College Updates

Repairs to College-Owned Properties Planned for FY18

Thursday, May 18, 2017

As part of campus improvements planned for fiscal year 2018, during summer 2017 Trinity will make structural and code-related repairs at College-owned residential properties on Allen Place, Vernon Street, and New Britain Avenue. Repairs to be made at these properties were determined through a comprehensive review by structural engineers and inspectors of all Trinity-owned residential properties. The College is committed to ensuring that all of its properties are safe spaces and has implemented policies and procedures designed to prevent an incident like the September 2016 balcony collapse at 1713-1715 Broad Street from happening again. The 1713-1715 Broad Street building will remain unoccupied and secured until its future use is determined within Trinity's overall planning for facilities asset management.

Balcony Collapse Incident

Friday, October 7, 2016
8:45 p.m.

Trinity College remains committed to the safety of all members of our community, and the College is working diligently to inspect College-owned residential properties and remedy issues that come to our attention. As of today, safety inspections at all Trinity-owned residential properties have been completed, and we expect to receive a report within one week. Trinity will share the information with the residents in each property and work to remedy any identified issues as promptly as possible. In some cases, repairs have already occurred.

With the completion of the safety inspections, Trinity is now turning its full attention to structural inspections. This is a more in-depth and intensive inspection that examines the structural integrity of a building. These inspections will occur at all Trinity-owned residential properties, and we will provide an update when we have more information about when the inspections will be completed. As with the safety inspections, the inspectors will provide a comprehensive report of any items that require remediation, and we will work quickly to remedy them.

Thursday, September 29, 2016
2:00 p.m.

Today, Trinity College released the independent site investigation report of the balcony collapse at 1713-1715 Broad Street on September 10, 2016. The report,

Report by Cirrus Structural Engineering

Download the report here (PDF)

Support and Resources for Students

Dean of Students Office
(860) 297-2156

Trinity College Counseling Center
(860) 297-2415

Trinity College Health Center
(860) 297-2018

Chaplain's Office
(860) 297-2012

Housing and Residential Life
(860) 297-2305

Accommodation Services
(860) 297-4025

Campus Safety
(860) 297-2222

conducted by Cirrus Structural Engineering, found the two elevated decks to be structurally deficient relative to "code requirements, engineering principles and general best practice." The report further concluded that "the failure of the rear elevated decks at 1713-1715 Broad Street was primarily caused by construction flaws..."

Trinity College President Joanne Berger-Sweeney said, "I express my sincere apologies that our students had to experience such a traumatic event and am grateful that all who were injured are back on campus. These students, their families, and all members of our community have my commitment to have all of Trinity's off-campus buildings regularly inspected so that something like this does not occur again."

Based on Trinity College's and the City of Hartford's records and the work of Cirrus Structural Engineering, the key findings are:

- Construction defects of the rear elevated decks included the lack of vertical load support, the use of improper fasteners, and failure to use protective flashing.
- The rear decks at 1713-1715 Broad Street were reconstructed sometime between 1990 and 2003, although exact dates could not be determined; there is no record of the company responsible for the reconstruction.
- The failure to reconstruct the decks in accordance with sound engineering principles and established "best practice" resulted in corrosion of the deck structure – the wooden beams, ledgers, and nails, which led to the gradual weakening of the deck structure and culminating with the decks being unable to support the weight placed upon them at the time of the accident, per Cirrus Engineering.

Trinity College owns 35 off-campus properties. Sixteen of these properties are residential and currently house Trinity graduate students, faculty, or staff, as well as non-Trinity renters. The remaining buildings are used as offices and academic and social spaces, or are unoccupied. Each property, beginning with those where individuals reside, has been or will be inspected by experts who will examine them for structural integrity, as well as the life safety, electrical, mechanical, and plumbing systems.

"For reasons unclear to us, no inspection was done at the time the 1713-1715 Broad Street building was purchased by the College in 2011," said Vice President of Finance and Operations Dan Hitchell, who joined the College in July 2016 and oversees facilities. "We are now inspecting all off-campus properties and will enact new procedures to ensure that all buildings that the College owns are safe."

Thirty-two students experienced a range of injuries as a result of the deck collapse; all have returned to campus and classes. Five students who lived in the 1713-1715 Broad Street property have been relocated to on-campus housing.

Thursday, September 29, 2016
11:10 a.m.

The report from the independent structural engineering firm will be available on this site at 2:00 p.m. EDT.

Wednesday, September 28, 2016
12:00 p.m.

Tomorrow, September 29, the College will be releasing an independent report by a structural engineering firm about the cause of the September 10 deck collapse. The report will be posted to this website as soon as it is available.

Tuesday, September 20, 2016
8:00 p.m.

We are grateful nearly all of our students injured on September 10 have returned to campus. Again, we thank the first responders and all who helped those in need. This includes the Counseling Center staff who have provided a great service to any who wished to take advantage of their support and guidance.

The independent investigation of what occurred and why is under way and we'll share findings once completed. Be assured that since the accident, all College-owned properties in which members of our extended community live have been or are being inspected to ensure the safety of those occupying these residences.

We'll continue to provide regular updates as we have more information to share.

Sunday, September 18, 2016
6:50 p.m.

