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VACANT HISTORIC SCHOOL BUILDINGS DISPOSITION PLAN

City of Detroit RFP# 19BW2717

Building Envelope and Structural Assessment Report

Hanneman Elementary School

Basic Property Information: COD 6-Hanneman-6420 McGraw

Short Name:	Hanneman
Address:	6420 Mcgraw Street Detroit, Michigan 48210
Year Built:	1916
Additions Built:	None
Outbuildings:	None
Year Vacated:	2007
Building Footprint:	82 feet x 180 feet
Square Footage:	42,651 sq. ft.
Number of Stories:	3
Building Height:	38 ft.

Current Ownership:	City of Detroit
City Council District:	6
SNF District:	NA

Structural Framing System:	■ Cast-in-Place Concrete ■ Brick Masonry ■ Structural Steel ■ Wood
Exterior Wall System:	■ Brick ■ Limestone
Window System(s):	■ Wood Framed ■ Aluminum Sashes
Roofing System(s):	■ Built-Up Roof ■ Modified Bitumen Flashing ■ Internal Roof Drains

Assessment Summary

Assessment Date:	March 19, 2020
WJE Inspector(s):	Cheryl Early; Sarah Rush
Report Date:	November 22, 2020
Building Risk Index:	**66.13**

Cost Estimate

Base Rehabilitation Cost Estimate:	$1,267,300
Preparation for Rehabilitation Work:	$900,000
Mechanical, Electrical, Plumbing, Fire Protection ($80/sq ft):	$3,412,080
Sub-Total	$5,579,380
Contingency (25%):	$1,394,845
Sub-Total	$6,974,225
Overhead and Profit (15-18%):	$1,046,133
Sub-Total	$8,020,358
Escalation (6% for 2 years)	$481,221
Sub-Total	$8,501,580
Architectural and Engineering Design Services (20%):	$1,700,316
TOTAL COST ESTIMATE:	$10,201,896

ASSESSMENT METHODS

Visual Survey

As requested, Wiss, Janney, Elstner Associates, Inc. (WJE) performed a visual review of the building envelope and structure to assess the viability of the building for reuse. WJE was joined by Mr. Andrew Wald of Interboro Partners and Ms. Jennifer Ross 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 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. Limited access to the attic was obtained near the roof hatch. The interior finishes are in a state of deterioration, exposing the structural framing systems. 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

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 two-story building is primarily rectangular in plan with a small, half-story projection northward at the center of the north facade which houses mechanical equipment in the basement level. A roof terrace is present over the half-story projection. The basement level is a garden level, where windows located at grade provide daylight into the basement spaces. The second-floor level stacks over the first-floor level, with nearly identical layouts.

The building facade consists of multi-wythe clay brick masonry in Flemish-bond with limestone accents at the entrances, window sills, and a belt course near the bottom of the facade. Aluminum replacement windows have been set in the original wood frames, and aluminum caps cover the wood frames on the exterior. The building entrances are typically steel doors surrounded by transoms and side-lites. An architectural sheet metal cornice wraps around the building perimeter near the top of the wall. The roofing consists of a bituminous built-up roof with a flood coat and granular cap sheet base flashing that slopes to internal drains along the central corridor. The roofing extends to the top of the exterior masonry walls with little to no freestanding parapet or exposed masonry on the roof side.

The sloped roof structure consists of wood framing spanning between the mass masonry perimeter walls and an interior beam and column system located within the corridor walls. The first and second floor structures are comprised of concrete tee joist-slabs with stay-in-place clay tile forms. The beams and columns, where exposed, are concrete, or steel encased in concrete. The roof structures of the mechanical rooms at the north side of the building are comprised of reinforced concrete slab and beam construction spanning between the mass masonry perimeter walls and interior concrete columns.

Although initial appearances of the existing conditions are concerning based on the magnitude of the failure of the interior finishes, the building is in a repairable state. Failed and missing roof drains along with missing mechanical rooftop units are permitting a significant amount of water to enter the building interior at the corridors. Water damage within the wood roof and ceiling framing was observed near the drains and mechanical unit roof penetrations. The concrete floor structures are generally in good condition with localized areas of spalled concrete revealing embedded corroded reinforcement. Replacement of the roofing, including roof drains and associated piping, is recommended to mitigate further damage to the interior finishes and structural elements. Many of the windows are missing or damaged and will require replacement, though repairs may be possible in select locations. The masonry is generally in good condition, except at poorly executed previous repairs at the half-story north terrace walls, where the repairs did not address the underlying causes of distress. Further detail of the observed distress is provided below.

