

ADDENDUM NO.:	02
PROJECT NAME:	Byrne Elementary School Annex Project
PROJECT NO.:	05015
CONTRACT NO.:	C1576
DATE OF ISSUE:	May 26. 2017

NOTICE OF CHANGES, MODIFICATIONS, OR CLARIFICATIONS TO CONTRACT DOCUMENTS

The following changes, modifications, or clarifications are hereby incorporated and made an integral part of the Contract Documents. Unless clearly expressed otherwise by this Addendum, all terms and conditions defined in the original Contract Documents shall continue in full force and effect and shall have the same meaning in this Addendum.

ITEM NO. 1: CHANGE TO KEY DATES

- Change 1. Bid Due/Time and Public Bid Opening:
 - a. The Bid Due Date/Time and Public Bid Opening has been rescheduled to Monday, June 5, 2017 at 11:00 a.m.
- **Change 2.** Pre-Award Meeting:

a. The Pre-Award Meeting has been rescheduled to Tuesday, June 6, 2017 at 11:00 a.m.

- ITEM NO. 2: REVISIONS TO BOOK 1 PBC INSTRUCTIONS TO BIDDERS None.
- ITEM NO. 3: REVISIONS TO BOOK 2 PBC STANDARD TERMS AND CONDITIONS None.

ITEM NO. 4: REVISIONS TO BOOK 3 – TECHNICAL SPECIFICATIONS

- Change 1 Book 3 Volume 1 Section 01 35 66 COMMISSIONING SUBMITTAL PROCEDURES REPLACE section.
 - Change 2 BOOK 3 Volume 1 Section 01 35 67 COMMISSIONING PROJECT RECORD DOCUMENTS REPLACE section.
- Change 3 BOOK 3 Volume 1 Section 01 35 68 COMMISSIONING OPERATIONS AND MAINTENANCE DATA REPLACE section.
- Change 4 BOOK 3 Volume 1 Section 01 35 69 COMMISSIONING PROCESS REPLACE section.
- Change 5 BOOK 3 Volume 1 Section 01 35 70 PRE-FUNCTIONAL CHECKLISTS REPLACE Section.
- Change 6 BOOK 3 Volume 1 Section 01 35 71 COMMISSIONING FUNCTIONAL PERFORMANCE TESTING. REPLACE section.
- Change 7 BOOK 3 Volume 1 Section 11 40 00 FOOD SERVICE EQUIPMENT 2.3, Item #8. REVISED roll-in heated cabinet to roll-through heated cabinet.
- Change 8 BOOK 3 Volume 2 Section 27 08 00 COMMISSIONING OF COMMUNICATIONS, 3.4 REVISED section.

ITEM NO. 5: REVISIONS TO DRAWINGS

- **Change 1** SHEET DS1.0 Demolition Site Plan **ADDED** parking lot scope and revised bike parking scope.
- Change 2 SHEET AS1.0 Architectural Site Plan ADDED parking lot scope and revised bike parking scope.

- Change 3 SHEET A0.1 Overall Floor Plans REMOVED stray signage tags from first floor plan.
- **Change 4** SHEET A3.0 Elevations **ADDED** control joints. Revised parapet heights at science classroom and stair 2. Corresponding wall sections will be revised for issued for construction drawings.
- Change 5 SHEET A5.3 Wall Sections REVISED detail call-out.
- Change 6 SHEET A6.0 Roof Details **REVISED** detail notes.
- Change 7 SHEET A6.1 Roof Hatch Details REVISED roof access hatch curb notes.
- Change 8 SHEET A6.6 Enlarged Details PROVIDED additional notes.
- **Change 9** SHEET A6.7 Enlarged Details **PROVIDED** additional notes.
- Change 10 SHEET A6.8 Enlarged Details PROVIDED additional notes.
- Change 11 SHEET A6.9 Enlarged Details PROVIDED additional notes and revised canopy fascia detail.
- Change 12 SHEET A6.10 Enlarged Details PROVIDED additional notes and added detail call-outs.
- Change 13 SHEET A6.11 Enlarged Details PROVIDED additional notes.
- Change 14 SHEET A8.0 Enlarged Floor Plan ADDED wall jamb detail call-outs.
- Change 15 SHEET A8.1 Enlarged Elevations ADDED solid surface detail call-outs.
- Change 16 SHEET A8.3 Enlarged Floor Plans ADDED solid surface detail call-outs.
- Change 17 SHEET A11.1 Opening Schedule ADDED window sill detail call-outs and revised door schedule.
- Change 18 SHEET A11.3 Window Details ADDED window sill pan receptor details 12 and 12A. Revised detail 9.
- Change 19 SHEET A12.0 FINISH SCHEDULE & DETAILS ADDED details 8A & 8B.
- Change 20 SHEET A12.1 First Floor Finish Plan REPLACED sheet.
- Change 21 SHEET A12.2 Second Floor Finish Plan REPLACED sheet.
- Change 22 SHEET C-005 Civil Site Utilities Plan ADDED parking lot scope.
- Change 23 SHEET L1.0 Overall Site Plan Total 12 bike racks removed from parkway. 9 bike racks and concrete sidewalk (requiring additional demo of existing asphalt) added on south side of proposed annex.
- Change 24 SHEET L1.0 Overall Site Plan One proposed parkway tree removed near southwest corner of S. Rutherford.
- Change 25 SHEET L2.0 Paving Plan Additional pavement and parkway restoration limits shown on Rutherford.
- Change 26 SHEET L2.0 Paving Plan Additional concrete sidewalk added on south side of proposed annex.
- Change 27 SHEET L3.0 Fencing and Furnishing Plan Total 12 bike racks removed from parkway. 9 bike racks and concrete sidewalk added on south side of proposed annex.
- **Change 28** Sheet L3.1 Furnishing Enlargement Plan Bike racks removed from parkway.
- Change 29 Sheet L4.0 Landscape Plan One proposed parkway tree removed near southwest corner of S. Rutherford. The two proposed trees in that location have been re-spaced per zoning review comments.
- Change 30 Sheet L6.0 Planting Details DELETE detail 11.
- Change 31 Sheet C-005 Site Utilities ADDED two new catch basins and regraded/resurfaced south end of existing parking lot.

Change 32 Sheet M0.0 – **ADDED** gas piping note.

ITEM NO. 6: REQUESTS FOR INFORMATION

RFI-1.

- Question: Refer to Sheet A12.1 Kitchen room 125 calls for Fiber Resin Panel (FRP) to be installed on the walls while the elevations on A8.1 and detail 10 on A12.0 for this area show SS-1 and SS-2 1) What item is intended to be used in this area, 2) If FRP is to be used, please indicate on drawings where this is to be installed.
- **Response:** Please refer to revised A12.1 of this Addendum, for location of solid surface and FRP panels. All Servery walls including west face of Office 127 wall as well as entire west wall of Servery up to column enclosure at Column Line 4 receive solid surface. Additionally, jambs in openings into Kitchen receive solid surface. All remaining kitchen walls (including south east face of Supply Room 125B receive FRP).

Please reference Specification 10 21 13: Toilet Compartments of the contract documents and drawing A10.0. Please clarify if any toilet compartments are to be provided per this contract bid. There are no key notes referencing new toilet compartments.
Toilet compartments are to be provided per Specification Section 10 21 13. Contractor shall furnish and install toilet compartments at each toilet location shown on Drawing A10.0.
Please reference drawing A0.1 – Detail 2. Please reference the section directly west of classroom 100. There are (2) floating exterior signs denoted as EXT-A and EXT-J. Please clarify where those signs are to be installed and/or if they should be included in the bid.
Please disregard. Please see revised drawing A0.1 of this Addendum.
Would it be possible to narrow the selection of Solid Surface to a group or have a material allowance included in the documents. For us to bid this, we absolutely need the color to be selected for the solid surface. There is a huge swing in pricing between color groups.
Please refer to revised Finish Legend on sheet A12.0, as issued with Addendum 1. Please note: drawing A12.0 is further revised as a part of this Addendum.
Specification Section 11 40 00 – Food Service Equipment calls for Item No. 08 to be a Roll-in Heated Cabinet. The Equipment Schedule on FS-1.01 calls for Item No. 08 to be a Roll-through Heated Cabinet. Please advise which Item No. 08 is correct.
The cabinet should be a roll-through cabinet, per revised Specification Section 11 40 00, of this Addendum.

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List of Attachments and Drawings:

(Available at Cushing and Co.'s Online Planroom: http://dfs.cushingco.com/pbc.htm)

This Addendum includes the following attached Specifications:

- 1. Section 01 35 66 Commissioning Submittal Procedures
- 2. Section 01 35 67 Commissioning Project Record Documents
- 3. Section 01 35 68 Commissioning Operations And Maintenance Data
- 4. Section 01 35 69 Commissioning Process
- 5. Section 01 35 70 Pre-Functional Checklists
- 6. Section 01 35 71 Commissioning Functional Performance Testing
- 7. Section 11 40 00 Food Service Equipment
- 8. Section 27 08 00 Commissioning Of Communications

This Addendum includes the following attached Architectural Drawings:

- 1. DS1.0 Demolition Site Plan
- 2. AS1.0 Architectural Site Plan
- 3. A0.1 Overall Floor
- 4. A3.0 Exterior Elevations
- 5. A5.3 Wall Sections
- 6. A6.0 Roof Details
- 7. A6.1 Roof Hatch Details
- 8. A6.6 Enlarged Details
- 9. A6.7 Enlarged Details
- 10. A6.8 Enlarged Details
- 11. A6.9 Enlarged Details
- 12. A6.10 Enlarged Details
- 13. A6.11 Enlarged Details
- 14. A8.0 Enlarged Floor Plan
- 15. A8.1 Enlarged Elevations
- 16. A8.3 Enlarged Floor Plans
- 17. A11.1 Opening Schedule
- 18. A11.3 Window Details
- 19. A12.0 Finish Schedule & Details
- 20. A12.1 First Floor Finish Plan
- 21. A12.2 Second Floor Finish Plan

This Addendum includes the following attached Civil Engineering Drawings:

1. C-005 Site Utilities

This Addendum includes the following attached Landscape Drawings:

- 1. L1.0 Overall Site Plan
- 2. L2.0 Paving Plan
- 3. L3.0 Fencing & Furnishing Plan
- 4. L3.1 Furnishing Enlargement Plans
- 5. L4.0 Landscape Plan
- 6. L6.0 Planting Details

This Addendum includes the following attached Mechanical Drawings:

1. M0.0 Mechanical General Notes, Symbols, & Abbreviations

END OF ADDENDUM NO. 01

SECTION 01 35 66

COMMISSIONING (Cx) SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires CxA's response.
- B. Informational Submittals: Written information that does not require CxA's response. Submittals may be reviewed and noted for not complying with requirements.
- C. Commissioning Submittals: Copy of selected submittals provided to the commissioning authority for review against the Owner's Project Requirements (OPR) during the normal submittal process.

1.3 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings may be provided by Architect by request for Contractor's use in preparing submittals. Contractor bears all responsibility for information contained in submittals whether or not provided in electronic format to the Contractor.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. CxA reserves the right to return without review submittals requiring coordination with other submittals.
- C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on CxA's receipt of submittal.
 - 1. Initial Review: Allow ten (10) working days for initial review of each submittal. CxA will advise Architect of notes and recommendations for the use and incorporation with their actions to the contractor.

- 2. Resubmittal Review: Allow ten (10) working days for review of each resubmittal.
- 3. If intermediate submittal is necessary, process it in same manner as initial submittal.
- 4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- E. Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect and Boards Authorized Representative.
 - 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Unique identifier, including revision number.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Other necessary identification.
 - 1. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- F. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. CxA will, without review, return submittals received from sources other than Contractor.
 - 1. Transmittal Form: Contractor's standard form which is to include the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal number.
 - h. Submittal purpose and description.
 - i. Submittal and transmittal distribution record.
 - j. Remarks.
 - k. Signature of transmitter.
 - 2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect or CxA on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, CxA, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions. (Must be included in all commissioning submittals)
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves. (Must be included in all commissioning submittals)
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operating and maintenance manuals. (Must be included in all commissioning submittals)
 - k. Compliance with recognized trade association standards.
 - 1. Compliance with recognized testing agency standards.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
 - 4. Submit Product Data prior to or concurrent with samples.
 - 5. Number of Copies: Submit one (1) electronic copy of each submittal, unless otherwise indicated. CxA will not return copies. Mark up and retain one returned copy as a Project Record Document.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

- 1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - 1. Notation of dimensions established by field measurement.
- 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
- 3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24x36.
- 4. Number of Copies: Submit copies of each submittal as agreed to at the Preconstruction Meeting. In the absence of other information submit copies as follows:
 - a. Initial Submittal: Submit one electronic set of prints. CxA will not return prints.
 - b. Final Submittal: Submit as per initial, unless prints are required for operation and maintenance manuals. Submit one (1) set of prints where prints are required for operation and maintenance manuals.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 - 1. Number of Copies: Submit one (1) copy of each submittal, unless otherwise indicated.
 - 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to CxA.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, signature/initials of reviewer, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 COMMISSIONING AUTHORITY'S ACTION

- A. General: CxA will not review submittals that do not bear Contractor's approval stamp or which, in the CxA's opinion, are incomplete, contain numerous errors, have not been checked or have only been checked superficially and will return them without action.
- B. Action Submittals: CxA will review submittal in accordance with sampling methodology and rate defined, make marks to indicate comments and recommendations, and return comments to Architect.
- C. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION

SECTION 01 35 67

COMMISSIONING (Cx) PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents (As-Builts).

1.2 SUBMITTALS

- A. Record Drawings: Submit copies of Record Drawings as follows:
 - 1. Initial Submittal: Submit to the CxA one (1) set of electronic drawings from corrected CAD Drawings and one electronic copy of the original marked-up Record Prints. CxA will provide comment as to whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - 2. Final Submittal: Submit one set of Record CAD Drawing files.
 - a. Submit all copies to the Boards Authorized Representative with a transmittal indicating compliance with requirements for Project Record Documents. Boards Authorized Representative will be responsible for distribution to the appropriate parties, including the end user.
- B. Record Specifications: Submit one (1) electronic copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one (1) electronic copy of each Product Data submittal.
 - 1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as Record Product Data.

1.3 DEFINITIONS

A. Record Documents: Documents submitted by a contractor or subcontractor to show the construction of a particular structure or work as actually completed. Record documents are also referred to as "as-builts".

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

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- 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
- 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - 1. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
- 3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
- 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
- 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
- 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record CAD Drawings: Immediately before inspection for Preliminary Acceptance, review marked-up Record Prints with Architect and Construction Manager. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
 - 1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
 - 2. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
 - 3. Refer instances of uncertainty to Architect through Construction Manager for resolution.
 - 4. Architect will furnish Contractor one electronic set of CAD Drawings of the Contract Drawings for use in recording information.

- a. Architect makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings.
- 5. Drawings shall include all referenced files, (font files, menus, shape files, x-refs, etc.) and strictly adhere to the current published CPS guidelines for layering standards.
- 6. In addition to editable drawing files (dwg, dxf) provide a complete set of plot files (PLT-FILES) in Hewlett Packard Graphics Language [HPGL] format.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing Record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
 - 1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 - 2. Consult with Architect and Construction Manager for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- D. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
 - 3. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect and Construction Manager.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of the manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 - 5. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for CxA's reference during normal working hours.

END OF SECTION

SECTION 01 35 68

COMMISSIONING (Cx) OPERATIONS AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance data.

1.2 SUBMITTALS

- A. Provide outline of O&M structure as described in section 2.1 to Architect and CxA at 50% construction completion milestone.
- B. Draft Submittal: Submit to Architect and CxA one electronic copy of each draft manual 60 days after O&M outline is accepted. Include a complete operation and maintenance directory.
 - 1. Draft manual shall constitute the full compilation of documentation by Division as outlined under this section. Manuals or documentation submitted in portions or by individual specification section shall be rejected and returned without review.
 - 2. Contractor will make any corrections required and resubmit all copies until Architect and CxA find manuals acceptable.
- C. Final Submittal: Submit five (5) hard copies of each manual and one (1) electronic copy of each manual in final form evidencing acceptance by the Architect and CxA. The Operation and Maintenance Manuals must be delivered to the Owner (end user) a minimum of 7 days prior to the commencement of any Owner's training on any systems or equipment.
 - 1. Submit all copies to the Owner's Authorized Representative with a transmittal indicating compliance with requirements for submittal of Operation and Maintenance Manuals.
 - 2. Owner's Authorized Representative will be responsible for distribution to the appropriate parties, including the end user.

1.3 OPERATIONS AND MAINTENANCE MANUALS GENERAL

A. The commissioning process requires detailed O&M documentation. O&M documentation requirements identified in this section, in Division 01 Section "Commissioning (Cx) Requirements" and other Division 21 through 28 sections.

PART 2 - PRODUCTS

- 2.1 MANUALS, GENERAL
 - A. The General Contractor shall compile O&M manuals for every piece of equipment, building operating or electrical system, and/or building materials as called for within these specifications or outlined by manufacturer/vendor.

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- B. Organization: There shall be a title page and table of contents in the front of each manual for each manuals contents. In each manual, there shall be a main tab for each specification section. Behind the section number tab there shall be the equipment ID tag sub-tab for each piece of major equipment (or group, if small or numerous). These sub-tabs shall be similar to the specification number tabs but have a different color. Behind each equipment name tab shall be the sections noted below, in the given order, divided by a double weight colored sheet labeled with the title of the section.
 - 1. Title Page: For paper copies of manuals enclose title page in transparent plastic sleeve, electronic copies shall have title page as first page of file for manual. Include the following information:
 - a. Subject matter included in manual.
 - b. Name and address of Project.
 - c. Name and address of the Owner.
 - d. Date of submittal.
 - e. Name, address, and telephone number of primary Contractors.
 - f. Name and address of A/E.
 - g. Cross-reference to related systems in other operation and maintenance manuals.
 - 2. Table of contents for each volume.
 - 3. Indices for each volume
 - 4. Specification Section Tab
 - a. Equipment ID Tag Tab
 - 1) Equipment ID Tag Summary
 - 2) Contractor: The first page behind the equipment tab shall contain the name, address and telephone number of the manufacturer and installing contractor and the 24-hour number for emergency service for all equipment in this section, identified by equipment.
 - 3) Submittal and Product Data: This section shall include all approved submittal data, cut sheets and appropriate shop drawings. If submittal was not required for approval, descriptive product data shall be included.
 - 4) Operation and Maintenance Instructions: These shall be the written manufacturer's data with the model and features of this installation clearly marked and edited to omit reference to products or data not applicable to this installation. This section shall include data on the following:
 - a) Installation, startup and break-in instructions
 - b) All starting, normal shutdown, emergency shutdown, manual operation, seasonal changeover and normal operating procedures and data, including any special limitations.
 - c) O&M and installation instructions that were shipped with the unit.
 - d) Preventative maintenance and service procedures and schedules.
 - e) Troubleshooting procedures.
 - f) A parts list, edited to omit reference to items, which do not apply to this installation.
 - g) A list of any special tools required to service or maintain the equipment.
 - h) Performance data, ratings and curves.

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COMMISSIONING (Cx) OPERATIONS AND MAINTENANCE DATA

- 5) Warranty, which clearly lists conditions to be maintained to keep warranty in effect and conditions that would affect the validity of the warranty.
- 6) Any service contracts issued.
- 7) Supplemental Data: Prepare written text and/or special drawings to provide necessary information, where manufacturer's standard printed data is not available and information is necessary for a proper understanding and operation and maintenance of equipment or systems, or where it is necessary to provide additional information to supplement data included in the manual or project documents.
- 8) Control Drawings: Include the control drawings for the piece of equipment and its components, including the sequence of operation. This section will be provided by the controls contractor. The drawings will be repeated in the control contractor's O&M submittals.
- 9) Specifications: This section is comprised of the component or system specification section copied and inserted complete with all addenda.
- 10) System Description: This section shall include the individual equipment portion of the overall system Design Documentation Narrative, if available. It will contain simplified professionally drawn single line system diagrams on 8-1/2 x 11 or 11 x 17 sheets, if the system's control drawing is not adequate.
- 11) Preventive Maintenance Instructions: This section shall include condensed typewritten excerpts from the manufacturers written instructions for weekly, monthly, quarterly, annual, etc. maintenance. This summary shall be prepared by the HVAC mechanical contractor with help from the equipment supplier. It shall be prepared for all items listed under condensed operating instructions (below), plus package, window or through the wall AC units and electric unitary heating equipment.
- 12) Condensed Operating Instructions: This section shall include condensed instructions for start-up, shutdown, emergency operation, safety precautions, unusual features and troubleshooting suggestions. Where control is clearly covered in controls description, it is not to be duplicated here. In addition, a copy of these instructions shall be clearly laminated and secured adjacent to the equipment where it can be easily read by operating personnel. These instructions shall be provided for boilers, furnaces, chillers, pumps, heat rejection equipment, large air handling units (greater than 10 tons), heat pump systems, control system, air compressors and dryers.
- C. Controls and Test and Balance (TAB) O&M Manuals: The controls contractor and TAB contractor have special O&M manual preparation requirements in Division 23 Section "Testing, Adjusting, and Balancing for HVAC" that shall be merged with those of this section.
- D. Paper Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem and equipment. If possible, assemble instructions for subsystems, equipment and components of one system into a single binder.
 - 1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

- a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
- b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name and subject matter of contents. Indicate volume number for multiple-volume sets.
- 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
- 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
- 4. Supplementary Text: Prepared on 8-1/2-by-11-inch, 20-lb/sq. ft. white bond paper.
- 5. Supplemental Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
- 6. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - a. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents and drawing locations.
- E. Electronic Manual Contents: Organize into sets of manageable size to ensure files for manual are contained within a single compact disc. Arrange contents alphabetically by file name or bookmarking, for organization to coincide with system, subsystem and equipment. Ensure instructions for subsystems, equipment and components of one system into a single compact disc.
 - 1. DVDs or Solid State Memory Device: All files shall be burned on to and provided in plastic cases. Discs shall be clearly labeled with the same information as required for the manual title page. If more than one manual is present on the disc a listing of the manual contained shall be provided on the label.
 - a. If two or more discs are necessary to accommodate data of a system, organize data in each disc into groupings by subsystem and related components. Cross-reference other discs by bookmarking or annotations in the electronic files contained on the disc if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Discs shall be clearly labeled with the same information as required for the manual title page. If more than one manual is present on the disc a listing of the manual contained shall be provided on the label.
 - 2. Bookmarking: The O&M manuals shall be fully integrated and navigable. "Fully integrated and navigable", is defined in this context as the ability for users to review and locate information utilizing bookmarks or other file organization methods. Use of folder structures for this purpose will be permitted provided file nomenclature utilized clearly indicates the type of document the file contains and all information pertinent to a given system, sub-system and/or unit is contained within a single folder.

- 3. Searching: All files shall be fully searchable using standard text search functions. If scanned copies of documents are provided, these files shall be converted into OCR recognized text format with original image overlay.
- 4. Acceptable Electronic Formats: Acceptable electronic formats for files provided for manuals shall be as listed below. Contractor shall be responsible to provide free viewers for all formats not listed below for any files provided in their submission. Scanned copies of paper documents must have prior approval from Owner.
 - a. Word, current version
 - b. Excel, current version
 - c. Adobe Acrobat, current version
 - d. WAV
 - e. WMV
 - f. DWF

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 35 69

COMMISSIONING (Cx) PROCESS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes specifications for the implementation, tracking and verification of the commissioning process.

1.2 DEFINITIONS

- A. Cx: Commissioning
- B. CxA: Commissioning Authority
- C. P/T: Pressure / Temperature
- D. OPR: Owner's Project Requirements
- E. BAS: Building Automation System
- F. PFC: Pre-functional Checklist
- G. FPT: Functional Performance Tests
- H. TAB: Test, Adjusting, Balancing
- I. MEP: Mechanical, Electrical, Plumbing

1.3 Submittals:

A. The following table contains deliverables and/or submittals required under this section, the party(s) responsible for each, the frequency and or timeline these items shall be provided, the format and quantity to be provided, and the party(s) to be provided to.

Submittal	Party(s) Responsible	Frequency or Timeline	Format & Quantity	Party(s) Provided To
Draft commissioning	CxA	45 days fol-	Electronic	Cx Team
plan		lowing com-		
		mencement of		
		work		
Draft construction sched-	Contractor	1 week prior to	Electronic	CxA
ule		commence-		
		ment of work		
Detailed MEP installation	Contractor	1 week prior to	Electronic	CxA
and start-up schedule and		commence-		
plan		ment of work		

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COMMISSIONING (Cx) PROCESS

Submittal	Party(s) Responsible	Frequency or Timeline	Format & Quantity	Party(s) Provided To
Commissioning mile- stones for construction schedule	CxA	Within 7 days of receipt of schedule	Electronic	Contractor
Updated construction schedule	Contractor	Concurrent with each pay period	Electronic	CxA
Submittal register	Contractor	1 week prior to commence- ment of work	Electronic	CxA
Submittal log	Contractor	Weekly	Electronic	CxA
Submittals (Commissioned Systems)	Contractor	Concurrent with submis- sions to A/E	Electronic	CxA
Notification of equipment and/or system start-up	Contractor	7 days prior to scheduled start-up	Electronic	CxA, Architect
Equipment and/or system start-up reports	Contractor	Within 7 days of start-up	Electronic	CxA, Architect
Notification of specified testing for commissioned systems and procedures (FPT excluded)	Contractor	7 days prior to scheduled test	Electronic	CxA, Architect
Specified testing reports for commissioned sys- tems	Contractor	Within 7 days of testing	Electronic	CxA, Architect
Notification of commis- sioning site visit	CxA	7 days prior to site visit	Electronic	Contractor
Site visit report	CxA	Within 7 days of site visit	Electronic	Contractor, Ar- chitect, Owner
Notification of commis- sioning meeting and agenda	CxA	7 days prior to meeting	Electronic	Contractor
Commissioning meeting minutes	CxA	Within 7 days of meeting	Electronic	Contractor, Ar- chitect, Owner
TAB plan	Contractor	90 days prior to scheduled start date	Electronic	CxA, Architect
TAB plan review com- ments	CxA	Within 7 days of receipt of plan	Electronic	Architect
TAB report	Contractor	Within 7 days of TAB com- pletion	Electronic	CxA, Architect
Resolution report for commissioning issues	Contractor	Within 7 days of receipt of issues report	Electronic	CxA, Architect, Owner

Submittal	Party(s) Responsible	Frequency or Timeline	Format & Quantity	Party(s) Provided To
Warranty review report	CxA	Within 7 days of completion of warranty walkthrough	Electronic	Contractor, Ar- chitect, Owner
Warranty resolution re- port	Contractor	Within 7 days of completion of work	Electronic	CxA, Architect, Owner

1.4 COMMUNICATION

A. Communication resulting from or in relation to commissioning activities will be relayed directly to the responsible party whenever possible, with copies to the Owner, A/E and Contractor.

1.5 COMMISSIONED SYSTEMS

- A. Commissioned systems are defined as the equipment and/or systems pertaining to the systems or equipment listed below:
 - 1. Chillers and Associated Pumps
 - 2. Air-handling Units
 - 3. Toilet, Kitchen, and General Exhaust
 - 4. Terminal Units
 - 5. Domestic Hot Water Systems and Associated Pumps
 - 6. Energy Management & Control Systems (BAS)
 - 7. Indoor Lighting and Control Systems
 - 8. Outdoor Lighting and Control Systems
 - 9. Energy Metering
 - 10. Boilers and Associated Pumps
 - 11. Booster Pump
 - 12. Sump Pumps
 - 13. Refrigerant Piping and Systems
 - 14. AC Units
 - 15. Ductwork
 - 16. Unit and Cabinet Heaters

1.6 **RESPONSIBILITIES**

- A. The responsibilities of various parties in the commissioning process are provided in this section. The responsibilities listed for Contractor apply to all contractors related scope as well as any sub-contractors, consultants and/or personnel under the employment of the Contractor.
- B. All Parties:
 - 1. Follow the Commissioning Plan.
 - 2. Attend commissioning meetings, as necessary.
- C. Architect:

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- 1. Review and approve submittals, O&M data, training program and as-builts in accordance with contracted services.
- 2. Provide design narrative documentation as requested by the CxA. This includes clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
- 3. Attend the commissioning meetings as requested.
- 4. Review TAB plan and report.
- 5. Coordinate resolution of system deficiencies and discrepancies identified during commissioning, according to the contract documents.
- 6. Prepare and submit final as-built basis of design and owner project requirements documentation for inclusion in the O&M data.
- 7. Prepare and submit final as-built one line system diagrams and narratives for inclusion in the O&M data.
- 8. Coordinate resolution of design non-conformance and deficiencies identified during warranty-period commissioning.
- D. CxA:
 - 1. The primary role of the CxA is to develop and coordinate the execution of a testing plan, observe and document performance—that systems are functioning in accordance with the documented intention of design and in accordance with the Contract Documents.
 - 2. Coordinates and directs the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise.
 - 3. Prepare and maintain commissioning plan.
 - 4. Prepare and update commissioning milestones and schedule.
 - 5. Coordinate the commissioning work and, with Contractor, verify that commissioned activities are being scheduled into the master schedule.
 - 6. Coordinate and facilitate commissioning meetings as required.
 - 7. Request and review additional information required to perform commissioning tasks, including O&M data, contractor start-up and checkout procedures.
 - 8. Review normal Contractor submittals applicable to systems being commissioned for compliance with commissioning needs, concurrent with the Architect reviews.
 - 9. Plan and conduct commissioning meetings.
 - 10. Develop pre-functional checklists and provide Contractor with final pre-functional checklists in approved format with accompanying tracking system.
 - 11. Provide Contractor with training in relation to use of pre-functional checklists and tracking system.
 - 12. Provide Contractor with access to itemized list detailing pre-functional checklist items requiring action.
 - 13. Before startup, review the current control sequences and interlocks and work with contractors and Architect until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.
 - 14. Perform site visits, as contracted, to observe equipment and system installations.
 - 15. Attend selected planning and job-site meetings to obtain information on construction progress.
 - 16. Witness part of the additional testing specified for the commissioned systems, in sufficient detail to be confident that proper procedures were followed. Review the

reports prepared by the Contractors to document the testing procedures. Notify Architect and Owner of any deficiencies in results or procedures.

- 17. Review pre-functional checklist completion by reviewing pre-functional checklist completion reports and by selected site observation and spot checking. Advise Contractor of status of pre-functional checklist completion and discrepancies identified.
- 18. Review and witness a sampling of equipment start-up and reports, in sufficient detail to be confident of results and procedures followed.
- 19. Review a sampling of as-built drawings, in sufficient detail to be confident of validity and accuracy of the documentation.
- 20. Review TAB plan and report.
- 21. Verify air and water systems balancing by spot testing, by reviewing completed reports and by selected site observation.
- 22. Prepare and provide contractor readiness criteria to Contractor.
- 23. Analyze any functional performance trend logs and monitoring data to verify performance.
- 24. Witness and document manual functional and seasonal tests performed by installing contractors. Coordinate retesting as necessary until satisfactory performance is achieved.
- 25. Maintain a master deficiency and resolution log and a separate testing record. Provide Contractor with written progress reports and test results with recommended actions.
- 26. Review equipment warranties to verify that the Owner's responsibilities are clearly defined.
- 27. Review the training of the Owner's operating personnel per contract.
- 28. Compile and maintain a commissioning record.
- 29. Review the preparation of the O&M data.
- 30. Coordinate and facilitate warranty review with Owner staff and provide formal report of findings to Architect, Owner and Contractor.
- E. Contractor:
 - 1. Facilitate the coordination of the commissioning work by the CxA, and with other contractors.
 - 2. Include the cost of commissioning in the total contract price as it relates to support, coordination and allocation of labor and resources to the CxA for the items and responsibilities outlined as contractor responsibilities for the commissioning process.
 - 3. Verify that commissioning activities are being scheduled into the master schedule.
 - 4. Develop and maintain a detailed MEP startup plan and schedule in accordance with guideline outlined within this section, and provide regular updates in coordination with master schedule update to CxA.
 - 5. Attend commissioning meetings as requested.
 - 6. Furnish a copy of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CxA.
 - 7. In each purchase order or subcontract written, include requirements for submittal data, O&M data, commissioning tasks and training.
 - 8. Ensure that all sub-contractors and personnel execute their commissioning responsibilities according to the Contract Documents and schedule.
 - 9. Complete pre-functional checklists for sections responsible for, according to procedures specified under this section.

10.

- 11. Review and approve the functional performance test procedures submitted by CxA.
- 12. Provide CxA with contractor readiness notification.

- 13. Facilitate and assist CxA as necessary in the functional and seasonal testing of selected equipment and systems.
- 14. Ensure sub-contractors and personnel facilitate and assist CxA as necessary in the functional and seasonal testing of selected equipment and systems.
- 15. Review commissioning progress and issues reports.
- 16. Coordinate and facilitate the resolution of non-compliance, deficiencies and discrepancies identified in all phases of commissioning.
- 17. Ensure sub-contractors and personnel coordinate and facilitate the resolution of noncompliance, deficiencies and discrepancies identified in all phases of commissioning.
- 18. Coordinate and facilitate the training of Owner personnel.
- 19. Prepare O&M data, according to the Contract Documents, including clarifying and updating Contract Documents to as-built conditions.
- F. Equipment and Material Suppliers
 - 1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Owner to keep warranties in force.
 - 2. Assist in equipment testing per agreements with Contractor.
 - 3. Include all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment according to these Contract Documents in the base bid price to the Contractor, except for stand-alone datalogging equipment that may be used by CxA.
 - 4. Through the Contractor they supply products to, analyze specified products and verify that the Architect has specified the newest most updated equipment reasonable for this project's scope and budget.
 - 5. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.
 - 6. Review and approve test procedures for equipment installed by factory representatives.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. All standard testing equipment required to perform startup, initial checkout, additional testing and required functional performance testing shall be provided by Contractor for the equipment being tested.
- B. Special equipment, tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment, according to these Contract Documents shall be included in the base bid price to the Contractor and left on site, except for stand-alone datalogging equipment that may be used by the CxA.
- C. Datalogging equipment and software required to test equipment, if used, will be provided by the CxA, but shall not become the property of the Owner.
- D. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply:

- 1. Temperature sensors and digital thermometers shall have a certified calibration within the past year to an accuracy of 0.5 deg F and a resolution of + or 0.1 deg F.
- 2. Pressure sensors shall have an accuracy of + or -2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.
- 3. All equipment shall be calibrated according to the manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.

PART 3 - EXECUTION

3.1 PURPOSE

- A. Commissioning is a systematic process of assess whether all commissioned systems perform interactively according to the owner's project requirements and the intention of the design, and to track the process by which any deviations from this performance are addressed. This is achieved by beginning in the design phase and continuing through construction, acceptance and the warranty period with actual verification of performance and adherence to the Owner's Project Requirements.
- B. The commissioning process does not take away from or reduce the responsibility of the Architect or installing contractors to provide a finished and fully functioning facility.

3.2 COMMISSIONING PLAN

- A. CxA shall develop a complete commissioning plan detailing the following information at a minimum:
 - 1. Contact information for key members of commissioning team.
 - 2. Description of procedures to be utilized for each commissioning task.
 - 3. List of commissioned systems and associated equipment.
 - 4. Sampling approach to be utilized for each equipment and system type by commissioning task.
 - 5. List of responsibilities for each party involved in the commissioning process.
 - 6. Commissioning milestones and schedule.
 - 7. Record of results for commissioning tasks to date.
- B. CxA shall provide an initial copy of the commissioning plan to Contractor in the format, quantity and timeframe defined under SUBMITTALS for this section.

3.3 SCHEDULING

- A. Contractor to provide CxA with updates to construction schedule in the format, quantity and timeframe defined under SUBMITTALS for this section.
- B. CxA shall provide Contractor detailed list of commissioning milestones and task schedule for incorporation into Contractor master schedule.
- C. Contractor to incorporate all commissioning milestones identified (including predecessors and dependencies) in the overall construction schedule and provide updates to all parties in the format, quantity and timeframe defined under SUBMITTALS for this section.

- D. Contractor shall develop a detailed MEP start-up plan and schedule for the project in accordance and provide to the CxA in the format, quantity and timeframe defined under SUBMITTALS for this section. The MEP start-up plan and schedule shall be organized by system and equipment and shall include at a minimum for each system and piece of equipment as applicable:
 - 1. Submittal Issuance Date and required Date for Approval
 - 2. Delivery Date
 - 3. Installation/Setting Start and Finish Dates
 - 4. Ductwork Installation to Unit Start and Finish Dates
 - 5. Ductwork Installation for Primary Systems Serving or Served by Unit Start and Finish Dates
 - 6. Ductwork Testing Start and Finish Dates (separate start and finish dates for each test specified)
 - a. Provide procedures and proposed report format for each test specified
 - 7. Piping Installation to Unit Start and Finish Dates (separate start and finish dates for each piping system to unit)
 - 8. Piping Installation for Primary Systems Serving or Served by Unit Start and Finish Dates (separate start and finish dates for each piping system served or serving unit)
 - 9. Piping Testing Start and Finish Dates (separate start and finish dates for each test specified)
 - a. Provide procedures and proposed report format for each test specified
 - 10. Electrical Installation to Unit Start and Finish Dates
 - 11. Electrical Installation for Primary Systems Serving or Served by Unit Start and Finish Dates
 - 12. Date for Application of Permanent Power
 - 13. Electrical Testing Start and Finish Dates (separate start and finish dates for each test specified)
 - a. Provide procedures and proposed report format for each test specified
 - 14. Controls Installation to Unit Start and Finish Dates
 - 15. Controls Installation for Primary Systems Serving or Served by Unit Start and Finish Dates
 - 16. Fire Alarm Installation to Unit Start and Finish Dates
 - 17. Fire Alarm Installation for Primary Systems Serving or Served by Unit Start and Finish Dates
 - 18. Security Installation to Unit Start and Finish Dates
 - 19. Security Installation for Primary Systems Serving or Served by Unit Start and Finish Dates
 - 20. Unit Start-up and Testing Start and Finish Dates (separate start and finish dates for each start-up/test specified)
 - a. Provide procedures and proposed report format for each start-up/test specified
 - 21. Controls Start-up and Testing Start and Finish Dates (separate start and finish dates for each start-up/test specified)

- a. Provide procedures and proposed report format for each start-up/test specified
- 22. Fire Alarm Testing Start and Finish Dates (separate start and finish dates for each test specified)
 - a. Provide procedures and proposed report format for each test specified
- 23. Security Testing Start and Finish Dates (separate start and finish dates for each test specified)
 - a. Provide procedures and proposed report format for each test specified
- 24. TAB Start and Finish Dates
- 25. Date for Issuance of TAB Report
- 26. Finalization and Cleanup Start and Finish Dates
- 27. Punchlist Start and Finish Dates
- 28. FPT Start and Finish Dates
- 29. Substantial Completion Date
- E. Contractor to provide notice to CxA in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section with regards to the following activities unless specifically stated otherwise within another section of the specifications:
 - 1. Equipment or system start-up.
 - 2. Specified testing other than FPT.
 - 3. Cancellation of activity requiring CxA attendance.

3.4 PRE-CONSTRUCTION COMMISSIONING MEETING

A. Contractor and affiliated sub-contractors and personnel associated with work with the commissioned systems of this project shall attend pre-construction commissioning meeting facilitated by CxA.

3.5 SUBMITTAL REVIEWS

- A. Contractor shall supply one complete copy of the submittal register in electronic format to CxA in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section. Register shall include at a minimum the following:
 - 1. Specification section number.
 - 2. List of equipment, system, materials, certifications and/or reports requiring submittals for each specification section.
 - 3. Number of submittals anticipated for each specification section.
- B. Contractor to supply one copy, in electronic format of each submittal required for the system or equipment of this section to CxA concurrently with Architect submission as outlined under 013566. This shall include but is not limited to:
 - 1. Equipment and system shop drawings.
 - 2. Coordination drawings.
 - 3. RFI's.

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- 4. CO's.
- 5. RFC's.
- C. Upon receipt CxA shall review submittal in accordance with sampling method and rate defined in parallel with Architect review and provide comments to the Architect for inclusion in their final comments to Contractor within 7 days of receipt of submittal.
- D. Architect shall provide CxA with responses to all comments issued by CxA via CxA provided issues management system in concurrence with collated comments and action for submittal in accordance with Division 01 requirements for submittals.
- E. CxA shall not review any re-submittal provided by Contractor regardless if re-submittal is in reference to comments issued by CxA. All re-submittals shall be handled in accordance with Division 01 requirements and process for submittals by Architect, and Architect shall be responsible to provide notification and response to CxA upon satisfactory closure of applicable comments for submittals and re-submittals.

3.6 CONSTRUCTION VERIFICATION

- A. See 013570-Commissioning (Cx) Pre-Functional Checklists.
- 3.7 START-UP VERIFICATION
 - A. Contractor shall notify CxA and Architect in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section.
 - B. CxA and Architect shall witness equipment or system start-up as deemed necessary.
 - C. Contractor to supply one copy of the start-up report to CxA and Architect in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section..

3.8 TESTING VERIFICATION

- A. For all commissioned systems, Contractor shall notify CxA and Architect in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section for any testing specified under technical section for a given equipment or system within the commissioned systems.
- B. CxA and Architect shall witness additional testing as deemed necessary.
- C. Contractor to supply one copy of the test report to CxA and Architect in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section..

3.9 AS-BUILT VERIFICATION

- A. Contractor shall maintain on site and up to date one copy of project as-builts per the requirements of Division 01 and 013567-Commissioning (Cx) Project Record Document.
- B. As-built drawings maintained by Contractor will be periodically reviewed and verified during construction by CxA. Discrepancies in the drawings will be documented in site visit reports and the Contractor shall be responsible to verify and correct the as-built drawings against the installed system for specified and all similar problems noted.

3.10 SITE VISITS

- A. CxA shall provide Contractor with site visit log detailing the number and dates of commissioning site visits within the Cx plan described within this section.
- B. CxA shall notify Contractor in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section as to a scheduled site visit for confirmation of schedule of site visit. Notification shall include the following items at a minimum:
 - 1. Date of site visit.
 - 2. CxA personnel to be in attendance.
- C. Site visits by CxA shall consist of at least one of the following activities, with the actual scope of activities to be clearly defined within the site visit report provided at the conclusion of the site visit:
 - 1. Pre-Functional Checklists
 - 2. Start-up verification
 - 3. Testing verification
 - 4. As-built verification
 - 5. General review of progress and quality
 - 6. Meeting attendance
 - 7. Commissioning meeting
 - 8. Attendance of Owner training session
- D. Contractor shall ensure that personnel related to activities, areas and systems scheduled for a given site visit by CxA are readily available for questions and/or assistance to CxA. CxA will give a minimum of 7 days' notice if assistance is anticipated for a given site visit.
- E. CxA shall provide Contractor, Architect and Owner with a clear record of the activities performed for the site visit and any deficiencies, discrepancies or issues identified in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section. Report shall clearly detail the scope and location of the issues identified, including provision of photographs as possible.
- F. Contractor shall supply CxA with a detailed resolution report via CxA provided issues management system in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section. Responses shall include the following information as applicable:
 - 1. Method of resolution.
 - 2. Date of resolution.
 - 3. List of similar installations and areas reviewed and resolved.
 - 4. Photo documentation of resolution (ONLY for items inaccessible for verification)
 - 5. Reference documentation

3.11 COMMISSIONING MEETINGS

A. Periodically CxA shall call a meeting of Contractor, Architect and Owner to review progress of the project, review issues, and discuss scheduling for future commissioning tasks.

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- B. To the fullest extent possible CxA shall schedule meetings to occur at times that coincide with existing meetings scheduled for Contractor to minimize downtime of Contractor, sub-contractors and personnel.
- C. CxA shall provide notification to all parties requested to attend a specific meeting in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section.. Notification shall include a formal agenda of the meeting, including the anticipated duration and attendees required.
- D. Contractor, Architect and Owner shall be responsible to have personnel requested in attendance at meeting for duration specified by CxA. If people requested are not available then Contractor, Architect or Owner shall provide notice to CxA and provide a substitute.
- E. CxA shall supply all attending parties with a formal copy of the minutes for the meeting in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section.
- F. Attending parties shall have 7 days from receipt of minutes to formally comment to CxA on changes to minutes.

3.12 VERIFICATION

- A. TAB Plan:
 - 1. 90 days prior to TAB, Contractor is to provide Architect and CxA with a complete copy of the TAB plan for the project. TAB plan shall include at a minimum the following information:
 - a. Review contract documentation, submittals and installations for each system requiring TAB. Provide comments on any conditions of design and installation that will preclude proper TAB of facility.
 - b. Copy of qualifications and certifications for technicians to be utilized for TAB work
 - c. Step by step procedures detailing the methods to be utilized for balancing of each system and equipment type present. Procedures shall be of sufficient detail to ensure repeatable measurement, as well as include procedures to be utilized for examination and preparation prior to TAB.
 - d. Pre-populated TAB report in format specified under Division 23 Section "Testing Adjusting, and Balancing for HVAC." TAB report shall include design and submitted performance data for facility equipment and systems.
 - 2. CxA shall provide comments to Architect for review and incorporation into the Architect response to the submittal in accordance with part 3.5 of this section
 - 3. Architect shall provide CxA with responses to all comments issued by CxA via CxA provided issues management system in concurrence with formal response and action for TAB plan to Contractor in accordance with part 3.5 of this section.
 - 4. Contractor shall utilize approved TAB plan as basis for all TAB work to be performed on site. CxA shall in turn utilize the TAB plan as the basis for establishment of the TAB verification plan and the body of record for reviewing the procedures utilized by Contractor in the verification of TAB.