In the one week since the balcony collapse occurred at 1713-1715 Broad Street, we recognize how difficult this ordeal has been for the entire Trinity College community. All members of our community -- students, faculty, staff, families, alumni, and friends -- have come together to support one another as all those affected by the accident begin to heal physically and emotionally.

The safety of our community is paramount, and we continue to work with engineers and inspectors to evaluate the safety of all College-owned properties in which our community members are living.

Saturday, September 17, 2016
6:05 p.m.

Trinity College is still investigating the root cause of the balcony collapse at 1713-1715 Broad Street, Hartford. We continue to work closely with structural engineers, inspectors, and municipal authorities.

Our highest priority is still to care for and support all students who were involved in the collapse, as well as the students' families. Administrators and support staff are working continuously with students and families on follow-up medical care, support for academics, housing, transportation, and counseling resources.

Friday, September 16, 2016
5:00 p.m.

Investigation by Trinity and municipal authorities regarding the cause of the September 10 balcony collapse continues. Reports from engineers and inspectors are anticipated to be received within the next two to three weeks.

As Trinity staff continue to work with affected students, we now know that a total of 32 students have reported physical injuries. Twenty-eight of those students were transported to local hospitals Saturday night and Sunday morning. A few students who were initially offered transportation to the hospital for further medical evaluation declined to go. However, in the days since the accident, additional students have

sought evaluation and treatment for physical injuries. One student remains in the hospital for ongoing treatment.

We encourage all of our community members who were affected by this incident and need help to please contact any of the support resources listed on this page.

Thursday, September 15, 2016
4:55 p.m.

Trinity College is continuing to work with the City of Hartford as well as structural engineers and home inspectors to evaluate the safety of all College-owned properties in which our community members are living. We are grateful to the City of Hartford for the swift, competent, and caring manner of responders and officials throughout this ordeal.

Trinity's administrators and staff remain in continuous contact with affected students and their families and are assisting with their immediate and ongoing needs resulting from the incident.

Wednesday, September 14, 2016
4:45 p.m.

Trinity College is investigating the cause of the accident, and we are working with structural engineers and home inspectors who are on campus over the next few days to evaluate the safety of all College-owned properties in which our community members are living. The property manager, David Lemkuil of SML Real Estate, Inc., is working with the College to assess the situation. Given the level of due diligence necessary to conduct a thorough review, we expect to receive additional information within the next two to three weeks.

Our priority continues to be the needs of our students and our faculty will continue to be as supportive as possible in making accommodations for students with issues directly impacting their academic work including physical injuries, concussions, and emotional needs.

Tuesday, September 13, 2016
5:30 p.m.

Trinity College's highest priority is to continue to care for and support all students who were involved in Saturday night's incident, as well as the students' families. Administrators and support staff are working continuously with students and families on follow-up medical care, support for academics, housing, transportation, and counseling resources.

As of today, one student remains in the hospital and the College is in close contact with the student and the family.

The root cause of the accident has yet to be determined, and the police are investigating. However, as the owner of the property, Trinity is also investigating the cause of the accident. We have engaged structural engineers and inspectors to assist with this investigation. We have not yet released the name of the property manager because our efforts are focused on gathering as much information as possible about the structural condition of the house's balconies and records of past maintenance. We want to be clear that the students who hosted the social gathering at the house followed procedures to register and host a social event per the policies outlined in the Student Handbook.

The amount of support and care exhibited by the Trinity community over the past several days has been extraordinary, and we ask that everyone continue to consider the impact this incident has on large number of our students, friends, and community members. Many staff members are focused on care and support, as well as investigating the incident, and we will update this page daily with new information.

Monday, September 12, 2016
3:30 p.m.

Trinity College is continuing to care for students who were affected by the balcony collapse that occurred on Saturday, September 10, 2016, especially those students who were injured, students present at the social gathering during the accident, residents of the house where the incident occurred, friends and families, and the staff and other responders at the scene.

Two students who were injured in the accident remain in the hospital with moderate injuries and one is expected to be released within 24 hours. The Dean of Students is in contact with the students and their families for ongoing support.

Trinity is in the process of investigating the incident and we will be cooperating with any authorities representing the City of Hartford in their review of this incident. The property is owned by the College and is managed by an outside property manager. Accommodations have been made for the five student residents of the house. The house cannot be occupied, and the students have been relocated to other campus housing.

The Trinity community is continuing to process and recover from the incident, and on Sunday at 4:00 p.m., students, support staff, and faculty gathered in the Trinity College Chapel to reflect and offer care and support to one another.

Trinity Counseling Center staff and Chaplains remain available to students, and urgent requests for assistance should be directed to Campus Safety at (860) 297-2222.

Sunday, ***September 11, 2016***
9:25 a.m.

A balcony collapse occurred at approximately 11 p.m. Saturday night (September 10, 2016) at a house at 1715 Broad Street, Hartford, where a social gathering of Trinity students was taking place. 28 students were transported to area hospitals and a few remain for ongoing treatment. College staff went to the hospitals to be with the students and assist with getting in touch with the students' families and with providing transportation back to campus. At this time, the majority of the students have been treated and discharged and the College will remain in direct contact with those still receiving treatment. Staff have attempted to reach family members for all students who went to the hospital. In the few cases where we were unable to reach a family member directly, a message was left. Most students involved have been in contact with their families but parents who have concerns are asked to please reach out to their students or to call Campus Safety.

