at building. Design and install structurally adequate attachments to the existing building.

3. There is no blocking between the rafters. In their current configuration, the joists are liable to roll.

Recommendations: Install 2x10 blocking at the brick wall and 2x8 blocking against the gutter.

4. At the 8' long skylights, the (2) 2x6 skylight framing members are stressed to 105% and 129% of allowable capacity. Headers at the short sides of the skylights are stressed to 163% of allowable capacity.

Recommendations: Replace framing around skylights with structurally adequate members and connections between members.

5. Hold-down ties are missing at the skylight headers and are inadequately fastened to the typical rafters.

Recommendations: Design and install structurally adequate hold-downs at the headers and rafters. Use fasteners approved by the hold-down manufacturer.

2.6 319 Wall Street

Roof framing at this location consists of sloped 2x6 roof rafters providing a roof slope of approximately 5 inches per foot. Typical framing is in accordance with Section 2.1, with the following additional observations at the exposed portions of the ceiling:

1. The header between posts is a (3) 2x12 header spanning 18'-7", which has some visible minor deterioration due to water damage. The header is stressed to 130% of its original capacity, not considering any reduction in capacity due to deterioration.

Recommendations: Design and install a replacement to the existing header with proper uplift connections to the existing posts.

2. No hold-down ties were observed tying roof rafters to the header.

Recommendations: Provide hold-down connectors at all rafters and skylight headers.

3. Rafters frame into the side of a 2x8 ledger and are toe-nailed in place. Only one (1) approximately ¼"-diameter threaded rod fastener was visible fastening the ledger to the building. This is structurally inadequate.

Recommendations: Add joist hangers from the rafters to the ledger. Add fasteners from the ledger to the existing building to adequately support the ledger design loads at the building.

4. Rafters are notched at the gutters. While this should typically be structurally adequate, if notches are overcut, rafters may need to be reinforced.

Recommendations: Design and install reinforcements to all rafters with overcut notches.

5. At the 12' long skylights, the 12' long (2) 2x6 skylight framing members are stressed to 205% and 244% of allowable capacity. Headers at the short sides of the skylights are stressed to 213% of allowable capacity. Additionally, the members are notched in order to accommodate the roof gutter.

Recommendations: Replace framing around skylights with structurally adequate members and connections between members.

2.7 323 Wall Street

Roof framing at this location consists of sloped 2x6 roof rafters providing a roof slope of approximately 5 inches per foot. Typical framing is in accordance with Section 2.1, with the following additional observations at the exposed portions of the ceiling:

1. The header between posts is a (3) 2x12 header spanning 18'-2", which has significant deterioration due to water damage near the midspan of the beam. The header is stressed to 160% of its original capacity, not considering any reduction in capacity due to deterioration.

Recommendations: Design and install a structurally adequate replacement header with a proper uplift connection to the existing posts. Given the level of overstress at this location, replacement of this header should be a priority. We would recommend that this header be replaced, or at least be temporarily shored with additional supports, before snow can accumulate on the roof.

2. No hold-down ties were observed tying roof rafters to the header.

Recommendations: Provide hold-down connectors at all rafters and skylight headers.

3. Rafters frame into the side of a 2x8 ledger and are toe-nailed in place. Only one (1) approximately ¼"-diameter threaded rod fastener was visible fastening the ledger to the building. This is structurally inadequate.

Recommendations: Add joist hangers from the rafters to the ledger. Add fasteners from the ledger to the existing building to adequately support the ledger design loads at the building.

4. Rafters are notched at the gutters. While this should typically be structurally adequate, if notches are overcut, rafters may need to be reinforced.

Recommendations: Design and install reinforcements to all rafters with overcut notches.

5. At the 12' long skylights, the 12' long (2) 2x6 skylight framing members are stressed to 205% and 244% of allowable capacity. Headers at the short sides of the skylights are stressed to 213% of allowable capacity. Additionally, the members are notched in order to accommodate the roof gutter.

