HISTORIC UNION COUNTY COURTHOUSE

HISTORIC STRUCTURE REPORT & RELATED SERVICES

JANUARY 23, 2017

walterrobbs

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HISTORIC STRUCTURE REPORT & RELATED SERVICES
JANUARY 20, 2017

HISTORIC UNION COUNTY COURTHOUSE
300 NORTH MAIN STREET
MONROE, NORTH CAROLINA 28112

Five bound copies of this report were delivered to the Owner's Representative:

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HISTORIC UNION COUNTY COURTHOUSE
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INTRODUCTION

According to the February 25, 2016 Request for Qualifications (RFQ #2016-020), this Historic Structure Report & Related Services document will be used by Union County to develop a feasibility study determining the most appropriate property uses, building uses and realistic financial strategies for the protection, restoration and redevelopment of the historic courthouse.

Union County contracted with Walter Robbs Callahan & Pierce, Architects to provide the Historic Structure Report & Related Services document. Walter Robbs assembled the following team of specialists to provide the information necessary for the report. Michelle Portman Walter authored three sections of the report, coordinated the efforts of the team, corresponded with the owner's representative, and compiled the final report.

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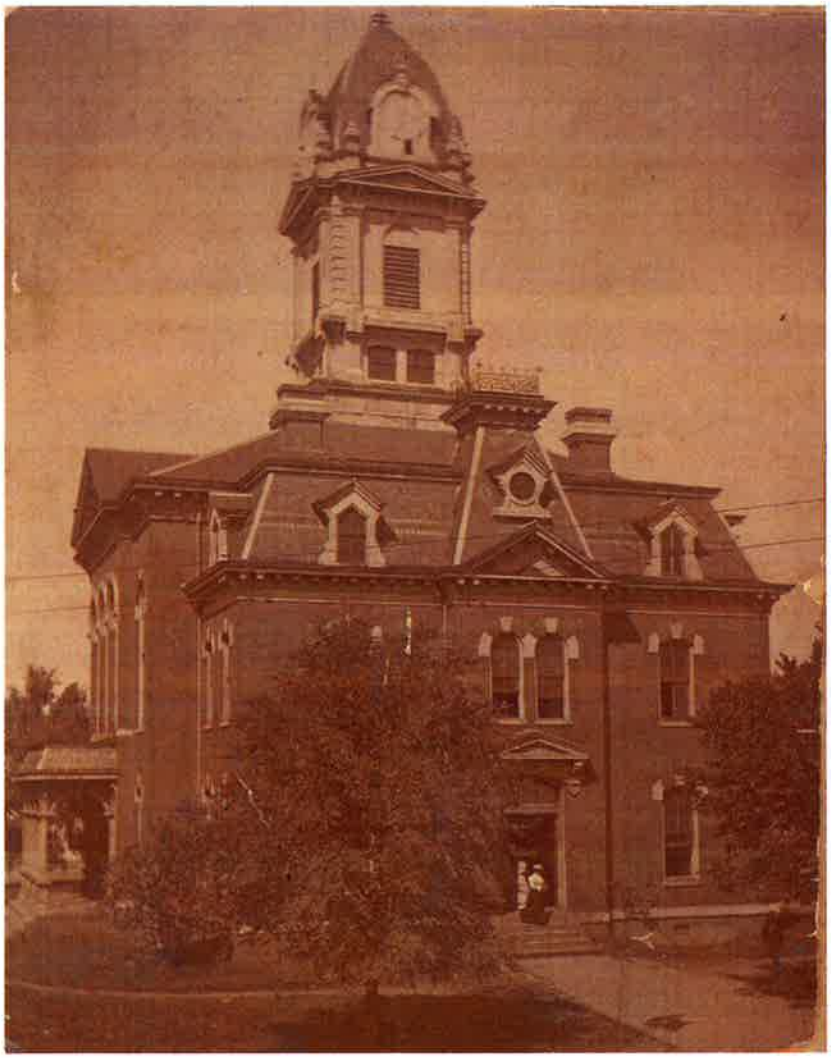
The Historic Building and Site Analysis in this report addresses the design and features of the original 1888 building, and the 1928 changes and additions. This section is included in the report to offer a fuller understanding of the physical history of the building. It is not intended to imply that the building should be returned to its 1888 appearance. In historic preservation terms, the primary "restore to" date for the proposed restoration/renovation is 1928, after the significant changes to the original building.

HISTORIC BUILDING AND SITE ANALYSIS

Since the Courthouse sits on the historic Union County Courthouse square and replaced the prior frame building in the same location, it is important to address the historic evolution of the site as well as the building. In addition, the building and site are included in the current "museum" designation.

HISTORIC BUILDING ANALYSIS

1888 – Original Masonry Courthouse Completed



Construction of the original Second-Empire style, masonry courthouse was completed in 1888. The west entrance (Lafayette Street originally, Main Street now) was originally, and remains, the main entrance.

Both monumental staircases served as public access to the second-floor courtroom. The original judge's bench was located on the east side of the courtroom. Please see the supporting documents below - a courthouse design in the 1878 publication *Bicknell's Village Builder and Supplement*; an interior photograph of the 1883 Hancock County Courthouse in Sparta, Georgia; and an interior photograph of the 1893 Franklin County Courthouse in Ottowa, Kansas.

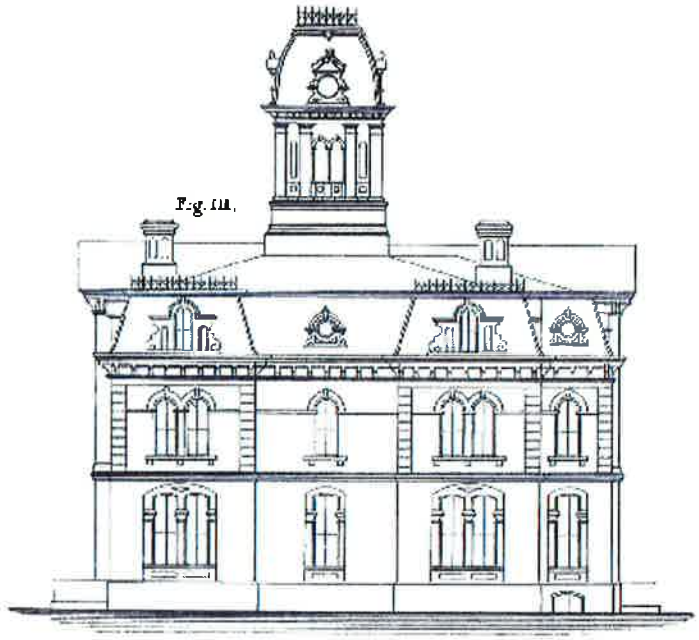


Fig. III.

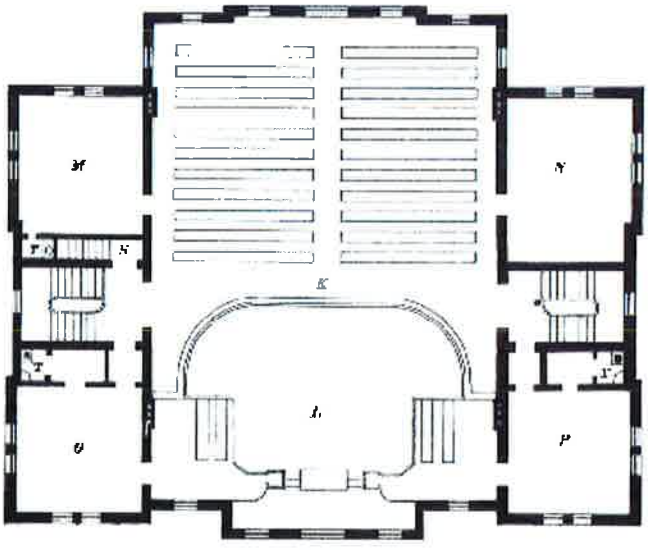


Fig. IV.

PLATE 50.

Design of Bay County Court-House, Bay City, Mich., in the 1878 publication *Bicknell's Village Builder and Supplement*

Courtroom interior facing judge's bench, 1883 Hancock County Courthouse in Sparta, Georgia (original interior before fire, since reconstructed)

Courtroom interior facing judge's bench, 1893 Franklin County Courthouse in Ottowa, Kansas (original interior)

1897 – Phase of Minor Repair Work

- Slate roof repaired.
- Courtroom walls and walls in first floor halls white washed.
- Locks installed on exterior doors.

1900 – Phase of Painting

- Courtroom walls white washed.
- Exterior woodwork (wood porches, windows, tower) painted.

1903 – Clock Installed in Tower

- First clock installed in tower in 1903.

1906 – Use Change, Electric Installed

Between 1900 and 1906 more full-time, salaried office workers began to occupy the courthouse. By 1906 the courthouse was open for business six days a week, eight hours a day.

- Electric power was brought to the courthouse, and rudimentary lighting fixtures were installed.
- Sawdust was removed from the floors, and "no spitting" notices were posted.

1908 – Water Installed

The first wells in Monroe were drilled by the railroad company near the train station. The city was responsible for installing the pipes and pumps. City water lines were installed in the streets all four sides of the courthouse between 1897 and 1902. In 1908 water lines were extended into the courthouse.

1912 – Indoor Plumbing Installed

Sewer lines were connected to the courthouse in 1912. A "ladies restroom" was installed in the northeast corner of the main level of the courthouse.

1920 – Indoor Plumbing Increased

A significant expansion of the sewer lines was undertaken in 1920, assembly for the installation of more bathroom facilities.

1928 - Significant Additions and Alterations Completed

Exterior:

- Tower roof and courtroom roof were repaired.
- Mansard roofs of original north and south wings were removed. New larger north and south wings were added. Original wings and new wings were topped with flat roofs.
- Courtroom sash windows were replaced with casement windows to give the building a more "Georgian" appearance (see image below).
- Skylights were installed above the 1888 south stair and in the 1928 north addition roof.
- Bars were added to the windows of the NW room off the courtroom. This room became the Detention Room for prisoners.

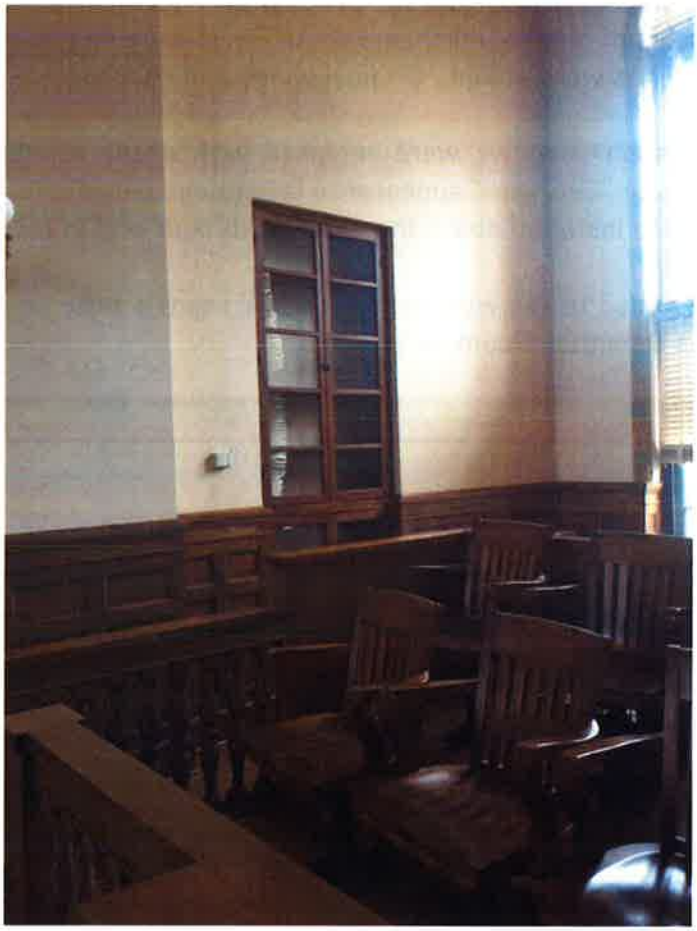
1895 Photograph showing original double-hung sash windows at courtroom.

Interior, General:

- Steam heat, new plumbing, new electric wiring, and new light fixtures were installed.
- Rooms in the NE and SE corners of the 1928 additions were built fireproof – concrete floors and ceilings, and steel roll up shutters at the windows.
- New wood flooring (1 ½" wide boards) laid over original floors (3 ½" wide boards) in main level halls. New stair tread installed from first to second floor.

Interior, Courtroom:

- Courtroom was reoriented with judge's bench at the north side of the room and balcony added at the south.
- The masonry opening at the original double door from the stairhall was infilled. Single door openings were cut through the north wall on either side of the new judge's bench.
- The masonry opening at the original Judge's Chamber door was infilled and a new wood and glass bookcase was installed in the recess.



- A door opening was cut through the north wall at the west side for the installation of a door into the new Detention Room. A small bathroom was added off of the new Detention Room.
- Louver in center of courtroom ceiling was removed and plaster medallion was installed. Plaster frieze was installed.

- Wood wainscot was installed in the courtroom.
- A 7 ½" high judicial platform was installed in the courtroom.
- All new furnishings were purchased for the courtroom - judge's bench, witness box, reporter's desk, jury box, courtroom bar, 207 opera chairs for the "auditorium".
- South stair rebuilt from second floor to attic for access to new balcony.
- Hall addition created to provide access between attic stair hall and new balcony.

- New opening made in south wall for access from hall addition to balcony.

1945 – Clock replaced

- Original winding clock works replaced with electrically operated clock works.

1978 – Phase of Roofing Work

- The cross atop the tower was removed and the original weathervane was re-installed.
- Built-up roofs on wings replaced and slate roof repaired.

1986 – Marshall McDowel Restoration

Exterior:

- Site Work – Exterior stairs to basement removed, door openings bricked up, areaways filled. Concrete paving removed, new brick walks installed. Two HVAC equipment pads and screens added. Exterior of masonry walls below grade waterproofed at 1928 wings.
- Exterior Masonry – all exterior masonry cleaned, damaged bricks repaired with mortar plug or replaced in-kind, some re-pointing of exterior walls, chimneys rebuilt and stucco trim replaced.
- Exterior Woodwork – all paint removed to bare wood (inside and out of windows), windows repaired with new sills as needed (also sealed shut and interior storms installed), doors repaired, porticos largely rebuilt, balcony rail repaired, clock tower structural repairs, wood sheathing and blocking beneath sheet metal repaired as needed.
- Exterior Metal – all paint removed to bare metal at clock tower sheathing, cornices, dentils, courtroom window trim and rails. All metal trim and skins including clock tower, facias, scrolled dentils, cornices, and balusters repaired or replaced and re-fastened. Six clock tower pinnacles repaired and two replaced and reinstalled. Two porticos and balcony re-roofed, and all flashing replaced. Downspouts installed at porticos. Iron portico railings repaired and reinstalled. Clock tower weathervane repaired and reinstalled.
- Exterior Painting – all exterior wood and metal repainted.
- Skylights – North skylight repaired. South skylight rebuilt.
- Clock Work – cast iron frame stripped and painted, face replaced with Plexiglas, new Plexiglas hands installed, clock works serviced.

Interior:

- Plaster Ceilings and Walls – All ceilings removed and replaced in-kind. Walls stripped to bare plaster and repainted. Some walls covered with a skim coat of plaster.
- Interior Woodwork – All wood floors sanded and refinished. Wood wainscot in main level halls sanded and refinished. All interior wood doors repaired and refinished. Wood stair baluster repaired as needed and refinished. Wood elements in courtroom (wainscot, court rail, etc.) repaired and refinished.
- Interior Painting – All interior finishes stripped to bare surface and repainted.
- Bathrooms – First floor bathrooms enlarged, floor/wall tile added, and new fixtures installed. North second floor bathrooms enlarged. South second floor bathrooms added.
- Windows at 1888 stairs – Openings bricked-up and plastered over.

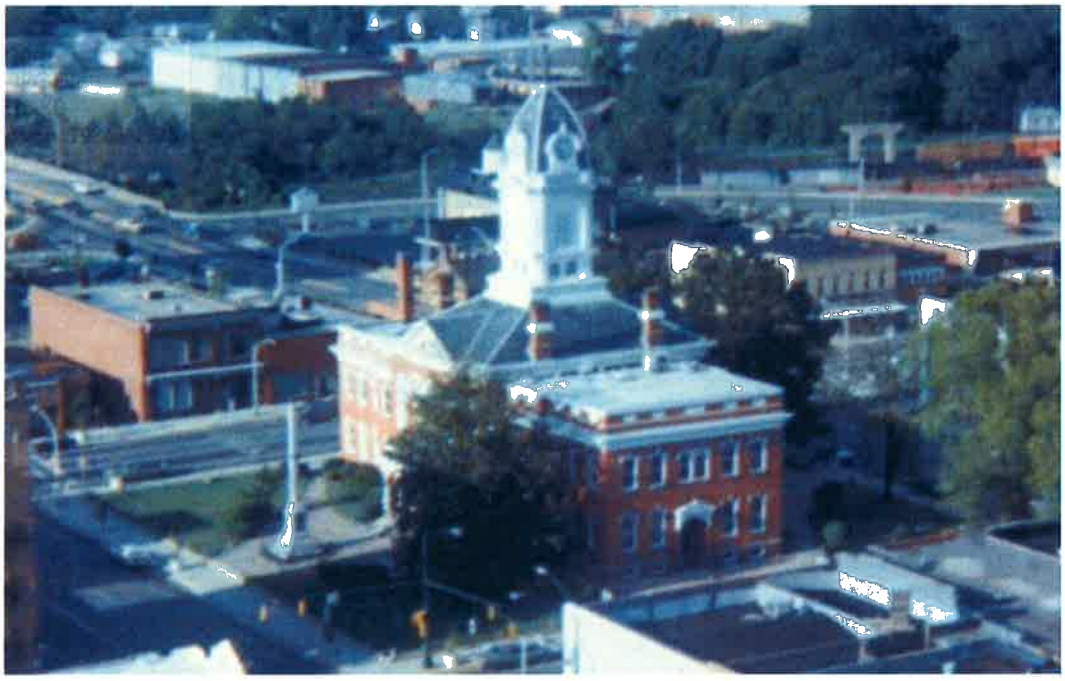
1990 - Repairs after Hurricane Hugo

During Hurricane Hugo (September 1989), the slate roof above the courtroom was damaged, causing significant water damage to the courtroom ceiling and plaster frieze.

- Slate roof above courtroom replaced.
- Flat plaster courtroom ceiling replaced with current "popcorn" ceiling.
- Decorative plaster frieze in courtroom replaced in-kind.
- Sheet linoleum flooring on judicial platform in courtroom replaced.

1993/1994 – Phase of Exterior Painting

- Tower painted and color changed from white to cream. See below photo of tower painted white in the 1970s.



1998/1999 – Phase of Minor Exterior and Site Work

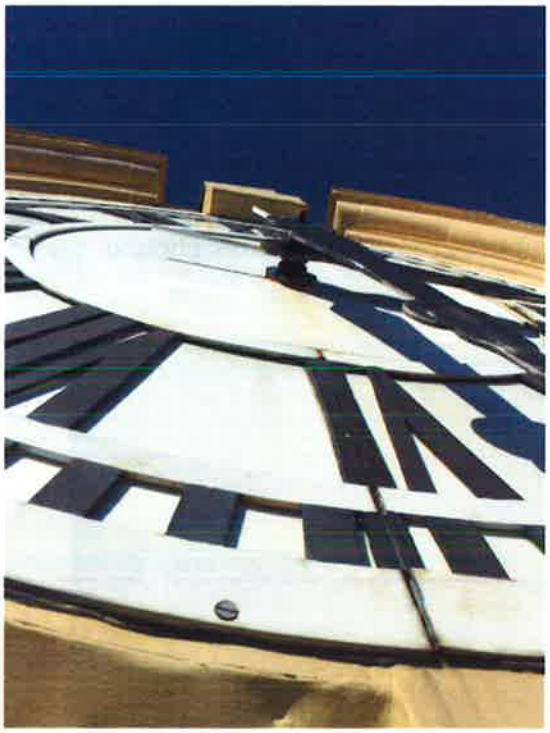
- Slate roof repaired.
- Chimneys rebuilt with original brick or matching new brick.
- North and South wing roofing replaced with modified bitumen rubber roofing.
- First french drain and membrane waterproofing installed at perimeter of 1926 additions.

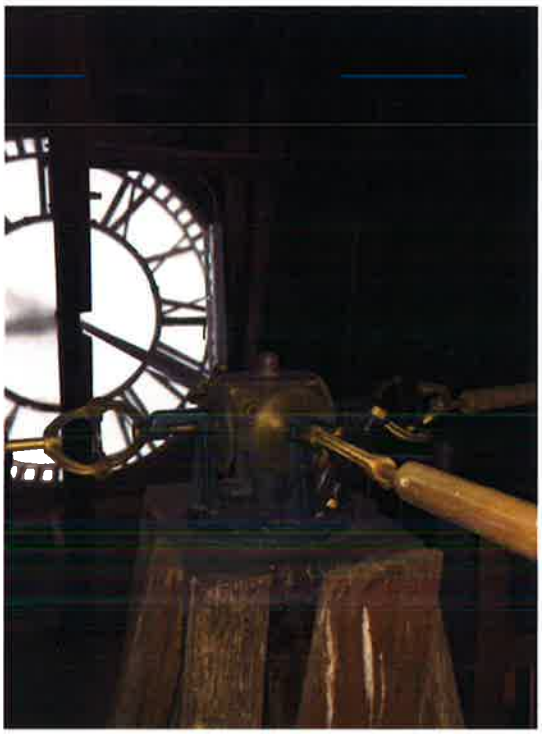
2001 – Egress Hardware Installed

- Exterior door hardware replaced to allow emergency egress.

2002 – Clock Restored

- Plexiglas clock faces replaced with milk glass clock faces.
- Electric clock works replaced with salvaged period clock works.
- Bell room and clock room interiors repaired.



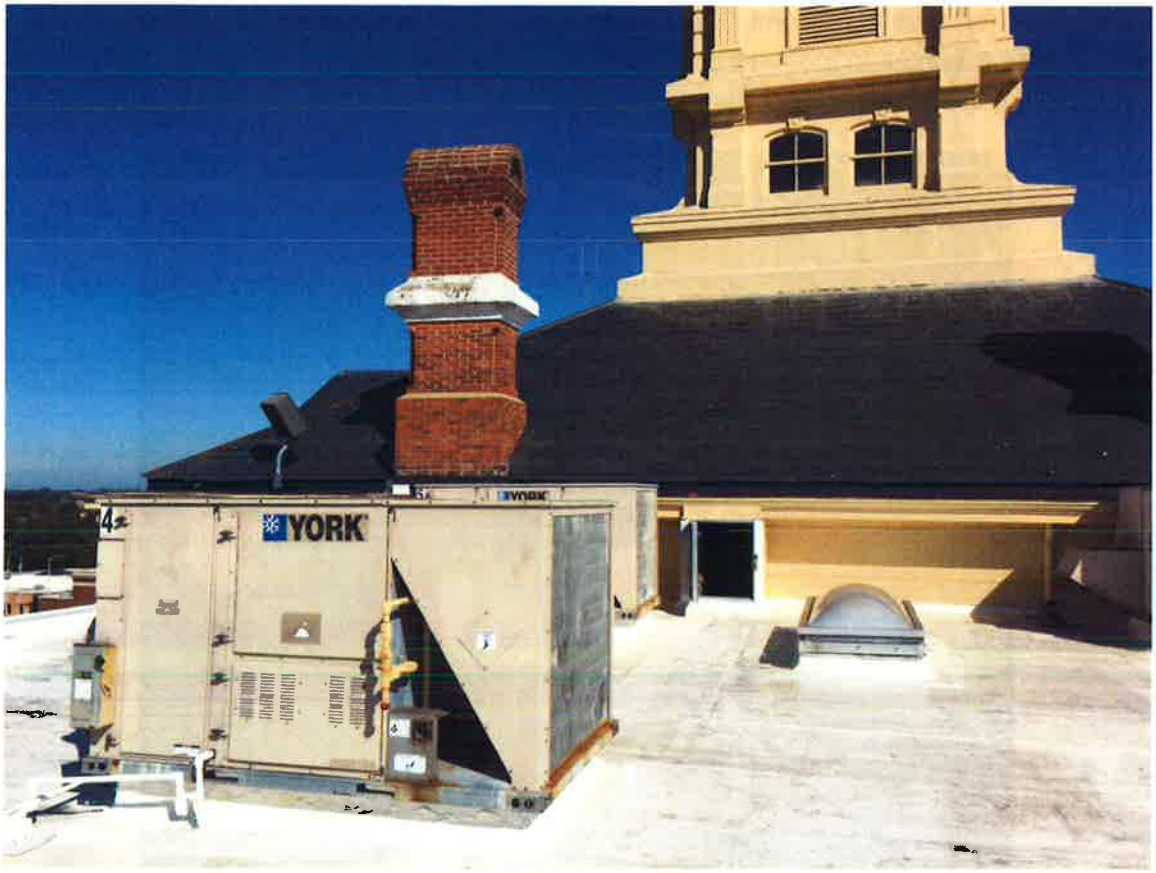


2003 – Phase of Minor Interior and Exterior Work

- North and south entrance doors reworked, re-glued and refinished.
- Sash of several second floor windows on the North and West sides of building were replaced in mahogany. Original glass was reused.
- Metal spiral staircase added to tower.

- Termite damage to wainscot and baseboards at North and South entrances, and elevator entrance, repaired.
- Second french drain and sump pump installed.
- Stair treads and floors in common areas refinished.

- Entire HVAC system replaced. Mechanical units moved out of tower and onto adjacent flat roofs.



- Handrails added at North and South side steps.
- Exterior masonry cleaned.
- Cast stone parapet cap and foundation repaired.

2005/2006 – County Moved Out

County offices occupying space in the courthouse moved to other county buildings.