The Trinity College Health Center will be reaching out to those students evaluated to determine and assist with any follow-up. The Dean of Students Office will also continue to work with students and parents in the days ahead.

While this event is upsetting, we are grateful that none of the injuries are life-threatening.

Trinity Counseling Center staff and Chaplains are available to students and families and can be reached through calling Campus Safety.

Trinity College Emergency Management Team

CIRRUS STRUCTURAL ENGINEERING

29 September 2016

Dan Hitchell, Vice President of Finance & Operations
Trinity College
300 Summit Street
Hartford, CT 06106

Reference: 1713-1715 Broad Street - Deck Collapse Investigation

Dear Mr. Hitchell:

The following report presents our findings from the structural investigation of the collapse of the rear decks at 1713-1715 Broad Street in Hartford, Connecticut on September 10, 2016.

For the purposes of this report, Broad Street runs in the north-south direction, and the decks are located on the west elevation of 1713-1715 Broad Street.

Executive Summary

Based on site investigation and analysis, and with a reasonable degree of engineering certainty, we conclude that the failure of the rear elevated decks at 1713-1715 Broad Street was primarily caused by construction flaws in some of the deck framing connections that resulted in a deficiency in capacity relative to building code requirements, engineering principles and general best practice. The under-strength connections gradually corroded over time, due to exposure to the elements, offering less and less support for the deck until the point when the occupancy loading exceeded the capacity of the south-east connection of the second floor deck triggering collapse on September 10, 2016.

These conclusions are based on visual examinations made after the incident occurred. We reserve the right to supplement or amend these findings should new information become available.

Background

On the night of 10/September/2016 during a student party for which the decks were being used as social gathering space, the second and third floor elevated decks collapsed. Police interviews, as verbally described by detectives on site during our investigation, determined that there were approximately 4 people on the third floor deck and 7 to 10 people on the second floor deck at the time of collapse. Reports described sounds of cracking made prior to the full collapse. Unofficial news reports describe the third floor as falling first then the second collapsing right after as well as decks tipping to one side as they fell.

Approach

Cirrus Structural Engineering was engaged to perform a structural investigation to identify failure modes in the framing and determine probable cause. An examination of the framing was conducted on site by the undersigned as well as Sergio Guindon from Cirrus Structural Engineering on 14/September/2016.

A visual examination of fallen deck members was made from the ground as well as from a ladder. Framing and fastener sizes, spacing and condition as well as failure patterns were observed in the field. Photographs were taken to document the examination.

Building Description

1713-1715 Broad Street is a 3-story balloon-framed residential structure with a front-facing gable roof constructed circa 1925. The front of the building faces east, while the back faces west. The decks of interest are located on the rear elevation.

The rear decks under study are stacked into three stories, with a deck serving each of the house levels. The second and third floor decks are elevated while the first floor sits slightly above grade. For the purposes of this report, the first, second and third story decks will be called Deck 1, Deck 2 and Deck 3 respectively. Deck 1 is approximately 8'-3" x 12' in plan dimension, Deck 2 roughly 5' x 12' and Deck 3 is roughly 5' x 13'.

The decks under investigation were largely rebuilt at some point in the last 30 years using pressure preservative treated lumber with a few remnants of the original structure included in the reconstruction. Although the exact date of reconstruction is unknown, we suspect that the decks were rebuilt between 1990 and 2003. We found clearly legible lumber stickers on the unfinished edges of handrails and joists. The tags indicate a CCA pressure preservative treatment whose use was replaced by ACQ in 2003. Based on the construction methods, it is our opinion that the deck framing was not engineered but rather designed on-site by a contractor whose design would have been bound by Connecticut Building Code.

The framing for each deck is described below including an itemized list of each of the framing members, roughly tracing the load path from point of origin down to the vertical support for the deck. Each member is identified by a letter, which is keyed into the images in the appendices to visually describe the framing. *Original* indicates probable original 1925 deck members; *replacement* indicates reconstructed members.

Deck 1 – The deck framing for Deck 1 did not appear to be affected or lend information to the investigation, so we will not describe it here for brevity.

Deck 2 – The deck framing for Deck 2 appears to have been completely rebuilt with the exception of the *original* 1925 ledger along the wall of the house onto which a new ledger was mounted. We observed abandoned original 4x4 outrigger beams cut-off at the main wall of the house. Deck 2 framing members include:

(a) Decking on second floor joists, 2" nominal decking on 2x6 joists at 16" o.c., north-south spanning, *replacement.*

(b) Second floor flush framed "beams", (1) 2x6, supporting joists on north and south ends of deck, east-west spanning, flush-framed with joists, *replacement.*

(c) Second floor ledger along the house wall, *replacement* 2x6 mounted to *original* 2x6 with 2 rows of 4 nails with penetration limited to thickness of original ledger; *original* 2x6 mounted to main wall studs through the sheathing with (2) *original* nails per stud.

(d) Second floor north-east (NE) vertical support, *replacement* 2x4 bracket post, original cut-off 4x4 outrigger beam visible and sandwiched in between ledger / beam connection and *replacement* 2x4 bracket post below.

(e) Second floor south-east (SE) corner, 2x6 beam nailed into end grain of original ledger with (2) nails, inclusion of vertical load resisting member or bearing not present as other corners, load transfer in this corner relies on indirect load transfer through nails from beam to ledger, then nailing from original ledger back to stud walls of the house.