Facade

The masonry is generally in good condition, though distress related to water penetration is present in localized areas.

At least two previous masonry repair projects have been completed at the building based on the observed brick unit replacement types and variations in the repair detailing. These past projects have included localized flashing repairs, rebuilding of localized brick areas, brick infill at a few wall openings, and

localized repointing of mortar. One of the masonry repair projects included appropriate detailing and largely remain in good condition. Repairs performed during the other restoration effort exhibit continued deterioration. In regions of poor previous masonry repair efforts, including the lower level windows and the north entrance terrace walls, severe corrosion and deflection of the steel lintels is present which has resulted in significant cracking and displacement of the surrounding masonry. Locations containing significant masonry distress should be rebuilt with new steel lintels and appropriate flashing and lateral reinforcement detailing.

In general, the original mortar has a uniformly eroded appearance due to its age but is well bonded and sound. However, some very localized areas of mortar are significantly eroded and friable or are missing and should be pointed (filled) with an appropriate mortar material.

The architectural metal cornice near the top of the facade is displaced and bent in some regions on the south facade. Peeling paint was observed on the underside while the condition of the skyward surfaces is unknown. Displaced areas should be re-secured and/or replaced. All surfaces should be painted to mitigate further deterioration.

The majority of the windows are missing or damaged with missing sashes, missing and decayed wood frames, and/or broken glass. Many of the steel doors are dented or corroded and the transoms and side lites contain localized dents in the metal frames and/or broken glass. Rehabilitation of the building should include replacement of the window and door assemblies, though restoration of select window locations may be considered in lieu of replacement.

Roofing

The roofing is in poor condition largely due to failed internal drainage systems and missing rooftop mechanical units. The observed deterioration includes a large area of roofing that has become un-adhered near the drains and widespread cracking, seam failures, and organic growth. Due to the sloped roof structure towards the central drains, the majority of damage to the structural and interior finishes is concentrated near the corridor. Rehabilitation of the building should include removal and replacement of the existing roof assemblies and replacement of the internal drains and drain pipe systems. In the near term, temporary measures should be considered to address the ongoing water management issues and stabilize the observed deterioration within the building interior.

The north terrace contains two internal drains that were clogged with organic growth at the time of our assessment, creating ponded water. The drain conductors were also missing, resulting in significant water infiltration into the mechanical space below. Waterproofing elements over the adjacent vaulted mechanical space were failed, resulting in water infiltration and deterioration of the concrete slab structure. Rehabilitation of the building should include replacement of these water management elements.

Structure

The deteriorated condition of the interior finishes at the center of the building has exposed the primary structural systems.

At the second-floor corridors, at the east wall of the west stair, and at the east wall of the auditorium, the wood roof decking, rafters and ceiling joists are decayed, and stained black and white fungal growth is

present. Daylight is penetrating through the wood decking in isolated locations. The decayed areas of the roof require full rebuilding and is recommended to be coordinated with the roofing repairs.

Although the finishes in the central rooms of the building are fully deteriorated and the underside of the second-floor structure was visibly wet; no distress of the concrete structure was observed. Similarly, the underside of the first-floor structure was visibly wet in the same areas of the building. The water presence is related to failed interior roof drains and roof openings at the missing mechanical roof top units. The underside of the concrete tee-joists is corrosion stained with exposed reinforcement present along portions of the joists in the classroom ceilings at the east and west ends of the basement level. The embedded concrete reinforcing steel appears to have minimal concrete cover, seemingly an as-built condition of the original construction. The above noted water infiltration is recommended to be addressed with the envelope repairs and subsequent partial depth concrete repairs may be required of the concrete joists.

The embedded steel reinforcement of the vaulted concrete slab and beam system of the fuel room is exposed and corroded on the underside of the slabs and beams. Incipient spalls are present along the beams. Both the slab and beams can be repaired with partial depth concrete repairs.

The exposed surfaces of the steel lintels over door and window openings in the interior walls of the basement level are corroded with visible deflection occurring at the lintel spanning over the door to the fuel room. This lintel requires replacement along with localized brick removal and replacement. The other lintels are to be cleaned, assessed and re-coated with a rust inhibiting paint.

