CONDITION STUDY FOR

CURRITUCK COUNTY

NORTH CAROLINA

PROJECT LOCATION

CURRITUCK COUNTY COURTHOUSE
CURRITUCK COUNTY
NORTH CAROLINA

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CONDITION STUDY
FOR THE
RENOVATION AND REPAIR OF THE
ORIGINAL CURRITUCK COUNTY COURTHOUSE

I. ARCHITECTURAL EVALUATION

A. Executive Summary

The purpose of this study was to investigate the physical condition of the "original" courthouse built of brick masonry.

According to local tradition the original, a wooden courthouse building, known as the Peyton building, after its builder, Robert Peyton, was replaced in the 1840's by the present building.

> "The present courthouse evidently dates prior to 1869 because no records exist for the construction of a courthouse from 1869 until the enlargement in 1897 in the Commissioners Minutes which are complete from 1869. In 1897 the building was enlarged and remodeled by the Saint Louis Art Metal Company. In 1952 the Courthouse was again remodeled and a rear addition connected the courthouse with the east end of the old jail. In 1989, the Courthouse was again expanded to include an elevator, and enlarge some offices."

At an initial meeting on October 27th, 1992, called by the County Manager, and attended by selected County staff personnel, State and County historians, and representatives of Cederquist Rodriguez Ripley, Architects and H.D. Manesh, Mechanical/Electrical Engineers, it was determined that a Field Investigation of the subject building would be made and a Preliminary Plan (or Plans) be prepared, addressing the known and/or anticipated problems associated with:

1. The Architectural Shell
2. The Interior Design
3. The Roof Structure
4. Heating, Ventilating, and A/C Systems
5. The Electrical System

Subsequent inspections were made in November and December of 1992. We report as follows:

1. The Architectural Shell

The original structure is two stories high with brick masonry bearing walls and wood framing. The building is structurally sound and in good to average condition considering its age. General maintenance is required inside and out plus special attention to the roof trusses and certain ground floor areas that have settled.

The building has no active fire protection system. Renovation should consider the installation of an approved sprinkler system plus the installation of smoke detectors and fire alarm system.

2. **The Interior Design**

The design intent is to capture the historic flavor, not to do an "authentic" restoration. The restoration is to be phased over a period not to exceed five years (to coincide with the 100 year anniversary of the 1897 renovation).

Although the building contains some remains of the interior details from before 1897, the vast majority of what remains in the building dates to the 1897 renovation by the St. Louis Art Metal Co. Therefore, the restoration intent will be in keeping with that time period. (Generally designated as "Victorian" in style.)

3. **The Roof Structure**

The trusses overall are in excellent condition considering their age. There is some checking or splitting in the top chord and diagonals, however it is our opinion that the checking in these members is not detrimental to the load carrying capacity of the trusses and replacement or repairs to the checks is unnecessary.

Where diagonals adjoining the top and bottom chords have separated, we recommend that the separations be closed on all three trusses.

Deflections of the plastered ceiling, is occurring because the weight of the mechanical units above is supported on ceiling joists that have been altered or cut to accommodate ductwork. This condition can be corrected by adding ceiling joists and bridging the cut joists or by supporting the mechanical units from the top chords of the trusses.

4. **Heating, Ventilating, and Air Conditioning Systems**

The mechanical equipment, consisting of split-system heat pump units with air handlers located in attic areas above the courtroom and condensers on concrete pads outside the building, was installed within the last five years and appears to be in good operating condition, but are in violation of mechanical ventilation code requirements.

The duct work system is poorly designed and contributes to inefficiency and higher operating cost. Extensive redesign is recommended.

5. **The Electrical System**

While the electrical power supply is adequate for lighting and power, various aspects of the system are outmoded, inefficient, and are in violation of electrical codes. Incandescent lighting fixtures are inefficiently used in most areas and lacking in others. The present system is over 30 years old and should be essentially replaced. Power receptacles are lacking in many areas. Some circuits are now run in exposed conduit.

Telephone wiring is run exposed in most locations.

The lightning protection system appears to be in good condition.

It is felt that the correction of the building deficiencies summarized above and presented in greater detail in the following report, will restore the "original building" portion of the present Courthouse Complex to a more intensive level of usage in addition to restoring to the courtroom area its circa 1897 Victorian atmosphere. Construction would be routine, and completion could be achieved within a period of six months.

B. **History**

The following is repeated from "Welcome to Historic Currituck County," a brochure distributed by the County and available to visitors.

CURRITUCK COURTHOUSE

"It is not certain when the first courthouse was built in Currituck County but during the 1722 session of the Assembly provision was made for a courthouse in the county on the adjoining land of either William Payton or William Parker. In 1723 Robert Peyton was commissioned to build a courthouse in the town of Currituck. Peyton, however, failed to comply with the building specifications of a wooden building thirty by eighteen feet with "stairs from flow to flow" and was sued. According to local tradition, the Peyton building was replaced in the 1840's. The present courthouse evidently dates prior to 1869 because no records exist for the construction of a courthouse from 1869 until the enlargement in 1897 in the Commissioners Minutes which are complete from 1869. In 1897 the building was enlarged and remodeled by the Saint Louis Art Metal Company. In 1952 the Courthouse was again remodeled and a rear addition connected the courthouse with the east end of the old jail. In 1989, the Courthouse was again expanded to include an elevator, and enlarge some offices."

The above was

"Compiled by **Currituck County Historical Society.** Information taken from the **National Register of Historic Places Inventory-Nomination Form.** Architectural description by Ruth Little-Stokes; Historical statement by John Flowers."

C. **General**

The original structure, dating prior to 1869 and enlarged in 1897 (see above) is a two-story brick masonry structure, 2,500 square feet on each floor, totalling 5,000 square feet. Dimensions of the exterior are 58 feet wide by 51 feet deep, at which point the addition of 1952 begins. Floors and some interior partitions are wood framed, with a crawl space under the ground floor. The wood roof is supported by heavy timber trusses in addition to wood rafters (See Section on Roof Structure).

The original exterior finish roofing was slate. The present roofing is of asphalt shingles which replaced the original roofing sometime in the last several years. Gutters and downspouts appear in good condition. Generally speaking the building is sound and in average condition, reflecting routine maintenance over the years. Several minor additions have changed the original character of the structure somewhat. The high gable added to the roof over the projecting central floor element of the building has, we feel, improved the west (front) facade. The original (?) front portico, originally constructed of wood has been replaced with a solidly constructed masonry structure which seems out of character with the original structure.

The ground floor spaces now housing office spaces show evidence of some settlement of the wood floor structure, especially in the records area which is heavily loaded by court and county records.

D. **Exterior Observations and Recommendations**

Exterior brick work on the south-east side is exposed to prevailing winds from Currituck Sound and shows evidence of weathering. Vertical lines of stress around windows on the eastern portion of the structure have been filled with mortar and are unsightly. The masonry cracks can be tuck-pointed with mortar of a matching color, or the cracked bricks can be removed and replaced with new bricks although matching will be difficult and will require skilled masons.

Openings into the crawl space for access or ventilation need attention. Vents should be screened with appropriate covers. A masonry filled access opening on the north-west side should be redone with matching brick. Various holes in the masonry made for mechanical piping should be pointed up with matching mortar.

The decorative white paint on the brick courses at the second floor and window head level should be considered. If the white decoration has historical significance or sentimental value it could remain, of course. Another solution: extend the painted band around the 1952 and 1989 additions.

Windows appear to be in good condition and are equipped with exterior storm sash. The lintels and sills are of granite or limestone (concrete?) which has spalled in several locations. The damaged areas can be replaced or repaired using an epoxy cement patching compound.

Exterior wood trim at the eaves appears to be in good condition, but should be inspected closely for signs of rot and replaced if necessary.

Doors at the front and side are somewhat the worst for wear and should be replaced. (See Interior for further comments).

The front portico and the sidewalk leading to it need attention. Lighting is necessary for proper illumination of the walkway at night. Bollard type lighting or 8 foot high glass lantern type fixtures should be installed. (See Electrical Section)

The granite steps and stone caps on the side piers should be checked for plumb and adjusted as necessary. The stone caps should be reset in mortar.

Lastly, walks and landscaping at front and sides could be improved so as to hide mechanical equipment. On the south side sidewalk the planting bed has sunk below the sidewalk level and should be built up and additional planting added.

The site as a whole, especially the parking area and rear driveway, needs attention badly but is recommended as another phase of study.

Ultimately, as the county grows in population and importance it is further recommended that a "master plan" of the entire Courthouse, Jail, Parking, and nearby Ferry Dock areas be studied and accomplished so as to present a unified concept to the citizens of the county and visitors who will be interested in the history and critical services now offered by the Courthouse and the nearby Governmental Complex.

E. **Interiors Investigation**

Investigations were performed in an attempt to uncover Historical evidence as to the materials and applications utilized during the original and transitional periods of the Courthouse construction. The following is a record of the areas investigated, the methods utilized, and the subsequent results.

1. **Courtroom**

Floor:

The existing carpet was removed (and reinstalled) in several areas to determine the condition and type of flooring underneath. The carpet was found to be a direct glue down system, over a tongue and groove wood flooring. Without a substantial removal of the carpeting system a room wide condition assessment can not be made, however the areas observed looked to be stable and repairable if desired in the renovation.

The raised flooring located at the west end of the courtroom is built up with wood members and was installed as part of the 1951 renovation. Significant wood trim members (base moldings) appear to have been removed at the time of this renovation although the current Judges Chambers door frame was moved vertically to accommodate the 1'-0" change.

Trim:

The existing windows retain the painted wood casings and corner block "bulls eye" molding, however, 1/4 round has been added to accommodate the wood paneling. The baseboards have been removed in all but minor amounts that can be found in the library and Judges Chambers. Door moldings/casings which match the windows are intact with the exception of the north hallway door. It was noted that one decorative corner bead remains in the Judges Chambers which is similar to those that exist in the second floor stairwell. All existing moldings were profiled (patterns drawn to scale) for potential reproduction.

Walls:

The existing wood paneling was removed (and reinstalled) in several areas to determine if suspected evidence of previous wood applications could be located. The existing wall subsurface is plaster and shows no signs of having been reworked.

Ceiling:

Inspections of the existing ceiling were performed from the attic space. Sections removed during the HVAC system installation remain amongst the rafters. The ceiling consists of a plaster and metal lath which is attached directly to the ceiling joists. No evidence was found that would indicate a tin ceiling was involved with this application.

All rafter and eave areas were inspected for any other debris which could have been left during a previous renovation.

NOTE: Inspections of both wall and ceiling systems reveal that if the period wood wainscoting and tin ceiling systems existed they were both removed in whole. An earlier extensive renovation could have replaced both of these systems with the plaster that we see today.

Windows:

The existing double hung windows are relatively new to the courthouse. The design, style, and installation are all appropriate to the historic character and should be retained. The south elevation roof dormer modification was part of the 1951 renovation. This dormer was constructed overtop of the original roof dormer. This dormer consists of (three) 4 paned windows, the top 3-panes being stained glass, which match the courthouse entrance doors.

NOTE: Although these windows (at dormer) are covered by the 1951 modification all three are intact.

The 1951 attic space was visited to examine the tie between the original courthouse and the 1951 addition. Three items of interest were revealed within this space:

a. The white brick detailing at the window arches and trim bands was intact at the attic space wall. This suggests that the white brick at least predates the 1951 addition. The white brick also is indicated in the Currituck County Brochure which shows it's existence prior to the front porch addition.

b. Two louvered arched top dormers are in the attic space. These dormers were installed in the 1951 addition (since removed).

c. Loose brick which matches the courthouse were found that are stamped Edenton Brick Works.

Doors:

Many of the original raised panel doors remain in place, however, several have been modified and/or replaced.

The existing front door, although appropriate in design, re: raised panel wood, it does not meet code per it's direction of swing.

Stair and Hall:

The framing and geometry of the front stair appears to be in the original configuration. It was suspected to have been more open underneath, but the relationship of the framing, lathe, and plaster indicate that it has not received modifications. Several balusters are damaged and/or missing.

2. **Second Floor**

Porch Area:

Flashings and roof materials show deterioration. These must be repaired prior to any installation of patio surfacing.

3. **First Floor**

Offices:

Much of the original trim and finishes have been removed in these areas. The entry doors/transoms do not match and are comprised of materials which do not contribute to the historic character.

General:

Paint samples were taken from several surfaces to determine the transitional color palates utilized. Many of the colors proposed by the County for the restoration appear in the samples taken. The condition of the wood under layers of paint at the front stair indicate that the original finish was a dark oak (natural) stain. Wear patterns indicate that the natural finish would perform better. Plaster surfaces throughout will require repairs, re: water and mildew damage, and in several areas structural repairs.

F. Interior Recommendations

1. Second Floor

Courtroom/Jury Room/Judges Chamber/Library:

The second floor is a functioning space, but the areas are cramped and uncomfortable for the participants. Just as importantly, the ADA requirements for handicapped accessibility are not being met. Therefore, some design changes are required to rectify the situation.

By creating a new hallway in line with the central hall in the 1951 and 1989 additions, there will be direct access to the courtroom from the elevator. Eliminating the existing platform at the front of the courtroom, will allow the handicapped to approach the witness stand, jury box, etc. Creating a sloping floor toward the rear of the courtroom (as in a theatre) allows the public to gain a better view of proceedings.

To create symmetry in the courtroom, the Judge's Bench would be centered and raised 12" (compensating for the elimination of the platform) and balanced on either side by the witness stand and the clerk of court's desk. Safety or bullet-proof glass could be added to the window behind the judge to enhance security. By eliminating the existing Judge's Chambers, a new space would be created for a Jury Box, placing them closer to the witness and Judge. This new Jury Box also secludes the jury from the public, eliminating the problem of having potentially hostile people directly at their backs.

