pch architects, l.l.p.

ADDENDUM NUMBER 2

To the Contract Documents
For the Construction of

Professional Development Center and Kitchen

For
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT
Bid No F16-05

January 5, 2016

NOTICE TO BIDDERS

It is intended that all work affected by the following provisions shall conform to the original plans and specifications. Delete or modify each of the following items wherever appearing on Drawings, and/or Specifications. Acknowledge receipt of Addendum No. 2 in the space provided on the Contractor's Proposal. Failure to do so may subject bidder to disqualification.

GENERAL:

Item Number 1; In any conflict between this addendum and prior addendums, this Addendum governs

SPECIFICATIONS:

Item Number 2; Reference: Supplementary General Conditions, Article 3 – The Contractor; Revise the Milestone Schedule to read:

"Total Duration **136 Calendar Days**
Start of Construction **February 8, 2016**

Item Number 3; Reference: Agreement, Article 2; Revise the first paragraph to read

"…the CONTRACTOR shall complete the work within **One Hundred and Thirty Six (136)** calendar days from receipt of the notice…."

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Item Number 4; Omit Section 01 11 14 – Work Sequence and Phasing.

Item Number 5; Reference: Section 01 52 00 - Construction Facilities; Omit the following sections:

1.05 TEMPORARY WATER (Water will be available from sources at the site.)
1.07 TEMPORARY TELEPHONE SERVICE (The contractor will be required to have at a minimum cell phones with texting capabilities)
1.08 TEMPORARY ELECTRICAL POWER (Power will be available from sources at the site.)
1.11 TEMPORARY GAS
1.13 FIELD OFFICES (The District will assign office space in the building being remodeled.)

Item Number 6; Add attached Section 08710 - Door Hardware.

Item Number 7; Add attached Section 15300 – Fire-Suppression & Sprinkler System.

Item Number 8; Add attached Section 16761 – Conference Room Audio/Video System.

Item Number 9; Reference: Section 16580 – Network Lighting Controls; Add the following paragraphs:

"PART 3 – EXECUTION

3.1 Protection and Cleaning

3.1.1 Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the Manufacturer.

3.1.2 Repair or Replace damaged components before Substantial Completion of the Project.

3.1.3 Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of the equipment. Remove construction debris from equipment area and dispose of properly.

3.2 Field Quality Control

3.2.1 Manufacturer's Field Services: Provide services of a Duly Factory Authorized Service Representative for this Project location to supervise the field assembly and connection of components and the pre-testing, testing, and adjustment of the system.
3.2.2 Testing:

.1 Provide all instruments for testing and demonstrating in the presence of the Owner's Inspector that the system is operating as stated in the factory data sheets.

Check all circuits and wiring to verify they are free of shorts and grounds. Perform all tests stated in each separate System Specification.

.2 Rectify deficiencies indicated by tests and completely re-test work affected by such deficiencies at Contractor's expense. Verify by the system test that the total system meets the Specifications and complies with applicable standards.

.3 The Owner reserves the right to make independent tests of all equipment furnished to determine whether or not the equipment complies with the requirements specified herein and to accept or reject any or all of the equipment on the basis of the results thereby obtained.

3.3 In Service Training

3.3.1 Train Owner's Maintenance Personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Provide a minimum of two (2) 4-hour training sessions at completion of the Project, one (1) for Operations and Maintenance Personnel and one (1) for Administration Staff. Operator's Manuals and Users Guides shall be provided at the time of this training. Training shall also include factory training and certification for (3) District employees and shall include travel and accommodations.

3.3.2 Provide an additional separate training session, separate from the 4 hour session above, that includes factory training and certification for (3) District employees and shall include travel and accommodation.

3.3.3 Within 12-months of acceptance of the Project when requested by the District, provide an Additional 4-hour Refresher Training Course

3.3.4 Schedule Training with Owner, with at least 7-days advance notice. This instruction time shall be divided as directed by the Owner.

3.4 Warranty

3.4.1 The Entire System shall be warranted free of mechanical or electrical defects for a period of 1-year after final acceptance of the installation. Any material showing mechanical or electrical defects shall be replaced promptly at no expense to the Purchaser."

Item Number 10; Reference: Section 16721 – Fire Alarm; Add the following paragraphs:

"2.1.3 Fireworks Emergency Communications Command to be part of new fire alarm system.

.1 Provide Insightful – Fireworks Emergency Communications command and control interface as an integral part of Edwards EST-3 Fire Alarm panel in order to communicate with the District's Fireworks Central Monitoring System at District's School Police Headquarters.

.2 The Edwards EST-3 control panel shall communicate with new Fireworks via District's LAN Network, Coordinate with District's IT Department for configuring LAN Network to communicate with Fire, Fire Works.

.3 The system shall utilize independently addressed, microprocessor-based fire alarm detectors, devices and modules.

.4 Edwards EST-3 Fire Alarm and Fireworks System shall be complete with all necessary hardware, software, monitors, control modules and memory specifically tailored for this installation and shall comply with all codes and regulations.

.5 Graphically display on the Fireworks Station, building diagram showing whole building with graphic scrolling through system prompts, down to point of alarm activation.

.6 All data, initiating, indicating and supervisory lines shall be constantly monitored for integrity, indicate opens shorts, grounds, at main control panel, remote annunciator and Fireworks Station."

DRAWINGS:

Item Number 11; Reference: Sheet A-1, Site Plan; Replace this sheet with attached sheet **A-1, Site Plan.**

Note: Revised sheet makes the following changes:

a) Adds truncated domes at the south entry walk
b) Adds recesses in parking stalls for Vehicle Chargers.
c) Replaces curb ramp with sidewalk/curb and gutter on west side of building near the new stair.

Item Number 12; Reference: Sheet A-2, First Floor Plan – Entire Floor; Replace this sheet with attached sheet **A-2, First Floor Plan – Entire Floor**

Note: Revised sheet makes the following changes:

a) Clarifies the construction of the feestanding counter in the Cafeteria
b) Details curb ramp replacement with sidewalk/curb and gutter on west side of building near the new stair.

Item Number 13; Reference; Sheets A-3 and A-6; Windows for the Window Schedule are identified on attached drawing AR-02.

Item Number 14; Reference; Sheet A-6, Second Floor Plan Entire Floor, Detail 28; Replace this detail with attached drawing **AR-01 – Cyclorama Revision.**

Note: The Cyclorama covers the west wall in plan not section as previously shown.

Item Number 15; Reference: Sheet A-10, Door Schedule Finish Schedule; Replace this sheet with attached sheet **A-10, Door Schedule Finish Schedule & Details.**

Note: Door 107 was changed to a Type D door.
Door hardware references were added.
Window Types were added.
Window Detail was added.

Item Number 16; Reference: Sheet A-12, Exterior Stair, Detail 28; Make the following changes:

a) Change the gauge of all rectangular tubes to 10 gauge (0.12 inches).
b) Change the vertical 2-1/2" x 2" tubes to 2-1/2" x 1-1/2" tubes.
c) One typical manufacturer is Totten Tubes 800-812-0113

Item Number 17; Reference: Sheet FS.02.0, Food Service Equipment Schedule & Abbreviation; The following equipment will be Owner Furnished, Coordinated and Installed by the Contractor.

Item 18 Warming cart model # 121-PH1818D
Item 20 Three door reach-in cooler. (Will be changed to model # G30012)
Item 21 Three door reach-in freezer. (Will be changed to model # G31312)
Item 26 Oven model # DFG-200 DBL
Item 34 Drop in food warmer model # ADI-4E-SW
Item 37 Drop-in cold well model # ADI-4MD-N7
Item 40 One door reach-in cooler. (Will be changed to model # G1100S)

Contractor shall be responsible for pick-up and delivery of the above equipment from the District Warehouse in San Bernardino to the construction site.

Item Number 18; Reference; Sheet P-0.01, Plumbing Legends, Symbols & Notes, General Notes; Add 26 to read:

"26. Contractor to modify existing Automatic Fire Sprinkler System as necessary to accommodate revisions being made to this building including new exterior stair. Contractor shall be C-16 licensed. Contractor shall produce all necessary drawings and documents, submit and receive approval from the local fire agency. The Contractor shall, pay for all permits and fees associated with approval and construction of the Automatic Fire Sprinkler System."

Item Number 19; Reference; Sheet P-1.01, Plumbing First Floor Plan; The 4" diam. sewer line shown running from the new Sample Box to the main sewer is existing and is stubbed up at the general location of the Sample Box. Only the cleanout is required prior to connection of the line to the new Sample Box.

Item Number 20; Reference: Sheet E-2, Fixture Schedule, Notes & Details, Fixture Schedule; Focal Point is an approved manufacturer for lighting fixture types A1, A2 and A3.

Item Number 21; Reference: Sheet E-3, Single Line Diagram; At circuit for car chargers, provide 480-volt/120/240-volt, single phase , 3-wire , 25KVA transformer "TC" wall mount.

Item Number 22; Reference: Sheet E-3, Single Line Diagram; Provide new 125 amp, 3-pole circuit breaker in main switchboard MSB, with 4#1/0, 1#6 ground, 1-1/2"conduit for electric vehicle car charger per attached drawings ESK-4 and ESK-5.

Item Number 23; Reference: Sheet E-4, F.A. Symbols, Details & Notes; Add Fireworks Emergency Communications Command and make part of Contract.

Item Number 24; Reference: Sheet E-4, F.A. Symbols, Details & Notes, Fire Alarm System Notes; Add the following notes to read:

> "6.0 Fire Alarm Contractor to monitor connect to existing elevator recall, existing fire sprinkler, existing Post Indicator Valve (PIV), existing smoke fire dampers and existing air handler for shut down as required.
>
> 7.0 New fire alarm remote annunciator can be installed in place of existing with new microphone and pre-recorded message as required."

Item Number 25; Reference: Sheet E-6, AV Signal Flow; Replace this sheet with attached sheet **E-6, AV Signal Flow**

Item Number 26; Reference: Sheet E-7, AV Signal Flow; Replace this sheet with attached sheet **E-7, AV Signal Flow**

Item Number 27; Reference; Sheet E1.0 First Floor Plan; All speakers shown are new Public Address ceiling speakers connected to the new Public Address equipment rack to be located in existing Data room. Provide new 2" diameter sleeves as required for wall penetrations.

> Note: Contractor may use existing cable tray ladder and existing conduit sleeves were applicable.

Item Number 28; Reference; Sheet E1.0 First Floor Plan, Detail 2; Replace this detail with attached drawing **ESK-4,** and add Plan Notes 12 – 18 as shown on attached drawing **ESK-5** and add General Notes:

> "1. Provide electrical vehicle car charger station with LCD display, weather-proof housing, quick disconnect, 12' of cord, integrated with Blink Network, charging status, user friendly touch screen, stop timing, wireless IEEE 802.11G and internet capabilities. NEC Article 625 electric vehicle charging system by Blink Network or equal.
>
> a. Provide one (1) Fast Charger Port Station, 480-volt, three-phase input rated at 89 amps, NEMA 3R enclosure. Fast Charger Coupler to be selected by District from types currently available. Provide selection for District review.

b. Provide three (3) Slow Charger Dual Port Station, 240-volt, single-phase input rated at 30 amps, NEMA 3R enclosure. Provide the standard SAE J1772-2009 round coupler and inlet with levels of safety and convenience prevents in advent disconnection, interlock device that prevents vehicle start-up with first in/last out ground.

2. Electrical vehicle pedestal mount should be provided with all appropriate installation accessories and should be protected from damage by vehicles or vandalism."

Item Number 29; Reference; Sheet E1.1 First Floor Lighting Plan; Remove existing fluorescent down lights and provide new LED down lights and reconnect to existing lighting controlled circuit as shown on attached drawing **ESK-1.**

Item Number 30; Reference; Sheet E2.0 Second Floor Plan; All speakers shown are new Public Address ceiling speakers and shall be connected to the new Public Address equipment rack to be located in existing Data room. Provide new 2" diameter sleeves as required for wall penetrations.

Note: Contractor may use existing cable tray ladder and existing conduit sleeves were applicable.

Item Number 31; Reference; Sheet E2.2 Second Floor Lighting Plan; Revise New Work Plan Notes and revise lighting as shown on attached drawing; **ESK-2**

Item Number 32; Reference; Sheet E2.2 Second Floor Lighting Plan; Add General Note to read:

"Conference Rooms lighting control shall function separately when partition walls are closed and as one when partition walls are open."

Item Number 33; Reference; Sheet E2.4 Second Floor Power & Signal Plan; Make the following power changes:

1. Provide 30 amp, 250-volt, 2-pole disconnect switch in Custodian Room with 2#8 circuit and 1#12 ground wire in 1" conduit to panel 2E2C – 39.41 with 30 amp, 2-pole circuit breaker for water heater WH-1 connection.

2. Provide 20 amp, 125-volt, grounding type receptacle adjacent to FC-4 for circulating pump and connect to existing circuit #32.

3. Provide 20 amp, 125-volt, grounding type receptacle adjacent to FC-5 for circulating pump and connect to existing circuit #17.

4. Electrical Contractor shall coordinate with Audio Video Contractor, Lighting Control, Computer Data and Fire Alarm Contractor for their respective equipment location and provide all line voltage and control conduit required.

Item Number 34; Reference; Sheet E2.4 Second Floor Power & Signal Plan; Make the following signal changes:

1. Locate Extron Audio/Video control pad (1 per Conference Rm.) adjacent to lighting control pad by corridor entrance. Locate 1 control pad in the video controller. Coordinate with the District Representative.

2. Audio/Video Contractor to provide flat panel monitors per Floor Plan and make all connections as required for full and functional audio video system.

3. Provide and locate antennas for wireless microphone and assistive listening as required to obtain full coverage of each area.

Item Number 35; Reference; Sheet E2.4 Second Floor Power & Signal Plan; Revise Panel 2E2C per attached drawing; **ESK-3**

Item Number 36; Reference; Sheet E2.4 Second Floor Power & Signal Plan; As clarification, the ceiling speakers shown on this plan (S in a hexagon) are sound enhancement speakers for the Extron system and are in addition to the Public Address System speakers.

Item Number 37; Reference; Sheet E2.5 Second Fire Alarm Plan; As clarification, Lobby high ceiling area fire alarm visual device can be installed on adjacent wall.

End of Addendum 2

Ralph Pacini,
PCH ARCHITECTS, LLP

PART 1 - GENERAL

1.1 SUMMARY

1.1.1. Section Includes: Work under this section comprises the furnishing and installation of hardware specified herein and noted on drawings for a complete and operational system, including any electrified hardware components, systems and controls.

1.1.2 Related Documents, drawings and general provisions of contract, including General and Supplementary Conditions, and Division 1.

1.1.3 Items include but are not limited to the following:

.1 Hinges
.2 Exit Devices
.3 Locksets
.4 Cylinders
.5 Push/Pull Plates
.6 Flush Bolts
.7 Closers
.8 Kick, Mop and Protection Plates
.9 Stops and Overhead Controls
.10 Thresholds, Gasketing and Door Bottoms
.11 Miscellaneous Accessories and Trim

1.2 SUBSTITUTIONS

1.2.1 References to specific products are used to establish minimum standards of utility and quality. Unless otherwise approved, furnish only the specified products.

1.2.2 Requests for substitutions to be in accordance with Division 1, General Requirements. Proposed substitutions must be submitted in writing and hand delivered to the Architect. Approvals must be by addendum ten [10] days prior to bid opening. District Lockshop Supervisor will be notified of any requests.

1.2.3 All requests to be accompanied by two [2] copies of the manufacturer's brochures and a physical sample of each item in the appropriate design and finish.

1.2.4 Items listed with no substitute have been requested by the Building Owner to match existing building standards.

1.2.5 Should the Contractor make any substitutions without the written consent of the Architect, Contractor shall remove all substituted hardware, replacing same with the hardware as specified and at no additional cost to the building owner.

1.3 REFERENCES:

1.3.1 References specified in this section subject to compliance as directed and shall meet requirements of Federal, State and local codes having jurisdiction over this project including:

.1 CCR - California Code of Regulations Title 24.
.2 ANSI-A 117.1- Accessible and Usable Buildings and Facilities.
.3 ADA - American Disabilities Act - Title III - Public Accommodations.
.4 UFAS - Uniform Federal Accessibility Standards.
.5 NFPA 80 - Standard for Fire Doors and Windows.
.6 NFPA 101 - Life Safety.
.7 ITS - Intertek Testing Service [Warnock Hersey].
.8 UL - Underwriters Laboratories.
.9 ANSI/BHMA A156 Product Listing.
.10 CBC - California Building Code, Local Codes and the Authority having Jurisdiction.
.11 UL 10C for Positive Pressure Fire Tests of Door Assemblies.

1.3.2 Hardware that is furnished and/or installed that does not meet code requirements, shall be removed and replaced with correct material at no additional expense to the Building Owner.

1.4 QUALITY ASSURANCE:

1.4.1 Product Uniformity: Except where specified, all hinges, keyed cylinders, electro-mechanical components, locksets, latchsets, exit devices, closers, overhead stop/holders and component parts shall be furnished by one manufacturer.

1.4.2 Rated Openings: Hardware used in labeled fire or smoke rated openings to be listed for those types of openings and bear the identifying label or mark indicating U.L. [Underwriter's Laboratories] approved for fire. Exit devices in non-labeled openings to be listed for panic.

1.4.3 Supplier: Shall be responsible for detailing hardware that meets project standards and where appropriate, retrofit applications which requires inspection of openings prior to detailing and ordering respective hardware items.

1.4.4 Pre-Installation Conference: Prior to installation of hardware, arrange a conference between supplier, installers, and related trades to review materials, procedures, hardware mounting locations and related work.

1.4.5 Installation Exercise: Contractor/Installer is required to install one complete exterior opening Hardware Set and the respective hollow metal door and frame to establish both know-ledge and skill as required for this project. Door/frame and hardware installation practice will be coordinated with the Project Architect and Building Owner’s Representative, and shall be accomplished to the PA’s satisfaction, and prior to the installation of any doors/frames and door hardware. Typical hardware set to be comprised of hinges, panic device, trim, door closer, overhead stop if detailed, flat goods, threshold, sweep, drip cap and perimeter seal or as directed by the Architect.

.1 Damage resulting in replacement material or repair, including labor, shall be absorbed by the Contractor/Installer.

1.4.6 Post-Installation Policing: Will be required by the Hardware Supplier, Contractor and Architect to determine compliance with the hardware specification and building standards.

1.4.7 Supplier Qualifications:

.1 Hardware supplier must be a recognized, Southern California based FACTORY DIRECT contract distributor with a minimum five (5) years experience specializing in institutional grade builders hardware of the type specified herein. Distributor's with less than two (2) years of history of furnishing builders hardware in the project's vicinity will not be acceptable.

.2 Supplier must have in his/her employment on a full time basis, a Certified Hardware Consultant [AHC] or person of equal experience who is acceptable to the Architect and GC. This individual shall be available for consultation and service to the architect, contractor, and building owner during construction and on an ongoing consulting service to the building owner following the completion of the project.

