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VACANT HISTORIC SCHOOL BUILDINGS DISPOSITION PLAN

City of Detroit RFP# 19BW2717

Building Envelope and Structural Assessment Report

Sherrill Elementary School

Basic Property Information: COD 6-Sherrill-7300 Garden

Short Name:	Sherrill
Address:	7300 Garden Street, Detroit, Michigan 48204
Year Built:	1924
Additions Built:	1925, 1930
Outbuildings:	None
Year Vacated:	2011
Building Footprint:	355 feet x 170 feet
Square Footage:	64,942 sq. ft.
Number of Stories:	2
Building Height:	30 ft.

Current Ownership:	City of Detroit	**Structural Framing System:**	▪ Cast-in-Place Concrete (or Concrete Encased Structural Steel) ▪ Brick Masonry ▪ CMU ▪ Structural Steel
City Council District:	6	**Exterior Wall System:**	▪ Brick ▪ Limestone ▪ Cast Stone
SNF District:	NA	**Window System(s):**	▪ Aluminum Replacements ▪ Wood
		Roofing System(s):	▪ Built-up roof with gravel surface and modified bitumen flashing ▪ Modified bitumen with aluminum coating ▪ Internal Roof Drains ▪ Asphalt Shingles ▪ Gutters

Assessment Summary

Assessment Date:	May 19, 2020
WJE Inspector(s):	Cheryl Early; Sarah Rush
Report Date:	October 29, 2020
Building Risk Index:	**68.35**

Cost Estimate

Base Rehabilitation Cost Estimate:	$1,207,200
Preparation for Rehabilitation Work:	$900,000
Mechanical, Electrical, Plumbing, Fire Protection ($80/sq ft):	$5,195,360
Sub-Total	$7,302,560
Contingency (25%)	$1,825,640
Sub-Total	$9,128,200
Overhead and Profit (15-18%):	$1,369,230
Sub-Total	$10,497,430
Escalation (6% for 2 years)	$629,845
Sub-Total	$11,127,275
Architectural and Engineering Design Services (20%):	$2,225,455
TOTAL COST ESTIMATE:	$13,352,730

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 from grade and roof levels, using binoculars as needed. On the interior, WJE performed a walkthrough of accessible areas of each floor of the building. Minimal access to the attic level was obtained near the roof access. The basement level is partially flooded, and thus, was only partially accessed. The interior finishes are intact excepting localized areas where the structural framing systems are exposed. 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 1924 portion and the 1925 addition that make up the main two-story, masonry building is symmetrical in footprint about an axis centered between two hipped roof towers which accentuate the front entrances into the building. The 1930, two-story addition extends from the east end of the north facade.

The facade is primarily of brick masonry construction with painted cast stone accents in the 1920s building areas and painted and non-painted limestone accents in the 1930s addition. The windows consist of replacement aluminum systems. The majority of the low-slope roofing consists of an internally drained, bituminous built-up roof assembly with gravel surfacing and modified bitumen perimeter flashing. The low-slope roofing over the auditorium and gymnasium consists of internally drained, granulated modified bitumen with an aluminum coating. Sloped asphalt shingled roofs are present on the east and west sides of the north central wing and at the two south towers, which drain to external gutters and downspouts. An elevated structural slab is located at grade over the fuel room within the courtyard.

The primary structural system consists of concrete, or steel encased in concrete, beams, and columns supporting reinforced concrete tee joist-slab floor and roof systems. The roof over the north central wing which houses the gymnasium and auditorium is framed with steel trusses and wood plank roof decking. The exterior walls are of mass masonry construction, a compilation of clay, and concrete bricks. The interior bearing lines generally align with the double-loaded corridors with columns spaced between the classroom doors and locker blocks. The majority of the finishes are intact, with structural elements exposed only at locations where water is infiltrating the building.