(f) Second floor north-west (NW) and south-west (SW) vertical outer post supports, 4x6, *replacement.*

Deck 3 – The joist framing for Deck 3 appears to have been rebuilt on the *original* 1925 4x4 beam frame. Deck 3 framing members include:

(g) Decking on third floor joists, 2" nominal decking on 2x8 @ 16" o.c joists, north-south spanning, top-framed onto original 4x4 beam frame, *replacement.*

(h) Third floor outrigger beams, 4x4, load-bearing part of original beam frame, supporting joists on north and south ends of deck, east-west spanning, joists top-framed, *original.*

(i) Third floor tying beam, 4x4, located along the west edge of the deck and served to tie the two outside posts together, *original*.

(j) Third floor north-east (NE) vertical support, 2x4 bracket post, installed below beam connection, *replacement*.

(k) Third floor south-east (SE) vertical support, 4x4 bearing bearing on 1" main house wood wall sheathing, *original*.

(l) Third floor north-west (NW) and south-west (SW) vertical outer post supports, 4x6, *replacement.*

Building Code Requirements

We estimate that these residential decks were reconstructed sometime between 1990 and 2003. During that time the governing building code would have been the Connecticut State Building Code dated 1989, 1994 or 1999. All three codes reference CABO One and Two Family Dwelling Code dated 1986, 1989 and 1995 respectively. The CABO One and Two Family Dwelling Code is the precursor to the International Residential Code (IRC), which was first published in 2003 and first introduced in the 2004 Amendment to the 1999 State Building Code in Connecticut.

The general design stipulations in both the CABO and IRC begin with an article describing the general performance requirements for buildings and structures. While each version is worded slightly differently, the meaning and intent of the article remain unchanged today since first published in CABO. The clause of interest, an excerpt from IRC 2009, describing the general performance requirements follows.

> **R301.1 Application**. Buildings and structures, and all parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, snow loads, wind loads and seismic loads as prescribed by this code. The construction of buildings and structures in accordance with the provisions of this code shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through the load resisting elements to the foundation.

Live loads are defined as the loads produced by use and occupancy of a structure. Both CABO and IRC define the minimum uniformly distributed live load capacity for decks during the period of probable construction to be 40 pounds per square foot (psf) of structure area.

Observations

Our investigation revealed the following observations and conditions. Photographs illustrating the points made in this section follow in the Appendices.

1. LIVE LOAD COMPARISON. Based on reported occupancies we calculated an equivalent uniformly distributed live load (see Building Code Requirements section above for definition) by multiplying the number of occupants by an assumed average weight of 200 lb per person to get a total estimated weight of the occupants, which we then divided by the square footage of the deck. The resulting equivalent uniformly distributed live load is approximately 33 psf at Deck 2, and 13 psf at Deck 3 assuming that occupants were uniformly distributed. As noted above, the code-prescribed uniformly distributed minimum live load capacity is 40 psf. Based on our estimated equivalent live loads, it does not appear that occupancy on either deck at the time of the failure on September 10, 2016 exceeded code-prescribed minimums for design.
2. DETERIORATION OF ORIGINAL 1925 LEDGER AND NAILS AT DECK 2. A ledger is defined as the structural member in the plane of the deck framing located directly against and fastened to the main wall of the house onto which the deck is attached. At Deck 2 the original 1925 ledger was retained against the house onto which a new ledger was mounted. The original ledger was fastened to the main house studs with 2 nails per stud at 16" on center. The new ledger was mounted to the original ledger with 2 rows of 4 nails; the new nails did not penetrate through the original ledger to the studs; thus the replacement deck relied on the original 1925 ledger nails to transfer ledger loads back to the main house wall. The reconstructed deck did not include flashing over the ledger, a general best practice, to protect the ledger and fasteners from precipitation draining off the deck. As a result, the original 1925 ledger and its fasteners deteriorated and corroded over time, to the point of significant section loss and reduction of capacity.
3. LACK OF DIRECT SUPPORT FOR EAST END OF DECK 2 SOUTH BEAM. Unlike the east end of the deck 2 north beam supported on the house wall by the 2x4 bracket post (d), or the deck 3 south beams supported by bearing into a pocket (k) in the house wall, the east end of the south beam was not directly supported by other structure. Rather, 2 nails were used to transfer loads from the beam into the end of the original 1925 ledger. As described in Item #2 above, the original ledger was supported by 2 nails into each stud. The nearest nailed ledger connection into the stud was approximately 12" north of the south-east corner. The size and quantity of nails was not adequate to support the loads from the beam end, especially with the 12" offset between the beam end and stud. In addition, severe corrosion on the ledger and nails undermined its capacity to support any load. Absence of a direct support for the east end of the beam is in direct violation of the code requirement for a continuous load path as described above.
4. DECK 3 BEAM DETERIORATION. Deterioration of the Deck 3 beam frame was observed, primarily in the south beam. The first photograph in the appendix shows the deck intact prior to collapse and does not indicate any major section loss of these members. Compression of wood on the top surface of these members, however, and subsequent settling in the deck above would have been likely. Loss of deteriorated wood would have most likely occurred during the impact from the deck collapse.
5. MINIMAL BEARING AT DECK 3 SOUTH OUTRIGGER BEAM. The deck 3 south outrigger was intended to bear on lumber blocking spanning between two main wall studs; however, hole in the sheathing for the outrigger did not quite align with the blocking; therefore, the bearing was supported entirely on the 1" nominal exterior sheathing of the main house. The bearing connection was not adequate to support minimum code-prescribed uniformly distributed live loads, and did not have the capacity to restrain the deck against lateral movements.