New Judge's Chambers would be created with space gained by moving a storage area. This new space greatly improves the Judge's ability to meet with people in his chambers, and by having the door open directly into the courtroom keeps it secure. The bathroom shown on the plan would be optional, because to meet codes, it's size would take much floor space from the Judge's Chamber.

The new Jury Room would be created from the old hallway space. Security is improved by having the door open directly from the courtroom. The bathroom would be enlarged to meet code and a coffee bar would be added to enhance the Jury's comfort during deliberations.

The library space would not be altered except to move the doorway over, allowing for the addition of a floor-to-ceiling bookcase behind the door. New shelving and counter space should allow for increased storage with better access. Volumes now housed elsewhere in the building could be brought to their proper location. Ideally this space would be enlarged, but building constraints prohibit.

As for the aesthetic aspect of the second floor, we suggest a return to the Victorian style that would have been apparent in 1897. Moldings with the "bulls eye" corners will be retained and replicated as required, as will the paneled doors, over-sized wood baseboards and door hardware. The 1951 paneling should be removed, returning to the original plaster walls. A wainscot of raised panel wood could be added to the walls and be used around the Judge's Bench, Witness and Clerk of Courts area, Jury Box, and as a division between the Attorneys and the Public. The wainscot is a period detail as well a protective barrier against impact to the plaster wall. New benches would replace the Public seating and other furnishings would be studied to determine whether re-furbishing or new purchase would be recommended.

Our investigation resulted in no evidence of former decorative ceilings, but a pressed metal ceiling would add needed interest to the courtroom space and was prevalent in that era (see photo). Air quality could be enhanced by the addition of ceiling fans, Victorian in styling. Lighting would be from the ceiling fans with the addition of down lights to achieve proper light levels.

The wood flooring under the existing carpet does not appear to be appropriate as the new floor finish due to the softness of the wood and also the noise that would be generated. We recommend a good quality broadloom carpet, possibly patterned, as would have been appropriate to the era. The color scheme and final decorative details will be finalized as the project progresses.

<u>The Lobby</u>:

All of the door/transom systems within the lobby need to be changed to be consistent with one another and to blend with the surrounding historic character. All original moldings, trims, doors and hardware would be restored and reproduced as required. The storm door should be removed. The entry door must be reworked to swing in the opposite direction to meet code. Some of the bannister pieces are broken and need to be replaced. All wood should be stripped and re-finished.

Again we suggest carpet on the floors, (same as on the second floor) due to noise control and because of the softness of the wood. Applying the carpet as a runner up the stairs and leaving the wood exposed at the edges would add warmth without noise. Because of heavy usage, wallcovering should be considered instead of paint due to ease of maintenance.

New seating will be suggested to both increase volume and for aesthetics. A decorative light fixture should replace the current fixture.

2. **First Floor**

Offices

As shown on the plans, through space planning and acquisition of some furnishings, the efficiency and appearance of some of the offices can be improved without any major construction. By shifting the Court Clerk's office around to better utilize existing square footage, there is more room to serve the public and the employees. The addition of some counters and utilization of vertical space will help eliminate a lot of clutter. This space of course will eventually be outgrown, so these improvements should be designed with flexibility for future, either within the building for other use or to be moved to another location.

Although dropped ceilings with modern fluorescent fixtures are neat and functional, the ceilings, ideally, would expose the historic metal work. Concealment of telephone and electrical wiring and addition of decorative lighting fixtures would enhance the look, giving a distinctive character without sacrificing function.

By cleaning up the office clutter, and standardizing the furnishings, aesthetically the spaces will need only paint and carpet to be completed.

G. **Architectural Cost Estimate**

Courtroom, Jury Room, Judge's Chamber

Woodwork	$	18,645.00
Ceiling	$	7,175.00
Carpet	$	7,500.00
Plaster Repairs	$	3,800.00
Chandeliers/Fans	$	6,800.00
Platform	$	6,000.00
Window Treatment	$	3,500.00
Paint Systems	$	5,500.00
Demolition	$	11,000.00
Doors	$	1,500.00
Furnishings: Chairs	$	5,700.00
Tables	$	3,500.00
Benches	$	8,000.00
Library Shelving	$	1,200.00
Casework	$	2,000.00
Total	**$**	**91,820.00**

Foyer

Stair Repairs/Refinishing	$	4,500.00
Paint Systems	$	1,400.00
Plaster Repairs	$	2,600.00
Carpet	$	3,000.00
Doors	$	3,500.00
Light Fixture	$	800.00
Wallcovering	$	1,200.00
Patio Blocks	$	800.00
Seating	$	1,800.00
Roof Repairs	$	2,000.00
Total	**$**	**21,600.00**

Clerk of Courts/Registrar of Deeds

Woodwork	$	1,800.00
Carpet	$	5,600.00
Paint Systems	$	4,500.00
Demolition	$	1,200.00
Plaster Repairs	$	2,800.00
Doors	$	1,500.00
Window Repairs	$	1,500.00
Total	**$**	**18,900.00**

Exterior

Building Trim Cleaning, Repair Painting	$	3,000.00
Masonry Repairs	$	1,500.00
Doors, Frames, and Hardware	$	3,000.00
Landscaping	$	1,000.00
Front Porch Area	$	1,200.00
Total	**$**	**9,700.00**

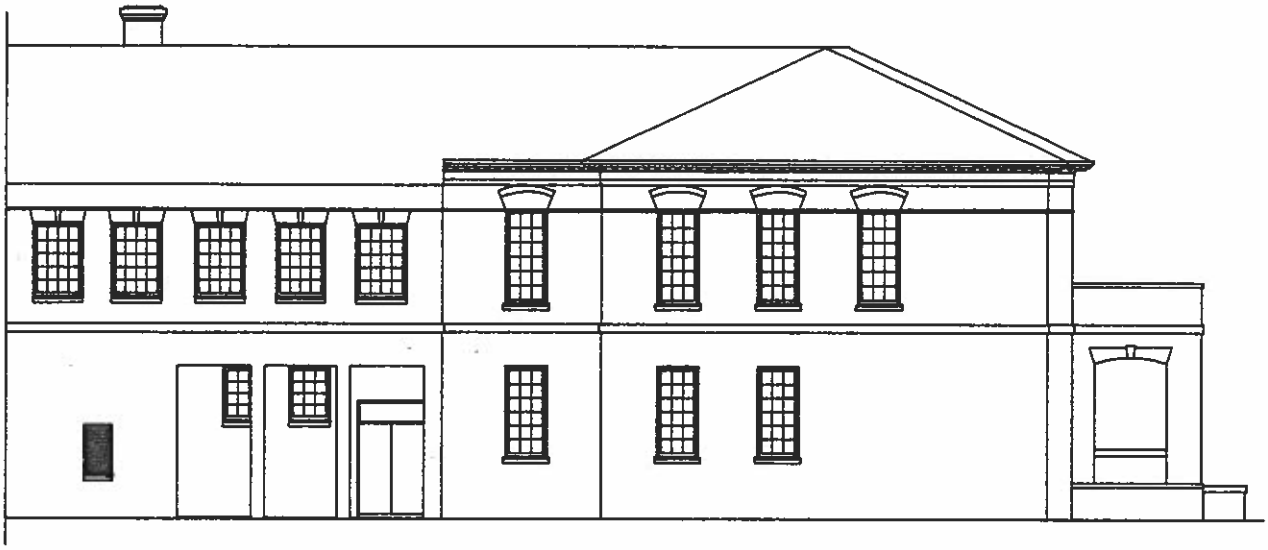
Structural Cost Estimate

Truss Repairs	$	9,500.00

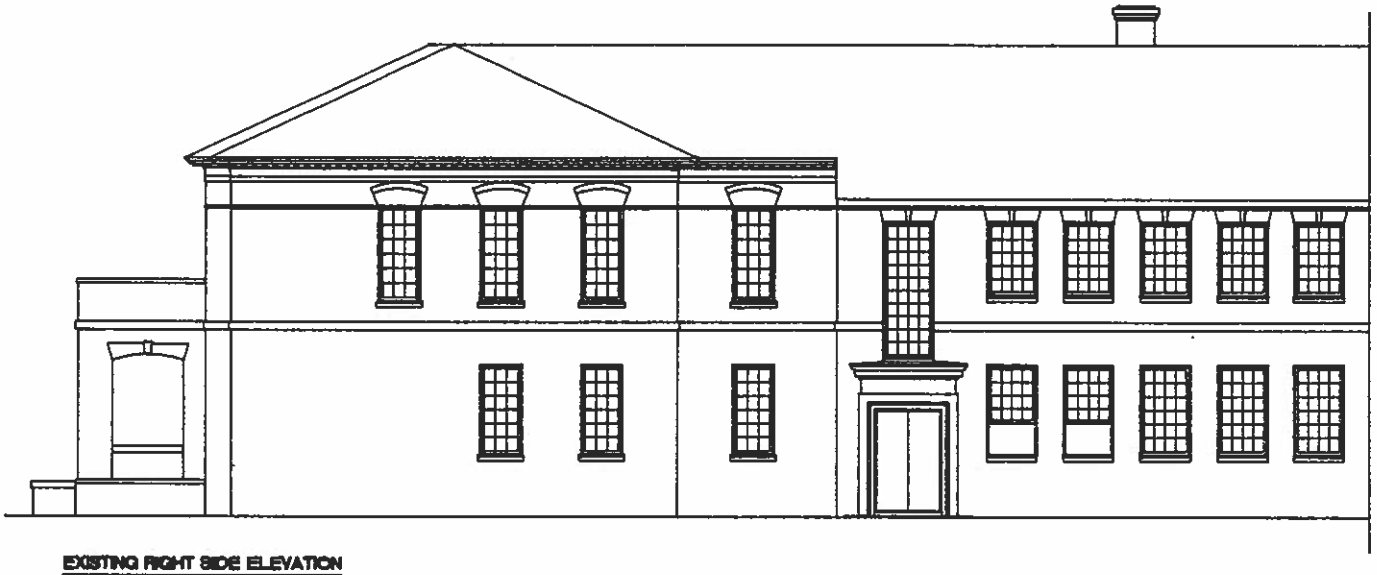
H. **Plans, Elevations, and Photographs**

COURTHOUSE ELEVATIONS

EXISTING FRONT ELEVATION
SCALE: 1/4" = 1'-0"

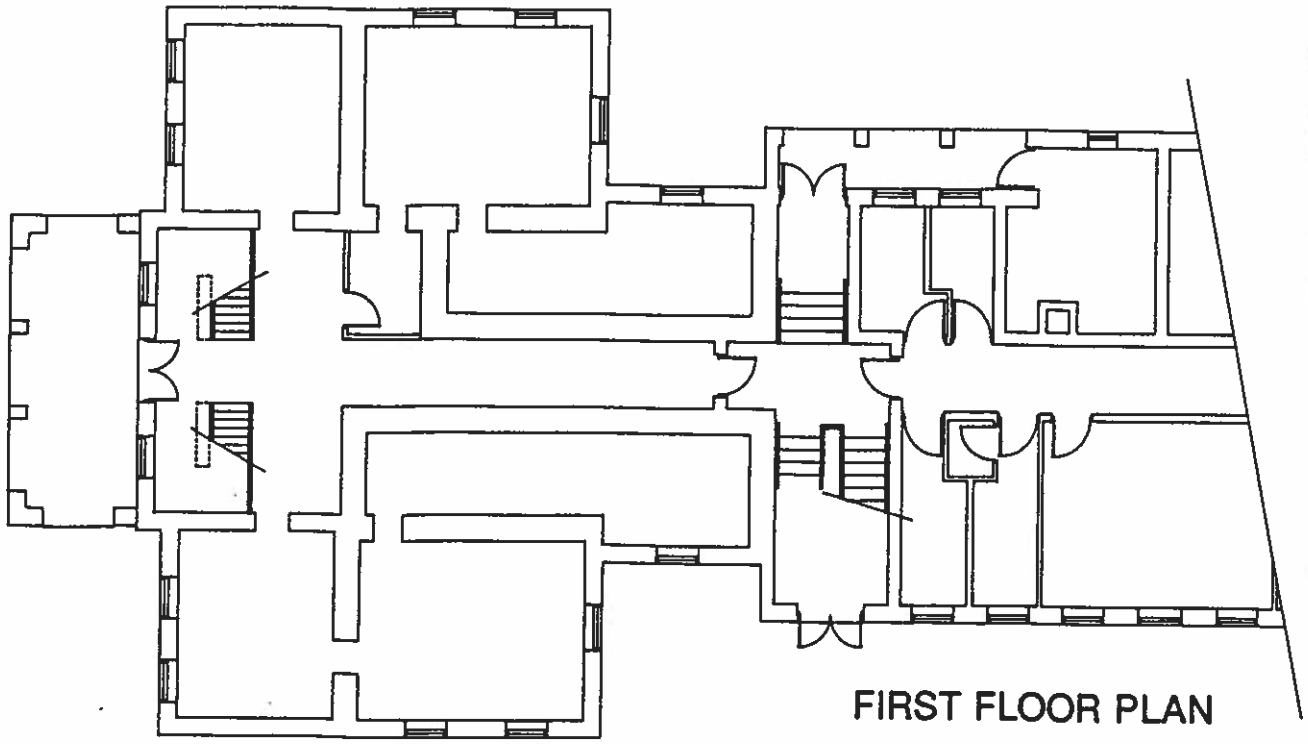


EXISTING LEFT SIDE ELEVATION
SCALE: 1/4" = 1'-0"

