JOHN A. MARTIN & ASSOCIATES, INC
STRUCTURAL ENGINEERS

SMASH-Muir Elementary School

Structural Assessment
Due to Water Intrusion

2526 6th Street
Santa Monica, CA 90405

prepared for
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June 29, 2022

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Introduction

John A. Martin & Associates, Inc. (JAMA) has been retained by Little Diversified Architectural Consulting (Little) and Santa Monica-Malibu Unified School District (SMMUSD) to perform a structural assessment of four existing buildings at SMASH-Muir Elementary School, specifically related to dry rot damage caused by water infiltration. These buildings are noted as Building A, B, C, and D and shown on the attached exhibits.

The SMASH-Muir ES site is located at 2526 6th Street, Santa Monica, CA and consists of four two-story conventional wood framed buildings supported on concrete slab foundations totaling approximately 45,000 square feet. Furthermore, the buildings were built in 1996 under the California Building Standards Commission, California Code of Regulations Title 24, with CBC Amendments for school construction per the Division of the State Architect (DSA).

Our structural assessment has been performed alongside Little and their team of forensic consultants including DTR for waterproofing and NV5 for environmental. This report is intended to supplement the reports by Little, DTR and NV5 as it relates to repair/replace of damaged framing, mitigating mold, and properly waterproofing the building. This assessment is considered "partial" in nature as we are not able to observe all structural framing beneath 100% of the interior and exterior wall coverings, just the areas exposed and for our observation and recommendations.

Purpose of the Assessment

The structural assessment is necessary to identify the current condition of the structural framing, specifically related to the water intrusion and damage it may have caused over the years. Furthermore, we offer our recommendations for repair or replacement of defective structural elements that we have observed. This is limited to areas that have been exposed to view and based on the reports previously prepared by others. Any future structural repairs and replacement work shall be done in conjunction with mold abatement and reinstallation of waterproofing membranes, particularly at the walls, doors, and windows. All locations that were opened up during this investigative work shall be restored structurally by replacing the materials in kind to match original approved construction details.

Observations & Recommendations

The field investigation by JAMA was completed on June 15 and 16, 2022 by Shane Fitzgerald, SE. Notes including location (building/room), observations, recommendations and photos are provided below. As noted above, these observations and recommendations are in distinct areas that were exposed during our investigation and exposed to view. We are unable to comment on anything beyond those areas observed.

Building A

Location No: **01**

Location Name: Exterior Soffit

Observations: Underside of existing plaster soffit exposed adjacent to an existing seismic joint. Small opening provided for access to ceiling and floor framing from underside. Ceiling joists are in good condition, no signs of rot or damage. Adjacent plywood shearwall was visible and some water staining and minor rusting at nails but very minor and no damage to plywood overall. The 4x12 diagonal beam at the east side of the joint had water damage and appeared the hanger supporting the floor joist is crushing the top of the beam, due to water having softened and compromised the wood.

Recommendations: Strengthen the damaged 4x12 beam by adding a piece of 2x12 sister joist/ledger approximately 4' long and screwing members together. Ceiling and floor to be temporarily shored while strengthening is done and joists to be re-supported on the sister joist.

Photos: See Photos 01 and 02

Photo 01: Opening in Existing Soffit

Photo 02: Damaged Beam at Existing Soffit

Location No.	**02**
Location Name:	First Floor Room 210B
Observations:	Underside of existing framing was exposed by removing ceiling tiles. No structural damage observed. Minor water staining on joists and underside of plywood.
Recommendations:	No structural work required.
Photos:	See Photos 03 and 04

Photo 03: Room 210B Containment

Photo 04: Room 210B Staining of Lumber

Building B

Location No. **03**

Location Name: First Floor Room 415

Observations: South wall of classroom was observed. Mold was visible on the interior side of the drywall, under the marker board and speaker box. Mold was also observed inside the wall cavity (see NV5 commentary). Drywall was removed for most of the wall length and full height of the wall; interior plywood removed as well. There was significant water damage and rotted lumber in this area starting about 4' from the southwest corner of the room and extending along the wall for approximately 6' or so, full height of exposed wall framing. Some wood was wet to the touch and included sill plate, studs, blocking and plywood on both faces (double sided shearwall). The insulation was wet, and studs were painted white from a prior encapsulation project. This area of wall is directly below a doorway above at room 480 which was also observed and noted as a source of water entry. There were some irregular shaped holes in the plywood but may have been at knots that fell out or plywood could have been damaged during installation.

