DOCUMENT 00 9113

ADDENDA

WITH PLANS
CV
07/08/2026

GENERAL

1.01 The following sets forth the format for issued Addenda.

ADDENDUM NO. 1 , dated July 8th, 2026.

RE: ADA BARRIER REMOVAL PROJECT
OWNER PROJECT NO.: 10373687
DSA #03-125645
AT
STRATHERN STREET ELEMENTARY SCHOOL
located at 7939 St. Claire Avenue, N Hollywood, CA 91605

FROM: OWNER: LOS ANGELES UNIFIED SCHOOL DISTRICT
FACILITIES CONSTRUCTION CONTRACTS
333 S. Beaudry Ave., 28th Fl.
Los Angeles, CA 90017

TO: ALL PROSPECTIVE BIDDERS:

This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated June 2026, as noted below. Acknowledge receipt of the Addendum in the space provided on Document 00 4100 - Bid and Acceptance Form. Failure to do so may result in the bid being deemed non-responsive.

The Addendum consists of 179 pages, and the attached 20 drawings.

"The DSA review of this addendum is not expected to result in a material change to the contract"

MICHAEL RUSTOM Digitally signed by MICHAEL RUSTOM
DN: C=US, E=MICHAEL.RUSTOM@LAUSD.NET, O=LAUSD - FSD, OU=PEX, CN=MICHAEL RUSTOM
Date: 2026.07.07 16:04:15-07'00'

OAR Name | Signature | Date

Digitally signed by Steve Boehm Deputy Director
DN: cn=Steve Boehm Deputy Director, o, ou=PEX, email=steve.boehm@lausd.net, c=US
Date: 2026.07.07 14:37:02 -07'00'

Regional Director Name | Signature | Date

NEW BID DUE DATE: BEFORE 2:00PM, ON FRIDAY JULY 24, 2026.

A. CHANGES TO BIDDING DOCUMENTS:

- Remove and Replace Table of Contents Document – 00 0110 – 5 pages
- Remove and Replace Invitation to Bid Document – 00 1116 – 4 pages
- Remove and Replace Bid and Acceptance Form Document – 00 4100 – 5 pages

2610086 - ADDENDUM 1

B. CHANGES TO SPECIFICATIONS:
The following Specification Sections are added by DSA-Addendum No. 1, dated 06/09/2026 (as submitted to DSA but not yet DSA approved):

- Remove section 01 7418 Water Pollution Control (4 pages) and replace it with revised section 01 7418 Water Pollution Control (4 pages).
- Remove section 08 7100 Door Hardware (54 pages) and replace it with revised section 08 7100 Door Hardware (41 pages).
- Add section 09 5113 Acoustical Panel Ceilings (9 pages).
- Add section 12 6100 Fixed Audience Seating (10 pages).
- Add section 26 0519 Low Voltage Wires (7 pages).
- Add section 26 0526 Grounding and Bonding (5 pages).
- Add section 26 0533 Raceways and Boxes Fitting and Supports (13 pages).
- Add section 28 3100 Fire Detection and Alarm (43 pages).
- Add section 31 2319 Excavation and Fill for Structures (7 pages).
- Add section 31 2323 Excavation and Fill for Utilities (6 pages).
- Add section 32 8416 Irrigation Controls (6 pages).
- Add section 32 9113 Lawns and Grasses (12 pages).

C. CHANGES TO DRAWINGS:
The following Drawings are added by DSA-Addendum No. 1, dated 06/09/2026 (as submitted to DSA but not yet DSA approved). Replace previously issued respective drawing sheets A-2.00, A-2.01, A-2.04, A-2.07, A-2.10, A-5.00, A-5.01, ACS-5.00, ACS-8.00, C-2.01, C-2.02, C-2.03, C-2.04, C-3.01, C-3.02, C-3.03, C-3.04, E-2.01, E-2.02, and E-2.03. All changes are clouded on drawings and labeled Delta 1.

D. OTHER CHANGES AS SET FORTH: N/A

E. Clarification or any other notice of a change in the Bidding Documents will be issued only by the OWNER office of Facilities Construction Contracts and only in the form of a written Addendum, transmitted by fax or e-mail to all who are known by the issuing office to have received a complete set of Bidding Documents. Any other purported Addenda are void and unenforceable.

END OF ADDENDUM NO. 1

TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS – DESIGN BID BUILD

DIVISION 02 - EXISTING CONDITIONS

END OF TABLE OF CONTENTS

SECTION 00 1116

INVITATION TO BID

Subject to all conditions prescribed by OWNER, sealed bids for a lump sum, fixed price contract are invited for the following Work:

STRATHERN STREET ELEMENTARY SCHOOL

LAUSD COLIN NO. 10373687

LOS ANGELES UNIFIED SCHOOL DISTRICT AS OWNER

EDUCATIONAL SERVICE CENTER – Local District Area North

DESCRIPTION OF WORK: ADA BARRIER REMOVAL

OWNER is committed to sustainable or "high performance" design and construction in all of its schools because high performance schools enhance student and teacher performance, reduce operating costs, and protect the environment. To implement this commitment, the Owner endorses the high performance school strategies defined in the Collaborative for High Performance School (CHPS) Best Practices Manuals (available at www.chps.net), and requires that all qualified projects achieve, at a minimum, a "CHPS School" rating. The Owner shall be responsible for monitoring compliance with the CHPS criteria necessary to achieve this objective.

The Los Angeles Unified School District's electronic bid submittal process has changed. Bidders are now required to utilize the Ariba Business (Supplier) Network to submit a bid package electronically.

Bidders will need their company's user ID and password to access the Ariba Business (Supplier) Network at https://LAUSD.sourcing3.ariba.com/ad/webjumper?itemID=NYm0APjDLJhJlmZ&awcharset=UTF-8 If an existing LAUSD vendor is unaware of the user ID and password associated with their Ariba Business (Supplier) Network account, they should contact the Vendor Services Unit for assistance via email at psg-vsu@lausd.net or via telephone at (562) 654-9404.

A bidder will need to access the Ariba Business (Supplier) Network and submit the bid package for the transaction number identified below by the Bid Due Date. Virtual drop-in sessions have been scheduled for Tuesdays and Thursdays, 11 am to 12 pm, to provide instructions on accessing and responding to LAUSD solicitations in the Ariba Business (Supplier) Network. You should join a session via the following link: https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZmI4MjU3ZTYtZmYxNC00MjZhLTk0MGQtNDljNTg3YmNlMzQ4%40thread.v2/0?context=%7b%22Tid%22%3a%22042a40a1-b128-4ac4-8648-016ffa121487%22%2c%22Oid%22%3a%22ec989ceb-0c29-4836-86b7-03f004059bc2%22%7d. A job aid on accessing and responding to LAUSD solicitations in the system is attached to Section 00 2113 - Instructions to Bidders. If unsuccessful in uploading the file, a bidder should e-mail cynthia.vargas@lausd.net at least two (2) days prior to the Bid Due Date for assistance.

The vendor is solely responsible for ensuring timely submission of its electronic solicitation response. A vendor should allow itself adequate time for bid submittal and possible technical support as bids will not be accepted after the deadline.

The vendor must complete its bid entry and upload all required documents before the end of the bid submission period. The District is not responsible for contractor system problems/errors.

To ensure that your bid is submitted properly and on time, please submit well before the Bid Due Date/Time, at least two (2) days in advance as suggested above.

The applicable reference number for this project in the Ariba Business (Supplier) Network is Ariba Sourcing project #Doc2287417309.

Bidding Documents will be available to bidder after the first date of advertisement and can be obtained at:

CRISP IMAGING
Los Angeles Office (Downtown)
1829 S. Main Street
Los Angeles, CA 90015
Business Hours:
Monday through Friday
7:00 a.m. to 6:00 p.m.
Telephone: (213) 741-9560

Additional office locations are listed at www.crispimg.com.

Bidders may also view and order Bidding Documents through the website by clicking on the "Planroom" button, click "Public Jobs".

Bid will only be accepted from a pre-qualified and qualified bidder pursuant to the OWNER prequalification process and RFQ requirements. To apply for prequalification or renewal, contractors should now go to lausd.qualitybidders.com to submit the prequalification questionnaires.

Bidders should note that the OWNER's prequalification requirements include mechanical, electrical, and plumbing contractors (i.e., contractors licensed pursuant to Sections 7056–7059 of the Business and Professions Code, specifically holding A, B, C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, or C-46 licenses pursuant to regulations of the Contractors' State License Board) that contract directly with a bidder to perform any such component work on the Project ("MEP subcontractors"). Bidders that intend to contract with any MEP subcontractors to perform any such component work on the Project shall only select MEP subcontractors that have been prequalified by the OWNER at least five (5) business days before the date fixed for the public opening of bids. Non-MEP subcontractors do not need to be prequalified to perform non-MEP component work on the Project. Bidders and MEP subcontractors shall not be eligible to bid or perform work on the Project if they (a) have not submitted completed prequalification questionnaires and financial statements to the OWNER at least ten (10) business days before the date fixed for the public opening of bids, and (b) have not been prequalified by the OWNER at least five (5) business days before the date fixed for the public opening of bids. The OWNER's lists of prequalified contractors can be found online at https://procurement.lausd.org/apps/pages/Prequalification under "List of Prequalified Contractors." The lists are updated on an ongoing basis. If an MEP subcontractor does not appear on the list, bidder should verify with the subcontractor to determine if subcontractor has received a notice from OWNER that confirms its prequalification by the above deadline. Unless prohibited by the OWNER, bidders licensed pursuant to Section 7057 of the Business and Professions Code, specifically holding general building contractor B licenses pursuant to regulations of the Contractors' State License Board, may self-perform any work on the Project to the extent permitted by law. Bids that fail to adhere to these requirements will be deemed non-responsive by the OWNER.

Bidder should note the disclaimer in Section 00 2113, 1.09 E, concerning the use of District prequalified subcontractors.

Bidder is advised that no contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relation pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations (DIR) and the Los Angeles Unified School District's DIR-approved Labor Compliance Program.

BID DUE DATE: Bid will only be accepted before 2:00PM, JULY **24**, 2026.

Deadline for MEP subcontractors to be prequalified by the OWNER: JULY **17**, 2026, occurring 5 business days prior to Bid Due Date. Bidder must only list MEP subcontractors that are prequalified by the OWNER as of this date. OWNER will attempt to ensure that all prequalified MEP subcontractors are placed on the OWNER's List of Prequalified MEP Subcontractors in a timely manner. However, if an MEP subcontractor does not appear on the list, bidder should verify with the subcontractor to determine if subcontractor has received a notice from OWNER that confirms its prequalification by the deadline. Bids that fail to adhere to this requirement will be deemed non-responsive by the OWNER.

Bidder is responsible for the cost of bid package. Cost for bid package is non-refundable. Bid package is non-returnable.

Bid security in the amount of ten (10) percent of the lump sum base bid, excluding bid items, as set forth in Section 01 2300, shall accompany each bid. Surety issuing the bid bond shall meet the requirements set forth in Article 5.17 of the General Conditions. A mandatory pre-bid meeting and pre-bid job walk will be held in accordance with Section 00 2513. The bidder is responsible for ensuring that they have complete Bidding Documents including all Addenda provided by the OWNER, prior to the bid due date.

Pursuant to Labor Code Section 1771.7, this Project will be subject to the Owner approved Labor Compliance Program (Final Approval, December 7, 1996). For questions or assistance concerning the Labor Compliance Program, contact the Labor Compliance Department at (213) 241-4665 or lcp@lausd.net, or go to https://facilities.lausd.org/apps/pages/lcp on the internet. Any Contractor to whom a contract for the Work is awarded by the Owner shall comply with the provisions of the California Labor Code, as well as the Owner Labor Compliance Program for the Project, including, without limitation, the obligation to pay the general prevailing rates of wages in the locality in which the Work is to be performed in accordance with, without limitation, Sections 1771, 1773.1, 1774, 1775 and 1776 of the California Labor Code and the obligation to comply with Section 1777.5 of the California Labor Code governing employment of apprentices. Copies of the prevailing rates of per diem wages are available to any interested party at www.laschools.org//new-site/labor-compliance/dir or www.dir.ca.gov/oprl.

The successful bidder will be required to pay prevailing wages in accordance with law and is required to have the following State of California Contractor license current at the time of bid submission:

In accordance with the provisions of Public Contract Code section 3300, OWNER has determined that the CONTRACTOR performing this project must hold the following license as the prime contractor: **B – General Building Contractor**. A prime CONTRACTOR self-performing any of the following specialty trades must also hold the required specialty license: None

To perform abatement and demolition work, including removal of roofing materials, bidders must select a subcontractor from the Owner's List of Asbestos Abatement Subcontractors as per Section 00 3126. The only license required to perform abatement and demolition work, including removal of roofing materials, is C-22. A dual license of C-22 and C-39 is not a requirement.

Bidder is required to participate in an OWNER Controlled Insurance Program (OCIP) as set forth in Section 00 7316 and Article 5 of the General Conditions.

Bidder is subject to the Small Business Enterprises participation requirements as set forth in Section 00 7339.

It is the responsibility of the Prime contractor to ensure that its subcontractors/suppliers register to become LAUSD certified prior to award. Please have all subcontractors/suppliers utilize the following link to access the online registration: https://facilities.lausd.org/apps/pages/small-business.

WORKER CERTIFICATION - Only Workers skilled in the various trades required on this Contract shall be employed upon the Work. In addition to all other requirements stated in the Bidding Documents, all craftsmen must adhere to the following requirement(s): Journeyman plumbers must possess a plumbing certificate issued by the Los Angeles County and City of Los Angeles, Building and Safety Divisions. All HVAC technicians must possess an EPA-608 Certification. Electricians working for a contractor with a C-10 license must possess a California State Electrician certification. Electricians that are certified can be verified via the State database at https://www.dir.ca.gov/dlse/ecu/ElectricalTrade.html. Elevator companies must possess a Certified Qualified Conveyance Company License (CQCC). Journeymen will be required to have their Certified Competent Conveyance Mechanics License (CCCM) from the State of California and Journeymen working within the City limits of Los Angeles will be required to have their Journeymen Elevator Mechanic's License. The State of California (Elevator, Ride and Tram Unit) will inspect all County Elevator Modernizations and Alterations.

Bidder is subject to the Project Stabilization Agreement (PSA) as set forth in Document 00 4500 and Section 00 7349.

All work to occur after school hours between 3:00 PM and 11:30 PM on Mondays to Fridays and between 8:00 AM and 6:00 PM on Saturdays. CONTRACTOR shall include in contract work on all Saturdays occurring during School Recesses. CONTRACTOR shall assume Summer Recess to occur between June and August during the year 2026 and the year 2027, Winter Recess occurring between December 2026 and January 2027 and Spring Recess occurring between March 2027 and April 2027. Contractor be advised the District may have other projects on site and will also hold other school programs after normal school hours and during school recess sessions such as Winter Recess, Spring Recess and Summer recess, which contractor is required to work around. Start of work in some areas will be contingent on completing work at other areas. Various work (encompassing multiple disciplines and locations) is limited to start and/or be complete during certain dates as well as during school recess sessions.

The District's contract bond estimate is $2,868,000.00.

The Contract Time is 420 calendar days.

CONTRACTOR should consult the General Conditions, Supplementary Conditions, and General Requirements regarding Milestones and Liquidated Damages. CONTRACTOR has those options regarding retention as set forth in Public Contract Code Section 22300.

CONTRACTOR is advised that fraud is investigated by the Office of the Inspector General. The Inspector General of the Los Angeles Unified School District has statutory authority to audit and investigate persons and companies that do business with the District. Identified criminal acts including fraud, kickbacks, theft, and conspiracy are pursued to the greatest extent of the law, in conjunction with Federal, State, and Local law enforcement partner agencies.

Examples of offenses and corresponding maximum sentences are:

- 15 U.S.C. §1 Conspiracy to Restrain Trade - 10 years
- 18 U.S.C. §1341 Mail Fraud - 20 years
- 18 U.S.C. §1344 Bank Fraud - 30 years
- 18 U.S.C. §1349 Conspiracy to Commit Wire Fraud - 20 years
- 18 U.S.C. §1956 Money Laundering - 20 years
- California Penal Code §487 Grand Theft – 3 years

Offenses carry potential fines of up to $1,000,000.

Call the OIG Hotline at **(213) 241-7778** or visit **https://oig.lausd.org/**

END OF SECTION

DOCUMENT 00 4100

BID AND ACCEPTANCE FORM

Bidder Name: _____

1.01 BID SUBMISSION INSTRUCTIONS

A. Submit this form, along with all other required bid forms, electronically as indicated in Section 00 2113 - Instructions to Bidders. The bid shall be submitted by the Bid Due Date.

B. Bidders shall keep the Bid and Acceptance Form intact and return all pages when submitting bid.

C. Failure to submit the complete Bid and Acceptance Form may invalidate the bid.

1.02 BID DUE DATE: Before 2:00 P.M. on July **24**, 2026.

The only acceptable time of receipt is the date/time stamp imprinted upon the bid package by the representative of Facilities Contracts.

1.03 PROJECT IDENTIFICATION:

A. The undersigned is familiar with the terms of the Contract, the local conditions affecting performance of Contract, the cost of the Work at the place where the Work is to be done, and with the Drawings, Specifications and all other Bidding Documents. The undersigned hereby proposes and agrees to perform, within the Contract Time stipulated, the Work including all of its component parts; and to provide and furnish any and all of the labor, materials, tools, apparatus, facilities, expendable equipment, and all utility and transportation services necessary to perform the Work in accordance with the Contract and complete all Work in a workmanlike manner for: **STRATHERN STREET ELEMENTARY SCHOOL (PSA), ADA BARRIER REMOVAL PROJECT - COLIN #10373687**

in strict conformity with the Drawings and Specifications prepared by:

Facilities Services Division
Los Angeles Unified School District

1.04 Bidder acknowledges the following Addendum:

Number Number Number Number Number Number Number Number Number Number Number Number
_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

1.05 BASE BID (MUST BE FULLY COMPLETED BY BIDDER)

Bidder will complete the Work in accordance with the Contract Documents for the following base bid amount:

($_____)
(numeric figures)

1.06 BID ITEMS N/A

1.07 The base bid amount includes all Contract Allowances, if any, as set forth in the Specifications or as described in Section 01 2100 - Allowances. N/A

1.08 The base bid amount includes all applicable taxes and does not include Federal Excise Tax as set forth in Article 6.38 of the General Conditions.

1.09 BASIS OF AWARD OF CONTRACT:

A. Pursuant to Public Contract Code 20119, OWNER shall award the contract to the bidder whose bid is determined to be the best value to the District. To determine the best value contractor, the District shall divide each bidder's price by its qualifications score. The lowest resulting cost per quality point will represent the best value bid.

B. The use of Public Contract Code Section 20119 does not preclude the OWNER from adding to or deducting from the Contract to be awarded any of the additive or deductive bid items identified in the bid solicitation.

C. OWNER RESERVES THE RIGHT TO REJECT ANY AND ALL BIDS.

Article 1 - Scope of Work

The CONTRACTOR shall perform, within the time stipulated in the Contract Documents, all of which are incorporated herein and shall provide all labor, materials, equipment, tools, utility services, transportation and everything else necessary to complete in a workmanlike manner, and in exact compliance with the terms of the Contract Documents, all of the Work required in connection with the following titled Project:

STRATHERN ST. ES SCHOOL - ADA BARRIER REMOVAL
2610086 / 10373687 / 233317

[Contract Number/Project Number(s) – to be filled in by Facilities Contracts]

Article 2 - Time for Completion

The Work shall be commenced on the date stated in the OWNER Notice to Proceed. The time period for Contract Completion of the Work shall be 420 calendar days from the date set forth in the Notice to Proceed issued by the OWNER, and in accordance with the Contract regarding milestones and liquidated damages.

TIME IS OF THE ESSENCE.

Article 3 - Hold Harmless, Defense and Indemnification

To the fullest extent permitted by law, the CONTRACTOR, even if it is without fault itself, shall indemnify, defend and hold harmless the OWNER, the Board, the OCIP Administrator, and its and their respective officers, employees, program administrators, representatives, agents and consultants, from every liability, claim, loss, cause of action, action, demand, penalty, cost, expense (including without limitation, attorneys' fees) related to or arising from:

1. Any injury to person or property sustained by the CONTRACTOR or by any person, firm, or corporation, employed directly or indirectly by it upon or in connection with the Work;

2. Any injury to person or property sustained by any person, firm, or corporation, caused by any act, neglect, default, or omission of the CONTRACTOR or any person, firm, or corporation, directly or indirectly employed by it upon or in connection with the Work, whether the injury or damage occurs upon or adjacent to the Work;

3. The furnishing or use of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, or appliance under the Contract Documents; and

4. As otherwise provided in the Contract Documents.

The CONTRACTOR at its own cost, expense, and risk, shall defend all legal proceedings that may be brought against all such potential indemnities for any such liability, claim, loss, cause of action, action, demand, penalty, cost and expense, and satisfy any resulting judgment that may be rendered against any of them whether or not the liability, claim, loss, cause of action, action, demand, penalty, cost and expense (including without limitation, attorneys' fees) was actually or allegedly caused wholly or in part through the negligence or other tortious conduct of any of them. OWNER shall have the right to approve counsel proposed for any such defense and shall be consulted with regard to any proposed settlement. This Article 3 is not meant to require the CONTRACTOR to defend, indemnify or hold harmless the potential indemnities from their own active negligence, such as is prohibited by Civil Code Section 2782.

Article 4 - Insurance

The OWNER maintains an Owner Controlled Insurance Program (OCIP). The specific provisions of that program are set forth in the General Conditions. CONTRACTOR will provide its own insurance coverage as to all types of insurance not provided for in the program and relevant to the Project in amounts of coverage and by carriers approved by the OWNER.

Article 5 - Bonding

If the amount of original award of the Contract exceeds TWENTY-FIVE THOUSAND DOLLARS ($25,000.00), the CONTRACTOR shall furnish to the OWNER a Payment Bond (Material and Labor). CONTRACTOR shall also provide a Faithful Performance Bond. Both Bonds shall be for 100% of the Contract Amount and contain the terms and conditions required by Articles 5.16 through 5.17 of the General Conditions. The CONTRACTOR is also required to submit all other bonds as required by the Contract Documents.

Article 6 - Provisions Required by Law Deemed Inserted

Each and every provision of law and clause required by law to be inserted in the Contract Documents shall be deemed to be inserted and the Contract Documents shall be read and enforced as though it were included in the Contract Documents. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, upon application of either party the Contract Documents shall forthwith be physically amended to make such insertion or correction.

Article 7 - Lead Renovation, Repair & Paint (RRP) Rule Requirements

A. Bidder Requirement

1. The below requirement applies to all District projects at all District sites regardless of the construction date of the building and/or building occupant's age.
2. Bidder must have a valid USEPA Lead-Safe Renovator Firm Certificate.
3. Firms cannot advertise or perform renovation activities covered by RRP Rule without firm certification.
4. Firms that are paid to perform work that disturb paint must be certified. This includes all firms, even sole proprietorships. Firms covered under this requirement are General Contractors, sub-contractors, and Special trade contractors, including but not limited to painters, plumbers, carpenters, electricians, window installers and replacers, telecommunication, remodeling, and repair/maintenance firms.

B. General Requirement

1. The below requirement applies to all District projects at all District sites regardless of the construction date of the building and/or building occupant's age.
2. Contractor (Firm) performing lead-related construction work must possess a current US EPA Lead-Safe Renovator Firm training completion certificate and provide a copy of the USEPA Lead-Safe Renovator Firm Certificate. *The certificate must be submitted prior to starting work.*
3. Each laborer/journeyperson level worker performing lead-related construction work must possess a current USEPA Lead Renovation, Repair and Paint ("RRP") Rule training completion certificate and *provide a copy* of the USEPA Lead Renovation, Repair and Paint ("RRP") Rule Certificate. *The certificate must be submitted prior to starting work.*

Article 8 - Internal Revenue Code Section 179D

For the purposes of this section, the term "CONTRACTOR" shall refer to the Architect-Engineer or other entity with whom the OWNER has entered into the Contract and that would qualify as the entity primarily responsible for designing certain energy efficient improvements for property owned by a Federal, State, or local government or a political subdivision as defined by Internal Revenue Code Section 179D, as amended ("Section 179D").

If this contract pertains to a project that includes energy-efficiency improvements to (a) the interior lighting systems, (b) the heating, cooling, ventilation, and hot water systems, or (c) the building envelope, and CONTRACTOR qualifies as a "Designer" of these improvements, CONTRACTOR may opt to be treated as the taxpayer for the purposes of Section 179D, and if so, shall coordinate the allocation of that deduction as follows:

1. LAUSD has retained an Energy Policy Act ("EPAct") Coordinator to act on its behalf in connection with the allocation of the Section 179D tax deduction. No other companies or individuals are authorized to represent LAUSD in relation to this allocation; only the District's EPAct Coordinator is authorized.

2. LAUSD intends to allocate a portion of the tax deduction to CONTRACTOR, following third-party certification of the required energy savings under Section 179D. In exchange, CONTRACTOR shall provide cash compensation (sometimes referred to as a "rebate") to LAUSD in an amount calculated to yield equal net values for both parties, where net value is defined as the value of the benefit remaining after relevant adjustments are made. (See paragraph 5 below.) The form of the rebate will be a check payable to Los Angeles Unified School District issued within 45 days of CONTRACTOR's receipt of the tax refund or other realization of the tax savings generated by CONTRACTOR's claim of the Section 179D deduction on CONTRACTOR's federal tax return for the year the energy efficiency improvements were placed in service.

3. CONTRACTOR will arrange, at its own expense, for certification by a qualified third party that the installed energy-efficiency property meets the requirements established by Section 179D, and will submit that certification to LAUSD's Facilities Legislation, Grants and Funding office (FLGF) within 15 days of obtaining it.

4. FLGF will submit the certification to the LAUSD Chief Facilities Executive (CFE) along with a completed allocation statement (template attached), which the CFE will sign and submit to CONTRACTOR within 15 days of FLGF's receipt of the certification.

5. CONTRACTOR will submit to the U.S. Internal Revenue Service a tax return (or amended tax return) that includes the Section 179D deduction. Within 15 days of receiving the tax refund or other benefit of the tax deduction, CONTRACTOR will provide all information necessary for EPAct Coordinator to calculate the gross and net values of the tax benefit, where the gross value to LAUSD will be the amount of the check to be issued by CONTRACTOR to LAUSD (i.e. the rebate); the net value, which will be equal for both parties, will be the value of the benefit remaining after all relevant adjustments for each party have been made. CONTRACTOR's information needed for the calculation just mentioned will consist of invoices for legal, accounting, and certification services; an adjustment will also be made for the value of the tax deductibility of CONTRACTOR's rebate to LAUSD. LAUSD's relevant adjustment will consist of its fee and expenses for the EPAct Coordinator. (See attached Sample 179D Assumptions and Calculations.)

6. EPAct Coordinator will provide this calculation to CONTRACTOR so that CONTRACTOR can submit the rebate check to LAUSD. The check must be delivered to FLGF within 45 days of CONTRACTOR's receipt of the tax refund or other realization of the tax savings generated by CONTRACTOR's claim of the Section 179D deduction on CONTRACTOR's federal tax return.

7. CONTRACTOR will remain solely liable for any penalties, interest, or costs that might result from the preparation, submittal, or any other future disposition of its claim of the Section 179D tax deduction. If this contract pertains to a project that includes energy-efficiency improvements to be installed in a building as part of (a) the interior lighting systems, (b) the heating, cooling, ventilation, and hot water systems, or (c) the building envelope, and CONTRACTOR does not qualify as a "Designer" of these improvements according to Section 179D, then CONTRACTOR will identify its Designer subcontractors and the energy-efficiency improvements for which each subcontractor is responsible so that LAUSD can contact them directly regarding possible allocation of LAUSD's Section 179D tax deduction benefits.

BID DATE:_____, 20_____

By_____ (SEAL)
(Firm Name as it appears on Contractor's State License)

_____
(Authorized person to sign bid – print name)

_____
(Signature of authorized person to sign bid)

Business Address: _____

_____

Phone No._____

Fax No._____

Email Address_____

FOR FC USE ONLY
Contract Number 2610086 ☑ **with Plans** ☑ **with Specs**

1.10 ACCEPTANCE

This Contract is made and entered into on the date set forth on Page 4 of this Contract, by and between the Los Angeles Unified School District, by and through its Board of Education (hereinafter the "OWNER"), and

_____,
{Name as it appears on Contractor's State License – to be filled in by OWNER / Facilities Contracts }
_____, a _____.
{sole ownership, partnership, corporation, joint venture, or other}

This Contract is for the purpose of constructing that Project identified as **STRATHERN STREET ELEMENTARY SCHOOL** and commonly referred to as **ADA BARRIER REMOVAL.**

CONTRACTOR is the lowest responsible bidder in response to an Invitation to Bid issued by the OWNER and represents that it is qualified to perform all of the terms, covenants, promises and conditions of this Contract.

Article 9 - Contract Amount

The OWNER shall pay, and the CONTRACTOR shall accept, in full payment for performance as required by the Contract Documents, the sum of _____
(To be filled in by OWNER / Office of Facilities Contracts)
($_____), subject to any additions or deductions, if any, as provided in the Contract Documents. It is understood and agreed that all applicable taxes are included in the Contract Amount and that the Federal Excise Tax, from which the OWNER is exempt, is not included. The OWNER, upon request, will furnish the CONTRACTOR such Tax Exemption Certificates as may be required by the Manufacturer or Dealer.

All of the above-named Contract Documents are intended to be complementary. Work required by one of the above-named Contract Documents and not by others shall be done as if required by all.

Executed on _____, 20_____ at Los Angeles, California.
(To be filled in by Chief Procurement Officer, Deputy Chief Procurement Officer (Facilities) (up to $20M), Director of Facilities Contracts (up to $10M), Sr. Contract Administration Manager (up to $5M), Contract Administration Manager (up to $2.5M), Assistant Contract Administration Manager (up to $1M), or Contract Administration Analyst (up to $500K))

LOS ANGELES UNIFIED SCHOOL DISTRICT

By:_____
CHIEF PROCUREMENT OFFICER, DEPUTY CHIEF PROCUREMENT OFFICER (FACILITIES), DIRECTOR OF FACILITIES CONTRACTS, SR. CONTRACT ADMINISTRATION MANAGER, CONTRACT ADMINISTRATION MANAGER, ASSISTANT CONTRACT ADMINISTRATION MANAGER, OR CONTRACT ADMINISTRATION ANALYST

BLUE INK SIGNATURE REQUESTED
FAILURE TO SUBMIT THIS FORM OR ANY MODIFICATION(S) TO THIS FORM SHALL RENDER THE BID NON-RESPONSIVE

END OF DOCUMENT

SECTION 01 7418
WATER POLLUTION CONTROL
FOR PROJECTS WITH LAND DISTURBANCE OF LESS THAN ONE ACRE OR WAIVER

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Control runoff and pollutants from the site during construction activities.
2. Preparation, implementation, and maintenance of construction BMPs.

B. Related Requirements:

1. Division 01 – General Requirements.

1.02 ACRONYMS AND DEFINITIONS

BMP	Best Management Practice.
CAN	Corrective Action Notice.
CASQA	California Stormwater Quality Association.
CGP	NPDES General Permit for Storm Water Discharges Associated with Construction Activities.
DWQ	Division of Water Quality.
LARWQCB	Los Angeles Regional Water Quality Control Board.
NPDES	National Pollutant Discharge Elimination System.
OEHS	LAUSD Office of Environmental Health and Safety.
SWPPP	Storm Water Pollution Prevention.
SWRCB	State Water Resources Control Board.
WPCD	Water Pollution Control Drawing.

1.03 REQUIREMENTS

A. CONTRACTOR shall:

1. Implement, install and maintain BMPs. Ensure that BMPs are designed to protect all exposed portions of the site, including:
    a. Erosion, Sediment, Tracking, and Wind Erosion Control BMPs.
    b. Preservation of natural features, vegetation, soil, and buffers around surface waters.

c. Drainage swales or lined ditches to control stormwater flow.

d. Mulching or hydroseeding to stabilize disturbed soils.

e. Erosion control to protect slopes.

f. Protection of storm drain inlets (gravel bags or catch basin inserts).

g. Perimeter sediment control (perimeter silt fence, fiber rolls).

h. Sediment trap or sediment basin to retain sediment on site.

i. Stabilized construction exits.

2. Implement Good Site Management "Housekeeping" BMPs to manage construction equipment, materials, non-stormwater discharges, and wastes. BMPs that should be considered for implementation as appropriate for each project include, but are not limited to, the following:

a. Dewatering activities.

b. Material handling and waste management.

c. Building materials stockpile management.

d. Management of washout areas (concrete, paints, stucco, etc.).

e. Control of vehicle/equipment fueling to staging area.

f. Vehicle and equipment cleaning performed off site.

g. Spill prevention and control.

3. Incorporate BMP activities into the Project Schedule. Schedule construction activity during dry weather, when possible.

4. Inform CONTRACTOR and Subcontractors personnel on the BMP procedures to prevent pollutants from entering the storm drain system, before the start of construction activities. Keep personnel informed of the BMP implementation process and of changes to the procedures. Provide record to OAR of stormwater topics discussed.

5. Conduct site inspections, at least weekly, of pollution prevention controls and repair or provide additional BMPs as required.

6. Pay fines and penalties from regulatory agencies against OWNER due to CONTRACTOR'S non-compliance with stormwater regulations. OWNER shall recover costs of fines and penalties by appropriate OWNER assessment. Review of the BMPs by OAR shall not relieve CONTRACTOR from liabilities arising from non-compliance of storm water pollution regulations.

B. Project Inspector will conduct inspection and examination of site storm water regulation compliance.

C. At substantial completion, conduct post-construction BMP training of OWNER personnel and submit any post-construction BMP maintenance information.

1.04 SUBMITTALS

A. BMP material quality, grade, type as specified in the CASCA BMP Handbook.

B. Water Pollution Control Drawing (WPCD).

C. BMP Implementation Schedule.

1.05 QUALITY ASSURANCE

A. Comply with the following regulatory requirements:

1. National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Lands Disturbance Activities; ORDER NO. 2022-0057-DWQ; NPDES NO. CAS000002, adopted by the State Water Resources Control Board.

2. Regulations of the California Environmental Protection Agency, State Water Resources Control Board; Los Angeles Regional Water Control Board, and local ordinances.

3. CASQA Stormwater Best Management Practice Handbook for Construction Activity (BMP Handbook) current adopted edition.

4. Local jurisdiction stormwater management (SWPPP) and erosion control ordinances.

1.06 STORAGE AND PROTECTION

A. Provide proper storage of materials and equipment to prevent rain and storm water runoff to come in contact with pollutants, such as soil stabilizers, paint or fluids from vehicles.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Provide quality, grade and type of materials as specified in CASQA Stormwater Best Management Practice, Handbook.

PART 3 – EXECUTION

3.01 IMPLEMENTATION

A. Install perimeter controls prior to starting Work at the Project site.

B. Contain on-site stormwater on the Project site. Provide storm drain inlet protection. Do not drain on-site water directly into the storm drain without proper BMP in place.

C. Prevent pollutant discharges into the storm drain system. Prevent stormwater from coming into contact with pollutants, such as sediment, material spills, or leakage from

storage tanks, waste containers or transfer areas. In the event contamination is found CONTRACTOR shall immediately notify OAR who will contact the OEHS.

D. Protect exposed dirt, such as stockpiles, landscaping areas, and hillsides.

E. Properly manage non-stormwater discharges such as ground water, broken utility lines and fire hydrant testing.

F. Adjust BMP's locations and layouts in accordance to construction progress to assure compliance to regulations.

G. Conduct inspections of pollution prevention controls and provide Site Monitoring Report to OAR immediately if pollutants are discharged into the site runoff. CONTRACTOR shall remediate contaminated water.

H. Upon Substantial Completion: Maintain and leave post-construction stormwater pollution prevention controls in place and remove those that are not needed as determined by the OAR.

3.02 CLOSEOUT

A. Verify the following prior to Substantial Completion:

1. Final stabilization of site has been demonstrated.
2. There is no potential for construction related stormwater pollutants to be discharged into site runoff.
3. Construction related equipment and temporary BMP have been removed from site.
4. Rubbish, debris, and waste materials have been removed and legally disposed of off the Project site.
5. OEHS CAN items have been closed and signed-off.
6. Post-Construction BMP Maintenance Plan has been established.

END OF SECTION

SECTION 08 7100

DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Door hardware.
2. Door Hardware Schedule.
3. Fire Department Key Vault.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 06 2000 - Finish Carpentry.
3. Section 08 1113 - Hollow Metal Doors and Frames.
4. Section 08 1613 - Fiberglass Doors and Frames.
5. Section 08 1416 - Flush Wood Doors.
6. Section 08 3313 - Coiling Counter Doors.
7. Section 08 3323 - Overhead Coiling Doors and Grilles.
8. Section 08 4113 - Aluminum Entrances and Storefronts.
9. Section 14 2423 - Hydraulic Passenger Elevators.
10. Section 26 0500 - Common Work Results for Electrical.
11. Section 26 0513 - Basic Electrical Materials and Methods
12. Section 28 3100 - Fire Detection and Alarm
13. Section 28 1600 - Intrusion Detection Systems

C. Items listed in other sections and not included herein as “Door Hardware.”

1. Cabinet hardware, except keying.
2. Bath accessories, excepting keying.
3. Nameplates, room numbers exit signs.
4. Disabled access signs.
5. Roll-up door hardware, except cylinders and padlocks.
6. Smoke detectors, 120VAC power, wiring, and conduit.
7. Door position switches.

8. Access panels, except padlocks.
9. Gate hardware, except locking devices.
10. Local alarms and annunciators.

1.02 DESIGN REQUIREMENTS

A. Design Requirements:

1. Exit doors, including each leaf of a pair of doors, shall always be operable from the inside by the simple turn of a lever or by pushing an exit device without the use of a key or any special knowledge or effort; this includes doors of toilet and storage rooms.
2. Unless otherwise specified, hand activated door opening hardware shall be located 36 inches above the finish floor.
3. Dead bolts are not permitted unless operable with a single effort by a lever type hardware.
4. The force applied to operate exit hardware shall not require more than 15 lbs. applied in the direction of travel.

B. Regulatory Requirements:

1. Comply with CBC requirements.
2. Hardware for fire doors shall conform to requirements of UL - Fire Protection and Accident Hazard Equipment and the California State Fire Marshal listing, NFPA - 80 and CBC requirements for positive pressure testing.
3. Hardware shall meet the requirements of CBC, Chapter 11B.

1.03 SUBMITTALS

A. Shop Drawings:

1. Wiring Diagrams: Submit diagrams, templates, instruction, and installation manuals, for electrical and electronic hardware.