Overall, the building is in good condition. Minimal distress of the structural elements was noted. Localized areas of the facade are recommended for repair to mitigate further deterioration of the masonry, fall hazards, and more costly repairs. Previous masonry facade repairs generally appear to be in serviceable condition with select areas of continued distress and one region of collapsed veneer. The windows are missing and require replacement. The low-slope roofing requires only minor maintenance repair work, except at the lower roof located over the boiler room which requires replacement. The asphalt shingle roofing over the auditorium and gymnasium require significant repairs, especially at the south valleys. The waterproofing assembly over the fuel room at grade also requires replacement.

Facade

The facade is generally in serviceable condition, though distress is present at the steel window lintels, reinforced cast stone units, and within some previous repairs. The observed distress included cracked, spalled, and displaced cast stone and brick masonry elements, which is primarily attributed to water infiltration and corrosion of the embedded steel support elements. Where previous lintel repairs have not been completed, or where repairs did not address the cause of distress and corrosion was permitted to continue, build-up of corrosion products (pack rust) is apparent and deflection of the steel lintels is visible. These regions required masonry repairs with improved flashing details and potential replacement of the steel elements to mitigate further distress to the masonry elements and building interior.

Where water infiltration into the wall assembly has resulted in corrosion- and freeze-thaw related damage to the cast stone elements, these units should be replaced in-kind. This includes the ornate cast stone units, such as those cladding the conservatory walls, which contain significant freeze-thaw damage. Alternative repair materials may also be considered. In the near term, loose stone material that has cracked or debonded but has not yet separated from the rest of the unit should be removed to mitigate falling object hazards. Similarly, displaced stone header and sill units should be stabilized, removed or reset. Patch repairs are not recommended for these units as a durable repair solution. The limestone masonry is generally in serviceable condition, except in localized areas where corroded pins and wall mounted elements are present. Paint should be removed from the limestone units to mitigate deterioration.

One region of collapsed veneer is located on the west elevation of the 1920s building portion. Previous repairs were performed at this location, which included new bolted connections to attach the existing lintel to the structural frame. The exposed steel lintel within the area of collapse was visibly corroded and displaced, and indications of previously existing lateral brick ties were not observed. Repairs may require installation of a new lintel with improved flashing detailed and new brick masonry with sufficient lateral brick ties. Anchorage of a new lintel will need to consider if the spandrel beam is reinforced concrete or a concrete encased steel beam. Further investigation is recommended at other previously repaired areas to determine the condition of the steel lintel and lateral brick ties, and to determine if additional repairs are required. Supplemental lateral anchorage may be needed, which may consist of externally installed helical or epoxy anchors.

The majority of windows are significantly deteriorated, damaged, or missing. Rehabilitation of the building should include replacement of the window and door assemblies. Ornate wood soffits and louvers at the roof level should be repaired as needed and repainted.

Roofing

The low-slope roofing assembly is generally in serviceable condition and requires only minor maintenance repair work, including repair of localized areas of open seams, replacement of missing drain strainers and failed drain pipes, and replacement of the cracked and open building expansion joint. However, the low-slope roofing over the boiler room contains significant distress and requires replacement. The asphalt shingles over the south towers appear to have been recently replaced and are in serviceable condition. The most significant roof-related distress is located within the asphalt shingled region over gymnasium and auditorium. Portions of the sheet metal flashing are missing and displaced resulting in localized failure of the roofing assembly, especially at the south valleys where portions of the roofing are missing and water infiltration, debris, and organic growth are present. These areas should be repaired including removal and replacement of localized areas of the roofing and wood roof sheathing, and repair of the existing gutter and downspout elements as needed.

A portion of the waterproofing assembly over the fuel room is significantly deteriorated. Water infiltration and localized concrete deterioration is visible from below. If this region is to remain, the waterproofing assembly should be replaced and the concrete slab should be repaired. Alternatively, if the region is not required for the new building use, this area may be infilled and a slab-on-grade may be installed.

Structure

The majority of the floor, wall and ceiling finishes are intact, revealing the structural system in only isolated locations. Generally, the condition of finishes is indicative of the condition of the structural elements behind. No significant distress of the tee joist-slab floors and roofs, nor concrete, or concrete-encased steel, beams and columns were observed. The masonry walls are cracked in two locations that may be related to overall structural movement of the building elements.