Recommendations: The 6' section of wall framing has been damaged and requires replacement. This will require all finishes on interior and exterior be removed completely and full height. Shoring to be installed and all lumber replaced in kind to original condition. Reinstall sill plate, studs, blocking and plywood to match existing.

Photos: See Photos 05 and 06

Photo 05: Room 415 Rotted Framing

Photo 06: Room 415 Rotted Framing

Location No.	**04**
Location Name:	Second Floor Room 480 Door
Observations:	South wall of classroom was observed. This occurs directly below room 415 water damaged wall. Contractor removed finish for team to observe flashing, paper, mold and potential source of water entry. Plywood was exposed and determined to be in dry condition and no apparent damage above the floor. Some evidence of termites was observed. Structurally there is no concern about damage at this location.
Recommendations:	No structural work required.
Photos:	See Photo 07

Photo 07: Room 415 Exposed Flashing

Location No.	**05**
Location Name:	First Floor Room 400
Observations:	South and west walls of classroom was observed. Drywall was removed and framing exposed. Wood appeared dry and no dry rot. There was evidence of termites. Structurally there is no concern about damage at this location.
Recommendations:	No structural work required.
Photos:	See Photos 08 and 09

Photo 08: Room 400 Exposed Framing Dry

Photo 09: Room 400 Exposed Framing Dry

Location No.	**06**
Location Name:	Soffit of Elevated Walkway
Observations:	An opening was cut in the overhead plaster soffit to the west of classroom 405. The location is below the exterior walkway above and near some rotted parapet framing. The opening allowed for observation of the ceiling joists, floor joists, and edge beam framing. All framing appeared to be structural sound and undamaged. However there was evidence of water staining on the framing throughout and some rust was present on the steel framing which confirms moisture. Structural framing does not appear compromised but waterproofing above should be addressed.
Recommendations:	No structural work required. Waterproofing above to be addressed.
Photos:	See Photos 09 and 10

Photo 09: Soffit Removed at Room 405

Photo 10: Rust Visible at Soffit Framing

Location No.	**07**
Location Name:	Elevated Walkway Parapets
Observations:	The historical photographs showed wood rot at the parapet framing around the campus alongside the exterior elevated walkways. We removed sheet metal caps in six locations to get a representative sampling. In all locations, the wood has rotted and to different degrees. Building B has some of the most significant rotted parapet framing along the south side over the Kindergarten Room 400. The exposed framing showed severely deteriorated wood top plates and studs such that the screws for the guardrail posts are compromised. Similar rotting in other locations extending to Buildings A, C, and D. This is a systemic deficiency.

Recommendations: All parapet framing to be exposed (remove finish both sides) and replace framing in kind to restore to original condition.

Photos: See Photos 11, 12 and 13

Photo 11: Parapet Plate Rotted

Photo 12: Parapet Plate Rotted

Photo 13: Parapet Plate Rotted

Building C

Location No.	**08**
Location Name:	First Floor Room 602
Observations:	The second-floor framing was exposed by removing ceiling tiles in this area to observe wood framing above. Although there was a cracked cast iron steel pipe, the structural framing was found to be in good condition with no rotted or damaged wood joists or plywood.
Recommendations:	No structural work required. Cracked pipe to be repaired.
Photos:	N/A

Building D

Location No.	**09**
Location Name:	First Floor Room 513
Observations:	The wall framing in this location was exposed and all lumber appeared dry and undamaged. There was no sign of water staining or rot.
Recommendations:	No structural work required.
Photos:	See Photos 14 and 15