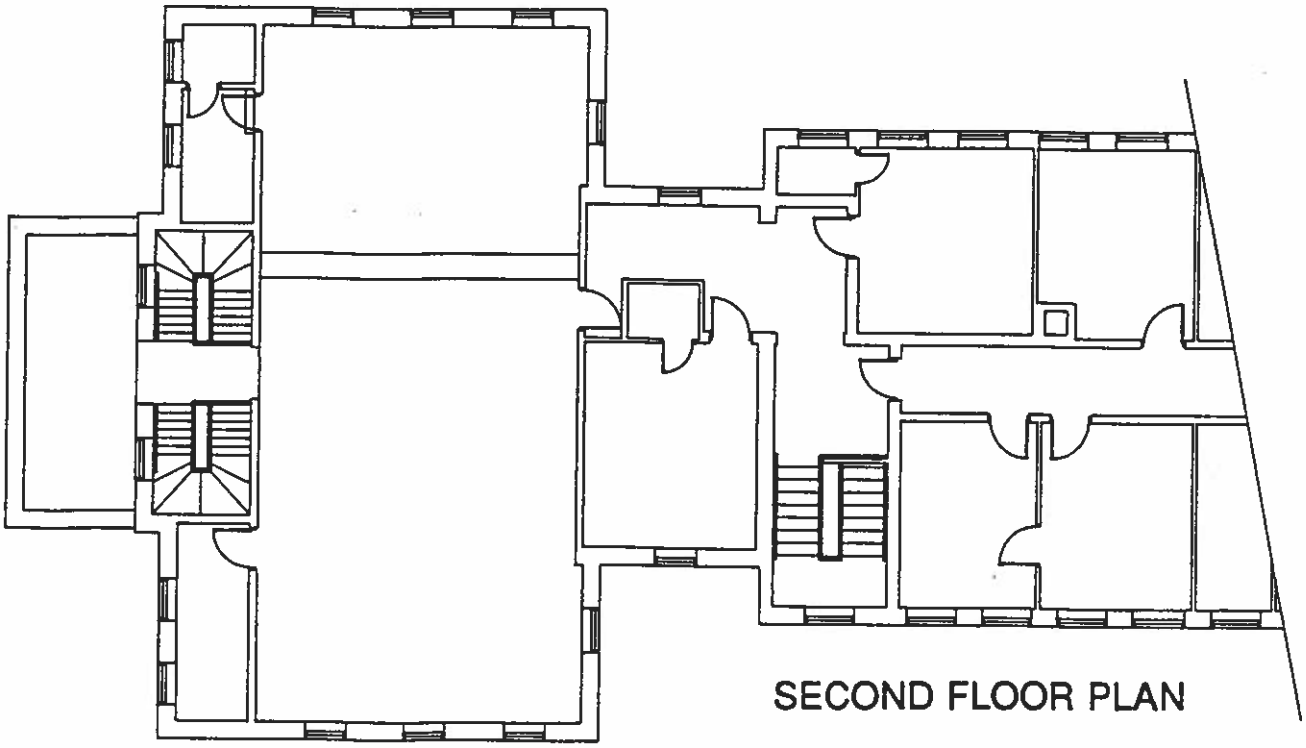


EXISTING RIGHT SIDE ELEVATION
SCALE: 1/4" = 1'-0"