Specifically, a vertical crack in the south wall of the gymnasium has occurred. There is no paint within the crack indicating the crack occurred, or widened, after the graffiti coated the wall. The crack is relatively large, measured to be 1/8 inches in width near the bottom of the wall, and narrows as the crack extends towards the upper portion of the wall. In reviewing the floor plans provided, the crack appears to align with a transition between a foundation wall and a presumed first floor beam spanning between the foundation wall and columns. The basement was partially flooded preventing access to this area of the first-floor structure to verify the condition of the wall support at this juncture. The basement should be dewatered to allow access and assess the condition of the support. Conservatively, the addition of a new foundation and bearing wall may be required to reinforce the existing support system, although other alternative reinforcing methods may be available once the condition is better understood.

Another vertical crack is located at the south end of the western most exterior wall, directly below a dropped beam bearing. The crack is more pronounced than the typical plaster cracks observed throughout the unconditioned building and may extend upwards to the underside of the second-floor window corner. This crack may be related to a vertical crack observed on the north end of the west exterior wall in the exterior brick masonry. Further investigation into the cause of these cracks is recommended.

The interior finishes are significantly deteriorated in the north central wing, where portions of the roofing assembly are missing or significantly deteriorated as previously discussed. Daylight and fungal growth were observed between and on roof deck boards near the southwest corner of the auditorium. Similar conditions are assumed to be occurring elsewhere in this north central wing roof.

The exterior masonry of the south entrance towers is in sound condition with minimal distress noted. However, on the interior of the towers above the roof level, the composite clay and concrete brick masonry walls are cracked on the southern edges of the masonry openings in the east and west walls for the full height of the tower interior. The masonry south of the cracks has displaced inward approximately one inch relative to the masonry north of the cracks. The cracking may be a result of differential movements of the supports of the east and west walls of the towers; the walls are partially supported on a foundation on the southern portion and on the roof structure on the northern portion. Water infiltration into the cracks may have undergone freeze-thaw action resulting in the masonry displacement. The hipped, wood-framed roof structure above also induces a roof thrust on the masonry walls that may be contributing to the distress. Further investigation is recommended in these regions to determine the extent of distress and appropriate repair recommendations. For budgetary purposes, localized repointing and rebuilding of the displaced brick masonry should be assumed with periodic monitoring to determine if the distress is ongoing.

Approximately three feet of ponded water was observed in portions of the basement level preventing access to all of the basement spaces. The portions of the basement walls and underside of the first-floor structure visible from the points of access are in good condition with no distress observed. The basement should be dewatered allowing for assessment of the basement level prior to the implementation of the recommendations stated herein.

Miscellaneous

Due to the unconditioned state of the building, the interior finishes are primarily intact, but are exhibiting signs of distress with cracking of the plaster, buckled wood floor boards, loose or missing floor tiles, and fallen ceiling tiles. The distress is greatest in areas where water is infiltrating the building near interior roof drain locations.

Repairs had been attempted at some of the plaster crack locations. The cracking may be related to thermal or volumetric changes in the gypsum block wall materials or relative stiffness of the walls within the structural frame system of the building. These cracks may recur after rehabilitation and remain an ongoing maintenance item unless the underlying cause of the cracking is further assessed and mitigated.

Isolated areas of concrete deterioration and steel corrosion were discovered in the non-flooded areas of the basement level. The concrete deterioration has exposed a severely corroded steel reinforcing bar, but the area of the deterioration is small; it appears to be related to a localized pipe failure. The steel corrosion was noted where the ceiling had failed along the length of the exposed steel plate or bottom flange of the steel beam.

Portion of the chalkboard has fallen from the south clay and concrete brick composite exterior wall of Classroom 222, located over the beam between the science room and conservatory below, exposing a crack in the masonry wall. This cracking, located at midspan of the beam below, may be indicating a structural concern with the beam, but there is no distress observed of the beam from the first-floor level. The cracking is most likely related to the original construction of the wall, the furring inset into the masonry wall to support the chalkboard, or thermal and volumetric changes in the masonry in the unconditioned building. Further monitor the condition of the beam below and the low roof area of the conservatory.

