

VACANT HISTORIC SCHOOL BUILDINGS DISPOSITION PLAN

City of Detroit RFP# 19BW2717

Building Envelope and Structural Assessment Report

Stephens Elementary School

Basic Property Information: COD 5-Stephens-5974 Seneca

Short Name:	Stephens
Address:	5974 Seneca Street, Detroit, Michigan 48213
Year Built:	1913
Additions Built:	1918, 1922
Outbuildings:	None
Year Vacated:	2009
Building Footprint:	145 feet x 192 feet
Square Footage:	73,719 sq. ft.
Number of Stories:	4
Building Height:	50 ft.



Current Ownership:	City of Detroit	Structural Framing System:	<ul style="list-style-type: none"> ▪ Cast-in-Place Concrete ▪ Brick Masonry ▪ Structural Steel ▪ Wood
City Council District:	5	Exterior Wall System:	<ul style="list-style-type: none"> ▪ Brick ▪ Stone
SNF District:	NA	Window System(s):	<ul style="list-style-type: none"> ▪ Wood ▪ Aluminum Replacement
		Roofing System(s):	<ul style="list-style-type: none"> ▪ Gutters ▪ Internal Roof Drains ▪ Modified Bitumen ▪ Built-up Roof



Assessment Summary

Assessment Date: May 21, 2020

WJE Inspector(s): Cheryl Early; Sarah Rush

Report Date: October 29, 2020

Building Risk Index: 60.37

Cost Estimate

Base Rehabilitation Cost Estimate: \$2,136,500

Preparation for Rehabilitation Work: \$900,000

**Mechanical, Electrical, Plumbing,
Fire Protection (\$80/sq ft):** \$5,897,520

Sub-Total \$8,934,020

Contingency (25%) \$2,233,505

Sub-Total \$11,167,525

Overhead and Profit (15-18%): \$1,116,752

Sub-Total \$12,284,277

Escalation (6% for 2 years) \$737,056

Sub-Total \$13,021,334

**Architectural and Engineering
Design Services (20%):** \$2,604,266

TOTAL COST ESTIMATE: \$15,625,600

ASSESSMENT METHODS

Visual Survey

As requested, Wiss, Janney, Elstner Associates, Inc. (WJE) performed a visual review of the building envelopes and structures to assess the viability of the building for reuse. WJE was joined by Mr. Andrew Wald of Interboro Partners and Ms. Jennifer Ross and Mr. Garrick Landsberg of City of Detroit Planning and Development Department. During the time on site, Mr. Wald gathered information pertinent to the general building site and layout of the building, and Ms. Ross and Mr. Landsberg assessed the condition of the historic fabric of the building.

WJE performed a visual review of the building envelope (including the courtyard facades) from grade, main roof levels, and interior spaces using binoculars as needed. The upper roof level above the third floor "open air" addition was inaccessible due to safety concerns pertaining to the wooden roof framing condition. On the interior, WJE performed a walkthrough of accessible areas of each floor of the building. The basement level is partially flooded, and thus, not all of the basement level was accessed. The interior finishes are largely intact excepting select locations. The structural framing systems are exposed in these select locations. Up-close examination of building elements and destructive inspection openings involving the removal of building finishes to review underlying conditions were generally not performed.

WJE's observations were documented with tablets and digital photography. WJE has shared our field data with Interboro Partners; City of Detroit Planning and Development representatives; and A.M. Higley Company, the cost estimator for this project. Each observed condition is documented in the field data and assessed as discussed under "Risk Characterization" below. A summary of the conditions observed is provided in the "Building Overview" section below.

Limitations of Assessment

Limited to four hours on site, WJE visually assessed the exposed portions of the building envelope and structure. Recognizing the limitations on visually detecting distress from afar and the limitations on detecting concealed internal distress, the assessment may not include all current conditions. As such, completion of this assessment is not an indication, certification, or representation that all deterioration or hazards have been observed or recorded, including underlying deterioration not evident from the building exterior or interior. Additionally, the conditions of the building elements discussed herein are exposed to further damage and deterioration due to the existing condition and unoccupied status of the property, and as such, WJE cannot state the conditions discussed herein will remain unaltered and as observed during the visual survey. However, we have performed these assessments in accordance with the requirements of applicable regulations and the applicable standard of care for architects or structural engineers performing such services.

WJE identified structural or building envelope issues that have significant impact on the viability of future reuse of the property. Items posing little risk such as regular maintenance items are not included in the assessment. The assessment was limited to within the walls of the building; on-grade walkways, access roads, parking lots, landscaping, play structures, or other site features were excluded from this assessment. The assessment, remediation, and identification of hazardous materials (e.g., asbestos, lead, etc.) or other environmental issues were also excluded. Based on WJE's past experience with building rehabilitation

projects, WJE has assumed existing mechanical, electrical, plumbing, interior finishes, and other building systems are anticipated be removed and replaced with future reuse of the building, and as such, were not included in WJE's assessment.

Document Review

WJE performed a cursory review of documentation provided by Interboro Partners to gain familiarity of the property. The documentation provided included:

- Site Plan (included with this report)
- Floor Plans (included with this report)
- Environmental Reports
- National Register of Historic Places Registration Form

Other documents, such as original construction drawings, specifications, or maintenance records, were not made available for our review.