Photo 14: Room 513 Framing

Photo 15: Room 513 Framing

Location No.	**10**
Location Name:	Underside of Exterior Stair
Observations:	While observing Room 513, we accessed the underside of the exterior stair to the west. The underside was severely corroded (and unprotected, just shop primer) and rust was significant. There were a couple of small holes in the steel pans which showed daylight. A number of the welded connections at the landing and top/bottom of stairs show extensive corrosion.
Recommendations:	Clean steel back to solid substrate and sample material thickness to determine if any structural degradation has occurred and if strengthening is required. Install flashing at stringers to building to prevent further water intrusion. Consider galvanizing paint for areas that are not fully waterproofed.
Photos:	See Photos 16, 17, and 18

Photo 16: Exterior Stair Corrosion

Photo 17: Exterior Stair Corrosion

Photo 18: Exterior Stair Corrosion

Conclusions

Water intrusion is confirmed in many locations identified in this report and is further discussed in the DTR and NV5 reports. Wood has been observed to be damaged due to water and termites; mold is present throughout. Additionally, poor flashing and waterproofing at doors and windows has been identified, as well as poor detailing of parapet assemblies that should be addressed immediately. Corrosion of exposed steel stairs was observed and should also be addressed.

This report identifies just a few locations where we have physically opened the building to observe potential damage. Without removing the exterior finish to expose the plywood and framing, we are unable to determine the exact *magnitude* of the water and termite damage to the primary wood framing. JAMA recommends "re-skinning" the building which would allow for complete exterior wall exposure and will enable us to visually observe all exterior wall sheathing and lumber/framing. This will provide the District with the assurance that the structure has not been compromised, all mold issues can be dealt with, and a new waterproofing system may be properly installed to ensure many additional years of building use.

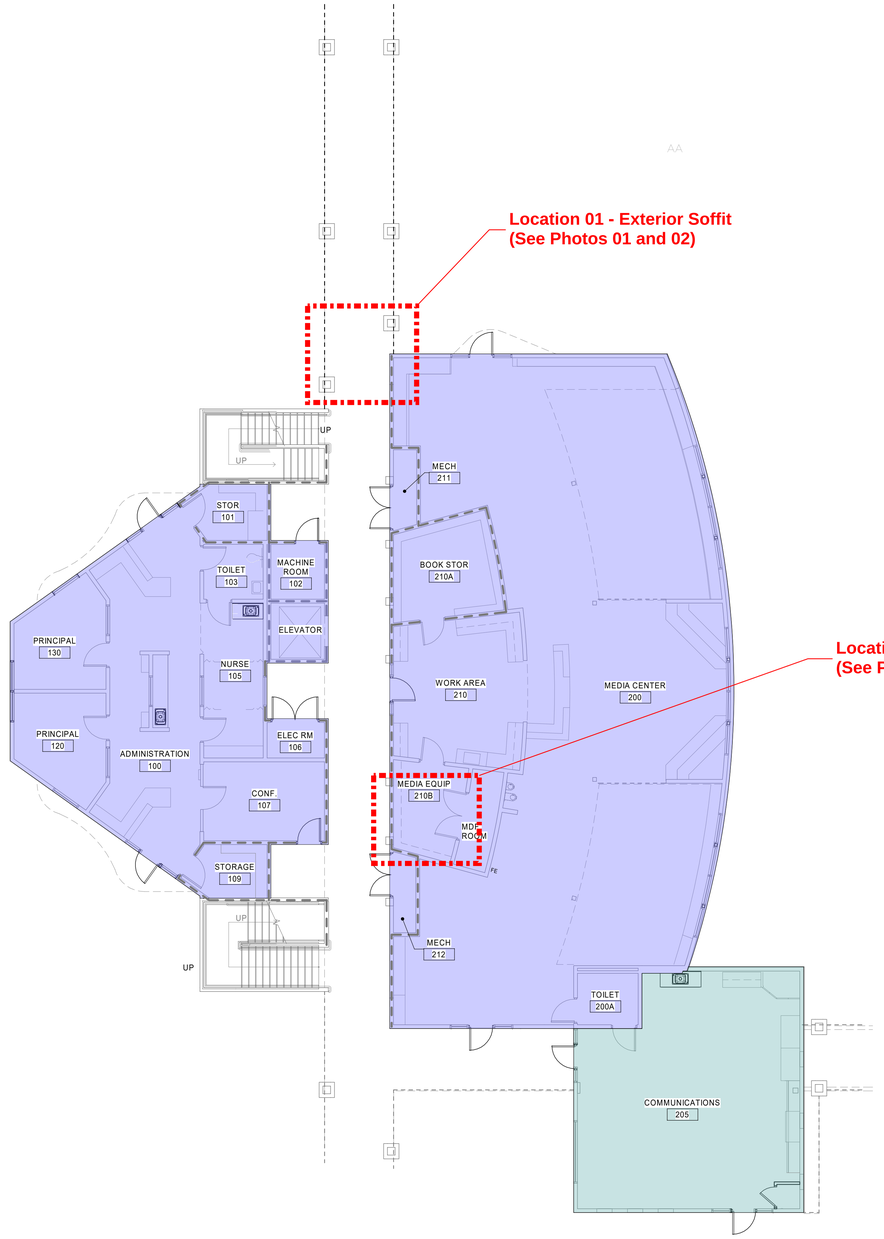
In closing, we appreciate the opportunity to provide our services and feel free to contact us if you have any questions.

