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VACANT HISTORIC SCHOOL BUILDINGS DISPOSITION PLAN

City of Detroit RFP# 19BW2717

Building Envelope and Structural Assessment Report

Lynch Elementary School

Basic Property Information: COD 3-Lynch-7575 Palmetto

Short Name:	Lynch
Address:	7575 Palmetto Street, Detroit, Michigan 48234
Year Built:	1916
Additions Built:	1922, 1975
Outbuildings:	None
Year Vacated:	2005
Building Footprint:	335 feet x 90 feet
Square Footage:	41,219 sq. ft.
Number of Stories:	2
Building Height:	49 ft.

Current Ownership:	City of Detroit
City Council District:	3
SNF District:	NA

Structural Framing System:	■ Cast-in-Place Concrete ■ Brick Masonry ■ CMU ■ Structural Steel ■ Wood
Exterior Wall System:	■ Brick Masonry ■ Cast Stone ■ Limestone
Window System(s):	■ Steel-framed ■ Wood
Roofing System(s):	■ Built-Up Roof ■ Internal Roof Drains ■ Gravel Surfacing ■ Asphalt Shingles ■ Gutters

Assessment Summary

Assessment Date:	June 11, 2020
WJE Inspector(s):	Andrew Lobbestael; Sarah Rush
Report Date:	October 29, 2020
Building Risk Index:	**100.50**

Cost Estimate

Base Rehabilitation Cost Estimate:	$1,240,250
Preparation for Rehabilitation Work:	$900,000
Mechanical, Electrical, Plumbing, Fire Protection ($80/sq ft):	$3,297,520
Sub-Total	$5,437,770
Contingency (25%)	$1,359,442
Sub-Total	$6,797,212
Overhead and Profit (15-18%):	$1,019,581
Sub-Total	$7,816,794
Escalation (6% for 2 years)	$469,007
Sub-Total	$8,285,802
Architectural and Engineering Design Services (20%):	$1,657,160
TOTAL COST ESTIMATE:	$9,942,962

ASSESSMENT METHODS

Visual Survey

As requested, Wiss, Janney, Elstner Associates, Inc. (WJE) performed a cursory 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 buildings, and Ms. Ross and Mr. Landsberg assessed the condition of the historic fabric of the buildings.

WJE performed a cursory visual review of the building envelope from grade and main low-slope roof levels, using binoculars as needed. On the interior, WJE performed a walkthrough of accessible areas of each floor of the building, including the basement. The interior finishes are in a state of deterioration, exposing the structural framing systems in multiple 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 three-story building was constructed between 1914 and 1916 with a two-story annex addition constructed in 1921 and a one-story addition at the west end of the annex portion of the building constructed in 1975. There is a two-story corridor that attaches the original building to the annex. The 1975 addition includes space for a gymnasium, an auditorium, and classrooms, among other ancillary spaces.

The facade of the original building generally consists of clay brick masonry with cast stone at the horizontal accent bands, entrance surrounds, window sills, and ornate accent units. The brick masonry units are typically oriented in a running bond with no visible header brick. The 1921 annex addition consists of clay brick masonry with limestone at the copings, horizontal bands, and window sills. The brick masonry is typically oriented in a running bond with a header course every seven courses vertically. The 1975 addition facade consists of clay brick masonry veneer over concrete masonry unit (CMU) back-up walls, and few fenestrations. Original wood-framed windows are present within the original building construction and the 1921 annex addition, while metal-framed windows are located in isolated regions of the 1921 annex addition and the 1970s addition. The exterior entrances consist of conventional steel-framed doors.

Steep-slope hip roofs covered with asphalt shingles are present on the original portion of the building, surrounding a low-slope roof located in the middle of the roof. The hip roofs slope to gutters and downspouts at the eave. The additions are covered with low sloped-roof consisting of an internally drained, slag-surfaced, bituminous (suspected to be asphaltic) built-up roofing system with granular surfaced base flashings.

The roof framing of the original building consists of wood decking supported by wood joists and rafters supported by wood trusses, wood columns, and loadbearing masonry walls. The floor framing at the lower levels of the original building consist of wood joists that span between loadbearing clay brick masonry walls. The roof framing of the 1921 Annex consists of gypsum deck over bulb tee purlins supported by wide flange steel beams. The supported floor framing of the 1921 Annex consists of cast-in-place concrete joist slabs with steel forms. The structure of the 1974 building addition consists of corrugated steel roof deck spanning over open-web steel joists supported by load bearing concrete masonry unit (CMU) walls with a concrete slab-on-ground.