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.

PLOT PLAN
SHERRILL SCHOOL
BOARD of EDUCATION
CITY of DETROIT
Landscape Department
Drawn by Sft.
Checked by
Nov. 20. 1924

N.

PRAIRIE AVE 50'

WYKES AV. 50'

GARDEN AVE 50'

ALASKA AVE

PLAYFIELD

BURNETTE AVE 50'

647'

7' Fence 237'

57'

135'

498'

Second Unit 1926

Fence

coal

DRIVE

90'

Lawn

First Unit 1924

Add 1930

Surfaced Playground

DRIVE

Scale 1" = 100'

SHERRILL ELEMENTARY

DEPT of ARCHITECTURAL ENGINEERING
BOARD of EDUCATION
DETROIT, MICH

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
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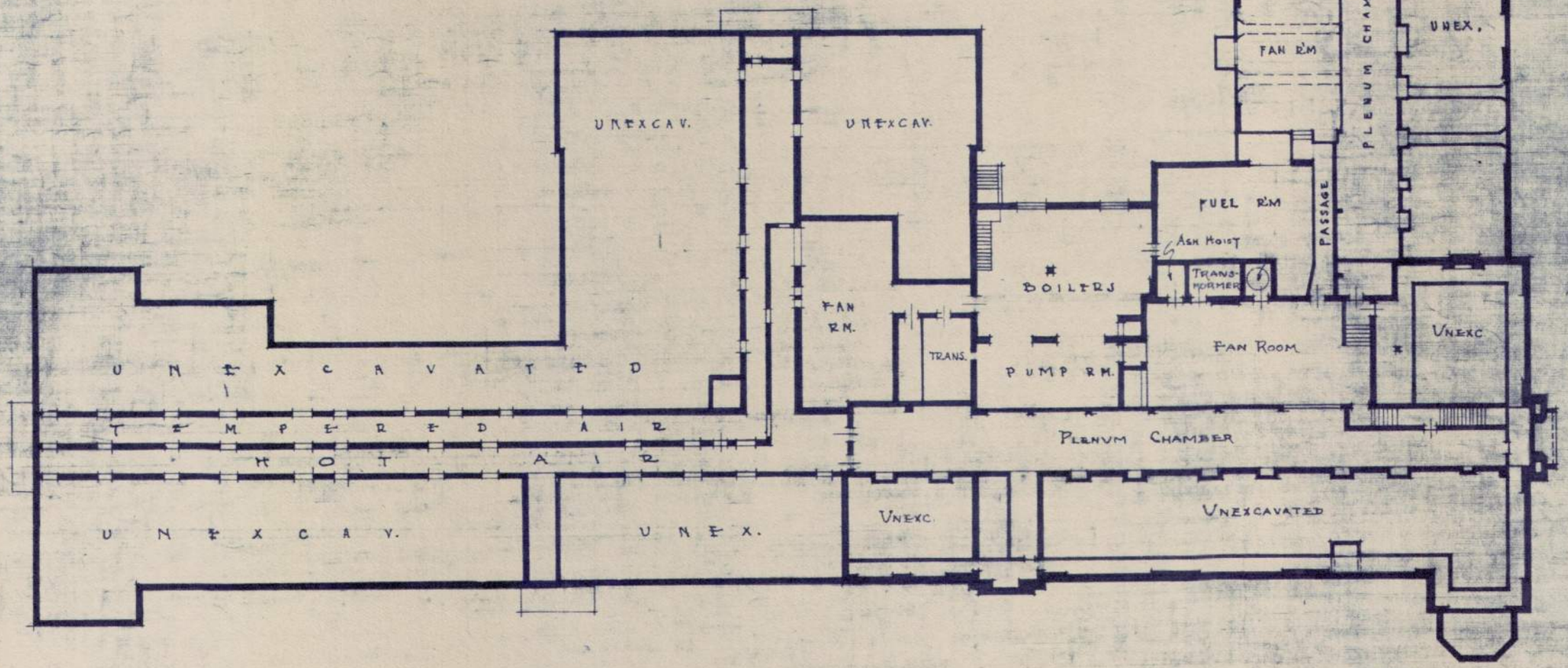

BASEMENT PLAN

SCALE: 1'-0" = 32'0"

SHERRILL ELEMENTARY

DEPT. of ARCHITECTURAL ENGINEERING
BOARD of EDUCATION
DETROIT, MICH.