Risk Characterization

WJE has categorized each significant area of distress, damage, or deterioration observed with a systematic methodology to provide an objective, quantitative characterization of its relative condition and associated risk, or its Condition Risk Index (CRI). The CRI is based on the primary building system affected by the condition and the condition's severity, prevalence, and the associated consequence of failure. A higher CRI score indicates that observed conditions embody relatively higher risk than conditions with a lower CRI. The CRI is the product of each of the rankings below multiplied and normalized to meet a maximum score of 100 per condition.

Specifically, the CRI assigns a numerical value to the following:

- System (Structural, Roofing, Facade, Other)
Conditions affecting the structure are assigned a higher rating than those affecting the facade or roofing systems. Other includes items such as non-load bearing partition walls and exterior steps, and are assigned a lower rating.
- Building Performance Impact (Minor, Moderate, Advanced, Critical, Imminently Hazardous)
This parameter addresses the severity of the impact of the observed condition on the performance of the affected building system. Imminently Hazardous is assigned the highest rating. For example, a crack in a concrete slab may be a minor distress, but a damaged prominent skylight is considered advanced distress. Imminently hazardous conditions are discussed immediately with Interboro Partners and the City of Detroit representatives.
- Size/Distribution (Isolated/Infrequent/Frequent/Widespread/Pervasive)
In short, this parameter rates how large and/or frequent a condition is with respect to the entire affected building system/component. Pervasive is assigned the highest rating. Examples include: an isolated step crack in a masonry wall versus pervasive corrosion of metal floor decking throughout a building.

- Consequence of Failure (Low, Moderate, High)

This parameter allows inspectors to exercise judgment regarding general risk to the public, considering the unoccupied status of the buildings. High is assigned a higher priority, and, for example, might be assigned to a condition whose failure would result in potential harm within the public right of way. Conditions rated with a high consequence of failure are discussed immediately with Interboro Partners and the City of Detroit representatives.

The CRI for each observed condition is summed to calculate a total Building Risk Index (BRI), as provided in this report. The reported BRI is therefore a numerical expression of the relative risk present at one property, as compared to other properties in the scope of this assessment.

Both the CRI and the BRI are expressions of WJE's professional opinion of the relative significance of an observed condition to other building conditions, and the collective relative risk of the structural and building enclosure elements of this property. Neither the CRI nor the BRI are an expression of actual risk or probability of occurrence of any event. The CRI for each condition is tabulated in WJE's electronic field notes. The BRI provides a numerical tool for the project team and the property owners to compare and make decisions about this property and the other properties included in this overall effort, in context with the cost estimate, market analysis and community input. Both the CRI and BRI are intended only for this assessment project. The numerical values do not have substantive meaning beyond the context of the Vacant Historic School Buildings Disposition Plan project.

Recommendations

Recommendations developed in the assessment are conceptual and are intended for budgetary and planning considerations. Recommendations are provided within the narrative below, and in the field data provided. It is not the intent or purpose of this report or the field data to direct a contractor to bid, or otherwise implement, the recommendations. Significant additional investigation by various professional disciplines is necessary to develop appropriate scopes of repair and rehabilitation efforts to enable the re-use of any facility included in this assessment.

Cost Estimating

The rehabilitation costs are opinions of probable construction cost and have been developed with the assistance of A.M. Higley Company, a contractor familiar with rehabilitation of historic buildings. The costs have been developed for evaluating the relative cost of repair of distressed conditions as well as establishment of order-of-magnitude repair budgets. They are based on national construction cost data, adjusted based on the local construction market, and our experience with similar past projects.

Understanding the rehabilitation cost may vary depending on type of future occupancy, this assessment assumes the building will be rehabilitated to a weathertight and "grey box" condition with unfinished walls, flooring and ceilings; no mechanical, electrical, plumbing or other building systems installed. The costs assume the rehabilitation work would occur in 2022 and are not inflated should the work occur in future years.

In addition to this "grey box" base rehabilitation cost, an allowance, based on percentage of costs and square footage of the building, is delineated for:

- Preparation for Rehabilitation Work

- Mechanical, Electrical, Plumbing, Fire Protection (\$80/sq ft)
- Contingency (25%)
- Overhead and Profit (15-18%)
- Escalation (6% for 2 years)
- Architectural and Engineering Design Services (20%)

The preparation for rehabilitation work item includes mobilization, hazardous material abatement as well as salvaging for potential later duplication or re-installation pertinent historic interior finishes identified by the City. For the purposes of the cost estimating effort, all roofing replacement or repair work is recommended to be performed with like-kind materials; all windows are assumed to be replaced with new commercial window assemblies in lieu of restoration of existing elements, and any exterior doors are to be repaired or replaced in like-kind. Where like-kind materials may no longer be available, WJE will offer alternative materials for the cost estimating purpose. For rehabilitation design and construction efforts, further evaluation of each of these elements is recommended. All work is recommended to be performed as per the Secretary of Interior's Standards for The Treatment of Historic Properties.