.3 Supplier who does not maintain personnel in a permanent facility within a reasonable driving radius of the project area for consultation and service with the Architect, Contractor and Building Owner will not be acceptable.

1.5 GENERAL REQUIREMENTS:

1.5.1 Coordination: Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

1.5.2 Sequencing and scheduling: Any part of the finish hardware required by the frame or door manufacturers or other suppliers, that is needed in order to produce doors or frames is to be sent to those suppliers in a timely manner.

1.5.3 Defective hardware: All hardware shall be new and free from defects affecting both serviceability and appearance. Working parts shall be properly fitted, smooth working and without excessive play.

1.5.4 Function/modification:

.1 Should any hardware fail to meet the intended operational requirements or require any modification to suit the intended location, this matter, or any other necessary advance information, shall be brought to the attention of the architect for correction or advice in ample time to avoid delay in the manufacture and delivery of the hardware.

.2 Modifications to specified hardware, required by reason of construction characteristics, shall be furnished in the specified operational, functional features, quality and finish. Modifications shall be subject to acceptance of the Architect at no additional cost to the Building Owner.

.3 Items of hardware not specified herein but necessary for completion of the work shall be furnished at no additional cost to the Owner. Such items shall be of the type specified and comparable to adjacent hardware.

1.5.5 Doors and frames: Hollow metal and wood doors shall be manufactured to templates. If required, physical hardware items shall be furnished to related manufacturers in sufficient time to avoid delay in work.

1.5.6 Contractor/Installer will deliver all unused finish hardware to the District Lockshop.

1.6 ACCESSIBILITY REQUIREMENTS:

1.6.1 Doors and doorways that are part of an accessible route shall comply with CBC, Section 11B-404.

1.6.2 The clear opening width for a door shall be 32" minimum. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees. There shall be no projections into it below 34" and 4" maximum projections into is between 34" and 80" above the finish floor or the ground per CBC Section 11B-404.2.3.

1.6.3 Handles, pulls, latches locks, and other operable parts on accessible doors shall comply with CBC Section 11B-309.4 and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Operable parts of such hardware shall be 34" minimum and 44" maximum above the finish floor or ground, specific requirements within this range are identified in Section 3.3.2 of this specification. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides per CBC Section 11B-404.2.7.

1.6.4 The force for pushing or pulling open a door shall be as follows (CBC Section 11B-402.2.9):

.1 Interior hinged doors, sliding or folding doors, and exterior hinged doors: 5 lbs. maximum.

.2 Required fire doors: the minimum opening force allowable by the DSA authority, not to exceed 15 lbs.

.3 These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.

.4 The force required to activate any operable parts, such as retracting latch bolts or disengaging other devices, shall be 5 lbs. maximum to comply with CBC Section 11B-404.2.5.

1.6.5 Door closing speed shall be as follows (CBC Section 11B-404.2.8):

.1 Closer shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds maximum.

.2 Spring hinges shall be adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is 1.5 seconds minimum.

1.6.6 Thresholds shall comply with CBC Section 11B-404.2.5.

1.6.7 Floor stops shall not be located in the path of travel and 4" maximum from walls (DSA Policy 99-08).

1.6.8 Hardware (including panic hardware) shall not be provided with "Night Latch" (NL) function for any accessible doors or gates unless the following conditions are met per DSA Interpretation 10-08 DSA/AC (External), revised 4/28/09. Such conditions must be clearly demonstrated and indicated in the specifications:

.1 Such hardware has a 'dogging' feature.

.2 It is dogged during the time the facility is open.

.3 Such 'dogging' operation is performed only by employees as their function (non-public use)

1.7 SUBMITTALS:

1.7.1 Hardware schedule: Submit typewritten copies of schedule in accordance with Division 1, General Requirements. Schedule to be in VERTICAL format, listing each door opening including; location, handing of opening, all hardware scheduled for each opening or otherwise required to allow for proper function of door opening as intended, finish of hardware, and respective manufacturers. Doors with closers or door controls shall require the degree of door opening.

.1 Supply six [6] copies of the schedules within fifteen [15] working days from date of purchase order.

a. The hardware schedule shall conform with DHI's: "Recommended Procedure For Processing Hardware Schedules and Templates."
b. Submit manufacturers' catalog cut sheets of all hardware items scheduled and any required special mounting instructions with the hardware schedule.
c. Include recommended mounting location data for each type of scheduled door hardware.

.2 No hardware item shall be delivered until the hardware schedule has been approved by the Project Architect.

.3 Approval of the hardware schedule by the Architect does not relieve the hardware supplier from the responsibility of furnishing the job complete.

1.7.2. Samples:

.1 If directed by the Architect, submit physical samples of each item of hardware proposed in work.

.2 Samples will be returned on the request of and at the expense of the Contractor.

1.7.3 Mfr's catalog illustrations and hardware data:

.1 Hardware Supplier shall submit, to the Architect, two [2] catalog cuts of every item of hardware furnished for this project. Data shall be contained in a binder appropriately divided by the respective manufacturers.

.2 Cuts shall include manufacturer's illustrations and shall identify finishes, sizes and product numbers. Abbreviations to be fully explained.

1.7.4 Operation/maintenance data:

.1 Deliver to the Building Owner, through the Architect, one set of maintenance operation manuals and installation guides for locksets, exit devices, door closers.

.2 Contractor/Installer to furnish to the hardware supplier one installation/template guide from each hardware/carton.

.3 Include one [2] complete catalogs for each manufacturer listed in the approved hardware schedule.

.4 Include one [2] copies of approved door and door hardware shop drawings/schedules. In addition to shop drawings/schedules, furnish two [2] copies of schedules on 3.5 Disk in Word or Word Perfect.

1.7.5 Templates: Templates for door hardware items to be sent to related door and frame suppliers within three [3] working days of receipt of approved hardware schedule. Templates shall not be issued until the door hardware schedule has been reviewed and approved by the Project Architect.

1.7.6 Certification of compliance: Submit any information necessary to indicate compliance to any or all of these specifications as required.

1.7.7 Keying schedule:

.1 Submit three [3] copies of a separate detailed keying schedule to the Contractor.

.2 Indicate keying of all cylinders, exit devices, locksets, and padlocks. Include door and item numbers as set forth in approved hardware schedule.

.3 Keying data shall follow DHI's "Keying Systems and Nomenclature."

.4 Include with the schedule a keying schematic layout.

.5 Prior to placing a factory order, the key schedule shall be approved in writing by the Building Owner and Contractor.

1.7.8
Close-out requirements: In addition to the items required under Section 1.6.4, furnish the following:

.1 Provide one set installation and adjusting tools, and one set of maintenance manuals and instruction sheets for each item of hardware furnished.

.2 Furnish three [3] dozen extra screws of each type, size and finish and other fasteners furnished in the work.

1.8 DELIVERY, STORAGE AND HANDLING;

1.8.1 Packaging: Each unit of hardware shall be individually packaged in the manufacturer's original containers as required by the respective hardware manufacturers.

.1 Packaging shall include factory original installation instructions, fastenings and all items necessary for complete installation.

1.8.2 Wrapping: Wrap & cushion each item to prevent scratches & dents during delivery & storage.

1.8.3 Environmental packaging: Hardware shipped to the jobsite is to be packaged in biodegradable packs, such as paper or cardboard boxes and wrapping. If non-biodegradable packing is utilized, such as plastic, plastic bags or styrofoam, then the Contractor will be responsible for the disposal of the non-biodegradable packing to a licensed or authorized collector for recycling of the material.

1.8.4 Markings: Each package shall be clearly marked on the outside, identifying contents with specific opening number corresponding to those listed in the hardware schedule. Include door and item number for each product.

1.8.5 Delivery: Except as dictated otherwise, deliver all hardware to the job site. The Contractor and Hardware Supplier's Representative shall check each item of hardware against the approved finish hardware schedule.

1.8.6 Storage: All hardware shall be stored in a locked storage space until ready for installation. Hardware shall be protected against damage after application and during construction period.

1.9 WARRANTY

All door hardware shall be supplied with a one [1] year warranty against defects in materials and workmanship, commencing with substantial completion of job.

PART 2: - PRODUCTS:

2.1 MANUFACTURERS:

2.1.2 Acceptable manufacturers:

.1 All materials or products specified herein shall be furnished AS SPECIFIED. Refer to Paragraph 1.2 SUBSTITUTIONS.

.2 Following are approved manufacturers for this work which comprise the base bid:

PRODUCT	SPECIFIED MFRS	APPROVED MFRS
Hinge	McKinney	Stanley,Law
Lockset (exterior)	Sargent	As Specified
Lockset (interior)	Sargent	Marks 195S-x American
Exit Device	Sargent	As Specified
Closer	Sargent	As Specified
Push/Pull/KP	Trimco	BBW,Quality
O.H. Stop	Sargent	As Specified
Door Stop	Trimco	BBW,Quality
Thresh/Seal	Pemko	Reese

2.2 FASTENINGS

2.2.1 Furnish hardware with all necessary screws, bolts or other fastenings of suitable type and size to anchor the hardware in position for long life and heavy use. Fasteners shall include expansion shields, sex bolts, toggle bolts, or other approved anchors according to material to which it is applied and as recommended by the respective manufacturers.

.1 Furnish Phillips flat-head screws except as otherwise indicated.

.2 Thru-bolts not to be supplied unless required by the door manufacturer and/ or building owner. Doors are to be adequately reinforced for surface hardware installation. To be verified with the District Lockshop.

2.2.2 Design of all fastenings shall harmonize with hardware as to material and finish.

2.3 HINGES:

2.3.1 All hingers and pivots, including single and double acting types, pocket hinges and continuous aluminum geared hinges to be of one manufacturer as listed for continuity and consideration of warranty.

2.3.2 Unless otherwise specified, furnish three-knuckle as specified; button tip, full mortise template type hinges with non-rising loose pins.

2.3.3 Out-swinging exterior doors to be furnished with anchor hinges of stainless steel or solid bronze with non-removable pins [NRP].

2.3.4 Interior doors to be furnished with wrought steel, polished and plated to match specified finish.

2.3.5 Furnish three [3] hinges up to 90 inches high and one [1] additional hinge for every 30 inches or fraction thereof.

2.3.6 Furnish standard weight hinges on doors up to 36 inches in width, and extra heavy weight on doors exceeding 36", or as indicated in the hardware schedule.

2.3.7 Furnish 4.5 x 4.5 inch for all 1-3/4 inch thick doors up to 36 inch wide, and 5 x 4.5 over 36 inch wide. Doors over 1-3/4 inch thru 2-1/4 inch thick, use 5 x 5 inch hinges.

2.3.8 Where required, furnish hinges of sufficient width to clear trim and/or permit the door to swing 180 degrees as required by the specific opening.

2.3.9 Furnish oil-impregnated bearing hinges [TA] at all doors.

2.4 LOCKS:

2.4.1 All locks, panic devices, trim and cylinders to be of one manufacturer as listed for continuity of design and consideration of warranty.

2.5 Cylindrical Locks:

2.5.1 All locksets, panics, trim and cylinders to be of one manufacturer as hereafter listed for continuity of design and consideration of warranty.

2.5.2 Locksets shall be Sargent FW10 Line Series x LL trim. FW required with all functions.

2.5.3 Locksets and latches shall be heavy duty cylindrical type. Latchbolts shall have minimum of 1/2 inch projection.

2.5.4 Lock and latchsets shall be constructed with thru-bolted design and independent spring cartridge system for lever stability operation.

2.5.5 Provide 4-7/8" curve lip strikes with wrought boxes. Strikes shall be sufficient length to protect trim or the inactive leaf of a pair of doors.

2.6 EXIT DEVICES:

2.6.1 All exit devices, mortise locks, cylinders and lever trim to be of one manufacturer as listed and in the hardware sets for continuity of design and consideration of warranty.

2.6.2 Exit devices shall be Sargent 80 Series x ETL and/ or Trimco 1096/97HA trim as listed.

2.6.3 Exit devices to be "UL" listed for life safety. All exit devices for labeled doors shall have "UL" label for "Fire Exit Hardware". All devices mounted on labeled wood doors are to be thru-bolted or per the manufacturer's listing requirements. All devices to conform to NFPA 80 and 101 requirements. The unlatching force shall not exceed 15 lbs. in the direction of travel.

2.6.4 All exit devices to be of a heavy duty, chassis mounting design, with one piece removable covers, eliminating necessity of removing the device from the door for standard maintenance.

2.6.5 All trim to be thru-bolted to the lock stile case.

2.6.6 Exit devices shall be push pad devices finished to match that of the locksets. Push pad to be high impact resistant black lexan with a maximum 3 inch projection.

2.6.7 Rail assemblies of all exit devices to be of solid stainless steel as required in the hardware schedule.

2.6.8 Removable Mullions to be heavy duty steel 12-L980 x Cylinder Latching.

2.7 CLOSERS:

2.7.1 All closers to be the product of a single manufacturer for continuity of design and consideration of warranty.

2.7.2 Closers shall be Sargent 351 Series x P10/PH10/CPS/CPSH and as specified. Hold-open devices are not to be furnished at air-conditioned spaces.

2.7.3 Closers shall be heavy duty, surface mounted, hydraulic type, with high strength cast case. Full rack and pinion constructed of heavy steel.

2.7.4 Size all closers in accordance with the manufacturer's recommendations at the work site.

2.7.5 Closers to have adjustable spring power, which allows for closer sizing. Closers to have separate tamper resistant, non-critical regulating screw valves for closing speed, latching speed and backcheck control as standard features.

2.7.6 Closer arms to be forged steel, interchangeable with all closers specified on this project for simplification of future Owner maintenance considerations.

2.7.7 Supply appropriate arm assembly for each closer so that closer body and arm are mounted on non-public side of door opening and on the interior side of exterior openings, except where otherwise detailed.

2.7.8 All closers to be rectangular, full cover type of non-ferrous, non-corrosive material painted to match lockset finish.

2.7.9 Refer to paragraph 3.2.1.8 Installation for opening force requirements.

2.8 PUSH PLATES, DOOR PULLS AND KICKPLATES

2.8.1 All push plates, door pulls, kickplates and other miscellaneous hardware as listed in hardware sets.

2.8.2 Supply 18 [.050] ga. thick stainless steel, beveled 4 sides. Doors with louvers or narrow bottom rails, kickplate height to be 1 inch less than the dimension shown from the door bottom to the bottom of the louver or glass.

.1 Kickplates to be 10 inches high and Mop plates to be 6 inches high, both by 2 inches or 1 inch less than the door width as specified.

.2 Armor plates, edge guards and protective hardware to be supplied in sizes as scheduled in the hardware sets.

2.9 DOOR STOPS:

2.9.1 Doors to be furnished for every door leaf. Overhead stop [OH] to be furnished when a wall and/ or floor stop is unacceptable. Floor stop to be Trimco's 1214CK x 1268CK as required. Omit1268CK at interior doors. Wall stops to be Trimco's 1270SV [School Version in US32D].

2.9.2 Install door stops in such a position that they permit maximum door swing, but do not present a hazard or obstruction. Floor stops to be within four (4) inches of adjacent wall maximum.

2.9.3 Where overhead stops and holders are specified, or otherwise required for proper door operation, they are to be heavy duty and of extruded brass or bronze with no plastic parts. No steel channels, arms, or brackets allowed.

2.10 FLUSH BOLTS, COORDINATORS AND SILENCERS:

2.10.1 Furnish Flush bolts with Dust Proof Strikes and Coordinators as detailed and/or as required in the respective hardware sets. Finish to match adjacent hardware. Flush bolts shall be automatic type at all code required exit doors.

2.10.2 Silencers to be furnished as follows:

.1 Three (3) at single openings and two (2) at pairs.

2.11 THRESHOLDS AND GASKETING:

2.11.1 Supply materials and finishes as listed hardware sets. All thresholds must be in accordance with the requirements of the ADA and ANSI A117.1, and CBC, Sect. 11B-404.2.5.

.1 Furnish thresholds with flat head sleeve anchors. Furnish all necessary anchoring devices for gasketing and seal.

.2 Thresholds may require modification depending on final drawings and frame/door details.

.3 All listed thresholds to be verified with final construction drawings/ elevations. Typical system: 196A x 192A x 196A x Welded.

2.12 FINISH:

2.12.1 Special care shall be taken to coordinate the finish of the various manufacturers to insure a uniform finish. This finish shall match the finish of the locksets.

.1 Plated hardware shall be BHMA626 [US26D] or as detailed in 630 [US32D].

2.12.2 Painted hardware items shall be lacquered to closely match plated hardware.

2.13 KEYING:

2.13.1 Furnish locks and exit devices requiring (6) six pin cylinders which comply with performance requirements of ANSI A156.5.

2.13.2 Exit Devices, mortise locks and cylinders to be supplied from the same manufacturer.

2.13.3 All cylinders and keys to be properly tagged to indicate their intended location and to enable the Owner, with a minimum of effort, to establish key control.

2.13.4 It shall be the responsibility of the hardware supplier to initiate a keying conference with the contractor and District Locksmith Supervisor to include: verification of keyway, keying, schematics/pinning chart, required cylinder/cam/lock types and details for a complete and correct cylinder factory order.

2.13.5 All permanent six (6) pin cylinders to be furnished factory keyed to the Sargent Series A restricted key system [keyway to be identified by the District]. All permanent cylinders to be supplied #1 bitted. The District will be responsible for all pinning and key cutting labor. The hardware supplier must have all permanent cylinders, keys and related material components shipped factory direct to the District Lockshop “Return Receipt Requested.” Under no circumstances will the Contractor be in possession of this material

2.13.6 All temporary cylinders to be furnished factory construction keyed-alike [not to be '0' or '1' bitted] in LA keyway or as designated by Sargent [consult with District as required]. Temporary construction cylinders [21 prefix] to be furnished with each Sargent exit device, removable mullion, mortise lock, cylindrical lock, deadlock, padlock, cylinder and as specified. Balance of cylinders to be shipped loose as required for non-Sargent locking devices including but not limited to: Adams-Rite, accordian, rolling and operable wall sliding doors as listed in the specifications. Verify locking type and required cylinder with correct operating cam and/or tailpiece with the respective manufacturers.

2.13.7 The Contractor will be responsible for the installation of temporary and permanent cylinders as required. Contractor will coordinate with the District Lockshop for the installation of the permanent system at project completion. Temporary cylinders to remain the property of the SBUSD.

2.13.8 All Masterkeys, Grand Masterkeys and Great Grand Masterkeys shall be delivered to the owner's representative via registered mail - "Return Receipt Requested."

2.13.9 Supply keys in the following quantities:

.1 Two thousand (500) six pin blanks [verify required keyway w/lockshop].

.2 Ten (10) construction keys [verify keyway w/Lockshop].

.3 Key blanks to be nickel silver material.

.4 Permanently inscribe each key with the manufacturer and "Do Not Duplicate" [Review stamping with the District Lockshop].

2.13.10 Furnish one [1] complete factory generated bitting list with sufficient expansion to double the size of the original project. List to be delivered to the Lockshop. Review with the District Lockshop.