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
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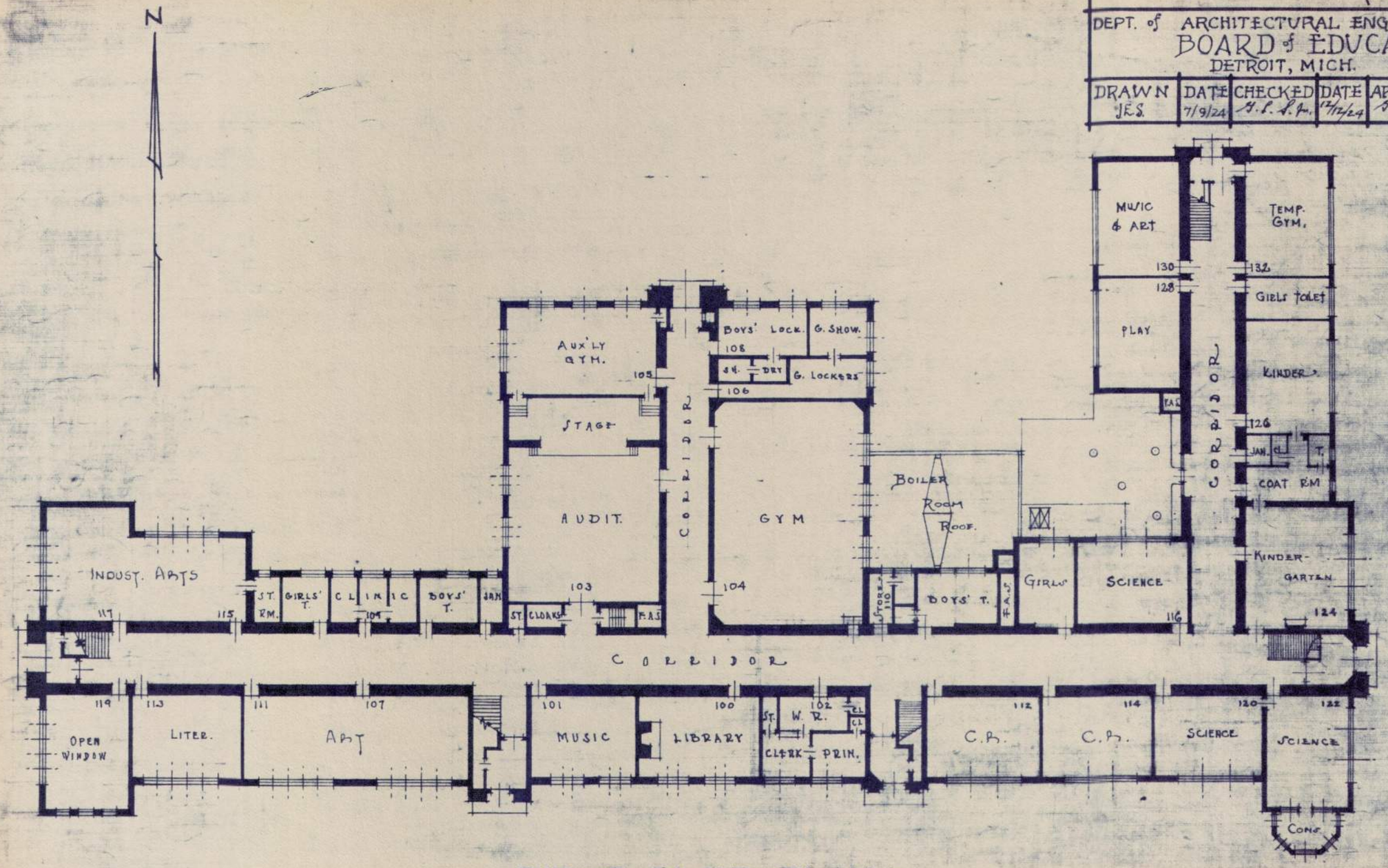

FIRST FLOOR PLAN

SCALE: 1'-0" = 32'-0"

SHERRILL ELEMENTARY

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DETROIT, MICH.