The condition-based subdivision of repair recommendations used to develop the base cost estimate is not representative of how a repair program could be implemented to remediate building conditions. Moreover, the costs assume that all repairs would be remediated in the same rehabilitation project. Execution of separate repair projects, or phasing of the rehabilitation project, could result in increases in the total repair cost. Furthermore, the final scope of repair work and the actual repair costs may vary depending on underlying or concealed conditions that were not apparent during our limited assessment.

BUILDING OVERVIEW

Overall

The original building was constructed in 1913 with additions completed in 1917 and 1921 per the site plan provided to WJE. Both additions extend off the east elevation of the original building, creating a U-shaped building footprint, with the 1917 addition extending off the north end and the 1921 addition extending off the south end. A corridor extends between the two additions, creating an interior courtyard, which was likely constructed as part of the 1921 addition based on the similar construction types. Windows are present at the basement, first, and second levels; classrooms within the basement level are finished and include stairwells to access egress windows. An "open-air" level was also added above the original building roof level to accommodate students diagnosed with tuberculosis or other respiratory conditions.

The facade of the original building and north 1917 addition consists of multi-wythe clay brick masonry laid in a running bond without header courses in the exterior wythe. Stucco-faced panels are located in horizontal bands, while limestone and clay tile coping units line the building's perimeter parapets. The 1921 addition is similar, but contains header units every seven brick courses and limestone at the horizontal bands. The "open-air" third floor level consists of partial height masonry walls, continuous fenestration openings around the perimeter of the space, and an ornate sheet metal fascia with a built-in gutter at roof level. Throughout the building, the windows are generally wood framed with aluminum caps on the exterior and aluminum replacement windows inset within the original window openings, though most aluminum elements have been removed by vandals. A few original window openings have been infilled with brick masonry. The two main building entrances on the west facade have been altered to create vestibules which project from the original wall surface. These projecting entrances are multi-sided and appear to consist of a steel frame with clay brick infill, stucco cladding on the exterior and interior surfaces, and a concrete roof canopy. Conventional steel doors are present at the building entrances. Another multi-sided projected bay is located on the south facade, which houses the conservatory.

Over the sloped gymnasium wing and the "open-air" levels of the original building, the roof consists of a modified bitumen roofing assembly. The remaining roof levels consist of internally drained, bituminous built-up roof (BUR) assemblies with slag surfacing and granulated cap sheet base flashing. This includes the roofs over the vaulted mechanical spaces located within the interior courtyard. An elevated structural slab is located at grade over the Coal Room within the east courtyard, which has an exposed concrete surface and several manhole covers. Three masonry chimneys are present.

The primary structural system of the original building and additions is a reinforced cast-in-place concrete, or concrete encased structural steel frame with mass masonry walls at the perimeter and interior beam and column lines located within the corridor walls. The "open air" addition is wood framed.

Overall, the building is in good condition with minor, localized distress of the interior finishes and facade. The window assemblies and exterior doors exhibit significant distress due to damage from vandalism and deterioration, requiring replacement. The roofing over select roof areas is significantly distressed and warrants replacement, though other areas require only maintenance repairs to extend the service life of the existing systems. Active water damage is prevalent in the northeast and northwest corners of the building, with distress observed within the corresponding structural wood and concrete framing elements. An advanced level of distress was also observed in the concrete framing of the ceiling of the Coal Room,

which is also the exterior pavement in the east courtyard. Further detail of the observed distress is provided below.

Facade

The facade is generally in good, serviceable condition. Minor brick repairs are recommended in localized areas, including cracks at some of the masonry parapets and building corners, and near isolated corroded steel lintels. Displacement is visible across the vertical expansion joint located between the original building and south addition, and should be repaired by routing out a larger joint to accommodate more movement, replacing the backer rod and sealant materials, and installing supplemental lateral brick ties as needed within the area of brick displacement. Localized displaced limestone coping units and brick masonry in this region should be reset. Mortar deterioration and water staining is present where isolated downspouts are missing, which should be repointed. Common brick is present at the base of the facades with a surface-applied parge coat which has delaminated in some regions, though the masonry was sound where exposed. Previous brick masonry repairs include localized steel lintel repairs, replacement of localized brick masonry, and localized mortar repointing. These repairs are generally in sound, serviceable condition.

The stucco-clad horizontal bands are generally cracked and delaminated, requiring repair. At the two projecting entrances on the west facade, the stucco walls are in poor condition and the concrete canopy is cracked. These elements will require repair if they are to remain. The limestone bands are in good condition with only localized mortar deterioration observed. The ornate sheet metal fascia that surrounds the built-in gutter at the "open air" third floor addition is dented, displaced, and missing in some regions, and the coated surfaces are peeling with isolated regions of corrosion visible. The fascia should be restored or replaced to mitigate further water infiltration into the wall assembly and corrosion of the sheet metal, with consideration of the original historical aesthetic.

The majority of the windows are missing or damaged, including missing sashes, missing and decayed frames, missing and displaced aluminum covers, and broken glass. The exterior steel doors are typically corroded near the base, dented, or missing, or have been damaged from the temporary measures to secure the building and barricade the doors. Rehabilitation of the building should include replacement of the window and exterior door assemblies.