B. TAB Report:

- 1. Contractor shall supply Architect and CxA with a complete copy of the TAB report for the facility in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section. Report is to meet the requirements stated under 230593-Testing Adjusting, and Balancing for HVAC.
- 2. CxA shall provide comments to Architect for review and incorporation into the Architect response to the submittal in accordance with part 3.5 of this section
- 3. Architect shall provide CxA with responses to all comments issued by CxA via CxA provided issues management system in concurrence with formal response and action for TAB report to Contractor in accordance with part 3.5 of this section.
- 4. If any deficiencies are noted in TAB report comments from the Architect that are related to the methods utilized or results of TAB, Contractor shall remedy said issues and inform Architect and CxA of completion, including provision of revised TAB report.
- C. TAB Verification:
 - 1. A minimum verification sample of 10% of the total terminal points and a minimum verification sample of 50% of the total major equipment points under the work of TAB shall be included for TAB verification. CxA shall define the overall sampling approach and rate to be utilized for TAB verification within the Cx plan provided to the team at the outset of the project construction.
 - 2. System is to be verified under normal operating conditions and automatic control as detailed in TAB Plan. System overrides are to be initiated only upon the discretion of CxA.
 - 3. CxA shall provide Architect, Owner and Contractor with formal TAB verification report. Report shall include at a minimum the following:
 - a. Lists of areas and equipment sampled
 - b. TAB report and verification values for each point sampled
 - c. Overall recommendation for approval of TAB
 - 4. Any deficiencies identified during TAB verification by CxA shall be reported via the CxA provided web issues management system. A deficiency as it pertains to TAB verification shall be any value recorded that is greater than the TAB report value +/- the tolerance permitted under 230593-Testing Adjusting, and Balancing for HVAC, or the value recorded is greater than the design value +/- the tolerance permitted under 230593-Testing Adjusting, and Balancing for HVAC, or the value recorded is greater than the design value +/- the tolerance permitted under 230593-Testing Adjusting, and Balancing for HVAC.
 - 5. Contractor shall re-balance any systems impacted by deficiencies noted during TAB verification to the satisfaction of the Architect and supply CxA with a detailed resolution report via CxA provided issues management system in accordance with the format, quantity and timeframe defined under SUBMITTALS for this section. Responses shall include the following information as applicable:
 - a. Method of resolution.
 - b. Date of resolution.
 - c. List of similar installations and areas reviewed and resolved.
 - d. Reference documentation, including revised TAB report

3.13 FUNCTIONAL PERFORMANCE AND SEASONAL TESTING

A. See 013571-Commissioning (Cx) Functional Performance Testing.

3.14 OPERATION AND MAINTENANCE DATA

- A. Contractor shall supply O&M data in format, quantity and timeframe as defined under 013568-Commissioning (Cx) Operations and Maintenance Data.
- B. CxA shall provide comments to Architect for review and incorporation into the Architect response to the O&M data submittals in accordance with part 3.5 of this section.
- C. Architect shall provide CxA with responses to all comments issued by CxA via CxA provided issues management system in concurrence with formal response and action for O&M data submittals to Contractor in accordance with part 3.5 of this section.
- D. Any revisions or changes to the systems and/or equipment post-delivery of the final O&M data submittal must be submitted to CxA as an addendum item. Any such submittal must adhere to specifications and be delivered within 30 days of the revision or change.

3.15 TRAINING AND DEMONSTRATION

- A. Contractor shall supply training and demonstration documentation in format, quantity and timeframe as defined under 013572-Commissioning (Cx) Demonstration and Training.
- B. CxA shall provide comments to Architect for review and incorporation into the Architect response to the training and demonstration submittals in accordance with part 3.5 of this section.
- C. Architect shall provide CxA with responses to all comments issued by CxA via CxA provided issues management system in concurrence with formal response and action for training and demonstration submittals to Contractor in accordance with part 3.5 of this section.
- D. Contractor shall notify CxA of confirmation for training session in accordance with requirements outlined under 013572-Commissioning (Cx) Demonstration and Training.
- E. CxA shall attend and review portions of the training sessions to verify that the training program was followed. CxA shall provide comments and recommendation for action for each session attended to Architect and Owner with 7 days of session. Any sessions deemed as unacceptable or rejected by Architect or Owner shall be re-done and taped at the convenience of the Owner, Architect and CxA in accordance with 013572-Commissioning (Cx) Demonstration and Training.

3.16 WARRANTY REVIEW

- A. Contractor shall supply a complete copy of all warranties applicable to the facility, the terms of maintenance for each warranty, and the inception and expiration dates for each within the O&M data.
- B. CxA shall conduct a review of the operations and condition of the facility with respect to warranty related issues. CxA shall supply Contractor, Architect and Owner with a detailed report listing the issues identified from this walkthrough in the format, quantity and timeframe

defined under SUBMITTALS for this section. This report shall include at a minimum the following:

- 1. Description of issue identified, including photographs as applicable.
- 2. Recommended course of action.
- 3. Supplementary information relative to previous maintenance or repairs attempted for resolution of issue.
- C. Architect shall provide CxA with responses to all comments issued by CxA via CxA provided issues management system in concurrence with formal course of action for warranty issues noted to Contractor for resolution of issues identified.
- D. Contractor shall employ services and materials necessary for compliance to action statement from Architect. All repairs and actions taken by Contractor shall be coordinated with Owner, with a formal log of work completed provided to Owner, Architect and CxA in the format, quantity and timeframe defined under SUBMITTALS for this section.

3.17 COMMISSIONING ISSUES

- A. Throughout the course of the project and commissioning process the CxA shall identify various issues relative to deficiencies or discrepancies with the installations, submissions, or instructions provided by Contractor. These issues shall be clearly identified to Contractor, Architect and other parties of interest via CxA provided web issues management system.
- B. Contractor and Architect are ultimately responsible for resolution of all issues identified during course of project and the commissioning process. Responsible party(s) noted by CxA shall supply CxA a formal resolution report for each outstanding issue listed in the CxA provided web issues management system per the format, quantity and timeframe defined under SUBMITTALS for this section..
- C. Owner and CxA shall have the sole responsibility of determining the satisfactory completion and approval of any and all commissioning issues. CxA shall provide Architect, Contractor and Owner with action and approval of issues.
- D. Party designated by CxA as responsible for a given issue or issues shall be solely responsible for working with CxA and Owner to resolve all commissioning issues within an acceptable timeframe as agreed upon by CxA, Owner and responsible party, but no later than final acceptance of project.

END OF SECTION

SECTION 01 35 70

COMMISSIONING (Cx) PRE-FUNCTIONAL CHECKLISTS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes specifications for the implementation, tracking and verification of the commissioning process during construction.

1.2 DEFINITIONS

- A. Cx: Commissioning
- B. CxA: Commissioning Authority
- C. BAS: Building Automation System
- D. TAB: Testing, Adjusting, and Balancing

1.3 SUBMITTALS

A. The following table contains deliverables and/or submittals required under this section, the party(s) responsible for each, the frequency and or timeline these items should be provided, the format and quantity to be provided, and the party(s) to be provided to.

Submittal	Party(s) Responsible	Frequency or Timeline	Format & Quantity	Party(s) Provided To
Pre-functional checklists	CxA	30 days following contract award or approved equipment submittals whichever is later	Electronic	Contractor, Owner and Architect
Checklist Tracking System	CxA	30 days following contract award or approved equipment submittals whichever is later	Electronic	Contractor

Submittal	Party(s) Responsible	Frequency or Timeline	Format & Quantity	Party(s) Provided To
PC and related software defined under the HARDWARE/SOFTWARE REQUIREMENTS for Checklist Tracking System	Contractor	30 days following contract award	N/A	N/A
List of deficiencies requiring action	CxA	Weekly	Electronic	Contractor
Resolution report for deficiencies	Contractor	Within 7 days of receipt of deficiency report	Electronic	Architect, CxA and Owner

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PURPOSE

A. The intent of the pre-functional checklists is to provide a formalized means to provide individual workers the key criteria for a successful installation and to easily track construction progress.

3.2 DEVELOPMENT PROCEDURE

- A. Pre-functional checklists shall be developed for each system or equipment to be commissioned. A list of the commissioned systems is located under 013569 Commissioning (Cx) Process.
- B. CxA shall be responsible to provide Contractor with copies of each checklist to be utilized for this project for each equipment/system type per the format, quantity and timeframe defined under SUBMITTALS for this section. An example for checklists is provided in Annex A showing the rigor and format to be used.
- C. Checklists shall be provided in the following formats:
 - 1. Equipment: Checklists related to a specific piece of equipment or portion of an overall system that is completed in a linear progression similar to the standard installation practices of the equipment.
 - 2. System: Checklists related to the overall distribution system or repetitive equipment found universally throughout a given system (i.e. valves, diffusers, outlets, etc.).
- D. Contractor and Architect are responsible to provide notice to CxA for any project modifications related to the addition or deletion of equipment and/or systems to be commissioned.
- E. CxA shall provide contractor with the following items to the Contractor upon issuance of checklists and checklist tracking system:
 - 1. Instructions for completion and utilization of checklists and tracking system.
 - 2. Checklists for all equipment and systems in the following format:

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CHECKLISTS

a. Short Form: Electronic checklists divided into individual groups as noted within the PRE-FUNCTIONAL CHECKLISTS provided under this section. Checklist shall be divided by trade and step of installation with each trade Contractor responsible for the completion of each checklist group. Each group to be provided and tracked as an individual checklist. Checklist shall include area to mark checklist as complete. Checklists to include ability for notation of any deficiencies identified during verification of installation.

3.3 HARDWARE/SOFTWARE REQUIREMENTS

- A. Contractor shall provide a dedicated tablet PC or multiple tablet PCs at the site trailer for utilization in the implementation and tracking of construction verification items. This PC shall meet and/or contain the following:
 - 1. Microsoft Windows 7 or later operating system
 - 2. Microsoft Office 2012 Professional or later
 - 3. Microsoft Internet Explorer 10 or later
 - 4. Minimum of 1 GB RÂM
 - 5. Minimum of 60 GB of free hard drive space
 - 6. Wireless network card
 - 7. Cellular network card with active data agreement to be maintained for duration of project
- B. PC shall be maintained and full access provided to Owner and Contractors during typical hours of operation on site.

3.4 COMPLETION PROCEDURE

- A. The following is the permitted method the Contractor is to utilize for completion of all construction verification checklists related to project. Any deviations from this procedure must be authorized by the CxA.
- B. Equipment Checklists:
 - 1. The checklist shall be completed by the individual completing the work who is responsible for the given delivery or installation step of the equipment utilizing the provided tablet PC or other Internet capable platform compatible with CxA provided checklist tracking system in the field.
 - 2. Checklists shall be completed fully with all information or responses noted in the spaces provided for each item. Any items that cannot be answered due to lack of information with equipment or not being applicable to a given installation shall be noted negatively, with an explanation provided in the deficiency section.
 - 3. Any negative responses on the checklist shall be explained and documented within the deficiency section. Explanation shall be detailed to a degree to define the reasoning for non-compliance without further observation.
 - 4. Once all items on a checklist have been completed, individual shall submit that group/checklist marking it as complete.
 - 5. At end of work week Contractor to review available tracking reports in Checklist Tracking System and verify progress is in line with noted work to date.
 - 6. CxA shall periodically review deficiency reports contained within the Checklist Tracking System and provide the Contractor a list of deficiencies requiring action by Contractor per the format, quantity and timeframe defined under SUBMITTALS for this section.

- 7. Contractor to record method and date of resolution upon completion of corrective action for any deficiency or non-compliance item noted as requiring action by CxA per the format, quantity and timeframe defined under SUBMITTALS for this section.
- 8. The completion of the checklists does not eliminate the Contractor's responsibility for meeting other requirements in the specifications and drawings.
- C. System Checklists:
 - 1. The checklist shall be completed by the individual completing the work who is responsible for the given installation of the system utilizing the provided tablet PC or other Internet capable platform compatible with CxA provided checklist tracking system in the field.
 - 2. Individual to periodically record the work completed for the given system and installation step in accordance with the completion of work for the system and given installation step equaling the prescribed milestone completion percentages established by the CxA within the Checklist Tracking System.
 - 3. Checklists shall be completed fully with all information or responses noted in the spaces provided for each item. Any items that cannot be answered due to lack of information with equipment or not being applicable to a given installation shall be noted negatively, with an explanation provided in the deficiency section.
 - 4. Any negative responses on the checklist shall be explained and documented within the deficiency section. Explanation shall be detailed to a degree to define the reasoning for non-compliance without further observation.
 - 5. Once all items on a checklist have been completed, individual shall submit that group/checklist marking it as complete.
 - 6. At end of work week Contractor to review available tracking reports in Checklist Tracking System and verify progress is in line with noted work to date.
 - 7. CxA shall periodically review deficiency reports contained within the Checklist Tracking System and provide the Contractor a list of deficiencies requiring action by Contractor per the format, quantity and timeframe defined under SUBMITTALS for this section.
 - 8. Contractor to record method and date of resolution upon completion of corrective action for any deficiency or non-compliance item noted as requiring action by CxA per the format, quantity and timeframe defined under SUBMITTALS for this section.
 - 9. The completion of the checklists does not eliminate the Contractor's responsibility for meeting other requirements in the specifications and drawings.

3.5 VERIFICATION PROCEDURE

- A. At the commencement of work related to the checklists the CxA will periodically verify the accuracy, completeness and tracking of the checklists in accordance with the CxA defined sampling method and rate. This verification shall consist of reviewing the as installed conditions of the equipment and/or system versus the statements recorded on the checklists and the progress of the checklists in general.
- B. CxA shall record any discrepancies noted between the as installed conditions and/or progress of installation versus the checklists in the Checklist Tracking System and/or site visit report. Any items noted as requiring action by CxA shall be issued to Contractor per the format, quantity and timeframe defined under SUBMITTALS for this section and in accordance with 013569-Commissioning (Cx) Process.
 - 1. If during verification the CxA identifies a discrepancy rate for items identified on an individual checklist, or for the overall item count for the checklists for a given equipment or

system greater than or equal to the defined sampling rate, the Contractor shall re-validate 100% of the checklists, equipment and/or system.

- C. Contractor shall provide CxA method and date of resolution upon completion of corrective action for and discrepancy noted by CxA and similar installations via the CxA web issues management system per the format, quantity and timeframe defined under SUBMITTALS for this section and in accordance with 013569-Commissioning (Cx) Process.
 - 1. Any discrepancies noted for action that are disputed by Contractor and cannot be resolved between the Contractor and the CxA, shall be presented to Owner and Architect for resolution via the CxA provided web issues management system and in accordance with 013569-Commissioning (Cx) Process.
- D. If during verification the CxA identifies more than a 10% discrepancy rate between the current installation completion percentage for a given equipment or system and that reflected in the current checklists, the Contractor will be given a written warning within the applicable site visit report issued by the CxA regarding this issue and shall be responsible to bring the checklist completion in line with the installation progress by the next scheduled CxA site visit. If this issue is not resolved by the next CxA Site Visit and/or occurs again during the course of the project, the Contractor can be back charged by the Owner to have the CxA review 100% of all un-completed checklists required to bring the checklist completion in line with the installation progress.

ANNEX A – SAMPLE CONSTRUCTION VERIFICATION CHECKLIST

The following checklist is provided as an example only. The content and format does not necessarily reflect the final scope, format or system to be utilized for this project.

TEST

AHUs, HW-CHW: Bldg BLDG 1, Area -, TEST

	Task Description		Response	
Α		Submitted	Del	ivered
1	Manufacturer			
2	Model Number			
3	Serial Number	N/A		
4	# of Supply Fans			
5	Supply Air Flow / External Static Pressure (cfm / in W.C.)	/		/
6	Outside Air Flow (cfm)			
7	Chilled Water Cooling Capacity (MBH / gpm)	/		/
8	Number of Chilled Water Cooling Coils			
9	Chilled Water Cooling Coil # of Rows per Coil	,		,
10	Hot Water Heating Capacity (MBH / gpm)	/		/
11	Number of Hot Water Heating Coils			
12	Hot Water Heating Coil # of Rows per Coil Supply Fan Motor Speed / Power (rpm / hp)	/		/
13 14	Voltage / Phase / Frequency (V / - / Hz)		/	/ /
14	NEMA Nominal Efficiency	/ /	/	/
B	Physical Checks - Mechanical Contractor		Ro	sponse
b 1	•		Yes	No
2	Unit is free of physical damage. Coil surface areas are free of damage.		Yes	No
2	Air openings are sealed with plastic.		Yes	No
4	Water openings are sealed with plastic plugs.		Yes	No
5	Boot connection between unit and duct connection tight and in good condition.		Yes	No
6	All components/accessories present.		Yes	No
7	All access doors are operable.		Yes	No
8	Installation and startup manual present with unit.		Yes	No
9	Manufacturer's ratings readable.		Yes	No
10	Cx unit tags affixed.		Yes	No
Α	Installation - Mechanical Contractor		Re	sponse
1	Concrete housekeeping pad or other support method to accommodate weight of unit	it provided.	Yes	No
2	Concrete housekeeping pad or other support method is of sufficient height to accor	nmodate conder	nsate trap depth.	Yes No
3	Unit secured and supported as required by manufacturer and specifications including	ng specified vib	ration isolation	Yes No
	devices.			
4	Unit is totally isolated (without rigid contact) from structure, ductwork or other sta	tionary equipmo		
5	Unit sections attached per manufacturer instructions.		Yes	No
6	Unit is level and all sections plumb and square.		Yes	No
7	Adequate clearance around unit for service per manufacturer's requirements.		Yes	No
8	All components accessible for maintenance.		Yes	No
9	Cooling coil drain pan slopes correctly.		Yes	No
10	Shipping bolts have been removed and internal isolators have free movement.		Yes	No
11	All Inspection and access doors are operable and sealed. Construction filters provided in unit per specification requirements.		Yes Yes	No No
12 B	Hot Water Piping - Mechanical Contractor			
				sponse
1	Piping arranged for ease of unit/coil removal.		Yes	No No
2	Unit piping arranged for counter flow arrangement.	tion values	Yes	No No
3	Coil connected to water supply and return piping using unions or flanges and isolat	ion valves.	Yes	No
4	All piping components have been installed (in the correct order) as required by con	tract document	s.Yes	No

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COMMISSIOINING (Cx) PRE-FUNCTIONAL CHECKLISTS

~	Distance future installed to instant discinction metanist	V		N.
5 6	Dielectric fittings installed to isolate dis-similar pipe materials. Separate air vent and drain valve provided for each coil header outside of unit or ductwork	Yes Yes		No No
7	Sufficient clearance is provided between piping, fittings and valves to allow the application of full insulation		e Yes	
8	Piping supported as required by specifications.	Yes		No
8 9	Valve handles will not interfere with adjacent piping or pipe insulation when operated.	Yes		No
10	All valves and test ports are easily accessible.	Yes		No
C	Chilled Water Piping - Mechanical Contractor		Respon	
1	Piping arranged for ease of unit/coil removal.	Yes	respon	No
2	Unit piping arranged for counter flow arrangement.	Yes		No
3	Coil connected to water supply and return piping using unions or flanges and isolation valves.	Yes		No
4	All piping components have been installed (in the correct order) as required by contract document			No
5	Dielectric fittings installed to isolate dis-similar pipe materials.	Yes		No
6	Separate air vent and drain valve provided for each coil header outside of unit or ductwork	Yes		No
7	Sufficient clearance is provided between piping, fittings and valves to allow the application of full	thickness pip	e Yes	No
	insulation			
8	Piping supported as required by specifications.	Yes		No
9	Valve handles will not interfere with adjacent piping or pipe insulation when operated.	Yes		No
10	All valves and test ports are easily accessible.	Yes		No
11	Trap provided for condensate drain line and line run to nearest floor drain.	Yes		No
D	Ductwork - Mechanical Contractor		Respon	
1	Adequate locations available for testing and balancing of unit.	Yes		No
2	All dampers and sensors are accessible (access panels).	Yes		No
3	All dampers close tightly and stroke fully and easily.	Yes		No
4	Ductwork is clean and free of debris.	Yes		No
5	Outdoor and return air arrangement will not freeze coils, i.e. outdoor air and return air are adequat	ely mixed bef	ore Ye	sNo
6	reaching coils.	Vas		No
6	Ductwork is properly supported externally and internally.	Yes Yes		No No
7 8	Flexible duct connections of proper material installed at each duct connection.	Yes		No No
E	Flexible duct connections are properly sealed. Electrical - Electrical Contractor		Respon	
L 2	Electrical - Electrical Contractor			
1	Local disconnect installed in accessible location within sight of unit it controls		xespon	
1	Local disconnect installed in accessible location within sight of unit it controls. Each motor terminal box is connected with a minimum 12" maximum 36" piece of flexible condu	Yes	-	No
1 2	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu	Yes	-	
2	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu junction box.	Yes it to a fixed	-	No No
2 3	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications.	Yes it to a fixed Yes	-	No No No
2 3 4	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified.	Yes it to a fixed	-	No No
2 3 4 5	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight.	Yes it to a fixed Yes Yes	-	No No No
2 3 4	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded.	Yes it to a fixed Yes Yes Yes	-	No No No No
2 3 4 5 6	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram.	Yes it to a fixed Yes Yes Yes Yes Yes	-	No No No No No
2 3 4 5 6 7	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded.	Yes it to a fixed Yes Yes Yes Yes Yes Yes	-	No No No No No No
2 3 4 5 6 7 8	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram. Internal lighting works properly. External receptacle has power.	Yes it to a fixed Yes Yes Yes Yes Yes Yes Yes	-	No No No No No No
2 3 4 5 6 7 8 9	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram. Internal lighting works properly.	Yes it to a fixed Yes Yes Yes Yes Yes Yes Yes Yes	-	No No No No No No No
2 3 4 5 6 7 8 9 10	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram. Internal lighting works properly. External receptacle has power. Motor rotation is in the proper direction.	Yes it to a fixed Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	-	No No No No No No No No No
2 3 4 5 6 7 8 9 10 11	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram. Internal lighting works properly. External receptacle has power. Motor rotation is in the proper direction. Motor windings resistance has been verified to be 6 meg-ohms or above.	Yes it to a fixed Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Yes	No No No No No No No No No
2 3 4 5 6 7 8 9 10 11 F	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram. Internal lighting works properly. External receptacle has power. Motor rotation is in the proper direction. Motor windings resistance has been verified to be 6 meg-ohms or above. Controls - Installation - Controls Contractor	Yes it to a fixed Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Yes	No No No No No No No No No
2 3 4 5 6 7 8 9 10 11 F 1	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram. Internal lighting works properly. External receptacle has power. Motor rotation is in the proper direction. Motor windings resistance has been verified to be 6 meg-ohms or above. Controls - Installation - Controls Contractor Control panel accessible and labeled properly. All sensors and actuators installed per contract documents. Proper location and installation of duct static pressure sensor verified and acceptable.	Yes it to a fixed Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Yes	No No No No No No No No No No No No No N
2 3 4 5 6 7 8 9 10 11 F 2	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram. Internal lighting works properly. External receptacle has power. Motor rotation is in the proper direction. Motor windings resistance has been verified to be 6 meg-ohms or above. Controls - Installation - Controls Contractor Control panel accessible and labeled properly. All sensors and actuators installed per contract documents. Proper location and installation of duct static pressure sensor verified and acceptable. All safety items installed per contract documents.	Yes it to a fixed Yes Yes Yes Yes Yes Yes Yes Yes	Yes	No No No No No No No No No No No No
2 3 4 5 6 7 8 9 10 11 F 1 2 3	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram. Internal lighting works properly. External receptacle has power. Motor rotation is in the proper direction. Motor windings resistance has been verified to be 6 meg-ohms or above. Controls - Installation - Controls Contractor Control panel accessible and labeled properly. All sensors and actuators installed per contract documents. Proper location and installation of duct static pressure sensor verified and acceptable. All safety items installed per contract documents. Freezestat or low temperature limit sensor wire run provides full coverage of coil per manufacture	Yes it to a fixed Yes Yes Yes Yes Yes Yes Yes Yes	Yes	No No No No No No No No No No No No
2 3 4 5 6 7 8 9 10 11 F 1 2 3 4	Each motor terminal box is connected with a minimum 12", maximum 36" piece of flexible condu- junction box. Motor NEMA Nominal Efficiency complies with specifications. VFD installed and installation verified. All electrical connections are tight. All electrical components are grounded. Connections match unit wiring diagram. Internal lighting works properly. External receptacle has power. Motor rotation is in the proper direction. Motor windings resistance has been verified to be 6 meg-ohms or above. Controls - Installation - Controls Contractor Control panel accessible and labeled properly. All sensors and actuators installed per contract documents. Proper location and installation of duct static pressure sensor verified and acceptable. All safety items installed per contract documents. Freezestat or low temperature limit sensor wire run provides full coverage of coil per manufacture recommendations.	Yes it to a fixed Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Yes	No No No No No No No No No No No No No N
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Michael M. Byrne Elementary School 2017-22501-ANX

01 35 70 - 7 COMMISSIOINING (Cx) PRE-FUNCTIONAL CHECKLISTS

8 Protective shrouds for fans and belts in place and secure. Yes 9 Fire, smoke, and terminal unit dampers manually opened or are controllable and open. Yes 11 Chilled water piping pressure tested, flushed and filled (reports submitted). Yes 12 Hot water piping pressure tested, flushed and filled (reports submitted). Yes 13 Proper water treatment has been done to ensure no scaling, erosion, corrosion, algae, or slime is present in each Yes hydronic system. Yes 14 Condensate drainage is unobstructed. Yes 15 Any damage to coil fins has been repaired. Yes 16 Condensate drainage is unobstructed. Yes 17 System starts and runs without any unusual noise or vibration. Yes 2 Fan rotates in proper direction. Yes 3 Motor voltage imbalance checked and is acceptable. Yes 4 Belt tension checked after initial startup and acceptable. Yes 7 Filters installed properly (no bypass air) and are clean. Yes 8 Motor voltage imbalance Yes 9 Point-to-point checkout completed (report submitted). Yes 9 Filters installed properly (no bypass air) and are	No
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3 Ductwork insulation is complete and sealed as per specifications, no exposed insulation can be seen. Yes	No
	No
A All damage to unit finish is repaired Vec	No
	No
5 All electrical wiring and motors labeled per contract document requirements. Yes	No
6 All control wiring and devices labeled per contract document requirements. Yes	No
7 Unit tags affixed. Yes	No
8 Belt tension verified and adjusted after 80 hours of operation. Yes	No

END OF SECTION

SECTION 01 35 71

Cx FUNCTIONAL PERFORMANCE TESTING

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes specifications for the implementation, tracking and verification of the commissioning process.

1.2 DEFINITIONS

- A. Cx: Commissioning.
- B. CxA: Commissioning Authority.
- C. BAS: Building Automation System.
- D. TAB: Testing, Adjusting, and Balancing.
- E. FPT: Functional Performance Test.

1.3 SUBMITTALS

- A. Contractor to supply construction schedule providing a minimum of 21 days prior to substantial completion for the functional testing of all commissioned systems. Schedule is to comply with general scheduling requirements specified under 013569-Commissioning (Cx) Process and shall provide sufficient time prior to specified testing period to meet contractor readiness notification requirements.
- B. CxA to provide Contractor with a proposed plan to implement the tests specified for approval in accordance with format, quantity and timeframe noted in this part. Plan to include the following on an hour/day schedule.
 - 1. Personnel to be in attendance
 - 2. Duration provided for each test
 - 3. Arrangement of tests to maximize personnel utilization and minimize down time required for test preparation.
- C. The following table contains deliverables and/or submittals required under this section, the party(s) responsible for each, the frequency and or timeline these items should be provided, the format and quantity to be provided, and the party(s) to be provided to.

Submittal	Party(s) Responsible	Frequency or Timeline	Format & Quantity	Party(s) Provided To
Review comments on draft	Contractor,	Within 7 days of	Electronic	СхА
FPT procedures	Architect	receipt of FPT		
		procedures		

Submittal	Party(s) Responsible	Frequency or Timeline	Format & Quantity	Party(s) Provided To
Final FPT procedures	CxA	Within 7 days of receipt of FPT procedure comments	Electronic	Contractor, Owner, Architect
Contractor readiness notification	Contractor	21 days prior to commencement of testing	Electronic	Contractor, Owner, Architect
FPT readiness confirmation	Contractor	14 days prior to commencement of testing	Electronic	CxA, Owner, Architect
FPT plan	СхА	7 days prior to commencement of testing	Electronic	Architect, Owner, Contractor
Remote Review Summary	CxA	Within 7 days prior to commencement of testing	Electronic	Architect, Owner, Contractor
Preliminary FPT report and list of deficiencies requiring action	СхА	Within 14 days of completion of testing	Electronic	Contractor, Owner, Architect
Resolution report for FPT deficiencies	Contractor	Within 7 days of receipt of report	Electronic	Architect, Owner and CxA
FPT Re-Testing readiness confirmation (if applicable)	Contractor	14 days prior to commencement of testing	Electronic	CxA, Owner, Architect
FPT re-test plan (if applicable)	СхА	7 days prior to commencement of testing	Electronic	Architect, Owner, Contractor
Final FPT report	CxA	Within 14 days of completion of re-testing (if applicable)	Electronic	Architect, Owner, Contractor
Preliminary seasonal testing report and list of deficiencies requiring action	СхА	Within 14 days of completion of testing	Electronic	Architect, Owner, Contractor
Resolution report for seasonal test deficiencies	Contractor	Within 7 days of receipt of report	Electronic	Architect, Owner, CxA
Seasonal Re-Testing readiness confirmation (if applicable)	Contractor	14 days prior to commencement of testing	Electronic	CxA, Owner, Architect
Final seasonal testing report	СхА	Within 14 days of receipt of report	Electronic	Architect, Owner, Contractor

1.4 TEST METHODS

A. FPT is achieved in accordance with the procedures outlined by the CxA and as outlined by the body of the Contract Documents. For the purpose of clarity CxA may require Contractor to employ one of the following methods below:

- 1. Simulated Conditions. Simulating conditions (not by an overwritten value) shall be allowed, though timing the testing to experience actual conditions is encouraged wherever practical.
- 2. Overwritten Values. Overwriting sensor values to simulate a condition, such as overwriting shall be allowed, but shall be used with caution and avoided when possible.
- 3. Simulated Signals. Using a signal generator which creates a simulated signal to test and calibrate transducers and DDC constants is generally recommended over using the sensor to act as the signal generator via simulated conditions or overwritten values.
- 4. Altering Setpoints. Rather than overwriting sensor values, and when simulating conditions is difficult, altering setpoints to test a sequence is acceptable.
- 5. Indirect Indicators. Relying on indirect indicators for responses or performance shall be allowed only after visually and directly verifying and documenting, over the range of the tested parameters, that the indirect readings through the control system represent actual conditions and responses.
- B. Sampling. Multiple identical pieces of non-life-safety or otherwise non-critical equipment may be functionally tested using a sampling strategy as defined by CxA within the Cx plan provided per 013569-Commissioning (Cx) Process.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. All standard testing equipment required to perform startup, initial checkout, additional testing and required functional performance testing shall be provided by Contractor for the equipment being tested.
- B. Special equipment, tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment, according to these Contract Documents shall be included in the basebid price to the Contractor and left on site, except for stand-alone datalogging equipment that may be used by the CxP.
- C. Datalogging equipment and software required to test equipment, if used, will be provided by the CxP, but shall not become the property of the Owner.
- D. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply:
 - 1. Temperature sensors and digital thermometers shall have a certified calibration within the past year to an accuracy of 0.5° F and a resolution of $+ \text{ or } 0.1^{\circ}$ F.
 - 2. Pressure sensors shall have an accuracy of + or -2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.
 - 3. All equipment shall be calibrated according to the manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.

PART 3 - EXECUTION

3.1 PURPOSE

A. The intent of the functional performance tests is to provide a formalized means to verify the completion and functional preparedness of the commissioned systems for operation and occupancy.

3.2 DEVELOPMENT PROCEDURE

- A. FPT procedures shall be developed for each system and equipment to be commissioned. For the purpose of clarity it can assumed the following tests with a total minimum duration of 50 hours will be required:
 - 1. Chilled Water System
 - 2. Hot Water System
 - 3. Air Distribution Systems
 - 4. Exhaust Systems
 - 5. Domestic Cold Water Systems
 - 6. Domestic Hot Water Systems
 - 7. Energy Management & Control Systems (BAS)
 - 8. Indoor Lighting and Control Systems
 - 9. Outdoor Lighting and Control Systems
 - 10. Energy Metering
 - 11. Miscellaneous HVAC Equipment
 - 12. Unitary AC Equipment
- B. Contractor and Architect are responsible to review the FPT procedures provided by CxA and provide any comments or issues related to the specified FPT procedures per the format, quantity and timeframe defined under SUBMITTALS for this section. Failure to provide comments on the FPT procedures shall constitute full acceptance as written and obligation of Contractor to full warrant the application, safety and warranty terms of the equipment and system under the conditions presented by the tests specified.
- C. Contractor and Architect are responsible to provide notice to CxA for any project modifications related to the addition or deletion of equipment and/or systems to be commissioned.
- D. CxA shall incorporate any comments from the Contractor and Architect that are not deemed in contradiction to the scope of the project, applicable codes and standards, and the OPR of the project.

3.3 CONTRACTOR READINESS

- A. The following conditions shall constitute the definition of contractor readiness. The Contractor shallbe responsible to formally provide written confirmation of compliance with all criteria per part 1.3 of this section, including sufficient background documentation as requested by CxA, Architect or Owner.
 - 1. Completed copies of all pre-functional checklists for equipment and systems pertaining to commissioned system and related systems.
 - 2. Written and approved notification of the resolution of all deficiencies, discrepancies and issues noted for equipment and systems pertaining to commissioned system.
 - 3. Completed and approved copies of all start-up, testing, certification and balancing reports specified for equipment and systems pertaining to commissioned system.

- 4. Documentation of preliminary functional testing results as performed by Contractor.
- B. Readiness requested by the contractor that is found to be incomplete or not have sufficient documentation supporting completion of all readiness criteria noted within this part as determined by the CxA, shall be deemed rejected and require re-submission by contractor with additional documentation as requested by CxA. Any and all delays, including additional costs incurred by Architect, Owner and CxA due to this rejection shall be the burden of the contractor at no additional cost to the Owner.

3.4 PRE-IMPLEMENTATION PROCEDURE

- A. The following is the permitted method the Contractor is to utilize prior to implementation of all FPT related to project. Any deviations from this procedure must be authorized by the CxA.
 - 1. CxA supplies Contractor and Architect with FPT procedures.
 - 2. Contractor and Architect review FPT procedures and provide comments to CxA.
 - 3. Contractor provides contractor readiness notification for commissioned systems per part 1.3 of this section.
 - 4. Contractor provides CxA with confirmation of FPT readiness per part 1.3 of this section.
 - 5. CxA provides Contractor with FPT plan per part 1.3 of this section.

3.5 IMPLEMENTATION PROCEDURE

- A. CxA is NOT responsible for the operation of equipment/systems and/or conducting the testing on the equipment/systems. CxA is only responsible for witnessing, reporting and approving the tests conducted by the Contractor. Contractor is fully responsible for operation of equipment/systems and conducting the testing on the equipment/system specified under the FPT procedures to the satisfaction of CxA. In addition, Contractor is responsible to ensure all equipment and systems are returned to normal operation state at conclusion of testing each day.
- B. The following is the permitted method the Contractor is to utilize for implementation of all FPT related to project. Any deviations from this procedure must be authorized by the CxA prior to testing.
 - 1. One week prior to scheduled start of testing, CxA shall perform a preliminary review of the BAS graphics and trends established by the contractor for all commissioned systems available. The CxA shall utilize this review as a means to determine the final readiness of the project to proceed with formal testing. If the CxA determines that the level of graphics, trending and/or issues noted are to a degree that warrant the delay to start testing, the CxA shall provide a recommendation of delay to the contractor, Architect and Owner with a summary of findings. Contractor shall then have 2 days to request a delay and submit a schedule for completion of noted issues to the CxA, Architect and Owner, or testing will remain scheduled to start as requested initially. If the CxA determines that the level of graphics, trending and/or issues noted are not to a degree that warrant the delay to start testing, the CxA shall provide a summary of findings to the contractor, Architect and Owner and no further action is required of the contractor.
 - 2. On day of scheduled test Contractor shall have personnel and tools present to accomplish test. If required personnel and/or tools are not present Contractor shall be responsible for re-testing in accordance with the requirements specified under RE-TESTING PROCEDURE of this section.
 - 3. Contractor shall ensure BAS and/or data logging equipment is set-up for trending specified for each test prior to initiation of test.

- 4. Contractor shall implement testing according to approved FPT procedures and plan unless directed by CxA.
- 5. If at any point, frequent failures are occurring and testing is requiring excessive troubleshooting, CxA may stop the testing and require the responsible Contractor to perform and document a checkout of the remaining units and systems, prior to continuing with functional testing. Failures of this nature shall constitute a re-test and handled in accordance with the guidelines specified for re-testing under this section.
- 6. If issues are identified during the test, CxA shall clearly identify the issue in the FPT report and via CxA provided web issues management system. Upon resolution of these issues Contractor shall supply CxA with report via CxA provided web issues management system detailing proposed method and schedule of resolution per the format, quantity and timeframe defined under SUBMITTALS for this section.
- C. CxA is solely responsible for defining what constitutes an issue during a test.
- D. At the completion and approval of all tests CxA shall provide Architect, Owner and Contractor with final copy of FPT results.
- E. The completion of the FPT does not eliminate the Contractor's responsibility for meeting other testing requirements in the specifications and drawings.

3.6 SEASONAL TESTING PROCEDURE

- A. Portions of or tests in whole are required to be run under near peak load conditions. For these instances the Contractor will be required to attend and implement seasonal tests under the direction of CxA.
- B. CxA shall develop and issue a seasonal test plan to Contractor 7 days prior to the commencement of seasonal testing, which shall have the same format and detail required for the FPT plan defined in this section.
- C. Contractor and CxA shall follow identical procedure defined for FPT under this section for all seasonal tests, including methods for issue resolution and re-testing.
- D. At the completion and approval of all tests CxA shall provide Architect, Owner and Contractor with final copy of seasonal test report.
- E. The completion of the seasonal tests does not eliminate the Contractor's responsibility for meeting other testing requirements in the specifications and drawings.

3.7 NON-CONFORMANCE AND APPROVAL OF TESTING

- A. Non-Conformance
 - 1. If any deficiencies or non-conformance are noted the Contractor shall remedy said issues until satisfactory performance is achieved in accordance with re-testing guidelines provided under this section and inform Architect and CxA of completion for re-testing per the format, quantity and timeframe defined under SUBMITTALS for this section.
- B. Failure Due to Manufacturer Defect

- 1. If 10%, or three, whichever is greater, of identical pieces of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the Architect or Owner. In such case, the Contractor shall provide the Owner with the following:
 - a. Within 7 days of notification from the Architect or Owner, the Contractor or manufacturer's representative shall examine all other identical units making a record of the findings.
 - b. Within 14 days of the original notification, the Contractor or manufacturer's representative shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittab to the Architect, Owner and CxA. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
 - c. Within 14 days of Contractor/Manufacturer's Representative report issuance Architect, Owner and CxA will determine whether a replacement of all identical units or repair proposed is acceptable.
 - d. Two examples of the proposed solution will be installed by the Contractor within 30 days of approval and the Architect, Owner and CxA will be allowed to review and test the installations/repairs for up to 7 days. Upon the end of this review and test period the Architect and Owner will decide whether to accept the solution. Cost of this re-testing for Architect, Owner and CxA shall fall under the guidelines for re-testing presented in this section.
 - e. Upon acceptance, the Contractor and/or manufacturer's representative shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within 7 days from when parts can be obtained.
- C. All deficiencies, non-conformance items and failures due to manufacturer defects shall be resolved by Contractor and verified and/or re-tested by CxA no later than 60 days from issuance of FPT report. Contractor shall coordinate with Architect, Owner and CxA to ensure acceptable resolution of items within this time period, or Owner reserves the right to withhold or alter the substantial completion to concur with final acceptance of these items.

D. Approval.

1. CxA shall have the sole responsibility of determining the satisfactory completion and approval of any and all functional and seasonal tests. CxA shall provide Architect, Contractor and Owner with formal approval of each functional and seasonal test as part of the final FPT report and via the CxA provided web issues management system.

3.8 RE-TESTING PROCEDURE

- A. CxA is responsible for attendance at one attempt per test, where an attempt is defined as the participation and attendance at a test at the time approved under the FPT readiness conformation.
- B. Any requirement for a re-test for a given test shall constitute the back charge to the responsible Contractor by the Owner for the attendance of CxA. A re-test shall be defined in this context as any time where a test defined under this section for the project cannot be fully executed due to any of the following conditions:

- 1. Date and time of test changed without a minimum of 3 days notice to CxA.
- 2. Improper or insufficient personnel and/or tools on site at time of test.
- 3. Deficiencies or discrepancies present at time of test that have been previously noted by CxA and remain unresolved.
- 4. Any issues that require stoppage of tests in progress that result in an incomplete test or inability to execute other tests within schedule time period.
- 5. ANY failure of test or portion of test for reason under responsibility of Contractor and/or Contractor responsible for sub or feed system (i.e. controls, electrical, etc.).
- 6. ANY failure due to manufacturer defect.
- C. The Contractor is responsible for all costs associated with re-testing, including any costs incurred by the Architect and/or Owner.
- D. Re-testing by Contractor shall not be considered a reason for a claim of delay or for a time extension by the Contractor.
- E. If any sample selected has a failure rate greater than or equal to 10% an additional sample equal to the number of units that failed shall be selected and treated as a re-test in accordance with re-testing guidelines provided under this section. This shall be in addition to the requirement to re-test the failed units.

END OF SECTION

SECTION 11 40 00

FOODSERVICE EQUIPENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes equipment for foodservice facilities indicated on the Drawings.
- B. Related Sections include the following:
 - 1. Division 03 Section "Cast-in-Place Concrete" for the following:
 - a. Requirements for slab depressions. (Walk-in Freezer/Cooler)
 - 2. Division 05 Section "Metal Fabrications" for equipment supports.
 - 3. Division 07 Section "Roof Accessories" for roof curbs and equipment supports.
 - 4. Division 22 & 23 Sections "Mechanical" for plumbing and HVAC systems.
 - 5. Division 26 Section "Electrical" for general electrical systems.
 - 6. Division 21, 22, and 23 Sections for supply and exhaust fans; exhaust ductwork; service roughing-ins; drain traps; atmospheric vents; valves, pipes, and fittings; fire-extinguishing systems; and other materials required to complete foodservice equipment installation.
 - 7. Division 23 Section "Commercial Kitchen Hoods" for ventilation hoods.
 - 8. Division 26 Sections for connections to fire alarm systems, wiring, disconnect switches, and other electrical materials required to complete foodservice equipment installation.
 - 9. PLUMBING DEVICES, FAUCETS, VALVES, FITTINGS, TEMPERATURE REGULATORS, AND SIMILAR ITEMS, shall be furnished and installed by the Plumbing Subcontractor unless specified in the Itemized Specifications.
 - 10. ELECTRICAL EQUIPMENT AND DEVICES, SWITCHES, STARTERS, AND CONTROLS, in fabricated equipment items shall be factory installed and of the proper type in accordance with the National Electrical Code. All devices shall be listed or recognized by Underwriters' Laboratories, Inc. Set controls that are mounted on vertical surfaces of fabricating fixtures, into recessed die stamped stainless steel cups or otherwise indent to prevent damage. EC shall provide electrical devices not supplied or specified herein.

C. DEFINITIONS & ABBREVIATIONS

A. NATIONAL SANITATION FOUNDATION (NSF). Construct Equipment in compliance with the standards of the National Sanitation Foundation and in full compliance with the

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Public Health Regulations of the County and State. Each piece of equipment shall have the "seal of approval" label of the National Sanitation Foundation.

B. REGULATIONS AND STANDARDS. Construct equipment in compliance with the following applicable codes, regulations, and standards. In case of conflict between the following standards, the most stringent requirements shall govern:

Americans with Disabilities Act (ADA)

American Gas Association (AGA)

American National Standards Institute (ANSI)

American Society of Heating, Ventilating & Air

Conditioning Engineers (ASHRAE)

American Society of Mechanical Engineers (ASME)

American Society for Testing and Materials (ASTM)

National Electrical Code (NEC)

National Electrical Manufacturers Association (NEMA)

National Fire Protection Association (NFPA)

Underwriters Laboratories Inc. (UL)

C. ABBREVIATIONS

EC - Electrical Contractor

FSEC – Foodservice Equipment Sub-Contractor

GC - General Contractor

HVAC – Heating, Ventilating and Air Conditioning

Contractor

PC – Plumbing Contractor

MC - Mechanical Contractor

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

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- 1. Manufacturer's model number.
- 2. Options, accessories, and components that will be included for Project.
- 3. Clearance requirements for access and maintenance.
- 4. Utility service connections for water, drainage, power, and fuel; include roughing-in dimensions.
- B. Shop Drawings: For fabricated equipment and special needs as required within these written specifications for successful project completion. Include plans, elevations, sections, roughing-in dimensions, fabrication details, utility service requirements, and attachments to other work.
- C. Coordination Drawings: For foodservice facilities.
 - 1. Indicate locations of foodservice equipment and connections to utilities.
 - 2. Key equipment using same designations as indicated on Drawings.
 - 3. Include plans and elevations; clearance requirements for equipment access and maintenance; details of support for equipment; and utility service characteristics.
 - 4. Include details of seismic bracing for equipment if required by local code.
- D. Samples for Initial Selection: For units with factory-applied color finishes.
- E. Samples for Verification: For each factory-applied color finish required, in manufacturer's standard sizes.
- F. Operation and Maintenance Data: For foodservice equipment to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Closeout Procedures & Operation and Maintenance Data," include the following:
 - 1. Product Schedule: For each foodservice equipment item, include the following:
 - a. Designation indicated on Drawings.
 - b. Manufacturer's name and model number.
 - c. List of factory-authorized service agencies including their addresses and telephone numbers.
- G. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. NSF Standards: Provide equipment that bears NSF Certification Mark or UL Classification Mark certifying compliance with applicable NSF/ANSI standards.
- B. BISSC Standards: Provide bakery equipment that complies with BISSC's "Sanitation Standards for the Design and Construction of Bakery Equipment and Machinery."
- C. UL Certification: Provide electric and fuel-burning equipment and components that are evaluated by UL for fire, electric shock, and casualty hazards according to applicable safety standards and that are UL certified for compliance and labeled for intended use.
- D. Steam Equipment: Provide steam-generating and direct-steam heating equipment that is fabricated and labeled to comply with ASME Boiler and Pressure Vessel Code.

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- E. Regulatory Requirements: Install equipment to comply with the following:
 - 1. ASHRAE 15, "Safety Code for Mechanical Refrigeration."
 - 2. NFPA 54, "National Fuel Gas Code."
 - 3. NFPA 70, "National Electrical Code."
 - 4. NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations."
- F. Seismic Restraints: Comply with SMACNA's "Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines," Appendix A, "Seismic Restraint Details," if required by code unless otherwise indicated.
- G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
- H. FSEC to provide faucets, pre-rinse units, hose reels, etc. by the same manufacturer.