B. Product Data: Finish Hardware Schedule:

1. Submit schedule including recap sheet:
   a. Include manufacturer’s name, catalog number, relevant dimensions, fasteners, location of item in Work, door index number, frame material, door material, door size and thickness, door type, handing, fire-rating (if any), and sound-rating (if any).
   b. Hardware shall be listed by "Headings" in following manner:
      1) HEADING NO. 1

         1 SINGLE/PAIR OF DOORS NO. (Room and Number) from/to (Room and Number)

1 SINGLE/PAIR OF DOORS NO. (Room and Number) from/to (Room and Number)

SPEC. NO. List the appropriate numbers from the specified LIST OF FINISH HARDWARE

List of finish hardware

2) HEADING NO. 2, etc.

C. Material Samples: Submit Samples of door hardware as required by Architect.

D. Submittal Review Time: In lieu of what is specified in Section 01 3300, allow at least twenty-eight days in the Milestones Schedule for Architect and OAR review following receipt of submittal.

1.04 QUALITY ASSURANCE

A. Each type of finish hardware furnished for the Work shall be of same make or manufacture, unless otherwise specified. Where existing items are being supplemented with new items, match existing items, subject to current code requirements and accessibility recommendations.

B. Coordinate and deliver templates or physical Samples of finish hardware items to manufacturer of interfacing items, such as doors and frames, in a timely manner to insure orderly progress of Work.

C. Comply with the following as a minimum requirement:

1. Conform to Builders Hardware Manufacturers Association (BHMA) Finish Code, latest edition.

2. DHI WDHS.3: Recommended Locations for Architectural Hardware for Wood Flush Doors

3. DHI WDHS.4: Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors.

4. HMMA 831: Recommended Hardware Locations for Custom Hollow Metal Doors and Frames

1.05 DELIVERY, STORAGE AND HANDLING

A. Package each item of hardware and each lockset individually, complete with necessary installation instructions, screws and fastenings, and installation templates; marked with item number corresponding to number on Finish Hardware Schedule.

1.06 WARRANTY

A. Manufacturer shall provide a minimum two-years material warranty except as follows:

1. Provide a ten-years manufacturer’s material warranty for door closers.

2. Provide a five-years manufacturer's material warranty for locksets and exit devices.

1.07 MAINTENANCE MATERIALS

A. Extra Materials:

1. Provide five percent or a minimum or one, whichever is greater, of the following hardware: locksets, exit devices, closers, fire rated smoke seals, seals, and electric or electronic hardware. Transmit to OAR before Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Butts and Hinges:

1. Width of hinges shall be of sufficient size to clear trim. Where provided with magnetic holders, hinge width shall be of sufficient size to ensure door is parallel to wall when magnetic holders are engaged.

2. Furnish one pair of hinges for door leaves up to 5-foot high. Furnish one additional hinge for every additional 30 inches or fraction thereof.

3. Butts for doors shall be non-rising, loose pins, with button tip.

4. Exterior and interior out-swinging doors with butt hinges shall be furnished with hinges furnished with a setscrew in hinge barrel to make pin non-removable (NRP); Butt hinges at exterior out-swinging doors shall have stainless steel pins and bearings.

5. Hinges installed on painted doors shall be BHMA 600 finishes. Hinges installed on stained and varnished doors shall be BHMA 626 for bronze/brass base metals and BHMA 652 for steel base metal. Exterior doors shall have non-ferrous hinges. Fire-rated doors shall have steel or stainless-steel hinges.

B. Locksets and Trim:

1. Unless otherwise specified, locks shall be of mortise type, complying with ANSI A156.13, grade 1.

2. Unless otherwise specified, escutcheons shall be 7 ½-inch by 2 ¼-inch wide by 0.050 thick minimum.

3. Levers shall be cast and shall return to within ½ inch of face of door.

4. Outside lever shall be pinned. Inside lever shall be by "Allen Head Set Screw" or by "Spanner Ring Nut".

5. Lock strikes shall be curved lip type, with exposed edges and corners rounded, of sufficient length to protect jamb and trim, and shall not extend more than 1/8 inch beyond trim, jambs, or face of doors in pairs. At out-

swinging pairs with overlapping astragal, strike shall have a 7/8-inch lip-to-center dimension. Dust box shall be provided for door locks.

6. Locksets throughout shall be lever type of same manufacture.

C. Exit Devices:

1. Unless otherwise specified, exterior doors shall be furnished with rim touch bar device; right hand reverse active leaf - night latch function by cylinder by hardened cylinder ring by flush pull by sex nut and bolt. Left-hand reverse inactive leaf - exit only by flush pull by sex nut and bolt.

2. Unless otherwise specified, interior doors shall be furnished with rim touch bar device; right hand reverse active leaf-lever handle by cylinder, left hand reverse inactive leaf; exit only.

3. Fire labeled exit devices shall conform to UL label requirements and be listed by the California State Fire Marshal.

4. Exit devices throughout shall be touch bar types of same manufacture. Exit devices shall meet ANSI BHMA, A153.3 Grade 1.

5. Lever design shall match lock levers.

6. Exit devices shall be furnished sized for the specific door width and height.

D. Door Closers:

1. Door closers shall conform to ANSI A156.4, Grade 1, CBC 1133B.2.5.

2. Door closers shall be heavy duty, rigid parallel arm; provide regular arm for regular bevel doors.

3. Door closer shall be full rack and pinion type, adjustable back check, and sweep and latch speed with key regulating screws.

4. Door closer shall have full fitted cover of plastic or stainless steel, attached to door closer body with tamperproof screws.

5. Provide spacer block or support bracket for securing fifth screw on closer arm shoe. Provide special brackets, shoes, or other attachment devices as required.

6. Maximum pressure to operate doors shall not exceed following:

a. Fire rated doors: The authority having jurisdiction may determine the maximum force, not to exceed 15.0 pounds to operate fire doors to achieve positive latching.

b. Exterior doors: 5.0 pounds.

c. Interior doors: 5.0 pounds.

7. Door closers shall be installed at the following:

a. Exterior doors.

b. Fire rated doors.

c. Corridor doors.

d. Toilet doors.

E. Protection Plates: Furnish kick plates of 10-inch high by 2-inch less door width on single doors, 10-inch high by 1 inch less door width on pairs of doors. Provide one plate for push side of closer-equipped doors. Furnish mop plates 4-inch high by 1 inch less door width on doors swinging into toilet rooms.

1. Kick and mop plates shall be a minimum 0.050 inch thick; Type 304 stainless steel, with finished beveled edges (B4E).

F. Stops:

1. Floor stops shall be mounted to protect door and trim.

2. Furnish stop of appropriate height, minimum ¾ inch above undercut of door.

3. Where the specified floor stop cannot be installed or would present a pedestrian hazard, omit and furnish a heavy-duty overhead stop (626 finish); if closer is specified, furnish closer with integral spring-cushion stop arm.

G. Weather stripping/Gasketing:

1. Install gaskets and intumescent seals on fire rated doors and frames.

2. Unless otherwise specified, install weather stripping on doors from air-conditioned spaces to the exterior: fastener-applied frame seals, nylon-brush door sweeps, and, at pairs, astragals.

H. Thresholds: Unless otherwise specified, thresholds shall conform to CBC Chapter 11B accessibility standards and ADAAG.

I. Push Plates: Plates shall be 0.050 thick, 6-inch by 16-inch minimum, with beveled edges.

1. Door Pulls: Pulls shall have protective plate mounted under pull, 0.050 inches thick, 4-inch by 16-inch beveled on four edges.

2. Hardware Cutouts: Pull plates and push plates installed over locking hardware shall have cylinder and turn lever cutouts as required.

J. Automatic Flush Bolts:

1. Strike plates for automatic bolts shall be provided for active door.

2. Provide dust proof strikes for bottom bolts.

K. Coordinators:

1. Provide brackets as required for items fastened to coordinators.

2. Provide door strike plates for both doors with coordinators.

L. Smoke Detectors and Magnetic Holders: Coordinate electrical devices with Division 26 and the Drawings.

M. Fasteners: Shall match finish of hardware. Provide fasteners for all hardware at toilet rooms, custodian rooms, kitchen doors, and exterior doors: stainless steel for chrome, aluminum, or stainless finish hardware; brass or bronze for brass or bronze finish hardware.

N. Key vault: Locate box as indicated on drawings.

1. Knox Box: Model 4400 series for low rise buildings with recessed mounting kit, or other as approved by local fire authority.

2. Construction: High Security Industrial/Government key box. UL listed double-action rotating tumblers and hardened steel pins accessed by a biased cut key. ¼" thick steel housing with ½ inch thick steel door with interior gasket seal and stainless-steel door hinge. Lock shall have a 1/8-inch-thick steel dust cover with tamper seal mounting capability.

3. Installation of Key Vault: Refer to manufacturer's printed instructions and LA City Fire Department's Fire Prevention Bureau's Requirement 75. Connect wiring conduit through one of the holes provided.

4. Labeling: The word "FIRE" shall be placed on the Key Box door in ¾ inch contrasting letters

2.02 FINISH

A. Unless otherwise specified, finish of hardware shall be dull chromium-plated BHMA 652 for steel-based metals, BHMA 626 for brass-based metals, except for kickplate, escutcheons, push plates, continuous hinges, lock strike plates, and exit device touch bars, which shall be BHMA 630. Levers for locksets and exit devices shall be BHMA 626.

B. Unless otherwise specified, overhead door closers and brackets shall be BHMA 689, to match other finish hardware in same room or space.

2.03 CYLINDERS AND KEYING

A. Project shall be keyed in accordance with keying schedule, prepared and furnished by the OAR.

B. Provide a cylinder security collar (SPEC. NO. 42) at each exterior door cylinder. Provide cylinder collars and spacers at all cylinders as needed to provide a neat, tight and secure fit of the cylinder to the locking hardware.

C. Permanent Cylinders:

1. Permanent cylinders shall be standard core type, 7-pins maximum.

a. Permanent cylinders as manufactured by [Schlage] shall be Owner furnished. The Work of this section includes obtaining the permanent cylinders from the Owner, and pinning, stamping, and installing.

b. Provide to the OAR an approved hardware schedule and floor plans. OAR shall return with keying added to the approved hardware schedule, bitting chart, and a complete sample set of permanent keys. OAR will provide notification when the cylinders are available for pick-up at the District's Central Lock Shop located at 1240 Naomi Street, Los Angeles.

2. Permanent cylinders shall be pinned with third-party (e.g., "LAB") 0.005 inch increment pins.

3. Pin cylinders according to OAR-furnished sample set of permanent keys, OAR-furnished bitting chart and OAR-furnished key schedule.

4. Change keys and master keys shall operate inside and outside cylinder on two cylinder locks, unless otherwise indicated.

5. Provide the set number of change key only stamped on cylinder faces.

D. Key Control:

1. Permanent cylinders and sample set of permanent keys shall be not used during the construction phase of the Project. Temporary construction cylinders and keys used for securing the Work is included as part of the Work of this section and will not be provided by the Owner.

2. Upon Substantial Completion of the Work, sample set of original keys shall be returned to the OAR. Duplication of Owner keys, or retaining keys, is not permitted.

3. Provide four unstamped, uncut nickel silver key blanks per cylinder to the OAR prior to Substantial Completion. Key blanks shall be by the permanent cylinder manufacturer and of the same keyway as the sample set of permanent keys or keyway designated by Owner.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Finish hardware shall be installed as specified in Finish Hardware Schedule.

1. Placement of Hardware: Finish hardware shall be installed as indicated on hardware placement sheets attached to end of this section.

2. Provide necessary screws, bolts, anchors, and fastenings, of required sizes and type for proper installation of hardware. Exposed screws shall have Phillips heads, and wood screws shall be fully threaded.

3. Fitting: Hardware shall be accurately fitted and, with exception of prime-coated butt or continuous hinges, bar-type coordinators, and flat astragals, shall be removed before finish painting is installed. Upon completion of finish painting and/or sealing, permanently install the hardware.

4. Anchorage of Hardware: Hardware fastened to concrete, masonry, or gunite construction shall be provided with drop-in expansion anchors by "Red Head Multi Set II", “Rawl Steel”, or as otherwise required by hardware manufacturer. Pilot holes of suitably lesser diameter shall be drilled prior to the insertion of wood and sheet metal screws.
5. Door escutcheons and push plates shall be installed with stainless steel or bronze, oval, "Phillips Head", fully threaded screws, not less than 3/4 inch - No. 6.
6. Exit devices shall be mounted with non-ferrous sex nuts and fully threaded machine screws, except where through bolts engage outside trim of locking case.
7. Mullion strike shall be installed with fully threaded machine screws.
8. Door closer shall be installed for maximum degree of opening of each door.
9. Following shall be installed with sex nuts and fully threaded machine screws.
    a. Door closers.
    b. Door pulls.
10. Install exterior doorstops as required. On new concrete, stops shall be installed with 1/4-20 screws. On asphalt concrete, stops shall be installed with 1/4-20 screws to an anchor plate set in a concrete monument. Anchor plate shall be Trimco 1268, or equal. Floor stops shall not be located in the path of travel and shall be located no more than 4 inches from walls.
11. Kickplate:
    a. Kickplates shall be installed with screws at each corner, and screws evenly spaced along each side not more than 3 inches apart on centers.
    b. Except on wood doors, screws shall be undercut pan head.
12. Thresholds shall be installed with 1/4-20 screws, set in Pour-Roc or mastic per section 07 9200, and coped to trim.
13. Sound Seals and Weather stripping / Gasketing:
    a. A mounting screw shall be installed within 2 inches of cuts or corners of weather stripping and/or gasketing.
    b. Sound seals and weather stripping and/or gasketing shall be installed with No. 8 - 3/4 inch Tek Phillips pan head screws.
14. Exterior doors not otherwise specified shall be provided with SPECS.1, 18, 28, 33, 36, 39, 42, 46, 54.
15. Interior doors not otherwise specified shall be provided with SPECS 2, 18, 28, 33, 35, 39, 42, 54.

3.02 ADJUSTING AND CLEANING

A. Before Substantial Completion, hardware shall be cleaned and inspected. Where hardware is deemed defective, repair or replace as required.

B. Door Closers: Final adjustments shall be performed before Substantial Completion, with mechanical system balanced and in operation.

3.03 EXAMINATION

A. Upon completion of installation, verify correct installation of hardware, according to reviewed Hardware Schedule and Keying Schedule. Verify that finish hardware is in optimum working condition.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.05 LIST OF FINISH HARDWARE

A. Following items designated by "SPEC NO." comprise the list of Finish Hardware, from which hardware shall be furnished as specified and required to complete the Work:

1. HINGES

SPEC. NO. 1 --Full Mortise Hinges -- Non-Ferrous -- For Exterior Reverse Bevel Doors

Ball or oilite bearings, 4 1/2-inch by 4-inch, or as required to clear projections, primed or plated as required. Furnish with security studs. Furnish with stainless steel non-removable pins and bearings.

	Bommer	Hager	Mc Kinney
Reg. Wt. -	BB5001-A	BB1191-NRP-SH	TA2314-NRP-SSF
Heavy Wt. -	BB5005--A	BB1199-NRP-SH	T4A3386-NRP-SSF

	Stanley	Ives	PBB
Reg. Wt. -	FBB191-NRP-Sec. St.	5BB1NRP/SS	BB21-NRP
Heavy Wt.	FBB199-NRP-Sec. St.	5BB1HW NRP/SS	4B21-NRP

SPEC. NO. 2 -- Full Mortise -- General Interior Doors

Steel, ball or oilite bearings, 4 1/2-inch by 4-inch, or as required to clear projections, primed or plated as required. Furnish with non-removable pins at out swinging doors.

Bommer	Hager	Mc Kinney	Stanley	Ives PBB
BB5000	BB-1279	TA-2714	FBB-179	5BB1 BB81

SPEC. NO. 3 --Full Mortise Swing Clear Hinges -- Non-Ferrous -- For Exterior Reverse Bevel Doors

Ball or oilite bearings, 4 1/2-inch by 4-inch, or as required to clear projections, primed or plated as required. Furnish with security studs. Furnish with stainless steel non-removable pins and bearings.

	Hager	Mc Kinney
Reg. Wt. -	AB7001-NRP-SH	TA2395-NRP-SSF
Heavy Wt. -	AB7502-NRP-SH	T4A3395-NRP-SSF

	Ives	PBB
Reg. Wt. -	5BB1SC NRP/SS	SCBB51-NRP
Heavy Wt. -	5BB1SCHW NRP/SS	SC4B51-NRP

2. LOCKSETS

SPEC. NO. 4 -- Lock -- Interior Doors

One cylinder: Key in cylinder locks or unlocks outside lever, inside lever always free. Protected front and deadlocking latch.

Corbin/Russwin	Sargent	Schlage	Marks
ML2055NSM	8237LW1L	L-9070-06N	LA318J

SPEC. NO. 5 -- Lock -- Classroom Security

Two cylinders: Key in inside cylinder locks or unlocks outside lever, key in outside cylinder retracts latch, inside lever always free. Protected front and deadlocking latch.

Corbin/Russwin	Sargent	Schlage	Marks
ML2052NSM	8238LW1L	L-9071-06N	LA318GJ-32D-G3

SPEC. NO. 6 -- Lock -- Cylinder Both Sides

Two cylinders: Dead bolt operated by key in either cylinder, latch bolt retracted by lever from either side. Protected front. Do not install at exit doors.

Corbin/Russwin	Sargent	Schlage	Marks
ML2022NSM	8226LW1L	L-9466-06N	LA118C

SPEC. NO. 7 -- Latchset

Latch bolt retracted by lever from either side. Protected front.

Corbin/Russwin	Sargent	Schlage	Marks
ML2010NSM	8215LW1L	L-9010-06N	LA118N

SPEC. NO. 8 -- Lock – with Emergency Key

Latch bolt retracted by lever from either side, except when deadbolt is projected by turn inside, turning inside lever retracts both deadbolt and latch

bolt simultaneously. In emergency, bolt can be operated by emergency key from outside. Turn shall be oval shaped minimum 1 3/4-inch by 1 inch at center with 1 1/4-inch projection.

Corbin/Russwin	Sargent	Schlage	Marks
ML2030NSM	8265LW1L	L-9040-06N -XL11-761	LA118LF

SPEC. NO. 9 -- Lock -- Special Rooms

One cylinder: Key in cylinder retracts latch bolt. Outside lever always rigid, inside lever always free. Protected front and deadlocking latch.

Corbin/Russwin	Sargent	Schlage	Marks
ML2057NSM	8204LW1L	L-9080-06N	LA118EW

SPEC. NO. 10 -- Lock -- Single Occupancy Faculty Toilets

Latch set contains a lever handle on each side with an oval shaped privacy bolt and latch on the inside. In an emergency, the lockset must open for the exterior with a key that overrides the privacy latch mechanism. From the interior, the occupant may open the door by activating the door lever which releases the privacy latch and door simultaneously. For existing staff use single occupancy restrooms only.

Corbin/Russwin	Sargent	Schlage	Marks
ML2029 NSM M34	8250LW1L	L-9486-06Nby L538-375	LA118LH

SPEC. NO. 11 -- Lock -- Connecting Room Lock

Two cylinders: Key in cylinder locks or unlocks both levers. Protected front and deadlocking latch. Do not install at exit doors.

Corbin/Russwin	Sargent	Marks
ML2042-404F90-8-NSM	8237 by DBL CYL by 82-3093LW1L	LA118JC

Locking Hub Rollback kit

Schlage

L-9066-06N-XL11-897

SPEC. NO. 12 -- Lock -- Special Gate Lock

Two cylinders: Latchbolt by key from either. Both levers always rigid. Auxiliary latch deadlocks latchbolt. Do not install at exit gates.

Corbin/Russwin	Sargent	Schlage	Marks
ML2032 NSM	8217LW1L	L-9082-06N	LA118WW

SPEC. NO. 13 -- Lock -- Interior Doors

One cylinder: Key in cylinder locks or unlocks outside lever, inside lever always free.

Protected front and deadlocking latch. doors

Corbin/Russwin	Sargent	Schalge	Marks
ML 2056 NSM	8289LW1L LA118JR	L9076-06N	

SPEC. NO. 14 -- Lock – Hold Back Function

One cylinder: Key in cylinder locks retracts latch, inside lever always free. Latchbolt can be held in a retracted position by key, or released by key. Protected front and deadlocking latch. No exterior lever trim. To be used in conjunction with Spec. No. 93. Install on non-rated doors

Corbin/Russwin	Sargent	Schalge	Marks
ML 2056 NSM-M30	8291LW1L	L9076LLL-06N	LA118JM-F5

SPEC. NO. - 15 – Electronic Lock – Single Occupancy Public-Use Toilets, Not Applicable.

3. PANIC HARDWARE AND FIRE LABELED HARDWARE

SPEC. NO. 16 -- Exit Device -- Single Door Aluminum StoreFront Door

Exit device shall be rim night latch function with a 3/4-inch latch bolt, dead latch, dogging device, and a stainless-steel touch pad. Furnish standard Allen-type dogging key with suitable hole for key ring. Furnish with offset pull (see SPEC. NO. 49).

Corbin Russwin	Precision	Sargent	Von Duprin	Dorma
ED4200 x K157	2403	8504	35A-NL-OP	5303x JP03
Detex				
4003 x CBK				

SPEC. NO. 17 -- Exit Device -- Pair Doors – Aluminum Storefront Doors

Exit device shall be rim rod night latch function by exit only function with a 3/4-inch latch bolt, dead latch, dogging device, and a stainless-steel touch pad. Furnish standard Allen-type dogging key with suitable hole for key ring. Furnish with offset pull (see SPEC. NO. 49)

Corbin Russwin	Precision	Sargent	Von Duprin	Dorma
Active Door				
ED4200 x K157	2403	8504	35A-NL-OP	5303 x JP03
Inactive Door				

ED4200	2401	8510	35A-EO	5303

SPEC. NO. 18 -- Exit Device -- Single Door

Exit device shall be rim night latch function with a 3/4-inch latch bolt, dead latch, dogging device, and a stainless-steel touch pad. Furnish standard Allen-type dogging key with suitable hole for key ring.

	Corbin/Russwin	Precision	Dorma
Int.	ED5200xN955	2108 x V4908A	9300 x YR08
Ext.	ED5200xK157	2103	9300 x HRT03

	Sargent	Von Duprin	Detex
Int.	8813-743-8ETL	98L-996L-06	1008DA
Ext.	8804X Less Pull	98NL-OP	1003 X CBK

Adams Rite 8800 Series at aluminum doors.

SPEC. NO. 18P – Exit Devices – Interior Pair Wood or Hollow Metal Doors

devices shall be surface-vertical rod types of less bottom rods, ANSI 08 function, key locks and unlocks lever by exit only function.

	Corbin Russwin	Precision	Detex
Active Door	ED5470xN955xM55	2208xV4908AxLBR	2108 DA
Inactive Door	ED5470xM55	2201xLBR	2101
	Sargent	Von Duprin	Dorma
Active Door	8713-743ETL-LBR	9827L-994L-06-LBR	9400 LB x YR08
Inactive Door	8710-LBR	9827EO-LBR	9400 LB

SPEC. NO. 19 -- Exit Device -- Exit Only -- Single Door

Exit device shall be rim exit only function with 3/4-inch latches bolt, dogging device, and a stainless-steel touch pad. Furnish standard Allen-type dogging key with suitable hole for key ring.

Corbin/Russwin	Precision	Sargent	Von Duprin	Dorma	Detex
ED5200	2101	8810	98EO	9300	1001

SPEC. NO. 20 -- Fire Rated Exit Device -- Single Door

Exit device shall be ANSI 08 function, key locks and unlocks lever.

Corbin/Russwin	Precision	Detex
ED5200AxN955	FL2108 x V4908A	F1008 DA
Sargent	Von Duprin	Dorma
12-8813-743-8ETL	98LF-994L-06	F9300 x YR08

SPEC. NO. 21 -- Fire Rated Exit Device -- Single Door

Exit device shall be self-latching, with exit only function, less dogging feature.

Corbin/Russwin	Precision	Detex
ED5200A	FL2101	F1001
Sargent	Von Duprin	Dorma
12-8810	98EO-F	F9300

SPEC. NO. 21P –Interior Fire Rated Pair Wood or Hollow Metal Doors

Exit devices shall be surface-vertical rod types of less bottom rods, ANSI 08 function, key locks and unlocks lever by exit only function. Exit devices shall be self-latching, less dogging feature.

	Corbin Russwin	Precision	Detex
Active Door	ED5470B/FxN955xM55	FL2208xV4908AxLBR	F2108 LD
Inactive Door	ED5470B/FxM55	FL2201xLBR	F2101 LD
	Sargent	Von Duprin	Dorma
Active Door	12-8713-743ETL-LBR	9827LF994L-06-LBR	F9400LBx YR08
Inactive Door	12-8710-LBR	9827EO-F-LBR	F9400 LB

SPEC. NO. 21DE – Exit Devices – Interior Fire Rated Double Egress Pair Wood or Hollow Metal Doors

Exit devices shall be surface-vertical rod type less bottom rods, exit only function. Exit devices shall be self-latching, less dogging feature. Furnish two exit devices per double egress pair.

Corbin Russwin	Dorma	Precision	Sargent
ED5470B/FxM55	F9400 LB	FL2201xLBR	12-8710-LBR
Von Duprin	Detex		
9827EO-FxLBR	F2101 LD		

SPEC. NO. 22 – Mortise Panic Exit Devices – Interior Pair Wood or Hollow Metal Doors

Devices shall be at active door a mortise panic devise with open back strike with Inactive door with surface-vertical rod type less bottom rods, ANSI 08 function, key locks and unlocks lever by exit only function.

	Corbin Russwin	Precision
Active Door	ED5657xN955xM55	2308xV4908A
Inactive Door	ED5470xM55 2201xLBR	2201-LBR

	Sargent	Von Duprin	Dorma
Active Door	8913-743ETL	9875L-994L-06	9500 x YR08
Inactive Door	8710-LBR	9827EO-LBR	9400 LBR

SPEC. NO. 23 -- Removable Mullion Non-labeled -- Pairs of Doors with Exit Devices

14 gage steel, approximately 2-inch by 3-inch. Furnish complete with soffit and sill fittings and fastenings as required.

Corbin/Russwin	Precision	Sargent	Von Duprin	Dorma	Detex
707A (7')708A (8')	822	980	4954	1330	90KR

SPEC. NO. 24 -- Removable Mullion Labeled -- Pairs of Doors Exit Devices

Listed as Fire Exit Hardware. Furnish complete with soffit and sill fittings and fastenings as required.

Corbin/Russwin	Precision	Sargent	Von Duprin	Dorma	Detex
707A (7')708A (8')	FL822	12-980	9954F	1300	F90KR

SPEC. NO. 25 -- Automatic Flush Bolts -- Labeled and Non-labeled Doors

Complete with necessary strikes and screws. Furnish 2 each inactive leaf.

Door Controls	Ives	Rockwood	
Wood or Composite	942 NH x 80	FB40PxDP2	1942NHx80
Hollow Metal	842 NH x 80	FB30PxDP2	1842NHx80

SPEC. NO. 26 -- Coordinator -- Labeled and Non-labeled Doors

Bar-type, complete with necessary strikes, bars, brackets, and screws.

Door Controls	Ives	Dorma	Rockwood
600 Series	COR Series	TS 93 GSR	1600

4. AUXILIARY LOCKS

SPEC. NO. 27 -- Padlock

Bronze or brass case, hardened steel shackle, length to fit condition; plated, brass chain, master keyed. Furnish by same manufacturer as lock cylinder key system.

5. DOOR CLOSERS

SPEC. NO. 28 -- Door Closer -- 180 Degree, Hold Open Arm

	L.C.N.	Stanley
Out swing	4041-H-EDA	D-4550HEDA
In-swing	4041-H (to 120°)/4041T-H-Top Jamb (past 120°)	D-4550H/51H

	Norton	Sargent	Dorma
Out swing	PR7500H xTorx	281 PH10 x Torx	8916 SP8T
In-swing	7500 x Torx less 1618	281-H x Torx	8916 PH

SPEC. NO. 29 -- Door Closer -- 180 Degree, Delayed Action

	L.C.N.	Dorma	Stanley
Out-swing	4041 DA EDA	8916 DA AF	D-4550DA-EDA
In-swing	N/A for 180°	8916DA SPA	D-4550DA/51DA

	Norton	Sargent
Out-swing	PR7500DA x Torx	281 P10-DA x Torx
In-swing	7500DA x Torx less 1618	281-DA x Torx

SPEC. NO. 30 –Electromechanical Door Closer – Maximum 170° Electronic Hold Open

For use on fire rated doors requiring hold open. At pairs, furnish a slave unit without smoke detector on one leaf tied into a master detector unit (types below) on the other leaf.

	LCN
Outswing	4410ME-B80
Inswing	N/A for 170°

	Norton	Sargent	Dorma
Outswing	7220/7230MPS	12-80-2990	8916 EMF PT
Inswing	7210MPS	12-80-2960	8916 EMF T

6. DOOR STOPS AND HOLDERS

SPEC. NO. 31 -- Door Type Holder

Cast bronze made to template, secured to door with oval head bronze machine screws and washers; when door has kickplate, mount sex bolts under kickplate. Provide strike of recommended height; install short strike whenever possible.

Ives	Trimco	Rockwood
FS40 Series	1260-SeriesxFloor Strike	491 Seriesx Floor Strike

SPEC. NO. 32 – Interior Floor-Mounted Door Stop

1-3/4 inches high, secured rubber.

Don-Jo	Trimco	Rockwood
1448	1214	481

SPEC. NO. 33 – Exterior Floor-Mounted Door Stop

Cast bronze, 2-1/4 inches high, secured rubber.

Trimco	Rockwood
1214CK	481H x Trox

SPEC. NO. 34 -- Overhead Door Holder, 180° Swing (max.), no stop feature. Provide auxiliary floor stop.

L.C.N.	Norton
PAH 60	No. 2

7. THRESHOLDS

SPEC. NO. 35 -- Aluminum Threshold -- Interior Door

Width 4-inch, height 1/2 inch. Full width of opening and coped to trim.

N.G.P.	Pemko	Reese
424A	170A	S-204A

SPEC. NO. 36 -- Aluminum Threshold -- Exterior Door

Half-saddle, height 1/2 inch. Threshold shall have one full-length bearing. Full width of opening and coped to trim. For ¼ inch rise.

N.G.P.	Pemko
653	158A

SPEC. NO. 37 -- Aluminum Threshold Strip -- Interior Door or Opening

Where cork, vinyl composition tile and other floor coverings terminate, except at raised cement thresholds, or where other thresholds are specified. Width 1 inch to 1 3/8-inch, height 1/4 inch with 1/8-inch offset.

N.G.P.	Pemko	Reese
432	N/A	T040A

SPEC. NO. 38 -- Aluminum Threshold -- Interior Door or Opening

Width 2 1/4-inch or 2 ½-inch, height 3/16 inch or 1/4 inch.

N.G.P.	Pemko	Reese
410A	173A	S-225A

8. MISC. AUXILIARY HARDWARE

SPEC. NO. 39 – Kick and Mop Plates

Ives	Trimco	Don-Jo	Rockwood
8400	KOO50/KM0050	90	K1050

SPEC. NO. 40 – Lock Guard

9 ½ to 10-inch by 1 ½ to 2 1/8-inch with lugs to receive flat Phillips head through-bolts.

Don-Jo	Markar	Trimco	Rockwood
NLP-110	M-930LG	5000	321 x 630

SPEC. NO. 41 -- Astragal

Stainless steel, 2 inches by height of door, secured by Phillips flat head through-bolts.

N.G.P.	Pemko	Reese	Anemostat
139SS	357SS	183SS	FBA x SS

SPEC. NO. 42 -- Cylinder Guard Ring

Manufactured of hardened materials to resist removal by wrenches and other devices. Furnish of sufficient length for cylinder. Provide appropriate filler rings as required. Furnish plated versions only. Install with all cylinders exposed to the exterior of the building, but not necessarily limited to that application.

Corbin/Russwin	Keedex	Major
416F39	K-24/K-24L	CG/CGL

SPEC. NO. 43 – Automatic Door Bottom

At exterior doors with surface applied walk off mats in lieu of Spec 101 door sweep. To ensure ADA 5-pounds door pressure opening.

	Pemko	NGP	Reese
Semi-mortise Wood	430MRL	421NA	521C

Full-mortise Wood	411RL	335N	370A
Hollow Metal	420PKL	320N	372A

SPEC. NO. 44 – Panic guard protection kickplate.

Install for latches and end caps of exit devices Existing Doors with exposed rod panic devices.

Trimco PG Series Panic Guard

SPEC. NO. 45 -- Push Plate

Provide cutout for cylinder or turn lever as required. Provide beveled on all four edges.

Ives	Trimco	Don-Jo	Rockwood
8311-5 4x16	1010-3	7110	132-70C

SPEC. NO. 46 -- Anti-Vandal Pull

Stainless steel or bronze, 5-inch by 5-nch by 1 inch. Provide with attached lugs for through bolting from inside. Furnish vandal-resistant screws. Furnish without cylinder cutout for exit only doors.

Trimco	Rockwood
1111C3-black coating at wood doors	BF94 – black coating at wood doors

1096 – RC – SP at single metal out swinging doors

1097 – RC – SP at pairs metal out swinging doors and at single or pair in-swing doors

Ives

VR900 - at single metal out swinging doors.

VR900LLP - at pairs metal out swinging doors and at single or pair inswing doors.

SPEC. NO. 47 -- Coat and Hat Hook

Cast aluminum, two prong, 1 1/8-inch inches projection, suitable for behind door application. Furnish three for teacher's wardrobes. Furnish quantities as indicated at other locations.

Ives	Don-Jo	Rockwood
582	302	796

SPEC. NO. 48 -- Cane Bolt

Steel, zinc-plated, 18 inches, with padlock eyes welded to bolt to lock in closed position. Two strikes each bolt to hold gate in open or closed position.

Hager	Richards-Wilcox	Stanley
1408	524-P21	1009

SPEC. NO. 49 – Offset Tube Door Pull

For installation on aluminum storefront doors with exit devices. Pulls shall be satin stainless steel (BHMA 630) and be mounted with spanner-screw through-bolts.

Don-Jo	Forms+Surfaces	Trimco	Rockwood
1158	DT1021-12”	1191-4	BF158

SPEC. NO. 50 – Wall-mounted Electro-magnetic Door Holder

For installation on fire-rated doors requiring hold-open

LCN	Norton	Rixson	Dorma	RSG
SEM7850	R6933	FM998	EM-F24120 DH1224 Series	

SPEC. NO. 51 – Meeting Stile Astragals – Fire-rated Pairs with Vertical Rod Exit Devices

N.G.P.	Pemko	Reese
140PA (set)	351Cx351CS	95Cx95CP

SPEC. NO. 52 – Adhesive Smoke Seals – Fire-rated Metal Doors

N.G.P.	Pemko	Reese
5050B	S88D	797B

SPEC. NO. 53 – Adhesive Intumescent Seals – Fire-rated Wood Doors

At single doors, furnish frame seals only. At pairs, furnish both frame seals and astragal seals.

	N.G.P.	Pemko	Reese
Frame	9440B	HSS2000 x S88D	GIS x 797B
Astragal	9500B x 2525B	HSS2000 x S77D	GIS x 798B

SPEC. NO. 54 – Exterior Door Seals. Furnish frame seals and door sweeps at exterior doors. At pairs, furnish astragal in addition to frame seals and door sweep. Furnish factory-cut for narrow frames where occurs. Furnish exterior door seals with stainless steel fasteners.

	N.G.P.	Pemko	Reese
Frame Seals	700SA	2891AS	755A
Door Sweep/Drip	C627A	3452CNB	354C
Astragal	140PA (SET)	351C x 351CS	95C x 95CP

SPEC. NO. 55 -- Padlock Hasp

Steel, zinc plated, secured with galvanized bolts, nuts, and washers, 6 inches, 3 ½-inch for lead-lined cabinet doors.

Hager	Stanley
WS-1941	SP-941

SPEC. NO. 56 -- Padlock Eyes

Steel, zinc plated.

Stanley

1245

SPEC. NO. 57 -- Key Tags

Furnish one fiber marker for each new file key, marked, attached, and placed as required.

Aladdin	Ke-Master	Lund	Telkee
OG	K9002	C-1507	2GF

Notes:
1. All existing doors require proper wood dutchman to install new panic devices on an existing mortise lock prepped door.
All existing doors on new concrete landings will need to be maintained undercut per specification 08 1416 and will need to be sealed at all raw wood edges prior re-installation.
Installation of new doors on existing wood frames. Consider continuous hinge or define new door as a "book door" or a scribe to fit installation.

OPT0375454 Version 12

Hardware Group No. 01

For use on Door #(s):
100A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
6	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	REMOVABLE MULLION	SPEC.NO.23	689
1	EA	PANIC HARDWARE	SPEC.NO.19 (VON DUPRIN PA-AX)	626
1	EA	PANIC HARDWARE	SPEC.NO.18 (VON DUPRIN PA-AX)	626
1	EA	RIM CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	DOOR PULL	SPEC.NO.46 (DT)	630
1	EA	DOOR PULL	SPEC.NO.46 (NL)	630
2	EA	SURFACE CLOSER	SPEC.NO.28	689
2	EA	KICK PLATE	SPEC.NO.39	630
2	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
2	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 02

For use on Door #(s):
101A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	PANIC HARDWARE	SPEC.NO.18 (VON DUPRIN PA-AX)	626
1	EA	RIM CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	DOOR PULL	SPEC.NO.46 (NL)	630
1	EA	SURFACE CLOSER	SPEC.NO.28	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 03

For use on Door #(s):
101B

Provide each UEP door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
6	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	AUTO FLUSH BOLT	SPEC. NO. 25	630
1	EA	REMOVABLE MULLION	SPEC.NO.23	689
1	EA	PANIC HARDWARE	SPEC.NO.18 (VON DUPRIN PA-AX)	626
1	EA	RIM CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	VANDAL RESISTANT TRIM	SPEC.NO.46	630
2	EA	SURFACE CLOSER	SPEC NO.29	689
2	EA	KICK PLATE	SPEC.NO.39	630
2	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
2	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 04

For use on Door #(s):
112.1 112.2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
2	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	SURFACE CLOSER	SPEC NO.29	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 05A

For use on Door #(s):
101.11 101.61 101.62

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	PANIC HARDWARE	SPEC.NO.18 (VON DUPRIN PA-AX)	626
1	EA	RIM CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	DOOR PULL	SPEC.NO.46 (NL)	630
1	EA	SURFACE CLOSER	SPEC.NO.28	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 05B

For use on Door #(s):
101.10

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	PANIC HARDWARE	SPEC.NO.18 (VON DUPRIN PA-AX)	626
1	EA	RIM CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	DOOR PULL	SPEC.NO.46 (NL)	630
1	EA	SURFACE CLOSER	SPEC.NO.29 (WITH SPRING CUSH ARM)	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.
(*) NOTE= USE DOOR CLOSER W/ INTEGRATED STOP ONLY IF THERE'S NO WALL TO LOCATE WALL/ FLOOR STOP, PER SPEC. SECTION-PART-2-F.3, AS REQ'D.