EXISTING COURTHOUSE PLANS

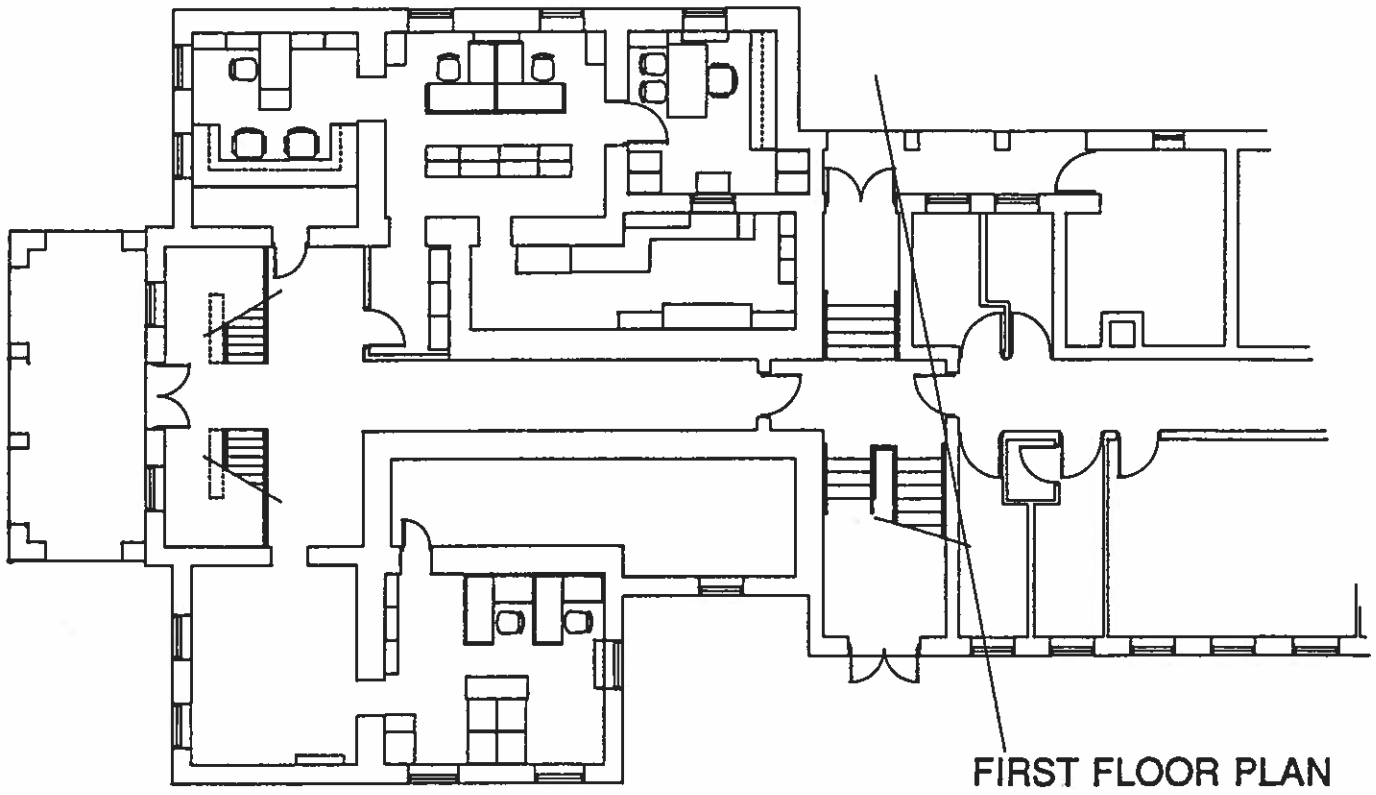


FIRST FLOOR PLAN

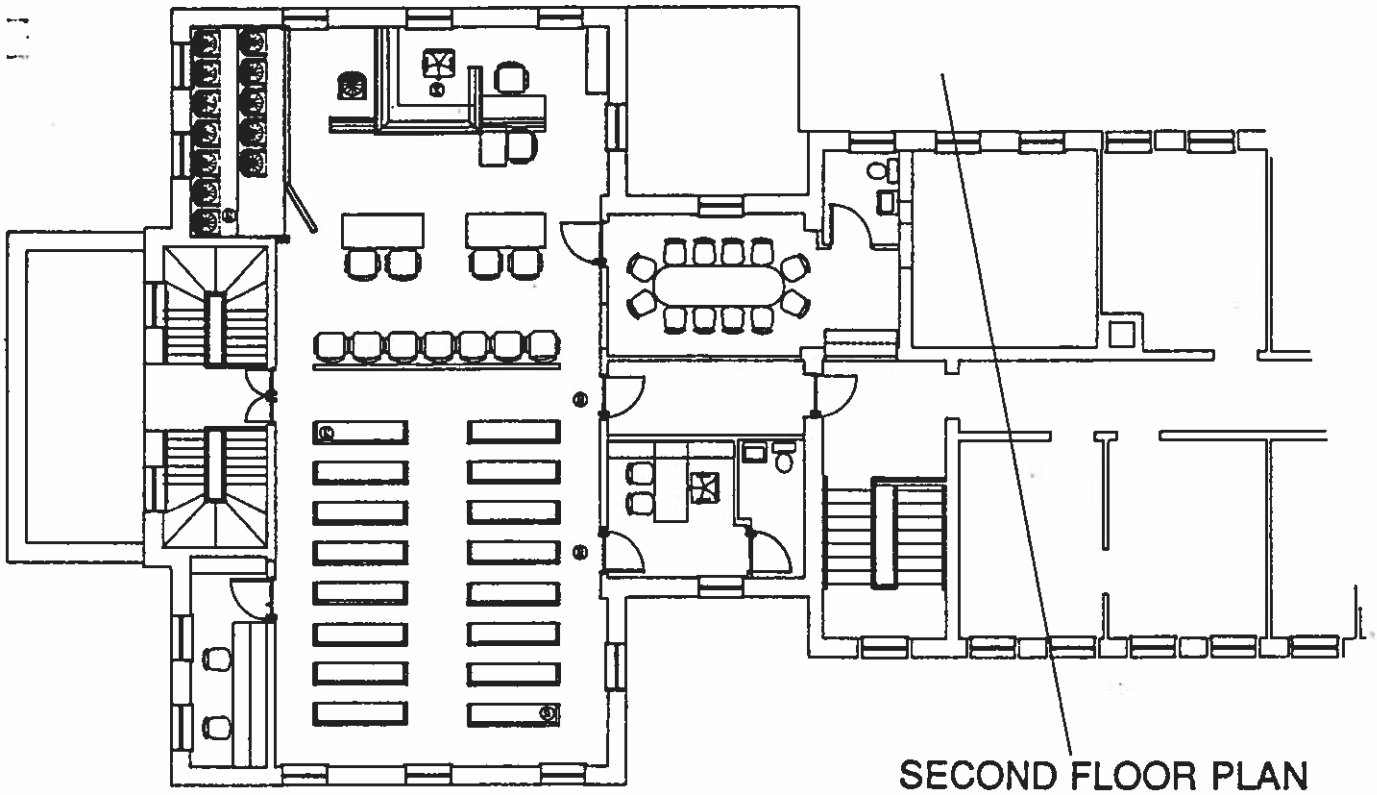


SECOND FLOOR PLAN

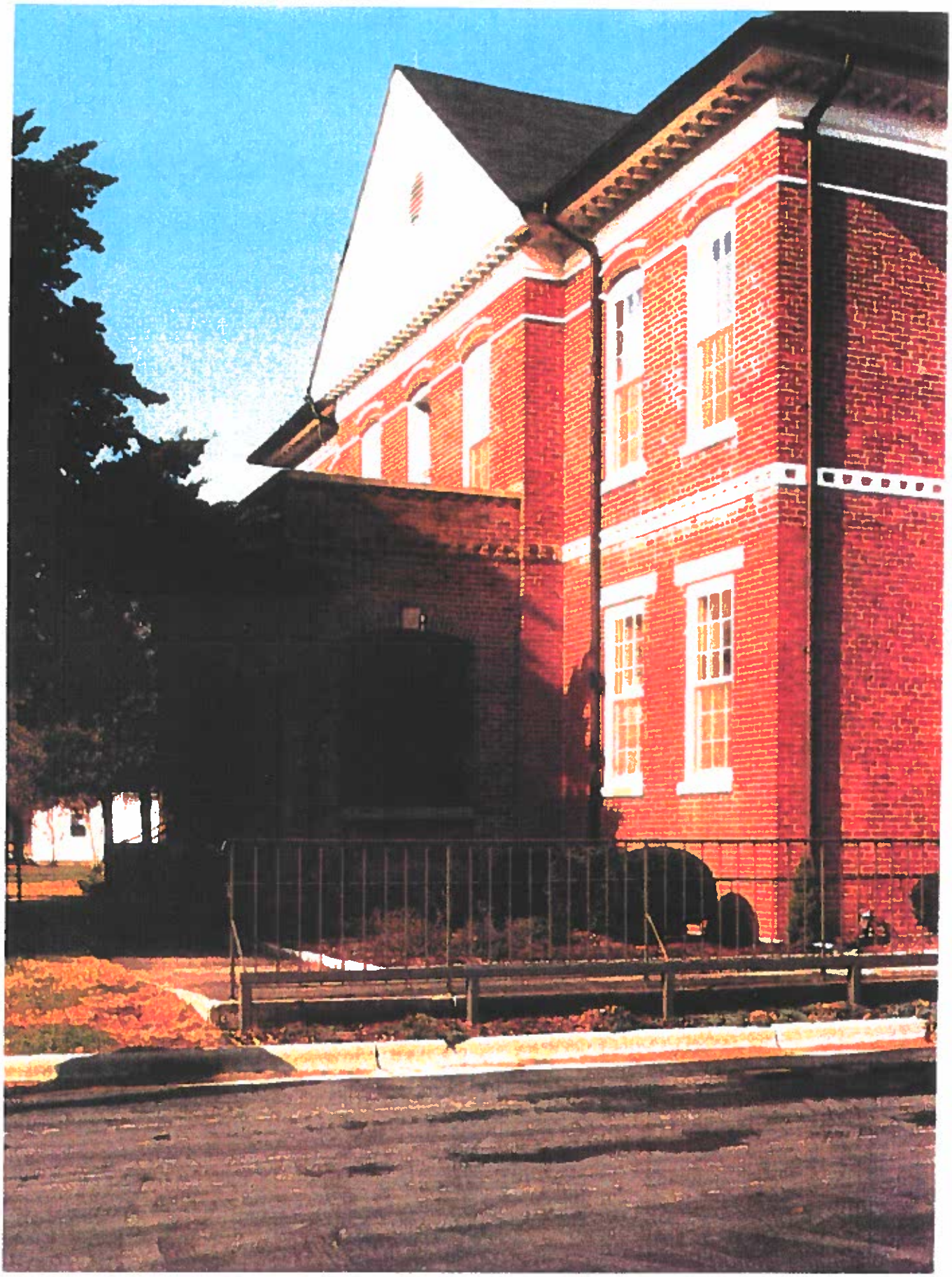
PROPOSED COURTHOUSE PLANS



FIRST FLOOR PLAN



SECOND FLOOR PLAN



FRONT VIEW OF COURTHOUSE

VIEW OF THE ORIGINAL COURTHOUSE
WITH 1951 AND 1989 ADDITIONS TO THE REAR

MASONRY CONDITIONS AT EAST ELEVATION

MASONRY REPAIRS

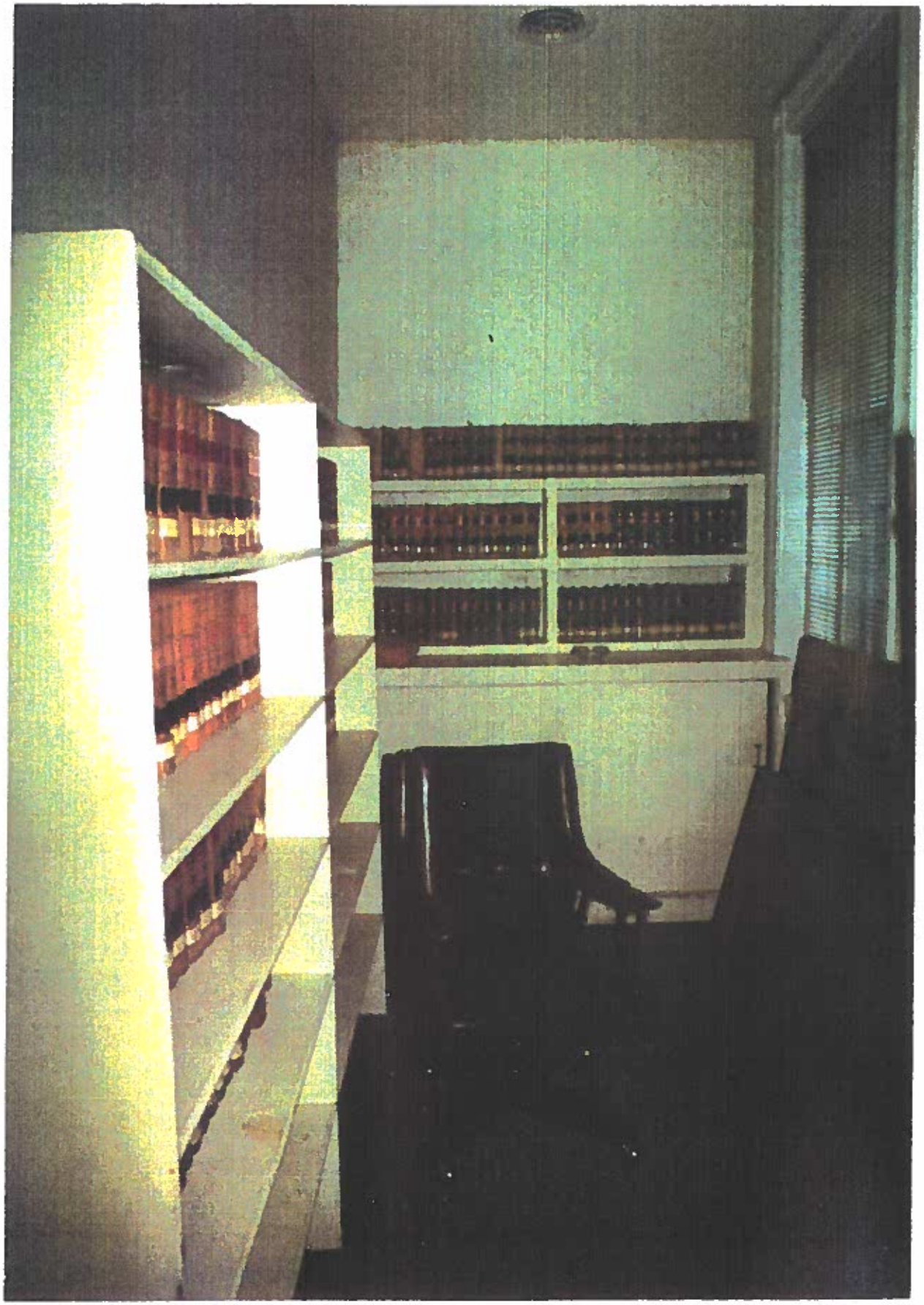
TRIM BAND

ENTRY DOORS AND LOBBY STAIR

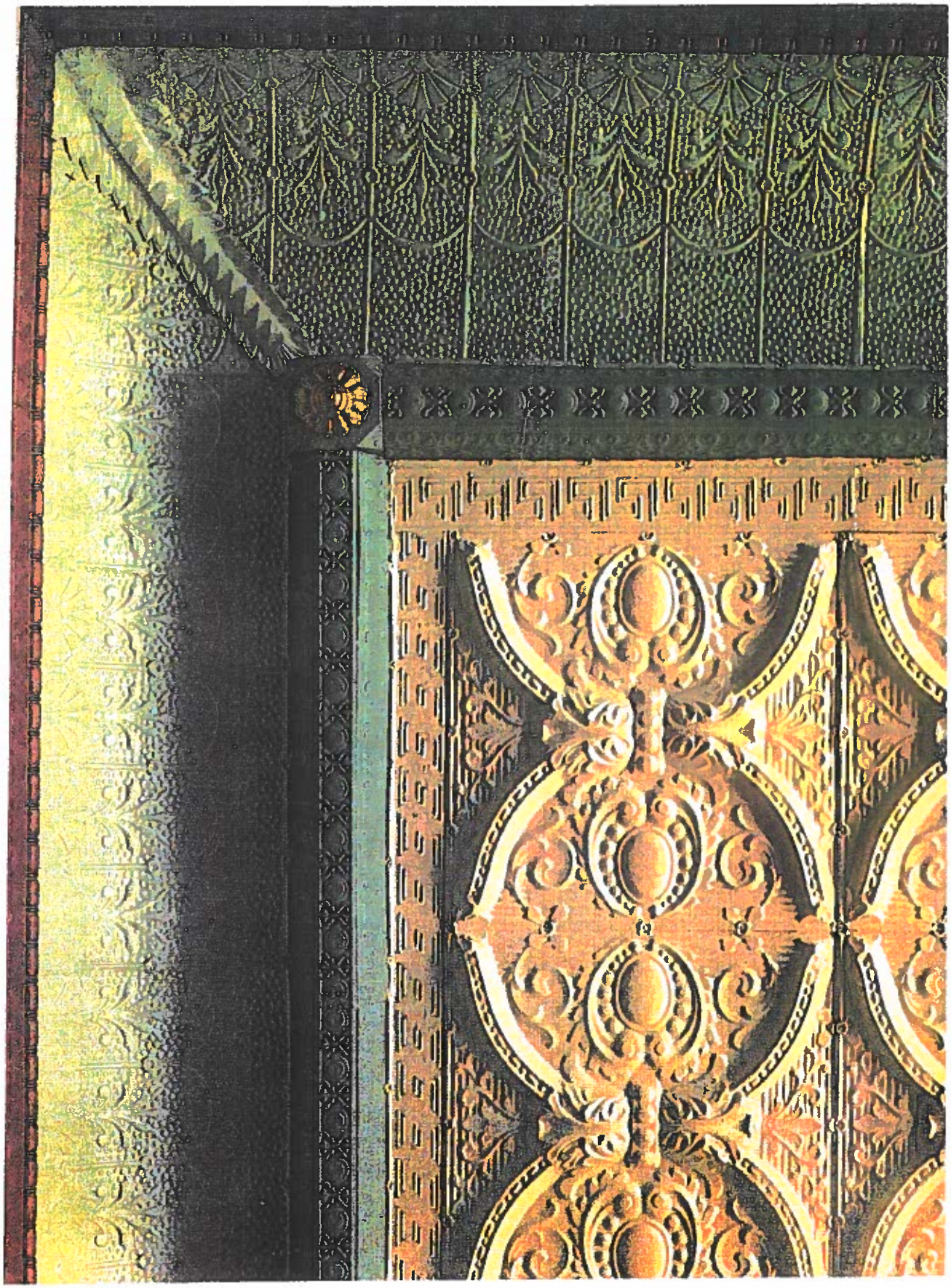
DOORS TO COURTROOM FROM LOBBY STAIRS

WEST VIEW OF COURTROOM

EAST VIEW OF COURTROOM



LIBRARY



TYPICAL PRESSED METAL CEILING

DOORS TO SECOND STORY BALCONY

II. STRUCTURAL EVALUATION

A. Structural Description of Existing Trusses

The wood trusses under investigation are in the older or front portion of the courthouse. There are only three trusses and they are located directly over the existing courtroom on the second floor. The trusses are approximately 14'-3" from center to center. For purposes to discussion and identification the trusses are labeled "Truss #1", "Truss #2" and "Truss #3: (see "Partial Plan" on sheet SK-1). Trusses #1 and #3 span approximately 36'-0" from brick bearing wall to brick bearing wall. The bottom chord on the west end of Truss #2 extends an additional 2'-0" in order to bear on the brick wall and therefore spans approximately 38"-0".

The trusses are approximately 6'-6" deep from the top of the top chord to the bottom of the bottom chord. The top chord of the trusses is a full size continuous 8" x 8" solid wood member. The bottom chord consists of 5 pieces of 2" x 12.5" full size wood members nailed together. The diagonals are full size 4" x 8" solid wood members. There are 3 vertical members that are 1" diameter steel rods. See "Truss Elevation" on sketch sheet SK-2 for shape of truss and member sizes.

The trusses are loaded by the roof beams and joists as shown on sketch sheet SK-2. The top chord is not uniformly loaded across its length but at the extreme panel points on each end. The bottom chord is uniformly loaded by a metal lath and plaster ceiling which is delivered by full size 2" x 6" ceiling joist at 16" o/c. The existing trusses appear to be relatively level which indicates an insignificant amount of deflection.

B. Existing Conditions of Trusses and Repairs

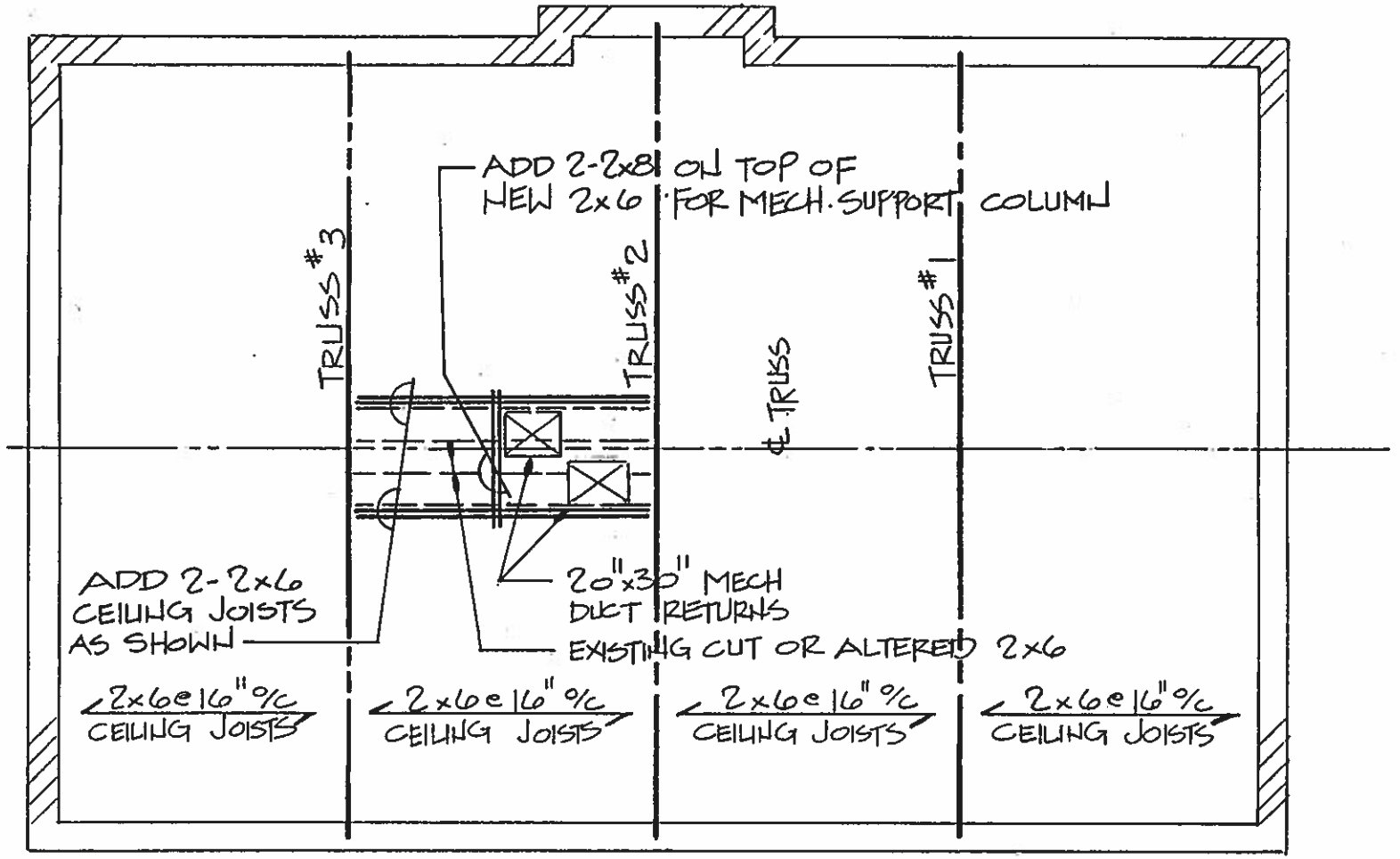
The trusses overall are in excellent condition considering their age. There is some checking or splitting in the top chord and diagonals. Checking occurs because of the volume change in the wood members as the wood loses its moisture. Since the checking occurs in members which are axially loaded and the actual stresses in these members is less than half the allowable, it is our opinion that the checking in these members is not detrimental to the load carrying capacity of the trusses and therefore we do not recommend any repairs to the checks. Examples of the checking described above can be seen in photographs #1, #2, and #6.