1.5 PROJECT CONDITIONS

A. Field Measurements: Indicate measurements on Coordination Drawings.

1.6 COORDINATION

- A. Coordinate foodservice equipment layout and installation with other work, including lighting fixtures, HVAC equipment, and fire-suppression system components.
- B. Coordinate location and requirements of utility service connections.
- C. Coordinate size, location, and requirements of the following:
 - 1. Overhead equipment supports.
 - 2. Equipment bases.
 - 3. Floor depressions.
 - 4. Insulated floors.
 - 5. Floor areas with positive slopes to drains.
 - 6. Floor sinks and drains serving foodservice equipment.
 - 7. Roof curbs, equipment supports, and penetrations.
 - 8. Equipment that requires thru-wall or in-wall installation.
- D. It is the responsibility of the FSEC to visit the job site and determine that adequate access to the kitchen area will allow for a successful installation of equipment. FSEC to verify all delivery access points, corridor, doorway, elevator, or other building constraints may prevent the equipment to be moved into place as specified. Any required changes to equipment specifications or, alteration of specified equipment, in order to properly install said equipment shall be reported immediately to the general contractor or construction manager so that accommodations can be made to address the issue.
- E. MECHANICAL AND ELECTRICAL ROUGH-INS. Examine roughed-in mechanical and electrical services, and installation of floors, walls, columns and conditions under which the work

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is to be installed. Notify the General Contractor of unsatisfactory conditions for proper installation of food service equipment.

- 1. Visit the job site to check mechanical and electrical rough-ins, prior to the installation of concrete floor.
- 2. Cost to relocate or add utility lines due to failure of the Foodservice Equipment Contractor Subcontractor to indicate their proper location on the rough-in shop drawings, will be assumed by the Foodservice Sub-Contractor.
- 3. THOUROUGHLY REVIEW Architectural, Mechanical and Electrical Drawings, and visit the project site as necessary to coordinate construction of all partitions prior to delivery of food service equipment.
- 4. PROVIDE information to all trades at an early date a list of all equipment requirements that are relevant to that trade. Assist with hook-ups as necessary.
- F. GENERAL INFORMATION CONCERNING EQUIPMENT AND WALK-IN INSTALLATION
 - 1. FSEC shall ASSEMBLE AND ERECT ALL EQUIPMENT ITEMS in the locations shown on the Drawings. Set up items plumb and level, ready for final plumbing, electrical, and ventilating connections. GC shall erect walk-in unit for final connections.
 - 2. FSEC shall CAULK BETWEEN WALLS and sinks, tables, and dish tables where backsplashes sit against walls. Caulking shall be CLEAR silicone, applied in a narrow smooth bead.
 - 3. FSEC shall INSTALL CLOSURE PANELS, TRIM STRIPS, and WALL FLASHING where required with matching metal using mastic or other fastener made of stainless steel or non-corrosive material. Trim Strips at top of backsplashes are not permitted. Equipment must fit within ¹/₄" of walls. GC shall verify if closure panels are required above walk-in unit with CPS.
 - 4. GC shall INSTALL INTERCONNECTING REFRIGERATION PIPING and insulation required for the walk-in cooler/freezer. All piping and insulation routed in the ceiling plenum shall comply with ASTM E-84 flame spread 25/smoke density-50). COORDINATE installation with general contractor. GC to start up and test unit.
 - 5. GC shall COMPLETE ERECTION OF ALL WALK-IN PANELS, including all necessary caulking.
 - 6. GC shall INSTALL BEAM AND POST SECTIONS in accordance with manufacturer's recommendations in the location indicated on the plan if required.
 - 7. GC shall MOUNT ALL INTERIOR CEILING LIGHTS where indicated. GC to wire all lights to "J" boxes and wire freezer condenser and evaporator, with defrost timer. GC shall also wire all other components, such as alarms, pressure relief ports, door & window heaters, etc.
 - 8. GC shall HANG EVAPORATOR COILS where indicated on drawing.
 - 9. GC shall coordinate and SET CONDENSING UNITS WHERE INDICATED. GC shall install all refrigeration lines. GC to install electrical wiring between condensing unit and evaporator coils and make final connections. GC to inter-wire freezer condenser and evaporator with time clock.
 - 10. GC to INSTALL HEAT TAPE and INSULATION ON FREEZER and COOLER DRAIN LINES and INSULATE REFRIGERATION LINES.
 - 11. GC shall install COPPER CONDENSATE line from evaporator to discharge outside of walk-in. Furnish "P" trap in drain line outside of freezer. Furnish drain line heater in freezer before insulating drain line. "T" freezer drain line with cooler drain line inside of cooler and discharge outside of walk-in. GC shall provide and install copper drain lines from evaporators to floor sink. GC to provide and install heat tape and insulation for drain

lines. GC to provide a P-trap on drain line at exterior of freezer/cooler ahead of termination at floor sink.

- 12. GC shall FOAM ALL PENETRATIONS before sealing with silicone.
- 13. FSEC shall TAG AND LABEL ALL KEYS with plastic identification tags and deliver to the owner.
- 14. GC to make all necessary electrical connections to switches, lights, condensers, evaporators, pressure relief ports, door heaters, etc. to insure a complete installation per manufacturer instructions.
- 15. GC SHALL wire lights and fan switches on exhaust hood. EC to provide shunt trip.
- 16. EC shall provide conduit from the Ansul system to the pull-down station.
- 17. Mechanical gas shunt trip valve to be provided by the FSEC to the PC.

1.7 TESTING AND DEMONSTRATING EQUIPMENT

- A. DELAY START-UP of food service equipment until lines have been tested, balanced, and adjusted for pressure, voltage and similar considerations; and until water lines have been cleaned and treated for sanitation.
- B. TEST EACH EQUIPMENT ITEM to demonstrate that it is operating properly, and that controls and safety devices are functioning. Repair or replace equipment that is found to be defective or operating with excess noise or vibration.
- C. FINAL TEST AND DEMONSTRATION OF EQUIPMENT shall be conducted by the Food Service Equipment Subcontractor in the presence of the Owner or his representative after all connections have been made. Notify the architect and consultant of start-up and demonstration dates. Qualified technicians (Manufacturers Representatives) shall instruct Owner personnel in proper function, adjustment methods, maintenance and care of each piece of equipment herein specified, to the complete satisfaction of the Owner. The respective manufacturer's representative shall demonstrate all cooking equipment. FSEC project manager needs to be present at time of all demonstrations.
- D. SCHEDULE DEMONSTRATION OF EQUIPMENT with Owner. Provide written notice of demonstration date to the Architect, General Contractor and Consultant, at a minimum of 7 days prior the scheduled date.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 - 2. Products: Subject to compliance with requirements, provide one of the products specified. If only one product is specified provide that product only.
 - 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

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- 4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified. If only one product is specified provide that product only.
- 5. Basis-of-Design Product: The design for foodservice equipment item is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.
- 6. All equipment shall be the latest manufacturers' model. Equipment specified by model number shall include all standard and any optional accessories as specified.
- 7. All equipment including custom and/or customized equipment shall each have a model number that includes the code *M125 as a suffix. This code is known as the Specifier Identification System. It is not to be removed by the bidders. Its purpose is to identify the specifier to the vendors providing equipment in the event it is necessary to communicate questions, clarifications and comments, from prior to bid award through the final purchase. It is to be used on all correspondence including fax and email when communicating with manufacturers' representatives and factories.
- B. <u>All equipment specified herein shall be basis of design products unless noted as "No Substitution"</u>. Foodservice Equipment Contractor shall submit for approval all requests for substitution against basis of design product at least two weeks prior to bid submittal. Failure to submit substitution request for products other than basis-of-design will result in FSEC being required to provide basis-of-design product only and any non-approved product will be returned to the FSEC.
- C. <u>ANY COSTS that result in changes to utility connections or dimensional variations that result in changes to the layout of the space, based upon "equal or substituted equipment", shall be at the sole expense of the FSEC.</u>

2.2 FABRICATED EQUIPMENT

- A. Where specifications state a basis-of-design product or Custom Fabricator in the manufacturer category, the FSEC can select a fabricator who will build the piece of equipment around the specifications of the basis-of-design product providing that the fabricator produce shop drawings for submittal and that the fabricator meets the requirements as specified in this section and as described below. All fabrication items to be produced by a single fabricating company. Multiple fabricators will only be allowed with prior approval from the consultant.
- B. Plant, Personnel and Facilities. Fabricated equipment described in the following specifications other than by name or catalog numbers, shall be manufactured by an equipment fabricator who has the plant, personnel and engineering facilities to properly design, detail and manufacture high quality foodservice equipment. The fabricator is subject to the approval of the architect and consultant.
- C. The fabricator shall have been engaged in the manufacture and distribution of foodservice equipment for the past ten years, or longer, as required under the Contract, as his principal product.
- D. Standard products and materials specified herein shall be furnished by manufacturers regularly engaged in the production of such materials, products and equipment and shall be of the manufacturers latest design that complies with the written specifications.

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- E. A competent foreman or supervisor and qualified workers shall be provided for installation of equipment and to counsel with other trades in regard to the installation and connections.
- F. Materials:
 - 1. Stainless Steel: ASTM A 666, with No. 4 finish (directional satin finish) on exposed surfaces.
 - 2. Galvanized Steel: ASTM A 653/A 653M, G90 coating designation; commercial-quality, cold-rolled steel that is zinc coated by the hot-dip process and chemically treated.

2.3 ITEMIZED SPECIFICATIONS

ITEM 01 - CASH REGISTER STAND (2 REQUIRED)

Randell Model RAN CA

RanServe Cash Register Stand, 30" L, 30" D, 35" H, portable with locking cash drawer, foot rest & cash register cord hole, 14 gauge stainless steel top with interchangeable laminate body panels, swivel casters (2 locking). Provide 90-day labor warranty standard and 1 yr. parts warranty standard. Furnish Model RSEXTLAM-CA Laminate Exterior (color by Architect/Owner), Model RSTOP14G30 Top, 14 gauge stainless steel 30" unit, Model RAN INV30-C Inverted Round Tray Slide, 10" deep, customer side, and 6" Casters, standard.

ITEM 02 - MILK COOLER (2 REQUIRED)

True Food Service Equipment Model TMC-49-S-SS-HC

Mobile Milk Cooler, FORCED-AIR, (12) crates, stainless steel drop front/hold-open flip-up lids, lock, 33-38°F, stainless exterior, stainless steel interior & floor, (3) heavy duty floor racks, digital thermometer, 4" castors, R290 Hydrocarbon refrigerant, 1/5 HP, 115v/60/1, 2.7 amps, 9' cord, NEMA 5-15P, cULus, UL EPH Classified, MADE IN USA. Provide Self-contained refrigeration, Warranty - 5 year compressor, Warranty - 3 year parts and labor, and4" Castors, standard.

ITEM 03 - COLD PAN SERVING COUNTER (2 REQUIRED)

Randell Model RAN SCA-4S

RanServe Cold Food Table, refrigerated cold pan, 60" L, 30" D, 35" H, mobile modular, 4-pan size, open base, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking), 1/4 HP. Provide 90-day labor warranty standard, 1 yr. parts warranty standard, Model CW5 5 yr. compressor warranty, 115v/60/1-ph, 5.0 amps, NEMA 5-15P, standard. Furnish Model RSEXTLAM-60 Laminate Exterior (color by Architect/Owner), Model RSTOP14G60 Top, 14 gauge stainless steel 60" unit, Model RAN SBS60 Single Sided Buffet Shield, 60" L, stainless steel top, acrylic insert, Model RSBORSWB-60 Flat Work Board, 60", stainless steel server side, Model RAN INV60-C Inverted Round Tray Slide, 10" deep, customer side, 6" Casters, standard.

ITEM 04 - UTILITY SERVING COUNTER (2 REQUIRED)

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Randell Model RAN ST-2S

RanServe Utility Unit, 24" L, 30" D, 35" H, mobile modular, open cabinet base with 2 shelves, 16 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking). Provide 90-day labor warranty standard, 1 yr. parts warranty standard, Model RSEXTLAM-24 Laminate Exterior (color byu Architect/Owner), for 24" units, Model RSTOP14G24 Top, 14 gauge stainless steel 24" unit, Model RSBORSWB-24 Flat Work Board, 24", stainless steel server side, Model RAN INV24-C Inverted Round Tray Slide, 10" deep, customer side, 6" Casters, standard.

ITEM 05 - HOT FOOD SERVING COUNTER (2 REQUIRED)

Randell Model RAN HTD-4S

RanServe Hot Food Table, electric, 60" L, 30" D, 35" H, mobile modular, (4) 12" x 20" hot food wells, open cabinet base with sliding doors, 14 gauge stainless steel top, laminate exterior with galvanized backing, swivel casters (2 locking). Provide 90-day labor warranty standard, 1 yr. parts warranty standard, 208v/60/1-ph, 21.2amps, NEMA 6-30P, Model RSEXTLAM-60 Laminate Exterior (color by Architect/Owner), for 60" units, Model RSTOP14G60 Top, 14 gauge stainless steel 60" unit, Model RAN CP60-GL Counter Protector, for 60" units, with glass top, Model RSBORSWB-60 Flat Work Board, 60", stainless steel server side, Model RAN INV60-C Inverted Round Tray Slide, 10" deep, customer side, 6" Casters, standard.

ITEM 06 - WIRE SHELVING UNIT (1 REQUIRED)

Eagle Group Model S4-74-2472E

Starter Shelving Unit, 4-tier, 72"W x 24"D x 74"H, wire shelves with patented QuadTruss® design, (4) 74"H posts, EAGLEgard® hybrid epoxy finish with MICROGARD® antimicrobial protection, KD, NSF.

ITEM 07 - REFRIGERATOR RACK, ROLL-IN (6 REQUIRED)

Eagle Group Model 4337 or Channel

Lifetime Series Roll-In Refrigerator, universal, 21-1/2" x 26" x 64"H, heavy duty, (11) 18" x 26", (10) 12" x 20", (22) 13" x 18", or (22) 14" x 18" pan capacity, slides on 5" centers, fully welded aluminum construction, (4) 5" x 1-3/8" non-marking swivel plate casters, NSF.

ITEM 08 - ROLL-IN HEATED CABINET (2 REQUIRED)

True Food Service Equipment Model STR1HRI89-15-

SPEC SERIES® Heated Roll-in, 89"H, one-section, stainless steel front & sides, (1) stainless steel doorwith lock, cam lift hinges, color-coded temperature display, stainless steel interior, interior lighting,stainless steel ramp, 2KW, 115/208-230v/60/1, cULus, UL EPH Classified, MADE IN USA. Warranty-3 year parts and labor, Provide Thermometer side: Doors hinged as shown on FS plan drawing.

ITEM 08 - ROLL-THRU HEATED CABINET (2 REQUIRED)

True Food Service Equipment Model STA1HRT89-1S-1S

SPEC SERIES® Heated Roll-thru, 89"H, one-section, stainless steel front & sides, (1) stainless steel door front & rear, locks, cam-lift hinges, color-coded temperature display, aluminum interior, interior lighting,

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stainless steel ramps, 2KW, 115/208-230v/60/1, NEMA 14-20P [accommodates 27"Wx29"Dx72"H cart, NOT included], cULus, UL EPH Classified, MADE IN USA. warranty - 3 year parts and labor, Provide Thermometer side: Doors hinged as shown on FS plan drawing.

ITEM 09 - ROLL-THRU REFRIGERATOR (2 REQUIRED)

True Food Service Equipment Model STR1RRT-1S-1S

SPEC SERIES® Roll-thru Refrigerator, stainless steel front & sides, (1) stainless steel door front & rear with locks, cam-lift hinges, digital temperature control, stainless steel interior, incandescent interior lighting, stainless steel ramps, 1/3 HP, 115v/60/1, 8.9 amps, 9' cord, NEMA 5-15P [accommodates 27"Wx29"Dx66"H cart, NOT included], cULus, UL EPH Classified, MADE IN USA. Warranty - 3 year parts and labor, Warranty - 5 year compressor, Doors hinged as shown on FS plan drawing.

ITEM 10 - CONVECTION OVEN (2 REQUIRED)

Vulcan Model VC66GD

Convection Oven, gas, double-deck, bakery depth, solid state controls, electronic spark igniters, 60 minute timer, 8" high legs, stainless steel front, top and sides, stainless steel doors with windows, 50,000 BTU each section, NSF, CSA Star, CSA Flame. 1 year limited parts & labor warranty, standard. K12 School Nutrition extended warranty extends the warranty for 12 months beyond the 12 month. Natural gas, (2) 120v/60/1-ph, (2) 1/2 HP, 16.0 amps total, (2) 6' cords with plugs, NEMA 5-15P, standard. Provide Gas manifold piping included with stacking kit to provide single point gas connection, Simultaneous doors, both ovens, Model 3/4QD HOSE-4 3/4" x 4' long gas flex hose & quick disconnect, 2 sets Casters.

ITEM 11 - CONVECTION STEAMER (2 REQUIRED)

Groen Model VRC-6E

Convection Steamer, connectionless, electric, countertop, (6) 12" x 20 x 2-1/2" pan capacity, 4 gallon capacity water reservoir, manual controls, electronic timer, left-hinged door, manual fill & drain, stainless steel construction, 4" legs, 9.0 kW, 208v/60/3-ph, 25.0 amps, NEMA 15-50P, UL, cUL, NSF, ENERGY STAR®. K-12 School Two year parts and labor warranty. Provide stacking stand for 2 units. Verify stand type to hold two VRC-6E steamers.

ITEM 12 - EXHAUST HOOD (1 REQUIRED)

Specifier I.D. #M125

Basis of Design Product: Halton Model EO

The hood shall be Type II. 129"L x 65"D x 24"H/ Duct collar shall be 13"x12" providing 1926 CFM @ 0.33"SP. The kitchen hood shall be constructed from 18 gauge stainless steel. The kitchen hoods shall be supplied complete with outer casing / main body, inner liner, exhaust duct, baffle plates, condensate channel, drain tap and assembly brackets. Outer casing panels shall be constructed of stainless steel with a brushed satin finish. Each joint shall be welded and liquid tight, avoiding harmful dripping of condensation. All exposed welds are ground and polished to the original finish of metal. Condensation is achieved by the use of angled internal baffles and deflectors. Efficient exhaust is maintained by using lateral side slots combined with the large internal volume. Furnish two (2) LED surface mount vapor proof light fixture(s). The lighting shall be suitable for single-phase power supply and shall be UL listed

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LED type, suitable for condensate hoods. Condensate channels guttering shall form part of the main construction of the canopy and run the entire perimeter of the hood. The drain tap shall be manufactured from stainless steel. Hood shall be hung so that bottom edge of hood is 80"AFF.

ITEM 13 - WORK TABLE (1 REQUIRED)

Eagle Group Model T3696SEM

Spec-Master® Marine Series Work Table, 96"W x 36"D, 14/300 series stainless steel top, box marine edge on all sides, adjustable 18/300 series stainless steel undershelf with marine edge, Uni-Lok® gusset system, (4) stainless steel legs & adjustable bullet feet, NSF. Provide (1) integral three drawer unit (TD#) at location shown on FS plan drawings.

ITEM 14 - HAND SINK (3 REQUIRED)

Eagle Group Model HSA-10-FA

Hand Sink, wall mount, 13-1/2" wide x 9-3/4" front-to-back x 6-3/4" deep bowl, 304 stainless steel construction, splash mount gooseneck faucet, P-trap & tail piece, basket drain, deep-drawn seamless design-positive drain, inverted "V" edge, NSF. Provide Model -MG MicroGard[™] antimicrobial finish on bowl only, Model 306495 Standard Gooseneck Faucet, with wrist handles, splash mount, 4" O.C., NSF, and Model 606396 Side Mount Wall Brackets, pair.

ITEM 15 - WORK TABLE (1 REQUIRED)

Eagle Group Model T3696SEM

Spec-Master® Marine Series Work Table, 72"W x 36"D, 14/300 series stainless steel top, box marine edge on all sides, adjustable 18/300 series stainless steel undershelf with marine edge, Uni-Lok® gusset system, (4) stainless steel legs & adjustable bullet feet, NSF. Provide (1) integral three drawer unit (TD#) at location shown on FS plan drawings. Furnish with 24" x 24" x 9.5"D sink as shown on FS plan drawings. Furnish DECK MOUNT FAUCET, Fisher Model 3313, Faucet, 8" c/c deck mount, mixing valve, 12" swing spout, with 1/2" inlets. Provide (1) each Fisher Model 24082 Twist Waste Standard Valve, 3-1/2" industry standard sink opening, 1-1/2" drain outlet, flat strainer, 12 GPM drain rate, stainless steel, CSA.

ITEM 16 - DECK MOUNT FAUCET (1 REQUIRED)

Fisher Model 3313 Faucet, 8" c/c deck mount, mixing valve, 12" swing spout, with 1/2" inlets

ITEM 17 - WORK TABLE (1 REQUIRED)

Eagle Group Model T3684SEM-BS

Spec-Master® Marine Series Work Table, 84"W x 36"D, 4-1/2"H backsplash, 14/300 series stainless steel top, box marine edge on front & sides, adjustable 18/300 series stainless steel undershelf with marine edge, Uni-Lok® gusset system, (6) stainless steel legs & adjustable bullet feet, NSF. Furnish with

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24" x 24" x 9.5"D sink as shown on FS plan drawings. Provide (1) each Fisher Model 24082 Twist Waste Standard Valve, 3-1/2" industry standard sink opening, 1-1/2" drain outlet, flat strainer, 12 GPM drain rate, stainless steel, CSA.

ITEM 18 - WALL / SPLASH MOUNT FAUCET (1 REQUIRED)

Fisher Model 13218 Faucet, backsplash mount, 8" c/c, 16" long swing spout, 1/2" inlets.

ITEM 19 - SPARE NO.

ITEM 20 - THREE (3) COMPARTMENT SINK (1 REQUIRED)

Eagle Group Model FN2860-3-24-14/3

Spec-Master® FN Series Sink, three compartment, 114"W x 35"D, 14/304 stainless steel top, 20" wide x 28" front-to-back x 14" deep compartments, 24" drainboards on left & right, 9-1/2"H backsplash with 1" upturn & tile edge, (2) sets of 8" O.C. splash mount faucet holes, rolled edges on front & sides, includes 3-1/2" basket drains, stainless steel cross-bracing on all sides, stainless steel legs & adjustable bullet feet, NSF. Provide (3) each Fisher Model 24082 Twist Waste Standard Valve, 3-1/2" industry standard sink opening, 1-1/2" drain outlet, flat strainer, 12 GPM drain rate, stainless steel, CSA.

ITEM 21 - WALL / SPLASH MOUNT FAUCET (2 REQUIRED)

Fisher Model 13269 Faucet, backsplash mount, 8" c/c, 12" long swing spout, 1/2" inlets

ITEM 22 - UTILITY CART (3 REQUIRED)

Lakeside Manufacturing Model 947

Tough Transport® Utility Cart, 2-tier, 42"W x 25-7/8"D x 37-3/8"H, stainless steel construction, open base U-frame with angled stainless steel, 24" x 36" 14-gauge shelves with reinforced edges, 21" shelf clearance, 1" O.D. tube push handle with bumpers, (2) 6" bumpers riveted to front legs, 1000 lb. capacity, (2) 5" reinforced swivel plate casters & (2) 8" fixed casters with non-marking polyurethane wheels, NSF 3 ea Casters, (2) 5" swivel, (2) 8" fixed, cushion tread, std

3 ea Wall-Saver perimeter bumpers

ITEM 23 - GARBAGE/RECYCLE STATION (1 REQUIRED)

Custom

Available Manufacturers:

Eagle Advance Tabco Sparks Custom Fabrication IEI

Recycling counter to be fabricated of 14 gauge, Type 304, stainless steel (see FS-1.08 for elevation drawing) with two hat channels and sound deadening to run the length of the shelf. Sink unit shall be a

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closed base cabinet unit with lockable double-pan cabinet doors. Cabinet shall measure 44"W x 30" frontto-back, x 31"H. Sink shall be 40"L x 20" W x 8.5"D. Backsplash to be 9"H with 45 degree turn up at top. 30"W steel shelf shall be field welded to sink cabinet and extend 7'-5" to each side of the sink unit. Provide galvanized steel cantilever brackets to support shelf at rear and space support brackets at 29" OC as shown on elevation detail to accommodate recycle bins. Provide 1' x 1' cut outs in shelf at intervals shown. Support free end of shelf with 16 gauge stainless steel tubing legs and cross rails. Edge detail for shelf shall be inverted V. Provide (1) ea Fisher Model 13218-Faucet, wall/backsplash mount, 8" C.C., 16" long swing spout, 1/2" inlets and (1) ea Fisher Model 22209 waste valve, with flat strainer, 12 GPM drain rate, cast red brass body.

ITEM 24 - WASTE CANS (18 REQUIRED)

Basis of Design Product: Rubbermaid Model FG264300GRAY & 395873 BLUE Available Manufacturers: Thunder Group Continental

Furnish (6) Six Container, without lid, 44 gallon, 24"D x 31-1/2"H, round, reinforced rims, built in handles, double rimmed base, high-impact plastic construction, gray, NSF. Provide (6) Model FG264560BLA container lids, 24-1/2"D x 1-1/2"H, black and (6) Model FG264043BLA quiet dollys, 18-1/4"D x 6-5/8"H, non-marking blue casters, black.

Furnish (12) Twelve Recycling Container, 35 gallon, 19-1/2" x 27-5/8"H, square, with recycle symbol, durable, easy-to-clean, dark blue. Furnish recycling label kit, includes: 11 color-coded symbol labels and three sets of 11 word labels in English, French, and Spanish.

ITEM 25 - WALK IN COMBINATION COOLER/FREEZER (1 REQUIRED)

Nor-Lake or Thermo-Kool

(Thermo-Kool drawing shown on FS-1.10 for reference ONLY-submittal drawings required) Indoor Two Compartment Walk-In, 8' x 16' x 7'-7" H, 8' x 8' & 8' x 8' compartments, smooth aluminum interior floor, 26 gauge embossed coated steel interior & exterior finish, self-closing doors with locking deadbolt handle. Condensers to be set as close to front of walk-in compartments as possible (preferred 1'-0" for ease of service).

1 each 15 year original equipment panel warranty

ITEM 26 - COOLER EVAPORATOR (1 REQUIRED)

See Item #27.

ITEM 27 - COOLER CONDENSER (1 REQUIRED)

- 1 each Model NAWD50RL0-Q Fast-Trak[™] Indoor Remote Refrigeration System, 35°F Cooler, 1/2 hp welded hermetic condensing unit, low profile ceiling mounted coil, R-404A refrigerant, quickconnect fittings, 115v/60/1-ph
- 1 each 18 Month Labor/Service and original equipment parts warranty
- 1 each 5 Yr compressor warranty (net)
- 1 each Pre-charged line set, 5' add Q-5 to model number (R-404A)
- 1 each 18 Month Labor/Service and original parts warranty
- 1 each Door size 36" x 78"

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1 each First Compartment Door hinged on left, specify door location with sketch

- 6 each Model 000695 Non-Skid Floor Strips, (shipped loose) price per strip
- 1 each Model 152117 48" LED light fixture (shipped loose)

1 each Model 123235 14" x 24" 3-pane unheated viewport with frame heater

ITEM 28 - FREEZER EVAPORATOR (1 **REQUIRED**) See Item #29.

ITEM 29 - FREEZER CONDENSER (1 REQUIRED)

- 1 each Model LAWD100RL4-Q Fast-Trak[™] Indoor Remote Refrigeration System, -10°F Freezer, 1 hp welded hermetic condensing unit, low profile ceiling mounted coil, R-404A refrigerant, quickconnect fittings, 208-230v/60/1-ph
- 1 each 18 Month Labor/Service and original equipment parts warranty
- 1 each 5 Yr compressor warranty (net)
- 1 each Pre-charged line set, 5' add Q-5 to model number (R-404A)
- 1 each 18 Month Labor/Service and original parts warranty
- 1 each Door size 36" x 78"
- 1 each Second Compartment Door hinged on left, specify door location with sketch
- 1 each Model 123236 14" x 24" 3-pane heated viewport with heated glass and frame heater
- 6 each Model 000695 Non-Skid Floor Strips, (shipped loose) price per strip
- 1 each Model 152117 48" LED light fixture (shipped loose)

ITEM 30 - WIRE SHELVING UNIT (10 REQUIRED)

(8) each Eagle Group Model S4-74-2442E

Starter Shelving Unit, 4-tier, 42"W x 24"D x 74"H, wire shelves with patented QuadTruss® design, (4) 74"H posts, EAGLEgard® hybrid epoxy finish with MICROGARD® antimicrobial protection, KD, NSF

(2) each Eagle Group Model S4-74-2448E

Starter Shelving Unit, 4-tier, 48"W x 24"D x 74"H, wire shelves with patented QuadTruss® design, (4) 74"H posts, EAGLEgard® hybrid epoxy finish with MICROGARD® antimicrobial protection, KD, NSF

ITEM 31 - POT & PAN SHELVING RACK (2 REQUIRED)

New Age Model PM2448

Pot & Pan Rack, mobile, 4-tier, 48"W x 24"D x 74"H, aluminum alloy construction, T-Bar shelf design adjustable in 2" increments, 1200 lb. capacity, 5" non-marking stem casters (#C440) with brakes, NSF, KD.

ITEM 32 - WIRE SHELVING UNIT (6 REQUIRED)

(4) each Eagle Group Model S4-74-2472E

Starter Shelving Unit, 4-tier, 72"W x 24"D x 74"H, wire shelves with patented QuadTruss® design, (4) 74"H posts, EAGLEgard® hybrid epoxy finish with MICROGARD® antimicrobial protection, KD, NSF. (1) each Eagle Group Model S4-74-2460E

Starter Shelving Unit, 4-tier, 60"W x 24"D x 74"H, wire shelves with patented QuadTruss® design, (4) 74"H posts, EAGLEgard® hybrid epoxy finish with MICROGARD® antimicrobial protection, KD, NSF. (1) each Eagle Group Model S4-74-2436E

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Starter Shelving Unit, 4-tier, 36"W x 24"D x 74"H, wire shelves with patented QuadTruss® design, (4) 74"H posts, EAGLEgard® hybrid epoxy finish with MICROGARD® antimicrobial protection, KD, NSF.

ITEM 33 - REACH-IN REFRIGERATOR (2 REQUIRED)

True Food Service Equipment Model STA2R-2S

SPEC SERIES® Refrigerator, Reach-in, two-section, stainless steel front & sides, (2) stainless steel doors with locks, cam-lift hinges, digital temperature control, aluminum interior, (6) chrome shelves, LED interior lights, 5" castors, 1/2 HP, 115v/60/1, 9.1 amps, NEMA 5-15P, cULus, UL EPH Classified, MADE IN USA, ENERGY STAR®. Warranty - 3 year parts and labor, Warranty - 5 year compressor,Left door hinged left, right door hinged right standard, (3) chrome shelves and shelf supports standard per section. 2 sets 5" castors, set of 4, standard.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. FSEC shall install foodservice equipment level and plumb, according to manufacturer's written instructions.
 - 1. Connection of equipment to utilities shall be performed by the trades. Coordinate and answer questions pertinent to the proper connection.
 - 2. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.
 - 3. FSEC shall be responsible for the complete installation of refrigeration, plumbing, and electrical connections of all walk-in refrigerators and freezers. FSEC shall provide start-up of units with a Factory Authorized Service Agent supervising. The Service Agent shall provide a report stating that the installation and connections have been completed as per manufacturer requirements.
- B. Complete equipment assembly where field assembly is required.
- C. Provide closed butt and contact joints that do not require filler.
 - 1. Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish.
- D. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and requirements of authorities having jurisdiction.
- E. Install closure-trim strips and similar items requiring fasteners in a bed of sealant.
- F. Install joint sealant in joints between equipment and abutting surfaces with continuous joint backing, unless otherwise indicated. Produce airtight, watertight, vermin-proof, sanitary joints.
- G. FSEC shall take every measure to provide a highly attractive fit and finish for all equipment items provided and installed. Extra care shall be taken

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3.2 CLEANING AND PROTECTING

- A. After completing installation of equipment, repair damaged finishes.
- B. Clean and adjust equipment as required to produce ready-for-use condition.
- C. Protect equipment from damage during remainder of the construction period.

3.3 **DEMONSTRATION**

A. Engage a factory-authorized service representative to train Owner's maintenance and kitchen personnel to adjust, operate, and maintain foodservice equipment. Refer to Division 01 Section "Closeout Procedures & Demonstration and Training."

END OF SECTION 11 40 00

SECTION 27 08 00

COMMISSIONING OF COMMUNICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the following:
 - 1. Performance tests for UTP and fiber optic structured cabling.
 - 2. Preparation of test and inspection reports.
- B. Section defines the tests and checks that shall be made on all communications hardware and wiring to ensure compliance with the requirements of the Contract Documents.

1.2 DEFINITIONS

- A. BICSI: Building Industry Consulting Service International.
- B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- C. EMI: Electromagnetic interference.
- D. IDC: Insulation displacement connector.
- E. Ladder Rack Runway: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).
- F. LAN: Local area network.
- G. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
- H. RCDD: Registered Communications Distribution Designer.
- I. UTP: Unshielded twisted pair.
- 1.3 SUBMITTALS
 - A. Product Data: For each type of product indicated.
 - B. Shop Drawings:
 - 1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by the Board.
 - 2. Cabling administration drawings and printouts.
 - 3. Wiring diagrams to show typical wiring schematics, including the following:

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27 08 00 - 1 COMMISSIONING OF COMMUNICATIONS

- a. Cross-connects.
- b. Patch panels.
- c. Patch cords.
- 4. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.
- C. Qualification Data: For Installer.
- D. Field quality-control reports.
- E. Maintenance Data.
- 1.4 QUALITY ASSURANCE
 - A. Installer Qualifications: Comply with requirements of Division 27 Section "General Requirements for Communications" for installer qualifications as noted in "Quality Assurance" Article.
 - B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in City of Chicago Electrical Code, by a qualified testing agency, and marked for intended location and application.
 - C. Comply with City of Chicago Building Code.
 - D. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.
 - E. Grounding: Comply with ANSI-J-STD-607-A.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Comply with requirements of Division 27 Section "General Requirements for Communications" for delivery, storage and handling.
- 1.6 COORDINATION
 - A. Coordinate activities and cooperate with others on the Project to ensure that communications systems are installed and fully tested in a timely basis to permit installation of Board Authorized Representation's installed communications equipment and connections.
 - B. Conduct tests and present test results to the Architect/Engineer, the Construction Manager, and the CPS Office of Information & Technology Services (ITS).
 - C. Final payment will not be issued until complete testing and compliant test results of all equipment, cabling, and connectivity is determined and submitted.
- 1.7 WARRANTY
 - A. Comply with requirements of Division 27 Section "General Requirements for Communications" for system warranty and application assurance.

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27 08 00 - 2 COMMISSIONING OF COMMUNICATIONS

PART 2 - PRODUCTS – (Not Used)

PART 3 - EXECUTION

3.1 COMMUNICATIONS DEMOLITION

A. Comply with requirements of Division 27 Section "General Requirements for Communications" for demolition of communications systems.

3.2 PHOTOGRAPHS

- A. Provide photographs of the completed MDF, and IDF,] and concentrator enclosures with all active and passive components installed, including the typewritten directories of the concentrator enclosures and the MDF and IDF.
 - 1. Each photograph shall each be imprinted with a Date/Time stamp.
 - 2. Photographs shall be minimum 3.5" x 5" in size.
- B. Photographs shall be included with documents at the concentrator enclosure locations and also in a full three ring binder located in the MDF and IDF respectively for future reference

3.3 INSPECTION

- A. Visually inspect UTP and optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with colorcoding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.
- B. Visually confirm Category 6 marking of outlets, outlet/connectors, and patch panels for horizontal UTP cabling for Data/Wireless, Kronos and MMTV applications.
- C. Visually confirm Category 5e marking of outlets, outlet/connectors, termination blocks and patch panels for horizontal UTP cabling voice and 25-pair Category 5e backbone applications.
- D. Visually confirm Category 3 marking of copper backbone UTP cables for indoor voice backbone applications.
- E. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
- F. Inspect cable terminations for color coded labels of proper type.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Copper UTP Cable Tests:
 - 1. Copper UTP Test Instruments:

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- a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for permanent link test configuration.
- b. For horizontal UTP cable certification tests, use a Level III tester.
- 2. Copper Backbone UTP Cable Tests:
 - a. Test copper backbone UTP cabling for DC loop resistance, shorts, opens, intermittent faults, polarity between conductors, and for insertion loss (attenuation). Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
- 3. UTP Performance Tests:
 - a. Test permanent link for each outlet. Perform the following tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.2:
 - 1) Wire map.
 - 2) Length (physical vs. electrical, and length requirements).
 - 3) Insertion loss.
 - 4) Near-end crosstalk (NEXT) loss.
 - 5) Power sum near-end crosstalk (PSNEXT) loss.
 - 6) Equal-level far-end crosstalk (ELFEXT).
 - 7) Power sum equal-level far-end crosstalk (PSELFEXT).
 - 8) Return loss.
 - 9) Propagation delay.
 - 10) Delay skew.
 - b. Testing for Category 6 horizontal UTP must additionally report values for attenuation-to-crosstalk ratio (ACR), and power sum attenuation-to-crosstalk ratio (PSACR).
 - c. A star ("*") passing shall not be considered acceptable.
- C. Optical Fiber Cable Tests:
 - 1. Optical Fiber Test Instruments:
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
 - 2. Optical Time Domain Reflectometry Tests: After terminating optical fiber cables, one individual fiber from each backbone cable installed shall be tested using an optical time domain reflectometer (OTDR). Perform OTDR testing in accordance with manufacturer's recommended test procedures. Test to determine the installed length, continuity, and OTDR-based attenuation measurement. Provide test report identifying backbone cable identification and indicating corresponding values from tests.

- 3. Link End-to-End Attenuation Tests: Perform optical fiber end-to-end link tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.3.
 - a. Multimode backbone link measurements: Test at 850 or 1300 nm in both directions according to TIA/EIA-526-14-A, Method B, One Reference Jumper.
 - b. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.
 - c. These readings must not be higher than the "Optimal Attenuation Loss (OAL)". The OAL will be calculated using the manufacturer's factory certified test results, (db/km) adjusted for the actual installed lengths (dBs) plus the manufacturer's best published attenuation losses for the connector on this project and/or splice installed on this project (0.25dB for Connectors and 0.10dB for splices).
 - d. Link End-to-End Attenuation Test reports shall include:
 - 1) Cable identification and Strand numbers
 - 2) The OAL value for each link
 - 3) The theoretical maximum attenuation value, per TIA/EIA-568-B.1, for each link
 - 4) Tested values for attenuation
- D. HDMI Cable Test Contractor to conduct approved cable tests on all HDMI cables and provide written results to CPS.
- E. Coaxial Cable Tests: Conduct tests according to Division 27 Section "Distributed audio-Video Communication Systems."
- F. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.
- G. End-to-end cabling will be considered defective if it does not pass tests and inspections. Correct failures and retest to demonstrate compliance; otherwise, remove and replace with new components and retest to demonstration compliance with requirements.
- H. Prepare test and inspection reports.

3.5 FIRESTOPPING

- A. Inspect and verify all firestopped locations comply with:
 - 1. Requirements in Division 07 Section "Penetration Firestopping."
 - 2. Comply with TIA/EIA-569-A, Annex A, "Firestopping."
 - 3. Comply with BICSI TDMM, "Firestopping Systems" Article.
- B. Correct any deficiencies.

3.6 GROUNDING

A. Inspect and verify all grounding and bonding has been installing according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter, and complies with ANSI-J-STD-607-A.

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B. Verify all floor-mounted racks, overhead ladder rack and concentrator enclosures are bonded to communications bus bar.

3.7 IDENTIFICATION

- A. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.
- B. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for MDF, IDF, concentrator enclosures, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Furnish electronic record of all drawings, in software and format selected by the Board.

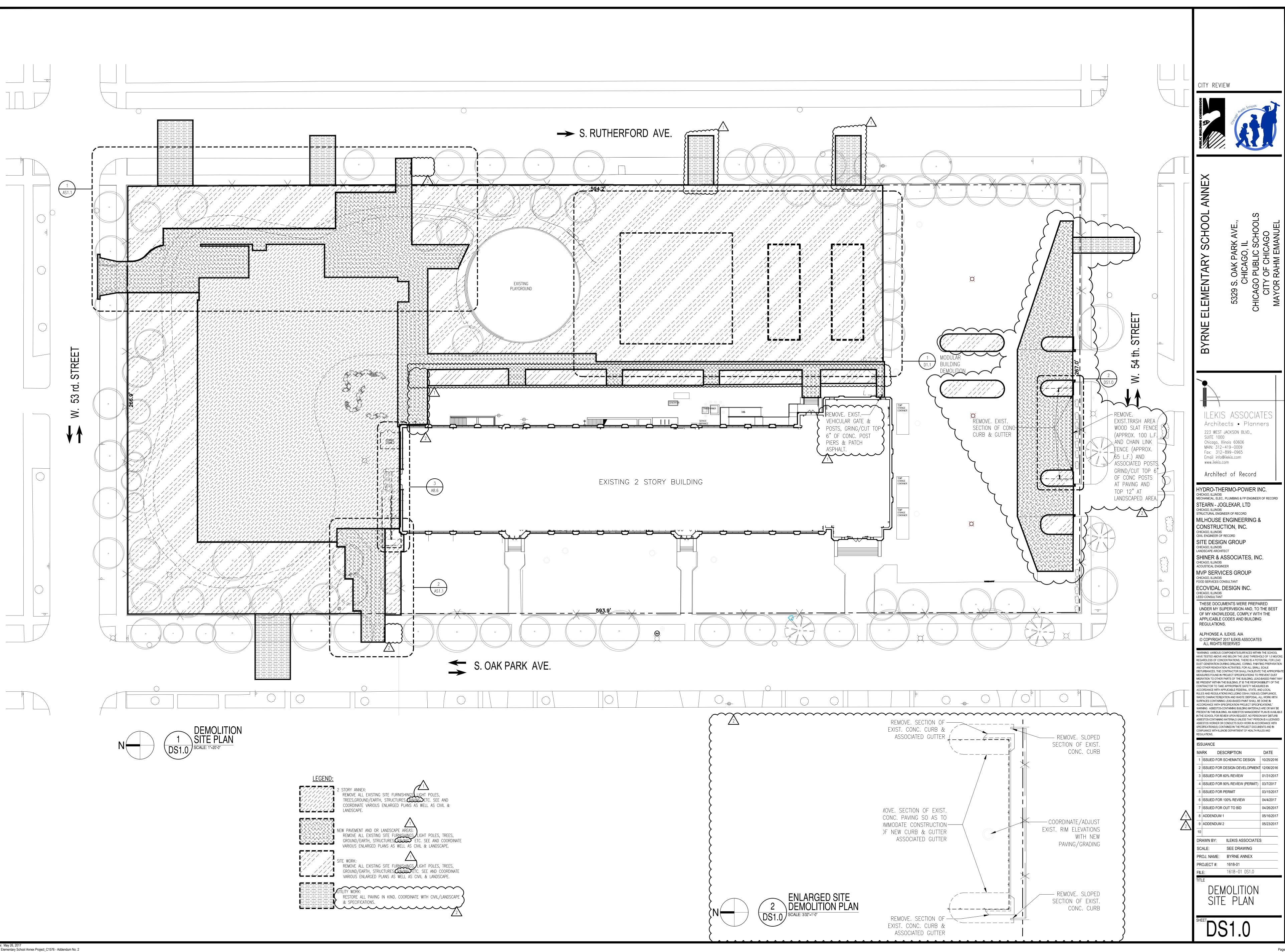
3.8 DEMONSTRATION

A. Train Board designated maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new workstation outlets. Schedule training with at least seven days notice.