Three brick chimneys are present at the building. The main east chimney contains minor isolated step cracks, vertical cracks, and eroded mortar. The large west chimney contains vertical cracks that extend down the north and south faces of the chimney. Previous repointing repairs have cracked and debonded, showing progression of the cracking and outward displacement of the masonry near top of the chimney. The small west chimney is slightly out-of-plumb (leaning) and the mortar is significantly eroded, though cracked and debonded mortar were not readily observed and the chimney appears sound and stable. These chimneys should be repaired as part of the building rehabilitation and monitored for further distress. Cracked brick units should be replaced and deteriorated mortar joints should be repointed. The existing caps should be repaired and new cap flashing should be installed to mitigate further water infiltration. Supplemental lateral brick ties should be installed near the top of the large west chimney to mitigate further displacement. The upper five feet of the small west chimney may need to be rebuilt if

continued distress and displacement are observed following the recommended repairs; or selective demolition may be considered.

Roofing

The condition of the roofing varies by roof area, though the roofing is significantly deteriorated over the third floor "open air" addition, the northeast gymnasium/auditorium, and the lower mechanical spaces within the central courtyard, warranting replacement. At the sloped gymnasium/auditorium roof, the insulation crushed underfoot, sheet metal flashings have been removed by vandals, and the corresponding base flashings are pulled away from the masonry substrates. Seam failures within the mod-bit roofing and cracking within the BUR were also observed. Ponded water, organic growth, and vegetation are present on these roof surfaces near failed drains. Downspouts that drain the third floor "open air" addition are missing in some regions, and should be replaced to mitigate further masonry deterioration. Evidence of prolonged water infiltration was observed within the building interior of these regions, including water staining, damaged interior finishes, and deterioration of the concrete and wood structural elements. The elevated concrete structure over the vaulted fuel room is also deteriorated due to an insufficient and/or deteriorated waterproofing system, which is discussed in further detail below.

The roofing systems within the remaining roof areas are in serviceable condition with minimal evidence of water infiltration below; these areas likely require only minor maintenance repairs to extend the service life of the existing assemblies.

Structure

Overall, the primary structural system, which is either conventionally reinforced concrete or structural steel encased in concrete, is in good condition with relatively isolated areas of distress. The structural system was visually confirmed in isolated locations of damaged finishes, but most of the finishes are in place. Generally, the condition of finishes is indicative of the condition of the structural elements behind. The uppermost "open-air" level is of wood construction built atop the original concrete roof structure.

The wood structural framing of the upper level "open-air" addition is exhibiting areas of decay due to the fully exposed nature of this addition. The wood tongue and groove roof decking is heavily water stained at the perimeter and at the chimney. Similarly, the wood 2x roof rafters are heavily water stained at the bearings with visible decay present at the chimney. The 2x rafters are lapped over built-up wood beams which span between nominal 6x6 timber columns. At two locations, the built-up beams are water stained and locally crushing at the column bearings. A third built-up box beam in this roof structure has visibly deflected down away from the rafter bearing, however the rafters are supported on a nearby beam. The timber columns at the northwest end are visibly bowing; minor decay is present at one of these columns at the flooring elevation. The localized distress described herein is relatively simple to repair with reinforcement or replacement of the members. The lateral force resisting system of this upper level wood-framed structure is recommended to be further reviewed. Additional bracing, shear walls, or other systems may be required to meet current building code requirements as part of a full building rehabilitation project.

The ceiling of the coal room also serves as the exterior grade in the central courtyard. The reinforced concrete slab is cracked on both the top and underside surfaces. The slab is supported with reinforced

concrete beams of which at least two have been previously repaired. Additional spalling and steel corrosion have occurred, requiring concrete repairs of each of the beams. Because the observed distress reduces the structural capacity of this concrete slab structure, near-term measures are recommended to be taken to mitigate the risk of vehicles loading this area of the pavement behind the building, or alternately, to shore the beams to provide supplemental structural capacity.

As discussed above, the exterior mass masonry walls are generally in good, serviceable condition. Brick masonry cracking and steel corrosion were apparent in isolated locations of the building interior surfaces. Masonry cracking in the gymnasium and adjacent locker rooms are likely related to corroded steel lintels embedded in the masonry walls causing rust jacking of the masonry. These concerns are minor and can be repaired with repointing and repair of the corroded steel elements.