Some of the diagonals adjoining the top and bottom chords have separated as much a 1-1/2". We recommend that he separations be closed in all conditions on all three trusses if the separation exceeds 1/4" and repairs be made to all diagonals at the top and bottom chords on all trusses in accordance with Details 1, 2, 3, and 4 on sketch sheets SK-3, SK-4, SK-5, and SK-6 respectively. See paragraph #1 for an example of the separation between the diagonal and the top chord.

In the area of the duct work shown in photographs #9 and #10 there appears to be some deflection of the plastered ceiling. In our opinion this is occurring because the weight of the mechanical units above is supported on ceiling joist that have been altered or cut completely to accommodate the ducts shown in photograph #10. Photograph #9 shows a ceiling joist that was cut ceiling joist. This condition can be corrected by adding ceiling joists and bridging the cut joist with 2-2 x 8 joist or by supporting the mechanical units from the top chords of the trusses. See "Partial Plan" on sheet SK-1 for details of bridging the cut ceiling joist.

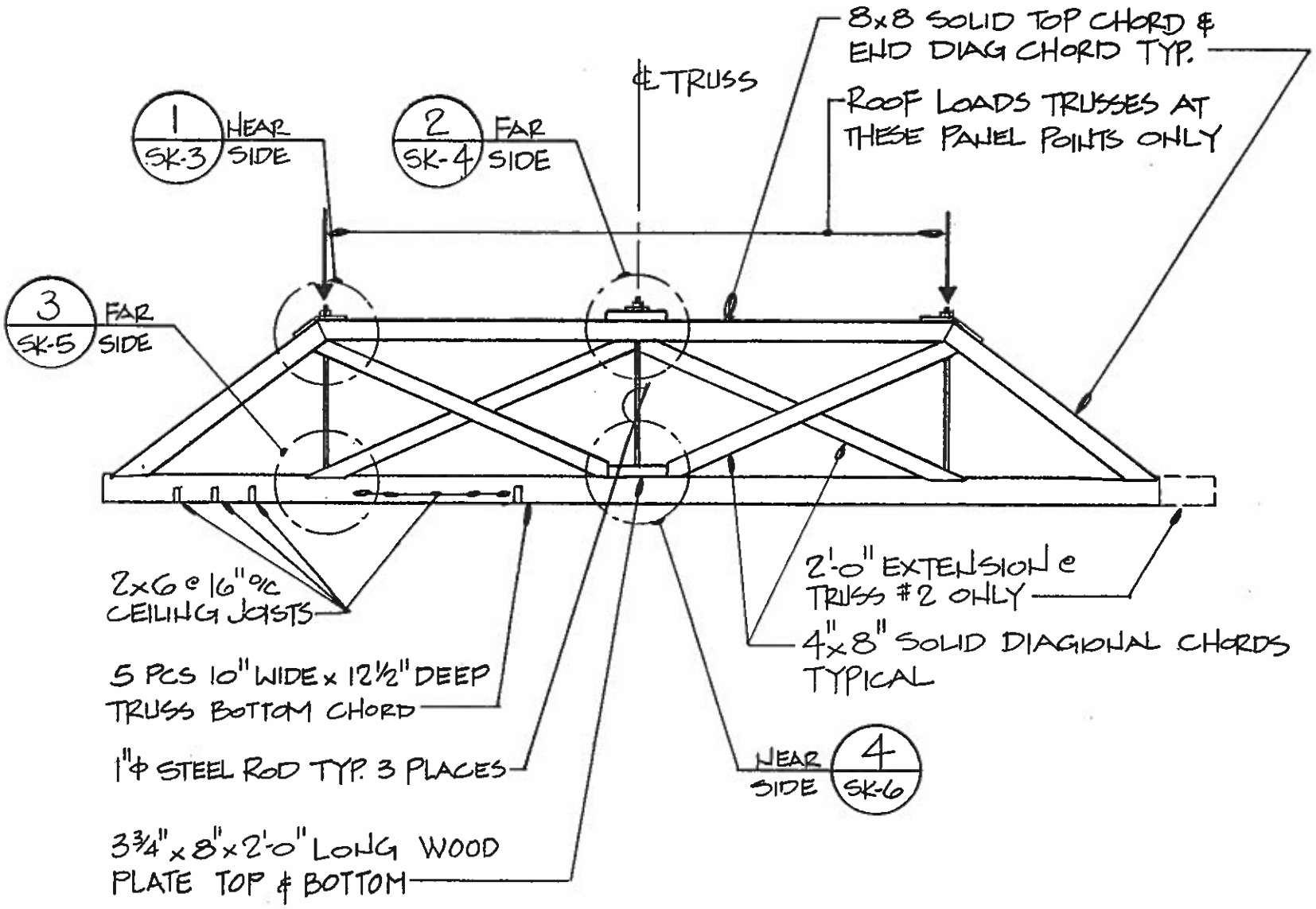
C. **Sketches and Photographs**

SKETCH SHEET SK-1



PARTIAL PLAN

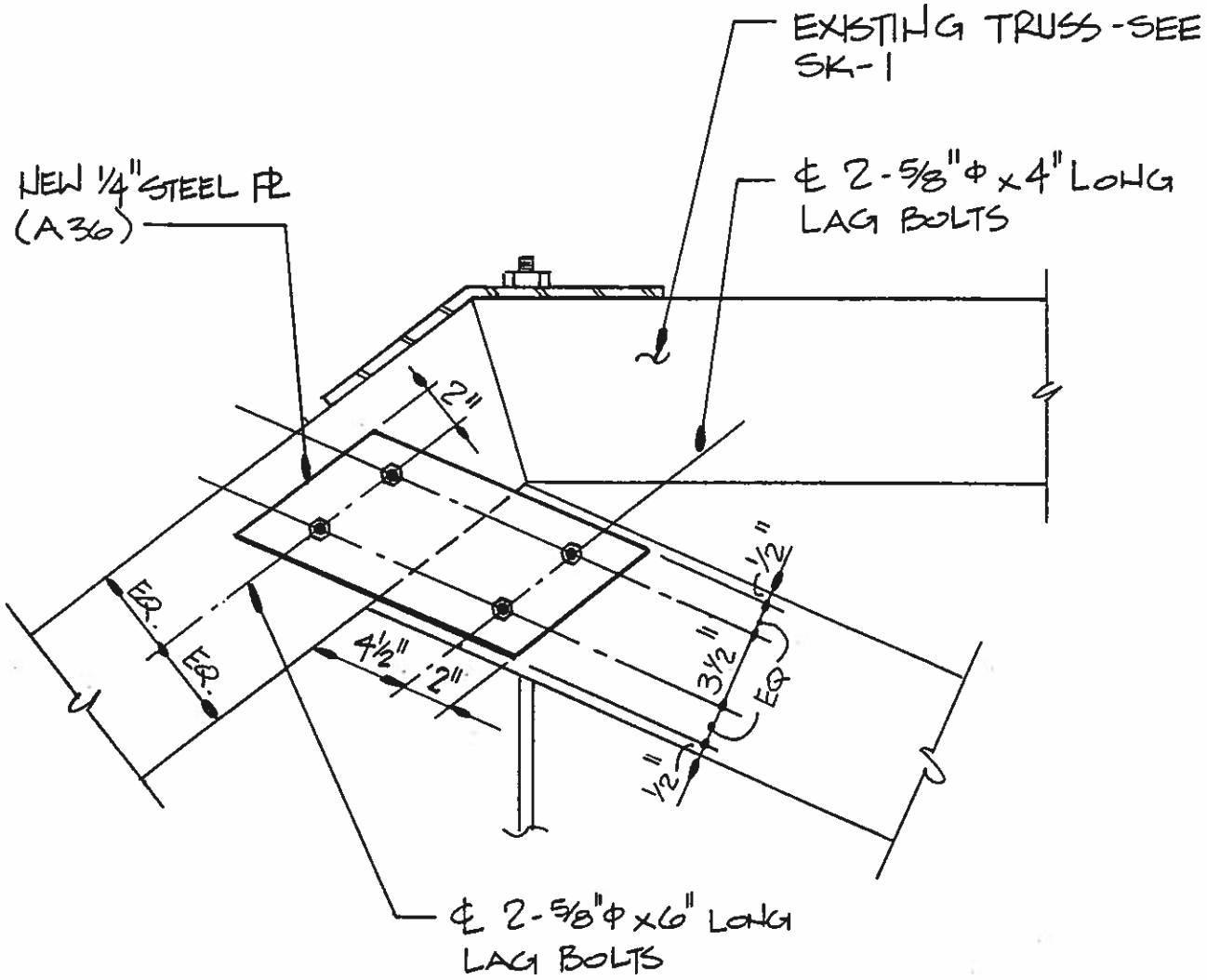
1/8" = 1'-0"



TRUSS ELEVATION

3/16" = 1'-0"

SKETCH SHEET SK-3

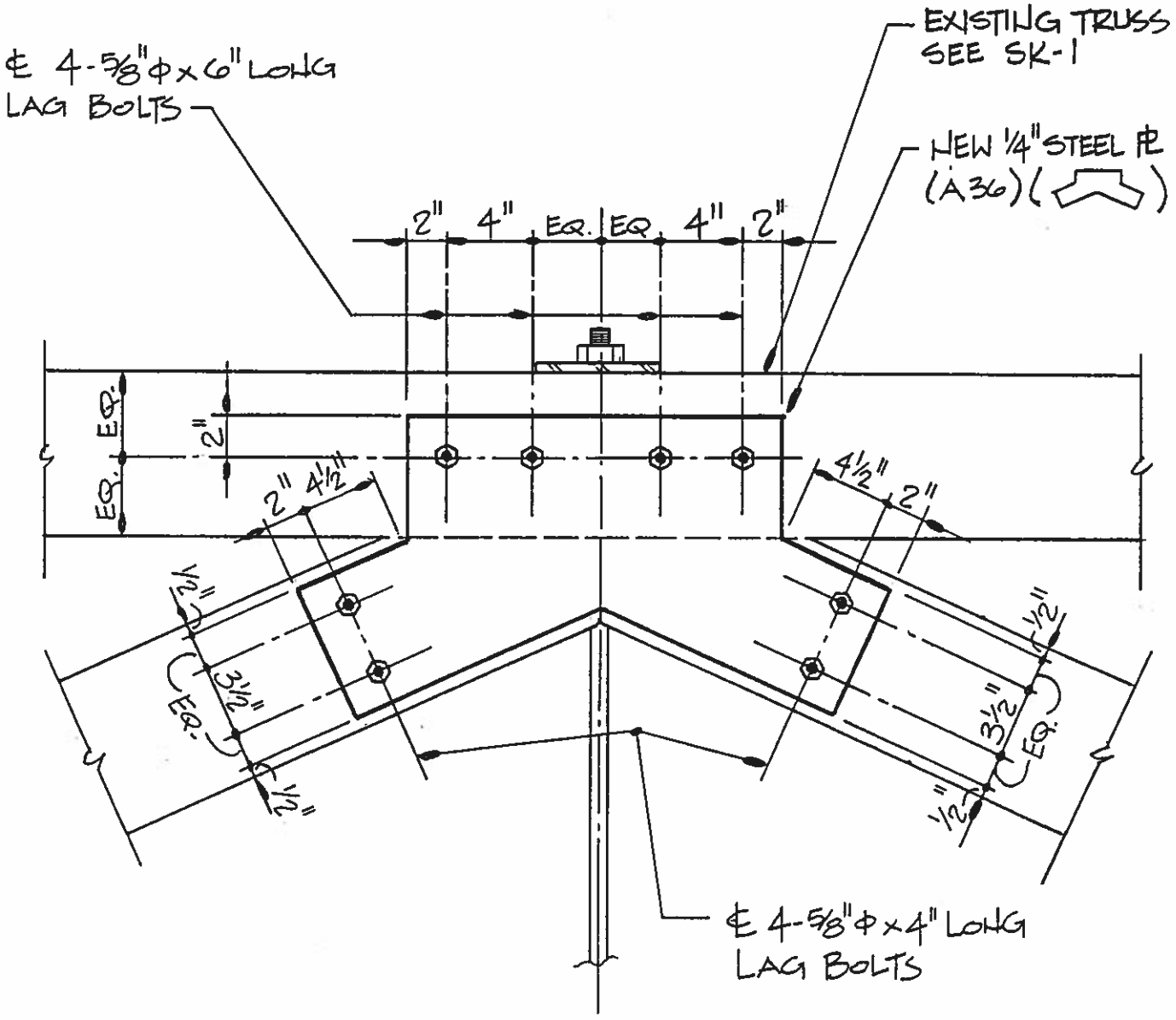


DETAIL

1½" = 1'-0"