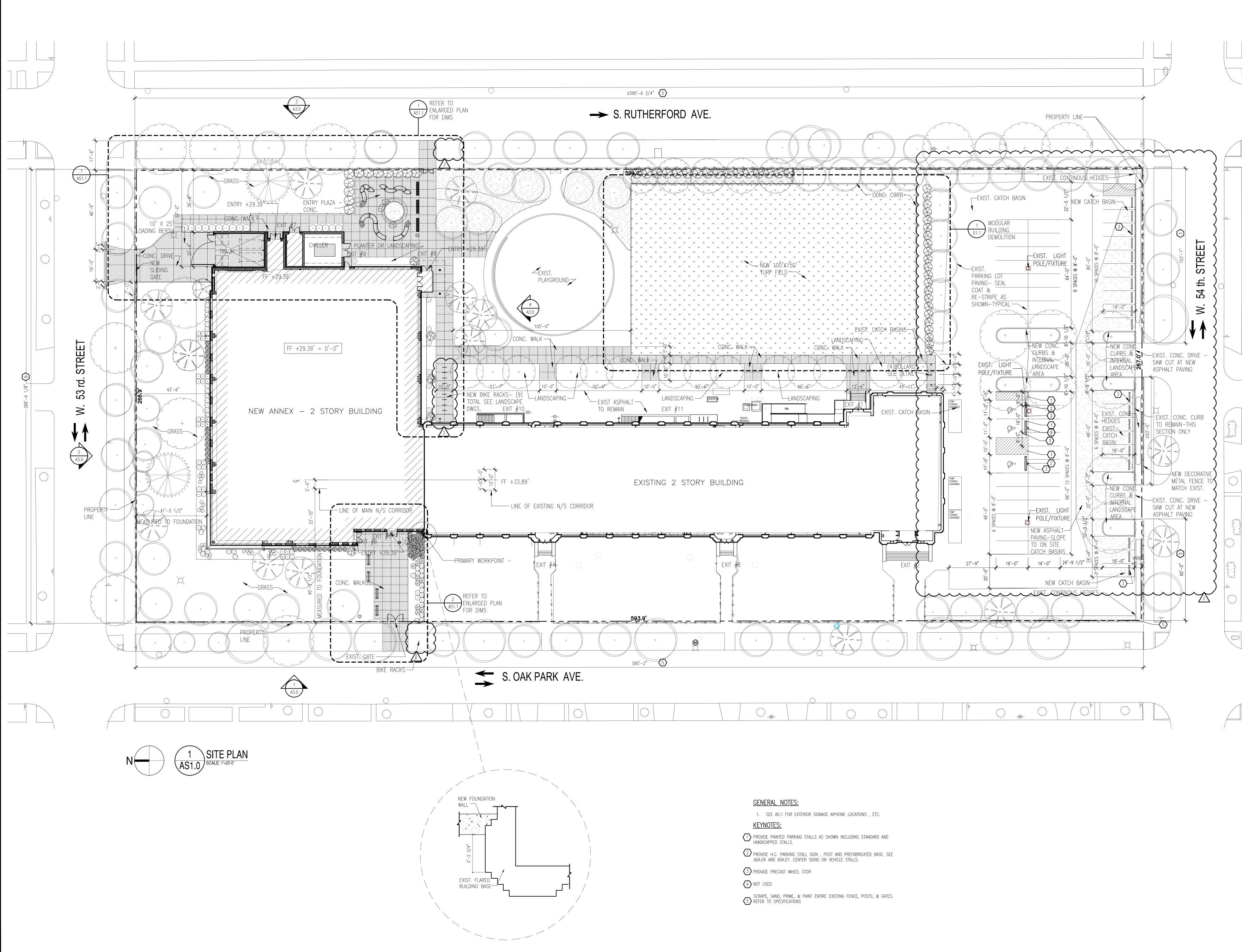
3.9 CLEANING

A. Comply with requirements of Division 27 Section "General Requirements for Communications" for cleaning.

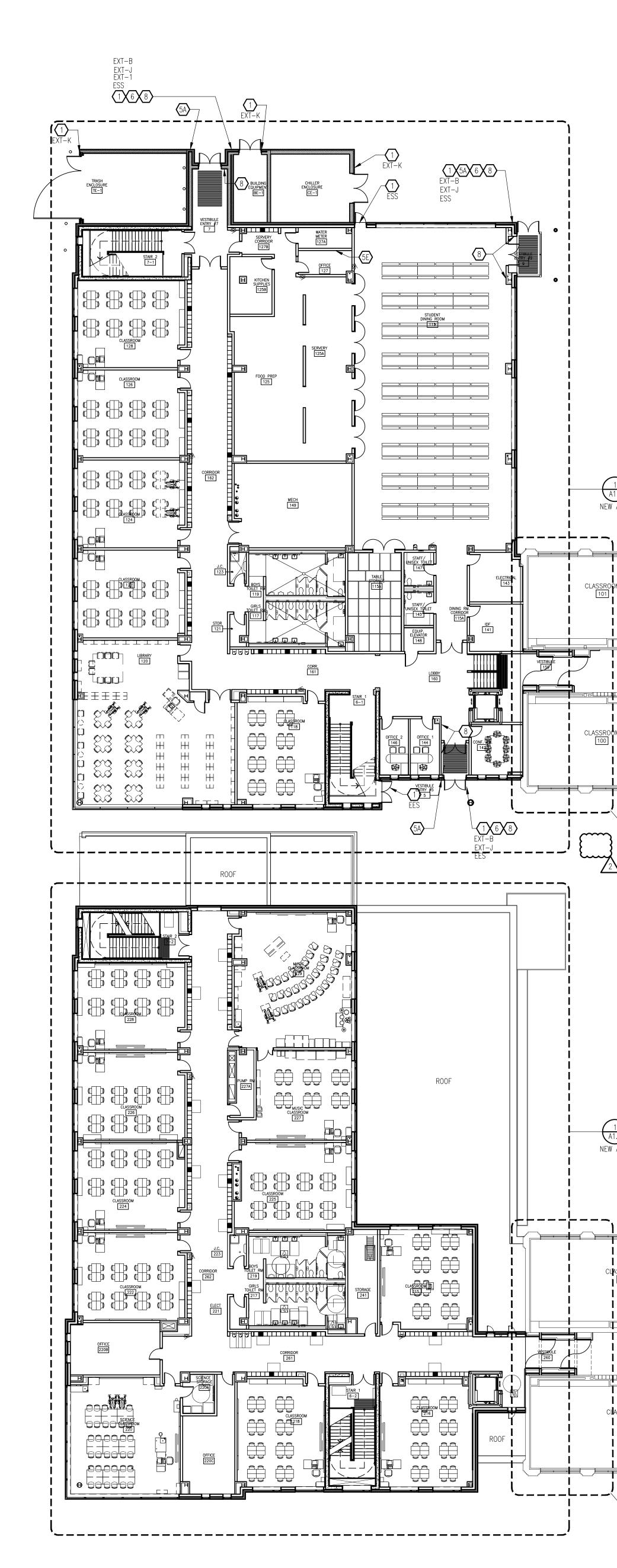
END OF SECTION

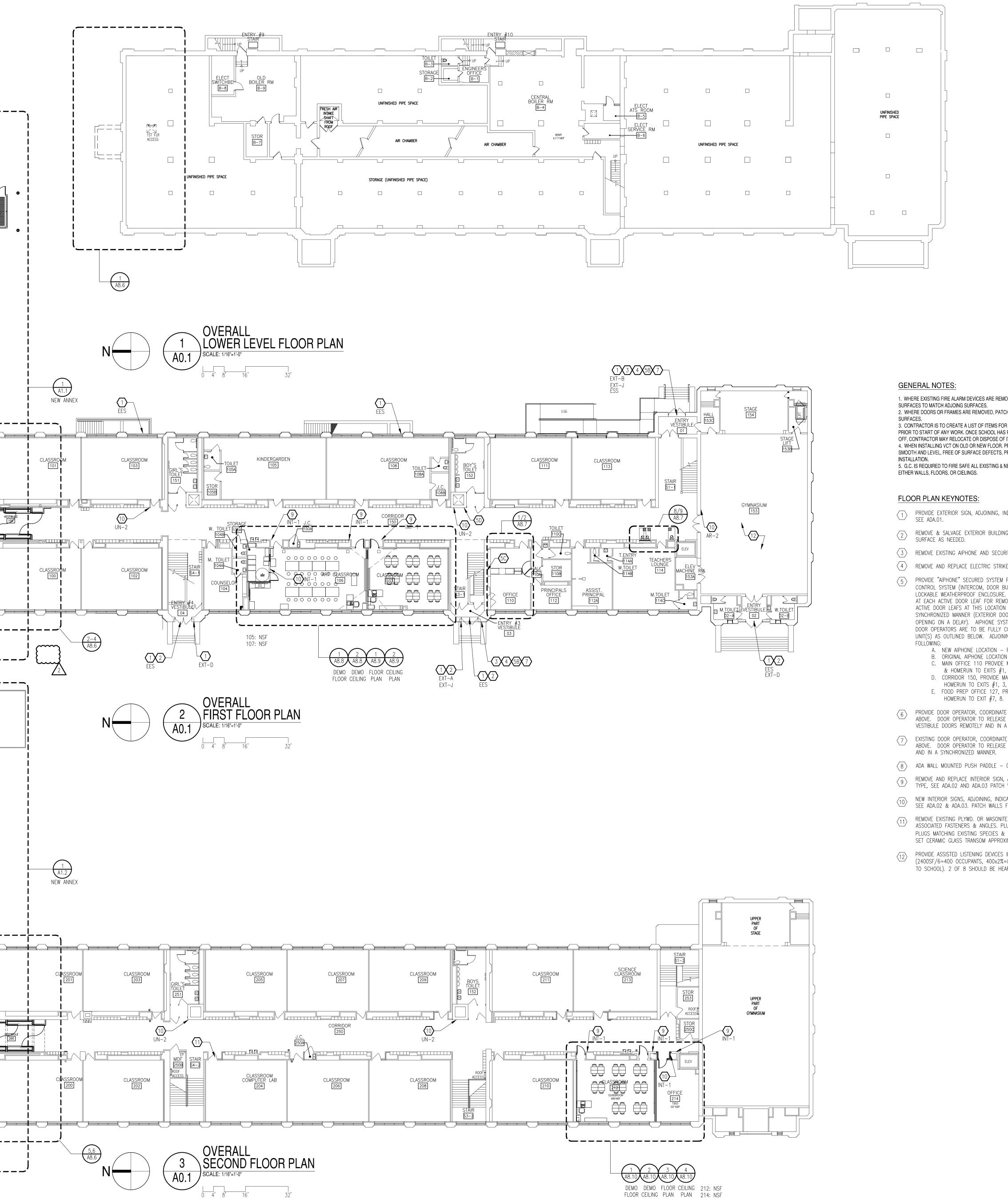










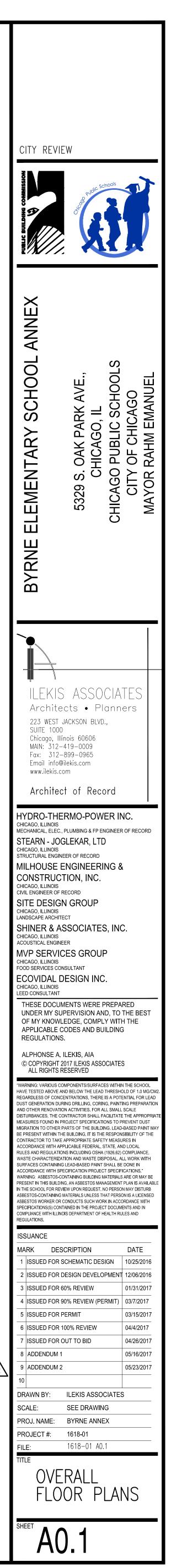


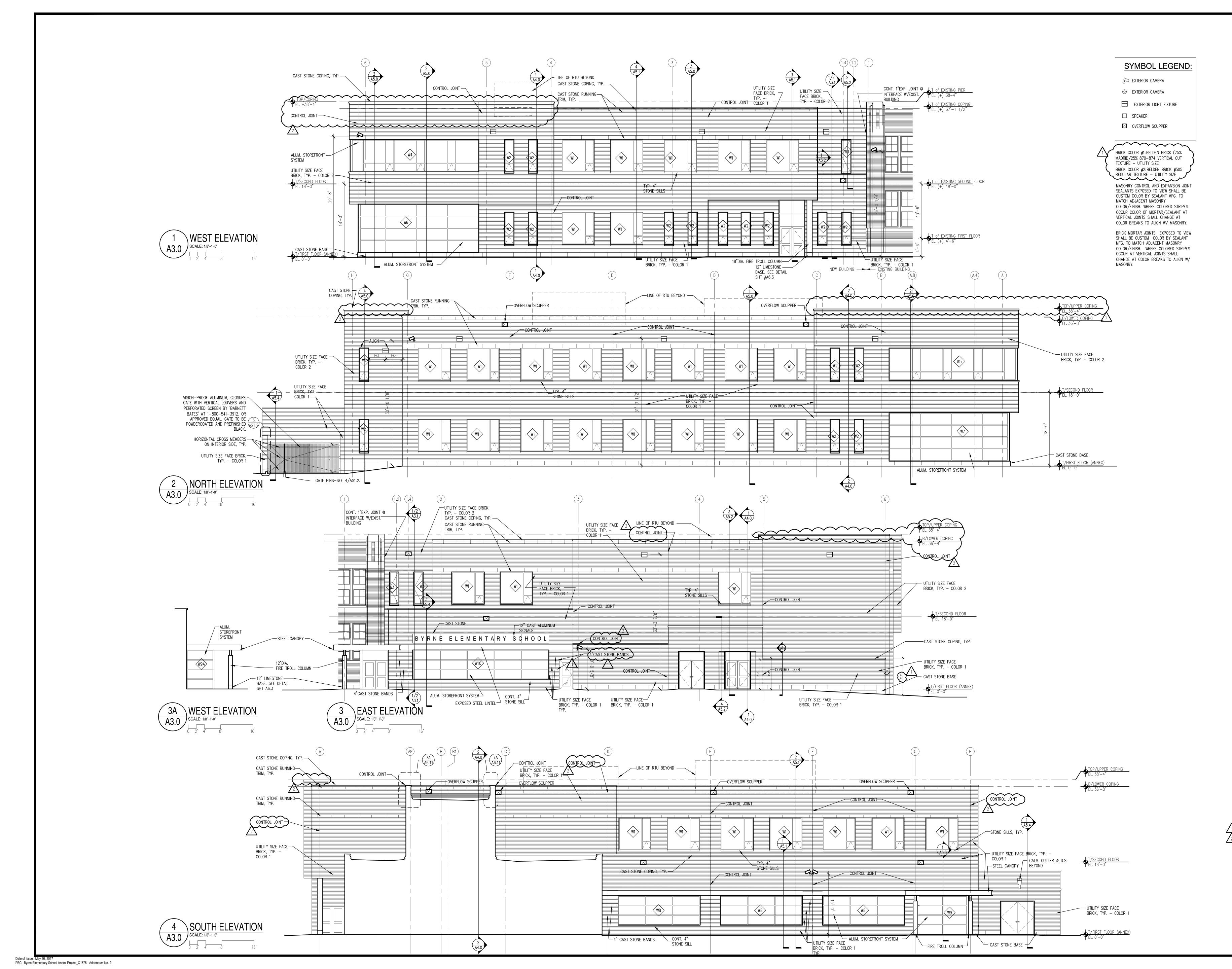
GENERAL NOTES:

1. WHERE EXISTING FIRE ALARM DEVICES ARE REMOVED, PATCH & PAINT SURFACES TO MATCH ADJOING SURFACES. 2. WHERE DOORS OR FRAMES ARE REMOVED, PATCH & MATCH ADJOINING 3. CONTRACTOR IS TO CREATE A LIST OF ITEMS FOR DISPOSAL FOR REVIEW PRIOR TO START OF ANY WORK. ONCE SCHOOL HAS REVIEWED AND SIGNED OFF, CONTRACTOR MAY RELOCATE OR DISPOSE OF ITEMS. 4. WHEN INSTALLING VCT ON OLD OR NEW FLOOR. PREPARE FLOOR TO BE SMOOTH AND LEVEL, FREE OF SURFACE DEFECTS, PRIOR TO NEW FLOOR 5. G.C. IS REQUIRED TO FIRE SAFE ALL EXISTING & NEW PENETRATIONS IN EITHER WALLS, FLOORS, OR CIELINGS.

FLOOR PLAN KEYNOTES:

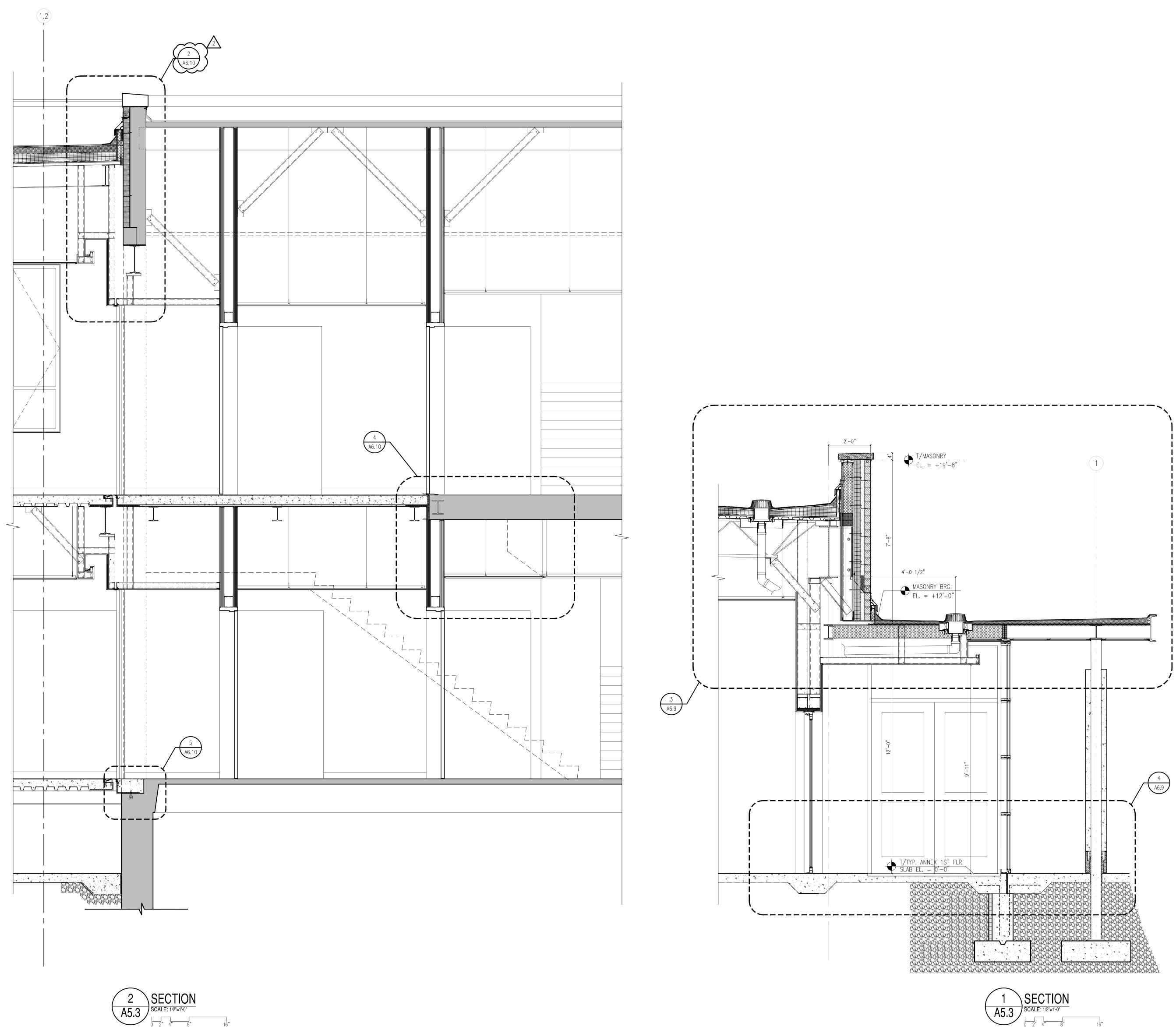
- PROVIDE EXTERIOR SIGN, ADJOINING, INDICATES SIGN TYPE, SEE ADA.01.
- REMOVE & SALVAGE EXTERIOR BUILDING SIGNAGE. PATCH WALL
- $\langle 3 \rangle$ REMOVE EXISTING AIPHONE AND SECURITY ENCLOSURE
- $\langle 4 \rangle$ REMOVE AND REPLACE ELECTRIC STRIKE
- 5 PROVIDE "AIPHONE" SECURED SYSTEM PER SPEC. 28 13 15 ACCESS CONTROL SYSTEM (INTERCOM, DOOR BUZZER, CAMERA, ETC.) WITH A LOCKABLE WEATHERPROOF ENCLOSURE. PROVIDE ELECTRIC STRIKE AT EACH ACTIVE DOOR LEAF FOR REMOTE RELEASE CAPABILITY - ALL ACTIVE DOOR LEAFS AT THIS LOCATION SHOULD BE OPENED IN A SYNCHRONIZED MANNER (EXTERIOR DOOR FIRST AND INTERIOR DOOR OPENING ON A DELAY). AIPHONE SYSTEM, ELECTRIC STRIKES AND/OR DOOR OPERATORS ARE TO BE FULLY CONTROLLED BY MASTER HEAD UNIT(S) AS OUTLINED BELOW. ADJOINING LETTER INDICATES THE FOLLOWING:
 - A. NEW AIPHONE LOCATION PROVIDE AIPHONE B. ORIGINAL AIPHONE LOCATION - PROVIDE AIPHONE
 - C. MAIN OFFICE 110 PROVIDE MASTER HEAD UNIT CONTROL & HOMERUN TO EXITS #1, 3, 5, 7, 8. D. CORRIDOR 150, PROVIDE MASTER HEAD UNIT CONTROL &
 - HOMERUN TO EXITS #1, 3, 5, 7, 8. E. FOOD PREP OFFICE 127, PROVIDE HEAD UNIT CONTROL &
- PROVIDE DOOR OPERATOR, COORDINATE CONTROLS WITH KEYNOTE 5 ABOVE. DOOR OPERATOR TO RELEASE AND OPEN INNER AND OUTER
- VESTIBULE DOORS REMOTELY AND IN A SYNCHRONIZED MANNER.
- $\langle 7 \rangle$ EXISTING DOOR OPERATOR, COORDINATE CONTROLS WITH KEYNOTE 5 ABOVE. DOOR OPERATOR TO RELEASE AND OPEN DOORS REMOTELY AND IN A SYNCHRONIZED MANNER.
- $\langle 8 \rangle$ ADA WALL MOUNTED PUSH PADDLE CONNECT TO DOOR OPERATOR.
- 9 REMOVE AND REPLACE INTERIOR SIGN, ADJOINING, INDICATES SIGN TYPE, SEE ADA.02 AND ADA.03 PATCH WALLS FROM OLD SIGNS.
- $\overbrace{10}^{\text{NEW}}$ INTERIOR SIGNS, ADJOINING, INDICATES SIGN TYPE, SEE ADA.02 & ADA.03. PATCH WALLS FROM OLD SIGNS.
- REMOVE EXISTING PLYWD. OR MASONITE TRANSOM PANEL & ASSOCIATED FASTENERS & ANGLES. PLUG ANY HOLES WITH WOOD PLUGS MATCHING EXISTING SPECIES & FINISH. INSTALL NEW $\frac{1}{4}$ " DIRECT SET CERAMIC GLASS TRANSOM APPROXIMATELLY 36"X36".
- PROVIDE ASSISTED LISTENING DEVICES IN EXISTING GYMNASIUM (2400SF/6=400 OCCUPANTS, 400x2%=8 UNITS, ARE TO BE PROVIDED TO SCHOOL). 2 OF 8 SHOULD BE HEARING AID COMPLIANT.





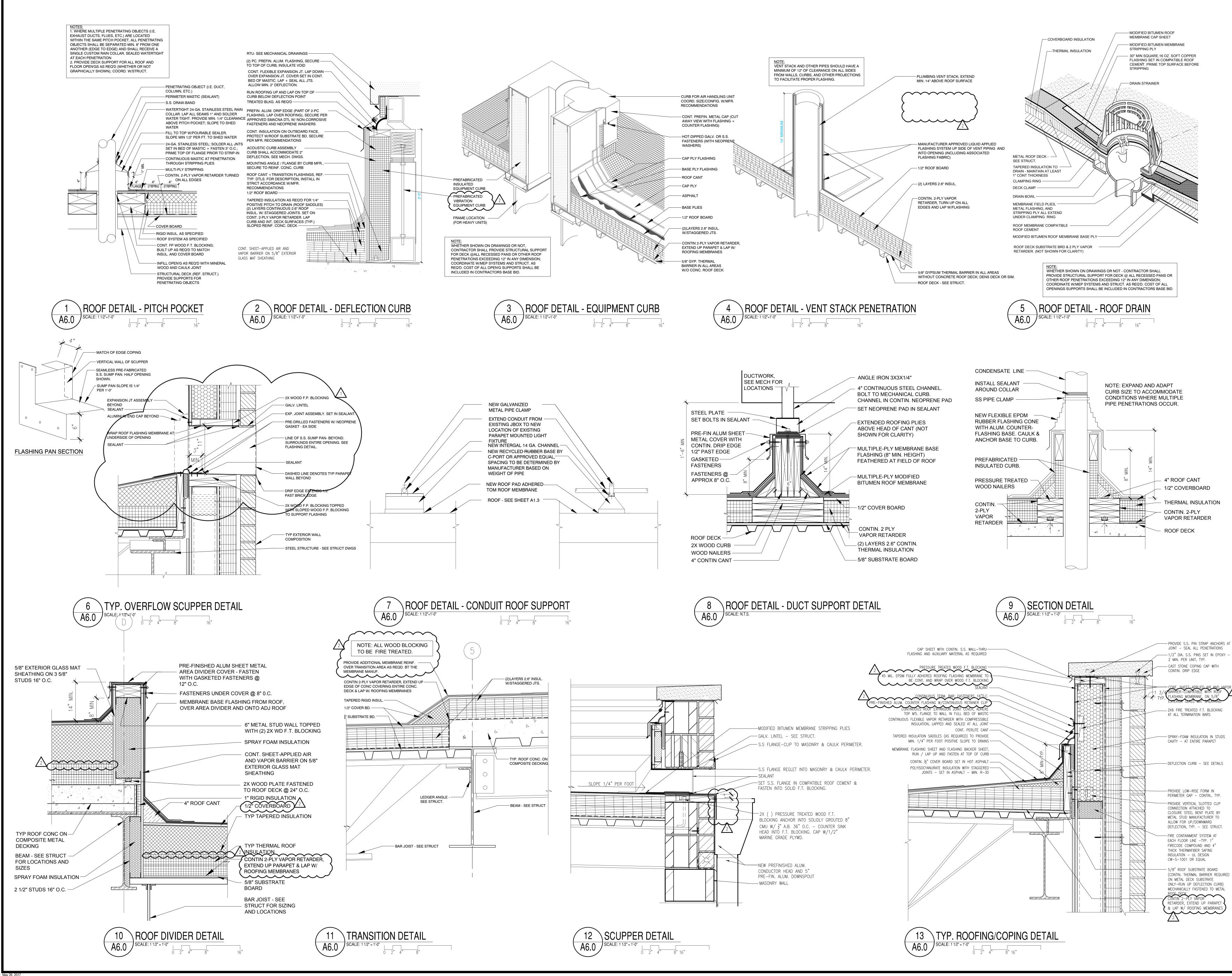






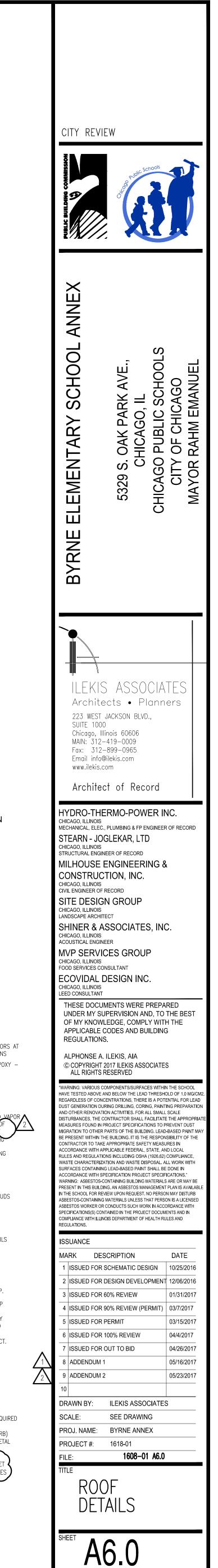


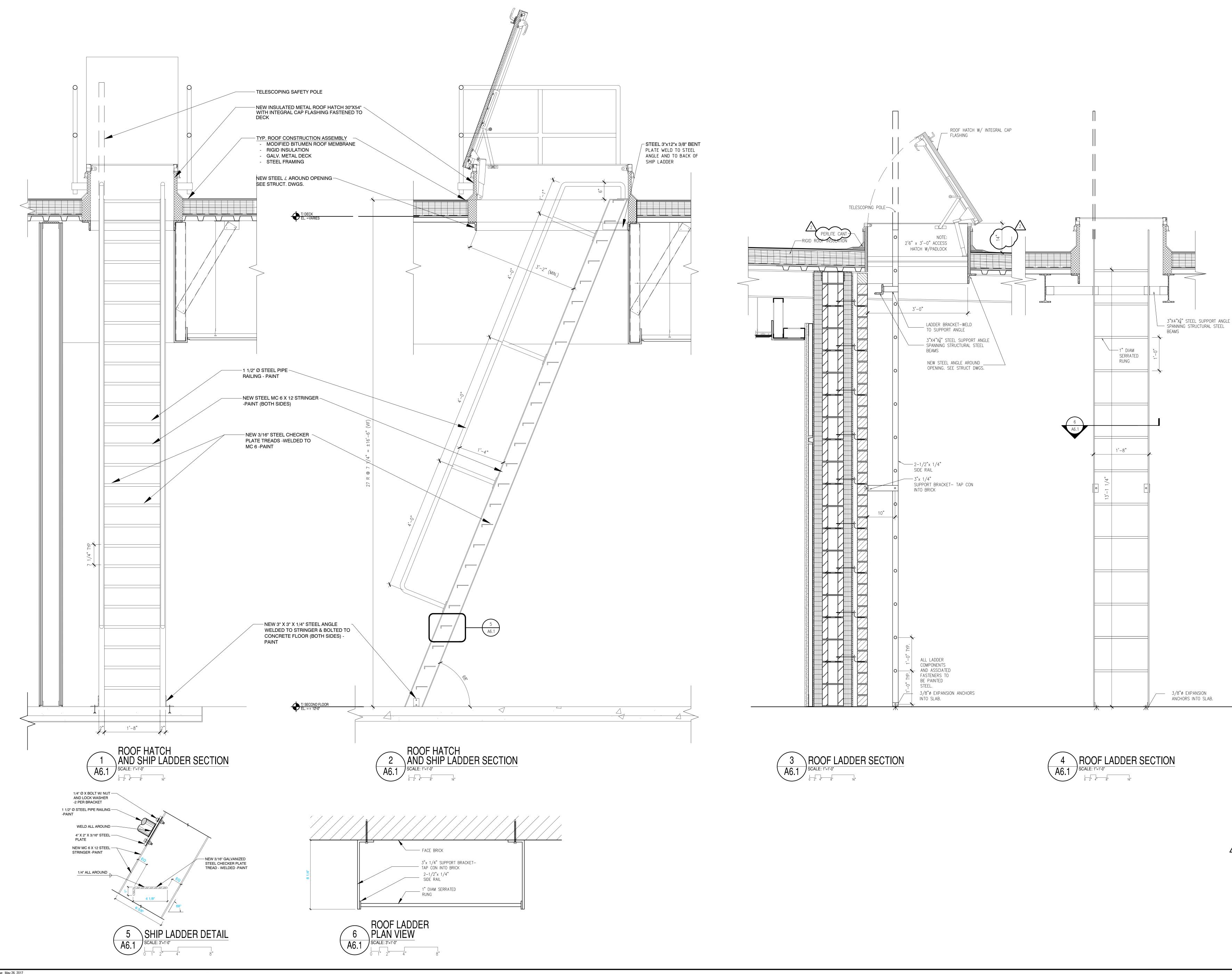
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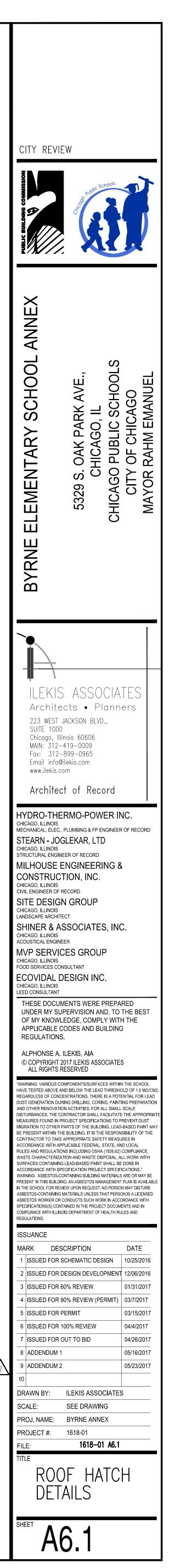
Date of Issue: May 26, 2017 PBC: Byrne Elementary School Annex Project_C1576 - Addendum No. 2



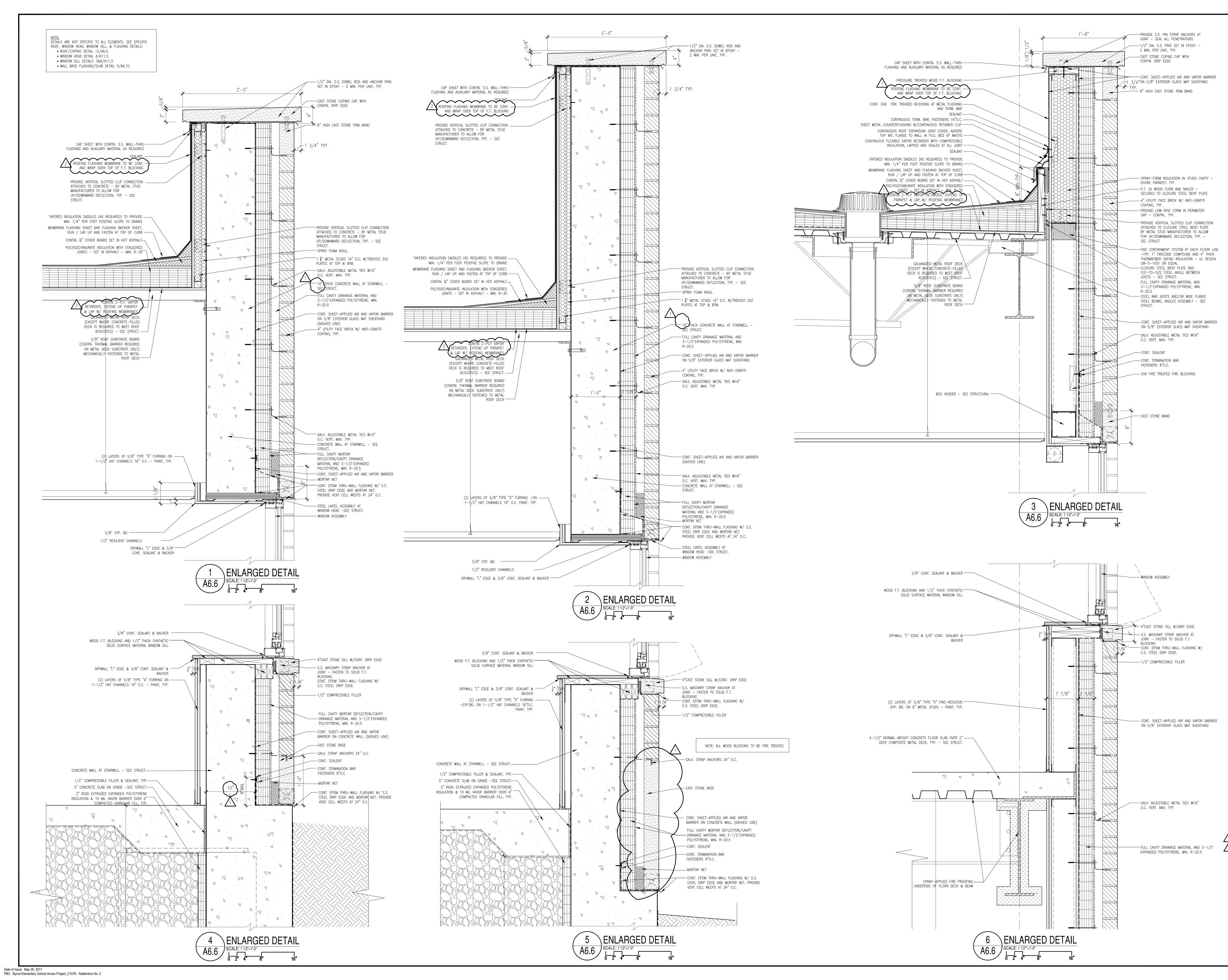




Date of Issue: May 26, 2017 PBC: Byrne Elementary School Annex Project_C1576 - Addendum No. 2

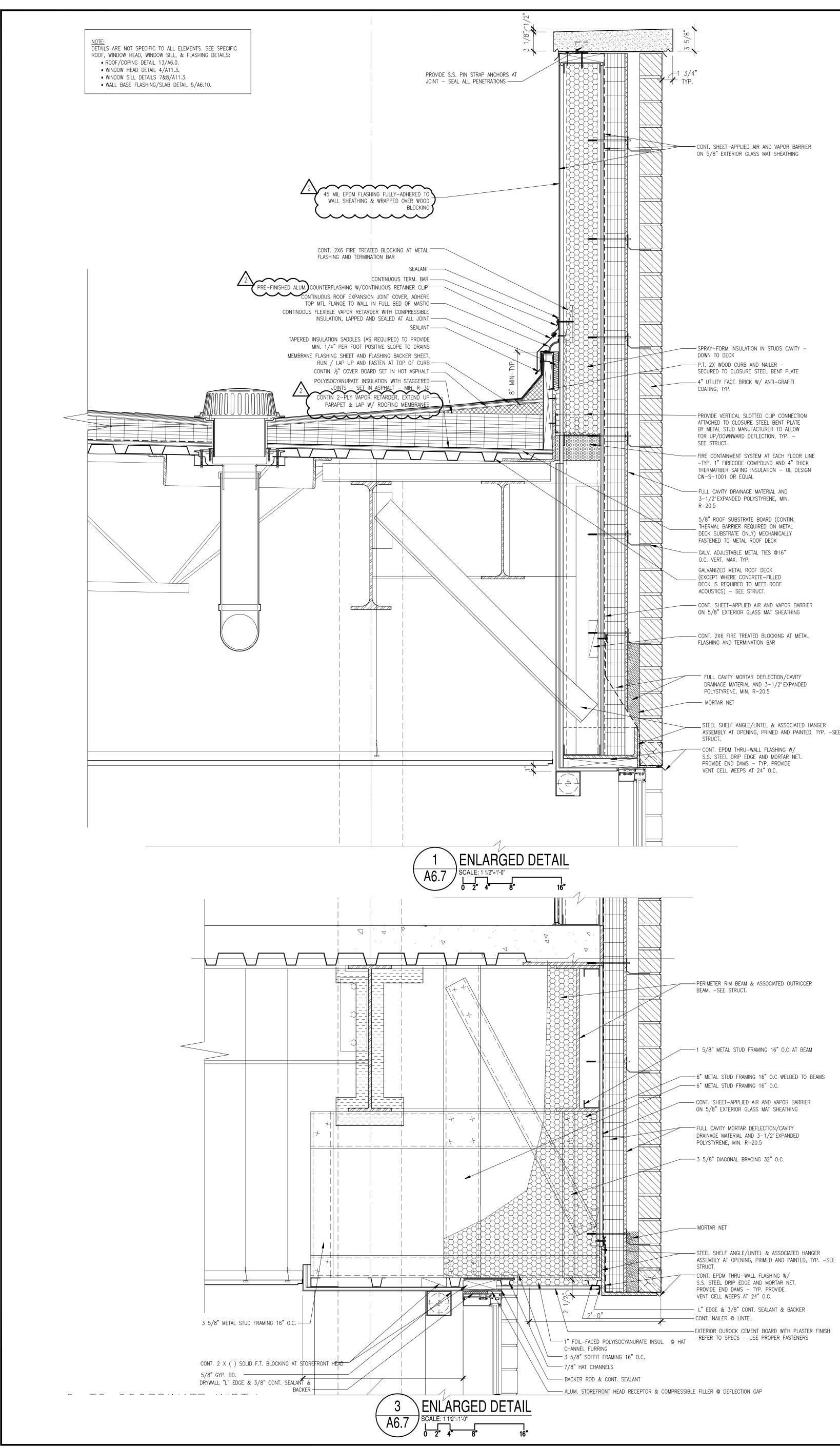


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Date of Issue: May 26, 2017 PBC: Byrne Elementary School Annex Project_C1576 - Addendum No. 2

CONT. SHEET-APPLIED AIR AND VAPOR BARRIER ON 5/8" EXTERIOR GLASS MAT SHEATHING

SECURED TO CLOSURE STEEL BENT PLATE — 4" UTILITY FACE BRICK W/ ANTI-GRAFITI

ATTACHED TO CLOSURE STEEL BENT PLATE BY METAL STUD MANUFACTURER TO ALLOW

- FIRE CONTAINMENT SYSTEM AT EACH FLOOR LINE -TYP. 1" FIRECODE COMPOUND AND 4" THICK THERMAFIBER SAFING INSULATION – UL DESIGN

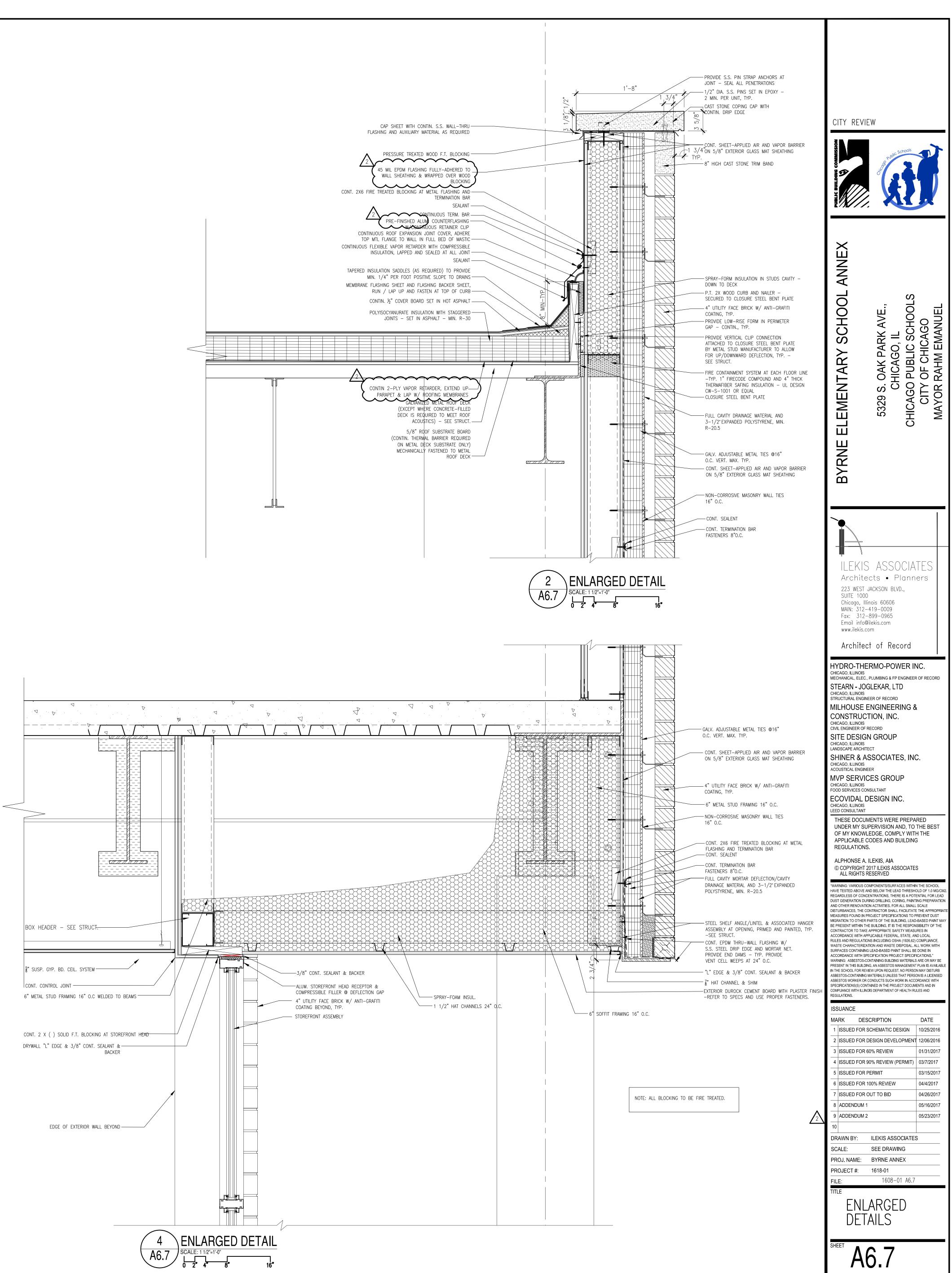
3-1/2" EXPANDED POLYSTYRENE, MIN.

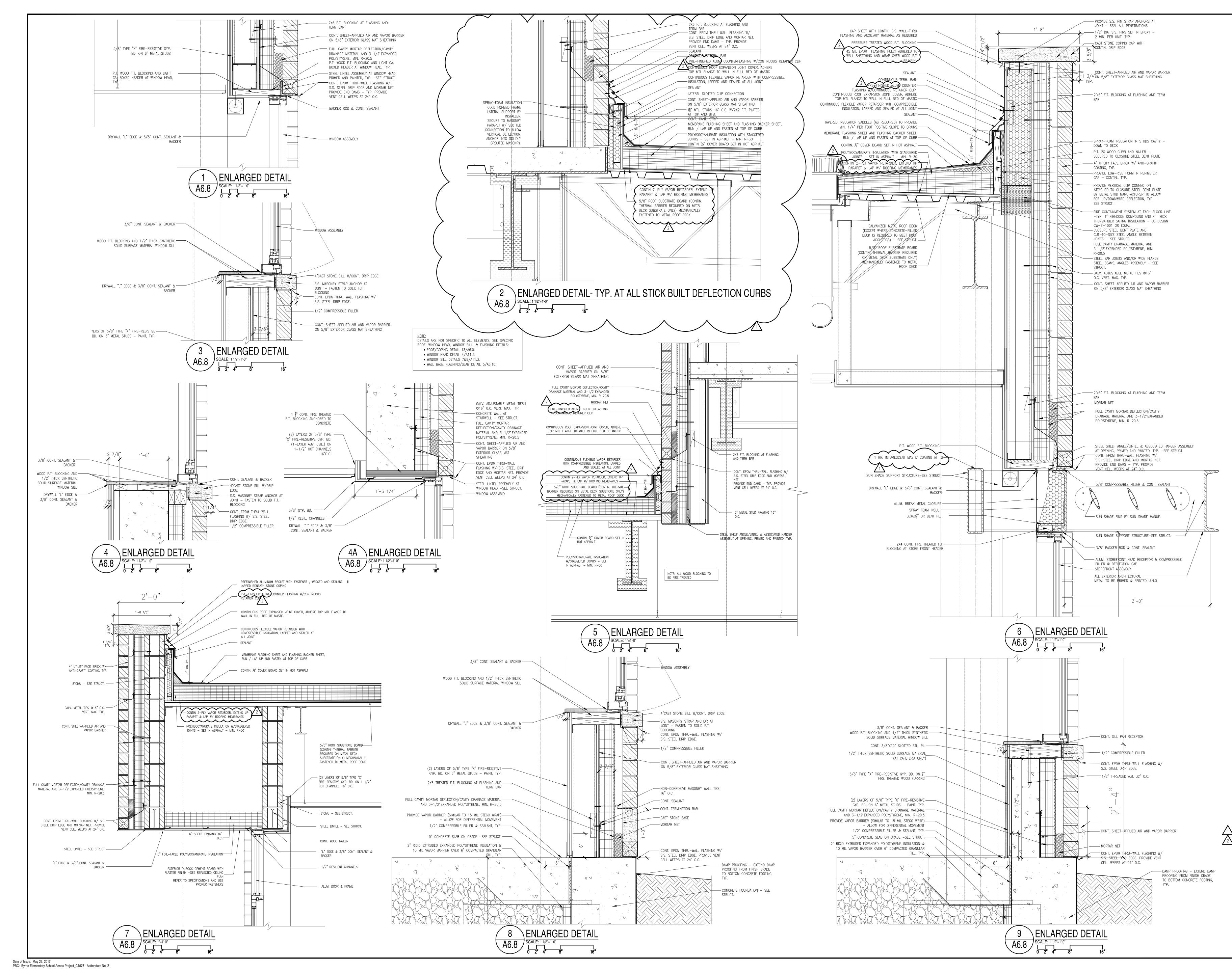
THERMAL BARRIER REQUIRED ON METAL DECK SUBSTRATE ONLY) MECHANICALLY

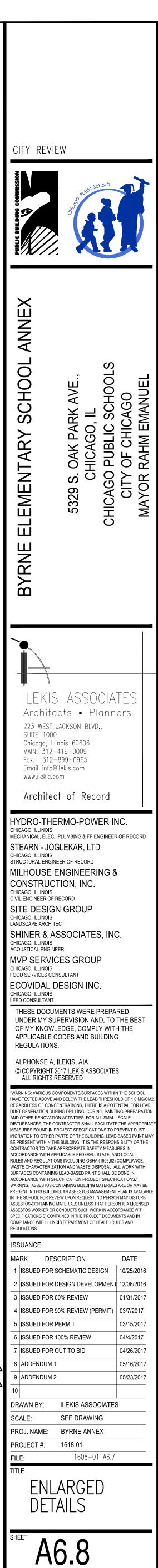
- GALV. ADJUSTABLE METAL TIES @16" GALVANIZED METAL ROOF DECK _ (EXCEPT WHERE CONCRETE-FILLED DECK IS REQUIRED TO MEET ROOF ACOUSTICS) – SEE STRUCT.