Respectfully submitted,

John A. Martin & Associates, Inc.

Shane S. Fitzgerald, SE, DBIA
Partner | Principal

Appendix A Building Key Plans



Structural Assessment Key Plan

SMASH / MUIR ELEMENTARY SCHOOL MODERNIZATION

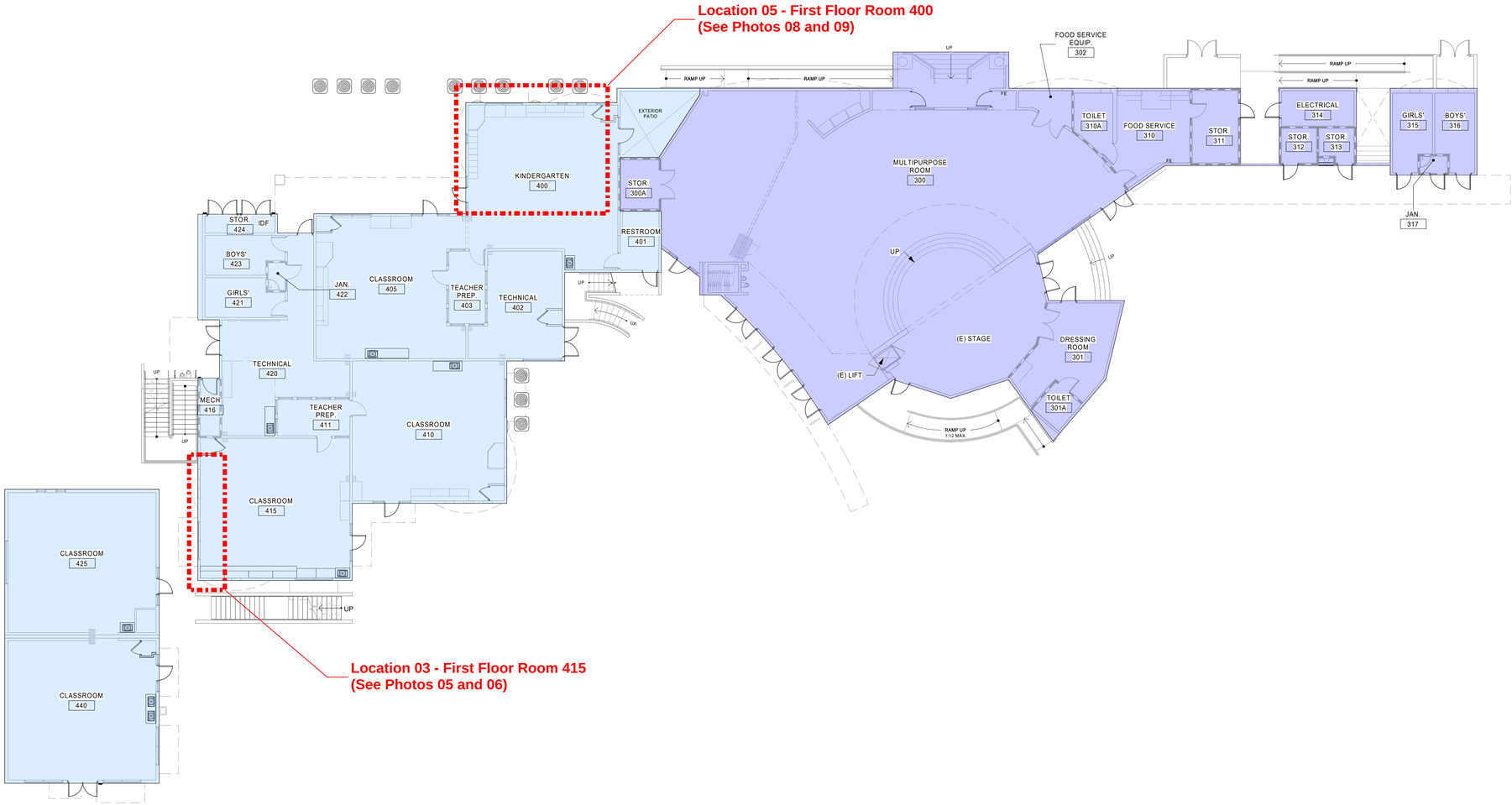
SANTA MONICA MALIBU USD

LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING

BLDG 'A' - FIRST FLOOR PLAN

Scale: 1/8" = 1'-0"