1
SK-3

SKETCH SHEET SK-4

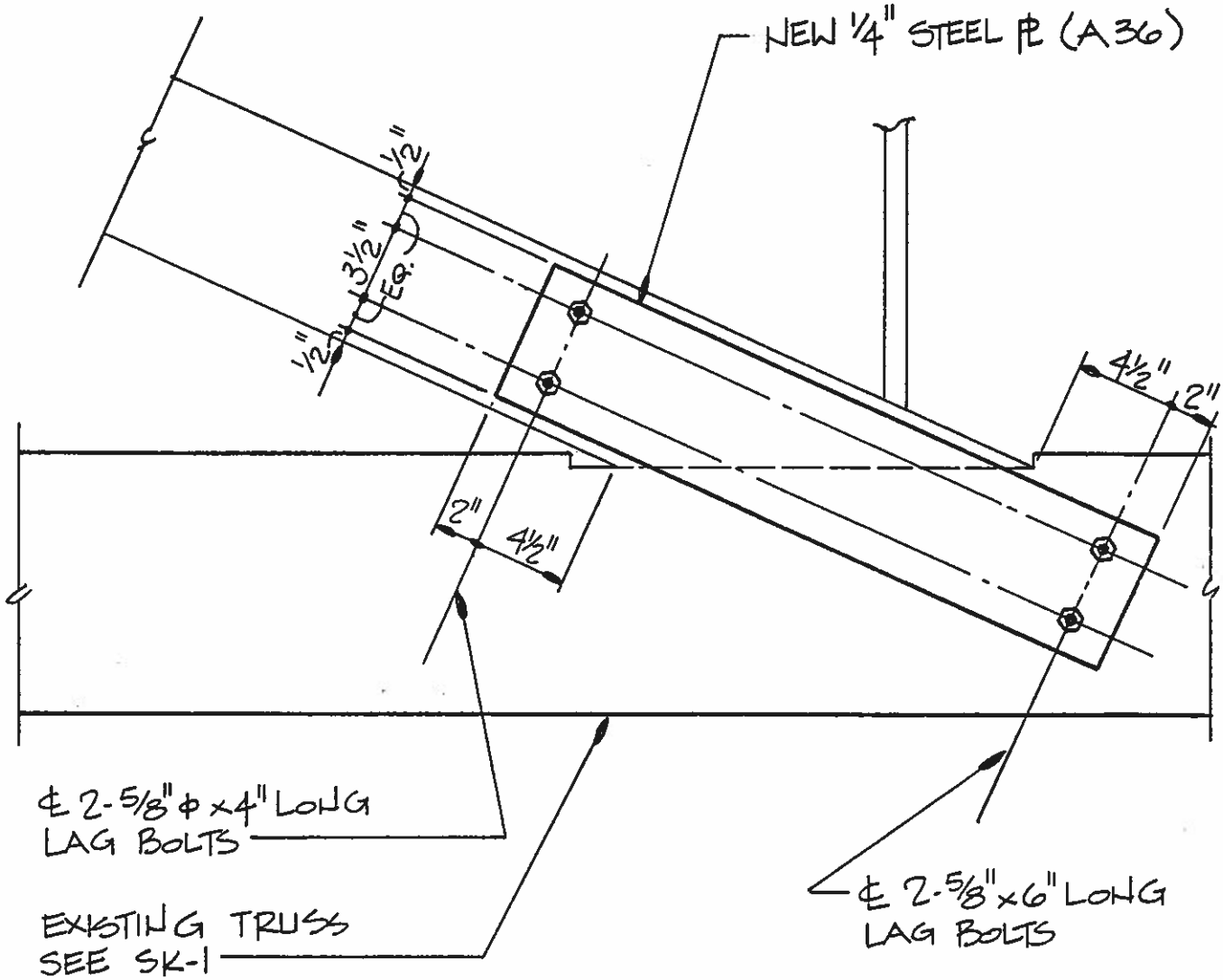


DETAIL

1½" = 1'-0"