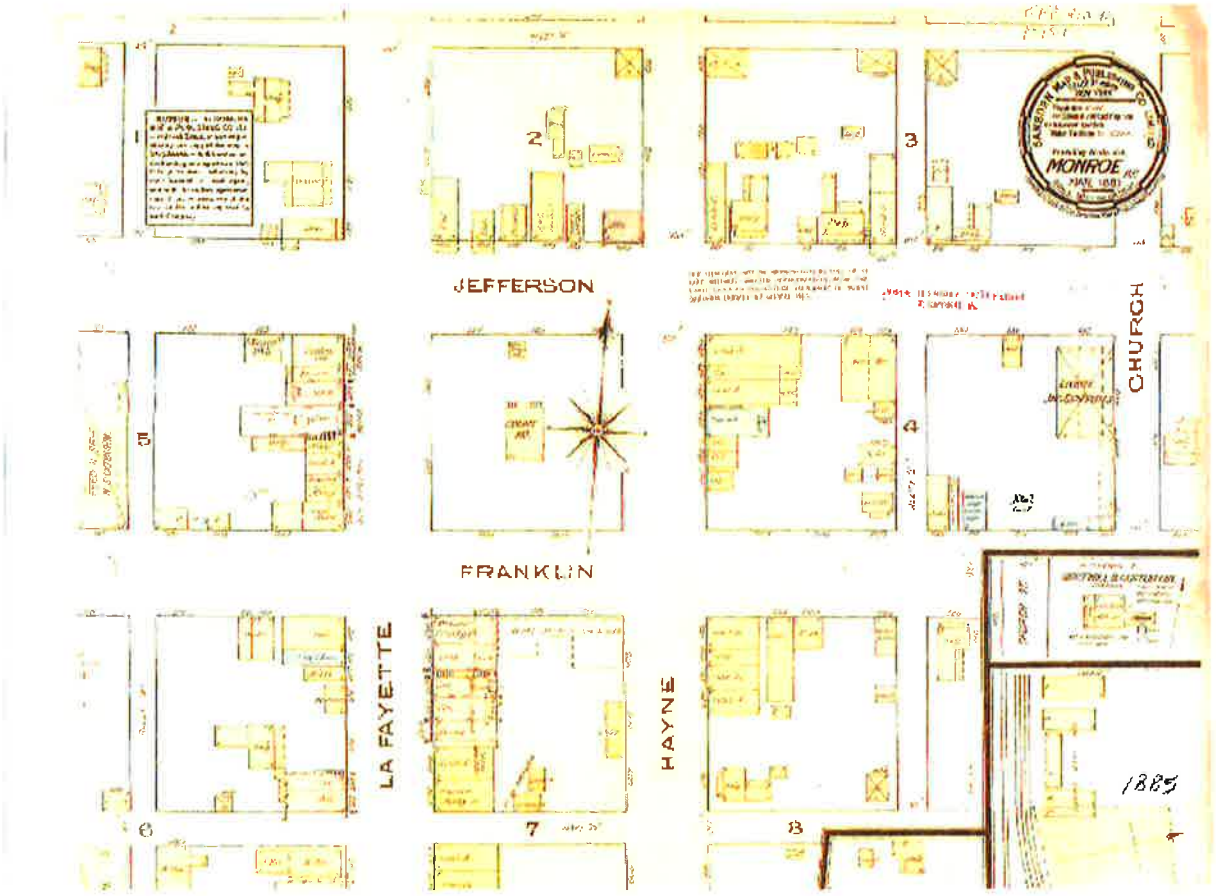
2015 – Museum Designation

In June of 2015 the entire site and building were designated a "museum".

HISTORIC SITE ANALYSIS

One of the major tools historians use to research the changes to building sites over time is the Sanborn Fire Insurance maps. Sanborn maps were created, starting in 1867, to assess fire insurance liability in urbanized areas across the United States. These maps include information regarding building footprint, height, construction material (frame vs masonry), proximity to fire stations / fire cisterns, etc. The Sanborn maps are wonderful resources but cannot be relied upon exclusively. Researchers have to remember these maps served a specific purpose which is not the purpose for which we are using them today. It is always advisable to substantiate the information shown on the maps with historic photographs were possible.

1885 Sanborn Map – Wood-Frame Courthouse



In an undated photo (below), most likely from the early 1900s, the bell is shown sitting on the southeast corner of the square at the intersections of Hayne and Jefferson Streets. The fire bell now forms part of the Firefighter's Memorial, located at the Hayne Street (East) entrance to the Courthouse.

1889 – First Site Work Completed

- Stone wall laid at the perimeter of the courthouse square.
- Brick sidewalks constructed.
- Granite walk constructed "in front of the Court House."

1892 Sanborn Map – Masonry Courthouse

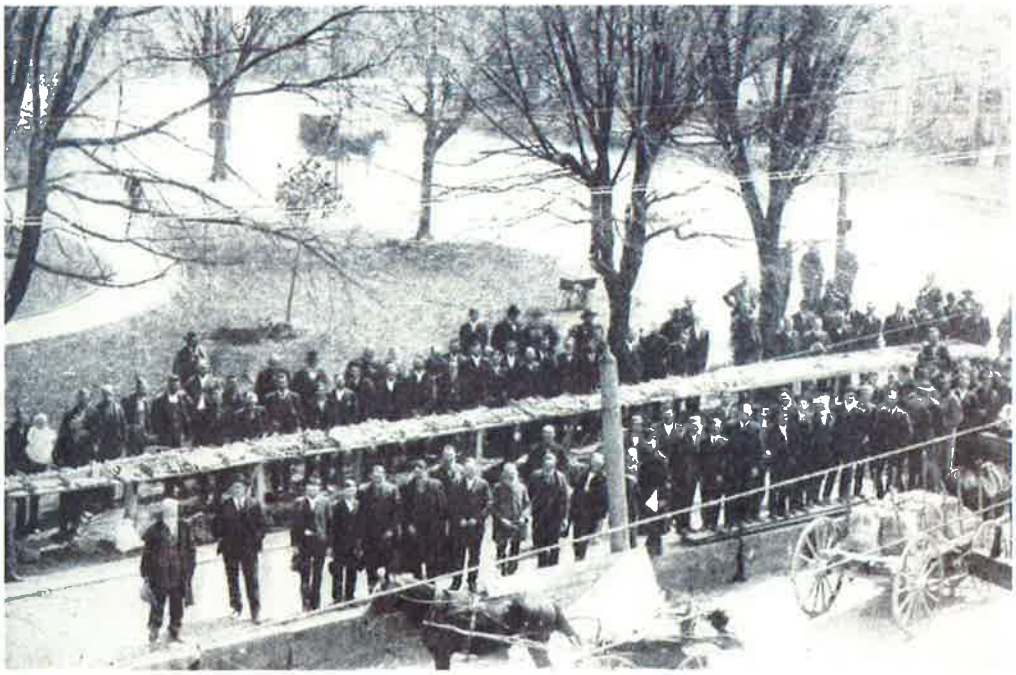
The masonry courthouse was completed in 1888, and appeared on the 1892 Sanborn map. The building is shown as a two-and-one-half story masonry structure, with a five-story wood frame tower, and two one-story wood frame porches on the east and west elevations. The roofing is indicated as slate, tin and shingle. The building is shown sitting equidistant from north to south on the block, but closer to the west side than the east. In his book "The Union County Courthouse 1843-1981", Wayne Durrill notes the business district was developing to the west of the courthouse square, so the west entrance was intended as the main entrance and located closer to the street.

Upon the completion of the courthouse in 1888, the Board of Commissioners turned their attention to the courthouse square. Over the next year and a half a wall of local stone was laid around the perimeter of the square, a brick sidewalk was installed, and granite walk was placed at the Lafayette Street side of the courthouse. The planting of grass on the square was first noted in 1896.

Photo research indicates that the Hayne Street side of the site was used for sales and display of goods by county residents. A 1906 photograph of Hayne Street taken from the

courthouse square (below) shows a dirt area approximately twenty-five feet deep, running the full width of the block, bordered by granite blocks, with a wood ramp at its center.

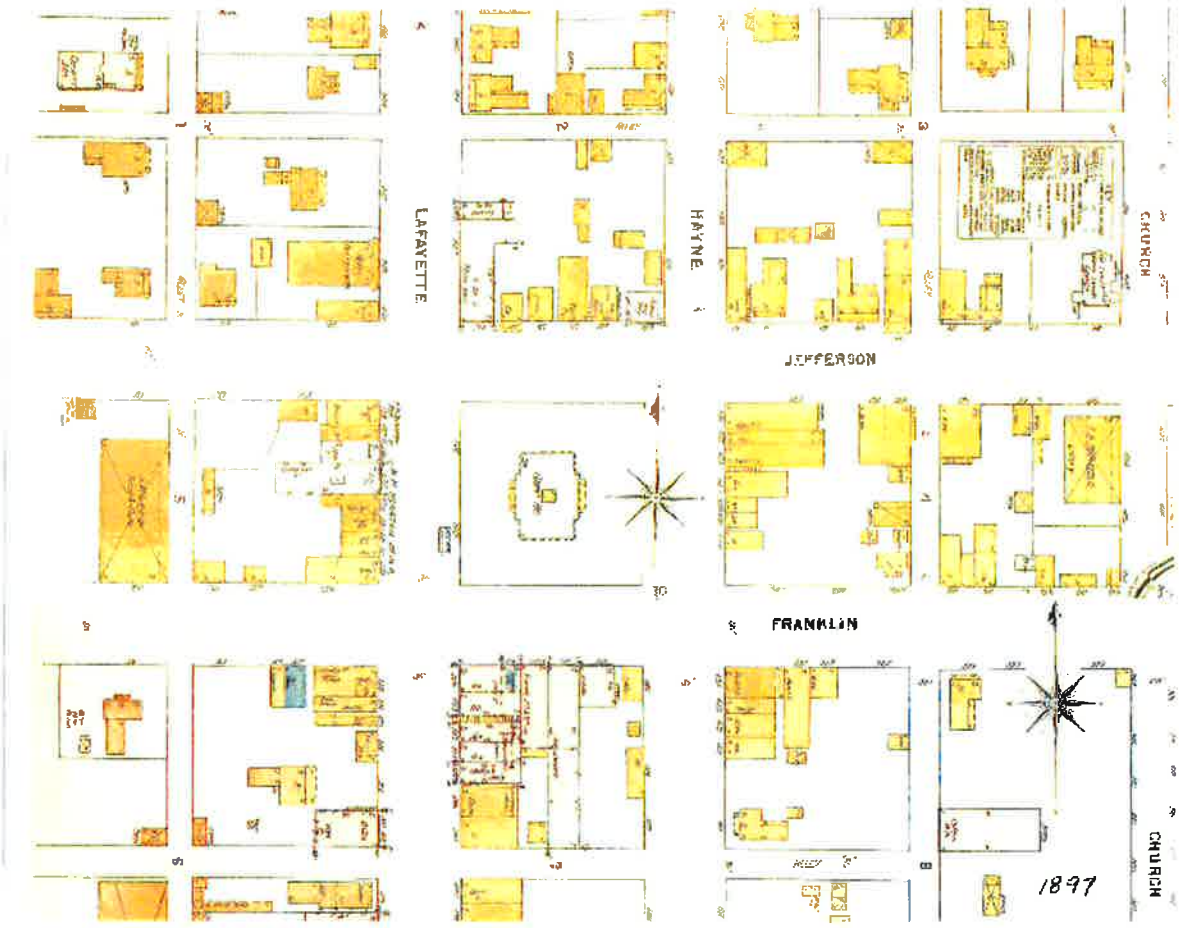
A 1910 photo of "Farm Demonstration Day on the Courthouse Square" explains the use of the large dirt area in contrast to the grassy area on the west side of the granite. In this photo (below) tables are lined up along the edge of the dirt area for display of farm wares to the public.



Beginning in 1910 the county government, city aldermen and Daughters of the Confederacy joined forces to renovate the courthouse square and change its usage from public to civic. From that point forward, sales and display of goods moved from the Hayne Street side of the courthouse square, to Hayne Street itself. A 1934 photo (below) shows trucks loaded with bales of cotton parking on Hayne Street adjacent to the courthouse square and one block south, in anticipation of a day of street sales.

On the 1885 and 1892 Sanborn maps, the Jail is shown at the corner of Hayne and Jefferson Streets, across the street from the courthouse. By 1897 a new County Jail had been constructed two blocks to the northwest of the Courthouse. This change did not affect the site, but may have affected the building. In 1928, a "detention room" was established inside the courthouse, just off the courtroom. This room may have been deemed necessary due to the move of the jail to a site further from the Courthouse.

1897 – Sanborn Map



The 1897 Sanborn map shows a well located just off the southeast corner of the site at the intersection of Hayne and Franklin Streets. Mr. Durrill's book states,

> "This was evidently one of the four wells at the courthouse that ordinarily did not appear on the Sanborn maps. The wells were reported to have stood in the middle of the four intersections of the courthouse square in the 1880s. By the 1930s the four wells were located at the four corners of the square, two of them then covered by fountains."

His footnote for this passage sites the 1897 Sanborn map and Board of Commissioners dockets from 1907 and 1908. I do not doubt that this information appears in the dockets, but I have found no map or photographic documentation to substantiate existence of the four wells. As Mr. Durrill implies, the 1897 map is the only Sanborn map on which any well is shown.

An undated photo (below), from approximately 1900, shows a well just off the southwest corner of the site at the intersection of Lafayette and Jefferson Streets (not the southeast corner as shown on the map). Water from the well would have been carried into the courthouse in buckets for use as drinking water.

Two cast iron fountains, thought to be original to the courthouse square, have been restored by the County. One is currently displayed in the lobby of the modern courthouse. The other is stored in the historic courthouse. The company who restored the fountains, Robinson Iron, estimates their date of production to the 1890s. A photo dating to the 1920s, and an enlargement of the area of interest (both below), show one of these fountains located on the southwest corner of the courthouse square.

Another photo dating to 1937 (below), also shows one of these fountains located on the southwest corner of the courthouse square.

A photo from a 1941 newspaper article (below), shows two soldiers drinking from one of the fountains.

For the purposes of this report, I will assume that the southwest fountain was originally installed in the 1890s.

1911 – Second Phase of Site Work Completed

- The Confederate Soldiers Monument, the first monument on the courthouse square, was installed on the west side of the county courthouse square. The 40-foot tall granite monument was dedicated on July 4, 1910.

- "Cement walks around the square and walks leading up to the Court House" were installed.
- Two to three foot tall granite curbs were installed at the perimeter of the courthouse square.
- A lawn was planted and iron benches were installed.

1914 – Sanborn Map

The 1914 Sanborn map shows a solid line at the perimeter of the courthouse, indicating a sheet metal cornice. The 1892 map shows no line, indicating that the building had no cornice. The 1897, 1902 and 1908 maps show a dashed line, indicating a wood cornice. The earliest known photo of the masonry courthouse dates from 1886 and shows a cornice. Mr. Durrill's book states:

> "Another interesting physical change in the courthouse was made sometime between 1892 and 1897. A wooden cornice was recorded for the first time attached to the brick outer walls of the courthouse. The cornice ran all the way around the building, not including the wooden porches. This was somewhat unusual in downtown Monroe, since most brick buildings showed metal cornices, rather than wooden ones. All of the brick buildings on the courthouse square had metal cornice facing the square, including the bank and general store on Franklin Street; and a brick store building under construction on the northeast corner of Lafayette and Jefferson Streets. Those buildings with wooden cornice were mainly smaller wooden buildings. The Board evidently hoped to enhance the appearance of the building and its role as a symbolic center, but at a minimal cost."

Forming and assembling sheet metal was common in the late Nineteenth Century and would have been expected for an important masonry building such as the courthouse. Our physical evidence research indicates the sheet metal on the tower is original to the 1886 building, thus the cornice would be as well. This is a minor point, but one goal of this report is to clarify and revise any past conclusions or assumptions regarding the courthouse and courthouse square.

The 1902 Sanborn map shows single water lines running down each of the streets bordering the courthouse square. The 1908 map records the installation of a second water line at three of the four streets bordering the courthouse square. The 1914 map notes "Heat: Stoves – Lights' Elec." Since heating sources and electric are potential sources of fire, and water quells fire, the Sanborn maps are a reliable source of information for these types of advances.

The 1914 Sanborn map shows the courthouse in plan for the first time. Previously, the courthouse was represented with a roof plan, the standard form of Sanborn building representation. The most likely reason this was done, was to allow a way to graphically indicate the location of the vaults and fire shutters. The floor system of the vaults consists of steel beams topped with brick arches and a concrete slab. The steel floor beams are embedded in the brick foundation walls. The brick foundation walls do not appear to have been modified for the installation of the beams. Thus, the physical evidence indicates that the vault construction is original to the 1886 building.

1922 – Sanborn Map

The 1922 Sanborn map shows the installation of new water lines at three of the four streets bordering the courthouse square. The two 4" lines on Hayne Street were consolidated into a single 8" line. The 8" and 4" lines on Jefferson Street were consolidated into a single 10" line. The 6" line on Franklin Street was replaced with a 10" line.

1930s – Third Phase of Site Work Completed

- The Union County Revolutionary War Soldiers Monument, a rough-hewn granite block with a bronze plaque attached, was dedicated on October 31, 1931. The monument is located on the west side of the courthouse square facing Franklin Street.

- A cannon was placed on the northeast corner of the square as a World War One memorial (see below photo). The cannon was eventually removed from the courthouse square.

1950s – World War Two Monuments Placed

- A bronze War Dead Plaque was attached to the west elevation of the courthouse just to the south of the entrance doors in 1952.

- A stainless steel and neon cross was placed atop the courthouse tower and dedicated in 1950. In 1978 the cross was removed and the original weather vane was reinstalled. The cross has been restored and placed on a wooden base, and is currently stored inside the courthouse. A bronze dedicatory plaque for the cross is located just above the War Dead Plaque.

1985 – Vietnam Memorial Placed

- The Union County Vietnam Memorial, a simple marble slab marker, was dedicated on May 27, 1985. The memorial is located on the east side of the courthouse square facing Jefferson Street.

1995 – Korean Memorial Placed

- The Union County Korean War Memorial, a simple granite slab marker, was dedicated on November 11, 1995. The memorial is located on the west side of the courthouse square, north of the Confederate Monument, facing Main Street.

1996 – World War One Memorial Placed

- The World War One Memorial, a simple granite slab marker, was dedicated on May 25, 1996. The memorial is located on the west side of the courthouse square, south of the Confederate Monument, facing Main Street.

2008 – Firefighter's Memorial Placed

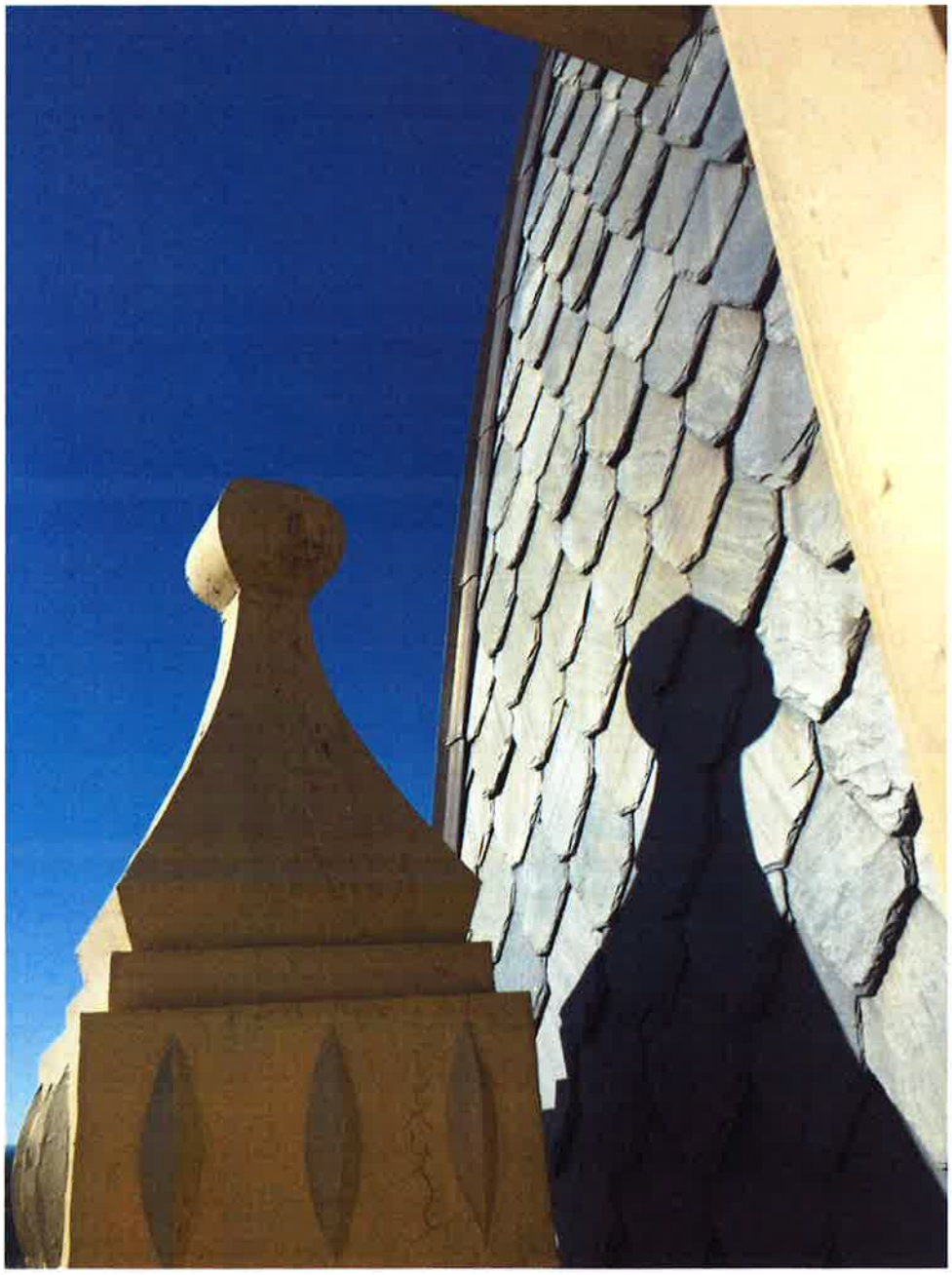
- The Firefighter's Memorial, a granite pedestal topped by the original courthouse square fire bell, was dedicated in September of 2008. The memorial is located on the east side of the courthouse square, in front of the east entrance, facing Hayne Street.

2012 – Memorial for Confederate Pensioners of Color Placed

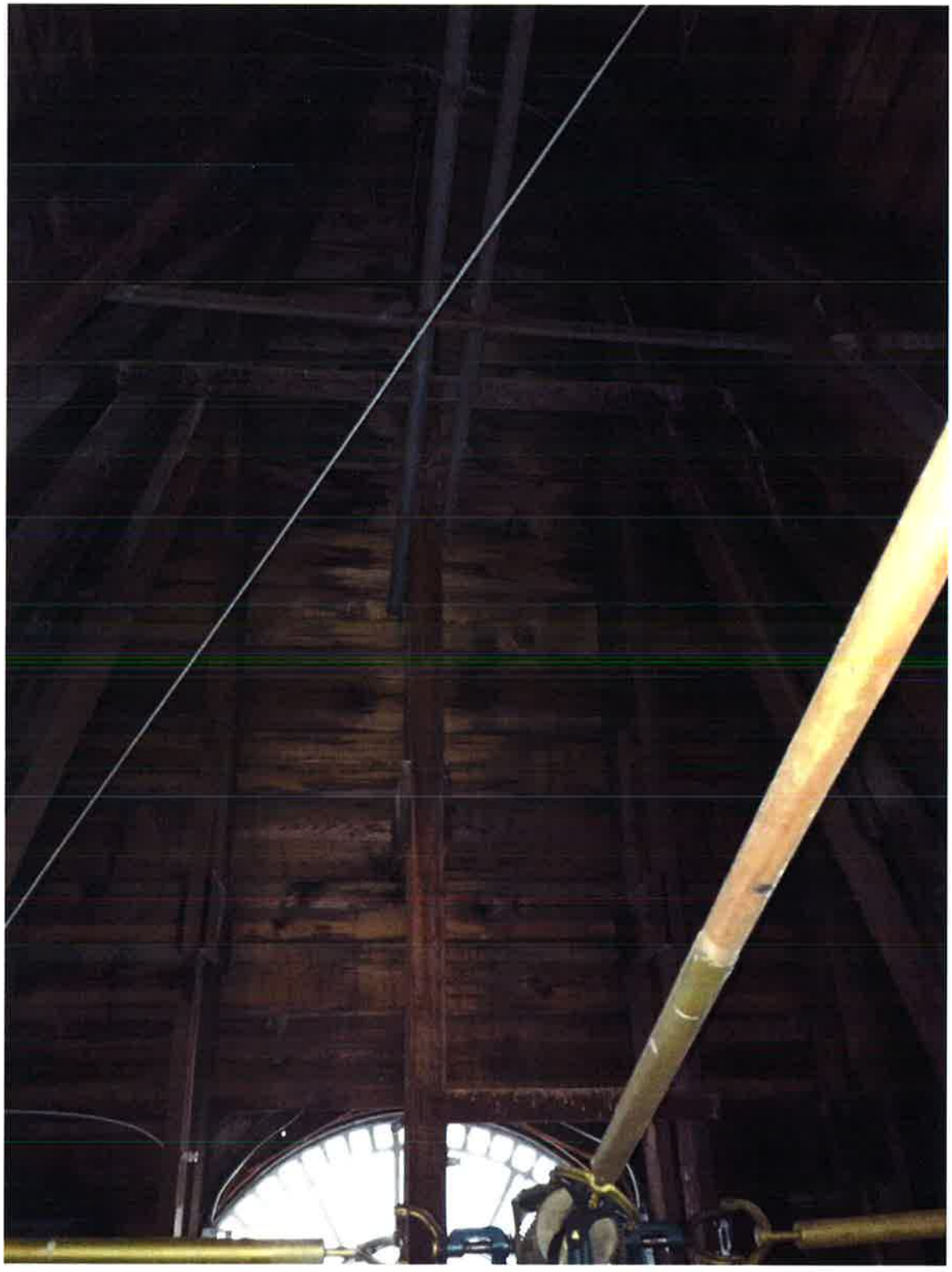
- The Memorial for Confederate Pensioners of Color, a granite marker set into a brick walkway, was dedicated on December 8, 2012. The memorial is located on the west side of the courthouse square, at the base of the Confederate Monument.