REFERENCE
NORTH



SMASH MUIR ELEMENTARY SCHOOL MODERNIZATION

SANTA MONICA MALIBU USD

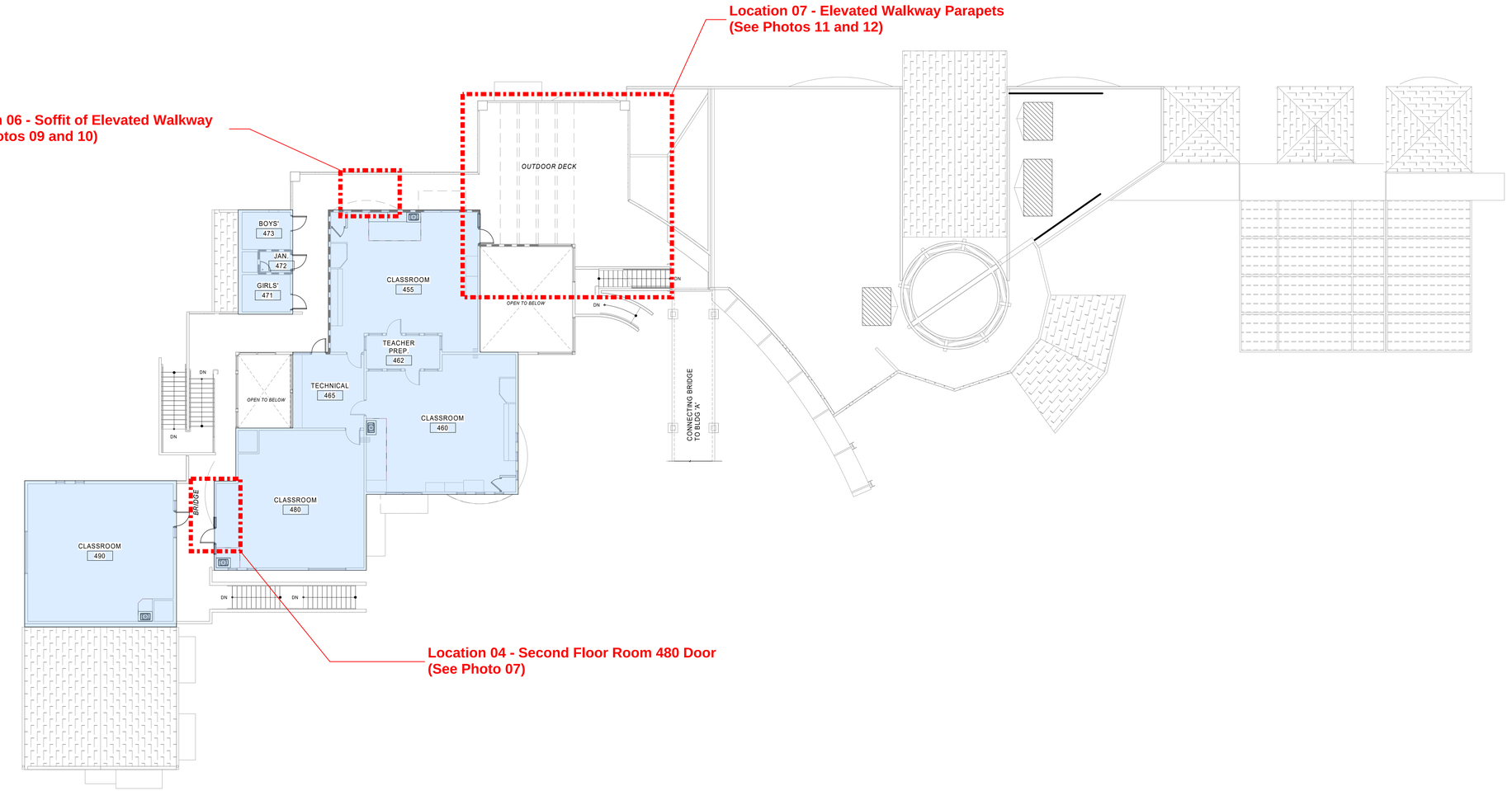
Structural Assessment Key Plan

LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING

BLDG. 'B' - FIRST FLOOR PLAN

Scale: 3/32" = 1'-0"

