MANGINI

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ADDENDUM FOR:

NEW PRESCHOOL AND TK/KINDERGARTEN CLASSROOMS AT SANTA FE ELEMENTARY SCHOOL

PORTERVILLE UNIFIED SCHOOL DISTRICT
PORTERVILLE, TULARE COUNTY, CALIFORNIA

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ADDENDUM #

2

ADDENDUM NO. 2

TO PROSPECTIVE BIDDERS:

This Addendum forms a part of the Contract Documents and modifies the Contract Documents dated December 31, 2023.

Bidders shall acknowledge receipt of this Addendum in the space provided in the Bid Form. Failure to do so may disqualify the Bidder.

This Addendum consists of 3 printed pages and the following Attachments:

Specification Section 04 2900 – Reinforced Unit Masonry
Specification Section 07 5416 – 2-Ply Ketone Ethylene Ester (KEE) Roofing
Specification Section 27 5120 – Classroom Listening Systems
Specification Section 32 1810 – Protective Surfacing – Rubberized
Drawing ES1.3R dated 5.30.25

CHANGES TO THE PROJECT MANUAL

ITEM NO. 2.1: Refer to Section 00 0100 - Table of Contents:

Add new attached specification Section 04 2900 – Reinforced Unit Masonry

Delete section 07 5115 – Cold Process Built-up Roofing in its entirety.

Add new attached specification Section 07 5416 – 2-Ply Ketone Ethylene Ester (KEE) Roofing

Add new attached specification Section 27 5120 – Classroom Listening Systems

Add new attached specification Section 32 1810 – Protective Surfacing - Rubberized

ITEM NO. 2.2: Refer to Section 00 4110 – Bid Form:

Refer to CARB Compliance Declaration. The bidder must submit the CARB Certificates of Reported Compliance (CRC) for the bidder and all its subcontractors within 7 calendar days of the bid opening.

ITEM NO. 2.3: Refer to Section 00 7310 – Supplementary Conditions:

Refer to Paragraph 11.1.6: Delete the requirement to provide insurance for flood and earthquake risks.

ITEM NO. 2.4: Refer to Section 01 1110 – Summary of Work

Refer to Section 1.4.B.1. The Owner has investigated the cost of the encroachment permit for the work performed in the public right-of-way. The fee is currently set at $320.

ADDENDUM NO. 2

ITEM NO. 2.5: Refer to Section 04 7310 – Manufactured Stone Veneer:

It is acceptable to install a water-resistive barrier, lath and plaster scratch and brown coat for stone veneer per specification Section 09 2400.

CHANGES TO THE DRAWINGS

ITEM NO. 2.6: Refer to Sheet SD3 – Enlarged Site Plan and Sheet SD5 – Enlarged Site Plan:

Refer to Poured-in Place Soft Fall Surfacing in Site Plan Legend and Keynote 22. The contractor is to provide and install play surfacing.

ITEM NO. 2.7: Refer to Sheet SD10 – Site Details:

Refer to Detail 23/SD10 for CMU wall at Electrical Enclosure shown detail 21/SD8. Refer to Item No. 2.8 below for CMU texture and color.

ITEM NO. 2.8: Refer to Sheet A24 – Building 700 Finish Schedule and Sheet A25 – Building 800 Finish Schedule:

Add a new finish "w : 'Basalite' #621 – Precision" to finishes list.

Add "CMU, Precision" with color designation "w" to Exterior Finishes list.

ITEM NO. 2.9: Refer to Sheet ES1.3, Partial Enlarged Site Electrical Plan - New:

Delete Sheet ES1.3 and replaced with attached Drawing ES1.3R.

Existing fire alarm 'F.A.C.P.' has been replaced by Owner under previous contract. Contractor shall exclude from bid the demolition of existing F.A.C.P. (Refer to keynote #18/ES1.3) and installation of new F.A.C.P. (Refer to Keynote #25/ES1.3). Contractor shall still include all new programming necessary for new devices being installed for Buildings 700/ 800 and all necessary new cabling/ connections as required.

END OF ADDENDUM NUMBER 2

SECTION 04 2900 - REINFORCED UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Provide reinforced unit masonry where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
2. Section 01 4520: Testing and inspection requirements.
3. Section 03 3500: Blast cleaning.
4. Section 07 1900: Water repellant coatings.
5. Section 07 9210: Joint Sealants.

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
2. Installation Procedures: Submit manufacturers recommended installation procedures.
3. Shop Drawings: Submit shop drawings for the reinforcing steel.
4. Mill Certificates: Submit steel producer's certificates of mill analysis, tensile and bend test for reinforcement steel required for project.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 6600.

B. Store masonry units above ground on level platforms which allow air circulation under the stacked units.

C. Cover and protect against wetting prior to use.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.2 CONCRETE MASONRY UNITS

A. Provide lightweight hollow load-bearing concrete masonry units complying with ASTM C90 in dimensions as indicated on the Drawings.
1. Where dimensions are not indicated on the Drawings, provide units having nominal face dimensions of 16" long by 8" high by the depth shown or otherwise required.
2. Provide accessory shapes as indicated or otherwise required.
3. Color and Texture: As indicated on the Finish Schedule or selected by the Architect.

2.3 REINFORCEMENT AND ACCESSORIES

A. Bars: ASTM A615, Grade 40 for #3 bars and smaller, Grade 60 for #4 bars and larger, using deformed bars for #3 and larger.

B. Fabricate reinforcement in accordance with recommendations contained in CRSI "Manual of Standard Practices."

C. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

2.4 MORTAR

A. Portland Cement: ASTM C150, Type II.

B. Lime: Hydrated lime, ASTM C207.

C. Aggregate: Clean, sharp, well graded aggregate free from injurious amounts of dust, lumps, shale, alkali, surface coatings, and organic matter; ASTM C144.

D. Admixtures: Do not use admixtures unless specifically approved by DSA and the Architect.

E. Water: Provide water free from deleterious amounts of acids, alkalis, and organic materials.

F. Mortar Mixing:
1. Compressive Strength: Minimum 1800 psi at 28 days.
2. Cement-Lime Mortar Proportions: Type S; ASTM C270.
   a. Add lime to mixer last.
   b. Measure materials in suitable calibrated devices. Shovel measurements will not be accepted.
3. Mechanically mix in a batch mixer for not less than three minutes, using only sufficient water to produce a mortar which is spreadable and of a workable consistency.
4. Re-temper mortar with water as required to maintain high plasticity.
   a. On mortar boards, re-temper only by adding water within a basin formed with mortar, and by working the mortar into the water.
   b. Discard and do not use mortar which is unused after 1-1/2 hours following initial mixing.

2.5 GROUT

A. Portland Cement: ASTM C150, Type II.

B. Aggregate: Clean, sharp, well graded aggregate free from injurious amounts of dust, lumps, shale, alkali, surface coatings, and organic matter; ASTM C404.

C. Admixtures:
1. Low Lift Grouting: Do not use admixtures for low lift grouting unless specifically approved by DSA and the Architect.
2. High Lift Grouting: Sika Grout Aid, or other DSA approved admixture. Submit alternatives not less than 30 days prior to beginning grouting.

D. Water: Provide water free from injurious amounts of acids, alkalis, and organic materials.

E. Grout Mixing:
1. Provide "fine grout" or "coarse grout" in locations required by CBC Section 2103A.3. Provide coarse grout in spaces 2" or more in width and in all filled-cell masonry construction.
2. Compressive Strength: Minimum of 2000 psi at 28 days.