Recommendations: Replace framing around skylights with structurally adequate members and connections between members.

3.0 CONCLUSION

Through the course of this investigation, we observed numerous structural issues at the six (6) canopy locations that were investigated. In order to perform the recommended repairs at each of these locations, additional removals of finish materials would be required in order to verify all existing conditions and to accurately determine the extent of repairs and the specific details required. Although the framing in the remaining portions of the canopy structure was not exposed for observation as part of this investigation, it is our opinion that similar conditions may likely exist in other portions of the canopy, and that similar repairs may be required.

Drawings that indicate the locations of the six (6) canopy locations that were investigated are enclosed in Appendix A. Photographs taken during our site visits are enclosed in Appendix B. If you have any questions regarding this report, or require additional information or assistance with further investigations or design of repairs, please contact us at (518) 786-7400.

Respectfully submitted,

C.T. MALE ASSOCIATES

Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.

Matthew W. Clark, P.E.

Project Structural Engineer

Christopher M. Shaver, P.E. Managing Structural Engineer

Appendix A

Ashokan Architecture & Planning PLLC Drawings A117, A114, A113, A104, and A107, Showing Framing Investigation Locations

NYC PIN 8760.18

KINGSTON, NEW YORK KINGSTON STREETS & IMPROVE

STREETSCAPES

Ashokan Architecture & Planning PLC
289 Yall Street Bulle 2
Kingalon, live York 18401
Ph. 846,338,8102
ALP9a hikkanarollulosture.com

(SSUE)

ADDENDA

N FRONT STREET NE ELEV. & ROOF PLAN

ASHOKAN ARCHITECTURE & PLANNING

SCALE:
1/4" = 1'-0"
DRAWN 6Y;
JS
DATE:

A 1 1 7 DATE: 05/01/10

0'-0" SKYLICHT 6'∸0" SKYLIGHT 6'-0" SKYLIGHT

36

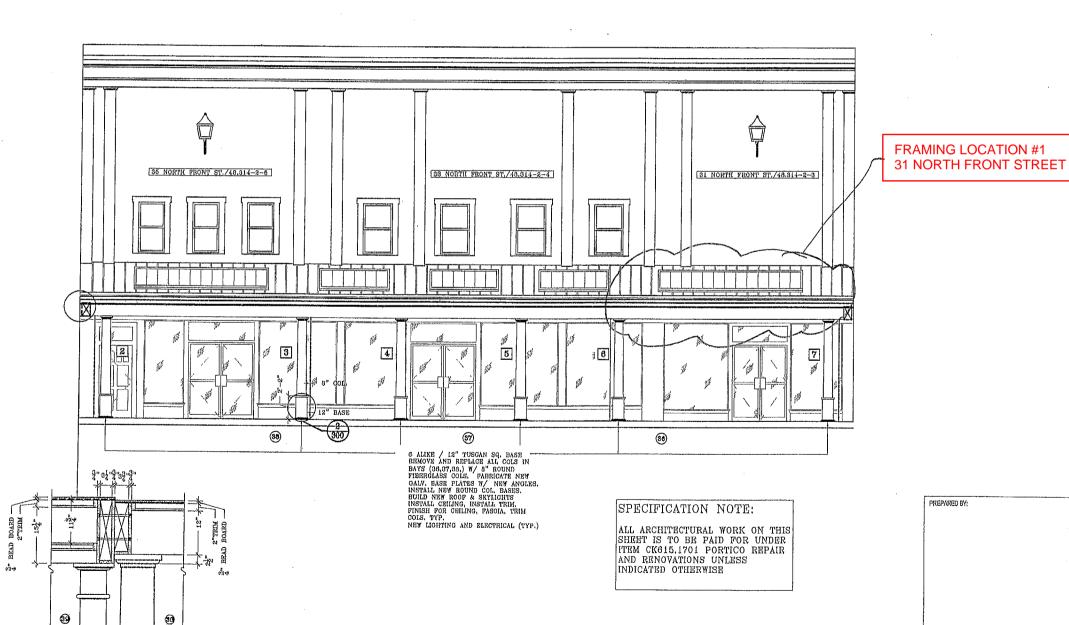
37 New Shed Roof W/ Galv. Metal Roofing

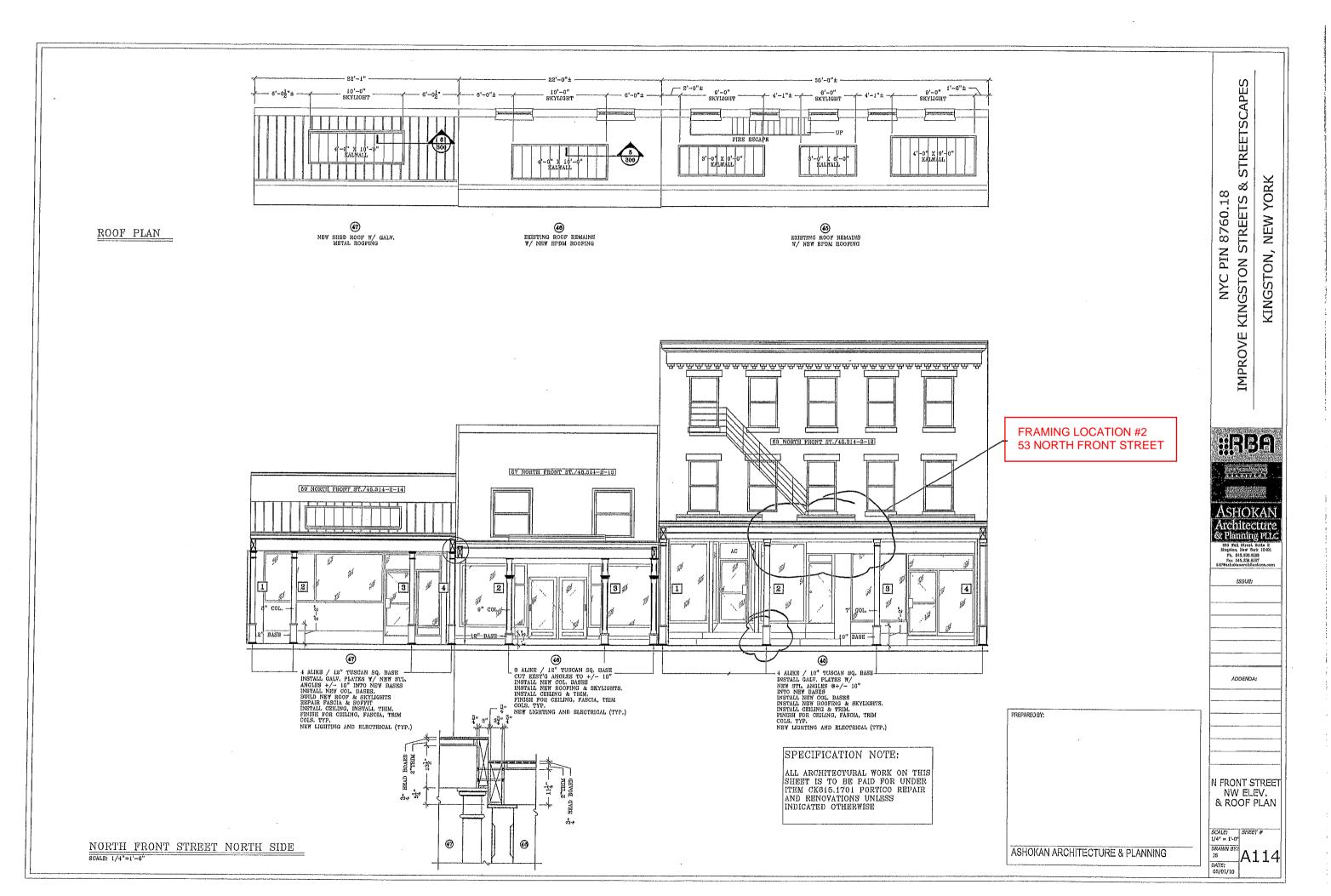
(38)

