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VACANT HISTORIC SCHOOL BUILDINGS DISPOSITION PLAN

City of Detroit RFP# 19BW2717

Building Envelope and Structural Assessment Report

Coolidge Elementary School

Basic Property Information: COD 7-Coolidge-16501 Elmira

Short Name:	Coolidge
Address:	16501 Elmira Street, Detroit, Michigan 48227
Year Built:	1925
Additions Built:	1928, 1941, 1951
Outbuildings:	None
Year Vacated:	2009
Building Footprint:	240 feet x 200 feet
Square Footage:	54,598 sq. ft.
Number of Stories:	2
Building Height:	32 ft.

Current Ownership:	City of Detroit	**Structural Framing System:**	▪ Cast-in-Place Concrete ▪ Brick Masonry ▪ CMU ▪ Structural Steel
City Council District:	7	**Exterior Wall System:**	▪ Brick ▪ Limestone ▪ Cast stone
SNF District:	NA	**Window System(s):**	▪ Wood ▪ Steel
		Roofing System(s):	▪ Built-up Roof ▪ Internal Roof Drains ▪ Gravel Surfaced

Assessment Summary

Assessment Date:	February 20, 2020
WJE Inspector(s):	Cheryl Early; Sarah Rush
Report Date:	October 27, 2020
Building Risk Index:	**114.35**

Cost Estimate

Base Rehabilitation Cost Estimate:	$1,919,500
Preparation for Rehabilitation Work:	$900,000
Mechanical, Electrical, Plumbing, Fire Protection ($80/sq ft):	$4,367,840
Sub-Total	$7,187,340
Contingency (25%):	$1,796,835
Sub-Total	$8,984,175
Overhead and Profit (15-18%):	$1,347,626
Sub-Total	$10,331,801
Escalation (6% for 2 years)	$619,908
Sub-Total	$10,951,709
Architectural and Engineering Design Services (20%):	$2,190,341
TOTAL COST ESTIMATE:	$13,142,051

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 main 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, including areas of the basement that were not flooded. 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 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 current U-shaped building footprint is comprised of four building areas with varying facade and structural assemblies. The original, two-story building is located in the center of the building. The first addition, constructed in 1928, extends from the east facade to the south. A small, second addition was constructed to the west of the original building in 1940, and a 1950 addition extended south of the 1940 addition creating the existing "U" shaped footprint.

The building facades generally consist of clay brick masonry with concrete masonry (CMU) or clay brick backup. Mass brick masonry is present at the building stairwells. At the original 1925 portion of the building, cast stone units accent the entrances, window sills, copings, and form horizontal bands on the walls. At the later building additions, limestone accent pieces are present at similar locations. In the original 1925 construction and the east 1928 addition, wood framed windows are present. In the more recent west additions (circa 1940 and 1950), steel-framed windows are present. The exterior doors are wood. The low-slope roofing consists of internally drained, gravel-surfaced, bituminous built-up roof (BUR) with granulated cap sheet base flashing.

The structures of the original 1925 building and 1928 addition are concrete tee joist-slab construction spanning to concrete beams and columns along the corridor walls. The 1940 and 1950 additions are constructed of presumed concrete-encased structural steel framing and with concrete tee joist-slab roof and floor construction. The beam and column systems are located at both the interior corridors and exterior walls in the 1940 and 1950 addition. CMU partition walls infill the beam and column system. The roof of the auditorium (1950) is of open web steel joists spanning to rolled and shop painted structural steel girders that bear on the CMU walls of the auditorium.