3. Proportions: ASTM C476.
4. Adjust water content to provide proper workability and ensure proper placement without segregation under field conditions. Water content, expressed on a saturated surface-dry basis, shall not exceed 0.7 times the weight (mass) of cement.
5. Course Grout: Combine coarse and fine aggregates such that the fine aggregate part is not greater than 80% of total aggregate weight (mass) and at least 90% shall pass the 1/2" sieve.

2.6 BOLTS AND ANCHORS

A. **In no case shall any bolt or anchor be stabbed in place during or after the grouting**. Provide templates or other means to secure embeds during the grouting process.

B. Bent bar anchor bolts are not permitted in masonry construction; use headed bolts only.

2.7 ACCESSORY MATERIALS

A. Joint sealant and backing: Refer to Section 07 9210 – Joint Sealants.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 ENVIRONMENTAL CONDITIONS

A. Do not place masonry units when air temperature is below 40 degrees F.

B. Protect masonry construction from direct exposure to wind and sun when erected in ambient air temperature of 99 degrees F in the shade, with relative humidity less than 50%.

3.3 INSTALLATION

A. Do not commence installation of the work of this Section until horizontal and vertical alignment of foundation is plumb and square.
   1. Lay only dry masonry units.
   2. Use masonry saws to cut and fit masonry units.
   3. Set units plumb, true to line, with level courses accurately spaced; comply with tolerance limits of ACI 530.1-13, 3.3.G. Failure to comply with tolerances will be cause for rejection of work.
   4. Clean the top surface of foundation free from dirt, debris, and laitance, and expose the aggregate by blast cleaning prior to start of installing first course.
   5. Accurately fit the units to plumbing, ducts, openings, and other interfaces, neatly patching all holes.
   6. Keep walls continually clean, preventing grout and mortar stains. If grout does run over, clean immediately.
   7. Do not use chipped or broken units. If such units are discovered in the finished wall, the Architect may require their immediate removal and replacement with new units at no additional cost to the Owner.

B. Laying Up:
   1. Build reinforced hollow-unit masonry to preserve the unobstructed vertical continuity of the cells to be filled. All head joints shall be solidly filled with mortar for a distance in from the face of the wall or unit not less than the thickness of the longitudinal face shells.
   2. Fully bed walls and cross webs forming such cells in mortar to prevent leakage of grout.

3. Vertical cells to be filled shall have vertical alignment sufficient to maintain a clear, unobstructed, continuous vertical cell measuring not less than 2" x 3", except the minimum cell dimension for high-lift grout shall be 3".
4. At the time of laying, all masonry units shall be free of dust and dirt.
5. Tooling: Tool joints to a dense, smooth surface.

C. Coursing:
1. Establish lines, levels, and coursing indicated; protect from displacement.
2. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
3. Bond: Running.
4. Coursing: One unit and one mortar joint to equal 8".
5. Mortar Joints: Concave.

3.4 REINFORCING

A. Embed all reinforcing and wire ties in the grout. The clear space between masonry unit surfaces and reinforcing shall be a minimum of 1/2" for coarse grout.

B. Place horizontal reinforcement in bond beam units with a minimum grout cover of 1" above steel for each grout pour. The depth of the bond beam channel below the top of the unit shall be a minimum of 1-1/2" and the width shall be 3” minimum.

3.5 CONDUITS AND PIPES IN MASONRY WALLS

A. Conduits up to 3/4" in diameter will be allowed in cells for vertical runs only. No horizontal runs are allowed except that vertical offsets between adjacent cells will be allowed to avoid interference and congestion with reinforcing steel and other embedded items.

B. Water, gas and other pipes may penetrate through a wall in a sleeve, but shall not be embedded in walls.

C. Reinforcing Cells: Limit conduit to one 3/4" diameter conduit per cell, provided the following conditions are maintained:
1. Reinforcing steel shall be properly placed and shall not be relocated to accommodate conduit.
2. Grout cover between conduit and reinforcing steel shall be 2.5 times the bar diameter with 1-1/2" minimum (1-1/2" at #5 bars, 1-7/8" at #6 bars).
3. Maintain a minimum clear area within cell of 3" by 3" for consolidation by vibration.

D. Unreinforced Cells: Limit conduit to two 3/4" diameter conduit or one 1" diameter conduit per cell, provided the following conditions are maintained:
1. Conduit shall not be placed closer than 3 diameters, center to center, to adjacent conduit.
2. Maintain minimum clear area within the cell of 3" by 3" for consolidation by vibration.

3.6 GROUTING

A. Perform grouting in strict accordance with CBC Section 2104A.
1. Solidly fill all cells.
2. Consolidate grout at time of pour by puddling with a mechanical vibrator, filling all cells of the masonry, and then reconsolidating later by puddling before the plasticity is lost.
3. Provide workable mix suitable for placing without segregation and thoroughly mix.
4. Place grout by pumping or an approved alternate method. Place before initial set or hardening occurs.
5. Consolidate grout by mechanical vibration during placing and reconsolidate after excess moisture has been absorbed, but before workability is lost.

6. The grouting of any section of a wall shall be completed in one day, with no interruptions greater than one hour.

B. Low-Lift Grouted Construction:
1. Units shall be laid a maximum of 4'-0" before grouting, and all overhanging mortar and mortar droppings shall be removed.
2. Grouting shall follow each 4'-0" of construction laid and shall be consolidated so as to completely fill all voids and embed all reinforcing steel.
3. When grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout not less than 1/2" nor more than 2" below the top of the uppermost unit grouted.
4. Horizontal steel shall be fully embedded in grout in an uninterrupted pour.

C. High-Lift Grouted Construction:
1. Where high-lift grouting is used, the method shall be approved by the enforcement agency. Submit complete specifications to Architect prior to starting construction; CBC Section 2104A.1.3.1.1.1.2 and DSA IR 21-2.
2. Cleanout openings shall be provided at the bottom of each pour of grout at all cells.
3. Any overhanging mortar or other debris shall be removed from the insides of cell walls. The foundation or other horizontal construction joints shall be cleaned of all loose material and mortar droppings before each pour. The cleanouts shall be sealed before grouting.
4. An approved admixture that reduces early water loss and produces an expansive action shall be used in the grout.
5. Grout lifts shall be limited to 4'-0" in height, or 5'-0" with written approval from DSA.

3.7 CAULKING

A. Seal all expansion and control joints. Refer to Section 07 9210 – Joint Sealants.

3.8 QUALITY CONTROL TESTING AND INSPECTION DURING CONSTRUCTION

A. The testing and inspection of masonry materials shall be in compliance with Section 01 4520 - Testing and Special Inspection Services, CBC Chapter 17A, and CBC Section 2105A.

B. The Owner will employ a testing laboratory to perform tests and to submit test reports. Sampling and testing for quality control during placement of masonry may include the following, as directed by the Architect.

C. Inspections: All masonry work shall be performed only in the presence of the special masonry inspector.

D. Manufacturer shall clearly identify and tag each pallet of material to simplify identification by materials testing lab.

E. Mortar and Grout Compression Tests:
1. Sample and test mortar specimens per ASTM C1586
2. Sample and test grout specimens per ASTM C1019.
3. Frequency: At the beginning of masonry work, take at least 1 test sample of mortar and grout on 3 successive working days, and take additional samples at least 1 week intervals thereafter. Take additional samples whenever any change in materials or job conditions occurs, or whenever in the judgement of the Architect or DSA such tests are necessary.