2.13.11 Furnish one (1) wall mounted steel key cabinet complete, similar to model AWS as manufactured by Telkee with a capacity of 125 percent of the number of locks required for project. Provide complete file and cross index file. All indexing and hanging of keys will be by the District. Deliver to the District Lockshop.

2.13.12 Furnish two (2) complete pin kits [437C] x 250 extra of each pin and driver size as required for the manufacturer's key system.

2.14 PROPRIETARY PRODUCTS

Refer to Paragraph 1.2. Unless otherwise approved, furnish only the specified products.

PART 3: - EXECUTION

3.1 INSPECTION:

3.1.1 After installation has been completed, hardware supplier shall have a qualified Hardware Consultant [AHC] inspect project to determine the proper application of hardware according to the approved hardware and keying schedules.

.1 Check operation and adjustment of all hardware items.

.2 Recommended hardware adjustments shall be made by the Contractor/Installer.

3.2 INSTALLATION:

3.2.1 Installation of finish hardware is specified under other sections. However, the following requirements apply to the work as follows:

.1 Hardware shall be installed by a QUALIFIED MECHANIC skilled in the application of institutional grade builders hardware.

.2 Install all hardware in full compliance with MFR'S instructions. When cutting and fitting is required to install hardware onto or into surfaces which are to be painted or finished, install each item completely and then remove during application. After completion, re-install each item.

.3 Care shall be exercised not to mar or damage adjacent work. Damaged work shall be repaired or replaced to the satisfaction of the Architect.

.4 Provide ADEQUATE BACKING in stud partitions for the attachment of all respective finish hardware.

.5 If door swing is changed from original drawings during construction, the contractor shall make necessary changes at no cost to the owner.

.6 Latches and bolts shall be installed to automatically engage strikes, whether activated by closers or manual push. In no instance should unusual manual pressure be required to engage latch or bolt in strikes. Install locks with keyways in proper position, with levers, roses, and/or escutcheons firmly affixed. Adjust strikes after silencers and/or seal are in place.

.7 Predrill pilot holes in wood for screws. Drill and tap for surface mounted hardware on metal. Set hinge leaf snug and flat in mortises, turn screws to flat seat [do not drive].

.8 Closers are to have opening force adjusted so as to comply with current applicable accessibility requirements as follows: interior doors 5 pounds maximum pressure to operate; exterior doors 8-1/2 pounds maximum pressure; fire doors 15 pounds maximum pressure.

.9 Mount closers and overhead stops/holders in accordance with the manufacturer's template for the degree of swing indicated on the drawings [180 degree swing where conditions allow].

3.2.2 HARDWARE LOCATIONS: Review and verify mounting locations with the Architect before issuing templates and door/hardware purchase orders. In no instance will hardware exceed 44 inches in height. The following hardware locations taken from SDI will be required unless modified by the Architect. Minor adjustments are permitted to meet specific door manufacturer's standards:

.1	40-5/16 inches	Locksets, Panic Devices and Roller Latches-centerline of strike from bottom of frame.
.2	44 inches	Deadlocks-centerline of strike from bottom of frame and shall be interconnected with lever handle.
.3	42 inches	Pull Plates-centerline of grip from bottom of frame.
.4	42 inches	Combination Push Bars-centerline from bottom of frame.
.5	44 inches	Push Plates-centerline from bottom of frame.
.6	Hinges	Per manufacturer's standard.
.7	48 inches	Coat hook from bottom of frame.

.8 Push/Pull x Deadlock to be coordinated with plates fabricated with cylinder cutout and mated to deadlock.

3.2.3 THRESHOLD AND PERIMETER SEAL:

.1 Cut and fit thresholds to profile of door frames, with mitered corners and hairline joints.

.2 On exterior doors, set thresholds in a bed of sealant.

.3 Before installation, carefully read manufacturer's instructions to assure tight and contiguous seal at the perimeter and corners of doors and frames.

.4 Depending on final drawings and conditions, specified thresholds are subject to modification. Verify required thresholds with final drawings.

3.3 ADJUSTING AND CLEANING:

3.3.1 At final completion, all hardware shall be left clean and free from disfigurement. Contractor shall make a final adjustment to all door closers and other items of hardware. Where hardware is found defective, repair or replace or otherwise correct as directed.

3.3.2 Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Adjust hardware so that moving parts operate freely, without bind, or excessive play. Hardware shall be free of paint, corrosion, or damage of any kind.

3.4 PROTECTION:

The Contractor is responsible for the proper protection of all items of hardware until the owner accepts the project as complete.

3.5 OWNER'S STOCK

3.5.1 Refer to 1.6 for close-out requirements.

3.5.2 Contractor/Installer to deliver all unused new and replaced finish hardware to the District's Lock Department.

3.6 MANUFACTURER'S ABBREVIATIONS OF LISTED HARDWARE:

[TEL]	TELEKEE
[MCK]	McKINNEY
[PEM]	PEMKO
[SGT]	SARGENT
[TEL]	TELKEE
[TIC]	TICE
[TRM]	TRIMCO

3.7 HARDWARE SETS

3.7.1 Items listed in the following Finish Hardware Schedule shall conform to the specification. The last column in the hardware schedule refers to the manufacturer's abbreviation listed above.

3.7.2 Furnish 1214CK in lieu of listed 1270SV wall stop where required.

NOTE: SOME HW SETS MAY NOT BE USED IN THIS PROJECT.

HW-01

1 SGL Door 101 EXTERIOR / CAFETERIA

Each Assembly to have:

2	EA	HINGE	TA386 5 X 4.5 NRP	630	MCK
	SET	ANCHOR HINGE SET	TA5392 4 X 4.5 NRP	630	MCK
1	EA	EXIT DEVICE	16-21-43-8804	630	SAR
1	EA	RIM CYLINDER	34	626	SAR
1	EA	VANDAL TRIM	1096-HASP	630	TRI
1	EA	CLOSER	EN351-P10 DA	689	SAR

1	EA	DROP PLATE	EN351-D OR AS REQUIRED	689	SAR
1	EA	KICK PLATE	K0050 B4E 10" X 2" LDW	630	TRI
1	EA	FLOOR STOP & ANCHOR	1214CK X 1269	626	TRI
1	EA	DOOR SWEEP	345A	AL	PEM
1	EA	THRESHOLD	276A	AL	PEM

SEALS ARE SUPPLIED BY THE AL/GL STOREFRONT MANUFACTURER.

HW-02

1 PR Door 103 OPEN OFFCE / CAFETERIA

Each Assembly to have:

8	EA	HINGE	TA386 5 X 4.5 NRP	630	MCK
1	EA	REMOVABLE MULLION	L980	689	SAR
2	EA	EXIT DEVICE	16-21-43-8813LL	630	SAR
2	EA	RIM CYLINDER	41	626	SAR
2	EA	CLOSER	EN351-P10 DA	689	SAR
1	EA	DROP PLATE	EN351-D OR AS REQUIRED	689	SAR
1	EA	THRESHOLD	1665A	AL	PEM
2	SET	SEALS	290AS	AL	PEM
1	SET	SEALS	HSS 1000 20’	BLK	PEM

(OMIT INTUMESCENT IF DOORS ARE POSITIVE PRESSURE LABELED DOORS)

INSTALL HEAD SEAL BEFORE CLOSER OR HOLDER.

HW-03

1 PR Door 203 ELEV. LOBBY / CONFERENCE ROOM
1 PR Door 205 HALL / CONFERENCE ROOM
1 PR Door 206 OPEN OFFICE / CONFERENCE ROOM

Each Assembly to have:

8	EA	HINGE	TA386 5 X 4.5 NRP	630	MCK
1	EA	REMOVABLE MULLION	L980	689	SAR
2	EA	EXIT DEVICE	16-21-43-8813LL	630	SAR
2	EA	CLOSER	EN351-P10 DA	689	SAR
2	EA	DROP PLATE	EN351-D OR AS REQUIRED	689	SAR
2	EA	FLOOR STOP	1211	626	TRI
1	EA	THRESHOLD	18/1 X 3	AL	PEM
2	SET	SEALS	290AS	AL	PEM
1	SET	SEALS	HSS 1000 20’	BLK	PEM

(OMIT INTUMESCENT IF DOORS ARE POSITIVE PRESSURE LABELED DOORS)

INSTALL HEAD SEAL BEFORE CLOSER OR HOLDER.

HW-04

1 SGL Door 105 BREAK AREA / KITCHEN

Each Assembly to have:

4	EA	HINGE	TA386 5 X 4.5	630	MCK
1	EA	OFFICE LOCK	21-28-10G24 LL	626	SAR
1	EA	CLOSER	EN351UO DA	689	SAR
1	EA	KICK PLATE	K0050 B4E 10" X 2" LDW	630	TRI
1	EA	FLOOR STOP	1211	630	TRI
2	SET	SEALS	290AS	AL	PEM
1	SET	SEALS	HSS 1000 20’	BLK	PEMI
1	EA	THRESHOLD	1665A	AL	PEM

(OMIT INTUMESCENT IF DOORS ARE POSITIVE PRESSURE LABELED DOORS)
INSTALL HEAD SEAL BEFORE CLOSER OR HOLDER.

HW-05

1 SGL Door 108 CAFETERIA / KITCHEN

Each Assembly to have:

4	EA	HINGE	TA386 5 X 4.5	630	MCK
1	EA	OFFICE LOCK	21-28-10G24 LL	626	SAR
1	EA	CLOSER	EN351UO DA	689	SAR
1	EA	KICK PLATE	K0050 B4E 10" X 2" LDW	630	TRI
1	EA	FLOOR STOP	1211	630	TRI
3	EA	SILENCERS	1229A	GRY	TRI

HW-06

1 PR Door 212 CONF. RM. / STORAGE

Each Assembly to have:

8	EA	HINGE	TA386 5 X 4.5	6302	MCK
1	SET	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	OFFICE LOCK	21-28-10G24 LL	626	SAR
2	EA	DOOR HOLDER	PAH60	689	LCN
1	EA	ASTRAGAL	357SP	600	PEM
2	EA	SILENCERS	1229A	GRY	TRI

HW-07

1 SGL Door 106 KITCHEN / DRY STORAGE

Each Assembly to have:

3	EA	HINGE	TA386 5 X 4.5	630	MCK
1	EA	OFFICE LOCK	21-28-10G24 LL	626	SAR
1	EA	CLOSER	EN351 DA CPS	689	SAR
1	EA	KICK PLATE	K0050 B4E 10" X 2" LDW	630	TRI
1	SET	SEALS	303AS	AL	PEM
1	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	151A MSES10	AL	PEM

HW-08

1 SGL Door 107 OPEN OFFICE / CAFETERIA

Each Assembly to have:

4	EA	HINGE	TA386 5 X 4.5	630	MCK
1	EA	CLASSROOM LOCK	21-28-10G37LL	626	SAR
1	EA	CLOSER	EN351UO DA	689	SAR
1	EA	KICK PLATE	K0050 B4E 10" X 2" LDW	630	TRI
1	EA	FLOOR STOP	1211	630	TRI
2	SET	SEALS	290AS	AL	PEM
1	SET	SEALS	HSS 1000 20’	BLK	PEMI
1	EA	THRESHOLD	1665A	AL	PEM

(OMIT INTUMESCENT IF DOORS ARE POSITIVE PRESSURE LABELED DOORS)
INSTALL HEAD SEAL BEFORE CLOSER OR HOLDER.

HW-09

1 SGL Door 104 BREAK AREA / CHANGING ROOM
1 SGL Door 204 ELEV LOBBY / OFFICE
1 SGL Door 207 OPEN OFFICE / STORAGE

Each Assembly to have:

4	EA	HINGE	TA714 4.5 X 4.5	652	MCK
1	EA	OFFICE LOCK	21-28-10G24 LL	626	SAR
1	EA	CLOSER	EN351UO DA	689	SAR
1	EA	FLOOR STOP	1211	630	TRI
4	EA	SILENCERS	1229A	GRY	TRI

HW-10

1	SGL	Door 209	OPEN OFFICE / A/V STUDIO
1	SGL	Door 210	CONF. ROOM / A/V CONTROL

Each Assembly to have:

4	EA	HINGE	TA386 5 X 4.5	630	MCK
1	EA	OFFICE LOCK	21-28-10G24 LL	626	SAR
1	EA	CLOSER	EN351UO DA	689	SAR
1	EA	KICK PLATE	K0050 B4E 10" X 2" LDW	630	TRI
1	EA	FLOOR STOP	1211	630	TRI
1	EA	THRESHOLD	1665A	AL	PEM
1	SET	SOUND SEALS	285CR	AL	PEM
1	EA	DOOR BOTTOM	411SL	AL	PEM

HW-11

1	SGL	Door 211	CONF. RM / HALL

Each Assembly to have:

4	EA	HINGE	TA386 5 X 4.5	630	MCK
1	EA	EXIT DEVICE	12-21-43-8816-ETL	626	SAR
1	EA	CLOSER	EN351P9 DA	689	SAR
1	EA	KICK PLATE	K0050 B4E 10" X 2" LDW	630	TRI
1	EA	FLOOR STOP	1211	630	TRI
1	SET	SEALS	290AS	AL	PEM
1	SET	SEALS	HSS1000 18'	BLK	PEM

(OMIT INTUMESCENT IF DOORS ARE POSITIVE PRESSURE LABELED DOORS)

INSTALL HEAD SEAL BEFORE CLOSER OR HOLDER.

* * * * * *

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Fire sprinkler system for protection of buildings.

B. Related Requirements: The requirements of this Section, NFPA 13 and NFPA 14 shall take precedence over requirements found in the following:

1. Section 15400: Plumbing.

C. Contractor to provide a complete design build Automatic Fire System for revisions to existing Automatic Fire Sprinkler System. Contractor shall produce and submit drawings to the Local Fire Agency:. Contractor to pay for and pull permit. Contractor shall be C-16 licensed.

1.02 SUBMITTALS

A. Manufacturer's Data:

1. Submit complete and detailed equipment and material list of items to be furnished and installed under this section.

2. Submit manufacturer's specifications and other data required to demonstrate compliance the plans and specified requirements.

B. Drawings:

1. Submit shop drawings of wet pipe fire protection sprinkler system in compliance to NFPA 13, Standard for the Installation of Sprinkler Systems, Sprinkler systems shall comply with the provisions of NFPA 13.

2. Shop drawings shall fully comply with the most stringent provisions of this specification and plans, and with the applicable codes and standards.

3. Shop drawings shall be same size as the Contract Drawings and shall be produced using AutoCAD.

C. Regulatory Requirements:

1. Installation of fire sprinkler system shall not vary from the plans unless alterations have been approved by the Local Fire Agency.

D. Closeout Submittals: Submit as specified herein:

1. Record Drawings:

a. Record drawings of installed Work shall be maintained current on the Project site, available for Fire Marshal and the Project Inspector to review.

b. At completion of installation submit Record Drawings signed by installing Contractor in AutoCad format, including:

1). Record Specifications.

2). Record Product Data: Include specific model, type and size for equipment and material installed.

3. Record Test Results.

4. Maintenance Manuals.

1.03 QUALITY ASSURANCE

A. Comply with applicable national or local codes and standards.

B. Except where exceeded by the requirements of these specifications, the following are made part of this section: prints and details, and provisions of the NFPA 13 Standard for Installation of Sprinkler Systems and NFPA 14 Standard for the Installation of Standpipes and Hose Systems.

C. Qualifications of Manufacturer: Products used in work of this section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a 5 year history of successful production that is acceptable to the Architect.

D. Qualifications of Installer: Installer shall have a current C-16 license in the State of California in the installation of fire sprinkler systems.

1.04 FIRE SERVICE WATER CONNECTION

A. The Owner shall pay fees and provide for the fire main POC (point of connection if required), consisting of the installation of a single detector check valve (if one is required) and meter shut off valve inside a meter vault.

B. Fire Service Mains shall be provided with approved Meter Service Backflow protection. An approved Reduced Pressure Principle Backflow Prevention Assembly (RP) to meet minimum backflow protection requirements for meter service protection (MSP) shall be provided on the fire main, according to the California Plumbing Code (CPC) and according to the current San Bernardino Department of Water and Power WATER SERVICE RULE 16-D where applicable (see section 2.02.D for backflow assemblies). Double Check Assemblies shall only be used with the written approval of the Water Purveyor.

1.06 JOB CONDITIONS

A. Unscheduled utility flow interruptions are not permitted. Schedule service interruptions in advance, with the OAR.

1.07 EXTRA MATERIALS FOR MAINTENANCE

A. Provide spare sprinkler heads in quantity equal to 2 percent of total number of each type of sprinkler head installed. There shall be no less than two heads of each type and temperature rating provided, and in no case less than six spare sprinkler heads per building. There shall be no fewer than 6 spare sprinkler heads for up to 300 sprinkler heads installed; no less than 12 spare sprinkler heads for up to 1,000 sprinkler heads installed; and no less than 24 spare sprinkler heads for the sites with more than 1,000 sprinkler heads installed. Spare sprinkler heads shall be kept inside of spare sprinkler head box(s). A spare sprinkler wrench for each type of sprinkler head shall also be provided inside of each spare sprinkler head box, at each building. Locations of spare sprinkler boxes shall be located at:

1. Fire Sprinkler Riser, when enclosed and secure.

2. Plant Manager's Office, when Fire Sprinkler Riser is exposed.

PART 2 - PRODUCTS

2.01 FIRE PROTECTION SYSTEM DESCRIPTION

A. General: Provide systems complete including, but not limited to:

1. Provide underground and above ground sprinkler and standpipe piping including trenching and backfilling. Materials and equipment shall be UL/FM listed and approved as required by NFPA for their application. Required signage shall be provided and installed as required by NFPA 13 and NFPA 14.

2. Provide overhead sprinkler system with sprinklers installed as required according to type, location and temperature rating.

B. Sprinkler Heads:

1. Provide chrome pendant spray type sprinkler heads with matching escutcheons in areas with finished ceilings. Exterior escutcheons shall be poly-coated or concealed type to prevent rusting and oxidation.

2. Provide upright sprinklers in areas with exposed piping.

3. Provide poly-coated glass bulb corrosion resistance type sprinklers heads in areas exposed to a corrosive environment such as parking garages and coastal air.

4. Sprinklers shall be glass bulb type, with hex-shaped wrench boss integrally cast into the sprinkler body to reduce the risk of damage during installation,

5. Sprinklers in concealed spaces, exterior locations, and other areas that will experience over 100 degrees F ambient temperature shall be furnished with 200 to 225 degree rated sprinklers. Sprinkler heads in boiler rooms, furnace rooms, or heater rooms shall be furnished with sprinklers rated at 250 to 290 degrees F. If a sprinkler is directly affected by a spotlight, steam, or other heat source, a 350 degree F or higher sprinkler head shall be furnished. Sprinkler heads in other locations, unless otherwise noted, shall be 155 to 165 degrees F rated.