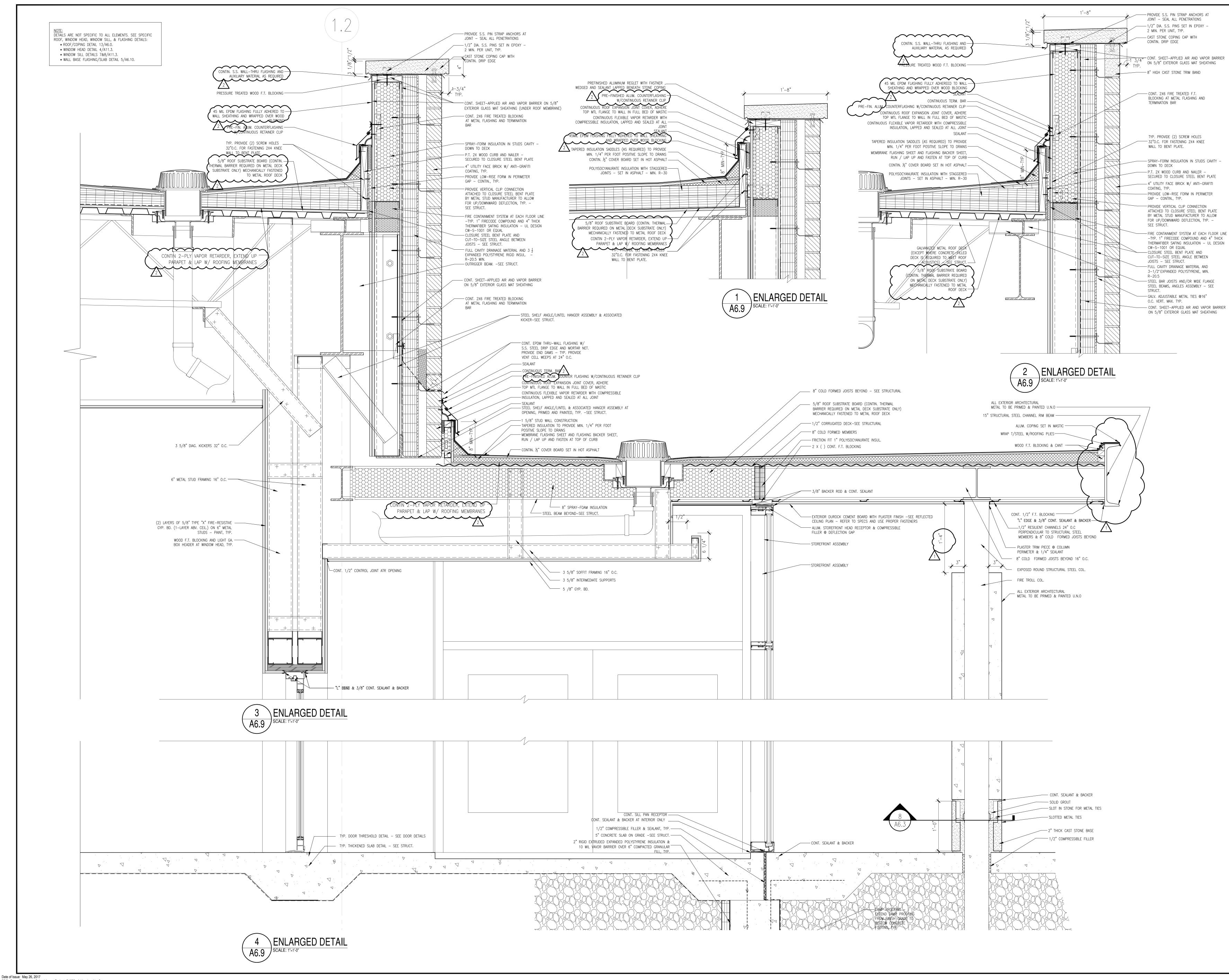
FULL CAVITY MORTAR DEFLECTION/CAVITY DRAINAGE MATERIAL AND 3-1/2" EXPANDED POLYSTYRENE, MIN. R-20.5

_STEEL SHELF ANGLE/LINTEL & ASSOCIATED HANGER ASSEMBLY AT OPENING, PRIMED AND PAINTED, TYP. -SEE - CONT. EPDM THRU-WALL FLASHING W/ S.S. STEEL DRIP EDGE AND MORTAR NET. PROVIDE END DAMS – TYP. PROVIDE

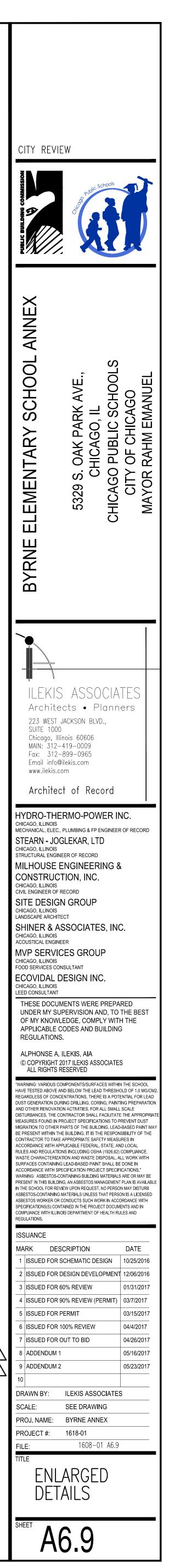




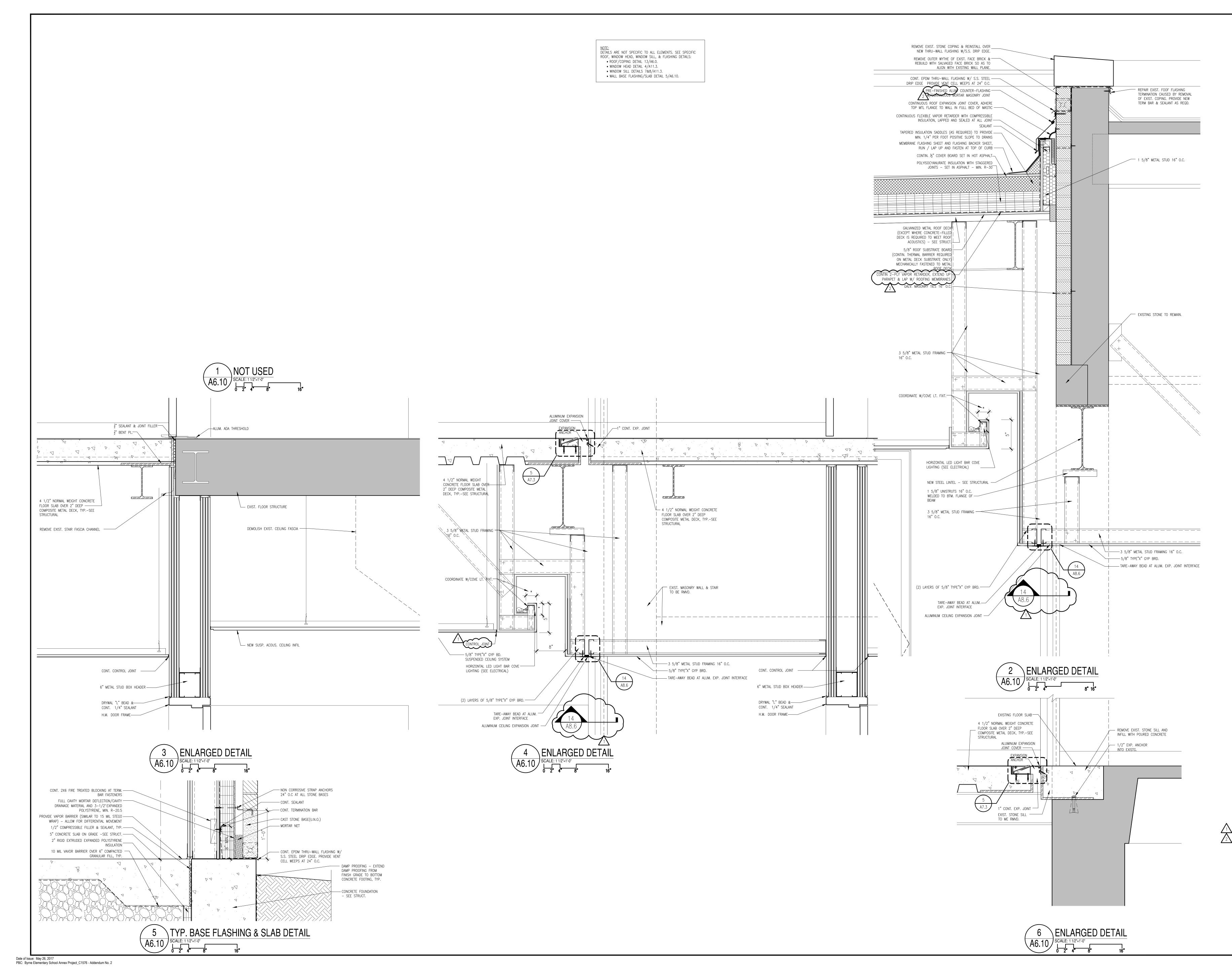




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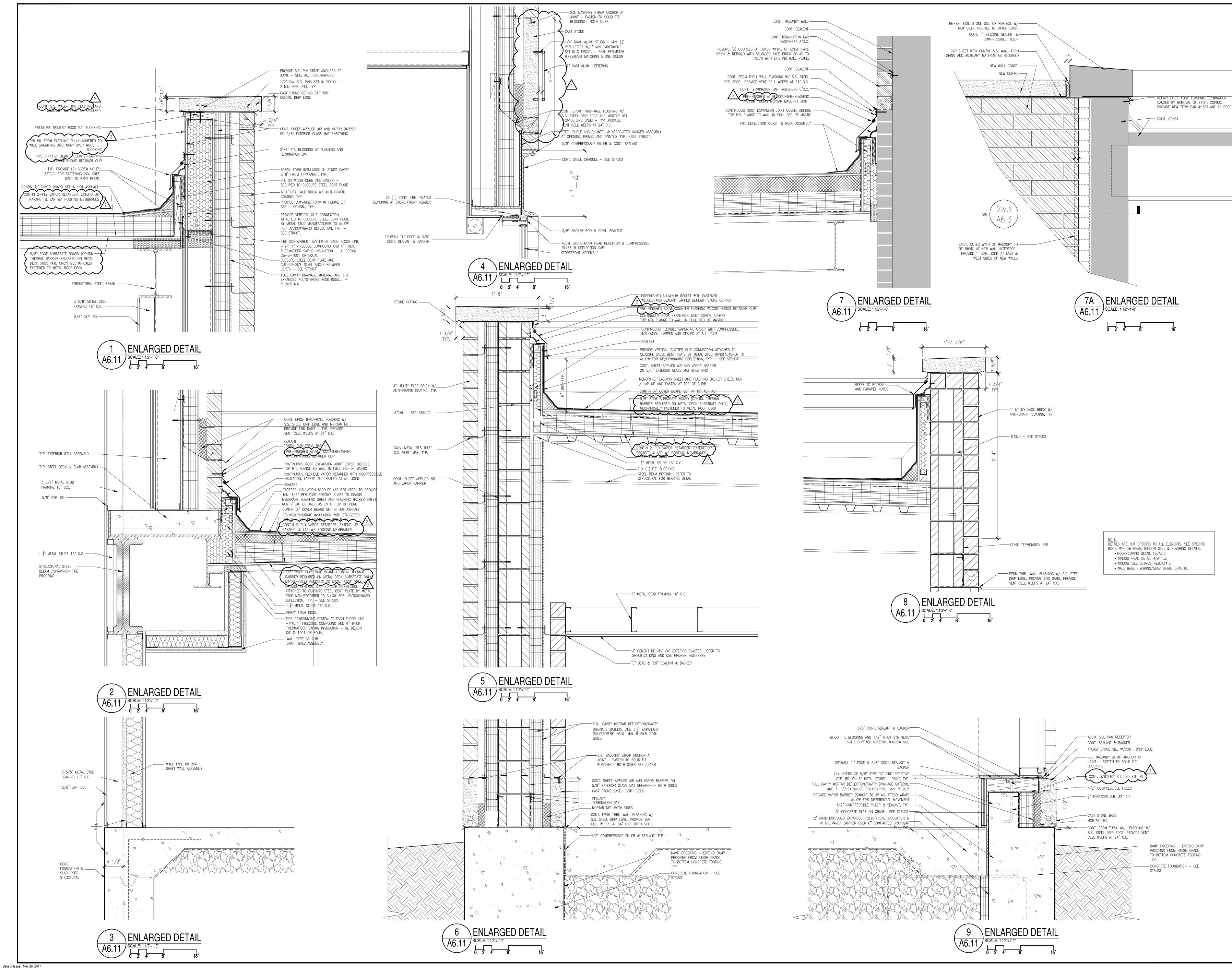


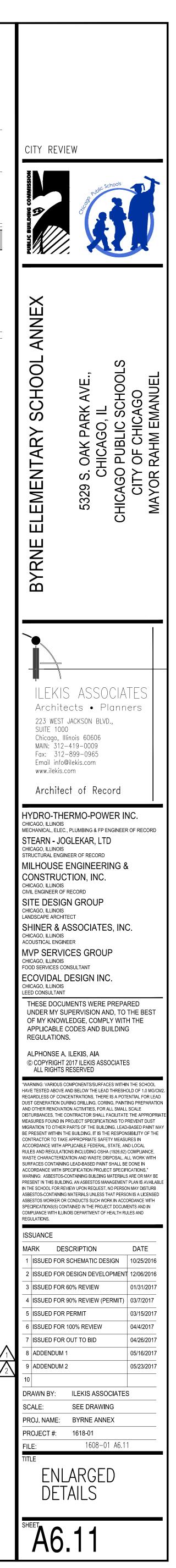
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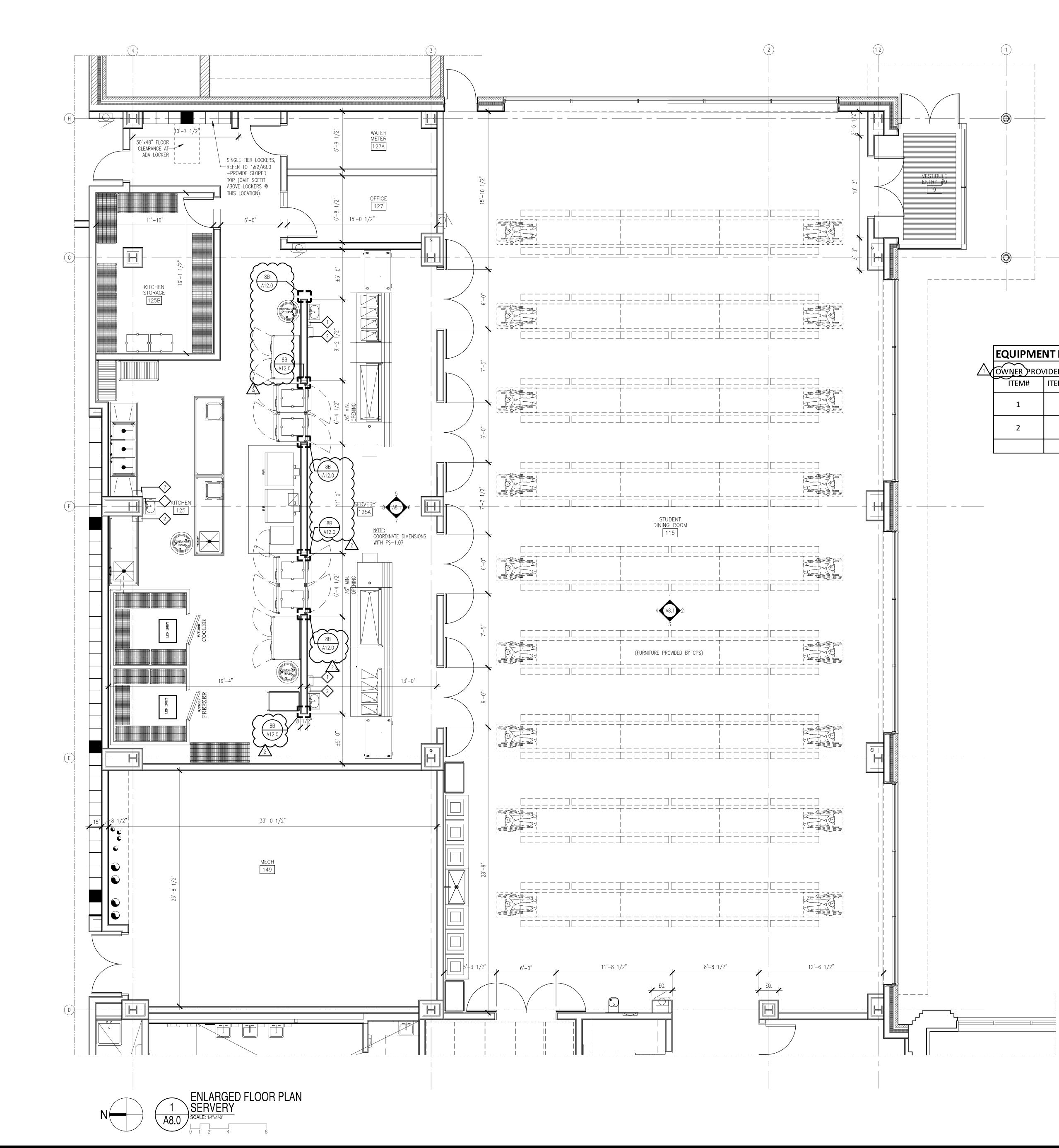




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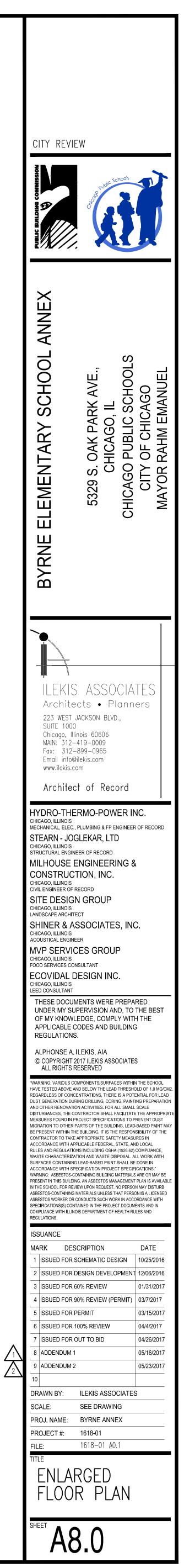


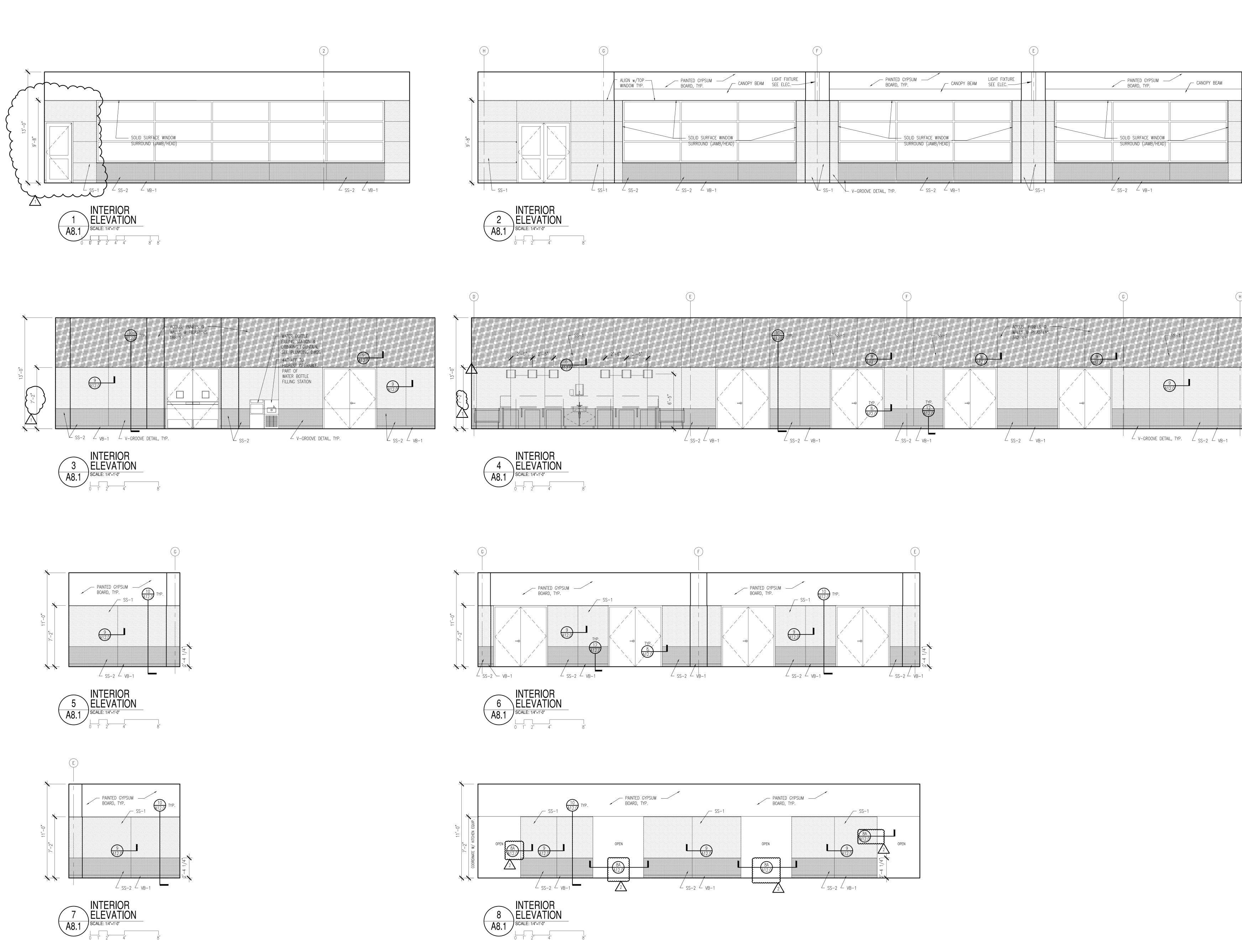


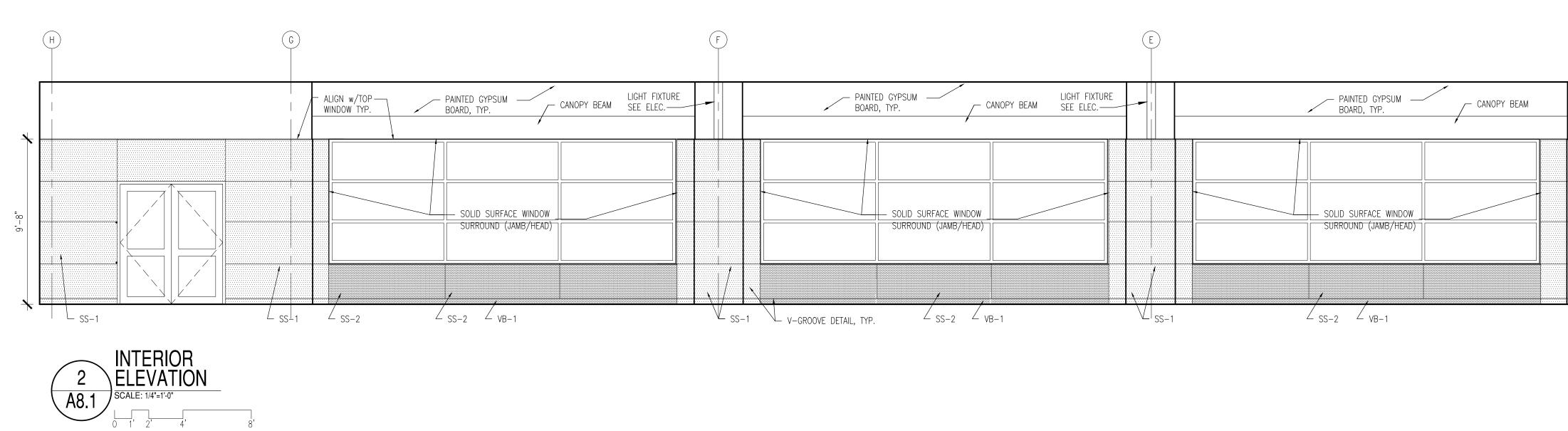


	EQUIPMENT LIST - KITCHEN											
1	OWNER PROV	/IDED & INS	STALLED	PLAN TAG:								
	ITEM#	ITEM REF	DESCRIPTION	MODEL	PROVIDED BY	INSTALLED BY						
	1		SOAP DISPENSER	ADX12 #8888- 06	ECO Labs	ECOlabs						
	2	PAPER TOWEL DISPENSER		Tork H1 roll	Aramark/Sodex o	ECOlabs						











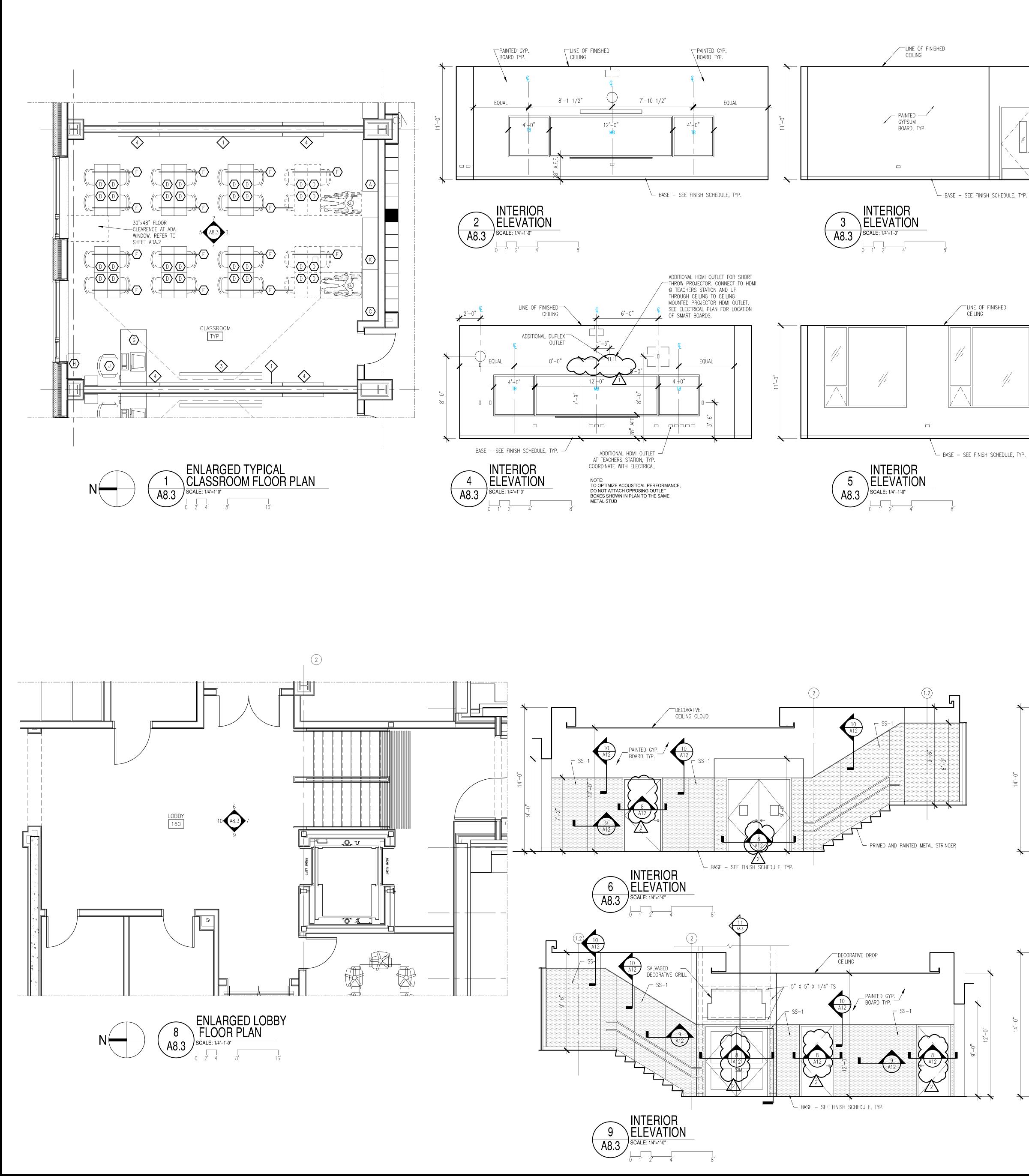
ANNEX SCHOOL EMENTARY 5329 MA CHI Ш BYRNE ILEKIS ASSOCIATES Architects • Planners 223 WEST JACKSON BLVD., SUITE 1000 Chicago, Illinois 60606 MAIN: 312-419-0009 Fax: 312-899-0965 Email info@ilekis.com www.ilekis.com Architect of Record HYDRO-THERMO-POWER INC. CHICAGO, ILLINOIS MECHANICAL, ELEC., PLUMBING & FP ENGINEER OF RECORD STEARN - JOGLEKAR, LTD CHICAGO, ILLINOIS STRUCTURAL ENGINEER OF RECORD MILHOUSE ENGINEERING & CONSTRUCTION, INC. CHICAGO, ILLINOIS CIVIL ENGINEER OF RECORD SITE DESIGN GROUP CHICAGO, ILLINOIS LANDSCAPE ARCHITECT SHINER & ASSOCIATES, INC. CHICAGO, ILLINOIS ACOUSTICAL ENGINEER MVP SERVICES GROUP CHICAGO, ILLINOIS FOOD SERVICES CONSULTANT ECOVIDAL DESIGN INC. CHICAGO, ILLINOIS LEED CONSULTANT THESE DOCUMENTS WERE PREPARED UNDER MY SUPERVISION AND, TO THE BEST OF MY KNOWLEDGE, COMPLY WITH THE APPLICABLE CODES AND BUILDING REGULATIONS. ALPHONSE A. ILEKIS, AIA © COPYRIGHT 2017 ILEKIS ASSOCIATES ALL RIGHTS RESERVED WARNING: VARIOUS COMPONENTS/SURFACES WITHIN THE SCHOOL HAVE TESTED ABOVE AND BELOW THE LEAD THRESHOLD OF 1.0 MG/C REGARDLESS OF CONCENTRATIONS, THERE IS A POTENTIAL FOR LEAD DUST GENERATION DURING DRILLING, CORING, PAINTING PREPARATION AND OTHER RENOVATION ACTIVITIES. FOR ALL SMALL SCALE DISTURBANCES, THE CONTRACTOR SHALL FACILITATE THE APPROPR MEASURES FOUND IN PROJECT SPECIFICATIONS TO PREVENT DUST MIGRATION TO OTHER PARTS OF THE BUILDING. LEAD-BASED PAINT MA BE PRESENT WITHIN THE BUILDING. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO TAKE APPROPRIATE SAFETY MEASURES IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL RULES AND REGULATIONS INCLUDING OSHA (1926.62) COMPLIANC WASTE CHARACTERIZATION AND WASTE DISPOSAL. ALL WORK WITH SURFACES CONTAINING LEAD-BASED PAINT SHALL BE DONE IN ACCORDANCE WITH SPECIFICATION PROJECT SPECIFICATIONS." WARNING: ASBESTOS-CONTAINING BUILDING MATERIALS ARE OR MAY BE PRESENT IN THIS BUILDING. AN ASBESTOS MANAGEMENT PLAN IS AVAILAB IN THE SCHOOL FOR REVIEW UPON REQUEST. NO PERSON MAY DISTURB ASBESTOS-CONTAINING MATERIALS UNLESS THAT PERSON IS A LICENSE ASBESTOS WORKER OR CONDUCTS SUCH WORK IN ACCORDANCE WITH SPECIFICATIONS(S) CONTAINED IN THE PROJECT DOCUMENTS AND IN COMPLIANCE WITH ILLINOIS DEPARTMENT OF HEALTH RULES AND REGULATIONS ISSUANCE DATE MARK DESCRIPTION 1 ISSUED FOR SCHEMATIC DESIGN 10/25/2016 2 ISSUED FOR DESIGN DEVELOPMENT 12/06/2016 3 ISSUED FOR 60% REVIEW 01/31/2017 4 ISSUED FOR 90% REVIEW (PERMIT) 03/7/2017 5 ISSUED FOR PERMIT 03/15/2017 6 ISSUED FOR 100% REVIEW 04/4/2017 7 ISSUED FOR OUT TO BID 04/26/2017 05/16/2017 8 ADDENDUM 1 9 ADDENDUM 2 05/23/2017 DRAWN BY: ILEKIS ASSOCIATES SCALE: SEE DRAWING PROJ. NAME: BYRNE ANNEX PROJECT #: 1618-01 1618-01 A8.1 Ell E ENLARGED ELEVATIONS A8.

(D)



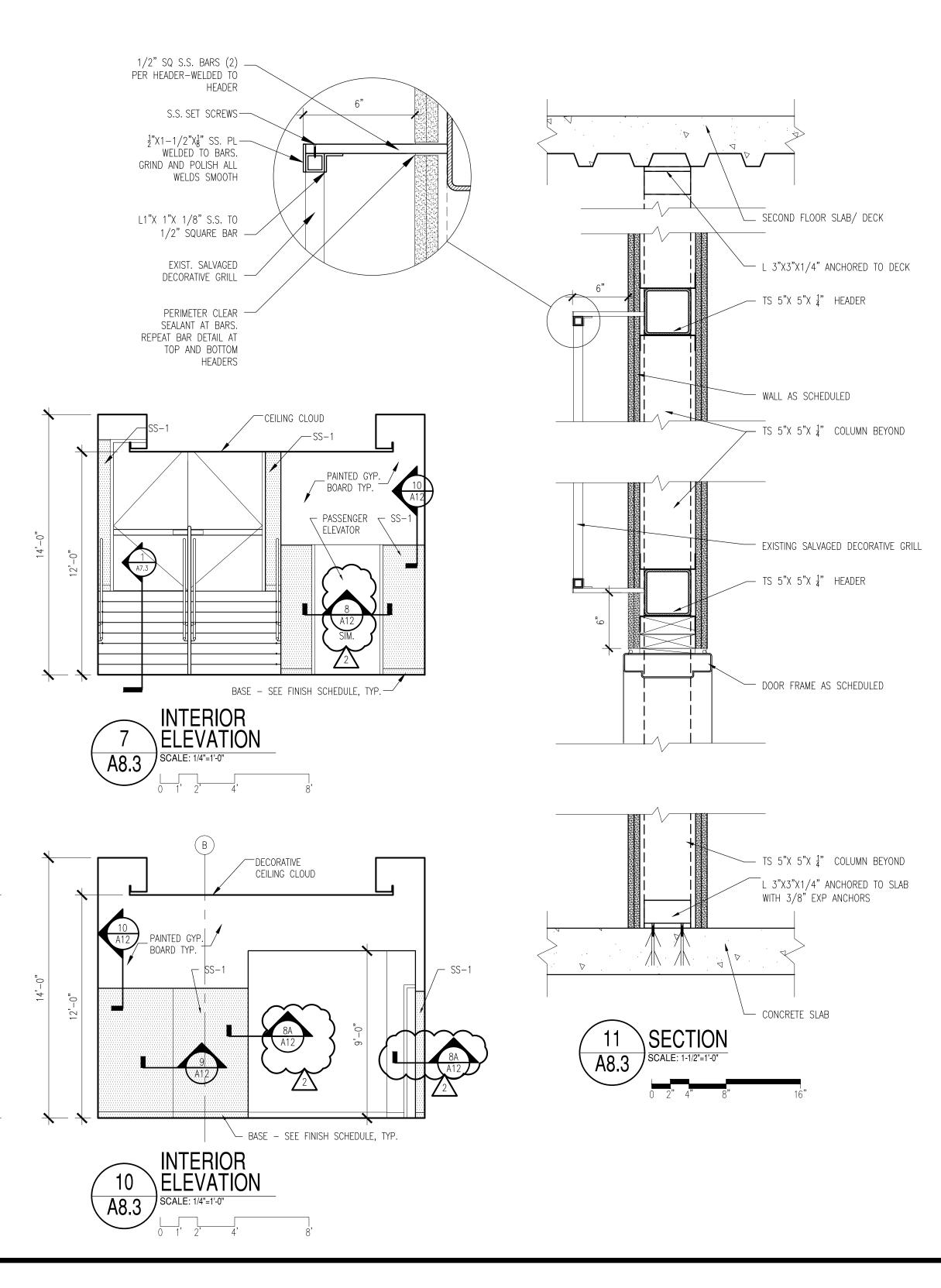


CITY REVIEW



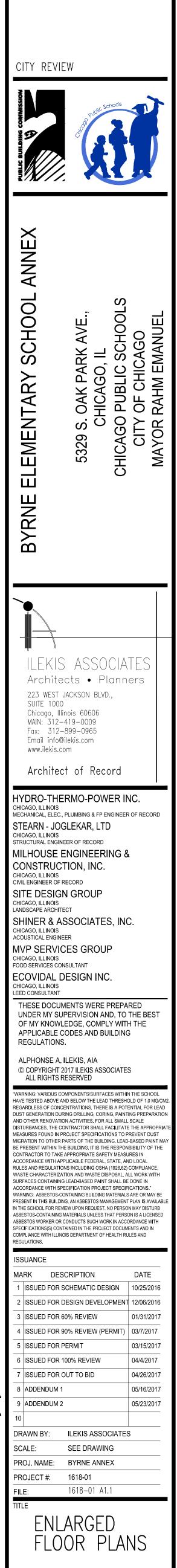
Date of Issue: May 26, 2017 PBC: Byrne Elementary School Annex Project_C1576 - Addendum No. 2

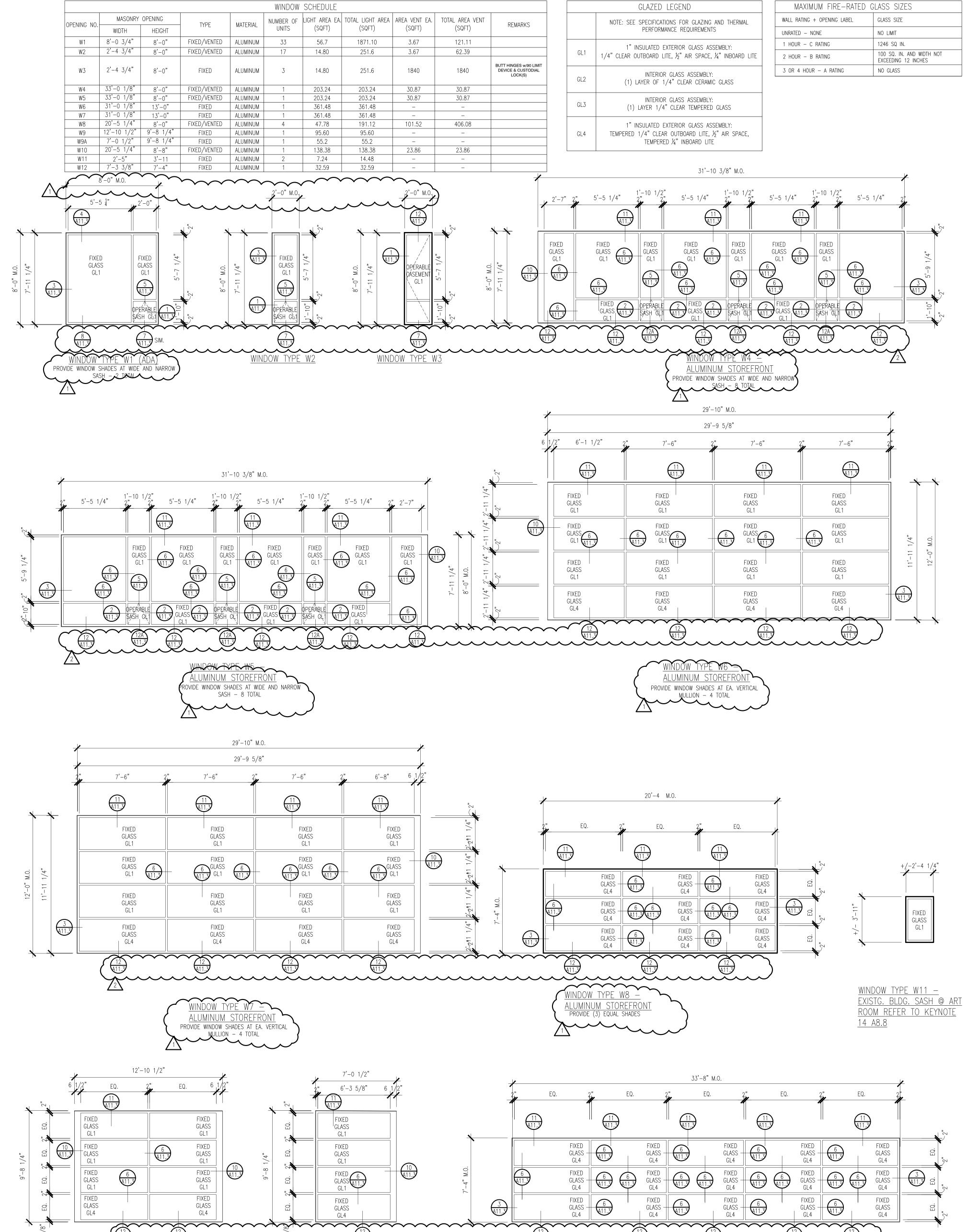
CONTRAC	TOR PROVIDED &	PLAN TAG:			
ITEM#		DESCRIPTION	SIZE	SPEC.	QTY
1		12'x4' MARKERBOARD	144"x48"	101100	2
2		CONCENTRATOR ENCLOSURES (REFER TO ELECTRICAL DRAWINGS FORT CLASSROOMS WITH CONCENTRATION ENCLOSURES)			(SEE ELEC
3		8' PROJECTION SCREEN - WALL MOUNTED		115213	1
4	CL-MISC-15	4'x4' TACKBOARD	48"X48"	10100	4
OWNER P	ROVIDED & INSTA	PLAN TAG:			-
ITEM#	ITEM REF	DESCRIPTION	SIZE	SPEC	QTY
А	CL-STO-2	STORAGE CABINET	36"x24"x72" H		1(x2)
В	CL-STO-3	WARDROBE CABINET	36"x24"x72" H		1(x2)
С	OF-BC-3	(TALL) BOOKCASE	36"x12"x72" H		1(x2)
D	CL-DSK-3	STUDENT DESK w/BOOK BOX	24"x18"x22- 30H		28
E	CL-DSK-5	ACCESSIBLE STUDENT DESK	36"x20"x26- 30"H		2
F	CL-CHR-6	STUDENT CHAIR	15" SEAT HEIGHT		30
G	OF-DSK-1	SINGLE PEDESTAL TEACHER'S DESK	48"x30"x29"		1
н	OF-FL-1	2-DRAWER VERTICAL FILE	18"x30"x29" H		1
J	OF-CHR-1	TASK CHAIR w/ARMS	17-21" SEAT HEIGHT		1
К		LAPTOP CHARGING CART	24"x36"		1