F. Masonry Unit - Unit Strength Method:
1. Sample and test units, mortar, and grout to show compliance with the compressive strength required in CBC 2105A.
2. Comply with "Unit Strength" or "Prism Test" method.

G. Masonry Core Tests: Take masonry core tests in compliance with CBC Section 2105A.4; not less than 2 cores from the project and at least 1 core from each building for every 5,000 square feet of the greater of the wall area or the floor area or fraction thereof.

H. Test Results will be reported in writing to Architect and Contractor within 24 hours that tests are made.

I. Reinforcing steel testing **will be required on this project**; CBC Section 1910A.2; provide mill certificates.

3.9 CLEANING

A. Inspection and Adjustment:
   1. Upon completion of the work of this Section, make a thorough inspection of installed masonry and verify that units have been installed in accordance with the provisions of this Section.
   2. Make necessary adjustments.

B. Clean surfaces of masonry as required for proper application of the specified finishes.

C. Provide light (whip clean) sandblast of all exposed CMU as specified in Section 03 3500. Protect adjacent surfaces.

END OF SECTION 04 2900

SECTION 07 5416 – 2-PLY KETONE ETHYLENE ESTER (KEE) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Adhered thermoplastic KEE roofing system on wood deck including:
2. Vapor retarder.
3. Roof insulation.
4. Roof insulation cover board.
5. Base-ply / ply sheet.
6. Walkway material.

B. Related Sections:
1. Division 07 Section "Preparation for Re-Roofing" for recover board beneath new membrane roofing.
2. Division 07 Section "Air Barrier Rehabilitation" for requirements for sealing of air barrier at perimeter of roofing and within roofing system.
3. Division 07 Section "Sheet Metal Flashing and Trim" for shop-formed sheet metal items including roof drainage system items, roof penetration flashings, base and counterflashings and reglets, and formed copings and roof edge metal items.
4. Division 07 Section "Roof Specialties" for manufactured copings, roof edge flashings and counterflashings, and roof edge drainage systems.
5. Division 07 Section "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.2 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 "Standard Terminology Relating to Roofing and Waterproofing" and applicable edition of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" and NRCA's Glossary for definition of terms related to roofing work in this Section.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review drawings and specifications.
3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and after roofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. SDS: For each type of product indicated.

C. Samples for Verification: For the following products:
   1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
   2. Walkway pads or rolls.

1.5 INFORMATIONAL SUBMITTALS

A. Submit in accordance with Section 01 3300.

B. Contractor’s Approval Certificate.
   1. Include letter from Manufacturer written for this Project indicating approval of Installer.

C. Qualification Data: For Roofing Inspector.
   1. Include a notarized letter from a corporate officer of the manufacturer stating that a manufacturer-employed inspector will provide three days per week jobsite inspections for the duration of the project.
   2. Provide three sample job site inspection reports used on previous projects.
   3. Provide five references of projects where three days per week jobsite inspections were performed by the manufacturer. Include customer name, point of contact, phone number and email address.

D. Warranties: Unexecuted sample copies of special warranties.

E. Inspection Reports: Reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.
   1. Submit reports within 48 hours after inspection.

F. Manufacturer's Instructions: Submit copy of manufacturer's written installation instructions for specified roofing system.

1.6 CLOSEOUT SUBMITTALS

A. Executed copies of warranties.

B. Maintenance Data: To include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.

B. Manufacturer Qualifications: Approved manufacturer with roofing systems comparable to that specified for this Project, with minimum five years' experience in manufacture of thermoplastic roof membrane products in successful use in similar applications.
   1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
      a. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturer names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

b. Product data, including certified independent test data indicating compliance with requirements.
c. Samples of each component.
d. Sample submittal from similar project.
e. Project references: Minimum of five installations of specified products not less than five years old, with Owner contact information.
f. Sample warranty.

2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
3. Approved manufacturers must meet separate requirements of Submittals Article.

C. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

D. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
1. An authorized full-time technical employee of the manufacturer.

E. Manufacturer's Installation Instructions: Obtain and maintain on-site access to manufacturer's written recommendations and instructions for installation of products.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT / FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
1. Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of roofing sheet securely in place with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.

3. Remove temporary plugs from roof drains at end of each day.
4. Remove and discard temporary seals before beginning work on adjoining roofing.

1.10 WARRANTY

A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Manufacturer's Warranty: Manufacturer's standard or customized form, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
   1. Manufacturer's warranty includes roofing membrane, base flashings, roofing membrane accessories and other components of roofing system specified in this Section.
   2. Warranty documents that exclude components not supplied by the manufacturer are not acceptable to the Owner.
   3. Warranty document will not exclude damaged from windspeeds below 74 MPH.
   4. Warranty Period: 30 years from date of Substantial Completion.

C. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.
   1. Inspections to occur in following years: 2, 5, 10,15, 20 and 25 following completion.
   2. Inspections include rooftop housekeeping, including removal of incidental debris (such as leaves, branches, paper and similar items) from the roof membrane and drainage areas such as gutters. All debris will be disposed of at the Owner’s approved on-site location.

D. Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of membrane roofing such as single ply roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
   1. Warranty Period: Five years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products specified are from companies listed below, or approved equivalent. These products listed herein establish the size, pattern, color range and function selected by the Architect for this Project. Manufacturers listed as acceptable alternative manufacturers must still comply with the requirements of the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable manufacturers listed are not approved during the Submittal Process due to non-compliance with the written documents, then the Contractor shall submit product specified.
   1. Specified Product Manufacturer:
      a. The Garland Company “KEE Stone FB 60”
      b. Tremco CPG “Tremply KEE FB 60 Mil”
   2. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.

B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
   1. Accelerated Weathering: Roofing system shall withstand 10,000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
   2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746/D3746M, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

B. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures calculated in accordance with ASCE-7 and applicable code.

C. Flashings and Fastening: Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
   1. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
   2. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.
   3. Comply with requirements of Division 07 Section "Sheet Metal Flashing and Trim".

D. Exterior Fire-Test Exposure: ASTM E108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

E. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E1980, based on testing identical products by a qualified testing agency.

F. Energy Performance: Roofing system shall have an initial solar reflectance index of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.

2.3 MATERIALS, GENERAL

A. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.

2.4 BASE SHEET MATERIALS

A. Sheathing Paper: Red-rosin type, minimum 3 lb./100 sq. ft (0.16 kg/sq. m).

2.5 BASE-PLY / PLY SHEET

A. Base-Ply Sheet:
   1. SBS/RET/Urethane-modified asphalt coated composite fiberglass mat and fiberglass scrim reinforced high strength sheet, smooth surfaced, ASTM D6163 Type III.
   2. Physical Properties:
      a. Tensile Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction 190 lbf/in (33 kN/m); cross machine direction 190 lbf/in (33 kN/m).
      b. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction 320 lbf (1420 N); cross machine direction 320 lbf (1420 N).

c. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D5147: Machine direction, 7 percent; cross machine direction, 4 percent.
d. Low Temperature Flex, maximum, ASTM D5147: -40 deg. F (-40 deg. C).
e. Thickness, minimum, ASTM D5147: 0.090 inch (2.3 mm).