6. Automatic fire sprinkler head type shall be as follows:

   a. In areas with ceiling heights of nine-feet or lower, sprinkler heads installed shall be recessed or fully concealed.

   b. Ceilings eight-feet or lower shall be provided with fully concealed sprinkler heads.

   c. Areas with ceiling height of nine-feet or lower, that are not constantly supervised such as corridors, arcades, students restrooms, and other restrooms shall be provided with fully concealed sprinkler heads.

7. Sprinkler heads in light hazard occupancies are required to be Quick Response sprinklers as required in NFPA 13. Sprinkler heads shall be of the same manufacturer throughout the building/site as indicated. Sprinklers shall typically be ½ inches NPT, standard orifice, minimum 5.6 nominal K factor, UL listed for 175 psi, and listed for light and ordinary hazard occupancies.

8. Other specialized sprinkler heads such as walk-in refrigerator or freezer heads, side wall, ¾ inches sprinklers above 5.6 K factor, and those sprinklers with a K factor below 5.6, shall only be used where required by project condition. Large drop sprinkler heads and extended coverage sprinkler heads shall not be installed.

9. Sprinkler head location shall be designed and installed in an aesthetically pleasing manner and should generally be located in center of 24-inch by 24-inch ceiling tiles and in center of 24-inch by 48-inch ceiling tiles in the 24-inch direction and no closer than 12-inch from the edge in the 48-inch direction.

10. UL/FM listed Sprinkler head guards shall be provided on Sprinkler heads installed at seven feet six inches above floor or lower in exposed locations, or

that are deemed subject to damage. Sprinkler head guards shall securely fasten with bolt-on feature to the base of the sprinkler or be a factory installed guard. Guards shall also be provided on upright and sidewall heads where sprinklers are installed at seven feet six-inch heights or lower.

C. Fire Sprinkler and Standpipe Systems:

1. Underground piping: Comply with the requirements Site Water Distribution Utilities.

2. Provide an underground UL/FM listed PVC or Ductile iron supply line connected to detector check meter or water main as indicated. Install site water mains no closer than 10'- 0" parallel to the building foundations. Underground fire water lines shall be installed 36 inches below grade.

3. Fire Department Connection (FDC) with check valve (wafer type) shall be provided after the backflow preventor, and before the building fire sprinkler riser(s), located where the FDC will be accessible to the fire department from the street or sidewalk without obstructions. No shut off valve shall be allowed on the FDC line as per NFPA 13. FDCs shall have a height between two and four-foot above the ground.

4. PIVs shall be electrically supervised regardless the number of fire sprinkler served (CBC 903.4), and set at a height of three feet to the top and have the handle locked in place with a break-a-way lock.

5. Provide a UL listed, FM approved FDC, approved RP type backflow assembly, check valves, shut-off valves, drain valves, ITV, and flow indicator at the locations required. (Test-and-drain combination valves are prohibited.)

6. Flow indicator shall activate the fire alarm system between 45 and 90 seconds, and activate a local alarm on the outside of the building continuously with water flow. Connection of this switch is a part of the Work of Division 26. Shut-off including valves on the fire main backflow preventor shall be electrically supervised according to CBC 903.4,, NFPA 13.

7. Pipe through ceilings at head locations shall be furnished with a two piece, or fully concealed escutcheon. Unless otherwise designated, escutcheons shall be identical and match the other escutcheons of the same type throughout the building or site. Piping through walls and ceilings shall have a split ring chrome escutcheon.

a. Flexible stainless steel sprinkler head drop system may be used. Flexible drops shall be UL listed, FM approved, and shall be compatible with ceiling systems. Flexible drop length shall be

included in the Hydraulic Calculations. The drop system shall include the required support bracing.

8. Furnish and install required signs, spare heads, special wrenches, and spare sprinkler head boxes as required to satisfy NFPA 13, NFPA 14 and this specification.

9. Sprinkler system piping shall be provided with complete drainage as required by NFPA. Test valve discharge shall be piped away from planters to asphalt areas. Furnish protection of piping against accidental or malicious damage.

10. Upon completion of the Work of this section, and before Substantial Completion, subject system, including underground supply connection, to tests required. A minimum hydrostatic test shall be two hundred pounds (200 psi) or fifty pounds (50 psi) in excess of the maximum system working pressure, whichever is greater, for two hours with no leaks or loss of pressure per NFPA 13. The Project Inspector shall be furnished with a NFPA 13 test certification.

11. Local fire sprinkler alarm requirements shall be accomplished with a vane or paddle type water flow detector switch and an electrically powered fire sprinkler horn located on the street side of the building and connected to the fire alarm control panel with secondary power provided from the fire alarm batteries. The drilled out disk shall be attached to the mounting U-bolt. Time delay shall be set at 45 to 60 seconds. Mechanically activated water bells with alarm valve and pressure switch are prohibited.

12. Seismic separation assemblies shall be located between the buildings if space allows accessibility. Otherwise they shall be located inside the building providing the most space. Swing joints may be fabricated on site using flexible groove couplings and six grooved (Victaulic) 90 degree elbows in a teepee formation (see NFPA 13, figure A.9.3.3). Seismic separation assemblies can also be made utilizing a manufactured, UL/FM listed swing joint assembly rated at a minimum 175 psi.

13. Hanging, bracing and support shall utilize only UL/FM listed approved products, and comply with NFPA 13, Chapter 9 requirements for rod and bolt sizes except for the following: 4 and 6 inch pipe shall be supported by a minimum ½ inch hanger rod, 8 inch pipe shall be supported by a minimum 5/8 inch hanger rod, 10 and 12 inch pipe shall be supported by a minimum ¾ inch hanger rod. Hanger rods in exterior locations and in parking structures shall have Electrodeposited Zinc Coating per ASTM B633 to prevent rusting.

14. Building Fire Sprinkler riser assemblies shall be provided as follows. Every building shall be provided with an accessible and electrically supervised riser shut off valve at a height not to exceed five-feet above the floor. Every building riser assembly shall be equipped with a check valve followed by a

main drain valve and then the flow indicating switch and pressure gauge immediately after the shut-off valve. In cases where a riser assembly is provided for each floor in the building, a check valve, main drain and flow switch shall be provided for each floor; the main building shut-off shall not be required. An electrically supervised Post Indicator Valve located outside the building may serve as the building riser shut-off valve.

2.02 MATERIALS

A. Access Panel:

FAP-1 Square, steel, prime-coated, with vandal-proof door lock operated by Allen wrench:

Smith	Josam	Elmdor	Or equal
4760		DW – AKL	

B. Globe or Angle Valves: UL/FM listed.

AV-1 Bronze angle valve: 2 inches and smaller, screwed-in bonnet, threaded ends, rising stem:

Nibco	Kennedy	Fairbanks	United	Or equal
T-301	98 SD	0210	126T	

C. Automatic Fire Sprinkler Head, UL/FM listed:

AFSH-1 Brass pendant type for areas with suspended ceilings:

Victaulic	Tyco	Viking	Reliable	Or equal
V27	TY 3231	VK302	F1FR56	

AFSH-2 Brass upright type for areas with no ceilings:

Victaulic	Tyco	Viking	Reliable	Or equal
V27	TY3131	VK300	F1FR300	

AFSH-3 Chrome or poly coated semi recessed type with semi-recessed escutcheon:

Victaulic	Tyco	Viking	Reliable	Or equal
V27	TY3231	VK302	F1FR56	

AFSH-4 Fully concealed type sprinklers; chrome cover:

Victaulic	Tyco	Viking	Reliable	Or equal
V38	TY3531	VK462	F4FR	
		VK404	G4A	

D. Backflow Prevention Assemblies:

BPV-1 Reduced Pressure Principle Backflow Prevention Assembly (RP) type for meter service protection (MSP) requirements:

Ames	Febco	Watts	Wilkins	Or equal
4000SS	860 OS&Y	909 RP	975 RP	
C400	880 OS&Y	957 RP	375 RP	
M400		994 RP		

BPV-2 Reduced Pressure Principle Detector Assembly (RPDA) for MSP requirements:

Ames	Febco	Watts	Wilkins	Or equal
5000SS	860 DA	909 RPDA	950 DA	
C500	880 DA	957 RPDA	350 DA	
M500		994 RPDA		

E. Gear Operated Butterfly Valves:

GOBFV-1 Grooved end Gear Operated Butterfly Valve, 300 psi, for fire protection sprinkler risers. UL listed, FM approved, with weatherproof gearbox and double pole/double throw monitor switch, double seal design for bubble tight shut off at 175 psi. Corrosion-resistant, fusion-bonded nylon II body coating, easy to read position indicator:

Kennedy	Nibco	Victaulic	Tyco	Or equal
Figure 82M	GD-4765-8N, 300 psi	705W 300 psi	580 300 psi	

GOBFV-2 Wafer Type Gear Operated. Butterfly Valve, same requirements as GOBFV-1:

Kennedy	Nibco	Or Equal
Figure 82W	WD-3510 300 psi	

F. Check Valves:

CV-1 Bronze check valves: 2 inches and smaller, 200 psi WOG, bronze disc, swing type, conforming to MSS-SP-80-97, threaded ends:

Crane	Nibco	Stockham	United	Or Equal
37	T-433-Y	B-319	62T	

CV-2 Iron check valves: 2-1/2 inches and larger, class 175, composition disc, swing type, bolted cap, UL listed, FM approved flanged ends:

Stockham	Kennedy	Tyco	Clow	Or Equal
G-940	126	Model G	F5380	

CV-3 Wafer Type Check Valve:

United Wafer Check #90	Nibco KW-900-W	Mueller A-2102	
Or equal.			

CV-4 Grooved Check valve 2 ½ inch and larger:

United	Gruvlock	Reliable	Victaulic	Tyco
67	7800	Mode "G"	Series 717	590F
Or equal.				

G. Escutcheons

ES-1 Chrome plated, or white poly-coated, 2-piece canopy (escutcheon), 2.25 to 3.5 inches in extended position:

FPPI	Tyco	Reliable	Or equal
01 - 401	No. 401	HBC (chrome)	
Chrome or	Chrome or	HBW (white)	
White	White		

ES-2 Chrome plated or white poly coated, 2-piece recessed:

FPPI	Tyco	Reliable (semi recessed)	Or equal
01 - 400	410	GF2-C (chrome)	
01 - 402	420	GF2-W (white)	

H. Fire Department Connections:

FDC-1 UL listed, FM approved, type, 4 inch by 2-1/2 inches by 2-1/2 inches bronze body fire department hose connection (FDC):

Crocker	Potter-Roemer	Tyco	Powhaten	Or equal
6405 or	5710 or	86	21-201 or	
6420	5730		31-133	

I. Flow Indicators:

FIA-1 Listed by State Fire Marshal, with double pole, double-throw switch, one normally open and one normally closed, UL listed and FM approved:

Potter-Roemer	Notifier	Or equal
VSRF Series	WFR Series	

J. Outside Stem and Yoke Gate Valves:

OS&Y-1 Bronze Gate Valves: 2 inches and smaller, class 175, solid bronze wedge disc, OS&Y, copper silicon alloy stem, UL/FM listed, threaded ends:

Stockham B-133	Crane 459	Nibco T-14	United 18	Or equal

OS&Y-2 Iron gate valves: 2 ½-inch and larger, class 175, IBBM, OS&Y, solid wedge disc, Teflon-impregnated packing, UL/FM listed, flanged ends:

Stockham G-634	Crane 467	Kennedy 68	Mueller A-2073	Victaulic 771

Or equal.

OS&Y-3 2 ½-inch and larger, epoxy coated, resilient wedge, 175 pounds gate valve for riser valves, P.I.V., and shut off:

Clow F-6136	Nibco 617-0	Kennedy KV-4068	Mueller A-2360	Or equal

K. Gate Valves:

GV-1 Bronze gate valves: 2-inch and smaller, class 175, solid bronze wedge disc, rising stem copper silicon alloy stem, UL/FM listed, threaded ends:

Stockham B-133	Crane 459	Grinnell Fig. 66	United 14	Or equal

GV-2 Iron gate valves: 2 ½-inch and larger, class 175, IBBM, solid wedge disc, Teflon impregnated packing, UL/FM listed, flanged ends:

Stockham G-634	Crane 467	Kennedy 68	Mueller A-2052	Victaulic 772

Or equal.

L. Seismic Swing Joints:

SJ-1 UL/FM Approved flexible seismic connector with grooved, or threaded ends for seismic separation requirements.

SJ-2 Fabricated swing joints as per NFPA 13 using six groove 90 degree elbows and flexible groove couplers such as Victaulic style 75.

M. Post Indicator Valves:

PIV-1 Vertical Indicator Posts: Furnished for underground valves, post must provide a means of knowing if the valve is open or shut, UL/FM listed. (Where a backflow assembly is provided, the shutoff valves on the backflow preventer satisfy the requirement for a post indicator valve to control the fire main and FD Connection):

Stockham	Kennedy	Grinnell	Or equal
G-951	2945	F-750	
Clow	Mueller	Victaulic	
F-576	2945	774	

PIV-2 Posts Indicator valve: Furnished for underground valves. Ductile iron fusion bonded epoxy coated resilient wedge gate valves: 4 inches and larger, class 175 lb, non-rising stem, mounting plate for indicator post, UL/FM listed, flanged or mechanical ends (in accordance with NSF 61).

Stockham	Kennedy	Clow	Mueller	Victaulic
G-635	71X	F-6100	2360	772
O equal				

N. Sprinkler Guards:

SPG-1 Sprinklers installed at seven feet six inches above floor or lower in exposed locations, or that are deemed subject to damage shall be equipped with a UL/FM listed, head guard. Guards shall be listed, supplied and approved for use with the sprinkler by the sprinkler manufacturer. Sprinkler head guards shall securely fasten with bolt-on feature to the base of the sprinkler or be a factory installed guard. Guards shall also be provided on upright and sidewall heads where sprinklers are installed at seven feet six-inch heights or lower.

Reliable Viking Tyco FPPI Victaulic
Or equal.

O. Sprinkler Horn:

SPH-1 UL/FM approved, surface-mounted, weatherproof and red finished:

Horn:	Bell:	Wheelock equal
HRK System Sensor	SSM-24-10 System Sensor	
24 V-DC	24 V-DC	
Weatherproof with	Weatherproof with	
BBS-2 back-box for	WBB box for	
Surface mount	Surface mount installation	

Or equal

P. Hangers, Supports, Bracing:

HSB-1 Tolco products or UL listed and FM or equal.

Q. Threaded fittings:

TF-1 Ductile iron, 300 psi rated, UL listed, FM or NFPA approved.

TF-2 Cast iron fittings, 175 psi rated, UL listed, FM or NFPA approved:

Anvil Ward Taylor Or equal

TF-3 Malleable Iron, 300 psi rated, UL, Listed, FM or NFPA approved

TF-4 Galvanized, 175 psi rated, UL Listed, FM or NFPA approved

R. Fire Sprinkler Pipes and Standpipes:

FSP-1 Fire sprinkler pipe: 1 inch through 8-inch, Schedule 40, black or galvanized steel meeting ASTM Standards A53, A135, or A795. Pipe Corrosion Resistance Ratio (CRR) shall be 1.00 or greater. Pipe may be threaded or grooved.

a. Piping 2 inches and smaller shall have threaded joints and fittings in concealed, non-accessible locations. Groove coupler connections (Victaulic, Viking VGS, or equal) on pipe sizes 1 inch through 2 inches are acceptable in accessible areas with required seismic bracing provided. Plain end connections such as "Plainlock" and "FIT" are prohibited.

b. For pipe sizes 2 ½-inch and larger, grooved type (Victaulic, Viking VGS, or equal), welded, threaded and flanged connections may be used. Any connection that does not utilize a threaded, welded or grooved connection is prohibited, except for mechanical tee bolt-on branch outlet fittings sizes 2-inch and smaller (Victaulic 920 and the 920N).

c. Submit Verification from manufacturer stating that piping material furnished meets above criteria; (i.e.: threadable pipe has a UL assigned CRR of 1.00 minimum, that it meets ASTM A53, A135 or A795, and it is UL listed, FM or NFPA approved.)

FSP-2 Ductile iron pipe, AWWA C151 (for pipes below grade). Gasketed self retaining joints per ASME/ANSI B16.4.

FSP-3 Plastic, PVC, thick wall (cast iron OD sized), DR 14 (200 PSI). UL listed for fire main service (underground). Gasketed self retaining joints - Johns Manville Blue Brute AWWA C900, JM Eagle C900 water pipe or equal.

FSP-4 Fire Sprinkler Pipe: 1 inch through 3-inch, Copper meeting NFPA 13 Standards. Pipe may be grooved.

FSP-5 Flexible Fire Sprinkler Head Connectors: 1 inch pipe size flexible stainless steel fire sprinkler head connectors “Flex Head Industries” Models 2024, 2036, 2048, 2060 and 2072, or equal..

2.03 ACCESSORIES AND APPURTENANCES

A. Escutcheons: Polished chrome plated split-ring type for exposed piping at every penetration inside finished rooms.

B. Guards: Provide sprinklers with guards at ceiling at or under seven feet six-inch high and where subject to damage or vandalism.

C. Miscellaneous: Provide accessories and appurtenances for a complete system.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions under which Work of this section shall be performed. Correct conditions detrimental to proper and timely completion of Work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel or groove plain end ferrous pipe ends.

B. Remove scale and foreign matter, from inside and outside of pipes, before assembly.

C. Provide piping connections to equipment with flanged or grooved connections.

3.03 INSTALLATION

A. Install underground supply line connected to detector check or water main indicated. Braced or clamped bends shall be in accordance with requirements of NFPA 24. Provide vertical clamp rods at flange and spigot piece of risers, long enough to pass through riser's base flange where required. Furnish concrete thrust blocks where required.

B. Install FDCs, check valves, shut-off valves, gauges, Inspector’s test and drain assemblies and flow indicator. FDC must be installed so that it is unobstructed and accessible for the Fire Department’s first response unit.

C. Pipe through floors, wall, and ceilings, at head locations, shall be furnished with required sleeves, and escutcheons and fire caulking where indicated and/or required by code. Escutcheons shall be polished chrome plated unless other finish is selected by the Architect.

D. Sprinkler system shall be provided with complete drainage facilities in accordance with CBC standards. Drain discharge may discharge into a sewer, storm drain, sump pit or street gutter. Fire sprinkler drains shall not discharge onto a playground or across a sidewalk. Discharge to plumbing fixtures is prohibited due to the inability of a plumbing fixture to receive a full flow of water from a fire sprinkler drain valve under working pressure.

E. Upon completion of the Work of this section, and before Substantial Completion, subject the entire system, including underground supply connections, to tests as required by NFPA 13, and CBC standards and furnish the Owner with a certificate of compliance as required.

F. Close nipples are prohibited. Threaded unions are prohibited. Where a threaded union or coupling is needed, a groove type fitting (Victaulic or equal) shall be used instead. If a groove style coupling is used in a concealed area, an access panel allowing full access to that connection shall be provided.

G. Fire sprinkler systems piping hangers, seismic bracing, anchors and supports shall conform to NFPA 13, CBC and other applicable codes and the requirements of this specification.