ROOF PLAN

NORTH FRONT STREET NORTH SIDE

SCALE: 1/4"=1'-0"





YORK

KINGSTON, NEW

Ashokan

Architecture & Planning PLC

200 Mail Street Suite R Kingeton, New York 1240 Fil. 845,309,8182 Fax 845,808,8197 APSaallokanerchileoture.c ISSUE

ADDENDA:

N FRONT STREET SW ELEV. & ROOF PLAN

SCALE: SHEET # DRAWN 071 JS DATE: 05/01/10 A 113

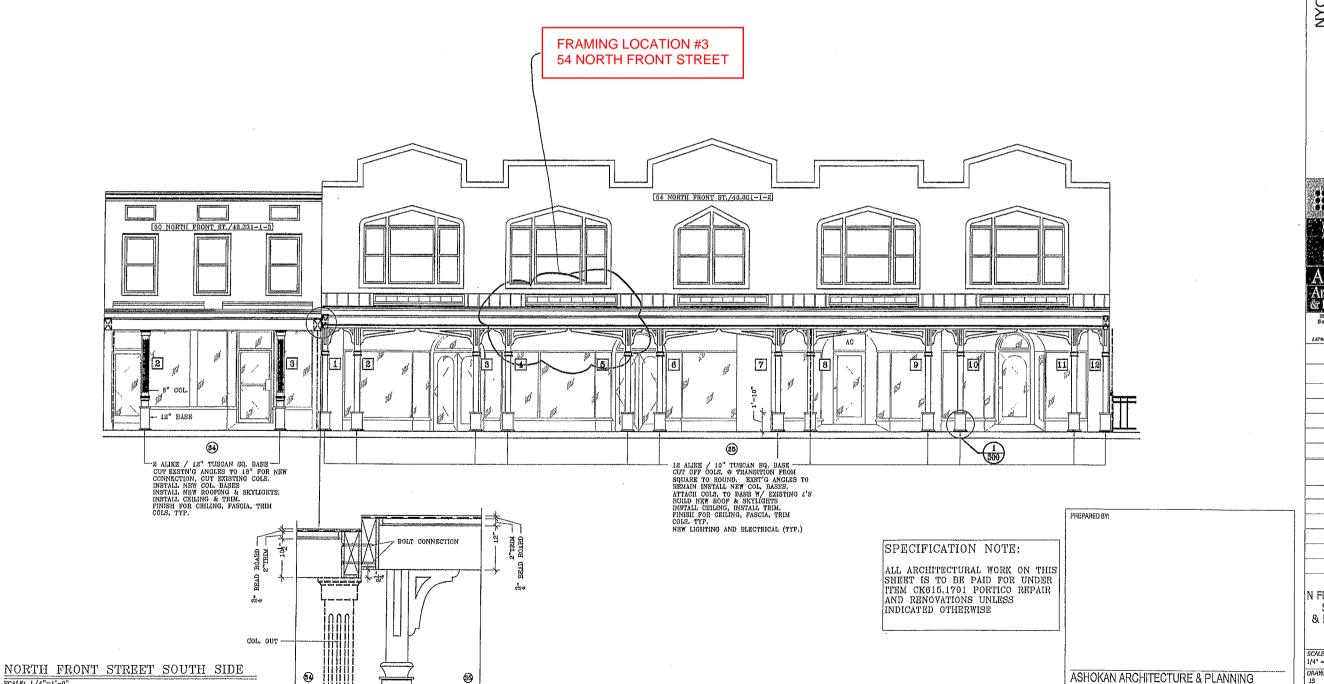
0'-11½"± 8'-0" skylight /- 2'-0" 0'-112"± -8'-0" SKYLIGHT g'-0" Skylight 8'-0" SKYLIGHT -0" X 8(-