In general, the building is in serviceable condition with concentrated locations of more severe deterioration and distress. Repair of the damaged open-web steel joists and the gypsum concrete within the building annex passageway is needed, and further investigation of the wood and concrete structural framing is recommended. The low-slope roofs are recommended for replacement due to the extent of the observed distress within the roofing assembly and/or deterioration of the structural elements below. Significant masonry distress was observed throughout the facade of the original building and 1921 annex, with collapsed areas of brick observed in two areas of the annex facades. The majority of the observed masonry distress is attributed to prolonged moisture penetration through the masonry walls. The existing windows are generally in serviceable condition and may be restored in place.

Facade

The masonry facade of the 1975 addition is in good condition with isolated minor distress; however, more significant masonry distress is present within the original 1916 building and 1921 annex.

The brick masonry near the top of the 1921 annex walls is commonly bowed or outwardly displaced, and a portion of the face brick have partially collapsed at the west ends of the north and south facades. The masonry surrounding the collapsed regions is also displaced outward and at risk of further collapse. Several of the limestone units within the horizontal header band are also cracked and displaced outward. Below the regions of displacement, the mortar is generally spalled or significantly deteriorated. Vertical cracks within the masonry are present near midspan of the windows due to deflection of the lintel supports, while step cracks often extend from the edges of the corroded steel lintels. The observed distress in these regions is attributed to prolonged water infiltration within the wall assembly and subsequent freeze-thaw damage, as well as corrosion of the embedded steel lintels. The collapsed region on the south facade may also have been influenced by impact damage from the adjacent overhanging tree branches. Temporary measures should be taken to remove loose and displaced masonry units or, at a minimum, barricades should be provided on the grounds below to mitigate pedestrian access until repairs can be conducted. Rehabilitation of the building should include rebuilding the displaced and collapsed portions of masonry, repointing deteriorated mortar joints near the top of the annex walls, and repairing the corroded steel lintels in conjunction with repairs to the coping and roofing elements to mitigate further water infiltration within the wall assembly. We anticipate that some repair of the masonry back-up will also be required.

Severe corrosion and deflection of the steel lintels was also noted at the original building facade, particularly above the basement windows, with some lintels exhibiting significant section loss and pack rust. The surrounding brick masonry and cast stone units are often cracked and displaced above these windows. Repairs should include removal and replacement of the masonry in order to expose the distressed lintels and repair the masonry distress, and replacement of the loose-laid lintels with new steel and improved flashing details.

Widespread mortar erosion and spalling of mortar is present throughout the facades of the original building and annex, as well as localized biological staining on the surface of the masonry. Beyond the regions of the more severe mortar deterioration near the top of the annex walls, deterioration is also common at locations of failed or missing gutters and downspouts, or near the base of the walls. Once the sources of water are addressed, grinding and pointing of deteriorated mortar joints and cleaning should be performed to remove biological growth and miscellaneous surface staining.

Several cast stone units are spalled or cracked at the south entrance of the original building, which is attributed to water infiltration and subsequent freeze-thaw deterioration due to failure of the roofing assembly located above the projecting entrance bay. Additionally, localized stone units are spalled at corroded steel anchors. Repair or replacement of the distressed stone elements is recommended in order to stabilize unsound stone units and mitigate further distress to the stone and surrounding masonry facade.

The exterior wood canopy above the south entrance has localized areas of decay of the soffit and fascia elements caused by moisture infiltration through the roofing above. The paint on the underside of the

canopy was flaked and cracked. Repairs at the canopy, involving removal and replacement of the decayed wood elements and cleaning and coating of the exposed wood surfaces in conjunction with replacement of the roofing above is recommended.

The chimney attached to the 1921 annex addition is distressed. Cracking and shifting of the brick masonry were observed near the top of the chimney on multiple sides with some areas exhibiting signs of instability. Based on the observed level of distress at the top of the chimney, we recommend dismantling and rebuilding the brick masonry walls above the lower limestone band, where the overall footprint of the chimney decreases. Rehabilitation should also include removal and resetting or replacement of the copings with new through-wall flashing. Depending on whether the chimney is functional, consideration could be given to capping the chimney at the lower horizontal band in lieu of rebuilding full height. Cracked masonry and eroded mortar is also present on the chimney attached to the original building. Rehabilitation should include the replacement of the localized cracked brick units and grinding and repointing the eroded mortar joints.