H. Grooved joints shall be installed in accordance with the manufacturer's latest published installation instructions. Grooved ends shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove. Gaskets shall be of an elastomer grade suitable for the intended service, and shall be molded and produced by the coupling manufacturer.

I. Tee branch outlets on fire sprinkler mains shall be by the use of a threaded ductile iron tee fitting, a groove type tee fitting, (Victaulic or equal), or by the use of a thread-a-let welded on by a certified welder as required by NFPA. Mechanical tee bolted branch outlet fittings are prohibited except for branch outlet sizes 2-inch and smaller.

J. Sprinkler lines within the building shall be concealed within the structure. Risers shall be installed in utility, supply rooms or similar service areas whenever possible, and shall not obstruct access, or maintenance of other equipment within the space. Mains and risers shall be located within the area protected by the sprinkler system unless otherwise approved by fire authorities having jurisdiction.

K. Sprinklers that have been dropped, damaged, have cracked bulbs, or show a visible loss of fluid shall not be installed.

L. Sprinkler bulb protectors shall be removed by hand after sprinkler installation. Tools or other devices to remove the protector that could damage the bulb in any way shall not be used.

M. Routing of piping in non-concealed exposed areas shall be subject to the Architect's review in the final shop drawings.

N. Underground piping shall have a minimum of 36 inches of cover to grade. Underground pipe shall be installed on a flat not less than 6-inch thick undisturbed sand bed. After required pressure-leak test, pipe shall be covered with sand not less than 6 inches thick, before backfilling. Comply with NFPA Standards. Piping is not allowed to be underground below the building floor slab.

O. Provide approved backflow prevention assemblies. Installations of backflow prevention assemblies shall be tested and certified by a certified San Bernardino County backflow prevention device tester prior to Substantial Completion. Tests shall be performed in the presence of the Project Inspector. Test reports shall be turned over to the Project Inspector for mailing to proper agency.

P. Provide shunt trip when sprinklers are installed in the elevator machine rooms and elevator hoist way unless the sprinklers are located 2 feet or less from the hoist way pit floor.

Q. Test valve (ITV) shall be located at the opposite end of the sprinkler system from the supply. Test-and-drain type combination valves are prohibited. ITV discharge and main drain lines shall be piped to a sump pit or to the outside of the building to within a foot from the ground where it will drain away from the building to an exterior storm drain.

R. Each building with a sprinkler riser shall be furnished with an accessible shut off riser valve installed no higher than five feet from the finish floor. Each floor shall have a separate shut off valve with flow switch, and shall be securely enclosed or secured with a chain and break-a-way lock. Also see section 2.01- C-12 of this specification.

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 at off-project site.

END OF SECTION

SECTION 16761

CONFERENCE ROOMS AUDIO/VIDEO SYSTEM

PART 1 GENERAL

1.1 SCOPE OF WORK:

1.1.1 Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

.1 Examine all other Sections for work related to those other Sections and required to be included as work under Division 16.

.2 General provisions and requirements for electrical work.

1.2 RELATED WORK:

Document affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections of Divisions 1 and 16 of these Specifications.

1.2.1 The work described by this part includes the furnishing of all materials, equipment, supplies, labor and the performing of all operations necessary for the installation of complete and operating systems.

1.2.2 All conduits, outlet boxes, back boxes, junction boxes, terminal cabinets and backboards are furnished and installed by others and not part of this Section. The wiring, cables, equipment, devices, etc., shall be furnished and installed complete under this Section. Conduit and junction box sizes shall be determined by the Contractor for the particular wire and cable fills required for the systems installed (conduit sizes shall comply with the National Electrical Code). The entire responsibility of the system, including the installation, operation, function, testing and maintenance for 1-year after final acceptance under this section shall be the responsibility of the Contractor.

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

1.2.4 Refer to Audio/Video System Drawings E-6 and E-7 for additional information.

1.3 GENERAL REQUIREMENTS

1.3.1 The Contractor shall warrantee station for the brand of equipment specified and shall maintain a fully equipped service organization capable of furnishing adequate repair service to the equipment. The Contractor shall maintain a spare set of all major parts for the system at all times. All circuit boards, amplifiers and control sub systems shall be 100-percent backed up with stock at Contractor's Shop.

1.4 QUALITY ASSURANCE:

1.4.1 Electrical Component Standard: Provide work complying with applicable requirements of NFPA 70 "National Electrical Code" including, but not limited to:

.1 Article 250, Grounding.

.2 Article 300, Part A. Wiring Method.

.3 Article 310, Conductors for General Wiring.

.4 Article 725, Remote Control, Signaling Circuits.

.5 Article 800, Communication Systems.

1.4.2 EIA Compliance: Comply with the following Electronics Industries Association Standards:

.1 Sound Systems, EIA-160.

.2 Loudspeakers, Dynamic Magnetic Structures, and Impedance, EIA-299-A.

.3 Racks, Panels, and Associated Equipment, EIA-310-A.

.4 Amplifiers for Sound Equipment, SE-101-A.

.5 Speakers for Sound Equipment, SE-103.

1.4.3 Installation and Startup of All Systems shall be under the direct supervision of a local Agency regularly engaged in installation, repair, and maintenance of such systems. The Supplier shall be accredited by the proposed Equipment Manufacturers and be prepared to offer a Service Contract for the audio-video system.

1.5 SUBMITTAL AND MANUALS (ADDITIONAL REQUIREMENTS)

1.5.1 General

.1 The submission shall consist of six (6) Major Sections with each Section separated with index tabs. Each page in the submission shall be numbered chronologically and shall be summarized in the index.

.2 The First Section shall be the "Index" which shall include the Project title and address, name of the firm submitting the proposal.

.3 The Second Section shall include a copy of the Contractors letters of Factory Authorization and Guaranteed service. List of proposed instrumentation to be used by the Contractor.

.4 The Third Section shall contain an original factory data sheet for every piece of equipment in the system.

.5 The Fourth Section shall contain block diagrams with wiring and connector schedule for each circuit leaving each piece of equipment and complete Plan Drawings showing system wiring. Provide engraving schedule for all wall plates.

.6 The Fifth Section shall contain details on the touch screen control system including software, proposed graphic depictions of the system with icons and text.

.7 The Sixth Section shall contain technical analysis data from EASE or similar computer study modeling the speakers in the room and justifying the coverage patterns of the system speakers.

1.5.2 At the Conclusion of the Project, the Contractor shall provide three (3) copies of an "Operating and Servicing Manual" for the system. The manuals shall be bound in flexible binders. All data shall be printed material or typewritten. Each manual shall include the following: Instructions necessary for the proper operation and servicing of the system; complete As-Built Installation Drawings of the system; a wiring destination schedule for each circuit leaving for each piece of equipment; a schematic diagram of major components.

PART 2 - PRODUCTS

2.1 GENERAL

2.1.1 The Completed System shall provide the following features and functions:

.1 A mode of operation in which the system microphones are mixed and broadcast over the system speakers.

.2 A mode of operation in which the output audio from a DVD or CD is decoded and broadcast over the system speakers.

.3 A mode of operation in which the output audio from an MP3 player is broadcast over the system speakers.

.4 A mode of operation in which the output audio from a computer is broadcast over the system speakers.

.5 A mode of operation in which video signals from video camera on the Conference Room are displayed on the system TV monitors and projector screen.

.6 A mode of operation in which video signals from a computer are displayed on the system TV monitors and projector screen.

.7 A mode of operation in which video signals from a computer on the Presenters Podium are displayed on the system TV monitors and projector screen.

.8 A mode of operation in which any of the system audio and video sources are mixed and streamed digitally onto the facility computer network.

.9 All audio signals sounded over the system speakers shall also be simultaneously broadcast over an assistive listening system for the hearing impaired which is integral to the system.

10. The system shall include switching to allow selection of which of the system speakers will broadcast audio signals.

11. The system shall include a touch screen control system located at the video control room for simple and intuitive operation by users not familiar with the audio/video system.

.12 A mode of operation in which the output audio from a computer in the Control Room is broadcast over the system speakers.

.13 A mode of operation in which the output audio from a TV tuner in the Control Room is broadcast over the system speakers.

.14 A mode of operation in which HDCP video signals from a Blu-Ray DVD player in the Control Room are displayed on the system TV monitors and video projector.

.15 A mode of operation in which video signals from a computer in the Control Room are displayed on the system TV monitors and video projector.

.16 A mode of operation in which video signals from a computer on the Presenters Podium are displayed on the system TV monitors and video projector.

.17 A mode of operation in which video signals from a TV tuner in the Control Room are displayed on the system TV monitors and video projector.

.18 A mode of operation in which any of the system audio and video sources are mixed and broadcasted Conference Room in English or Spanish.

.19 The system shall include switching to allow a TV monitor in the Control Room to display any of the video sources.

.20 The system shall include switching to allow selection of which of the system speakers will broadcast audio signals (in what language?).

.21 The system shall allow each Conference Room to function independent from others.

.22 The system shall include switching to control retractable projector mounts.

.23 The system shall include switching to control retractable projector screens.

.24 The system shall include mode operation for MAC, Apple TV, Chromecast and WiFi password protected coordinate with District Representative.

2.2 RACK MOUNTED EQUIPMENT

2.2.1 The Audio System Floor Standing Equipment Rack shall be installed in the following new audio/video system equipment:

2.2.2 Audio Equipment in Rack

.1 Telex ST-300 Series personal listening system transmitter with remotely mounted antenna for the hearing impaired.

.2 Three (3) Electrovoice #RE-2 UHF wireless microphone receivers with remote antenna. Provide Electrovoice #ADP-4+ UHF antenna distribution systems and four (4) FA-XX remotely mounted antenna, each with #AB-2 mounting bracket, cables and terminators.

.3 Pink noise generators to facilitate system set up.

2.2.3 Video Equipment in Rack

.1 One (1) Extron #XTP CrossPoint 1600 Series modular digital matrix switcher from 4x4 to 16x16 with Speed switch technology, with number of inputs and outputs and blank coverplates as indicated on Plans.

.2 One (1) Extron #IPCP Pro 250 IP Link Pro control processor.

.3 Three (3) Pioneer #BDP-V6000 Blu-Ray DVD/CD player control port for operation via the touch-screen control system, and LAN connection.

2.2.4 Miscellaneous Audio-Video Equipment

.1 Extron #PS-124 12-volt dc power supplies for various components in the system.

.2 Custom power sequencing system including controllers and 20amp power modules connected to control six (6) 120-volt branch circuits so that rack equipment is sequentially turned on with amplifiers turned on last. Provide surge suppressor for each power module.

.3 Provide flush mount switch with LED status lights for mounting external to the rack so that system can be remotely turned on.

.4 Rack mounting hardware for all system components.

2.3 SPEAKERS

2.3.1 Distributed Loud System Speakers shall be Extron #SI 26CT furnished in quantities as indicated on plans. Each speaker shall be flush in ceiling speakers with metal backbox enclosure containing 70V, 2-way speaker with 6.5-inch woofer, 1-inch tweeter and internal crossover. Coverage pattern of loud speakers shall be as determined by EASE Analysis of the speaker coverage of the room based on its location as indicated on the Plans.

2.4 MICROPHONES AND ACCESSORIES

2.4.1 Provide ten (10) Shure #MX412D electret condenser gooseneck microphones with desktop base, mute button and LED indicator and 10 feet long cable.

2.4.2 Provide ten (10) Electrovoice #RE-2 handheld wireless transmitters with RE10 condenser microphone elements and two (2) Electrovoice #RE-2 handheld wireless transmitters with #NDYM-767a dynamic, voice-optimized-bass microphone elements.

2.4.3 All New Microphones shall connect to mixing console located on Audio/Video Control Room. Coordinate with District Representative and provide all cabling, connectors, accessories and connections for a complete and operable system.

2.5 MONITORS

2.5.1 Provide five (5) 75-inches Pro Bravia LED edge-lit commercial-grade large screen LCD 2160 UHD display monitor to be mounted at locations where shown on Plans. Monitor shall be 75

UHD 2160 by Sony, 120Hz, with integrated digital tuner for using digital signage, RGB input, RS232C control port, HDMI and LAN connection. Provide wall mount kit for each of the 80-inch display monitors.

2.5.2 Provide two (2) 24-inch Monitor to be located in Audio/Video Control Room. Monitor shall be Dell #U2413 or equal with desk stand, HDMI and RS-232 input.

2.5.3 Provide three (3) 36-inches high performance LED Edge-Lit commercial grade LED full 2160 UHD monitor, RGB input, HPMI and LAN connection 36 UHD 2160 by Sony 120Hz.

2.6 TOUCH PANELS

2.6.1 Provide four (4) Touch-Screen Control Panels wall mounted where shown on Plans. Touch Panels shall be Extron #TLP Pro 720M Series with 7-inch screen.

2.7 TRANSMITTERS AND RECEIVERS

2.7.1 Extron #XTP T HWP 102 twisted pair transmitter with VGA and HDMI inputs and Decora wall plate for video source inputs. Provide where shown on Plans.

2.7.2 Extron #XTP R HWP 201 twisted pair receiver with RS-232, Ethernet and HDMI output and decor wall plate for wall display monitors.

2.8 AUDIO-VIDEO HDMI RECEIVERS

2.8.1 Provide seventeen (17) Extron #XTP R HDMI receivers. One (1) each for the 75-inch LCD display, Control AV Room 36-inch LCD display and the overhead projector.

2.9 VIDEO PROJECTOR

2.9.1 Projectors shall be Epson Powerlite 4770W Series with lens appropriate for the installation. Verify exact screen size with screen installer and provide proper lens. Projector shall have 15-pin analog video input, RS232C control port, and LAN connection.

.1 Contractor to provide 9 ceiling mount projectors at locations shown on plans and coordinated with the Audio / Video contractor.

2.9.2 Provide retractable ceiling mounting bracket by DA-Lite #DA-Lift 15m at each location shown on Plans.

.1 Contractor to provide 9 ceiling retractable projector mounts at locations shown on plans and coordinated with the Audio / Video contractor.

2.10 FIXED MOUNTED VIDEO CAMERA

2.10.1 Camera shall be Sony #BRCZ330 Series high definition pan/tilt/zoom with 15-pin analog video output, RS232C control, and LAN connection.

.1 Provide 2 Video Cameras, one each for Conference Rooms A and B, and aim at the podium, coordinate locations with Audio / Video contractor.

2.10.2 Provide Sony #RMBR300 joy-stick type remote camera controller in Control Room.

2.11 WALL OUTLETS

2.11.1 Wall and Ceiling Mounted Video and Control Connectors shall be Extron AAP Series architectural wall plates. Wall plates shall be white in color. Provide custom engraving on each connector. Provide flush mounted single and multi-gang outlet boxes compatible with wall plates at each location.

2.11.2 Wall Mounted Microphone Outlets shall be Switchcraft XLR connector on Extron #AAP Series black wall plate in flush mounted outlet box. Engrave each outlet with the microphone-input number corresponding to the respective input of the mixer to which the outlets are connected.

2.11.3 MP3 Player Input shall be Switchcraft 3.5mm stereo jack mounted to Extron #AAP Series engraved white wall plate in flush wall mounted box.

2.12 CABLE

2.12.1 Microphone Cable shall be West Penn #291 2-conductor #22AWG shielded or equal.

2.12.2 Speaker Cable shall be UL listed for Class 1 circuits as defined by NEC Article 725. West Penn #77295 #14AWG shielded or equal.

2.12.3 VGA Cables Connecting Rack Components to each other and to the camera and projector shall be as manufactured by Extron.

2.12.4 Category 5e Cables shall be Extron UTP Skew Free Series.

2.12.5 Provide Portable Cables Complete with connectors on each end for connection of camera and wall monitors to their respective outlet boxes. Cables shall be of sufficient length at each location to reach from outlet box to the connector on the device with no more than 12-inches of slack cable.

2.13 ACCESSORIES

2.13.1 Provide Telex #DEB-2 dual earbud receivers and #SR-50 Series receivers for the assistive listening system in quantity based on 4-percent times the occupancy load. System shall comply with the requirements of CBC 1104 B.2. and be compatible with the rack mounted transmitter.

2.13.2 Provide one (1) Telex #BC-100 battery charger for each two (2) #SR-50 receivers furnished.

2.13.3 Provide Telex #HGA-1 remote antenna and connecting cable.

2.13.4 Provide Wall Mounted System on-off switch with pilot light connected to the power controller in the rack to remotely turn the system on and off.

2.14 SOFTWARE

2.14.1 Provide Extron Global Configuration Professional software for the touch-screen control system. Include Extron TouchLink GUI Modification and Customization Services to customize the control system for ease of operation.

PART 3 - EXECUTION

3.1 GENERAL

3.1.1 Anchor Camera and Monitors to ceiling and walls at approximate locations shown on Plans and positioned for best performance.

3.2 INSTALLATION

3.2.1 The Wiring of the System shall be executed in accordance with the Drawings and the Equipment Manufacturer's wiring diagrams. Should any variations in these requirements occur, the Contractor shall notify the Architect before making any changes. It shall be the responsibility of the Factory-Authorized Distributor of the specified equipment to install the equipment and guarantee the system to operate as per Plans and Specifications.

3.2.2 Furnish all conductors, equipment plugs, terminal strips, etc., and labor to install a complete and operable system.

3.2.3 The Labor Employed by the Contractor shall be regularly employed in the installation and repair of audio/video systems and shall be acceptable to the Owner and Architect to engage in the installation and service of this system. The systems shall be installed in accordance with NFPA 70 and other applicable Codes.

3.2.4 Impedance and Level Matching: Carefully match input and output impedance’s and signal levels at signal interfaces. Provide matching networks where required.

3.2.5 Control Circuit Wiring:

.1 Install control circuits in accordance with NFPA 70 and as indicated. Provide number of conductors as recommended by System Manufacturer to provide control functions indicated or specified.

.2 The Contractor shall mount an equipment rack as shown on the Plans. All wires shall be identified by the actual location it serves. All the audio/video points shall be wired into this equipment rack, laid down in sequence, and identified by which line it is on and the point position it serves. Cross connect circuits for proper operation.

.3 The Contractor shall provide necessary transient protection on the AC power feed. All protection shall be as recommended by the Equipment Supplier and referenced to earth ground.

3.2.6 Grounding

.1 Provide equipment grounding connections for audio/video systems as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounds.

.2 Ground equipment, conductor, and cable shields to eliminate shock hazard and to minimize to the greatest extent possible, ground loops, common mode returns, noise pickup, cross talk, and other impairments. Provide 5-ohm ground at main equipment location. Measure, record, and report ground resistance.

.3 The Contractor shall provide all necessary transient protection on the AC power feeds.

.4 The Contractor shall note in his System Drawings, the type and location of these protection devices as well as all wiring information.

.5 The Contractor shall furnish and install a dedicated, isolated earth ground from the central equipment rack and bond to the incoming electrical service ground buss bar.

3.2.7 Wiring within Enclosures:

.1 Provide adequate length of conductors. Bundle, lace, and train the conductors to terminal points with no excess. Provide and use lacing bars. The cables within the rack or cabinets shall be carefully cabled and laced with No. 12 Cord waxed linen lacing twine or ty-raps. All cables shall be numbered for identification.