Hardware Group No. 06

For use on Door #(s):
101.22 101.24

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.2 (HEAVY WT.)	652
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	EA	GASKETING	SPEC.NO.52	Gy

-FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 07

For use on Door #(s):
001.50 001.51

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	SURFACE CLOSER	SPEC NO.29	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 08

For use on Door #(s):
110.14

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	STOREROOM LOCK	SPEC.NO.9	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	SURFACE CLOSER	SPEC NO.29	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A
1	EA	SIGNAGE	SIGNAGE SPECIFIED IN SECTION 10 14 00	TBD

-FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING DOOR/ FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 08A

For use on Door #(s):
103.34

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	STOREROOM LOCK	SPEC.NO.9	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING DOOR/ FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 08B

For use on Door #(s):
SA2C SA2D

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	CLASSROOM HOLDBK	SPEC.NO.14(LESS OUTSIDE TRIM)	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	VANDAL RESISTANT TRIM	SPEC.NO.46	630
1	EA	SURFACE CLOSER	SPEC NO.29	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	MOP PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	MARBLE THRESHOLD	SPECIFIED IN SECTION 09 30 13	TBD

-FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING DOOR/ FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.
-FIELD VERIFY (E) EXISTING HARDWARE PRIOR RE-USE.

Hardware Group No. 09

For use on Door #(s):

05.42	012.47	013.46	101.6	~~101.7~~	101.31
101.41	101.60	102.8	102.20	~~102.21~~	102.33
103.9	103.25				

1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
2	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	SURFACE CLOSER	SPEC NO.29	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 09A

For use on Door #(s):
014.53 109.13 109.14

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
2	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	SURFACE CLOSER	SPEC.NO.28	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 09B

For use on Door #(s):
101.30 102.12 102.32

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
2	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	SURFACE CLOSER	SPEC.NO.29 (WITH SPRING CUSH ARM)	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.
(*) NOTE= USE DOOR CLOSER W/ INTEGRATED STOP ONLY IF THERE'S NO WALL TO LOCATE WALL/ FLOOR STOP, PER SPEC. SECTION-PART-2-F.3, AS REQ'D.

Hardware Group No. 10

For use on Door #(s):
104.23

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC. NO. 2	652
1	EA	PASSAGE SET	SPEC.NO.7	626
1	EA	SURFACE CLOSER	SPEC.NO.29 (WITH SPRING CUSH ARM)	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	MOP PLATE	SPEC.NO.39	630
1	EA	GASKETING	SPEC.NO.52	Gy
1	EA	MARBLE THRESHOLD	SPECIFIED IN SECTION 09 30 13	TBD
1	EA	COAT AND HAT HOOK	SPEC NO.57	626

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-(*) NOTE= USE DOOR CLOSER W/ INTEGRATED STOP ONLY IF THERE'S NO WALL TO LOCATE WALL/ FLOOR STOP, PER SPEC. SECTION-PART-2-F.3, AS REQ'D.

Hardware Group No. 11

For use on Door #(s):
111.15

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC. NO. 2	652
1	EA	FAC RESTRM /HOTEL W/IND	SPEC.NO.10	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	SURFACE CLOSER	SPEC.NO.29	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	MOP PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	EA	GASKETING	SPEC.NO.52	Gy
1	EA	MARBLE THRESHOLD	SPECIFIED IN SECTION 09 30 13	TBD
1	EA	COAT AND HAT HOOK	SPEC NO.57	626
1	EA	SIGNAGE	SIGNAGE SPECIFIED IN SECTION 10 14 00	TBD

-FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 12

For use on Door #(s):
104.35 104.36

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC. NO. 2	652
1	EA	PASSAGE SET	SPEC.NO.7	626
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	MOP PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	EA	GASKETING	SPEC.NO.52	Gy
1	EA	MARBLE THRESHOLD	SPECIFIED IN SECTION 09 30 13	TBD
1	EA	COAT AND HAT HOOK	SPEC NO.57	626
1	EA	SIGNAGE	SIGNAGE SPECIFIED IN SECTION 10 14 00	TBD

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 16

For use on Door #(s):
SA1A SA1B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.1 (HEAVY WT.)	630
1	EA	CLASSROOM HOLDBK	SPEC.NO.14(LESS OUTSIDE TRIM)	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	CYLINDER GUARD	SPEC.NO.42	626
1	EA	VANDAL RESISTANT TRIM	SPEC.NO.46	630
1	EA	SURFACE CLOSER	SPEC NO.29	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	MOP PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.33	626
1	SET	GASKETING	SPEC NO.54	AA
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	MARBLE THRESHOLD	SPECIFIED IN SECTION 09 30 13	TBD
1	EA	SIGNAGE	SIGNAGE SPECIFIED IN SECTION 10 14 00	TBD

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 17

For use on Door #(s):
102A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.2 (HEAVY WT.)	652
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	SURFACE CLOSER	SPEC.NO.29 (WITH SPRING CUSH ARM)	689
1	EA	GASKETING	SPEC.NO.52	Gy

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.
(*) NOTE= USE DOOR CLOSER W/ INTEGRATED STOP ONLY IF THERE'S NO WALL TO LOCATE WALL/ FLOOR STOP, PER SPEC. SECTION-PART-2-F.3, AS REQ'D.

Hardware Group No. 17A

For use on Door #(s):
104A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.2 (HEAVY WT.)	652
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	SURFACE CLOSER	SPEC.NO.28	689
1	EA	GASKETING	SPEC.NO.52	Gy

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 18

For use on Door #(s):
108A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.3	652
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
2	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	SURFACE CLOSER	SPEC.NO.29	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	FLOOR STOP	SPEC.NO.32	626
1	EA	GASKETING	SPEC.NO.52	Gy

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. 19

For use on Door #(s):
108B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	HINGE	SPEC.NO.3	652
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	SPEC.NO.5 (W/ INSIDE INDICATOR)	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	SURFACE CLOSER	SPEC.NO.29 (WITH SPRING CUSH ARM)	689
1	EA	KICK PLATE	SPEC.NO.39	630
1	EA	WALL STOP	SPECS.NO.32	630
1	EA	GASKETING	SPEC.NO.52	Gy

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.
(*) NOTE= USE DOOR CLOSER W/ INTEGRATED STOP ONLY IF THERE'S NO WALL TO LOCATE WALL/ FLOOR STOP, PER SPEC. SECTION-PART-2-F.3, AS REQ'D.

Hardware Group No. EXIST-01

For use on Door #(s):
101.63

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
1	EA	THRESHOLD	SPEC.NO.36	A

-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/ DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ ALTER EXISTING FRAME/ DOOR PREP. TO ACCOMODATE SPECIFIED HARDWARE.

Hardware Group No. GATE-01

For use on Door #(s):
G1 G2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	ITEMID	FINISH
3	EA	BARREL HINGES-7"	BY GATE MFG.	TBD
1	EA	DBL CYL STORE LOCK	SPEC.NO.11	626
1	EA	MORTISE CYLINDER	-CAMPUS STD-	626
1	EA	WELDED GATE BOX FOR MORTISE LOCKSET	BY GATE MFG.	TBD
1	EA	SURFACE CLOSER	SPEC NO.29	689
1	EA	FLOOR STOP	SPEC.NO.33	626
1	EA	DOOR SWEEP	SPEC.NO.54	AA
1	EA	THRESHOLD	SPEC.NO.36	A

-CONFIRM HARDWARE COMPATIBILITY WITH GATE MFG./ SUPPLIER PRIOR ORDERING.
-BARREL HINGES, WELDABLE GATE BOX FOR LOCK HARDWARE, FRAME POSY, BOTTOM DOOR PLATES, GATE ACCESSIBLE SIGN, AND BALANCE OF HARDWARE BY GATE MFG./ SUPPLIER.
-PROVIDE MOUNTING PLATES (AS REQ'D),
-ENSURE FLOOR STOP HEIGHT TO MEET DOOR.
-JAMB POSTS TO HAVE STEEL POSITIONED TO SERVE AS A POSITIVE STOP; THAT GATE CANNOT SWING PAST THE SUPPLIED STRIKE.
-DOUBLE CYLINDER, KEY USE ON EITHER SIDE UNLOCKS BOTH LEVERS AND RETRACTS LATCHBOLT.
-FIELD VERIFY EXISTING MATERIAL/ CONDITIONS/DIMENSIONS PRIOR PROCEEDING REQUIRED WORK OR HARDWARE ORDERING.
-CONFRIM/ALTER EXISTING FRAME PREP. TO ACCOMODATE SPECIFIED HARDWARE.

HARDWARE PLACEMENT
MORTISE LOCKSET (HP-ML)

NOTES:

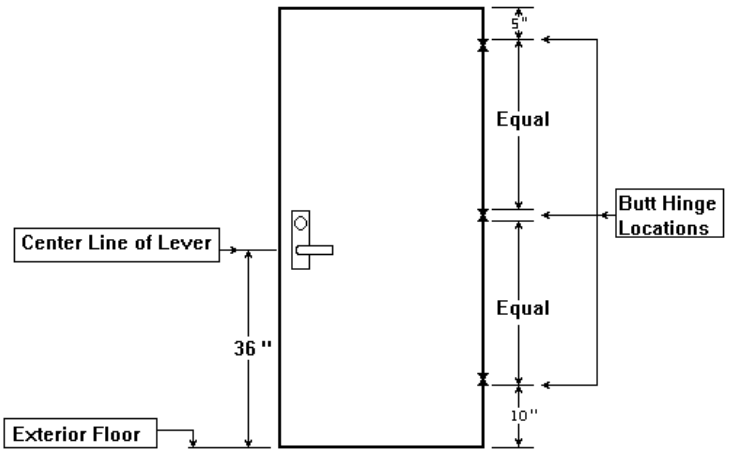
Lock Strikes: Strikes shall be boxed, with curved lip of sufficient length to protect the trim and jamb.

Hinges Reinforcement of steel doors and frames shall be per Specification Section 08110.

All Frames Head shall have door closer reinforcement, full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.

Door Closer Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.

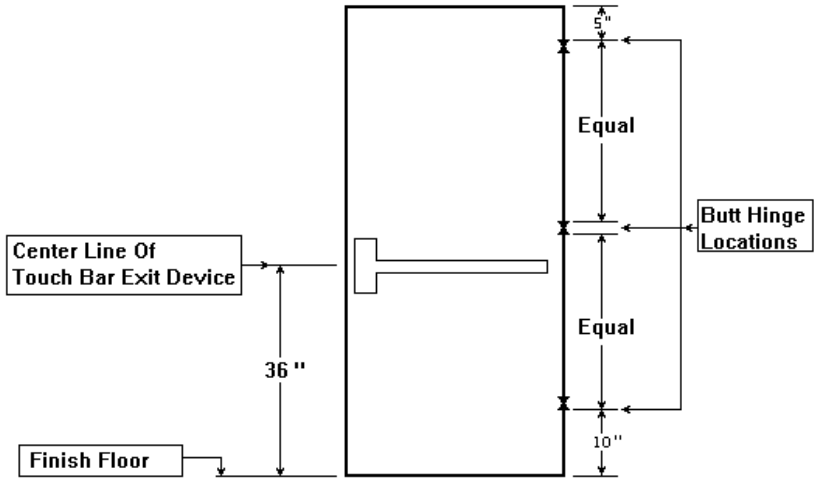
Doorstop Unless otherwise directed, doorstop or spike shall be mounted within 4 inches of the wall.



HARDWARE PLACEMENT
EXIT DEVICE (HP-ED)

NOTES:

Kickplate	Where specified 10 inches height, width 1 inch less than total width of door between stops. Secured with flat head undercut, full thread screws.
Hinges	Reinforcement of steel doors and frames shall be per Specification Section 08 1113.
All Frames	Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.
Door Closer	Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.
Door stop	Unless otherwise directed, doorstop or spike shall be mounted within 4 inches of the wall.

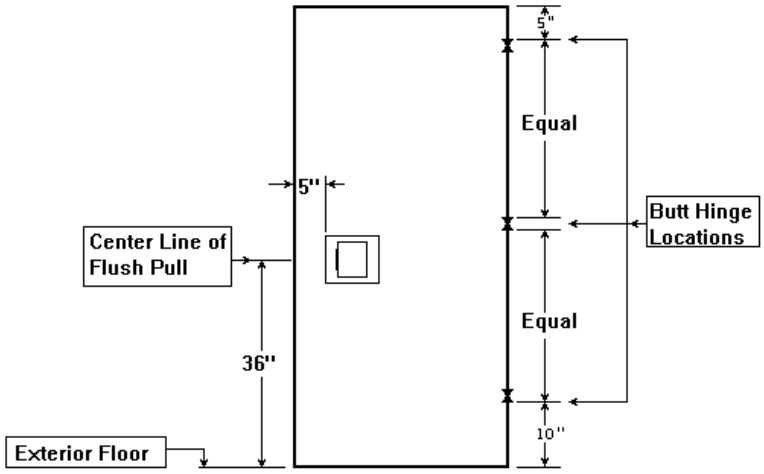


HARDWARE PLACEMENT

FLUSH PULL (HP-FP)

NOTES:

Hinges	Reinforcement of steel doors and frames shall be per Specification Section 08 1113.
All Frames	Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.
Door Closer	Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.
Doorstop	Unless otherwise directed, doorstop or spike shall be mounted within 4" of the wall.



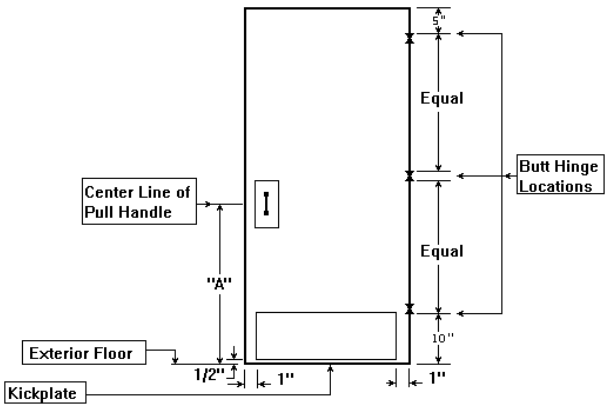
HARDWARE PLACEMENT

AUXILIARY HARDWARE (HP-AUX)

NOTES:

Kickplate	Where specified 10 inches height, width 1 inch less than total width of door between stops. Secured with countersunk head, full thread screws.
Hinges	Reinforcement of steel doors and frames shall be per Specification Section 08 1113.
All Frames	Head shall have door closer reinforcement, full length of head, whether or not closers are called for. Reinforcement shall be per specification Section 08 1113. No mutes or mute holes.
Door Closer	Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.
Door stop	Unless otherwise required doorstop or spike shall be mounted within 4 inches of the wall.

HIGH SCHOOL	A = 40 inches X 2 3/4 inches
MIDDLE SCHOOL	A = 38 inches X 2 3/4 inches
ELEMENTARY PRIMARY CENTERS.	A= 36 inches X 2 3/4 inches



HARDWARE PLACEMENT

IDENTIFICATION SYMBOL (HP-RR)

NOTES:

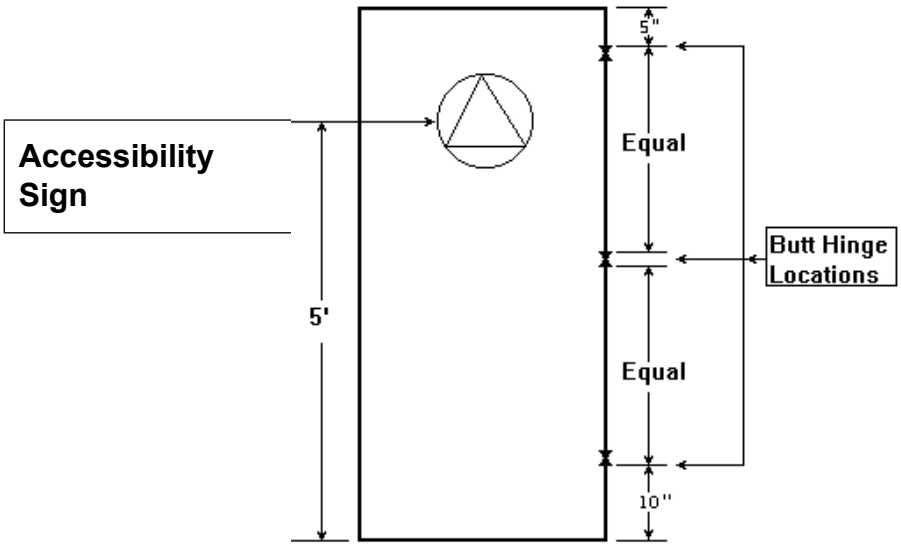
Hinges Reinforcement of steel doors and frames shall be per Specification Section 08 1113.

All Frames Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.

Door Closer Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.

Door stop Unless otherwise required doorstop or spike shall be mounted within 4 inches of the wall.

IDENTIFICATION SYMBOLS - To be installed per CBC Chapter 11B.

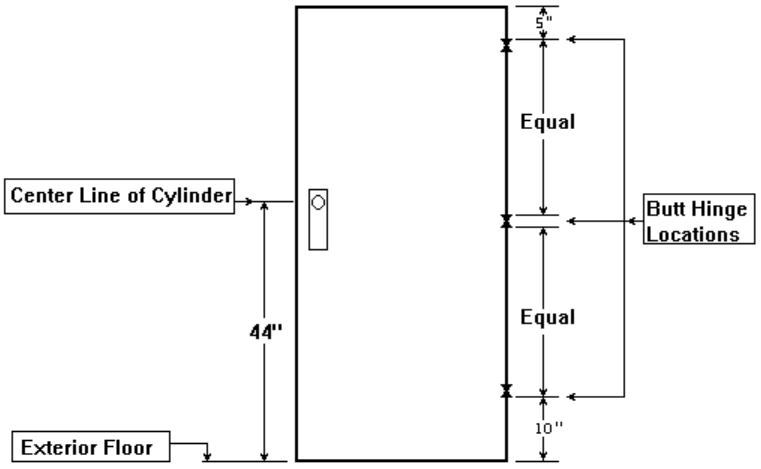


HARDWARE PLACEMENT

DEADBOLT (HP-DB)

NOTES:

Lock Strike	Strike shall be boxed, to protect the jamb.
Hinges	Reinforcement of steel doors and frames shall be per Specification Section 08 1113.
All Frames	Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.
Door Closer	Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.
Door stop	Unless otherwise required doorstop or spike shall be mounted within 4 inches of the wall.



HARDWARE PLACEMENT

DUTCH DOOR (HP-DD)

NOTES:

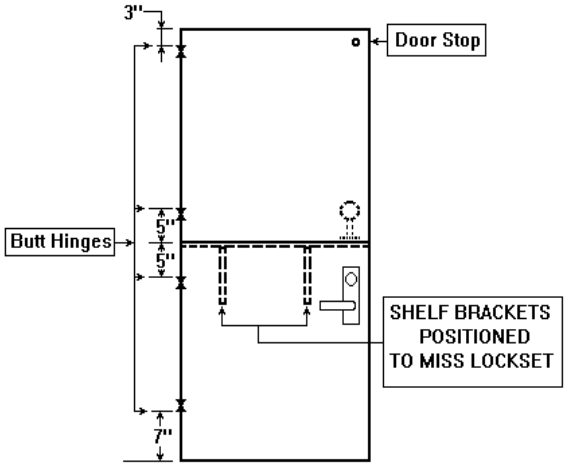
Lock Strikes: Strikes shall be boxed, with curved lip of sufficient length to protect the trim and jamb.

Hinges Reinforcement of steel doors and frames shall be per Specification Section 08 1113.

All Frames Head shall have door closer reinforcement full length of head, whether or not closers are called for. Reinforcement shall be per Specification Section 08 1113. No mutes or mute holes.

Door Closer Install according to manufacturers' template. With closer installed, doors shall have maximum swing possible, 90 degrees minimum.

Door stop Unless otherwise directed doorstop or spike shall be mounted within 4 inches of the wall.



END OF SECTION

SECTION 09 5113

Addendum no. 1

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Lay-in acoustical ceiling systems and metal suspension systems.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 09 2216 - Non-Structural Metal Framing.
3. Section 09 2900 - Gypsum Board.
4. Division 26 - Electrical.

1.02 REFERENCES

A. ASTM International (ASTM):

1. ASTM A641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
2. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
4. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
5. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
7. ASTM E580 – Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
8. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.
9. ASTM E1414 - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
10. ASTM E1477 - Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.

B. American Society of Civil Engineers (ASCE):

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures, as amended by CBC 1615A.1.16.

1.03 QUALITY ASSURANCE

A. Ceiling systems shall consist of lay-in acoustical ceiling panels by a single manufacturer and suspension systems by a single manufacturer for the entire project.

B. Qualifications of Installer: Minimum five years experience in installing acoustical ceiling systems of the types specified.

C. Design Criteria:

1. Deflection of finished surface to 1/360 of span or less.

2. 1/8-inch maximum permissible variation from true plane measured from 10-foot straightedge placed on surface of finished acoustical fiber units.

D. Requirements of Regulatory Agencies:

1. Conform to CBC requirements and UL - Tunnel Test for Fire Hazard Classification of Building Materials.

2. CISCA: Acoustical Ceilings Use and Practice.

3. Division of the State Architect: Comply with requirements of IR 25-2.

E. Pre-Installation Meeting: Conform to requirements of Section 01 3119 Project Meetings, Article Pre-Installation Conferences.

1.04 SUBMITTALS

A. Samples:

1. Lay-in panels of each specified type, 6-inch by 6-inch minimum size.

2. Suspension System: 12-inch-long samples of suspension system members, connections, moldings and wall angles, for each color specified.

B. Shop Drawings:

1. Indicate complete plan layouts and installation details.

2. Indicate related Work of other sections which is installed in, attached to, or penetrates ceiling areas, such as air distribution and electrical devices.

C. Product Data:

1. Suspension System for Lay-in Ceiling: Printed data for suspension system components, including load tests, indicating conformance to specified tests and standards.

2. Acoustical units: Printed data indicating conformance to specified tests and standards.

D. Maintenance Materials: Provide extra panels equal to 1 percent of the area of each typical module size of acoustical panel, but not less than 8 of each specified size, style and color.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the Project site in original sealed packages.

B. Storage: Store materials in building area where they will be installed, in original package. Keep clean and free from damage due to water or deteriorating elements.

C. Handle in a manner to prevent damage during storage and installation.

1.06 PROJECT CONDITIONS

A. Installation of acoustical ceiling system shall not begin until the building is enclosed, permanent heating and cooling is in operation, and residual moisture from plaster and concrete work has dissipated. Building areas to receive ceilings shall be free of construction dust and debris.

B. Environmental Requirements: Maintain temperature in space at 55 degrees F or above for 24 hours before, during, and after installation of materials.

C. Scheduling:

1. Before concealing Work of other sections, verify required tests and inspections have been completed.

2. Coordinate with related Work of other sections. Coordinate location and symmetrical placement of air distribution devices, electrical devices, and penetrations with related Work section.

1.07 WARRANTY

A. Manufacturer shall provide a 10-year material warranty.

B. Installer shall provide a two-year fabrication and installation warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. USG Corporation.

B. Armstrong World Industries.

C. CertainTeed / Saint-Gobain.

D. Equal.

2.02 SUSPENSION SYSTEM

A. Metal suspension system for acoustical lay-in tile shall be hot-dipped galvanized steel conforming to ASTM A653. Main beams and cross tees shall be double-web steel construction with exposed flange design, with factory punched cross tee slots, hanger holes and integral couplings.

B. Metal suspension system for acoustical lay-in tile shall conform with ASTM C635, C636 and E580 and section 13.5.6 of ASCE 7, as amended by CBC Section 1615A.1.16, for installation in high seismic areas.

C. Structural classification of suspension systems shall be heavy-duty in conformance to ASTM C635.

D. Vertical Strut: USG Donn Compression Post, or equal, or as indicated; types and designs complying with requirements of authorities having jurisdiction and seismic Zones D, E and F requirements. Provide base attachment clip for connection of vertical strut to main beams.

E. Wall Molding: Fabricated from galvanized steel with 2-inch horizontal leg and hemmed edges, same finish as main and cross tees.

F. Spacer/Stabilizer Bars: Provide for tying together the ends of main runners and cross tees that are not attached to wall molding.

G. Hanger Wire: 0.106 inch diameter (0.144 inch diameter for pendant fixtures), galvanized soft annealed mild steel wire as defined in ASTM A641, Class 1 coating.

H. Provide attachment devices and any other required accessories for a complete suspended ceiling system installation.

2.03 ACOUSTICAL CEILING PANELS

A. Acoustical ceiling panels shall be class A in accordance with ASTM E1264.

B. Acoustical panels shall meet the following surface-burning characteristics when tested in accordance with ASTM E84 for Class A materials:

1. Maximum Flame Spread: 25.

2. Maximum Smoke Developed: 50.

C. Mold and Mildew Resistance: Panels and faces shall be treated with a biocide paint additive or an antimicrobial solution to inhibit mold and mildew.

2.04 CEILING TYPES

A. ACT 1 - Classrooms:

1. Acoustical Ceiling Panels:

a. Panel Name: Armstrong Fine Fissured High NRC 1811, USG Radar Climaplus HiNRC 22311, CertainTeed / Saint-Gobain Fine Fissured HHF 497 HNRC, or equal.

b. Panel Size: 2-foot by 4-foot.

c. Panel Thickness: 3/4 inch.

d. Edge Detail: Lay-in.

e. Light Reflectance: 0.83 minimum, complying with ASTM E1477.

f. CAC: Minimum 35 - 39, UL Classified, complying with ASTM E1414.

g. NRC: Minimum 0.70, UL Classified, complying with ASTM C423.

h. Color: White.

i. Recycled Content: Minimum 37 percent.

2. Suspension System:

a. Suspension System Name: Prelude XL by Armstrong, Donn DX by USG, 1200 Seismic Series by Chicago Metallic Corporation, or equal.

b. Color: White.

B. ACT 2 - Administration:

1. Acoustical Ceiling Panels:

a. Panel Name: Armstrong Ultima 1912, USG Mars ClimaPlus 86985, CertainTeed / Saint-Gobain Symphony M #1222BF-OVT-1, or equal.

b. Panel Size: 2-foot by 2-foot.

c. Panel Thickness: 3/4 inch.

d. Edge Detail: Beveled tegular.

e. Light Reflectance: 0.89 minimum, in accordance with ASTM E1477.

f. CAC: Minimum 35, UL Classified, complying with ASTM E1414.

g. NRC: Minimum 0.70, UL Classified, complying with ASTM C423.

h. Color: White.

i. Recycled Content: 74 percent minimum.

2. Suspension System:

a. Suspension System Name: Silhouette XL by Armstrong, Fineline by USG, 4500 Ultraline Series by Chicago Metallic Corporation, or equal.

b. Color: White.

C. ACT 3 - Cafeteria:

1. Acoustical Ceiling Panel:

a. Panel Name: Armstrong Optima Open Plan 3250, USG Halcyon #98223, CertainTeed / Saint-Gobain Symphony F 1342B-OVT-1, or equal.

b. Panel Size: 2-foot by 2-foot.

c. Panel Thickness: 1 inch.

d. Edge Detail: Tegular.

e. Light Reflectance: 0.88 minimum, complying with ASTM E1477.

f. NRC: Minimum 0.95, UL Classified, complying with ASTM C423.

g. Color: White.

h. Recycled Content: Minimum 28 percent.

2. Suspension System:

a. Suspension System Name: Prelude XL by Armstrong, Donn DX by USG, 1200 Seismic Series by Chicago Metallic Corporation, or equal.

b. Color: White.

D. ACT 4 – Other areas:

1. Acoustical Ceiling Panel:

a. Panel Name: Armstrong Fine Fissured 1729, USG Radar Climaplus 2410, CertainTeed / Saint-Gobain Hytone Fine Fissured HHF 197, or equal.

b. Panel Size: 2-foot by 4-foot.

c. Panel Thickness: 5/8 inch.

d. Edge Detail: Lay-in.

e. Light Reflectance: 0.82 minimum, complying with ASTM E1477.

f. CAC: Minimum 35, UL Classified, complying with ASTM E1414.

g. NRC: Minimum 0.55, UL Classified; complying with ASTM C423.

h. Color: White.

i. Recycled Content: Minimum 37 percent.

2. Suspension System:

a. Suspension System Name: Prelude XL by Armstrong, Donn DX by USG, 1200 Seismic Series by Chicago Metallic Corporation, or equal.

b. Color: White.

PART 3 - EXECUTION

3.01 PREPARATION

A. Furnish layouts for inserts, clips or other supports and struts required to be installed by the Work of other trades that depend on the suspended ceiling system for support.

B. Coordinate related Work to ensure completion prior to installation of clips or fasteners.

C. Compare layouts with construction conditions. Tile shall be spaced symmetrically about the centerlines of the room or space and shall start with a tile or joint line as required to avoid narrow tiles at the finish edges unless indicated otherwise. Joints shall be tight with joint lines straight and aligned with the walls. Ceiling moldings shall be provided where tile abuts wall with matching caulking to eliminate any space.

3.02 INSTALLATION OF SUSPENSION SYSTEMS

A. General:

1. Install suspension system in accordance with ASTM C636 and ASTM E580.

2. System shall be complete; with joints neatly and tightly joined and securely fastened; suspension members shall be installed in a true, flat, level plane.

3. Hanger Wires: 0.106 inch diameter minimum; larger sizes as indicated or required.

a. Fasten wires to panel points and structure above per most stringent requirements of fabricator and CBC and as indicated on Drawings.

b. Wires exceeding 1:6 out-of-plumb shall be braced with counter-sloping wires.

c. Maintain wires at least 6 inches from non-braced ducts, pipes, conduits, and other items.

d. Install wire along main runners at 4 feet on center. Terminal ends of each main runner and cross tee must be supported within 8 inches of each wall with a perimeter wire or within one-fourth (1/4) of the length of the end tee, whichever is least, for the perimeter of the ceiling area.

e. Where obstructions prevent direct suspension, provide trapezes or equivalent devices; 1 ½-inch minimum cold rolled channels back to back may be installed for spans to 6 feet maximum.

f. Wire shall be straight, without extraneous kinks or bend. Hanger wire connections must be capable of carrying a 200 - pound pull without stretching or shifting the suspension clip.

4. Bracing Wires to Resist Seismic Forces: 0.106 inch diameter minimum, larger sizes as indicated or required.

a. System for Bracing Ceilings: Lay-In Ceiling Systems: Install one four-wire set of sway-bracing wires and a vertical strut for each 144 square feet maximum of ceiling area. Locate wire-sets and struts at 12 feet maximum on center. At ceiling perimeters, wire-sets shall be installed within 6 feet of walls.

b. Install four-wire sets and struts within 2 inches of cross-runner intersection with main runner; space wires 90 degrees from each other.

c. Do not install sway bracing wires at an angle greater than 45 degrees with the ceiling plane.

d. Wires shall be tight, without causing ceiling to lift.

e. Fasten struts in accordance with CBC requirements.

f. Maintain wires at least 6 inches from non-braced ducts, pipes, conduit, and other items.

5. Provide additional wires, 0.106-inch diameter minimum, necessary to properly support suspension at electrical devices, air distribution devices, vertical soffits, and other concentrated loads.

6. Suspension:

a. Suspension members shall be fastened to two adjacent walls per ASTM 580; but shall be at least 3/4 inches minimum clear of other walls.

b. Any suspension members not fastened to walls shall be interconnected to prevent spreading, near their free end, with a horizontal metal strut or stabilizer bar or 0.064-inch diameter taut tie wire.

c. Provide additional tees or sub-tees to frame openings for lights, air distribution devices, electrical devices, and other items penetrating through ceiling, which do not have an integral flange to support and conceal cut edges of acoustic panels. Provide cross bracing necessary to securely support any surface mounted fixtures or other items.

7. Attachment of Wires:

a. To Metal Deck or Steel Framing Members: Install as required by current code.

b. To Suspension Members: Insert through holes in members or supporting clips.

c. Wires shall be fastened with three tight turns minimum for hanger wires and four tight turns minimum bracing wires. Turns shall be made in a 1 ½-inch maximum distance.

B. Suspension System for 2-foot by 4-foot Lay-in Acoustical Ceilings:

1. Main Runners: Install main runners 48 inches apart; 0.106-inch diameter hanger wires space 48 inches on center maximum along runners, and within 8 inches of ends.

2. Install wall moldings with fasteners to studs. Install corner caps at molding intersections.

3. Cross-Tees: Install between main runners in a repetitive pattern of 2-foot spacings.

4. Sub-Tees: Install at edges of penetrations.

3.03 INSTALLATION OF ACOUSTICAL PANELS

A. Install panels into suspension system. Partial panels shall be neatly cut and fitted to suspension and around penetrations and/or obstructions. Duplicate tegular edges at partial panels; cuts to be straight. Repaint cut tiles to match color or as directed by manufacturer for mylar facing at visually exposed conditions or as required by the ARCHITECT.

B. Penetrations through the ceilings for sprinkler heads and other similar devices that are not integgrally tied to the celing system in the lateral direction shall have a 2 inch oversized ring, sleeve or adapter through the celing tile to allow freee movement of one inch in horizontal directions. Alternateively per ASTM E580, a flexible sprinkler hose fitting that can accommodate one inch of celing movement shall be permitted to be used in lieu of the oversized ring, sleeve or adapter.

3.04 AIR DISTRIBUTION DEVICES

A. Refer to and coordinate with Division 23 - HVAC.

B. Install air distribution grilles and other devices into suspension system. Install 4 taut wires, each 0.106-inch diameter minimum, to each device within 3 inches of device corners, to support their weight independent of the suspension system.

3.05 LIGHT FIXTURES

A. Refer to and coordinate with Division 26 - Electrical.

B. Fixtures weighing less than 56 pounds: Install fixtures into suspension systems and fasten earthquake clips to suspension members. Install minimum 2 slack safety wires, each 0.106-inch diameter minimum, to each fixture at diagonally opposite corners, to support their weight independent of the system.

C. Fixtures weighing 56 Pounds or more: Install fixtures into suspension system and fasten earthquake clips to suspension system members as required by the Drawings and/or code. Install not less than 4 taut 0.106-inch diameter wires capable of supporting four times the fixture load.

D. Support pendant-mounted light fixtures directly from the structure above with hanger wires or cables passing through each pendant hanger and capable of supporting two times the weight of the fixture. Brace the pendant-mounted light fixtures by either a bracing assembly at the ceiling penetration or below the ceiling to the walls, as indicated in the drawings.

3.06 CLEANING

A. General: After installation of acoustical material has been completed, clean surfaces of the material, removing any dirt or discolorations. Replace panels as required.

B. Acoustical Panels: Minor abraded spots and cut edges shall be touched up with the same paint as was used for factory applied finish of the lay-in panels.

C. Remove and replace work that can not be succesfully cleaned and repaired to eliminate evidence of damage.

3.07 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose off of the Project site.

3.08 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 12 6100 ***Addendum no. 1***

FIXED AUDIENCE SEATING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Auditorium Seating:

a. Fixed upholstered floor mounted chairs with self-rising seat mechanism.

b. Fixed upholstered floor mounted chairs with self-rising seat mechanism with folding tablet arms.

B. Related Requirements:

1. Division 01 - General Requirements.

2. Section 03 3000 - Cast-In-Place Concrete.

3. Division 09 – Finishes, flooring.

1.02 REFERENCES

A. ASTM International:

1. ASTM A36 – Standard Specification for Carbon Structural Steel.

2. ASTM A48 - Standard Specification for Gray Iron Castings.

3. ASTM A513 – Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.

4. ASTM A1001 – Standard Specification for High-Strength Steel Castings in Heavy Sections.

5. ASTM A1008 – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable.

6. ASTM B85 - Standard Specification for Aluminum-Alloy Die Castings.

7. ASTM D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

8. ASTM D3359 – Standards Test Methods for Rating Adhesion by Tape Test.

9. ASTM D3363 - Standards Test Method for Film Hardness by Pencil Test.

10. ASTM D4157 - Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method).

11. ASTM F851 - Standard Test Method for Self-Rising Seat Mechanisms.

B. American National Standards Institute (ANSI):

1. ANSI A208.2 – Medium Density Fiberboard (MDF) for Interior Applications.

2. ANSI/HPVA HP-1 – Standard for Hardwood and Decorative Plywood.

C. National Electrical Manufacturers Association (NEMA):

1. NEMA LD 3 - High Pressure Decorative Laminates.

D. State of California, Department of Consumer Affairs, Bureau of Household Goods and Services (BHGS):

1. Technical Bulletin - No. 116 Requirements, Test Procedures and Apparatus for Testing Flame Retardance of Upholstered Furniture.

2. Technical Bulletin - No. 117 Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture.

1.03 PROJECT REQUIREMENTS

A. Seating Layout: Design and install seating to conform with specified requirements in a manner that produces seating layout with standards spaced laterally in each row so that end standards are in alignment from first to last row, regardless of whether aisles converge or are of constant width, and so that sightlines are optimized.

B. The first rows of seating, as indicated on the Drawings, shall be provided entirely with not less than one hundred seats with folding tablet arms, with 10 per cent of these seats to accommodate left-handed individuals.

1.04 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings prepared from field measurements indicating layout of seating units, chair sizes, aisle widths, left- and right-hand tablet arms, row-lettering and chair-numbering scheme, electrical devices, anchorage, and accessories.

B. Product Data: Submit Product Data for each type of seating, tabletops and accessories.

C. Material Samples: Submit color charts and Sample materials indicating manufacturer's full color range of standard colors, finishes, patterns and texture available for each exposed material.

D. Certificates: Submit product certificates signed by manufacturer of seating, certifying that products comply with specified requirements.

E. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication.

1. Standard Seating: Provide mockup of two seats representing extremes of widths to be provided, one of the seats shall be an aisle unit.

2. Seating with Folding Tablet: Provide mockup of one seating showing end aisle condition.

3. Approved mockup may become part of the Work.

1.05 QUALITY ASSURANCE

A. Source Limitations:

1. Obtain each type of fixed seating required, including accessories and mounting components, from a single manufacturer.

2. Obtain fabric of a single dye lot for each color and pattern of fabric required except when yardage requirement exceeds maximum dye lot. Multiple dye lots shall be color matched for quality assurance.

B. Pre-installation Meetings: Conform to requirements of Section 01 3119 Project Meetings.

C. Coordination of Work:

1. Coordinate installation of electrical wiring with seating layout to ensure floor junction boxes for aisle lights are located inboard of aisle light standards and result in minimal exposure of electrical conduit.

2. Coordinate layout and installation of seating with HVAC contractor to ensure that vents are located in a manner that will not interfere with seating installation.

D. Fire Performance Characteristics of Upholstered Seating: Upholstered furniture shall be tested in accordance with the BHGS Technical Bulletins No. 116.

1. Fabric shall be Class 1 in accordance with State of California, BHGS Technical Bulletin No. 117.

2. Padding shall comply with the State of California BHGS Technical Bulletin 117.

E. Qualifications of Installer: A minimum of five years' experience installing and servicing auditorium, theater, and lecture room seating similar in kind, quality, and extent indicated.