Miscellaneous

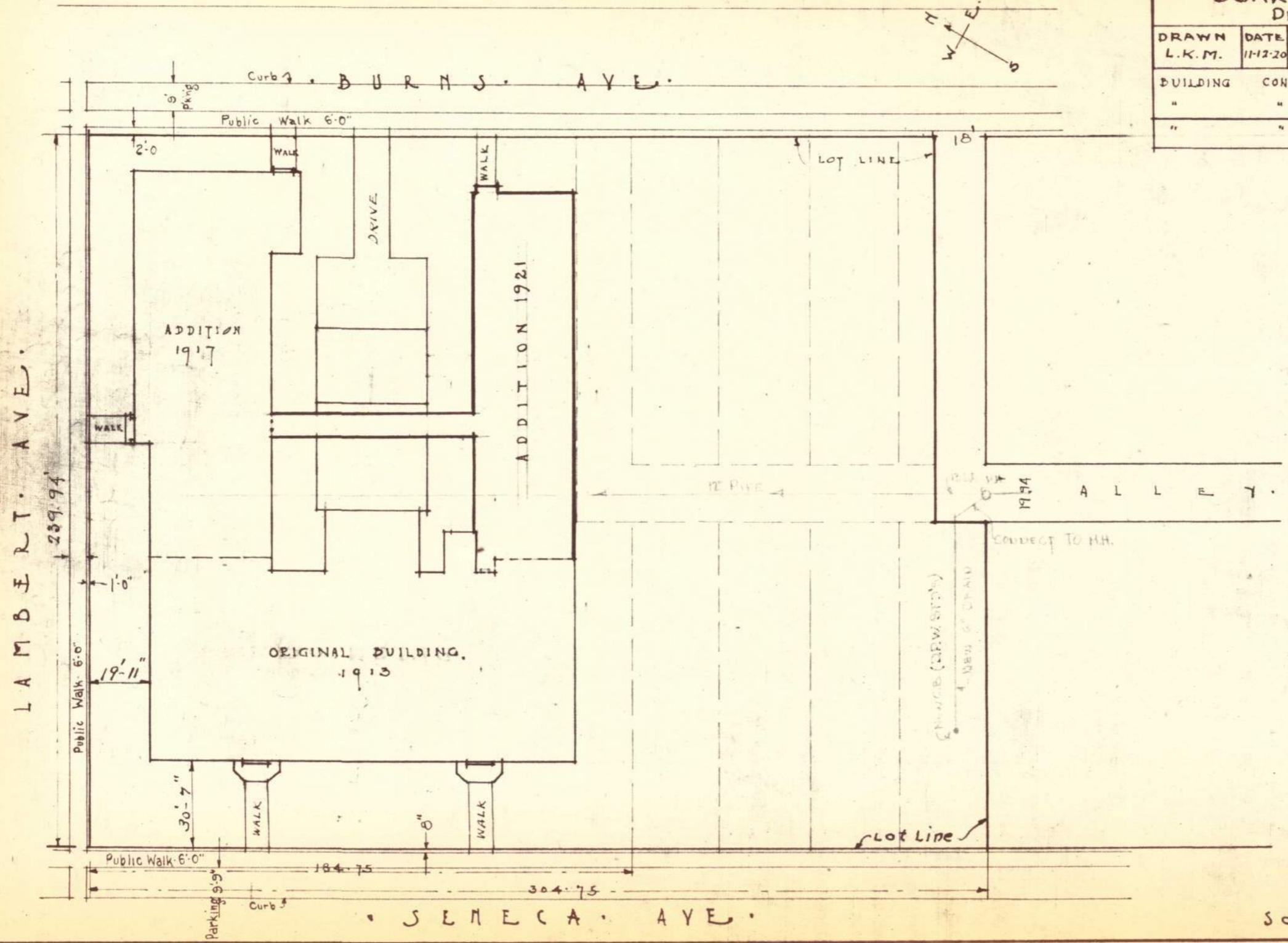
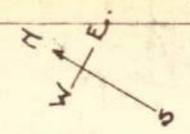
Internal roof drains are damaged in the northeast and northwest corners of the building, leading to deterioration of the finishes in these areas. Other localized areas of water damage have deteriorated the finishes, exposing the structural system in these areas. The majority of the finishes, however, are extant.

Some localized masonry infill areas and partition walls are damaged from vandalism during the removal of plumbing and heating elements. Repair of these partition walls is recommended as appropriate for potential new use of the spaces.

STEPHENS SCHOOL
DETAIL OF SITE.

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BOARD OF EDUCATION
DETROIT MICH.

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
L.K.M.	11-12-20	Ⓔ	11-12-20		
BUILDING	CONST.	1913	BRICK WALL/	CONCR. SLAB	
"	"	1917	"	"	"
"	"	1921	"	"	"
"	"	1922	"	"	"