BUILDING ENVELOPE STUDY

Union County has been an excellent steward of its historic courthouse. That said, time and weather take a toll on all structures. The following building envelope study is organized from the top down, starting with the 1886 building and moving to the 1926 wings.

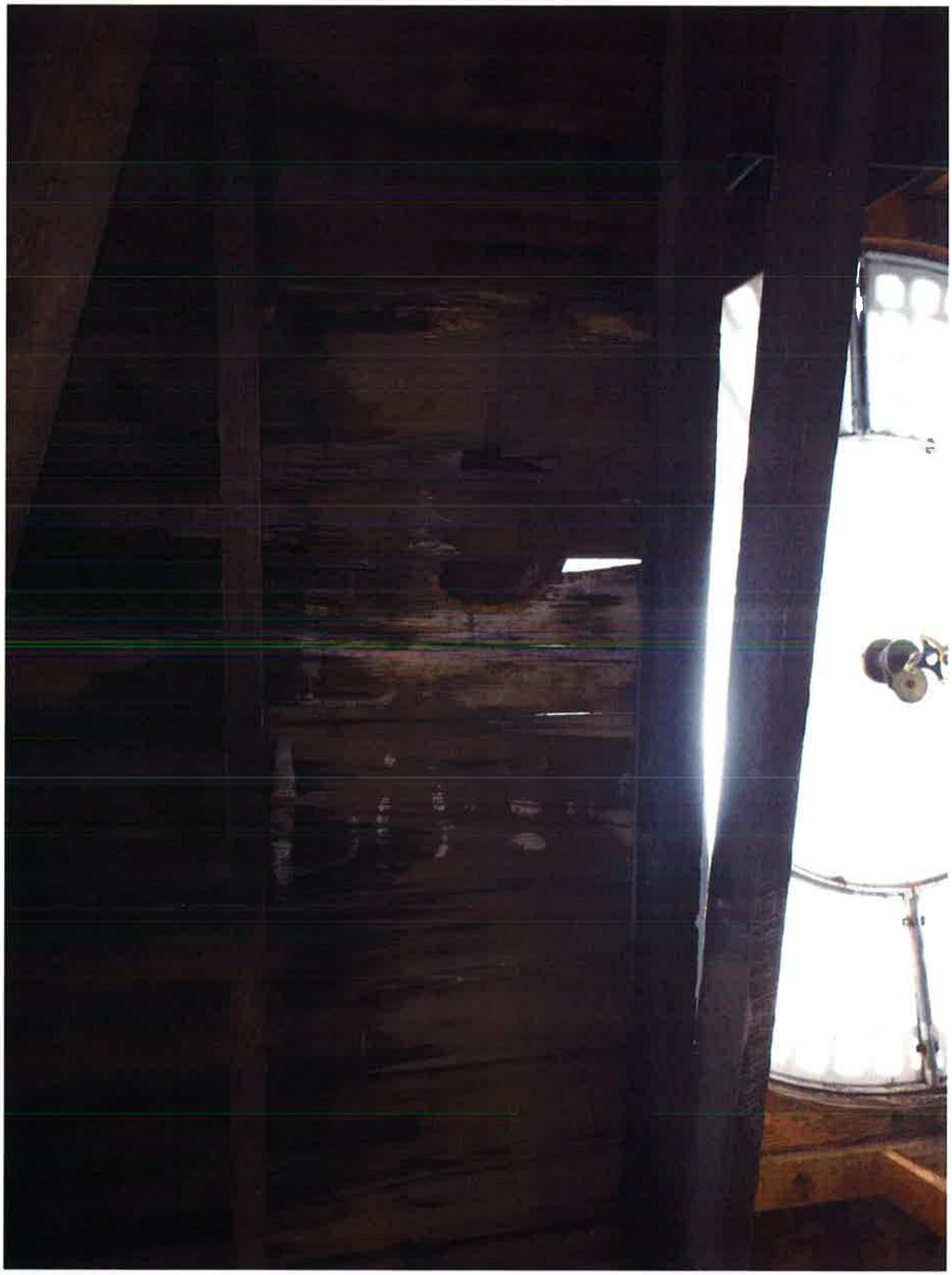


The ridge flashing installed during the 1986 restoration is made up of many segments. This installation allows for many more points of water entry than a single piece of flashing.



Water appears to be "washing" the interior face of the cupola decking boards. We assume the flashing at weathervane atop of the cupola has failed allowing water to penetrate the roofing assembly.

Water is penetrating the hoods above the clocks in all four locations. Bolt holes where the finials are attached have been some of the first areas of decking to deteriorate.



The decking below the valleys created where the clock hoods meet the roofing, has significantly deteriorated in some locations.

The sheet metal roofing just below the clocks is in good shape, with only minor areas of rust and paint loss.

The 1990 slate roofing work is less than ideal. Reglets were cut into the brick chimneys where step flashing should have been installed. The anchors holding the slate are beginning to fail as evidenced by fallen slates and inappropriate "tab" copper temporary repairs which are also failing.

The open gutter around the slate roof is far too shallow and has no retaining edge. Water washes over the edge of the gutter, down the face of the metal cornice and brick below. In heavy rains, the water cascades over the gutter to the flat roof below and splashes back onto the brick wall below.

Water penetration at the slate roof can be seen as water staining and damage to the roof plate, rafters and decking below.

Water penetration from the slate roof and box gutter, has caused significant deterioration of the plaster frieze in the courtroom below.

In the courtroom, some walls have been covered in fabric to cover cracks and other forms of plaster damage.

At the courtroom windows, heat caused by the interior storms and UV damage has damaged the wood at the interior face of the window sash. The interior sills have also suffered UV damage.

Exterior window muntins appear to have been rebuilt with wood filler and hastily re-glazed in several locations.

The flat seam metal roofing on the porticos has been covered with roofing tar which has crazed and eroded.

Moisture penetration from the roof above has caused paint deterioration at the portico ceilings and mildew at the windows.

The flat roofs on the 1926 wings are holding water, specifically at the far south and far north edges.

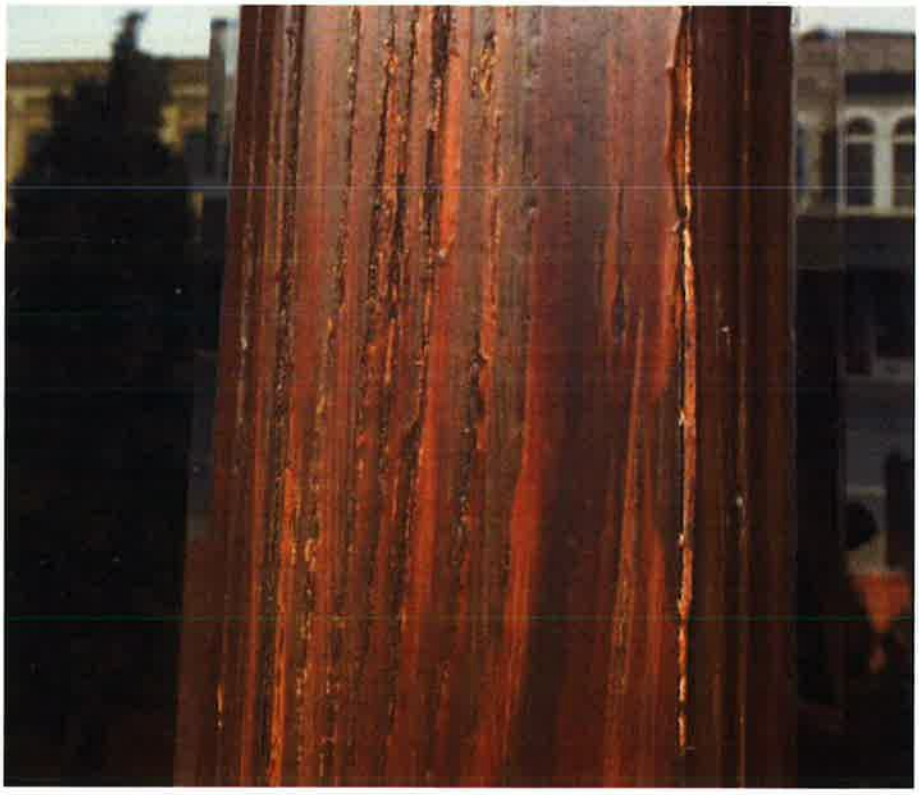
Water penetrating the flat roofs, specifically at the SE corner, has damaged the roof decking, attic flooring and the ceiling in the room below.

Water has damaged the ceiling in the room at the NW corner of the second floor.

Past roof damage has caused water staining to the flooring in the room at the SE corner of the second floor.

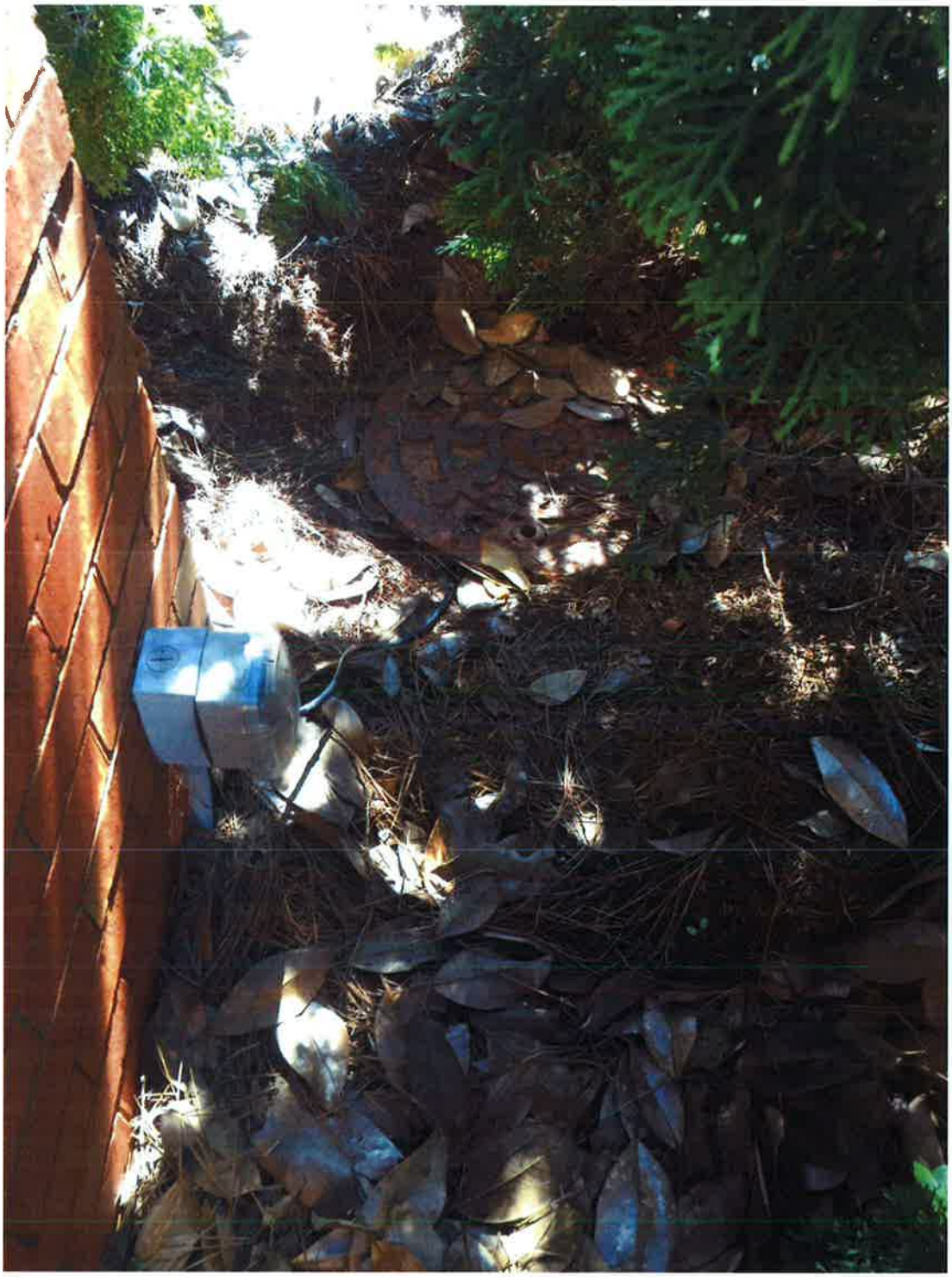
The pent eaves at the 1926 wings are beginning to spot rust in many areas.

The flat seam metal at the balcony flooring has begun to corrode.



The finish on the exterior doors, specifically the south pair of doors, has begun to fail.

In 1998/1999 a waterproofing was applied to the sub-grade level of the 1926 wings. This waterproofing has begun to deteriorate.



At the same time a sump pump was installed at the SW corner of the building. This pump is no longer functional. According to Union County Public Works staff, the sump pump limited water infiltration into the south basement for several years after it was installed, while it was functional.

According to Union County Public Works staff, the basements of the 1926 wings flood during heavy rainfall events. Infrared photographs do not indicate the types of saturation conditions that would be expected if water intrusion was due to groundwater.

Water penetration at the handicap ramp into the elevator lobby appears to be due to a clogged drain at the base of the ramp.

Large shrubs have been installed adjacent to the foundation of the building in all locations, excluding the four entrances.

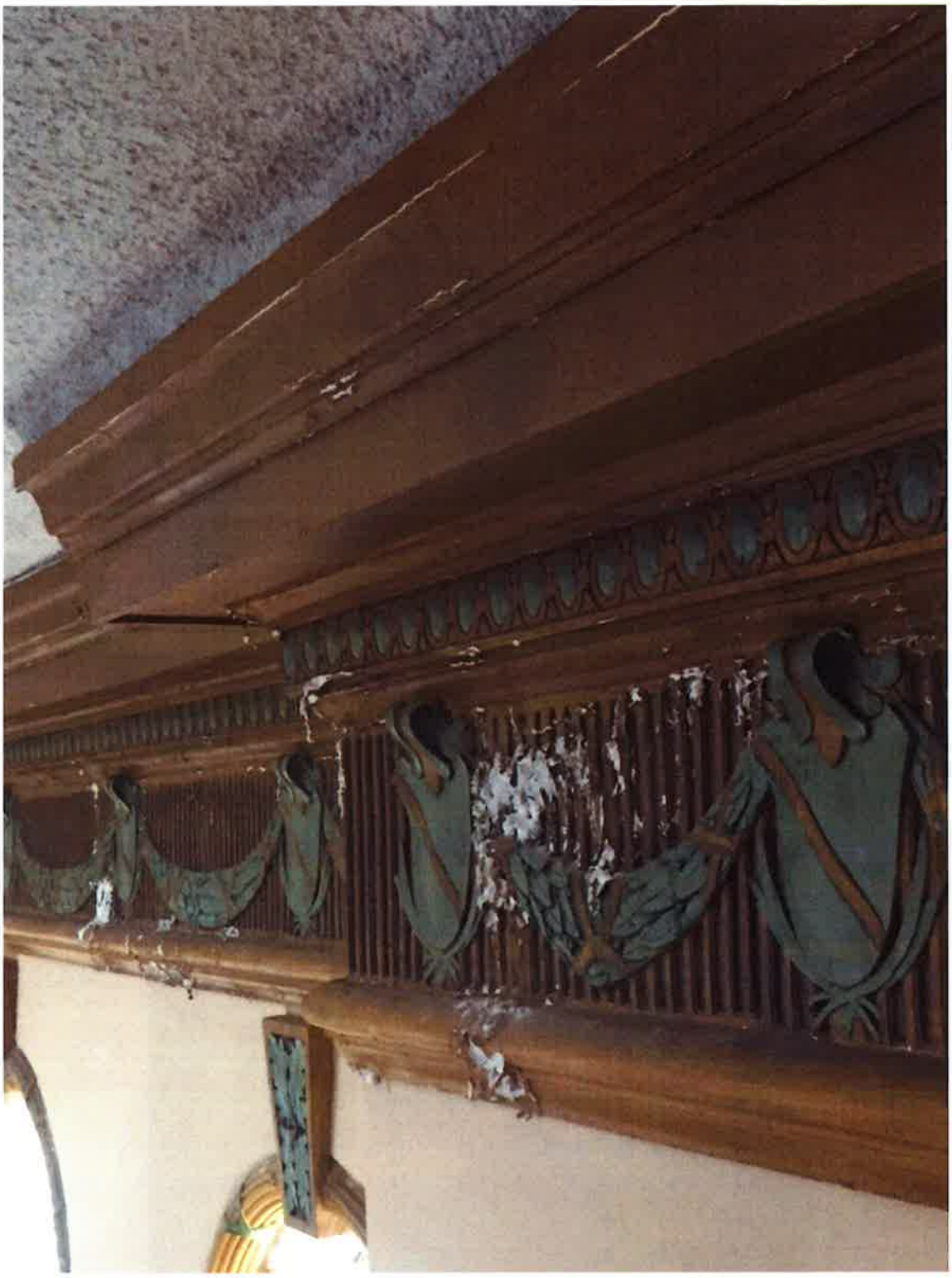
A sprinkler system has been installed to water the large shrubs. The sprinkler system is currently functional and used.

INTERIOR FINISH AND FEATURE ANALYSIS

The 1888 Union County Courthouse has undergone a major renovation and additions (1928), a significant restoration (1986), and post hurricane repairs 1990, all of which addressed interior finishes and features. Some of the items added in 1928 are in need of restoration for the first time. Some items restored in 1986, in high traffic zones or sacrificial locations, are in need of restoration again. Some repairs made in 1990 have failed again due to water infiltration. The below analysis will begin with plaster walls and ceilings, move to wood features and flooring, and conclude with light fixtures.

During the 1988 renovation, many of the plaster walls were "skim-coated" to cover areas of repair. This was a common technique at the time, but is no longer recommended. Over time, the thin layer of finish plaster fails, as seen in the above photo.

As part of the 1990 post-hurricane repairs, the 1928 flat plaster ceiling was replaced with a textured "popcorn" finish. This finish is historically inappropriate and has not aged well. There is unsightly staining at the air registers located throughout the ceiling.



In 1990, the 1928 lime plaster frieze was replaced with fiber-reinforced gypsum plaster. Some of the formwork and unused pieces remain in the attic (see following photos). Due to water infiltration at the slate roof and gutters, the gypsum plaster frieze is failing.

Foam formwork for 1990s plaster frieze.

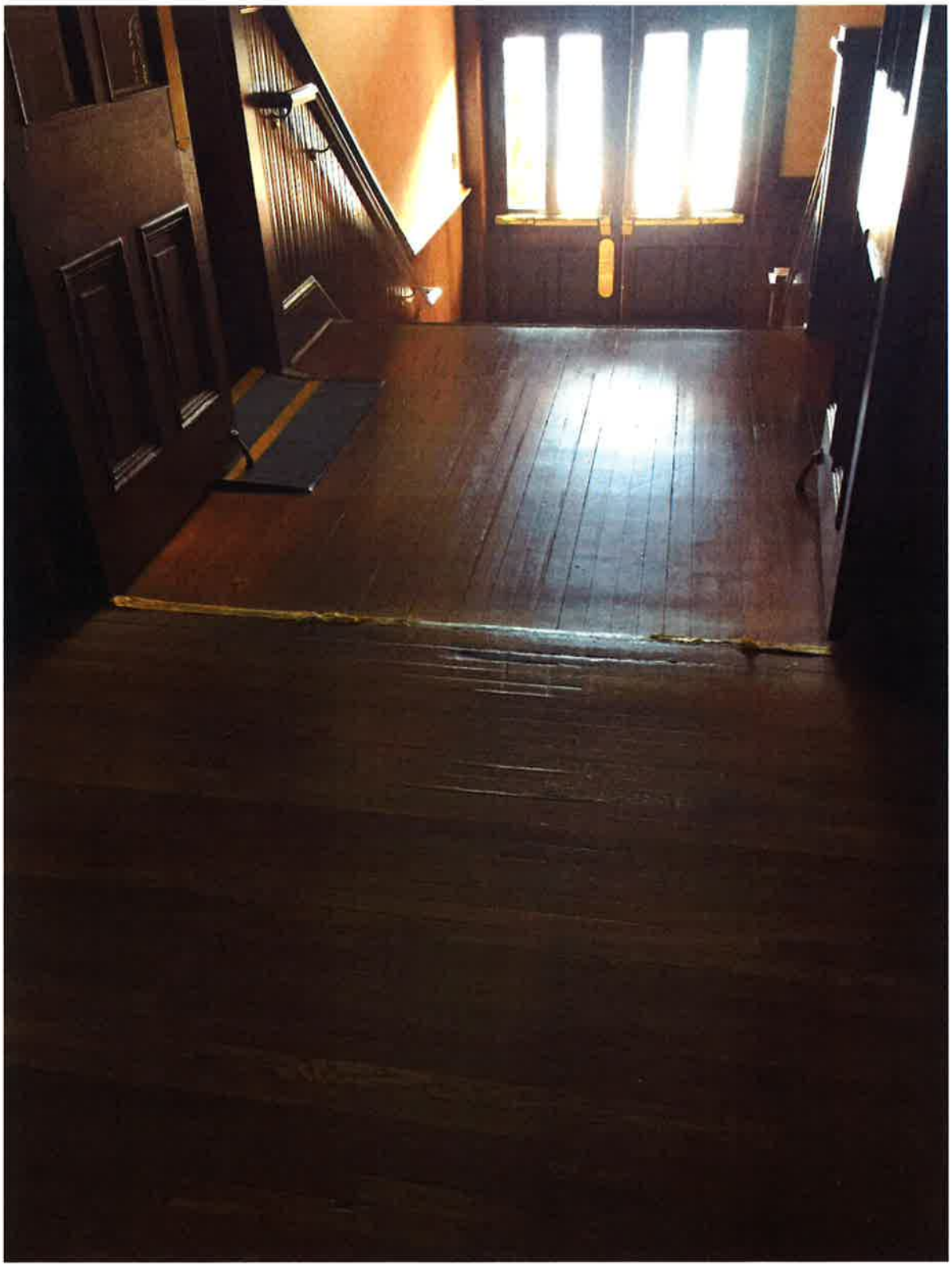
Unused fiber-reinforced (blue plastic mesh) plaster units from 1990s plaster work.

During the 1886 renovation, fabric was applied to areas of the courtroom walls to cover damage and cracking. This is no longer recommended. In addition to limiting the breathability of the walls, it alters the aesthetics of the wall surface and corners.

Most, if not all of the 1888 and 1928 woodwork in the building was repaired and refinished during the 1988 renovation.

Hardware changes and use over the last 28 years have taken their toll on the doors and door surrounds.

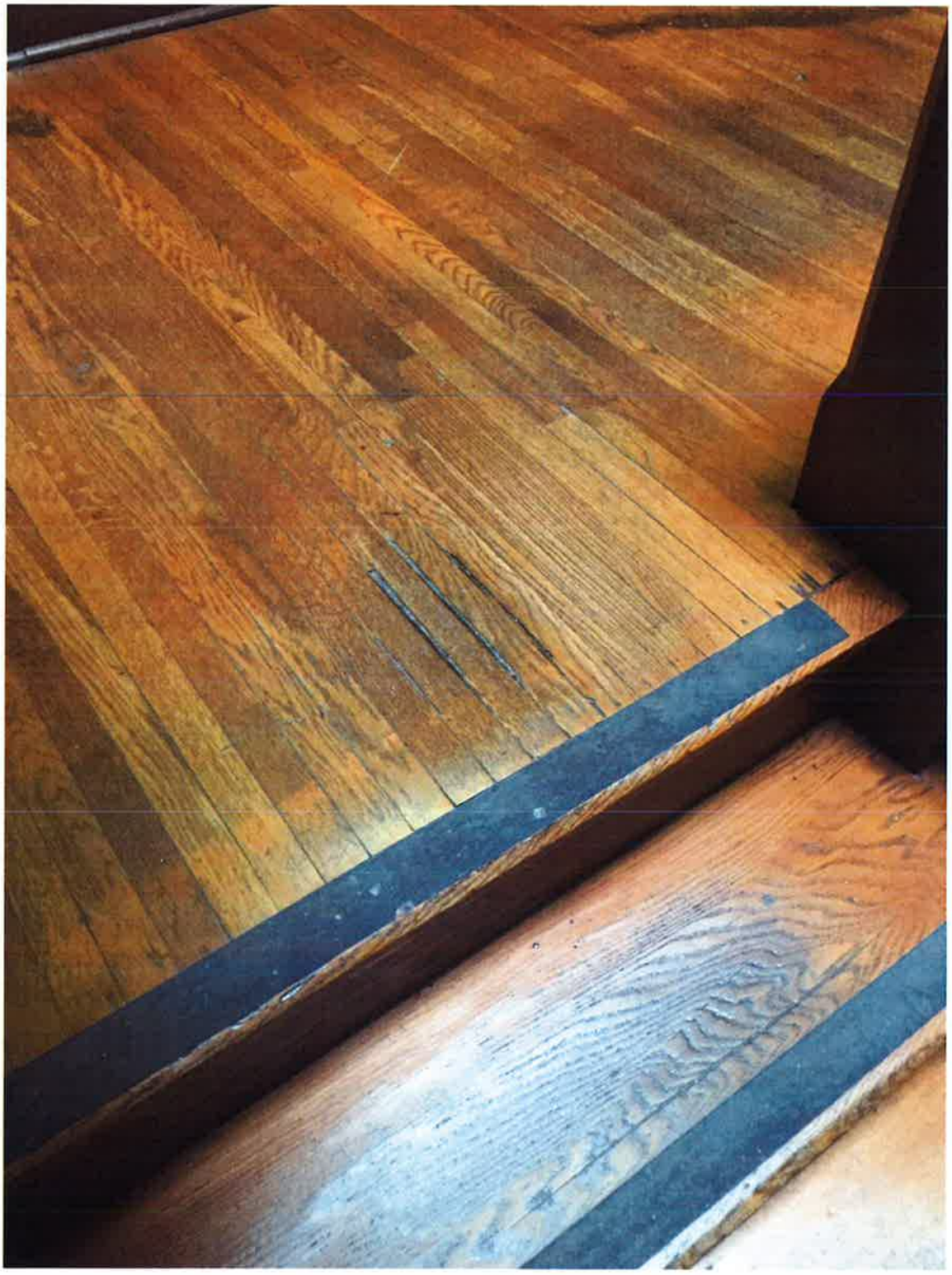
Historical accounts describe the 1888 floors as being covered in sawdust to absorb chewing tobacco spit. Given this "rough" use, it is not surprising that the 1888 floors were covered with a new layer of flooring in 1928. The original flooring can be seen at the enclosures beneath the stairs.