F. Regulatory Requirements: CBC Chapter 11B Assembly Areas – Auditoriums, Assembly Halls, Theaters and related facilities – accessible seating for persons using wheelchairs and semi-ambulant persons.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver seating, tops, pedestals, modesty panels, and accessories in manufacturer's unopened cartons clearly labeled with manufacturer's name and contents.

B. Store seating and accessories in dry location protected from damage and soiling under environmental conditions acceptable to manufacturer.

C. Protect seating and accessories from damage.

1.07 PROJECT CONDITIONS

A. Do not deliver or install seating until space is free of lifts and/or scaffolding used by other trades which may interfere with installation and/or damage seating.

B. Environmental Conditions: Do not install seating and accessories until space is enclosed and weatherproof; wet work in space is complete and nominally dry; installation of finishes, including painting is complete; other units of Work above ceiling are complete; ambient temperature and humidity conditions shall be continuously maintained at values near those indicated for Substantial Completion.

1.08 WARRANTY

A. Provide a manufacturer's warranty covering the material and workmanship for the specified warranty period from date of Substantial Completion.

B. Warranty Periods:

1. Structural Components: five years.

2. Operating Mechanisms: five years.

3. Plastic, Wood and Painted Components: five years.

4. Upholstery Fabric: one year.

5. Electrical Components: one year.

1.09 MAINTENANCE

A. Extra Materials: Deliver to storage location indicated by the OAR. Provide the following:

1. Complete seat and back covers equal to five percent of the amount installed for each seat size.

2. Seat and back fabric cover equal to 5 percent of amount installed for each type and size of cushion.

3. Armrests equal to 5 percent of amount installed for each type of armrest.

4. Writing tablets equal to 5 percent of amount installed for each type of armrest.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Auditorium Seating:

1. Irwin Seating Co.:

a. Chairs Without Writing Tablet: Model 90.12.56.12 Citation.

b. Chairs With Writing Tablet: Model 90.12.86.4 Citation.

2. Hussey Seating Co.

3. Wenger/Series Seating.

4. Equal.

2.02 MATERIALS AND FINISHES

A. Steel shall meet requirements for ASTM A36 plates, shapes, and bars; ASTM A513 mechanical tubing; ASTM A1008 cold-rolled sheet; and ASTM A1011 hot-rolled sheet and strip.

B. Cast Iron shall meet requirements for ASTM A48, Class 25, gray iron castings free of blow holes and hot checks with parting lines ground smooth.

C. Cast Aluminum shall meet requirements for ASTM B85 aluminum-alloy die castings.

D. Prior to powder coating, metal and cast iron parts shall be treated with a three-stage non-acidic, cleaning process for superior finish adhesion. The hybrid thermosetting powder coat finish shall be applied by electrostatic means to a thickness of 2 - 5 mils. After coating, parts shall be oven baked to create a durable finish which meets the following criteria:

1. Cross Hatch Adhesion of 5B (No Loss) per ASTM D3359.

2. Pencil Hardness with a minimum rating of 2H per ASTM D3363.

3. Front impact of at least 80in-lbs when tested per ASTM D2794.

4. Color shall be chosen from manufacturer’s standard offering.

E. Medium-density fiberboard shall meet requirements for ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.

F. Concealed plywood shall meet requirements for HPVA HP-1 hardwood plywood.

G. Exposed plywood shall meet requirements for HPVA HP-1, Face Grade A, hardwood veneer core with color-matched hardwood-veneer faces, made with adhesive containing no urea formaldehyde.

H. Hardwood lumber and veneer faces shall be maple selected to be free of visible defects. Exposed wood shall be sanded smooth and stained to color selected with low-VOC water-based stain and topcoat to provide with a high-quality finish. Color to be chosen from manufacturer's standard offering.

I. Plastic Laminate shall meet requirements NEMA LD 3, Grade VGS for vertical surfaces and Grade HGS for horizontal surfaces. Color and pattern to be chosen from manufacturer's standard offering.

J. Upholstery fabric shall be 70% recycled polyester, 30% cotton Glen Arbor pattern by DesignTex. Fabric shall have an acrylic backing and a weight of 14.3 oz. per lineal yard and withstand 50,000 double rubs per ASTM D4157. Fabric shall meet flammability resistance outlined in the State of California, BHGS Technical Bulletin No. 117.

K. Upholstery padding shall be molded or slab polyurethane foam.

L. Molded Plastics:

1. Structural components shall be mar and dent resistant high-density glass-filled polypropylene with UV stabilizers.

2. Decorative components shall be mar and dent resistant high-density polyethylene (HDPE) with UV stabilizers.

3. Plastic components shall be chosen from manufacturer's standard offering.

2.03 FIXED AUDIENCE SEATING

A. Chair Support:

1. Chairs Without Tablets: Aisle and center standards shall be modern pedestal-design, Class 25 cast gray iron, one-piece standards. Standards shall be cast to maintain proper seat and back height and angle. Standards shall be cast with front and rear flanges for extra strength. Mounting points for seats shall be designed with a reinforced area to assure a solid fit and shall be furnished with a cored bolt hole to facilitate solid mounting through use of 5/16" x 1-3/4" hex bolts. Back attachment shall be arranged via two holes cast in the standard. Standards shall have integral cast lugs for mounting armrests. Standards shall be cast to be compatible with the floor incline to maintain proper seat and back height and angle. Cast standards shall be provided with mounting feet featuring 4 anchoring holes allowing a choice of two alternative 2-hole anchoring schemes.

2. Chairs With Tablets: Chair support columns shall be a formed 14-gauge (.0747") steel tube with an integral back wing plate. Column shall exhibit a 10° rearward incline to help conceal back attachment hardware. Column shall be welded to a 2-1/2-inch x 1-inch rectangular pillar that extends back toward the riser face. Pillar shall be fabricated from 14-gauge steel at an appropriate angle to provide

riser clearance for the chair as well as proper seat and back height. Brackets for seat attachment shall be 7-gauge (.1875") steel for superior strength, formed with an integral support buttress. Pillar shall be welded to a 1/4-inch steel attachment plate used to secure the chair to the riser face. All steel components shall be welded.

B. Aisle End Panels:

1. Chairs Without Tablets: Aisle end panels shall be rectangular shaped with rounded bottom corners, constructed of medium density fiberboard (MDF) and surfaced with plastic laminate specified and a lacquered edge to match the dominant color of the laminate. Panels shall be secured to a formed 14-gauge steel panel MIG welded to the support column.

2. Chairs With Tablets: Aisle end panels shall be keystone-shaped, constructed of medium density fiberboard (MDF) and surfaced with plastic laminate specified and a lacquered edge to match the dominant color of the laminate. Panels shall be provided with a seat bracket recess for precise location and support of the panel. Panel shall be secured to a 14-gauge formed steel bracket bolted to the top of the support column and directly to the support column with the use of a spacer. Panel bracket assembly shall be concealed behind a steel shroud attached with a tamper resistant screw.

C. Backs shall be rectangular shaped, padded and upholstered on their face, with a one-piece injection molded polymer rear panel. The foundation of the back component shall be provided by a 7/16-inch thick, 5-ply hardwood inner panel that shall also serve as the upholstery substrate. The face of the back shall be upholstered over a 2-inch thick polyurethane foam pad. The polyfoam pad shall be securely cemented to the plywood inner panel and upholstered with a one-piece cover securely fastened to the hardwood inner panel by means of upholstery staples to facilitate ease of re-upholstering. The rear designer panel shall be injection molded HDPE plastic, high impact-resistant, with textured outer surface, formed to enclose the edges of the inner upholstery panel at the top and both sides of the back, and shall be not less than 25-inches in length, extending down to the rear of the seat. There shall be no exposed screws above the armrests. Wings used for the attachment of the complete back assembly to the standards shall be not less than 14-gauge (.0747") steel. Wings shall be firmly secured to the inner panel through the use of threaded t-nuts fastened to the inner panel. Assembled chair shall have a nominal back height of 34-inches. The back assembly shall be certified through routine ISO testing to withstand a 250 lb. static load test applied approximately 16-inches above the seat assembly and a 100,000 cycle 40 lb. swing impact test.

D. Seats shall be padded and upholstered on their top surface with a structural, injection molded polypropylene seat foundation. Seats shall self-rise to a uniform position when unoccupied. The mechanism shall be certified through routine ISO testing to exceed 300,000 cycles per ASTM F851. In addition, the seat shall withstand as a 600 lb. static load test applied approximately 3” from the front edge of the seat assembly and a 50,000 cycles 125 lb. vertical drop impact test.

1. Seat foundation shall be engineered glass-filled, injection molded polypropylene, strengthened by deep internal ribs and gussets, completely enclosing the self-rising hinge mechanism. Bottom surface of the foundation shall be textured and feature a molded recess. Bolted attachment of the seat

assembly to the chair standard shall be concealed by an integral color-coordinated plastic cap to present a finished, refined appearance.

2. When unoccupied, the seat shall rise automatically to a 3/4 safety fold position, and upon a slight rearward pressure, shall achieve full-fold, allowing the patron additional passing room. The seat shall rotate on two, molded acetal shafts supported by nylon bearings with integral down-stops for additional strength. Seat-lift shall be accomplished by compression springs and self-lubricating plastic cams.

3. Base Structure for Cushion Assembly:

   a. Chairs Without Tablets: Shall be five serpentine springs locked to an engineered, glass-filled polypropylene frame. Serpentine springs shall be covered with 3-1/2-inch thick molded polyurethane foam. Cushion molded with an integral chafing barrier to protect the foam from the serpentine springs and a waterfall leading edge. Cushion assembly upholstered with a carefully tailored fabric cover secured around the perimeter of the cushion frame by means of a drawstring and staples and securely locked to the seat foundation, preventing unauthorized removal; but facilitating convenient access by trained maintenance personnel.

   b. Chairs With Tablets: Shall be an ergonomic contoured, rigid thermoplastic resin panel covered with a 3-inch thick molded polyurethane foam pad. Cushion assembly shall be upholstered with a tailored fabric cover secured around the perimeter of the thermoplastic resin panel by means of a drawstring and staples and securely locked to the seat foundation, preventing unauthorized removal; but facilitating convenient access by maintenance personnel.

E. Chair width shall match existing seats.

F. Back height and pitch shall be fixed as shown on seating layout drawings.

G. Armrests shall be solid hardwood. Armrests shall be attached without exposed fasteners through the use of two keyhole slots in the bottom which lock securely to dovetail lugs provided on aisle and center standards. Further, one security screw shall be utilized.

H. Tablet arm equipped standards shall be provided with an assembly, which provides a folding writing tablet to the chair. The main support structure for the assembly shall be a 16-gauge (.065") steel tube within a glass-filled polypropylene housing and attached to the support column with an integral ribbed post that binds into the steel support column and locked in place with tamper resistant hardware. The hinge mechanism for the writing tablet shall be molded glass-filled nylon capable of supporting 200 lbs and flex under load without permanent deflection. The mechanism for the tablet shall allow for approximately 5-inches of horizontal movement when placed in the in-use position and provide a one-motion, anti-panic folding action. Tablets shall store directly below the armrest assembly for convenient access. Writing tablets shall be 100 sq. inches constructed from 5/8-inch 11-ply hardwood plywood surfaced on both sides with high pressure plastic laminate and a lacquered edge to match the dominant color of the laminate. Tablet arm assembly shall be capped with a laminate surfaced solid wood armrest attached with concealed hardware.

I. Row-lettering and chair numbering shall be provided for identification of all chairs as shown on approved seating layout drawings. Number plates shall be 5/8-inch x 1-5/8-inch aluminum with a bronze finish and black sans serif numerals. The seat pans shall be recessed at the center of the front edge for the number plates and attached by two pop rivets. Letter plates shall be 5/8-inch x 1-5/8-inch with a bronze finish and black sans serif letters attached in recess of aisle standard armrest by two escutcheon pins. Attaching hardware shall have a finish compatible to plates.

J. Transfer Arm Accessible Seating: The aisle standard shall be equipped with an armrest capable of lifting to a position parallel with the chair back, opening sideways access to the seat. Aisle standards so equipped shall be provided with a label, displaying an easily recognizable accessibility symbol. Decorative requirements of aisle standards are waived for the accessible access standards.

K. Furnish extra materials from the same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

2.04 FABRICATION

A. Manufacture fabric-covered cushions with molded padding beneath fabric and with fabric covering free of welts, creases, stretch lines, and wrinkles. For each upholstered component, install pile and pattern run in a consistent direction.

B. Fabricate floor attachment plates to conform to floor slope, so that standards are plumb and chairs are maintained at same angular relationship to vertical throughout project.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to layout and installation examine floors, risers, and other adjacent work and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the work including, but not limited to, plumb of riser faces and concrete conditions

B. Examine locations of electrical connections.

C. Examine locations of HVAC supply ducts and diffusers.

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

3.02 INSTALLATION

A. Install seating in locations indicated and fastened securely to substrates according to manufacturer's written installation instructions.

B. Use installation methods and fasteners that produce fixed audience seating assemblies with individual chairs capable of supporting an evenly distributed 600-lb static load

applied 3-inches from front edge of the seat without failure or other conditions that might impair the chair's usefulness.

C. Install seating with chair end standards aligned from first to last row and with backs and seats varied in width and spacing to optimize sightlines.

D. Install riser-mounted attachments to maintain uniform chair heights above floor.

E. Install chairs in curved rows at a smooth radius.

F. Install seating so moving components operate smoothly and quietly.

G. Install wiring conductors and cables concealed in components of seating and accessible for servicing.

3.03 ADJUSTING AND CLEANUP

A. Verify that all seats are securely anchored to the floor.

B. Adjust chair backs so that they are properly aligned with each other.

C. Verify that moving components operate properly, smoothly and quietly.

D. Adjust self-rising seat mechanisms to ensure seats in each row are aligned when in upright position.

E. Repair minor abrasions and imperfections in painted finishes with a coating that matches factory applied finish.

F. Replace upholstery fabric damaged during installation.

G. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 26 0519

Addendum no. 1

LOW-VOLTAGE WIRES (600 VOLT AC)

PART 1 - GENERAL

1.01 SUMMARY

A. Provisions of Division 01 apply to this section.

B. Section Includes: Low-voltage wire, splices, terminations and installation.

1.02 SUBMITTALS

A. Provide in accordance with Division 01.

B. List of Materials: Submit a complete list of proposed materials.

C. Shop Drawings: Provide detailed and dimensioned Shop Drawings indicating kind, weight and thickness of materials, insulation type, resistivity, conductivity, impedance, and conductance. Drawings shall contain sufficient information to assemble and install equipment at the Project site without further instructions.

D. Prior to start of construction; provide letter from wiring and electrical cables manufacturer certifying that the products are qualified/ listed as low electromagnetic field products.

1.03 SUBSTITUTIONS

A. Deviations/Substitutions from these Requirements shall not be accepted without written approval from OWNER'S Design Standards Section and Maintenance and Operations Technical Unit. When deviating are proposed the following information shall be submitted:

1. Substitution request form stating reasons and benefits to OWNER.

2. OWNER'S approval shall be obtained for any equipment or materials substitutions.

3. Proposed substitutions requests shall provide proof of compliance with OWNER'S Requirements and applicable standards.

B. Submittals must comply with contract general provisions.

1.04 QUALITY ASSURANCE

A. Components and materials shall be listed and approved for the intended application by Underwriter's Laboratories (UL), or other Nationally Recognized Testing Laboratory (NRTL), and in compliance with applicable industry standards and codes.

B. Wiring installation shall be performed under the supervision of state certified Electricians. Contractor or Installer’s electricians shall be certified in accordance with Labor Code sections 3099, and 3099.2 and section 209.0 of the California Code of Regulations.

C. Contractor shall have adequate experience installing systems of similar size and complexity.

1. Qualifications of Installer: Minimum five years of experience installing products and systems of similar scope and complexity.

2. Installer shall have completed at least five projects of equivalent scope and complexity.

3. Contractor shall have completed and commissioned a minimum of five service agreements that provide similar support services to those needed for this project.

4. System startup and testing shall be performed under direct observation of the Project Inspector and OAR.

D. The Project Inspector will observe installation of feeder cables. Notify the Project Inspector not less than two working days in advance of the proposed time of feeder installation.

1.05 WARRANTY

A. Provide a 1-year labor warranty.

B. Provide material warranty of no less than 10 years.

C. Warranty period begins at substantial completion or project acceptance for beneficial occupancy.

D. CONTRACTOR shall warranty all products and materials. Multiple warranty sources is not acceptable.

PART 2 - PRODUCTS

2.01 WIRES

A. Pressure cable connectors shall be pre-insulated 3M Scotchlok, Ideal Wing Nut, O-Z/Gedney or equal.

B. Wires shall be single conductor type THHN or THWN insulated with polyvinyl chloride and covered with a protective sheath of nylon, rated at 600 volts. Wires may be operated at a maximum continuous conductor temperature in dry locations of 90 degrees C. and 75 degrees C. in wet locations. Wires and cables shall be listed by Underwriter's Laboratories (UL) Standard 83 for thermoplastic insulated wires and listed for installation in accordance with Article 310 of the California Electrical Code (CEC).

C. Conductors shall be solid copper for 12 AWG and smaller conductors, and stranded copper for 10 AWG and larger conductors.

D. Conductors shall be insulated with PVC and sheathed with nylon.

E. Wires shall be identified by surface markings indicating manufacturer's identification, conductor size and metal, voltage rating, UL symbol, type designations and optional rating. Indentations for lettering are not permitted.

F. Wires shall be tested in accordance with the Requirements of UL standard for types THWN and THHN.

G. Conductors shall be solid Class B or stranded Class C annealed uncoated copper in accordance with UL standards, or another Nationally Recognized Testing Laboratory (NRTL).

2.02 STANDARDS

A. THWN/THHN wires shall comply with the following standards:

1. UL 83 for thermoplastic insulated wires.

2. UL 1063 for machine tool wires and cables.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Wires shall not be installed until debris and moisture is removed from conduits, boxes, and cabinets. Wires stored at site shall be protected from physical damage until they are installed and walls are completed.

B. Wire-pulling compounds furnished as lubricants for installation of conductors in raceways shall be compounds approved and listed by UL, NRTL, or equal. Oil, grease, graphite, or similar substances are not permitted. Pulling of 2 AWG or larger conductors shall be performed with a cable pull machine. Any runs shorter than 50 feet are exempt. When pulling conductors, do not exceed manufacturer's recommended values

C. At outlets for light, power, and signal equipment, pigtail splices with 8-inch circuit conductor leads for connection to fixtures, equipment, and devices.

D. Pressure cable connectors, Yellow, Red, or Blue spring-loaded twist-on type, may be furnished in splicing number 8 AWG or smaller wires for wiring systems. Listed Push-in spring clamp wire connectors, Ideal In-Sure, or equal may be used in luminaires for fixture wiring.

E. Joints, splices, taps, and connections to switchboard neutral, bonding or grounding conductors, conductors to ground busses, and transformer connections for wires 6 gage and larger shall be performed with high-pressure cable connectors approved for installation with copper conductors. Connectors shall be insulated with heavy wall heat shrink WCSM, or cold-applied roll-on sleeve RVS. Insulation level shall be a minimum of 600V and joints, splices, and taps shall be qualified to ANSI C 119.1, UL, NRTL, or equal listed mechanical pressure connections.

F. Connections to any bussing and high-press cable connectors shall be securely bolted together with corrosion-resistant plated carbon steel, minimum grade five machine screws secured with constant pressure-type locking devices.

G. Connection of any bonding or grounding conductors shall be securely bolted together with corrosion-resistant plated carbon steel, minimum grade five machine screws secured with constant pressure-type locking devices.

H. Wire switchboards, panel cabinets, pull boxes, and other cabinets except public address, shall be neatly grouped and tied in bundles with nylon ties at 10-inch intervals. In switchboards, panels and terminal blocks, wires shall be fanned out to terminals. If bundles are longer than 24 inches, a maximum of nine current carrying conductors may be bundled together.

I. Install conductor lengths with a minimum length within the wiring space. Conductors must be long enough to reach the terminal location in a manner that avoids strain on the connecting lug.

J. Maintain the conductor required bending radius.

K. Neutral conductors larger than 6 gage, which are not color identified throughout their entire length, shall be taped, painted white or natural gray, or taped white where they appear in switchboards, cabinet, gutters or pull boxes. Neutral conductors 6 gage and smaller shall be white color identified throughout their entire length.

L. Fire alarm and clock wiring shall be continuous from terminal cabinets or from equipment to each device. Splices are not permitted between devices and/or terminal cabinets at junction and pull boxes. Wiring shall be terminated at terminal blocks or devices only.

M. Wiring systems shall be free from short circuits and grounds, other than required grounds. The contractor shall be responsible for the testing of feeder and branch circuit conductor's insulation resistance. The insulation of the conductors shall be tested prior to connections to any panelboards, switchboards, variable frequency drives, lighting control systems, ballasts, and wiring devices such as but not limited to GFI receptacles, TVSS receptacles, or equipment. Insulation testing of panelboards and switchboards shall be independently performed from the insulation testing of any conductors as specified in other sections of this specification.

1. Utilize the services of an approved independent testing laboratory to perform megger time-resistance insulation testing of feeder conductors. Tests must be conducted with wires disconnected at both ends.

   a. Provide calibration program records to assure the testing instrument to be within rated accuracy. The test equipment accuracy shall be in accord with the Requirements stated by the National Institute of Standards and Technology (NIST).

   b. Test equipment shall be provided with a label stating the date of last calibration. As a minimum the equipment shall have been calibrated within the past 12 months.

   c. Test reports shall include the following:

      1) Identification of the testing organization.
      2) Equipment identification.
      3) Ambient conditions.
      4) Identification of the testing technician.
      5) Summary of project.
      6) Description of equipment being tested.
      7) Description of tests.
      8) Test results.
      9) Analysis, interpretation and recommendations.

2. Utilize the services of an approved independent testing laboratory or a qualified Contractor's employee (Technician certified in accordance with ANSI/NETA ETT-2000 Standard for Certification of Electrical Testing Personnel) to perform megger time-resistance insulation testing of branch circuit conductors. Tests must be conducted with wires disconnected at both ends.

a. Test equipment and report Requirements stipulated under paragraph 3.01.N.1 apply to branch circuit testing.

3. Tests shall be performed in the presence of the Project Inspector.

4. Insulation resistance shall not be less than 100 mega-ohms.

3.02 COLOR CODES

A. General Wiring:

1. For phase and neutral conductors 6 gage or larger, permanent plastic-colored tape may be furnished to mark conductor end instead of coded insulation. Tape shall cover not less than 2 inches of conductor insulation within enclosure.

2. Color code conductor insulation as follows:

	SYSTEM VOLTAGE	
Conductor	208Y/120	480Y/277
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Natural Gray

Neutrals shall be colored-distinguished if circuits of two voltage systems are used in the same raceway.

3. Where two voltage systems are combined in an enclosure; CONTRACTOR shall apply a permanent color code label where the circuits originate.

B. Signal Systems: Wires for signal systems shall be color-coded and installed under observation of the Project Inspector. Except where otherwise specified, color-coding shall be as follows:

SYSTEM	COLOR CODE
Clocks	Pink, Gray and Orange
Program Bells (some existing elementary schools)	White (Common)Black
Initiating Devices (Non-Addressable)	Red (+) and Black (-)
Program Bells (some existing secondary schools)	White (120 volt, common) Black (C.R. program) Blue (Shop program) Brown (Gym program) Yellow (Auditorium fire alarm)
Fire Alarm Horns	Pink (+) and Gray (-)
Fire Alarm Strobes	Orange (+) and Blue (-)
Un-Interruptible 24 Volt Power (Annunciator, Water Flow, and	Yellow (+) and White (-) Note: A single white wire may be common to both

Audible Device)	
Interruptible 24 Volt Power (4 wire smoke detectors, duct detectors)	Brown (+) and White (-) Note: A single white wire may be common to both
Switch-Leg Sprinkler Bell (Between water flow and audible device)	Violet (+) and White (-)
Door Holding Magnets (Non Power Limited)	Black (+) and White (-)

3.03 FEEDER IDENTIFICATION

A. Feeder wires and cables shall be identified at each point the conduit run is broken by a cabinet, box, gutter, etc. Where terminal ends are available, identification shall be by means of heat shrink wire markers, which provide terminal strain relief. Markers shall be by Tyco Electronics, Panduit, Brady Perma-Sleeve, or equal. Identification in other areas shall be by means of wrap-around tape markers from Tyco Electronics, Panduit, Brady Perma-Code or equal. Markers shall include feeder designation, size, and description.

3.04 TAPE AND SPLICE KITS

A. Splices, joints, and connectors joining conductors in dry and wet locations shall be covered with insulation equivalent to that provided on conductors. Free ends of conductors connected to energized sources shall be taped. Voids in irregular connectors shall be filled with insulating compound before taping. Thermoplastic insulation tape approved by UL, NRTL, or equal for installation as sole insulation of splices shall be furnished and shall be installed according to manufacturer's printed specifications.

3.05 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.06 CLEANUP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 26 0526

Addendum no. 1

GROUNDING AND BONDING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide and install an effective grounding and bonding system.

B. Related Requirements:

1. Refer to related sections for their System Grounding Requirements.

2. Division 01 - General Requirements.

3. Division 26 – Electrical.

4. Division 27 – Communications.

5. Division 28 - Electronic Safety and Security.

1.02 QUALITY ASSURANCE

A. Reference Standards:

1. IEEE 142 Green Book.

2. Underwriter's Laboratories (UL).

3. California Electrical Code.

4. Building Industry Consultant Services International (BICSI).

5. EIA/TIA (Signal and power).

6. Nationally Recognized Testing Laboratory (NRTL).

1.03 SYSTEM DESCRIPTION

A. Equipment, components, or materials that enclose electrical conductors, or are likely to be energized by electrical currents shall be effectively grounded.

B. Metal equipment parts such as switchboards, panelboards, metal enclosures, raceways, equipment grounding conductors, and earth grounding electrodes shall be effectively bonded into a continuous grounding path.

C. Metallic systems or electrically conductive materials shall be effectively bonded to the building's grounding electrode system.

D. A separately derived AC system shall be grounded to the equipment grounding conductor and to a separate "made" electrode of building grounding electrode system.

E. Provide effective electrical equipment bond continuity to all metal raceways and enclosures. Grounding shall be achieved through a code sized green insulated grounding conductor provided within each raceway.

1. Each flexible conduit over 6-feet in length shall be provided with a green insulated grounding conductor of required size.

2. Provide code sized equipment grounding conductor in all flexible conduits as required by CEC.

3. The length of flexible conduit installations shall not be less than six feet.

4. Effectively ground metal raceways and enclosures at each end.

F. Cold water, or other utility piping systems, shall not be utilized as grounding electrodes. In addition to bonding to cold water pipe provide at least one of the following made grounding electrodes:

1. Provide a dedicated "made" electrode for new buildings and existing facilities service upgrades. The made electrode shall be fabricated of at least 20 feet of uncoated galvanized 1/2 inch diameter rebar encased by at least two inches of concrete, and placed next to the bottom of a concrete foundation, or footing in direct contact with earth A welded extended portion shall surface at the location of the common grounding electrode bus bar and be extended by a 3/0 exothermic welded bare copper cable, or be welded directly to the bus. The exothermic weld shall be at least four inches above finished floor in a dry location. The main grounding electrode and associated grounding conductors shall be in an enclosure and in conduit.

2. The concrete enclosed electrode shall be fabricated of at least 20 feet of code sized bare copper conductor. The electrode conductor shall never be smaller than No. 2 AWG. Electrode shall be encased by at least two inches of concrete, located within or near bottom of a concrete foundation, or footing in direct contact with earth. Footing rebar shall be connected to electrode conductor with approved connectors.

3. An external grounding electrode, as specified hereafter or as required by the CEC shall be installed and connected to foundation or footing rebar.

G. Non-current carrying metal parts of equipment enclosures, signal and power conduits, switchboard and panelboard enclosures, motor frames, equipment cabinets, and metal

frames of buildings shall be permanently and effectively bonded to the grounding system. Provide a CEC sized equipment grounding conductor in every raceway.

H. Metallic or semi-conducting shields and lead sheaths of cables operating above 1000 Volts shall be permanently and effectively grounded at each splice and termination.

I. Neutral of service conductors shall be grounded as follows:

1. Neutral shall be solidly grounded at only one point within the Project site for that particular service. Preferable location of grounding point shall be at the service switchboard, or main switch.

2. Equipment and conduit grounding conductors shall be bonded to that grounding point.

3. If other buildings or structures on the Project site are served from a switchboard or panelboard in another building, power supply is classified as a feeder and not as a service.

4. Equipment grounding conductor shall be installed from switchboard to each individual building. At building, grounding conductor shall be bonded with power equipment enclosures, metal frames of building, etc., to "made" electrode for that building.

5. Feeder neutrals shall be bonded at service entrance point only; neutrals of separately derived systems shall be bonded at the source only.

J. If there is a distribution transformer at a building the secondary neutral conductor shall be grounded to "made" electrode serving the building.

K. Within every building, the main switchboard or panelboard, shall be bonded to the cold-water line. Metallic piping systems such as gas, fire sprinkler, or other systems shall be bonded to the cold-water line.

1.04 SUBMITTALS

A. Provide in accordance with Division 01.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Furnished yard boxes shall be precast concrete and shall be approximately 14 inches wide by 19 inches long by 12 inches deep or larger.

1. Boxes shall be furnished with bolt-down, checkered, cast iron covers and cast-iron frames cast into the yard boxes.

2. Yard boxes shall comply with LAUSD standard detail E-102.

3. Provide yard boxes with hinged Frame Locking Cover.

4. Approved products include Brooks No. 36 HFL, Jensen Precast, Oldcastle Precast, Western Precast, Kistner, or equal.

B. External ground electrodes shall be copper-clad steel ground rods, minimum 3/4-inch diameter by ten feet long.

C. Clamps and fittings used in ground boxes below grade shall be listed for direct burial.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Grounding electrodes shall be installed in the nearest suitable planting area, where not otherwise indicated on Drawings, and each electrode shall terminate within a concrete yard box installed flush with finish grade. In planting areas, finish elevation of concrete yard boxes shall be two inches above planting surfaces.

B. If concrete enclosed electrode is provided, grounding wire shall be terminated to a suitable copper plate with grounding lugs and must be enclosed in a raceway or box.

C. Grounding rods shall be driven to a depth of not less than eight feet. Permanent ground enhancement material, (GEM) as manufactured by Erico Electrical Products, Loresco Powerset, Tessco Ultrafil or equal, shall be installed at each ground rod to improve grounding effectiveness. Install in accordance with manufacture's installation instructions.

D. Grounding electrodes shall provide a resistance to ground of not more than 25 ohms.

E. When installing grounding rods, if resistance to ground exceeds 25 ohms, two or more rods connected in parallel, or coupled together shall be provided to meet CEC grounding resistance Requirements.

F. Ground rods shall be separated from one another by not less than ten feet.

G. Parallel grounding rods shall be bonded together with listed fittings and grounding conductors in galvanized rigid steel conduit, buried not less than 12 inches below finish grade.

3.02 TESTING

A. Provide the services of an approved independent testing laboratory to test grounding resistance of “made” electrodes, ground rods, bonding of building steel, water pipes, gas pipes and other utility piping. Tests shall be performed as follows:

1. Visually and mechanically examine ground system connections for completeness and adequacy.

2. Perform fall of potential tests on each ground rod or ground electrode where suitable locations are available per IEEE Standard No. 81, Section 8.2.1.2. Where suitable locations are not available, measurements will be referenced to a known dead earth or reference ground.

3. Perform the two-point method test per IEEE No. 81, Section 8.2.1.1 to determine ground resistance between ground rod and building steel, and utility piping - such as water, gas and panelboard grounds. Metal hand railings at building entrances and at handicapped ramps shall also be tested.

4. Test shall be performed in the presence of the Inspector.

B. Submit three copies of test results to the Architect. Test results shall be submitted on an official form from the independent testing laboratory recording Project location, Test Engineer, test conditions, test equipment data, ground system layout or diagram, and final test results.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.04 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

Addendum no. 1

SECTION 26 0533

RACEWAYS, BOXES, FITTINGS, AND SUPPORTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Raceways and wire ways.
2. Conduit installation.
3. Underground requirements.

B. Related Requirements:

1. Section 26 0500: Common Work Results for Electrical.
2. Section 26 0513: Basic Electrical Materials and Methods.
3. Division 27: Communications.
4. Division 28 - Electronic Safety and Security.

C. Applicable Standards and Codes.

1. EIA/TIA 569 Standards.
2. National American Standards Institute (ANSI).
3. National Electrical Manufacturer’s Association (NEMA).
4. Nationally Recognized Testing Laboratory (NRTL).
5. California Electrical Code (CEC).
6. Uniform Building Code (UBC).
7. Underwriters Laboratory (UL).

1.02 SUBMITTALS

A. Materials List: Provide in accordance with Division 01.

PART 2 - PRODUCTS

2.01 RACEWAYS

A. Conduit Materials:

1. Metallic conduit, and tubing shall be manufactured under the supervision of an UL, or another NRTL factory inspection and label service program. Each ten-foot length of conduit and tubing shall bear the UL or another NRTL label and manufacturer's name.

2. Rigid metallic conduit shall be rigid steel, heavy wall, mild steel, zinc-coated, with an inside and outside protective coating manufactured in accordance with ANSI C 80.1. Couplings, elbows, bends, conduits, bushings and other fittings shall be the same materials and finish as the rigid metallic conduit. Fittings, connectors, and couplings shall be threaded type, manufactured in accordance with ANSI C 80.1 and UL 6.

3. Electrical metallic tubing shall be steel tubing, zinc-coated with a protective enamel coating inside, manufactured in accordance with NEMA C 80.3. Fittings, couplings, and connectors shall be gland compression type, set screw couplings and connectors not permitted. All parts shall be manufactured in accordance with NEMA C80.3 and UL 6A Electrical metallic tubing is designated hereinafter as EMT. Steel and rain tight fittings shall be approved and listed for the intended application.

4. Flexible steel conduit shall be of flexible interlocking strip construction with continuous zinc coating on strips, manufactured in accordance with UL 1.

   a. Connectors and couplings shall be required fittings of the type, which threads into convolutions of flexible conduit.

5. Liquid-tight flexible metal conduit shall be galvanized heavy wall, flexible locked steel strip construction, UV rated, with smooth moisture and oil-proof, abrasion-resistant, extruded plastic jacket. Connectors shall be as required for installation with liquid-tight flexible conduit and shall be installed to provide a liquid-tight connection.

6. Non-metallic conduit shall be rigid PVC electrical conduit extruded to schedule 40 dimensions of Type II. Grade 1 high impact, polyvinyl chloride, sweeps, couplings, reducers and terminating fittings shall be listed under the UL, or another NRTL, and shall bear the manufacturer's listed marking.

7. Multi-cell raceway shall be four inch PVC, Type 40, UL or another NRTL listed for underground use with optical fiber and signal system cables. Raceway shall be furnished with 3-1/2 inch factory installed inner ducts with required internal spacers, and required couplers, sweeps, and end bells. Multicell raceway shall be Carlon Multigard, or District approved equal.

8. Metal Clad (MC) cable system is not allowed.

B. Sleeves for Conduits: Sleeves shall be adjustable type by Carlon, U.S. Plastic, PEP Plastic or equal.

C. Where conduit enters a building through a concrete foundation below grade, or ground water level, or where it is necessary to seal around a conduit where it passes through a concrete floor or wall, provide O-Z/Gedney Type FSK Thru Wall and Floor Seal, equivalent Cooper Crouse Hinds Thru-Wall, Legrand Thru-Wall, or equal.

D. Expansion Joints-Seismic Separations between building(s) and other locations as indicated on drawings:

1. Provide Thomas & Betts XJG-TB, O-Z/Gedney. type AX with bonding strap and clamps, Cooper XJGD or equal. At exterior locations, provide Thomas & Betts XJG-TB, O-Z/Gedney type EX, Cooper XJGD, or equal. Provide O-Z/Gedney type AXDX, or equal combination deflection/expansion fittings at all seismic separations. Provide manufacture's internal and external bonding jumpers at all locations. Liquid-tight metal conduit or flexible metal conduit shall not be approved at expansion joints, separations between buildings or seismic separations.

2. Provide expansion fittings at intervals not exceeding 100 feet in conduits exposed to direct sunlight. Fittings may be installed in the conduit run or where conduit attaches to junction or pull boxes. OZ/Gedney type AX, TX or EXE series, or equivalent by Thomas and Betts, Crouse-Hinds or approved equal.

E. Conduit Seal Fittings:

1. Provide conduit seal fittings where indicated on the Drawings. Conduit seals shall be of rigid galvanized steel. Seals in horizontal conduit installations shall be Thomas & Betts EYS, Appleton Type ESU, Crouse Hinds Type EYS, or equal. Seals in vertical conduit installations shall be Thomas & Betts EYD, Appleton Type SF, Crouse Hinds Type EYD, or equal, with continuous drain. When installing conduit seals make provision for percent fill space reduction in accordance with CEC.

2. Install sealing compound after wire has been installed. Ensure drain is not blocked in vertical seals when installing compound. Where conduit seals are installed in hazardous area applications, there shall be no conduit coupling, fitting, etc., between seal and boundary of hazardous area.

F. Surface Steel Raceway:

1. The surface steel raceway system for branch circuit wiring, data network, voice, video, and other low voltage wiring shall be as manufactured by the Wiremold Company, Hubbell, or Mono-Systems, Inc. or equal. The raceway system may be supplied pre-wired in accordance with all sections of these specifications and requirements herein, and shall be UL or another NRTL listed. Computer data installation shall be as required by other sections of this Division.

a. If furnished pre-wired, the system must be listed in accordance with UL or another NRTL for "Multiple Outlet Assemblies" and so labeled on interior of the assembly. The pre-wired installation must contain no extra wire splices in the raceway as compared to a contractor assembled installation assembled from components. The pre-wired steel raceway shall be Hi-Pot tested at the factory to prevent any potential bare wire or shot circuit defects.

2. The raceway base, cover, and device bracket shall be manufactured of steel and finished in ivory, gray enamel or custom colors suitable for field painting to match adjacent finishes.

3. The raceway shall be a two-piece design with a metal base and snap-on metal cover, except for the Wiremold V700 system, Hubbell HBL750 series and Mono-Systems Inc. S145-700 series that shall be a one-piece design. The base and cover sections shall be a minimum of 0.040 inch wall thickness. The base section shall be available in ten-foot lengths. A hand-operated cutting tool shall be available for the base and cover to ensure clean, square cuts. Wiremold V500, Hubbell V500, and Mono Systems inc. SM500 series are not permitted.

4. A full complement of fittings shall be furnished, including but not limited to, flat internal and external elbows, tees, entrance fittings, wire clips, cover clips, couplings, support clips, C-hangers and end caps. The fitting color shall match the raceway color. Fittings shall be supplied with a base where indicated and/or required. A take-off fitting shall be furnished as required to adapt to existing flush wall boxes.