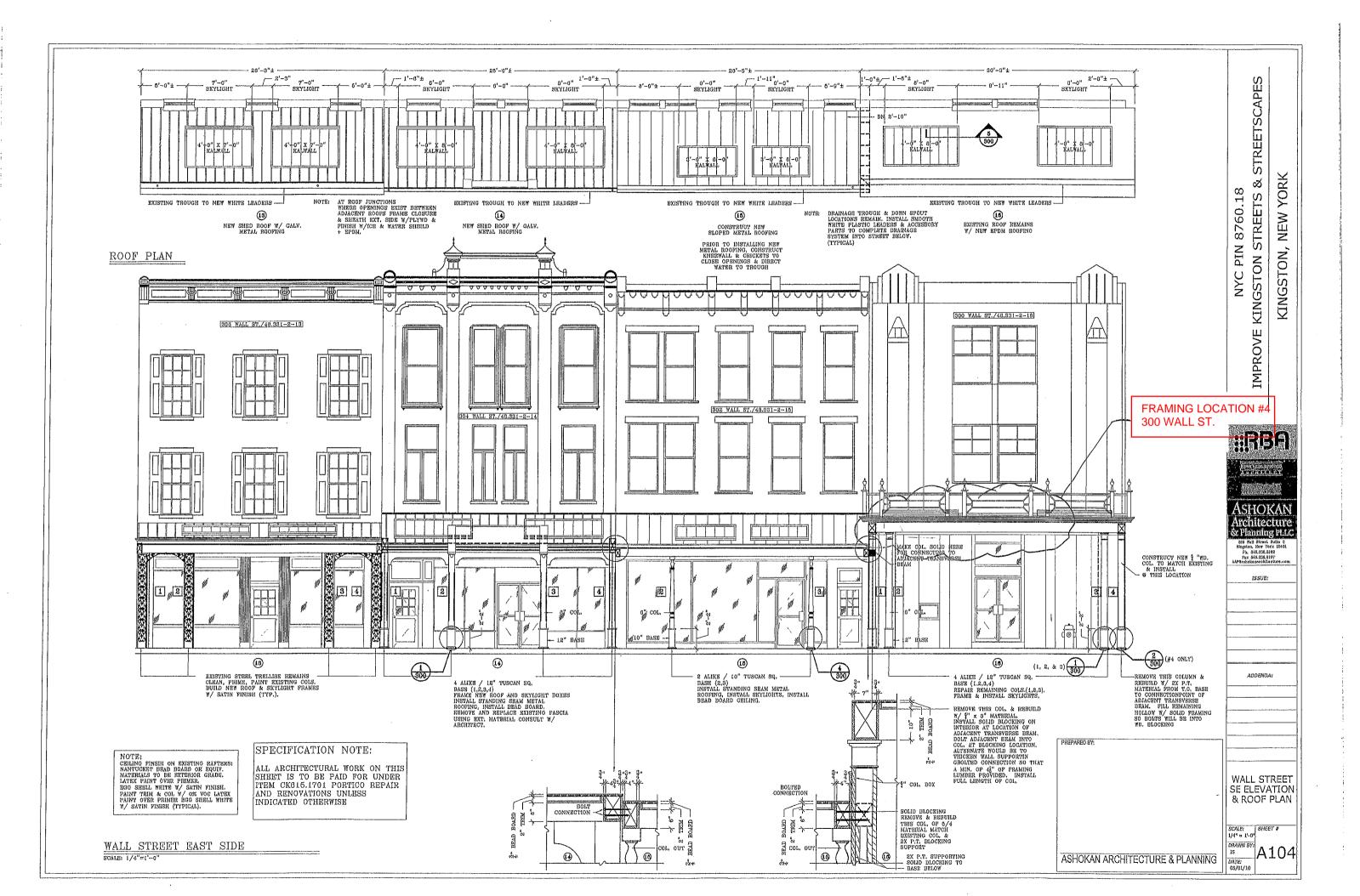
EXISTING ROOF REMAINS W/ NEW EPDM ROOFING