Miscellaneous

Many of the interior walls are cracked and partially collapsed. The distress is related to ongoing water infiltration and thermal or volumetric changes in the wall materials. Cracking within select walls, such as interior stairwell and classroom walls, may be related to the relative stiffness of the walls within the structural building frame system. After the water infiltration is mitigated through the envelope repairs, the distressed interior walls can be repaired as required for the new building use. Plaster cracks can be repaired, and damaged or missing gypsum blocks can be replaced with lightweight CMU or similar material. Where cracking is related to the relative stiffness of the structural frame, the cracks may recur after rehabilitation and remain an ongoing maintenance item unless mitigated with appropriate detailing that can accommodate repeated movement.

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.

HANNEMAN SCHOOL
DETAIL OF SITE

DEPT. OF ARCHITECTURAL ENGINEERING
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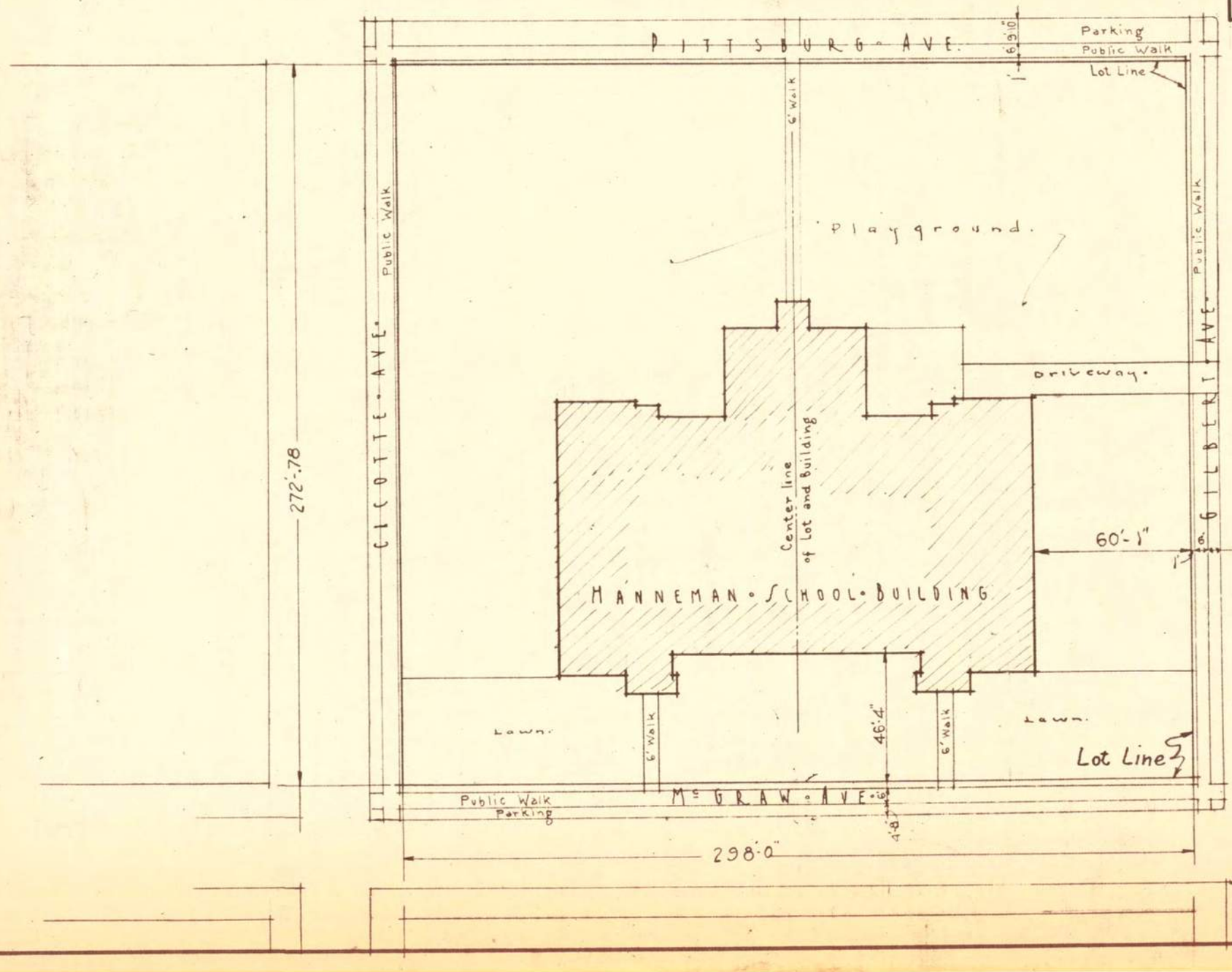
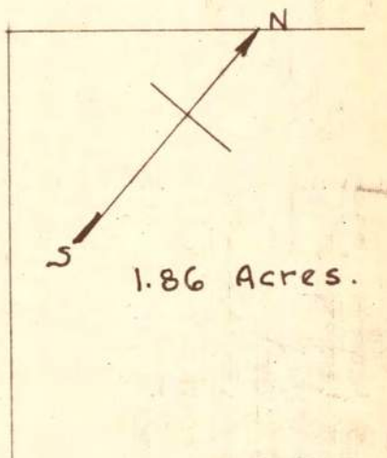
DETROIT MICH.