5. Device brackets shall be furnished for mounting single or two-gang devices within the raceway. Devices shall be provided with the ability of mounting flush or in conjunction with standard steel, stainless steel, or manufacturer's metal faceplates.

6. The raceway shall be furnished with a complete line of connectivity outlets and modular inserts for unshielded twisted pair including category 5, fiber-optic, coaxial, and other cabling types with face plates and bezels to facilitate installation. Computer data installation shall be as required by other sections of this Division, and Division 27.

7. Raceway shall be furnished with corner elbows and tee fittings to maintain a cable bend radius which meets the requirements of fiber-optic and copper cables under EIA/TIA 569 for communications pathways.

G. Factory Pre-Wired Surface Metal Raceway:

1. Furnish and install pre-wired surface metal raceways as indicated on Drawings and as specified.

2. Metal Raceway shall be galvanized steel Wiremold V4000, Hubbell 4000 series, or Mono-Systems Inc. SMS-4000 series complete with raceway base, cover, fittings, receptacles and mounting plates required for a complete assembly. Raceway shall have two wiring compartments with integral dividing barrier for isolating the wiring compartments.

3. Pre-wired assembly shall be UL, or another NRTL listed as a multi-outlet assembly and surface raceway as labeled on interior of assembly.

4. Wiring devices and other components shall be factory installed, electrically wired and covers labeled as indicated on drawings. Each receptacle shall be identified with panelboard and circuit number from which it was fed.

Grounding shall be maintained by means of factory installed grounding conductors.

5. Where shown on Drawings, Raceway covers shall have provisions for mounting computer data outlets.
6. Complete assembly is to consist of required fittings such as elbows, slide couplings for joining raceway sections, blank end caps and flat tees.
7. Prewired assembly must contain no wire splices.
8. Receptacles and wiring shall be as indicated on drawings and as specified.
9. Where raceway is used for power and computer data outlets, installation of data outlets shall be as required by other sections of this specification.
10. Prior and during installation, verify and comply with manufacturer's installation instructions.
11. Entire assembly shall be tested for shorts, opens, ground faults, and wire insulation at factory and certified. Raceways shall be electrically continuous and bonded in accordance with California Electrical Code.
12. Submit shop drawings for approval showing the complete layout of all components of each raceway, raceway lengths, each component description, location and circuit identification.
13. All wiring devices shall be removable without requiring disassembly of wireway.
14. Standard non OEM wiring devices shall be used as specified in District's specifications.

H. Wireways shall be 16 gage galvanized steel enclosed hinge/screw wiring troughs, surface metal raceway, wireway, and auxiliary gutter designed to enclose electrical wiring. Wireway fittings shall be furnished with removable covers and sides to permit complete installation of conductors throughout the entire wireway run. Cover shall be furnished with keyhole slots to accept captive screws locking the cover securely closed. Wireways shall be UL or another NRTL listed, and shall be Square D Type LDB NEMA-1 enclosure for interior applications, or Type RDB NEMA-3R enclosure for exterior applications, or equal by Cooper B-line, Hoffman, Wire Guard, or Circle AW.

I. Penetration in Fire-Rated Structures: Provide 3M, or equal, sealant and fire barriers for installing fire-rated seals around penetrations through floors, walls, and elevator hoistways. Fire stop system must be UL, or another NRTL listed, and classified for through-penetration applications of metallic conduits and busways.

J. Pull Wires: Install 1/8 inch polypropylene cords in empty or spare conduits.

PART 3 - EXECUTION

3.01 CONDUIT INSTALLATION

A. General Requirements:

1. Provide complete and continuous systems of rigid metallic conduit, outlet boxes, junction boxes, fittings and cabinets for systems of electrical wiring including lighting, power, and signal systems, except as otherwise specified.

2. EMT may be installed in interior concealed applications and in areas approved by owner. EMT shall not be installed in concrete, directly buried underground, outdoors, in boiler rooms, elevator pits, or where subject to damage.

3. Within buildings, flexible steel conduit may be installed instead of rigid steel conduit where permitted by code. Flexible steel conduit shall be installed:

   a. For continuous lengths not exceeding more than 50 feet between pull points (pull boxes, outlet boxes, etcetera).

   b. With no maximum total raceway length located within a building interior when the flex is located in concealed locations.

4. Flexible Steel conduit shall not exceed 1-1/2 inches in size.

5. Liquid-tight flexible steel conduit shall only be installed, except where otherwise specified, for final connection of motor terminal boxes, shop equipment, cafeteria equipment, HVAC equipment and other equipment, or for frequent interchange, and shall be of sufficient length, not exceeding 36 inches, to permit full travel or adjustment of motor on its base. Liquid-tight flexible conduit shall not be used for equipment not requiring adjustment or frequent interchange.

6. Connectors for flexible metal conduit shall be made of steel, and of the types which threads into convolutions of conduit. Connectors for watertight flexible metal conduit shall be as required for installation and shall be installed to provide a watertight connection.

7. Exposed conduit shall be installed vertically and horizontally following the general configuration of the equipment, using cast threaded hub conduit fittings where required and shall be clamped to equipment with suitable iron brackets and one hole pipe strap.

8. If connection is from a flush wall-mounted junction box, install an approved extension box.

9. Underground feeder distribution conduits for systems may be non-metallic conduit instead of rigid conduit except where otherwise specified or indicated.

10. Conduit shall be concealed unless otherwise indicated. Conduits exposed to view, except those in attic spaces and under buildings, shall be installed parallel or at right angles to structural members, walls, or lines of building. Conduits shall be installed to clear access openings.

11. Bends or offsets will not be permitted unless absolutely necessary. Radius of each conduit bend or offset shall be as required by ordinance. Bends and offsets shall be performed with standard industry tools and equipment or may be factory fabricated bends or elbows complying with requirements for radius of bend specified. Heating of metallic conduit to facilitate bending is not permitted. Public telephone conduit bends and offsets shall be provided with a radius which is not less than ten times trade size of conduit unless otherwise permitted. Refer to underground installation, specified in this section, for radius of bends and offsets required for underground installations.

12. Running threads are not permitted. Provide conduit unions where union joints are necessary. Conduit shall be maintained at least six inches from covering of hot water and steam pipes and 18 inches from flues and breechings. Open ends of conduits shall be sealed with permitted conduit seals during construction of buildings and during installation of underground systems.

13. Expansion Joints/Seismic Separations/Separations between buildings/Locations Indicated: Provide Thomas & Betts XJG-TB, O-Z Electrical Mfg. Co. Inc. Type AX with bonding strap and clamps. Crouse Hinds XJGD, or equal. At exterior locations, provide Thomas & Betts XJG-TB, O-Z Electrical Mfg. Co. Inc. Type EX, Crouse Hinds XJGD, or equal. Provide Crouse Hinds, Thomas & Betts, or O-Z Electrical Mfg. Co. Type AXDX, or equal Combination Deflection/Expansion Fittings at all seismic separations. Provide manufactures internal and external Bonding Jumpers at all locations. Liquid-tight flexible conduit shall not be approved at expansion joints or seismic separations.

14. Where conduits are terminated in groups at panelboards, switchboards, and signal cabinets, etc., provide templates or spacers to fasten conduits in proper position and to preserve alignment. Conduits terminating at signal cabinets shall only enter cabinets in the following locations:

    a. Conduits entering top, side, and bottom of cabinets shall be aligned in a single row, centered two inches from rear of cabinet.

    b. Conduits entering back of cabinet shall be aligned in a single row centered two inches from top of cabinet.

    c. Conduits shall not be spaced closer than three inches on centers.

15. Conduits above metal lath ceilings shall be rigidly suspended with pipe hangers or pipe racks or shall be secured to superstructure with factory fabricated pipe straps. Conduits in metal lath or steel stud partitions shall be tied to furring channels or studs. In ceiling spaces and in partitions, tie wires shall be spaced not more than 5 feet apart, shall fasten conduit tight against channels and studs at point of tie and shall not support any of conduit weight. Tie wire shall be 16 gage galvanized double annealed steel.

16. Where auxiliary supports, saddles, brackets, etc., are required to meet special conditions, they shall be fastened rigid and secure before conduit is attached.

17. Conduit in ceiling spaces, stud walls, and under floors, shall be supported with factory fabricated pipe straps or shall be suspended with pipe hangers or pipe

racks. Pipe straps shall be attached to and shall fasten conduit tight at point of support against ceiling and floor joists, rafters, and wall studs, or two-inch x four-inch headers fitted between joists or wall studs.

18. Conduits installed on exposed steel trusses and rafters shall be fastened with factory fabricated conduit straps or clamps, which shall fasten conduit tight against supporting member at point of support.

19. Conduits installed under buildings shall be strapped with factory fabricated conduit straps to underside of concrete floor or joists, or wood floor joists, or shall be suspended with pipe hangers or pipe racks. Conduits under building are not permitted to be placed directly on grade; they shall be suspended from building or shall be buried below surface or ground. 1-1/4 inch and larger conduits under buildings shall be installed with conduit hangers or racks.

20. Pipe hangers for individual conduits shall be factory fabricated. Steel rods shall be 3/8 inch for two-inch conduit hangers and smaller and shall be 1/2 inch for 2 ½-inch conduit hangers and larger.

21. Pipe racks for groups of parallel conduits and for supporting total weights not exceeding 500 pounds shall be trapeze type and shall consist of a cross channel, Steel City Kindorf B-900, Unistrut P-1000, equivalent Cooper B-Line or equal, suspended with a 3/8 inch minimum diameter steel rod at each end. Rods shall be fastened with nuts, top and bottom to cross-channel and with square washers on top of channel. Conduits shall be clamped to top for cross-channel with conduit clamps, Steel City Kindorf C-105 or Unistrut P-1111 through P-1124, equivalent Cooper B-Line, or equal. Conduits shall not be stacked one on top of another, but a maximum of two tiers may be on same rack providing an additional cross-channel is installed. Where a pipe rack is to be longer than 24 inches, or if the supported weight exceeds 500 pounds, submit Shop Drawings of installation to the Architect for review.

22. Conduits suspended on rods more than two feet long shall be rigidly braced to prevent horizontal motion or swaying. Installation shall meet zone 4 seismic requirements.

23. Factory fabricated pipe straps shall be one or two-hole formed galvanized clamps, heavy-duty type, except where otherwise specified.

24. Hangers, straps, rods, or pipe supports under concrete shall be attached to inserts set at time concrete is placed, or with approved concrete anchors. Under wood, install bolts, lag bolts, or lag screws; under steel joists or trusses, install beam clamps. Contractor shall submit size of anchors, bolts, screws, and installation method to Architect for approval prior to start of any work.

25. Conduits shall be supported at intervals required by code, but not to exceed ten feet. One inch and smaller exposed conduits shall be fastened with one-hole malleable iron straps. Perforated straps and plumber's tape is not permitted for the support of conduits.

26. Conduits stubbed up through a roof or an arcade shall be flashed with a waterproof flashing. Refer to Division 07 for additional requirements.

27. Bushings and locknuts for rigid steel conduit shall be steel threaded insulating type. Setscrew bushings are not permitted.

28. Flex conduits shall be cut square and not at an angle.

29. Routing of conduits may be changed providing length of any conduit run is not increased more than ten percent of the length indicated on Drawings.

B. Underground Requirements:

1. Conduits and multicell raceways installed underground shall be entirely encased in three inch thick concrete on all sides , except where otherwise specified. Provide required spacers to prevent any deflection when concrete is placed and to preserve position and alignment. Conduits and raceways shall be tied to spacers. Anchors shall be installed to prevent floating of conduits and raceways during placing of concrete. Provide red colored concrete to encase conduits of systems operating above 600 volts.

2. Underground conduits and raceways shall be buried to a depth of not less than 24 inches below finished grade to top of the concrete envelope, unless otherwise specified.

3. Assemble sections of conduit with required fittings. Cut ends of conduit shall be reamed to remove rough edges. Joints in conduits shall be provided liquid-tight. Bends at risers shall be completely below surface where possible.

4. Conduits and raceways in a common trench shall be separated by at least three inches of concrete. Electrical power and/or lighting conduit runs installed in a common trench with conduits containing signal system wiring such as public address, telephone, intrusion detection, fire alarm, television, computer networking, and clock systems shall maintain a separation of a minimum of six inches from these types of signal system conduits and raceways. Electrical power, lighting and signal conduits and raceways installed in a common trench with other utility lines such as gas, water, sewer and storm lines shall maintain 12 inches separation from these types of utility lines.

5. The Inspector will observe underground installations before and during concrete placement. A mandrel shall be drawn through each run of conduit in presence of the Inspector before and after placing concrete. Mandrel shall be six inches in length minimum, and have a diameter that is within 1/4 inches of diameter of conduit to be tested.

6. Non-metallic conduit installations shall comply with following additional requirements. Joints in PVC conduit shall be sealed by means of required solvent-weld cement supplied by conduit manufacturer. Non-metallic conduit bends and deflections shall comply with requirements of applicable electrical code, except that minimum radius of any bend or offset for conduits sized from 1/2 inch to 1 ½-inch inclusive shall not be less than 24 inches. Bends at risers and risers shall be PVC-coated rigid steel conduit. Radius of curve of bends or offsets in non-metallic conduit for public telephone system shall be not less than ten times trade size of conduit, unless otherwise specifically permitted.

7. Furnish and install a six-inch wide, polyethylene, red underground barrier type 12 inches above full length of concrete reading, "CAUTION ELECTRIC LINE BURIED BELOW".

8. Underground conduit systems provided for utility companies shall be furnished to meet the requirements of the utility companies requiring service.

9. Protect inside of conduit and raceway from dirt and rubbish during construction by capping openings.

10. Add bell-end bushings for conduit stub-up including underground entries to pull boxes, and manholes. Under floor standing switchboards and motor control centers provide a four-inch galvanized nipple with ground bushing.

11. Underground conduit for systems operating above 600 volts shall be a minimum size of four inches.

12. At portable classroom all stub ups shall be installed with a coupling flush to finish grade.

13. Underground conduits and raceways shall be swabbed prior to wire pull.

C. Rooftop conduit shall be supported from channels, stands, clamps, trapezes, rollers, or structures mounted on 100% rubber, UV resistant rooftop supports with reflective strips, Dura-Blok, or equal. Roller type supports shall be provided below and above conduit to prevent its dislodgement. Bottom of conduits shall clear the roof surface by 10 inches.

1. At PVC roofing provide walk tread, polyester reinforced, UV resistant, with surface embossment at rooftop supports. Heat welding of walk pads shall only be done by manufacturer certified installers.

   a. Sika-Sarnafil and Carlisle: Walk tread shall be no more than one inch larger than the plan area of the pipe support blocks and adhered to the roof membrane with Sika 1A or Carlisle Universal Single-Ply sealant, as applicable.

   b. Johns Manville: Walk tread shall be installed under the pipe support blocks and adhered to the blocks, if possible, and left loose laid on top of the PVC roof system. Walk-pad shall have a minimum of 4 inches of material past perimeter on all 4 sides of block.

2. Built-up roofing: Provide APP granulated modified torch-down at each pipe support block. Torch-down shall extend 2 to 4 inches beyond the edges of the block and adhered by torch application over existing cap sheet membrane. This work shall be performed by a certified roofer.

D. General Installation Requirements for Computer Network System Conduits:

1. Location of outlet boxes and equipment on Drawings is approximate, unless dimensions are indicated. Drawings shall not be scaled to determine position and routing of wireways, drops, and outlet boxes. Location of outlet boxes and

equipment shall conform to architectural features of the building and other Work already in place and must be ascertained in the field before start of Work.

2. The maximum pulling tensions of the specified cables shall not be exceeded and proper radius of cable bends shall be maintained.

3. For computer network wiring, conduit types shall be limited to rigid metal conduit, electrical metallic tubing, schedule 40 PVC, multi-cell raceways, and flexible metallic conduit for lengths less than six feet.

4. Interior section of conduit run shall be not longer than 100 feet and shall not contain more than two bends of 90 degrees between pull points or pull boxes.

5. The inside radius of a conduit bend shall be at least six times the internal diameter of the conduit. When the conduit size is greater than two inches, the inside radius shall be at least ten times the internal diameter of the conduit. For fiber-optic cable, the inside radius of a conduit bend shall be at least ten times the internal diameter of the conduit.

6. Conduit shall be sized in accordance with Table 4.4-1 of EIA/ TIA 569 standard.

7. Splicing or terminating cables in pull boxes is not permitted.

8. For indoor application, a pull box shall be provided in conduit run where:

   a. The length is over 100 feet.

   b. There are more than two bends of 90 degrees.

   c. There is a reverse bend in the run.

9. Boxes shall be provided in a straight section of conduit and shall not be installed in lieu of a bend. The corresponding conduit ends are to be aligned with each other. Conduit fittings shall not be installed in place of pull boxes.

10. Where a pull box is provided with raceways, pull box shall comply with the following:

    a. For straight pull-through, provide a length of at least eight times the trade-size diameter of the largest raceway.

    b. For angle and U-pulls:

       1) Provide a distance between each raceway entry inside the box and the opposite wall of the box of at least six times the trade-size diameter of the largest raceway, this distance being increased by the sum of the trade-size diameters of the other raceways on the same wall of the box.

       2) Provide a distance between the nearest edges of each raceway entry enclosing the same conductor of at least:

          a) Six times the trade-size diameter of the raceway; or

          b) Six times the trade-size diameter of the larger raceway if they are of different size.

c) For a raceway entering the wall of a pull box opposite to a removable cover, provide a distance from the wall to the cover of not less than the trade-size diameter of the largest raceway plus six times the diameter of the largest conductor.

11. Drawings generally indicate Work to be installed, but do not indicate all bends, transitions of special fittings required to clear beams, girders or other Work already in place. Investigate conditions where conduits and wireways are to be installed, and furnish and install required fittings.

E. Slabs on Grade:

1. Unless specifically reviewed by the Architect and DSA, conduits 1 ¼-inches and larger are not permitted to be installed in structural concrete slabs. Where conduits are permitted, and are installed in concrete slabs on grade, slabs shall be thickened at bottom where conduits occur to provide three inches of concrete between conduit and earth. Required excavation shall be part of the Work of this section.

2. If concrete slab is five inches or more in thickness with a moisture barrier plastic sheet between earth and slab, one inch and smaller conduits shall be installed in the slab with a minimum of one inch concrete between earth and conduit.

F. Concrete Walls, Beams, and Floors: Provide sleeves where conduits pierce concrete walls, beams, and floors, except floor slabs on grade. Sleeves shall provide 1/2 inch clearance around conduits. Sleeves shall not extend beyond exposed surfaces of concrete and shall be securely fastened to forms. Where conduits pass through walls below grade, seal with required sealant and backer materials between conduit and sleeve to provide a watertight joint. Sealant shall be as indicated in Section 07 9200: Joint Sealants.

3.02 STUBS

A. Panelboard: Install two one inch conduits from each flush mounted panelboard to access under floor space and to access above ceiling space where these conditions occur. Cap conduits with standard galvanized pipe caps.

B. Floor: At points where floor stubs are indicated in open floor areas, for connections to machines and equipment, conduits shall be terminated with couplings, tops flush with finished floor. Stubs shall extend above couplings the indicated distance. Where capped stubs are designated, couplings shall be closed with cast iron plugs with screw drive slots.

C. Underground:

1. Underground conduit stubs shall be terminated at locations indicated, and shall extend five feet beyond building foundations, steps, arcades, concrete walks and paving. Rigid metallic conduit stubs and non-metallic conduit stubs shall be capped by installing a coupling flush in end wall of concrete encasement and plugging with a permitted plug. Project record drawings shall indicate location of ends of underground conduit stubs fully dimensioned and triangulated with

reference to buildings or permanent landmarks. These dimensions, including depth below finished grade, shall be marked on project record drawings in presence of the Inspector before backfilling trench. Where extending existing concrete encased stubs, clean, chip and wire brush end of existing concrete and brush on a heavy coat of neat cement paste or epoxy bonding agent.

2. Over ends of individual underground conduit stubs or groups of conduit stubs, install four-inch by 18-inch deep PVC filled with concrete, flush with finished grade in asphaltic concrete or lawns, and two inches above finished grade in planting areas. Cast a three-inch by three-inch brass plate engraved "ELECT" flush in top of concrete. Secure plate to concrete with brass dowels or as indicated on drawings.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.04 CLEANUP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 28 3100

Addendum no. 1

FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Fire alarm system shall consist of fire alarm control panel or networked nodes of the same make and be CSFM (California State Fire Marshall) listed for the application.

2. Labor, equipment, materials, connections, testing, and performance of operations in the installation of fire alarm system.

B. Related Requirements:

1. Division 01 General Requirements.

2. Section 14 2423: Hydraulic Passenger Elevators.

3. Section 21 1313: Fire Suppression Sprinkler Systems.

4. Section 23 0900: HVAC Instrumentation and Controls.

5. Section 23 3813: Kitchen Ventilation System.

6. Section 23 8000: Heating, Ventilating, and Air Conditioning Equipment.

7. Section 26 0500: Common Work Results for Electrical.

8. Section 26 0513: Basic Electrical Materials and Methods.

9. Section 26 0519: Low-Voltage Wire (600 Volt AC).

10. Section 26 0526: Grounding and Bonding.

11. Section 26 0533: Raceways, Boxes, Fittings, and Supports.

12. Section 26 5563: Theatrical Lighting and Stage Dimming Systems

13. Section 27 5313: Clock and Program Systems.

14. Section 27 5116: Public Address and Intercommunication Systems.

15. Section 27 5127: Public Address Systems (Small Gymnasiums – Multi-Purpose Rooms) (ES).

16. Section 27 5128: Public Address Systems (Auditoriums, Performing Art, M-P Rooms) (MS and HS).

17. Section 27 5129: Public Address Systems (Gymnasiums).

18. Section 27 5130: Public Address Systems (Athletic Fields).

1.02 SYSTEM REQUIREMENTS

A. Fire detection system shall continually supervise and monitor the following initiating, signaling, and monitoring circuits:

1. Manual fire-pull stations.

2. Smoke and heat detectors, duct detectors, multicriteria detectors, combination smoke/heat/CO Detectors, including detectors installed under other sections.

3. Fire sprinkler flow and tamper switches. In existing installations also include PIV tamper switches.

4. Alarm signaling circuits including alarm bells, horns and visual alarm units.

5. Annunciators.

6. Power supplies and batteries.

7. Interconnection with Central and Autonomous Public Address systems, telephone network system, Clock System-Classroom or Program schedule change, HVAC system where applicable, kitchen fire suppression system, Theatrical and House Lighting, elevator equipment for control of recall function and elevator circuit breaker shunt trip, and other systems required by code.

B. System controls shall be UL listed for power limited applications in accordance with California Electrical Code.

C. System shall be listed for Internet of Things (IoT) security in compliance with UL 2900.

D. The fire alarm devices and equipment shall be listed for installation for the fire alarm control panel to which they are being connected.

E. Complete installation shall conform to the version of NFPA 72, California Fire Code, California Building Code (CBC), and California Electrical Code (CEC) as approved by DSA on stamped drawings.

F. System labels and devices programming addresses shall be based on final signage and building labeling submittals. For existing facilities contractor shall obtain from Owner Authorized Representative a copy of the current site layout and building labeling designations.

1.03 CERTIFICATION

A. Certification: Installation of fire alarm system shall not begin until Shop Drawings, including State Fire Marshal listing numbers of fire alarm components, are submitted and reviewed by the Architect. Written certification by fire alarm equipment distributor or manufacturer shall be submitted to the Architect stating that system and its component parts are as approved and listed by the State Fire Marshal, and that the design conforms to Requirements set forth in CBC.

1.04 PERFORMANCE

A. System shall be fully programmable, configurable, and expandable in the field without special tools or PROM programmers and shall not require replacement of memory ICs. Installer shall provide a CD of system installed software, site specific system programming and information and tools required to re-program or modify the system.

1.05 SYSTEM FUNCTIONAL OPERATION

A. When a fire alarm condition is detected by one of the system initiating devices, the following functions shall occur:

1. System alarm LED shall flash.
2. Local sounding device in panel shall be activated.
3. The LCD display shall indicate type of device, custom label location label and point status alarm condition.
4. Appropriate change of status message shall be transmitted to remote annunciator(s).
5. Automatic programs assigned to alarm point shall be executed and associated indicating devices and relays activated.
6. In the event of a fire alarm control panel activation, manual and automatic electronic tone or electromechanical bell class passing signals shall be disabled.
7. In the event of a fire alarm condition the Central and Autonomous Public Address System shall be overridden.
8. UDACT (Universal Digital Alarm Communicator Transmitter) shall activate.
9. Provide necessary hardware and labor for a complete and tested interfacing of the fire alarm system with the lighting controls systems in Auditoriums, Multi-Purpose rooms, and Gymnasiums; lighting in these areas shall be brought to full brightness in the event of a fire alarm.

B. Trouble and Supervisory Conditions.

1. When any trouble condition is detected the following functions shall occur:
    a. System trouble LED shall flash.
    b. Local sounding device in panel shall be activated.
    c. The LCD display shall indicate the type of trouble and custom label location associated with the trouble condition and its location. Unacknowledged alarm messages shall have priority over trouble messages. If such an alarm is displayed, then trouble messages shall not be displayed.
    d. Appropriate message shall be transmitted to remote annunciators.

e. UDACT shall activate.

C. When any supervisory condition occurs such as a sprinkler valve tamper, the following function shall occur:

1. System supervisory LED shall flash.

2. Local sounding device in panel shall be activated.

3. Appropriate message shall be transmitted to remote annunciators.

4. UDACT shall activate.

D. Activation of control panel ACKNOWLEDGE switch in response to a single new alarm, trouble or supervisory condition shall silence panel sounding device and change system alarm, trouble, or supervisory LED from flashing to steady-ON. If additional new alarm, trouble, or supervisory conditions exist in the system; activation of this switch shall advance display to next alarm, trouble, or supervisory condition that exists, and shall not silence local audible device or change LED to steady until new conditions have been so acknowledged. New alarm conditions shall always be displayed before new trouble conditions. Occurrence of a new alarm, trouble, or supervisory condition shall cause panel to resound, and sequences as described above, shall repeat.

E. Activation of the signal silence switch shall cause appropriate notification (indicating) appliances and relays to return to normal condition. Selection of notification appliance circuits and relays silenced by this switch shall be fully programmable.

F. Activation of system reset switch shall cause electronically latched initiating devices or zones, as well as associated output devices and circuits, to return to normal condition after sixty seconds of alarm. If alarm conditions exist in system after system reset switch activation, system shall then re-sound alarm conditions as indicated hereafter.

G. Activation of lamp test switch shall turn on LED indicators, LCD display, and local sounding device in panel, and then return to previous condition.

H. Fire alarm indicating appliances may be silenced or extinguished, after one minute, by operating signal silence switch at the FACP or by use of key supervised alarm silence switch at remote annunciators. A subsequent zone alarm shall reactivate signals. Audible indicating appliances shall be automatically silenced after no less than five nor more than ten minutes of operation. Visual indicating appliances shall be extinguished at system reset, or automatically after no less than five nor more than ten minutes of operation. Fire sprinkler flow alarm bells shall not silence until the contacts in the fire sprinkler flow switch return to the normal non-alarm state. Appropriate signage must be installed on or next to the sprinkler alarm bell.

I. Elevator lobby, machine room and hoistway smoke detectors shall, in addition to operations listed above, cause elevator cars to be recalled as follows:

1. Elevator cars shall be recalled to main level of egress through the use of a primary recall interface relay.

2. Elevator cars shall be recalled to predetermined alternate level if main lobby smoke detector is activated.

3. Fire Fighter's hat light indicator in elevators shall provide visual warning when elevator lobby, machine room, and hoistway smoke detectors are activated.

J. System's circuits including but not limited to initiation, indicating, and equipment interfacing shall be monitored for open or short circuit and ground fault conditions, these conditions shall be indicated on the Fire Alarm Control Panel and Annunciator displays while remaining circuits continue to operate normally.

K. Notification appliance circuits shall be silenceable for testing purposes by authorized persons. Protected passcodes, keys, or another secure method that does not require entering into the system programming shall be used.

1.06 POWER REQUIREMENTS

A. The fire alarm control panel and remote power supply shall receive 120 VAC power, 60 Hz, through a dedicated 20 amps circuit. Circuit breaker protection for the dedicated fire alarm power circuits shall be equipped with a handle lock-on device; the breaker handle shall be colored red and labeled "FIRE ALARM". Clearly label the Electrical panel name, location and circuit number on the inside of the fire alarm control panel and remote power supplies using a p-touch style labeling system. Transient voltage surge suppression shall be provided at the 120VAC input terminal.

B. System shall be provided with sufficient battery capacity to operate entire system upon loss of normal 120 VAC power, in a normal quiescent mode, for a period of 24 hours with 5-minutes of alarm indication at end of this period. System shall automatically transfer to standby batteries upon power failure. Battery charging and recharging operations shall be automatic. Batteries, once discharged, shall recharge at a rate to provide a minimum of 70% capacity in 12 hours.

C. Circuits requiring system operating power shall be 24 VDC and shall be individually protected at control panel.

1.07 SUBMITTALS

A. Provide in accordance with Division 01.

B. Component Plan Submittal: Availability and listing for its application shall be verified for system components before presentation of the submittal. Include the following information and details as applicable:

1. Installer name, address, telephone number.

2. List of system components, equipment and devices, including manufacturer model numbers, quantity and California State Fire Marshal listing numbers, mounting heights, and symbols per LAUSD symbol list.

3. Copies of Manufacturer Specification sheets for equipment and devices indicated. Highlight or identify the specific components on Catalog cut sheets.

4. Voltage Drop Calculations: Include the following information for the worst case:

   a. Point-to-point or Ohms law calculations.

   b. Zone used in calculations.

   c. Voltage drop percent. Voltage drop shall not exceed Manufacturer's Requirements. If voltage drop exceeds 10%, indicate manufacturer listed operating voltage ranges for equipment and devices.

5. Battery types, amp hours, and load calculations including the following:

   a. Normal operation: 100% of applicable devices for 24 hours to equal control panel amps plus list of amps per device that draw power form the panel during standby power condition including, but not limited to, zone modules, detectors and devices as identified.

   b. Alarm condition: 100% of applicable devices for five minutes to equal control panel amps plus list of amps per device that draw power from panel during alarm condition including, but not limited to, the following:

      1) Zone modules.

      2) Signal modules.

      3) Detectors.

      4) Signal devises.

      5) Annunciator.

      6) Other devices as identified.

   c. Normal operation plus alarm operation load calculation shall include total amp hours required and total amp hours provided.

6. Provide one copy of testing procedures.

C. Shop Drawings: Provide Shop Drawings, in the same size as the design Drawings, include the following:

1. Provide drawing scale, elevations of system enclosures, and actual layout of the Fire Alarm Control Panel, power supply, annunciator, and main system components.

2. Site Plan indicating PIV and related fire sprinkler system devices and equipment to be monitored or supervised; such as water flow valves, and main equipment such as control panels, power supplies, annunciators, and components such as outdoor wall-mounted horns, sprinkler bells, pull boxes, underground pull boxes , wiring routes on buildings exteriors and

underground locations. In each conduit or raceway run indicate conduit sizes, and quantities and type of wires.

a. In existing facilities make a distinction between existing and new installation.

3. Complete battery calculations, and voltage drop calculation shall be included; these calculations shall be based on the devices maximum UL current rating.

4. One line drawing for the entire system network indicating system components and wiring. The one line diagram shall show but not be limited to panel to panel interconnections, conductors gage and quantity, conduit size and type (designation) and specific function.

5. System panel one-line drawings indicating the quantity and type (designation) of conductors entering and exiting the fire alarm terminal cabinet in each building (enclosure) for initiating, notification, or other command control functions required for complete system operation:

   a. Individual floor or building plan view drawings indicating device locations including end of line resistors "EOLR" in accordance with the legend provided.

   b. Individual point addresses for initiation and notification devices.

   c. Device "typical" wiring diagrams. These drawings shall indicate specific termination details for peripheral equipment and interface devices.

6. Provide interfacing with equipment furnished by others including voltages, and other required coordination items. Refer to 3.01-B.

7. Each of the pictorial diagrams included shall appear identical to the products they are intended to depict, in order to speed installation of the system, and to enhance the accuracy of the installation Work. Typical wiring diagrams or catalog sheets are not permitted.

8. Background Drawings with device locations of DSA approved drawings are available in electronic format and may be obtained from the Owner Authorized Representative (OAR). Contractor is solely responsible for the accuracy and completeness of shop drawings. Buildings that are not part of the contract shall be clearly identified "NOT IN CONTRACT". Shop Drawings shall be prepared in the latest version of AutoCAD with three – CD ROM electronic copies submitted along with full sized Shop Drawings.

9. Other installation and coordination drawings specifically related to this section shall be included as follows:

   a. Size A (8 ½ by 11) and size B (11 by 17) shall be bound into the manual.

   b. Larger drawings shall be folded and inserted into transparent envelopes and bound into the manual.

10. Installation and coordination drawings for items in other sections shall be included with submittal of Shop Drawings. Submit blue line copies and one reproducible copy of installation and coordination drawings.

11. Samples: Provide Samples of material and equipment as required by the Architect. If Samples are requested, they shall be submitted within ten days from date of request.

D. In addition to the above Requirements, provide submittals to meet any additional Requirements of DSA.

E. Submittal of Equivalent Systems:

1. In addition to the Submittal Requirements of this section, if an equivalent system listed in Section 2.01A is submitted in lieu of the designed system shown on DSA approved drawings, the Contractor shall also submit a letter stating that the system is equivalent, and that device locations and quantities of devices are unchanged. Attached to this letter shall be a copy of the revised equipment schedule with corresponding CSFM numbers and a cut sheet for each item.

F. Modifications or additions to existing fire alarm systems shall be compatible and of the same manufacturer as the existing system. Contractor shall be solely responsible for engineering, plan check and any fees resulting from an installation that deviates from this Requirement.

G. Prior to Substantial Completion submit to the Architect or Engineer of Record and to Owner Authorized Representative a complete updated set of the Shop Drawings showing changes made to the Fire Alarm System during construction. These drawings will become the System As-Built Drawing set for the Fire Alarm System Owner's Manual.

1.08 QUALITY ASSURANCE

A. Installer shall have successfully completed at least five projects of equal scope in the past five years, and have been in business of furnishing and installing fire alarm systems of this type for at least five years.

B. Installer shall be a factory authorized distributor and service provider for the brand of equipment offered and shall provide documentation to the Architect upon request.

C. Installer shall maintain a fully equipped service organization capable of furnishing repair service to the equipment and shall maintain a spare set of major parts for the system at all times.

D. Installer shall furnish a letter from manufacturer of equipment certifying equipment has been installed according to factory standards and that system is operating properly.

E. Certifications: Installer shall submit certification from the equipment manufacturer indicating that installer is an authorized representative of the equipment manufacturer and is trained on network applications.

F. Materials and equipment installed shall be new.

G. Equipment in this specification shall be furnished and installed by the Authorized Factory Distributor of the equipment. Furnish a letter from the manufacturer of major equipment, which certifies that the installer is an authorized distributor and that the equipment has been installed according to factory intended practices. Furnish a written guarantee from the manufacturer that they will have a service representative assigned to this area for the life of the equipment.

H. Installer shall be Underwriters Laboratory (UL) listed company under the UUJS classification, and shall certify that the installation has been made in accordance with UL Requirements.

I. The fire alarm contractor shall have a NICET II Certified Technician on staff in their facility directly involved with this project to ensure technical expertise to this project and adherence with these specifications.

J. Contractor or Installer's Electricians and fire and life safety technicians shall be certified in accordance with Labor Code sections 3099, and 3099.2, and section 209.0 of the California Code of Regulations.

K. System startup and testing shall be performed under the direct observation of the Project Inspector and OAR. Provide a legible half size reproduction of the original completed fire alarm red-line drawings (this copy will be retained by the Owner), an accurate copy of the fire alarm system points list, and a copy of the construction drawings on CD in AutoCAD format.

L. At the time of installation the most current software package available shall be provided.

M. Provide at the time of Owner Acceptance of the installation, equipment, and updated software which is to include the appropriate operating system, pass-codes, electronic keys and program disks, manuals and cables employed in the installation of the system. These components shall be delivered to the OAR.

N. Provide a backup copy of the most current software revision, in disk format. This copy shall be delivered to the OAR

O. A software license agreement shall be made available for the responsible Owner representative to sign at the time of training.

1.09 WARRANTY

A. The Fire Alarm Equipment Manufacturer shall provide a three year material warranty. Installer shall provide a three year labor warranty.

B. Complete maintenance and repair service for the fire alarm system shall be available from a factory trained authorized representative of the manufacturer for a period of five years after expiration of the warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Fire alarm equipment shall be standard products of the Notifier Co., Edwards Systems Technology, Siemens Building Technologies, Inc. Johnson Controls and Gamewell-FCI, or equal.

B. Catalog and model numbers listed are intended to establish type and quality of equipment and system design as well as operating features required. Deviations from intended functions of specified system are not permitted. Equipment shall not be ordered or installed until such equipment has been reviewed and approved by the Architect.

C. Products Requirements indicated in articles 2.02 through 2.05 are based on Notifier system components. Refer to Attachment A – Fire Alarm Approved System Components for a complete list of approved products.

2.02 FIRE ALARM CONTROL PANEL (FACP) OR NETWORK NODES

A. Furnish Fire Alarm Control Panels as indicated on drawings.

B. Operator Control:

1. Acknowledge Switch: Activation of control panel acknowledge switch in response to a single new trouble or alarm condition shall silence panel sounding device and change system alarm or trouble LED from flashing to steady-ON. If additional new alarm or trouble conditions exist in system, activation of this switch shall advance display to next alarm or trouble condition that exists, and shall not silence local audible device or change LED to steady until new conditions have been so acknowledged. New alarm conditions shall always be displayed before new trouble conditions. Occurrence of a new alarm or trouble condition shall cause panel to resound, and sequences as described above, shall repeat.

2. Signal (Alarm) Silence Switch: Activation of the signal silence switch shall cause programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silenceable by this switch shall be fully fielded programmable within the confines of applicable standards at the job site. The FACP software shall include silence inhibit and auto-silence timers.

3. Alarm Activate (Drill) Switch: Alarm activate switch shall activate notification appliance circuits. The drill function shall latch until the panel is silenced or reset.

4. System Reset Switch: Activation of the System Reset switch shall cause electronically-latched initiating devices, appliances or software zone, as well as associated output devices and circuits, to return to their normal condition.

5. Lamp Test Switch: Switch shall activate local system LEDs, light each segment of the liquid crystal display and display the panel software revision for service personnel.

6. Hot Button Switch: Hot Button Key switch shall be provided in FACP to disable all output devices for testing or repair of system. Key switch shall silence all horn and strobes, disable PA cutouts, HVAC shutdowns, door closures, and Autonomous PA systems. Key switch shall be password protected to enable function. LED indicator shall illuminate a trouble condition while Hot Button Switch is activated and shall turn off when system is re-enabled.