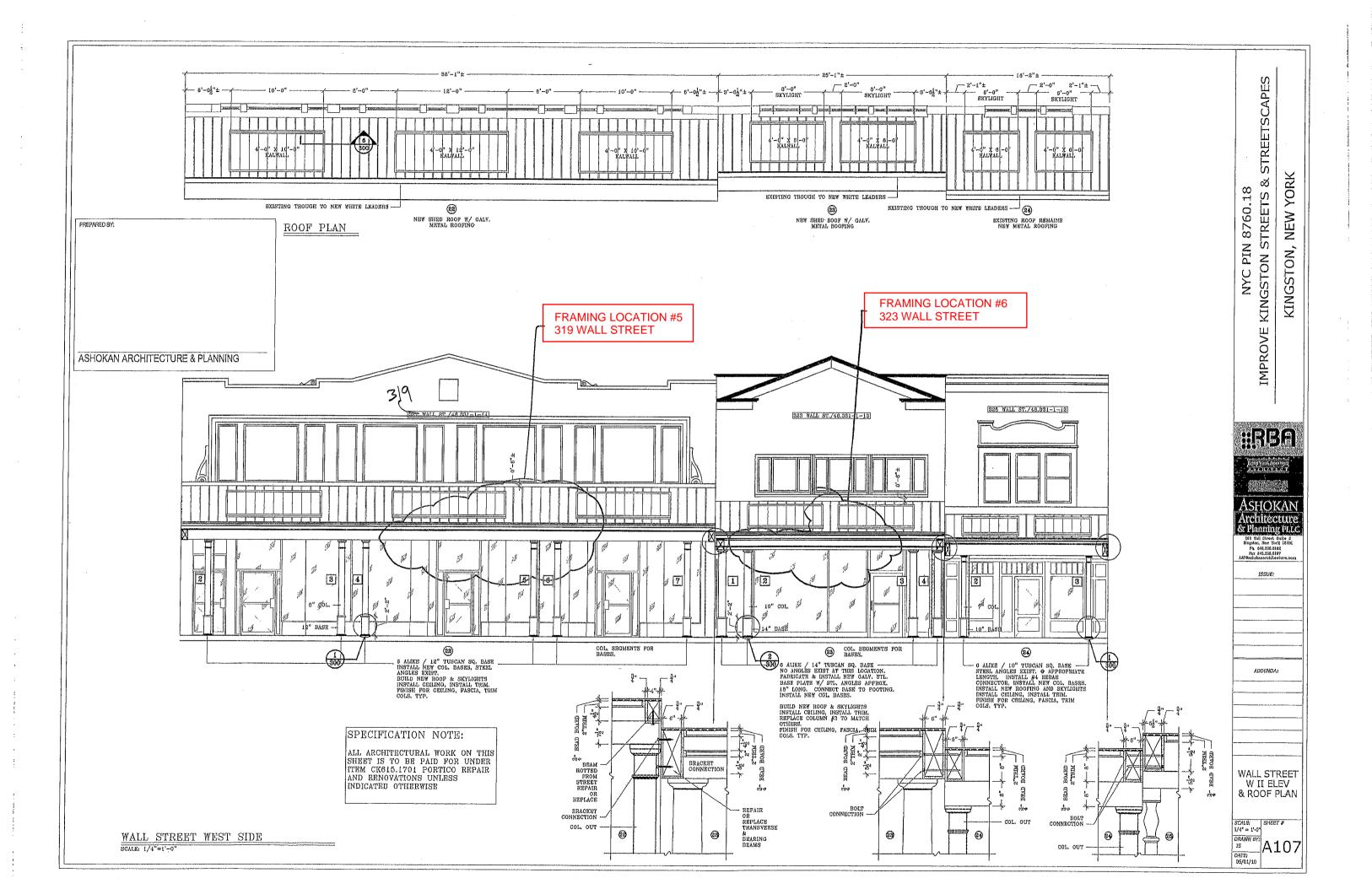
NEW SHED ROOF W/ GALY, METAL ROOFING

ROOF PLAN

SCALE: 1/4"=1'-0"