Although the appearance of the building's interior initially elicits concern based on the magnitude of the distress and damage to finishes, the building enclosure and structure is in fact in a repairable state. The roof and windows require replacement. Failed and missing roof drains and missing mechanical rooftop units are allowing a significant amount of water to collect on the top of the second floor over much of the area within the original 1925 construction and east 1928 addition. The roof drains are positioned within the exterior walls and are typically failed. Water infiltration within the wall assemblies due to the failed drains, missing flashings, and other roof deficiencies has resulted in significant masonry distress and corrosion of embedded steel support elements within the facade. The extent of ponded water within the 1925 and 1928 portions of the building is leading to material degradation of the second-floor structure, as well as deterioration of the interior finishes. The limestone copings above the west 1940 and 1950 additions have been removed and set on the roof, causing damage to the roofing and allowing water infiltration into the top of the wall assembly and interior of the building. Cracking in the CMU walls of the auditorium may be related to the water infiltration caused by damage to the wall parapets. Further detail of the observed distress is provided below.

Facade

The facade is generally in fair-to-poor condition. Corrosion of the steel lintels was generally observed, with some areas containing significant masonry distress and lintel displacement due to the development of

pack rust. The observed masonry distress includes cracked, spalled, and displaced brick, cast stone, and limestone elements. Below the second floor, roof drain pipes within the original 1925 construction and east 1928 addition are positioned within the exterior walls. These failed drain pipes have resulted in significant water staining, effloresce, and mortar deterioration in the corresponding regions of the facade. The cast stone accent pieces within the original 1925 construction are reinforced. Corrosion of these embedded steel reinforcing (rebar) elements has caused additional distress, including cracked and spalled units, with the most significant distress observed on the south facade. Localized limestone and cast stone units at the windows and entrances are spalled due to corrosion of the embedded steel anchors and lintels. Ornate square pendants within the west 1950 addition are missing. Restoration of the building should include repair of the distressed masonry and steel support elements to mitigate further distress within the wall assembly and building interior.

The limestone copings above the west 1940 and 1950 additions have been removed and generally set on top of the roofing. Removal of these units may be attributable to vandalism to access the copper flashing elements previously located below the coping stones. In some areas where the copper flashing has been removed, the roofing membrane is pulled away from the masonry substrate, exposing the wall cavity and building interior to water infiltration. The corresponding masonry facades below these regions (within the west facade) are currently showing only early signs of deterioration, though these conditions are anticipated to progress relatively rapidly and necessitate more significant repairs if the coping conditions are not addressed in the near term. Rehabilitation of the building should include installation of new flashings and resetting the existing coping stones. In the near term, temporary repairs could be considered to address ongoing water management issues and mitigate the progression of deterioration.

Significant distress was observed within the brick masonry chimney, including relatively large sections of brick that were cracked and outwardly displaced relative to the remainder of the chimney surface. The observed distress is largely located within the upper half of the chimney and is concentrated at the corners. These conditions are attributed to water penetration, subsequent freeze-thaw damage, and failure of the lateral support for the veneer units. Rehabilitation of the building should include rebuilding the displaced areas of masonry, though supplemental ties may be utilized in some regions in lieu of rebuilding the outer brick wythe. The vertical mortar joints at the chimney corners should be modified to include a sealant joint and the cap should be repaired with improved flashing to mitigate further water penetration and masonry distress.

The original wood windows and frames within the original 1925 construction and the east 1928 addition are generally missing or significantly distressed. The steel-framed windows within the west 1940 and 1950 additions are in fair condition with minor corrosion, paint failure, and localized areas of damaged framing elements and missing glass. At two entrances, the exterior wood door leafs are missing; decay is present near the base of the remaining wood doors. The temporary barricades at the southeast exterior door had been previously removed prior to our arrival on site, allowing open access to the interior of the building. Rehabilitation of the building should include replacement of the window and door assemblies. Temporary enclosure to limit access to the interior of the building is recommended for the interim.

An original conservatory is located on the west wing of the 1928 addition. The cast iron frame elements are largely intact with minor corrosion of the connectors at the partial height, brick masonry walls. Glass is missing in the lites of the steel window frames located over the structural frame. The steel window frame is

deformed and no longer secured to the masonry walls. The outer wythe of the brick masonry walls is damaged and displaced on one corner. The doorway to the conservatory has been infilled with CMU. Significant vegetation has taken root on the interior of the space and is extending through the roof and walls. The partial height masonry walls and glass system would require replacement after the vegetation is removed. However, the structural frame can be salvaged and repaired if desired.