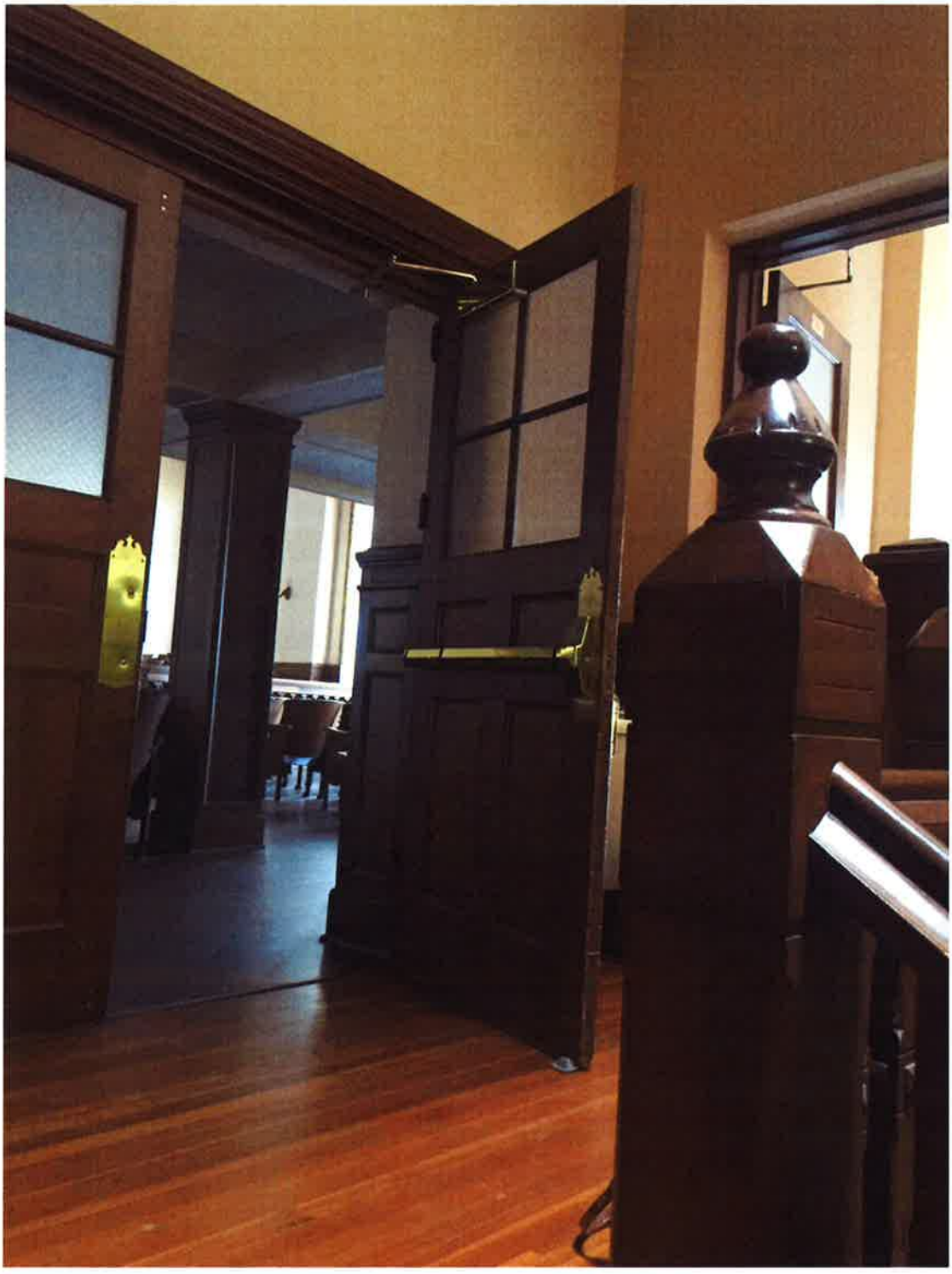
In high traffic areas, such as the south stair hall and exit, the 1928 flooring is showing wear.

During the 1928 renovation, the original north and south exterior doors were repurposed as interior doors. The center raised panels were removed and replaced with glass to allow additional light into the north and south stair halls. The door hardware dates to the 1988 renovation.

The stair stringers, treads and risers were replaced in 1928.



The stair treads are experiencing some wallowing due to use. The landing flooring, like the flooring at the main level halls, is worn to the point of damage. As the tongue-and-groove floor boards wear down, the top section of the grooved edge weakens and breaks away.



In 1928, the two original upper panels of the courtroom doors were removed and replaced with four panes of wire glass. This allowed light from the skylight (also added in 1928) to filter into the area below the balcony. Originally, exterior windows lit the north and south stairwells. In 1888, both stairwells were used for public access to the courtroom.

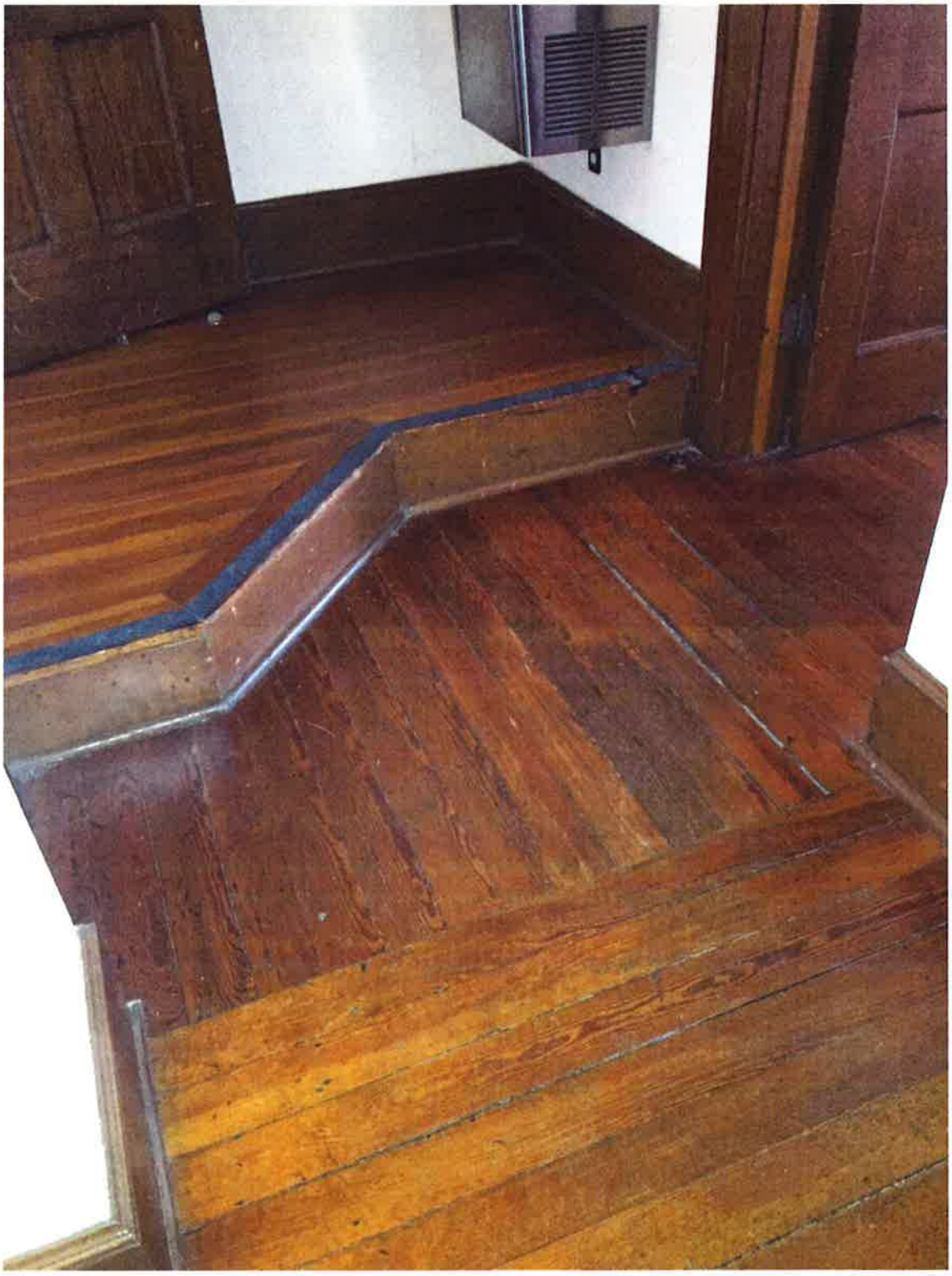
The hardware on the courtroom doors dates to three periods. The hinges are from 1928. The back plates date from 1988 and would have originally had decorative pulls, like the doors downstairs. The deadbolt and current pull have been installed since 1988.

The courtroom wainscot, like everything in the courtroom, was installed in 1928.

The finish on the top rail of the gates at the courtroom bar is worn away from use.

The sheet linoleum flooring in the courtroom, replaced in 1988, is curling slightly at the edges and breaking away in some locations.

Flooring in the north stair hall was damaged by a past film crew.



Flooring in the north hall is showing water damage from a plumbing leak in the bathroom in the adjacent holding cell.

Flooring in the NW room on the second floor shows isolated signs of wear at previous cubicle locations, heightened near the balcony door due to UV light.

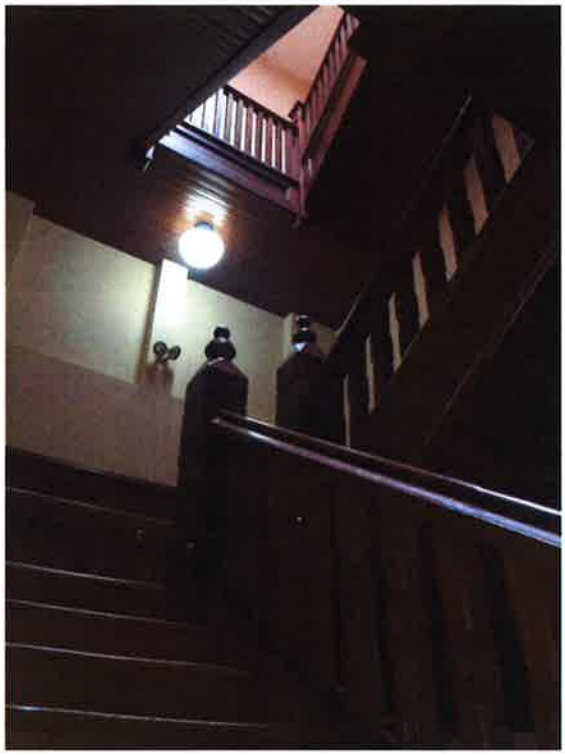
Flooring in the SE room on the second floor shows water staining, most likely from a past roof failure in this area.

In 1888, the south monumental staircase led only as far as the second floor landing. There may have been a lesser stair for accessing the attic, similar to the one currently in place at the north stair. In 1928, when the courtroom was re-oriented and the balcony was added, the monumental staircase was extended to the attic level.

The skylights above south stair and in the NW room on the second floor were added in 1928.

The steps in the balcony are far too steep to meet any current code for use of this space.

A bench, currently stored in the NE room at the second floor, made of very wide boards may date to the original 1888 courtroom.



Rudimentary light fixtures were installed in 1906 when electricity was first supplied to the courthouse. The current large, non-decorative pendant and flush-mount ceiling fixtures were installed in 1928.

There are additional 1928-era globes and flush-mount fixture bases stored in the attic. This shape of globe is no longer available, so more careful storage would be warranted.

Additional decorative pendant, flush-mount ceiling, and wall sconce fixtures were added to the courtroom in 1928.

Modern fluorescent lighting was added to many rooms during the 1988 renovation and since.

Modern life safety lighting and signage, and bathroom lighting, were also added during the 1988 renovation.

STRUCTURAL ANALYSIS

SKA Consulting Engineers, Inc. (SKA) has completed a preliminary general visual assessment of the accessible structural framing of the Historic Union County Courthouse. Following is an overview of the structure and a summary of our findings, opinions and recommendations regarding specific conditions noted during our assessment.

STRUCTURAL OVERVIEW

The original structure makes up three framed floor levels:

- Ground level floor over a crawlspace;
- Second floor courtroom and accessory rooms;
- Third floor balcony access and attic floor.

The majority of the ground level and attic floors are framed using sawn lumber joists spaced approximately 16 to 20 inches apart supporting "1x" floor decking planks. Although not observed during our assessment, it is likely that the second floor is framed using the same system.

View from beneath corridor toward added basement mechanical room

Crawlspace framing

Crawlspace framing

Exterior foundation wall in crawlspace

Center pier beneath corridor.

An exception to the sawn lumber framing occurs in two "fire safe, secure" rooms on each side of the north-south axis of the building. The floor framing and floor/ceiling framing of these rooms consists of steel beams supporting arched brick floors with, presumably, concrete and/or mortar fill.

Structural steel and brick floor beneath "secure" room

The sloped roof and ceiling of the original structure over the courtroom is framed using sawn lumber rafters and ceiling joists supported by heavy timber trusses that clear span the courtroom space. These trusses include large diameter steel rod web members.

"Hip" beam bearing supporting courtroom ceiling

All the sawn lumber and timber truss framing of the original structure are supported by interior and exterior mass masonry of multiple brick wythes.

Main truss bearing on north side.

Mortise and peg outrigger connection at roof.

Centered above the main courtroom, an approximately 16-foot by 16-foot (plan dimensions) clock tower stands with a height of approximately 55 feet to 60 feet. The clock tower framing consists of heavy timber framing supported by the main trusses over the courtroom.

Upward view of clock tower

After the original construction, additions were constructed on the north and south ends of the original construction. These additions are structurally mirror images of each other. These additions are four stories tall including a basement level. The main and second floors were not visible. However, the attic floor and flat roof framing were visible and consist of "2x" sawn lumber joists spaced at 16 inches center-to-center. The attic floor/second floor framing of each addition includes two steel beams supporting the interior ends of the attic floor/ceiling and flat roof joists.

Steel attic floor beam on outer wall of addition.

Roof bearing line over steel attic floor beam.

Original roof rafter/joist bearing on exterior wall.

Exterior wall support and outriggers.

OPINIONS AND RECOMMENDATIONS

Crawlspace/First Floor Framing: The original first floor framing occurs primarily over a crawlspace and consists of 2 x 12 (nominal) joists spaced at 17 inches center-to-center supported on mass masonry foundation walls. The first floor framing of the east and west additions were not observed due to installed finishes.

- The crawlspace framing was generally in good condition. The crawlspace was noted to be dry. No standing water or excessively damp soil was noted. No significant deterioration of framing was observed.

- The crawlspace framing beneath the secure rooms consists of wide flange steel beams supporting an arched brick floor supporting, presumably, a concrete floor. Surface corrosion of the steel was noted, but does not appear to have significantly compromised the capacity of the members.

- Isolated locations require strengthening where masonry bearing walls have been cut to allow access or penetrations for new ductwork. These openings occur beneath existing joists and no particular framing was installed to re-support the framing at the openings.

Crawlspace framing and foundation wall at wall penetration

- Based on assumed allowable stress values in the floor, the original floor joists are capable of supporting current dead loads in addition to a live load of 100 psf, consistent with first floor corridors and public spaces. Supplemental

strengthening may be required for heavier exhibit loads. SKA recommends that the lumber be examined by a certified timber inspector to verify assumed grades and allowable bearing stresses.

- The first floor framing of the additions was not observed during our visits because they are concealed by the ceiling finishes of the basement areas. We recommend the framing be exposed for assessment.

- Refer to the attached Table 1: Summary of Selected Load Capacities for available load capacities of selected members.

Second Floor Framing: Framing of the second floor was concealed by existing finishes. Sizes, span lengths, and direction of framing materials were not determined. However, isolated conditions of de-formation were noted in the floor finishes as follows:

- The floor is noticeably deflected in a small corridor north of the main courtroom. We recommend the finishes be removed in this area to allow assessment of the framing at the deformation.

- A "hump" exists in the floor on the north side in the large open office area. The "hump" occurs where a floor beam or bearing wall is suspected to support floor joists. We recommend the finishes be removed to allow examination of the floor joist connections to the floor beam. This "hump" also occurs on the south side of the building.

Tower Framing – Center Pitched Roof: The existing tower framing consists of heavy wood timber framework supported on heavy wood timber trusses that span over the main courtroom. The heavy wood timber roof trusses also support the pitched roof and ceiling over the main courtroom.

- The timber grade appears to be of a good quality due to the tight, straight grain observed. SKA assumed No. 1 Grade Southern Yellow Pine for all analyses. SKA recommends that the lumber be examined by a certified timber inspector to verify assumed grades and allowable bearing stresses.

- Systematic leakage has occurred around the perimeter at the "valley" type gutter. The outriggers and roof deck are deteriorated in some locations and require replacement.

View of outrigger extension beneath exterior gutter. Note concealed top side of exterior decorative metal soffit.

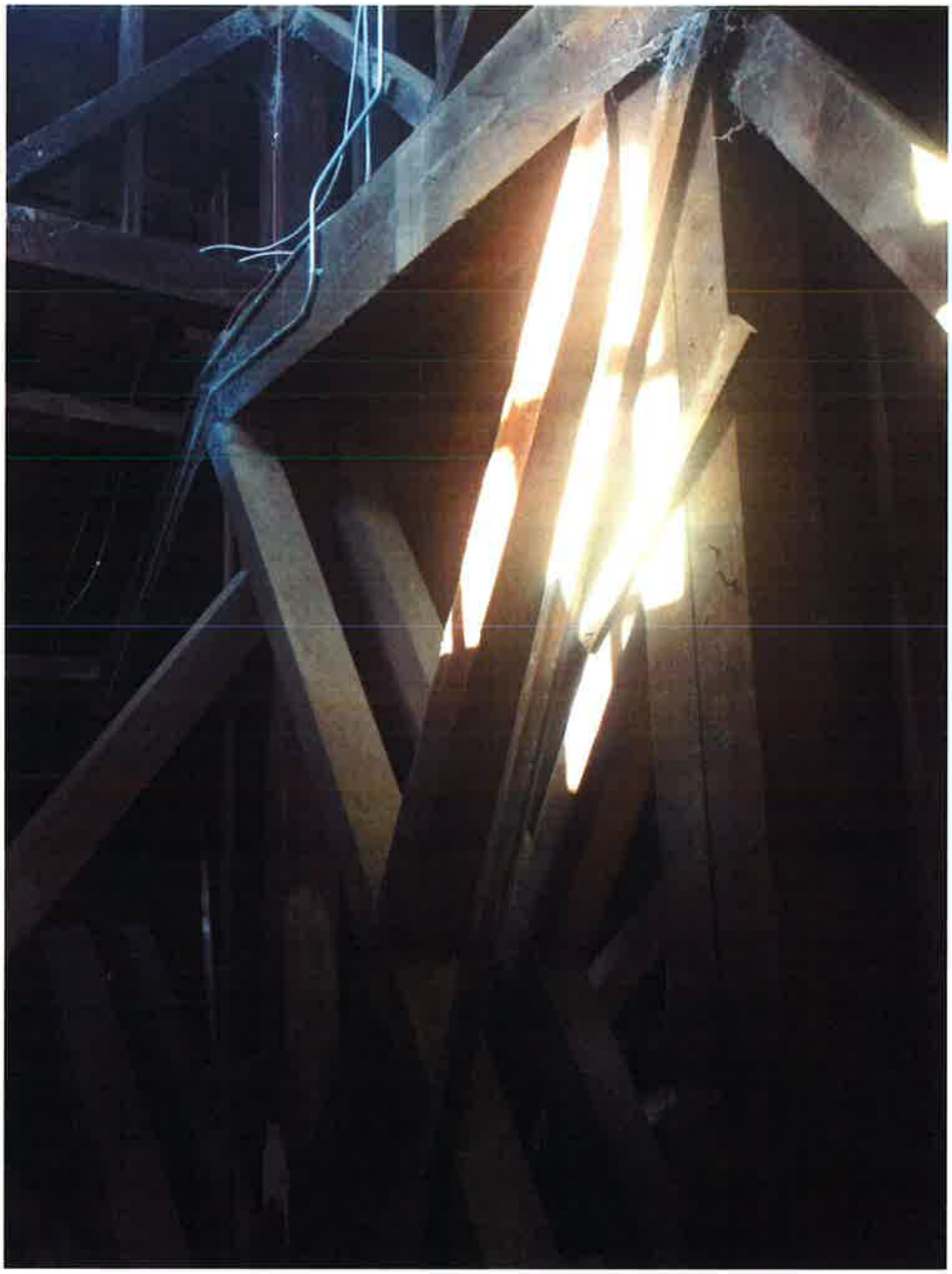
Deteriorated and crushed outrigger supporting gutter.

Deteriorated framing at gutter.

Deteriorated outrigger extension supporting roof framing.

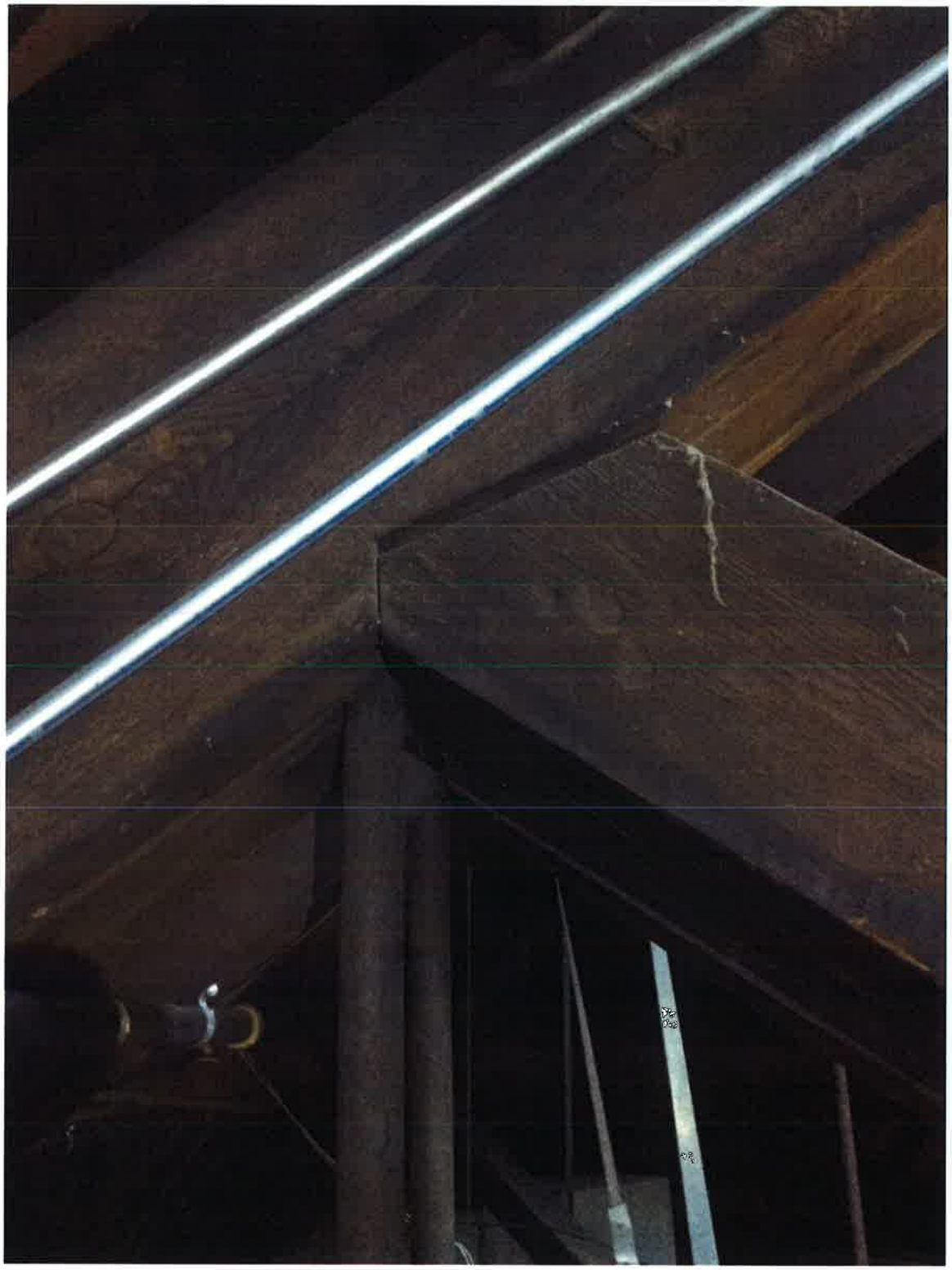
Crushed and deterioraed outrigger supporting roof purlin.

- Locations were noted where existing tension rods were noted to be loose. In addition, some of the main timber web members were noted to be easily moved indicating these members are currently bearing no load. These members have most likely loosened due to long term drying shrinkage of the timber truss members. We recommend these rods be tightened to overcome the shrinkage that has occurred in order to achieve the intended strength of the "friction" type connections.



Diagonal web members of main roof trusses.
In some cases these diagonal web members are loose.

Roof truss web members. Note gap between timber web and chords. Integrity of connection depends on bolt tension on connection.



Loosened roof truss connection.

Roof truss bearing. Note notched truss connection with through bolt.

- The ceiling framing over the courtroom area is supported by the timber trusses spanning over the courtroom area. The ceiling framing consists of 2-inch by 9-5/8-inch joists supporting the plaster ceiling. The "hip" member supporting the ceiling framing is, based on our analysis, overstressed and was noted to be deteriorated in some locations near its bearing on the exterior masonry walls. We recommend these members be strengthened.

"Hip" beam bearing supporting courtroom ceiling. Note deterioration.

"Hip" beam bearing supporting courtroom ceiling. Note deterioration.

- Due to potential excess drying of the framing, we recommend the connections of the lathe-to-ceiling members be observed to verify their holding ability. Smooth shank nails used to secure vertical supports of the plaster could pull out of excessively dried lumber. Supplemental anchorage of the ceiling to the joists may be necessary.