2.6 THERMOPLASTIC MEMBRANE MATERIALS

A. KEE Roof Membrane:
1. Thermoplastic Ketone Ethylene Ester (KEE) coated polyester fabric-reinforced fleece-backed sheet, ASTM D6754.
2. Physical Properties:
a. Membrane shall comply with ASTM D 6754 "Specification for Ketone Ethylene Ester (KEE) Based Sheet Roofing".
b. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to:
1) ASTM G 152 "Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials", or
2) ASTM G 154 "Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials", or
3) ASTM G 155 "Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials".
c. Impact Resistance: Roofing system shall resist impact damage when tested according to:
1) ASTM D 3746 "Test Method for Impact Resistance of Bituminous Roofing Systems" or
2) ASTM D 4272 "Test Method for Total Energy Impact of Plastic Films by Dart Drop”
d. Total Thickness: 0.060 inch per ASTM D 751 "Test Methods for Coated Fabrics".
e. Tensile Strength: 350 lbf minimum per ASTM D 751 "Test Methods for Coated Fabrics".
f. Elongation at Break: 15 percent MD and 15 percent XMD per ASTM D 751 "Test Methods for Coated Fabrics".
g. Tear Strength: 100 lbf minimum per ASTM D 751 "Test Methods for Coated Fabrics".
h. Low Temperature Flexibility: - 40 degrees F per ASTM D 2136 "Test Method for Coated Fabrics - Low-Temperature Bend Test".
i. Reflectivity: 0.81 (Initial) per ASTM C 1549 "Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer".
j. Thermal Emittance: 0.86 (Initial) per ASTM C 1371 "Test method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissiometers"
k. SRI-Solar Reflective Index: 108 (Initial), and 81 minimum at 3 years per ASTM E 1980 "Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces".

B. Sheet Flashing: Manufacturer's standard, smooth-backed, sheet flashing of same material, type, reinforcement, thickness and color as KEE roof membrane.

2.7 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
a. Plastic Foam Adhesives: 50 g/L.
b. Single-Ply Roof Membrane Sealants: 450 g/L.
c. Nonmembrane Roof Sealants: 300 g/L.
d. Sealant Primers for Nonporous Substrates: 250 g/L.
e. Sealant Primers for Porous Substrates: 775 g/L.

3. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Base-Ply Sheet Adhesive:

1. Cold-applied bio-based low odor urethane roofing adhesive, formulated for compatibility and use with specified roofing membranes and flashings.
2. Physical Properties:
   a. Volatile Organic Compounds (VOC), maximum, ASTM D3690: 0 g/L.
   b. Low Temperature Flexibility, ASTM D2240: Pass at -30 deg F (-34 deg C).
   c. Solids, by Volume, ASTM D2697: 100 percent.
   d. Biobased Content, Minimum, ASTM D6866: 70 percent.

C. Membrane Bonding Adhesive:

1. Urethane Adhesive: Low VOC, low-pressure spatter-spray-applied, two-component polyurethane adhesive for membranes and insulations.
   a. Spatter Spray: Dual component, single bead (ribbon applied) urethane insulation/membrane adhesive.

D. Flashing Membrane Adhesive:
1. Bonding adhesive, solvent based fast drying, VOC-compliant, for bonding KEE smooth-backed single ply membranes and flashings to substrates.
2. Physical Properties:
   a. VOC, maximum, ASTM D 3960: 200 g/L.

E. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 mm by 3 mm) thick; with anchors.

F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to membrane roofing system manufacturer.

Joint Sealant: Elastomeric joint sealant compatible with roofing materials, with movement capability appropriate for application.
1. Joint Sealant, Polyurethane: ASTM C920, Type S, Grade NS, Class 50 single-component moisture curing sealant, formulated for compatibility and use in dynamic and static joints; paintable.
2. Physical Properties:
   a. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 40 g/L.
   b. Hardness, Shore A, ASTM C661: 40.
   c. Adhesion to Concrete, ASTM C794: 35 pli.
   d. Tensile Strength, ASTM D412: 350 psi (2410 kPa).
   e. Color: White.

G. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.

H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.8 ROOF INSULATION MATERIALS

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from insulation manufacturer's standard sizes, suitable for application, and of thicknesses indicated.
   1. Insulation and Cricket Boards:
      a. Polyisocyanurate Board, Glass-Fiber-Mat Faced: ASTM C 1289 "Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board", glass-fiber-mat faced, Type II, Class 2., isocyanurate with top surface compatible with Single Ply Membrane material and adhesives, long term thermal resistance "R" value of 5.7 per inch
         1) 1.50 inches thick
      b. Flame Spread and Smoke Developed in accordance with ASTM E 84 "Test Method for Surface Burning Characteristics of Building Materials":
         1) Flame Spread Index: 25 maximum.
         2) Smoke Density Development Index: 125-175 range.
   2. Cover board: Provide 1/4" thick DENS-DECK board at horizontal applications, and 5/8" thick board at vertical applications. Composition shall be nonstructural, glass mat-embedded, water resistant gypsum core panel.
      a. Flame Spread and Smoke Developed in accordance with ASTM E 84 "Test Method for Surface Burning Characteristics of Building Materials":
         1) Flame Spread Index: 0.
         2) Smoke Density Developed Index: 0.
   3. Other accessories:
      a. Primary accessories shall be factory prefabricated or manufactured by or under the direction of roofing membrane manufacturer. All other shall be furnished and approved by the membrane manufacturer. These items are, but not limited to, the following: Gutter edges, termination bars, parapet caps, roof drains, miscellaneous flashings, expansion joint and valley flashings.

2.9 WALKWAY MATERIALS

A. Walkway Material:
   1. Protection walkway roll, reinforced KEE membrane roll with diamond-tread, slip-resistant surface, fabricated for heat welding to compatible KEE membrane surface.
   2. Physical Properties:
      a. Roll Size: 30 inches by 60 ft minimum
      b. Thickness: 0.060 inch (1.5 mm).
      c. Breaking strength: 450 lbs (77 kN/m).
      d. Color: Yellow.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
   1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
   2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
   3. Verify that substrate is sound and dry.
   4. Wood Roof Deck: Verify that deck shows no signs of damage, rot or deterioration, and is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer’s written instructions and approved details.

B. Install wood cants, blocking, curbs, and nailers in accordance with requirements of Division 06 Section "Miscellaneous Rough Carpentry."

C. Installation of FM-Compliant Roof Assemblies: Install roofing membrane, base flashings, and component materials in compliance with requirements in FMG 4470 as part of a membrane roofing system as listed in FMG’s “Approval Guide” for fire/windstorm classification indicated. Comply with recommendations in FMG Loss Prevention Data Sheet 1-49.

D. NRCA Installation Details: Install roofing system in accordance with applicable NRCA Manual Plates and NRCA recommendations; modify as required to comply with manufacturer's approved details and perimeter fastening requirements of FM Global references if applicable.

3.4 BASE SHEET INSTALLATION

A. Loosely lay slip sheet, lapping edges and ends a minimum of 2 inches and 6 inches (50 mm and 150 mm), respectively.

3.5 INSULATION INSTALLATION

A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
C. Tapered Insulation and Crickets: Install tapered insulation under area of roofing to conform to slopes indicated on roof plans.
    1. Where crickets are indicated or required to provide positive slope to drain, make slope of crickets minimum of two times the roof slope, not less than 1/4 inch in 12 inches (1:48).
D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (70 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
    1. Insulation Drain Sumps: Tapered insulation sumps, not less than 2 by 2 ft. (600 by 600 mm), sloped to roof drain.
        a. Sump to maximum depth of not more than 1 inch (25 mm) less than the Project-stipulated continuous insulation thickness based upon code requirements.
        b. Maintain minimum 1 inch (25 mm) insulation thickness at low point.