6. "BEST PRACTICE" CONSTRUCTION METHODS NOT FOLLOWED. Since 2003, the IRC has become increasingly responsive to common deck construction weaknesses susceptible to failure, and has developed a number of best practice construction methods to improve performance as published in a sister document to the IRC titled Prescriptive Residential Wood Construction Guide (DCA6) by the American Wood Council. The reconstructed decks at 1713-1715 Broad Street most likely predate the formal publication of best practices; however, the list is a useful tool in identifying overall vulnerabilities and explaining areas of weakness found on site. Best practice details for decks include knee bracing of outboard posts, use of joist hangers to support joist ends in lieu of end grain nailing, flashing above the ledger to protect the fasteners from water and corrosion, post base and cap hardware to tie beams into the posts in lieu of toenails, lag screws fastening ledgers to the main wall of the house in lieu of nails, and tension ties at main house wall to restrain the deck laterally. The reconstructed decks did not incorporate any of these best practice details.

Conclusions

It is our opinion that the deck failure was initiated at the south-east corner of the second floor deck where the edge beam was not directly bearing on the main wall of the house or a supplemental post as at other corners. Instead, sub-capacity nailing between the beam and ledger, and ledger and main wall studs, were supporting the beam end.

The sub-capacity nailing was able to support the south-east corner of the second floor deck for many years by bolstering additional support from the vertical rail attachment above the beam and nailed directly into the main wall of the house. A chain reaction started by the contractor's failure to replace the original 1925 second floor deck ledger and its fasteners, and subsequent corrosion due to the absence of protective flashing above, caused the nails to become so severely corroded that their capacity was overwhelmed by the occupants of the deck on September 10, 2016. Downward movements in the south-east corner of the second floor deck most likely caused upward and/or lateral movements in the north-west corner which were transferred to the third floor deck. The third floor deck, having limited bearing of the beam at its south-east corner, was most likely the first to fully collapse causing the subsequent collapse of the second floor deck.

Respectfully Yours,

Cirrus Structural Engineering, LLC

Elizabeth Acly, PE
Principal

Appendices:

Images Corresponding to **General Description** Section – pages 7 to 12

Images Corresponding to **Observations** Section – pages 13 to 15

Key to Member Designations: (as repeated from Building Description section of main report)

Deck 2

(a) Decking on second floor joists, 2" nominal decking on 2x6 joists at 16" o.c., north-south spanning, *replacement.*

(b) Second floor flush framed "beams", (1) 2x6, supporting joists on north and south ends of deck, east-west spanning, flush-framed with joists, *replacement.*

(c) Second floor ledger along the house wall, *replacement* 2x6 mounted to *original* 2x6 with 2 rows of 4 nails with penetration limited to thickness of original ledger; *original* 2x6 mounted to main wall studs through the sheathing with (2) *original* nails per stud.

(d) Second floor north-east (NE) vertical support, *replacement* 2x4 bracket post, original cut-off 4x4 outrigger beam visible and sandwiched in between ledger / beam connection and *replacement* 2x4 bracket post below.

(e) Second floor south-east (SE) corner, 2x6 beam nailed into end grain of original ledger with (2) nails, inclusion of vertical load resisting member or bearing not present as other corners, load transfer in this corner relies on indirect load transfer of nails from beam to ledger, then nailing from original ledger back to stud walls of the house.

(f) Second floor north-west (NW) and south-west (SW) vertical outer post supports, 4x6, *replacement.*

Deck 3

(g) Decking on third floor joists, 2" nominal decking on 2x8 @ 16" o.c joists, north-south spanning, top-framed onto original 4x4 beam frame, *replacement.*

(h) Third floor outrigger beams, 4x4, load-bearing part of original beam frame, supporting joists on north and south ends of deck, east-west spanning, joists top-framed, *original.*