- The clock tower framing consists of 8-inch by 8-inch heavy timber columns at each corner. 4-inch by 6-inch bracing occurs in the walls. The 8-inch by 8-inch columns are periodically spliced. These splice connections were not exposed; However, no distressed conditions were noted.

- The floor framing at the access platforms in the clock tower had been modified to accommodate new access framing. Some of the framing around these access holes appeared to have been framed without added reinforcement around the openings. Strengthening may be required.

- We recommend additional assessment of the clock tower to assess the framing around the access openings and to gain a better understanding of the 8-inch by 8-inch corner splices and connections.

Isolated deterioration of clock tower framing.

Isolated deterioration of clock tower framing.

Attic Floor Framing of Additions:

- The attic floor framing of the additions also supports the ceiling of the second floor of the additions. The framing on each side consists of three bays supported on two interior steel beams and the exterior by the north and south exterior mass masonry walls.

- The interior bay supports no floor deck and consists of sawn 2 x 8 (nominal) joists spaced at 16 inches center-to-center.

- The exterior bays are believed to be framed using sawn 2 x 10 joists spaced at 16 inches center-to-center supporting '1x' plank attic floor decks, due to the lack of accessibility.

- Based on our field measurements, the interior beams appear to be W 18 x 46 (AISC designation) and are supported by masonry walls. These steel beams also support the roof framing.

- Near the attic floor framing on the exterior walls, decorative outriggers extend outward and are embedded in the mass masonry walls. These outriggers are heavily deteriorated from years of direct contact with the exterior masonry and will require replacement.

Deteriorated Outrigger.

- Refer to the Load Capacity Summary Table for the attic floor capacity.

Roof Framing of Additions:

- The roof framing of the additions is similar to the attic floor framing except that the roof joists are supported by a series of sawn lumber posts and built-up timber beams that bear on attic floor framing.

- The flat joists appear to be consistent of 2 x 10 (nominal) joists spaced at 19 inches ± center-to-center. These joists appeared to be in good condition with little to no deterioration.

- However, the flat roof framing did not appear to be adequately anchored to the supported framing relative to the uplift and lateral forces. We recommend installation of a continuous support ledger to the wall, positive anchorage to the steel beam, and hold-down anchors at all joist supports.

Corner jack truss bearing.

Corner jack truss bearing.

- In addition, we recommend that the miscellaneous added framing supporting mechanical units and roof openings be strengthened.

Supplemental framing of roof top units.

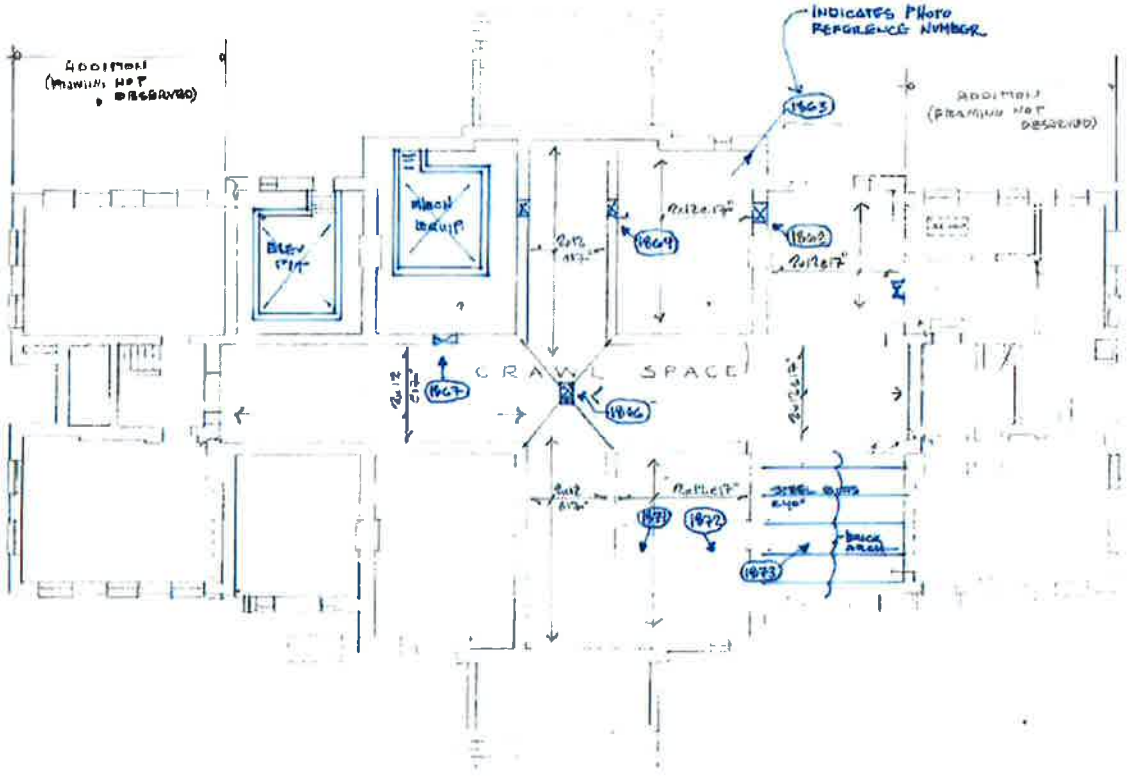
The forgoing are the results of a general visual assessment of the conditions observed during our site visits. Our opinions and assessment are limited in nature as stated herein and no inferences should be made relative to conditions not described or observed. Testing of materials has not been completed to verify assumptions relative to existing material strengths.

SUMMARY OF SELECTED LOAD CAPACITIES

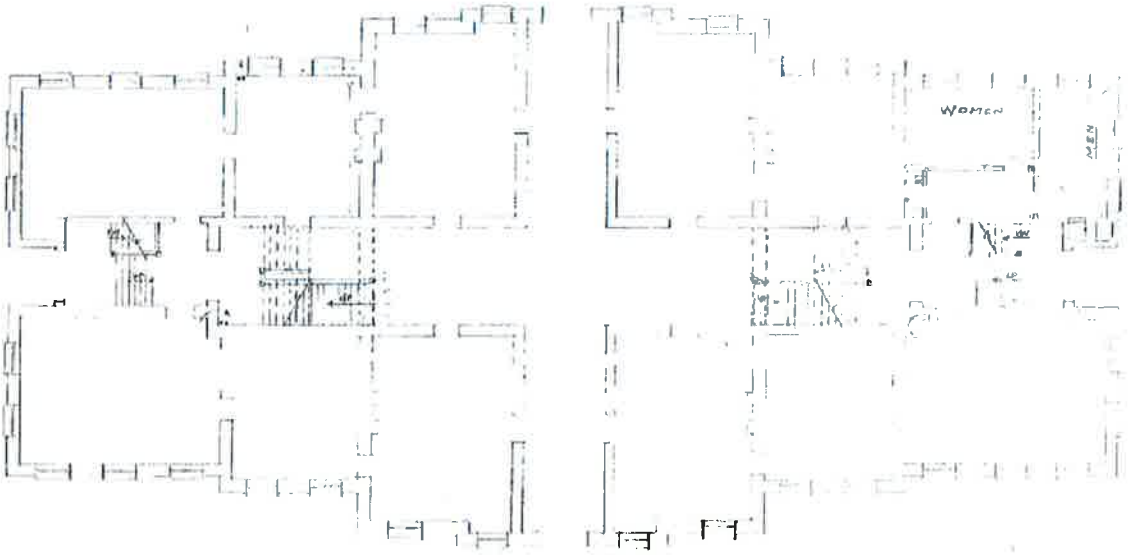
Location	Member	Basic Allowable Bending Stress[1]	Dead Load	Available Live Load	Current Code Required LL	Remarks
Original Main Floor (Typical)	2 x 12.5 @ 17" x 16.5'	1,350 psi	20 sf	100 psf	100 psf	
Original Main Floor Corridor	2 x 12.5 @ 17" x 11.5'	1,350 psi	20 psf	100 psf	100 psf	Includes 500 # for stair.
First Floor Addition-Office	2 x 10 @ 16" x 16.75'	1,350 psi	20 psf	60 psf	50 psf	No provisions for movable partitions included (15 psf min.); Assumed size and space.
Second Floor Addition-Corr	2 x 10 @ 16" x 14.17'	1,350 psi	20 psf	100 psf	100 psf	
Second Floor Courtroom Front	2 x 9.5 @ 16" x 16.5'	1,350 psi	27 psf	56 psf	60 psf (fixed seat assembly)	Includes 7 psf for courtroom front overbuild; Assumed joist size and space.
Second Floor Courtroom	2 x 9.5 @ 16" x 16.5'	1,350 psi	27 psf	63 psf	60 psf (fixed seat assembly)	Assumed joist size and spacing.
Second Floor Courtroom Waiting	2 x 9.5 @ 16" x 15.5'	1,350 psi	27 psf	75 psf	100 psf (lobby/corridor)	Assumed joist size and spacing.
Second Floor Addition-Office	2 x 10 @ 16" x 16.75'	1,350 psi	27 psf	50 psf	50 psf	No provisions for movable partitions included (15 psf min.); Assumed size and space.
Attic Floor-Original	2 x 9.5 @16" x 16.3'	1,350 psi	24 psf	60 psf	n/a	
Attic Floor-Addition	1.875 x 9.875 @ 16" x 16.75'	1,350 psi	24 psf	60 psf	n/a	Assumed joist size and spacing
Attic Steel Beam	W 18 x 46	16,000 psi	25 Roof + 25 Floor	26 psf (attic storage)	n/a	Assumes 20 psf LL on roof
Original Roof Rafter	1.875 x 6.125 @ 20'		25 psf	20 psf	20 psf	Slate roof; Excessive deflection.
Original Roof Purlin	3.5 x 5.625 @ 4 x various	1,350 psi	25 psf	See Remark	20 psf	Max. allowed span = 9.75' less than actual.
Original Flat Roof	1.875 x 9.875 @ 19 x 19'	1,350 psi	20 psf	20 psf	20 psf	No consideration for mechanical units.
Flat Roof Addition	1.875 x 9.875 @ 19 x 17'	1,350 psi	20 psf	20 psf	20 psf	No consideration for mechanical units

Note: SKA recommends the lumber be examined by a Certified Timber Inspector to verify the bending stress.

PLANS WITH STRUCTURAL NOTES

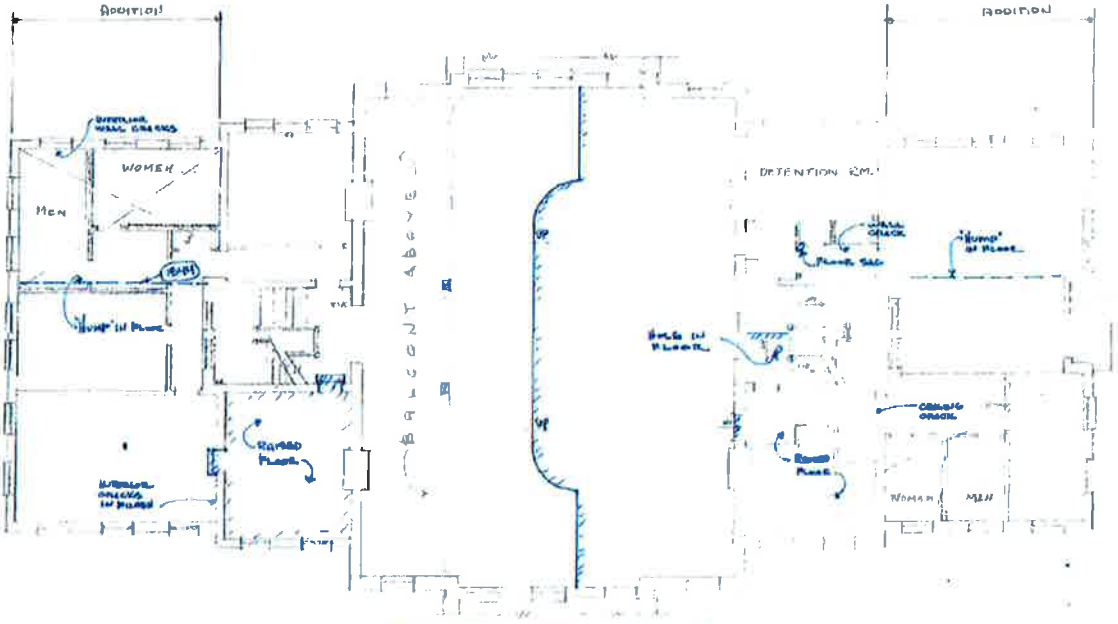


BASEMENT PLAN / FIRST FLOOR FRAMING

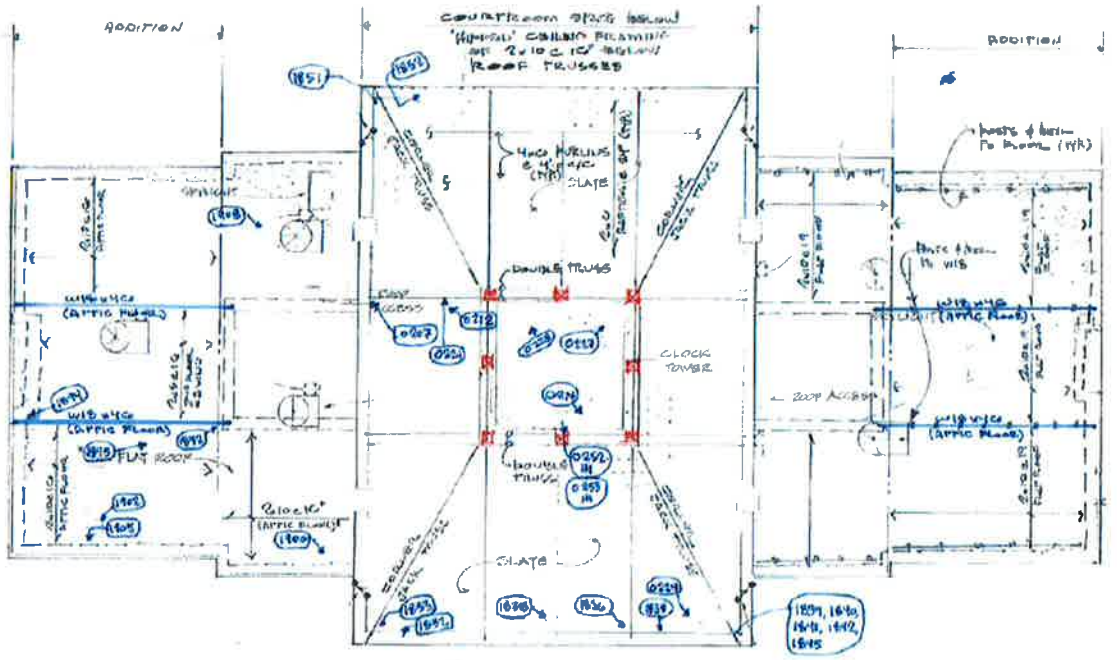


FIRST FLOOR PLAN / 2ND FLOOR FRAMING

NOTE: 2ND FLOOR FRAMING NOT OBSERVED



SECOND FLOOR PLAN



ROOF PLAN Roof & Attic framing plans
SCALE 1/8"=1'-0"

ELECTRICAL, MECHANICAL AND PLUMBING CONDITION ASSESSMENT

ELECTRICAL

General

There was a major renovation in 1984 upgrading the electrical service and distribution. The renovation replaced existing lighting and fire alarm equipment, and added computer conduits. It appeared that the lighting, fire alarm, and Normal power distribution systems were in working order at the time the survey for this report was completed.

Observations and Comments

Lighting

The exterior of the clock tower is lit by floodlight mounted on the slate roof. The clock faces and the inside of the clock tower are lit with fluorescent strips.

Roof – clock tower floodlight

Clock tower – fluorescent strips illuminate face.

A combination of surface-mounted 2' x 4' fluorescent modular fixtures and period style incandescent globes are installed throughout most of the building. In the court room are period style incandescent pendants centered in medallions, surface-mounted period style globes, and decorative cast incandescent wall sconces. In general, lighting appears well-maintained and in working order. The majority of lamps currently installed in the building are T12 fluorescent tubes with a smaller number of incandescent lamps.

Basement – Typical room lighting

Second Floor – Lighting.

Second Floor – Lighting.

First Floor – Ligting in vault. Surface-mounted conduits.

Egress lighting is minimal and is achieved through a combination of single- and dual-head incandescent lights fed from a central battery at the basement level. There did not appear to be any battery backed-up lighting immediately outside the doors or down the exterior stairways. In general, exterior lighting was minimal.

Basement - Egress light is blocked by door.

Outside – Exterior wall sconce

All egress paths leading to the outside will have to be illuminated with battery backed-up fixtures, inside and outside the building in order to comply with the Life Safety code.

The entire building will have to be equipped with a lighting control panel, or each room in the building will have to be provided with occupancy sensors to turn lights off to comply with the North Carolina Energy Code.

As the spaces within the building are renovated, consider updating the existing lighting with new LED lamps. The T12 lamps are being phased out of production and being replaced with T8 and T5 lamp technologies. LED lighting is becoming more mainstream, as quality has improved and pricing has come down considerably. One advantage of LED lighting is that the expected life is 2.5 times the life of a fluorescent lamp, so maintenance cost is reduced. Another advantage is that the efficacy (watts-in vs. lumens-out) has surpassed that of fluorescent lamps, so the energy cost of using LED is less. Another advantage is that LED does not emit UV, so museum artwork is not damaged as it is with other types of lighting. We have worked successfully with two historic lighting manufacturers, Crenshaw and McLean, on past projects, so the historic value of the lighting fixtures can be maintained during a switch to LED.

Receptacles

Receptacles on the first and second floors are generally in good condition. Due to frequent flooding, all devices in basement should be replaced and located above the flood line. There are new requirements in the electrical code which may necessitate upgrading the receptacles according to the use of the building (e.g. museum-use may require tamper-resistant receptacles).

The number of existing receptacle circuits is less than what we would ordinarily specify for office or for museum layouts. We would recommend doubling the available receptacle circuits throughout the building.

The useful life of branch circuit wiring and devices is 30 years. It is expected that as each area of the building is renovated, all of the receptacles and wiring will be replaced. The branch wiring will be re-routed to accommodate any new panels and to accommodate any floor plan changes.

Power Distribution

The building is fed from a utility-owned, pad-mounted transformer which is located at the southwest corner of the building site. The transformer and several panels serving other areas are screened with a tall hedge of bushes. Inside the building, the main distribution panel 'MDP' is rated: 1,200 amps, 208/120V, 3-phase 4-wire with a code-maximum of six (6) main circuit breakers. Some of the distribution system equipment has been updated with the 1984 renovation. There are six branch panels located throughout the building to serve lighting and receptacle loads.

Outside – Electric utility transformer.

The room in the basement, housing the main electrical panel, appears to have been flooded above the bottom of the main panel. If the source of the flooding cannot be found, then the main panel should be moved upstairs away from the water threat.

Basement – Flooding at main panel.

Typical basement electrical panel.

Electrical panels, with the exception of the main panel, appeared to be in good condition. Life span of electrical panels is listed at around 30 years. Life span of feeder wiring is listed at around 40 years. The main panel should be replaced due to the exposure to the flooding. The branch panels can be replaced as budget allows.

There were some locations where conduit penetrations had not been sealed to maintain the rating of the partition. The unsealed openings are pathways to allow fire and smoke between rooms and building wings.

Basement – Conduit penetrations not fire-sealed.

Fire Alarm

The fire alarm panel is located in the basement. The panel is a Fire-Lite Alarms #MS-9600UDLS addressable panel. The digital alarm communicator is installed directly adjacent to the fire alarm panel and is a Honeywell #IPGSM-4G model. The system display was Normal at the time of the site visit.

Basement – Existing Fire Alarm panel.

Initiating devices are heat detectors in the tower space and pull stations at the exit doors. Some smoke detectors should be added at the fire alarm panel, the electrical panels, and in any storage rooms.

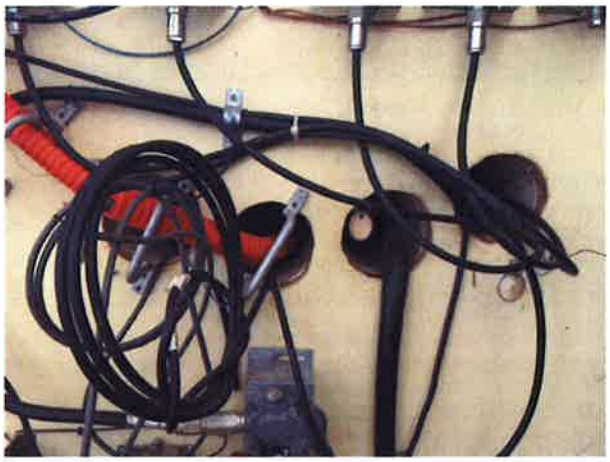
Notification devices appear to be horn/strobe combination units located near the stairs in the corridors. Some new notification devices will have to be added in restrooms, meeting rooms, and other areas to meet ADA.

The fire alarm system was not tested during the visit, but appeared to be in working order. It is not known if the sound levels of the fire alarm horns meet the requirement of 15dB above ambient. Fire alarm initiating devices have a life of 10 years. Notification devices and control panels have a life of 15 years. Fire alarm wiring has a life of 30 years. The existing fire alarm panel can probably be reused and adapted to accommodate additional devices as required.

Telephone Cabling

The telephone service enters the building in the basement at the northwest corner of the building. The telephone wiring is terminated in patch panels inside a small room. Existing drawings indicate separate conduits for telephone and for computer. The telephone conduits are run in a "daisy chain" fashion, a manner that is no longer used.

The computer conduits are homerun to locations in the attic and in the basement, however the indicated sizes are smaller than what is now typically run. There do not appear to be sufficient locations where telephone or computer outlets are installed. Some cables in the basement were run exposed at the floor level and may be damaged by the flooding.



Basement – Telephone cable entrance.

Basement - Telephone service.

There is a wireless access point on the first floor. We understand that the wireless effectiveness is less than desirable. The building probably requires a number of wireless access points distributed throughout. Due to the thickness of the existing floors and walls, a wireless access point may be required in every room, or every other room, to provide sufficient wireless coverage throughout the building.

First Floor - Wireless access point.

Electrical Recommendations

The existing lighting is inefficient. This recommendation proposes to replace all lighting with LED type fixtures. Where historic value is placed, those fixtures can be retrofitted to accommodate LED lamps. Any additional historic fixtures can be recreated as required. New egress lighting should be installed to illuminate the path of egress from inside the building to the sidewalk surrounding the building.

All wiring devices which are damaged should be replaced. Occupancy sensors should be installed in every room to turn off lights when the room is vacant.

The existing electrical main panel is below grade. This recommendation proposes to relocate the electrical main panel to the first floor, into the room immediately south of the elevator shaft, to protect against flooding. All existing panels can be re-fed from this location. All lugs in existing panels should be torqued to manufacturer recommendations every 2-4 years.

This recommendation would be to add smoke detectors in storage rooms and to add strobes in all meeting rooms and restrooms. A fire alarm test may need to be performed to verify that the alarm signal is heard in all rooms of the building. Any HVAC units with air distribution over 2,000cfm should be fitted with a duct-mounted smoke detector.

As the Courthouse is the tallest building on the block, and situated on top of a hill, the Owner may consider providing the building with lightning protection.

Electrical Whole Building Approach

The extent of electrical distribution work is best accomplished with a total shut-down of the building. The vertical work needed (chases, telecomm ducts, and panel feeders) would be very disruptive to the floors as they are being prepped and installed.

In the whole building approach, all of the existing electrical panels, exposed conduits, lights, and wiring devices would be disconnected and removed during the demolition. New panels, where indicated, would be installed in the proposed locations and branch circuiting would be installed as the interior spaces become ready. The new electrical service would be installed but would not be energized until all wiring is made safe and complete. Fire alarm devices, lighting, and receptacles would be installed as building finishes are being completed.

MECHANICAL

General

There was a major mechanical renovation in 2003 replacing existing air handling systems.

Observations and Comments

The building is heated and cooled by six packaged DX air handling units with gas heat. Four of the units are located on the flat roof sections of the wings and two units are located on grade. The units were installed in 2003 and appear to be in average condition.

DX Air handling unit on grade behind screen wall.

The Average Life Expectancy (ALE) for packaged DX units is 15 years. The installed equipment is nearing its ALE. As the equipment ages, the chances for component failure increases including coil leaks, condenser fan motor failure and compressor failure.

Three exhaust fans provide exhaust air for toilets. One inline fan located in the basement exhausts the first floor toilets. Two rooftop mounted fans serve the second floor toilets. The fans appeared to be in average condition but were not operational at the time of observation. The exact age is the fans is not known, however, it appears that fans are within the ALE of 20-25 years depending on the type of fan. Fan capacities are not able to be confirmed without testing by a certified TAB contractor, however, plans provided by the

owner indicate that fans may be oversized based upon current NC Mechanical Code requirements of 50 CFM per flushing fixture.

Basement – Exhaust fan installed in utility room.

Ductwork is primarily externally insulated galvanized steel. The ductwork appeared to be generally clear of significant dust and debris accumulations at the limited locations internal inspection was possible.

Supply duct in attic.

Inside of ductwork in attic. No significant accumulation of dust.

The packaged units are provided with an outside air damper. The outside air dampers were closed in all locations that were inspected. Current NC Mechanical Code requires 7.5 CFM per person and 0.06 CFM per square foot of floor area.

DX air handling unit outside air damper closed.

Two wall mounted electric heaters are installed in the courtroom. The heaters appear to good condition.

Second Floor – Electric heater in courtroom.

Controls for the mechanical systems are direct digital controls (DDC) by Johnson Controls. A combination of wired and wireless space temperature sensors are located throughout the building.

Basement – Johnson Controls building automation panel in utility room.

Mechanical Recommendations

The six packaged DX units are approaching end of life and will require replacement within the next 3-5 years. The current units do not provide individual space control capabilities resulting in potential comfort issues within the areas served by each unit.

It is recommended that the rooftop units serving all areas except the court room be replaced with variable refrigerant volume (VRV) system and a dedicated outdoor air unit. The VRV system will be a heat recovery type to allow for simultaneous heating and cooling of different spaces. Current system sizing would require two outdoor condensing units mounted on the roof on each end of the building. System capacity may be able to be reduced once space programming is completed. Indoor units will be a combination of vertical console and horizontal concealed type units.