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
G.D.L.	11-17-20	C			

BUILDING CONSTR.	1916	BRICK WALLS CONCRT. FLRS.





1.86 Acres.

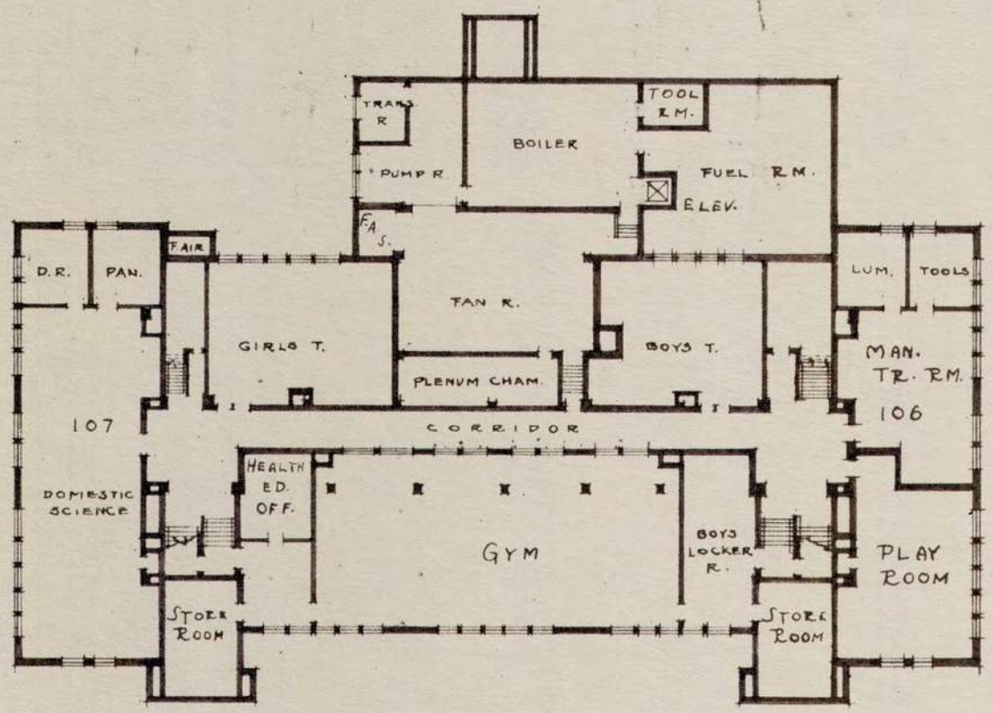
SCALE 1" = 50'-0"

HANNEMAN · SCHOOL
BASEMENT · FLOOR · PLAN

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

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
G.D.L.	11-17-20	C			

REVISED. . 7-15-46. R.D.