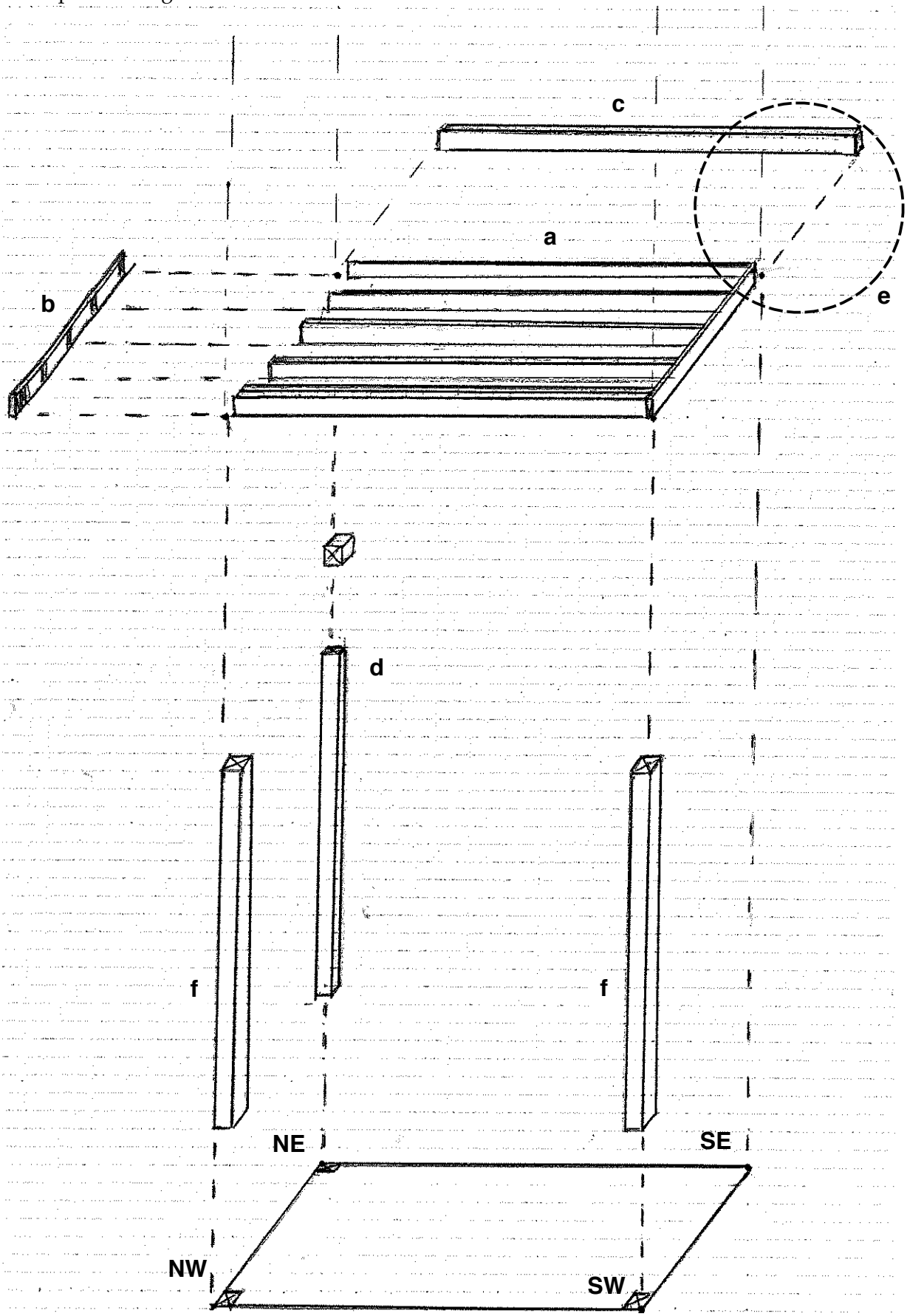
(i) Third floor tying beam, 4x4, located along the west edge of the deck and served to tie the two outside posts together, *original*.

(j) Third floor north-east (NE) vertical support, 2x4 bracket post, installed below beam connection, *replacement*.

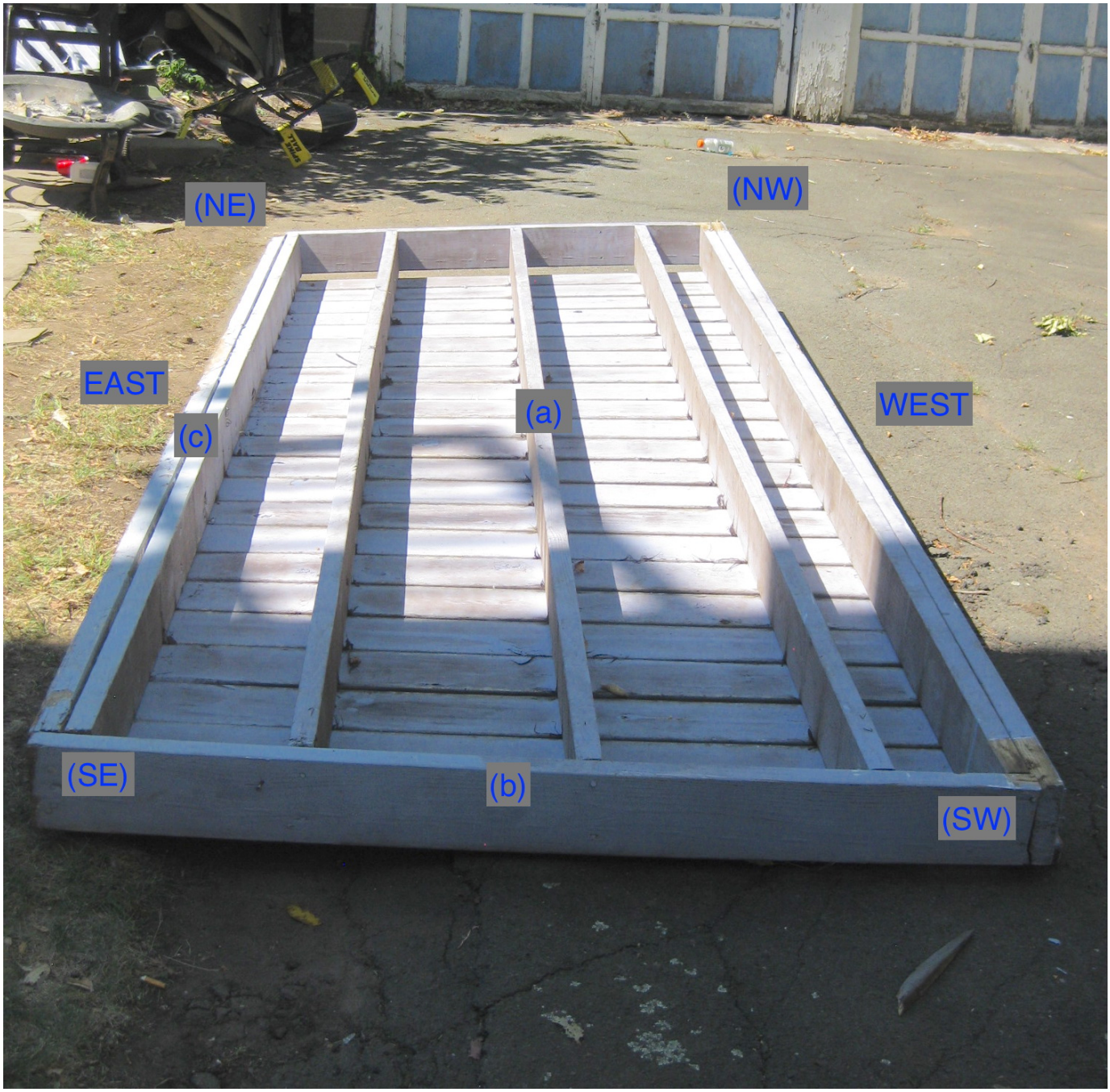
(k) Third floor south-east (SE) vertical support, 4x4 bearing bearing on 1" main house wood wall sheathing, *original*.