.2 Provide physical isolation from each other for speaker-microphone, line-level, speaker-level, and power wiring. Run in separate raceways, or where exposed or in same enclosure, provide 12-inches minimum separation between conductors to speaker- microphones and adjacent parallel power and telephone wiring. Provide physical separation as recommended by Equipment Manufacturer for audio/video system conductors.

.3 Splices, Taps, and Terminations: Make splices, taps and terminations on numbered terminal punch blocks in junction, pull, and outlet boxes, terminal cabinets and equipment enclosures. Splices of conductors in underground pull boxes is not permitted.

.4 Identification of Conductors and Cables: Use color coding of conductors and apply wire and cable marking tape to designate wires and cables so all media are identified in coordination with system wiring diagrams.

3.3 PROTECTION AND CLEANING

3.3.1 Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the Manufacturer.

3.3.2 Repair or Replace damaged components before Substantial Completion of the Project.

3.3.3 Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of the equipment. Remove construction debris from equipment area and dispose of properly.

3.4 FIELD QUALITY CONTROL

3.4.1 Manufacturer's Field Services: Provide services of a duly Factory Authorized Service Representative for this Project location to supervise the field assembly and connection of components and the pre-testing, testing, and adjustment of the system.

3.4.2 Inspection: Make observations to verify that units and controls are properly labeled and interconnecting wires and terminals are identified. Provide a list of final tap settings of paging speaker line matching transformers.

3.4.3 Testing:

.1 Provide all instruments for testing and demonstrating in the presence of the Owner's Inspector that the system is operating as stated in the factory data sheets. Check all circuits and wiring to verify they are free of shorts and grounds. Perform all tests stated in each separate System Specification.

.2 The Contractor shall time align and balance the system, and shall report the on-axis frequency results after equalization of the system. The Contractor shall also measure and report:

- Maximum program material sound level and related headroom.
- Maximum system gain, and
- Hum and noise signal-to-noise ratio of the overall system for each mike input channel.

.3 Rectify deficiencies indicated by tests and completely re-test work affected by such deficiencies at Contractor's expense. Verify by the system test that the total system meets the Specifications and complies with applicable standards.

.4 The Owner reserves the right to make independent tests of all equipment furnished to determine whether or not the equipment complies with the requirements specified herein and to accept or reject any or all of the equipment on the basis of the results thereby obtained.

.5 The Contractor shall adjust system gain controls for optimum S/N ratio so that full amplifier output will be achieved with 0dBm at a line-level input. Contractor shall also verify correct polarity of the speakers and verify all operational functions at each control device. Each of these items shall be documented and reported in a test report to be included as part of an Owner’s Manual.

3.5 IN SERVICE TRAINING

3.5.1 Train Owner's Maintenance Personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Provide a minimum of two (2) 4-hour training sessions at completion of the Project, one (1) for Operations and Maintenance Personnel and one (1) for Administration Staff. Operator’s Manuals and Users Guides shall be provided at the time of this training.

3.5.2 Provide an Additional 4-hour Refresher Training Course within 12-months of acceptance of the Project when requested by the District.

3.5.3 Schedule Training with Owner through the Architect, with at least 7-days advance notice. This instruction time shall be divided as directed by the Owner.

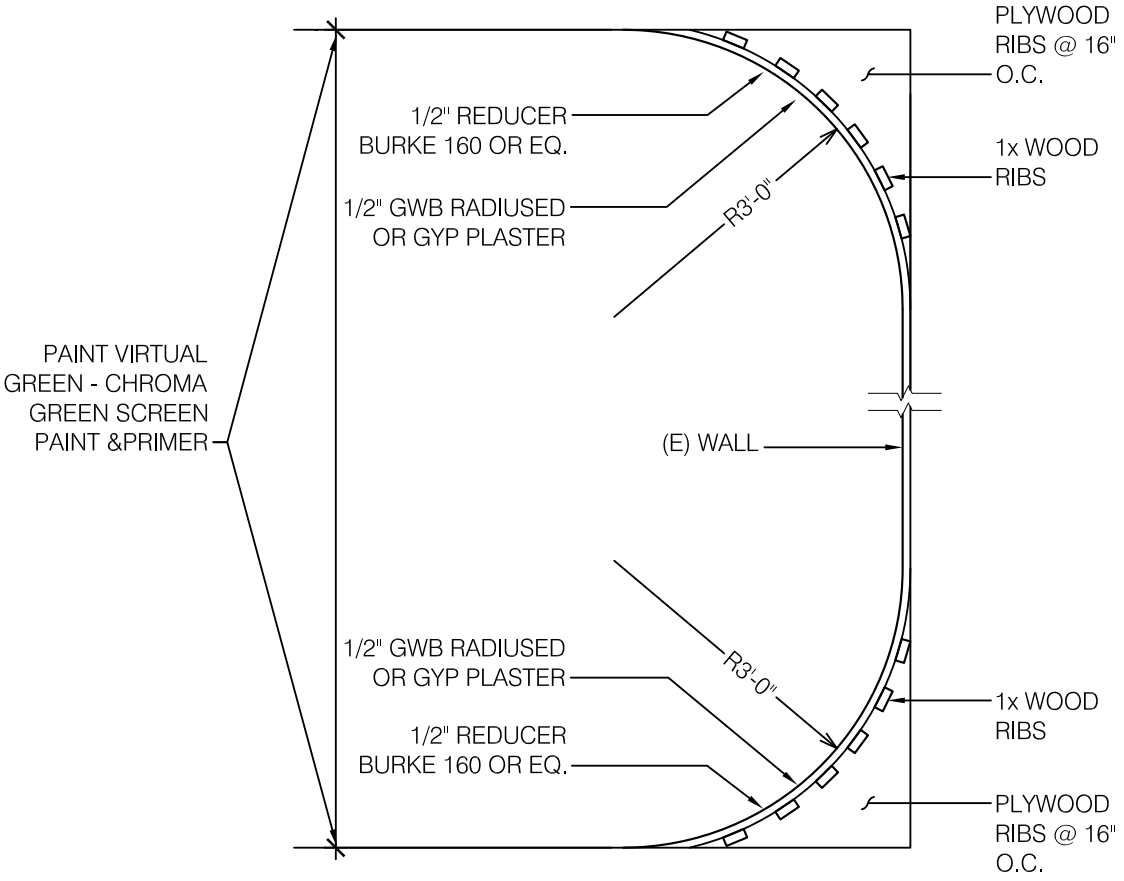
3.6 WARRANTY

3.6.1 The Entire System shall be warranted free of mechanical or electrical defects for a period of 1-year after final acceptance of the installation. Any material showing mechanical or electrical defects shall be replaced promptly at no expense to the Purchaser.

3.6.2 The Contractor shall maintain a competent service organization and shall, if requested, submit a Service Maintenance Agreement to the Owner after the end of the guarantee period.

3.6.3 A Typewritten Notice shall be posted at the equipment rack which shall indicate the firm, address and telephone number to call when service is necessary. The notice shall be mounted in a neatly finished metal frame with a clear plastic window and securely attached to the inside of the door.

****



PLAN VIEW

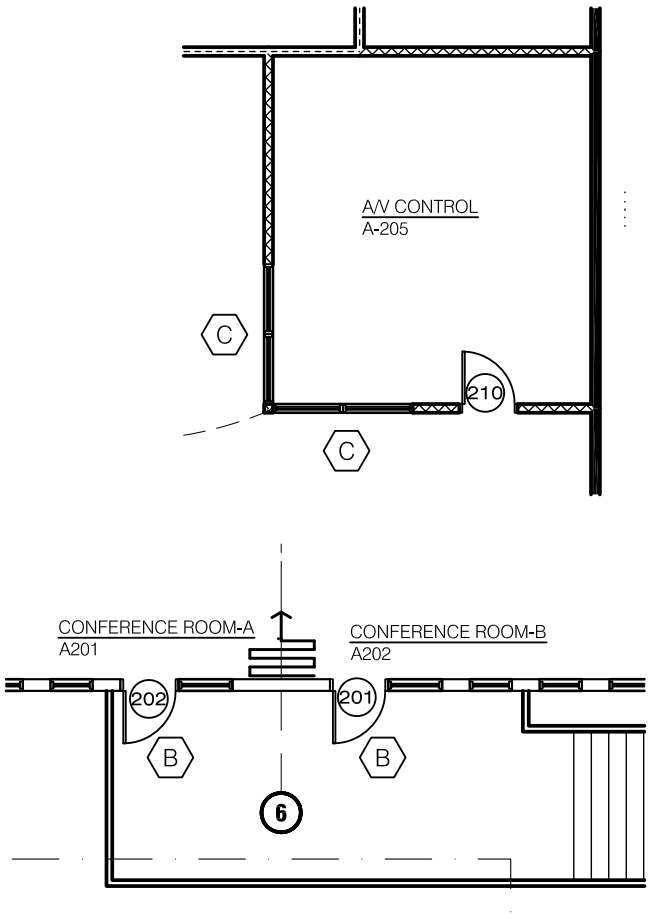
APPL. #

pdh architects, llp

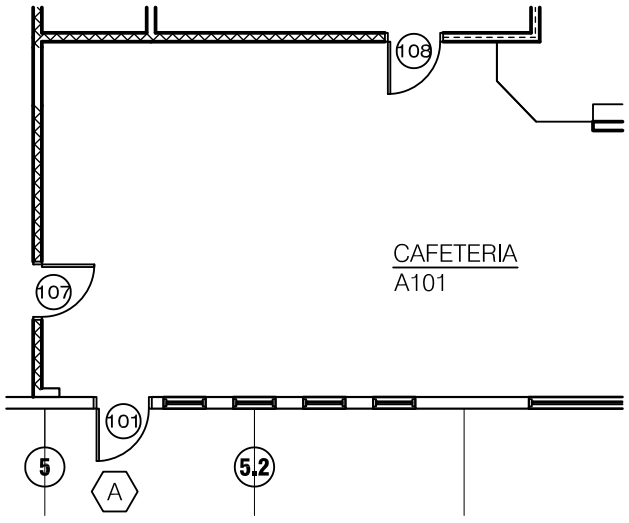
30 South Center Street,
Redlands California 92373
Telephone: 909.792.7397
Fax: 909.793.7873

LICENSED ARCHITECT
RALPH PACINI
NO. C11095
REN. 08-31-17
STATE OF CALIFORNIA

TITLE: CYCLORAMA REVISION	PCH # 10962
	SCALE 1/4" =1'-0"
	DATE 12-31-15
PROJECT: PROFESSIONAL DEVELOPEMENT CENTER AND KITCHEN SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT	SHEET # AR-01



SECOND FLOOR



FIRST FLOOR

APPL. # APPROVAL #

pdr architects, llp
30 South Center Street,
Redlands California 92373
Telephone: 909.792.7397
Fax: 909.793.7873

LICENSED ARCHITECT RALPH PACINI NO. C11095 REN. 08-31-17 STATE OF CALIFORNIA

TITLE PARTIAL PLANS WINDOW LOCATIONS

PCH # 10962

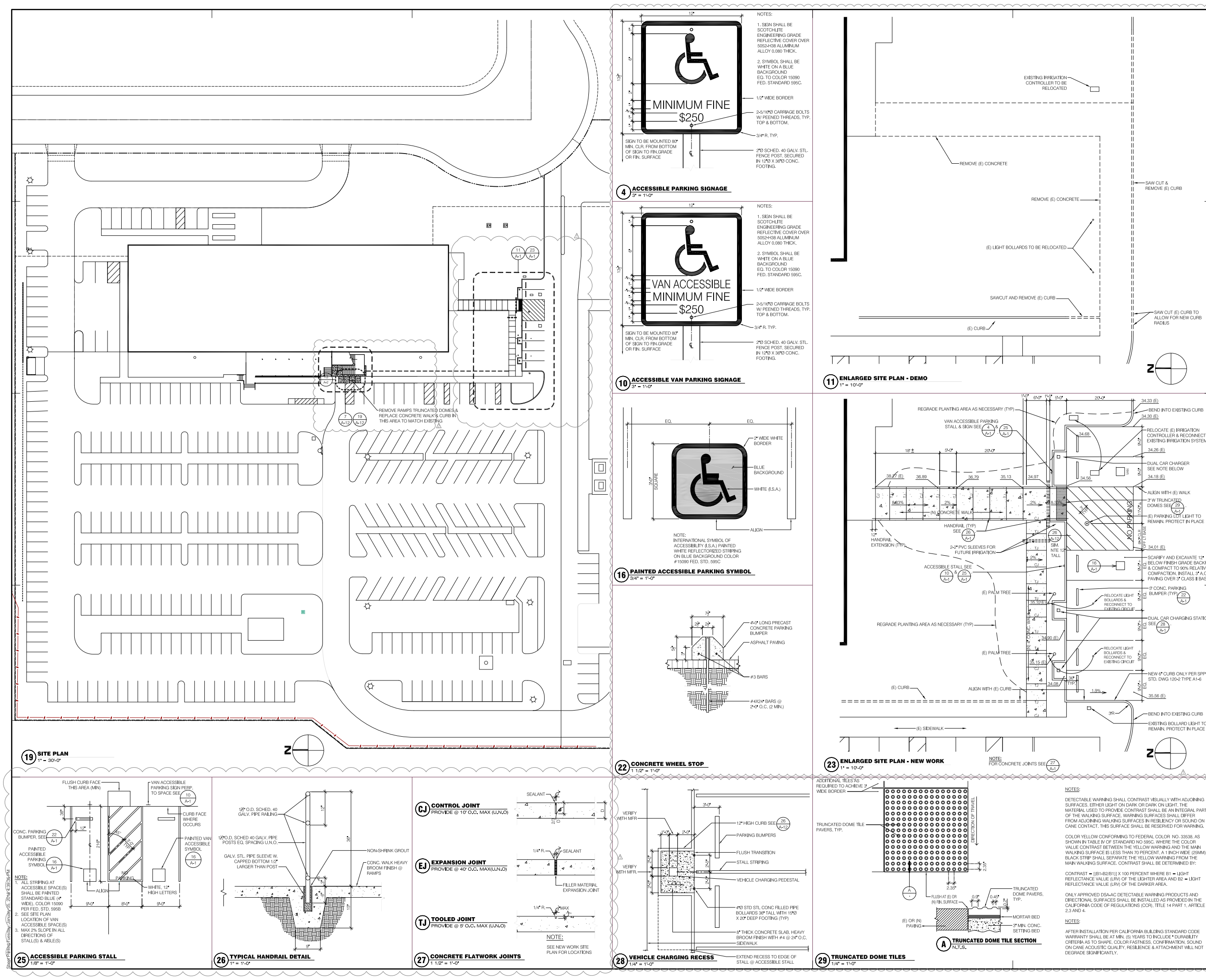
SCALE 3/32" = 1'-0"

DATE 01-04-15

PROJECT PROFESSIONAL DEVELOPEMENT CENTER AND KITCHEN

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

SHEET # **AR-02**



pch architects, llp
30 South Center Street, Redlands California 92373
Telephone: 909.792.7397, Fax: 909.793.7873

ARCHITECT STAMP: LICENSED ARCHITECT RALPH PACINI NO. C11095 REN. 08-31-17 STATE OF CALIFORNIA

CONSULTANT STAMP

CONSULTANT LOGO

PROFESSIONAL DEVELOPEMENT CENTER AND KITCHEN

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

DSA STAMP

MARK	DATE	DESCRIPTION
1	12/24/15	ADDENDUM #1
2	01/05/16	ADDENDUM #2

PROJECT NO: 10962

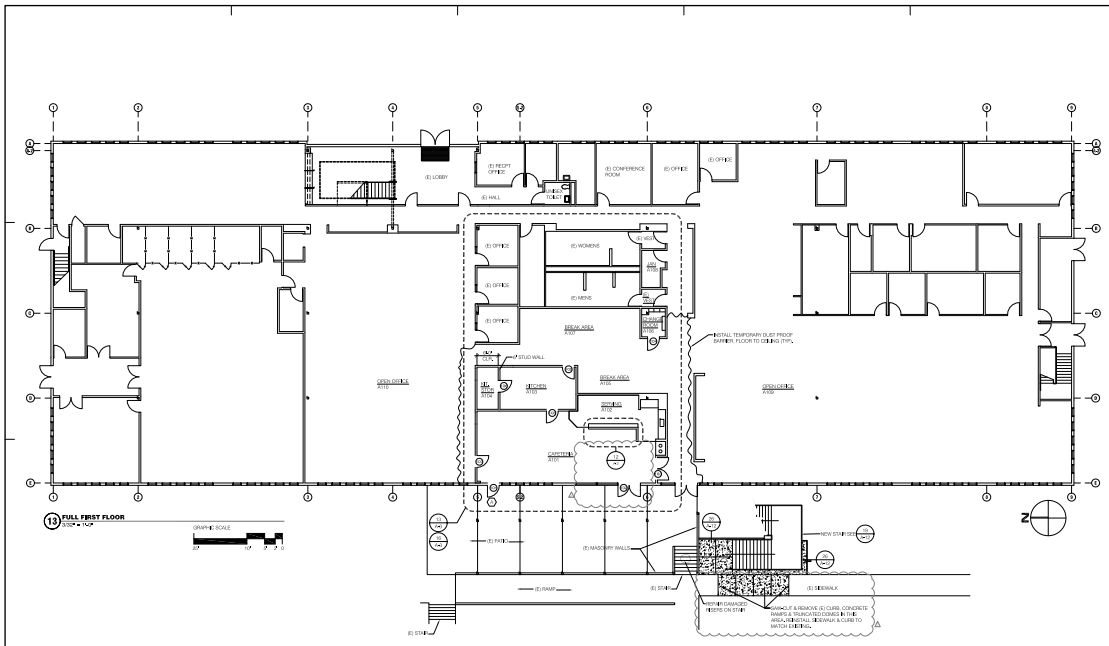
CHK'D BY:

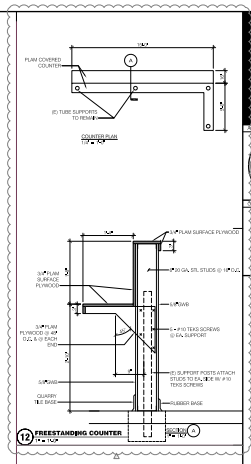
DATE:

SHEET TITLE

SITE PLAN

A-1





architects, llp
Center Street, Redlands California 92373
t 909.792.7397, Fax 909.793.7673

ARCHITECT STAMP

CONSULTANT STAMP

CONSULTANT LOGO

PROFESSIONAL DEVELOPEMENT CENTER AND KITCHEN

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

DSA STAMP

MARK	DATE	DESCRIPTION
A	8/24/16	ADDENDUM #1

PROJECT NO: 10982

CHKD BY:

DATE:

SHEET TITLE

FIRST FLOOR
PLAN-ENTIRE FLOOR

A-2

DOOR SCHEDULE

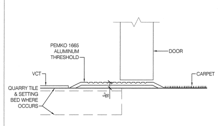
DR. NO.	DOOR SIZE	DOOR TYPE	DOOR MATERIAL	FRAME TYPE	FRAME MATERIAL	LOUVER	DETAILS JAMB	DETAILS HEAD	DETAILS THRESH	FIRE RATING	HARDWARE	SIGNAGE PUSH SIDE		SIGNAGE PULL SIDE		NOTES	DR. NO.
101	3-0 x 8-0	A	ALUM	I	ALUM	-	16/A-10	23/A-10	11/A-10 (SIM)	-	HW -1		EXIT	-	-		101
102	(E) PR 6-0 x 9-3	(E)	(E)	(E)	(E)	-	-	-	-	-	-		EXIT		CAFETERIA		102
103	PR 6-0 x 8-0 X 1-3/4	E	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	5/A-10	45 MIN	HW-2		EXIT		CAFETERIA		103
104	3-0 x 8-0 x 1-3/4	C	SCWD	I	ALUM	UC	17/A-10	17/A-10 (SIM)	5/A-10	-	HW-9	-	-	-	-		104
105	3-6 x 8-0 x 1-3/4	C	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	5/A-10	45 MIN	HW-4		KITCHEN				105
106	3-0 x 7-0 x 1-3/4	C	SCWD	I	ALUM	UC	17/A-10	17/A-10 (SIM)	-	-	HW-7	-	-	-	-		106
107	3-0 x 8-0 x 1-3/4	D	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	5/A-10	45 MIN	HW-8		CAFETERIA	-	-		107
108	3-6 x 8-0 x 1-3/4	D	SCWD	1	ALUM	-	17/A-10	17/A-10 (SIM)	-	-	HW-5	-	-	-	-		108
201	3-0 x 8-0	A	ALUM	I	ALUM	-	12 & 16/A-10	23/A-10	11/A-10 (SIM)	-	HW-1		EXIT		CONF. B		201
202	3-0 x 8-0	A	ALUM	I	ALUM	-	12 & 16/A-10	23/A-10	11/A-10 (SIM)	-	HW-1		EXIT		CONF. A		202
203	PR 6-0 x 8-0 X 1-3/4	E	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	6/A-10	45 MIN	HW-3		EXIT		CONF. A		203
204	3-0 x 8-0 x 1-3/4	C	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	-	-	HW-9	-	-	-	-	1	204
205	PR 6-0 x 8-0 X 1-3/4	E	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	6/A-10	45 MIN	HW-3		EXIT		CONF. B		205
206	PR 6-0 x 8-0 X 1-3/4	E	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	6/A-10	45 MIN	HW-3		EXIT		CONF. C		206
207	3-0 x 8-0 x 1-3/4	C	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	-	-	HW-9	-	-		STORAGE		207
208	(NOT USED)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	208
209	3-0 x 8-0 x 1-3/4	C	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	5/A-10	-	HW-10		A/V PRODUCTION	-	-		209
210	3-0 x 8-0 x 1-3/4	C	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	-	-	HW-10	-	CONTROL RM.	-	-		210
211	3-0 x 8-0 x 1-3/4	D	SCWD	I	ALUM	-	17/A-10	17/A-10 (SIM)	6/A-10	-	HW-11		EXIT		CONF. C		211
212	PR 6-0 x 8-0 X 1-3/4	B	SCWD	I	ALUM	UC	17/A-10	17/A-10 (SIM)	5/A-10	-	HW-6	-	-		STORAGE		212

DOOR SCHEDULE NOTES

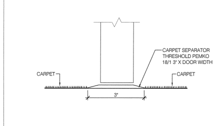
1 RELOCATE AND REUSE EXISING ALUM FRAME AND WOOD DOOR.
2 INSTALL DUAL PANE SOUND ATTENUATING GLASS IN LITE

DOOR SCHEDULE ABBREVIATIONS

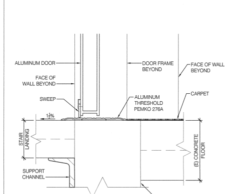
ALUM ALUMINUM FRAME
(E) EXISTING
HM HOLLOW METAL FRAME
SCWD SOLID CORE WOOD DOOR
UC UNDER CUT DOOR



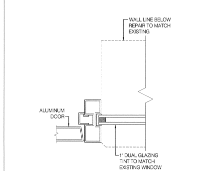
5 THRESHOLD
6" = 1'-0"



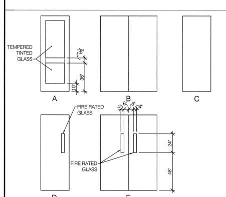
6 THRESHOLD
6" = 1'-0"



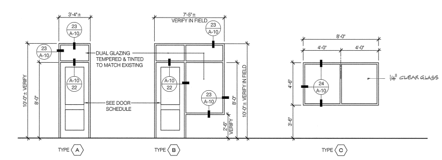
11 THRESHOLD
3" = 1'-0"



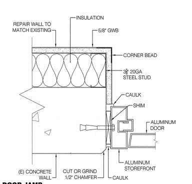
12 DOOR JAMB
3" = 1'-0"



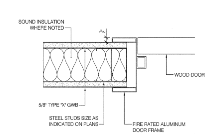
13 DOOR TYPES
1/4" = 1'-0"



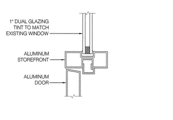
14 WINDOW TYPES
1/4" = 1'-0"



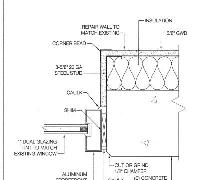
16 DOOR JAMB
3" = 1'-0"



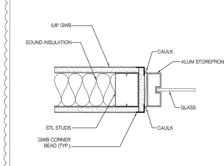
17 DOOR JAMB (HEAD SIM)
3" = 1'-0"



22 DOOR HEAD
3" = 1'-0"



23 WINDOW JAMB (HEAD & SILL SIM)
3" = 1'-0"



24 WINDOW JAMB - HEAD & SILL SIM.
3" = 1'-0"

FINISH SCHEDULE

Rm No.	Room Name	Floor	Base	Walls North	Walls East	Walls South	Walls West	Ceiling	Clg Ht.	Notes	Rm. No.
A101	CAFETERIA	VCT	4"R	PSG	PSG	PSG	PSG	T-BAR			A101
A102	SERVING	QT	QT	PSG	PSG	PSG	-	T-BAR-W			A102
A103	KITCHEN	QT	QT	PSG	PSG	PSG	PSG	T-BAR-W			A103
A104	KITCHEN STORAGE	QT	QT	PSG	PSG	PSG	PSG	T-BAR-W			A104
A105	BREAK AREA	CPT	4"R	PE	-	-	PSG	T-BAR	10'-0"	1	A105
A106	CHANGING RM	VCT	4"R	PSG	PSG	PSG	PSG	T-BAR	8'-0"		A106
A107	BREAK AREA	CPT	4"R	PE	PE	PE	-	T-BAR	10'-0"	1	A107
A108	JANITOR	S-CONC	4"R	PSG	PSG	PSG	PSG	(e)	(e)		A108
A109	OPEN OFFICE	(e)	4"R	PE	-	-	-	(e)	(e)	1,2	A109
A110	OPEN OFFICE	(e)	4"R	-	-	PE	-	(e)	(e)	1,2	A110
											0
											0
A201	CONFERENCE RM - A	CPT	4"R	PE	PE	PE/OW	PE	T-BAR	10'-0"	1	A201
A202	CONFERENCE RM - B	CPT	4"R	PE/OW	PE	PE/OW	PE	T-BAR	10'-0"	1	A202
A203	CONFERENCE RM - B	CPT	4"R	PE/OW	PE	PE	PE	T-BAR	10'-0"	1	A203
A204	STORAGE	VCT	4"R	PE	PE	PE	PE	T-BAR	10'-0"		A204
A205	A/V CONTROL	CPT	4"R	PE	PE	PE	PE	T-BAR	10'-0"	1	A205
A206	HALL	CPT	4"R	PE	-	PE	PE	T-BAR	10'-0"	1	A206
A207	(NOT USED)	-	-	-	-	-	-	-	-	-	A207
A208	A/V STUDIO	VCT	4"R	PE	PE	PE	PE	ACT	10'-0"		A208
A209	STORAGE	VCT	4"R	PE	PE	PE	PE	T-BAR	10'-0"		A209
A210	JANITOR	S-CONC	4"R	PSG	PSG	PSG	PSG	(e)	(e)		A210
A211	OFFICE	CPT	4"R	PE	PE	PE	PE	T-BAR	10'-0"	1	A211
A212	OPEN OFFICE	(e)	4"R	-	-	PE	-	(e)	(e)	1,2	A212
A213	ELEV LOBBY	(e)	(e)	PE	-	PE	PE	(e)	(e)	1,2	A213
A214	HALL	(e)	(e)	PE	-	PE	PE	(e)	(e)	1,2	A214
A215	HALL	(e)	(e)	PE	-	PE	PE	(e)	(e)	1,2	A215

FINISH SCHEDULE NOTES

1 CARPET IS N.I.C. TO BE PROVIDED AND INSTALLED BY THE SCHOOL DISTRICT.
2 RUBBER BASE ON NEW WALLS & AS REQUIRED TO REPAIR EXISTING DAMAGED BY REMODEL.

FINISH ABBREVIATIONS:

VCT VINYL COMPOSITION TILE
QT QUARRY TILE
PSG PAINT - SEMI GLOSS
PE PAINT - EGGSHELL OR SATIN FINISH
T-BAR 2 X 4 TEE GRID WITH LAY-IN ACOUSTIC PANELS
T-BAR-W 2 X 4 TEE GRID WITH WASHABLE LAY-IN ACOUSTIC PANELS
CPT CARPET TILES (BY DISTRICT)
4"R 4" RUBBER BASE
OW OPERABLE WALL (FINISH AS SPECIFIED)
ACT 12"X12" ACOUSTICAL CEILING TILE
S-CONC SEALED CONCRETE

pch architects, llp
30 South Center Street, Redlands California 92373
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ARCHITECT STAMP
LICENSED ARCHITECT RALPH PACINI NO. C11095 REN. 08-31-17 STATE OF CALIFORNIA

CONSULTANT STAMP

CONSULTANT LOGO

PROFESSIONAL DEVELOPEMENT CENTER AND KITCHEN

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

DSA STAMP

MARK	DATE	DESCRIPTION
1	12/24/15	ADDENDUM #1
2	1/05/16	ADDENDUM #2

PROJECT NO: 10962

CHK'D BY:

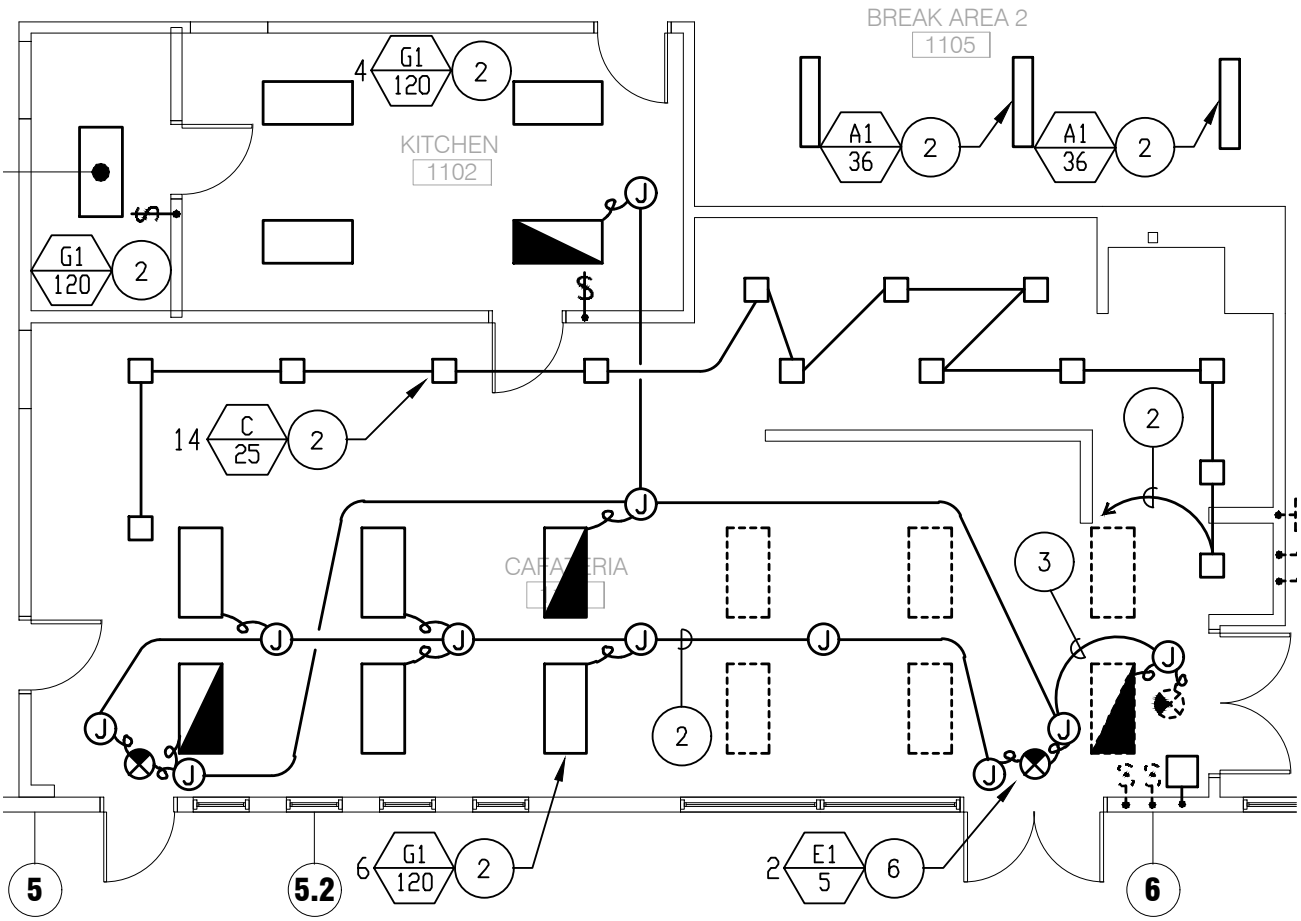
DATE:

SHEET TITLE

DOOR SCHEDULE, FINISH SCHEDULE & DETAILS

A-10

Sheet Printed:Tuesday, January 05, 2016 10:32:36 AM



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No. E 10372
Exp. 09-30-16
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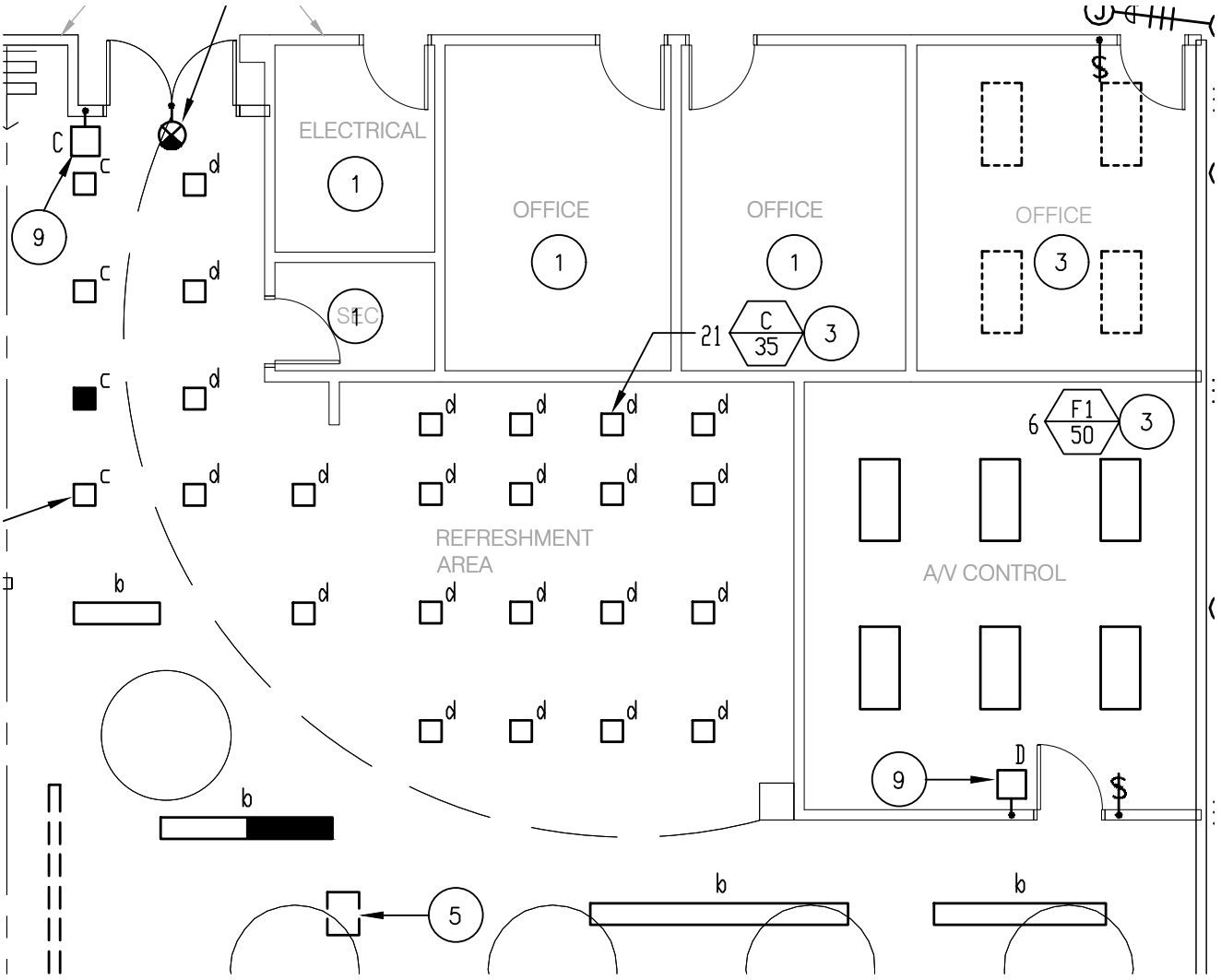
STATE OF CALIFORNIA

Stamp

Sheet Name:
FIRST FLOOR
LIGHTING PLAN

Project Name: PROF. DEV. CNTR & KITCHEN	
Drawn:	FBA Project Number: 205.170
Date: 12/28/2015	Scale: 1/8"=1'-0"
Reference Sheet: E1.1	Sketch Number: ESK-1



NEW WORK PLAN NOTES:

(4) CEILING MOUNT, RETRACTABLE PROJECTION SCREEN, COORDINATE SIZE AND EXACT LOCATION WITH AV CONTRACTOR AND ARCHITECT.

(5) CEILING MOUNT, FLUSH IN CEILING RETRACTABLE PROJECTOR MOUNT WITH POWER AND AV COMPONENTS COORDINATE EXACT LOCATION WITH AV CONTRACTOR AND REFLECTED CEILING.