E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
   1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
G. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
   1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
H. Cover Boards: Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together.
   1. Secure cover boards Secure cover boards to resist uplift pressure at corners, perimeter, and field of roof.
   2. Mechanically fasten cover boards.

3.6 BASE-PLY / PLY SHEET INSTALLATION

A. Install lapped base-ply sheet course, extending sheet over and terminating beyond cants. Attach base ply sheet as follows:
   1. Adhere to substrate in a full application of cold-applied adhesive.

3.7 ADHERED MEMBRANE ROOFING INSTALLATION

A. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.

B. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.

C. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Spatter-spray adhesive in accordance with manufacturer's instructions. Apply at rate and pattern required for wind uplift resistance.

E. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.

F. Apply membrane roofing with side laps shingled with slope of roof deck where possible.

G. Welded Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
   1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
   2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
   3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

H. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

I. Install membrane roofing and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition. Install in such a manner as to not void warranty for existing membrane roofing system.

3.8 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.

E. Seal top termination of base flashing with a metal termination bar and a continuous bead of joint sealant.

3.9 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.10 FIELD QUALITY CONTROL

A. Roofing Inspector: Contractor shall engage a qualified roofing inspector of the manufacturer to perform roof tests and inspections and to prepare test reports.
   1. Engage a qualified roofing inspector for a minimum of 3 full-time days on site, per 40-hour crew week, to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with applicable criteria established in NRCA's "Quality Control and Quality-assurance Guidelines for the Application of Membrane Roofing Systems."

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.

D. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and and Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075416

27 5120 Classroom Assistive Listening Systems (CBC 2022/ADA 2010)

1. GENERAL

1.1. Work Includes

A. This specification is to be used where an Assistive Listing System is not called for within a specific audio-visual system or room but is required by the CBC and/or ADA.

B. All labor, materials, appliances tools, equipment, facilities transportation, and services necessary for and incidental to perform all operations in connection with furnishing, delivery, and installation of the work of this Section. Complete as specified herein.

C. The Contractor shall furnish and install all equipment, cables, devices, and other materials even though not specifically mentioned herein, which are necessary for the proper integration of the system, so that the system shall perform the function listed herein compliance with all the specified requirements.

1.2. Scope of Work

A. Provide Assistive Listening Systems per CBC Section 11B.219 & 11B.706.

1. CBC 11B-219.3 Receiver Quantity based on space.

a. The minimum number of receivers to be provided shall be equal to 4 percent of the total number of seats, but in no case less than two. Twenty-five percent minimum of receivers provided, but no fewer than two, shall be hearing-aid compatible in accordance with Section 11B-706.3.

B. The Americans with Disabilities Act (ADA) 2010 ADA Standards requires public facilities to provide auditory assistance devices.

http://www.ada.gov/regs2010/2010ADAStandards/2010ADAStandards.pdf

Section: **706 Assistive Listening Systems**

Capacity of Seating in Assembly Area	**Minimum Number of Required Receivers**	**Minimum Number of Required Receivers Required to be Hearing-aid Compatible**
50 or less	2	2
51 to 200	2, plus 1 per 25 seats over 50 seats*	2
201 to 500	2, plus 1 per 25 seats over 50 seats*	1 per 4 receivers*
501 to 1000	20, plus 1 per 33 seats over 500 seats*	1 per 4 receivers*
1001 to 2000	35, plus 1 per 50 seats over 1000 seats*	1 per 4 receivers*
2001 and over	55 plus 1 per 100 seats over 2000 seats*	1 per 4 receivers*

*Or fraction thereof

1.3. References

A. Americans with Disabilities Act (ADA)

B. California Electric Code (CEC)

C. American National Standards Institute (ANSI)

D. Underwriters Laboratories, Inc. (UL)

1.4. Quality Assurance

A. The system Contractor shall warrant any equipment installed under this specification to be free from defect for a period of one (1) year from the date of final acceptance.

B. The contractor shall certify completion in writing and schedule the commissioning walk through. The contractor shall provide all the tools and personnel needed to conduct an efficient commissioning process.

C. The contractor shall coordinate with the commissioning staff and schedule appropriate walk-through and training.

1.5. Submittals

A. REFER TO SUBMITTAL SECTION 013300 FOR REQUIREMENTS.

B. Provide product data for the following:

1. Manufacturers cut sheets, specifications and installation instructions for all products.

2. PRODUCTS

2.1. Assistive Listening Systems

A. Furnish a portable assistive listening system for use by the hearing-impaired. The system shall be capable of operating on the 1.9 GHz unlicensed PCS band utilizing Frequency-Hopping Spread Spectrum (FHSS) techniques allowing interference free one-way communication. The devices shall employ a multiply layer security protocol consisting of a 40-bit (pin free) group subscription, 32-bit authentication and a 64-bit encryption scheme enabling secure audio. They shall be easy to pair and form groups via Near-field communication (NFC), Docking Station or Software Suite. The system devices shall be simple to operate with a Power and Volume Up and Down buttons. The devices shall allow up to 10 simultaneous groups to operate in the same area. They shall be powered via a removable non-proprietary rechargeable lithium-ion battery or via an optional 3 AAA alkaline battery compartment.

1. The system devices shall have a 3.5 mm TRRS CTIA compliant headset connection allowing use with personal ear buds. They shall have a 64 x 128 OLED display with auto diming allowing display of all current status (group name, volume levels, battery status, time remaining, signal strength, unit ID, etc.) The leader/presenter device shall have a leader clip and when inserted the unit automatically designates itself as a leader and allows the leader/presenter to control pairing/group creation.

2. The system devices shall have a signal-to-noise ratio of 70 dB or greater and shall have an audio frequency response of 40 Hz – 15 kHz (±3 dB). The devices shall incorporate automatic battery charging circuitry to charge and maintain the lithium-Ion battery either via the micro USB port or via the docking station using the additional charging contacts on the bottom of the devices.
3. The LKS-8-A1 ListenTALK Portable ADA Kit 2 is specified..

B. Listen Technologies LA-304 ADA Access/Compliance signage kit. (Qty 1 ea.)

C. Approved equals; Williams Sound, Shure, Phonic Ear , Telex and Sennheiser of equal type and quantities.

D. Contractor to provide additional equipment as required by ADA assembly area table.

3. EXECUTION

3.1. Installation

A. None. Provide the Owner boxed sets for storage in each room.

B. The installation shall be accomplished by and under the direction of skilled electronic craftsmen, factory trained by the equipment manufacturer, and experienced in the installation of systems of this type in the State of California. Workmanship shall be of the highest quality.

C. During preparation for installation of any of the systems described in this Section of these Specifications and prior to ordering any material, coordinate all options and requirements with the Owner.

3.2. Instruction/Training

A. The equipment supplier/installer shall instruct the Owner or his designated representative(s) in the proper operation and maintenance of the system. Allow a minimum of four (4) hours for this on-site "hands-on" instruction. The Electronics Contractor shall provide sufficient personnel to provide adequate operations and maintenance training for all aspects of the system to the school staff.

END of SECTION

SECTION 32 1810 - PLAYGROUND PROTECTIVE SURFACING - RUBBERIZED

PART 1 - GENERAL

1.1 SUMMARY

A. Provide poured-in-place rubberized playground surface and related materials as indicated on the Drawings, specified herein, and needed for a complete and proper installation. Section includes:
   1. Playground surfacing.
   2. Stone base course under playground surfacing.