Appendix B

Photographs from March 31 and April 7, 2017 Site Visits

Photographs – 31 North Front Street

March 31, 2017





31 N. Front St. 01.jpg 31 N. Front St. 02.jpg





31 N. Front St. 03.jpg 31 N. Front St. 04.jpg





31 N. Front St. 07.jpg









31 N. Front St. 11.jpg



31 N. Front St. 10.jpg

Photographs – 53 North Front Street

March 31, 2017



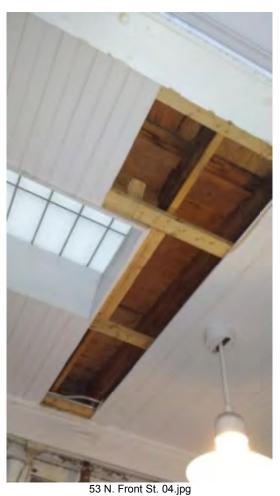


53 N. Front St. 01.jpg



53 N. Front St. 03.jpg

53 N. Front St. 02.jpg







53 N. Front St. 05.jpg 53 N. Front St. 06.jpg





53 N. Front St. 07.jpg 53 N. Front St. 08.jpg



53 N. Front St. 09.jpg



53 N. Front St. 11.jpg



53 N. Front St. 10.jpg







53 N. Front St. 14.jpg





Photographs – 54 North Front Street

March 31, 2017







54 N. Front St. 01.jpg



54 N. Front St. 03.jpg



54 N. Front St. 02.jpg



54 N. Front St. 04.jpg



54 N. Front St. 05.jpg



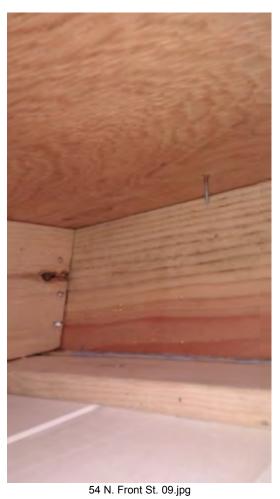
54 N. Front St. 07.jpg



54 N. Front St. 06.jpg



54 N. Front St. 08.jpg





54 N. Front St. 11.jpg



54 N. Front St. 10.jpg



Photographs – 300 Wall Street

April 7, 2014





300 Wall St. 01.jpg



300 Wall St. 02.jpg



300 Wall St. 03.jpg 300 Wall St. 04





300 Wall St. 06.jpg





300 Wall St. 07.jpg 300 Wall St. 08.jpg Photographs – 319 Wall Street

April 7, 2017







319 Wall St. 02.jpg



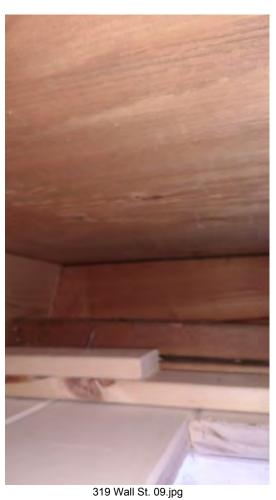








319 Wall St. 08.jpg





319 Wall St. 10.jpg

Photographs – 323 Wall Street

April 7, 2017



323 Wall St. 01.jpg



323 Wall St. 02.jpg





323 Wall St. 03.jpg







323 Wall St. 06.jpg



323 Wall St. 07.jpg





323 Wall St. 10.jpg

323 Wall St. 09.jpg



323 Wall St. 11.jpg



323 Wall St. 12.jpg