Overall, the original wood windows are in fair, serviceable condition. However, minor distress such as cracked, broken, or missing glass lites and localized decay of the wood framing near the window sills was observed. Additionally, the sealant at the perimeter of the window frames typically exhibited weathering and bond failure. Restoration of the windows is recommended, including replacement of cracked and broken lites, installation of new sealant at the window perimeter, and replacement of the localized decayed wood elements. Similarly, the steel-framed and metal-framed windows are in serviceable condition and may be repaired in-place. The exterior metal doors are typically corroded, dented, or missing, and warrant replacement.

Roofing

The asphalt shingle roof over the original building was generally in good, serviceable condition with minor distress observed such as localized missing metal fascia elements and downspouts. Maintenance repairs within the roofing assembly over original building portion, in coordination with repair of the structural wood roof deck, including replacement of missing fascia and downspouts, painting of the sheet metal elements to mitigate corrosion, and trimming the overhanging trees is recommended. WJE was not able to access the low-sloped roof over the original building due to the condition of the roof access ladder. However, aerial images indicated it is a smooth surfaced roofing with an aluminized coating. The wood decking below the roofing is generally in serviceable condition with localized decay at a pipe penetration and around a copula. It is not clear if the decay is from a previous issue that has been addressed or if the roof leak causing the decay is ongoing. We recommend repairing the flashing at these locations if they are from an ongoing roof leak.

The low slope roofs over the two building additions and the annex corridor are generally in poor condition and are beyond the end of their useful service life. Displaced and missing flashing, loss of adhesion of the flashing, displaced and missing coping, missing drain strainers and rooftop units, vegetation growing from seams in the roofing, missing and displaced gutters and downspouts, and cracking of the roof surface was observed. Damage to the interior finishes and structural roof decks were also observed at locations of missing drains and roof top units. Additionally, the roof damage and deterioration has caused accelerated

distress to the adjacent masonry walls leading to localized masonry instability and collapse. Replacement of the low slope roofing assemblies and drainage systems are recommended.

There are multiple openings in the low-slope roof areas that are permitting water into the building. This includes two missing roof access hatches and several roof curbs with missing mechanical equipment. We recommend that the holes be covered in the near-term to prevent additional water infiltration.

Structure

In the 1976 addition, four of the open-web steel joists have been cut and are missing a portion of their bottom chord and web members. The remaining sections of the joists are not adequate to resist code required loads, and this portion of the structure is susceptible to partial collapse. In a letter dated June 17, 2020, WJE recommended temporary shoring be installed to support the roof at the cut joists or, at minimum, provide barricades to prevent access below or on top of this area of the roof. Rehabilitation of the building should include removal and replacement of the existing damaged joists in conjunction with roofing replacement work. Alternatively, it may be feasible to install new joists adjacent to the existing damaged joists.

The wood decking in the original building is decayed and has areas of water staining on the wood decking and joists. The decay is generally more concentrated at the transition from the steep slope roof to the low-slope roof and near the eave. However, plywood sheathing was installed over the original wood decking, likely during the previous roofing replacement project. Provided that the plywood is well attached to the roof rafters, then repair to the decayed wood decking is not necessary. We recommend a further investigation to verify the attachment condition of the plywood.

Long-term exposure to moisture intrusion has caused cracking, erosion, and holes in the gypsum roof deck and corrosion of the bulb tees and steel beam at the east end of the roof deck within the passageway between the original building and annex addition. We recommend replacing the deteriorated regions of gypsum deck in-kind, in coordination with the roofing replacement. Alternatively, full removal and replacement of the structural framing and decking over the passageway may also be considered to compare the economical and schedule impacts.

Most of the concrete floor slabs and joists within the annex building addition are concealed by plaster finishes. Only limited distress or deterioration of the concrete structure was observed, and significant concrete repairs are not anticipated at this building. In the annex building, water intrusion has damaged the ceiling finishes, exposing the structural roof deck. Localized erosion, moisture staining, efflorescence, and cracking was observed at the joist slab roof deck. Full-depth concrete repairs may be required in these localized areas; however, further investigation to determine the extent of concrete deterioration is recommended.