2
SK-4

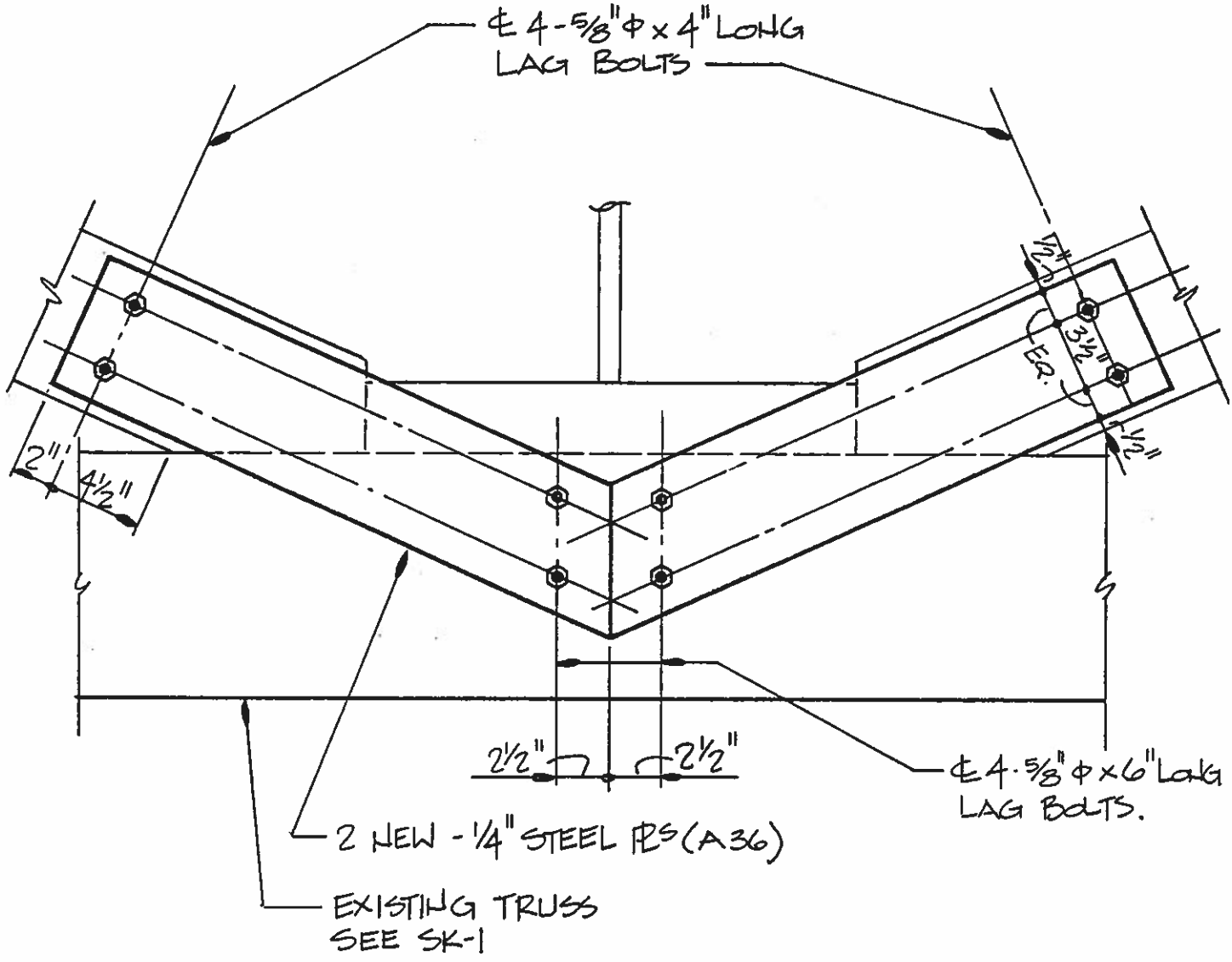
SKETCH SHEET SK-5



DETAIL 3

1 1/2" = 1'-0" SK-5

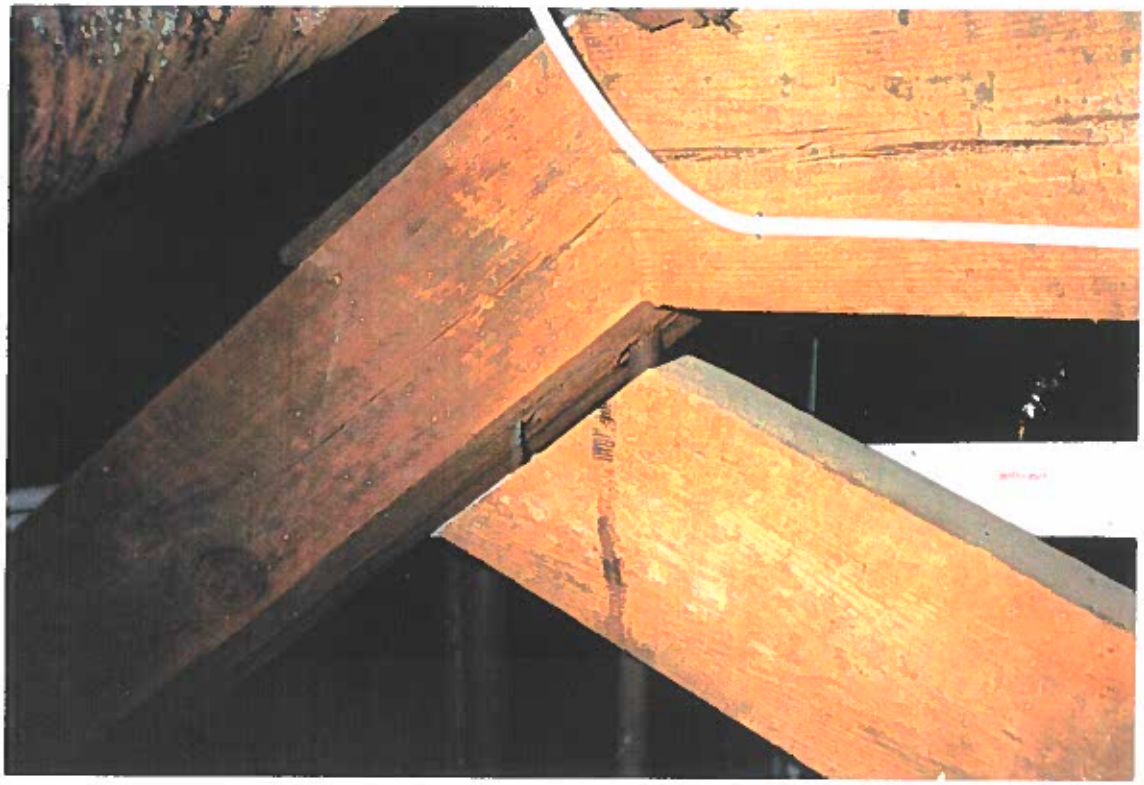
SKETCH SHEET SK-6



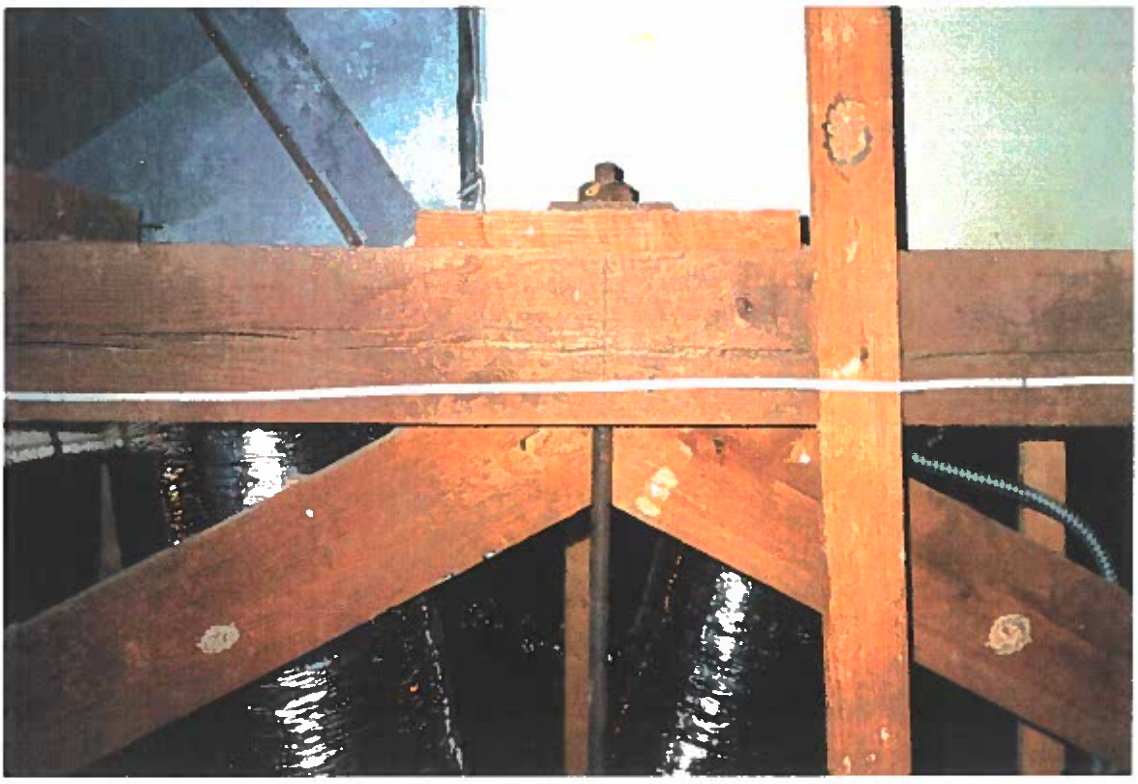
DETAIL 4

1 1/2" = 1'-0" SK-6

PHOTOGRAPH #1



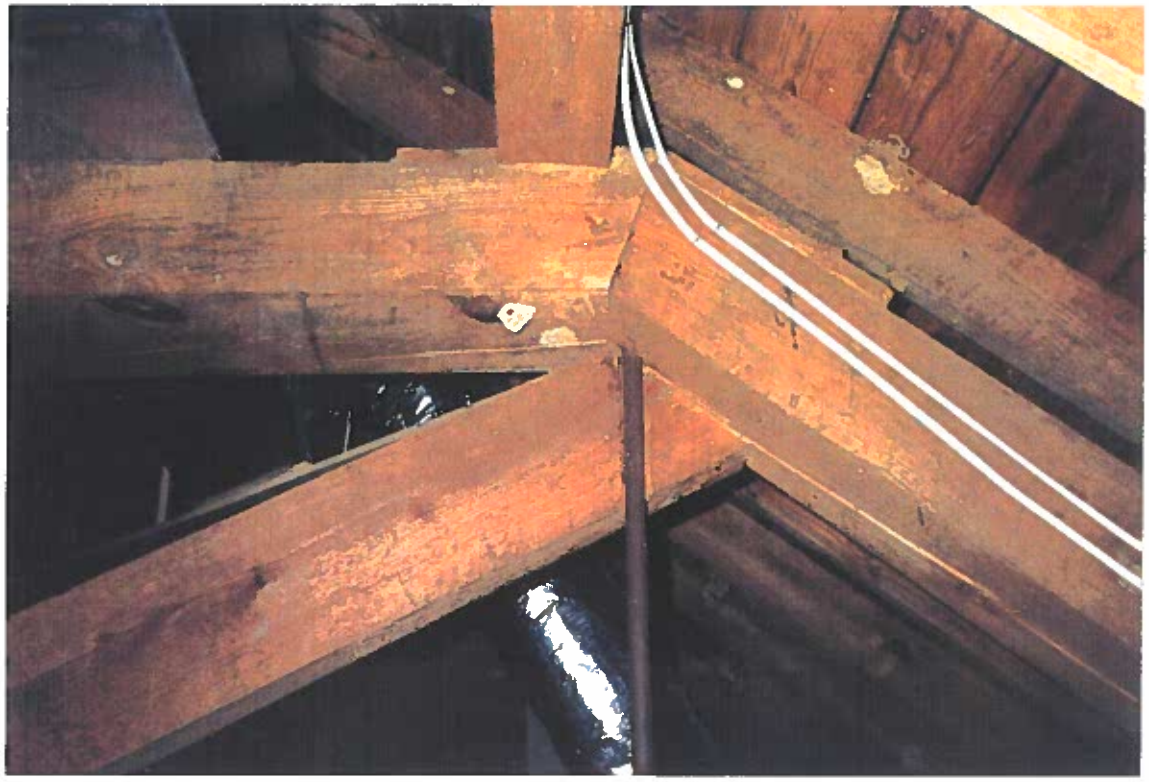
PHOTOGRAPH #2



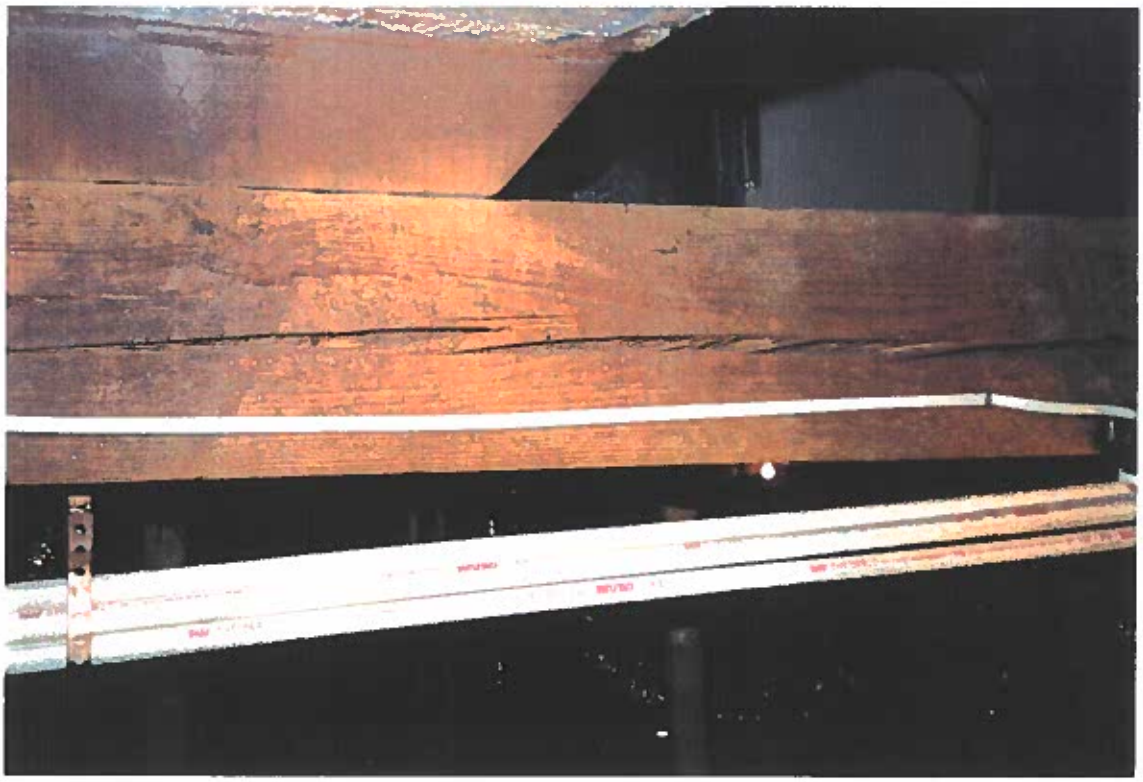
PHOTOGRAPH #3

PHOTOGRAPH #4

PHOTOGRAPH #5



PHOTOGRAPH #6



III. MECHANICAL EVALUATION

A. Mechanical Existing Conditions

The courtroom is presently served by two nominal 5 ton split system heat pumps with auxiliary hot water heating coils located in the supply ductwork. The indoor sections (air handlers) are located in the attic above the courtroom and is supported by the roof truss system and the ceiling support beams. The beams have been cut to allow for ductwork connection to the return grilles This situation compromises the integrity of the ceiling support system and will be addressed in the structural portion of this study. The outdoor sections (condensers) are located on the exterior of the building adjacent to the files vault on the east side. Both the indoor and outdoor sections of this split system heat pump were installed within the last five years and appear to be in good operating condition. The auxiliary hot water heating coil also appears to be in good condition.

The ductwork system from a design, material and construction view point is a source of concern. The air handler ductwork was designed in a disorganized fashion in an attempt to equally distribute the conditioned air throughout the entire courtroom by each unit. An excellent opportunity to zone the courtroom into an east/west or front/rear arrangement was missed. The ductwork is constructed of fiberglass or ductboard as it is called in the industry. This type of construction is an inexpensive form of ductwork which installed properly and supported properly may maintain its integrity for many years but this is not the case in the courthouse. The taped joints were improperly applied in numerous locations causing air leaks on the supply and return sides of the air system. This situation is aggravated by improper ductwork hanger supports and hanger support spacing which puts stresses on the tape joints causing eventual separation of the tape from the ductboard exterior surface. In addition, extended lengths of flexible ductwork were installed, sometimes in excess of twenty five feet. Recommended practices advise the use of no more than five to eight feet of flexible ductwork on any run out to a diffuser due to the high static pressure loss associated with this type of ductwork. The high static pressure losses which have been imposed on the air handlers have resulted, most likely, in a reduction in air flow to the courtroom. The installed air handlers are not capable of over coming high system static pressures.

The present ductwork arrangement has no provision for the introduction of outside air into the air handler, therefore this system does not meet code requirements for ventilation. In addition, the lack of positive pressure within the courtroom causes infiltration of unconditioned air from outside through the walls,windows and from the adjacent stairwell and corridor below the courtroom.

The existing diffuser arrangement is satisfactory, but the return grille location is unacceptable.

The existing thermostats are located on the wall adjacent to the stairwell, are residential type and are not programmable.

The adjacent corridor and work room to the courtroom are conditioned by an air handler located above the ceiling of the new 1951 addition. A return grille is located in the corridor adjacent to the courtroom to return the air back to the air handler. These areas are thermostatic controlled from adjacent areas in the addition.

The hot water convectors located under the windows around the perimeter of the courtroom have been disconnected from the hot water piping system.

The first floor entrance lobby, corridor and stairwell leading to the courtroom are unconditioned areas and shall remain unconditioned. The clerical office spaces, file rooms and vaults are presently conditioned by small split system wall type heat pump systems which provide adequate air conditioning and heating in the staffs opinion. A request has been noted, however, for ceiling hung propeller fans to induce the stratified hot air in the high ceilings in these offices back down to the floor.

B. **Mechanical Recommendations**

Mechanical calculations were performed to evaluate the air conditioning and heating requirements based on the proposed architectural renovations to the courtroom. The following is a list of recommendations to best utilize the existing mechanical systems and to provide required equipment and devices which would bring the courtroom up to today's standards. The proposed new toilet shall also be addressed as to required mechanical systems.

1. Courtroom Mechanical Systems

The cooling load calculations, using a ventilation rate of 15 CFM/person, have revealed the following air conditioning requirements.

At maximum seating capacity of 80 people - 12.24 tons

At diversified seating of 52 people (65%) - 9.69 tons

The ARI rating of the existing air conditioning equipment at 95 degrees fahrenheit is 4.75 tons per system or 9.5 tons total cooling capacity.

The heating load calculations, using a ventilation rate of 15 CFM/person, have revealed that the existing duct mounted hot water heating coils in combination with the existing system heating capacity will more than satisfy the new heating requirements. The heating load required is 98,350 BTU/HR and the units combined, without the additional help from the duct mounted hot water coils, is 69,000 BTU/HR @ 17 degrees fahrenheit outside air temperature.

a. Install an additional 3 ton split system heat pump to handle the load deficiency when the courtroom approaches peak occupancy. This system would be on a separate thermostat control therefore its use could be kept on an as need basis. The ductwork supply air would be distributed to the courtroom seating area only.

b. Remove all the existing supply and return ductwork presently constructed of ductboard and the reduction of branch runouts to the new diffusers to no more than 8 feet. Some of the existing flex duct may be salvageable if the sizes match the new requirements.

c. Provide new ductwork constructed of lined galvanized steel, laid out in a zone type air distribution system. The supply and return air grilles will be located to integrate with the existing ceiling/roof truss system.

d. Relocate existing thermostats to facilitate proper zoning of the courtroom.

e. Remove hot water convectors around the perimeter of courtroom.

2. Judge's Chamber, Corridor and Jury Room System

   a. Remove the existing ductwork and diffusers presently serving the work room and adjacent corridor on the second floor from the air conditioning system located in the building addition.

   b. Install a 2.5 ton split system heat pump system, including a galvanized duct distribution system with new diffusers to serve the judges chambers, corridor and jury room. The thermostat would be located in the judges chamber for his comfort control.

   c. Remove the existing toilet and lavatory located in the existing jury room.

   d. Provide a new restroom arrangement including a new water closet, lavatory and exhaust fan to integrate with the new architectural layout adjacent to the new jury room.

   e. Remove hot water convector on exterior wall.

3. First Floor Clerical Area

   a. Leave the existing air conditioning equipment in place. Install ceiling mounted propeller fans throughout the clerical office area to induce the stratified warm air, provided by the wall mounted split system heat pumps, down to the floor.

C. **Mechanical Cost Estimate**

1. Contractor markup factor includes 6% sales tax on material, 21% tax and insurance on labor, 18% sub-contractor overhead and profit, 14% general contractor overhead and profit, and 1% bond.

Judge's Chamber, Corridor & Jury Room

Demolition:		
Remove Water Closet	$	16.52
Remove Lavatory	$	13.22
Remove Ductwork	$	72.00
Remove Diffusers & Grilles	$	21.81
Remove Exhaust Duct & Grille	$	10.00
Remove Hot Water Convector	$	8.76
Total	$	142.31
Total With Mark-Up	$	250.00
New Work:		
Indoor heatpump Section (2.5 Ton)	$	485.00
Outdoor Heatpump Unit (Air Cooled)	$	2,180.00
Refrigerant Piping	$	82.00
Ductwork (Galvanized)	$	936.00
Diffusers	$	154.76
Flexible Duct	$	300.72
Return Grilles	$	95.88
Concrete Equipment Pad	$	240.00
Controls	$	300.00

Test and Balance	$	238.00
Water Closet	$	371.20
Water Closet Rough-In	$	243.53
Lavatory	$	654.91
Lavatory Rough-in	$	196.73
3/4" CU Water Piping & Fittings	$	127.80
4" DWV Piping, Sch 40 PVC	$	189.20
Exhaust Fan	$	63.08
Total	$	6,859.00
Total With Mark-Up	$	8,900.00

Courtroom

Demolition:

Remove Ductwork	$	367.20
Remove Grilles and Diffusers	$	116.32
Remove Thermostats	$	19.18
Remove Hot Water Convector	$	87.60
Total	$	590.30
Total With Mark-Up	$	720.00

New Work:

Indoor Heatpump Section (3 Ton)	$	551.00
Outdoor Heatpump Unit (Air Cooled)	$	2,426.00
Refrigerant Piping	$	82.00
Ductwork (Galvanized)	$	1,365.00
Diffusers	$	232.14
Flexible Duct	$	451.08
Return Grilles	$	95.88
Outdoor Air Intake Hood w/ Curb	$	470.50
Concrete Equipment Pad	$	240.00
Controls	$	300.00
Relocated Existing Thermostat	$	15.00
Test and Balance	$	238.00
Total	$	6,467.00
Total With Mark-Up	$	11,600.00

First Floor Foyer

New Work	$	2,480.00

IV. ELECTRICAL EVALUATION

A. Electrical Existing Conditions

1. Electrical Service

The existing service is 240/120 volts, 3 phase, 4-wire, open delta. The building is fed from 2 pole mounted transformers located in the rear of the site. One 100 KVA transformer is center tapped to obtain 120 volts line to neutral, 240 volts line uo line. The second transformer is a 50 KVA unit to obtain the 240 volt delta.

The electrical service entrance is located in the rear of the building. The main panelboard is a Square D I-line circuit breaker panelboard, with an 800 amp main circuit breaker. The main panel feeds sub panels A, B, C, D, and F, located in the same room. This equipment is new and in good condition. There are spaces for three 200 amp breakers in the main panel.