The dedicated outdoor air unit will be a 100% outside air with energy recovery for toilet exhaust. The unit will be a DX unit with variable speed compressors and condensing fans and gas heat. New ductwork will be installed to each space.

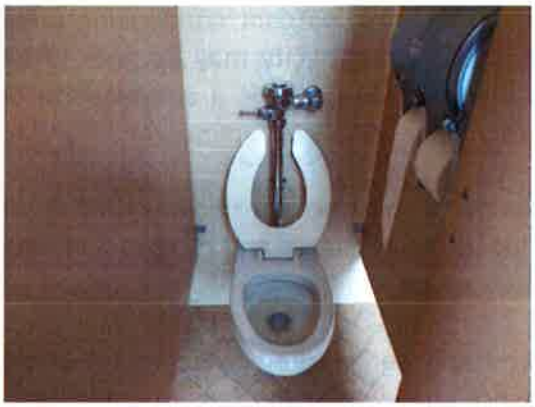
A new variable volume single zone rooftop DX unit will be installed to serve the court room. The unit will have variable speed compressors and condensing fans and gas heat. Existing ductwork will be utilized where possible and new air distribution devices will be installed.

All equipment will be provided with DDC controls for integration into the existing Johnson Controls Metasys controls system.

PLUMBING

General

The building has a combination of wall and floor mounted water closets with manual flush valve, wall mounted urinals and wall mounted lavatories located in the toilets. Drinking fountains are installed on each floor.



Typical wall mounted water closet with manual flush valve.

Wall mounted lavatories and instantaneous water heater serving two gang toilets.

Typical wall mounted urinal with manual flush.

Typical single level water cooler.

Instantaneous electric water heaters located in the bathrooms provide hot water for the building. The plumbing piping appears to have been installed during a renovation in the mid 1980's. It is not known whether piping from the original building was reused in any locations.

Observations and Comments

The majority of the plumbing appears to have been installed during a renovation to the building and appear to be over 30 years old. The plumbing fixtures are in average condition. The majority of flush valves and faucets appear to have been replaced within the past 10 years and appear to be in good condition. No leaks were noted and fixtures that were spot checked during the assessment functioned properly.

Domestic water distribution piping appears to be copper throughout the building. Very little piping was visible. The ALE of copper piping systems is 20 years.

Sanitary waste and vent piping is primarily cast iron. The piping appears to be in average condition. The internal condition of the piping is not known and would require removal of piping for further inspection.

Basement – Cast iron waste pipe.

Reconfiguration and replacement of fixtures will be required to meet ADA accessibility requirements.

Hot water is provided by several small instantaneous electric water heaters. The heaters vary in age and condition. One of the heaters is in poor condition and does not appear to be functional. The remaining heaters are in average to good condition.

Instantaneous water heater beginning to rust at base of unit.

The drinking water coolers appear to be original to the mid 1980's renovation and are not ADA compliant. The water cooler on the second floor was not functional.


Domestic water backflow preventer adjacent to crawlspace.

Plumbing Recommendations

The majority of the building plumbing systems will be replaced due to age and reconfiguration of toilets for ADA accessibility requirements. This includes fixtures, water piping and sanitary waste and vent piping.

New plumbing fixtures will be specified as water saving type (1.0 gallon flush urinals, 1.6 gallon flush type water closets, and 0.5 gallon faucets on hand wash sinks). Urinals, water closets and lavatories shall be provided with electronic type operators.

New sanitary waste and vent systems will be installed during the renovation work. All systems shall be gravity flow. Waste systems below floor shall be hub and spigot cast iron. Waste and vent systems above floor shall be no-hub cast iron.

Domestic water pipe shall be copper type "L", joined with lead free solder for pipe sizes 1-1/4" and smaller. Piping sized 1-1/2" and larger shall be brazed. New instantaneous-type, electric domestic water heaters with will be provided to generate 110° water for the building. Hot and cold water piping will be insulated with fiberglass insulation with all-service jacket.

FIRE PROTECTION ANALYSIS

GENERAL FIRE SAFETY ELEMENTS DESCRIPTION

Fire safety of historical buildings is one of the most important aspects for the preservation of historical and un-replaceable treasures for the future generations.

The fire safety of the building can minimize the likelihood of a fire to occur (fire prevention) and can limit the damage from a fire that does occur (loss control).
Fire prevention is the best line of defense as it can avoid even small fires.

Fire can occur for different reasons but the most popular sources are: arson, smoking, heating, electric wiring, appliances, and cooking. Some of sources of fire can be hard to prevent though many can be prevented. For example, maintaining the condition of all mechanical and electrical systems can reduce possibility of fire. Good planning, design practice and containment in small compartment combustible commodities can prevent or minimize fire risk as well.

Building separation by fire rated walls as well as providing fire alarm system and installation of sprinkler system can prevent from spreading the fire or minimize fire damage.

Required fire prevention through building elements such as type of construction, building separation by fire rated wall, etc., are described as passive fire prevention and will be addressed by the architectural portion of the report.
Active fire suppression systems work to detect, suppress, or extinguish fires. The passive and active systems have to work together. This part of report will cover active fire suppression system. Detection of fire is described as Fire Alarm system and is described in the Electrical portion of report.

Building and fire codes dictate a minimum level of fire safety. Insurance Underwriter, Local Authority Having Jurisdiction (LAHJ) and Owner of property vested interest, and importance of historical structure may increase minimum life safety and property defined by building code. In our report we describe minimum requirements defined by codes.

BUILDING CODE REQUIREMENTS

Applicable codes:

- North Carolina State Building Code: Existing Building Code, 2016 edition.
- North Carolina State Building Code: Building Code, 2012 edition.

Building will be going through limited alternation. Future work planned to be performed on Union County Court House was established with consultation with Local Fire Marshall as Level 2 Alternation.

- Existing Building Code, Chapter 8 Alternations-Level 2, Section 804 Fire Protection, paragraph 804.2 Automatic sprinkler systems. *Automatic sprinkler systems shall be provided in accordance with the requirements of Section 804.2.1 through 804.2.5. Installation requirements shall be in accordance with the international Building Code.*

- Existing Building Code, Chapter 8 Alternations-Level 2, Section 804 Fire Protection, paragraph 804.2.2 Low-rise building. *Work area that increase the fire area or calculated occupant load above the limits listed in Sections 903.2.1 through 903.2.10 of the International Building Code shall meet the requirements of those sections.*

Union County Court House is classified as A-3 occupancy. Section 903.2.1.3 North Carolina Building Code, Section 903.2.1.3 requires installation of sprinkler system in entire building.

TYPES OF ACTIVE FIRE PROTECTION SYSTEMS

There are several different fire protection systems that can be provided:

- Wet system - Water is the most popular fire extinguisher, extremely efficient coolant, environmentally safe, inexpensive, very reliable and easy to maintain.

- Dry system – air is in piping system and is released when sprinkler is activated and water released to piping and sprinklers. A dry system is to be installed when the temperature can't be kept above 40ºF.

- Preaction fire protection – air in piping system, closed sprinklers, and alarm system heat or smoke detectors installed throughout entire protected space. Water discharge to piping only when several actions occur. System is installed when incidental water discharge is not desirable and valuables are to be protected.

- Deluge suppression systems utilizing open sprinklers and a heat detection system. Usually installed outdoors or when large amount of water discharge is required. Installed as a water curtain at stage of big theaters, protection of flammable liquids storage tanks, mechanical equipment protection.

- Water Mist Suppression Systems – small particles of water and much smaller damaged due to water discharge. Installed when discharge of large amount of water is not desired.

- Gas Suppression Systems utilizing chemical gases as an extinguishing agent. Alarm detection system releases agent. Mostly used when water can damage contents of protected space such as computer centers, control rooms, electric utilities, art galleries, bank vaults, etc.

Benefits of Automatic Fire Suppression:

- Enhanced Life Safety
- Fast response to the fire
- Reducing Damage
- Flexibility
- Reducing Insurance Cost

DESCRIPTION OF EXISTING FIRE PROTECTION SYSTEM

Existing sprinkler system is limited to water curtain above entry on both side of monumental stairs, located on north and south sides of corridor. Existing sprinklers are supplied from domestic water system. Each sprinkler water curtain contains: piping, two

sprinklers, and unsupervised ball valve. This system does not meet current code requirements. It is recommended that the current system be demolished.

DESCRIPTION OF PROPOSED NEW SPRINKLER SYSTEM

The most commonly used and most reliable is wet type fire protection system. It is also the most economical installation with a minimal required maintenance. Fire protection system will be divided into two zones.

- Zone 1 – Wet fire protection system to protect Basement, 1st Floor, partially 2nd Floor, and Balcony of Court Room.
  Alternate Zone 1 - Preaction fire protection system to protect Basement, 1st Floor, partially 2nd Floor, and Balcony of Court Room.

- Zone 2 – Dry sprinkler system to protect attic, Clock Tower, and Court Room.

DESIGN BASIS

Sprinkler system to be designed based on:

- 2015 North Carolina Existing Building Code.
- 2012 North Carolina Fire Code and Building Code.
- NFPA 13 – "Standard for the Installation of Sprinkler System"
- NFPA 20 - "Installation of Stationary Pumps for Fire Protection"
- NFPA 24 - "Standard for the Installation of Private Fire Service Mains"

CITY WATER TEST DATA ANALYSIS

A water flow test was performed by City of Monroe Fire Department on 8-12-2016. Data was established as: static pressure 54 psi, residual pressure 44 psi at water flow of 1938 gpm. Based on this data and engineering calculations, city water pressure can't meet the requirements for design of the sprinkler system and will require the installation of a fire pump.

MAIN COMPONENETS OF THE PROPOSED NEW SPRINKLER SYSTEM

- 6" water line connected to city water main.
- 6" back flow preventer installed outside, above grade in heated enclosure (hot-box).
- Fire pump 500 gpm @ 100psi to boost city water pressure.
- Water line from fire pump will supply 2 risers, one to serve wet system and second dry sprinkler system.

- Installation of floor control valve assembly serving wet system on Basement, 1st and 2nd floor including separation valve, alarm valve, water flow switch and test and drain assembly, electric alarm, piping system fill with water, with sprinklers spaced to provide coverage through entire building.

- Installation of floor control valve assembly serving dry system in clock tower including control valve, dry valve, air compressor, pressure switch, test and drain, piping system filled with air or nitrogen, with sprinklers spaced to provide coverage through entire building.

WET SPRINKLER SYSTEM

A wet pipe automatic fire sprinkler system is fully charged with water coming from a city water main and fire pump. The installation is pressurized with the alarm valve secured in the open position. When a fire sprinkler is exposed for a sufficient time to a temperature at or above the temperature rating of the heat sensitive element (sprinklers with glass bulb or fusible link) it releases, allowing water to flow from only the affected sprinkler. Additional fire sprinklers will open when exposed to sufficient heat.

When this occurs water from the water supply will pass through the alarm valve to the affected fire sprinkler and also past the alarm bell. The resultant pressure drop will also activate the alarm pressure switch, which in turn will activate an alarm and will call the fire department.

A flow switch will operate in the affected section of the fire sprinkler system, indicating the water flow. The flow switch will activate a building alarm system.

PREACTION SYSTEM

A Preaction System is a system which employs automatic and closed-type sprinkler heads connected to a piping system that contains air (either pressurized or non-pressurized), with a supplemental system of detection serving the same area as the sprinklers.

Preaction Systems are similar to Dry Pipe Systems in that the water is kept from entering the piping by a valve, in this case a preaction valve. This valve is held closed electrically, only being released by the activation of the detection system (heat or smoke detectors mainly) when an electrical signal is sent to the releasing solenoid valve. The water then fills the pipe, ready for the activation of the sprinkler heads. Preaction systems can be arranged to be activated by only one detection device type, or many. Preaction system is alternate to wet system in Zone 1

DRY PIPE SPRINKLER SYSTEM

A dry sprinkler system employing automatic sprinklers that are attached to a piping system containing air or nitrogen under pressure, the release of which (as from the opening of a sprinkler) permits the water pressure to open a dry pipe valve, and the water then flows into the piping system and out the opened sprinklers. Dry pipe sprinkler system is proposed to be installed in the area of the clock tower, Court Room and attic (area is exposed to freezing temperatures).

INSTALLATION DETAILS

Installation of fire protection system will be dictated by desired esthetics and available space in existing building. Include installation of piping, alarm valves, alarm devices, risers, sprinklers, sprinkler guards, escutcheons, inspector test connections and all appurtenances required for a complete wet pipe sprinkler system serving the building. A water line connected to city water main will enter building in basement. Location of fire pump will be established during design stage of fire protection system. Fire pump room requires easy access for fire fighter's usage. It is recommended to have entry to fire pump room and riser room from outside.

From our preliminary walk through it appears that piping and sprinklers in basement could be installed in mechanical soffits or exposed. Additional soffits can be constructed if concealing of piping is important. The first floor does not have suspended ceiling so installed piping and sprinklers are currently exposed. Sprinklers in finished spaces shall be fully recessed or concealed with glass bulb/quick-response type with white trim. Exposed sprinklers will be pendent or upright type with brass finish. Sprinkler guards to be installed in areas subject to physical abuse (Mechanical Rooms, Electrical Rooms, Service Areas, spaces with low ceiling clearances).

Dry riser will be installed in Attic space. A dry system will provide protection for Court Room, attic space and clock tower. Sprinklers in ceiling of Court Room will be concealed dry pendent, and in attic space will be brass pendent/ upright.

All grooved pipe fittings will be Victaulic type. New sprinkler piping will be ASTM A53 black steel, standard weight, except where thin-wall piping (Schedule 10) is specifically approved for the application. Underground fire protection piping to the risers will be ductile iron type (per NFPA 24). Tamper switches will be provided on all sprinkler system zone valves. UL/FM approved riser assemblies will be provided for the sprinkler system.

ADA COMPLIANCE STUDY

2015 North Carolina Existing Building Code
2012 North Carolina State Building Code
Accessible and Usable Buildings and Facilities, ICC A117.1 (ANSI).

PARKING
Accessible parking is required only if parking is provided. The County does not provide parking for the Historic Courthouse and accessible parking conditions are not applicable.

Recommended Action: None

DIRECTIONAL SIGNAGE
Directional signs required for directions to the accessible elevator entrance are incomplete.

Recommended Action: Provide complete directional signage from the point of site access to the elevator entrance door. Provide directional signage at inaccessible entrance locations to the Courthouse. Signage should provide directions to the accessible elevator entrance.

HANDICAP RAMP LEADING TO THE EXTERIOR DOOR TO ELEVATION VESTIBULE
The existing ramp is adequate.

Recommended Action: None

ACCESSIBLE ENTRANCE THRESHOLD
The threshold at the exterior door leading to the Elevator Vestibule exceeds the maximum height of ½" and the brick landing is uneven.

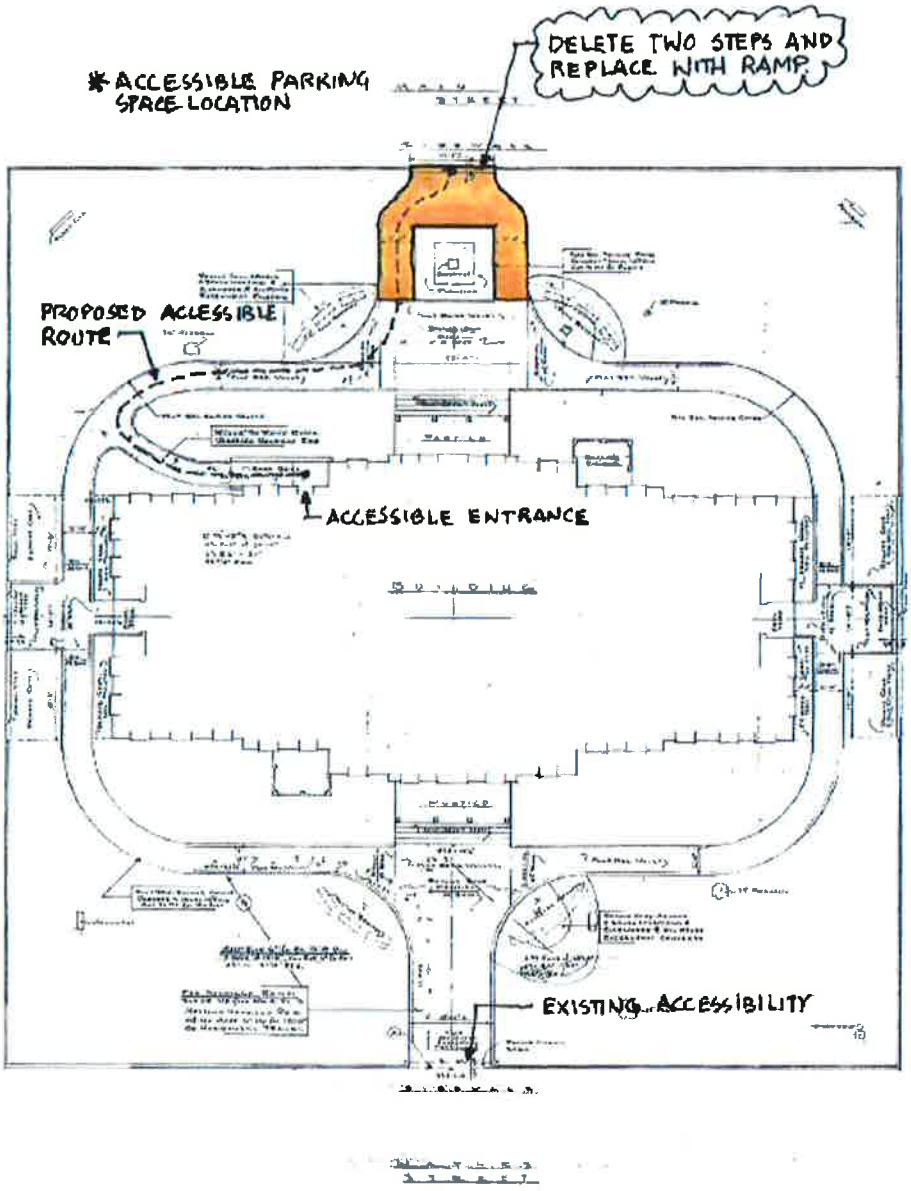
Recommended Action: Raise and level the landing at the exterior door leading to the Elevator Vestibule

ELEVATOR
The elevator meets the code for accessibility.

Recommended Action: None

SITE ACCESSIBILITY (See Attachment E-1)
The accessible route from the City's on-street accessible parking on the west side of the site goes to the east side of the site and then back again to the elevator entrance which is located on the west side. This circuitous route is inadequate.

Recommended Action: Replace the two granite risers between the concrete city sidewalk and the brick walkway paving on the west side with a brick ramp at a five percent (5%) slope or less.



ATTACHMENT E-1

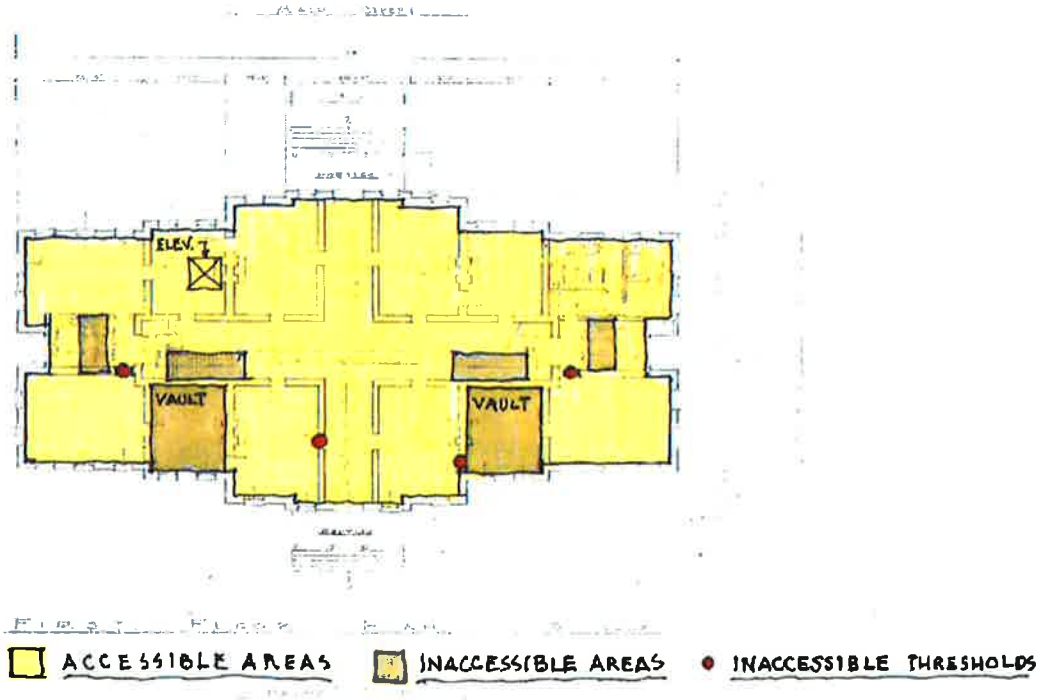
ACCESSIBLE/INACCESSIBLE AREAS OF COURTHOUSE

The 1st floor level is relatively accessible. (See Attachment F-1) The steel vault doors are approximately 30" clear in width and the Vault Rooms are inaccessible. Changing the existing door width is technically infeasible and removing the doors may damage the historical significance.

Recommended Action: No changes – restrict public access to these areas.
OR
Recommended Action: Alter wall/door assembly in future renovation to meet ADA requirements

Sloped thresholds leading to the Vault Rooms have 17% to 20% slopes and are too steep for accessibility. (See Attachment F-1)

Recommended Action: No changes - restrict public access to these areas.
OR
Recommended Action: Remove flooring and sub-floor inside rooms and provide flooring level with adjacent spaces in future renovation.



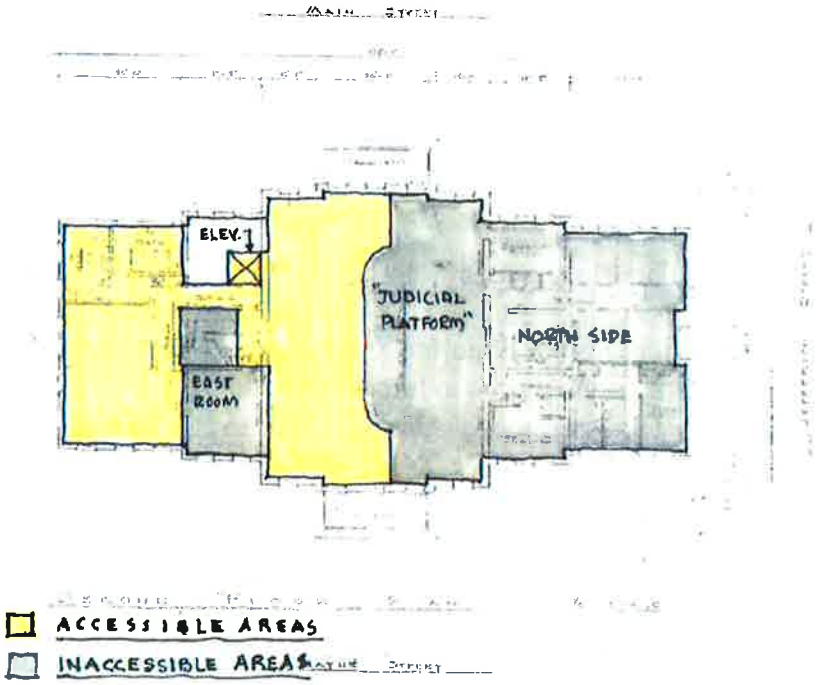
ATTACHMENT F-1

Approximately 50% of the 2nd floor level is inaccessible. (See Attachment F-2)

Recommended Action: No changes – restrict public access to these areas.

OR

Recommended Action: Remove judicial platform (retain railing, judge's dias and jury dias) and raised floors in other areas of the second floor to allow free passage.



ATTACHMENT F-2

The Attic Balcony seating area is inaccessible.

Recommended Action: None – courtroom accessibility is provided on 2nd floor level.

The Basement is inaccessible.

Recommended Action: None – restrict public access.

M-1 MEN'S RESTROOM (See Attachments G – 1 and G – 3)

Restroom does not have a required five foot by five foot toilet compartment as required for accessibility.

Recommended Action: Replace two toilets with one accessible toilet in a five x five foot toilet compartment. Provide grab bars, including required vertical bar.

OR

Recommended Action: Relocate remaining toilet as required and replace existing toilet compartments.

Exposed water supply and drainpipe below accessible sink is not insulated.

Recommended Action: Provide pipe insulation.

The bottom edge of the reflective surface of mirrors is located above the maximum height of 40" above the floor surface.

Recommended Action: Re-locate reflective surface of mirrors to 40" maximum.

Two existing sinks are too close.

Recommended Action: Remove one sink and relocate remaining sink for improved accessibility.

W-1 WOMEN'S RESTROOM (See Attachments G – 1 and G – 3)

Restroom does not have a required five foot by five foot toilet compartment as required for accessibility.

Recommended Action: Replace two toilets with one accessible toilet in a five x five foot toilet compartment. Provide grab bars, including required vertical bar.

OR

Recommended Action: Relocate remaining toilet as required and replace existing toilet compartments.

There isn't an adequate turn-around.