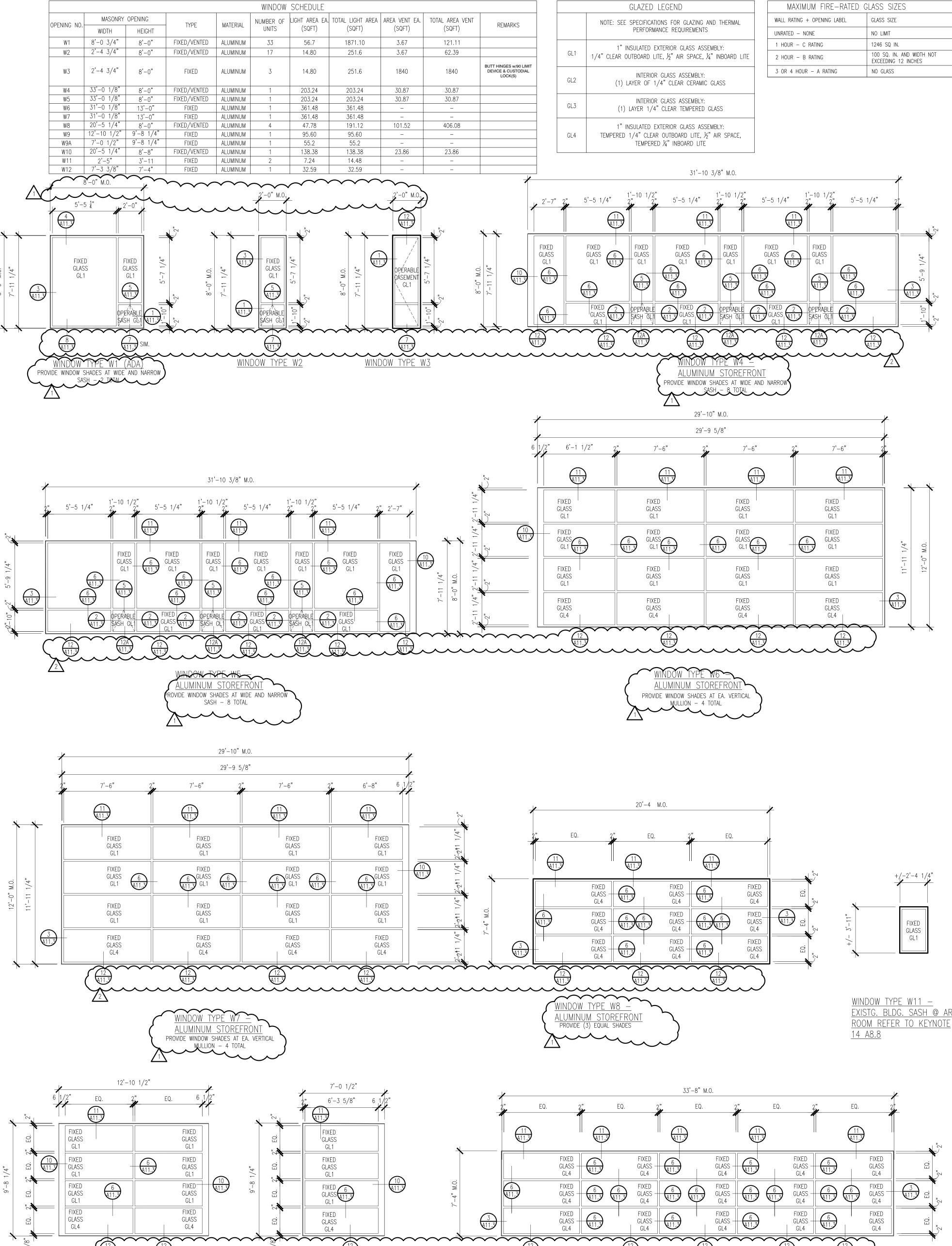


Page 88 of 10	1
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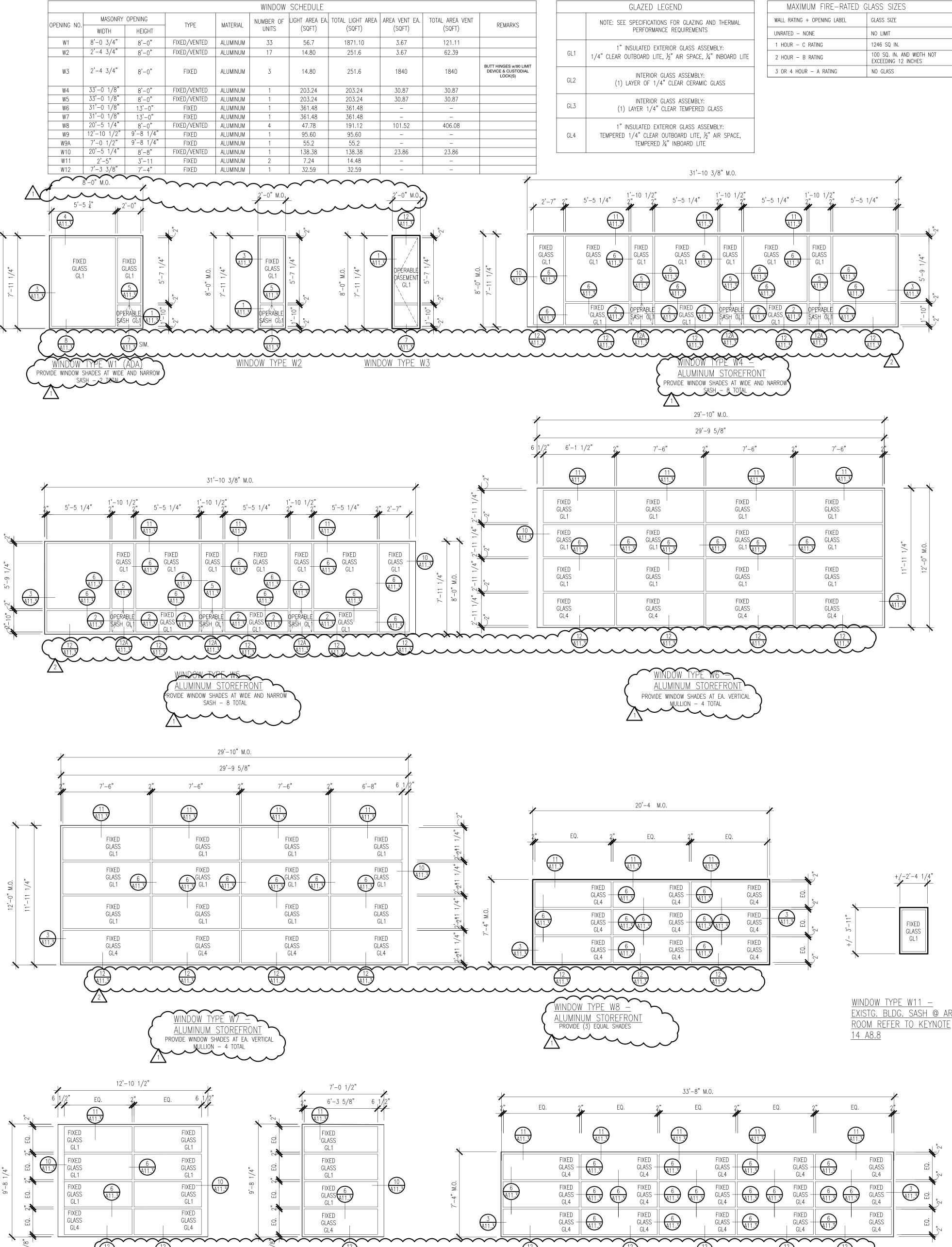
A8.3





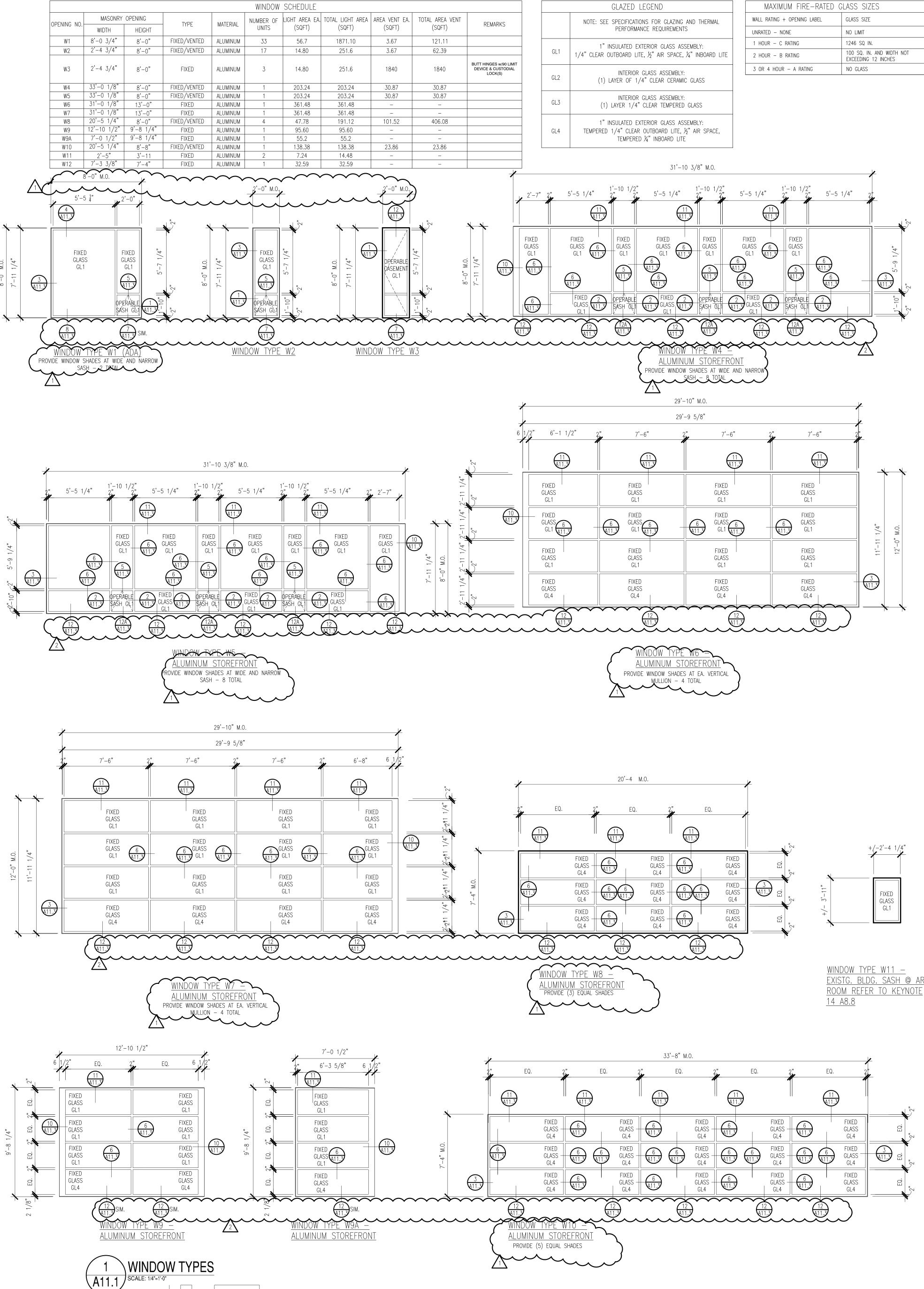








, <u>1</u>, <u>2</u>, <u>7</u>



PBC: Byrne Elementary School Annex Project_C1576 - Addendum No. 2

FANIC HARUWARE	DOOR NUMBER	SHEET #
STING	I FIRST FLOOI	<u> </u> ?
	106-2	01/A8.4
	106A	01/A8.4
	107	01/A8.4
EX F	IRST FLOOR	01/A1.1
<	5B	01/A1.1
¢	6-1A	, 01/A1.1
¢	7	01/A1.1
¢	7-1	01/A1.1
<	8	01/A1.1
<	9A 9B	01/A1.1 01/A1.1
	CE-1	01/A1.1
	BE-1	01/A1.1
	115	01/A1.1
	115A	01/A1.1
	115B	01/A1.1
	115C 115D	01/A1.1 01/A1.1
	115D	01/A1.1
	118	01/A1.1
	120A	01/A1.1
	120B	01/A1.1
	120C	01/A1.1
	121 122	01/A1.1 01/A1.1
	122	01/A1.1
	124	01/A1.1
	125	01/A1.1
	125B	01/A1.1
	126	01/A1.1
	127	01/A1.1 01/A1.1
	127A 128	01/A1.1
	141	01/A1.1
	142	01/A1.1
	143	01/A1.1
	144	01/A1.1
	145 146	01/A1.1 01/A1.1
	147	01/A1.1
	148	01/A1.1
	149	01/A1.1
¢	159A	01/A1.1
<	159B	01/A1.1
<u> </u>	162	01/A1.1
STING	SECOND FL)OR
	212-1	03/A8.10
	212-2	03/A8.10
	214	03/A8.10
EX S	ECOND FLOO	R 01/A1.2
<	7-2	01/A1.2
	215	01/A1.2
	216	01/A1.2
	218	01/A1.2
	220	01/A1.2
	220A 220B	01/A1.2 01/A1.2
	220B	01/A1.2
	221	01/A1.2
	222	01/A1.2
	223	01/A1.2
	224	01/A1.2
	225	01/A1.2 01/A1.2
	226 227	01/A1.2 01/A1.2
	227A	01/A1.2
	228	01/A1.2
	229A	01/A1.2
	229B	01/A1.2
	229C	01/A1.2 01/A1.2
k	241 260	01/A1.2 01/A1.2
k	260A	01/A1.2

- EXTERIOR WALL FRAMES, INSULATE JAMB FRAMING. HOLLOW METAL FRAME.
- FINISH HARDWARE GENERAL NOTES:
- 1. ACCESSIBILITY REQUIREMENTS: REQUIREMENTS. KEYNOTE "N9" AND IN SCHEDULE.
- ORNAMENTAL STEEL FENCE GATES:

						DOOR/F	RAME SCHEDU	JLE						16		
		DOOR					FRAME			DETAIL			re set	RATING	LED	
DOO	R SIZE		TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	HEAD	JAMB	THRESHOLD	LABEL	HARDWARE	(MIN.)	KNURLED	NOTES
W	Н	Т											HA	STC		
3'-0"	7'-0"	1 3/4"	6	WD	STAIN	В	HM	PT	11A	11A	16	С	76	30	_	N4,N20
3'-0"	7'-0"	1 3/4"	1	WD	STAIN	A	HM	PT	13	_	-	B	61	-	_	N19
3'-0"	7'-0"	1 3/4"	6	WD	STAIN	В	HM	PT	11A	11A	16	С	76	30	_	N1,N3,N11
(2)3'-0"	7'-4"	1 3/4"	4	AL	PRE-FIN	С	AL	PRE-FIN	8	2	10	_	51*	_	_	N3,N10,N13,N14,N18
(2)3'-0" (2)3'-0"	7'-0" 7'-2"	1 3/4" 1 3/4"	4	AL AL	PRE-FIN PRE-FIN	C	AL AL	PRE-FIN PRE-FIN	9	5 2	- 10	_	53 56*	-	_	N3,N17,N18
(2)3'-0"	7'-0"	1 3/4"	4	AL	PRE-FIN	А	AL	PRE-FIN	2	2	10		51*	_	_	N3,N8,N10,N18
(2)3'-0" 3'-0"	7'-0"	1 3/4" 1 3/4"	2	WD AL	STAIN PRE-FIN	A C	HM AL	PT PRE-FIN	1	1	-	_	57* 55*	-	-	N1,N3,N11,N14
(2)3'-0"	7'-0	1 3/4"	4	AL	PRE-FIN	C	AL	PRE-FIN	9 (SIMILAR)	2	10	_	51*	_	_	N1,N3,N10,N11,N18
(2)3'-0"	7'-2" 8'-0"	1 3/4" 1 3/4"	4	AL	PRE-FIN	C	AL FRP	PRE-FIN	9	5	_	-	53	-		N12
(2)4'-0" 4'-0"	8 –0 7'–2"	1 3/4"	1	FRP FRP	PRE-FIN PT	A	FRP FRP	PT PT	3 7	3		-	63 64		X	N9 N3,N9,N16,N17,N18
(2) 3'-0"	7'-0"	1 3/4"	3	2	PT	А		PT	1	1	_	В	58	_	-	N6
(2)3'-0" (2)3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	3	HM HM	PT PT	A	HM HM	PT PT	1	1		_	78 78	-	_	N6 N6
(2)3'-0"	7'-0"	1 3/4"	3	HM	PT	A	HM	PT	1	1	_	_	78	_	_	N6
(2)3'-0" (2)3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	3	HM HM	PT PT	A	HM HM	PT PT	1	1		— В	78 78	-	-	N6 N9
3'-0"	7 –0 7'–0"	1 3/4"	2	WD	STAIN	A	HM	PT	1	1	-	C	78	30	_	N9 N4
3'-0"	7'-0"	1 3/4" 1 3/4"	2	WD WD	STAIN	A	HM	PT	1	1	_	С	59*	_	_	
1'-10" (2)3'-0"	7'-0" 7'-0"	1 3/4 1 3/4"	1	WD WD	STAIN STAIN	A	HM HM	PT PT	1	1		- C	65 60*	- 30	_	N4
3'-0"	7'-0"	1 3/4"	1	HM	PT	A	HM	PT	1	1	_	С	62	-	_	N9
3'-0" 3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	2	WD HM	STAIN PT	A	HM HM	PT PT	1	1		C C	75 66	30	X	N4 N9
3'-0"	7'-0"	1 3/4"	2	WD	STAIN	A	HM	PT	1	1	_	C	75	30	_	N4
3'-0" 3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	3	HM HM	PT PT	A	HM HM	PT PT	1	1	-	B	74 73	-	-	N18 N9,N18
3'-0"	7'-0"	1 3/4"	2	WD	STAIN	A	HM	PT	1	1	_	C	75	30	_	N4
3'-0"	7'-0"	1 3/4"	2	HM	PT	E	HM	PT	1	1	-	-	70	-	-	
3'-0" 3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	1	HM WD	PT STAIN	A	HM HM	PT PT	1	1		B C	61 75	- 30	X _	N9 N4
3'-0"	7'-0"	1 3/4"	1	НМ	PT	А	НМ	PT	1	1	-	В	66	-	Х	N9
<u> </u>	7'-0" 7'-0"	1 3/4" 1 3/4"	2	WD HM	STAIN PT	A	HM HM	PT PT	1	1		C B	77 66		X	N9
3'-0"	7'-0"	1 3/4"	2	WD	STAIN	A	HM	PT	1	1	-	C	70	_	_	
3'-0" 3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	1	HM WD	PT STAIN	A	HM HM	PT PT	1	1	-	B C	79 70	-	-	
3'-0"	7'-0"	1 3/4"	1	HM	PT	A	HM	PT	1	1	_	B	79	-	-	
3'-6" (2) <u>3'</u> -0"	7'-0"	1 3/4" 1 3/4"	1	HM	PT	A	HM	PT	1	1	_	B	66	-	X	N9
$(2)3^{-0}$	7'-0" 8'-0"	1 3/4"	1	HM HM	PT PT	A	HM HM	PT PT	1	1	-	B	67 54*	40	X _	N4,N5,N9 N7
(2)4'-0"	8'-0"	1 3/4"	1	HM	PT	A	HM	PT	1	1	_	A	54*	-	-	N7
(2)3'-0"	7'-0"	1 3/4"	4	AL	PRE-FIN	В	AL	PRE-FIN	9	5	-	-	54*	-	_	N7,N8
		(.)				_										
3'-0" 3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	6	WD WD	STAIN STAIN	B	HM HM	PT PT	13 13	11	16 16	C C	75 75	30 30	-	N4,N20 N4,N20
3'-0"	7'-0"	1 3/4"	6	WD	STAIN	В	HM	PT	18	16	16	С	69	30	_	N4
(2)3'-0"	7'-0"	1 3/4"	2	WD	STAIN	А	НМ	PT	1	1	_	_	52*	-	_	N2
(2)3'-0" 3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	2	WD WD	STAIN STAIN	A	HM HM	PT PT	1	1		– C	52* 75	-	-	N2
<u> </u>	7 –0 7'–0"	1 3/4"	2	WD	STAIN	A	HM HM	PT	1	1	-	C	75	- 30	_	N4
3'-0"	7'-0"	1 3/4"	2	WD	STAIN	A	HM	PT	1	1	-	С	75	30	-	N4
3'-0" 3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	2	WD WD	STAIN STAIN	A	HM HM	PT PT	1	1		C B	75 68	30 -	X	N4 N9
3'-0"	7'-0"	1 3/4"	2	WD	STAIN	A	HM	PT	1	1	_	С	72	-	-	
<u> </u>	7'-0" 7'-0"	1 3/4" 1 3/4"	2	WD HM	STAIN PT	A	HM HM	PT PT	1	1		C C	71 66	30 30	X	N4 N9
3'-0"	7'-0"	1 3/4"	2	WD	STAIN	A	HM	PT	1	1	_	С	75	30	-	N4
3'-0" 3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	1	HM WD	PT STAIN	A	HM HM	PT PT	1	1	-	C C	62 75	- 30	X	N9 N4
3'-0"	7 –0 7'–0"	1 3/4"	2	WD	STAIN	A	HM	PT	1	1	-	C	75	30	_	N4 N4
3'-0"	7'-0"	1 3/4"	2	WD WD	STAIN	A	HM	PT	1	1	-	С	75	30	_ _	N4 N5
3'-0" 3'-0"	7'-0" 7'-0"	1 3/4" 1 3/4"	2	WD WD	STAIN STAIN	A	HM HM	PT PT	1	1		C B	75 66	40	X _	N4,N5 N9
3'-0"	7'-0"	1 3/4"	2	WD	STAIN	A	HM	PT	1	1	_	С	75	30	_	N4
3'-0" 3'-0"/1-4	7'-0" 7'-0"	1 3/4" 1 3/4"	2	WD WD	STAIN STAIN	A	HM HM	PT PT	1	1		C B	75 80	40 40	-	N4,N5 N4,N5
3'-0"/1'-4"	7'-0"	1 3/4"	1	WD	STAIN	A	HM	PT	1	1	_	С	80	40	_	N4,N5
3'-0" (2)4'-0"	7'-0" 8'-0"	1 3/4" 1 3/4"	1	WD HM	STAIN PT	A	HM HM	PT PT	1	1	-	B	62 54*	-	-	N9 N7
(2)4 - 0 (2)4' - 0"	8 -0 8'-0"	1 3/4"	1	HM HM	PT	A	HM	PT	1	1	-	A	54* 54*	-	_	N7 N7

S TO ACCOMMODATE PARTITION TYPES AND REQUIREMENTS FOR FIRE RATING. TIONS, SPOT GROUT FRAMES AT EACH JAMB ANCHOR. FULLY GROUT ALL

3. AT ALL MASONRY PARTITIONS, SOLIDLY GROUT THE ENTIRE VOID IN THE HOLLOW METAL FRAME 4. PROVIDE SEALANT AT JUNCTURE OF ALL FRAMES TO PARTITIONS AND FRAMES TO FLOOR W/ RATING AS REQ'D. AT NON-RATED ASSEMBLIES CAULK IN COLOR TO MATCH FRAME PAINT COLOR. AT FRAMES ANCHORED TO MASONRY PROVIDE 3/8" DIA. EXPANSION ANCHORS WITH FLAT COUNTERSUNK HEADS. DIMPLE FRAME WITH 1/16" DEPRESSION TO RECEIVE SCREW HEAD. PROVIDE METAL BODY PUTTY FILL OVER SCREW HEAD + GRIND SMOOTH, PRIME + PAINT. 6. PAINT ALL METAL GLAZING STOPS, ROUND LITE KIT TRIM TO MATCH FINAL DOOR / FRAME FINISH HEIGHT & WIDTH OF DOOR OPENING INDICATED ON SCHEDULE ARE DIMENSIONS EXCLUSIVE OF

8. ALL B-LABEL AND C-LABEL OPENING PROTECTIVES INCLUDING LITES, DOOR LITES, AND SIDE LITES SHALL RECEIVE 5/16" CERAMIC FIRE RATED GLAZING AND BE INSTALLED WITH FIRE GLAZING COMPOUND. 9. ALL DOOR FRAMES SHALL MATCH THE FIRE DOOR RATING AND UL LABEL. 10. ALL HOLLOW METAL DOORS/FRAMES SHALL BE PAINTED, SEE FINISH SCHEDULE FOR COLOR. 11. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND QUANTITIES PRIOR TO

FABRICATION AND IS RESPONSIBLE FOR FIT AND OPERATION. 12. REFERENCE THIS SHEET FOR GLAZING SCHEDULE / DESCRIPTION. 13. SEE SPECIFICATION SECTION 08 71 00, "DOOR HARDWARE" FOR HARDWARE SETS.

A. ALL DOORS TO REQUIRED ACCESSIBLE ROOMS AND SPACES TO RECEIVE HARDWARE PER ADAAG 4.13.9 MINIMUM 32" CLEAR OPENING, AND COMPLY WITH ALL ADAAG 4.13

B. ALL DOORS TO HAZARDOUS ROOMS, INCLUDING ALL ELECTRICAL, MECHANICAL, MDF ROOM AND SIMILAR ROOMS SHALL HAVE KNURLED HARDWARE PER ADAAG SECTION 4.27.3 SEE

A. PROVIDE ADA COMPLIANT LATCH HARDWARE AND LOCK HASP. REFER TO LANDSCAPE PLANS/DETAILS AND SITE PLAN. COORDINATE W/ FENCING CONTRACTOR AS REQ'D.

HARDWARE KEY:

N1 INTEGRAL WINDOW W/WALL COORD. W/GC. AND W/MFR. AS REQ'D N2 DOORS ON ELECTROMAGNETIC HOLD OPENS - SEE ELECTRICAL SHEETS

N3 PROVIDE + INSTALL WEATHERSTRIPPING ON ALL SIDES N4 PROVIDE + INSTALL ACOUSTICAL SOUND SEAL ON JAMB AND HEAD TO ACHIEVE STC

- RATING INDICATED ON SCHEDULE N5 PROVIDE & INSTALL ACOUSTICAL DOOR BOTTOM SOUND SEAL.
- N6 PROVIDE & INSTALL FLOOR KICKS AS HOLD OPENS.

N7 PROVIDE 8 5 FRAME. N8 PROVIDE 2'-2" TRANSOM.

N9 PROVIDE AND INSTALL KNURLED HARDWARE PER IAC AND ANSI A117.12003

N10 ELECTRIC STRIKE, TIE TO AIPHONE N11 PROVIDE 2'-8" TRANSOM.

N12 PROVIDE 2'-4" TRANSOM. N13 PROVIDE 6'-7" TRANSOM.

N14 EXIT ONLY N15 PROVIDE 2'-2" FRP INSULATED TRANSOM.

N16 PROVIDE EXTRA HEAVY HINGES

N17 INSULATED EXTERIOR DOOR/FRAME N18 PROVIDE DOOR SWEEP, REF. TO HW SET. IF NOT OTHERWISE INDICATED, PROVIDE PEMKO 18100CP; OTHER MANUFACTURERS PRODUCTS MEETING DESIGN CRITERIA WILL BE

CONSIDERED SUBJECT TO COMPLIANCE WITH PROJECT REQUIREMENTS N19 FRAME WIDTH TO MATCH WALL THICKNESS, INSTALL WOOD CASING MATCHING EIST.

(BOTH SIDES). COORDINATE LOCKSET AND KEYING WITH SCHOOL ENGINEER. GENERAL CONTRACTOR TO PROVIDE SIGN-OFF.

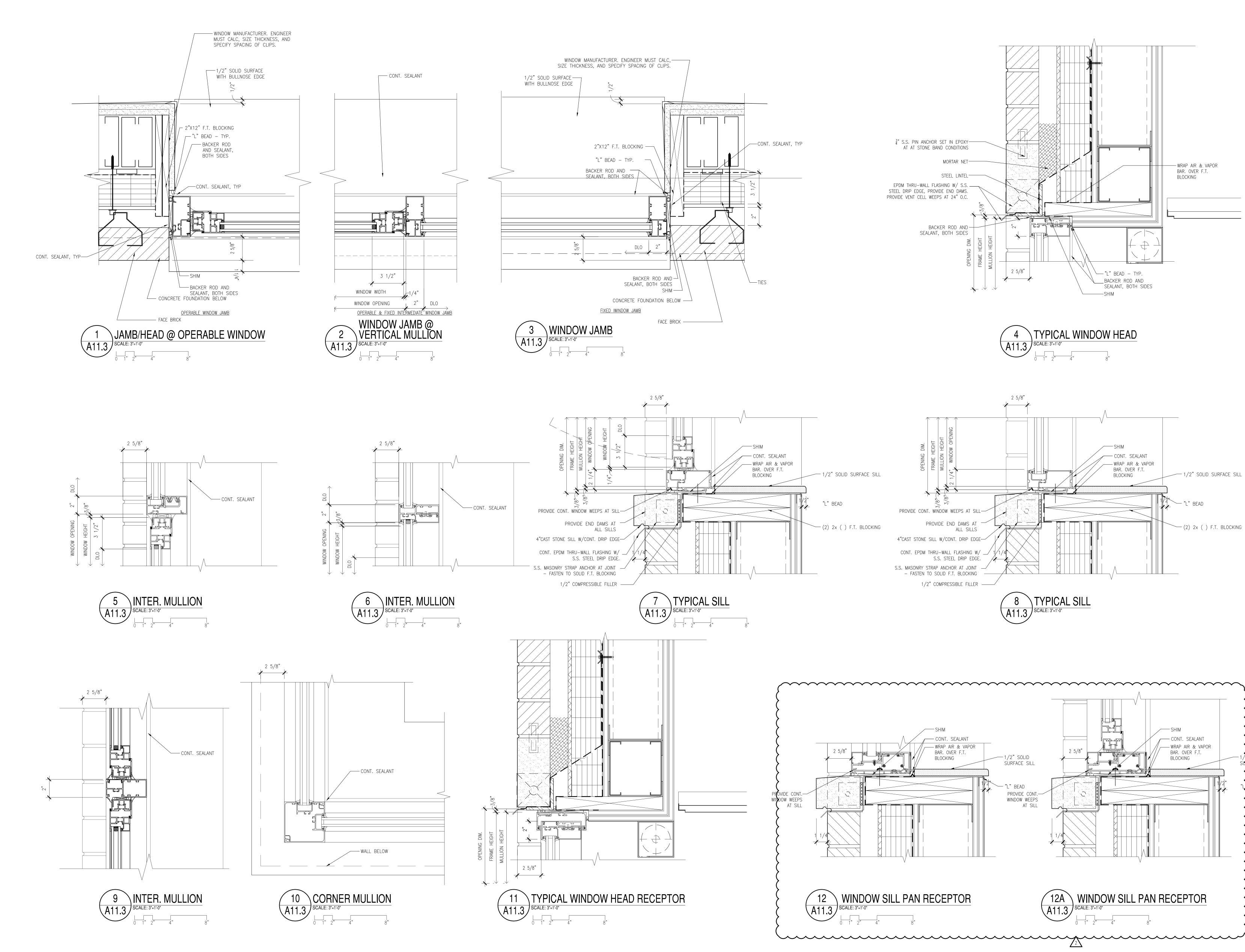
THE HARDWARE SETS OF DOORS WITH AN * THAT HAVE PANIC HARDWARE

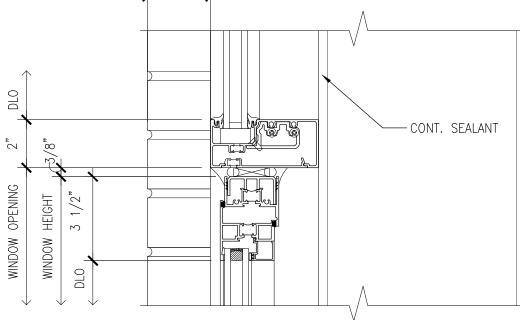
ALL REQUIRED FIRE RATED DOORS & ACCESSORIES TO COMPLY WITH CBC - 7 (15-12-090) ABBREVIATIONS:

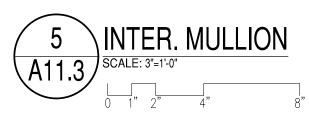
AL	ALUMINUM

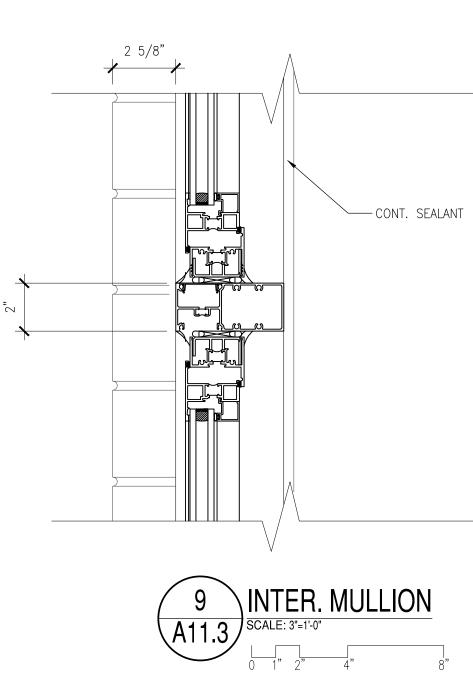
- ANOD ANODIZED
- HC HOLLOW CORE-WOOD ΗМ HOLLOW METAL
- GALV GALVANIZED STEEL STAINLESS STEEL
- SS ST STEEL WD WOOD
- FRP FIBER REINFORCED PANEL PRE-FIN PRE-FINISHED
- NR NOT REQUIRED NA NOT APPLICABLE

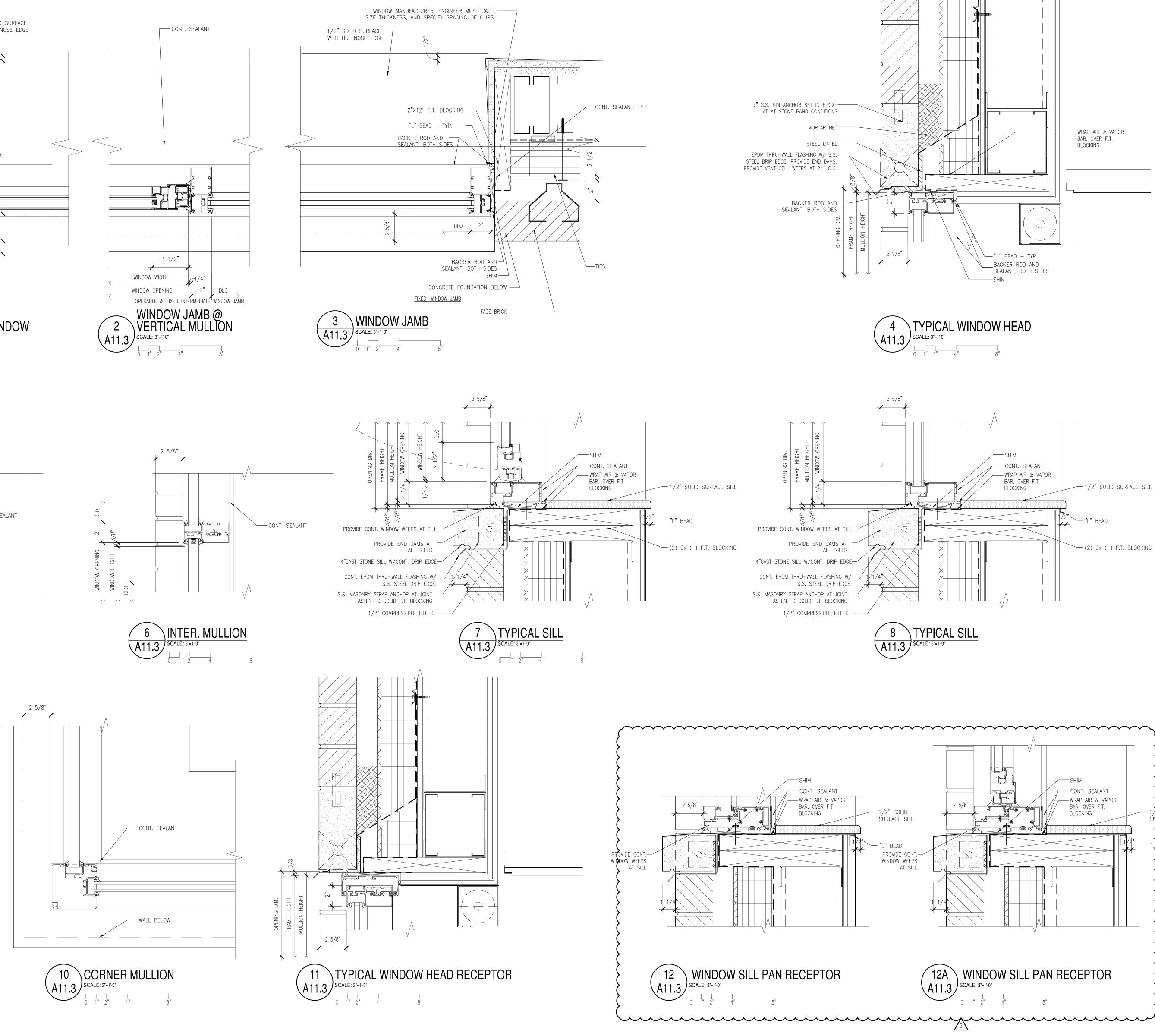
	EW C ^{ices Public School}	5
BYRNE ELEMENTARY SCHOOL ANNEX	5329 S. OAK PARK AVE., CHICAGO, IL	CITY OF CHICAGO CITY OF CHICAGO MAYOR RAHM EMANUEL
Archite 223 WEST SUITE 1000 Chicago, III MAIN: 312- Fax: 312- Email info@ www.ilekis.c	linois 60606 -419-0009 -899-0965 ⊇ilekis.com	iners
HYDRO-THE CHICAGO, ILLINOIS MECHANICAL, ELEC. STEARN - JOU CHICAGO, ILLINOIS STRUCTURAL ENGINE MILHOUSE I CONSTRUC CHICAGO, ILLINOIS CIVIL ENGINEER OF SITE DESIG CHICAGO, ILLINOIS LANDSCAPE ARCHIT SHINER & A CHICAGO, ILLINOIS ACOUSTICAL ENGIN MVP SERVIC CHICAGO, ILLINOIS FOOD SERVICES CO ECOVIDAL I CHICAGO, ILLINOIS FOOD SERVICES CO ECOVIDAL I CHICAGO, ILLINOIS LEED CONSULTANT THESE DOCUU UNDER MY SU OF MY KNOW APPLICABLE O REGULATIONS ALPHONSE A. © COPYRIGHT ALL RIGHTS I	ERMO-POWER , PLUMBING & FP ENGIN GLEKAR, LTD NEER OF RECORD ENGINEERING TION, INC. RECORD N GROUP TECT SSOCIATES, I EER CES GROUP INSULTANT DESIGN INC. MENTS WERE PRE JPERVISION AND, T LEDGE, COMPLY W CODES AND BUILDI S. ILEKIS, AIA 2017 ILEKIS ASSOCIA RESERVED OMPONENTS/SURFACES WI	A INC. EER OF RECORD
REGARDLESS OF CONC DUST GENERATION DU AND OTHER RENOVATI DISTURBANCES, THE C MEASURES FOUND IN F MIGRATION TO OTHER BE PRESENT WITHIN TH CONTRACTOR TO TAKE ACCORDANCE WITH AF RULES AND REGULATIC WASTE CHARACTERIZ/ SURFACES CONTAININ ACCORDANCE WITH SE WARNING: ASBESTOS-CO PRESENT IN THIS BUILDI IN THE SCHOOL FOR REY ASBESTOS-CONTAINING ASBESTOS-CONTAINING ASBESTOS WORKER OR SPECIFICATIONS(S) CON COMPLIANCE WITH ILLIN REGULATIONS. ISSUANCE MARK DES 1 ISSUED FOR	CENTRATIONS, THERE IS A F IRING DRILLING, CORING, PA ION ACTIVITIES. FOR ALL SM CONTRACTOR SHALL FACILIT PROJECT SPECIFICATIONS 1 PARTS OF THE BUILDING. L HE BUILDING. IT IS THE RESI E APPROPRIATE SAFETY ME PPLICABLE FEDERAL, STATE DONS INCLUDING OSHA (1926 ATION AND WASTE DISPOSA G LEAD-BASED PAINT SHALL PECIFICATION PROJECT SPE CONTAINING BUILDING MATER CONTAINING BUILDING MATER ING. AN ASBESTOS MANAGEM VIEW UPON REQUEST. NO PE IMATERIALS UNLESS THAT PI CONDUCTS SUCH WORK IN A ITAINED IN THE PROJECT DOC IOIS DEPARTMENT OF HEALTI SCRIPTION SCHEMATIC DESIGN DESIGN DEVELOPME	POTENTIAL FOR LEAD AINTING PREPARATION IALL SCALE TATE THE APPROPRIATE TO PREVENT DUST EAD-BASED PAINT MAY PONSIBILITY OF THE ASURES IN 5, AND LOCAL .62) COMPLIANCE, A. ALL WORK WITH L BE DONE IN ECIFICATIONS." IALS ARE OR MAY BE IENT PLAN IS AVAILABLE RSON MAY DISTURB ERSON IN A LICENSED ACCORDANCE WITH CUMENTS AND IN H RULES AND DATE 10/25/2016
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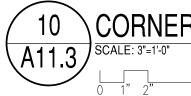