(10) PROVIDE LOW VOLTAGE, PARTITION SENSOR #SYAIR, CONTACT CLOSURE #n101S AND MINI POWER PACK #MP FOR PARTITION WALL MONITORING COORDINATE WITH LIGHTING CONTROLS AND CONNECT AS REQUIRED.

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Sheet Name:
SECOND FLOOR
NEW LIGHTING PLAN

Project Name: PROF. DEV. CNTR & KITCHEN	
Drawn:	FBA Project Number: 205.170
Date: 12/28/2015	Scale: 1/8"=1'-0"
Reference Sheet: E2.2	Sketch Number: ESK-2

DISTRICT OFFICE BUILDING & PDC REMODEL — PROJECT NO. 205.170

VOLTS 120/208 — PANELBOARD 2E2C (EXISTING) — MAIN M.L.O.
PHASE 3PH, 4W — BUS 225A
MTG SURFACE — LOCATION FLR 2 EAST ELECT

CKT	LOAD (VA) A	B	C	TYPE	BKR	OUTLET QUAN	DESCRIPTION
1	1080			R	20/1	6	(E) FURN-ED WRITER
3		540		R	20/1	3	(E) FURN-ED WRITER
5			1080	R	20/1	6	(E) C/O-MKT MGR/DIR
7	1080			R	20/1	6	C/O-MKT MGR/DIR
9		1000		R	20/1	1	(E) LIBRARY-COFFEE
11			1080	R	20/1	6	(E) C/O BOARD RM
13	500			R	20/1	1	(E) PROJECTOR-BOARD RM
15		500		R	20/1	1	(E) AV PROD. -STUDIO
17			500	R	20/1	1	(E) AV PROD. -STUDIO
19	500			R	20/1	1	(E) AV PROD. -STUDIO
21		1200		L	20/1	1	PRODUCTION RM LTS
23			1200	L	20/1	1	PRODUCTION RM LTS
25	720			R	20/1	4	C/O-MEETING RM CONV. REC
27		900		R	20/1	5	(E) RESTROOM/JAN
29			540	R	20/1	3	C/O-CONF RM A REC
31	540			R	20/1	3	C/O-CONF RM A REC
33		540		R	20/1	3	C/O-CONF RM A REC
35			1080	R	20/1	6	(E) C/O-PUBLISHER
37	900			R	20/1	5	(E) C/O-MANAGER
39		2800		G	30/2		WH-1
41			2800	-	30/2		---

CKT	LOAD (VA) A	B	C	TYPE	BKR	OUTLET QUAN	DESCRIPTION
A 2	1200			L	20/1	1	PRODUCTION RM LTS
B 4		1200		L	20/1	1	PRODUCTION RM LTS
C 6			1200	L	20/1	1	PRODUCTION RM LTS
A 8	1200			L	20/1	1	PRODUCTION RM LTS
B 10		1650		R	20/1	3	(E) COMP-ED WRITER
C 12			500	R	20/1	1	(E) BOARD RM TABLE
A 14	500			R	20/1	1	(E) BOARD RM TABLE
B 16		550		R	20/1	1	CONF RM C FLOOR
C 18			500	R	20/1	1	(E) FLOOR-LIBRARY
A 20	500			R	20/1	1	(E) FLOOR-LIBRARY
B 22		540		R	20/1	3	CONF RM A REC
C 24			720	R	20/1	4	CONF RM A REC
A 26	1100			R	20/1	2	(E) COMP-PUB/MANAGER
B 28		500			20/1	1	CONF RM B FLOOR
C 30			500		20/1	1	CONF RM A FLOOR
A 32					20/1		SPARE
B 34					20/1		SPARE
C 36					20/1		SPARE
A 38	3175				100/3		PANEL 'KIT'
B 40		2000			100/3		----
C 42			2375		100/3		----

CONNECTED:

	VA	AMPS
PHASE A =	12995	108
PHASE B =	13920	116
PHASE C =	14075	117
TOTAL =	40990	114

L.C.L. @ 125% =	9000	
RECEPT. ( ) 10 kVA @ 50%) =	14820	
KITCHEN @ 65% =		
OTHER LOAD @ 100% =	14150	
TOTAL VA =	37970	
TOTAL AMPS =	105	

LOAD TYPE:

G - GENERAL (100%) — M - MOTOR (100%)
L - L.C.L. (125%) — M1 - MOTOR (125%)
R - RECEPTACLE (50%) — X - X-RAY (100%)
(10 kVA @ 100%) — X1 - X-RAY (50%)
K - KITCHEN (65%)

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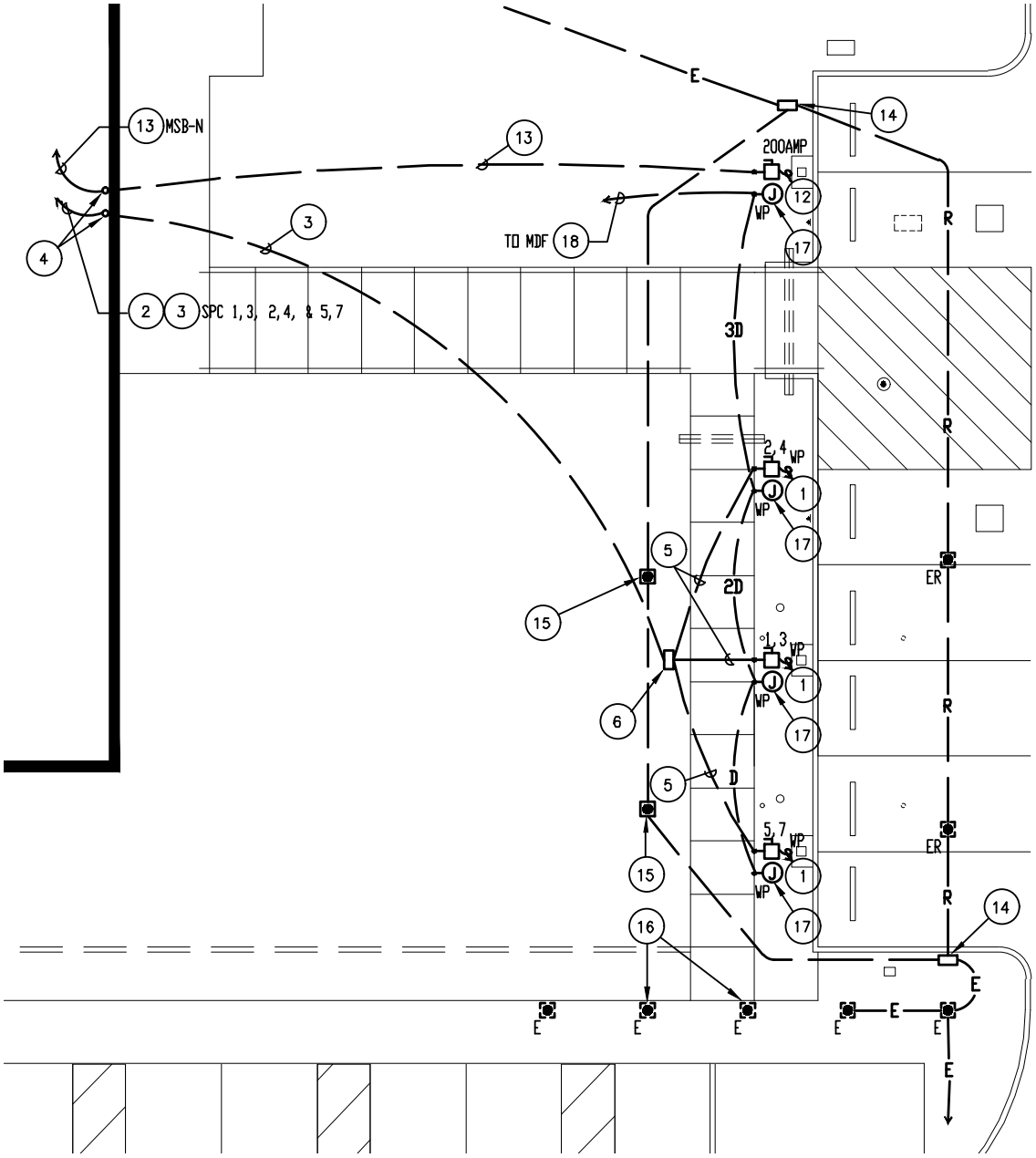
Sheet Name:
SECOND FLOOR NEW POWER/SIGNAL PLAN

Project Name: PROF. DEV. CNTR & KITCHEN

Drawn:
FBA Project Number: 205.170
Date: 12/28/2015
Scale: NONE
Reference Sheet: E2.4
Sketch Number: ESK-3



2 PARTIAL SITE PLAN

1/16" = 1'-0"

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Sheet Name: FIRST FLOOR PLAN

Project Name: PROF. DEV. CNTR & KITCHEN	
Drawn:	FBA Project Number: 205.170
Date: 12/28/2015	Scale: 1/16"=1'-0"
Reference Sheet: E1.0	Sketch Number: ESK-4

PLAN NOTES:

12. WIRE AND CONNECT TO VEHICLE SUPER CHARGER.

13. PROVIDE 4#1/0 AND 1#6 GROUND IN 2" CONDUIT.

14. PROVIDE 2'x3'x36" DEEP INTERCEPT TYPE CONCRETE PULL BOX AND RE-PULL, RE-ROUTE EXISTING CONDUCTORS AS SHOWN.

15. RELOCATE EXISTING BOLLARD WITH NEW CONCRETE BASE FOOTING.

16. EXISTING BOLLARD TO REMAIN.

17. PROVIDE WEATHER PROOF OUTLET WITH 6' SLACK OF CAT 6 DATA CABLE FOR CAR CHARGING STATION.

18. PROVIDE 2" C. WITH FOUR (4) CAT 6 DATA CABLE TO MDF RACK FOR CAR CHARGER CONTROLS.

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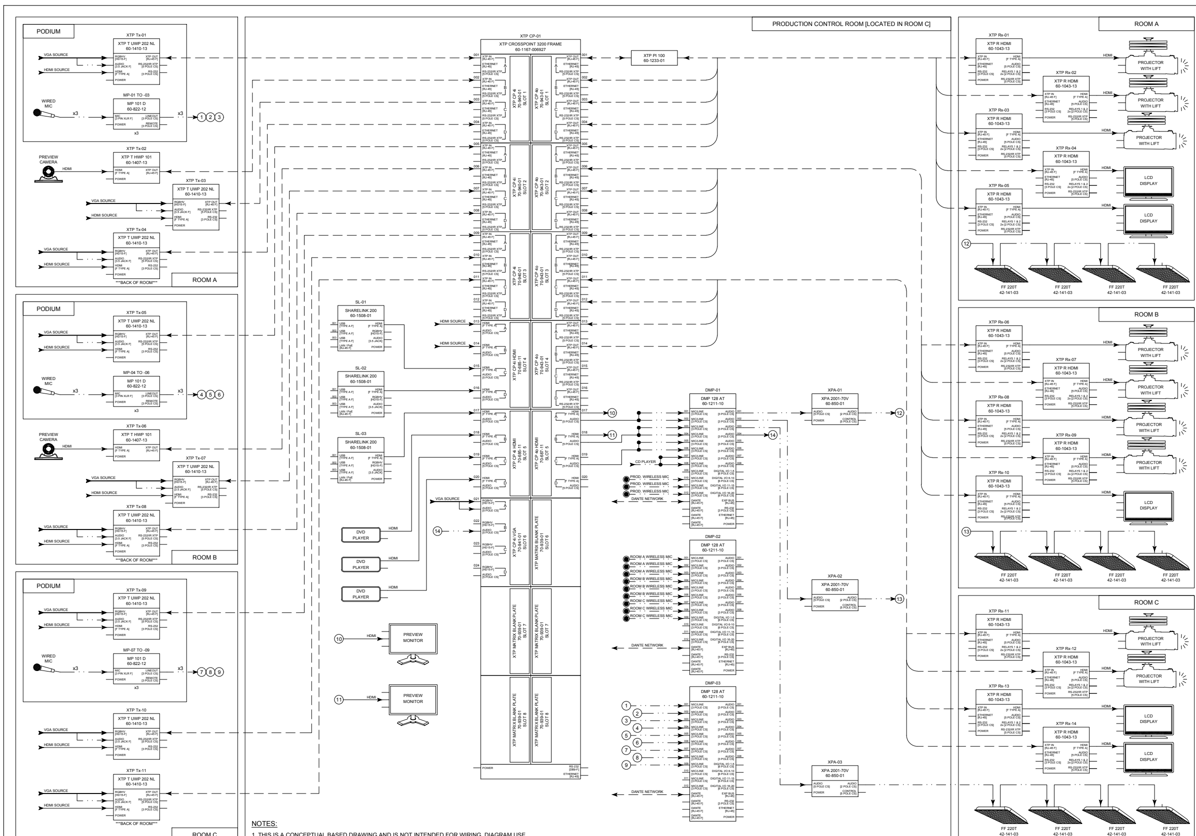
Sheet Name: FIRST FLOOR PLAN	
Project Name: PROF. DEV. CNTR & KITCHEN	
Drawn:	FBA Project Number: 205.170
Date: 12/28/2015	Scale: NONE
Reference Sheet: E1.0	Sketch Number: ESK-5



NOTES:
1. THIS IS A CONCEPTUAL BASED DRAWING AND IS NOT INTENDED FOR WIRING DIAGRAM USE.

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SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT
777 NORTH F. STREET
SAN BERNADINO, CA 92410

REVISIONS:	DATE:
A REVISED PER CUSTOMER COMMENTS	09/29/15
B REVISED PER CUSTOMER COMMENTS	10/20/15
C REVISED PER CUSTOMER COMMENTS	10/22/15
D REVISED PER CUSTOMER COMMENTS	12/01/15
E REVISED PER CUSTOMER COMMENTS	12/14/15

PROJECT NAME:
PDC
AV SIGNAL FLOW

APPROVED BY:
NICK LACOMMARE

REQUESTED BY:
EZEKIEL ADELEKE

DRAWN BY:
STANLEY MENCHAVEZ

CALL LOG No.: 2253499
DATE: 09/24/15

SHEET: 1 OF 2
SCALE: NTS

2

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CONSULTANT STAMP
REGISTERED PROFESSIONAL ENGINEER STEPHEN R. KAJTCEK No. E 10372 Exp. 09-30-16 ELECTRICAL STATE OF CALIFORNIA

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FBA Job Number: 205.170

PROFESSIONAL DEVELOPEMENT CENTER AND KITCHEN

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

DSA STAMP

MARK	DATE	DESCRIPTION
2	1/05/16	ADDENDUM #2

PROJECT NO: 10962

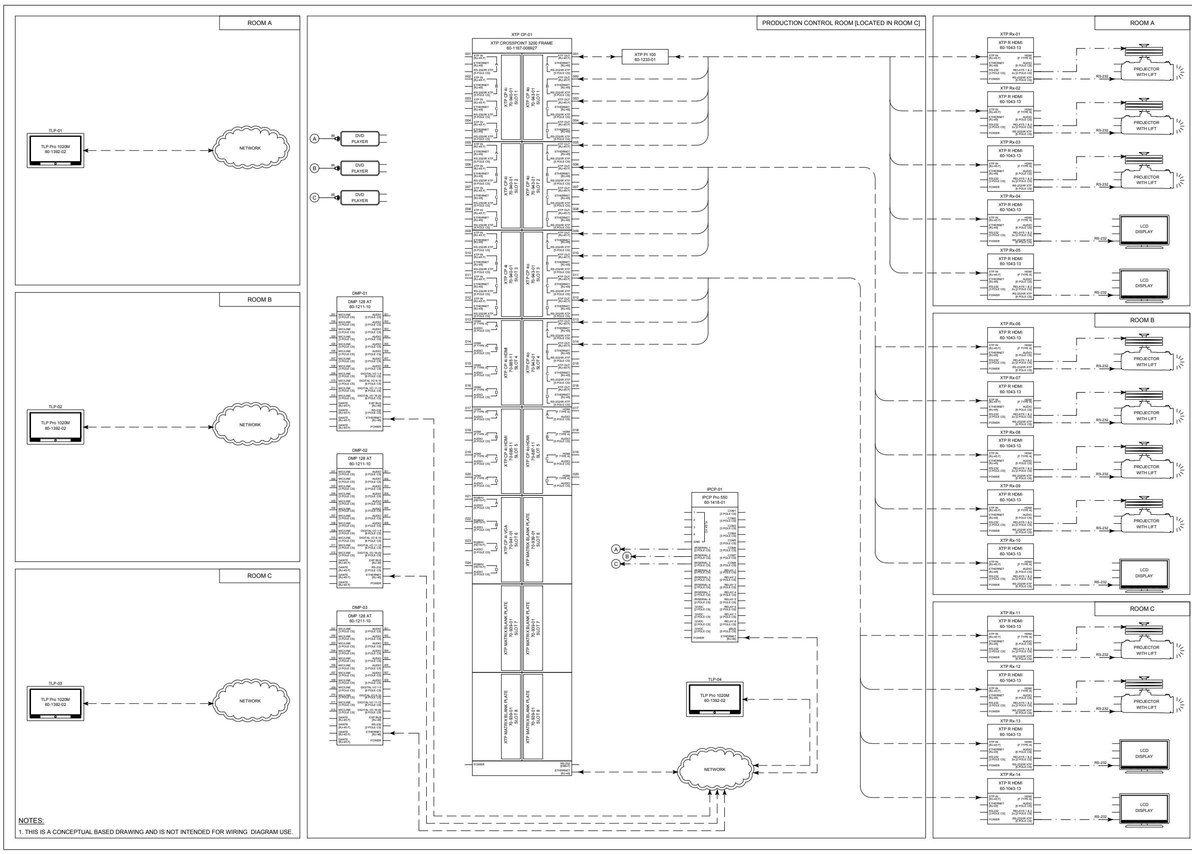
CHK'D BY:

DATE:

SHEET TITLE

AV SIGNAL FLOW

E-6



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777 NORTH F. STREET
SAN BERNARDINO, CA 92410

REVISIONS:	DATE:
A REVISED PER CUSTOMER COMMENTS	09/29/15
B REVISED PER CUSTOMER COMMENTS	10/20/15
C REVISED PER CUSTOMER COMMENTS	10/22/15
D REVISED PER CUSTOMER COMMENTS	12/01/15
E REVISED PER CUSTOMER COMMENTS	12/14/15

PROJECT NAME:
PDC
CONTROL SIGNAL FLOW

APPROVED BY: NICK LACOMMARE
REQUESTED BY: EZEKIEL ADELEKE
DRAWN BY: STANLEY MENCHAVEZ

CALL LOG No.:	DATE:
2253499	09/24/15
SHEET:	SCALE:
2 OF 2	NTS

2

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CONSULTANT STAMP

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PROFESSIONAL DEVELOPEMENT CENTER AND KITCHEN

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

DSA STAMP

MARK	DATE	DESCRIPTION
2	1/05/16	ADDENDUM #2

PROJECT NO: 10962

CHK'D BY:
DATE:

SHEET TITLE

AV SIGNAL FLOW

E-7