Roofing

The roofing assemblies are in poor condition, largely due to the missing rooftop mechanical units, failure of the internal drains, and deferred maintenance. Cracking, seam failures, ponded water and organic growth were observed on the roof surface. Above a building shaft on the east end of the building, the roofing materials are displaced or missing. At a missing rooftop mechanical unit, raised curbs are not present, allowing water on the roof level to drain directly into the building. Rehabilitation of the building should include removal and replacement of the existing roof assemblies and replacement of the internal drains and drain pipe systems.

Structure

The wood floors, vinyl composite tile, and most of the plaster finish and trim are deteriorated due to water infiltration, but sufficient, intact remnants of these systems are present such that the interior finishes could be replicated during rehabilitation if desired. The deteriorated state of the finishes allowed visual access to the structural systems of the building. Although areas of repair are recommended, the overall structure is in serviceable condition.

The roof structure of the 1925 construction is a combination of board-formed concrete slab and stay-in-place clay tile formed tee joist-slab construction. The second-floor concrete tee joist-slab construction was constructed with ribbed metal forms, which are corroded but in place. Localized areas of concrete distress are present where water is entering the building. The concrete distress includes corrosion and water staining, stalactites, localized exposed reinforcement, and scaling of the vertical sides of the exposed concrete joists. Partial depth concrete repairs of the deeper structural elements and full depth concrete repair of the slabs is recommended. Specifically, the areas of concern are generally of the roof and second floor structures of the north entry, classrooms on either side of the north entry, and the second-floor corridor structure.

The 1928 addition roof deck is constructed with a series of gypsum or concrete planks spanning over small steel channel beams, as was observed where water infiltration at a roof top unit location has deteriorated the suspended ceiling finishes. The roof planks in the 1928 addition are recommended to be further assessed based on cracking and spalling observed at the edges of the planks.

Forms are not present in the eastern 1928 addition second floor concrete tee joist-slab structure, and similar distress to that observed in the northern portion of the original building was recorded, including corrosion and water staining, stalactites, localized exposed reinforcement, and scaling of the vertical sides of the exposed concrete joists. Partial depth concrete repairs may be feasible after further assessment of approximately half of the corridor joists in the east wing, but full replacement may be warranted of the structure over the gymnasium space for at least half of the gymnasium area, subject to further investigation.

The 1940 and 1950 additions are constructed of concrete, potentially concrete encased structural steel framing, and concrete tee joist-slab roof and floor construction. Although much of the masonry infill has been damaged by vandalism, minimal distress was observed of the structure in this area of the building.

Access was limited to a plenum space in the basement level, as the other lower elevation rooms were flooded. The concrete wall and first floor structures visible from the basement stairwells of the flooded rooms and of the accessible plenum are in good condition with no significant distress noted. The original 1925 northwest foundation corner is exposed in the plenum space.

Miscellaneous

Cracking in the CMU infill walls between the classrooms, in the auditorium in the west wing, and in the plaster walls between the classrooms in the north and east wings may be related to water infiltration into the building, thermal or volumetric changes in the 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.

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.

Concrete stair treads that extend up to the roof level are significantly deteriorated and spalled. Vegetation has rooted in the stair treads of the west entrance stair. Repairs of these stairs are warranted.