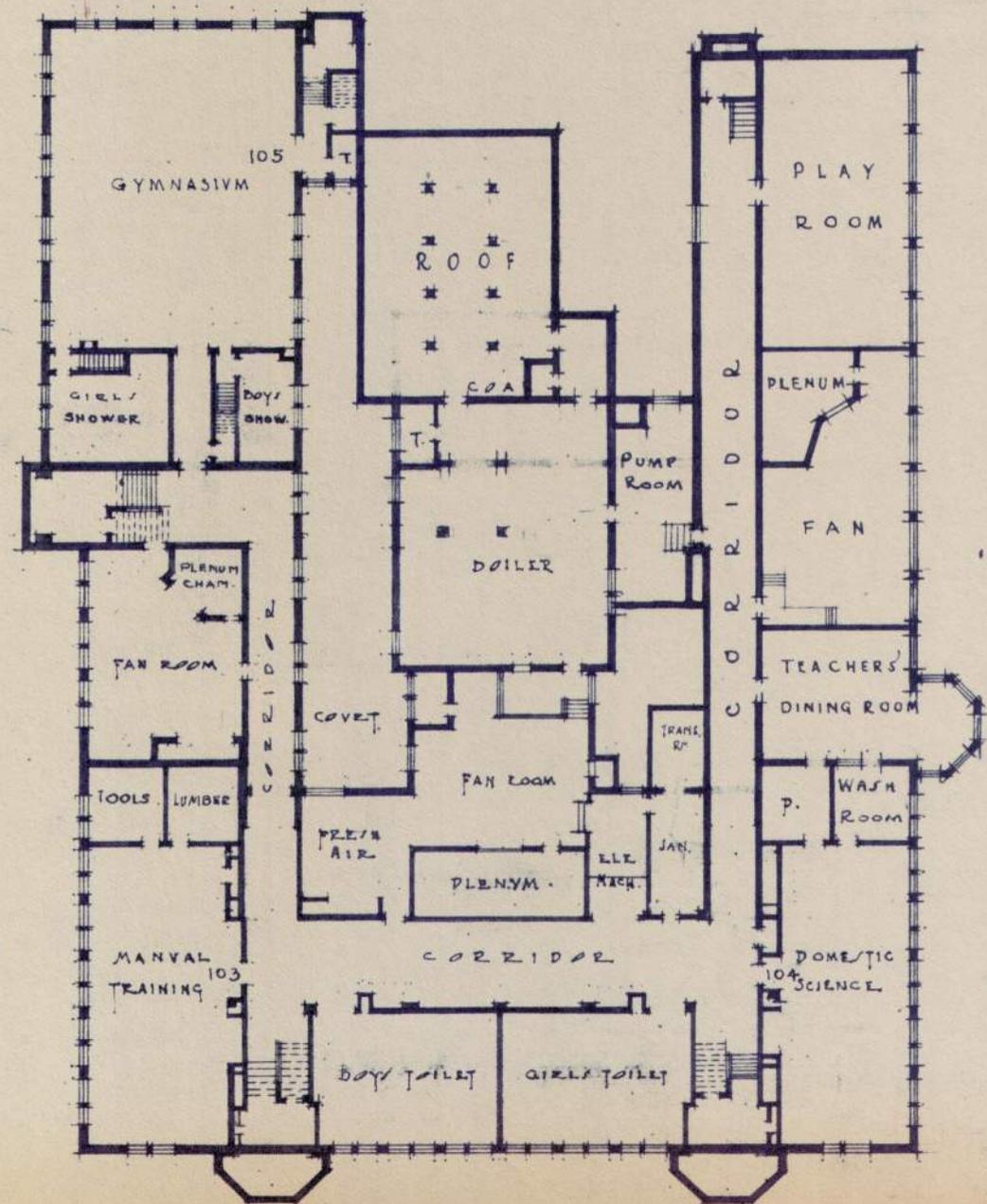


Scale 1" = 40'-0"

STEPHENS SCHOOL
 BASEMENT FLOOR PLAN Scale $\frac{1"}{32} = 1'-0"$
 DEPT. OF ARCHITECTURAL ENGINEERING
 BOARD OF EDUCATION
 DETROIT, MICH.

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
G.D.L.	10-30-20	E	11-12-20		

REVISED 7/25/45 G.H.M.