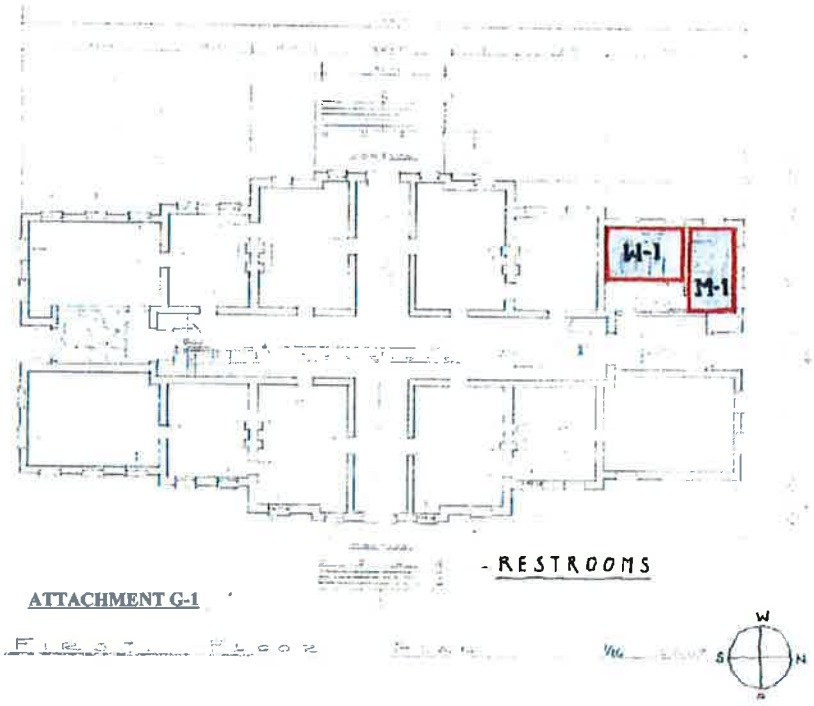
Recommended Action: Remove one sink and provide two 2'-8" wide toilet compartments.

Exposed water supply and drainpipes below accessible sink is not insulated.

Recommended Action: Provide pipe insulation.

The bottom edge of the reflective surface of mirrors is located above the maximum height of 40" above the floor surface.

Recommended Action: Re-locate reflective surface of mirrors to 40" maximum.



M-2 MEN'S RESTROOM_(See Attachments G-2 and G-3)

Restroom does not have a required five foot by five foot toilet compartment as required for accessibility.

Recommended Action: Replace two toilets with one accessible toilet in a five x five foot toilet compartment. Provide grab bars, including required vertical bar.

OR

Recommended Action: Relocate remaining toilet as required and replace existing toilet compartments.

Exposed water supply and drainpipes below accessible sink is not insulated.

Recommended Action: Provide pipe insulation.

The bottom edge of the reflective surface of mirrors is located above the maximum height of 40" above the floor surface.

Recommended Action: Re-locate reflective surface of mirrors to 40" maximum.

Two existing sinks are crowded and do not allow for 18" on door pull side.

Recommended Action: Remove one sink and relocate remaining sink for improved accessibility.

Urinal screen restricts accessible access.

Recommended Action: Remove one urinal and relocate remaining urinal for improved accessibility.

W-2 WOMEN'S RESTROOM (See Attachment G-2 and G-3)

Restroom does not have a required five foot by five foot toilet compartment as required for accessibility.

Recommended Action: Replace two toilets with one accessible toilet in a five x five foot toilet compartment. Provide grab bars, including required vertical bar.

OR

Recommended Action: Relocate toilets as required and replace existing remaining toilet compartments with 2'-8" wide units.

Exposed water supply and drainpipes below accessible sink is not insulated.

Recommended Action: Provide pipe insulation.

The bottom edge of the reflective surface of mirrors is located above the maximum height of 40" above the floor surface.

Recommended Action: Re-locate reflective surface of mirrors to 40" maximum.

One sink is too close to the doorway.

Recommended Action: Remove sink.

W-3 WOMEN'S RESTROOM & M-3 MEN'S RESTROOM (See Attachment G-2 and G-3)

These restrooms do not have a 5 foot turn-around and are not accessible.

Recommended Action: If an accessible route is provided to these restrooms, convert each restroom to an Assisted-Use Toilet Room.

OR

Recommended Action: If an accessible route is not provided to these restrooms, do not renovate.

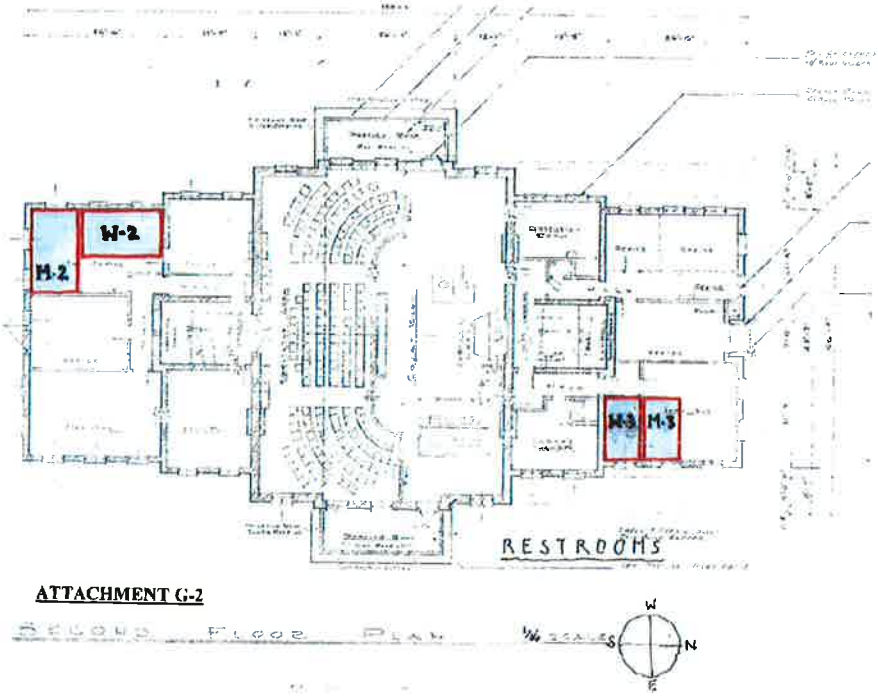
FAMILY ASSISTED OR ASSISTED-USE TOILET ROOMS_(See Attachment G-2 and G-3)

An accessible Family Assisted or Assisted-Use Toilet Room is required in an Assembly Occupancy that has an aggregate sum (total) of six (6) or more male and female toilets combined. The minimum aggregate number of toilets required for the courthouse is six. The building does not currently have a Family Assisted or Assisted-Use Toilet Room.

Recommended Action: If an accessible route is provided to restrooms W-3 and M-3, renovate each restroom to a Family Assisted or Assisted-Use Toilet Room.

OR

Recommended Action: If an accessible route is not provided to restrooms W-3 and M-3, do not renovate and provide a Uni-Sex Assisted-Use Toilet Room adjacent to the elevator on the 2nd floor.



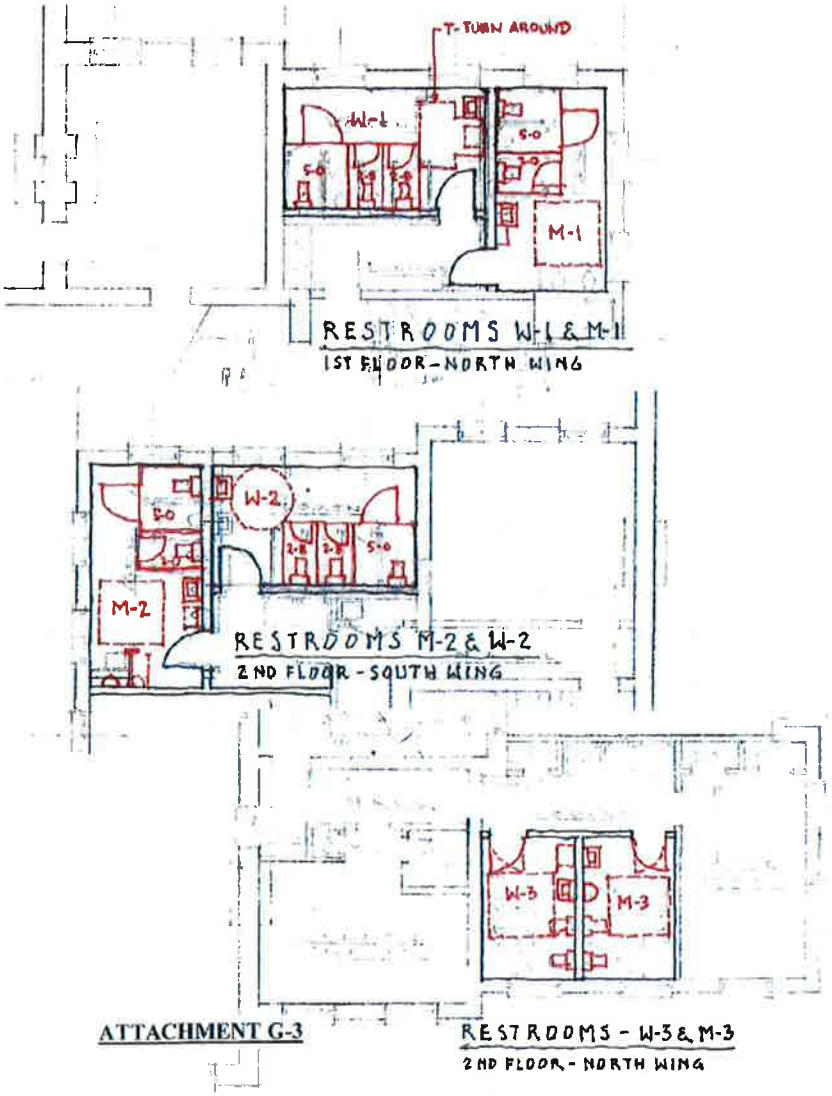
WATER FOUNTAINS

Three existing water fountains do not meet accessibility standards.

Recommended Action: Replace the existing two water fountains on the first floor with either one or two accessible duplex water fountains with dual heights.

OR

Recommended Action: Either delete or replace the existing water fountain located on the north side of the judicial platform on the second floor. If replaced, relocate a dual height fountain to the area adjacent the more accessible restrooms on the south side.



BUILDING CODE COMPLIANCE STUDY

2015 North Carolina Existing Building Code (NCEBC)
2012 North Carolina State Building Code (NCSBC)
Accessible and Usable Buildings and Facilities, ICC A117.1 (ANSI).

COMPLIANCE WITH *2015 North Carolina Existing Building Code*

Structures must comply with the code under which they were constructed. The Courthouse was constructed prior to 1936 and, in accordance with the *2015 North*

Carolina Existing Building Code, has "no continuing conditions". In other words, no work, except for ADA compliance, is required to bring the building in compliance with the building code provided that there are no conditions that pose an "imminent life safety Hazard". Any conditions that pose an "imminent life safety hazard" must be mitigated. Captain Robert Bolick of the Monroe Fire Department confirmed that the Courthouse has no conditions that pose an "imminent life safety hazard" and the building is in "compliance" with the NC Fire Prevention Code, Chapter 1, regarding "conditions posing an imminent life safety hazard". Any "new work" is required to comply with the current applicable codes.

Recommended Action: None

ADA ACCESSIBILITY

Existing construction is required to meet ADA standards for accessibility in compliance with *Accessible and Usable Buildings and Facilities, ICC A117.1 (ANSI).* The Courthouse is listed on the National Register of Historical Places and is a designated as a Local Historic Property. Where compliance with the requirements for accessible routes, ramps, entrances or toilet rooms are technically infeasible or would threaten or destroy the historic significance of the building, as determined by the AHJ, the alternative requirements of Sections 1204.1.1 through 1204.1.4 of the NCEBC shall be permitted.

Recommended Action: Renovate restrooms and courtroom for accessibility – see ADA Compliance Study.

RENOVATION WORK CLASSIFICATION

Renovations for accessibility in the Men and Women Restrooms, and the addition of a Family Assisted or Assisted-Use Toilet Room, would be classified as a *Level 2 Alteration* and all new construction shall be required to comply with a *Level 2 Alteration* as outlined in the *2015 North Carolina Existing Building Code* (NCEBC). The local AHJ recommends using the "work area compliance method" of the 2015 NCEBC, and the Level 2 classification applies only to the defined "work area", which in this case is the Restrooms and the accessibility renovations in the courtroom. There can be other "work areas" in the building with different levels of classification depending on the type of alteration – such as plaster repair work in the courtroom that would be classified as "Repair" work.

Recommended Action: Provide Level 2 Alterations according to the "work area compliance method"

OCCUPANCY CLASSIFICATION

The "Occupancy Classification" for the Historic Courthouse is an "A-3 Assembly Occupancy" - which includes both "courtroom" and "museum" uses. The "occupant load" – the number of persons for which the *means of egress* and number of plumbing fixtures of a building are determined - is based on the following "*use*" classifications:

"A-3 Assembly (with fixed seats)" for the courtroom
"Museum" for the first floor and designated areas on the second floor
"Storage" for the Basement and selected areas on the second floor

The Courtroom area (second floor level), other than the fixed seating area, has been classified as "Museum" use for the purpose of determining the Occupant Load.

Recommended Action: None

OCCUPANT LOADS (see attachments B-1, B-2, B-3 and B-4)

The 2015 IBC specifies the following for determining the Occupant Loads: (See the attached sketches "Occupant Load - Floor Plan Area" for the designated areas and "use" classifications.)

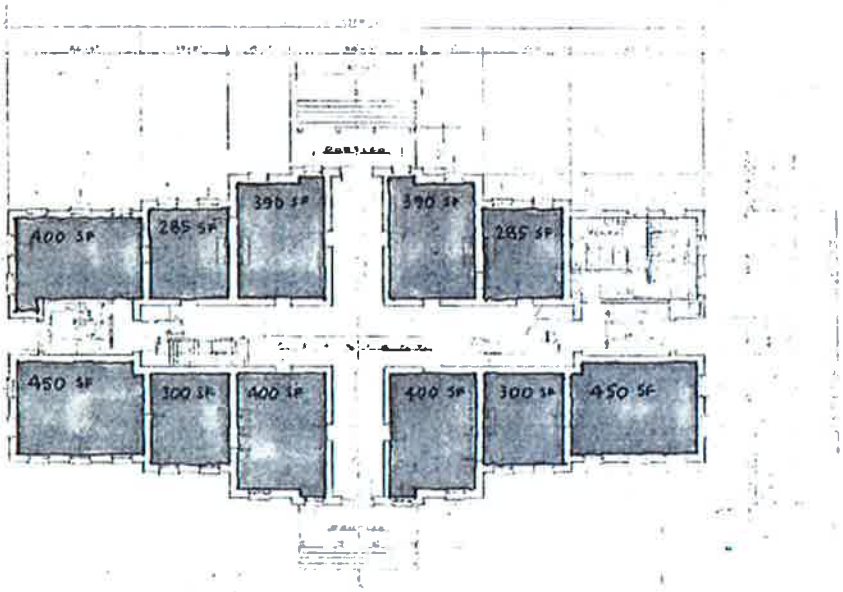
1. "Museum" Occupant Load for the first floor level and designated areas on the second floor: 7505 square feet net area at one (1) person per thirty (30) square feet net area equals an Occupant Load of 251 persons.

2. "Assembly" Occupant Load for the fixed seating on the second floor Courtroom and the Balcony Mezzanine equals and Occupant Load of 290 persons.

3. "Storage" Occupant Load for storage areas in the Basement and storage adjacent the Balcony Mezzanine: 5070 square feet gross area at one (1) person per three hundred (300) square feet gross area equals an Occupant Load of 17 persons.

Total Occupant Load for the Historic Courthouse: 558 persons

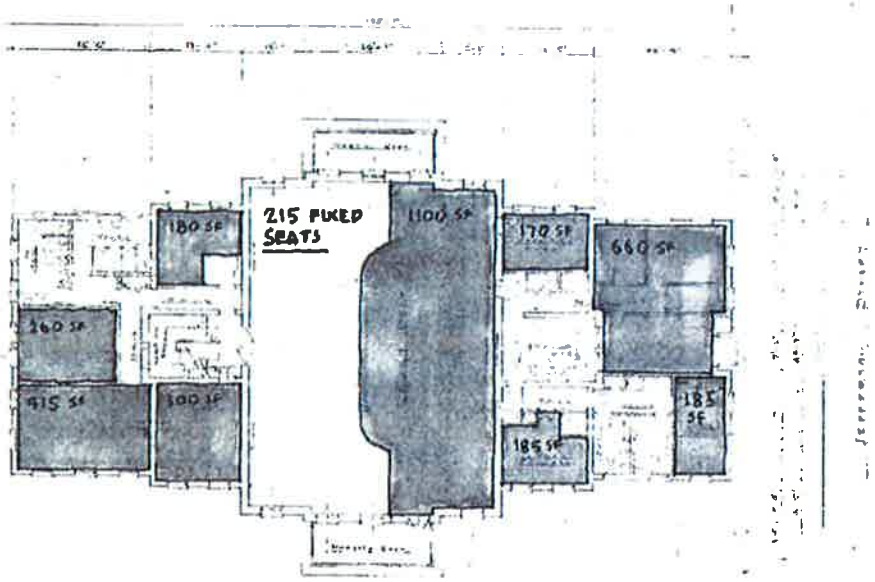
Recommended Action: None required



FIRST FLOOR PLAN

1 - OCCUPANT LOAD: 4050 S.F. NET AREA/30 S.F. = 135 PERSONS TOTAL (MUSEUM USE)

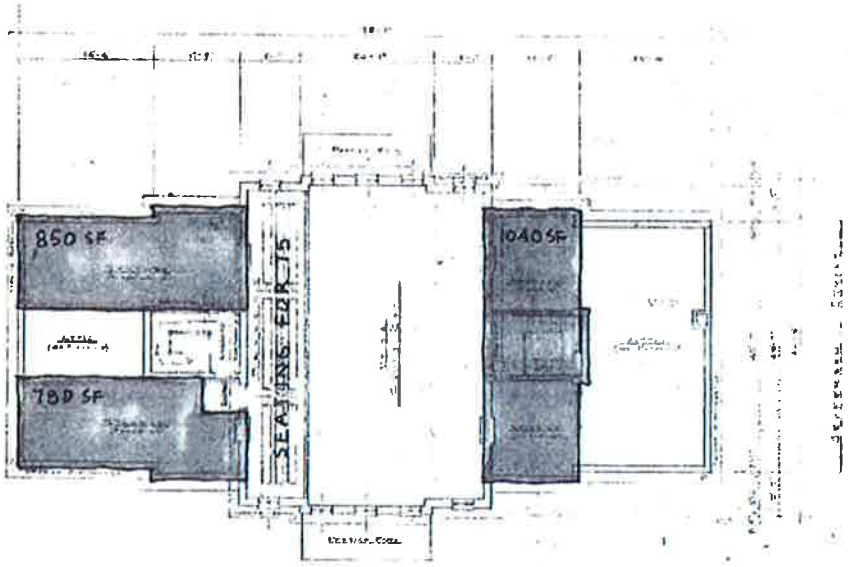
ATTACHMENT B-1



SECOND FLOOR PLAN

2- OCCUPANT LOAD: 215 FIXED SEATING = 215 PERSONS (A-3)
3455 SF NET AREA/30 S.F. = 116 PERSONS (MUSEUM USE)
331 PERSONS TOTAL

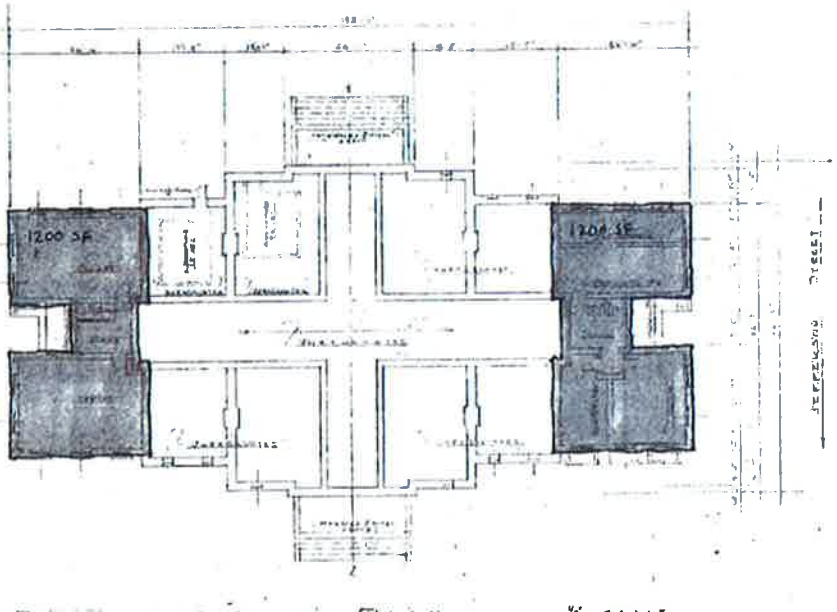
ATTACHMENT B-2



ATTIC FLOOR PLAN ⅛" SCALE

3- OCCUPANT LOAD: FIXED SEATING = 75 PERSONS (ASSEMBLY A-3)
STORAGE GROSS AREA = 2670 SF/300 SF = 9 PERSONS
84 PERSONS TOTAL

ATTACHMENT B-3



BASEMENT PLAN ⅛" SCALE

4- OCCUPANT LOAD: STORAGE GROSS AREA = 2400 SF/300SF = 8 PERSONS TOTAL

ATTACHMENT B-4

EXISTING STAIR WIDTH, DOORS AND EXIT CAPACITY

Balcony: (52" stair clear width /22") x 75 persons = 177 person capacity > 84 Occupant Load.

Second Floor: (52" stair clear width /22") x 2 stairs x 75 persons = 354 person capacity > 331 Occupant Load.

First Floor: (4 doors x 34" clear width /22") x 100 persons = 618 person capacity + (75" stair clear width /22") x 2 stairs x 75 persons = 1128 person capacity > 558 Total Occupant Load.

Recommended Action: None

EXISTING STAIR HANDRAIL HEIGHT - 34"

Recommended Action: None

EXISTING PRIMARY CORRIDOR WIDTH - 10 feet, First Floor

Recommended Action: None

EXISTING CORRIDOR FIRE RESISTANCE

Walls: 1-hour (per 2015 NCEBC)
Doors and Frames: Unrated

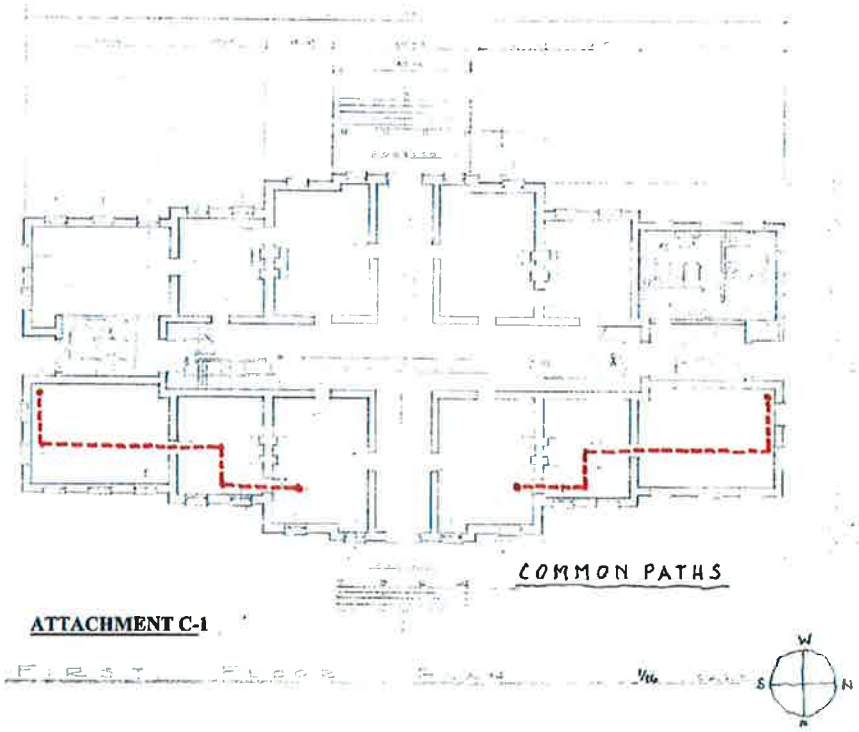
Recommended Action: None

EXIT DOOR COUNT - Eight (8)

Recommended Action: None

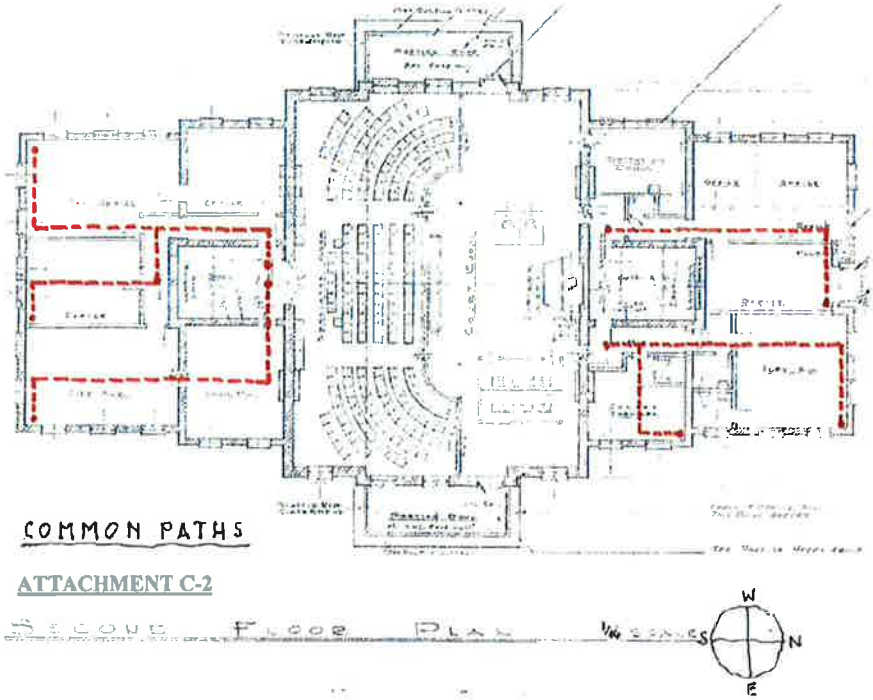
COMMON PATH OF EGRESS TRAVEL (See attachments C-1, C-2, C-3 & C-4)