PLOT PLAN.
· COOLIDGE SCHOOL ·
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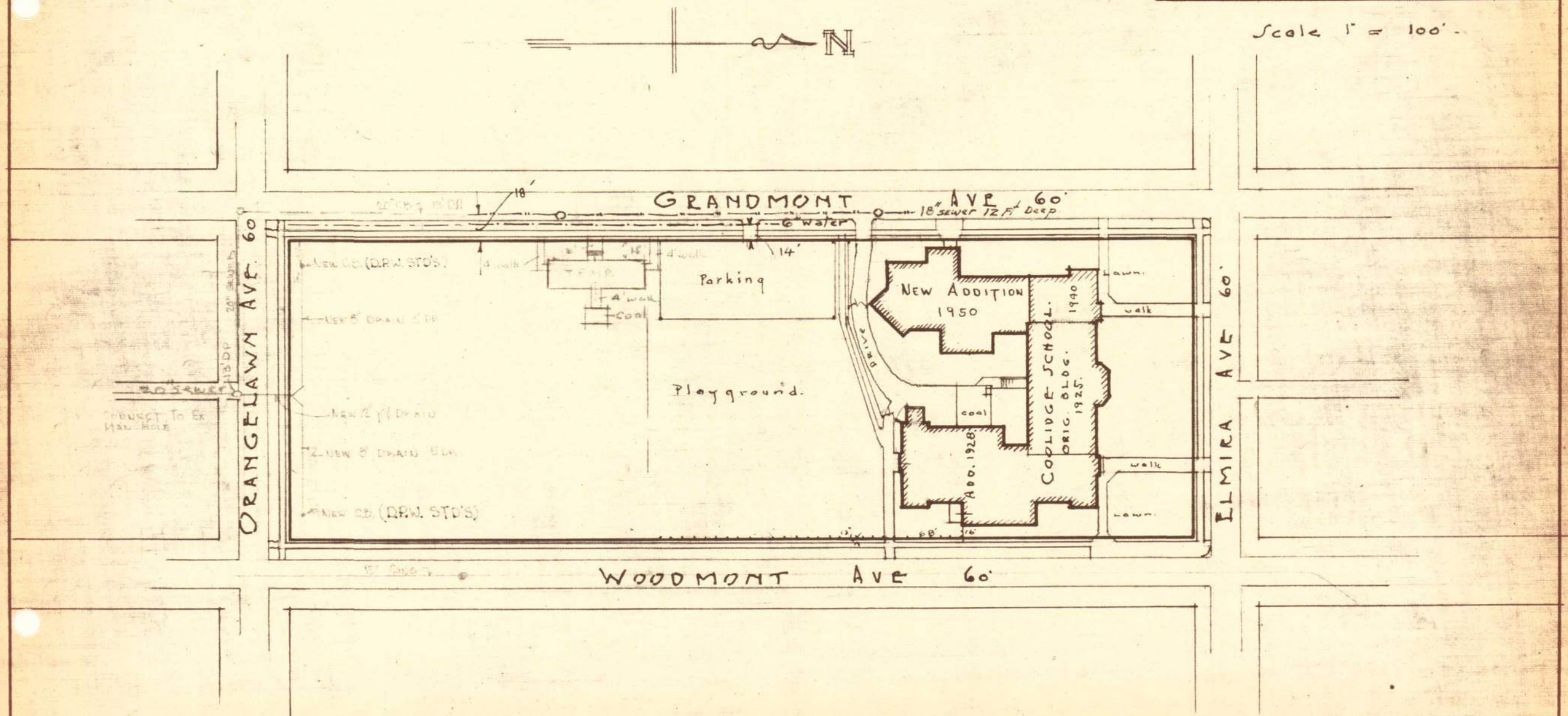
DETROIT.
Dep't of Building & Grounds
Drawn by SCH 1-8-28
Revised by SCH Nov. 1951

Scale 1" = 100'.



COOLIDGE
BASEMENT PLAN
ARCHITECTURAL PLANNING DEPT.
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COOLIDGE
FIRST FLOOR PLAN
ARCHITECTURAL PLANNING DEPT
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SCALE 1/16" = 1'-0"

COOLIDGE

RESERVE FLOOR PLAN

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SCALE 1/8" = 1'-0"