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
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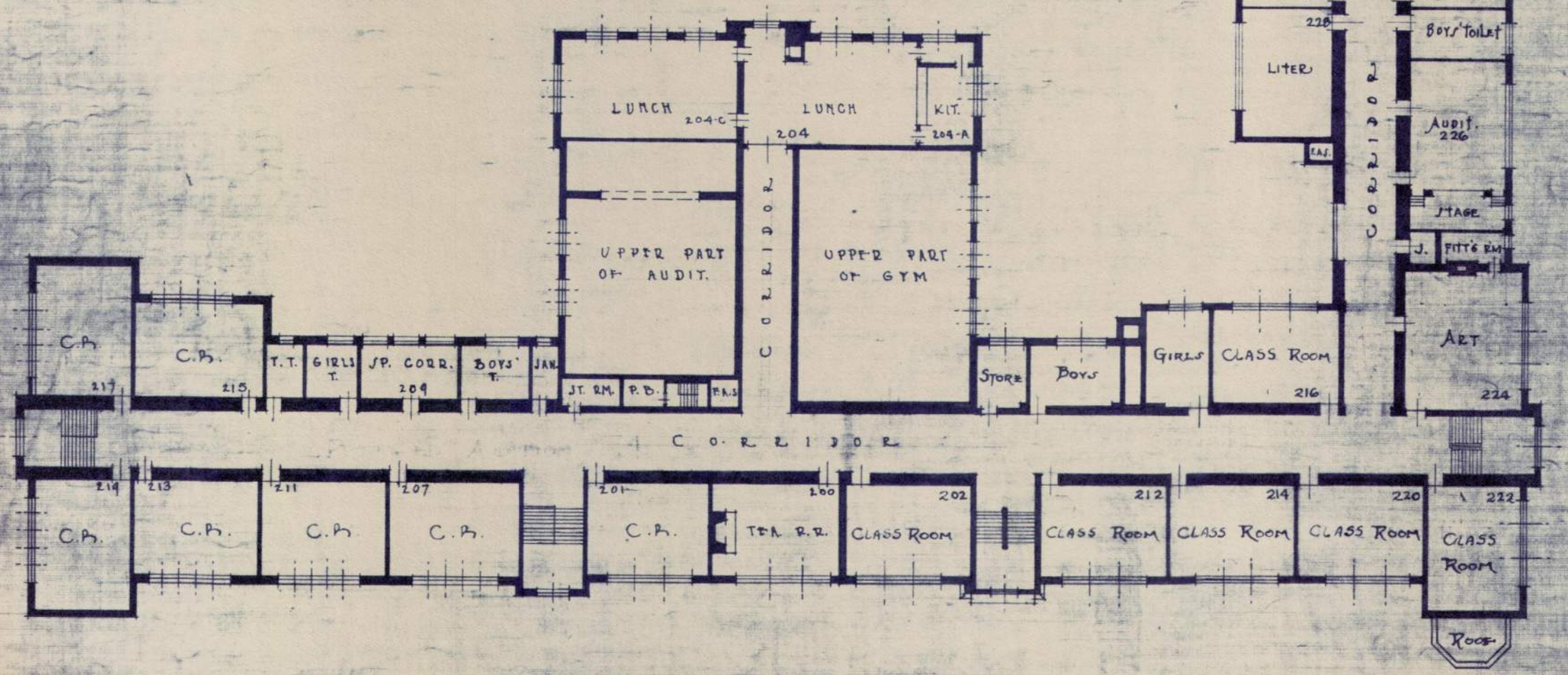

SECOND FLOOR PLAN

SCALE: 1'-0" = 32'-0"