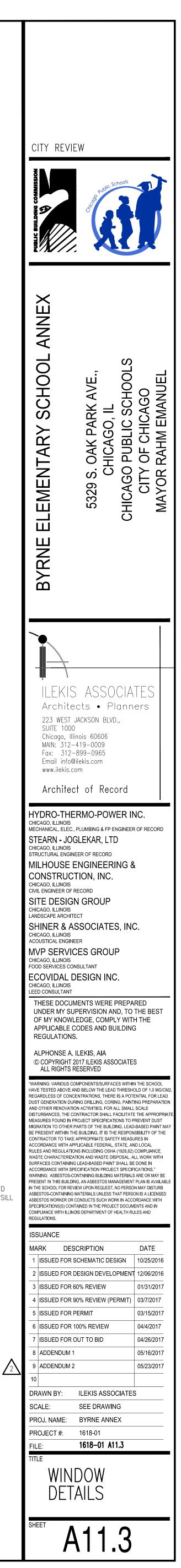






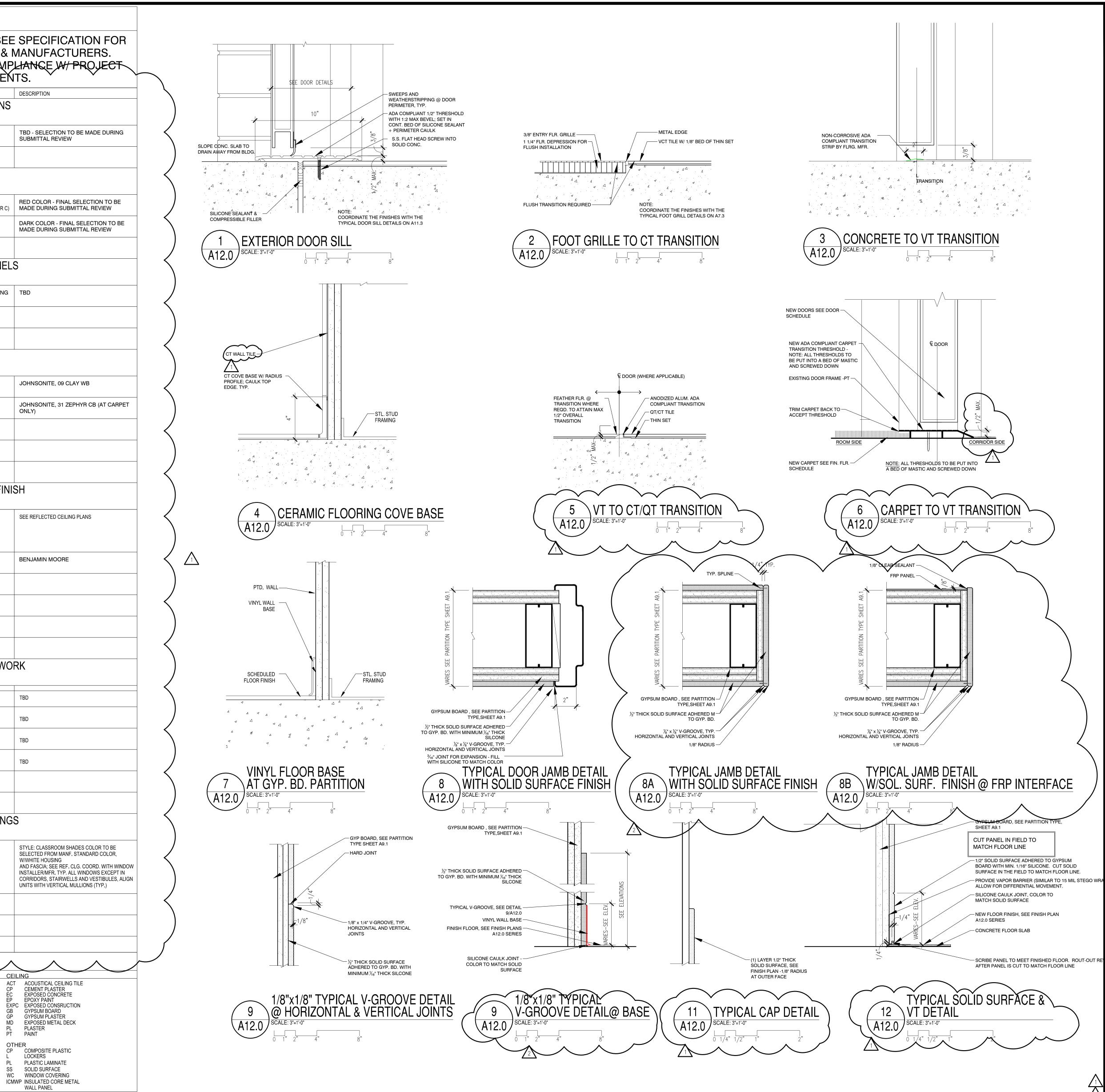


SOLID BEAD

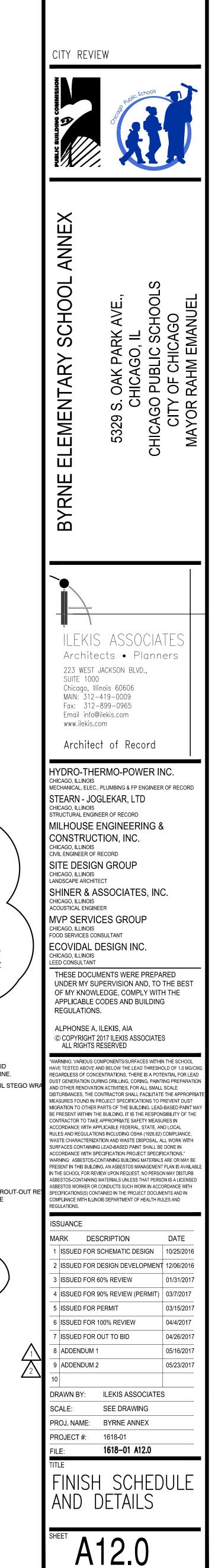


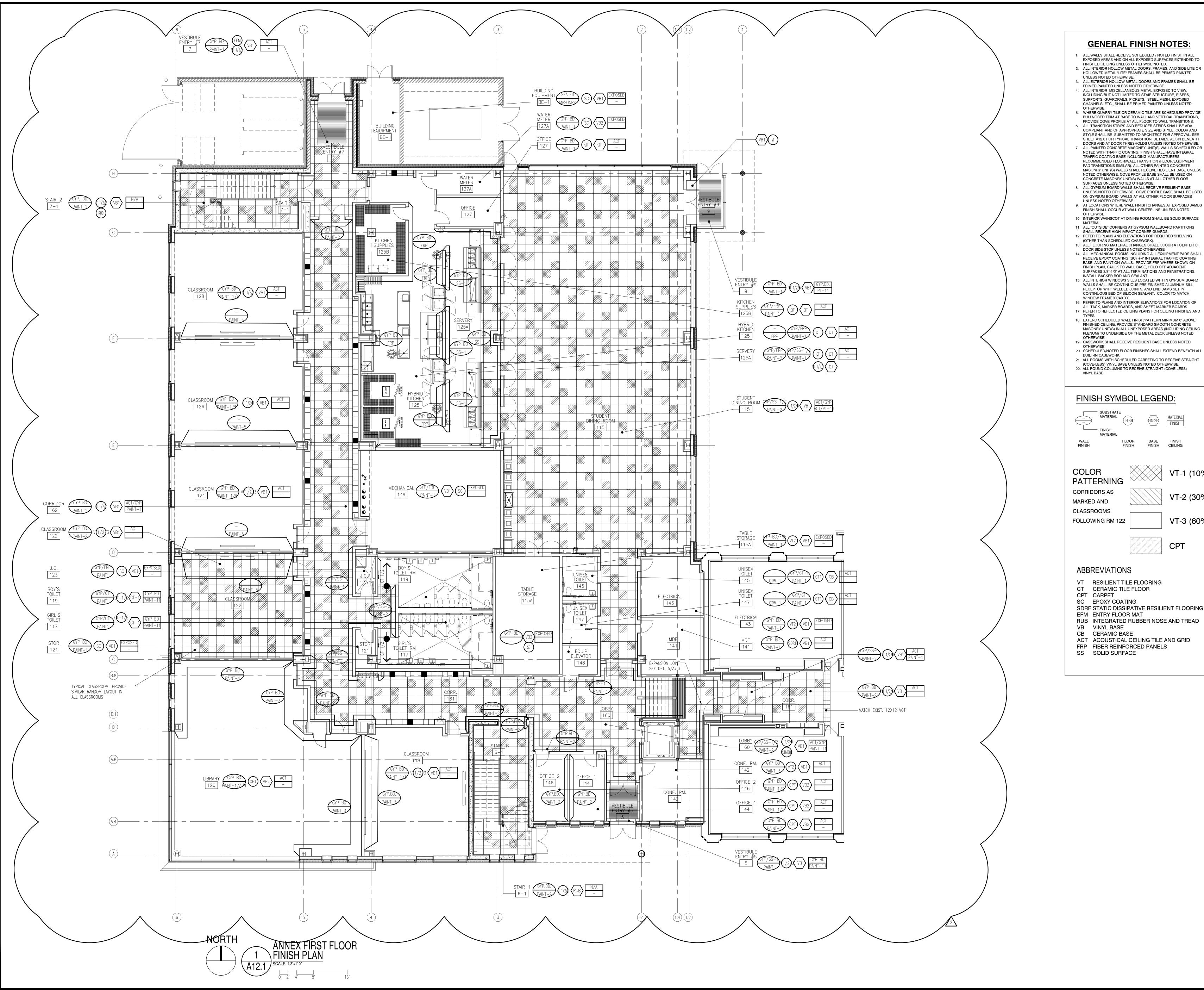
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* REQUIREME	BASE FINISH FINISH CEILING	FLOOR FINISH	WALL FINISH
SYMBOL MATERIAL	DESCRIPTION		SYMBOL
(SP) SOLID POLYMER	ENTRANCE FOOT GRILLE	FOOT GRILLE	(FG)
	JOHNSONITE DIAMOND PATT. STAIR LANDING COLOR TBD COMPLYING W/ TACTILE	STAINLESS STEEL	
LOCKERS	WARNING REQMTS. OF IAC FIGS. 40 +41. JOHNSONITE COLOR TBD, MATCHING DETECTABLE WARNING TILE TO VT 2 OR 3	RUBBER TREAD AND NOSING	RUB
L1 CORRIDOR - STUDENT	SEE SPECIFICATION 09 97 24	CONCRETE FLOORING	SC
LOCKERS (TYPE A, B OR C)	DAL TILE, VOLUME 1.0 AURAL SAND VL77 (12"X12" TILE)	CERAMIC FLOOR TILE	(CT1)
127B	JOHNSONITE TARKETT IQ GRANIT (24" X 24" TILE) - 411 PRIM ROSE - 10% OF TOTAL MATRIX	SOLID VINYL	(VT1)
ACOUSTICAL PANE	JOHNSONITE TARKETT iQ GRTSD-XX (24" X 24" TILE) - 716 KAHLUA - 30% OF TOTAL MATRIX	SOLID VINYL	VT2
(ACT) ACOUSTICAL CEILING	JOHNSONITE TARKETT iQ GRTSD-XX (24" X 24" TILE) - 714 MISTY - 60% OF TOTAL MATRIX	SOLID VINYL	(VT3)
TILE AND GRID	STANDARD RED COLOR TILE - SUBMIT FOR ARCHITECT'S APPROVAL.	QUARRY TILE	QT
	SHAW CONTRACT GROUP - BEYOND THE FOLD 5T060 DOLPHIN ECRU 60105 (18"X36" CARPET TILE)	CARPET TILE	CPT
BASE FINISH			
VINYL		FINISH	WALL
COVE BASE	WILSONART AVALANCHE MELANGE 9175 ML (3) 13MM - VERTICAL INSTALLATION ONLY	SOLID SURFACE	- <u>SS-1</u>
STRAIGHT BASE	WILSONART MARZIPAN MIRAGE 9130 MG (2) 13MM - VERTICAL INSTALLATION ONLY	SOLID SURFACE (ACCENT & WINDOW SILLS)	-
	DAL TILE, VOLUME 1.0 AURAL SAND VL77 (12"X12" TILE)	CERAMIC FLOOR TILE	CTW-1
	DAL TILE, VOLUME 1.0 VICTORY RED VL85 (12"X12" TILE)	CERAMIC FLOOR TILE	CTW-2
CEILING/SOFFIT FI	TBD - SELECTION TO BE MADE DURING SUBMITTAL REVIEW	FIBER GLASS REINFORCED PANEL	FRP
MATERIAL SATC (SUSPENDED	MAIN COLOR, BENJAMIN MOORE - OC-14 ANTIQUE LACE	PAINT 1	- PT-1
ACOUSTIC TILE)	ACCENT COLOR, BENJAMIN MOORE - HC-8 DORSET GOLD	PAINT 2	- PT-2
GYP BD 1 GYP BD (GYPSUM	ACCENT COLOR, BENJAMIN MOORE - HC-80 BLEEKER BEIGE	PAINT 3	PT-3
PAINT WALL BOARD)	ACCENT COLOR, BENJAMIN MOORE - 2129-60 MT. RAINER GRAY	PAINT 4	PT-4
	ACCENT COLOR, BENJAMIN MOORE - 2021-50 YELLOW LOTUS	PAINT 5	PT-5
•	STEEL STRINGERS, RAILING AND OR GUARD RAILS.		PT-6
	INTERIOR HOLLOW METAL FRAMES TO BE PAINTED THE COLOR OF THE WALL THEY'RE ATTACHED TO (IN SOME CASES	VAIRES	- PT-8
MILLWORK/CASEV	THE FRAME WILL BE 2 COLORS DEPENDING ON ROOM COLOR ON EACH SIDE)		
	INTERIOR HOLLOW METAL FRAMES AND DOORS		- PT-9
PL-1 PLASTIC LAMINATE	ALL EXTERIOR HOLLOW METAL FRAMES (MATCH WINDOW FRAMES)		- PT-10
PL-2 PLASTIC LAMINATE	CEILING - GYP. BD. SOFFIT OR WINDOW HEADS	PAINT 11	PT-11
SS -4			
SOLID SURFACE			
WINDOW COVERIN			
WC-1 WINDOW COVERING			
BREVIATIONS	ROOM FINISH LEGEND AB		
ACOUSTICAL WALL PANELS BRICK	BASE WALL CB CERAMIC COVE BASE AP COVE EPOXY FLOORING BASE BR	CRETE C XY COATING E	FLOOR CONC CON SC EPO
CONCRETE CHALK BOARD CONCRETE MASONRY UNIT CERAMIC TILE WALL	//B VINYL COVE 4" HIGH C //S VINYL STAIGHT 4" HIGH CB AC ARCHITECTURAL CONCRETE CMU CC TRAFFIC COATING CTW	AMIC TILE	CT CER DW DETI
EPOXY PAINT GYPSUM BOARD METAL PANEL	EP GYP BD MP	FFIC COATING RRY TILE	TC TRA QT QUA
MARKER BOARD PROJECTION SCREEN PLASTIC LAMINATE PAINT	MB PS PL PT	D VINYL TILE IPATIVE	
TACK BOARD SHT MARKER BOARD SOLID SURFACE	TB SMB SS		
METAL PANEL MARKER BOARD PROJECTION SCREEN PLASTIC LAMINATE PAINT TACK BOARD SHT MARKER BOARD	MP MB PS PL PT TB SMB	D VINYL TILE	olli SS









DOORS AND AT DOOR THRESHOLDS UNLESS NOTED OTHERWISE. ALL PAINTED CONCRETE MASONRY UNIT(S) WALLS SCHEDULED OR NOTED WITH TRAFFIC COATING. FINISH SHALL HAVE INTEGRAL TRAFFIC COATING BASE INCLUDING MANUFACTURERS RECOMMENDED FLOOR/WALL TRANSITION (FLOOR/EQUIPMENT PAD TRANSITIONS SIMILAR). ALL OTHER PAINTED CONCRETE MASONRY UNIT(S) WALLS SHALL RECEIVE RESILIENT BASE UNLESS NOTED OTHERWISE. COVE PROFILE BASE SHALL BE USED ON CONCRETE MASONRY UNIT(S) WALLS AT ALL OTHER FLOOR 8. ALL GYPSUM BOARD WALLS SHALL RECEIVE RESILIENT BASE UNLESS NOTED OTHERWISE. COVE PROFILE BASE SHALL BE USED ON GYPSUM BOARD. WALLS AT ALL OTHER FLOOR SURFACES 9. AT LOCATIONS WHERE WALL FINISH CHANGES AT EXPOSED JAMBS FINISH SHALL OCCUR AT WALL CENTERLINE UNLESS NOTED 10. INTERIOR WAINSCOT AT DINING ROOM SHALL BE SOLID SURFACE 11. ALL "OUTSIDE" CORNERS AT GYPSUM WALLBOARD PARTITIONS SHALL RECEIVE HIGH IMPACT CORNER GUARDS. 12. REFER TO PLANS AND ELEVATIONS FOR REQUIRED SHELVING 13. ALL FLOORING MATERIAL CHANGES SHALL OCCUR AT CENTER OF 14. ALL MECHANICAL ROOMS INCLUDING ALL EQUIPMENT PADS SHALL RECEIVE EPOXY COATING (SC) +4" INTEGRAL TRAFFIC COATING BASE, AND PAINT ON WALLS. PROVIDE FRP WHERE SHOWN ON FINISH PLAN, CAULK TO WALL BASE, HOLD OFF ADJACENT SURFACES 3/8"-1/2" AT ALL TERMINATIONS AND PENETRATIONS, 15. ALL INTERIOR WINDOWS SILLS LOCATED WITHIN GYPSUM BOARD WALLS SHALL BE CONTINUOUS PRE-FINISHED ALUMINUM SILL RECEPTOR WITH WELDED JOINTS, AND END DAMS SET IN CONTINUOUS BED OF SILICON SEALANT. COLOR TO MATCH 16. REFER TO PLANS AND INTERIOR ELEVATIONS FOR LOCATION OF ALL TACK, MARKER BOARDS, AND SHEET MARKER BOARDS. 17. REFER TO REFLECTED CEILING PLANS FOR CEILING FINISHES AND 18. EXTEND SCHEDULED WALL FINISH/PATTERN MINIMUM 8" ABOVE FINISHED CEILING, PROVIDE STANDARD SMOOTH CONCRETE MASONRY UNIT(S) IN ALL UNEXPOSED AREAS (INCLUDING CEILING PLENUM) TO UNDERSIDE OF THE METAL DECK UNLESS NOTED 19. CASEWORK SHALL RECEIVE RESILIENT BASE UNLESS NOTED 20. SCHEDULED/NOTED FLOOR FINISHES SHALL EXTEND BENEATH ALL 21. ALL ROOMS WITH SCHEDULED CARPETING TO RECEIVE STRAIGHT (COVE-LESS) VINYL BASE UNLESS NOTED OTHERWISE.

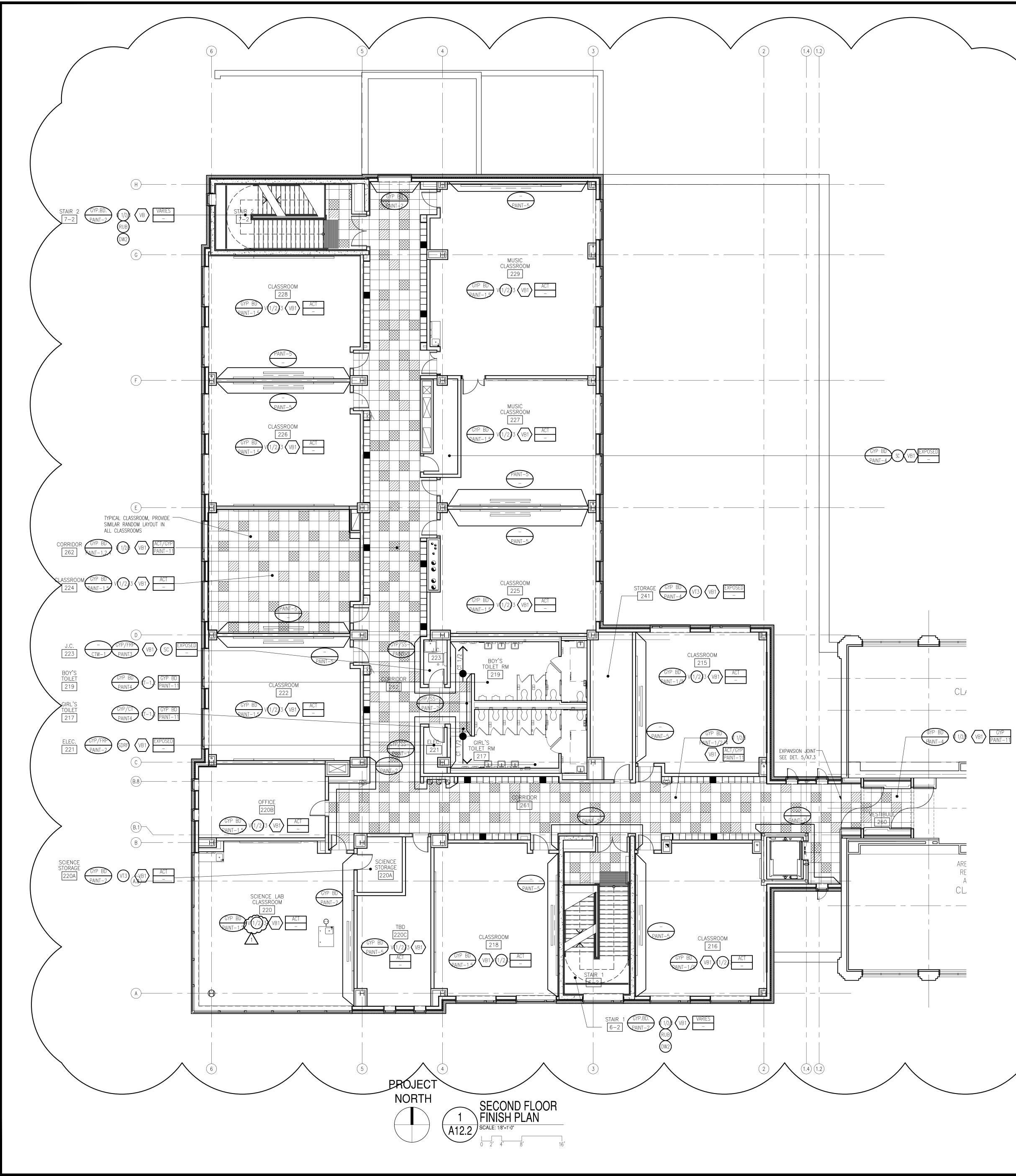
22. ALL ROUND COLUMNS TO RECEIVE STRAIGHT (COVE-LESS)

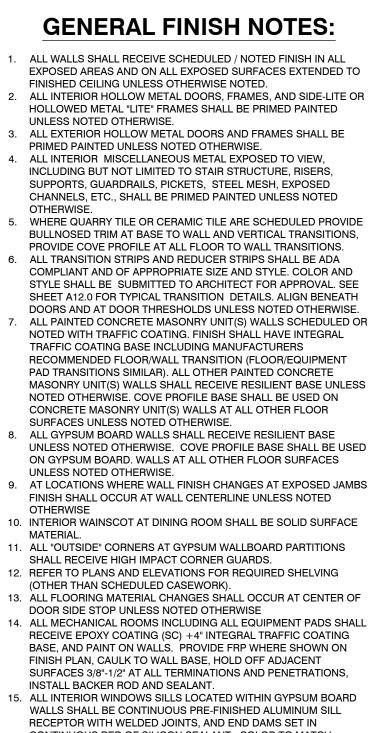
FINISH SYMBOL LEGEND:

- M	UBSTRATE IATERIAL INISH IATERIAL	VISH	FINISH	MATERIAL FINISH	
M WALL FINISH	FL	OOR NISH	BASE FINISH	FINISH CEILING	
COLOR PATTER	NING			VT-1	(10%)
CORRIDORS				VT-2	(30%)
CLASSROO FOLLOWING				VT-3	(60%)
				CPT	
ABBREV	/IATION	S			

- SDRF STATIC DISSIPATIVE RESILIENT FLOORING
- ACT ACOUSTICAL CEILING TILE AND GRID





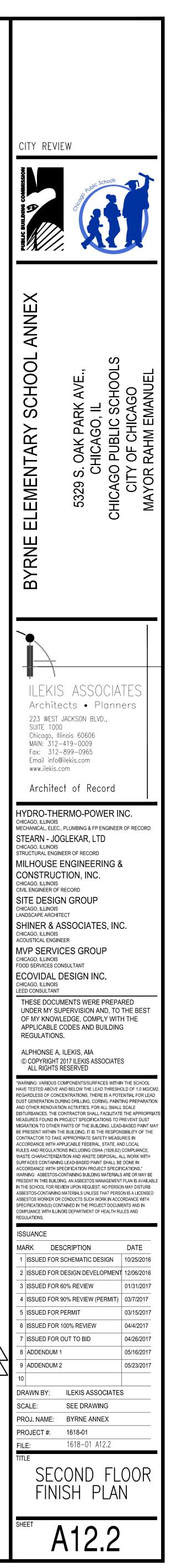


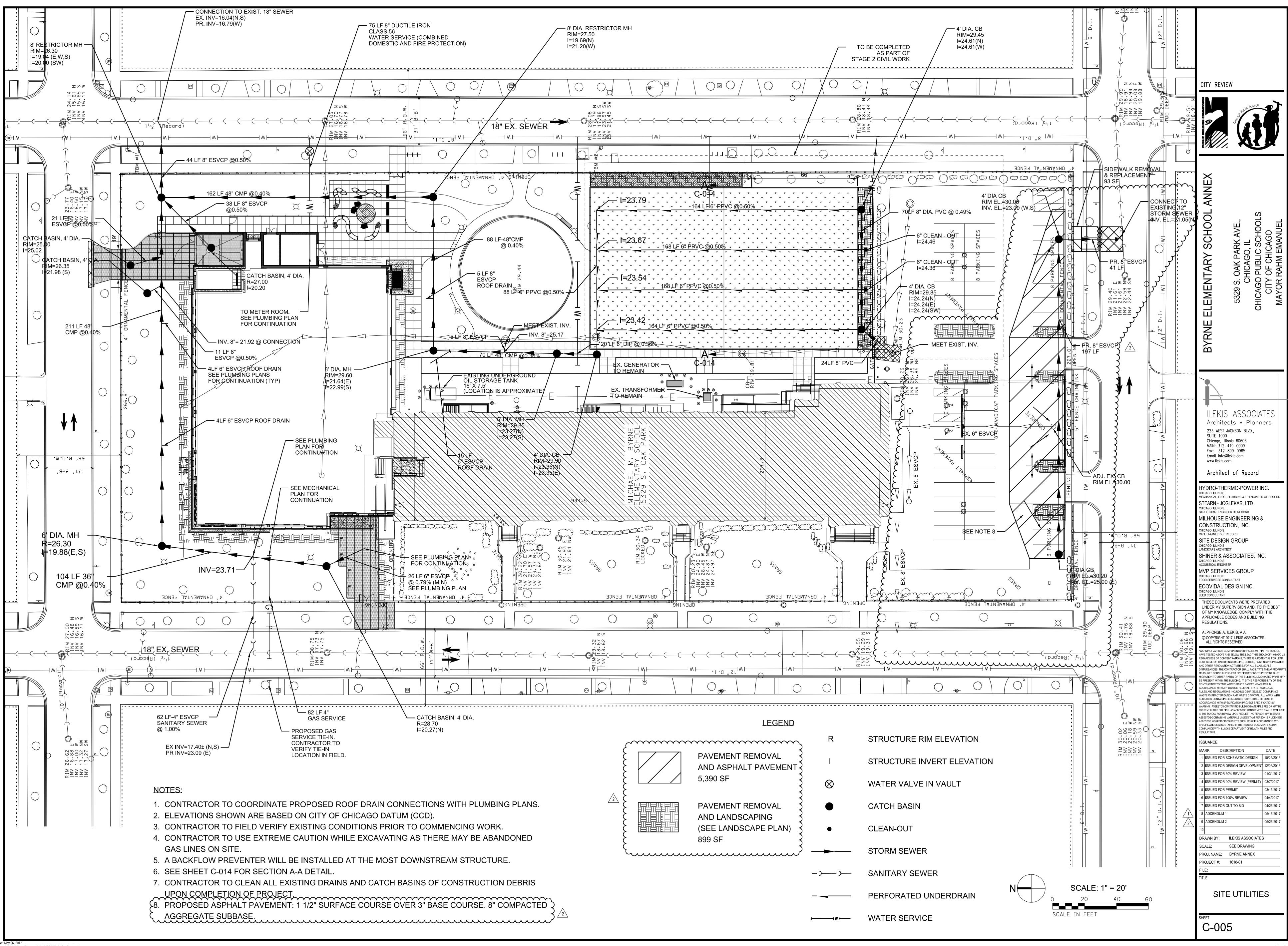
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- OTHERWISE 19. CASEWORK SHALL RECEIVE RESILIENT BASE UNLESS NOTED OTHERWISE
- 20. SCHEDULED/NOTED FLOOR FINISHES SHALL EXTEND BENEATH ALL BUILT-IN CASEWORK. 21. ALL ROOMS WITH SCHEDULED CARPETING TO RECEIVE STRAIGHT
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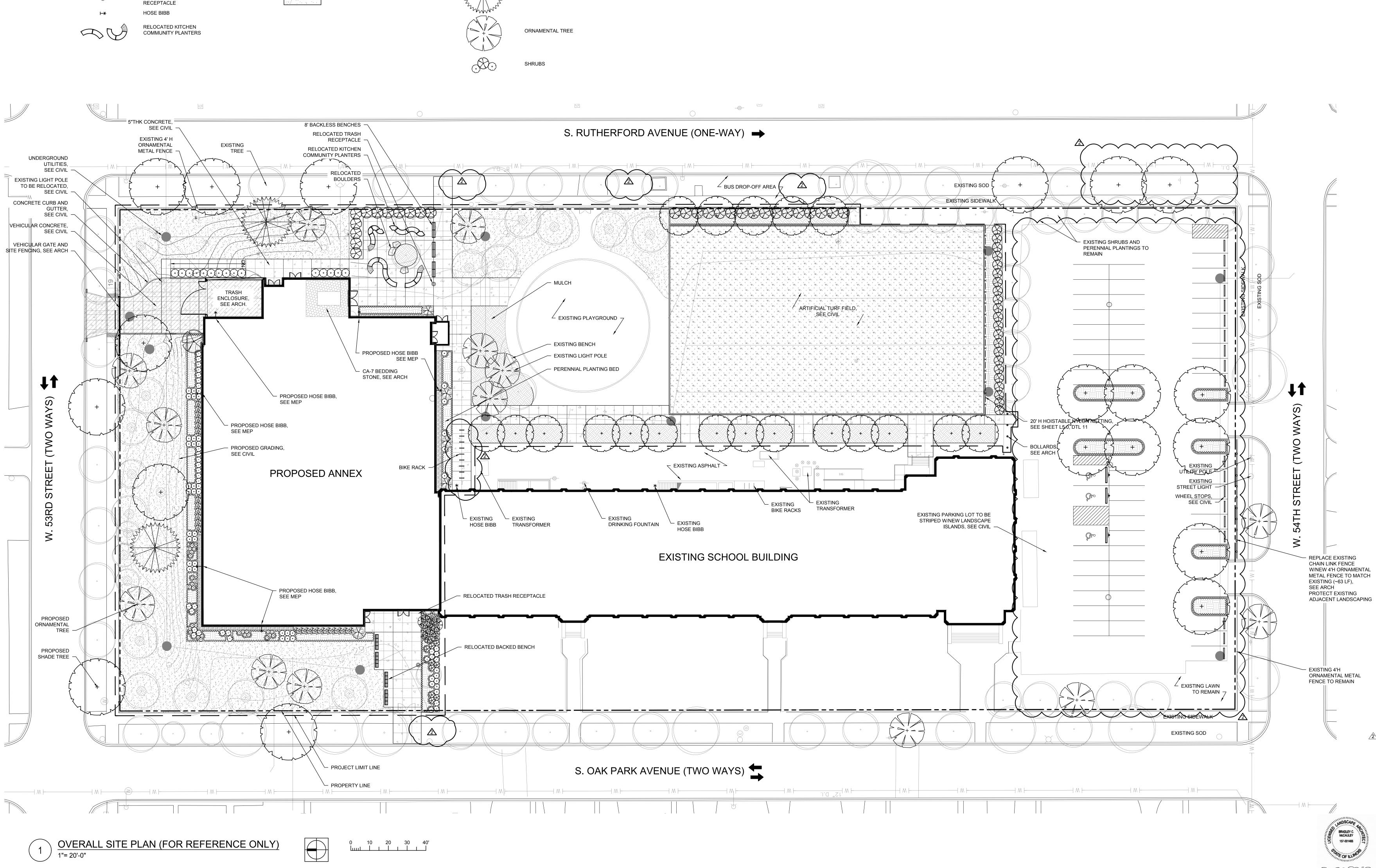
FINISH SYMBOL LEGEND:

	MATERIAL		FINISH	MATERIAL FINISH
WALL FINISH	- FINISH MATERIAL	Floor Finish	BASE FINISH	FINISH CEILING
COLO PATTE		G		VT-1 (10%)
CORRIDC MARKED				VT-2 (30%)
CLASSRC FOLLOWI		22		VT-3 (60%)
				CPT
ABBRI	EVIATIO	ONS		

- VT RESILIENT TILE FLOORING
- CT CERAMIC TILE FLOOR CPT CARPET
- SC EPOXY COATING
- SDRF STATIC DISSIPATIVE RESILIENT FLOORING
- EFM ENTRY FLOOR MAT RUB INTEGRATED RUBBER NOSE AND TREAD
- VB VINYL BASE
- CB CERAMIC BASE
- ACT ACOUSTICAL CEILING TILE AND GRID FRP FIBER REINFORCED PANELS
- SS SOLID SURFACE









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PROJECT LIMIT LINE

— x — x — x — x — x — 20' H HOISTABLE NYLON NETTING

PROPOSED FENCE

PROPERTY LINE

EXISTING FENCE

BACKLESS BENCH

RELOCATED BACKED BENCH

RELOCATED BOULDERS

RELOCATED TRASH

°	EXISTING TREE				
+	SHADE TREE				
	EVERGREEN TREE				
	ORNAMENTAL TREE				
t Det	SHRUBS				
	[<i>O</i>]	(-@-		0
				_	

5" THICK CONCRETE

WASHED RIVER ROCK

PERENNIAL PLANTING

ARTIFICIAL TURF

MULCH

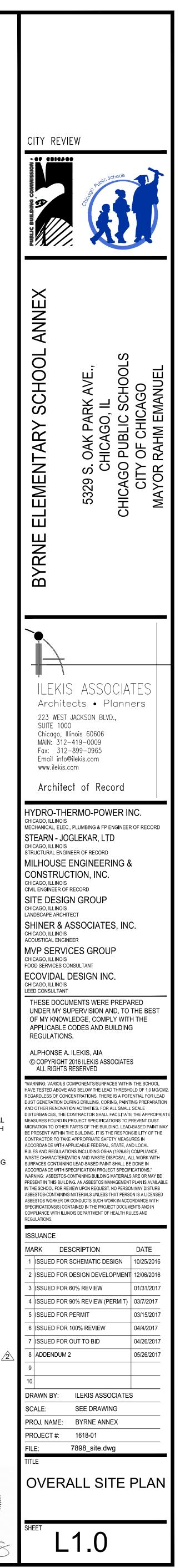
SOD

VEHICULAR CONCRETE

GENERAL NOTES:

- 1. COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND ORDINANCES FOR ALL WORK AND OPERATIONS. 2. KEEP ALL AREAS CLEAN, NEAT AND ORDERLY AT ALL TIMES, CLEAR OF RUBBISH AND DEBRIS. LEGALLY DISPOSE OF ALL
- MATERIALS REMOVED FROM THE SITE. 3. DO NOT INTERFERE WITH USE OF ADJACENT PROPERTIES INCLUDING BUT NOT LIMITED TO BUILDINGS, PARKING LOTS,
- STREETS OR ALLEYS. 4. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, FENCING, FURNISHINGS AND PLANTINGS, TREES AND LAWNS
- FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUTS, AND OTHER HAZARDS CREATED BY SITE IMPROVEMENTS. IF ANY DAMAGE OCCURS, REPAIR TO ORIGINAL CONDITION AT NO ADDITIONAL COST.
- 5. PROTECT AND/OR RESTORE EXISTING LAWN TO EXCELLENT CONDITION WITH TOPSOIL AND SOD.
- 6. VERIFY SITE CONDITIONS BEFORE PROCEEDING WITH WORK AND REPORT ANY CONFLICT TO AOR.
- 7. VERIFY DIMENSIONS IN FIELD.
- 8. COORDINATE WORK WITH ALL OTHER TRADES.

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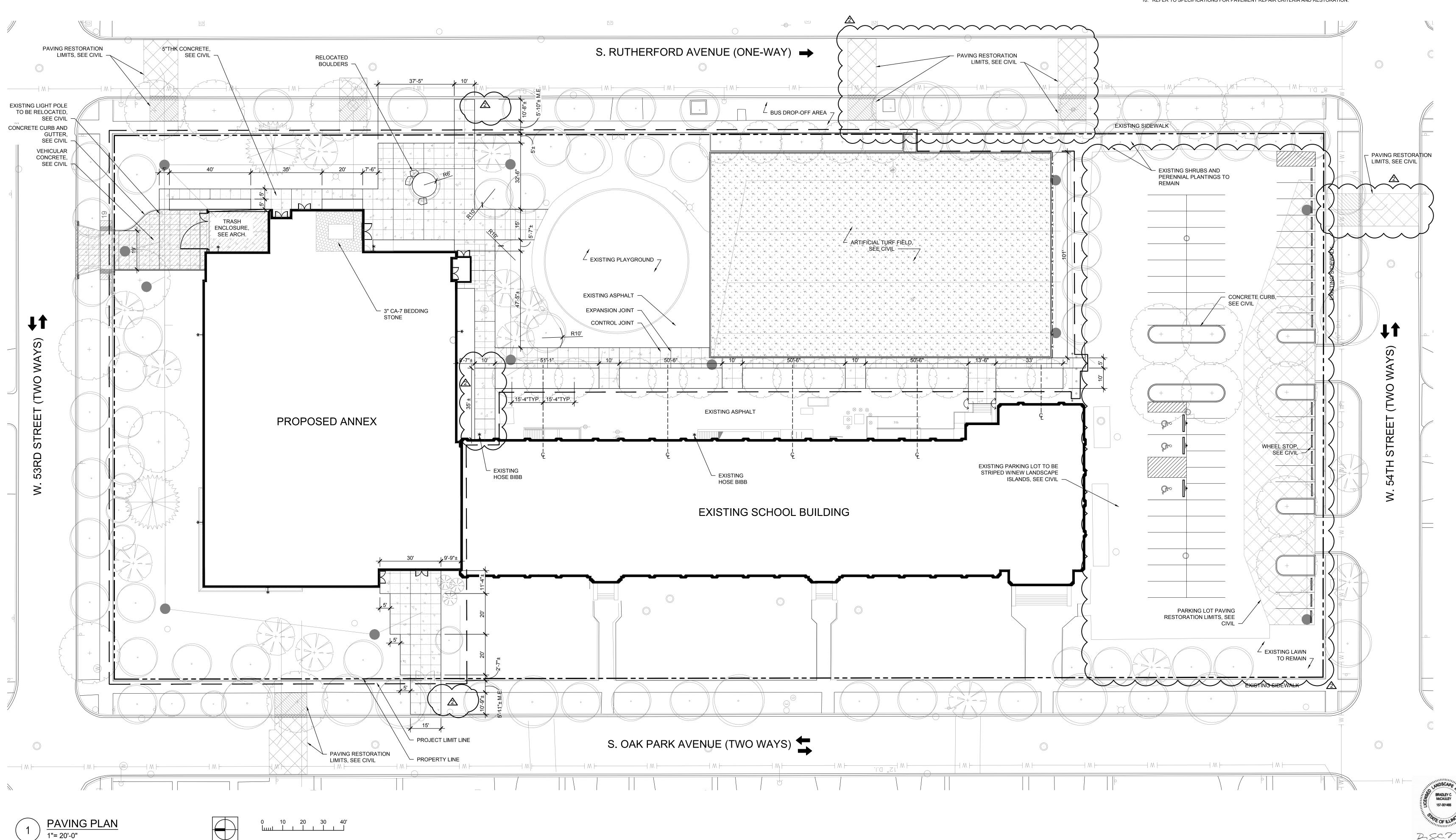
PROJECT LIMIT LINE PROPERTY LINE EXISTING FENCE PROPOSED FENCE RELOCATED BOULDERS HOSE BIBB

VEHICULAR CONCRETE

5" THICK CONCRETE

WASHED RIVER ROCK

ARTIFICIAL TURF RELOCATED BOULDERS _____



GENERAL NOTES:

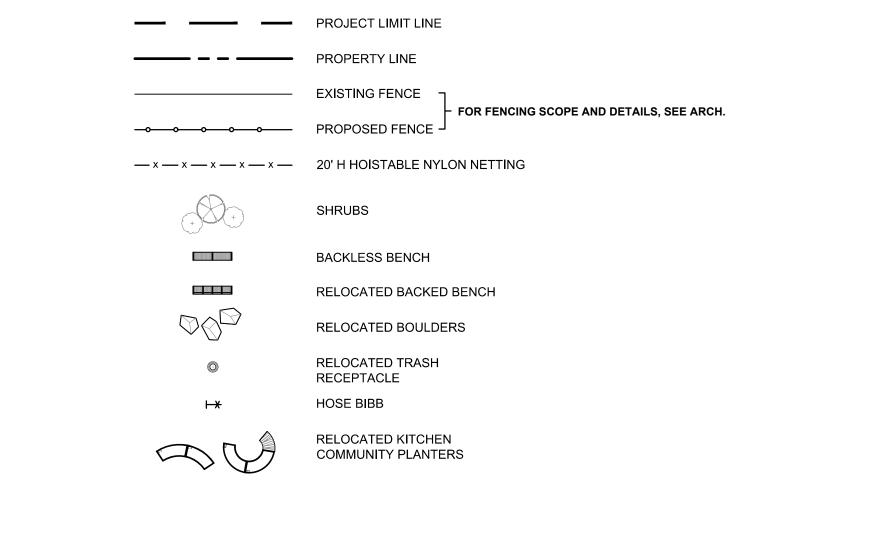
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PAVING NOTES:

- 1. INSTALL ALL PAVING TO BE SMOOTH AND CONTINUOUS WITHOUT KINKS OR ABRUPT CHANGES. STAKE LAYOUT AND FRAMEWORK AND ACQUIRE APPROVAL OF AOR PRIOR TO CONCRETE POUR AND OTHER CONSTRUCTION ACTIVITIES.
- 2. MATCH LINE AND GRADE OF PAVEMENT, LAWN AND PLANTING AREAS TO EXISTING ADJACENT AREAS.
- 3. TRANSITION SMOOTHLY BETWEEN DIFFERENT SLOPES WITHOUT ABRUPT CHANGES IN SLOPE. SEE GRADING PLAN.
- 4. GRADE ALL PAVED SURFACES TO A MAXIMUM 5% SLOPE WITH A MAXIMUM CROSS SLOPE OF 2% AND A MINIMUM SLOPE OF 1%. SLOPE ALL PAVEMENT TO DRAIN. 5. ADJUST UTILITY STRUCTURES TO MEET FINISH GRADE.
- 6. LAYOUT CONTROL JOINTS AT A MAX. 5' O.C. AND EXPANSION JOINTS AT A MAX 30' O.C. U.N.O. IF PAVEMENT IS ARCED, LAYOUT CONTROL JOINTS EQUALLY ALONG LENGTH OF ARC AND PERPENDICULAR TO CENTERLINE OF ARC U.N.O.
- 7. FOR PAVING DETAILS, SEE CIVIL. 8. ALL CONTROL JOINTS AND EXPANSION JOINTS ARE PERPENDICULAR AND PARALLEL
- TO BUILDING FACADE U.N.O.
- 9. ALL EXPOSED VERTICAL CONCRETE SURFACES TO BE CHAMFERED 1/2", 45°. 10. REFER TO SPECIFICATIONS FOR PAVEMENT REPAIR CRITERIA AND RESTORATION.



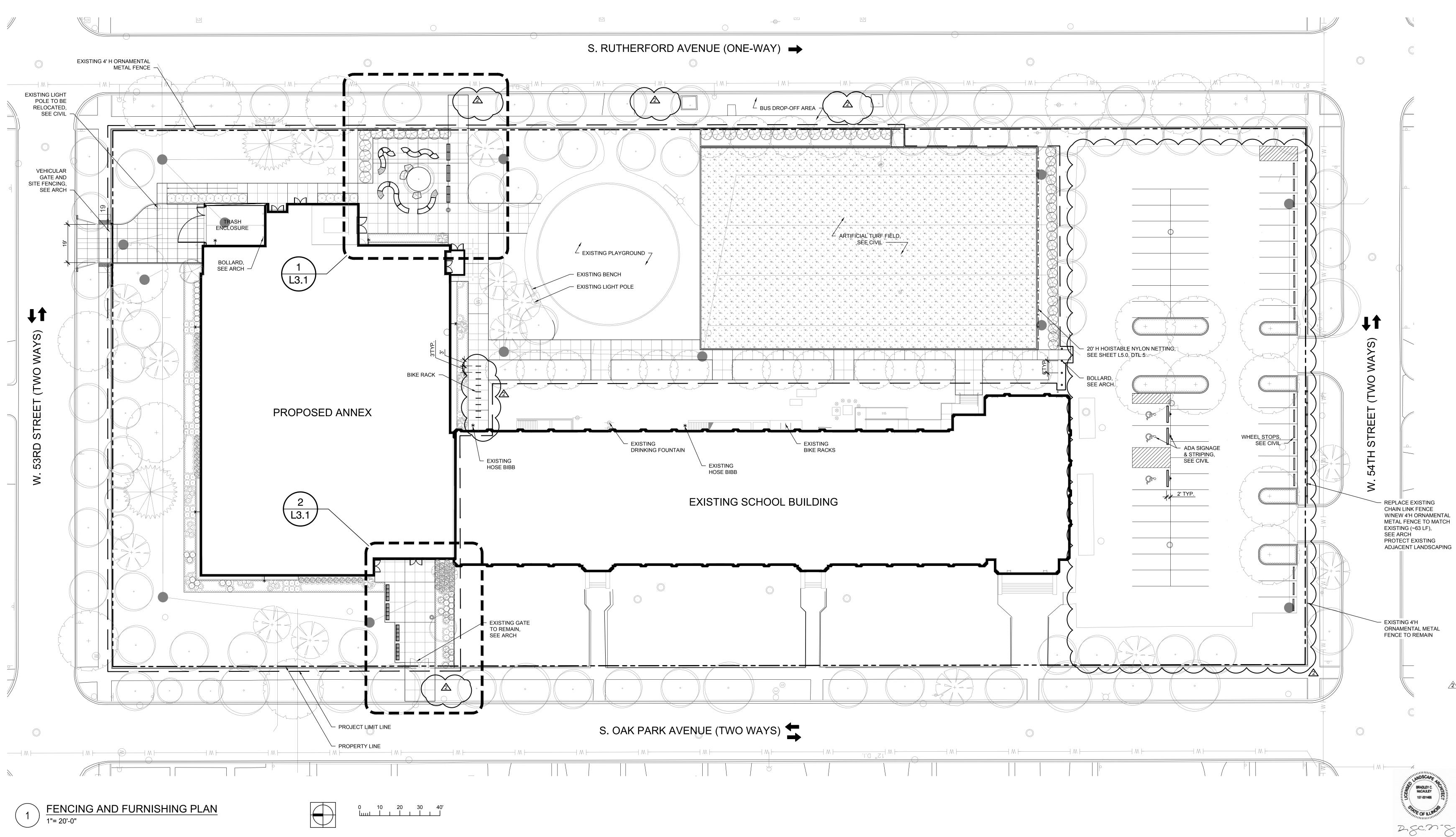
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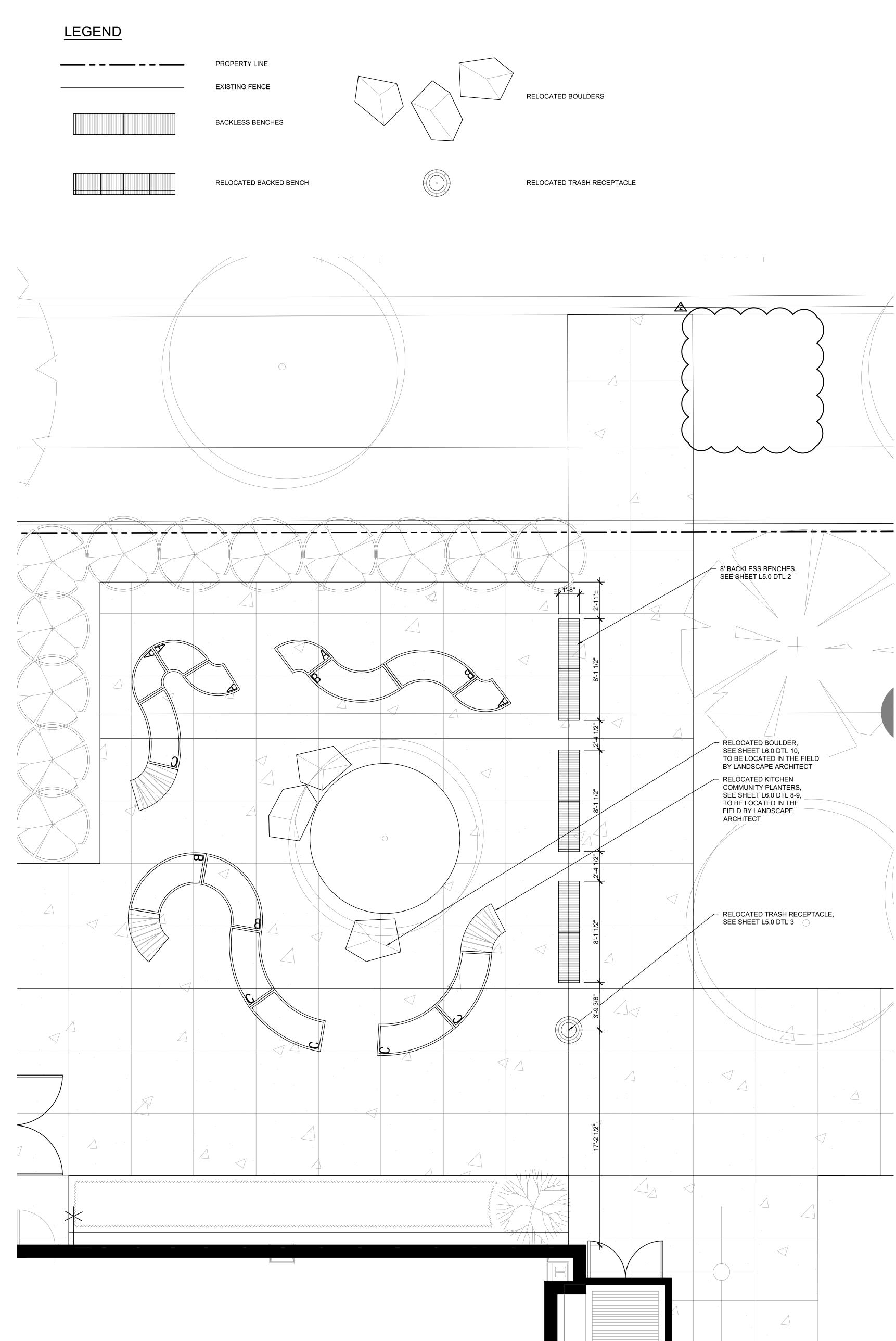
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- 7. VERIFY DIMENSIONS IN FIELD.
- 8. COORDINATE WORK WITH ALL OTHER TRADES.

FENCING AND FURNISHING NOTES:

- 1. CONFIRM ALL FENCING AND FURNISHING QUANTITIES AND DIMENSIONS.
- 2. INSTALL ALL FENCING POST FOOTINGS AND GATE SWINGS WITHIN PROPERTY LIMITS. ALONG PROPERTY LIMITS, CENTER FENCE 6" INSIDE PROPERTY LINE U.N.O.
- 3. FOR FURNISHING DETAILS, SEE SHEET L5.0.
- 4. FOR FENCING SCOPE AND DETAILS, SEE ARCH.
- 5. PROVIDE STAINLESS STEEL TAMPER PROOF FASTENERS.