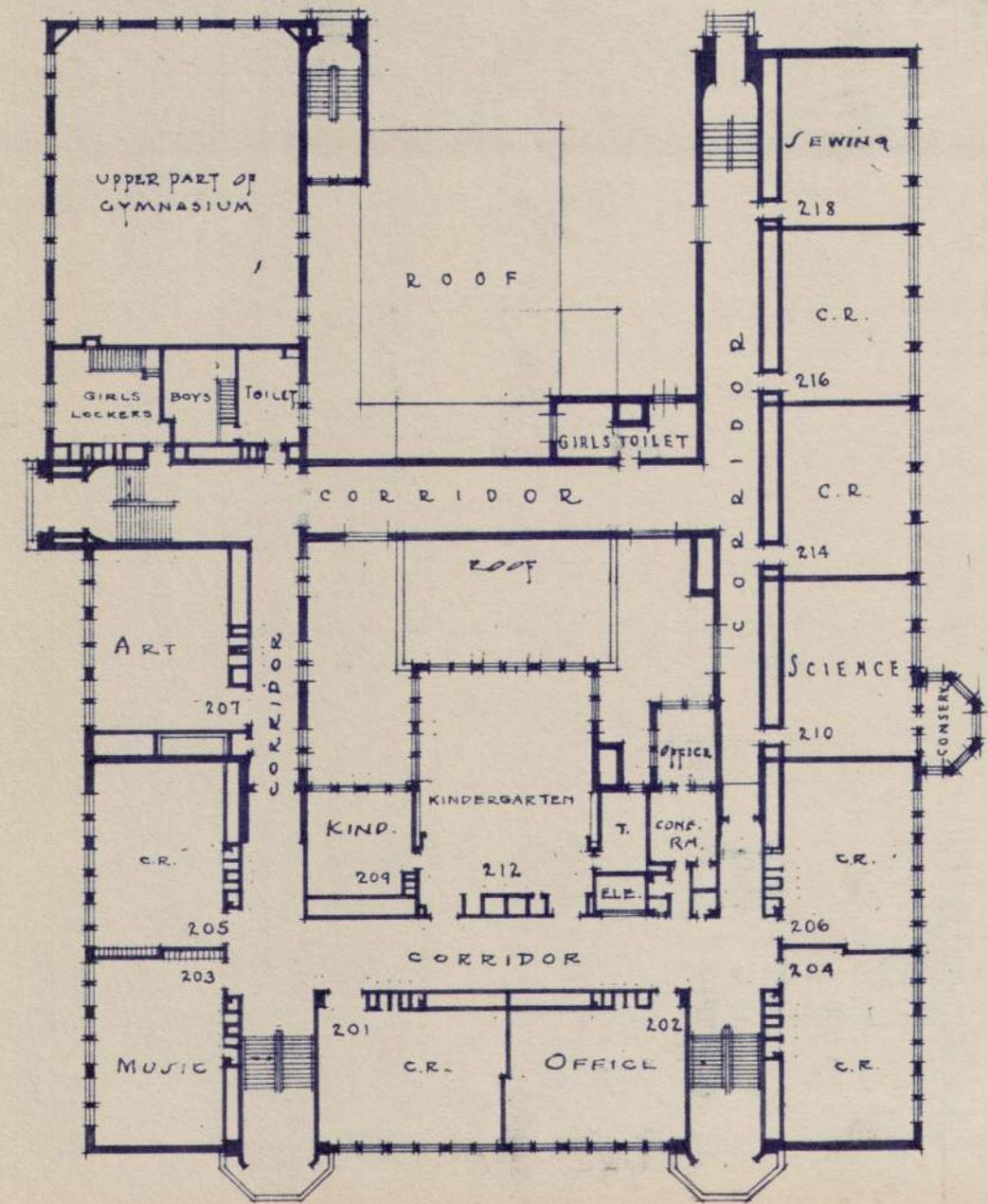
BASEMENT PLAN

SCALE $\frac{1"}{32} = 1'-0"$

STEPHEN S. SCHOOL
FIRST FLOOR PLAN - Scale $\frac{1}{32} = 1'-0"$

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DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
G.D.L.	10-30-20	E	11-12-20		
BUILDING	CONST.	1913	BRICK WALLS/	CONCR. SLAB	
"	"	1917	"	"	"
"	"	1921 1922	"	"	"
REVISED					9/26/46 G.H.M.



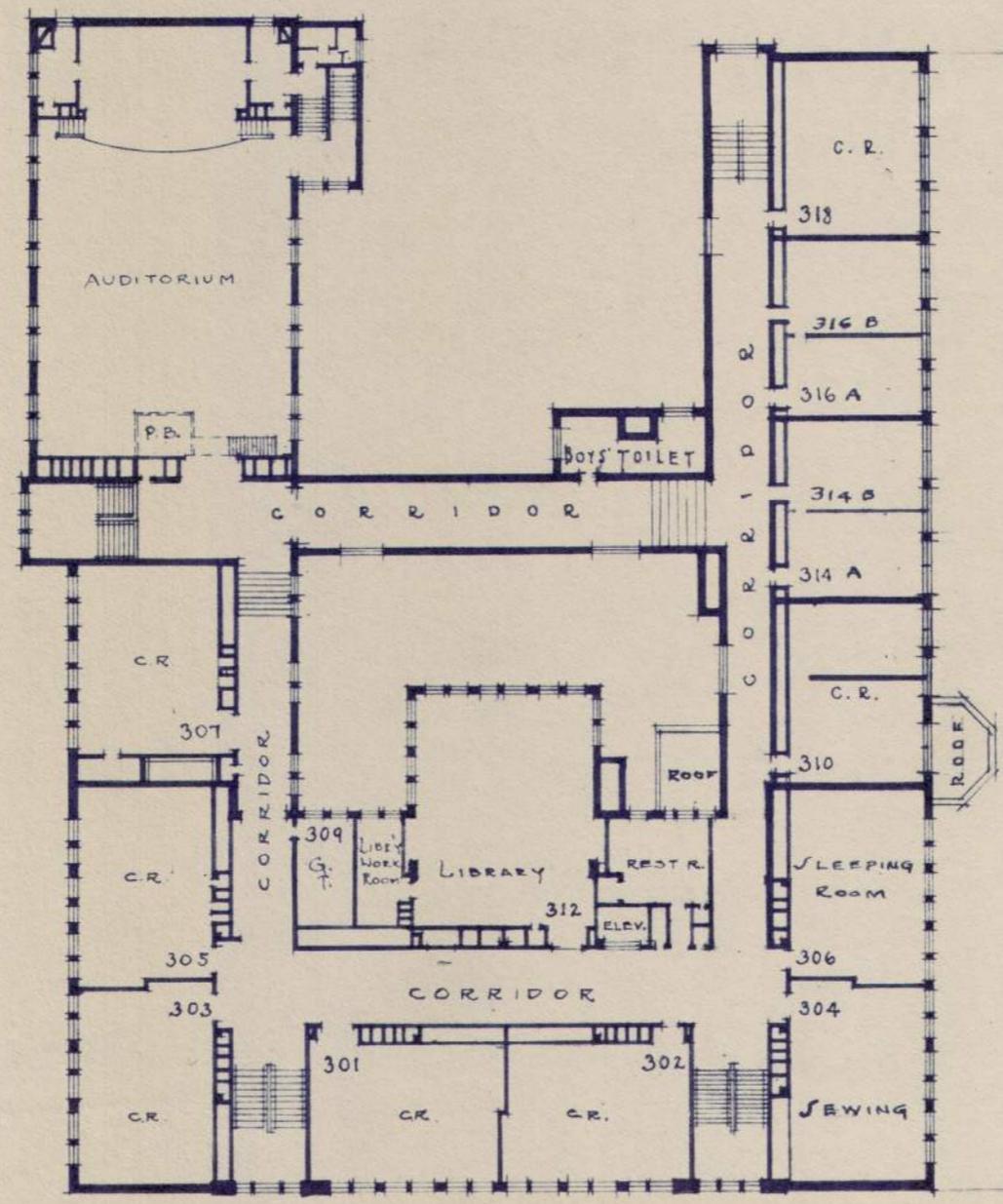
FIRST FLOOR PLAN
Scale $\frac{1}{32} = 1'-0"$