B. Related Sections:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division l of these Specifications.
   2. Section 03 3000: Cast In Place Concrete
   3. Section 31 2000: Earthwork
   4. Section 33 4000: Storm Drainage

1.2 DEFINITIONS

A. Use Zone: The area beneath and immediately adjacent to a play structure or equipment (play event) that is designated for unrestricted circulation around equipment, and on whose surface it is predicted that a user would land when falling from or exiting the equipment.

B. Critical Fall Height: The maximum fall height at which the protective surfacing meets the requirements of ASTM F1292.

C. High Play Activity Area: Areas where the fall height is especially great, such as at swings. A high play activity area is defined only where the protective surfacing of the entire playground area is not designed for the greatest fall height. High play activity areas are defined on the drawings.

D. Fall Height: The vertical distance between the finished elevation of the designated play surface and the finished elevation of the protective surfacing beneath it as defined by ASTM F1487.

E. Protective Surfacing: Resilient ground surfacing. The characteristics of the protective surfacing are based on the fall height of the playground equipment. Changes in either the surfacing or the fall height, particularly reducing the resilience of the protective surfacing or increasing the fall height, will reduce safety-related performance.

F. Subgrade: The surface of the ground on which the protective surfacing is installed.

1.3 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.
   1. Product Data: Submit manufacturer's descriptive literature and product specifications for each product. Include data to indicate compliance with the specified requirements.
      a. Include IPEMA certifications where required.
   2. Installation Procedures: Submit manufacturer's recommended installation procedures.
   3. Shop Drawings: Detailed scale drawings showing locations of existing playground equipment and exposed footings, bases, and anchorage points.
      a. Clearly identify footing and base elevations in relation to a fixed survey point on site and to subgrade elevation and depth of protective surfacing, surveyed by land surveyor licensed in the State in which the Project is located.
      b. Show locations of underground utilities, storm-drainage system and irrigation system.

c. Show locations of related construction such as walkways and roadways, fences, site furnishings, and plantings.
d. Show measured fall height for each playground equipment item; ASTM F1487.
e. Show Use Zone perimeters; ASTM F1487.

4. Certification: Provide IPEMA certification of ASTM F1292 Critical Fall Height at thickness specified.
5. Three samples of safety surface for this project, minimum of 6" x 6" in size.

B. Contract Closeout Submittals: Comply with requirements of Section 01 7700.
1. Maintenance data in accordance with requirements of Section 01 7820. Include detailed re-ordering information to enable Owner to match installed material exactly.

1.4 QUALITY ASSURANCE

A. Maintain one copy of the latest edition of ASTM F1487 and CPSC Pub. No. 325 at project site.

B. Installer Qualifications: Company certified by manufacturer for training and experience installing the protective surfacing; provide installer's company name and address, and training and experience certificate.

1.5 SPECIAL WARRANTY

A. In addition to the warranty requirements of the Contract Documents, submit 3 original copies of the manufacturer's warranty, signed by the subcontractor/installer and the Contractor with an extended correction period of **5 years**. Warranty shall include repair/replacement defective workmanship or materials, including edge raveling, bubbling, delaminiation, peeling, and rubber degradation.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

A. Because the safety of the playground depends on strict conformance to the design criteria, this information is provided for Contractor's information.
1. The protective surfacing constitutes a resilient layer installed over a non-resilient layer, which is installed over the subgrade, with the top of playground equipment footings and anchorage devices covered by full depth of the resilient portion of the protective surfacing.
2. The top elevation of the protective surfacing is intended to be flush with adjacent grades.

3. Use Zone: The protective surfacing has been designed to provide acceptable impact attenuation as defined in ASTM F 1292 for Critical Height of 8 feet.
4. High Play Activity Area: The protective surfacing has been designed to provide impact acceptable attenuation as defined in ASTM F1292 for Critical Fall Height of 10 feet.

B. If deviation from specified depth is required, it is the Contractor's responsibility to make all changes required to maintain specified top elevation and required impact attenuation at no extra cost to Owner; obtain approval prior to proceeding; follow approval request procedure as specified for substitutions.

2.2 PLAYGROUND SURFACING MATERIALS

A. Poured-In-Place Membrane Surfacing: Weather-resistant wear layer over impact attenuating substrate over aggregate subbase.
1. Wear Layer: Ethylene propylene diene monomer (EPDM) particles adhered with a ultraviolet-stabilized polyurethane binder to produce an even, uniformly colored surface.
2. Wear Layer Thickness: 3/8" minimum.

3. Coefficient of Friction: 0.8 minimum; ASTM D2047.
4. Wear Layer Color(s): As selected from manufacturer's full range of bright colors.
5. Impact Attenuating Substrate: 100 percent recycled shredded styrene butadiene rubber (SBR) shreds or granules with 100 percent solids polyurethane binder to form a resilient material; do not use foam rubber.
   a. Use Zone Depth: 3".
   b. High Play Activity Zone Depth: 4".
6. Geotextile Fabric: Nonwoven polypropylene sheet.

B. Manufacturers:
1. GameTime, Inc., Product GT IMPAX.
2. Play Safe Surfacing, Inc., Product EPDM Pour-n-place.
3. Hanover Specialties Inc., Product Vitriturf.
4. Products specified are for establishing the type, design, and quality required. Products of equal or better type, design, and quality produced by other manufacturers will be considered provided the request for substitution is submitted in accordance with Section 01 2500.

2.3 STONE BASE COURSE

A. Uniformly mixed stone base course with the following gradation:

Stone Gradation	
US Sieve	**Percent Passing**
1"	100
3/4"	90 - 100
No. 4	35 - 60
No. 30	10 - 30
No. 200	2 - 9

2.4 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

B. Provide manufacturer's standard tapered transition elements to support surfacing between changes of surface grade.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Playground equipment installer will perform playground layout prior to installation of footings; verify correctness of layout before starting this work.

C. Verify that playground equipment and site furnishings and irrigation system located within playground area are complete.

D. Verify location of underground utilities and facilities in the playground area. Damage to underground utilities and facilities will be repaired at Contractor's expense.

E. Verify that subgrades are at proper elevations and that smooth grading is complete.

F. Verify that proper depth of surfacing is marked on base supports of playground equipment.

3.2 PREPARATION

A. Correct subgrade irregularities to ensure that required depth of protective surfacing can be installed, and subgrade elevation is in accordance with manufacturer's requirements.

B. Inside Use Zones remove all obstructions that would extend into the resilient protective surfacing.

C. Remove rocks, debris, and other similar items.

3.3 SUBBASE

A. Install stone base course; compacted 90%; ASTM D1557.

B. Install with top surface of base course no higher than grades and levels indicated and not more than 1/4" lower than grades and levels indicated.

C. Install in true, even plane, sloped to provide positive drainage.

D. Flatness Tolerance: 1/4" in 10', maximum.

3.4 RESILIENT SURFACING LAYER

A. Install in accordance with CPSC Pub. No. 325, ASTM F1487, manufacturer's instructions, and requirements of authorities having jurisdiction.