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

HANNEMAN SCHOOL
FIRST FLOOR PLAN

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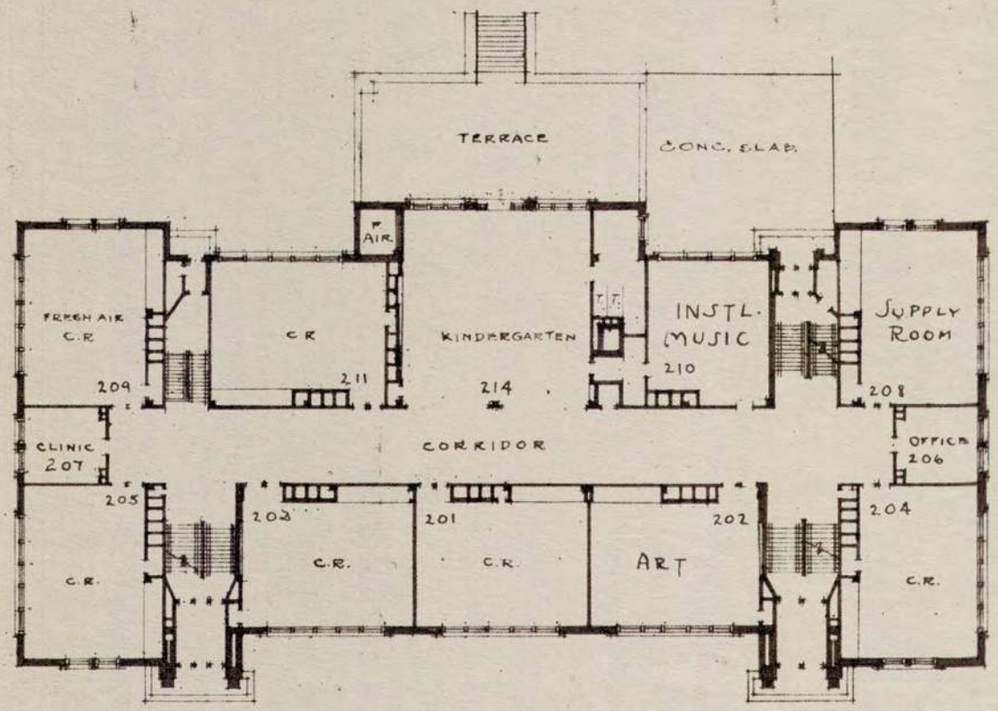
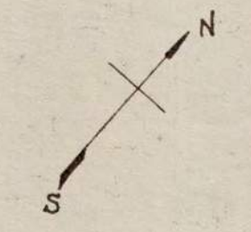
DRAWN	DATE	CHECKED	DATE	APPROVED	DATE

BUILDING CONSTR.	1916	BRICK WALLS CONCRT FLOORS

REVISED. 7-15-46. R.D.



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



HANNEMAN · SCHOOL
SECOND FLOOR PLAN

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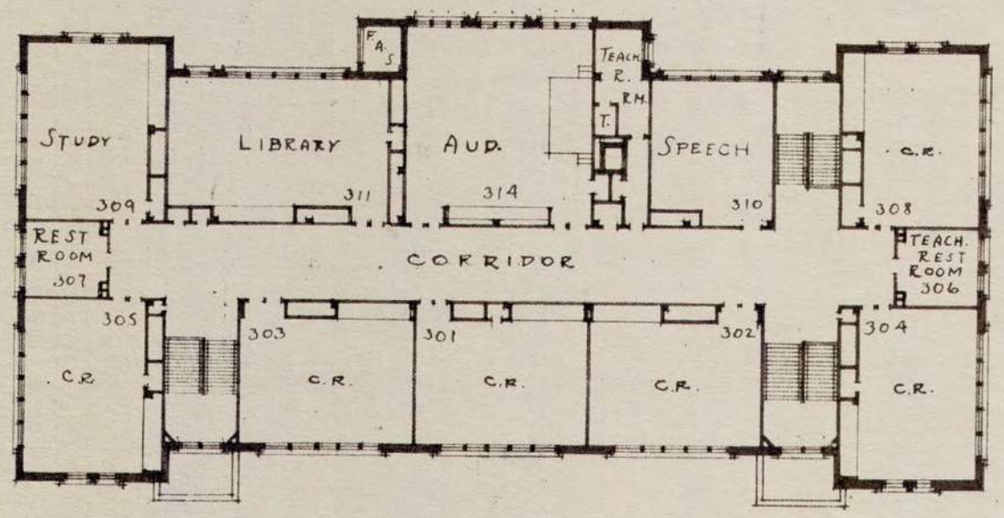
DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
G.D.L.	11-17-20	C			

REVISED. 7-15-46. R.D.



SECOND FLOOR PLAN

scale $\frac{1}{32}$ - 1'-0"