STEPHEN S. SCHOOL
 SECOND FLOOR PLAN scale $\frac{1}{32}''=1'-0''$

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DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
G.D.L.	10-30-20	Ⓔ	11-12-20		

REVISED 7/26/46 G.H.M.



SECOND FLOOR PLAN
 scale $\frac{1}{32}''=1'-0''$

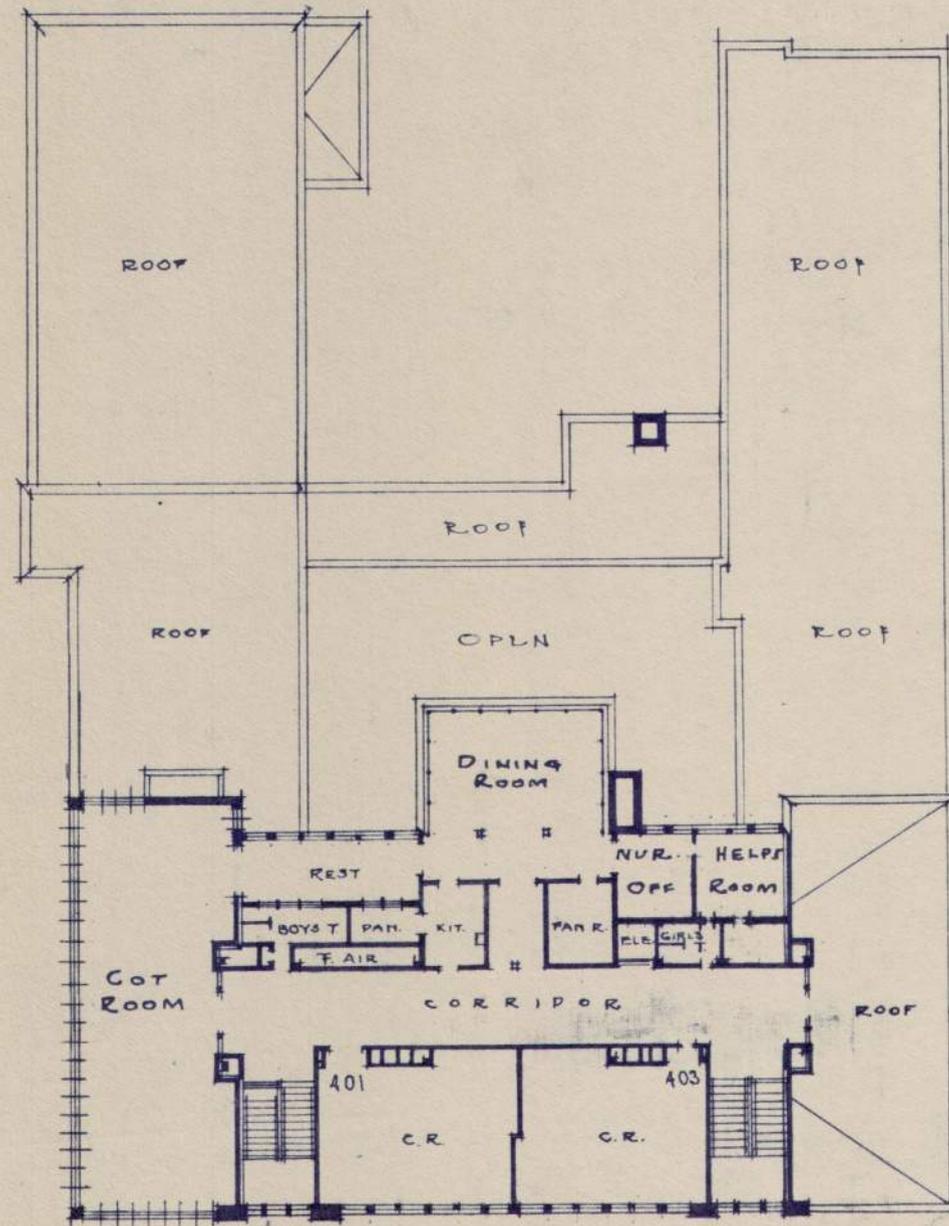
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• STEPHENS • SCHOOL •
 THIRD FLOOR PLAN • Scale $\frac{1}{32}'' = 1'-0''$

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DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
G.D.L.	10-29-20	E	11-12-20		

REVISED 9/26/46 G.H.M.



THIRD FLOOR PLAN
 scale $\frac{1}{32}'' = 1'-0''$