C. System Capacity and General Operation

1. The control panel or each network node shall provide or be capable of expansion to 636 minimum intelligent addressable devices in smaller systems, and 3180 intelligent addressable devices for larger systems.

2. The control panel or each network node shall include Form-C alarm, trouble, supervisory, and security relays rated at a minimum of two amps at 30 VDC. It shall also include four Class B (NFPA Style Y) or Class A (NFPA Style Z) programmable Notifications Appliance Circuits.

3. The control panel or each network node shall support up to eight output modules (signal or relay), each with eight circuits for a total of 64 circuits for the smaller capacity panels, and 12 output modules for a total of 96 circuits for the larger capacity panels. Programmable notification appliance circuits shall be class B.

4. The system shall include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual color coded system status LEDs, and an alphanumeric keypad with easy touch rubber keys for the field programming and control of the fire alarm system.

5. The system shall be programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers. It shall not require replacement of memory ICs to facilitate programming changes.

6. The system shall allow the programming of any input to activate any output or group of outputs. The FACP shall support up to 20 logic equations, including “and” “or” and “not”, or timed delay equations to be used for advanced programming. Logic equations shall require the use of a PC with software utility designed for programming.

7. The FACP or each network node shall provide the following features:

   a. Drift compensation to extend detector accuracy over life. Drift Compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.

b. Detector Sensitivity tests, meeting Requirements of NFPA 72 Chapter seven.

c. Maintenance alert, with two levels (maintenance alert or maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.

d. Nine sensitivity levels for alarm, selected by detector. The alarm level range shall be 0.5 to 2.35 percent per foot for photoelectric detectors and 0.5 to 2.5 percent per foot for ionization detectors. The system shall also support sensitive advance detection laser detectors with an alarm level range of 0.03 percent per foot to one percent per foot. The system shall also include up to nine levels of Pre- alarm, selected by detector, to indicate impending alarms to maintenance personnel.

e. Circuit boards, programming, and interconnecting cables to enable the system to display or print system reports.

f. Alarm verification, with counters and a trouble indication to alert maintenance personnel when a detector enters verification 20 times.

g. PAS pre-signal testing in accordance with California Fire Code (CFC) and NFPA 72 Requirements.

h. Rapid manual station reporting (less than three seconds) shall meet CFC and NFPA 72 Requirements for activation of notification circuits within ten Seconds of initiating device activation.

i. Periodic detector test, conducted automatically by the software.

j. Self-optimizing pre-alarm for advance fire warning, which allows each detector to learn its particular environment and set its pre-alarm level to just above normal peaks.

k. Cross zoning with the capability of counting: two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.

l. Walk test, with a check for two detectors set to same address.

m. Control-by-time for non-fire operations, with holiday schedules.

n. Day or night automatic adjustment of detector sensitivity.

o. RS 232 serial port to support a District supplied printer to be used for silent testing and certification of the system.

8. The FACP shall be capable of coding main panel(s) node notification circuits in temporal code (NFPA 72 A-2-2.2.2).The panel shall also provide a coding option that will synchronize specific strobe lights designed to accept a specific “sync pulse”.

9. Network Communication:

   a. The network architecture shall be based on a Local Area Network (LAN), a firmware package that utilizes a peer-to-peer, inherently regenerative communication format and protocol. The protocol shall be based on ARCNET or equivalent non-proprietary protocol.

   b. Failure of any node shall not cause failure or communication degradation of any other node or change the network communication protocol among surviving nodes located within distance limitations. A node may be an intelligent Fire Alarm Control Panel (FACP), Network Control Station PC (NCS) or Network Control Annunciator (NCA).

   c. Each network node address shall be capable of storing Event Equations which shall be used to activate outputs on one network node from inputs on other network nodes.

D. System Display:

1. Utilize the 640-character display option. The design of the CPU shall provide for a configuration with the 640-character display mounted on the front of the unit in place of the standard 80-character display.

2. The 640-character display shall provide the controls and indicators used by the system operator: The 640 character display shall include the following operator control switches; Acknowledge, Alarm, Silence, Alarm Activate (drill), System Reset and Lamp Test.

3. The display shall annunciate status information and custom alphanumeric labels for intelligent detector, addressable modules, internal panel circuits, and software zones.

4. The 640-character display shall provide ten Light-Emitting-Diodes (LEDs) that indicate the status of the following system parameters: AC Power and Network Communication, Fire Alarm, Pre alarm Warning, Security Alarm, Supervisory Event, System Trouble, Alarm Silence, Disabled Points, CPU failure.

5. The 640-character display shall use ten “soft” keys for screen navigation or to accomplish dedicated programming functions. Full programming access shall require use of a laptop and the proper programming utility. The programming utility shall be provided to the OAR who will forward it to the local maintenance area representative.

6. The system shall support the display of battery charging current and voltage on the LCD display.

E. Network Control Annunciator:

1. When a networked system is installed a network controlled annunciator (NCA) shall be provided to display system intelligent points. The NCA

shall be capable of displaying information for all possible points on the network.

2. The NCA shall include a minimum of 640 characters, backlit by a long life, solid-state LCD display. Additionally, the network display shall include ten soft keys for screen navigation and the ability to scroll events by type. i.e. Fire Alarm, Supervisory Alarm, Trouble, etc.

3. The NCA shall have the ability to display up to eight events in order of priority and time of occurrence. Counters shall be provided to indicate the total number of event by type.

4. The NCA shall mount in a Notifier ABS-2DB or equal keyed box; provide a key enable or disable switch for the network node fire alarm control panels. The network display may mount in a backbox designed for this use. The network shall support the NCAs.

5. The network control annunciator shall have an event history buffer capable of storing a minimum of 1000 events in nonvolatile memory. Additionally, the NCA shall have a fire alarm history buffer capable of storing a minimum of 200 events in nonvolatile memory.

6. The NCA shall include two EIA-232 ports for UL864 listed printers and CRT's.

7. The NCA shall include control switches for system wide control of Acknowledge, Signal Silence, System Reset, Drill, and local Lamp Test. A mechanical means, by which the controls switches are locked out, such as a key, shall be provided.

8. The NCA shall include long life LEDs to display Power, Fire Alarm, Pre-Alarm, Security Alarm, System Trouble, Supervisory, Signals, Silenced, Disabled Prints, other (non-fire) Events, and CPU Failure.

9. The NCA shall include a Master Password and up to nine user Passwords. The Master password shall be required to access the programming and alter status menus. Each User password may have different levels of authorization assigned by the Master password. Passwords installed into the NCA shall be made available to the OAR who will forward them to the local maintenance area representative.

10. The NCA shall allow editing of label for points within the network, control on or off of outputs, enable or disable of network points, alter detector sensitivity, clear detector verification counters for any analog addressable detector within the network, clear any history log within the network, change the Time or Date settings, initiate a Walk Test.

11. The NCA shall include a time of day clock.

12. Each NCA shall support 80-character remote display annunciators for displaying network activity. These "Terminal Mode" displays will mimic the activity appearing on the corresponding NCA. There shall be only one

annunciator or control system consisting of components manufactured by one manufacturer for the fire alarm system.

F. Signaling Line Circuits (SLC):

1. Each FACP or FACP network node shall support a minimum of one SLC for the smaller panels and ten SLC's for the larger panels. Each SLC interface shall provide power to and communicate with up to 159 intelligent detectors (ionization, photoelectric or thermal) and 159 intelligent modules (monitor or control) for a loop capacity of 318 devices.

2. CPU shall receive analog information from intelligent detectors to be processed to determine whether normal, alarm, pre-alarm, or trouble conditions exist for each detector. The software shall automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors including the accumulation of dust in each detector. The analog information shall also be used for automatic detectors testing and for the automatic determination of detector maintenance Requirements.

G. Enclosures:

1. The control panel shall be housed in a UL-listed cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.

2. The back box and door shall be constructed of 0.030 steel with provisions for electrical conduit connections into the sides and top.

3. The supplied door shall include a key lock and shall include glass or other transparent opening for viewing of indicators. For convenience, the door may be site configured for either right or left hand hinging.

H. Power Supply:

1. An off-line switching power supply shall be available for the fire alarm control panel or network nodes.

2. Provisions shall be made to allow the audio-visual power to be increased as required by adding modular expansion audio-visual power supplies.

3. Over-current protection shall be provided on power outputs. The power supply shall provide an integral battery charger. Battery arrangement may be configured in the field.

4. The power supply shall continuously monitor field wires for earth ground conditions, and shall have the following LED indicators:

a. Ground Fault LED.

b. AC Power Fail LED.

c. NCA-2 on LED (4).

5. The main power supply shall operate on 120 VAC, 60 Hz, and shall provide power for the FACP or network node(s).

6. The main power supply shall provide a battery charger using dual rate charging technology for fast battery recharge and be capable of charging batteries up to 60 AH for the smaller panels and 200 AH for larger panels.

2.03 REMOTE ANNUNCIATORS

A. A non-networked fire alarm system annunciator is required when there is only one FACP in the system. Provide alphanumeric display remote annunciator(s) per plans. A Network annunciator is required for any system that contains more than one fire alarm control panel (FACP) or network node. Display shall be back lit and be furnished with a maximum of 20 characters of 4 lines for the smaller panels, and 40 characters on 16 lines for the larger panels. Annunciators shall provide the following functions:

1. Control switches for system acknowledge, signal silence and system reset via a touchpad.

2. Time and date display field.

3. Local piezo sounder with alarm or trouble resound.

4. On-line green LED (flashing).

5. Evacuation and drill switches, via a touchpad.

6. Pre-signal hold via a touchpad.

7. System test at control panel and CTR.

B. Following additional features shall be furnished:

1. Device Fire Annunciation.

2. Device Trouble Annunciation.

3. System Operation Annunciation.

4. "Power On" LED.

C. Typewritten operating instructions and a site map shall be posted adjacent to remote annunciator(s). The site map shall be sized and include designations and devices as described in paragraph 3.02 N. of this specification. Project site map shall depict fire alarm devices in the building(s) in which they are installed. The instruction and site map shall be mounted in suitable document frames and attached to the wall with a minimum of two screws each. Contractor’s name and telephone number shall not be placed on either the instruction or the site map.

2.04 POWER SUPPLIES

A. Remote Notification Appliance Circuit (NAC) extender power supplies shall be furnished with main printed circuit board, transformers, lockable cabinet, and batteries. Unit shall be configured to drive 4 notification appliance circuits. The remote power supplies shall be configured with a monitor module to report trouble

conditions to the controlling FACP via an SLC. Triggering of NAC inputs shall be directly controlled from the FACP without the use of addressable control or relay modules.

2.05 PERIPHERAL DEVICES AND EQUIPMENT

A. Manual Stations (interior): Manual pull stations shall be addressable semi-flush, non-breakable glass type for building interiors. Station housing shall be fabricated of die-cast aluminum with reset lock and key. Provide an addressable monitor module for each manual station.

B. Manual Stations (exterior): Manual stations shall be addressable semi-flush, non-breakable glass type for building exteriors. Station housing shall be fabricated of die-cast aluminum with reset lock and key. Provide an addressable monitor module for each manual station.

C. Smoke Detectors: Smoke Detectors shall be addressable. Detector shall be microprocessor based, using a combination of photoelectric, and thermal sensing technologies. The smoke detector shall have its loop number and electronic address permanently and clearly labeled onto the device base using a p-touch type labeling system. The label shall be visible without re moving the detector head.

D. Non-Explosion Proof Automatic Addressable Heat Detectors shall be combination rate-of-rise and fixed-temperature type. When fixed-temperature portion is activated, units shall provide visual evidence of such operation (LED). The location of the heat detector must be clearly marked below the ceiling and the detector must be readily accessible. The heat detector shall have its electronic address permanently and clearly labeled onto the device and be readily accessible. For spaces such as attics, where the ambient temperature can reach around 150^{o} degrees Fahrenheit in hot days, use detectors rated for the application. The heat detector shall have its loop number and electronic address permanently and clearly labeled onto the device using a p-touch labeling system. The label shall be visible without removing the detector head.

E. Explosion Proof Automatic Heat Detectors shall be rated for 135^{o} degree Fahrenheit alarm temperature. Mount the detector on a JL threaded hub cover manufactured by Killark Electric, or equivalent from other owner approved manufacturers. Seals, conduit type, and fittings shall be suitable for the hazardous zone and location where the device will be installed. Provide an appropriate wire protective cover over box and detector. Addressable module(s) associated with this type of devices shall be installed outside of the hazardous area.

F. Weatherproof Automatic heat Detectors: Detectors shall be rated for 135^{o} degree Fahrenheit alarm temperature. Detector shall be mounted horizontally in a two gang weatherproof box with cover manufactured by Hubbell/Bell or equivalent from other owner approved manufactures. Install an appropriate wire protective cover over box and detector. Conduit type and fittings shall be suitable for the environment where the device will be installed.

G. Duct Smoke Detectors: Duct smoke detectors shall be of solid-state photoelectric type and shall operate on light-scattering photodiode principle. The location of the duct detector must be clearly marked below the ceiling and the detector must be readily accessible. The duct smoke detector shall have its electronic address permanently and clearly labeled onto the device. The label shall be visible without removing the detector head. Duct smoke detectors that are already installed as part of packaged ventilation equipment that are not the detector specified above shall be connected to the fire alarm system via a monitor module. The existing power source shall be disconnected and resettable power from the FACP or Remote Power Supply shall be connected in place of the existing power source for fire alarm system resettable power and alarm initiation.

H. Projected Beam Infrared Type Smoke Detectors shall consist of a transmitter/ receiver unit and reflector to be used in accordance with manufacturer's recommendations. Each detector shall include six user-selectable sensitivity levels. Alignment shall be achieved with a signal strength meter incorporated into the beam detector. The detector shall feature automatic detection and adjustment to the optimum level for the specific environment. Provide remote Notifier Model RTS-451KEY test stations with key lock for detectors or equal, locate test stations below ceiling.

I. Linear Heat Detectors: Linear detectors shall be Protectowire or equal. linear detectors shall be rated for 150-degree Fahrenheit installed ambient temperature and 190-degree Fahrenheit alarm temperature. Damaged detector due to excessive bending or kinking during installation shall not be accepted. Interface the Protectowire detector with the FACP system via addressable monitor module(s) located on one extreme of the detector and an end of line resistor at the other extreme. End of line resistor shall be readily accessible for testing. Provide appropriate signs indicating the existence of linear heat detectors at the entrances of areas protected with this type of fire detection. Installation shall be done in accordance with applicable codes and standards, and manufacturer's published installation recommendations.

1. Provide a system that utilizes linear heat detectors in concealed or controlled access areas. The detection wire shall be installed within 20 inches of the underside of the building roof or the above floor as recommended by the manufacturer. In shallow areas install the detection wire within the upper part of the space to be protected.

    a. One circuit of linear heat detection shall be utilized for areas not exceeding 4,000 square feet above multiple rooms.

    b. Areas above Gymnasiums and Auditoriums exceeding 4,000 square feet shall be considered one zone.

    c. Areas divided by a fire rated wall shall be protected separately and considered an independent zone.

J. Multi-Criteria Fire Detectors (MS and HS Only): These Detectors shall be used on performing stages and surrounding areas of the performing stage and other locations where the use of special effect smoke systems may be used.

1. Multi-Criteria Fire Detector shall combine four separate sensing elements into one unit:

a. Photoelectric chamber shall sense airborne particulate for smoke detection.

b. Electrochemical cell technology shall monitor carbon monoxide.

c. Infrared sensing shall measure ambient light levels and flame signatures.

d. Thermal detection shall monitor temperature.

2. Multi-Criteria Detector shall be capable of generating only one alarm signal from at least two sensors of the four when positively confirming a fire. The sensor output shall be mathematically evaluated to determine when a signal is warranted.

3. Twin LED indicators shall provide 360 degree visibility.

K. Monitor Modules:

1. Monitor modules shall connect a supervised zone of conventional initiating devices, N.O. dry contact devices, including four-wire smoke detectors, to one of SLC loops. Monitor module shall install in a four-inch square by 2 1/8-inch deep electrical box. The module shall have its loop number, electronic address, and function label on the front cover using a P-Touch type or equal labeling system.

2. Monitor module shall provide address-setting means using rotary decimal switches and shall store an internal type of device. An LED shall be provided which shall flash under normal conditions indicating that monitor module is operational and in regular communication with control panel.

L. Control Modules:

1. Control modules shall be used to connect conventional indicating appliances or MR type isolation relays to one of the SLC loops. Control modules shall be installed in a standard four-inch square by 2 1/8-inch deep electrical box. Audio or visual or relay power shall be provided by a separate loop from main control panel or from supervised remote power supplies. Each module shall have its loop number, electronic address, and function label on the front cover using a p-Touch type or equal labeling system. Provide Air Products PAM-3 Relay Model or equal power supervision relay to monitor 24-volt DC power.

2. Control module shall provide address-setting means using rotary decimal switches and shall store an internal identifying code which control panel shall use to identify type of device. An LED shall be provided which shall

flash under normal conditions, indicating that control module is operational and in regular communication with control panel.

M. Relay Modules:

1. Relay Module shall be Notifier FRM-1 or FMM-101 depending on Requirements. Modules shall provide as a minimum one set of form "C" dry contacts and have its loop number, electronic address, and function labeled on the front cover using a P-Touch type labeling system.

2. Provide a buffer relay that is part of the control system if controlled circuit(s) exceeds the voltage or current rating of the relay module.

3. Relays used to interface control of other systems shall be electrically supervised and shall only be wired in a fail-safe mode of function during a power failure.

4. Relay modules for HVAC units on roof shall be located in a NEMA 3R box next to unit being controlled. Provide approved weather listed vibration connection conduit and fittings to interface fire alarm system module with HVAC controls compartment. Do not penetrate the HVAC unit from the bottom. Bottom penetrations shall not be accepted.

N. Isolator Modules:

1. Isolator module shall isolate wire-to-wire circuits on an SLC loop in order to limit number of other modules or detectors that are incapacitated by short circuit fault. If a wire-to-wire short occurs, isolator shall automatically open-circuit SLC loop. When short is corrected, isolators shall automatically reconnect isolated section of SLC loop.

2. Isolator module shall not require address setting, although isolators will electrically reduce capacity of loop by two detectors or module addresses. Isolator module will install in a standard 4-inch deep electrical box. It shall include a single LED that shall flash to indicate that isolator is operational and shall illuminate steadily to indicate that a short has been detected and isolated.

O. Horns and Strobes: Horns and strobes shall be products of the same manufacturer. In order to establish a standard of quality, items are specified from the products manufactured by System Sensor, acceptable manufacturers are Honeywell, Wheelock Inc., Gentex or District approved equal. Addressable or multifunction two wire indicating (Audible or Visual) appliances shall not be acceptable.

1. Alarm horns shall be polarized and operated by 24 VDC. Entire unit shall be red finish. Horn assemblies shall be furnished with separate wire leads for in or out wiring for legs of associated signal circuits. T tapping of signal device conductors to signal circuit conductors is not permitted. Suitable gaskets shall be provided for weatherproof installation. Horns shall provide a minimum sound pressure level of 100 dB at 10 feet. Horns shall be

mounted on manufacturer's recommended outlet boxes. Provide horns with a back box skirt on indoor surface mount outlet boxes.

2. Horn/strobe shall be wall mounted or ceiling mounted System Sensor or equal. Horn/strobe shall operate on two separate two wire 24 VDC polarized circuits and shall be provided with a semi-flush mounting plate. Entire unit shall be red finish. Strobe light shall have a clear Lexan lens. The word "FIRE" shall be printed on the two sides of the strobe body. Horn shall provide a minimum sound output of 100 dB at 10 feet. The strobe shall provide a selectable minimum light intensity of 15, 30, 60, 75, 90, 110, 135, 150, or 185 Candela as indicated on Drawings to meet or exceed Requirements of CBC, CHAPTER 11B AND ADAAG and UL 1971. Horn/Strobes shall be mounted on manufacturer recommended outlet boxes. Weather proof horn or strobe shall be model No. P4RK or Model No. P4RHK. Provide a model No. BBS-2 back box skirt on indoor surface mounted outlet boxes.

3. Strobe indicating appliances shall be System Sensor or equal. Devices shall be UL listed and shall be wall-mounted. Entire unit shall be red finish. Strobe light shall have a clear Lexan lens. The word "FIRE" shall be printed on two sides of the strobe body. Strobes shall meet CBC, CHAPTER 11B AND ADAAG and UL 1971 Requirements. The strobe shall provide a selectable minimum light intensity of 15, 30, 60, 75, 90, 110, 135, 150, or 185 Candela as indicated on the Drawings to meet or exceed Requirements of CBC, CHAPTER 11B AND ADAAG and UL 1971. Strobes shall be mounted on manufacturer recommended outlet boxes. Weather proof strobe shall be model No. SRK or Model No. SRHK. Provide a model No. BBS-2 back box skirt on indoor outlet boxes.

4. Strobe synchronization modules if required shall be System Sensor or equal, to be installed in conjunction with two or more strobes located in same room or corridor or as indicated on Drawings. (Strobe synchronization modules must be compatible with installed strobes).

P. Electromagnetic Door Holder: Electromagnetic door holders shall be installed on doors as indicated on Drawings or as required. Electromagnetic Doors shall consist of a wall-mounted electromagnet and a door-mounted armature with an adjustable contact plate. Electromagnets shall provide a force of attraction of 35 pounds when energized and less than three pounds residual with power disconnected. Armature contact plates shall provide a horizontal adjustment of 25 degrees. The holding force of Electromagnetic Doors shall be totally electromagnetic and without the use of mechanical linkage or other moving parts. Electromagnetic Door Holders shall normally be energized, and a release shall be accomplished by interrupting the circuit. Door holders shall be Reliable Security Group DH Serie or Altronix. The power supply shall be equipped with a failsafe input trigger circuit and five individually protected outputs. (Electromagnetic Door holders shall not be powered by an FACP or remote NAC power supplies).

Q. Bells shall be System Sensor polarized type and operated by 24 VDC. Bell shall be powered from FACP or Remote NAC power supply. When used as a notification appliance to indicate fire sprinkler water flow the bell shall be directly controlled by contacts in the associated flow switch. Addressable relays or control modules shall not be used to supervise sprinkler bells. Bell assemblies shall provide separate wire leads for in or out wiring for legs of associated signal circuits. Bells shall be vibrating type providing a minimum sound pressure level output of 84 - 87 dB at ten feet. Bells shall be ten inches in diameter, finished with baked-on red enamel paint, UL listed for fire alarm installation, and suitable for surface or semi-flush mounting. Provide a sign adjacent to the water flow bell with one inch tall and 3/8 inch stroke white lettering on a bright red background. The sign shall read: "NOTIFY FIRE DEPARTMENT WHEN ALARM SOUNDS".

R. Water-flow Switches:

1. Water-flow switches shall be Potter Electric or equal. Vane-type water-flow switches shall be installed on system piping as designated on Drawings or as required. Detectors shall install on clear pipe spans of appropriate nominal size, either a vertical or horizontal run, at least six inches from fittings or valves which may change water direction, flow rate or pipe diameter, and not closer than 24 inches to valves or drains. Detector shall respond to water-flow in specified direction after a preset time delay that is field adjustable. Actuation mechanism shall include a polyethylene vane inserted through a hole in the pipe and connected by a mechanical linkage to delay mechanism. Output shall consist of ten amps (dual SPDT switches form-C contacts). A conduit entrance for standard electrical conduit fittings shall be provided on detectors. Detectors shall be listed by UL for indoor or outdoor installation. No more than 18 inches of seal-tight flex may be used to connect the water flow or tamper switch to the site conduit system at any one location.

2. Sprinkler valve tamper switches shall be System Sensor for use with outside screw-and-yoke valves or for use with post indicating valves or equal, as indicated. Supervisory switch shall be installed on valves as designated on Drawings or as required. Switches shall be installed to not interfere with normal valve operation and shall be adjusted to operate within two revolutions of valve control or when stem has moved no more than 1/5 of distance from its normal position. Mechanism shall be housed in a weatherproof die cast metal enclosure, also providing a 3/4 inch tapped conduit entrance to incorporate necessary facilities for attachment to valve. Switch mechanism shall be furnished with a minimum rated capacity of ten amps at 125 VAC and 2.5 amps at 24 VAC. Entire installed assembly shall be tamper-resistant. Tamper switches shall be UL listed. No more than 18 inches of seal-tight flex may be used to connect the water flow or tamper switch to the site conduit system at any one location.

S. Universal Digital Alarm Communicator Transmitter shall be Notifier Model No. UDAC-2 (CSFM 7165-0028:0243/7165-0028:0224). The UDACT is an interface for communication of digital information between a fire alarm control panel and a UL-Listed central station.

1. The UDACT shall be compact in size, mounting in a standard module position of the fire alarm control cabinet. Optionally, the UDACT shall have the ability for remote mounting, up to 6000 feet from the fire alarm control panel. The wire connections between the UDACT and the control panel shall be supervised with one pair for power and one pair for multiplexed communication of overall system status.

2. The UDACT shall include connections for dual telephone lines (with voltage detect), per UL or NFPA or FCC Requirements. It shall include the ability for split reporting of panel events between up to three different telephone numbers.

3. It shall be completely field programmable from a built in keypad or laptop computer, and shall be capable of transmitting events in multiple formats.

4. Communication shall include vital system status such as:

   a. Independent Zone (Alarm, trouble, non-alarm, supervisory.

   b. Independent Addressable Device Status.

   c. AC (Mains) and Earth Fault.

   d. System Off Normal.

   e. 12 and 24 Hour Test Signal.

   f. Abnormal Test Signal (per UL Requirements).

   g. EIA-485 Communications Failure.

   h. Phone Line Failure.

5. The UDACT shall support independent zone or point reporting when used in the Contact ID format. This enables the central station to have exact details concerning the origin of the fire or response emergency.

6. The UDACT shall be supplied with two eight conductor, two to six foot long line cords. One end of the cords shall plug into the jacks on the UDACT. The other end of the cords shall plug into industry standard RJ-31X surface mounted telephone jacks. Install jacks in a screw cover box adjacent to the FACP if sufficient space is not available within the FACP, or adjacent fire alarm terminal cabinet. The line cords shall be installed in conduit when it is necessary to locate the jacks remotely from the FACP enclosure. The jacks shall be mounted to the rear of the box. The telephone number for each line shall be labeled on its respective jack.

T. Voice Evacuation System:

1. The Voice Evacuation Control (EVAC) Panel. The self-contained control panel shall be equipped with dual 25-watt audio amplifiers each with a single style Y (Class B) supervised 25 Vrms output circuit. The EVAC panel shall have the ability to record a minimum of two field-programmable messages of up to 60 seconds total duration with an integral microphone or an external source via an audio input jack. The messages shall be stored digitally onto a non-volatile EEPROM. The message(s) shall be individually field programmable for three, four, six, eight, or indefinite repeat while triggered by the host FACP. Any message being delivered at the time of the trigger circuit(s) reset shall not stop in mid-sentence but shall be completed to the end of the message. A tone generator shall be provided capable of emulating a field programmable lead-in or trailing alert tone or an Audible Emergency Evacuation Signal (Temporal Pattern). The EVAC panel shall be capable of electrically supervising in both active and standby conditions, the amplifier outputs, field wiring, message generator, tone generator, microphone and primary or secondary power supplies to an internal trouble relay(s). The trouble relay(s) contacts shall be accessible via a terminal strip and be configured and connected to report internal or external trouble conditions to the host FACP via the trigger circuit or a separate monitor module. The minimum of two trigger circuits shall be individually field-configurable for triggering with a NAC circuit or a supervised dry contact. The control panel shall be equipped with LED indicator lights for Power On, System Trouble, Message Generator Trouble, Tone Generator Trouble, Microphone Trouble, Battery Trouble, Charger Trouble, Ground Fault, Output Circuit Trouble and Amplifier Supervisory. The panel shall be equipped with an internal monitor speaker for reviewing the field recorded messages. The primary power supply shall operate at 120 VAC through a dedicated 20 amp. circuit and shall be capable of charging 18 AH lead acid batteries. Provide two 12 volt batteries that will provide a secondary power source for the same or longer duration than is required by the host FACP. An auxiliary 24 volt DC power output shall be provided for use by an associated addressable control module. The EVAC control panel shall be triggered either directly by the associated FACP with a NAC circuit or by an addressable control module. Provide 3/8 inch minimum P Touch labeling on the window in front of the built in microphone indicating that "THE INTERNAL MICROPHONE IS TO BE USED FOR THE RECORDING OF ANNOUNCEMENTS ONLY. NOT FOR USE BY STAFF OR FIRE DEPARTMENT PERSONNEL."

2. Ceiling Mounted eight-inch EVAC Speakers shall be mounted in a Notifier Model CBB-8 back box or equal. The speaker assembly shall be supplied with a white 12 inch round metal grill. The 8 inch speaker shall have an impedance of 8 ohms, minimum 9.5 ounce magnet and an attached 25 volt audio line matching transformer with 1/8, 1/4, 1/2, 1, 2, 4 and 8 watt tap settings and DC blocking capacitor. Wattage shall be selectable by the use

of a jumper or shunt. Audio levels shall be 75, 78, 81 87, 90 or 93 dba at ten feet. Input or output terminals that will accommodate 12 to 18 AWG wire shall be provided. Speakers orientated in the same direction shall be connected in phase with each other. Multiple speakers in areas such as Auditoriums or Gymnasiums shall be divided into two circuits in a checker board pattern and connected separately to the two audio output circuits.

3. Wall Mount four-inch EVAC Speakers shall be mounted on a manufacture recommended outlet box. When mounted on a surface mount outlet box, Provide a Model No. BBS-SP201R surface mount backbox skirt. The speaker assembly shall be supplied with a square high impact red grill. The four inch speaker shall have an attached 25 volt audio line matching transformer with 1/4, 1/2, 1 and 2 watt tap settings and a DC blocking capacitor. Wattage shall be selectable by the use of a jumper or shunt. Audio levels shall be 80, 84, 86 or 89 dba at ten feet. Input or Output terminals that will accommodate 12 to 18 AWG wire shall be provided. Speakers orientated in the same direction shall be connected in phase with each other; but when installed facing opposite directions they shall be connected out of phase.

U. Network Cables or SLC or Annunciator Data or Audio Output Cables: The construction and physical characteristics such as aqua-seal water block, wire gage, insulation and jacket types, etc. shall not be altered. Equivalent cables must be specifically approved and recommended by the manufacturer of the fire alarm system equipment. Substitutions will require review from the Architect or Engineer of Record.

V. The cable types listed below are based and specified on the recommendations of Notifier Fire Alarm Systems. If the submitted fire alarm system requires a different cable configuration with additional conductors, multi-conductor versus twisted pairs, etcetera, other than as is specified above, then request a substitution to supply and install the configuration of cables by the make and model of the fire alarm system that is to be installed.

1. Indoor Network and EVAC System Audio Output Circuit(s) applications shall be in conduit or in surface mounted raceway as indicated on drawings: West Penn No. D980, one pair 18 gage solid copper, unshielded, Copolene II insulated and PVC jacketed, or equal.

2. Indoor SLC applications in conduit or in surface mounted raceway where it is indicated on drawings: West Penn No. D990, one pair 16 gage solid copper, unshielded, Copolene II insulated and PVC jacketed, or equal.

3. Indoor Annunciator applications in conduit or in surface mounted raceway where it is indicated on drawings: West Penn No. D975, one pair 18 gage solid copper, shielded, Copolene II insulated and PVC jacketed, or equal.

4. Outdoor or Underground Network Applications: West Penn AQ224, two-conductor 18 gage stranded copper, unshielded, water-blocked construction and PVC insulated, or equal.

5. Outdoor or Underground SLC applications: West Penn AQ225, 2-conductor 16 gage, AQ226, 2 conductor 14 gage, or AQ227, 2 conductor 12 gage stranded copper, unshielded water-blocked construction and PVC insulated, or equal.

6. Outdoor or Underground Annunciator applications: West Penn AQ293, 2 conductors, 18 gage stranded copper, shielded water-blocked construction and PVC insulated, or equal.

W. Protective Covers

1. Provide protective covers for pull stations, smoke and heat detectors, and audible and visual devices located in areas occupied by students that can be subjected to vandalism such as gyms, restrooms, locker and shower rooms, and all hallways and corridors associated with these spaces. Installation of cover must not protrude over current ADA limitations.

PART 3 - EXECUTION

3.01 GENERAL

A. Fire alarm system shall not be used for any purpose other than fire alarm functions.

B. Fire alarm shall be interconnected but not limited to the following systems:

1. Systems required by code to be connected to the fire alarm systems shall be connected.

2. Public address system for disabling the manual and automatic bell or tone class passing signals. Manual and automatic class passing signals shall not be operable during alarm conditions.

3. Ventilation systems where required for the purpose of fan shutdown

4. Damper control or smoke management systems.

5. Water based fire sprinkler systems.

6. Chemical fire extinguisher systems.

7. Central and Autonomous PA system(s).

8. Theatrical lighting control system.

9. Elevator controls for the purpose of elevator cab Phase 1 recall and shunt trip control, circuit supervision and shunt trip power supervision.

10. Fire pump controller for required signaling and trouble supervision.

C. Fire alarm system shall not be interconnected to any of the following:

1. Sump warning systems,

2. Carbon monoxide detection systems.

3. Methane gas detection systems.

4. Elevator car alarm bell circuit.

5. Other unrelated system.

3.02 SYSTEM INSTALLATION

A. Install required conductors to devices indicated on Drawings. Provide required conductor terminations to devices for a complete system to function as specified and indicated on Drawings. Refer to Section 26 0519: Low-Voltage Wire (600 Volt AC), for installation and color coding Requirements.

B. Splices are not allowed in junction boxes. Terminations shall be in terminal cabinets or on equipment terminals.

C. Conductors shall be installed within conduits, boxes, and terminal cabinets in a totally enclosed installation. Furnish and install conductors required to connect incoming and outgoing circuits, including spare conductors, to terminal strips within terminal cabinets.

D. Wiring within equipment and terminal cabinets shall be installed to conform to contract documentation and NFPA 72 standards, and shall be terminated on terminal blocks having terminals for required connections. Wiring shall be cabled, laced, and securely fastened in place so that no weight is imposed on equipment or terminals.

E. Install required terminal blocks within terminal cabinets. Terminal blocks shall be installed on inside back of cabinets only, not on side. Incoming wiring shall be terminated on the left side of terminal blocks; outgoing wiring shall be terminated on the right side of the terminal blocks.

F. Conductors shall be color-coded per specification section 26 0519 Low Voltage wires and tagged with code markers at terminal cabinets, and equipment. A wire index shall be typed and installed on terminal cabinet doors. Index shall be covered with clear plastic adhesive covers. Wiring shall be identified as to building and location of devices in the index.

G. Wiring within equipment and terminal cabinets shall be carefully strapped, and shall be formed in rectangular configuration. Wires shall be properly numbered in numerical order and shall maintain same number throughout the Project site.

H. Complete installation shall comply with local building codes and applicable provisions of the California Electrical Code, California Fire Code and the NFPA 72 National Fire Alarm Code.

I. Location of outlet boxes and equipment on Drawings is approximate, unless dimensions are indicated. Do not scale Drawings to determine locations and routing of conduits and outlet boxes. Location of outlet boxes and equipment shall conform to architectural features of the building and other Work already in place, and must be ascertained in the field before the start of Work.

J. Drawings generally indicate Work to be provided, but do not indicate all bends, transitions or special fittings required to clear beams, girders or other Work already

in place. Investigate conditions where conduits are to be installed, and furnish and install required fittings.

K. Provide P-touch label of approximately one inch wide with red lettering for each initiating device that is hidden from view. Tags shall indicate the name and type of device: Heat Detector, or Duct Smoke Detector. Tags shall be permanently attached on access panel or t-bar grid which is used to access a hidden device.

L. Provide smoke and heat detectors in elevator hoist-ways if a fire sprinkler head is located at the top of the elevator hoist-way. Provisions shall be made for access to the detector without entering the elevator hoist-way. Access shall be provided through an approved enclosure with self-locking fire rated door. The detectors shall be so placed as to allow service to them without the service personnel having to reach into the hoist-way in the way of travel of the elevator car. Access to elevator hoist-ways and machine rooms (including escalators) must be supervised by the Owner's licensed elevator or escalator maintenance contractor. OAR is responsible for coordinating access in accordance with Contractor's schedule. Contractor shall provide a minimum of 48 hours' notice.

M. Provide adjacent to each annunciator a neatly typewritten copy of the Fire Alarm Operating Instructions. The instructions shall reflect the installed and programmed features of the system. Instructions that include information on non-installed or programmed features will not be acceptable. The instructions shall be placed into a suitably sized dark colored wood or metal frame with a glass document face cover. The frame shall be attached to the wall with a minimum of two screws into the wall material with appropriate anchors.

N. Provide adjacent to each annunciator a neatly drawn site map showing rooms with designations and buildings with names as programmed into the system. This map shall be sized to allow (normal vision) reading of the designations, names etc. A map so reduced in size to the point of not being readable will not be acceptable. This map shall include symbols indicating the locations of installed fire sprinkler flow switches, riser shut off valves, post indicating valves and manual pull stations. Provide a symbol list on the map for the symbols used. The site map shall be placed into a suitably sized dark colored wood or metal frame with a glass document face cover. The frame shall be attached to the wall with a minimum of two screws into the wall material with the appropriate anchors.

3.03 SYSTEM PROGRAMMING

A. Programming shall be performed in accordance with District Requirements set forth in this section – the local authority having jurisdiction and applicable codes. If a conflict arises or a clarification is required, the contractor through the project's OAR shall contact the Districts Fire Life Systems Testing Group (FLSTG) for clarification

B. As part of the 50 percent construction completion label devices and locations in the manner indicted in the attached guidelines on a separate copy of the shop drawings. Request a meeting with OAR, Project Inspector, and representative of FLSTG to review, finalize and obtain approval of the proposed device, equipment and location

descriptors that will be programmed into the system. The District may at time of substantial completion request minor changes to program descriptors if needed to conform to site conditions.

C. The following functions and features as required by the site or system configuration and installed peripheral equipment and systems shall be programmed into LAUSD fire alarm systems. The definition of programming shall include but not be limited to the use of a built in keyboard, the use of a connected PC with the appropriate software, dip or rotary switches, wiring or installable or removable jumpers as required or provided in the fire alarm equipment.

1. Signal Silence Switch Inhibit: The audible signal silence switch located on the remote fire alarm annunciator(s) or any fire alarm control panel(s) shall be programmed to not silence the audible or extinguish the visual alarm circuits during the first minute (60 seconds) of alarm activation. Activation of this switch shall silence only the audible signals. Enabling or disabling this feature shall be allowed only if approved by the local Fire Marshal and District's Supervising Electrical Engineer, and authorized District maintenance personnel. The activation feature shall be protected by a maintenance level password.