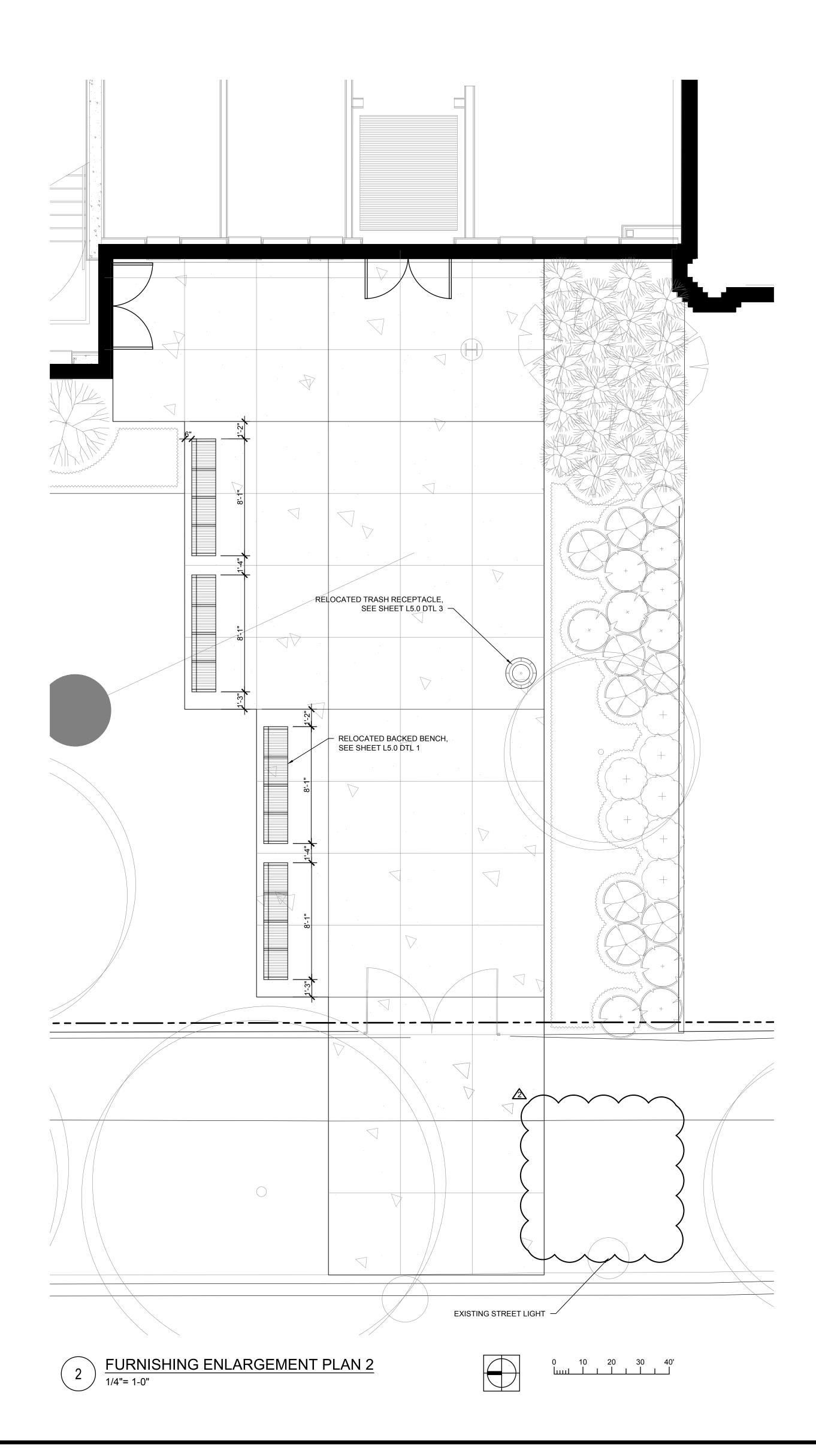
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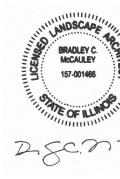


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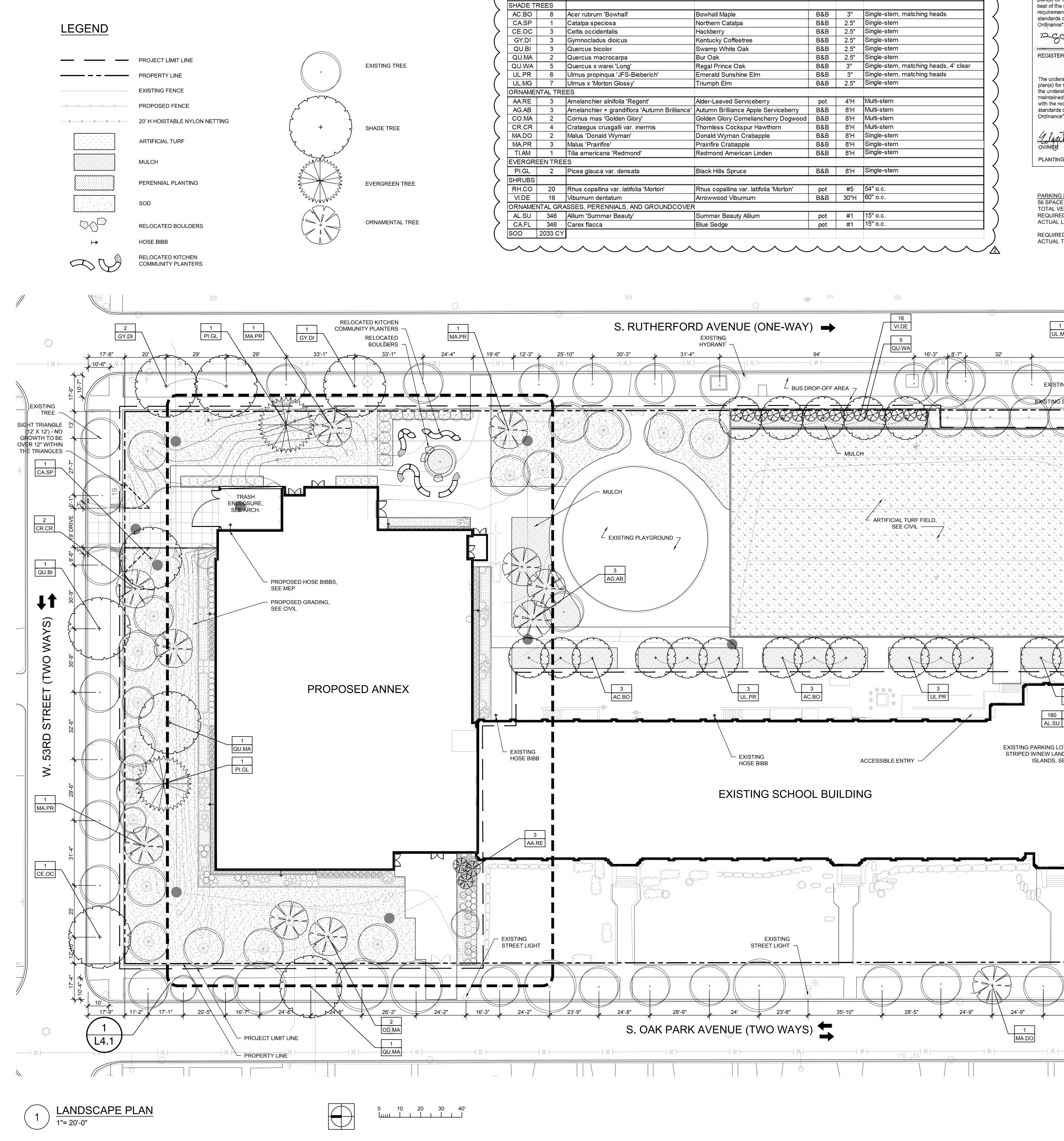
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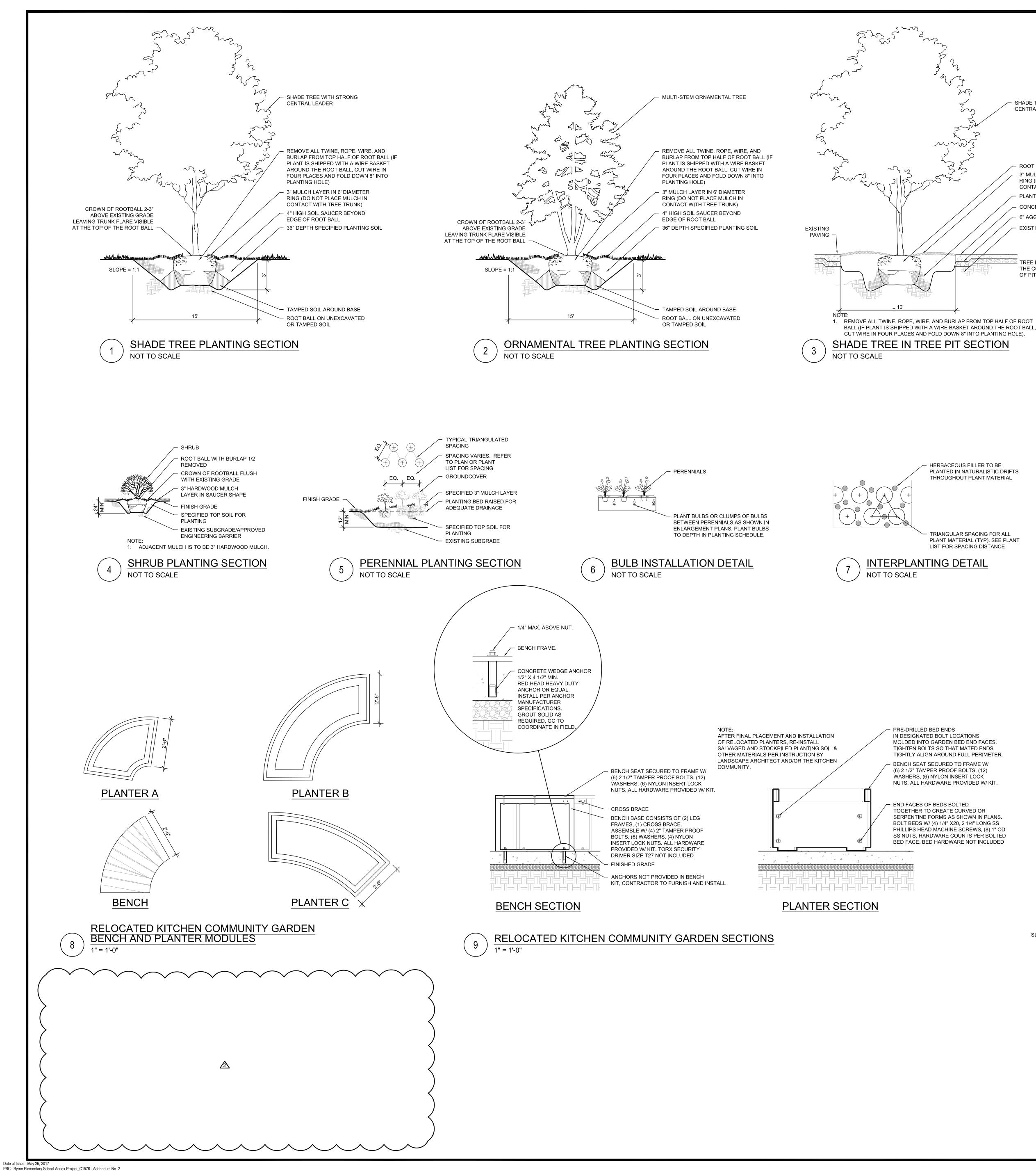


PLANT SC	CHEDULE					
CODE	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	REMARKS
SHADE T	REES					
AC.BO	8	Acer rubrum 'Bowhall'	Bowhall Maple	B&B	3"	Single-stem, matching heads
CA.SP	1	Catalpa speciosa	Northern Catalpa	B&B	2.5"	Single-stem
CE.OC	3	Celtis occidentalis	Hackberry	B&B	2.5"	Single-stem
GY.DI	3	Gymnocladus dioicus	Kentucky Coffeetree	B&B	2.5"	Single-stem
QU.BI	3	Quercus bicolor	Swamp White Oak	B&B	2.5"	Single-stem
QU.MA	2	Quercus macrocarpa	Bur Oak	B&B	2.5"	Single-stem
QU.WA	5	Quercus x warei 'Long'	Regal Prince Oak	B&B	3"	Single-stem, matching heads,
UL.PR	6	Ulmus propinqua 'JFS-Bieberich'	Emerald Sunshine Elm	B&B	3"	Single-stem, matching heads
UL.MG	7	Ulmus x 'Morton Glossy'	Triumph Elm	B&B	2.5"	Single-stem
ORNAME	NTAL TRE	ËS				
AA.RE	3	Amelanchier alnifolia 'Regent'	Alder-Leaved Serviceberry	pot	4'H	Multi-stem
AG.AB	3	Amelanchier × grandiflora 'Autumn Brilliance'	Autumn Brilliance Apple Serviceberry	B&B	8'H	Multi-stem
CO.MA	2	Cornus mas 'Golden Glory'	Golden Glory Corneliancherry Dogwood	B&B	8'H	Multi-stem
CR.CR	4	Crataegus crusgalli var. inermis	Thornless Cockspur Hawthorn	B&B	8'H	Multi-stem
MA.DO	2	Malus 'Donald Wyman'	Donald Wyman Crabapple	B&B	8'H	Single-stem
MA.PR	3	Malus 'Prairifire'	Prairifire Crabapple	B&B	8'H	Single-stem
TI.AM	1	Tilia americana 'Redmond'	Redmond American Linden	B&B	8'H	Single-stem
EVERGR	EEN TREE	ES				
PI.GL	2	Picea glauca var. densata	Black Hills Spruce	B&B	8'H	Single-stem
SHRUBS						
RH.CO	20	Rhus copallina var. latifolia 'Morton'	Rhus copallina var. latifolia 'Morton'	pot	#5	54" o.c.
VI.DE	16	Viburnum dentatum	Arrowwood Viburnum	B&B	30"H	60" o.c.
ORNAME	NTAL GRA	ASSES, PERENNIALS, AND GROUNDCOVER				
AL.SU	346	Allium 'Summer Beauty'	Summer Beauty Allium	pot	#1	15" o.c.
CA.FL	346	Carex flacca	Blue Sedge	pot	#1	15" o.c.
SOD	2033 CY					

GENERAL NOTES: The undersigned landscape architect, registered in the State of Illinois, acknowledges that 1. COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES the landscape planting plan and construction details shown on the attached landscape AND ORDINANCES FOR ALL WORK AND OPERATIONS. plan(s) for the property at 5329 S Oak Park Avenue, Chicago, Illinois 60638 has, to the best of the undersigned applicant's knowledge, been designed in accordance with the 2. KEEP ALL AREAS CLEAN, NEAT AND ORDERLY AT ALL TIMES, CLEAR OF requirements of Title 10, Chapter 32 of the Chicago Municipal Code, the landscaping RUBBISH AND DEBRIS. LEGALLY DISPOSE OF ALL MATERIALS standards of the Chicago Zoning Ordinance, and the "Guide to the Chicago Landscape REMOVED FROM THE SITE. Ordinance". 3. DO NOT INTERFERE WITH USE OF ADJACENT PROPERTIES INCLUDING 5-CC.MC BUT NOT LIMITED TO BUILDINGS, PARKING LOTS, STREETS OR ALLEYS. JUNE 15, 2018 4. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, FENCING, FURNISHINGS AND PLANTINGS, TREES AND LAWNS FROM DAMAGE REGISTERED[®]LANDSCAPE[®]ARCHITECT DATE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUTS, AND OTHER HAZARDS CREATED BY SITE IMPROVEMENTS. lear IF ANY DAMAGE OCCURS, REPAIR TO ORIGINAL CONDITION AT NO ADDITIONAL COST. The undersigned acknowledges that the landscape planting shown on the landscape plan(s) for the property at 5329 S Oak Park Avenue, Chicago, Illinois 60638 to the best of 5. PROTECT AND/OR RESTORE EXISTING LAWN TO EXCELLENT the undersigned applicant's knowledge has been designed and will be installed, CONDITION WITH TOPSOIL AND SOD. maintained, and replaced, as required, by current and subsequent owners in accordance with the requirements of Chapter 32 of the Chicago Municipal Code, the landscaping 6. VERIFY SITE CONDITIONS BEFORE PROCEEDING WITH WORK AND standards of the Chicago Zoning Ordinance, and the "Guide to the Chicago Landscape REPORT ANY CONFLICT TO AOR. Ordinance". 7. VERIFY DIMENSIONS IN FIELD. I lugitation to finite 5/19/17____ 8. COORDINATE WORK WITH ALL OTHER TRADES. DATE OWNER PLANTING TIME BY JUNE 15, 2018 LANDSCAPE NOTES: 1. OBTAIN PERMIT FROM CITY OF CHICAGO BUREAU OF FORESTRY FOR ANY TREES, REMOVED OR REPLACED IN THE PUBLIC R.O.W. PARKING LOT VEHICULAR USE AREA CALCULATIONS 2. EXISTING PKWY & INTERIOR TREES/FENCING TO BE 56 SPACE PARKING LOT W/3 ACCESSIBLE SPACES PROTECTED WHILE PROJECT IS UNDER CONSTRUCTION AND TOTAL VEHICULAR USE AREA: 28,500 S.F. WILL BE REPLACED IF DAMAGED BY CONTRACTOR. REQUIRED INTERNAL LANDSCAPED AREA: 7.5% x 28,500 = 2,138 SF ACTUAL LANDSCAPED AREA: 2,400 SF 3. FOR LANDSCAPE DETAILS, SEE SHEET L6.0. REQUIRED INTERNAL TREE PLANTING: 2,138/125 = 17 4. ALL NEW TREES TO BE FIELD LOCATED BY AOR. ACTUAL TREE PLANTING: 5. AOR TO BE PRESENT DURING ALL CONTRACTOR & COMMUNITY PLANTING LAYOUT ACTIVITIES. CONTRACTOR TO COORDINATE TIMES WITH AOR & COMMUNITY 6. FOR PERENNIAL PLANTING PLAN, SEE SHEET L4.1 1 UL.MG CE.OC 41'-1" -1 M F EXISTING SOD EXISTING SIDEWALK ~e~ MULCH 🗧 EXISTING SHRUBS AND PERENNIAL PLANTINGS TO REMAIN Y . Y . Y $\langle \cdot, \cdot \rangle$, $\langle \cdot \rangle$, $\dot{\gamma}$ $\dot{\gamma}$ $\gamma \rightarrow \psi_{\gamma} \rightarrow$ \rightarrow ψ \rightarrow ψ \rightarrow ψ \rightarrow ψ \rightarrow ψ \rightarrow ψ $, \Psi_{2}$ $, \Psi_{2}$ $, \Psi_{3}$ $, \Psi_{3}$ \rightarrow \rightarrow Ψ \rightarrow Ψ \rightarrow Ψ \rightarrow Ψ \rightarrow Ψ $, \Psi_{2}, \Psi_{3}, \Psi_{3}$ UL.MG Ψ₂ , Ψ₂ , Ψ₂ , Ψ₂ , Ψ₂ , \rightarrow Ψ_{2} \rightarrow Ψ_{2} \rightarrow Ψ_{3} \rightarrow Ψ_{3} \rightarrow Ψ_{3} \rightarrow Ψ_{3} X \cap 2 AC.BO UTINITY POLE EXISTING Ш 180180AL.SUCA.FL STREET LIGHT WHEEL STOP, Gr S SEE CIVIL ADA SIGNAGE & STRIPING EXISTING PARKING LOT TO BE SEE CIVIL STRIPED W/NEW LANDSCAPE ISLANDS, SEE CIVIL QU.BI ſr REPLACE EXISTING CHAIN LINK FENCE 40 40 W/NEW 4'H ORNAMENTAL AL.SU CA.FL METAL FENCE TO MATCH EXISTING (~63 LF), 53 53 SEE ARCH AL.SU CA.FL PROTECT EXISTING ADJACENT LANDSCAPING CR.CR SIGHT TRIANGLE (12' X 12') -NO GROWTH TO BE OVER 12" TI.AM WITHIN THE TRIANGLES -EXISTING 4'H ORNAMENTAL METAL FENCE TO REMAIN - EXISTING LAWN TO REMAIN EXISTING SIDE WALK EXISTING SOD 24'-9" 13'-7" 17'∓3" 19'-6" EXISTING 1 \bigcirc STREET LIGHT MA.DO ____ M |_____ ANDSCAD BRADLEY C. McCAULEY 157-001466

STATE OF ILLING







· SHADE TREE WITH STRONG CENTRAL LEADER

ROOT BALL WITH BURLAP TOP 1/2 REMOVED 3" MULCH LAYER IN 6' DIAMETER RING (DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK)

- PLANTING SOIL - CONCRETE WALK W/ THICKENED SLAB (SEE PLAN) - 6" AGGREGATE SUBBASE

- EXISTING SUBGRADE

TREE PIT AS WIDE AS POSSIBLE, GIVEN THE CONSTRAINED CONDITIONS (EDGES OF PIT TO BE ROUGHENED)

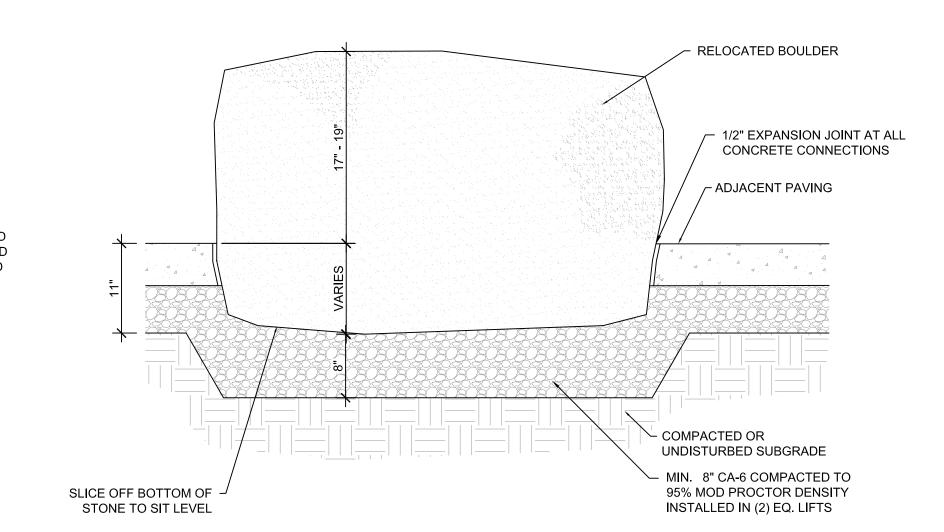
PLANTED IN NATURALISTIC DRIFTS THROUGHOUT PLANT MATERIAL

TRIANGULAR SPACING FOR ALL

PLANT MATERIAL (TYP). SEE PLANT

GENERAL PLANTING NOTES

- 1. DETERMINE EXACT LOCATIONS OF ALL UNDERGROUND UTILITIES AND VERIFY IN FIELD. REPORT ANY CONFLICTS TO AOR PRIOR TO BEGINNING WORK.
- 2. INFORM AOR AS EACH PHASE OF WORK IS UNDERTAKEN.
- 3. PROTECT EXISTING VEGETATION INCLUDING ALL EXISTING PARKWAY AND INTERIOR TREES.
- REPLACE DAMAGED VEGETATION WITH APPROVED SIMILAR MATERIAL.
- 4. MAINTAIN SITE DRAINAGE DURING LANDSCAPE INSTALLATION.
- 5. SLOPE ALL PLANTING AREAS AWAY FROM BUILDING AT 2% MINIMUM GRADE UNO.
- 6. PRIOR TO LANDSCAPE INSTALLATION, VERIFY PLANTING AREAS ARE GRADED AT +/- 0.1 FOOT TO FINISH GRADE.
- 7. IN LANDSCAPE AREAS, FINISH GRADE TO 4" MINIMUM BELOW ADJACENT BUILDING FINISH FLOOR ELEVATION UNO.
- 8. FINISH GRADE TO 1" BELOW FINISH PAVING SURFACE IN LAWN AREAS AND 2" BELOW IN PLANTING AREAS.
- 9. CONFIRM ALL PLANT QUANTITIES. PROVIDE PLANT MATERIALS SUFFICIENT TO COVER AREAS SHOWN ON PLANS AT THE SPACINGS INDICATED.
- 10. PROVIDE SINGLE TRUNK STANDARD TREES UNO.
- 11. PROVIDE IDENTIFICATION TAG FROM THE SUPPLYING NURSERY SHOWING COMMON AND BOTANICAL PLANT NAMES FOR AT LEAST ONE PLANT OF EACH SPECIES DELIVERED TO THE SITE. PROTECT ALL PLANTS AGAINST HEAT, SUN, WIND AND FROST DURING TRANSPORTATION TO THE SITE AND WHILE BEING HELD AT THE SITE. DO NOT STORE PLANTS IN TOTAL DARKNESS MORE THAN ONE DAY.
- 12. DO NOT DAMAGE PLANT ROOT BALL DURING TRANSPORTATION OR PLANTING.
- 13. NOTIFY THE AOR AT THE TIME OF DELIVERY OF ANY PLANT MATERIAL THAT IS DAMAGED OR IN POOR CONDITION.
- 14. AOR RESERVES THE RIGHT TO INSPECT ALL PLANT MATERIALS BEFORE PLANTING. MATERIAL MAY BE REJECTED AT ANY TIME DUE TO CONDITION, FORM OR DAMAGE BEFORE OR AFTER PLANTING.
- 15. REMOVE ALL ROCK AND DEBRIS 1" AND LARGER FROM PLANTING AREAS. LEGALLY DISPOSE ALL EXCESS MATERIALS RESULTING FROM THE WORK.
- 16. IN PLANTING SOIL PIT, REMOVE CRUSHED AGGREGRATE TO AN ADEQUATE DEPTH TO ENSURE THAT NO PART OF THE PLANT MATERIAL IS IN CONTACT OR AFFECTED BY THE LIME OR LIMESTONE IN THE AGGREGATE
- 17. PROVIDE NEW TOPSOIL THAT IS FERTILE, FRIABLE AND NATURAL LOAM SURFACE SOIL, REASONABLY FREE OF SUBSOIL, CLAY, CLAY LUMPS, BRUSH, WEEDS, AND OTHER LITTER AND FREE OF ROOTS, STUMPS, STONES LARGER THAN 2" IN ANY DIMENSION AND OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH. OBTAIN TOPSOIL FROM LOCAL SOURCES OR FROM AREAS HAVING SIMILAR SOIL CHARACTERISTICS TO THAT NECESSARY FOR VIGOROUS GROWTH OF SPECIFIED PLANTINGS. OBTAIN TOPSOIL THAT OCCURS IN A DEPTH OF NOT LESS THAN 6". DO NOT OBTAIN SOIL FROM BOGS OR MARSHES. SEE SPECIFICATIONS 32 93 11 PLANTINGS AND/OR 32 92 23 SODDING.
- 18. MIX SOIL AMENDMENTS AND FERTILIZERS WITH TOPSOIL ON A SITE SPECIFIC BASIS AT RATES APPROPRIATE FOR PLANTINGS IN ACCORDANCE WITH SPECIFICATION SECTION 32 93 11 PLANTINGS AND/OR 32 92 23 SODDING.
- 19. STAKE LOCATION OF ALL TREES, HEDGE LINES AND PLANTING BEDS AND NOTIFY AOR FOR REVIEW PRIOR TO PLANTING.
- 20. THE PLANTING PLANS ARE DIAGRAMMATIC. SPOT PLANT MATERIALS APPROXIMATELY AS SHOWN ON THE LANDSCAPE DRAWING AND NOTIFY AOR FOR REVIEW BEFORE REMOVING FROM CONTAINERS.
- 21. INSTALL ALL PLANT MATERIAL IN ACCORDANCE WITH DETAILS AND SPECIFICATIONS.
- 22. REMOVE ALL PLANT TYING MATERIAL AND MARKING TAPES AT THE TIME OF PLANTING. 23. INSTALL A MIN 3" LAYER OF HARDWOOD BARK MULCH AROUND ALL TREES AND IN ALL PLANTING AREAS UNO. CREATE A NATURAL SPADED EDGE WHERE PLANTING BEDS MEET TURF AREAS. SEE SPECIFICATION SECTION 32 93 11 PLANTINGS.
- 24. WATER ALL PLANTS IMMEDIATELY AFTER PLANTING. FLOOD PLANTS TWICE DURING FIRST TWENTY-FOUR HOUR PERIOD OF PLANTING.
- 25. GUY AND STAKE TREES, AS DIRECTED BY AOR, IMMEDIATELY AFTER PLANTING. PROVIDE A MINIMUM OF TWO GUY WIRES PER TREE ON THE UPHILL SIDE OF TREES PLANTED ON SLOPES STEEPER THAN 3:1.
- 26. PRUNE ALL DECIDUOUS SHADE TREES FOR A MINIMUM LOWEST BRANCH HEIGHT OF 7 FEET.
- 27. INSTALL AND MAINTAIN SOD TO PREVENT EVIDENT SEAMS.
- 28. PROTECT SEEDED AREAS AND SLOPES AGAINST EROSION AND SEED LOSS DUE TO BIRDS AND OTHER WILDLIFE BY APPLYING SHORT TERM, BIODEGRADABLE EROSION CONTROL BLANKETS, MATS, AND/OR NETTING AFTER COMPLETION OF SEEDING OPERATIONS. ADHERE TO MANUFACTURER'S SPECIFICATIONS FOR REQUIRED PLACEMENT AND STAKING.
- 29. WARRANTY ALL PLANTS AND LAWN EXPERIENCING DEATH AND DEFECTS INCLUDING UNSATISFACTORY GROWTH, EXCEPT FOR DEFECTS RESULTING FROM NEGLECT BY OWNER, ABUSE OR DAMAGE BY OTHERS OR UNUSUAL PHENOMENON OR INCIDENTS WHICH ARE BEYOND CONTRACTOR'S CONTROL.



1. CONTRACTOR SHALL ENSURE OUTCROPPING DO NOT MOVE, ROCK, OR ROLL DUE TO NORMAL ANTICIPATED FORCES PLACED AGAINST IT. 2. OUTCROPPING TO BE PLACED PRIOR TO POURING CONCRETE. FINAL LOCATION TO BE DETERMINED IN THE FIELD BY LANDSCAPE ARCHITECT.



RELOCATED BOULDER SETTING DETAIL



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GENERA	L MECHANICAL SYM
	DEMOLITION KEY NOTE NEW WORK KEY NOTE NEW WORK
	EXISTING WORK TO BE REMOV
	EXISTING WORK TO REMAIN
	NEW CONNECTION TO EXIST
	DETAIL NUMBER DRAWING NUMBER
$\left(\begin{array}{c} X \\ X \\ X \end{array} \right)$	EQUIPMENT TYPE EQUIPMENT NUMBER
ABB	REVIATIONS
BHP –	BRAKE HORSEPOWER
CFM – DBT –	CUBIC FEET PER MINUTE DRY BULB TEMPERATURE
DIFF -	DIFFUSER
DN –	DOWN
	DRAWING EXHAUST FAN
	EQUIPMENT
EXIST -	EXISTING
	FEET PER MINUTE
GAL – HP –	GALLON HORSEPOWER
kW –	
	LINEAR FEET
0A – 0P'G –	OUTSIDE AIR
	REGISTER
RM -	
SP –	STATIC PRESSURE
	TEMPERATURE
V – VA –	VENT
	VOLUME DAMPER
	MANUAL BALANCING DAMPER
(E) —	EXISTING
(N) –	NEW
	REMOVE
	OPPOSED BLADE DAMPER DOOR GRILLE
	SUPPLY AIR
R.A. –	RETURN AIR
	EXHAUST AIR
	LONG CONNECTION
	IR CFM - XXX CFM-S
EXHAUST ,	AIR CFM – XXX CFM-R
	BOILER FEED WATER TEMPERATURE
	– A/C CONDENSATE DRAIN
	STEAM CONDENSATE RETURN
FCU –	FAN COIL UNIT
	MAKE-UP AIR
EXH – RET –	
SUP -	
STAT –	THERMOSTAT
	VARIABLE FREQUENCY DRIVE
	SUPPLY GRILLE RETURN GRILLE
	EXHAUST GRILLE
	SUPPLY REGISTER
	RETURN REGISTER
	EXHAUST REGISTER TRANSFER
	OPEN SITE DRAIN
TYP –	
	FIRE DAMPER ACCESS DOOR
AD —	

SYMBOLS	PIPING	SYMBOL LIST
SYMBOLS REMOVED AIN IST	PIPING	ARROW INDICATES DIRECTION OF FLOW PIPE ELBOW (TURNED UP) PIPE ELBOW (TURNED DOWN) PIPE TEE DOWN (DROP) PIPE TEE UP PIPE TEE UP OR ANGLE PIPE TEE DOWN OR ANGLE NEW PIPING EXISTING PIPING TO REMAIN PIPING OR EQUIPMENT TO BE REMOVED HOT WATER SUPPLY HOT WATER RETURN GAS PIPING DUAL TEMP. WATER SUPPLY DUAL TEMP. WATER RETURN CONDENSATE DRAIN CHILLED WATER RERTURN GAS COCK SHUTOFF VALVE GLOBE VALVE
		STRAINER 2-WAY CONTROL VALVE 3-WAY CONTROL VALVE CHECK VALVE (ARROW SHOWS FLOW DIRECTION) CALIBRATED BALANCING VALVE BALANCING VALVE BUTTERFLY VALVE PIPE ANCHOR
	VENTILATIO	ON SYMBOLS
		NEW DUCTWORK EXISTING DUCTWORK TO REMAIN
	↓↓ ↓	DUCTWORK TO BE REMOVED
		SUPPLY DUCT UP SUPPLY DUCT DOWN
		RETURN OR EXHAUST DUCT UP
		RETURN OR EXHAUST DUCT DOWN
		SQUARE ELBOW WITH TURNING VANES
		VOLUME DAMPER
		RETURN OR EXHAUST GRILLE
	X	SUPPLY DIFFUSER
	1	THERMOSTAT
	(\mathbb{S})	TEMPERATURE SENSOR
		FIRE DAMPER
		MOTORIZED DAMPER
	ŢIII_Ţ	FLEX CONNECTION

HVAC GENERAL NOTES

- 1. THE WORK IS SUBJECT TO THE REQUIREMENTS OF ALL CONTRACT DOCUMENTS, ALL OTHER TRADE DRAWINGS AND SPECIFICATIONS AS APPLICABLE, AND ANY GENERAL CONDITIONS AND SPECIAL CONDITIONS ISSUED.
- 2. CREATE COMPLETE AND FULLY OPERATIONAL SYSTEMS. 3. FIELD VERIFY CONDITIONS IN AREAS OF WORK. COORDINATE WITH NEW & EXISTING WORK OF ALL TRADES AND WITH OWNER. INCLUDE ALL LABOR,
- MATERIAL, AND MISCELLANEOUS COSTS REQUIRED. 4. ALL WORK SHALL BE DONE IN A GOOD WORKMANLIKE MANNER.
- 5. KEEP SITE OF WORK CLEAN AND REMOVE ALL DEBRIS DAILY.
- 6. INSULATION, DUCTWORK, PIPING, ETC. SHALL HAVE A SMOKE DEVELOPED RATING NO MORE THAN 50 AND A FLAME SPREAD RATING NO MORE THAN 25.
- 7. PROVIDE PROPER ACCESS TO ALL EQUIPMENT, VALVES, AND DEVICES. 8. ALL WORK SHALL BE IN ACCORDANCE WITH THE CITY OF CHICAGO BUILDING,
- MECHANICAL, FIRE PREVENTION, ELECTRICAL, AND ENERGY CODES AND ALL APPLICABLE CODES, RULES, AND REGULATIONS OF LOCAL, STATE, AND FEDERAL GOVERNMENTS, AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION.
- 9. WHEREVER APPLICABLE, THE WORK SHALL CONFORM TO THE STANDARDS AND GUIDELINES OF ANSI, ASHRAE, ASME, ASTM, NEC, NFPA, OSHA, AND UL.
- 10. ALL WORK SHALL BE IN CONFORMANCE WITH THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND THE ILLINOIS ACCESSIBILITY CODE.
- 11. OBTAIN ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, AND APPROVALS.
- 12. ALL WORK SHALL BE DONE IN A GOOD WORKMANLIKE MANNER. USE ONLY SKILLED WORKERS, QUALIFIED FOR THE WORK REQUIRED. 13. PROTECT BUILDING STRUCTURES, GROUNDS, AND WORK OF ALL TRADES FROM DAMAGE WHICH MIGHT OCCUR DURING WORK. ANY DAMAGE TO FACILITIES SHALL BE REPAIRED OR REPLACED AND RESTORED TO THE ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
- 14. STORE ALL EQUIPMENT, PRODUCTS, AND MATERIALS DELIVERED TO THE SITE IN A SECURED AREA, OFF THE GROUND, AND PROTECTED FROM THE ELEMENTS.
- 15. PROTECT NEW & EXISTING EQUIPMENT AND DUCTWORK FROM DUST & DIRT. CAP OR COVER NEW AND EXISTING WORK TO PROTECT FROM DUST AND DIRT.
- 16. DRAWINGS AND SPECIFICATIONS ARE DIAGRAMMATIC AND DESCRIPTIVE IN NATURE AND MAY NOT EXPLICITLY SHOW EVERY DETAIL REQUIRED TO COMPLETE THE WORK. INCLUDE ALL ITEMS REASONABLY INFERABLE AS NECESSARY FOR THE PROPER, SAFE OPERATION OF THE SYSTEMS, WHETHER OR NOT EXPLICITLY INDICATED IN THE DOCUMENTS.
- 17. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- 18. INSPECT AND TEST ALL WORK BEFORE PLACING INTO OPERATION. AT THE END OF CONSTRUCTION HAVE QUALIFIED PERSONNEL START UP NEW EQUIPMENT AND CONTROLS IN THE PRESENCE OF THE OWNER'S REPRESENTATIVES.
- 19. TRAIN THE OWNER'S PERSONNEL IN OPERATION AND MAINTENANCE OF ALL NEW EQUIPMENT AND SYSTEMS. PROVIDE AND EXPLAIN TEST REPORTS, OPERATING AND MAINTENANCE MANUALS, AND START-UP LOGS TO THE OWNER.
- 20. AT THE END OF WORK ALL NEW, EXISTING, AND MODIFIED SYSTEMS AFFECTED BY THIS WORK SHALL BE LEFT CLEAN, COMPLETE, IN FULL OPERATING CONDITION, AND FULLY TESTED, BEFORE TURNING OVER TO OWNER.
- 21. GUARANTEE ALL WORK TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A MINIMUM PERIOD OF ONE YEAR AFTER DATE OF SUBSTANTIAL COMPLETION. REPAIR OR REPLACE, AT NO ADDITIONAL COST TO THE OWNER, ANY MATERIAL OR EQUIPMENT DEVELOPING DEFECTS WHILE GUARANTEE IS IN EFFECT. 22. PROVIDE MANUFACTURER'S WARRANTIES FOR ALL NEW EQUIPMENT AND
- CONTROLS, MINIMUM ONE YEAR, PLUS AS INDICATED IN SPECIFICATIONS. 23. VISIT JOB SITE TO DETERMINE CONDITIONS. FIELD VERIFY LOCATIONS AND SIZES OF STRUCTURES, EQUIPMENT, DUCTWORK, PIPING, CONDUIT, ETC. IN AREAS OF WORK.
- 24. INSPECT AND TEST ANY EXISTING WORK INTENDED TO BE USED AS PART OF MODIFIED OR NEW SYSTEMS, AND REPORT IF ANY REPAIRS OR MODIFICATIONS ARE REQUIRED TO ENSURE PROPERLY OPERATING COMPLETED SYSTEMS.
- 25. COORDINATE WITH WORK OF ALL TRADES. REVIEW ARCHITECTURAL AND STRUCTURAL CONDITIONS, DRAWINGS OF ALL TRADES, FIELD MEASUREMENTS, AND SUPPLIER DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR EXACT DIMENSIONS AND LOCATIONS OF THEIR WORK, AND SHALL PROVIDE ANY MINOR CHANGES REQUIRED AT NO ADDITIONAL COST.
- 26. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK REQUIRED TO COMPLETE THE SYSTEMS SHOWN ON THE MECHANICAL DRAWINGS AND LISTED IN THE SPECIFICATIONS AND SCHEDULES, UNLESS EXPLICITLY INDICATED OTHERWISE. WHEREVER THE WORK REQUIRED IS OUTSIDE OF THE NORMAL AREA OF EXPERTISE AND/OR IS NOT REGULARLY PERFORMED BY THE MECHANICAL CONTRACTOR, THEY SHALL ENGAGE A FULLY QUALIFIED SUB-CONTRACTOR TO PERFORM THE WORK UNDER THE DIRECT SUPERVISION AND RESPONSIBILITY OF THE CONTRACTOR.
- 27. CONTRACTOR SHALL PROVIDE EQUIPMENT SPECIFIED OR EQUIVALENT EQUIPMENT APPROVED MANUFACTURERS LISTED IN THE SPECIFICATIONS. NO SUBSTITUTIONS ARE ALLOWED BY OTHER MANUFACTURERS. 28. COORDINATE ALL SUPPORTS, DIMENSIONS, AND WEIGHTS.
- 29. COOPERATE WITH ALL TRADES AND WITH THE OWNER TO ESTABLISH A SCHEDULE OF TASKS AS SOON AS POSSIBLE.
- 30. THE WORK IS TO BE DONE AS REQUIRED TO ALLOW THE EXISTING SCHOOL TO REMAIN OPEN DURING CONSTRUCTION AND TO MINIMIZE DISRUPTIONS TO OPERATIONS.
- 31. SERVICE INTERRUPTIONS AFFECTING THE SCHOOL SHALL BE HELD TO A MINIMUM. WHEREVER POSSIBLE, THE CONTRACTOR SHALL PROVIDE SUITABLE TEMPORARY SERVICES OR CONNECTIONS TO PROVIDE CONTINUITY OF SERVICE. EXCEPT IN CASES OF EMERGENCY, SHUTDOWNS SHALL NOT COMMENCE UNTIL APPROVED BY CPS.
- 32. TEST, ADJUST, AND BALANCE ALL NEW MECHANICAL EQUIPMENT & SYSTEMS, INCLUDING ALL CFMS AND GPMS SHOWN ON DRAWINGS, TO ESTABLISH PROPER OPERATING CONDITIONS.
- ESTABLISH APPROPRIATE SETPOINTS.
- 34. ADJUST DRIVES, SPEED CONTROLS, AND MOTORS AS REQUIRED TO DELIVER DESIRED AIR & WATER FLOWS AT MINIMUM NOISE AND ENERGY USE.

33. COORDINATE WITH CONTROLS CONTRACTOR TO CALIBRATE CONTROLS AND

CITY OF CHICAGO BUILDING CODE VENTILATION NOTES

- ALL WORK SHALL CONFORM TO CITY OF CHICAGO BUILDING CODE. ALL EQUIPMENT SHALL BE U/L LISTED.
- DUCTWORK SHALL BE GALVANIZED SHEET METAL WITH SEALED JOINTS, CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CURRENT SMACNA MANUAL.
- EQUIPMENT NOISE LEVEL SHALL NOT EXCEED 55 dBA AT THE LOT LINE.
- ALL ROUND FLEXIBLE DUCTWORK SHALL BE MAXIMUM OF 5'-0" IN LENGTH AND CITY OF CHICAGO APPROVED.
- RELIEF DUCTS SHALL NOT EXCEED 5'-0" IN LENGTH.
- VOLUME DAMPERS SHALL BE OF LOCKING TYPE AND INSTALLED IN EACH SUPPLY, RETURN, EXHAUST AND OUTSIDE AIR INTAKE BRANCH.
- THE CONTRACTOR SHALL GUARANTEE THAT THE PLENUM CHAMBER USED FOR RECIRCULATION OF AIR WILL BE OF TIGHT CONSTRUCTION AND THAT ALL SOURCES OF AIR CONTAMINATION FROM TRAPS, SOIL STACKS, DOWNSPOUTS, VENTS AND ALL OTHER SOURCES OF CONTAMINATION WILL BE ENCLOSED SUCH THAT NO CONTAMINATED AIR WILL BE RECIRCULATED.

BUILDING PRESSURIZATION TABLE	
TOTAL ORDINANCE REQUIRED OUTSIDE AIR (29,763x33.3%)	9,911 CFM
TOTAL ACTUAL CONTINUOUSLY OPERATING EXHAUST	9,820 CFM
NOTE: THIS TABLE TO SHOW CONFORMITY TO SECTION 18–28–501.4. ONLY SYSTEMS W/ CAPACITIES AFFECTED BY NEW WORK INCLUDED IN TH SPACES RELYING ON NATURAL VENTILATION ARE NOT INCLUDED IN THIS T	

HEATING SCHEDULE

BUILDING ENVELOPE LOAD (MBH) BASED ON ASHRAE (MBH)	344
VENTILATION LOAD (MBH) 1/3 x 29763 CFM x 80°F x 1.08 / 1000	857
TOTAL HEATING LOAD (MBH)	1200
TOTAL HEATING SYSTEM OUTPUT (MBH)	1,530
HEATING SYSTEM EQUIPMENT INCLUDED IN THIS TABLE:	
BOILER B-1	765
BOILER B-2	765

HEATING CERTIFICATION STATEMENT

I hereby certify that the heating system will heat all rooms regularly occupied by humans to an inside temperature of 68° when the outside temperature is minus 10° F as required by the Chicago Building Code.

Signed: Owner, Contractor or Owner's licensed engineer representative.

REFRIGERATION CODE NOTES

REFRIGERANT PIPING SHALL BE HARD DRAWN COPPER TYPE K OR TYPE ACR.

PIPING AND DEVICES SHALL BE JOINED BY BRAZING.

PROJECT.

REMOVE EXPANSION VALVES, DEVICES, AND CONNECTIONS FROM AIR STREAM.

PRESSURE RELIEF DEVICE SHALL BE INSTALLED ON HIGH PRESSURE SIDE OF SYSTEM, UPSTREAM OF ANY INTERVENING VALVES.

TAG	SUPPLY CFM	RETURN CFM	OUTSIDE AIR INTAKE CFM	EXHAUST CFM
S-1(AHU-1)	7,600	_	2,800	0
S-2(AHU-2)	19,000		7,250	
RF-1		3,926		874
RF-2		11,980		4,020
HE-1				1,926
TE-1				3,000
TOTALS:	26600	15906	10050	9820

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NOTES RE: NATURAL GAS PIPING NATURAL GAS DISTRIBUTION SHALL BE AS FOLLOWS: ALL GAS PIPING LESS THAN 2" INSIDE DIAMETER SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH CLASS 150 MALLEABLE IRON FITTINGS, EXCEPT WHERE LOCATED IN RETURN AIR PLENUM. ALL GAS PIPING WITH AN INSIDE DIAMETER GREATER THAN 2" SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH WELDED FITTINGS. ALL GAS PIPING IN RETURN AIR PLENUM CEILINGS SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH WELDED FITTINGS. THERE IS NO GAS PIPING CARRYING MORE THAN 5 POUNDS (PSIG) ON THE