B. Install proper thickness throughout Use Zone(s).

C. Clean and dry surface of subbase.

D. Cover aggregate base course with geotextile fabric:
   1. Verify that aggregate is free of ruts or protruding objects.
   2. Lap seams a minimum of 4", adhere seams in accordance with manufacturer's recommendations.
   3. Install fabric smooth, and free of tensile stresses, folds, or wrinkles.
   4. Protect fabric from clogging, tears, or other damage during surfacing installation.
   5. Repair or replace damaged fabric in accordance with manufacturer's recommendations.

E. Poured In Place Surfacing:
   1. Mix components mechanically on-site per manufacturer's instructions; do not hand mix.
   2. Install seamlessly; ensure complete bond to subbase.
   3. Cover footings and foundations and adhere tightly around penetrating elements.
   4. Maintain full thickness of resilient layers within Use Zone; cover or abut containment curbs as indicated on drawings; completely cover tapered transition edges.
   5. Hand trowel exposed surface to smooth, even finish.

6. Impact Attenuation Layer: Install entire layer in one continuous pour on the same day.

F. Wear Surface: Bond wear surface to substrate with adhesive. Apply adhesive in small quantities so that wear surface can be applied before adhesive dries.
   1. Install surfacing seamlessly. When wear surface is composed of different color patterns, pour surface continuously and seamlessly.
   2. When seams are required due to color change or field conditions, place adjacent wear surface as soon as possible, before initial pour has cured. Coat edge of initial pour with adhesive and apply wear surface mixture immediately.
   3. Add a minimum of 1/16" depth to specified surfacing depth to ensure required impact attenuation performance is met.
   4. Install wear surface to cover foundations and adhere tightly around elements penetrating the surface.

3.5 CLEANING AND PROTECTION

A. Restore adjacent existing areas that have been damaged from the construction.

B. Clean playground equipment of construction materials, dirt, stains, filings, and blemishes due to shipment or installation. Clean in accordance with manufacturer's instructions, using cleaning agents as recommended by manufacturer.

C. Clean playground area of excess construction materials, debris, and waste.

D. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction.

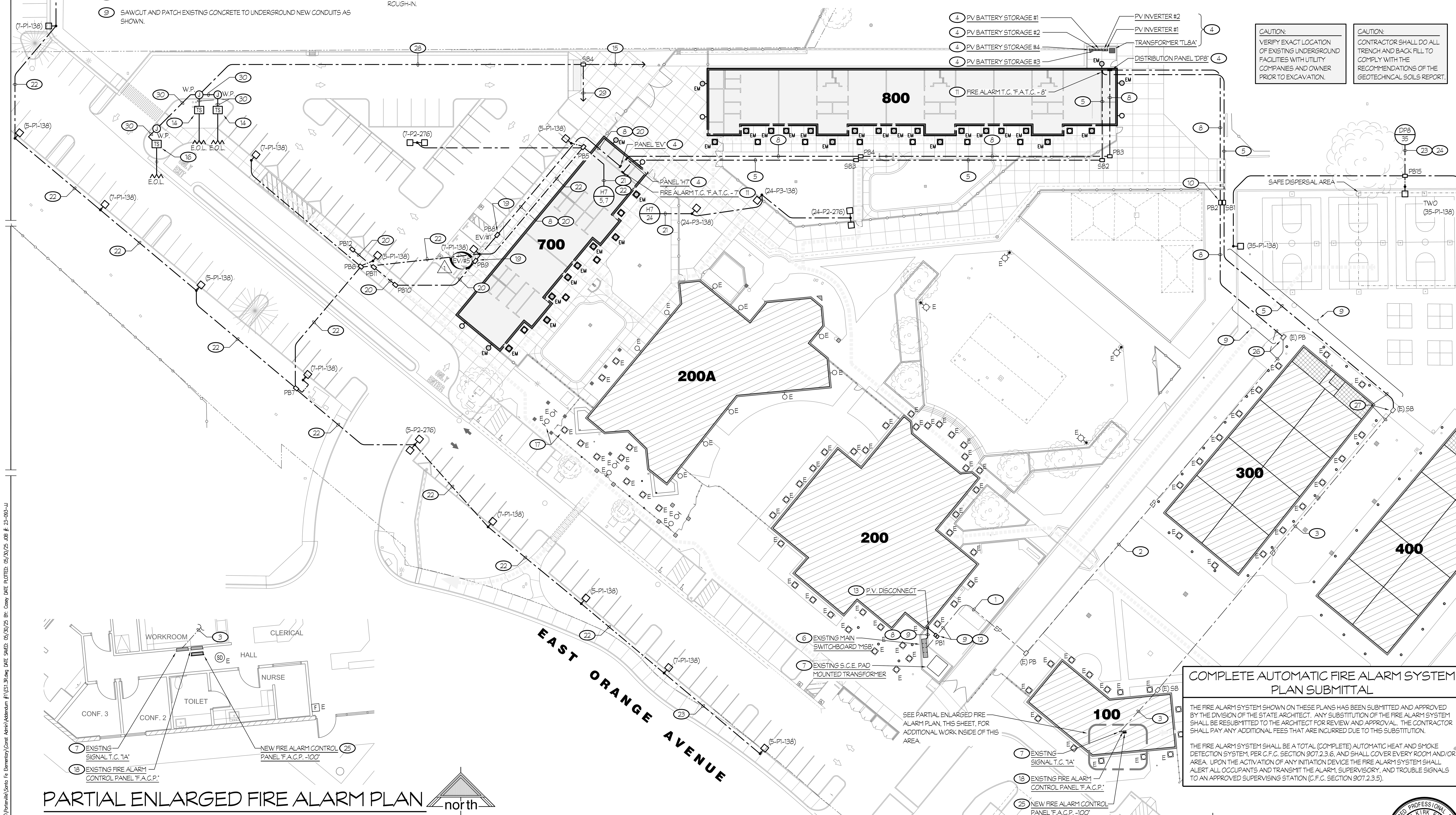
E. Protect installed products until Owner occupancy.

END OF SECTION 32 1810

APPROVALS
FILE # 54-76
APPLICATION # 02-121996

NOTES (THIS SHEET ONLY):