Recommended Action: None



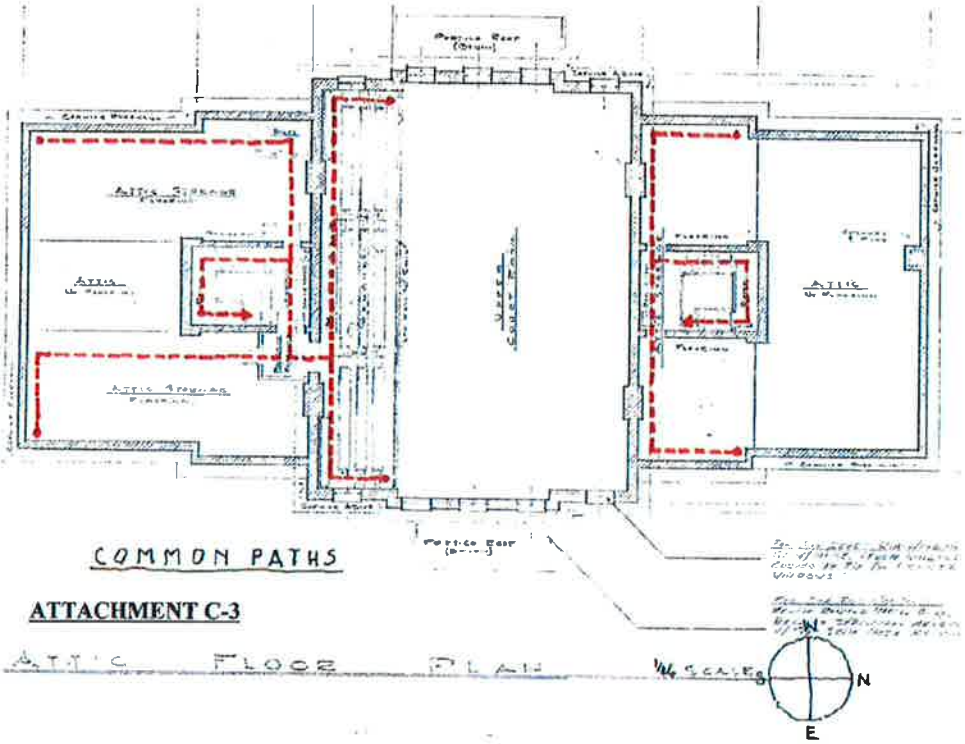
ATTACHMENT C-1

FIRST FLOOR PLAN



ATTACHMENT C-2

SECOND FLOOR PLAN


COMMON PATHS
ATTACHMENT C-3
ATTIC FLOOR PLAN
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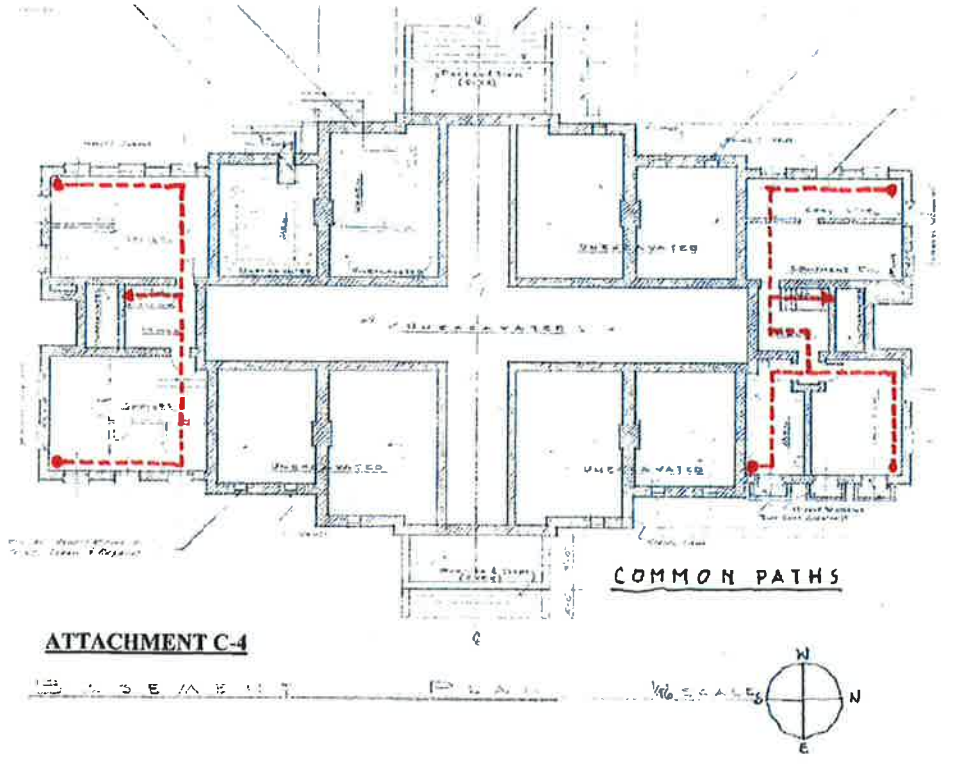
COMMON PATHS
ATTACHMENT C-4
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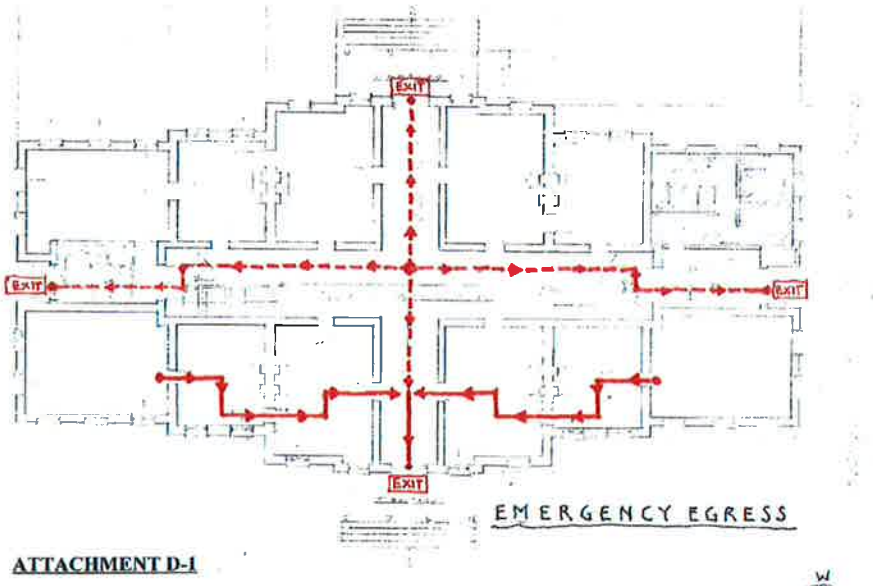
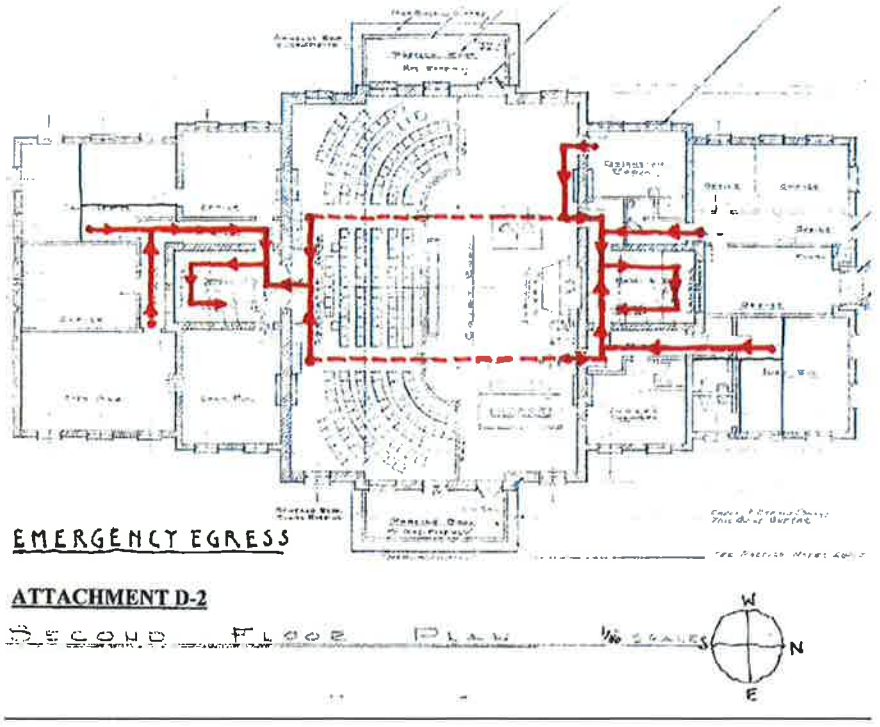
EMERGENCY EGRESS (See attachments D-1, D-2, D-3 & D-4)

Recommended Action: None



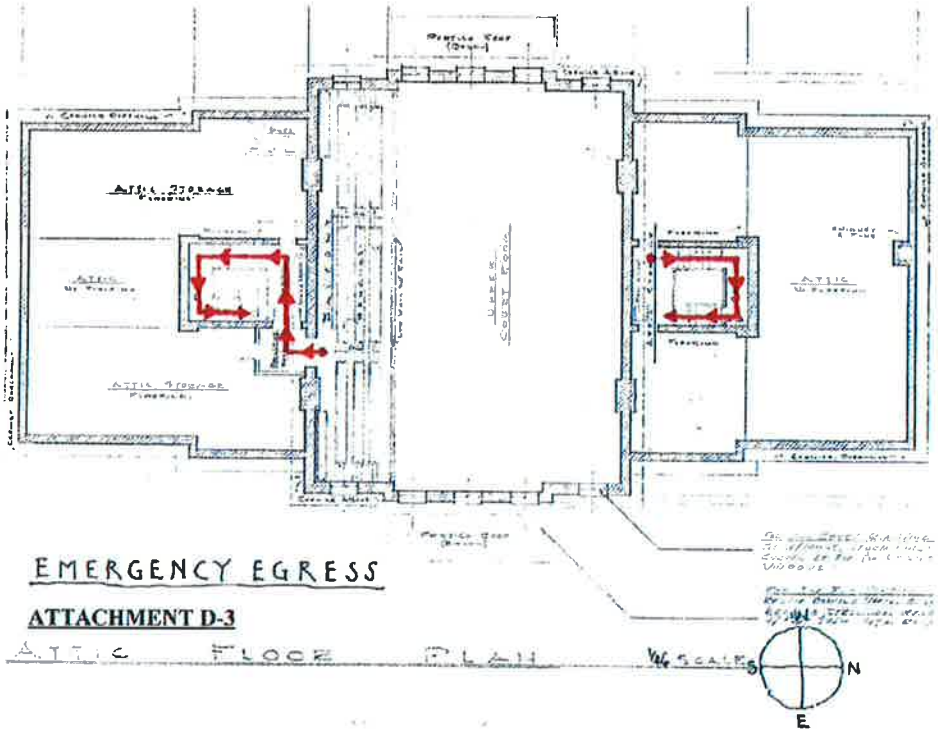
ATTACHMENT D-1

FIRST FLOOR PLAN



ATTACHMENT D-2

SECOND FLOOR PLAN


EMERGENCY EGRESS
ATTACHMENT D-3
ATTIC FLOOR PLAN
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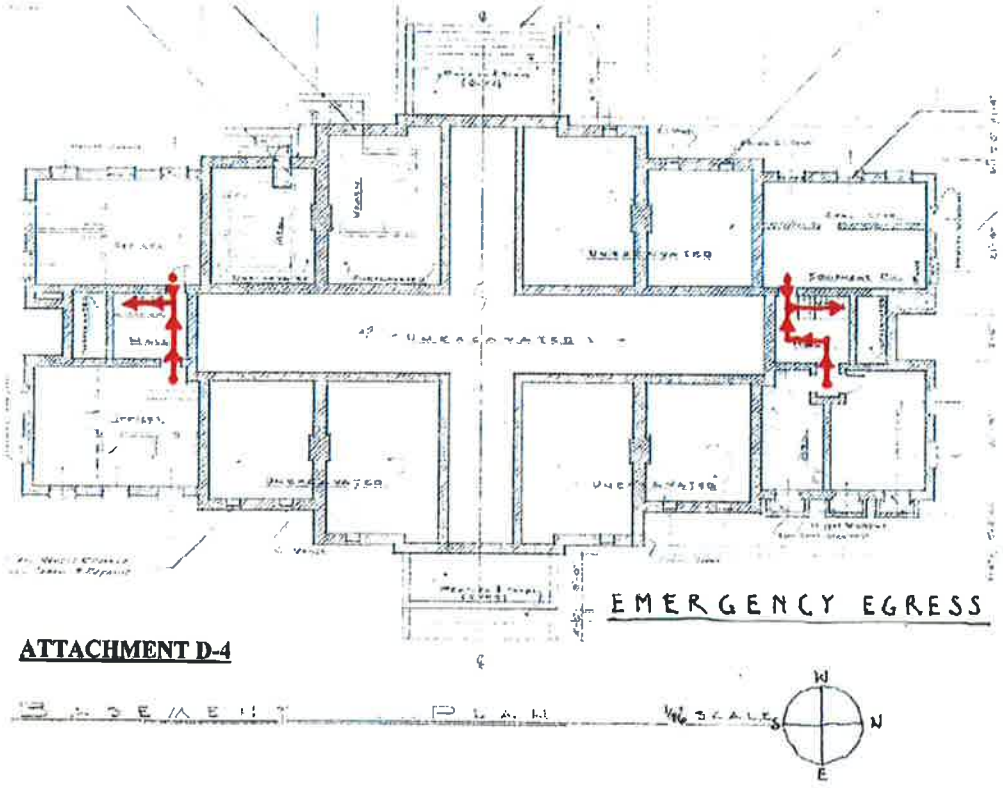
EMERGENCY EGRESS
ATTACHMENT D-4
BASEMENT PLAN
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E

RESTROOM PLUMBING FIXTURE COUNT
(Fixtures required are based on a Total Occupant Load of 558 persons)

Existing: Men: Toilets – 8; Urinals – 5; Sinks – 5
Women: Toilets – 10; Sinks – 6

Required: Men: Toilets – 2; Urinals - 0; Sinks – 2
Women: Toilets – 4; Sinks – 2

Proposed: Men: Toilets – 4; Urinals - 2; Sinks – 3
Women: Toilets – 6; Sinks – 3
Unisex Family Assisted or Assisted-Use Toilet Room: Toilets – 2; Sinks – 2

Recommended Action: Provide restroom renovations for "Proposed" fixtures noted above. The total number of toilet fixtures (12) exceeds the minimum amount required (6). (See also Recommended Actions listed in the ADA Compliance Study)

RECOMMENDATIONS AND COST ESTIMATES

Costs do not include design fees, general contractor overhead or contingencies.

ARCHITECTURAL COST ESTIMATE

It is our understanding the County wishes to embark upon a comprehensive exterior restoration. The intention being the exterior of the building would only require basic maintenance for the next 30-50 years. Most materials and systems recommended below will last a minimum of thirty years, in many cases much longer. Vermont slate roofing has an expected life span of 90 years. Copper roofing and flashing has an expected life span of 75 years. To realize these life spans, the materials must be maintained by knowledgeable craftspeople. Slate roofing is repaired with bronze hooks, not the flat tabs of copper seen on the current roof. Copper flashing is installed and re-secured over time with mortar, not caulking. Copper box gutters and portico roofs are re-soldered when a seam breaks, not mopped with tar.

To monitor the condition of these materials and systems over time, it is recommended the County have a qualified professional (architect or engineer) monitor the condition of the exterior envelope on a scheduled basis (every ten years is recommended). If repairs need to be made, the professional can write up the scope of the work with minimal drawing notes and/or specifications, and assist the owner in finding properly skilled craftspeople to make the repairs. This assures both quality work and accurate bids.

COST ESTIMATORS

The following architectural cost estimates were graciously provided by three companies – The Century Slate Company, Centennial Preservation Group, and Sealing Agents Waterproofing Inc.

Century Slate: The Century Slate Company is a roofing contractor specializing in slate, copper and other historic roofing materials. Michelle Walter has worked with Century Slate at Centenary United Methodist Church and First Baptist Church, both in Winston-Salem, NC, and highly recommends their work.

Centennial Preservation: Centennial Preservation Group is a preservation contractor specializing in the restoration of masonry, doors, windows, plaster and wood. Michelle has worked with Centennial Preservation at First Baptist Church and Union Train Station, both in Winston-Salem, NC, and highly recommends their work.

Sealing Agents: Sealing Agents Waterproofing is a fully service waterproofing company. Sealing Agents was referred to Michelle by Union County Public Works. Michelle was impressed by their professionalism and is looking forward to working with them in the future.

Clock Tower

Replace slate roofing and copper flashing in-kind.
Install historically-accurate copper ridge detail.
Replace wood decking as needed $100,000

Strip sheet metal sheathing to bare metal.
Repair sheet metal sheathing as needed, specifically at clock hoods, and repaint.
Replace wood decking as needed $25,000

Slate Roof

Replace slate roofing and copper flashing.
Match original slate stored in basement.
Use true step flashing at masonry $140,000

Replace box gutter in lead-coated copper.
Replace all wood decking $35,000

Strip sheet metal cornice, frieze, dentils and east and west pediments to bare metal.
Repair sheet metal as needed and repaint $30,000

Flat Roofs

Replace EPDM roofing. Replace low gable framing below roofing to provide positive drainage to downspout locations. Remove modern sheet metal placed over original cast stone parapets, and attached modern flashing. Install proper base and cap flashing bedded into the masonry joints at the back of the masonry parapet. Replace decking as needed, specifically at downspouts and far north and south edges of the roofs $70,000

Portico Roofs, Balcony Flooring and Entrance Hoods

Replace east and west portico roofs with flat-seam lead-coated copper roofing. Install proper base and cap flashing bedded into the masonry joints at the face of the masonry wall. Replace decking as needed $50,000

Replace slate facing in-kind and flash with copper $4,000

Remove wrought iron railing. Sandblast to bare metal, make repairs as needed and repaint. Reinstall railing atop portico roofs after new roofing has been installed $8,500

Replace north balcony flooring with flat-seam lead-coated copper roofing. Install proper base and cap flashing bedded into the masonry joints at the face of the masonry wall. Replace decking as needed $7,000

Strip sheet metal balcony railing to bare metal. Repair sheet metal as needed and repaint $4,500

Strip sheet metal north and south entrance hoods to bare metal. Repair sheet metal as needed and repaint $2,500

Windows

Strip wood sash and surrounds to bare wood. Make dutchmen repairs as needed. Reinstall original glass in sash and repaint sash and surrounds. Sash will be removed cyclically for shop restoration, and reinstalled in surrounds after both sash and surround are restored. Install new spring bronze weather stripping in all locations. Use pure linseed oil putty for glazing and pure linseed oil paint on wood. These historically accurate materials have the longest lifespan of any materials on the market, are breathable and can be easily touched up and repaired on-site $242,000

Portico Woodwork

Strip all portico woodwork to bare wood, make dutchmen repairs as needed, and repaint with linseed oil paint $30,000

Exterior Doors

Strip all exterior doors and surrounds to bare wood. Make dutchmen repairs as needed. Reinstall original glass in doors and re-finish sash and surrounds. Install new spring bronze weather stripping in all locations. Use pure linseed oil putty for glazing and traditional varnish on wood $34,000

Foundation

Remove all landscaping and sprinklers within six feet of the exterior wall of the building. Excavate at the exterior walls of the 1928 additions to expose the existing water proofing and french drains. Clean-out, repair and replace drains and waterproofing as needed. Make existing sump-pump operable or replace. Replace missing sum-pump(s). Fill trench. Do not reinstall landscaping or sprinklers $16,000

All exterior restoration work should be completed prior to embarking on the below listed interior restoration items.

Plaster $58,000

Remove skim coat plaster from first floor walls, where failing. Repair plaster as needed and repaint.

Remove "popcorn" from plaster ceiling in courtroom. Reinforce plaster attachment to lathe per structural recommendations. Repair plaster as needed and repaint.

Consolidate plaster frieze in courtroom. Remove delaminated area of plaster. Re-build face of plaster as needed, and repaint.

Remove skim coat plaster and fabric reinforcement from courtroom wall, where failing. Correctly repair plaster cracks and de-lamination to original 1928 face of plaster.

Woodwork and Flooring $60,000

Repair finish on doors and surrounds, at commonly used doors on first floors.
Repair wood flooring at south entrance on first floor.
Repair first floor landing south stairs.
Repair finish on south courtroom door.
Refinish window sills in courtroom.
Refinish gates at courtroom bar and other minor areas of woodwork as required.
Replace linoleum flooring in entire courtroom.
Repair wood flooring north of courtroom at east landing.
Repair wood flooring north of courtroom at backside of detention room.
Refinish wood flooring in NW room on second floor.

Total Cost Estimate for Architectural Repairs $916,500

STRUCTURAL COST ESTIMATE

The following is a summary of recommended structural repairs with estimated costs associated with each. These costs do not include engineering costs and have not been verified by a Contractor or Estimator. These costs should only be considered as rough estimates. We strongly recommend these conditions be observed in the field by a Contractor qualified to perform the work described and determine more accurate costs prior to establishing any budgets.

The below are the results of a general visual assessment of the conditions observed during our site visits. Our opinions and assessment are limited in nature as stated herein and no inferences should be made relative to conditions not described or observed. Testing of materials has not been completed to verify assumptions relative to existing material strengths.

High Roof/Clock Tower

Tighten Existing Connections of Roof Trusses to Overcome shrinkage $7,500

Repair Existing Gutter System around Perimeters and Replace Existing "Outriggers", where Rotted (Framing Only) $7,500

Re-Secure Existing Plaster and Lathe Ceiling System over the Courtroom $6,500

Strengthen Existing Purlins Supporting Slate Roof $3,500

Strengthen Existing Courtroom Ceiling "Hip" Beam $5,000

Strengthen Framing around Floor Openings in Clock Tower with Handrails as Required $3,000

Clean Areas around Perimeters of Clock Towers to Eliminate Moisture Holding Dust/Debris and Allow Better Assessment of Primary and Secondary Members. Consider Installation of New Floor Decks at Intermediate Levels to Eliminate Floor Opening Hazards and Allow More Thorough Assessment of Floor Framing $15,000

Attic/Low Roof

Supplement Securement of Low Roof to Existing Attic Walls and Strengthen Existing Edge Beam Support $5,000

Replace Existing "Low" Outriggers $5,000

Supplement Anchorage of Existing Bearing Lines on Steel Beams $2,500

Supplement Framing around Openings and Beneath Mechanical Units $4,500

Second Floor Framing

Correct Floor Hump as Necessary (Unknown Condition) $7,500

Repair Floor Sag in Corridor behind "Judge Seat" Area (Unknown Condition) $3,500

First Floor/Crawlspace Framing

Supplement Support at Access Ways through Foundation Walls $5,000

Total Cost Estimate for Structural Repairs **81,000**

ELECTRICAL COST ESTIMATE

Pricing opinion does not include communications cabling.

Demolition

Panels $8,000
Feeders $800
Lights $9,900
Branch wire $17,600
Wiring devices $3,600

New Construction

Main panelboard 1,200A, 208/120V $32,500
Service $36,900
Distribution section $9,600
Grounding $1,700
Panels (to replace all) $73,500
Panel feeders (to replace all) $49,600
Lights $64,300
Wiring devices (to replace all) $64,900
Branch wire $45,000
Fire Alarm System (additional devices) $18,700
Fire Pump Feeder (50hp) 225A $17,500
Lightning Protection System $17,700
Data outlets $19,500

Total Cost Estimate for Electrical Upgrades **$491,300**

MECHANICAL COST ESTIMATE

Demolition

Air Handling Units	$17,700
Gas Piping	$9,600
Electric Heaters	$7,700
Air Distribution	$13,000
Controls	$4,500

New Construction

VRV System (including piping)	$264,500
Energy Recovery Ventilator	$42,000
Air Handling Unit	$40,000
Air Distribution	$51,700
Controls	$73,800

Total Cost Estimate for Mechanical Upgrades **$524,500**

PLUMBING COST ESTIMATE

Demolition

Fixtures	$7,300
Domestic Water Piping	$6,500
Sanitary Waste and Vent	$5,900
Water Heaters	$600

New Construction

Fixtures	$88,800
Domestic Water Piping	$61,000
Sanitary Waste and Vent	$48,900
Water Heaters	$22,200

Total Cost Estimate for Plumbing Upgrades **$240,400**

FIRE PROTECTION COST ESTIMATE

New Construction and Demolition

Fire pump system	$53,000
Sprinkler system (Wet and Dry)	$163,000
Installation of double interlocked pre-action system instead of wet system in Zone 1	$40,000
Connection to city water and underground water supply	$58,000
Total Cost Estimate for Fire Protection Upgrades	**$314,000**
TOTAL RESTORATION/RENOVATION COST ESTIMATE	**$2,567,700**

CONCLUSION

Walter Robbs would like to thank Union County, specifically Michael James, for selecting us to author this exciting report. It was a pleasure to work with Mr. James, the staff at Public Works, Mark Watson, Barbara Moore and the Heritage Room volunteers.

The Historic Union County Courthouse is an amazing building with a fascinating history. We hope you enjoyed reading the Historic Building and Site Analysis as much as we enjoyed doing the physical and documentary research. In the Building Envelope Study and following sections, we tried to address every physical issue possible. All in all, the building is in very good condition for its age and time elapsed since a major restoration (twenty-eight years). The maintenance required and upgrades needed, can easily be incorporated into a restoration and renovation project addressing new programming for the building.

It is wonderful that Union County has chosen to designate the historic courthouse and courthouse square as a museum. Walter Robbs hopes to be given the chance to assist the county further in the restoration/renovation and repurposing of the historic courthouse.

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Online Photograph Collection of The Heritage Room of Union County, Monroe, NC.

MAPS

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McDowell, Marshall, AIA, *Renovation & Restoration Old Court House Union County Monroe, NC, Phase II – Interior*, June 1984, from Dean Glenn of Union County Public Works.

McDowell, Marshall, AIA, *Renovation & Restoration Old Court House Union County Monroe, NC, Phase III– Grounds*, February 1986, from Dean Glenn of Union County Public Works.

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PHYSICAL INVESTIGATIONS

15 February 2016 - Michelle Walter, John Dickerson and Tim Cook.

June 2016 – Bruce Dalton

28 June 2016 - Michelle Walter, Tim Cook, Stephen Moorefield, Anna Reich and Bruce Dalton.

26 August 2016 - Michelle Walter and John Dickerson.

15 September 2016 – Tim Cook.

13 October 2016 - Michelle Walter and Tim Cook.