REFERENCE NORTH



COMMON

JOHN MUIR CAMPUS

SMASH CAMPUS

SMASH MUIR ELEMENTARY SCHOOL MODERNIZATION

SANTA MONICA MALIBU USD

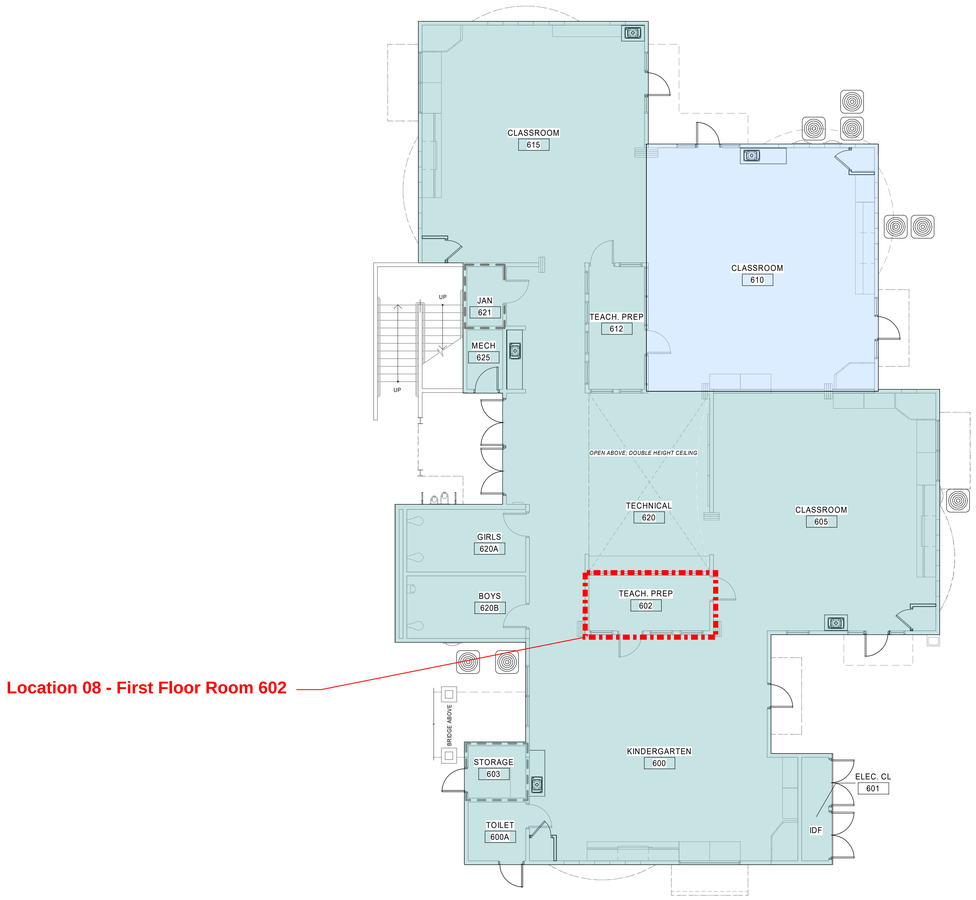
Structural Assessment Key Plan

LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING

BLDG. 'B' - SECOND FLOOR PLAN

Scale: 3/32" = 1'-0"

REFERENCE
NORTH



COMMON

JOHN MUIR CAMPUS

SMASH CAMPUS

SMASH MUIR ELEMENTARY SCHOOL MODERNIZATION

SANTA MONICA MALIBU USD

Structural Assessment Key Plan

LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING

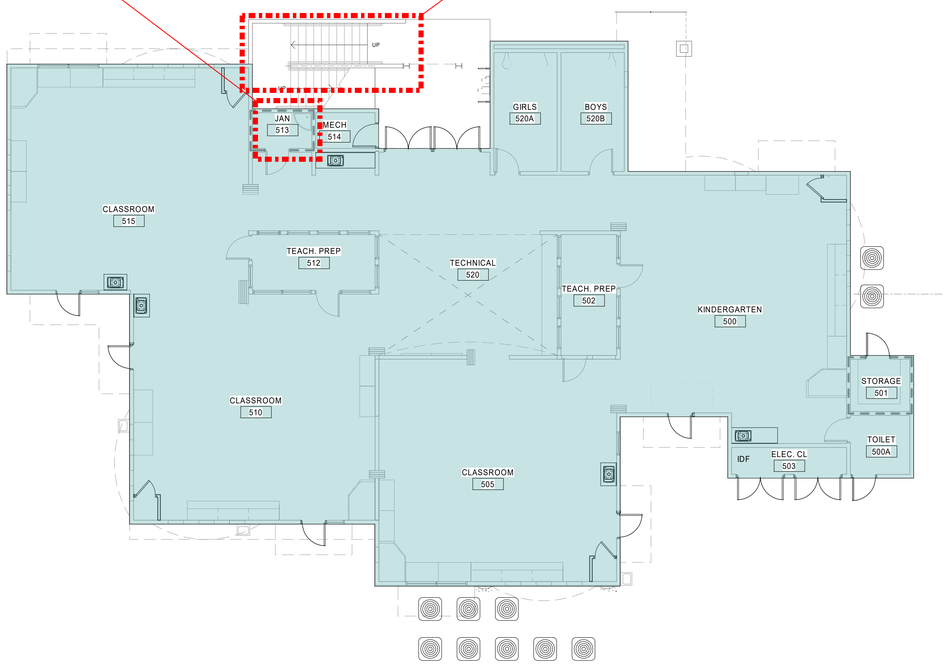
BLDG 'C' - FIRST FLOOR PLAN

Scale: 1/8" = 1'-0"

REFERENCE NORTH

Location 09 - First Floor Room 513
(See Photos 14 and 15)

Location 10 - Underside of Exterior Stair
(See Photos 16, 17, and 18)



COMMON

JOHN MUIR CAMPUS

SMASH CAMPUS

SMASH MUIR ELEMENTARY SCHOOL MODERNIZATION

SANTA MONICA MALIBU USD

Structural Assessment Key Plan

LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING

BLDG. 'D' - FIRST FLOOR PLAN

Scale: 1/8" = 1'-0"

REFERENCE NORTH