In the original building, efflorescence and moisture staining are present on the inboard side of the below-grade portions of the exterior walls. This is likely due to deficient conditions in the wall's waterproofing or damp proofing. One approach to this condition is to use moisture-tolerant interior finishes and permit the moisture intrusion to continue. The moisture intrusion can likely be reduced by sloping the exterior grade away from the building and having operable downspouts and drain extensions. Alternatively, the wall can be excavated, exposed, and waterproofed. Water infiltration testing could also be conducted to better

understand the severity and magnitude of the water intrusion; this may help provide information to determine whether new waterproofing is warranted.

A steel lintel with significant corrosion is present within the basement of the annex addition. Cleaning the steel surfaces and coating the steel is recommended to minimize additional corrosion. Replacement of the steel may be warranted long-term if left unaddressed.

Miscellaneous

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.

Cast-in-place concrete steps and landing at the south building entrance approach are cracked and displaced due to differential settlement and loss of support below the concrete. Replacement of the steps and landing with improved grade materials is recommended. At the rear of the original building portion, masonry retaining walls at a basement egress door are displaced and should be rebuilt.

A sinkhole near the northeast corner of the building was observed posing a potentially hazardous condition. We recommend investigating the cause of the washout, filling the sinkhole with appropriate sub-grade materials, re-grading the surrounding areas, and reinstalling the asphalt drive.

LYNCH SCHOOL
DETAIL of SITE

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

DRAWN BY	DATE	CHECKED	DATE	APPROVED	DATE
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BUILDING CONS'T.			
1914-16	1921	BRICK WALLS	WOOD JOISTS / CONC. SLAB

1.64 Acres.

FOREST LAWN CEMETARY.

ALLEY 18'

390'

340'

1921 ANNEX

PASSAGE

OLD BUILDING 1914-1916

WALK

WALK

26'5"

4'

113'2"

ALLEY 18'

CHURCH PROP.

118'

84'-7" fence

LOT LINE

SIDEWALK

PALMETTO AVE.

VAN DYKE AVE.

SCALE 1"=40'

LYNCH SCHOOL
BASEMENT FLOOR PLAN

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

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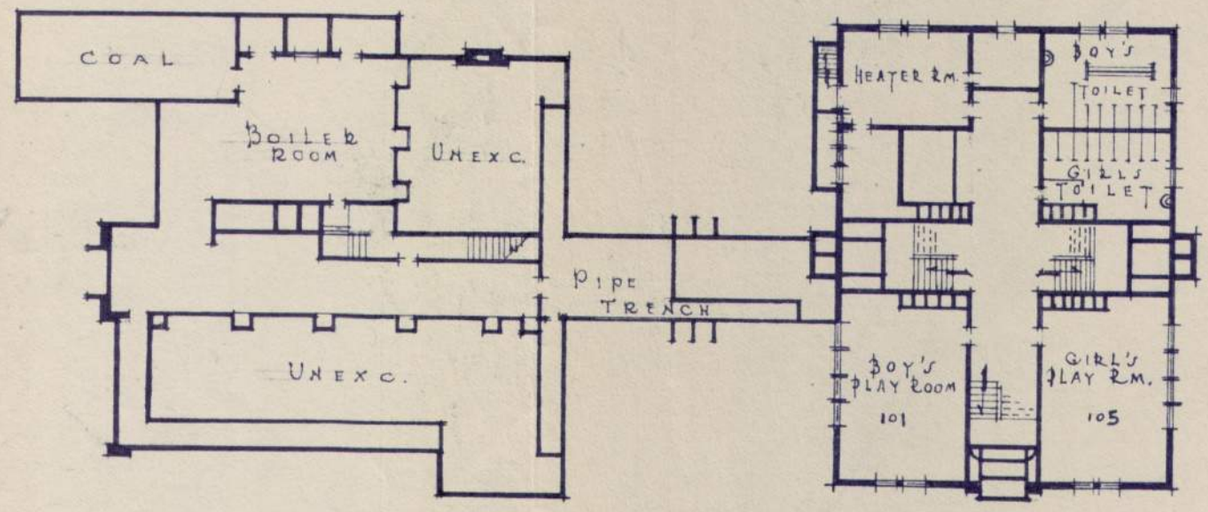

BASEMENT FLOOR PLAN

SCALE 1/32" = 1'-0"