2. Fire Sprinkler Water Flow Audible Appliance: The fire sprinkler water flow appliance (bell) shall not require any programming but shall be directly controlled by a set of dry contacts within the associated sprinkler water flow switch(s). The 24 volt DC auxiliary power for the sprinkler water flow audible appliances shall be supplied by an FACP or a remote power supply. This audible appliance shall operate continuously during the detection of fire sprinkler water flow and shall not be coded in any manner nor silenced automatically by any FACP or manually by any user controls at any FACP or remote annunciator.

3. Fire Sprinkler Water Flow Switch: Fire sprinkler water flow switches shall be programmed in a manner that shall prevent the above Signal Silence Switch from silencing the audible coded signals or visual signals after the initiation of an alarm by a fire sprinkler flow switch.

4. Audible Notification Appliance Circuits: Audible notification appliance circuits shall be programmed to emulate the temporal code (ANSI S 3.41) from fire alarm audible appliances (horns). This coding shall originate and be controlled by a single coder residing within the FACP(s). The use of coders within remote power supplies either mounted adjacent to an FACP or at a remote location or directly by an audible notification appliance will not be permitted. Programmable audible notification appliances shall be configured to emulate a steady tone at approximately 1000 Hz. Audible notification appliance circuits shall be programmed to be silenced as described above. Notification appliance circuits throughout the site shall be activated by any alarm initiating device. Coded audible signals shall be controlled by a single synchronized FACP.

5. Visual Notification Appliance Circuits: Visual notification appliance circuits shall be programmed to provide steady non-coded power to the visual appliances (strobes). As required by code and the system configuration, a synchronization signal shall be superimposed onto the NAC by the FACP, a remote power supply or an add-on synchronization module. Visual notification appliance circuits shall be programmed to be extinguished as described above. Visual notification appliance circuits throughout the site shall be activated by any alarm initiating device.

6. System Reset Button: The system reset button located on FACPs and remote annunciators in addition to resetting the fire alarm system and silencing or extinguishing notification appliances except for the sprinkler water flow appliances shall be programmed to reset analog and addressable smoke detectors, duct detectors, beam detectors and relays, addressable control modules and addressable relay modules used to interface to other systems and equipment. Each installed system reset button shall be programmed to operate as a "single point of reset" for the complete system.

7. HVAC Shutdown: Relays and addressable relay modules used to interface to HVAC equipment dampers, and supply and exhaust fan motors shall be programmed to shut down this equipment only within the same building where the detection of smoke, heat, carbon monoxide or fire sprinkler water flow has taken place. Manual pull stations within any building shall not affect the operation of the HVAC equipment. These relays shall return to normal only after the system is reset.

8. Elevator Recall: The addressable relay modules for the primary and alternate elevator recall function shall be programmed to activate only with the detection of smoke by a detector located in the elevator machine room, elevator hoistway or the main floor or alternate floor landing(s) smoke detector associated with that elevator or bank of elevators. Recall of an elevator shall be on a per-elevator or on a per-bank of elevators basis. Activation of other initiating devices shall not cause the recall of an elevator.

9. Fire Fighter Warning: In conjunction with the above elevator recall function, an additional addressable relay module shall be programmed to operate only with the detection of smoke by a detector located in an elevator machine room or elevator hoistway to provide a warning signal to fire fighters attempting to use the phase II elevator function.

10. Elevator Shunt Trip: The addressable control module or MR control relay for the elevator shunt trip shall only be activated by the heat detector located within the elevator machine room or elevator hoistway for each elevator or bank of elevators. Circuit integrity, and AC and DC power to the MR control relay shall be electrically supervised. Activation of other initiating devices shall not operate the shunt trip.

11. Smoke Detector Maintenance Alert: Addressable smoke detectors shall be programmed with the capability of initiating a maintenance alert when any one detector becomes obscured by dust or any other contaminates at approximately 10 percent below the level of obstruction that would initiate an alarm.

12. Disabling Class Passing Signals: The relay or addressable relay module shall be programmed to disable the class passing signals during any alarm condition at the site. This relay or addressable module shall return to normal only after the system is reset.

13. Disabling Audio of a Public Address System: The relay or addressable relay module shall be programmed to mute the audio output of the associated public address system during any activation of an audible notification appliance circuit or a voice evacuation announcement. This or these relays shall automatically restore to normal upon the silencing of the audible NACs and the voice evacuation announcement.

14. Release of Electro-Magnetically Held Doors: The relay or addressable relay module shall be programmed to open or close the control circuit as needed of the 24 volt DC door holder power supply. This relay(s) shall operate during any alarm condition within the same building as the door holders. The contacts shall return to normal only after system reset.

15. Illumination of House Lighting: The relay or addressable relay module shall be programmed to turn on to full brilliance the house lighting of an Auditorium, MP Room, etc. during any alarm condition at the site. This relay or addressable module shall return to normal only after the system is reset.

16. UDACT: The FACP and the associated Universal Digital Alarm Communication Transmitter shall be programmed to transmit to the central monitoring station separate indications for General Alarm, Fire Sprinkler Water Flow Alarm, System Trouble and Supervisory Conditions. These indications shall be in addition to any indications initiated by the UDACT itself.

17. Voice Evacuation Panel: The NAC originating at, or the addressable control module controlled by the associated FACP that is controlling the EVAC panel shall be programmed to emulate the above paragraph “E” Audible Notification Appliance Circuits except that it shall be non-coded. Trouble conditions at the EVAC panel shall report back to the associated FACP via the controlling NAC or addressable control module or a separate addressable monitor module. Transformer taps at the EVAC speakers shall be selected to provide the proper balance of audio volume in larger and smaller areas. The message shall be programmed in a female voice in the English language as follows: A minimum of two but no more than three cycle sounding of an approximate 1000 Hz tone in the pattern of the NFPA required temporal code followed by: “May I have your attention please. May I have your attention please”. The fire alarm has

been activated in the building. The fire alarm has been activated in the building. Please proceed to the nearest exit and leave the building." The sounding of the temporal patterned signal followed by the indicated message shall repeat indefinitely until the controlling NAC is reset.

18. Power Failure Reporting Time Delay: Main and remote NAC power supplies shall be programmed to delay the reporting of a site AC power failure for a minimum of 6 hours.

D. Device Descriptors:

1. Descriptors shall enable responding personnel to identify the location of a fire quickly and accurately, and shall indicate the status of emergency equipment or fire safety functions that might affect the safety of occupants. The minimum required information for devices intended to report smoke, fire, or fire sprinklers water flow include, but may not be limited to: Building, floor (if multiple floors exist in the building), room or space description, and device type and digital address (Smoke detector, Heat detector, Fire sprinkler water flow switch, etc.)

   a. Building: The building must always be included in the descriptor, even if there is only one building one the site. Additional building(s) may be added at a later date creating the possibility of confusion by similar designated spaces, such as "Work room" or "Staff restroom" if more than one building has these similar designated spaces. The building designation in the descriptor must be what the site-based personnel call the building. The building should be provided with signage to aid fire department personnel in the identification of the building.

   b. Floor: In multi-floor buildings the floor designation (1st, 2nd, etc.) must be included in the descriptor.

   c. Room Description: The room or space description must be unique. Using the same designation for multiple spaces, such as "Workroom", "Counselor's Office", or "Men's restroom", etc. is not acceptable. If, during a project, the room numbers or the use of the room changes then the room or space descriptor must be changed to agree with the change. Proper signage should be provided for each space to aid fire department personnel in the identification of the room or space.

   d. Device Type, Address and Compass Designations: The device type and digital address must be included with the descriptor, such as smoke detector or heat detector, etc. Some systems provide this information automatically in the descriptor. Compass designations, (N, S, E, and W) are required in spaces such as corridors where there are multiple detectors and this information would be helpful to responding fire department personnel in locating the device reporting alarm. It is not necessary to include compass

designations in smaller spaces where there are multiple detectors located in close proximity to each other.

E. ACCEPTABLE ABBREVIATIONS

Rm.- Room	Bldg.- Building	Smk. - Smoke
Corr.- Corridor	Lby- Lobby	Asst. - Assistant
Eng.- English	N – North	Nrs. - Nurse
Flr.- Floor	S – South	Cnclr - Counselor
Ht.- Heat	E – East	Off. - Office
Lib.- Library	W – West	PE – Physical Education
Lkr. – Locker	Kit- Kitchen	RR- Rest Room
Stu Str – Student Store	Sci - Science	By = near
Stor Rm – Store Room	Café - Cafeteria	PM – Plant Manager
1st- First	2nd- Second	3rd- Third
Hopr Rm – Hopper Room	Det - Detector	Elev - Elevator
Prin – Principal	Blr Rm – Boiler Room	Conf – Conference
Park – Parking	Bsmt –Basement	MPR.- Multi-Purpose room

3.04 SYSTEM OPERATION

A. Unless otherwise specified, but not limited to actuation of manual stations, smoke detectors, heat detectors, linear heat or smoke detectors, or water-flow switches shall cause the following operations to occur, refer to Attachment B:

1. Activate audible circuits.
2. Actuate strobe units until the panel is reset or strobe circuit time-out.
3. Release magnetic door holders to doors to adjacent zones on the floor from which the alarm was initiated.
4. Where required, return elevators to the primary or alternate floor of egress.
5. Smoke detectors in elevator lobbies shall, in addition to the above functions, return elevators to the primary or alternate floor of egress.
6. Smoke detectors in elevator machine rooms or tops of hoist-ways shall return elevators to the primary or alternate floor. Smoke detectors or heat

detectors installed to shut down elevator power shall perform this function in accordance with ANSI A 17.1 Requirements and shall be coordinated.

7. Duct type smoke detectors shall, in addition to the above functions, shut down the ventilation system or close associated control dampers as required.

8. Activation of fire sprinkler system low-pressure switches, post indicator valve or tamper switches shall initiate a system supervisory alarm indication.

9. UL listed central station shall be notified via – Universal Digital Alarm Communicator Transmitter (UDACT).

3.05 TESTING

A. A 48 hour notice shall be provided to the Project Inspector before final testing.

B. Testing of fire detection system shall be as required by the State Fire Marshal and local authorities having jurisdiction. Installer is responsible for identifying required testing, coordinating, scheduling, and conducting tests before Substantial Completion. Tests shall include the following:

1. Operation of signal-initiating devices (smoke detectors, heat detectors, pull stations etc.).

2. Operation of indicating devices (alarm horns, alarm bells and alarm strobes).

3. Operation of system features under normal operation.

4. Operation of system supervisory features.

5. Operation of system features on standby power, with primary power turned off.

6. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.

7. Close sprinkler system flow valves and verify proper supervisory alarm at the FACP.

8. Verify activation of flow switches.

9. Open initiating device circuits and verify that trouble signal actuates.

10. Open signaling line circuits and verify that trouble signal actuates.

11. Open and short notification appliance circuits and verify that trouble signal actuates.

12. Open and short (wire only) network communications and verify that trouble signals are received at network annunciators or reporting terminals.

13. Ground initiating device circuits and verify response of trouble signals.

14. Ground signaling line circuit and verify response of trouble signals.

15. Ground notification appliance circuit and verify response of trouble signals.
16. Check alert tone to alarm notification devices.
17. Check installation, supervision, and operation of intelligent smoke detectors.
18. Alarm conditions that the system is required to detect shall be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.
19. When the system is equipped with optional features, consult the manufacturer manual to determine proper testing procedures.
20. Theatrical lighting house light control override.
21. Central and Autonomous PA systems for muting during the sounding of the audible notification appliances and voice evacuation announcements.
22. Disabling electronic tone or electromechanical bell class passing signals until system reset.

C. Upon completion of installation of fire alarm equipment, provide to the OAR a signed, written statement confirming that fire alarm equipment was installed in accordance with the Specifications, Shop Drawings, instructions and directions provided by the manufacturer.

D. Demonstrate in presence of the Project Inspector that circuit and wiring tests are free of shorts and grounds and that installation performs as specified herein and within manufacturer's guidelines.

E. Software Modifications:

1. Provide the services of a factory trained and authorized technician to perform system software modification, upgrades or changes. Response time of the technician to the Project site shall not exceed 24 hours.
2. Provide hardware, software, programming tools, and documentation necessary to modify the fire alarm network on the Project site. Modification includes: addition and deletion of devices, circuits, zones and changes to system operation and custom label changes for devices or zones. The system structure and software shall place no limit on the type or extent of software modification on-site. Modification of software shall not require power-down of the system or loss of system fire protection while modifications are being provided.

F. Complete the inspection and testing form as required by NFPA 72, and submit one copy of the completed form to the Architect and Project Inspector.

3.06 SERVICE MANUALS

A. Deliver to OAR, three copies of the service manuals. Each manual shall include the following:

1. Installation manuals, programming manuals and user manual if applicable for every control panel, control panel power supply, FACP input or output or relay or control module, auxiliary power supply, UDACT, remote NAC extender power supply, door holder power supplies, installed annunciators, initiating and indicating devices and addressable monitor, relay and control modules. Catalog cut sheets are not acceptable.

2. A printed copy of the system configuration as programmed, including system labeling codes, and passwords.

3. An electronic copy on compact disk of the system configuration program

4. Final test report.

5. Detailed explanation of the operation of the system.

6. Instructions for routine maintenance.

7. Detailed wiring diagram for the connection of relays, addressable monitor, and control or relay modules as applied in the interfacing of peripheral systems or equipment to the fire alarm system. Updated shop drawings shall include revisions made in the field via plan changes, RFIs, Field Change Directives, and any other construction change documents including interface details with ancillary systems.

8. An electronic copy (CD) of the posted site or fire alarm map in Auto-Cad and pdf formats.

9. Provide a CD ROM electronic copy of the updated system As-Built Drawings to the OAR, prepare this copy in the latest version of AutoCAD; along with the electronic copy provide a full size bond copy. Include one CD-ROM of the up-dated As-Built Drawings into each of the Service Manuals. CD and folded drawings shall be secured and inserted into the Service Manuals via a three-hole punched protective CD case and protective envelopes for the drawings.

10. Provide codes and passwords for fire alarm system at testing.

3.07 SPARE PARTS

The following new spare parts shall be furnished in unopened boxes:

1. Five percent spare pull stations including the associated monitor module (minimum one spare pull station per type).

2. Five percent spare smoke and heat detectors (minimum one spare smoke and heat detector per type).

3. Five percent spare audible devices (minimum one spare audible device per type).

4. Five percent spare strobe devices (minimum one spare strobe device per type).

3.08 SYSTEM USER AND MAINTENANCE PERSONNEL TRAINING

A. Before Substantial Completion, provide one instruction period for the Project site based Owner operators and system users. The instruction period shall be scheduled and coordinated by the OAR.

B. Training materials and required deliverables shall be submitted to the OAR.

1. Prior to beginning the operational demonstration, notify Central monitoring Station that an instructional activity is beginning; inform them that it includes setting and resetting the system in test mode. After the demonstration is completed and the system restored, notify the Central Monitoring Station that the system has been restored and it is back on line for continuous monitoring.

C. User Instruction and Training

1. Before substantial completion and with a fully functional fire alarm system installed at the site, the contractor shall provide a minimum of four hours of user training for site based staff. The date and time for this training shall be coordinated by the project OAR.

D. Instruction period training for site based staff shall consist of the following:

1. Overview:

a. Explain the fire system is “addressable” which means every device-smoke detector, heat detector, sprinkler water flow switch, manual pull station, etc. has a unique address or identity. This makes it possible to positively identify the exact device causing an alarm, trouble or supervisory condition.

b. Explain the fire alarm control panel also controls the horns and strobes throughout the campus or building.

c. Explain that the fire alarm system is interconnected to various other systems and equipment throughout the site such as:

1) Elevators to recall them to the main floor or to an alternate floor and as an option dependent circumstances turn off the power to the elevators.

2) Heating and air conditioning equipment to turn off fans and close dampers to stop the spread of smoke throughout a building.

3) The class passing signaling system to disable the bells or tones to not accidentally signal students and staff to return to the buildings.

4) Magnetically held doors to close them to stop the spread of smoke.

5) To turn up house lighting in an occupied Auditorium or Multi-Purpose room to provide adequate egress lighting.

6) The Central and Autonomous PA systems to mute them during the sounding of the alarm signal.

d. Explain the fire system has a battery backup in case of power failure and that it will continue to function for a minimum of 24 hours after a total power failure.

e. Explain that the fire alarm system components and wiring are monitored to report a malfunction, damage or vandalism. When this occurs, a trouble indication will appear on the fire alarm annunciator and FACP and this indication will be transmitted to the central monitoring station.

f. Explain that other equipment and systems are monitored for abnormal conditions such as the fire sprinkler water being turned off. When this occurs, a supervisory condition is created. A supervisory indication will appear on the fire alarm annunciator and FACP and this indication will be transmitted to the central monitoring station.

g. Explain that the fire system in addition to notifying the occupants of a possible fire condition also transmits an alarm indication to the central monitoring station that will in turn notify and dispatch the local fire department to your site.

2. Basic:

a. Hand out the SYSTEM OPERATION instructions to attendees.

b. Point out the Fire Alarm Control Panel and have them observe the normal LED status (one green LED only should be on):

1) GREEN = Normal.

2) YELLOW = Trouble.

3) RED = ALARM.

c. Have the attendees observe the LCD display that should be indicating a SYSTEM NORMAL message.

d. Point out the Fire Alarm System Annunciator and have attendees observe the LCD display that should be indicating a SYSTEM NORMAL message.

3. Operation and Demonstration:

   a. After putting the system or having someone put the system central station monitoring into the test mode demonstrate the following:

   b. Activate a Manual Pull Station to demonstrate ALARM.

      1) Demonstrate audible and visual notification appliances and if installed the voice evacuation signal announcement.

      2) Demonstrate panel or annunciator sounder tone for ALARM.

      3) Have staff SILENCE system.

      4) Show LCD display and LED of alarm.

      5) Demonstrate and have staff reset the manual pull station.

      6) Have staff RESET fire system.

   c. Activate Smoke Detector with canned smoke to demonstrate address identification:

      1) Have staff SILENCE system.

      2) Show LCD and display LED of ALARM.

      3) Have staff RESET fire system.

   d. Remove Smoke Detector to demonstrate SYSTEM TROUBLE.

      1) Demonstrate panel or annunciator sounder tone for TROUBLE.

      2) Have staff SILENCE system.

      3) Show LCD display and LED of TROUBLE.

      4) Replace the smoke detector.

      5) Have staff RESET fire system.

   e. Remove power to demonstrate function during power failure.

      1) Have staff SILENCE system.

      2) Show LCD display and LED of TROUBLE.

      3) Activate Manual Pull station to demonstrate audible or visual functions in power failure mode.

      4) Reset manual pull station.

      5) Reset fire system.

      6) If applicable, point out sprinkler riser and shut off valves.

      7) Show location of a water flow switch.

      8) Show location of a valve tamper switch.

9) Point out valves must always be OPEN or fully counter clock wise.

10) Point out PIV (Post Indicator Valves) if applicable.

11) Have water flow through the inspectors test valve and point out the ringing water flow bell.

12) After the horns are silenced by an assistant, show that the water flow bell is ringing continuously indicating water flow.

13) Have the assistant turn off the inspectors test valve to show that water flow alarm bell turns off.

14) Reset system.

15) Unlock and turn off a PIV or riser valve to show a supervisory condition.

16) Turn valve back on, lock the valve open and demonstrate the end of the indication of a supervisory condition.

4. Training documentation.

a. Insure fire panel is reset and indicates normal and central station monitoring is taken off of the test mode.

b. Have staff attendees sign off training sheet and provide a copy to the PROJECT INSPECTOR.

3.09 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.10 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

END OF SECTION

FIRE ALARM SYSTEMS - APPROVED SYSTEMS COMPONENTS - ATTACHMENT A

LOS ANGELES UNIFIED SCHOOL DISTRICT FACILITIES SERVICES DIVISION

FIRE ALARM SYSTEMS APPROVED COMPONENTS - ATTACHMENT A

TYPE	EQUIPMENT	NOTIFIER		EDWARDS SYSTEMS TECHNOLOGY		SIMPLEX - GRINNELL		SIEMENS BUILDING TECHNOLOGIES		JOHNSONS CONTROLS		FCI - GAMEWELL	
		Catalog No.	CSFM No.	Catalog No.	CSFM No.	Catalog No.	CSFM No.	Catalog No.	CSFM No.	Catalog No.	CSFM No.	Catalog No.	CSFM No.
Controls	FACP	NFS2-640	7165-0028:0243	EST3	7165-1657:0186	4100-9311	7165-0026:0251	FC922-US	7165-0067:0264	IFC2-640	7165-0554:0153	E3 SERIES	7165-1708:0125
		NFS2-3030	7165-0028:0224	NA	NA	4100-9311	7165-0026:0252	FC924-US	7165-0067:0264	IFC2-3030	7165-0028:0149	S3 SERIES	7165-1708:0176
	Network Control Annunciator	NCA-2	7165-0028:0224	EST3-LCDANN	7120-1657:0193	4608-9101	7120-0026:0179	FT2015-US	7165-0067:0264	JNCA-2	7165-0554:0153	NGA	7165-1708:0125
	Remote Annunciator (with Microphone)	LCD2-80 or 160	7165-0028:0224	EST3-LCDANN	7120-1657:0193	4608-9101	7120-0026:0179	FT2008-U1	7165-0067:0264	LCD2-80 or 160	7165-0554:0153	LCD-E3 or LCD-SLP	7165-1708:0125
	Remote Annunciator-Power Supply	FCPS-24S6	7315-0028:0225	EST BPS6A, BPS10A	7300-1657:0229	4009-9601	7300-0026:0375	PAD-4	7315-0067:0268	FCPS-24S6	7315-0054:122	HPFS24S6	7315-1637:0102
	Voice Evacuation System	NFC-50/100 DVC-EM Digital Voice Command	6911-0028:0265 7165-0028:0224	EST3-ASU/4 Audio Source Unit with 3-ZAxx Zoned Amplifier	7165-1657:0186	4100-9311	7165-0026:0251	FV920-EK	7165-0067:0264	JDVC	7165-0554:0153	Fire VAC IV	7300-1708:0168
	Manual Pull Stations	NBG-12LX	7150-0028:0199	EST SIGA-270	7150-1657:0129	4099-9021	7150-0026:0224	HMS-D	7150-0067:0036	JBG-12L	7165-0554:0149	MS-7	7150-1708:109
		NBG-12LO B (exO)	7150-0028:199	EST MPSR SERIES	7150-1657:0236			HMS-M	7150-0067:0036	JBG-12LOB	7165-0554:0153	MS-7 W/SB-I/O	7150-1708:109
	Smoke Detectors	FPTI-951 WHITE FPTI-951-IV	7272-0028:0510	SIGA-PD	7272-1657:0831	4098-9714	7272-0026:0218	OP921	7272-0067:0258	2951J	7272-0554:145	ASD-PTI2F	7272-1708:0121
	Smoke Detector Base	B210LP	7272-0028:0206	SIGA-SB4	7300-1657:0120	4098-9792	7300-0026:0217	DB-11	7300-0067:0134	B210LP	7272-0028:0206	B210LP	7272-1708:0121
	Heat Detectors	FST-951R WHITE FST-951R-IV	7270-0028:0196	SIGA-HRD	7270-1657:0833	4098-9733	7270-0026:0216	HB21	7272-0067:0261	5951J	7270-0554:133	ATD-RL2F	7270-1708:0115
	Heat Detector Base	B210LP	7270-0028:196	SIGA-SB4	7300-1657:0120	4098-9792	7300-0026:0217	DB-11	7300-0067:0134	B210LP	7270-0028:196	B210LP	7270-1708:0115
	Heat Detectors for High temperature spaces (e.g. atics)	FST-951 WHITE FST-951-IV	7270-0028:0196	EST2808-PL SERIES	7270-1657:0109	5602 (SysSensor)	7270-1658:0167	DT-135R/DT-200R	7270-0067:0026	5951HJ	7270-0554:133	ATD-HL2F	7270-1708:0115
	Explosion Proof Automatic Heat Detectors (Thermotech)	302-EPM-135	7270-0021:0001	302-EPM-135	7270-0021:0001	302-EPM-135	7270-0021:0001	DT-225EP	7270-0067:0026	30-3003	7270-0021:0001	302-EPM-135	7300-1708:0131
	Base (Killark Electric)	JL Threaded Hub	NA	JL Threaded Hub	NA			ADAPT PLATE	7270-0067:0026	JL Threaded Hub	NA	CPU20-50 (APPLETON)	N/A
	Weather Proof Automatic Heat Detectors (Thermotech)	302-ET-135	7270-0021:0001	302-ET-135	7270-0021:0001	302-ET-135	7270-0021:0001	DT-135WP/DT-200WP	7270-0067:0026	30-2021E-24	7270-0021:0001	302-ET-135	7300-1708:0131
	Duct Smoke Detectors	FSP-951R and FSP-951R-IV	7272-0028:0206	ESTSIGA-DH housing with SIGA-PS Duct smoke detector	3240-1657:0108 / 7272-1657:0126	4098-9755	3240-0026:0241	FDBZ492	3240-0067:0265	DNR	3242-1653:209	ASD-PL2FR W/ DNR	7272-1708-0121
		751PL(A)	3242-1653:0209	NA	NA	4098-9751	3240-0026:0220	FDBZ-WT	3240-0067:0265	2951J	7272-0554:145	ASD-PL2F W/DNR	7272-1708-0121
	CO Detectors	FSCO-951, FPC-951	5278-0028:0511	ESTSIGA2-HCOS	5278-1657:0800	4098-9770	7272-0026:0330	OOHC941	7272-0067:0260	2951COJ	7275-0028:0264	CO1224 SERIES	5278-1658:0219
	Multi-Media Criteria Detector	FCO-951 WHITE FCO-951-IV	7272-0028:0510	ESTSIGA-PHCD	7263-1657:0832			OOH941	7272-0067:0260	2951TMJ	7272-0028:0295	MCS-ACCLIMATE2F	7272-1708:0121
	Projected Beam Detectors	FSOSHRI	7260-0028:0509	System Sensor Beam 1224S	7260-1653:0168	4098-9019	7260-0026:0377	PB-191	7260-1506:0100	FS8200	7260-0028:228	ABD-2F	7260-1708:0120
	Projected Beam Detectors Remote Key Stations	RTS451KEY	7300-1653:0212	RTS151KEY	7300-1653:0212			TSM-1X	7300-0067-0501	RTS451KEY		RTS151KEY	7300-1653:0212
	Linear Heat Detector (Protector wire)	PHSC-190-EPR	7270-0854:0101	ProtectoWire PHSC-190-EPR	7270-0854:0101	PHSC-190-EPR	7270-0854:0101	N/A	N/A	PHSC-190-EPR	7270-0854:0101	PHSC-190-EPR	7270-0854:0101
	Monitor Module	FMM-1	7300-0028:0219	ESTSIGA-CT1 ESTSIGA-CT2	7300-1657:0121	4090-9001	7300-0026:0223	HTRI-M	7300-0067:0244	M300MJ	7165-0554:0153	AMM-4F	7300-1703:0102
	Control Module	FCM-1	7300-0028:0219	ESTSIGA-CC1	7300-1657:0121	4090-9002	7300-0026:0223	HTRI-S	7300-0067:0244	M300CJ	7165-0554:0153	AOM-2SF	7135-1703:0102
	Relay Module	FRM-1	7300-0028:0219	ESTSIGA-CR, SIGA-CRH	7300-1657:0121	4090-9008	7300-0026:0311	XTRI-R	7300-0067:0501	M300RJ	7165-0554:0153	AOM-2RF	7135-1703:0102
		MR-101	7300-1004:0101	MR-101	7300-1004:0101	4090-9010	7300-0026:0311	HTRI-R	7300-0067:0244	M300RJ	7300-1004:0101	MR-101	7300-1004:0101
	Strobe Synchronization Module (System Sensor)	MDL3R	7300-1653:0130	NA	NA			DSC-W	7300-0067:0212	DSM-12/24	7300-1653:0130	MDL3R	7300-1653:0130
	Power Supply Relay (Air Products PAM-3 Relay Module)	A77-716B	7300-1004:0101	A77-716B	7300-1004:0101			HTRI-R	7300-0067:0244	A77-716B	7300-1004:0101	A77-716B	7300-1004:0101
	Isolator Module	ISO-X	7165-0028:0214	ESTSIGA-IM	7300-1657:0121	4090-9116	7300-0026:0252	HLIM	7300-0067:0244	M500XJ	7300-0554:152	M500X	7300-1653:0103
	Universal Digital Alarm Communicator Transmitter	UDACT-2	7165-0028:0243	EST3-MIO DCOM	7165-1657:0186	4100-9311	7165-0026:0251	FCA2015-U1	7165-0067:0264	UDACT-2	7165-0554:0153	411 SERIES	7300-0075:174
	Door Holder/ Releases	FM Series	3550-0028:0210	EST 1500 Series (EDWARD SIGNAL)	3550-1501:0137	DH-Series by RSG	3550-1039:0100	SDH-2A	NA	Fm Series	3550-0028:0210	FM Series	3550-0028:0210
Annunciators and Other Devices													
	Alarm Horns/Strobes (System Sensor)	P2RL(wall)	7135-1653:0503	ESTG1RF-VM (wall strobe)	7125-1657:0218	49AV-WRF	7320-0026:0373	ZH-MC-W	7125-0067:0248	P2RL(wall)	7135-1653:0503	P2RL(wall)	7135-1653:0503
		PC2RL (ceiling)	7135-1653:0503	ESTGCF-VM (ceiling strobe)	7125-1657:0219	4906-9128	7125-0026:0317	ZH-MC-CW	7125-0067:0248	PC2RL (ceiling)	7135-1653:0503	PC2RL (ceiling)	7135-1653:0503
	Alarm Horns (weather Proof) (System Sensor)	HRK with BBS-2 Skirt	7135-1653:0189	EST757-1A-T, WITH 757A-WB BACK BOX	7135-1657:0188, 7300-1657:0191	AH-24WP-R	7125-0785:0131	AS-HMC-R-WP	7125-0067:0296	HRK with BBS-2 Skirt	7135-1653:0189	HRK with BBS-2 Skirt	7135-1653:0189
	Horns (System Sensor)	HR	7135-1653:0189	EST757 SERIES	7125-1657:0184	49AO-WRF	7135-0026:0372	ZH-W	7125-0067:0248	HR	7135-1653:0189	HR	7135-1653:0189
	Mini Alert Sounders	NA	NA	ESTG1RF-HD (horn)	7135-1657:0230			MH-W	7135-0067:0246	NA	NA	N/A	N/A
	Exterior Speakers	SPKR	7320-1653:201	ESTGENESIS WG4 SERIES	7320-1657:0239			SET-177-CW-WP	7125-0067:0296	SPKR	7320-1653:201	SPKR	7320-1653:201
	Voice Evacuation System 8" Speakers (Wheelock)	SS-70-25	7320-0785:0164	ESTGC SERIES	7320-1657:0211	49HF-APPLC	7300-0026:0322	S-HQ-MC-W	7320-0067:0243	SS-70-25	7320-0785:0164	SS-70-25	7320-0785:0164
	Voice Evacuation System 5" Speakers (Wheelock)	SPRV	7320-1653:0201	ESTG4 SERIES	7320-1657:0211			NA	NA			SPRV	7320-1653:0201
	Ceiling Speaker/Strobe	SPSCRL	7320-1653:0505	ESTGENESIS GC SERIES	7320-1657:0211	49HFV-APPLC	7300-0026:0322	SEH-MC-CW	7320-0067:0275	SPSCRL	7320-1653:0505	SPSCRL	7320-1653:0505
	Wall Mounted Speaker/Strobe	SPSWL	7320-1653:0505	ESTGENESIS G4 SERIES	7320-1657:0211	49HFV-APPLW	7300-0026:0322	SEH-MC-W	7320-0067:0275	SPSWL	7320-1653:0505	SPSRL	7320-1653:0505
	Strobes	SRL (wall)	7135-1653:0504	ESTGENESIS SERIES	7125-1657:0218	49VO-WRF	7135-0026:0373	ZR-MC-W (Wall)	7125-0067:0252	SRL (wall)	7135-1653:0504	SRL (wall)	7135-1653:0504

FIRE ALARM SYSTEMS - APPROVED SYSTEMS COMPONENTS - ATTACHMENT A
LOS ANGELES UNIFIED SCHOOL DISTRICT FACILITIES SERVICES DIVISION

FIRE ALARM SYSTEMS APPROVED COMPONENTS - ATTACHMENT A		NOTIFIER		EDWARDS SYSTEMS TECHNOLOGY		SIMPLEX - GRINNELL		SIEMENS BUILDING TECHNOLOGIES		JOHNSONS CONTROLS		FCI - GAMEWELL	
TYPE	EQUIPMENT	Catalog No.	CSFM No.	Catalog No.	CSFM No.	Catalog No.	CSFM No.	Catalog No.	CSFM No.	Catalog No.	CSFM No.	Catalog No.	CSFM No.
		SCRL (ceiling)	7135-16530504	EST GENESIS SERIES	7125-16570219	4900-APPLC	7135-00260373	ZR-MC-CW (Ceil.)	7125-00670252	SCRL (ceiling)	7135-16530504	SCRL (ceiling)	7135-16530504
	Bells - Indoor (System Sensor)	SSM-24-10	7135-16530217	EST 439D-10AW(R)	7136-16570150	MB-G10-24-R	7135-07850113	B10-115-R	7135-00670137	SSM-24-10	7135-16530217	SSM-24-10	7135-16530217
	Bells - Outdoor (with WP Box)	SSM-24-10	7135-16530217	EST 439D-10AW(R) WITH EST CAT#4-B BOX	7136-16570150	MB-G10-24-R	7135-07850113	MBDC-10	7135-00670137	SSM-24-10	7135-16530217	SSM-24-10	7135-16530217
	Water Flow Supervisory Switches	OSYZ	7770-16530118	OSYZ	7770-16530118	OSYZ	7770-16530118	OSYZ	7770-16530118	OSYZ	7770-16530118	OSYZ	7770-16530118
		PIBVZ	7770-16530118	PIBVZ	7770-16530118	PIBVZ	7770-16530118	PIBVZ	7770-16530118	PIBVZ	7770-16530118	PIBVZ	7770-16530118
	Water Flow Switches - Vane Type (Potter Electric)	VSR-F	7770-03280001	VSR-F	7770-03280001	VSR-F	7770-03280001	VSR-F	7770-03280001	VSR-F	7770-03280001	VSR-F	7770-03280001
	Electromagnetic Door Holders Power Supply (Altronix)	AL400ULM - 3 Amps	7315-13350100	AL400ULM - 3 Amps	7315-13350100	AL400ULM - 3 Amps	7315-13350100	AL400ULM - 3 Amps	7315-13350100	AL400ULM - 3 Amps	7315-13350100	AL400ULM - 3 Amps	7315-13350100
		AL600ULM - 6 Amps	7315-13350100	AL600ULM - 6 Amps	7315-13350100	AL600ULM - 6 Amps	7315-13350100	AL600ULM - 6 Amps	7315-13350100	AL600ULM - 6 Amps	7315-13350100	AL600ULM - 6 Amps	7315-13350100
		AL1024ULM - 10 Amps	7315-13350100	AL1024ULM - 10 Amps	7315-13350100	AL1024ULM - 10 Amps	7315-13350100	AL1024ULM - 10 Amps	7315-13350100	AL1024ULM - 10 Amps	7315-13350100	AL1024ULM - 10 Amps	7315-13350100
	Door Holders Power Supply (Reliable Security Group)	DH Series	3550-10390100	DH Series	3550-10390100	DH-Series by RSG	3550-10390100	DH Series	3550-10390100	DH Series	3550-10390100	DH Series	3550-10390100
	Sprinkler Bell Tamper Switches (System Sensor)	PIBVZ	7770-16530118	PIBVZ	7770-16530118	PIBVZ	7770-16530118	PIBVZ	7770-16530118	PIBVZ	7770-16530118	PIBVZ	7770-16530118
	Sprinkler Bell Tamper Switches (System Sensor)	OSYZ	7770-16530118	OSYZ	7770-16530118	OSYZ	7770-16530118	OSYZ	7770-16530118	OSYZ	7770-16530118	OSYZ	7770-16530118
Cables													
	Indoor Network Applications	West Penn D980		West Penn D990		West Penn D980		West Penn D980		West Penn D980		West Penn D990	
	Indoor SLC Applications	West Penn D990		West Penn D990		West Penn D990		West Penn D990		West Penn D990		West Penn D990	
	Indoor Annunciator Application	West Penn D975		West Penn D990		West Penn D975		West Penn D975		West Penn D975		West Penn D990	
	Outdoor Underground Network Application	West Penn AQ224		West Penn AQ225		West Penn AQ224		West Penn AQ224		West Penn AQ224		West Penn AQ224	
	Outdoor Underground SLC Application	West Penn AQ225		West Penn AQ225		West Penn AQ225		West Penn AQ225		West Penn AQ225		West Penn AQ225	
	Outdoor Underground Annunciator Application	West Penn AQ293		West Penn AQ225		West Penn AQ293		West Penn AQ293		West Penn AQ293		West Penn AQ225	

Notes:

(1) Utilize a power supply that meets current specifications.

(2) The District is standardizing on key operated metal pull stations. Utilize approved Notifier units.

FIRE ALARM SYSTEMS - SEQUENCE OF OPERATIONS - ATTACHMENT B

LOS ANGELES UNIFIED SCHOOL DISTRICT FACILITIES SERVICES DIVISION

FIRE ALARM SYSTEM SEQUENCE OF OPERATIONS																
DEVICE/ACTION	Manual Pull Stations	Area Smoke Detectors	Area Heat Detectors	Beam Detectors	Sprinkler Water Flow	Sprinkler Bell Tamper Switch	Power Failure	Kitchen Fire Suppression	Elevator Machine Room Smoke Detector	Elevator Lobby Smoke Detector	Elevator Machine Room Heat Detector	Hoistway Heat Detector	Fire Pump Controller	Notes
Annunciate alarm at FACP and Remore Annunciator	X	X	X	X	X			X	X	X	X	X		
Annunciate supervisory condition at FACP and Remote Annunciator						X							X	
Annunciate trouble at FACP and Remote Annunciator	X	X	X	X	X	X	X	X	X	X	X	X	X	[1]
Activate Audible/Visual Signal Throughout School (Alarm)	X	X	X	X	X			X	X	X	X	X		
Contact Central Station (UDACT)	X	X	X	X	X	X	X	X	X	X	X	X	X	
Mute Local Public Address System	X	X	X	X	X			X	X	X	X	X		
Disable Passing Signals	X	X	X	X	X			X	X	X	X	X		
Shut down Air Handling Equipment		X	X	X	X				X	X	X	X		[2]
Close Smoke/Fire Dampers		X	X	X	X				X	X	X	X		[3]
Close Smoke and Fire Doors		X	X	X	X			X	X	X	X	X		[4]
Turn on general house lighting	X	X	X	X	X			X	X	X	X	X		[5]
Elevator Power Shunt Trip											X	X		
Elevator Recall									X	X				[6]
Sound Sprinkler Bell					X									

NOTES:

[1] Indicate trouble on wiring fault or device as required.