(l) Third floor north-west (NW) and south-west (SW) vertical outer post supports, 4x6, *replacement.*

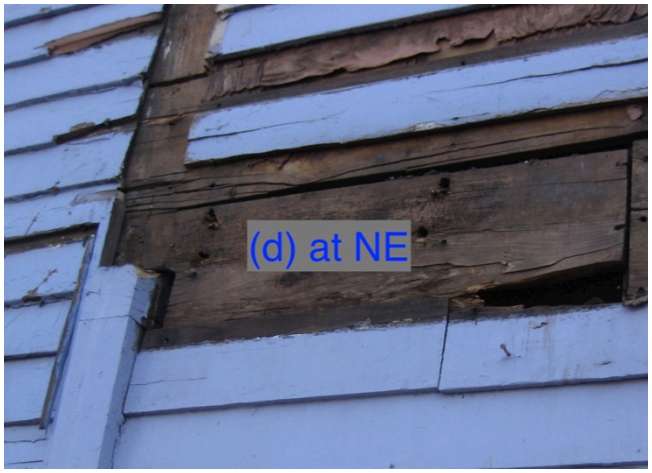
Decks Intact Prior to Failure

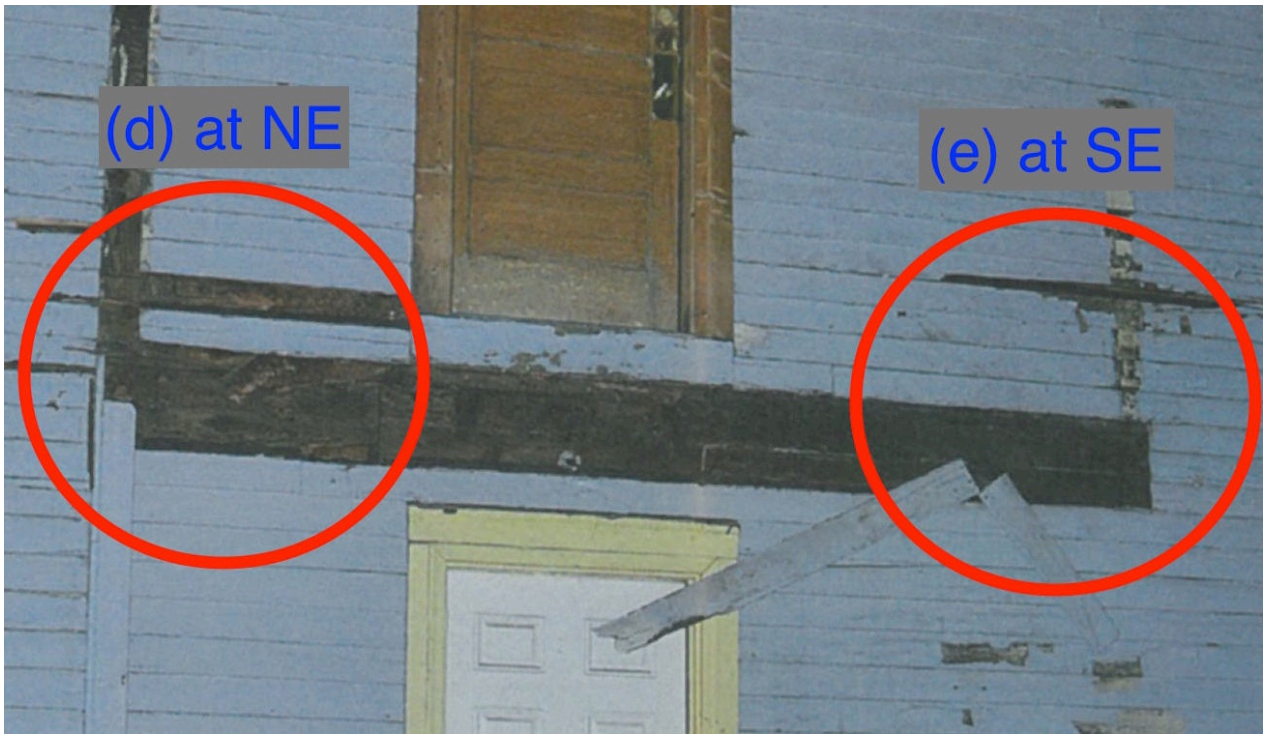


Second Floor Deck Exploded Framing Sketch (DECK 2)

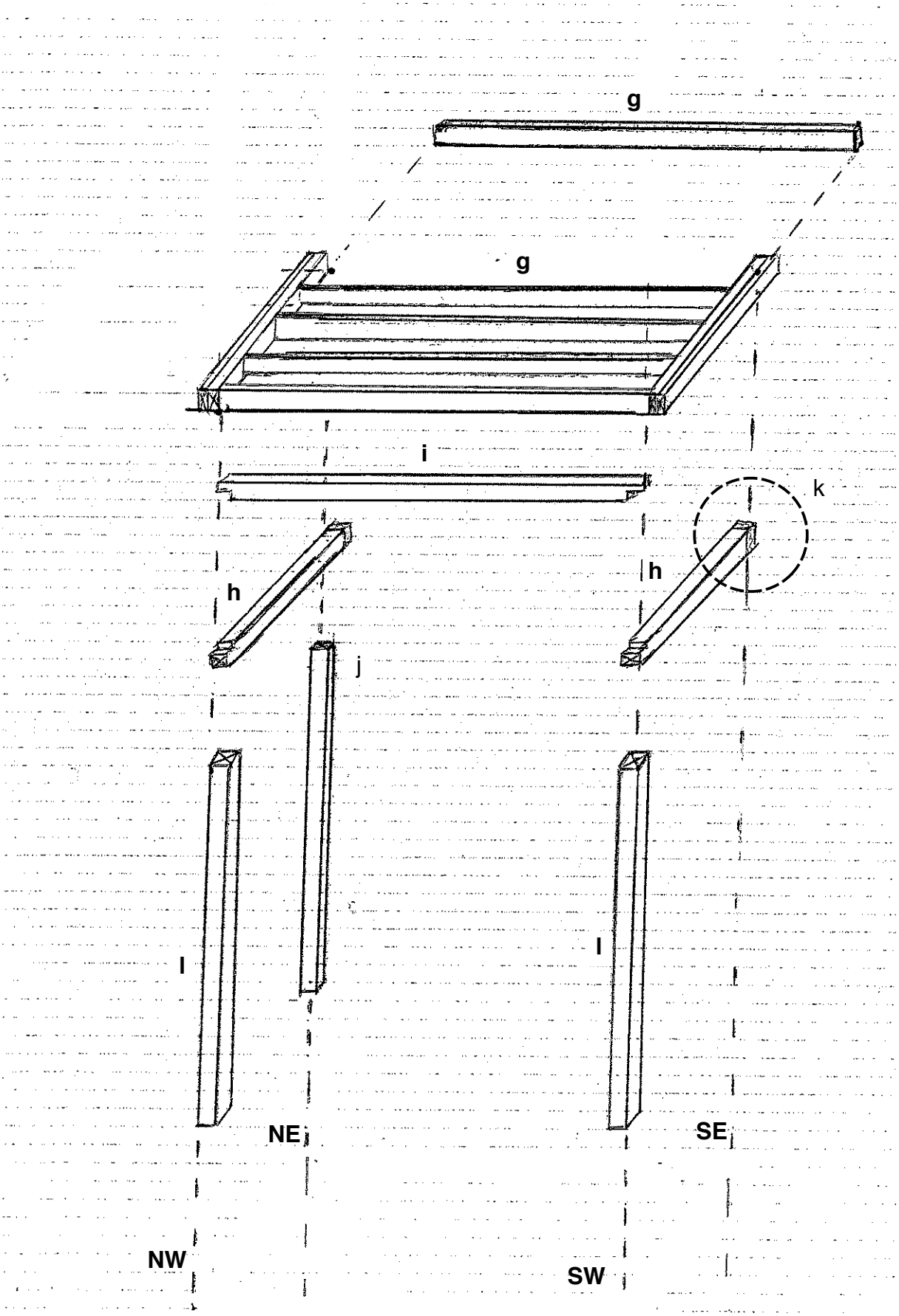


Underside of Second Floor Deck Framing (DECK 2)





Connection of Second Floor Deck to Main House (DECK 2)



Third Floor Deck Exploded Framing Sketch (DECK 3)

Underside of Third Floor Deck Framing (DECK 3)

#2. Deteriorated Deck 2 original 1925 ledger and nails

#2. Corroded Deck 2 nails

#3. Deck 2 South-East Beam End Connected to Ledger with only 2 nails; SE beam end not extended to bear onto main house wall

#4. Deck 3 Deterioration at West End of South Beam

#5. Deck 3, Wall Bearing Support at East End of South Beam