LYNCH SCHOOL
FIRST FLOOR PLAN

DEPT. OF ARCHITECTURAL ENGINEERING
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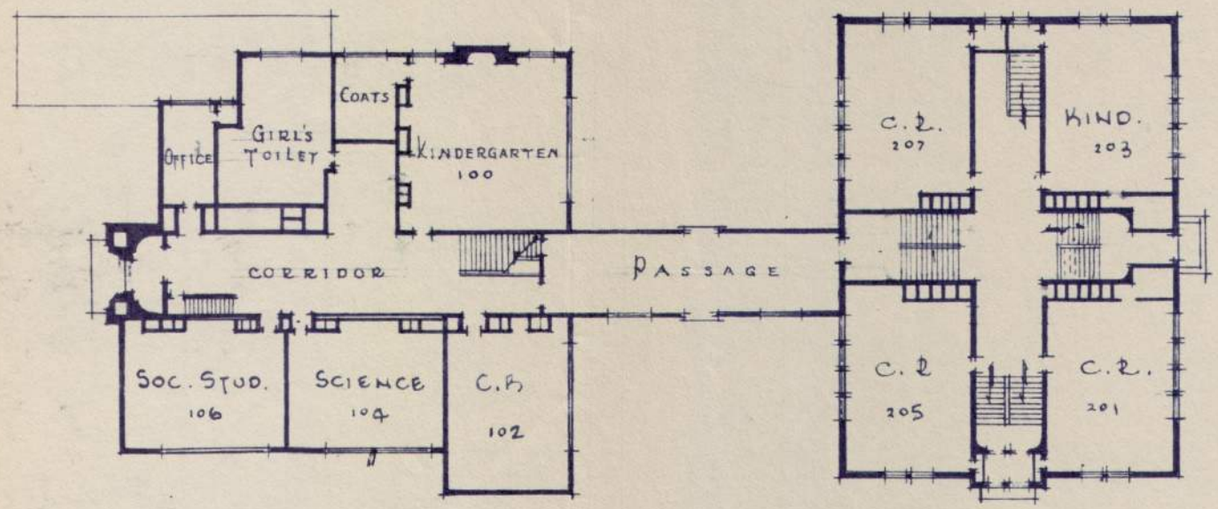
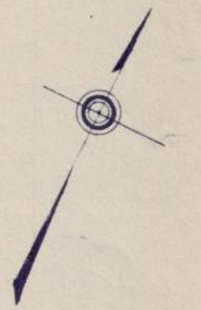
BLD'G. CONSTR	1914-16	BRICK WALLS--WOOD JOISTS	
" "	1921	" " CONC. SLABS	



FIRST FLOOR PLAN



SCALE 1/32" - 1'-0"

LYNCH SCHOOL
SECOND FLOOR PLAN

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

DRAWN BY	DATE	CHECKED	DATE	APPROVED	DATE
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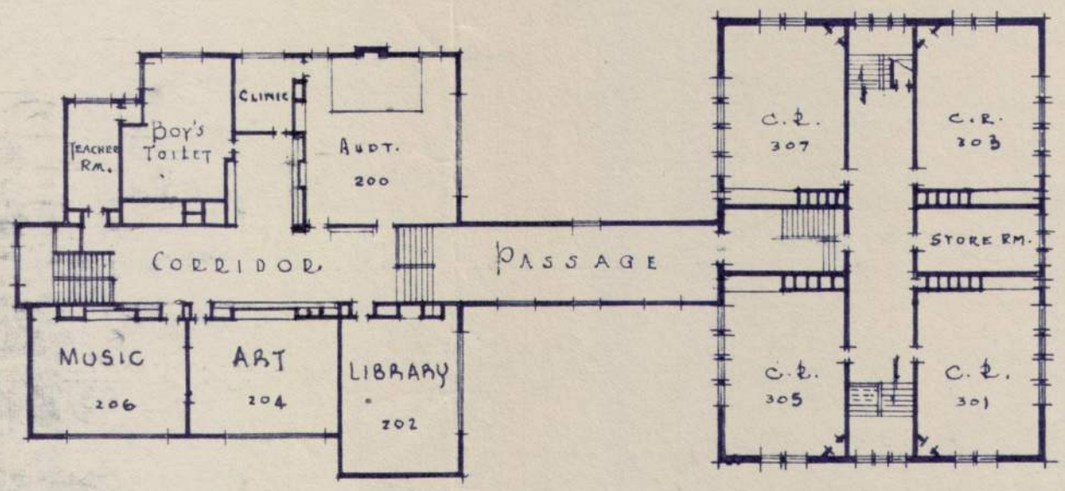

SECOND FLOOR PLAN

SCALE 1/32" = 1'-0"