The old courthouse building is fed from 3 panelboards. All three panels are fed from panel B in the main switchboard room.

a. Panel B1 is flush mounted in the first floor corridor at the rear of the old courthouse building. It is a 100 amp 120/240 volt panel with twenty 20/1 circuit breakers that serve lights and receptacles. It is old and has no spaces available.

b. Panel B2 is flush mounted in the second floor corridor at the rear of the old courthouse building. It is a 100 amp 120/240 volt panel with thirty circuit breakers that serve lights and receptacles. It has no spaces available.

c. Panel B3 is surface mounted, outside near the condensing units at the south side of the old courthouse building. It is a 100 amp 120/240 volt panel that serves the outdoor condensing units. It is in good condition.

2. Emergency Power

The old courthouse has no emergency powered exit signs or egress lighting.

A new diesel generator is presently being installed at the rear of the courthouse near the main switchboard. An emergency panel is located in the main switchboard room.

3. Lighting

The majority of the lighting in the old courthouse building is incandescent fixtures installed during the 1950's remodel. Surface mounted fluorescent fixtures have been installed in the courtroom and in several work areas. The only exterior lighting around the old courthouse is a bare bulb lamp on the porch and a street light at the parking lot on the south side.

The old courthouse entry area dos not have adequate lighting. There is no light on the sidewalks.

4. Small Power and Receptacles

The last major remodel took place in the 1950's. The amount of electric equipment used in the building has greatly increased since that time, and the number of outlets are inadequate to serve the present needs. Presently there are many extension cords used to provide power where needed. The receptacles installed at that time were not polarized and did not have a grounding plug.

Some new receptacles have been added. These are surface mounted with conduit exposed on walls.

The majority of the branch circuit wiring does not have a ground wire. The wiring system is over 30 years old and in need of replacement.

5. Lightning Protection

The old courthouse has a lightning protection system installed. The system has exposed down conductors, but they do not detract from the appearance of the building. The system appears to be in good condition.

6. Telephone Distribution System

The main telephone backboard is located in the rear of the building.

The majority of the telephone outlets are exposed wiring.

B. **Electrical Recommendations**

1. Electrical Service

The remodeling of the old courthouse building should not require any major changes to the electric service. The feeders to the existing panels can be reused, and there are spaces for additional circuit breakers if required.

Since the building is not being enlarged and the function is essentially unchanged the addition of receptacles will not increase the demand load. Changing from incandescent to fluorescent lighting will reduce the demand load. Revisions to the heating, ventilating, and air conditioning system (HVAC) will only increase the efficiency of the system and not increase the electrical demand load.

The old panels B1 and B2 should be replaced with 42 pole panels to provide additional circuits and outlets. Panel B3 is in good condition and can be modified to serve the new HVAC system. Additional 120/240 volt panels should be provided if required, to serve the new and future lighting and receptacle loads.

2. Emergency Power

Emergency powered exit signs and egress lighting should be provided to meet current codes.

When the new diesel generator is connected, emergency power circuits should be extended to serve exit sign and egress lighting in the old courthouse.

3. Lighting

The incandescent lighting is inefficient, outdated, and a high maintenance item. All incandescent lighting in general areas should be replaced with fluorescent fixtures. In lobbies and areas where there will be special architectural treatment, special fixtures should be selected to match and compliment the architecture.

The office and work areas should have new fluorescent fixtures installed to match the new ceiling type.

The courtroom lighting should compliment the architecture while being efficient and cost effective. Chandeliers and wall sconces should provide general lighting with downlights in the activity area. Light sources should be PL fluorescent and metal halide.

New work should provide walkway and entry lighting. Facade lighting of the building front should be considered.

All lighting should be designed to the latest Illuminating Engineering Society (IES) footcandle requirements. Courtroom should have 30 footcandles in the seating area and 70 footcandles in the activity area. Offices and work areas should have 70 footcandles. Corridors and stairs should have 20 footcandles.

4. Small Power and Receptacles

A remodel should include replacing the existing ungrounded outlets with grounded receptacles, and the addition of receptacles to meet present and future needs. As a minimum there should be one receptacle per 25 square feet in office and work areas, with additional outlets for special equipment.

All new wiring should be installed concealed and include a ground wire to meet current codes. The cost estimate has been based upon using Electrical Metallic Tubing (EMT) and THW conductors. EMT offers good physical protection for conductors. An option to use type AC cable (BX) has been included. AC cable is a cost effective alternative and offers ease of installation on remodel projects. Although type NM cable (Romex) is acceptable by code it does not offer good physical protection and should not be considered for a building of the architectural, historical, and functional significance of the old courthouse.

5. Lightning Protection

The lightning protection system should be inspected and tested to verify compliance with code, and any required modifications performed during the remodel.

6. Telephone Distribution System

Additional telephone outlets should be installed for present and future needs. All telephone wiring should be concealed. Outlets should be recessed modular telephone jacks. A telephone backboard should be installed in the old courthouse building with multipair cable run to the main telephone backboard.

C. **Electrical Cost Estimate**

The scope of the cost estimate includes the following.

Interior lighting and wiring includes light fixtures for all areas of the building as described in the lighting recommendations. EMT conduit and THW cables are included in the base cost. New switches are included. A new fixture at the front porch and south exit is included.

Panelboard replacement includes new main lug only panelboard complete with branch circuit breakers as required to feed loads. Feeders includes one new feeder for a new panelboard. Replacing existing feeders is not included.

Receptacles and wiring includes all new branch circuiting and receptacles for the old courthouse. Miscellaneous small power includes paddle fan connections and control.

Telephone outlets include modular jack and 2-pair cable to a telephone backboard in the old courthouse.

Telephone cable includes a new multipair cable from the old courthouse to the existing telephone backboard in the new switchboard room.

A new telephone cabinet is proposed for the old courthouse.

HVAC connections include connecting 1 new 3 ton split system AC unit, 1 new 2.5 ton split system AC unit, and 1 exhaust fan.

Outside lighting includes 4 bollards and direct buried PVC conduit and cable. A time control is included. The light for the front porch and south exit is included in the interior lighting.

Facade lighting includes lighting the front face of the old courthouse, time control, and direct buried PVC conduit and cable.

Emergency lighting includes exit signs, connection to egress lights and exit signs, EMT conduit and cable back to the emergency panel in the main switchboard room, and new circuit breakers.

Demolition includes removal of all existing light fixtures, switches, receptacles, and branch circuit wiring. Removal of 2 panelboards and telephone wiring is included.

Testing includes testing of the lightning protection system and the panelboard feeders. Any revisions to the lightning protection system or the feeders are not included.

Contractor markup factor includes 6% sales tax on material, 21% tax and insurance on labor, 18% sub-contractor overhead and profit, 14% general contractor overhead and profit, and 1% bond.

A deduct has been included to use type AC cable in lieu of EMT conduit and THW conductors for all branch circuit wiring.

Electrical Cost Estimate

Interior Lighting & Wiring	$	13,000.00
Replace Panelboards	$	3,500.00
Feeders	$	2,500.00
Receptacles & Wiring	$	7,670.00
Misc Small Power	$	962.00
Telephone Outlets	$	150.00
Telephone Cable	$	137.00
Telephone Cabinet	$	131.00
HVAC/Connections	$	1,680.00
Outside Lighting:		
Bollards	$	1,900.00
Wiring	$	465.00
Emergency Lighting		
Exit Signs	$	710.00
Wiring	$	800.00
Fixture Connections	$	100.00
Testing	$	300.00
Demolition	$	6,500.00
Total With Mark-Up	**$**	**51,000.00**

H.D. MANESH & ASSOCIATES, INC.
A Professional Corporation
CONSULTING ENGINEERS

ELECTRICAL COST ESTIMATE

SHEET 1

PROJECT: CURRITUCK COURTHOUSE

DATE: DECEMBER 18, 1992

PROJECT NUMBER: 92082

BY: G. KLEMAN

ITEM	QUANTITY	UNIT	MATERIAL UNIT	MATERIAL TOTAL	LABOR UNIT	LABOR TOTAL	TOTAL
INTERIOR LIGHTING AND WIRING	5000	SQ.FT.	1.64	$8,200.00	2.75	$13,750.00	$21,950.00
				$0.00		$0.00	$0.00
REPLACE PANELBOARDS	3	EACH	632.00	$1,896.00	505.00	$1,515.00	$3,411.00
FEEDERS	200	LF	4.55	$910.00	8.20	$1,640.00	$2,550.00
				$0.00		$0.00	$0.00
RECEPTACLES AND WIRING	5000	SQ.FT.	0.50	$2,500.00	2.45	$12,250.00	$14,750.00
MISC. SMALL POWER	5000	SQ.FT.	0.09	$450.00	0.28	$1,400.00	$1,850.00
				$0.00		$0.00	$0.00
TELEPHONE OUTLETS	11	EACH	5.20	$57.20	7.75	$85.25	$142.45
TELEPHONE CABLE	100	FT	0.87	$87.00	0.50	$50.00	$137.00
TELEPHONE CABINET	1	EACH	83.00	$83.00	48.00	$48.00	$131.00
				$0.00		$0.00	$0.00
HVAC CONNECTIONS	3	EACH	290.00	$870.00	270.00	$810.00	$1,680.00
				$0.00		$0.00	$0.00
OUTSIDE LIGHTING				$0.00		$0.00	$0.00
BOLLARDS	4	EACH	390.00	$1,560.00	67.00	$268.00	$1,828.00
WIRING	150	FT.	0.70	$105.00	2.40	$360.00	$465.00
				$0.00		$0.00	$0.00
FACADE LIGHTING				$0.00		$0.00	$0.00
175 WATT METAL HALIDE FLOOD	3	EACH	283.00	$849.00	75.00	$225.00	$1,074.00
WIRING	150	FT.	0.75	$112.50	2.40	$360.00	$472.50
				$0.00		$0.00	$0.00
EMERGENCY LIGHTING				$0.00		$0.00	$0.00
EXIT SIGNS	10	EACH	46.00	$460.00	25.00	$250.00	$710.00
WIRING	300	FT.	0.67	$201.00	1.90	$570.00	$771.00
FIXTURE CONNECTIONS	7	EACH	5.30	$37.10	6.30	$44.10	$81.20
				$0.00		$0.00	$0.00
TESTING	1	EACH		$0.00	300.00	$300.00	$300.00
				$0.00		$0.00	$0.00
DEMOLITION	5000	SQ.FT.		$0.00	2.50	$12,500.00	$12,500.00
				$0.00		$0.00	$0.00
SUBTOTAL				$18,377.80		$46,425.35	$64,803.15
CONTRACTOR MARKUP			0.456	$8,380.28	0.662	$30,733.58	$39,113.86
TOTAL				$26,758.08		$77,158.93	$103,917.01

H.D. MANESH & ASSOCIATES, INC.
A Professional Corporation
CONSULTING ENGINEERS

ELECTRICAL COST ESTIMATE

PROJECT: CURRITUCK COURTHOUSE DATE: DECEMBER 18, 1992

PROJECT NUMBER: 92082 BY: G. KLEMAN

ITEM	QUANTITY	UNIT	MATERIAL UNIT	MATERIAL TOTAL	LABOR UNIT	LABOR TOTAL	TOTAL
				$0.00		$0.00	$0.00
				$0.00		$0.00	$0.00
				$0.00		$0.00	$0.00
				$0.00		$0.00	$0.00
				$0.00		$0.00	$0.00
SUBTOTAL FROM SHEET 1				$18,377.80		$46,425.35	$64,803.15
				$0.00		$0.00	$0.00
				$0.00		$0.00	$0.00
DEDUCT FOR USING TYPE AC CABLE				$0.00		$0.00	$0.00
IN LIEU OF CONDUIT AND CABLE	5000	SQ.FT.	0.19	($950.00)	0.82	($4,100.00)	($5,050.00)
				$0.00		$0.00	$0.00
				$0.00		$0.00	$0.00
				$0.00		$0.00	$0.00
SUBTOTAL				$17,427.80		$42,325.35	$59,753.15
CONTRACTOR MARKUP			0.456	$7,947.08	0.662	$28,019.38	$35,966.46
TOTAL				$25,374.88		$70,344.73	$95,719.61

CURRITUCK COUNTY COURTHOUSE
RENOVATION OF ORIGINAL STRUCTURE
ESTIMATED PROBABLE COST OF CONSTRUCTION

NOTE: It has been suggested that the work be divided into phases, in order to spread the cost over 2 or 3 years. The following summary is so divided. Phase II, Interior Architectural and Mechanical/Electrical can be further divided into Parts A and B, however such a division would not be cost effective in our opinion.

PHASE I - STRUCTURAL (ROOF)

Repair Roof Joists	$ 9,500.00		
Demolish Existing and All New Drywall Rated Ceiling	$ 2,500.00		
Phase I Total	**$ 12,000.00**	**$**	**12,000.00**

PHASE II - MECHANICAL/ELECTRICAL

Mechanical

Part A:

Courtroom	$ 12,320.00		
Judges Chamber, Jury	$ 9,150.00		

Part B:

First Floor, Foyer	$ 2,480.00		

Electrical

Part A:

Courtroom, Judges Chamber, Jury

Part B:

First Floor, Foyer	$ 51,000.00		
Phase II Total	**$ 74,950.00**	**$**	**74,950.00**

PHASE III - ARCHITECTURAL

Part A:

Courtroom, Judges Chamber, Jury	$ 91,820.00		

Part B:

First Floor, Foyer	$ 40,500.00		

Part C:

Exterior	$ 9,700.00		
Phase III Total	**$ 142,020.00**	**$**	**142,020.00**

GRAND TOTAL ..... **$ 228,970.00**