1. EXISTING FOUR SPARE 3"C. SEE ONE LINE DIAGRAM, #1/E5.1 FOR ADDITIONAL INFORMATION.
2. EXISTING TWO SPARE 3"C. SEE ONE LINE DIAGRAM, #1/E5.1 FOR ADDITIONAL INFORMATION.
3. EXISTING TWO SPARE 2"C. SEE FIRE ALARM SYSTEM RISER DIAGRAM, #1/E4.2 FOR ADDITIONAL INFORMATION.
4. SEE POWER PLANS FOR EXACT LOCATION AND REQUIREMENTS.
5. CONDUIT AND WIRING PER FIRE ALARM RISER DIAGRAM #1/E4.2.
6. SEE ONE LINE DIAGRAM, #1/E5.1 FOR ADDITIONAL INFORMATION.
7. TO REMAIN IN USE. NO WORK REQUIRED.
8. FEEDER PER ONE LINE DIAGRAM, #1/E5.1.
9. SAWCUT AND PATCH EXISTING CONCRETE TO UNDERGROUND NEW CONDUITS AS SHOWN.
10. PULL BOX PER DETAILS #3/E5.3 AND #4/E5.3. TYPICAL, U.O.N..
11. SEE FIRE ALARM PLANS FOR EXACT LOCATION AND REQUIREMENTS.
12. INTERCEPT TWO EXISTING SPARE 3"C WITH NEW PULL BOX AND EXTEND AS SHOWN. PULL IN CONDUCTORS PER ONE LINE DIAGRAM #1/E5.1.
13. PROVIDE WEATHERPROOF VISIBLE STYLE DISCONNECT SWITCH PER UTILITY REQUIREMENTS. MOUNT PER DETAIL #5/E5.5.
14. CONNECT TAMPER SWITCH AT THE POST INDICATOR VALVE "P.I.V.". RUN 1/2" LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT WITH 2 #14 INSIDE TO TAMPER SWITCH AND PROVIDE AN END-OF-LINE RESISTOR "E.O.L.". SECURE CONDUIT TO PIPING WITH 1/2" WIDE STAINLESS STEEL STRAPPING. PROVIDE A TWO-DEVICE DIECAST WEATHERPROOF JUNCTION BOX WITH A BLANK GASKETED COVER AND MOUNT AT +6" A.F.G.. PROVIDE AN ADDITIONAL GALVANIZED RIGID STEEL CONDUIT, MINIMUM OF 24" LONG, WRAPPED WITH PVC TAPE TO SUPPORT WEATHERPROOF JUNCTION BOX. COORDINATE EXACT LOCATION WITH FIRE SPRINKLER CONTRACTOR PRIOR TO ROUGH-IN.
15. RUN 3/4"C - 6 #14 TO DUAL MONITOR MODULES " 18-15a" AND " 18-15b" ROOM #803.
16. CONNECT TAMPER SWITCHES AT THE O.S.&Y. VALVES LOCATED ON THE DOUBLE CHECK DETECTOR/BACKFLOW PREVENTER ASSEMBLY. RUN 1/2" LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT WITH 2 #14 INSIDE TO EACH TAMPER SWITCH AND PROVIDE AN END-OF-LINE RESISTOR "E.O.L." AT EACH TAMPER SWITCH. SECURE CONDUIT TO PIPING WITH 1/2" WIDE STAINLESS STEEL STRAPPING. PROVIDE A TWO-DEVICE DIECAST WEATHERPROOF JUNCTION BOX WITH A BLANK GASKETED COVER AND MOUNT AT +6" A.F.G.. PROVIDE AN ADDITIONAL GALVANIZED RIGID STEEL CONDUIT, MINIMUM OF 24" LONG, WRAPPED WITH PVC TAPE TO SUPPORT WEATHERPROOF JUNCTION BOX. COORDINATE EXACT LOCATION WITH FIRE SPRINKLER CONTRACTOR PRIOR TO ROUGH-IN.
17. INDICATES EXISTING EXTERIOR LIGHTS TO REMAIN. TYPICAL, U.ON..
18. DISCONNECT, REMOVE AND RETURN EXISTING FIRE ALARM CONTROL PANEL TO THE OWNER. LEAVE CONDUIT AND WIRING IN PLACE FOR RECONNECTION.
19. CONNECT ELECTRIC VEHICLE CHARGING STATION, AC LEVEL 2, SINGLE HEAD, 208V 1ph, 30A (BTC POWER #L2P-30-208/240-16 OR EQUAL). COORDINATE EXACT "POINT-OF-CONNECTION" PRIOR TO ROUGH-IN.
20. SPARE CONDUIT(S) PER ONE LINE DIAGRAM #1/E5.1.
21. ROUTE LIGHTING CIRCUIT THROUGH LIGHTING CONTROL CONTACTOR CABINET IN ROOM #724.
22. 3/4"C - 3 #10 + 1 #10 GND.
23. 3/4"C - 2 #10 + 1 #10 GND.
24. ROUTE LIGHTING CIRCUIT THROUGH LIGHTING CONTROL CONTACTOR CABINET IN ROOM #835.
25. INSTALL NEW FIRE ALARM CONTROL PANEL N SAME LOCATION AS ONE THAT WAS REMOVED PER DETAIL #7/E4.4. RECONNECT ALL EXISTING CONDUIT AND WIRING.
26. ACCESS EXISTING PULL BOX AS REQUIRED TO PICK UP EXISTING TWO SPARE 3"C AND EXTEND AS SHOWN. PULL IN NEW FEEDER PER ONE LINE DIAGRAM, #1/E5.1.
27. ACCESS EXISTING PULL BOX AS REQUIRED TO PICK UP EXISTING SPARE 2"C AND EXTEND AS SHOWN. CONDUIT AND WIRING PER FIRE ALARM SYSTEM RISER DIAGRAM, #1/E4.1. THE OTHER SPARE 2"C IS TO REMAIN SPARE.
28. 3/4"C - 10 #14.
29. RUN 3/4"C - 6 #14 TO DUAL MONITOR MODULES " 17-29" AND " 17-30" ROOM #728.
30. 3/4"C - 2 #14.



CAUTION:
VERIFY EXACT LOCATION OF EXISTING UNDERGROUND FACILITIES WITH UTILITY COMPANIES AND OWNER PRIOR TO EXCAVATION.

CAUTION:
CONTRACTOR SHALL DO ALL TRENCH AND BACK FILL TO COMPLY WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL SOILS REPORT.

COMPLETE AUTOMATIC FIRE ALARM SYSTEM PLAN SUBMITTAL

THE FIRE ALARM SYSTEM SHOWN ON THESE PLANS HAS BEEN SUBMITTED AND APPROVED BY THE DIVISION OF THE STATE ARCHITECT. ANY SUBSTITUTION OF THE FIRE ALARM SYSTEM SHALL BE RESUBMITTED TO THE ARCHITECT FOR REVIEW AND APPROVAL. THE CONTRACTOR SHALL PAY ANY ADDITIONAL FEES THAT ARE INCURRED DUE TO THIS SUBSTITUTION.

THE FIRE ALARM SYSTEM SHALL BE A TOTAL (COMPLETE) AUTOMATIC HEAT AND SMOKE DETECTION SYSTEM, PER C.F.C. SECTION 907.2.3.6, AND SHALL COVER EVERY ROOM AND/OR AREA. UPON THE ACTIVATION OF ANY INITIATION DEVICE THE FIRE ALARM SYSTEM SHALL ALERT ALL OCCUPANTS AND TRANSMIT THE ALARM, SUPERVISORY, AND TROUBLE SIGNALS TO AN APPROVED SUPERVISING STATION (C.F.C. SECTION 907.2.3.5).

PARTIAL ENLARGED FIRE ALARM PLAN
1/8" = 1'-0"

PARTIAL ENLARGED SITE ELECTRICAL PLAN - NEW
1" = 30'-0"

Rose Sing Eastham & Associates
Electrical Consultants
131 S. Dunworth - (559)733-2671
Visalia, California 93292-6705

LICENSED ARCHITECT MICHAEL J. SCOTT JR. No. C-34290 REN. 05-31-25 STATE OF CALIFORNIA
DATE: DECEMBER 31, 2023

REGISTERED PROFESSIONAL ENGINEER STEVEN KIRK EASTHAM No. E-18786 Exp. 6/30/25 ELECTRICAL STATE OF CALIFORNIA

NEW PRESCHOOL AND TK/KINDERGARTEN CLASSROOMS AT SANTA FE ELEMENTARY SCHOOL
PORTERVILLE UNIFIED SCHOOL DISTRICT
286 E ORANGE AVENUE, PORTERVILLE, CA 93257

REVISIONS
1 5.30.25 ADDENDUM 2

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TITLE
PARTIAL ENLARGED SITE ELECTRICAL PLAN - NEW

ES1.3R

PROJECT 23076