[2] Shut down only air handler equipment in the building or area where alarm condition occurs.

[3] Close only smoke and fire dampers in the building or area where alarm condition occurs.

[4] Close only smoke and fire doors in the building or area where alarm condition occurs.

[5] In Multi-Purpose Rooms, Auditoriums, and similar areas equipped with lighting controls, the geneal house lighting shall come to full bright in the event of a fire alarm condition.

[6] Recall only the elevators in the building where the alarm condition has occurred

SECTION 31 2319

EXCAVATION AND FILL FOR STRUCTURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Excavating, backfilling, and compacting for buildings and structures.

2. Fill materials.

B. Related Requirements:

1. Division 01 - General Requirements.

2. Section 01 4524 - Environmental Import/Export Materials Testing.

3. Section 31 1000 - Site Clearing.

4. Section 31 2200 - Grading.

5. Section 31 2616 - Excavation and Fill for Paving.

1.02 PROJECT REQUIREMENTS

A. Import and Export of Earth Materials:

1. Fees: Pay as required by authorities having jurisdiction over the area.

2. Bonds: Post as required by authorities having jurisdiction over the area.

3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

1.03 SUBMITTALS

A. Imported Soils: A Geotechnical Engineer, retained by the Owner as an Owner Consultant, will obtain initial product Sample for testing in accordance with the terms of Article 3.05 of this Section.

B. Shoring calculations as required in Article 3.03 of this Section.

1.04 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement: Standard Specifications for Public Works Construction, current edition, except as modified herein.

B. Sampling, testing, and certification of imported and/or exported soils shall be performed in accordance with Section 01 4524 - Environmental Import/Export Materials Testing.

1.05 TESTING

A. OWNER will retain a Geotechnical Engineer as an OWNER Consultant who will provide observations, tests, inspections and approvals identified in the Contract Documents as being responsibility of OWNER.

B. Imported Soils: The Geotechnical Engineer will obtain initial product Sample for testing in accordance Article 3.05 of this Section.

1.06 PROJECT CONDITIONS

A. Information on Drawings or in soils report does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.

PART 2 - PRODUCTS

2.01 FILL AND BACKFILL MATERIALS

A. Fill and backfill materials shall be a granular material previously removed from excavation, or imported fill material, free of large clods and stones larger than 3 inches, foreign materials, vegetable growths, sod, expansive soils, rubbish and debris. Material shall conform to these specified requirements and related sections.

B. Fill material exhibiting a wide variation in consistency and or moisture content shall be blended and/or aerated to stabilize and upgrade the material.

C. Imported Fill Material:

1. Provide suitable materials obtained from Project site excavations for earthwork and fill materials. If excavated materials are not of suitable quality or sufficient quantity, import additional materials as necessary.

2. Imported fill shall be a granular material with sufficient binder to form a firm and stable unyielding subgrade and shall not have more than 60 percent of fines passing 200 mesh sieve. Material shall have a coefficient of expansion of not more than two percent from air dry to optimum moisture content and not more than six percent from air dry to saturation. Imported material shall be clean and free of rubbish, debris and toxic or hazardous contaminants. Adobe or clay soils are not permitted.

D. Brick rubble and broken concrete originating from the Project site shall be legally disposed of off the Project site No such materials shall be imported from outside the Project site.

E. Permeable Backfill:

1. Provide permeable backfill material behind retaining structures consisting of gravel, crushed gravel, crushed rock, natural sands, manufactured sand, or combinations of these materials conforming to the following gradations:

Sieve Size	Percentage Passing
3/4 inch	100
3/8 inch	80 to 100
No. 100	0 to 8
No. 200	0 to 3

2. Those portions of fill material passing a No. 4 sieve shall provide a sand equivalent of at least 60.

3. Provided backing for weep-holes shall consist of two cubic feet of aggregate in burlap sacks, securely tied. Aggregate shall conform to requirements for No. 3 concrete aggregate as specified in subsection 200-1.4 of the Standard Specifications for Public Works Construction.

4. Permeable Backfill Alternate Materials: Instead of the materials specified for retaining structures backfill, a drainage matting system, Miradrain by Mirafi, Inc., or equal, may be provided if reviewed and approved by the ARCHITECT.

PART 3 - EXECUTION

3.01 GENERAL

A. Before initiating intrusive activities, contact Underground Service Alert of Southern California (USA or Dig Alert) to obtain a Dig Alert ticket for location information on buried public and USA member utilities and pipelines at least 48-hours prior to beginning work. A copy of the Dig Alert ticket shall be forwarded to the OWNER. For on-site utilities, retain a state-licensed third party underground utility locating service.

B. Clear the Project site as indicated in Section 31 1000 - Site Clearing.

3.02 PROTECTION

A. Protect and guard excavations against danger to life, limb, and property as required by, but not limited to, Cal-OSHA regulations.

B. Protect adjacent existing improvements including landscaping against damage.

C. Shore, crib, or lag excavations and earthen banks as necessary to prevent caving-in, erosion or gullying of sides.

D. Divert or de-water excavations until concrete is placed, forms are removed, and backfilling is complete.

3.03 SHORING

A. Provide shoring as necessary to properly and safely support earth sides of excavations, curbs, sidewalks, gutter, drives and stairs, against movement and collapse.

B. Design and Calculations: Provide in accordance with requirement of Cal-OHSA. Remove shoring upon completion of Work, or when no longer needed.

3.04 EXCAVATION

A. Form sides of footings, pads, grade beams, and slab foundations, unless otherwise indicated. Provide excavations of sufficient size to permit installation and removal of forms and other Work as required.

B. Machine-drill excavation for round footings to size and depth indicated. Provide a collar or casing, or other adequate protection, to exclude dirt and debris. Protect excavations with plank covers until concrete is placed.

C. Provide excavation bottoms level and free from loose material. Excavate to indicated or required elevations of undisturbed earth.

D. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. If soil becomes soft, soggy, or saturated, excavate to firm undisturbed soil and fill as required. Slope adjacent grades away from excavations to minimize entry of water.

E. Calculate excavation quantities based on elevations or depths indicated on Drawings.

F. Provide 2,000 psi concrete for backfill of over-excavated areas to indicated or required elevations.

G. Special preparation of bottom of excavated planes areas: Excavate areas designated on Drawings as bottom of excavated planes (B.E.P.), by excavating and filling to indicated grades and elevations.

3.05 IMPORT/EXPORT OF MATERIALS

A. Provide fill materials as specified in Part 2- Products. If excavated materials from the Project site are not of required quality or sufficient quantity, import additional materials as necessary.

B. In addition to the requirements of this Section, import and/or exported materials shall comply with the requirements of Section 01 4524 - Environmental Import/Export Materials Testing.

C. Imported fill materials will be sampled by the Geotechnical Engineer for compliance with the requirements of Part 2 of this Section.

D. The geotechnical engineer will submit all samples to a DSA approved independent testing laboratory for testing.

E. Initial sampling will be performed by the Geotechnical Engineer before importing material to the Project site. Identify the location of the source site in addition to the address, name of the person and/or entity responsible for the source site. The

Geotechnical Engineer will obtain both the initial sample and additional samples from the identified site and will submit samples to the approved independent testing laboratory for testing.

F. The Geotechnical Engineer will perform additional sampling during import operations. If the total quantity of import is determined to be greater than 1,000 cubic yards of material, one sample shall be obtained and submitted for testing for each 250 cubic yards of imported material. If the total quantity of import is determined to be less than 1,000 yards, one sample shall be obtained and submitted for testing for each 100 cubic yards of imported material.

G. The independent approved testing laboratory will perform the required tests and report results of tests noting if the tested material passed or failed such tests and will furnish copies to the Project Inspector, ARCHITECT, OAR, DSA, CONTRACTOR, and others as required. Report shall state tests were conducted under the responsible charge of a licensed State of California professional engineer and the material was tested in accordance with applicable provisions of the Contract Documents, CBC and the DSA. Upon completion of the Work of this Section, the independent testing laboratory and Geotechnical Engineer will submit a verified report to the DSA as required by CBC.

H. Bills of lading or equivalent documentation will be submitted to the Project Inspector on a daily basis.

I. Upon completion of import operations, provide the OAR a certification statement attesting that all imported material has been obtained from the identified source site.

3.06 BACKFILLING

A. After concrete has been placed, forms removed and concrete Work inspected, backfill excavations to indicated or required grades. Backfill simultaneously on each side of walls or grade beams. Remove rubbish, debris, and other waste materials from excavations before placing backfill.

B. Before installing backfill, adequately cure concrete and provide bracing to stabilize structures. Protect waterproofing or dampproofing against damage during backfilling operations with required protection board. Remove bracing as backfill operation progresses.

C. Do not furnish or install expansive soils for below grade building walls.

D. Install each layer of material in a not to exceed thickness of 6 inches, unless otherwise required.

E. Rigidly control the amount of water to be installed to provide optimum moisture content for type of fill material furnished. Do not over-saturate or compact by flooding or jetting.

F. Install wall backfill before installing railings and fences on walls.

G. Impervious backfill materials shall be installed in layers along with and by the same methods specified for structure backfill. Impervious backfill materials shall be at the approximate grade and elevation and where exposed to erosion, shall be covered with at least a 12-inch layer of fill material as reviewed by the Geotechnical Engineer.

H. Install weep hole drainage at the backside of walls so the backing completely covers the weep holes, is horizontally centered and extends at least 12 inches above the bottom of the weep opening. Provide an 8-inch square section of 1/4 inch galvanized or aluminum screen, with a minimum wire diameter of 0.03 inch, and install at the backside of each weep hole before installing the backfill material.

I. Where a reviewed drainage matting system is provided instead of permeable backfill for retaining structures, install in accordance with the manufacturer recommendations.

3.07 COMPACTING

A. Compact each layer of fill material by tamping, sheepsfoot rollers or pneumatic-tired rollers, to such extent as to provide specified relative compaction. At inaccessible locations, compact to specified requirements with hand-held, operated and directed compaction equipment.

A. Unless otherwise indicated, compact each layer of fill material to a relative compaction of at least 95 percent.

B. Do not compact by flooding or jetting.

C. When fill materials, or a combination of fill materials, are encountered or provided which develop densely packed surfaces as a result of installation or compacting operations, scarify each layer of compacted fill before installing the next succeeding layer.

3.08 INSPECTION AND TESTING

A. The Geotechnical Engineer will inspect and test excavations, sample material quality as required in Part 2, and observe installation and compaction of fill materials.

B. The Geotechnical Engineer will sample imported fill materials from their designated source before delivery to the Project site.

C. Installation of backfill shall be observed by the Geotechnical Engineer.

D. The Geotechnical Engineer will inspect and test excavation Work before the installation of fill and/or other materials.

E. Compaction: Test compaction in accordance with ASTM D1557, Method C.

F. The Project Inspector will inspect foundation excavations when completed and ready for forms, after forms are in place and before first placement of concrete.

3.09 PROTECTION

A. Protect the Work of this Section until Substantial Completion.

3.10 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 31 2323

EXCAVATION AND FILL FOR UTILITIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Excavating, backfilling, and compacting utility trenches such as water, gas, irrigation, storm drain, sewer lines, concrete-encased conduits, and manholes, vaults, valve boxes, catch basins, underground tanks, thrust blocks, yard boxes, pull boxes and other utility appurtenances.

B. Related Requirements:

1. Division 01 - General Requirements.

2. Section 01 4524 - Environmental Import/Export Materials Testing.

3. Section 31 1000 - Site Clearing.

4. Section 31 2200 - Grading.

5. Section 31 2316 - Excavation and Fill for Paving.

6. Section 31 2319 - Excavation and Fill for Structures.

7. Section 32 0117 - Pavement Repair.

8. Section 32 1313 - Site Concrete Work.

9. Division 22 - Plumbing.

10. Division 26 - Electrical.

1.02 PROJECT REQUIREMENTS

A. Import and Export of Earth Materials:

1. Fees: Pay as required by authorities having jurisdiction over the area.

2. Bonds: Post as required by authorities having jurisdiction over the area.

3. Haul Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

1.03 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement: Standard Specifications for Public Works construction, current edition except as modified herein.

B. Sampling, testing, and certification of imported and/or exported soils shall be performed in accordance with Section 01 4524 - Environmental Import/Export Materials Testing.

1.04 TESTING

A. OWNER will retain a Geotechnical Engineer as an OWNER Consultant who will provide observations, tests, inspections and approvals identified in the Contract Documents as being responsibility of OWNER.

B. Imported Soils: The Geotechnical Engineer will obtain initial product Sample for testing in accordance Article 3.02 of this Section.

1.05 PROJECT CONDITIONS

A. Information on Drawings or in soils report does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Bedding material from trench bottom to one foot above the pipe:

1. Sand, gravel, crushed aggregate or native free-draining granular material providing a sand equivalent of at least 30 or a coefficient of permeability greater than 1.4 inches per hour.

2. Sand complying with the Specifications for cement concrete aggregates.

B. Backfill Materials:

1. Excavated trench material to be installed for backfilling shall be clean, free of large clods, and stones larger than 2 ½-inch in any dimension.

2. Cement-sand slurry shall be provided with one sack of cement per cubic yard of the mixture.

3. Imported Fill Material: Imported fill material shall be a granular material with sufficient binder to form a firm and stable unyielding subgrade and shall not have more than 60 percent of fines passing a 200 mesh sieve. Material shall provide a coefficient of expansion of not more than two percent from air dry to optimum moisture content and not more than six percent from air dry to saturation. Imported materials shall be clean and free of rubbish, debris, and toxic or hazardous contaminants. Adobe or clay soils are not permitted.

PART 3 - EXECUTION

3.01 GENERAL

A. Before initiating intrusive activities, contact Underground Service Alert of Southern California (USA or Dig Alert) to obtain a Dig Alert ticket for location information on buried public and USA member utilities and pipelines at least 48-hours prior to beginning work. A copy of the Dig Alert ticket shall be forwarded to the OWNER. For on-site utilities, retain a state-licensed third party underground utility locating service.

B. Barricade trenches, ditches, pits, sumps, and similar Work outside the barricaded working area with chain link fence as specified in Section 01 5000, Construction Facilities and Temporary Controls, and in accordance with Cal-OSHA standards and requirements.

C. Saw-cut concrete or bituminous paving for trench installation.

D. Trenches over 5 feet in depth shall conform to the Cal-OSHA.

E. Where indicated and required to excavate in lawn areas, protect adjoining lawn areas outside of the Work area. Replace or install removed sod upon completion of backfill by installing sod level with adjacent lawns. If installation of removed sod fails, furnish sod and install to match existing lawns.

F. Backfill over excavations to the required elevations with earth, gravel, sand, or concrete and compact as required. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. Slope adjacent grades away from excavations to minimize entry of water.

G. Do not install piping lengthwise under concrete walks without review by the ARCHITECT.

H. Do not excavate trenches parallel to footings closer than 18 inches from the face of the footing or below a plane having a downward slope of two horizontal to one vertical, from a line 9 inches above bottom of footings.

1. Unless otherwise indicated on Drawings, depth of excavations outside the buildings shall allow for a minimum coverage above top of pipe, tank, or conduit measured from the lowest adjoining finished grade, as follows:

Steel Pipe	24 inches below finished grade
Copper Water Tube	18 inches below finished grade
Cast-Iron Pressure Pipe	36 inches below finished grade
Plastic Pipe (other than waste)	30 inches below finished grade
Tanks or other structures	36 inches below finished grade
Soil, Sewer & Storm Drain	minimum 18 inches below finished grade, and as required for proper pitch and traffic load. (Install polypropylene sewer pipe with at least 24 inches coverage)

Irrigation Pipe:	nonpressure pipe 12 inches, pressure pipe 24 inches

2. Trench width shall provide ample space for fitting and joining. Excavate for piping bells and fittings, bell and spigot pipe and other fittings.

I. Unless indicated otherwise, excavate trenches to the required depths for utilities, such as pipes, conduit and tanks, with minimum allowances of 6 inches at the bottom and 6 inches at the sides for bedding of unprotected piping or as required for concrete encasement of conduits as indicated on Drawings. Grade bottom of trenches to a uniform smooth surface. Remove loose soil from the excavation before installing sand bedding or concrete encasement.

J. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. If soil becomes soft, soggy, or saturated, excavate to firm undisturbed soil and fill as required. Slope adjacent grades away from excavations to minimize entry of water.

K. Provide a minimum clear dimension of 2 inches from sides of wall excavation to outer surfaces of buried pipes or conduits installed in the same trench or outside surfaces of containers and tanks.

L. Do not install backfill until required inspections and testing is completed.

M. Backfill electrical or other excavated utility trenches located outside of barricaded installation areas within 24 hours after inspection by the Project Inspector.

N. Install backfill materials in layers not exceeding 4 inches in thickness and compact to 90 percent of the maximum density.

O. If materials excavated from the Project site are not permitted for trench backfill in paved areas, backfill trenches with a cement-sand slurry mix. Install backfill to an elevation of the existing undisturbed grade plus one inch.

P. Install and compact sand bedding to provide a uniform full length bearing under piping and conduits.

Q. Where portions of existing structures, walks, paving, or other improvements are removed or cut for piping or conduit installation, replace the material with equal quality, finished to match adjoining existing improvements. Repair pavement as specified in Section 32 0117, Pavement Repair.

3.02 IMPORT/EXPORT OF MATERIALS

A. Provide fill materials as specified in Part 2, Products. If excavated materials from the Project site are not of required quality or sufficient quantity, import additional materials as necessary.

B. In addition to the requirements of this Section, import and exported materials shall comply with the requirements of Section 01 4524, Environmental Import/Export Material Testing.

C. Imported fill materials will be sampled by the Geotechnical Engineer for compliance with the requirements of Part 2 of this Section.

D. The Geotechnical Engineer will perform the tests by utilizing an independent approved testing laboratory.

E. Initial sampling will be performed by the Geotechnical Engineer before importing material to the Project site. Identify the location of the source site in addition to the address, name of the person and/or entity responsible for the source site. The Geotechnical Engineer will obtain both the initial sample and additional samples from the identified site and shall submit all samples to the approved independent testing laboratory.

F. The Geotechnical Engineer will perform additional sampling during import operations. If the total quantity of import is determined to be greater than 1,000 cubic yards of material, one sample shall be obtained and submitted for testing for each 250 cubic yards of imported material. If the total quantity of import is determined to be less than 1,000 yards, one sample shall be obtained and submitted for testing for each 100 cubic yards of imported material.

G. The independent approved testing laboratory will perform the required tests and report results of all tests noting if the tested material passed or failed such tests and will furnish copies to the Project Inspector, ARCHITECT, OAR, DSA, CONTRACTOR, and others as required. Report shall state tests were conducted under the responsible charge of a licensed State of California professional engineer and the material was tested in accordance with applicable provisions of the Contract Documents, CBC and the DSA. Upon completion of the Work of this Section, the independent testing laboratory and Geotechnical Engineer will submit a verified report to the DSA as required by CBC.

H. Bills of lading or equivalent documentation will be submitted to the Project Inspector on a daily basis.

I. Upon completion of import operations, provide the OAR a certification statement attesting that imported material has been obtained from the identified source site.

3.03 INSPECTION AND TESTING

A. The Geotechnical Engineer will inspect and test excavations, sample material quality as required in Part 2, observe installation and compaction of fill materials.

B. Compaction test shall be performed in accordance with ASTM D1557, method "C."

3.04 PROTECTION

A. Protect the Work of this Section until Substantial Completion.

3.05 CLEANUP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

Addendum no. 1

SECTION 32 8416

IRRIGATION CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Weather based irrigation controllers.
2. Flow sensors.
3. Master valves.
4. Enclosures.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Division 22 - Plumbing.
3. Division 26 - Electrical.
4. Section 32 9113 – Lawns and Grasses.

1.02 PROJECT REQUIREMENTS

A. Provide an EvapoTranspiration (ET) weather based irrigation controller with capabilities to receive data from weather stations and sensing devices or servers to automatically adjust or terminate programmed watering schedules.

B. The controller must be capable of utilizing two way communications with server for remote programming and continuous control and monitoring of the central irrigation system from OWNER's designated location.

1.03 SUBMITTALS

A. Product Data: Provide catalog cuts, technical data, and manufacturer's specifications for each product provided.

B. Provide proof of purchase to the OWNER. OWNER will receive rebates as part of energy savings program.

C. Operation and Maintenance Manuals:

1. Provide complete operating and maintenance instruction manuals for each weather based irrigation controller provided.

2. Provide complete programming instructions for each weather based controller.

3. Provide documentation showing compliance with the California Code of Regulations, Title 23, Division 2, Chapter 2.7, Model Water Efficient Landscape Ordinance.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with local, municipal and state laws, rules, and regulations governing or relating to this Work. Wiring shall conform to National Electrical.

B. Conform to California Code of Regulations, Title 23 Division 2, Chapter 2.7, Model Water Efficient Landscape Ordinance.

1.05 PRODUCT HANDLING

A. Do not damage materials during handling, loading, unloading, and storage. Transport materials in a manner to avoid undue stress on products.

B. Packaging of weather based controller shall be sufficient to eliminate damage to the controller upon shipping.

1.06 TRAINING

A. Provide a minimum 4 hours of on-site installation training per site from each ET irrigation controller manufacturer. Training shall explain facets necessary to set up a centrally managed irrigation system. Training is to include drawings and handouts for trainee reference. Training shall be provided by an authorized representative of the controller manufacturer.

B. Provide a minimum 2 hours of on-site operation training per site from each ET irrigation controller manufacturer. Training shall demonstrate all irrigation control and hand held remote control programming features. Training shall be provided by an authorized representative of the controller manufacturer.

C. Provide 8 hours of central management system training from each weather based irrigation control manufacturer. Training, for designated OWNER personnel shall include generating reports from the Central Management Control Area to satisfy the Model Water Efficient Landscape Ordinance, requirements as well as operating and programming irrigation controllers using a remote personal computer. Training shall be provided by an authorized representative of the controller manufacturer.

D. Provide an attendance sheet to the OWNER listing personnel trained. The attendance sheet shall list the date and time and type of training and shall have signatures and contact information of all attendees including the instructor.

1.07 WARRANTY

A. Provide a five year manufacturer's warranty for controller units commencing from time of installation.

PART 2 – PRODUCTS

2.01 CENTRAL IRRIGATION CONTROLLERS

A. General:

1. Controllers shall be UL approved.

2. Controllers shall operate on 110 volts, single phase current, shall be completely automatic, and shall function with clock. Controllers output shall be at least 2 Amps and minimum 24 volts.

3. Controllers shall fully perform without soil moisture sensors, or mandatory telephone wires, repeaters or CAT5/Ethernet wiring.

4. Controllers shall have a Master Valve output circuit.

5. Controllers shall be capable of operating normally open or normally closed master valves.

6. After installation all ET weather based irrigation controllers shall be capable of being monitored and programmed from a single central location away from individual school sites.

7. Controllers shall have a built in flow metering circuit.

8. Controllers shall be capable of receiving EvapoTranspiration (ET) data to automatically adjust or terminate existing programmed watering schedules.

9. Weather based controllers shall be provided with appropriate antenna for wireless transceiver.

10. Weather based controllers with more than six stations shall be furnished with at least 3 extra stations for future use.

11. Weather based controllers shall be capable of fully operating without the need of excavating to conceal wiring infrastructure.

12. Controllers shall be capable of watering using (ET) Data without the need of a central monitoring station.

    a. Rain Master i-Central, Rain Bird ESP-LXME, or equal.

B. Communications Capabilities:

1. System shall be capable of wireless 2-way communications.

C. Programming Capabilities:

1. Controllers shall be capable of allowing programming changes to be performed at the controller and from a central irrigation management center away from individual school campuses.

2. Each controller shall be capable of being automatically updated with daily ET weather data.

3. System shall be capable of providing ET data from more than one source.

4. Controllers shall be able to pause or suspend irrigation automatically in real time.

5. Controllers shall be able to automatically read flow sensing equipment without adding on flow meter circuits.

6. Flow metering circuit shall provide high flow shutoff protection to individual remote control valves or circuits.

7. Controllers shall be capable of programming appropriate pipe size for accurate water consumption reports.

8. System shall be able to fully function using a hand held remote transmitter without additional set up requirements.

9. Controllers shall be password protected.

10. Controller management system shall not impose a security, infrastructure or product support impact on OWNER's ITD department.

11. Controllers shall be capable of producing water savings efficiency data reports required by state agencies.

D. Antenna:

1. Provide appropriate antenna type to allow complete operation of system.

2. After installation, antenna must communicate with server to produce two way communications in order to manage the central irrigation system on site and from a central irrigation management center designated by OWNER.

E. Weather Based ET Data:

1. Provide with each controller a one year subscription of weather based ET data for each irrigation controller requiring a subscription.

2.02 FLOW SENSORS

A. Spinning impeller type, brass or PVC tee as required and sized to accurately read irrigation system designed flow maximum and minimum.

1. Data Industrial Model IR Series or equal.

2.03 MASTER VALVES

A. Normally open, solid brass (ASTM B584, B271, B505), self-cleaning, automatic electric globe valve with manual flow control stem. Valve shall operate with pressures to 200 psi and shall be slow closing with one-piece molded diaphragm incorporated with an integral O-ring seal reinforced with 600 pound test fabric and be guaranteed for 15 years. Equip with an internal self-flushing filter and self-cleaning metering rod for dirty water. Plunger and solenoid coil shall be electroless nickel plated for corrosion protection. 24 VAC 3-way solenoid coil shall be guaranteed for the life of the valve.

1. Superior Controls Model 3300 Series, or equal.

2.04 ENCLOSURES

A. Controllers shall be provided with a lockable weather resistant housing enclosure for protection of control panel and wireless transceiver.

B. Pedestal Enclosures:

1. Shall be constructed with 14 gage stainless steel.

2. Shall include a 110 Volt GFI power outlet inside enclosure.

C. Wall Mounted Enclosures:

1. Shall be constructed with 18 gage stainless steel.

2. Shall include a 110 Volt GFI power outlet inside enclosure.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installations shall include at least one flow sensor and master valve.

B. Installation of irrigation controllers, flow sensors, master valves, antennas, cabinets, and enclosures will be the CONTRACTOR's responsibility unless otherwise specified.

3.02 MANUFACTURERS' FIELD SERVICES

A. Provide technical support to assure communication capabilities between controllers and sensing devices and between controllers and servers are within acceptable range for operation of the system.

3.03 MANUFACTURERS' TECHNICAL SERVICES

A. ET irrigation control manufacturers shall provide phone in technical support to OWNER's of their irrigation controllers.

END OF SECTION

Addendum no. 1

SECTION 32 9113

LAWNS AND GRASSES

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes the furnishing and installation of materials for lawns and grasses. Products shall be as follows or as directed by the OWNER. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 31 2200 - Grading.
3. Section 32 1313 - Site Concrete Work.
4. Section 32 8413 - Potable Water Irrigation.

C. Section Includes:

1. Sodding.
2. Turf Renovation.
3. Erosion-control material.

D. Definitions:

1. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
2. Finish Grade: Elevation of finished surface of planting soil.
3. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
4. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
5. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
6. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil

mixture best for plant growth.

7. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

8. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.

9. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.02 SUBMITTALS

A. Comply with provisions of Section 01 3300.

B. Product data: For each type of product indicated.

C. Certification of each seed mixture for turfgrass sod as directed.

D. Product Certificates: For soil amendments and fertilizers, from manufacturer.

E. USGA Sand based Rootzone import material with additives. Provide product data sheets, pre-mix source and location, plus a one gallon physical sample review.

F. Sod: Furnish certificate by grower for type, and trueness to name of grass variety or strain. Where or seed issued, provide quality to be delivered.

1.03 QUALITY ASSURANCE

A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

B. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory.

1. The soil-testing laboratory shall oversee soil sampling.

2. Report suitability of tested soil for turf growth.

a. State recommendations for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.

b. Report presence of problem salts, minerals, or heavy metals; if present, provide additional recommendations for corrective action.

1.04 DELIVERY, STORAGE AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

B. Sod: Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.

2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.

3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

1.05 MAINTENANCE SERVICE

A. See Specification Section 32 0190 for lawns & grasses Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Begin maintenance immediately after each area is planted and continue until acceptable turf is established.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Turfgrass Sod:

1. Turfgrass Sod: Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects. Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.

2. Turfgrass species (warm-season grass): Hybrid Bermudagrass (Cynodon dactylon).

3. Turf Grass species (cool season grass): Tall Fescue (Festuca arundinacea), Improved varieties, as specified on plans.

B. Elementary School/Primary Center:

1. General Sod Areas are to be sod or roll sod: Tall Fescues.

2. Multi Purpose field:

a. Sod or Roll Sod: Hybrid Bermuda.

C. Middle Schools/High Schools:

1. General Sod Areas:

a. Sod or Roll Sod: Tall Fescues.

2. Baseball/Softball (enclosed):

a. Infield: Sod or Roll Sod: Hybrid Bermuda.

b. Outfield: Big Roll Sod: Hybrid Bermuda.

3. Football/Soccer Field:

a. Big Roll Sod: Hybrid Bermuda.

4. Multi-Purpose Fields:

   a. Big Roll Sod: Hybrid Bermuda.

D. For USGA Sand Based Rootzone (if specified).

1. Root zone for sand based athletic turf and materials.
2. Pre-manufactured Sport Sand by Gail Materials, or Equal.
3. USGA Sand Growing Medium: Refer to detail on approved plans for depth.

   a. Sand shall meet the following gradation:

Sieve	Percent Retained
#10	<3%
#18	20-30%
#35 & #60	>50% combined
#100	<20%
#270	<5%
PAN	0-5% Combined

   b. CU coefficient between 2.5 - 5.0.

4. Amendments:

   a. Blend peat moss at the rate of 10% by volume. Final organic content shall be 0.4 - 0.8% by weight.

   b. Reed Sedge Peat Moss 10% by volume of mix.

   c. Lassenite Pozzolan porous ceramic soil amendment 5% 8X20 per cubic yard.

   d. Fertilizer 6-20-20 mix 15 lbs. per cubic yard.

   e. Gypsum, mix 50 lbs. per cubic yard.

   f. Mycorrhizal fungi - MycoApply® All Purpose granular material mix 1.5 pounds per 1,000 sq.ft.

   g. AxisDE® diatomaceous earth 10% by volume of mix.

5. Chemistry:

   a. Salinity: Saturation extract conductivity (ECe) shall be less than 3.0 dS, @ 25 degree C.

   b. Sodium: Sodium absorption ratio (SAR) shall be less than 6.0.

   c. Boron: Saturation extract concentration shall be less than 1.0 ppm.

   d. Reaction pH of saturation paste shall be 5.5 to 7.8 without height lime content.

6. Location:
    a. Use in designated field areas.
    b. Depth shall be per details.
7. Available through Gail Materials, Corona.

E. Inorganic Soil Amendments:

1. Lime: ASTM C602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
    a. Class T, with a minimum of 99 percent passing through No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through No. 60 (0.25-mm) sieve, or Class O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through No. 60 (0.25-mm) sieve.
    b. Provide lime in form of ground dolomitic limestone.
2. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, and with a minimum of 99 percent passing through No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through No. 40 (0.425-mm) sieve
3. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
4. Aluminum Sulfate: Commercial grade, unadulterated.
5. Perlite: Horticultural perlite, soil amendment grade.
6. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 (0.30-mm) sieve.
7. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

F. Organic Soil Amendments:

1. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) or 3/4-inch (19-mm) or 1/2-inch (12.5-mm), as directed, sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
    a. Organic Matter Content: 50 to 60 percent of dry weight.
2. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
    a. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. (2.4 kg/cu. m) of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. (4 kg/cu. m) of loose sawdust or ground bark.

3. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

G. Fertilizers:

1. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1 percent nitrogen and 10 percent phosphoric acid.

2. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

3. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

a. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

b. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

4. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

a. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

Or:

b. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

H. Planting Soils:

1. Planting Soil: ASTM D5268 topsoil, with pH range of 5.5 to 7 Imported topsoil or manufactured topsoil from off-site source. Verify suitability of soil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

a. Ratio of Loose Compost to Topsoil by Volume: 1:3.

b. Ratio of Loose Wood Derivatives to Topsoil by Volume: as directed by the OWNER.

c. Weight of Iron Sulfate per 1000 Sq. Ft.: as directed by the OWNER.

d. Weight of Agricultural Gypsum per 1000 Sq. Ft.: as directed by the OWNER.

e. Volume of Sand per 1000 Sq. Ft.: as directed by the OWNER.

f. Weight of Bonemeal per 1000 Sq. Ft.: as directed by the OWNER.

g. Weight of Superphosphate per 1000 Sq. Ft.: as directed by the OWNER.

h. Weight of Commercial Fertilizer per 1000 Sq. Ft.: as directed by the OWNER.

i. Weight of Slow-Release Fertilizer per 1000 Sq. Ft.: as directed by the OWNER.

I. Mulches:

1. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

a. Organic Matter Content: 50 to 60 percent of dry weight.

J. Erosion Control Materials:

1. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

2. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

3. Erosion-Control Mats: Cellular, non-biodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface, 4-inch nominal mat thickness. Include manufacturer's recommended anchorage system for slope conditions.

PART 3 – EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil- bearing water runoff or airborne dust to adjacent properties and walkways.

3.02 TURF AREA PREPARATION

A. Limit turf subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than ¾" inch in any dimension, and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off OWNER's property.

1. Apply superphosphate fertilizer directly to subgrade before loosening.

2. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.

a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.

b. Mix lime with dry soil before mixing fertilizer.

3. Spread planting soil to a depth of 6 inches, but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet

a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil.

b. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.

2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 6 inches of soil. Till soil to a homogeneous mixture of fine texture.

a. Apply superphosphate fertilizer directly to surface soil before loosening.

3. Remove stones larger than 3/4 inch in any dimension and sticks, roots, trash, and other extraneous matter.

Legally dispose of waste material, including grass, vegetation, and turf, off OWNER's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Before planting, obtain the OWNER's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

G. For USGA Rootzone for Sand Based Turf (if specified):

1. The thoroughly mixed root zone material shall be placed on the areas designated for Athletic turf and firmed to a uniform depth of 6 inches (300mm) minimum

or as detailed. Mix shall be moist when spread to discourage migration into the subgrade and to assist forming.

2. See Planting Plans for turf locations.

3. Finish grade shall be rolled with a water drum 1,000 lbs max.

4. Finish grade of the rootzone sand shall be 1/8" over 10'-0".

5. Installed product shall be saturated to 100% bearing capacity to ensure no void spaces exist and the material has been properly installed. irregularities shall be top dressed and skimmed as necessary to provide an even surface free from depressions or varying firmness. Compact per geotechnical recommendations 85% relative compaction 5% above optimum moisture content minimum.

6. ARCHITECT shall review and approve the Finished Surface prior to laying sod.

7. Reserve additional USGA sand based rootzone material for top dressing the installed sod.

3.03 PREPARATION FOR EROSION-CONTROL MATERIALS

A. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.

B. Fill cells of erosion-control mat with planting soil and compact before planting.

C. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

D. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.04 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.

2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.

C. Sod or Roll Sod: type, thickness, and areas of installation shall be in accordance with Drawings and Specifications.

D. Remove roll sod netting prior to installation.

E. Lightly irrigate within two hours after installing sod and before rolling. Roll seams and joints until sod is well bonded to sub-grade.

F. Water area thoroughly to penetrate sub-grade at least 8 inches. Repeat watering as necessary to keep sod moist until rooted in sub-grade. Protect sod areas against foot traffic until sod is well established. Replace damaged areas with new sod.

G. Sand leveling shall occur post sod installation. Topically apply USGA sand growing medium to fill low spots and proof roll the sod for a uniform surface. Finish grade shall not deviate more than 1/8” in 10’-0”. Lawn mower wheels shall not pump or yield atop the surface after installation. A maximum of 1/4” of sand can be applied.

3.05 TURF RENOVATION

A. Renovate existing turf damaged by CONTRACTOR's operations, such as storage of materials or equipment and movement of vehicles, or due to lack of maintenance during construction activities.

1. Reestablish turf where settlement or washouts occur or where minor regrading is required.

2. Install new planting soil as required.

3. Rake, drag, float and roll seed bed as often as necessary to produce a true, uniform, and smooth seed bed. Remove debris, stones, etcetera.

B. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

C. Remove topsoil containing foreign materials such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from CONTRACTOR 's operation and replace with new planting soil.

D. Mow, dethatch, core aerate, and rake existing turf.

E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off OWNER's property.

G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

H. Apply soil amendments and initial fertilizers required for establishing new turf and mix thoroughly into top 6 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.

I. Apply seed and protect with mulch as required for new turf.

J. Water seed bed thoroughly until a moisture penetration of 8 inches is achieved.

K. Seed mixture shall be sown at following rates:

1. Common Bermuda: 4 pounds per 1000 square feet or as recommended by manufacturer.

L. Seeding by hand, "Cyclone" type seeder, or pushed seeder shall be done in two passes at right angles to each other using 50 percent of specified rate for each pass. After seeding, apply a top dressing of wood residuals at rate of 3/4 cubic yards per 1,000 square feet.

M. Large sod areas shall be seeded by using "Brillion" type seeder. Areas inaccessible to seeder shall be handed seeded and seed raked lightly into top 1/4 inch of seed bed.

N. Irrigate immediately after completion and irrigation as frequently as necessary to assure complete germination of seed without creating run-off.

O. Areas that do not germinate satisfactorily shall be reseeded at proper intervals until an overall acceptable stand of grass is produced. Good turf coverage will be required before final acceptance of work.

P. Protect new sod from damage by erosion, trespass or any source. Safeguards and temporary fencing shall be erected where necessary, and precautions taken to prevent excessive runoff.

Q. Hydro-Seeding (Supplement of Sod Area):

1. Mix slurry of seeds and fertilizer to produce a homogeneous slurry mixture in designated proportions. Discharge system shall apply slurry at a continuous and uniform rate.

2. Immediately after application, irrigate seeded areas thoroughly. Application pattern shall conform to irrigation system so that watering can be accomplished in a timely sequence.

3. Program watering so that repeated watering at short application times can be made to prevent excessive runoff and to prevent erosion.

4. Prior to planting, hydro-seeding shall be done. Abutting ground cover beds shall be neatly trimmed to forms and lines shown on drawing.

5. Areas that do not germinate satisfactorily shall be reseeded at 14-day intervals until an overall acceptable stand of vegetation is achieved.

R. Hydroseed slurry: Proportions to be as follows:

	Manufacturers
Seed mix (see paragraph 2.01)	Recommendation
Wood Cellulose fiber (dyed green)	2000 pounds per acre
M-Binder Soil Stabilizer	100 pounds per acre
Triple Super Phosphate	250 pounds per acre
Water and Dye	As needed

3.06 TURF MAINTENANCE

A. See Specification Section 32 0190- Operation and Maintenance of Planting for Turf and Lawn Care.

B. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.

2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.

3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

3.07 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by ARCHITECT:

1. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even- colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.08 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION