HMC ARCHITECTS
3546 Concours Street
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March 12, 2010

Group 7
San Bernardino City Unified School District
Modernization Projects

Bradley Elementary School Modernization - DSA #04-107962	HMC #3137106
Marshall Elementary School Modernization - DSA #04-106227	HMC #3137114
Ramona-Alessandro Elementary School Modernization - DSA #04-106133	HMC #3137117
Ramona-Alessandro Elementary School Interim Housing Port. - DSA #04-110478	HMC #3137117
Bradley Elementary School Deferred Maintenance - DSA #04-110585	HMC #3137206

ADDENDUM NO. 4

The following changes, additions, or clarifications have been made to the original approved project Documents and shall be incorporated in the Bidder's bid amount. The Bidder shall acknowledge receipt of the Addendum in the BID FORM. All other aspects of the work from the original Documents shall remain unchanged. In case of conflict between the Drawings and Specifications and this Addendum, this Addendum shall govern. The Bidders shall be responsible for transmitting this information to all affected subcontractors and suppliers prior to the closing of bids.

SPECIFICATIONS FOR BRADLEY, MARSHALL AND RAMONA-ALESSANDRO ELEMENTARY SCHOOLS
3137106, 3137114, 3137117, 3137206

BID FORM

Item No. AD-4.1: Reference Previously Issued Addendum No. 1, Bid Form

A. DELETE Bid Form originally issued. Substitute therefore Revised Bid Form hereby issued.

AGREEMENT

Item No. AD-4.2: Reference Previously Issued Addendum No. 1, Agreement

A. DELETE Agreement originally issued. Substitute therefore Revised Agreement hereby issued.

SUPPLEMENTARY GENERAL CONDITIONS

Item No. AD-4.3: Reference Section 00800 (Addendum No. 1)

A. Add the following amendment to the first sentence of ARTICLE 3.3.1 **FULL-TIME SUPERINTENDENT** of the General Conditions, Section 00700 to Section 00800 as follows:

"During progress of the Work, CONTRACTOR shall keep on each active work site a competent full-time Superintendent satisfactory to DISTRICT."

B. Add the following to ARTICLE 3.3.2, **STAFF:**

"All Employees of the General Contractor and Subcontractors shall wear, at a minimum, the following at all times while on the site: 1) Hard Hats, 2) Proper long pants and shirts with sleeves, and 3) Work boots, with steel toes if necessary, for the work being performed."

C. Add the following Amendment to ARTICLE 4.3.4 **INSPECTOR'S FACILITIES** of the General Conditions Section 00700 to Section 00800 as follows:

"4.3.4 INSPECTOR'S FACILITIES

Within seven (7) calendar days after notice to proceed, the CONTRACTOR shall provide the inspector with the temporary facilities as required under Division 1 of the Specifications."

SPECIFICATIONS

Item No. AD-4.4: Reference Section 01 11 14, Work Sequence and Phasing (Issued in Addendum No. 1)

A. Add the following new paragraph:

"1.04.E. Student testing will be taking place on all sites in the months of April and May. 10 work days per month are to be placed in the Construction Progress Schedule where no work during hours that will conflict with the campus testing activities by the Contractors will be allowed to occur for a total of 20 work days. Contractor to refer to attached School Calendars for identification of testing days."

Item No. AD-4.5: Reference Previously Issued Addendum No. 1, Section 01 11 14, Work Sequence and Phasing

A. Paragraph 1.05-A1 - **Bradley Elementary School** - The Preliminary Project Phasing Plan is as follows:

Phase 1 - Buildings A and B - 90 days
Phase 2 - Buildings C and D - 90 days
Phase 3 - Buildings E and F - 90 days
Phase 4 - Buildings G and M and Sitework - 150 days

B. Paragraph 1.05-A2 - **Marshall Elementary School** - The Preliminary Project Phasing Plan is as follows:

Phase 1 - Building B (B1 - B12) - 90 days
Phase 2 - Buildings C, D and E - 120 days
Phase 3 - Building F and Sitework - 90 days
Phase 4 - Building A - 150 days

C. Paragraph 1.05-A3 - **Ramona-Alessandro Elementary School** - The Preliminary Project Phasing Plan is as follows:

Phase 1 - Interim Housing Portables and Related Path-of-Travel - 45 days.
Improvements to gain access to Building "A" Wing
Phase 2 - Building "B" Wing - 120 days.
Phase 3 - Building "C" Wing, Admin. Offices and East Building "A" Wing - 120 days.
Phase 4 - West Building "A" Wing, Library and Multi-Purpose - 90 days.
Phase 5 - Interim Housing Removal, Exterior Painting and Misc. Sitework - 45 days.

D. Paragraph 1.05-A4 - **Warm Springs Elementary School**

Phase 1 - All Mechanical Systems Upgrade - 180 days.
Scopes of Work.

E. In the Proposed Staging and Phasing Plan Strategy sections previously referenced in Addendum No. 1 for each campus, revise the first sentence shown under the heading Staging Area to read as follows:

"Staging Area: A staging area has been outlined on the Monterey Elementary School Site Plan Exhibit in Section 01 11 00, and will serve as the staging area serving all of the campuses."

F. In the Proposed Staging and Phasing Plan Strategy sections previously referenced in Addendum No. 1, revise the chain link fence height reference in the fourth sentence shown under the heading Staging Area from 8 feet high to 6 feet high.

Item No. AD-4.6: Reference Section 01 26 13, Contractor's Request for Information (RFI's)

A. Revise Paragraph 1.03.I to read as follows:

"I. Contractor shall prepare, input and maintain the District's web-based log of RFI's utilizing the District's Construction Management software programs, and at any time requested by District or Architect, Contractor shall furnish copies of log showing outstanding RFI's. Contractor shall note unanswered RFI's in log. District shall furnish General Contractor with password - encrypted access to this software program and training to the General Contractor's staff who will be entering data into this system at no cost to the Contractor."

B. Add Paragraph 1.03.H. to read as follows:

H. Contractor shall notify the Architect and the District of any cost impacts to the project within five (5) calendar days of receiving a response to an RFI. Failure to furnish such notification within the specified time frame will result in the Contractor's forfeiture of submitting subsequent claims for additional time or costs related to those RFI responses.

Item No. AD-4.7: Reference Previously Issued Addendum No. 1, Section 01 31 14, Labor Compliance Program (LCP) Coordination

A. In Part 1.03, **Article 4. Certified Payroll Reports:** Delete third paragraph in its entirety. Substitute therefore:

"Each CONTRACTOR and every lower-tier subcontractor and supplier is required to submit certified payrolls and labor compliance documentation electronically as specified by the DISTRICT.

Electronic submittal will be a web-based system, accessed on the World Wide Web by a web browser. Each contractor and subcontractor will be given a Log On identification and a password to access the DISTRICT'S reporting system.

Use of the system may entail data entry of weekly payroll information including: employee identification, labor classification, total hours worked and hours worked on this project, wage and benefit rates paid, etc. The CONTRACTOR's payroll and accounting software may be capable of generating a "comma delimited file" that will interface with the software.

This electronic reporting requirement will be "flowed down" to every lower-tier subcontractor and vendor required to provide labor compliance documentation."

B. Revise last two sentences of Part 1 to read as follows:

"At the meeting, the DISTRICT's LCP representative will provide the CONTRACTOR with a copy of the DISTRICT's LCP package.

It will be the CONTRACTOR's responsibility to provide copies of the LCP package to all the CONTRACTOR's listed subcontractors and to any substituted subcontractors."

C. In Part 1.03, **Article 10, Proper Licensing,** Add a second paragraph to this Article to read as follows:

"Pursuant to the requirements of SB 1362 and California Labor Code Section 3099.2, all employees performing electrical work for a subcontractor holding a C-10 license must be certified. If employees working on project are found to be not certified, they shall be immediately removed. Failure to provide proof of this documentation on all employees will be considered a violation and subject the contractor to corrective action up to and including being removed from the project."

Item No. AD-4.8: Reference Section 01 32 16, Construction Progress Schedule

A. In Paragraph 1.06.B.2, revise first sentence to read as follows:

"Construction activity durations shall be limited to no more than 14 working days, with exception of fabrication and procurement activities, unless approved otherwise by District."

Item No. AD-4.9: Reference Previously Issued Addendum No. 1, Section 01 52 00, Construction Facilities

A. In Article 1.22, Add the following new paragraphs:

"B. Contractor to be responsible for the re-establishment of affected grass areas within the staging and lay down areas at each project site. Irrigation systems to be re-connected, verified/tested by the Contractor and observed/recorded by the Project Inspector prior to the re-seeding of affected areas.

C. A grass seed mixture of thirty percent (30%) Bermuda and seventy percent (70%) Perennial Rye shall be utilized at the re-seeding turf areas. Contractor to furnish district/Project Inspector with documentation verifying composition of seed mix being supplied and planted material meets these requirements. District will not accept these re-seeded turf areas until all the different type grasses have filled in completely and have been exposed to normal summer time temperatures for sixty (60) days, under normal watering conditions and without suffering detrimental growing effects."

Item No. AD-4.10: Reference Deleted Sections

A. The following specification sections are hereby DELETED:

Section 16715, Structured Cabling System
Section 16721, Fire Alarm System
Section 16722, Fire Alarm System

Item No. AD-4.11: Reference New Sections

A. The following new specification sections are hereby issued:

Section 02821, Fences and Gates
Section 04060, Mortar & Grout
Section 04820, Reinforced Unit Masonry
Section 07265, Concrete Slab Vapor Emissions Treatment
Section 09110, Non-Load Bearing Metal Studs
Section 09651, Resilient Tile Flooring
Section 09653, Top-Set Resilient Base
Section 09680, Sheet Carpet
Section 10115, Markerboards
Section 10121, Tackable Wall Panels
Section 10520, Fire Extinguishers and Cabinets
Section 11130, Projector Screens
Section 11131, Projector Mounts
Section 12491, Horizontal Louver Blinds
Section 16760, Data System
Section 16820, Hearing Assistance System

Item No. AD-4.12: Reference New Form

A. New CAD Drawing Request Form is hereby issued.

Item No. AD-4.13: Reference Section 02740, Asphaltic Concrete Paving

A. Add the following new Article:

"2.04 DETECTABLE WARNING AND DIRECTIONAL TEXTURE

A. Division of the State Architect (DSA/Access Compliance) approved products shall be used, CBC Section 1133B.8.3 through 1133B.8.5 and Figure 11B-23A, California Accessibility Reference Manual.

1. Provide curb ramp with Detectable Warnings that extends full width and depth of curb ramp inside grooved border at every curb ramp.

2. Provide raised truncated domes with diameter of 0.9 inch at base tapering to 0.45 inch at top, height of 0.2 inch, with center-to-center spacing of 1.67 inches and 2.35 inches center-to-center diagonally, in compliance with CBC Section 1133B.8.3 through 1133B.8.5 and Figure 11B-23A, California Accessibility Reference Manual. Provide raised truncated domes in an in-line pattern, rather than off-set pattern.
3. Detectable Warnings shall contrast visually with adjoining surfaces, light-on-dark or dark-on-light. Material used to provide contrast shall be integral part of walking surface.
4. Construct domes in cast-in-place, or may be prefabricated or be part of prefabricated surface treatment. Warning surface shall differ from adjoining surface in resiliency or sound to cane contact.
5. Install per manufacturer's instructions and in accordance with CBC.
6. Detectable Warning Texture (Truncated Domes): Tires: 24" x 24" x 2.2" with pre-formed fastener locations.
   a. Pavers: Hanover Architectural Products, Hanover, PA., Wausau Tile, Wausau, WI, Cold Spring Granite, Cold Spring, MN or equal."

Item No. AD-4.14: Reference Section 02821, Fences and Gates

A. In Paragraph 3.02.C, add the following new Paragraph:

"1. Panic Hardware: Panic hardware shall be furnished at all gates in the path of travel and shall comply with UBC Standard 10-4 and shall be mounted between 36" to 44" above the finished floor surface. The unlatching force shall not exceed 15 lbs applied in the direction of travel. Panic hardware shall comply with CBC Section 1003.3.1.9.
   a. Panic Bar: Exit Device; Von Duprin Rim Device 99L Series exit device, anodized aluminum finish, 992L trim with #06 Lever, 299 strike, at single gates, devices in exit pathways where shown on drawings, include cylinders, attach to gate post. Lever on exterior of gate.
   b. Accessories: 4" x 3" x ¼" x 8" high galv. steel angle welded to strike-side frame and 1" x 3" x ¼" thick bolt keeper. Fabricate galv. Steel lock box 16 ga x 3" high x 8" wide x 1-3/4" thick to encase lockset, weld all joints and grind smooth, touch up with galvanizing compound.
   c. Perforated Metal Panel: Manufactured by McNichols Co. Tampa, FL. Aluminum Plate: Perforated, 0.125 inch thick with 1/4 inch diameter holes 42 percent open area, 24 in. high by width of gate behind panic device centered at 40 in. above finish surface. Secure to gate frame with #8 stainless steel screws at 6 inches on center.
2. Furnish and install closer device at all gates in the path of travel. Provide closer as specified in Hardware Set HW3."

Item No. AD-4.15: Reference Section 08710, Door Hardware

A. Revise all Hardware Groups not applicable to Project to read "NOT USED".

Item No. AD-4.16: Reference Section 09651, Resilient Tile Flooring

A. Revise Subparagraph 2.01.A.3 to read as follows:

"3. Armstrong World Industries, Inc., Lancaster, PA"

B. In Article 3.05, Delete Paragraph B. Substitute therefore:

"B. Maintenance immediately after installation.
1. Sweep or vacuum floor thoroughly.
2. Damp mop with a solution to a neutral detergent such as Armstrong S-485 Floor Cleaner, carefully wiping up black marks, use a scrubbing pad or brush as recommended for the type of floor being maintained.
3. When the floor is thoroughly cleaned, rinsed and dried, apply to coats of sealer equal to Armstrong S-495 floor sealer followed by five coats of a high-quality commercial floor polish equal to Armstrong S-480 Floor Polish.
4. Burnish to acceptable sheen.
5. Allow 8 hours drying time between coats of sealer and finish.
6. Do not allow traffic on the floor for several hours (overnight, if possible).
7. Do not wash, scrub or strip the floor for at least four to five days after installation.

C. Protection: Cover work with a heavy non-asphaltic non-staining type building paper where subsequent building operations occur. Protect work until completion. Repair or make good any damaged to this work and other materials damaged during installation of flooring."

C. Delete Paragraph 2.02.A. Substitute therefore:

"A. Armstrong Excelon VC Tile (all product series/models), 1/8 inch thick, 12 x 12 inch size, homogeneous composition tile, pattern uniformly dispersed throughout thickness of material, Colors: Refer to Section 09050, or as available from the manufacturer's full range of colors through all VCT product series.
1. Required Static Load Limit: 75 psi.
2. Coefficient of Friction: ASTM D 2047; Minimum 0.60."

Item No. AD-4.17: Reference Section 09900, Painting

A. Revise Paragraph 1.01.E to read as follows:

"E. Painting of all building's interior and exterior wall, door/window and roof/ceiling/soffit surfaces and other surfaces within view shall be a part of the Base Bid Scope of Work. Refer to Section 09050, Colors and Materials - Finish Schedule, and Section 09 06 00 - Schedule For Finishes (Bradley Deferred Maintenance)."

B. In Paragraph 2.01.A, Revise the reference to "Sinclair Paint Co.," to read: "Vista Paint Co., (V)".

Item No. AD-4.18: Reference Section 15400, Plumbing

A. In Article 1.07, Add the following new paragraph:

"B. Contractor shall be fully responsible for installing plumbing materials that are in compliance with Assembly Bill (AB) 1953 that phases out lead from brass plumbing used to convey drinking water in water utility distribution pipe and in consumer plumbing fittings and faucets. Contractors shall make the necessary modifications to the Plumbing Fixture Schedule and material callouts to ensure these requirements are being met and included in the Contractor's submitted bid pricing."

Item No. AD-4.19: Reference Section 16720, Previously Issued Addendum No. 3, Fire Alarm / Security System

A. In Paragraph 3.09.A, Add second sentence to read as follows:

"Contractor to also furnish an additional 10% of the total number of identified attic heat detectors for placement of additional attic heat detectors at unforeseen conditions, where devices will be required by code. This additional allotment shall be based upon the total device count for all three campuses and be available for usage amongst any of the three campuses."

SPECIFICATIONS FOR BRADLEY ELEMENTARY SCHOOL
3137106

Item No. AD-4.20: Reference Previously Issued Bound Specification Book (**without** Volume 2 of 6 heading shown on Cover Sheet)

A. Delete in its entirety, the duplicate bound Specification Book that does not reference Volume 2 of 6 on the Cover Sheet, and contains the Division 1, General Requirement Section. Bidders are to use the Specification Book that is referenced as Volume 2 of 6.

SPECIFICATIONS FOR MARSHALL ELEMENTARY SCHOOL
3137114

Item No. AD-4.21: Reference New Sections

A. The following new specification sections are hereby issued:

Section 09130, Acoustical Suspension Systems
Section 09511, Acoustical Ceilings - Lay-In

SPECIFICATIONS FOR RAMONA-ALESSANDRO ELEMENTARY SCHOOL
3137117

Item No. AD-4.22: Reference Previously Issued Bound Specification Book (**without** Volume 4 of 6 heading shown on Cover Sheet)

A. Delete in its entirety, the duplicate bound Specification Book that does not reference Volume 4 of 6 on the Cover Sheet, and contains the Division 1, General Requirement Section. Bidders are to use the Specification Book that is referenced as Volume 4 of 6.

Item No. AD-4.23: Reference Previously Issued Addendum No. 1, Section 10615, Demountable Partitions

A. In Subparagraph 1.01.A.1, Modify as follows:

""30 inch wide" to read: "60 inch wide"."

B. Delete Paragraph 3.04.C in its entirety and the Exhibit 1 Partition Schedule. Refer to the construction keynotes shown on Remodel Floor Plan, Sheets AA2.3, AB2.1 and AC2.1 to delineate the Scope of Work required for the demountable partition system (including new, rework, relocation or to remain.).

SPECIFICATIONS FOR BRADLEY ELEMENTARY SCHOOL -DEFERRED MAINTENANCE PROJECT
3137206

Item No. AD-4.24: Reference New Sections

A. The following new specification section is hereby issued:

Section 15400, Plumbing

Item No. AD-4.25: Reference Section 08710, Door Hardware

A. Revise Paragraph 2.06.J. to read:

"J. Exit devices shall comply with UBC Standard 10-4 and CBC 1008.1.9."

DRAWINGS

DRAWINGS FOR BRADLEY, MARSHALL AND RAMONA-ALESSANDRO ELEMENTARY SCHOOLS
3137106, 3137114, 3137117

Item No. AD-4.26: Reference Previously Issued Addendum No. 1 and Addendum No. 3, Door Schedules

A. All doors contained within existing or new demountable partition wall panels that serve classroom and office spaces shall be provided with a 1/2 lite vision panel (24" x 24" minimum) with tempered glazing.

Item No. AD-4.27: Reference Reflected Ceilings Plans - All Buildings with Existing Structural Ceiling Grid System

A. Add the following note:

"A. Where existing ceiling tiles occurring within the 5'-0" x 5'-0" structural ceiling grid system (grid to remain) are noted to be removed or need to be replaced / patched in conjunction with the other specified ceiling/lighting replacement Scopes of Work, Contractor shall subdivide the existing 5'-0" x 5'-0" grid area to accept a new 2'-0" x 4'-0" suspended t-bar ceiling grid layout. New lighting fixtures shall remain centered within the existing 5'-0" x 5'-0" structural ceiling grid system, and the other ceiling-mounted devices noted to remain shall be re-installed onto the new 2'-0" x 4'-0" acoustical ceiling tiles."

DRAWINGS FOR BRADLEY ELEMENTARY SCHOOL - MODERNIZATION
3137106

Item No. AD-4.28: Reference Revised Drawings

A. The following Revised Drawings are hereby issued:

C100 - ADA

Item No. AD-4.29: Reference New Drawings

A. The following New Drawings are hereby issued:

AD-4.20
AD-4.21
AD-4.22
AD-4.23
AD-4.24

Item No. AD-4.30: Reference Previously Issued Addendum No. 3, Drawing T.1 - Title Sheet

A. Additive Alternates: The Scopes of Work described under the "Additive Alternates" heading (upper right hand of page) shall be bid as part of the Base Bid Scope of Work. There are no Additive Alternates in the project.

Item No. AD-4.31: Reference Drawing A1.1

A. Revise gate scope at Building F. Delete Gate S3 from scope. Revise notation on plan to read: "Remove (E) chain link gate." Cut bollard and grind smooth with (E) walk. Fill with non-shrink grout if necessary to assure flush surface.

B. Add the following general note: "Refer to Civil for grading and hardscape requirements."

Item No. AD-4.32: Reference Drawing A8.1

A. Revise Gate Schedule. Delete Gate S3. Include as a general note for all gates:

"1. Gates in P.O.T. must comply with door requirements (Section 1133B.2). Lever and hardware per specs. Provide kick plates. 5 lb. pressure maximum to operate and strike side clearance.

2. Paint fence/gate to match (E) adjacent fence color."

Item No. AD-4.33: Reference Drawing A9.1

A. Omit Detail E7. Gate S3 deleted from scope. Detail in-applicable.

B. On Detail J17, Revise footing rebar to 12" o.c.

C. On Detail E14, Delete concrete thickness dimension 2'-8" at (E) concrete.

Item No. AD-4.34: Reference Drawing A9.4

A. On Detail E11, Add the following note:

"Hydraulic gate closer, 5 lbs. pressure maximum force for opening, 3 second minimum sweep period from 70 degrees open position to 3" from latch."

DRAWINGS FOR MARSHALL ELEMENTARY SCHOOL
3137114

Item No. AD-4.35: Reference Drawing A2.1A

A. At Staff Lounge adjacent to Kitchen Area, provide 2 sets complete casework 24" deep, 10'-0" long each (20 LF total) conforming to W.I. Standards (WI 440) similar to Detail A14 / A7.1.

Item No. AD-4.36: Reference Drawing A8.1

A. Revise Finish Schedule to coordinate with keynotes at Classroom Floor Plans: Provide VCT flooring in lieu of ceramic tile where existing casework is being replaced with ADA compliant casework in classrooms only. Toilet rooms are to remain as-is. Applied to Buildings B-F only.

DRAWINGS FOR RAMONA-ALESSANDRO ELEMENTARY SCHOOL
3137117

Item No. AD-4.37: Reference Revised Drawings

A. The following Revised Drawings are hereby issued:

AB-2.1
AC-2.1
EB-2.2
EB-2.3
EC-2.2
EC-2.3

Item No. AD-4.38: Reference New Drawings

A. The following New Drawings are hereby issued:

AD-4.01 through AD-4.04
AD-4.06 through AD-4.12
AD-4.14
AD-4.15
AD-4M1 through AD-4M7
AD4P1
AD4P2
AD-4E.01 through AD-4E.03

Item No. AD-4.39: Reference Previously Issued Addendum No. 1, Drawings AA2.3

A. Vice Principal Office (A31), Add new full height demountable partitions Note 9 to refer to each of the two (2) existing walls (South and East). Furnish new door and hardware within new demountable panel.

Item No. AD-4.40: Reference Previously Issued Addendum No. 1, Drawings AA2.4, AB2.2, AC2.2, Buildings "A", "B" and "C" Wings

A. On Construction Keynotes Legend, Add Note 7.21 to read as follows:

"7.21 R-30 Roof Insulation to be added at underside of roof framing assembly between existing roof joists. Typical for all attic spaces / rooms occurring with the Buildings "A", "B" and "C" Wings. Refer to Specification Section 07210, Insulation for additional requirements."

Item No. AD-4.41: Reference Drawing A-4.2

A. On Detail A2, Revise Keynote 1.08 at casework to read: "1.99". Keynote 1.08 at handrail to remain.

B. On Detail B3, Revise to read: "Ramp - Enlarged Remodel Plan - "C" Wing"

C. On Detail A3, Revise to read: "Stair - Enlarged Demolition Plan - "C" Wing"

D. On Detail D5, Int. Elev. Callout B3 / A4.5 to read: "A6 / A4.5 Sim"

E. On Detail D5, Int. Elev. Callout B2 / A4.5 to read: "A5 / A4.5 Sim"

Item No. AD-4.42: Reference Drawing A-4.3

A. On Detail A6, Revise Keynote 1.60 to read: "1.61".

B. Include Keynote 1.61 to read: "Cut and Grind Smooth Portion of (E) Core as Necessary for New Construction."

Item No. AD-4.43: Reference Drawing A-4.4

A. On Detail E6, Revise dimension of lower handrail to read: " 2'-0" ".

B. On Detail B5, Remove Keynote 1.52 from plans.

Item No. AD-4.44: Reference Drawing A-5.1

A. On Detail A6, Add the following note:

"Contractor to field verify dimensions of base cabinets. Overall width to match existing casework."

Item No. AD-4.45: Reference Drawing A-5.2

A. On Detail E6, Remove Keynote 10.48 from Elevation 1.

B. Keynote 10.47 to read: "Grab Bar per Detail C2, D1 / A9.2"

C. On Detail D6, Delete single wall hung element at Keynote 10.50. Mirrors at Keynote 10.49 to remain.

D. On Detail B3, Revise interior head detail callout "B1 / A9.3" to read: "A1 / A9.3".

Item No. AD-4.46: Reference Drawing A-5.3

A. On Detail B4, Revise Title to read: "Casework - B8, C1, C2".

B. On Detail A2, Revise Title to read: "Casework - B8, B2, B6 Opp. Hand".

C. On Detail D6, Revise Keynote "6.41" to read: "6.44".

Item No. AD-4.47: Reference Drawing A8.1

A. On Door B9a, Include in Remarks: (E) door to receive fixed leaf hardware as shown in drawings.

B. Revise Doors B18a, B19a. Provide single solid core doors on hollow metal painted frames to include Hardware Group 19 and door signage per Detail E2/A9.2.

C. Revise Doors B23a through B26a (4 doors total) to read as follows:

"Door Type = F, Glass = Tempered Glass. All remaining notation to remain as is. Provide single half glass doors with tempered glazing in lieu of single flush doors."

D. Revise sill threshold detail for new exterior doors at CMU walls to read:

"C2/A9.1 Sim. Provide 1/2" maximum threshold to new concrete, provide new weather stripping. All other applicable notation to remain as is."

E. Revise duplicate Door A26a to read as Door A25c. Provide two single full glass doors a new storefront. Coordinate with Detail B6/A4.5, revised per Drawing AD-4.14. Jamb strike and head per elevation and aluminum storefront finishes specification section.

G. Revise multi-use 1, A28 to receive new VCT flooring. (This is a coordination issue, keynotes on plan are correct. See Drawing AA2.3).

H. Revise Flooring Schedule, topset base occurs in only areas to receive new flooring.

I. Include in Finish Schedule, Offices B23, B24, B25 and B26. Provide new carpet and topset base.

J. Provide new flooring in all Admin Areas. A25, A24, A20 to receive new carpet and topset base. Nurse and Cot A18 and A19 to receive VCT and topset base. Nurse toilet to receive ceramic tile flooring and ceramic tile thinset full height at all walls.

Item No. AD-4.48: Reference Drawing AA-2.2

A. Keynote 15.07 to read as follows:

"Accessible Drinking Fountain, See Plumbing Plans. Interior Guardrail per Detail C3 / A9.1, Exterior per Detail A3 / A9.1."

B. Keynote 9.40 to read as follows:

"New Demountable Partition per Detail C3 / A9.4."

C. Revise Keynote 9.01 referenced at Corridor A40 to read as Keynote 9.35. Provide new 12" x 12" vinyl composition tiles and 4" high topset base to the following rooms: Corridor A40, Corridor A40a, Corridor A40b, Corridor A41, Corridor A41a, Corridor A41b, Entry A26, Corridor A38, Corridor A42 and Corridor A42a. Flooring Color / Pattern design to utilize 4 colors as selected from the manufacturer's full color range in the following amounts: (Color 1 - 40%, Color 2 - 20%, Color 3 - 20%, and Color 4 - 20%).

D. Revise Keynote 9.01 occurring at Flex Room A15 to read as Keynote 9.36.

E. Provide new 20'-0" long Teaching Wall casework along the North wall of Flex Room A15 as depicted in Addendum No. 4, Exhibits AD-4.06 and AD-4.08.

F. Provide 120 lineal feet of 36" wide x 12" deep x 52" high welded metal library shelving units and 50 lineal feet of 36" wide x 12" deep x 72" high units within Flex Room A15 and Library A16.

Item No. AD-4.49: Reference Drawing AA-2.3

A. Elevation marker at Storage Room A15a, revise to read: "A6 / A5.1."

Item No. AD-4.50: Reference Drawing AA-2.4

A. Title of sheet to be revised to read: "REMODELED REFLECTED CEILING PLAN "A" WING".

B. Provide new 2' x 4' lay-in acoustical ceiling tiles and new lay-in 2' x 4' fluorescent lighting fixtures in the following rooms: A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A18, A19, A20, A24, A25, A26, A28, A38, A40, A40a, A40b, A41, A42 and A42a. Refer to Specification Section 09511, Acoustical Ceilings - Lay-In for additional requirements.

C. At Multi-Use 11 A27, (See AA-2.3 for location, room tag not on sheet). Where 5' x 5' grid occurs on plan, provide new ceiling tiles in existing suspension grid to seismically brace per Keynote 9.20. Provide new hangar wires, seismic bracing and compression struts per Details A6, D5, D6, E5 and E6 on A9.3.

Item No. AD-4.51: Reference Drawing AB-2.1

A. Doors at Custodial Room B9 to receive Door Tag B9a, refer to door schedule for further information.

B. Classroom B7 to have only 1 fire extinguisher per Keynote 10.24. Eliminate Keynote 10.24 at wall adjacent to Office B26.

C. Remove reference to Enlarged Demo Plan B5 / A4.2 at Teacher's Prep B12.

D. Revise enlarged ramp plan callout at Corridor B22 to read: "D5 / A4.2".

E. Revise Keynotes to include 16.99 - (E) IDF cabinet to remain.

F. Revise Keynote 3.01 to read: "New concrete sloped work, not to exceed 5% in direction of travel, cross-slope not to exceed 2%, typical."

G. Revise Keynote 9.35 at Offices B23-B26 to read: "9.36". Provide new carpet and topset base, coordinate with Finish Schedule.

Item No. AD-4.52: Reference Drawing AB-2.2

A. Delete room tags "Wheelchair Lift" at Teacher Prep B12, B6B, B3B.

B. Add the following general note:

"Contractor to replace and finish areas of ceiling as necessary for the removal and reinstallation of HVAC Scope of Work elements, Refer to Mechanical Drawings."

Item No. AD-4.53: Reference Drawing AC-2.1

A. Delete Keynote 9.34 at Classroom C3.

B. At Teacher Prep C9, Revise Keynote "9.01" to read: "9.35".

C. At Teacher Prep C9, Revise Enlarged Floor Plan callout to read: "A3 / A4.1".

D. Include Keynote 1.55 "Remove Handrails" to the Construction Keynotes Legend.

E. Revise Keynote 3.01 to read:

"New concrete sloped walk, not to exceed 5% gradient. In direction of travel, cross slope not to exceed 2% gradient."

Item No. AD-4.54: Reference Drawing DA-2.3

A. Demolition Keynote 1.08 to read as follows:

"Remove Guardrail / Handrail".

B. Remove Demolition Keynote 1.10 from Custodial Room B9.

C. Vice Principal Office (A31), Add Demolition Keynote 1.13 to refer to each of the two (2) existing walls (South and East).

Item No. AD-4.55: Reference Drawing DB-2.1

A. Custodial Room B9 to receive Demolition Keynote 1.53.

B. At Men's B10, Women's B11, Revise Keynote 1.53 to read: "1.10".

C. Add Keynote 1.55, "Remove Handrail".

D. At Toilets B16, B18 and B19, Revise Keynote 1.53 to read "1.10" to reflect enlarged plan.

E. At Teacher's Prep B12, Revise Keynote 1.16 to read: "1.10".

F. At Keynote 1.98, Remove and Relocate (E) low voltage elements to allow for new construction.

Item No. AD-4.56: Reference Drawing DB-2.2

A. Adjacent to Classrooms B2 and B5, Revise Keynote 1.50 to read: "1.17". Keynote applies at "B" Wing where suspended ceiling occurs, typ.

Item No. AD-4.57: Reference Drawing DC-2.1

A. Delete Keynote 1.14 at Common Area C7.

B. At Classroom C2, Revise Keynote 1.53 to read: "1.10".

Item No. AD-4.58: Reference Drawing DC-2.2

A. Add Keynote 1.49 "Remove Light Fixtures". See Electrical Drawings.

DRAWINGS FOR RAMONA-ALESSANDRO ELEMENTARY SCHOOL - INTERIM HOUSING PORTABLES PROJECT
3137117

Item No. AD-4.59: Reference Drawing A1.1

A. On Detail A12, Revise the word "Backout" to read: "Blackout". (Where existing accessible parking striping is to be blacked out and painted over).

B. On Detail A12, Furnish two (2) fence-mounted accessible parking signs, centered on each accessible vehicle stall, typical at each existing and new accessible parking stalls.

Item No. AD-4.60: Reference Drawing A2.1

A. On Drawing A10, Add Construction Note No. 13 to reference the portion of temporary chain link fencing occurring at the Northwest corner of Interim Housing Unit T1 and connecting to the existing property edge chain link fencing along Medical Center Drive.

B. On Drawing E1, Ornamental Gate, It shall be herein clarified that the 3'-0" wide new accessible pedestrian gate and new adjacent 1'-6" wide fence panel shall be constructed with 1/2" x 1/2" ornamental pickets (Keynote No. 11) to match existing adjacent fence components. All new post, header frames and pickets to be of tubular steel construction.

DRAWINGS FOR BRADLEY ELEMENTARY SCHOOL - DEFERRED MAINTENANCE PROJECT
3137206

Item No. AD-4.61: Reference Revised Drawings

A. The following Revised Drawing is hereby issued:

A-2.2M

Item No. AD-4.62: Reference New Drawings

A. The following New Drawings are hereby issued:

AD-4.16
AD-4.17
AD-4.18
AD-4.19

Item No. AD-4.63: Reference Drawing T1

A. Revise partial list of applicable codes to reflect current code:

Standpipe Systems: 2007 Edition
Private Fire Mains: 2007 Edition
National Fire Alarm Code, California Amended: 2007 Edition

All others to remain as is unless noted otherwise per Addenda.

Item No. AD-4.64: Reference Drawing A1.1

A. Revise Building Code Summary to reflect 2007 CBC. All "EI" Occupancies shall be listed as "E" Occupancies. Revise construction type for Building as VB, non-rated. Revise all "NR" as "VB" to reflect current code.

B. Delete illuminated exit signage from scope for Buildings A - G. At Building M, Delete illuminated exit signage from classrooms M118A - M123F (6 total). Include 3 illuminated exit signs at multi-purpose. All classrooms less than 1000 s.f., illuminated exit signage not required.

Item No. AD-4.65: Reference Drawing A1.1R, Fire Authority Site Plan

A. This Drawing is for "Reference Only". Bid Scopes of Work pertaining to the site are indicated on Drawings C100 (Addendum No. 4), A1.1 (Addendum No. 1) and other complimentary Detail and Building Plan Sheets issued in both the Bradley Elementary School Deferred Maintenance and Bradley Elementary School Modernization Bid Sets.

Item No. AD-4.66: Reference Drawing A2.1M

A. Revised scope includes, but is not limited to new casework and ADA accessible sinks at 5 locations. In addition, Contractor to include demolition of existing casework, VCT and plumbing as required for installation of work shown on revised remodel plans. Contractor to remove (E) sinks complete and all related appurtenances, return to Owner. Temporarily cap utilities (water, waste, and vent piping) in wall, above ceiling, or below floor as required to receive new fixture.

Item No. AD-4.67: Reference Drawing A8.1, Building Schedules

A. Room Finish Schedule, Revise referenced wall finish designation "PS" to read: "P" (Paint) for all rooms identified in Building M.

B. Add the "P" (Paint) designation to the wall finish columns for all North, East, South and West walls occurring at all Buildings A, B, C, D, E, F, and G rooms.

C. Add the "P1" color designation to the wall color columns for all North, East, South and West walls occurring at all Buildings A, B, C, D, E, F and G rooms. Refer to Section 09 06 00, Schedules For Finishes for additional information.

D. Revise Door Schedule, signage detail for Doors M118-M123 to read: "E14/A9.2".

Item No. AD-4.68: Reference Drawing A9.2

A. On Detail A4, Non-Bearing Wall Connection, Add the following note:

"Refer to 2/S1.3 for further information"

Item No. AD-4.69: Reference Drawing S1.2

A. On Detail 3, Revise detail to include (N) blocking between (E) framing where Microlam does not fall directly upon 2x vertical framing, typical.

Item No. AD-4.70: Reference Drawing M0.1

A. Revise General Note No. 1 to refer to 2007 California Mechanical Code in lieu of Plumbing Code.

B. Revise Wall Schedule, Refer to Detail A4/A9.2 and 2/S1.2 for (N) non-rated 2x wood stud wall.

C. Revise Remodel Keynote No. 13. Remove reference to detail, no detail required for installation of batt insulation at underside of roof deck.

HMC ARCHITECTS

By PETER LAVELLE FOR DAN BENNER

Dan Benner, Principal-In-Charge

PROJECT NAME: Group 7 Modernization, Interim Housing and Deferred Maint. Projects (Bradley, Marshall, Ramona-Alessandro and Warm Springs Elementary Schools)

BID NUMBER: # F08-10

BID FORM

TO: **SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT**, acting by and through its Governing Board, herein called the "DISTRICT."

FROM: _____
(Proper Name of Bidder)

1. Pursuant to and in compliance with your Notice Inviting Bids and the other documents relating thereto, the undersigned Bidder, having familiarized himself/herself with the terms of the Contract and the Contract Documents, the local conditions affecting the performance of the Contract and the cost of the work at the place where the work is to be done, hereby proposes and agrees to perform within the time stipulated, the Work of the Contract, including all of its component parts, and the furnishing of all materials and equipment required to be incorporated in and form a permanent part of the work; the furnishing of tools, equipment, supplies, transportation, utilities, facilities, labor, superintendence and services required to perform and complete the work; bonds, insurance and submittals; and including the assumption of all obligations, duties and responsibilities necessary to the successful completion of the Contract, including its acceptance by the DISTRICT, for the following Project:

   PROJECT NAME: Group 7 Modernization, Interim Housing and Deferred Maint. Projects, Bradley, Marshall, Ramona-Alessandro and Warm Springs Elementary Schools (Bid #F08-10)

2. ADDENDA

   The undersigned has thoroughly examined any and all Addenda (if any) issued during the bid period and is thoroughly familiar with all contents thereof and acknowledges receipt of the following Addenda: *(Bidder to list all addenda)*

   Group 7 Modernization, Interim Housing and Deferred Maint. Projects, Bradley, Marshall, Ramona-Alessandro and Warm Springs Elementary Schools (Bid #F08-10)

   ADDENDUM NO._____DATE ISSUED_____DATE RECEIVED_____

   ADDENDUM NO._____DATE ISSUED_____DATE RECEIVED_____

   ADDENDUM NO._____DATE ISSUED_____DATE RECEIVED_____

   ADDENDUM NO._____DATE ISSUED_____DATE RECEIVED_____

3. ALLOWANCES:

A1 Unforeseen Site Conditions $100,000

Additional effort, over and above contract work, due to existing soil conditions or obstructions encountered during trenching which are not readily discernable prior to excavation.

A2 Unforeseen Structural Repairs $125,000

Additional effort, over and above contract work, due to existing conditions, observable only after demolition, which require immediate repair, i.e. termite damage, dry rot, damaged bracing and repairs necessitated as a result of the certification investigation process or other. Repair will be forwarded to DSA, via field Change Directive, to document the repairs.

A3 Unforeseen Access Compliance Repairs $40,000

Additional effort, over and above contract work, due to existing conditions, observable only after demolition, which require immediate repair prior to installation of Access Compliance components. Repairs will be forwarded to DSA, via Field Change Directive, to document the repairs.

A4 Unforeseen Fire Alarm and Electrical $30,000

Additional effort, over and above contract work, due to existing conditions, observable only after demolition, which require immediate repair on order to install new fire alarm and electrical items. Repairs will be forwarded to DSA, via field Change Directive, to document the repairs.

A5 Restore Contractor Lay Down Areas $20,000

All work associated with bringing extra lawn area at designated Contractor staging area and lay down area, back to current conditions upon completion of trailer demobilization.

4. COMBINED BASE BIDS FOR **Bradley, Marshall, Ramona-Alessandro and Warm Springs Elementary Schools**

A. Modernizations for Bradley, Marshall, Ramona-Alessandro and Warm Springs Elementary Schools $_____

B. Allowances: $ 315,000

TOTAL COMBINED BASE BID PRICE OF MODERNIZATIONS AND ALLOWANCES AT Bradley, Marshall, Ramona-Alessandro and Warm Springs Elementary Schools

_____

_____

Total Combined Base Bid Price (Sum of A + B):
(Numerical Value): $_____

5. TIME FOR COMPLETION: The aggregate sum total work of the Contractor comprises the entire "Project" and shall be commenced and completed in conformance with the Project Construction Schedule. The entire Project shall be completed within **four hundred and five (405) consecutive calendar days**. Bidder acknowledges liability for liquidated damages in the amount as stipulated herein for each calendar day of delay.

6. DISTRICT'S RIGHT TO REJECT: It is understood that the DISTRICT reserves the right to reject this bid and that the bid shall remain open to acceptance and is irrevocable for a period of **One hundred and Twenty Days (120)**.

7. BID SECURITY: The required bid security in the amount of not less than ten percent (10%) of the bid is attached hereto.

8. PROPOSED SUBCONTRACTORS: The required list of proposed subcontractors is attached hereto. Bidder understands and acknowledges that all subcontractors providing goods and services in excess of $100,000.00 must be bonded in accordance with the Subletting and Subcontracting Fair Practices Act. (Refer to Notice Inviting Bids.)

9. NONCOLLUSION AFFIDAVIT: The required notarized Bidder's Noncollusion Affidavit is attached hereto.

10. SITE VISIT CERTIFICATION: The required Site Visit Certification is attached hereto.

11. DVBE CERTIFICATION: The required Certification of Compliance with DVBE Policy is attached hereto.

12. CRIMINAL BACKGROUND CHECK CERTIFICATION: The required Criminal Background Check Certification will be submitted prior to Contractor commencing work on the project in accordance with the Notice Inviting Bids.

13. FAITHFUL PERFORMANCE AND PAYMENT BOND: It is understood and agreed that if written notice of the acceptance of this bid is mailed, FAXED, or delivered to the undersigned after the opening of the bid, and within the time this bid is required to remain open, or at any time thereafter before this bid is withdrawn, the undersigned will execute and deliver to the DISTRICT a fully executed Form of Agreement (Contract) in the form attached hereto in accordance with the bid as accepted, and that it will also furnish and deliver to the DISTRICT six (6) executed copies of a Faithful Performance Bond and a separate Payment Bond as specified, and Certificates of Insurance, all within ten (10) calendar days after receipt of notification of the acceptance.
Bidder further agrees that the work under the Contract will be commenced by the Bidder, if awarded the Contract, on the date to be stated in the DISTRICT's "Notice to Proceed" and will be completed within the time specified in the Contract documents.

14. PROPER ADDRESS: Notice of Award of Contract or other correspondence should be addressed to the undersigned at the address stated below.

_____

_____

15. NAME(S) OF PRINCIPALS: Principals of the Bidder's company are::

_____

_____

_____

(IMPORTANT NOTICE: If Bidder is a corporation, state legal name of corporation, as well as names of the president, secretary treasurer, and general manager thereof; if a partnership, state true name of firm, also names of all individual partners composing firm; if an individual, state full name.)

16. The undersigned bidder declares that the bidder is licensed in the State of California as required by the Business and Professional Code in accordance with the act providing for registration of Contractors and the documentation of licensure is as follows:

	License No.	Classification	Expiration Date
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

If the bidder is a joint venture, each member of the joint venture must include the above information.

Bidder certifies that the above-mentioned license(s) entitle(s) Bidder to provide the work required by the Contract, that such license will be in full force and effect throughout the duration of work under this Contract, and that any and all subcontractors to be employed for the work will have appropriate licenses.

17. FORFEITURE OF SECURITY: In the event the Bidder to whom the Notice of Award of Contract is given fails or refuses to post the required bonds and return executed copies of the Form of Agreement with all required attachments within ten (10) calendar days from the date of the Notice of Award, the DISTRICT may declare the Bidder's bid deposit or bond forfeited as liquidated damages.

18. ASSIGNMENT OF RIGHTS, TITLE AND INTEREST IN CAUSES OF ACTION: Pursuant to Section 4552 of the Government code, in submitting a bid to the DISTRICT, the bidder offers and agrees that if the bid is accepted, it will assign to DISTRICT all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

19. IRCA: The bidder hereby certifies that it is, and at all times during the performance of work hereunder will be, in full compliance with the provisions of the Immigration Reform and Control Act of 1986 ("IRCA") in the hiring of its employees and the bidder shall indemnify, hold harmless and defend the DISTRICT against any and all actions, proceedings, penalties or claims arising out of the bidder's failure to comply strictly with the IRCA.

20. FINANCIAL STATEMENTS: It is understood and agreed that if requested by the DISTRICT, the Bidder will furnish a notarized financial statement, references and other information required by the DISTRICT sufficiently comprehensive to permit an appraisal of bidder's ability to perform the work of the Contract.

21. LIQUIDATED DAMAGES: The undersigned hereby warrants that all work shall be completed as soon as practicable but not later than **four hundred fifty (450) consecutive calendar days** from the date specified on the Notice to Proceed issued by the DISTRICT. Time is of the essence. The undersigned agrees that failure to complete the work or any scheduled activity within the time set forth herein will result in the imposition of liquidated damages for each consecutive calendar day of delay in the amount of **ONE THOUSAND DOLLARS ($ 1,000.00).**

22. CHANGE ORDER REQUESTS: Bidder understands and agrees that all change order requests must be submitted in the form set forth in the Contract Documents. The amount of allowable charges submitted pursuant to a change order shall be limited to the charges allowed by the Conditions of the Contract. Indirect costs, consequential and incidental costs, project management costs, extended home office and field office overhead, administrative costs and profit and other charges not specifically authorized by the Contract Conditions will not be allowed.

The undersigned declares and certifies under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

_____

Name of Corporation, Joint Venture, Partnership or Sole Proprietorship

_____

Address

Telephone:_____

_____

Proper Names of Bidder Empowered to Sign On Behalf of the Corporation, Joint Venture, Partnership or Sole Proprietorship

_____

Signature of Bidder

_____

Signature of Bidder (If more than one is required)

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of authorized officers or agents and the document shall bear the corporate seal; if bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his or her name and signature shall be placed above. If the bidder is a Joint Venture all individuals empowered by the Joint Venture Agreement must sign.

ATTACHMENTS TO BE COMPLETED AND SUBMITTED BY BIDDER:

To be submitted with Bid Form. Refer to Notice Inviting Bids.

1. Bidder's Noncollusion Affidavit
2. Site Visit Certification
3. Certification of Compliance with DVBE Policy
4. Proposed Subcontractors
5. Bid Bond Form
6. Bidder References and Responsibility Information
7. NOT USED
8. Local Business Outreach Program Registration Form, (Voluntary, Not Required with Bid Submission)

To be Submitted with Executed Contract (Agreement) by Successful Bidder:

1. Certificate Regarding Worker's Compensation
2. Drug-Free Work Place Certification
3. Statement of Intent to Meet DVBE Participation Goal
4. Faithful Performance Bond Form
5. Payment Bond Form
6. Vendor Tax Information
7. Certification of Non-Utilization of Asbestos Material
8. General Contractor Information
9. Contractor Prevailing Wage Compliance Certification
10. Guarantee
11. Criminal Records Checks Certification Forms

PROJECT NAME: Group 7 Modernization, Interim Housing and Deferred Maint. Projects (Bradley, Marshall, Ramona-Alessandro and Warm Springs Elementary Schools)

BID NUMBER: # F08-10

AGREEMENT BETWEEN DISTRICT AND CONTRACTOR

THIS AGREEMENT made in **three** (3) copies on this _____, BY AND BETWEEN **SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT,** San Bernardino County, California, hereinafter called the DISTRICT

and

_____. hereinafter called the CONTRACTOR. (CONTRACTOR's License No. _____).

WITNESSETH: That the DISTRICT and CONTRACTOR for the considerations hereinafter named agree as follows:

ARTICLE 1 - SCOPE OF THE WORK: CONTRACTOR shall perform within the time set forth in Article 2 of this Agreement and shall furnish all labor, materials, equipment, tools, utility services, and transportation and perform and complete all work required in connection with the construction as indicated on the drawings and as described in the Project Manual for the complete project at:

Group 7 Modernization, Interim Housing and Deferred Maintenance Projects
Bradley, Marshall, Ramona-Alessandro and Warm Springs Elementary Schools
San Bernardino City Unified School District
Bid No. F08-10

and shall do everything required by the Agreement, the General Conditions of the Contract for Construction, Supplementary Conditions, Technical Specification Sections and Drawings and Addenda.

ARTICLE 2 - TIME FOR PROJECT COMPLETION: All work under this Contract shall be completed within a period of **four hundred and five (405)** consecutive calendar days commencing with the Start Date indicated in the written Notice to Proceed received from the DISTRICT and all work under this contract shall be completed on or before completion date. CONTRACTOR shall refer to Section 01100 Summary of Work, and the Preliminary Schedule, Section 01 32 16 Construction Progress Schedule, and Article 17 of this Agreement for contractual obligation regarding individual activity durations.

ARTICLE 3 - THE AGREEMENT SUM: The DISTRICT shall pay the CONTRACTOR for the performance of this Contract, subject to the additions and deductions provided herein, the sum of:

_____
($ _____)

ARTICLE 4 - PROGRESS PAYMENTS: Based upon Applications for Payment submitted to the Architect by the CONTRACTOR and Certificates for Payment issued by the Architect, the DISTRICT shall make progress payments on account of the Agreement Sum to the CONTRACTOR as provided in Article 9 of the General Conditions and amended by the Supplementary Conditions.

ARTICLE 5 - RETENTION OF SECURITIES: Pursuant to Public Contract Code Section 22300, CONTRACTOR has the option to deposit securities with an escrow agent approved by the DISTRICT as a substitute for retention earnings withheld by the DISTRICT to ensure performance.

ARTICLE 6 - HOLD HARMLESS AGREEMENT: The CONTRACTOR agrees to and does hereby indemnify and hold harmless the DISTRICT, its officers, agents, and employees from every claim or demand made and every liability, loss, damage, or expense of any nature whatsoever, which may be incurred by reason of:

A. Liability for damages for (1) death or bodily injury to persons, (2) injury to property, or (3) any other loss, damage or expense arising under either (1) or (2) above, sustained by the CONTRACTOR or any person, firm or corporation employed by the CONTRACTOR upon or in connection with the work called for in this Agreement except for liability for damages referred to above which result from the sole negligence or willful misconduct of the DISTRICT, its officers, employees, agents or independent contractors who are directly employed by the DISTRICT, or for defects in design furnished by such persons.

B. Any injury to or death of persons or damage, loss or theft of any property, sustained by any person, firm, or corporation, including the DISTRICT, arising out of, or in any way connected with the work covered by this Agreement, whether said injury or damage occurs either on or off school DISTRICT property, except for liability for damages which result from the sole negligence or willful misconduct of the DISTRICT, its officers, employees, agents or independent contractors who are directly employed by the DISTRICT, or for defects in design furnished by such persons.

C. Any dispute between CONTRACTOR and CONTRACTOR'S subcontractors, suppliers, sureties, including, but not limited to, any stop notice actions.

D. The CONTRACTOR, at his own expense, cost, and risk, shall defend any and all actions, suits, or other proceeding that may be brought or instituted against the DISTRICT, its officers, agents, or employees on any such claim, demand, or liability and shall pay or satisfy any judgment that may be rendered against the DISTRICT, its officers, agents, or employees in any action, suit, or other proceedings as a result thereof.

ARTICLE 7 – PREVAILING WAGES

A. Wage rates for this project shall be in accordance with the "General Wage Determination Made By The Director of Industrial Relations Pursuant To California Labor Code, Part 7, Chapter 1, Article 2, Sections 1770, et seq., for San Bernardino County. Wage rates shall conform with those posted in the DISTRICT Office.

B. The following labor code sections are hereby referenced and made a part of this agreement:

1. Section 1735, Anti-Discrimination Requirements.
2. Section 1775, Penalty for Failure to Comply with Prevailing Wage Rates.
3. Section 1776, Payroll Records.
4. Section 1777.5 and 1777.6, Apprenticeship Requirements.
5. Section 1810 and 1811, Working Hour Restrictions.
6. Section 1813, Penalty for Failure to Pay Overtime.
7. Section 1815, Overtime Pay.

C. Submission of Certified Payroll is a Condition Precedent to Receipt of Payment. CONTRACTOR agrees that submission of Certified Payroll Records as well as all related or subsequent requests for supporting documents made by the DISTRICT or its Labor Compliance Plan ("LCP") shall be a condition precedent to receipt of progress, final, and or/retention payments on all State Funded Projects. The DISTRICT shall withhold any portion of the progress and/or final payments up to and including the entire payment until the Certified Payroll Records requirements is met by the CONTRACTOR. If the CONTRACTOR is determined to have failed to pay workers in compliance with the applicable prevailing wage sections of the Labor Code and the DISTRICT's LCP, the DISTRICT shall continue to withhold progress, final, or retention payments until sufficient funds have been withheld for payment of wages to workers and all applicable penalties imposed by the LCP.]

D. Forfeiture for Failure to Comply with Written Record Request. The CONTRACTOR shall have ten (10) days in which to comply subsequent to receipt of a written notice requesting Certified Payroll Records or supporting documents. In the event that the CONTRACTOR fails to comply within the 10-day period, he or she shall, as a penalty to the DISTRICT or its LCP, forfeit twenty-five ($25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards ("DAS") or the Department of Labor Standards and Enforcement ("DLSE"), these penalties shall be withheld from progress payments then due. A CONTRACTOR is not subject to a penalty assessment pursuant to this section due to the failure of a Subcontractor to comply with this section.

E. Mandatory Attendance at Pre-Job Conference: CONTRACTOR and Sub-contractors are required to attend the DISTRICT's Pre-Job Conference. At the Pre-Job Conference, the DISTRICT's Labor Compliance Program (LCP) Plan will be explained and its Pre-Job Conference checklist will be reviewed. CONTRACTOR and Sub-contractors are required to sign the Checklist to verify attendance of the Pre-Job Conference.

ARTICLE 8 - RECORD AUDIT: In accordance with Government Code, Section 8546.7, records of both the DISTRICT and the CONTRACTOR shall be subject to examination and audit by the Auditor General for a period of three (3) years after final payment.

ARTICLE 9 - CERTIFICATIONS:

A. Certifications of compliance with requirements for Worker's Compensation (Attachment No. 1 to Agreement), Drug-Free Work Place (Attachment No. 2 to Agreement) and CONTRACTOR Certification Education Code 45125.2 and 45125.1 (Attachment No. 3 to Agreement) and Prevailing Wage Certification (Attachment No. 4 to Agreement) are hereby made a part of this Agreement.

B. Prime Bidder's Certifications of compliance with requirements for Disabled Veteran Business Enterprise Participation, Good Faith Effort Worksheet are hereby made a part of this Agreement.

ARTICLE 10 - FINAL PAYMENT: Final payment, constituting the entire unpaid balance of the Agreement Sum, shall be paid by the DISTRICT to the CONTRACTOR 35 days after a Notice of Completion has been recorded, unless otherwise stipulated in the Notice of Completion, provided the Work has then been completed, the Contract fully performed, and a final Certificate for Payment has been issued by the Architect.

ARTICLE 11 – CONTRACTOR'S FAILURE TO PROCURE COMPLETION OF PROJECT: In the event said CONTRACTOR fails to furnish tools, equipment, or labor in the necessary quantity or quality, or fails to prosecute the work or any part thereof contemplated by this Agreement in a diligent and workmanlike manner, and if the CONTRACTOR for a period of two (2) calendar days after receipt of written demand from DISTRICT to do so, fails to furnish tools, equipment, or labor in the necessary quantity or quality, and to prosecute said work and all parts thereof in a diligent and workmanlike manner, or after commencing to do so within said two (2) calendar days, fails to continue to do so, then the DISTRICT may exclude the CONTRACTOR from the premises, or any portion thereof, and take possession of said premises or any portion thereof, together with all material and equipment thereon, and my complete the work contemplated by this Agreement or any portion of said work, either by furnishing the tools, equipment, labor or material necessary, or by letting the unfinished portion of said work, or the portion taken over by the DISTRICT to another contractor, or by a combination of such methods. In any event, the procuring of the completion of said work, or the portion thereof taken over by the DISTRICT, shall be a charge against the CONTRACTOR, and may be deducted from any money due or becoming due to CONTRACTOR from the DISTRICT, or the CONTRACTOR shall pay the DISTRICT the amount of said charge, or the portion thereof unsatisfied. The sureties, provided for under this Agreement shall become liable for payment should CONTRACTOR fail to pay in full any said cost incurred by the DISTRICT.

ARTICLE 12 – INSURANCE: CONTRACTOR shall take out, prior to commencing the work, and maintain, during the life of this Agreement, insurance with the limits shown below. CONTRACTOR shall require all subcontractors, if any, whether primary or secondary, to take out and maintain insurance in accordance with the limits shown in Supplementary General Conditions, Article 11.

Public Liability Insurance for injuries including accidental death, to any one person in an amount not less than: $1,000,000.00 and subject to the same limit for each person on account of one accident, in an amount not less than: $1,000,000.00.

Property Damage Insurance in an amount not less than: $1,000,000.00

Insurance Covering Special Hazards: The following special hazards shall be covered by rider or riders to above-mentioned public liability insurance or property damage insurance policy or policies of insurance, or by special policies of insurance in amounts as follows:

- Automotive and truck where operated in amounts as above
- Material hoist where used in amounts as above

ARTICLE 13 – CONTRACTOR'S LICENSE: CONTRACTOR must possess a **CLASS B** Contractor's License, issued by the State of California, which is current and in good standing.

ARTICLE 14 – CORPORATION IN GOOD STANDING: If CONTRACTOR is a corporation, the undersigned hereby represents and warrants that the corporation is duly incorporated and in good standing in the State of California, and that _____ whose title is _____, is authorized to act for and bind the corporation.

ARTICLE 15 – PROVISIONS REQUIRED BY LAW: Each and every provision of law and clause required by law to be inserted in this Agreement shall be deemed to be inserted herein and the Agreement shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not currently inserted, then upon application of either party the Agreement shall forthwith be physically amended to make such insertion or correction.

ARTICLE 16 - SUBSURFACE HAZARDOUS MATERIALS:

A. In the event trenches or other excavations extend deeper than four (4) feet below the surface, the CONTRACTOR shall promptly, and before the following conditions are disturbed, notify the DISTRICT in writing of any:

1. Material that the CONTRACTOR believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II or Class III disposal site in accordance with the provisions of existing law.
2. Subsurface or latent physical conditions at the site differing from those indicated.
3. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in the work of the character provided for in the contract.

B. Upon receipt of said notification the DISTRICT will investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the CONTRACTOR's cost of or the time required for performance of any part of the work, the DISTRICT will issue a change order under the procedures described in the General Conditions.

C. In the event that a dispute arises between the DISTRICT and the CONTRACTOR whether the conditions materially differ, or involve hazardous waste or cause a decrease or increase in the CONTRACTOR's cost of or time required for performance of any part of the work, the CONTRACTOR shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract. The CONTRACTOR shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

ARTICLE 17 - LIQUIDATED DAMAGES: Pursuant to Government Code Section 53069.85, if Work is not completed within the Contract Time or in strict accordance with the Project Schedule, It is understood, acknowledged and agreed that the DISTRICT will suffer damage. It is therefore agreed that the CONTRACTOR will pay the DISTRICT the sum of **ONE THOUSAND DOLLARS ($1,000.00)** for each and every calendar day of delay beyond the Contract Time, or beyond any completion schedule, construction schedule or Project milestones established in or pursuant to the Project Schedule, or beyond the time indicated in the PROJECT Schedule for any individual contract activity. Contractor expressly understands, acknowledges and agrees that such liquidated damages can and shall be imposed if the CONTRACTOR does not meet each and every aspect of any activity schedule, completion schedule, construction schedule or Project milestones established in or pursuant to the default by reason of delays, the acceptance of such work and/or payment(s) shall in no respect constitute a waiver or modification of any provisions regarding Contract Time, a completion schedule, the Project Schedule or liquidated damages. In the event the same is not paid, the CONTRACTOR further agrees that the DISTRICT may deduct the amount thereof from any money due or that may become due the CONTRACTOR under the Agreement. This Article does not exclude recovery of damages under provisions of the Agreement Documents.

Contractor is to refer to Section 01 11 00 Summary of Work, and the Preliminary Construction Schedule, and Section 01 32 16 Project Construction Schedule for duration of individual activities contained within the Four Hundred and Five (405) calendar day project requirement. Liquidated damages may be assessed if any individual activity duration exceeds the time indicated for that activity on the Project Construction Schedule.

ARTICLE 18 – COMPONENT PARTS OF THE AGREEMENT: The Agreement entered into by this Agreement consists of the following Agreement Documents, all of which are component parts of the Agreement as if herein set out in full or attached hereto:

Notice Inviting Bids
Information for Bidders
Bid Cover Sheet
Scope of Work Summary
Bid Form
Non-Collusion Affidavit
Site Visit Certification
DVBE Certification
Designation of Subcontractors
Bid Bond
Addenda
Agreement

Certification of Workers' Compensation
Certification of Drug Free Workplace
Performance Bond
Labor and Materials Payment bond
DVBE Participation Statement
General Conditions and Supplementary General Conditions
Special Conditions
Project Construction Schedule
Plans and Specifications
Drawings
Change Orders
Shop Drawing Transmittals
Information Required from bidder
Contractor's Certificate Regarding Non-Asbestos Containing Materials
Fingerprinting Requirements Under Assembly Bills 1610 and 1612
Vendor Tax Information

All of the above named Agreement Documents are intended to be complementary. Work required by one of the above named Agreement Documents and to by others shall be done as if required by all.

ARTICLE 19 - BACKGROUND CHECK: CONTRACTOR agrees to comply with all provisions of Education Code Section 45125.1. CONTRACTOR shall conduct criminal background check of all employees assigned to the DISTRICT, and will certify that no employees who have been convicted of serious or violent felonies as specified in Education Code 45125, will have contact with students, pursuant to this Agreement. CONTRACTOR must provide the DISTRICT with a list of all employees providing services pursuant to this Agreement, and designate to which sites they will be assigned. Failure to comply with this law may result in, at DISTRICT's sole discretion, termination of this Agreement.

ARTICLE 20 - DOCUMENT CONTROL PROGRAM: CONTRACTOR shall be required to utilize the DISTRICT'S established standard, centralized, Internet-based document control program to record, attach, track and manager Transmittals, Requests for Information (RFIs), Submittals, Daily Reports, Meeting Minutes, Punch Lists and other documents as required. Software and training for the Contractor's document coordinator and managers will be provided by the DISTRICT at no charge to the CONTRACTOR.

ARTICLE 21 – ENTIRE AGREEMENT: The complete Agreement as set forth in Article 1 of this Agreement constitutes the entire Agreement of the parties. No other agreements, oral or written, pertaining to the work to be performed, exists between the parties. This Agreement can be modified only by an amendment in writing, signed by both parties and pursuant to action of the Governing Board of the DISTRICT.

_____	**SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT**
_____	(DISTRICT)
(CONTRACTOR)	
By _____	By _____
_____	Mohammad Z. Islam
Official Title	Assistant Superintendent, Business and Finance
	Official Title
Date _____	Date _____
Address	
_____	
_____	
Official Seal	

SECTION 02821

FENCES AND GATES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fence framework, fabric and accessories.

B. Excavation for post bases.

C. Concrete anchorage for posts and center drop for gates.

D. Manual gates, swing, signs and related hardware.

E. Related Section: Section 02750, Sitework Concrete.

1.02 REFERENCES

A. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless.

B. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

C. ASTM A392 - Zinc-Coated Steel Chain-Link Fence Fabric.

D. ASTM F567 - Practice for Installation of Chain-Link Fence.

E. ASTM F1083- Pipe, steel, hot-dipped zinc coated (galvanized), welded, for fence structures.

F. SSPWC - Standard Specifications for Public Works Construction, 2000 Edition.

G. CLFM - Chain Link Fence Manufacturer's Institute

H. Chapters 10 and 19A, 2001 CBC.

1.03 QUALITY ASSURANCE

A. Manufacturer: Company specializing in commercial quality chain link fencing with five years experience.

1.04 SUBMITTALS

A. Shop drawings including plan layout, grid, spacing of components, accessories, fittings, hardware, anchorages and schedule of components.

B. Product data.

C. Manufacturer's installation instructions.

D. Three samples illustrating each fence fabric finish.

1.05 WARRANTY

A. Provide two-year warranty to insure materials against rusting or breakdown of finish. Provide adjustments as needed to assure continued smooth operation of gates.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Acceptable Manufacturers
1. Master-Halco/Anchor Fence Inc., Baltimore, MD
2. Boundary Fence and Railing Co., Richmond, NY.
3. Reeves Southeastern Wire Corp., Tampa, FL.
4. Or equal in accordance with Division 1, General Requirements for substitutions.

B. Framework: ASTM A53, Schedule 40, galvanized steel pipe, minimum 1.8 ounces per square feet galvanizing, ASTM A123 and ASTM F1083. Class 1, sized in accordance with Table 206-6.2, Standard Specifications for Public Works Construction. One piece without joints in accordance with CLFM I.

C. Fabric: Class 2, ASTM A392 galvanized after fabrication, 2 inch mesh, 9 gage, interwoven, top and bottom knuckled selvage, closed end.

2.02 CONCRETE MIX

A. Concrete: Normal portland cement; 2,500 psi at 28 days; 4 inch slump, conforming to Section 1905A, CBC.
1. Design Mix: Conform to Method A Table 19A-A-8 CBC.

2.03 COMPONENTS

A. Nominal pipe size (NPS) and weight (Class 1) in pounds per lineal foot:

	NPS	Pounds/LF
1.	1-1/4:	2.27
2.	1-1/2:	2.72
3.	2:	3.65
4.	2-1/2:	5.79
5.	3:	7.58
6.	3-1/2:	9.11
7.	6:	18.97
8.	8:	24.58

B. Posts for fencing

	Fence height in feet	Outside diameter in inches
1.	Less than 6 feet	3-1/2
2.	6 to 7.9	3-1/2
3.	8 to 11.9	3-1/2
4.	12 to 16	4.0

C. Terminal Posts – end, corner and slope.

	Fence height in feet	Outside diameter in inches
1.	6 to 8	3-1/2
2.	8 to 12	4.0

D. Swing gate posts, single leaf; opening widths in feet:

1.	Up to 6 wide	2" dia.
2.	6-13 wide	3-1/2" dia.
3.	13-18 wide:	6" dia.
4.	18 or more wide:	8" dia.

E. Swing gate posts, double leaf, opening widths in feet:

1.	Up to 12 wide	2-1/2" dia.
2.	12-26 wide	3-1/2" dia.
3.	26-36 wide	6" dia.
4.	36 or more wide:	8" dia.

F. Top rail and braces: 1-5/8, plain end, sleeve coupled.

G. Swing Gate Frames: 1-1/2.

H. Stiffeners for swing gates: 1-1/4.

I. Caps: Domed cast steel or malleable iron, galvanized and coated; sized to post dimension, set screw retained.

J. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings: Galvanized Steel.

K. Tension Wire: 7 gage thick coil spring steel, single strand, galvanized.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install framework, fabric, accessories and gates in accordance with Section 304-3, SSPWC and ASTM F567.

1. Post Footings: 4 times the diameter of the largest core section of the post, 12 inches minimum.

2. Posts Set in Hard Rock: Drill holes 1 inch larger than post and set in non-shrink grout.
3. Footings 6 inches below post bottom.
4. Minimum Depth: 36 inches plus 3 inches for each one ft over four ft.

B. Provide fence height as indicated on Drawings.

C. Space line posts at intervals not exceeding 10 feet.

D. Set terminal, gate and line posts plumb, in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.

E. Provide top rail through line post tops and splice with 7 inch long rail sleeves, outside sleeve type.

F. Brace each gate and corner post back to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end and gate posts.

G. Install center and bottom brace rail on gate leaves.

H. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.

I. Position bottom of fabric 2 inches above finished grade.

J. Fasten fabric to top rail, line posts, braces and bottom tension wire with tie wires maximum 16 inches on centers.

K. Attach fabric to end, corner and gate posts with tension bars and tension bar clips.

L. Install bottom tension wire stretched taut between terminal posts, (corner posts shall have brace rail).

M. Double Gates: Provide drop rod to hold inactive leaf. Provide locking device and padlock eyes as an integral part of latch, requiring for locking both gate leaves.

N. Provide concrete center drop and drop rod retainers at center of double gate openings, except gates with panic hardware.

3.02 SWING GATES

A. Gate Frames: 1-1/2 inch diameter steel pipe, welded corners, hot dip galvanized after fabrication.

B. Sizes: As indicated on the Drawings, minimum widths of gates shall not be less than 36".

C. Hardware: Heavy-duty, galvanized ferrous metal industrial quality as manufactured by Master-Halco/Anchor Fence Inc., Baltimore, MD. or equal as approved in accordance with Division 1, General Requirements for substitutions.

1. Hinges: Structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off type hinge design shall permit gate to swing 180 degrees inward. Steel Gate Hinges, Series 15600, industrial malleable, three each leaf.
2. Latch: ADA required fork type capable of retaining gate in closed position. Malleable, Series 16600.
3. Locking: Provide padlock capability.
4. Gate Hardware: Mount at 40 inches above finish floor and according to Sections 1007.3.11, 1003.3.2 and 1133B1.1.1.4 CBC.
   a. Provide strike strap.
   b. Bolt keeper.
5. Install 1/8 in. thick aluminum plate 24 in. high behind panic device centered at 40 in. above finish floor. Secure to gate frame with #8 stainless steel screws at 6 in on center.
6. Install 1/8 in. thick aluminum plate 10 inches kickplate, 3 inches from paving. Secure with # 8 stainless steel screws 4 places.
7. Panic Hardware: Panic hardware shall be furnished at all gates in the path of travel and shall comply with UBC Standard 10-4 and shall be mounted above 36" to 44" above the finished floor surface. The unlatching force shall not exceed 15 lbs applied in the direction of travel. Panic hardware shall comply with CBC Section 1003.3.1.9.
   a. Panic Bar: Exit Device; Von Duprin Rim Device 99L Series exit device, anodized aluminum finish, 992L trim with #06 Lever, 299 strike, at single gates, devices in exit pathways where shown on drawings, include cylinders, attach to gate post. Lever on exterior of gate.
   b. Accessories: 4" x 3" x ¼" x 8" high galv. steel angle welded to strike-side frame and 1" x 3" x ¼" thick bolt keeper. Fabricate galv. Steel lock box 16 ga x 3" high x 8" wide x 1-3/4" thick to encase lockset, weld all joints and grind smooth, touch up with galvanizing compound.
   c. Perforated Metal Panel: Manufactured by McNichols Co. Tampa, FL. Aluminum Plate: Perforated, 0.125 inch thick with 1/4 inch diameter holes 42 percent open area , 24 in. high by width of gate behind panic device centered at 40 in. above finish surface. Secure to gate frame with #8 stainless steel screws at 6 in on center.
8. Furnish and install closer device at all gates in the path of travel. Provide closer as specified in Hardware Set HW3.

3.03 TESTING

A. At Architect's option, Contractor shall be required to cut any pipe column after installation to confirm requirements of this Specification. If conformance is confirmed, replacement members shall be installed at Owner's cost. Components not meeting required standards shall be replaced.

END OF SECTION

SECTION 04060

MORTAR AND GROUT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Mortar and grout for masonry.

1.02 REFERENCES

A. ACI - American Concrete Institute
ASCE – American Society of Civil Engineers
1. ACI 530/ASCE 5 - Building Code Requirements for Masonry Structures

B. ASTM - American Society for Testing and Materials
1. ASTM A36 - Carbon Structural Steel
2. ASTM A307- Carbon Steel Bolts and Studs
3. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement
4. ASTM C90 - Concrete Masonry Units
5. ASTM C150 - Portland Cement
6. ASTM C207 - Hydrated Lime for Masonry Purposes
7. ASTM C216 - Facing Brick (Solid Masonry Units Made from Clay or Shale)
8. ASTM C270 - Mortar for Unit Masonry
9. ASTM C331 - Light Weight Aggregates for Concrete Masonry Units
10. ASTM C404 - Aggregate for Masonry Grout
11. ASTM C476 - Grout for Masonry
12. ASTM C494 - Chemical Admixtures for Concrete
13. ASTM C1019 - Test Method of Sampling and Testing Grout
14. ASTM C1314 - Test Method for Compressive Strength of Masonry Prisms
15. ASTM C1586 - Guide for Quality Assurance of Mortars

C. AWS - American Welding Society
1. AWS D1.4 - Structural Welding Code, Reinforcing Steel

D. CBC - 2007 California Building Code
1. CBC-21 – CBC Chapter 21A, Masonry (for DSA)

E. DSA – Division of State Architect, Interpretation of Regulations (IR)
1. DSA IR 21-1, Masonry Wall Non-Structural

1.03 SUBMITTALS

A. Product data including design mix, method used, required environmental conditions and admixture limitations.

B. Samples include two ribbons of mortar color, illustrating color and color range.

C. Manufacturer's certificate that products meet or exceed specified requirements.

1.04 DELIVERY, STORAGE AND HANDLING

A. Store and protect products.

B. Maintain packaged materials clean, dry and protected against dampness, freezing and foreign matter.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Maintain materials and surrounding air temperatures to minimum 40 degrees F prior to, during and 48 hours after completion of masonry work.

1.06 MIX TESTS

A. Test mortar and grout in accordance with Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Type I or II.

B. Mortar Aggregate: Wash sand with clean potable water and per Section 2103A.8 CBC, ASTM C 144.

C. Hydrated Lime: ASTM C207, Type S.

D. Grout Aggregate: Section 2103A.12.3 CBC, ASTM C404.

E. Water: Clean and potable.

F. Bonding Agent:
   1. WELD-CRETE; Larsen Products Corp., Rockville, MD.
   2. THOROBOND; Thoro System Products, Newark, CA.
   3. SONOCRETE; Sonneborn Building Products, Hayward, CA.
   4. Or equal, as approved in accordance with Division 01, General Requirements for substitutions.

G. Admixture: ASTM C494, early-water-loss reducing admixture, at high-lift grouting only, Sika GroutAid for Brick and CMU shall be used. Other products require pre-approval from approving agency.

2.02 MORTAR COLORS

A. Mortar Color: Pure mineral oxide pigment; colors as selected by the Architect.
   1. TRUE TONE; Davis Colors, Los Angeles, CA, or equal as approved in accordance with Division 01, General Requirements for substitutions.

B. Color Intensity: Up to 4 lbs. per sack of masonry cement.

2.03 MORTAR MIXES - PROPORTIONS BY VOLUME

A. Mortar Type and Proportions: Tables 2103A.8(1) and 2103A.8(2) CBC for Cement-Lime Mortar Type S, 1 part Portland cement, 1/4 to 1/2 part lime and loose damp sand in the amount of not less than 2-1/4 and not more than 3 times the sum of the separate volumes of cementitious materials.

B. Mortar strength: 1800 psi minimum at 28 days and mix to conform to Section 2103A, and Table 2103A.8(2) CBC.

2.04 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use. No admixtures permitted. Add lime last, in accordance with Section 2103A and Table 2103A.8(2) CBC.

B. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration. Omit mortar color where surfaces are scheduled to receive plaster or paint.

C. Do not use anti-freeze compounds to lower the freezing point of mortar.

D. If water is lost by evaporation, retemper by fully mixing with required volume of water, only within one hour of mixing. Dashing or pouring water over mixture not permitted.

E. Use mortar within two hours after mixing at temperatures of 80 degrees F or two-and-one-half hours at temperatures under 50 degrees F.

2.05 GROUT MIXES - PROPORTIONS BY VOLUME

A. Per Table 2103A.12 California Building Code.

B. Fine Grout: 1 part Portland cement, loose damp sand in the amount of 2-1/4 to 3 times the sum of the volumes of the cementitious materials and 1/10 part hydrated lime. Sufficient water shall be added to grout to cause it to flow into all joints of the masonry.

C. Coarse Grout: 1 part Portland cement, 0 to 1/10 part hydrated lime, 2-1/4 to 3 parts sand (fine aggregate) times the sum of the volumes of the cementitious materials, 1 to 2 parts pea gravel (coarse aggregate) times the sum of the volumes of the cementitious materials.

D. Grout Strength: 1200 psi minimum at 7 days, 2000 psi minimum at 28 days, and conform to Section 2103A, California Building Code 2007.

E. Use Fine Grout for cavity behind cement masonry and brick veneer. Coarse grout for all filled-cell masonry.

F. Use Fine Grout at grouted metal door frames.

2.06 GROUT MIXING

A. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476.

B. Do not use anti-freeze compounds to lower the freezing point of grout.

2.07 CALIBRATING

A. Proportion mortar and grout mixes by accurate volume measurements in accordance with Section 2103A, California Building Code. Maintain at the site, calibrated boxes or containers of such nature that quantities measured can be readily and accurately checked at any time. Proportion by shovel measure not permitted.

2.08 STRENGTH

A. Mortar: Minimum compressive strength at 28 days, 1800 psi.

B. Grout: Minimum compressive strength 2000 psi.

PART 3 - EXECUTION

3.01 TESTING AND INSPECTION

A. Request inspection of spaces to be grouted. Masonry work shall be continuously inspected during laying and grouting by the Special Masonry Inspector certified by DSA , in accordance with Section 1704.5, 2007 California Building Code.
   1. CMU Sampling and Testing: ASTM C140
   2. Mortar Sampling and Testing: ASTM C1586
   3. Prism Testing: ASTM C1314
   4. Grout Sampling and Testing: ASTM C1019

3.02 PREPARATION

A. Apply bonding agent to existing surfaces.

B. Plug cleanout holes to prevent leakage of grout materials. Brace masonry for wet grout pressure.

3.03 INSTALLATION

A. Install mortar and grout in accordance with Section 2104A, California Building Code.

B. Work grout into masonry cores and cavities to eliminate voids. Use coarse grout in cavities 2 inches wide or more and in all filled cell construction.

C. Do not displace reinforcement while placing grout.

D. Remove grout spaces of excess mortar.

E. Fill door frame voids solid with grout.

3.04 CURING

A. When atmosphere is extremely dry, dampen the masonry surfaces with a light fog spray for three days during the curing period for the mortar. Use a nozzle regulated fog spray sufficiently to dampen but not of such quantities to cause water to flow down over masonry.

END OF SECTION

SECTION 04820

REINFORCED UNIT MASONRY SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Concrete masonry units.

B. Reinforcement, anchorage and accessories.

C. Related Sections
   1. Section 04060, Mortar and Grout.
   2. Section 09900 Painting.

1.02 REFERENCES

A. ACI - American Concrete Institute
   ASCE – American Society of Civil Engineers
   1. ACI 530/ASCE 5 - Building Code Requirements for Masonry Structures

B. ASTM - American Society for Testing and Materials
   1. ASTM A36 - Carbon Structural Steel
   2. ASTM A307 - Carbon Steel Bolts and Studs
   3. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement
   4. ASTM C90 - Concrete Masonry Units
   5. ASTM C150 - Portland Cement
   6. ASTM C207 - Hydrated Lime for Masonry Purposes
   7. ASTM C216 - Facing Brick (Solid Masonry Units Made from Clay or Shale)
   8. ASTM C270 - Mortar for Unit Masonry
   9. ASTM C331 - Light Weight Aggregates for Concrete Masonry Units
   10. ASTM C404 - Aggregate for Masonry Grout
   11. ASTM C476 - Grout for Masonry
   12. ASTM C494 - Chemical Admixtures for Concrete
   13. ASTM C1019 - Test Method of Sampling and Testing Grout
   14. ASTM C1314 - Test Method for Compressive Strength of Masonry Prisms
   15. ASTM C1586 - Guide for Quality Assurance of Mortars

C. AWS - American Welding Society
   1. AWS D1.4 - Structural Welding Code, Reinforcing Steel

D. CBC - 2007 California Building Code
   1. CBC-21 - CBC Chapter 21A, Masonry for DSA.

E. CACRM - California Access Compliance Reference Manual, latest updates and based on the 2007 California Building Code.

F. DSA – Division of State Architect, Interpretation of Regulations (IR)
   1. DSA IR 21-1, Masonry Wall Non-Structural.

2. DSA IR 21-3 - Brick

1.03 SUBMITTALS

A. Product data.

B. Three samples of concrete masonry units to illustrate color, texture and extremes of color range.

1.04 QUALITY ASSURANCE

A. Installer's Qualifications. Company specializing in performing the work of this Section with minimum five years experience.

B. Tests and Inspections: Division 01, General Requirements.

C. Mock-up
1. Provide mock-up of concrete masonry in a location as approved.
2. Erect masonry to 3 by 4 feet panel size. Include specified mortar and accessories and one expansion joint.
3. When accepted, mock-up will demonstrate minimum standard for the work. Mock-up may remain as part of the work.

D. Pre-installation Conference
1. Convene minimum two weeks prior to commencing Work of this Section.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site, store and protect materials from damage.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do no masonry work when surrounding air temperature is anticipated to be 40 degrees F or lower, within 48-hours of placement.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
1. Angelus Block Co., Inc., Sun Valley, CA.
2. Trenwyth Industries, Inc.
3. Orco Block Co., Inc. Stanton, Ca.

B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.02 CONCRETE MASONRY UNITS

A. Hollow Load Bearing Block Units: ASTM C90, Grade N, Class: medium weight, Type 1. Minimum compressive strength: 1900 pounds per square inch per Table 2105A.2.2.1.2 of CBC.

B. Masonry Units: Nominal modular size of 8 by 8 by 16 inches. Provide special units for 90 degree corners and special profiles as indicated, provide caps same color as walls.
   1. Color: Beige
   2. Texture: Smooth.

C. Provide units manufactured in one batch production to ensure continuity of color.

2.03 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: ASTM A615, deformed billet steel bars, in grades as follows, and conforming to CBC-19, Section 1903A.
   1. For No.4 and larger bars, use 60 ksi yield grade.
   2. For ties and stirrups, and No. 3 and smaller bars, use 40 ksi yield grade.
   3. For welded bars, use ASTM A706 60 ksi yield grade.

2.04 ACCESSORIES

A. Steel Wire Ties: Minimum 16 gauge black annealed type.

B. Expansion Joint Filler: premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, "Closed Cell Neoprene" by Sandell Manufacturing, or equal.

C. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

D. Sealant: Two component Polyurethane, Non-sag, as specified in Section 07 92 00.

E. Backer Rod: Closed cell polyethylene; oversized 50 percent to joint width; self-expanding; ASTM C1330 Class O, DENVER FOAM (open cell) or ASTM C1330 Class C, GREEN ROD (closed cell), manufactured by the Pecora Corp., Harleysville, PA, or equal as approved in accordance with Division 01, General Requirements for substitutions.

F. Cleaning Solution: Not harmful to masonry work or adjacent materials.

G. Primers: manufacture's standard product for flashing specified.

H. Preformed Control–Joint Gaskets: styrene-butadiene-rubber type, ASTM D2287.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify items provided by other Sections of work are properly sized and located.

C. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied by other Sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place.

C. Sandblast concrete foundation clean prior to installation of first masonry course. Clean construction joints accordance with Section 1906A.4 CBC.

D. Install flashings as detailed.

3.03 COURSING

A. Establish lines, levels and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Lay concrete masonry units in running bond [stacked bond]. Course one unit and one mortar joint to equal 8 inches. Form concave mortar joints.

3.04 PLACING AND BONDING

A. Lay hollow masonry units in full bed of mortar with full head joints, uniformly jointed with other work.

B. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

C. Remove excess mortar as work progresses.

D. Interlock intersections and external corners.

E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

F. Perform jobsite cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

G. In texture-faced block assemblies, provide smooth-face block where required for attachment or mounting of building elements such as signage, and mechanical and electrical fittings and fixtures.

3.05 REINFORCEMENT

A. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

3.06 GROUTED COMPONENTS

A. Lap splices in reinforcing steel minimum 72 bar diameters. Welded splices required for No. 8 bars or larger.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position. Wire positioners or other approved devices are required.

C. Place and consolidate grout fill without displacing reinforcing.

3.07 LOW LIFT GROUTED CONSTRUCTION

A. Units shall be laid a maximum of 4 feet before grouting all cells. All overhanging mortar and mortar droppings shall be removed. Conform to Sections 2104 A.6.1.1.2 and 2104 A.6.1.2.2, California Building Code.

B. Grouting shall follow each 4 feet high lift of construction laid and shall be consolidated so as to completely fill all voids and embed all reinforcing steel. [Provide cleanouts for pours over 5 feet in height].

C. When grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout not less than 1/2 inch nor more than 2 inch below the top of uppermost unit grouted.

D. Horizontal steel shall be fully embedded in grout in an uninterrupted pour.

3.08 EXPANSION AND CONTROL JOINTS

A. Install control joints at approximately 20 feet on center maximum 25 feet on centers and seismic expansion joints at maximum 50 feet on center, unless indicated otherwise on drawings.

B. Install preformed control joint devices in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Size of expansion joints in accordance with Section 07 92 00 and as required for optimum sealant performance.

D. Form expansion joint to full depth of wall, sealant both sides.

3.09 BUILT-IN WORK

A. As work progresses, build in metal frames, anchor bolts and other items furnished by other Sections.

B. Build in items plumb and level.

C. Bed anchors of metal frames in adjacent mortar joints. Fill frame voids solid with grout.

D. Do not build in organic materials subject to deterioration.

3.10 TOLERANCES

A. Maximum Variation From Unit to Adjacent Unit: 1/32 inch.

B. Maximum Variation From Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.

C. Maximum Variation From Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet 1/2 inch in 30 feet.

D. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

3.11 CUTTING AND FITTING

A. Cut and fit for conduit, sleeves, piping, grounds and other inserts. Coordinate with other Sections of work to provide correct size, shape and location. Cut blocks neatly and true.

B. Obtain Architect's approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

C. At openings of chases in textured-face walls, grind faces of block to smooth finish all-around opening as required for face-plate or frame of cover assembly. Grinding shall leave uniform gap all-around installed cover of approximately 1/2-inch.

3.12 CURING

A. When atmosphere is dry, dampen the masonry surfaces with a light fog spray for three days during the curing period for the mortar. Use a nozzle regulated fog spray sufficiently to dampen but not of such quantities to cause water to flow down over masonry.

3.13 FINISH COATING

A. Field Painting: In accordance with Section 09900 Painting.
   1. Colors: As selected by Architect.

3.14 FIELD QUALITY CONTROL

A. Continuous inspections by Inspector of Record in accordance with Section 1704.5.

B. Test and inspect in accordance with requirements of Division 01, General Requirements

3.15 CLEANING

A. Remove excess mortar and mortar smears.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with an approved cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.16 PROTECTION OF FINISHED WORK

A. Protect finish installation from damage.

B. Without damaging completed work, provide protective boards at exposed external corners that may be damaged by construction activities.

END OF SECTION

SECTION 07265

CONCRETE SLAB VAPOR EMISSIONS TREATMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Vapor Emissions Treatment System for concrete floor slabs receiving adhesive applied floor coverings.

B. Install where floor slab moisture emissions exceed 3 pounds per 1,000 square feet in 24 hours with Calcium Chloride "Dome" Test.

C. Related Sections
   1. Section 03300, Concrete
   2. Section 09651, Resilient Tile Flooring
   3. Section 09680, Sheet Carpet

1.02 SUBMITTALS

A. Product data describing physical and performance characteristics.

B. Manufacturers written installation instructions.

1.03 GUARANTEE

A. Submit under provisions of Division 1, General Requirements.

B. Provide 5-year warranty against defects in product and installation.

C. Include all costs for replacement of failed flooring material installed over the moisture seal membrane.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. Dex-O-Tex Division of Crossfield, Rancho Dominguez, CA. Product: Vapor Shield.
   2. Sealflex Industries, Costa Mesa, CA.
   3. Industrial Products Inc., San Leandro, CA.

B. Or equal as approved in accordance with Division 1, General Requirements.

2.02 MATERIALS

A. Dex-O-Tex
   1. Vapor Shield Mortar.
   2. Vapor Shield Liquid Membrane.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify surfaces are dry and free of dirt and contaminates.

B. Beginning of Installation means acceptance of existing substrate and site conditions.

3.02 PREPARATION

A. Prepare surface by removal of laitence, grease and foreign matter. Use mechanical means (scarifing or bead blasting) where required.

B. Thoroughly clean all cracks.

C. Clean expansion joints and provide slip joint as required.

D. Maintain building temperature above 65 degrees Fahrenheit for a period of 48 hours prior to start of installation of base coat.

3.03 APPLICATION

A. Mix and apply concrete moisture seal materials in accordance with manufacturer's written instructions..

B. Base Coat: Trowel to a minimum thickness of 3/32 inch. Allow to dry 8 hours.

C. Membrane Liquid: Over the base coat roll or squeegee a layer of seal coat to a minimum thickness of 24 mils DFT.

D. Finish Coat: Over the rubber coat, apply a finish coat to a minimum thickness of 3/32 inches or as required to provide a level substrate for the finish floor material. For fills deeper than 1/4 inch, add washed pea gravel as recommended by the manufacturer.

E. Wherever moisture seal terminates at an area not receiving the moisture seal coating, feather the finish coat material to provide a smooth transition to the adjacent finish floor material.

F. After the finish coat has dried, remove trowel marks, ridges and imperfections by scraping, sanding and stoning to provide a smooth surface.

3.04 PROTECTION

A. Prohibit traffic on finish treated surface prior to installation of finish floor covering.

END OF SECTION

SECTION 09110

NON-LOAD BEARING METAL STUDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Formed metal stud framing at interior partitions.

B. Framing accessories.

1.02 REFERENCES

A. ASTM A924/A 924M - Steel sheet metallic coated by the hot-dip process.

B. ASTM A591 - Steel Sheet, Cold-Rolled, Electrolytic Zinc-Coated.

C. ASTM C645 -Non load bearing (axial) steel studs, runners (track), and rigid furring channels for screw application of gypsum board.

D. ASTM C754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board or Water-Resistant Backing Board.

E. ASTM C954 - Steel Drill Screws for the Application of Gypsum Board on Metal Plaster Bases.

F. AWS D1.3 - Structural Welding Code, Sheet Steel.

G. UL Fire Resistance Directory, latest Edition.

H. SSMA – Steel Stud Manufacturer's Association.

I. ICC - Evaluation Report 4943P.

J. AISI – American Iron and Steel Institute, Design for Cold-formed Steel Structural Members.

1.02 DESIGN REQUIREMENTS

K. Members shall be manufactured from steel that meets the mechanical requirements of the AISI Specification for the Design of Cold-Formed Steel Structural Members, Latest Edition.

1.03 SUBMITTALS

A. Product data describing standard framing member materials and finish, product criteria, load charts, limitations and accessories.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in non-bearing metal studs with minimum 5 years experience.

B. Installation by trained applicator as required by manufacturer.

PART 2 - PRODUCTS

2.01 STUD FRAMING MATERIALS

A. Acceptable Manufacturers
   1. Current Members of Steel Stud Manufacturers Association (SSMA).

B. Studs: SSMA, ICC ER-4943P, minimum yield 33 ksi, hot-dip galvanized or electro galvanized sheet steel, C-Stud type, punched web, 20 gage thick, minimum 1-1/4 inch flange, sizes required to conform to details and scheduled wall thicknesses. Studs shall be rolled from new steel sheet and shall not be produced from re-rolled steel.
   1. Bottom and Top Track: T-Sections, sizes required to conform to details and scheduled wall thicknesses, conform to SSMA.
   2. Section Properties, C-Studs, minimum values unless noted otherwise in drawings: Effective 33 ksi.

	Gross area	Ixx	Sxx
a. 2-1/2 inch	0.176 sq.in.	0.175 $in.^4$	0.120 $in.^3$
b. 3-5/8 inch	0.215 sq.in.	0.415 $in.^4$	0.202 $in.^3$
c. 4 inch	0.228 sq.in.	0.523 $in.^4$	0.231 $in.^3$
d. 6 inch	0.297 sq.in.	1.391 $in.^4$	0.408 $in.^3$

C. Head-of-Wall Track: FIRETRAK CORP., KIMBALL, MN. or equal as approved in accordance with Division 01, General Requirements for substitutions.
   1. Insulation Backer: Mineral wool.
   2. Sealant: FS-90 STA-SMOOTH, by Goldbond.
   3. Install one or two 5/8 inch thick sections of fire-rated gypsum board, 9 inches wide at deck flutes, both sides, custom fitted to within 1/8 to 3/8 inch of decking profile. Fill space with sealant, full depth, both sides.
   4. FIRETRAK SHADOW LINE RUNNER shall be attached to bottom flute of decking as recommended by manufacturer.
   5. Approval: Bearing UL Fire Resistance Classification and approve assembly.

D. Head-of-Wall Track: Slotted Top Track SLP-TRK Systems, Sliptrack Systems, Inc.. or equal as approved in accordance with Division 01, General Requirements for substitutions.
   1. Insulation Backer: per system UL Directory.
   2. Sealant: per system UL Directory.
   3. Install in accordance with manufacturer's approvals.
   4. Approval: Bearing UL Fire Resistance Classification and approve assembly, ICC ER-5344.

E. Fasteners: ASTM C954 self-drilling, self-tapping screws, Type S-12 pan head, 1/2 inch long.

F. Stiffeners: 3/4 inch, .3 lbs. per lineal foot, cold or hot rolled channel, (16 gage).

G. Metal Backing: Metal-Lite Flushmount & Standard backing.

H. Anchorage Devices, Drilled Expansion Anchors:
   1. Wedge Type: KWIK Bolt 3 (KB3), 1/4 to 1 inch diameter, ICC ESR-1385, by Hilti Inc., Tulsa, OK.
      a. Eyebolt HCKB KWIK-BOLT ICC ER-5224 drill-in anchor for suspended ceilings. Provide minimum 5/16 inch size anchor, requires testing.
      b. Expansion Anchor Bolts for CMU construction per ICC ES-5193 (HIT HY-150).
   2. Shell Type: HDI or HDI-L, 1/4 to 3/4 inch diameter, ICC-ES 2895, HDI-P, 3/8 inch Diameter, ICC ES-1291 by Hilti Inc., Tulsa, OK.

I. Anchorage Devices, Powder Actuated:
   1. Use of Powder actuated fasteners for tension loads is limited to support of minor loads such as suspended acoustical ceilings, ductwork and conduit. Powder actuated fasteners shall be installed to conform to the load requirements of this Section.
      a. Utilize tools as recommended by the manufacture in compliance with ICC numbers.
      b. ICC-ES 2388, Fasteners – Manual, Pneumatic, or Powder-Driven Steel Studs and Nails
   2. Allowable Loads: Limited 100 lbs. maximum. Testing required.
   3. Permissible Loads:
      a. Normal-Weight Concrete: Minimum 0.177 inch diameter, minimum penetration 1-1/2 inch. Required Allowable Loads: 100 lbs. or 80 percent of values listed in ICC Report whichever is less: ICC ES-5457.
         1) Type CC27ALH42 w/DX KWIK, by Hilti, Inc., Tulsa, OK.

J. Tie Wire: Minimum 16 gage, galvanized, annealed low carbon steel.

K. Welding: In accordance with AWS D1.3.

L. Firestopping and Safing at Fire-Rated Walls: Conform to listed assemblies in U.L. Directory.

M. Channels: U-Sections and F-Sections for Furring channels.

N. Top and Bottom Track for Curved Walls: ASTM A653 G40. 20 gauge, Flex-C Trac and Flex-C Angle, widths to match wall stud, provide "D-Flexion Post System for deflection conditions. Manufacturer: FLEX-ABILITY CONCEPTS, Edmond, OK.

2.02 FABRICATION

A. Fabricate assemblies to sizes and profiles required; with framing members fitted, reinforced and braced to suit design requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that conditions are ready to receive work.

B. Verify field measurements.

C. Verify that rough-in utilities are in proper location.

D. Beginning of installation means installer accepts existing conditions.

3.02 ERECTION

A. Perform work in accordance with ASTM C754.

B. Install pre-fabricated slip track at top of wall. Attach to supporting structure above.

C. Align and fasten top and bottom runners at maximum 32 inches on centers.

D. Fit runners under and above openings; secure intermediate studs at spacing of wall studs.

E. Install studs vertically at 16 inches on centers. Studs where ceramic tile is applied on one or both sides higher than 36 inches: 12 inch spacing required.

F. Connect studs to tracks using one fastener at each flange.

G. Stud splicing not permissible.

H. Construct corners using minimum three studs.

I. Brace stud framing system and make rigid.

J. Provide supports and attachments for the work.

K. Align stud web openings.

L. Install anchors and blocking for electrical and mechanical work to be placed in or behind stud framing.

M. Where required by manufacturers Load Tables for gage and wall height, install 3/4 inch furring channel stiffeners within 24 inches of top and bottom runners and one stiffener at mid height of 8 feet high walls. At higher walls, install stiffeners spaced maximum 48 inches on centers. Tie stiffeners to studs with specified wire ties and at laps.

N. In areas where a finish material occurs on one side of wall only, provide bridging or bracing. Two systems permitted:
   1. Install 3/4 inch x 16 gage continuous brace through stud punch-outs, fastened to studs with angle clips welded or screw fastened, spaced as scheduled below.
   2. Install 1-1/4 inch x 16 gage strap, 3/4 inch x 16 gage cold-rolled channel or 2-1/2 inch 20 gage stud continuous across unrestrained edges of studs, screw fastened or welded to each stud, and connected to one blocking member screw fastened or welded to adjacent studs.

O. Bracing Schedule:

Stud Size	Bracing Spacing Maximum
2-1/2 inch	2'- 6"
3-5/8 or 4 in	4'- 0"
6 inch	6'- 0"

P. Refer to Drawings for indication of partitions extending to ceiling only and for partitions extending through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs.

Q. Verify installation of insulation in multiple stud spaces made inaccessible after stud framing erection.

R. Erect 2 stud construction at expansion joints for exterior cement plaster construction.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.

B. Maximum Variation of any Member from Plane: 1/4 inch.

END OF SECTION

SECTION 09130

ACOUSTICAL SUSPENSION SYSTEMS

PART 1 GENERAL

1.01 WORK INCLUDED

A. New acoustical suspension system, heavy duty.

B. Removal, repair and re-installation of existing acoustical panels and suspension systems.
   1. Field verify the extent of the Work to match existing.

C. Perimeter trim.

D. Suspension trim.

1.02 RELATED SECTIONS

A. Section 09511 - Acoustical Ceilings

1.03 REFERENCES

A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

B. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

C. ASTM E84 - Surface Burning Characteristics of Building Materials.

D. ASTM E580 - Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint.

E. Chapter 19A California Building Code.

F. Chapter 23A California Building Code.

G. DSA IR M-3, June 2003.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacture of ceiling suspension system with five years minimum experience.

B. Installer: Company with five years minimum experience.

1.05 SUBMITTALS

A. Submit shop drawings indicating, grid layout and related dimensioning, junctions with other work or ceiling finishes and interrelation of mechanical and electrical items. Photographic reproductions of the contract drawings shall not be used.

B. Submit product data.

C. Submit three samples of each suspension system main runner, cross runner and edge trim.

D. Submit manufacturer's installation instructions.

E. Submit UL Design number or State Fire Marshal listing number for required fire-rated grid system.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Products of the following manufacturers form the basis for design and quality intended.
   1. Chicago Metallic Corp., Los Angeles, CA, Product: SERIES 1200 Heavy Duty, 15/16 inch wide face, exposed T.
   2. BPB Celotex, Tampa, FL.
   3. Armstrong World Industries. Lancaster, CA.
   4. USG Interiors Inc., Chicago, IL.

B. Existing Suspension Systems:
   1. Existing system is a suspended grid complete with wall moldings with members forming a 24 inch by 24 inch grid.
   2. New suspension system and their components for patching existing system shall match existing.

C. Or equal as approved in accordance with Division 1, General Requirements for substitutions.
   1. Substitutions shall have a current product acceptance document filed with DSA prior to submission of Bids.

2.02 SUSPENSION SYSTEM MATERIALS

A. Grid: ASTM C635, heavy duty, exposed T, components die cut and interlocking.
   1. Main Runners: 200-01.
   2. Cross Tees - Stepped End: 1204, 1210, 1226 at 24 x 24 inch grid.
   3. Hold-Down Clips: 425, 820 or 935 at fire-rated corridors and exitways.
   4. Edge Trim: 1420, 15/16 x 15/16 inch angle.

B. Accessories: Stabilizer bars, splices, edge trim and all necessary components required for the specified suspended grid system. Provide manufacturers standard hold-down clips at fire-rated assemblies and at panel weighing less than 1 lb PSF.

C. Grid Materials: Commercial quality cold rolled steel with galvanized coating.

D. Grid Finish: Factory applied standard white.

E. Hanger Wire: No. 12 gage galvanized, annealed steel wire.

F. Suspension Trim: USG, Model Compasso Trim, painted steel, sizes 6" and 8". Provide attachment clips and splices. Refer to drawings for location and sizes.

2.03 FIRE CLASSIFICATION REQUIREMENTS

A. ASTM E84, all materials shall have a flame spread density rating of less than 25 and a smoke density rating of less than 450.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that existing conditions are ready to receive work.

B. Verify that layout of hangers will not interfere with other work.

C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install system in accordance with ASTM C636, ASTM E580, Section 2501 California Building Code and DSA IR M-3, and as supplemented in this Section.

B. Lay-in ceiling assemblies in exitways shall be installed with a main runner, crossrunner or ledger surrounding all sides of each panel and each light fixture or grill. Splices and intersections of such runners shall be attached with through-connectors such as pop rivets screws, pins, plates with bent tabs or by other approved connectors at wall slip joint and wall ledger, provide a main runner parallel to wall, suspended with 12 gage hangar wires spaced 4 ft oc and one pair of parallel bracing wires spaced 12 ft oc. Such main runner shall be locked to each intersecting, perpendicular grid member by an approved through-connection splice.

C. Ceilings shall not support material or building components other than grilles or light fixtures except as herein provided. Ductwork, plumbing and like work shall have its own support system and shall not utilize the ceiling system or suspension wires.

D. 12 gage hanger wires shall be used to support a maximum ceiling area of 16 square feet, spaced at 4 x 4 foot along main runners. Splices will not be permitted in any hanger wires.

E. Provide 12 gage minimum hanger wires at the ends of main and cross runners within 8 inch from the support or within 1/4 of the length of the end tee, whichever is least, for the perimeter of the ceiling area.

F. Provide trapeze or other supplementary support members at obstructions to main hanger spacing. Provide additional hangers, struts or braces as required at ceiling breaks, soffits or discontinuous areas. Hanger wires that are more than 1 in 6 out of plumb shall have counter-sloping wires.

G. Ceiling grid members shall be attached to not more than 2 adjacent walls. Ceiling grid members shall be at least 1/2 inch free of other walls. If walls run diagonally to ceiling grid system runners, one end of main and cross runners shall be free and a minimum of 1/2 inch clear of wall.

H. At the perimeter of the ceiling area where main or cross runners are not connected to the adjacent wall, provide interconnection between the runners at the free end to prevent lateral spreading. A metal strut or a 16 gage wire with a positive mechanical connection to the runner may be used. Where the perpendicular distance from the wall to the first parallel runner is 12 inches or less, this interlock is not required.

1. Install Compasso Suspension Trim as indicated on Drawings.

I. Provide sets of four 12 gage splayed bracing wires oriented 90 degrees from each other at a spacing of 12 ft by 8 ft. Install vertical compression strut at each set of bracing wires.

J. Compression Struts: 20 gage 4 inch stud. Attach to main runners within 2 inch of cross runner with 2-# 12 self-drilling self-tapping (SDST) screws and to structure with 2-#12 by 2 inch screws at wood or 3/16 inch diameter anchor at concrete/steel. Compression strut shall not replace hanger wire.

K. Provide bracing wires at locations not more than 1/2 the spacings specified herein from each perimeter wall and at the edge of vertical ceiling offsets.

L. The slope of bracing wires shall not exceed 45 degrees from the plane of the ceiling and shall be taut without causing the ceiling to lift. Splices in bracing wires are not permitted. Powder actuated fasteners are not permitted for the attachment of splay wires. Conform to Division 1, General Requirements for testing requirements for fasteners.

M. Fasten hanger wires with not less than 3 tight turns. Fasten bracing wires with 4 tight turns. Make all tight turns within a distance of 1-1/2 inches. Hanger or bracing wire anchors to the structure shall be installed in such a manner that the direction of the wire aligns as closely as possible with the direction of the forces acting on the wire. Wire turns made by machine where both strands have been deformed or bent in wrapping can waive the 1-1/2 inch requirement, but the number of turns shall be maintained and shall be as tight as possible.

N. Separate all ceiling hanging and bracing wires at least 6 inches from unbraced ducts, pipes or conduit. Attach lightweight items, such as single electrical conduit not exceeding 3/4 inch nominal diameter to hanger wires using approved connectors.

O. Attach light fixtures to the ceiling grid runners to resist a horizontal force equal to the weight of the fixtures.

P. Flush or recessed light fixtures and air terminals or services weighing less than 56 pounds may be supported directly on the runners. Install a minimum of two 12 gage slack safety wires attached to the fixture at diagonal corners and anchored to the structure above. All 4 ft x 4 ft light fixtures must have slack safety wires at each corner.

Q. Flush or recessed light fixtures and air terminals or services weighing 56 pounds or more shall be independently supported by not less than 4 taut 12 gage wires each attached to the fixture and to the structure above.

1. The 4 taut 12 gage wires including their attachment to the structure above shall be capable of supporting 4 times the weight of the unit.

R. Support surface mounted light fixtures by at least two positive devices which surround the ceiling runner and which are each supported from the structure above by a 12 gage wire. Spring clips or clamps that connect only to the runner are not acceptable. Provide additional supports when light fixtures are 8 feet or longer.

S. Support pendant mounted light fixtures directly from the structure above with hanger wires or cables passing through each pendant hanger and capable of supporting 4 times the weight of the fixture. Restrain pendant fixtures with aircraft cable to prevent contacting anything within 45-degree swing.

T. Partitions: If non-bearing partitions that extend to and terminate at a suspended ceiling are supported laterally by opposing bracing wires spaced a maximum of 8 ft oc along the top edge of the partition or by other equivalent means, they shall be considered as not adding to the lateral load required to be resisted by the ceiling system.

U. Do not eccentrically load system or produce rotation of runners.

V. Install edge angle at intersection of ceiling and vertical surfaces using longest practical lengths. Miter corners. Provide edge angles at junctions with other interruptions. Where curved obstructions occur, provide preformed closers to match edge molding.

W. Form expansion joints as indicated on drawings.

3.03 TESTING

A. When drilled-in concrete anchors or shot-in anchors are used in reinforced concrete for hanger wires, 1 out of 10 must be field tested for 200 pounds of tension.

B. Test drilled-in expansion-type concrete anchors for bracing wires, 50% bolt in a group must be field tested for 440 pounds in tension.

C. Shot-in anchors in concrete are not permitted for bracing wires.

D. If any shot-in or drilled-in anchors fails, conform to Section 1923A.3.5, California Building Code.

3.04 EXISTING SUSPENSION SYSTEM

A. Preparation
   1. Remove suspension system as necessary to perform the work. Safely store removed units for reinstallation.

B. Reinstalling Removed Suspension System:
   1. Reinstall satisfactory salvaged suspension system or install new matching systems and materials to make ceiling complete.
   2. Limit reinstalled systems and materials to those that are in conditions equal to or better than, adjacent undisturbed systems.
   3. Use existing hangers and hanger attachments where they have been approved. Provide new hangers and hanger attachments where existing hanger and attachments have been removed or are improperly placed or otherwise inappropriate and where there are no existing hangers.

3.05 TOLERANCES

A. Variation from Flat and Level Surface: 1/8 inch in 10 feet.

END OF SECTION

SECTION 09511

ACOUSTICAL CEILINGS - LAY-IN

PART 1 GENERAL

1.01 WORK INCLUDED

A. Acoustical panels, lay-in.

1.02 RELATED SECTIONS

A. Section 09130 - Acoustical Suspension Systems.

1.03 REFERENCES

A. ASTM E84 - Surface Burning Characteristics of Building Materials.

B. ASTM E1264 - Acoustic Ceiling Products.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacture of ceiling panels with five years minimum experience.

B. Installer: Company with three years minimum experience.

1.05 SUBMITTALS

A. Submit product data for acoustical panels.

B. Submit three samples illustrating material and finish of acoustic units.

C. Submit manufacturer's installation instructions.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Interior wet work shall be completed prior to installation of panels. Windows and doors shall be in place. HVAC systems shall be installed and operable where necessary to maintain a temperature range of 60 to 85 degrees F and maximum 70 percent relative humidity.

1.07 EXTRA STOCK

A. Provide extra quantity of acoustic units in the amount of one box of each type specified.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Products of the following manufacturers form the basis for design and quality intended.
   1. Armstrong World Industries, Fullerton, CA.
   2. USG Interiors, Chicago, IL.
   3. Celotex Corp., Tampa, Fl.

B. Or equal as approved in accordance with Division 1, General Requirements for substitutions.

2.02 MATERIALS

A. Acoustical Panels: Armstrong Fine Fissured
   1. Size: 24 x 48 inches
   2. Thickness: 5/8 inches
   3. Light Reflectance: 0.85
   4. NRC: 0.7
   5. Edge: Square edge.
   6. Surface color: Factory White.

B. Retention Clips: Armstrong #414 Retention Clip or equal. Panels weighing more than 1/2 pound per square foot other than acoustical tile is to be positively attached to the ceiling suspension runners.

2.03 FIRE CLASSIFICATION REQUIREMENTS

A. ASTM E84, all materials shall have a flame spread of less than 25 and a smoke density rating of less than 450.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that existing conditions are ready to receive work.

B. Verify that layout of hangers will not interfere with installation of acoustic units.

C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.

B. Where square units are indicated, lay directional patterned units in basket weave pattern. Fit border neatly against abutting surfaces.

C. Install acoustic units level, in uniform plane, and free from twist, warp and dents. Replace damaged or soiled units.

D. Provide for complete accessibility for all units.

E. Install retention-panel clips at gypsum panel ceilings, and at panels weighing less than 1/2 lb. per square foot.

END OF SECTION

SECTION 09651

RESILIENT TILE FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

1.02 REFERENCES

A. ASTM E648 and NFPA 253 - Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

B. ASTM D2047 - Static Coefficient of Friction, at least 0.6.

C. UBC Standard 8-1, Test Method for Surface Burning Characteristics for Building Materials.

1.03 FIRE CLASSIFICATION REQUIREMENTS

A. ASTM E648, NFPA 253: Class 1, Critical Radiant Flux Flame Spread Value: Minimum 0.45 watts per sq cm.

B. Flame spread not greater than 25 and smoke density not greater than 450 when tested in accordance with UBC Standard 8-1.

1.04 SUBMITTALS

A. Provide product data on specified products, describing physical and performance characteristics, sizes, patterns and colors available.

B. Submit three samples, 12 x 12 inches in size, illustrating color and pattern for each floor material specified.

C. Submit manufacturer's installation instructions.

D. Submit maintenance procedures and recommended maintenance materials, and suggested schedule for cleaning, stripping and re-waxing.

1.05 WARRANTY

A. Submit under provisions of Division 1, General Requirements.

B. Provide manufacturer's 5 year warranty against defects and wear-through.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain minimum 70 degrees F temperature three days prior to, during and 24 hours after installation of materials.

C. Provide adequate ventilation to carry off volatile fumes.

1.07 EXTRA MATERIALS

A. Provide minimum three percent of all materials furnished for each color and size of materials installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS - TILE FLOORING

A. Products of the following manufacturers form the basis for design and quality intended.
   1. Azrock Commercial, San Antonio, TX.
   2. Tarkett, Parsippany, NJ.
   3. Armstrong Work Industries, Inc., Fullerton , CA.

B. Or equal as approved in accordance with Division 1, General Requirements for Substitutions.

2.02 TILE FLOORING MATERIALS

A. Azrock VC Tile, 1/8 in thick, 12 x 12 inch size, homogeneous composition tile, pattern uniformly dispersed throughout thickness of material, color : Refer to Section 09050.
   1. Required Static Load Limit: 75 psi.
   2. Coefficient of Friction: ASTM D2047 at least 0.6.

B. Special Patterns as designed by Architect, refer to drawings.

2.03 MANUFACTURERS - REDUCER STRIPS AND ACCESSORIES

A. Products of the following manufacturers form the basis for design and quality intended.
   1. Duramax Inc./Johnsonite, Chagrin Falls, OH.
   2. The Roppe Co., Fostoria, OH.
   3. Mercer Products Co., Inc., Orlando, FL.
   4. The Flexco Co., Tuscumbia, AL.
   5. AFCO Rubber Corp., North Canton, OH.

B. Or equal as approved in accordance with Division 1, General Requirements for Substitutions.

2.04 REDUCER STRIPS AND ACCESSORIES

A. Reducer Strip: 1/8 inch, vinyl RRS-A, B or C JOHNSONITE.

B. Butting Gage: EG Series, thickness on each side of strip to accommodate type of flooring material to be jointed.

2.05 FILLERS AND ADHESIVES

A. Subfloor Filler: Portland cement compound, Henry 345 "Milkless" Flooring Underlayment.

B. Adhesives: Waterproof; Tarkett FB-1 MULTI-PURPOSE ADHESIVE, in full compliance with California VOC Regulations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft, and are ready to receive Work.

B. Prior to ordering flooring materials, contractor shall conduct calcium chloride "dome" test to verify that concrete floors are dry with maximum moisture vapor emissions of three lbs per 1000 sf in 24 hours, and exhibit negative alkalinity, carbonization or dusting. Apply moisture test in four (4) different areas of each floor location with at least on test for each 1,000 sf. of floor area.

C. Ordering of flooring materials and beginning of installation means acceptance of existing substrate and site conditions.

3.02 PREPARATION

A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with subfloor filler.

B. Apply, trowel and float filler to leave a smooth, flat, hard surface, free of bumps or depressions of any size.

C. Prohibit traffic from area until filler is cured.

D. Vacuum clean substrate.

E. Apply primer as recommended by the materials manufacturer.

3.03 INSTALLATION - TILE MATERIAL

A. Install in accordance with manufacturers' instructions.

B. Mix tile from container to ensure shade variations are consistent.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Set flooring in place, press with heavy roller to attain full adhesion.

E. Lay flooring with joints parallel to building lines.

F. Install tile to square grid pattern with all joints aligned, with pattern grain alternating with adjacent unit to produce basket weave pattern. Allow minimum 1/2 full size tile width at room or area perimeter, where possible.

G. Terminate flooring at centerline of door at door openings where adjacent floor finish is dissimilar.

H. Install edge strips at unprotected or exposed edges, and where flooring terminates.

I. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.

J. Install flooring under movable partitions and under open cabinets without interrupting floor pattern.

K. Install edge strips where flooring does not terminate at walls and where indicated. Fit joints tightly.

L. Install wall base per Section 09653.

3.04 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

3.05 CLEANING

A. Remove excess adhesive from floor, base and wall surfaces without damage.

B. Protection: Cover work with a heavy non-asphaltic non-staining type building paper where subsequent building operations occur. Protect work until completion. Repair or make good any damage to this work and other materials damaged during installation of flooring.

END OF SECTION

SECTION 09653

TOP-SET RESILIENT BASE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient base.

1.02 REFERENCES

A. ASTM E648 and NFPA 253 - Critical Radiant Flux of Floor Covering Systems.

B. UBC Standard No. 8-1.

C. FS-SS-W40a - Wall Base, Rubber and Vinyl Plastic.

1.03 FIRE CLASSIFICATION REQUIREMENTS

A. ASTM E648, NFPA 253: Class 1, Critical Radiant Flux Flame Spread Value: minimum 0.45 watts per sq cm.

B. UBC Standard No. 8-1, smoke density less than 450.

1.04 SUBMITTALS

A. Submit product data on specified products and colors available.

B. Submit three 6 inch long samples of base material for each color selected.

C. Submit manufacturer's installation instructions.

D. Submit maintenance procedures and recommended maintenance materials.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain minimum 70 degrees F temperature three days prior to, during and 24 hours after installation of materials.

C. Provide adequate ventilation to carry off volatile fumes.

1.06 REPLACEMENT MATERIALS

A. Provide minimum three percent of all materials furnished for each color and size of materials installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS, RUBBER

A. Burke Flooring Products, City of Commerce, CA.

B. Johnsonite Chagrin Falls, OH.

C. Nora Flooring Systems, Lawrence, MA.

D. Endura Co., Waltham, MA..

E. Musson Rubber Co., Akron, OH.

F. Roppe Corp., Fostoria, OH.

G. Or equal as approved in accordance with Division 1, General Requirements for substitutions.

2.02 BASE MATERIALS

A. Base: Rubber, 1/8 inch gage, standard toe, 4 inches high.
1. Color: Refer to Section 09050.

B. Base material shall meet FS-SS-W-40a Type I for rubber.

C. Base Accessories: Premolded end stops, internal and external corners of same material, size and color as base.

D. Adhesive: As recommended by the manufacturer and if full compliance with the California VOC regulations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft and are ready to receive Work.

B. Verify that surfaces are finished, ready to receive base installation.

C. Beginning of installation means acceptance of existing substrate and site conditions.

3.02 INSTALLATION - BASE MATERIAL

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

B. At all 90 degree external corners use premolded units only. At corners more or less than 90 degrees, shave a vertical strip down the back side of the material, 1/4 inch wide and not more than 1/2 the thickness at the point of bend. Bend coved toe to required angle. Bond material firmly to wall on both sides of joint to ensure a tight fit with no open void at top.

C. At 90 degree internal corners use premolded units or as an alternate, miter material to exact angle.

D. Install base on solid backing. Bond tight to wall and floor surfaces.

E. Scribe and fit to door frames and other interruptions.

3.03 CLEANING

A. Remove excess adhesive from floor, base and wall surfaces without damage.

B. Protection: Protect work until completion. Repair or make good any damage to this work and other materials damaged during installation of base material.

3.04 SCHEDULE

A. Install at all walls not specified to receive integral base and as scheduled in the finish schedule.

B. Install all rubber bases at all cabinet bases.

END OF SECTION

SECTION 09680

SHEET CARPET

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Broadloom carpeting, glue-down.

B. Accessories

1.02 REFERENCES

A. ASTM E648 and NFPA 253 - Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

1.03 FIRE CLASSIFICATION REQUIREMENTS

A. ASTM E648, NFPA 253: Class I, Heat Flux Minimum 0.45 watts per sq cm., Smoke Developed: Less than 450.

1.04 SUBMITTALS

A. Submit shop drawings showing seaming plan, method of joining seams and direction of carpet based on field measurements.

B. Submit product data on specified products, describing physical and performance characteristics; sizes, patterns, colors available and method of installation.

C. Submit three samples 12 x 12 inch in size illustrating color and pattern for each carpet material specified.

D. Submit manufacturer's installation instructions.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance.

B. Include maintenance procedures, recommended maintenance materials and suggested schedule for cleaning and shampooing.

1.06 QUALITY ASSURANCE

A. Manufacturer: Company specializing in carpet with ten years minimum experience.

B. Installer: Company with three years minimum experience, certified when required by the manufacturer.

C. Regulatory Requirements: Carpet shall have level loop, textured loop, or level-cut/uncut pile texture and maximum pile height of 1/2 inch according to CBC Section 1124B.3.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Store materials in sufficient time prior to installation in area of installation to achieve temperature stability.

B. Maintain minimum 70 degrees F ambient temperature three days prior to, during and 24 hours after installation of materials.

1.08 EXTRA MATERIALS

A. Provide an average of 3 percent in usable size of carpeting of each color specified, not less than 12 inches long by roll width.

1.09 GUARANTEE

A. Provide manufacturers lifetime of Carpet, 10 percent excess wear guarantee, 5 year limited performance guarantee with no edge ravel or delamination.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Bigelow Commercial, Kennesaw, Georgia.

2.02 MATERIALS - CARPET

A. Carpet: Manufactured by Bigelow Commercial
1. Style: Fairfield II (Style W), Conforming to following criteria:

a.	Construction:	Loop Graphic
b.	Pile Fiber:	100% Chromell Nylon
c.	Gauge:	1/10
d.	Stitches Per Inch:	8.3
e.	Pile Height (Tufted):	.156 inch.
f.	Average Pile thickness:	.111
g.	Yarn Weight (Tufted):	28 oz/sq. yard
h.	Dye Method:	Solution Dyed
i.	Density:	9081
j.	Weight Density:	254,270
k.	Width:	12' (3.66m)
l.	Primary Back;	Woven Polypropylene
m.	Secondary Back:	ActionBac or Euroflex
n.	Approx. Total Weight:	63 oz/sq. yd.
o.	Pattern Repeat:	5/16" W x ¼" L
p.	Performance:	Lift Swatch for Information
q.	Warranties:	Lift Swatch for Information

2. Color: Refer to Section 09050.

2.03 MANUFACTURERS - REDUCER STRIPS AND ACCESSORIES

A. Products of the following manufacturers form the basis for design and quality intended.
1. Duramax Inc./Johnsonite, Chagrin Falls, OH.
2. The Roppe Co., Fostoria, OH.
3. Mercer Products Co., Inc. Orlando, FL.
4. The Flexco Co., Tuscumbia, AL.
5. AFCO Rubber Corp., North Canton, OH.

B. Or equal as approved in accordance with Division 1, General Requirements for substitutions.

2.04 REDUCER STRIPS AND ACCESSORIES

A. 1/4 inch carpet to 1/8 inch resilient flooring adapter: CTA-A.

B. 1/4 inch carpet to 3/16 inch resilient flooring adapter: CTA-B.

C. 3/16 inch carpet butting gauge: EG-F.

D. 1/4 inch carpet butting gauge: EG-E.

E. Carpet edge guards shall comply with CBC Section 1124B.2.

2.05 FILLER AND ADHESIVE

A. Subfloor Filler: Latex based underlayment acceptable to the manufacturer.

B. Primers and Adhesives: 600 adhesive or Type recommended by Carpet Manufacturer, and in full compliance with California VOC regulations.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft, and are ready to receive Work.

B. Prior to ordering flooring materials, contractor shall conduct calcium chloride "dome" test to verify that concrete floors are dry with maximum moisture vapor emissions of three lbs per 1000 sf in 24 hours, and exhibit negative alkalinity, carbonization or dusting. Apply moisture test in four (4) different areas of each floor location with at least one test for each 1,000 sf. of floor area.

C. Ordering of flooring materials and beginning of installation means acceptance of existing substrate and site conditions.

3.02 PREPARATION

A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with subfloor filler.

B. Apply, trowel and float filler to leave a smooth, flat, hard surface, free of bumps or depressions of any size.
   1. Trowel: Proper notch: 1/8 inch.

C. Prohibit traffic from area until filler is cured.

D. Vacuum clean substrate.

E. Apply primer as recommended by the materials manufacturer.

3.03 INSTALLATION - GLUE DOWN

A. Apply carpet and adhesive in accordance with manufacturers' instructions.

B. Lay out rolls of carpet for approval.

C. Verify carpet match before cutting to ensure minimal variation between dye lots.

D. Double cut carpet to allow intended seam and pattern match. Make cuts straight, true and unfrayed. Edge seam carpet where required to prevent fraying.

E. Provide carpet with least number of seams possible for each room. Locate seams in area of least traffic. Install seams in corridors perpendicular to line of traffic.

F. Fit seams straight, not crowded or peaked, free of gaps.

G. Lay carpet on floors with run of pile in same direction as anticipated traffic.

H. Do not change run of pile in any room where carpet is continuous through a wall opening into another room. Locate change of color or pattern between rooms under door centerline.

I. Cut and fit carpet around interruptions. Extend carpets into cabinets which do not contain bottoms.

J. Fit carpet tight to intersection with vertical surfaces without gaps.

K. Install edge guards in lengths as long as possible. Firmly adhere to surfaces with adhesive recommended by the manufacturer.

L. Install in accordance with CBC Section 1124B.3.

3.04 CLEANING

A. Remove excessive adhesive from floor, base and wall surfaces without damage.

B. Clean and vacuum carpet surfaces.

3.05 PROTECTION

A. Prohibit traffic from carpet areas for 24 hours after installation.

END OF SECTION

SECTION 10115

MARKERBOARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Markerboard

B. Trim, chalkrail and accessories.

1.02 REFERENCES

A. ANSI A208.1 - Mat Formed Wood Particleboard.

B. ASTM A526 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.

C. ASTM B209 - Aluminum-Alloy Sheet and Plate.

D. ASTM B221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.

E. PEI - Porcelain Enamel Institute - Performance Specifications for Porcelain Enamel Chalkboards.

F. ASTM A424 - Sheet Steel for Porcelain Enameling.

G. ANSI A135.4 - Basic Hardboard.

1.03 SUBMITTALS

A. Shop drawings indicating, wall elevations, dimensions and joint locations between panels.

B. Provide product data on trim and accessories.

C. Three samples illustrating materials and finish, color and texture of markerboard.

D. Include maintenance information on regular cleaning, stain removal and removal of damaged components.

1.04 WARRANTY

A. General Warranty: Special Markerboard warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of Contract Documents.

B. Markerboard Warranty: Submit written warranty executed by manufacturer agreeing to replace markerboards that do not retain their original writing and erasing qualities, become slick and shiny, or exhibit crazing, cracking, or flaking within specified warranty period, provided manufacturer's written instructions for handling, installation, protection, and maintenance have been followed.

C. Warranty Period: Life of building.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
1. Polyvision Corp./Nelson-Adams, Norcross, GA.
2. ABC School Equipment, Inc., Corona, CA.
3. Tri-Best Visual Display Products, Rancho Cucamonga, CA.
4. ADP Lemco Inc., Salt Lake City, UT.
5. Claridge Products and Equipment, Inc., Harrison, AR.

B. Or equal as approved in accordance with Division 1, General Requirements for Substitutions.

2.02 MATERIALS

A. Sheet Steel: ASTM A424, minimum 28 gage. 16 by 5 feet panel size: without joints.

B. Sheet Steel: ASTM A526, galvanized to G60 designation.

C. Aluminum Sheet: ASTM B209, 6063 alloy, T52 temper.

D. Aluminum Extrusions: ASTM B221, 6061 alloy, temper.

E. Particle Board: ANSI A208.1; wood chips or shavings set with waterproof resin binder, sanded faces.

F. Adhesives: Type recommended by manufacturer. Waterproof type.

G. Hardboard: ANSI A135.4, tempered, smooth.

2.03 ACCESSORIES

A. Map Supports: Formed aluminum roller brackets, sliding type to fit map rail.

B. Provide instructions for markerboard cleaning on metal plate attached to perimeter frame near chalkrail.

C. Manufacturer's standard support clip, hangers, and accessories for markerboards to function properly.

2.04 FABRICATION - MARKERBOARDS

A. Outer Face Sheet: ASTM A424, steel, 28 gage thick, with vitreous porcelain enamel finish. P3 ceramic steel or approved equal.

B. Core: ANSI A208.1, particle board; 1/2 inch thick or ANSI A135.4 hardboard (2 layers).

C. Backing Surface: ASTM B209, aluminum sheet, 0.015 inch thick, or ASTM A526, 26 gage galvanized steel.

D. Sizes: Refer to Drawings for sizes, locations and quantities.

E. Frame: aluminum frame.

2.05 FRAME AND TRIM

A. Frame: Extruded aluminum, AX Series, except with galvanized steel or aluminum backing, concealed fasteners:
1. Display Rail: 1 inch with cork insert, full length of markerboard.
2. Head and Side Trims: C-18 Aluminum.
3. Mullion Trim: Butt joints.

B. Chalkrail: Extruded aluminum, manufacturer's standard profile; one piece, full length of markerboard; attached end closures; concealed fasteners.

C. Provide two map supports and two roller brackets for each markerboard unit. One flag holder per room.

2.06 FINISHES

A. Porcelain Enamel: Glass fired enamel in accordance with PEI Type A. Color Light Gray (P-3) (#6101 L.).

B. Aluminum Frame and Accessories: Anodized to clear natural finish.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that surfaces and internal wall blocking are ready to receive Work and dimensions are as indicated on shop drawings.

B. Beginning of installation means acceptance of substrate construction.

3.02 INSTALLATION

A. Install markerboards in accordance with manufacturer's instructions.

B. Establish bottom of frame perimeter at 24 inches for Kindergarten (26 inches 1st to 3rd Grades), (30 inches 4th to 6th Grade) (34 inches 7th to 9th Grades) (37 inches 10th Grade and higher) above finished floor or as approved by Architect.

C. Secure units level and plumb.

D. Where markerboard adjoins tackboard or chalkboard, join panels with batten joint.

E. NO holes in markerboard permitted.

3.03 CLEANING

A. Clean markerboard surfaces and aluminum in accordance with manufacturer's instructions.

B. Cover markerboard surfaces with protective cover, taped to frame.

C. Remove protective cover at Date of Notice of Completion.

END OF SECTION

SECTION 10121

TACKABLE WALL PANELS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field applied tackable wall panels.

1.02 REFERENCES

A. ASTM E84 - Surface Burning Characteristics of Building Materials.

B. Chapter 8, California Building Code.

1.03 SUBMITTALS

A. Product data on wallcovering, core and adhesive.

B. Three samples of covering illustrating color, finish and texture.

C. Test reports verifying flame and smoke ratings when tested by UL.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing shop applied wall fabrics to tackable substrates with five years experience.

B. Applicator: Company specializing in installing wall panels with three years experience.

C. Regulatory Requirements
1. Conform to Table 8-B, California Building Code for flame/spread ratings permitted.

D. Field Samples
1. Provide field sample panel, full size, illustrating installed wall covering.
2. Locate where approved.
3. Accepted sample may remain as part of Work.

1.05 DELIVERY, STORAGE AND HANDLING

A. Inspect roll materials on site to verify acceptance.

B. Protect packaged adhesive from temperature cycling and cold temperatures.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Provide continuous ventilation and heating facilities to maintain substrate surface and ambient temperatures above 60 degrees F, unless required otherwise by manufacturer's instructions.

B. Do not apply adhesive when substrate surface temperature or ambient temperature is below 60 degrees F.

C. Maintain these conditions 24 hours before, during and after installation of adhesive wall covering.

D. Provide lighting level of required to conduct operations.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. Claridge Products and Equipment, Inc., Harrison, AR.
   2. Polyvision Corp./Nelson-Adams, Norcross, GA.
   3. ABC School Equipment, Inc., Corona, CA.
   4. ADP Lemco Inc., Salt Lake City, UT.

B. Or equal as approved in accordance with Division 1, General Requirements for substitutions.

2.02 MATERIALS

A. FABRICORK VINYL BULLETIN BOARDS, No. 1381-FR, sizes as indicated on Drawings.

B. Core Material: Incombustible 7/16 inch thick Duracore with flame spread less than 25, smoke density developed 0.

C. Fabric: Flame spread less than 75, smoke density less than 450, ASTM E84, CCC-W-408 A Type II.
   1. Colors and Materials: Refer to Section 09050.

D. Adhesive:
   1. No. 16-A for mounting bulletin board to substrate.
   2. No. 17 for mounting fabric to core.

E. Trims: Fabric covered extruded aluminum, H bar, edge molding and corner trim, manufacturer's standard.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that substrate surfaces are ready to receive work and conform to requirements of wall panel manufacturer.

B. Verify flatness tolerance of surfaces does not vary more than 1/4 inch in 10 feet.

C. Beginning of installation means acceptance of existing surfaces.

3.02 INSTALLATION

A. Building shall be closed and under approximate occupancy temperature and humidity conditions.

B. Secure wall panels by means of specified adhesive to gypsum board substrate. Install fabric covered H-bar at butt joints and fabric covered edge moldings all sides, color coordinated.

C. Top and bottom conditions shall be as indicated on Drawings, including sizes.

D. Apply duct tape or similar heavy mastic type tape over penetrations in core to prevent air passage through panel.

E. Coordinate with Mechanical Division to ensure that no supply or return-air grilles will adversely affect fabric wrapped work.

F. Coordinate with Electrical Division to provide flush plates for wall receptacles and outlets in areas where fabric wrapped work occurs.

3.03 CLEANING

A. Clean panels of excess adhesive, dust, dirt and other contaminants.

B. Replace wall plates and accessories removed prior to Work of this Section.

END OF SECTION

SECTION 10520

FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers and Brackets.

1.02 REFERENCES

A. CFC - California Fire Code, Section 1002.

B. UFC - Uniform Fire Code Standard No. 10-1.

C. California Code of Regulations Title 19, Chapter 3.

1.03 QUALITY ASSURANCE

A. Conform to CFC and UFC requirements for extinguishers.

1.04 SUBMITTALS

A. Product data showing physical dimensions, operational features, color and finish, anchorage details, rough-in measurements, location and details.

B. Manufacturer's installation instructions.

C. Manufacturer's operation and maintenance data. Include test, refill or recharge schedules, procedures and recertification requirements including requirements applicable to the Work.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Do not install extinguishers when ambient temperatures may cause freezing.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. Ansul Incorporated, Marinette, WI.
   2. Potter-Roemer, Inc., Santa Ana, CA.
   3. J.L. Industries, Bloomington, MN.
   4. Larsen's Manufacturing Company, Minneapolis, MN.
   5. Amarax Corporation, Los Angeles, CA (Extinguishers).

B. Or equal as approved in accordance with Division 1, General Requirements for substitutions.

2.02 EXTINGUISHERS

A. ABC Multi-Purpose Dry Chemical: Product: Sentry Series, Ansul, Inc.
   1. Red glossy polyester coated steel cylinder with pressure gage and nozzle.
   2. Size: 5 lbs.
   3. Class: 2A:10B:C

B. Wet Chemical - Kitchen use; Product: K-Guard, Ansul, Inc.
   1. NFPA 10, Class K fires, 30B:C.
   2. Size: 6 liters.
   3. Stainless steel cylinder with pressure gage, hose and wand.
   4. 2 per kitchen.
   5. Provide heavy duty vehicle, box type bracket to fit size of fire extinguisher unit.

2.03 MOUNTING BRACKETS

A. Manufacturer's standard steel, designed to secure extinguisher, of sizes required for types and capacities of extinguishers indicated, with plated or baked-enamel finish.

B. Provide brackets for extinguishers not located in cabinets sized for unit.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify mounting brackets are correctly sized and located.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Mount brackets to a height to yield 48 inches maximum to handle of fire extinguisher where no cabinets are indicated. In the path of travel: 4 inches as maximum projection.

B. Secure rigidly in place.

C. Install one portable fire extinguisher at each classroom and as noted on drawings.

END OF SECTION

SECTION 11130

PROJECTION SCREENS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Projection screens.
   1. Manually operated.
   2. Surface mounted.

1.02 REFERENCES

A. UL - Underwriters Laboratories, Inc.

1.03 SUBMITTALS

A. Shop Drawings: Showing case dimensions, mounting requirements and materials.

B. Product Data: Showing fabric dimensions, finish, border type and accessories.

C. Manufacturer's Installation Instructions: Indicating installation procedures and component installation sequence, clearances and tolerances from adjacent construction and maintenance.

1.04 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on Shop Drawings.

1.05 COORDINATION

A. Coordinate Work with ceiling construction.

1.06 FIRE CLASSIFICATION REQUIREMENTS

A. Materials shall be inherently fire-retardant or treated with flame retardant solution approved by the State Fire Marshal in accordance with Title 19, CCR Division 01, Chapter 8, Article 8.

B. ASTM E84 and UBC Standard No. 8-1, all materials shall have flame spread of less than 25 and smoke developed of less than 450.

C. California Fire Code, Section 1103.3.3.

D. NFPA 701- Standard Methods of Fire Tests Flame-Resistant Textiles and Films.

E. FS 191A/5760 Mildew Resistant of Textile Materials.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. DA-LITE Screen Co., Inc., Warsaw, IN.
   2. Bretford Manufacturing Inc., Van Nuys, CA.
   3. Draper Inc., Spiceland, IN.

B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.02 COMPONENTS

A. Product: DA-LITE MODEL B Manual.
   1. Operation: Manual pull-down, spring operated retraction.
   2. Mounting Brackets:
      a. Use Manufacturer's standard T-Bar clips plus the suspended aircraft cable system. Provide attachment hardware to complete suspension.
   3. Case: Steel, minimum 22 gauge, painted or in wood grains as selected by Architect.
   4. Screen: Flame retardant, mildew resistant, Matte White, 2 inch black masking border bottom and sides. Size: 7 by 7 feet Quantities: One per classroom and as indicated on drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site conditions.

B. Verify that prepared openings are ready to receive work and opening dimensions are as indicated on shop drawings.

C. Verify that structure above ceiling is accessible to secure cable suspension system.

D. Verify that proper power supply is available.

3.02 INSTALLATION

A. Install mounting hardware, minimum two suspension assemblies per unit. Attach anchorages to building structure.

1. Suspend from building structure with 3/32 stainless steel aircraft cables, thimbles, wire grips, stainless steel grommets, cable anchors and hooks. Install 4 wires in splay manner at 90 degrees to each other and 45 degrees from vertical and the following: Fasten 12 gauge hanger wires with not less than 3 tight turns. Fasten 12 gauge bracing wires with 4 tight turns. Make all tight turns within distance of 1-1/2 inches. Bracing wire anchors to structure shall be installed in such manner that direction of wire aligns as closely as possible with direction of forces acting on wire.

B. Install unit assembly in accordance with manufacturer's instructions.

3.03 ERECTION TOLERANCES

A. Maximum Variation of Unit From Plumb: 1/4 inch.

END OF SECTION

SECTION 11131

PROJECTOR MOUNTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Ceiling projector mounts.

B. Accessories.

1.02 SUBMITTALS

A. Shop Drawings showing mounting requirements and materials. Shop Drawings shall also include anchor typed and structural calculations by a California Structural Engineer confirming conformance with Table 1607.1, California Building Code.
   1. Indicate anchorage and accessory items, details signed by licensed Structural Engineer. Costs relating to engineering, calculations, and stamps by Structural Engineer shall be borne by Contractor.

B. Manufacturer's Installation Instructions: Indicating installation procedures and component installation sequence, clearances and tolerances from adjacent construction and maintenance.

1.03 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.04 COORDINATION

A. Coordinate the work with ceiling construction.

B. Coordinate with Details.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of the following manufacturer or supplier form the basis for design and quality intended.
   1. Bretford Manufacturing, Inc., Franklin Park, IL.
   2. Draper Inc., Spiceland, IN.
   3. Chief Manufacturing Company, Savage, NM.

B. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.02 COMPONENTS

A. Product: Bretford Model TPMA1-BK, pipe mounted for suspended ceilings, or TPMA1-BK, at ceiling flush mounted conditions.
   1. Operation: Fixed mounted.
   2. Mounting Accessories: Ceiling-Flange TVCM-BK for treaded pipe ceiling flush mounted, installation.
   3. Threaded pipe and ceiling mounted, 1-1/2" NPS TV18-BK (18" pipe), escutcheon ring TMER-BK, TVCPLR-BK (coupler).
   4. Threaded rod, 1/4" diameter, TVAC-BK couplers.

B. Product: Bretford Universal Adjustable Data Projector Mounts: TPMUN14
   1. Operation: Fixed mounted.
   2. Aluminum construction, finish in neutral color.
   3. For LCD projectors max 25 lbs.
   4. Extension arm/Tube: Adjust from 23" to 46".
   5. Quick Release Mechanism for easy removal of projector.
   6. Include accessories.
   7. Ceiling Mounting Plate: Model TPM8 Plate for suspended ceilings."

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site conditions.

B. Verify that ceiling structure are ready to receive work.

3.02 INSTALLATION

A. Install unit assembly in accordance with manufacturer's instructions.

B. Provide electrical, accessories, hook-up for complete operation.

3.03 ERECTION TOLERANCES

A. Maximum Variation of Unit From Plumb: Zero tolerance.

END OF SECTION

SECTION 12491

HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Horizontal slat louver blinds.

B. Operating hardware.

1.02 SYSTEM DESCRIPTION

A. Horizontal metal slat louver blinds installed at window openings, manual control of raising and lowering by cord; blade angle adjustable by control wand.

1.03 SUBMITTALS

A. Shop drawings indicating opening sizes, tolerances required, installation of blind at window opening, method of attachment, clearances and operation.

B. Product data indicating physical and dimensional characteristics and operating features.

C. Three samples illustrating slat materials and finish, color, cord or rod type and color.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with five years experience.

B. Field Samples
1. Construct field sample panel for one opening illustrating complete blind assembly with operable hardware and accessories.
2. Provide field sample after submitted shop drawings are approved.
3. Locate where approved by Architect.
4. If accepted, field sample will demonstrate minimum standard for Work. Field sample may remain as part of Work.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver blinds wrapped and crated in manner to prevent damage to components or marring of surfaces.

B. Store in clean, dry area, laid flat and blocked off ground to prevent sagging, twisting, or warping.

1.06 EXTRA MATERIALS

A. Furnish ten additional slats of each length and color specified.

1.07 FIRE CLASSIFICATION REQUIREMENTS

A. Materials shall be inherently fire-retardant or treated with a flame retardant solution approved by the State Fire Marshal in accordance with Chapter 8, Division 1, Title 19, CCR.

B. ASTM E84 and UBC Standard No. 8-1, all materials shall have a flame spread of less than 25 and a smoke developed of less than 450.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.
   1. Levolor Home Fashions, High Point, NC.
   2. Springs Window Fashions Division Inc., (Bali-Graber), Montomery, PA.
   3. Hunter Douglas, Inc., Los Angeles, CA..

B. Or equal as approved in accordance with Division 1, General Requirements for substitutions.

2.02 MATERIALS

A. Product Levolor: RIVIERA Dustguard 2" Blind.

B. Louver Slats: minimum .011 inch thick spring tempered prefinished aluminum horizontal slats with manufacturing burrs removed, radiused slat corners;
   1. RIVIERA Contract Dustguard 2" Blind
      a. Unperforated.
      b. Pinlight Magic: Perforated with pattern of randomly spaced 0.

C. Slat Support: Woven polypropylene, ladder configuration.

D. Head Rail Housing: Prefinished, formed steel box, internally fitted with hardware, pulleys and bearings for blind operation.

E. Cord C-90: Braided nylon or polypropylene, continuous loop, looped through wall mounted spring tensioned pulley.

F. Tilt Wand: Extruded hollow plastic, shape, non-removable type, length of window opening height less 12 inches.

G. Brackets and Accessory Hardware: Type recommended by blind manufacturer.

2.03 FACTORY FINISHING

A. Color: #112 Alabaster.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that openings are ready to receive the work.

B. Do not commence fabrication until field measurements are confirmed.

C. Ensure structural supports are correctly placed.

D. Beginning of installation means installer accepts existing surfaces.

3.02 INSTALLATION

A. Install blinds in accordance with manufacturer's instructions.

B. Secure in place with flush countersunk fasteners.

3.03 TOLERANCES

A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.

B. Maximum Offset From Level: 1/8 inch.

3.04 ADJUSTING

A. Adjust blinds for smooth operation.

3.05 SCHEDULE

A. Provide at all glazed openings excluding doors.

END OF SECTION

SECTION 15400

PLUMBING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Furnish all tools, labors, fixtures, equipment, appliances and materials to perform all operations in connection with the Plumbing Work, complete as indicated and specified.

B. Work Included: Principal items of work included, but are not limited to the following:

1. Sanitary sewer systems consisting of connection to existing on-site soil and waste piping from plumbing fixtures installed in existing location.

2. Potable cold water system consisting of piping and connections to plumbing fixtures and piping and connections to existing water inside the building.

3. Potable hot water supply system consisting of hot water piping and connections to plumbing fixtures and existing potable hot water inside the building.

4. Install plumbing fixtures specified and rough-in and connecting fixtures under other Section of the Specifications.

5. Condensate drainage piping and connections to heating and air conditioning equipment as required.

6. Fuel gas system consisting of piping and connections to on-site gas main, fixtures and air conditioning gas-fired equipment.

C. Work not Included:

1. Formed concrete work for equipment foundation and pedestals.

2. Electrical Work: Disconnect switches, conduit and wiring for all equipment requiring electrical connections.

3. Painting.

4. Miscellaneous equipment furnished by Owner or other Sections of the Specifications, except that rough-in and plumbing connections for the equipment shall be made under this Section of the Specifications.

1.02 SUBMITTALS

A. Contractor shall submit in accordance with the submittal schedule specified in Section 01600, a list of materials, equipment, appliances and fixtures giving complete information as to the proposed 2.01, "Mechanical Materials and Equipment of Equal Manufacturer". Substitutions shall comply with Section 01600.

B. No equipment shall be ordered without shop drawings approved by the Architect. Any item ordered without approval are at the Contractor's own risk.

C. Orders for all materials, equipment, appliances and fixtures shall be placed with sufficient time to be received at the job site prior to installation time.

D. Summary of Submittals:

1. Six (6) complete brochures on materials and equipment

2. Sterilization certificates.

3. Test data.

4. Operating and maintenance brochures and valve charts.

5. Letter that Owner has been completely instructed in the operation and maintenance of all mechanical equipment.

6. Guarantees.

1.03 SITE INSPECTION

A. Contractor will be held responsible that he has examined the premises and understands the conditions under which he will be obligated to operate in performing his part of the Contract. No allowances will be made subsequently on behalf of the Contractor for any error through negligence on his part.

1.04 DRAWINGS AND SPECIFICATIONS

A. These specifications are intended to cover labor, materials and standards of mechanical workmanship to be employed in the work shown on drawings, and items called for in these Specifications are intended to supplement one another and any part of the work that is mentioned or represented in both. Large scale drawings shall take precedence over small scale drawings. The omission from specifications or drawings of any minor details of construction, installation, materials or essentials specialties, shall not relieve Contractor from furnishing same in place, complete.

B. Interpretation of Drawings and Specifications

1. Architect will interpret meaning of any part of drawings and specifications about which any misunderstanding may arise and his decision will be final.

2. Should there appear to be an error or discrepancy in or between the Drawings and/or the Specifications, refer the matter to the Architect for adjustment before proceeding with work. Should the Contractor proceed with work without referring the matter to the Architect, he does so at his own risk.

1.05 PERMITS, FEES, AND INSPECTIONS

A. Apply and pay for all necessary permits and fees required by any of the legally constituted public authorities having jurisdiction. Arrange and pay for all required inspections or examinations unless specifically otherwise noted.

B. Any expenses incurred in securing permits and any fees or charges paid for by Contractor shall become part of this Contract.

C. Excavation, backfilling and repaving in connection with work is part of this Contract and shall be done as directed and under the supervision of proper authorities.

1.06 QUALITY OF MATERIALS AND WORKMANSHIP

A. Unless otherwise specifically provided elsewhere in the Specifications, materials, equipment and articles incorporated in the work covered under this Section of the Specifications, shall be new, of best grade, and latest products as listed in printed catalog data of latest date. Each article of its kind shall be standard product of a single manufacturer.

B. Workmanship shall be of the best quality and competent mechanics skilled in their trades shall be employed. Furnish the service of an experienced Superintendent, who will be constantly in on erection of the work, together with necessary journeyman, helpers and laborers required to properly unload, construct, connect and test these systems.

C. Architect shall have the right to accept or reject materials and/or workmanship and determine when Contractor has complied with requirements herein specified.

1.07 REGULATIONS AND CODES

A. Install work materials in full accordance with the latest published editions of the California Building Code. National Fire Protection Association Numbers 13, 14 and 20 with all applicable state codes and regulations including Industrial Safety Orders, Health and Safety Code, State Fire Marshal's regulations and with other prevailing rules and regulations. When drawings or specifications call for grades different than required by governing codes, provide and install the larger size or higher grade; but nothing in these drawings or specifications is to be construed to permit work in violation of governing codes.

1.08 RECORD DRAWINGS

A. Provide and keep up-to-date a complete as-built set of blue line prints, which shall be corrected daily to show every change from original drawings and specifications, size and kind of equipment and runs of all pipe, pipe elevations, etc. Prints for this purpose may be obtained from the Architect. This set of drawings shall be kept on-site and shall be used only as a record set. On completion of work, furnish a completed, up-to-date set of record drawings to the Architect. Conform to Section 01700.

1.09 LOCATION AND ACCESSIBILITY

A. Contractor shall fully inform himself regarding peculiarities and limitations of the spaces available for installation of work and materials furnished and installed under this Section of the Specifications. Drawings indicate desired locations and arrangement of piping, equipment and other items and are to be followed as closely as possible. Work specified and not clearly defined by drawings shall be installed and arranged in a manner approved by the Architect. In the event changes in indicted locations and arrangements are deemed necessary by the Architect, they shall be made by the Contractor without additional charges provided the change is ordered before work is installed and no extra materials are required.

1.10 CLEANING OF EQUIPMENT, MATERIALS AND PREMISES

A. Clean equipment and materials thoroughly. Leave surfaces to be painted smooth and clean, ready for painters. Clean entire premises of unused materials, rubbish, debris, grease spots and dirt. Remove, clean and replace pipe line strainers after system has been in operation for a period of thirty (30) calendar days.

PART 2 - PRODUCTS

2.01 MECHANICAL MATERIALS AND EQUIPMENT OF EQUAL MANUFACTURER

A. In addition to manufacturers specified, the following shall also be considered equal, provided corresponding models meet specification requirements. The equivalent equipment names herein shall be submitted to the Architect for approval.

1. Cleanouts: Zurn, Josam, J.R. Smith

2. Valves: Stockham, Milwaukee, Nibco

3. Pipe Hangers and Supports: Grinnell, Tolco

4. Insulation: O.C. Fiberglass, Gustin-Bacon.

5. Drains: J.R. Smith, Josam, Zurn.

6. Plumbing Fixtures Trim: T & S Faucet, Chicago, Delta, Zurn, Moen.

7. Plumbing Fixtures: American-Standard, Eljer, Crane, Kohler, Elkay, Just, Ceco.

2.02 MATERIALS

A. Pipe and Fittings:

1. Sanitary Waste and Vent Inside Building:

a. 2-1/2" and Smaller: 6" above ground, C1SP1 301-90 no-hub service weight coated cast iron soil pipe and no hub couples or Schedule 40 ASTM A53 galvanized pipe and coated cast iron fittings. No galvanized pipe for urinal waste.

b. 3" and Larger: C1SP1 301-90 no-hub service weight coated cast iron soil pipe and no hub couplings.

2. Potable Cold Water and Hot Water - Above Ground:

Type "L" , ASTM B88 hard drawn copper tubing with wrought copper fittings ASSI/ASME B16.22. Piping below ground shall be Type K.

3. Natural Fuel Gas: Schedule 40 black steel ERN pipe, ASTM A53 with 150 pound WOG black malleable iron screwed fittings ANSI/ASME B16.3. Piping shall be wrapped below ground in accordance with NFPA standards.

B. Union and Gaskets:

1. Unions for Steel Pipe: Walworth screwed malleable iron ground seat, 250# Class.

2. Unions for Copper Tubing: Anaconda #1633 or 1733.

3. Gasket : 1/6" Garlock #7022.

C. Materials for Joints:

1. Threaded Compound: Type "Untye" for general use and Acorn #3500 for cleanouts.

2. No-Hub Joints - 4" and Smaller: Heavy gauge stainless steel complete with two bands and neoprene gasket.

3. Solder:

a. Water Piping Above Ground: Mueller Streamline #95 with non-corrosive paste type solder flux.

b. Water Piping Below Ground: "Silfos".

D. Cleanouts:

1. General: Cleanouts on cast iron soil pipe shall be iron body with extra-heavy bronze plugs screwed into caulking ferrules. Where cleanouts occur in finished interior walls, provide plates and frames for flush mounting, with exposed parts smooth polished chrome plated. Exposed parts of floor cleanouts in finished rooms shall be diamond tread, non-slip polished nickel bronze and in unfinished rooms and outside paved areas, cast iron. Floor cleanouts shall have adjustable watertight top.

2. Interior:

   a. Plastered and/or Drywall Type for Cast Iron Pipe: Smith #FIG. 4558S

   b. Wall Type for Cast Iron Pipe: Smith # FIG. 4512 W/ FIG.4730

   c. Tile Wall Type for Cast Iron Pipe: Smith # FIG. 4558S:NB stainless steel

   d. Floor Level Type in Finished Rooms: Smith # Fig. 4053 W/ no-hub end.

   e. Floor Level Type in Unfinished Rooms: Smith # Fig. 4233L w/ no-hub end.

E. Valves: Valves shall be of the same manufacturer or following numbers of the equivalent by comparator chart of approved manufacturers. All valves shall be gate type unless otherwise noted or specified. Provide adapters for valves in copper tubing where necessary.

1. Gate Valves: NIBCO T-113 or S-13

2. Globe Valves:NIBCO T-211 OR S-211

3. Check Valves: NIBCO T-413 OR S-413

4. Balancing Cocks: Rockwell Fig. 1416 screwed.

5. Gas Cocks:
   a. Rockwell Fig. 142 or Fig. 143.

   b. Mc Donald 10596

6. Stops:

Chicago	
Straight	45-LK
Angle	442-LK
Partition	770-LK

F. Pipe Sleeves:

1. Concrete Walls or Floors: "Adjust-to-crete" or Paramount. For fire rated walls and floors use Dow Corning 3-6548 RTV foam to fill annular space.

2. Under Walks, Building or Other Structures: Terra Cotta or Fibre.

G. Pipe Hangers:

1. Hangers shall be complete with threaded steel rods, sound and electrolysis isolators as required and hereinafter specified.

a. 2-1/2" and Smaller for Water, Waste and Vent Piping: Grinnell Fig. 104.

b. Concrete Inserts: Grinnell Fig. 281.

H. Access Boxes and Panels:

1. Access panels in Plaster Walls or Ceilings: Smith Fig. 4760AK 12"x12" minimum size. Door and frame shall be prime coated steel.

2. Access Panels in Walls and Inaccessible Ceilings: Shall be the responsibility of and provided under this Section as indicated on the drawings and required by these Specifications

3. Access Panels in Ceramic Tile Walls: Smith Fig. 4762AK, cover and frame suitable size for purpose intended, but in no case shall be less than 12"x12"

I. Pipe Flashing:

1. Sanitary Vents: Stoneman #S1100-5R with one-piece lead flashing and counter flashing sleeve.

2. Miscellaneous Piping: Stoneman #S1000-4 with one-piece lead flashing and counter flashing sleeve.

J. Floor, Wall and Ceiling Plates: Beaton and Cadwell #10 polished chrome plated steel with locking device.

K. Sound and Electrolysis Isolation: Stoneman "Trisolators" of size as required.

L. Dielectric Unions: Epco nut type or flange type union with insulators and gaskets to suit service requirements.

M. Water Hammer Arrestors: Precision Plumbing Products, sized in accordance with Plumbing Drainage Institute Standards.

N. Insulation - Potable Hot Water:

1. Concealed Piping:

a. Hot water piping shall be provided with 1" thick minimum Manville Flame-Safe (VB) pipe insulation. Insulation shall be applied after piping has been installed, tested, approved and after pipes are in a dry and clean condition. Provide Childer's aluminum jacketing to piping insulation exposed to weather. Secure jacketing as recommended by manufacturer.

b. Condensate drainage piping above ceiling shall be provided with 1" thick "Armaflex" pipe insulation. Insulation shall be applied similar to hot water piping.

c. Fittings and valve bodies shall be covered with Manville #375 insulating cement worked on it two applications and furnished with adjoining insulation. Provide formed aluminum covers to fittings and valve bodies exposed to the weather.

d. Insulation and Covering on Pipe and Tubing: Insulation and covering on pipe and tubing shall have a flame spread rating not to exceed 25 and a smoke density not to exceed 50 when tested in accordance with U.B.C. Standard #42-1.

2.03 PLUMBING FIXTURES

A. Plumbing fixtures trim, exposed supplies and 17 gauge "P" traps shall be brass with polished chrome plated finish unless otherwise specified. Exposed wastes between trap and wall may be galvanized steel nipples with polished chrome plated brass casing. Concealed wastes may be galvanized steel pipe and concealed traps may be rough brass. Individual loose key stops, or, if so specified, screw driver stops, shall be provided for all supplies and unless integral with valves of faucets, or unless otherwise approved by the Architect shall be mounted under this fixture. All wastes shall be separately trapped. Exposed supplies and wastes to wall shall be provided with polished chrome plated cast brass wall escutcheons.

B. Wall Hung Fixtures:

1. Fixtures specified with hanger or supporting arms shall have hangers or arms securely mounted on a 1/4" thick X 8" wide steel wall plate which shall extend at least one stud beyond the first and last fixture mounting points, Concealed are assembled shall be attached to plates by four 3/8" x 1-1/4" steel bolts, nuts, hangers and exposed by 5/16" minimum full thread steel studs and jam nuts. Plates shall be drilled and tapped at the time of fixture installation.

2. Wall plates shall be recessed flush with studs and shall be securely attached to each stud crossed. In wood stud construction the plate shall be attached to each stud with 3/8" steel carriage bolts which shall extend through the center of the stud and be secured on the opposite side with steel washers and nuts.

C. Where drains are specified with clamping collars, carefully cut the waterproof membranes to fit the drain, then anchor between drain and collar with rustproof bolts.

D. Type: Refer to plumbing fixture schedule on plumbing drawings for fixture types.

PART 3 - EXECUTION

3.01 MANUFACTURER'S DIRECTIONS: Where manufacturers of articles used in this Contract furnish directions covering points of installation not shown on drawings or herein specified, such directions shall be followed.

3.02 EXCAVATION AND BACKFILLING: Excavation and backfilling required for any Mechanical Work shall be under this Section of the Specifications and shall conform to the requirements of California Plumbing Code.

3.03 OPENINGS, SUPPORTS AND CUTTING AND PATCHING: Contractor shall provide all openings and supports and shall do all cutting and patching which may be required for installation of work under this Section of the Specifications. Patching shall be of the same materials, workmanship, and finish and shall accurately match all surrounding construction. Where pipes are to pass through or interfere with any structural member, or where notching, boring, cutting or patching of the structure is necessary, the work shall be done as approved by the Architect.

3.04 GENERAL INSTALLATION

A. Piping:

1. Pipe runs shall be straight and true. Springing or forcing piping into place will not be permitted. Piping shall be installed in such a manner as to prevent any due strain on the equipment.

2. Joints shall be smooth and unobstructed inside and cut pipe ends shall be thoroughly reamed to remove all burrs.

3. Pipe runs and connections shall be carefully made to insure unrestricted flow, eliminate air pockets and permit complete drainage of the system.

4. Piping shall be concealed in finished portions of the building except as otherwise directed.

5. Piping shall be installed to clear beams, unless sleeving is indicated. The Contractor shall constantly check the work of other Sections so as to prevent any interference with this installation.

6. Exposed plated, polished or enameled connections from equipment, shall be made with special care, showing no tool marks or threads and shall be supported by neat plated hangers with round screws of same material and finish.

7. The ends and openings of all pipe and fitting shall be capped or plugged immediately to exclude dirt until equipment is installed and final connections are made.

8. Pipe size reduction shall be made with reducing fittings. No bushing shall be used unless specifically authorized.

9. Closed nipples shall not be used.

10. Floor, wall and ceiling plates shall be installed at all points where pipes pierce the finished surface.

11. A union shall be installed on one side of each shut-off valve, at both sides of automatic valves, at equipment connections and elsewhere as indicated or required.

12. Rough-in shall proceed as rapidly as the general construction of the building will permit and shall be completed and tested before lathing, plastering or other finish work is started. Work shall be fitted to the available space and shall be accurately roughed-in.

13. Branch hot water piping in walls running to plumbing fixtures need to be insulated, but shall not be touching any other piping or steel studs in walls unless provided with trisolators or approved insulating materials.

14. Water piping shall be graded and valved so as to provide for the complete drainage and control of the system.

15. Soil, waste and water piping shall be installed in such a manner as to prevent any unusual noise from the flow of water under normal conditions.

16. Shut-off valves shall be provided where indicated on the drawings, where required for adequate control of the system and for isolation of fixture group.
17. Except where location makes the use obvious, all valves shall be labeled with securely attached metal tags.

18. Connections between two dissimilar metal pipes shall be made with dielectric unions.

19. Sanitary vents shall be grouped together wherever possible.

20. Buried pipes shall have a minimum coverage of 18" unless otherwise indicated, or if this coverage cannot be obtained and if approved by the Architect, shall be encased in concrete.

21. Gas piping trapped by change of grade shall be provided with drip legs.

22. Refer to California Plumbing Code for other installation requirements.

B. Pipe Joints: Screwed joints shall be made with a minimum amount of compound applied to the male thread only.

C. Hangers and Bracing:

1. Unless otherwise indicated horizontal pipe runs shall be firmly held in place by approved steel and iron hangers, supports and/or pipe rests.

2. Hanger rod shall be suspended from approval brackets, clamps or clips. Inserts shall be installed with 1/3" steel reinforcing rods passing through the holes provided for this purpose.

3. Pipe runs, except buried piping, shall be installed and so hung or supported that they may expand or contract freely without strain to pipe or equipment.

4. Horizontal steel piping shall have hangers or supports every 10' except that piping under 1" in diameter shall have hangers or supports every 8' unless otherwise hereinafter specified.

5. Horizontal copper tubing 2" and over shall have hangers every 10'-0", 1" to 1-1/2" every 8' and 1/2" to 3/4" every 6'.

6. Horizontal cast iron no-hub piping shall have hangers or supports on each side of mechanical joints.

7. Vertical piping shall be supported at floor and at ceiling with wrought iron pipe clamps.

8. Branches from all lines 6' in length or longer shall have separated hangers or supports.

9. Provide sound and electrolysis isolators at all hangers and supports for cold domestic water lines. Where space limitations will not permit the use of manufactured items, the Contractor shall install support insolation as otherwise approved.

10. Pipes hall be support and braced per section 1632A.6 part 2 title 24 and DSA pre-applied No. R-0010. The SMACNA " Guideline for seismic restraint of mechanical system and plumbing piping systems.

D. Cleanouts:

1. Cleanouts shall be installed where indicated on the drawings and as required by code. All shall be accessible with extensions to grade, to outside of buildings, or to floor above as indicated on the drawings.

2. When waterproofing membrane is used in the floor, the membrane shall be brought to the cleanout without puncturing and shall be permanently anchored to the integral anchoring flange by means of a heavy cast iron clamping collar and rustproof bolts.

3. Cleanout covers shall be set flush with the finished wall, floor or grade and shall be securely anchored by means of integral lugs and bolts. Where surfacing materials are specified, it is the Contractor's responsibility to ascertain the thickness and to set the cleanout top so that the finished floor will be smooth.

E. Access Boxes and Panels:

1. Valve boxes shall be provided for valves located below grade unless otherwise indicated and for outside cleanouts in paved areas which extend to grade.

2. Metal access panels of suitable size and type hereinafter specified shall be provided for all valves and shock absorbers located in concealed pipe runs.

3. All access boxes and panels shall be set flush with the finished wall and shall have the door or plate removed during construction, or be otherwise suitable protected.

F. Wrapping for Buried Steel Piping:

1. Unless otherwise hereinafter specified, steel pipe for installation below ground with the exception of pipe conduit shall be shop coated and wrapped by an approved pipe coating applicator as follows:

   1 coat of asphalt primer
   2 coats of hot asphalt
   1 layer of 15 lb. felt
   1 coat of hot asphalt
   1 layer of Kraft paper

2. All coated pipe delivered to the job site shall be accompanied by applicator's affidavit certifying that the pipe has been given high voltage holiday detector test and that the pipe was free of holidays when shipped from the applicator's yard. One copy of each affidavit shall be submitted to the Architect.

3. A similar wrapping for made-up fittings and couplings shall be applied in the field. All field applications shall be then tested for holidays by an approved method in the presence of the Inspector.

4. Wrapped piping shall be handled in a particularly careful manner to avoid injury. Any questionable pipe wrapping may be rejected and the Contractor may be required to retest same.

G. Sterilization: Each unit of the water supply and distribution system shall be sterilized with chlorine gas or liquid hypochlorite before acceptance for operation. Work shall be done by an approved application laboratory. Unless otherwise required by local ordinances sterilization shall conform to the following:

1. Materials:

a. Liquid Chlorine: U.S. Army Specification #4-1

b. Hypochlorite: Liquid shall conform to Federal Specifications #O-B-441A Rev. A and Amendment 1, Grade D.

2. Methods: The amount of chlorine shall provide a dosage of not less than 50 parts per million.

a. The chlorinating materials shall be introduced into the lines and distribution system in a manner approved by the Architect.

b. After a contact period of not less than 24 hours during which period the chlorine residual shall be maintained at not less than 50 parts per million, the system shall be flushed out with clean water until the residual content is not greater than 0.2 parts per million.

c. Flush the entire system including all hose bibbs, fixture outlets, dead ends and other points where stagnant water tends to collect.

d. All valves in lines being sterilized shall be opened and closed several times during the contact period.

3.05 TESTS

A. The Contractor shall perform all tests to the approval of the Architect. All tests shall be made in the presence of the Architect and at a time suitable to him.

B. Contractor shall furnish necessary labor and equipment for testing the tightness of all parts of the work. Cost of such test and replacing and/or repairing any damage resulting therefrom shall be borne by the Contractor.

C. Hydrostatic test shall be made by completely filling the piping system with water and eliminating all accumulations of air so that leakage, no matter how small, will be apparent on the test gauge immediately. Pressure shall be maintained until all pipe under has been examined, but in no case for less than one hour.

1. Sanitary Sewer System: 5 psig.

2. Cold and Hot Water Systems: 125 psig.

D. Fuel gas piping tested for 60 psig air pressure.

3.06 DAMAGE FROM LEAKS: Contractor shall be responsible for damage to any part of the premises caused by leaks or breaks in pipe, fixtures or equipment furnished and installed under these Specifications for a period of one (1) year from date of substantial completion.

3.07 GUARANTEE: In addition to guarantees required in General Conditions, certificates which guarantee equipment one (1) year after date of "Substantial Completion" shall be delivered to the Owner.

END OF SECTION

SBCUSD Data Cabling Specifications

SPECIFICATION SECTION 16760

DATA SYSTEM

1. PART 1 – GENERAL

1.1 SCOPE OF WORK

A. The work under this section includes all labor, materials, equipment and accessories required to furnish and install a complete Data Cabling System as indicated on the drawings and as specified herein.

1.2 APPLICABLE DOCUMENTS

A. The system design described in this document and depicted in the attached drawing package is derived in part from recommendations made in industry standard documents. The list of documents below are incorporated by reference:
   1. This Technical Specification
   2. ANSI/EIA/TIA-568-B series of standards
      ANSI/EIA/TIA-568-B-1 Commercial Building Telecommunications Cabling Standard – April 2001.
      ANSI/EIA/TIA-568-B-2 Commercial Building Telecommunications Cabling Standard - April 2001
      ANSI/EIA/TIA-568-B-3 Optical Fiber Cabling Components Standard – April 2000
   3. ANSI/EIA/TIA-568 Commercial Building Wiring Standard - July 1991, and Standards Proposal No. 2840-A, Proposed Revision of EIA/TIA-568 Commercial Building Cabling Standard (published as TIA/EIA-568-A)
   4. EIA/TIA-TSB-36 Technical Systems Bulletin, Additional Cable Specifications for Unshielded Twisted-Pair Cables - November, 1991
   5. TIA/EIA-TSB-40 Telecommunications Systems Bulletin, Additional Transmission Specifications for Unshielded Twisted-Pair Connecting Hardware - January, 1994
   6. TIA/EIA-TSB-75 Telecommunications Systems Bulletin, Additional Transmission Specifications for Unshielded Twisted-Pair consolidation points and cabling - January, 1997
   7. ANSI/EIA/TIA-569 Commercial Building Standard for Telecommunications Pathways and Spaces - October 1990
   8. ANSI/EIA/TIA-606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings - February 1993
   9. ANSI/TIA/EIA-607 Commercial Building Grounding and Bonding Requirements for Telecommunications - August, 1994
   10. Building Industries Consulting Services, International (BICSI)Telecommunications Distribution Methods Manual (TDMM) - 1996
   11. National Fire Protection Agency (NFPA) - 70, National Electrical Code (NEC) -1997

B. If a conflict exists between applicable documents then the order in the list above shall dictate order of precedence in resolving conflicts. This order of precedence shall be maintained unless lesser order document has been adopted as code by local, state.or federal entity, and is therefore enforceable as law by local, state or federal inspection agency.

C. If this document and any of the documents listed above are in conflict, then the more stringent requirement shall apply. It is important to note, that all documents listed above are believed to be the most current releases of the standards at the time of this writing, however, the vendor is totally responsible for determining and adhering to the most recent cable standards when developing the proposal for installation.

D. Contractors bidding on District projects shall have as a minimum, the following qualifications:
   1. Contractor must be a CommScope/Systimax Value Added Reseller (VAR). Bidder must include a current certificate of authorization with bid response. **Site certifications are not allowed.**
   2. Contractor must also be a Cisco Gold, Silver, or Premier partner. Bidder must submit a current certificate of partnership with bid response.
   2. Must have a current and in good standing, California C-10 contractors license.
   3. Must have completed at least 10 projects of equal size and scope for public entities within the past 3 years.

2.PART 2 - PRODUCTS

2.1 ASSOCIATED REFERENCES

SBCUSD Data Cabling Specifications

A. This document describes a system to be installed in accordance with recognized telecommunications industry cabling standards. Although the intent of the standard is to provide an application independent cable system, one or more of the following documents, describing specific network types and topologies, may be pertinent to the overall operation of the system and should be considered associated reference materials.
   1. ISO/IEC 8802-3 (IEEE 802.3)
   2. ISO/IEC 8802-5 (IEEE 802.5)
   3. ANSI ANSI X3T9.5 Fiber Distributed Data Interface (FDDI) Physical Medium Dependent (PMD)
   4. ANSI ANSI X3T9.5 Twisted Pair Physical Medium Dependent (TP-PMD)

2.2 CABLING SYSTEM

All components of the copper horizontal system and entire fiber optic cabling system shall be of the same manufacturer or manufacturer partnered system in order to provide one single product component and cabling system performance warranty direct from a single point of contact to the San Bernardino City Unified School District. The factory warranties must include a product component warranty and a system performance warranty to the Category 6 standard and revision in force at the time the system is installed. The factory warranty period shall be not less than 25 years.

The San Bernardino City Unified School District has established CommScope/Systimax, as the standard for the network structured cabling plant to eliminate additional training time and costs as well as reduce spare parts costs and database information, **NO SUBSTITUTIONS WILL BE ALLOWED.**

2.3 CABLE TYPES

A. New Construction and New IDF/MDF. The new planned cable system shall utilize the following cable types for horizontal distribution. Each cable shall meet or exceed the mechanical and electrical performance characteristics listed below.
   1. Horizontal Distribution Cable--Unshielded Twisted Pair Cable: construction shall be 24 AWG, 4-pair, Category 6 Enhanced, with a bandwidth of not less than 350mhz.
   2. 50/125 multi-mode optical fiber cable with dual bandwidth minimums of 850nm and 1300nm at 500mhz. Optical fiber cable shall provide a maximum attenuation of 3.5 dB/km @ 850 nm and 1.5 dB/Km @ 1300 nm.

B. For additional cabling in an existing IDF/MDF. To ensure proper specification adherence please contact IT. The planned cable system added to current category 5e systems shall completely utilize all available Cat 5e patch panel terminations. Any additional patch panels installed will be category 6 horizontal cable drops that terminate into the new category 6 patch panel. Cables and drops added to existing network systems should continue with the existing MDF/IDF numbering pattern.
   1. Horizontal Distribution Cable--Unshielded Twisted Pair Cable: construction shall be 24 AWG, 4-pair, Category 5 Enhanced or Category 6 Enhanced (as defined above,) with a bandwidth of not less than 350mhz.
   2. 50/125 multi-mode optical fiber cable with dual bandwidth minimums of 850nm and 1300nm at 500mhz. Optical fiber cable shall provide a maximum attenuation of 3.5 dB/km @ 850 nm and 1.5 dB/Km @ 1300 nm.

When new data cabling is specified for a room or office location at any District site, and there is existing data cabling in the room or office location then designated site personnel and designated IT personnel must approve the exact placement for each new data jack, the removal of any existing data jacks, the terminations into existing patch panels for each new data jack, and the data connection to any existing electronics equipment such as switches or hubs. Additionally, if new data jacks are required in a room or office location with no existing data jacks, but the new data jacks will be terminated into an existing IDF or MDF then designated IT personnel must approve all connections into existing equipment and any new patch panel and cabinet installations at that IDF. Furthermore, any new equipment required to support the new data cabling must be calculated and incorporated into the cost of the new cabling. This standard should be followed exactly, and any deviation needs to be approved by IT management prior to implementation of the deviation.

2.4 COPPER SYSTEM

A. JACKS AND PATCH PANELS
   1. Eight-wire, eight-position modular jacks shall be used for all telecommunications outlets. Each jack shall be fed by a separate four pair cable sheath. All four (4) pair shall be wired to the jack using TIA/EIA-568-B wiring scheme. The jacks shall employ PC board mounted (110 or IDC) contacts for termination of the wire.
   2. The jacks shall be matched to the Category rating of the attached horizontal distribution cable which will all be enhanced Category 6 compliant or better.
   3. Patch panels supporting Category 6 enhanced cabling shall be 24 or 48 ports as needed. Panels shall be

factory assembled with eight-wire, eight-position modular jacks that employ PC board mounted (110 or IDC) contacts for termination of the wire. Panels shall be wired to the TIA/EIA-568-B wiring scheme.

B. TELECOMMUNICATIONS OUTLET PLATE
1. The outlet shall be configured so that the interconnect couplings are at an acute angle to, or parallel with, the wall surface.
2. The outlet plate shall be affixed to an in-wall or surface mount box with two screws, which match the color of the outlet plate, or a previously installed floor mount device.
3. To meet district standards faceplates shall be two port, four port, six port or duplex mounting straps as required in any floor box or surface raceway application.

C. OUTLET INSTALLATION
1. All outlets shall be installed in the following manner:
a. Wall mount boxes shall be attached to (*box eliminators, 4"X4" boxes, old work boxes*) provided by the (*contractor providing raceway and boxes*).
b. Wall mount boxes shall be installed with the center of the plate at (*15" IAW ADA requirements or match existing*) above finished floor (AFF). The faceplates shall be installed in a horizontal or vertical orientation.
c. Any unused faceplate positions shall be covered/filled with a blank insert made of the same or compatible material as the faceplate and shall be molded in the same color. Blank spaces shall be incorporated between populated positions on the faceplate.
d. Cables shall be coiled in the in-wall or surface-mount boxes. In hollow wall installations where box-eliminators are used, excess wire can be stored in the wall.
e. No more than 12" of slack shall be stored in an in-wall box, modular furniture raceway, or insulated walls. Excess slack for these situations shall be neatly coiled in the ceiling above drop location. The amount of cable slack in the ceiling is not to exceed 4 feet per horizontal run. Enough slack must be provided, however, for at least one jack re-termination at the outlet plate.

D. HORIZONTAL DISTRIBUTION CABLE
1. Horizontal distribution cables shall be installed from the MDF and IDF to the designated locations in the Work Area Information Outlet (IO). Horizontal distribution cables shall be manufactured in compliance with the mechanical and electrical specifications detailed in the TIA/EIA-568-B document, as applicable. Cables not supported under the current revision of the standard shall be of recent design and manufacture and be capable of supporting the application (e.g., broadband coaxial, baseband coaxial).
2. All cables shall be furnished by the contractor in full, factory packaged reels or pull boxes. The packages shall be marked with the respective cable part number and lot number by the manufacturer. Upon request by the Owner, the contractor shall provide manufacturer's proof of compliance with the required manufacturing guidelines presented in the aforementioned standards. Each reel shall be visually inspected upon receipt and prior to installation to ensure that no damage was incurred during shipment. Any damaged cable shall be returned to the vendor/manufacturer for replacement of the entire reel. The cost for replacement cable shall be borne by the contractor. Any residual cable, in lengths greater than 500 feet, shall be delivered to the Owner and the Owner shall decide the disposition of the cable.

E. HORIZONTAL DISTRIBUTION CABLE SHALL BE INSTALLED AND TERMINATED AS BELOW
1. 100 Ω Unshielded Twisted Pair—Jacks/Patch Panels
2. Cables shall be dressed and terminated in accordance with the recommendations made in the TIA/EIA-568-B document, manufacturers' recommendations and/or best industry practices.
3. Pair untwist at the termination shall not exceed one-half an inch.
4. Bend radius of the cable in the termination area and at any point along the distribution path shall not exceed four (4) times the outside diameter of the cable.
5. The cable jacket shall be maintained as close as possible to the termination point.
6. All modular jacks shall be oriented with the locking tab slot towards the floor.
7. Voice jacks shall be located in the top or top left position of each faceplate. In instances where there is more than one voice jack per faceplate, then the second shall occupy the top right or second position, continuing top to bottom or left to right. Voice jacks in horizontally oriented faceplates shall occupy the left-most position. Modem jacks shall be considered the last voice jack in the sequence.
8. Data jacks that are in surface metal/plastic raceway (Panduit/Wiremold) shall be mounted in the proper termination plate compatible with manufacturer of the raceway to ensure that the District receives a professional end installation. <u>These termination plates and trim are to be provided by the electrical contractor installing the raceway and power outlets to ensure that all outlets and trim will match. The mounting straps shall be provided by the data contractor.</u>
9. Cable raceways shall not be filled greater than the NEC maximum fill for the particular raceway type. Conduit sizing shall be a minimum of 3/4 inch conduit for each outlet with no more than two outlets fed by one 1" homerun. If two outlets are fed by one homerun the conduit shall be 1" to the IDF or MDF and ¾ inch

to the end box. For conduits feeding a multiple outlet surface raceway the sizing shall be as follows: 1" for raceways 6' long and under, 1 ¼" for raceways 6' to 18' long and multiple conduits to meet this pattern for lengths greater than 18'. These specifications shall take precedence over conduit routing shown on the plans that deviate from this method. The data contractor shall bring any discrepancies to the attention of the owner before bid time.

10. Cables shall be installed in continuous lengths from origin to destination (no splices) unless specifically addressed in this document.
11. Where cable splices are allowed, they shall be in accessible locations and housed in an enclosure intended and suitable for the purpose.
12. Maximum pulling tension shall not exceed 25 pounds for a single cable or for a cable bundle.
13. When not installed in conduit, (per the plans and electrical specifications requirements), all horizontal cables shall be supported at a maximum of four-foot intervals. At no point shall cable(s) rest on acoustic ceiling grids or panels, nor shall they be attached to ceiling grid wires. Horizontal distribution cables shall be bundled in groups not greater than 48 cables. Bundles shall be supported by cable tray, conduit, trapezes, or multiple support strap made by Erico, Caddy part # CAT21 and CAT32. Saddle supports are not allowed. Plenum rated cable is to be installed in plenum rated areas and non-plenum cable to be installed in non-plenum areas.
14. The cable system shall not be attached to the fire sprinkler system or any ancillary equipment or hardware. The cable system and support hardware shall be installed so that it does not obscure any valves, fire alarm conduit, boxes or other control devices.
15. Cables shall not be attached to ceiling grid or lighting support wires. Where light support style wires for drop cable legs are required, the contractor shall install clips to support the cabling.
16. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.
17. Cables shall be identified by a computer generated, permanent, self-adhesive label in accordance with the System Documentation Section of this specification. The cable label shall be applied to the cable behind the faceplate on a section of cable that can be accessed by removing the cover plate.

F. IDF/MDF Data Labeling.
   1. Data Patch Panel Labels at each IDF/MDF shall be labeled with 2 lines of information. The top line should indicate the drop number and the second line shall indicate the building and room number of the drop. The drop numbers shall be numbered consecutively beginning at one (1) through and including the total number of drops connected to all IDF/MDF patch panels. If a particular installation is an addition to an existing IDF/MDF, the newly added drops and patch panels shall continue the number sequence from the last number of the previous patch panel.
      a. Example Line 1: Two (2) 48-port patch panels newly installed will be numbered one (1) through 96. Later, when a 48-port patch panel is installed, the number sequence on the newly installed patch panel shall begin at 97 and continue.
      b. Example Line 2: Under drops 1 through 8 the label says B5, under drops 9 through 15 the label says Lib6. This indicates that drops 1 through 8 are located in the B building room 5, while drops 9 through 15 are located in the Library building, room 6.

G. Drop Plate Labeling.
   1. Each data drop plate shall list the following 2 items.
      a. IDF/MDF name or number and the location of that IDF/MDF, ie "IDF-3 B-2" for IDF 3 in room B-2.
      b. Each data drop port shall list the drop number that corresponds with their drop number as listed at the IDF/MDF patch panel. Example: 4 data drop ports should be numbered like d-110, d-111, d-112, and d-113.

2.5 FIBER OPTIC SYSTEM

A. FIBER OPTIC CONNNECTORS
   1. Fiber optic connectors shall be SC-style
   2. Connectors shall incorporate zircona ceramic ferrules. The same type shall be used throughout the installation.
   3. All connectors provided by Contractor shall be of same manufacturer and termination method throughout this contract.
   4. Fiber optic connectors shall be rated for a mean loss not greater than 0.3 dB per mated pair.

B. OPTICAL FIBER COUPLERS
   1. Multimode optical fibers shall be terminated with (duplex *SC -style*) connectors and attached to (*duplex SC, duplex SC to duplex SC*) feed-through couplers.
   2. Single-mode optical fibers shall be terminated with (duplex SC) connectors and attached to (duplex SC) feed-through couplers.
   3. All fiber optic terminations shall be installed in boxes with bend limiting provisions for fiber slack storage.

C. FIBER TERMINATION PANELS

1. Fiber termination panels shall be capable of handling a minimum of 24 fiber optic connectors with the appropriate number of connector panels and couplers. All unused locations shall be filled with blank panels.
2. Fiber termination panels shall be 19" rack mountable.
3. Fiber termination panels shall be hinged to provide complete access to connectors and slack storage from the front.
4. Fiber termination panels shall be complete with 12 **SC**-style interconnect couplers.
5. Fiber termination panels shall be equipped with cable strain relief brackets.
6. Fiber termination panels shall provide ample storage and handling for up to 36" of slack per fiber strand.
7. Fiber termination panels shall protect both the installed cable and patch cord cable interface when the panel is in the closed position.
8. Fiber termination panels must be of the same manufacturer as the fiber cable and SC connectors, as well as the horizontal cabling system to ensure the owner will not have any coordination problems in the future.

D. FIBER OPTIC CABLE

The optical fiber cable construction shall meet or exceed the requirements of the EIA/TIA-568-A Standard specification

1. Optical fiber cables used outside shall be housed in an OSP loose tube, gel-filled, construction jacket configuration. Inside fiber shall be riser or plenum tight buffered.
2. Inside/outside gel-filled construction shall be used if entering a building more than 50 feet *outside* of EMT or IMC conduit.
3. Use OFNR construction if used as a riser cable.
4. Use Plenum construction if used in an air plenum of any kind.
5. Optical fiber shall be rated a minimum of 100 Mbps.
6. Each optical fiber component shall be surrounded by an individual aramid yarn strength member.
7. The optical fiber cable construction shall meet or exceed the requirements of the EIA/TIA-568-B.3 Standard specification, to achieve 500 MHz-km.
8. Optical fiber cable shall withstand a minimum short term tensile load of 105 pounds without damage to the optical fiber
9. Optical fiber cable shall be able to withstand a minimum bend radius of 45 millimeters (mm) during installation without damage to the optical fiber elements
10. Optical fiber cable shall have a minimum crush resistance of 200 N/cm
11. Optical fiber shall be rated a minimum of 100 Kpsi.
12. Optical fiber cable shall withstand a minimum short-term tensile load of 448 pounds without damage to the optical fiber.
13. Optical fiber cable shall be able to withstand a minimum bend radius of 128 mm during installation without damage to the optical fiber elements.
14. All fiber optic cable shall be installed per industry standards. This includes using a proper *break-away swivel* and sealing the end of all cables before pulling through any conduit system. 10 feet of slack cable shall be left at each end of the cable run for future maintenance purposes.
15. OSP, loose-tube cables shall be properly prepared and protected per industry standards. All cables shall be properly cleaned. The cable ends shall be terminated through a breakout unit and a 900 micron buffer tube for each fiber strand. Each cable OSP buffer tube shall be labeled for strand counts contained therein. Provide proper break out kits as manufactured by AT&T, Corning, or equal.
16. When distribution style fiber cable is installed, strength members shall be mechanically secured to the outlet box and distribution enclosure.
17. A minimum of 12-inches of slack shall be stored at the drop end and 36-inches shall be stored at the TC termination enclosure.
18. Where 250-micron coated cable is field terminated, breakout kits that build up the fiber to a minimum of 900 microns shall be used.
19. Any splices, fusion only, shall be housed in fiber trays and an enclosure with splice tray organizers.

2.6 BACKBONE CABLING SUBSYSTEM

A. The backbone cable subsystem is comprised of all cable, connecting hardware, pathways and cable management hardware required to form a continuous path from the Telecommunications Entrance Facility (EF) to the Equipment Room, from the ER (MDF) to each TC (IDF), and between TCs (IDFs) on the same floor.

B. BACKBONE CABLE
1. Backbone cables will be installed between the locations described in the scope of work and on the plans. An inner-duct shall be pulled in all backbone conduits along with the fiber-optic cable. This inner-duct shall be left with only a pull rope for future use and shall be of the size and quantity called out in other areas of this specification. All conduits shall be plugged with snug plugs and duct seal after inner-duct installation is completed.
2. All cables shall be furnished by the contractor in full, factory packaged reels. The reels shall be marked with the respective cable part number and lot number by the manufacturer. Upon request by the Owner, the contractor shall provide manufacturers' proof of compliance with the required manufacturing guidelines presented in the aforementioned standards. Each reel shall be visually inspected upon receipt and prior to installation to ensure that no damage was incurred during shipment. Any damaged cable shall be returned to the vendor/manufacturer for replacement. The cost for replacement cable shall be borne by the contractor. Any residual cable, in lengths greater than 500 feet, shall be delivered to the Owner and the Owner shall decide the disposition of the cable.

C. BACKBONE CABLE INSTALLATION: All backbone cables shall be installed in the following manner:
1. Backbone cables shall be installed separately from horizontal distribution cables.
2. Where cables are housed in conduits, the backbone and horizontal cables shall be installed in separate conduits or in separate inner-ducts within conduits.
3. Where cables are installed in an air return plenum, the cable shall be installed in conduit, or plenum cable shall be installed in a plenum inner-duct to provide protection to the cable
4. Where backbone cables and distribution cables are installed in a cable tray or wire-way, backbone cables shall be installed first and bundled separately from the horizontal distribution cables.
5. Backbone fiber cable shall consist of a six (6) strand count unless specified differently on the plans and in the scope of work. These cables shall emanate from the MDF to each IDF. These cables shall be of the same manufacturer of all the other fiber and copper cabling system and terminations. These cables shall be FDDI+ grade per EIA/TIA standards.
6. All backbone conduit shall have (1) 3/4" inner-duct with pull ropes if in a 2" conduit, (2) 1" inner-duct with pull ropes if in a 3" conduit, and (4) 1" inner-duct with proper "Jack-moon" plugs if installed in a 4" conduit. This inner-duct will be for future use in the 2" and 3" conduits and one or as many as necessary will be utilized in the 4" conduit leaving the remainder for future use. All unused inner-duct shall have a rubber snug plug with rope tie off installed and all inner-duct occupied with cable shall have the appropriate cable seal.

D. HORIZONTAL CROSS-CONNECT TERMINATION HARDWARE
1. The backbone side of the horizontal cross-connect, and the main cross connect shall be terminated in the same termination panels as the horizontal cables. The backbone fibers shall be maintained in separate termination panels from the horizontal distribution fiber cables. The backbone termination panels shall be installed in the double swing enclosed rack. Termination details and rack elevations for fiber panel placement shall be provided in the contractor submittals.
2. The contractor shall be required to install, secure and ground the racks. The Contractor shall only be required to install those fiber termination panels to fully terminate all newly installed fiber strands unless otherwise noted. Placement of the enclosures shall be detailed in the contractors working drawings.
3. Each fiber optic cable shall be terminated in the telecommunications closet in a 12, 24, 48, or 72 fiber port rack mounted patch panel enclosure providing protection to the terminated fibers. The enclosures shall provide a strain relief bracket for attaching the optical fiber cable and support slack storage of a minimum of 36" per fiber cable. The enclosure shall provide a minimum of 12 ports for fiber terminations and fully enclose both the hardwired cable and the patch cord terminations when the shelf is closed.
4. Products for this installation shall be furnished in new and factory packaged condition. Each product shall be inspected by the Contractor to ensure completeness and that no damage was incurred during shipping. The contractor shall return to the manufacturer, any product found to be deficient. The cost of the return and replacement product shall be borne by the Contractor.

2.7 RACKS/CABINETS

A. The products supplied shall meet the following specifications:
1. All MDF racks/cabinets shall be an APW or equivalent 7' open relay rack or a 6' enclosed cabinet manufactured by APW or equal.
   a. Enclosed rack should be a minimum of 24" wide and 42" deep.
   b. Cabinet must be adequately equipped with self-contained ventilation system such as fans or similar means.
2. A cable trough shall be supplied at the bottom of each open rack to support patch cord routing between racks.
3. Server Racks (minimum one per campus) shall be floor-mounted racks with (2) peripheral shelves, server sliding shelf (150lb capacity), and monitor and keyboard shelf all as manufactured by APW or equal. (More detail in Paragraph 2.12.C)
4. Inter-bay and end-cap cable managers shall be a single piece full height unit supporting front and rear cable routing and attachment.

5. The inter-bay manager shall have integral routing and slack storage loops supporting a 1.5" minimum bend radius.
6. Inter-bay and end-cap management panels shall be supplied with adjustable routing guides.
7. Both inter-bay and end-cap units shall have removable covers secured with 1/4 turn fasteners.
8. Inter-bay and end-cap cable managers shall securely attach to the rear rail of the rack with #12-24 screws.
9. All IDF locations shall be 2', 3' or 4' wall-mount enclosures manufactured by APW or equal. Size of IDF cabinet shall depend on the number of switches, cabling connectivity, and cable management devices for IDF, or as stated on plans and in scope of work. Each cabinet is to provide space for 25% equipment growth. Cabinets shall:
   a. Be a minimum of 24" and a maximum of 30" deep
   b. Be double-swing design and 3-piece construction
   c. Provide in-field door hinge reversing
   d. Shall include louvered sides
   e. Shall include a solid metal door
   f. Shall be mounted on 1" plywood back-board, anchored sufficiently to mount the cabinet.
10. All cabinets shall be keyed alike.
11. All cabinets shall provide a minimum of two cooling fans in the top cover.

B. CABLE MANAGEMENT
1. Horizontal cable management shall be provided in each rack. A minimum of two front wire- management panels shall be provided in each rack. One combination front and rear horizontal wire management shall be provided for each fiber termination box, for each 24 ports of RJ45 panels, and each 24 ports of switches. Cable dressing at all racks/enclosures shall utilize velcro straps. The use of cable ties is not permitted. All cables and their termination on each end shall be labeled per EIA/TIA administration standards. All labeling schemes and label designations shall be reflected on the CAD drawings at the end of the project and in the submittals.

C. RACK MOUNTING AND HARDWARE
1. Vertical wire management shall be supplied for all open racks.
2. A TGMB ground buss shall be provided at the MDF and a TGB ground buss shall be provided at each IDF. All racks shall be grounded to the telecommunications ground bus bar. The buss bars will be installed by an electrical contractor and not part of the scope of work in this specification section.
3. Floor mount open racks shall be securely attached to the concrete floor using 3/8" hardware and a minimum of 3 feet and a maximum of 10 feet away from the most adjacent wall. The contractor shall install a 12" wide ladder tray system, as manufactured by APW or equal, from the most adjacent wall to the rack. Appropriate wall and rack mounting from the same manufacturer shall be installed as well. These racks should have a minimum of 30" clearance on all sides for access.
4. Rack mount screws (#12-24) not used for installing fiber panels and other hardware shall be bagged and left with the rack upon completion of the installation.
5. Inter-bay and end-cap managers shall be installed to the rear mounting rail of the rack using all available mounting holes.
6. Inner-ducts and cables shall be securely fastened to the cable managers.
7. Cable feeds shall alternate left and right to minimize congestion at the top of the rack.
8. Wall mounted racks shall be installed with a minimum of six 5/16" lag bolts or masonry anchors into structural building members.

2.8 OTHER NETWORK CABLING NOTES

A. Data cabling shall not occupy the same conduits as other low-voltage systems to ensure the data network can be up-graded and expanded in the future without disturbing the other critical communications systems.

B. Each RJ45 workstation outlet shall be provided with one (1) 3' patch cord for the rack location and one (1) 7' workstation cord for the future computer. These patch cords shall be of the same manufacturer as the cabling system. Patch cord shall be factory assembled and include *snagless* color-coded strain relief boot. No field assembled patch cords allowed.

2.9 ACTIVE COMPONENTS

CONTRACTOR MUST BE A CISCO GOLD, SILVER, PREMIER PARTNER. NO SITE CERTIFICATIONS ARE ALLOWED

A. MDF GENERAL REQUIREMENTS "CORE" SWITCHES
1. Will be comprised of the Cisco Catalyst 4500 Series Chassis at Elementary and Middle Schools and the Catalyst 6500 Series chassis at High Schools.
2. A true on-line battery backup UPS system shall be provided for each Core switch installed and shall provide a

minimum of 60 minutes run time, and shall include a SNMP module with alert notification software as manufactured by TrippLite or APC.

3. Core-switch will contain modules capable of providing gigabit Ethernet to each of the IDF's it supports.
4. Core-switch will provide one (1) gigabit link for each (96) drops supported by the respective IDF.
5. Contractor to supply and install all required patch cords as needed to fully support all Edge switches newly installed in order to facilitate a fully operational system. Fiber optic patch cords are to be 1 or 2 meters in length as required. The cords are to be Duplex SC style connectors on 50/125 multimode fiber optic zip-cord style cable as manufactured by Systimax. Cords must be the same manufacturer as the cabling system being installed. **No field terminated cords are allowed.**
6. A 1U (1.75") front wire management panel shall be installed for every 48-ports of electronics with no less than one for each rack location as manufactured by Systimaxt.

B. IDF GENERAL REQUIREMENTS "EDGE" SWITCHES

1. Will be comprised of the Cisco Catalyst 3750 Series SMI (Standard Multilayer Image) switch.
2. Each switch at the IDF will be a minimum of twenty-four (24) 10/100Base-TX ports.
3. All IDF switches will be the Enterprise Edition switch.
4. One 1000BaseSX GBIC module will support no more than 96 drops before adding subsequent 1000BaseSX GBIC modules in the IDF for additional gigabit links to the MDF.
5. Contractor to supply and install all required patch cords as needed to fully support all Edge switches newly installed in order to facilitate a fully operational system. Fiber optic patch cords are to be 1 or 2 meters in length as required. The cords are to be Duplex SC style connectors on 50/125 multimode fiber optic zip-cord style cable as manufactured by Systimax. Cords must be the same manufacturer as the cabling system being installed. **No field terminated cords are allowed.**
6. A 1U (1.75") front wire management panel shall be installed for every 48-ports of electronics with no less than one for each rack location as manufactured by Systimax.
7. A true on-line battery backup UPS system shall be provided for each IDF and shall provide a minimum of 30 minutes run time and shall include an SNMP module with alert notification software as manufactured by TrippLite or APC.

C. SERVER RACKS GENERAL REQUIREMENTS (minimum one per campus)

1. Data contractor will provide one (1) enclosed 7ft server cabinet which will be provided with proper shelving and ventilation (2 fans minimum) to support a minimum of two file servers (see rack specifications section).
2. A true on-line battery backup UPS system shall be provided for each server installed and shall provide a minimum of 60 minutes run time, and shall include an SNMP module with alert notification software, as manufactured by TrippLite or APC.
3. The server rack shall be complete with a server, 104-key key-board, 3-button Logitech mouse, 17" .28 NI SVGA color monitor. The server shall have 512MB of RAM, (6) 18GB SCSI hard-drives (RAID 5), dual Intel 1000Mhz Pentium III processor, 512KB pipeline burst cache, 32X CD-ROM drive, (1) INTEL 100BASETX Dual Port PCI NIC, 3 ½" floppy drive, 8MB AGP video card, and a full size tower for future expansions. The server shall be completely modular as manufactured by Dell or equal.
4. The data contractor or OEM shall provide Network Monitoring (SNMP) software for Windows 2000 as manufacturer by Castlerock or equivalent
5. The data contractor or OEM shall provide a copy of Windows 2000 Server with 200 Client Access licenses on the new server.
6. The data contractor shall configure all switches with IP addresses and user labeling in the SNMP software and fully test the network for proper operation.
7. The data contractor shall provide 24 hours of user training on the network with the customer provided computers. Any training or customer provided computer configuration beyond this shall be outside the contract and negotiated as a service contract.
8. All computer labs on campus shall be autonomous with their own server, SWE 456P rack (or equivalent) with two slide out shelves, hubs and patch panels. The server shall have a 104-key key-board, 3-button Logitech mouse, 17" .28 NI SVGA color monitor. The server shall have 512MB of RAM, (6) 18GB SCSI hard-drives (RAID 5), an Intel 1000Mhz Pentium III processor, 512KB pipeline burst cache, 32X CD-ROM drive, INTEL 100BASETX PCI NIC, 3 ½" floppy drive, 8MB AGP video card, and a full size tower for future expansions and shall be rack mounted. Servers shall be completely modular and manufactured by Dell or other manufacturer as designated by the district.
9. All the servers shall be true servers (not a PC) and shall be completely modular in design with hot-swappable components as manufactured by Dell or manufacturer specified by the district.

D. ROUTER

The Data contractor shall provide a Cisco 3745 router, or superceded product from Cisco, with a minimum of two (2) Fast Ethernet connections and four (4) IMA (Inverse multiplexing over ATM) T1 connections. Contractor shall coordinate the installation of the pre-designated number of T1 lines from the serving utility company and configure the router as needed for a complete and operational WAN connection to the district's network.

PART 3 - EXECUTION

3.1 CABLE SYSTEM TESTING

A. All cables and termination hardware shall be 100% tested for defects in installation to verify cable performance under installed conditions. All conductors of each installed cable shall be verified as useable by the contractor prior to system acceptance. Any defect in the cable system installation including but not limited to cable, connectors, feed-through couplers, patch panels and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed.

B. Copper: Each cable shall be tested for continuity on all pairs and/or conductors. Coaxial cables shall be tested for continuity, opens shorts and resistance using a volt/ohm meter (VOM) and installed length using a Time Domain Reflectometer (TDR). Twisted-pair voice cables shall be tested for continuity, pair reversals, shorts, and opens using a "green light" type test set. Twisted-pair data cables shall be tested for the all of the above requirements, plus tests that indicate installed cable performance. All Category 6 cables shall be tested to ensure the Category 6 standard performance to 100Mhtz is complied with. All tests shall be printed out in hard copy in the quantity called out in the general specifications for Maintenance & Operations turn-over documents as well as one CD copy for the owner's use. These data cabling links shall be tested with a Level III cable analyzer utilizing bi-directional swept frequency testing procedures.

C. Continuity: Each pair of installed multi-conductor inter-building phone cable shall be tested using a "green light" test set that shows opens, shorts, polarity and pair-reversals. Shielded/screened cables shall be tested with a device that verifies shield continuity in addition to the above stated tests. The test shall be recorded as pass/fail as indicated by the test set in accordance with the manufacturers recommended procedures, and referenced to the appropriate cable identification number and circuit or pair number. Any faults in the wiring shall be corrected and the cable re-tested prior to final acceptance.

D. Length: Category 6 unshielded twisted pair (UTP) data cable shall be tested for installed length using a TDR type device. The cables shall be tested from patch panel to patch panel, block to block, patch panel to outlet or block to outlet as appropriate. The cable length shall conform to the maximum distances set forth in the TIA/EIA-568-B Standard. Cable lengths shall be recorded, referencing the cable identification number and circuit or pair number. For multi-pair cables, the longest pair length shall be recorded as the length for the cable.

E. Performance Verification: Category 6 unshielded twisted pair (UTP) data cable shall be performance verified using an automated test set. This test set shall be capable of testing for the continuity and length parameters defined above, and provide results for the following tests:
   1. Near End Cross-Talk (NEXT)
   2. Attenuation
   3. Ambient Noise
   4. Attenuation to Cross-Talk Ratio (ACR)
   5. Test results shall be automatically evaluated by the equipment, using the most up-to-date criteria from the TIA/EIA Standard, and the result shown as pass/fail. Test results shall be printed directly from the test unit or from a download file using an application from the test equipment manufacturer. The printed test results shall include all tests performed, the expected test result and the actual test result achieved.

F. Fiber: All fiber terminations shall be visually inspected with a minimum 200 X microscope to ensure that no surface imperfections exist after final polishing. This step is not necessary of factory pre-polished connectors are installed. In addition, each fiber strand shall be tested for attenuation with an optical power meter and light source. *Cable length and splice attenuation shall be verified and documented using an OTDR.*

G. Attenuation:
   1. Horizontal distribution multimode optical fiber attenuation shall be measured at either 850 nanometers (nm) or 1300 nm using an LED light source and power meter. Backbone multimode fiber shall be tested at both 850 nm and 1300 nm in one direction. Test set-up and performance shall be conducted in accordance with ANSI/EIA/TIA-526-14 Standard, Method B. One 2-meter patch cord shall be used for the test reference and two 2-meter patch cords shall be used for the actual test. This test method uses a one jumper reference–two jumper test to estimate the actual link loss of the installed cables plus the loss of two connectors. This measurement is consistent with the loss which network equipment will see under normal installation and use. Test evaluation for the panel to panel (backbone) or panel to outlet (horizontal) shall be based on the values set forth in the **EIA/TIA-568-A** Annex H, Optical Fiber Link Performance Testing.
   2. Where concatenated links are installed to complete a circuit between devices, the Contractor shall test each link from end to end to ensure the performance of the system. After the link performance test has been successfully completed, each link shall be concatenated and tested. The test method shall be the same used for the test

described above. The evaluation criteria shall be established between the Owner and the Contractor prior to the start of the test.

3. Single-mode optical fiber attenuation shall be measured at 1310 nm and 1500 nm using a laser light source and power meter. Tests shall be performed at both wavelengths in one direction on each strand of fiber. The set-up and test shall be performed in accordance with EIA/TIA-526-7 Standard, Method 1A. Two meter patch cords shall be used as test references and for the actual test. This test method utilizes a one jumper reference, two jumper test to estimate the actual link loss of the install cable plus two patch cords.
4. Test evaluation for the panel to panel (backbone) shall be based on the values set forth in the EIA/TIA-568-A Annex H, Optical Fiber Link Performance Testing.
   **For this application, the length based on cable length measurements marked on the jacket, will be suitable. OTDR testing is to be performed in accordance with 8.2.2, then the actual measured length shall be used. Conversion from metric to US Standard measurement shall use 3.2808 as a constant with the result rounded to the next highest whole number.*
   ***The testing for this project is measuring the loss over the installed cable plus two jumpers which accounts for three mated pairs of connectors. Subtract one mated pair for the equipment interface to arrive at a total of two mated pairs under test.*

H. Length and Splice Loss
1. Each cable shall be tested with an Optical Time Domain Reflectometer (OTDR) to verify installed cable length and splice losses. The OTDR measurements for length shall be performed in accordance with EIA/TIA-455-60. The measurements to determine splice loss shall be performed in accordance with manufacturers' recommendations and best industry practices. These tests shall be employed on all cables after installation and in addition where one or more of the following conditions exist.
2. OTDR and power meter testing is specifically requested by the Owner.
3. Each strand shall be tested on all outside plant and tight-buffered cables and/or where splices exist.
4. A representative strand of each fiber cable shall be tested to verify length if the estimated cable length is within 10% of the maximum length specified, respective to cable function, in the TIA/EIA-568-B Standard.

3.2 FIRESTOP SYSTEMS

A. A firestop system is comprised of: the item or items penetrating the fire rated structure; the opening in the structure and the materials and assembly of the materials used to seal the penetrated structure. Firestop systems comprise an effective block for fire, heat, vapor and pressurized water stream.

B. All penetrations through fire rated building structures (walls and floors) shall be sealed with an appropriate firestop system. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire rated structure). Any penetrating items i.e., riser slots and sleeves, cables, conduit, cable tray, and raceways, etc. shall be properly firestopped.

C. Firestop systems shall be UL Classified to ASTM E814 (UL 1479) and shall be approved by a qualified Professional Engineer (PE), licensed (actual or reciprocal) in the state where the work is to be performed. A drawing showing the proposed firestopped system, stamped/embossed by the cognizant PE shall be provided to the Owner's Technical Representative prior to installing the firestop system.

D. All firestop systems shall be installed in accordance with the manufacturer's recommendations and shall be completely installed and available for inspection by the local inspection authorities prior to cable system acceptance.

3.3 GROUNDING AND BONDING

<u>All grounding and bonding work is to be completed by an electrical contactor and not part of this scope of work. This information is placed here for reference only.</u>

A. The facility shall be equipped with a Telecommunications Bonding Backbone (TBB). This backbone shall be used to ground all telecommunications cable shields, equipment, racks, cabinets, raceways, and other associated hardware that has the potential for acting as a current carrying conductor. The TBB shall be installed independent of the buildings electrical and building ground and shall be designed in accordance with the recommendations contained in the TIA/EIA-607 Telecommunications Bonding and Grounding Standard.

1. The main entrance facility/equipment room in each building shall be equipped with a telecommunications main grounding bus bar (TMGB). Each telecommunications closet shall be provided with a telecommunications ground bus bar (TGB). The TMGB shall be connected to the building electrical entrance grounding facility. The intent of this system is to provide a grounding system that is equal in potential to the building electrical ground system. Therefore, ground loop current potential is minimized between telecommunications equipment and the electrical system to which it is attached.

B. Product Specifications
1. All racks, metallic backboards, cable sheaths, metallic strength members, splice cases, cable trays, etc. entering or residing in the TC or ER shall be grounded to the respective TGB or TMGB using a minimum #6 AWG stranded copper bonding conductor and compression connectors. Where metallic panels attached to the rack to not have sufficient metal to metal contact to provide an adequate path to ground, they shall be bonded to the rack using a minimum #14 AWG copper conductor. The copper conductor size shall be upgraded based on the largest power conductor feeding any rack mount equipment. The conductor shall be continuous, attaching all isolated components in a daisy chain fashion from top to bottom and bonded to the rack using the appropriate compression connector.
2. All wires used for telecommunications grounding purposes shall be identified with a green insulation. Non-insulated wires shall be identified at each termination point with a wrap of green tape. All cables, and buss-bars shall be identified and labeled in accordance with the System Documentation Section of this specification.

C. Ground System Installation
1. The TBB shall be designed and/or approved by a qualified PE, licensed (actual or reciprocal) in the state that the work is to be performed. The TBB shall adhere to the recommendations of the TIA/EIA-607 standard, and shall be installed in accordance with best industry practices. Installation and termination of the main bonding conductor to the building service entrance ground, at a minimum, shall be performed by a licensed C10 electrical contractor.

3.4 SYSTEM DOCUMENTATION

A. The following section describes the installation, administration, testing, and as-built documentation required to be produced and/or maintained by the contractor during the course of the installation. The documentation required will allow the owner to create a TIA/EIA 606 compliant administration system.

B. Cable System Labeling
1. The contractor shall develop and submit for approval a labeling system for this cable installation. At a minimum, the labeling system shall clearly identify all components of the system: racks, cables, panels and outlets. The labeling system shall designate the cables origin and destination and a unique identifier for the cable within the system. Racks and patch panels shall be labeled to identify the location within the cable system infrastructure. All labeling information shall be recorded on the as-built drawings and all test documents shall reflect the appropriate labeling scheme.
2. All label printing will be machine generated using indelible ink ribbons or cartridges. Self laminating labels will be used on cable jackets, appropriately sized to the OD of the cable, and placed within view at the termination point on each end. Outlet labels will be the manufacturer's label provided with the outlet assembly.

C. As-Built Drawings
1. The installation contractor will be provided with (*two*) set(*s*) of (*D*-)size drawings at the start of the project. One set will be designated for the central location to document all as-built information as it occurs throughout the project. The central set will be maintained by the Contractor's Foreman on a daily basis, and will be available to the Technical representative upon request during the course of the project. Anticipated variations from the building drawings may be for such things as cable routing and actual outlet placement. No variations will be allowed to the planned termination positions of horizontal and backbone cables, and grounding conductors unless approved in writing by the Owner. Contractor shall also redraw the site and floor plans showing all fiber, copper, racks, and information outlets as well as the labeling scheme for all items. These CAD drawings shall be on 81/2" x 11" sheets of paper and be turned over to the owner with the O&M manuals.
2. The Contractor shall provide the central drawing set to the owner at the conclusion of the project. The marked up drawing set will accurately depict the as-built status of the system including termination locations, cable routing, and all administration labeling for the cable system. In addition, a narrative will be provided that describes any areas of difficulty encountered during the installation that could potentially cause problems to the telecommunications system.

D. Test Documentation

1. Test documentation shall be provided in a three ring binder(s) within three weeks after the completion of the project. The binder(s) shall be clearly marked on the outside front cover and spine with the words "Test Results", the project name, and the date of completion (month and year). The binder shall be divided by major heading tabs, Horizontal and Backbone. Each major heading shall be further sectioned by test type. Within the horizontal and backbone sections, scanner test results (Category 3, 4, or 5), fiber optic attenuation test results, OTDR traces, and green light test results shall be segregated by tab. Test data within each section shall be presented in the sequence listed in the administration records. The test equipment by name, manufacturer, model number and last calibration date will also be provided at the end of the document. Unless a more frequent calibration cycle is specified by the manufacturer, an annual calibration cycle is anticipated on all test equipment used for this installation. The test document shall detail test method used and specific settings of the equipment during the test.
2. Scanner tests shall be printed on 8-1/2" x 11". Hand written test results (attenuation results and green light results) shall be *documented on an Excel spreadsheet. OTDR test results shall be printed or attached and copied on 8-1/2" x 11" paper for inclusion in test documentation binder.*
3. When repairs and re-tests are performed, the problem found and corrective action taken shall be noted, and both the failed and passed test data shall collocated in the binder.

3.5 WARRANTY AND SERVICES

A. The contractor shall provide a system warranty covering the installed cable system against defects in workmanship, components, and performance, and follow-on support after project completion.

B. Installation Warranty: The contractor shall warrant the cabling system against defects in workmanship for a period of one year from the date of system acceptance. The warranty shall cover all labor and materials necessary to correct a failed portion of the system and to demonstrate performance within the original installation specifications after repairs are accomplished. This warranty shall be provided at no additional cost to the Owner.

C. Cable System Warranty: The contractor shall facilitate a warranty between the manufacturer and the Owner that provides coverage of the installed cabling system to a minimum of 25 years. An extended component warranty shall be provided which warrants functionality of all components used in the system for a minimum of 25 years from the date of acceptance. All fiber cable, copper cable, fiber termination hardware and housings, copper termination hardware and trim shall be of one manufacturer to ensure the owner can establish one relationship for the warranty. A performance warranty in excess of 25 years shall also be provided which warrants the installed 100 MHz horizontal copper (HC to WA) and for both the horizontal and the backbone optical fiber (HC to WA, or cross-connect to cross-connect) portions of the cabling system. Copper links shall be warranted against the link performance minimum expected results defined in the TIA/EIA 568-B and/or TIA/EIA 568-A. Fiber optic links shall be warranted against the link and segment performance minimum expected results defined in the TIA/EIA 568-B and/or TIA/EIA 568-A. All fiber and copper cabling, termination components, and ancillary devices shall be of one manufacturer to insure no disputes can arise between different manufacturers if performance problems arise. Installers shall be factory trained technicians with a factory trained supervisor overseeing the project. Certificates of factory training by the manufacturer, or authorized representative, of the cabling system being installed must be made available if requested by the District or District's representative.

3.6 CABLE SYSTEM ACCEPTANCE

A. The Owner's Technical Representative will make periodic inspection of the project in progress. One inspection will be performed at the conclusion of cable pulling, prior to closing of the false ceiling, to inspect the method of cable routing and support, and the fire-stopping of penetrations. A second inspection will be performed at completion of cable termination to validate that cables were dressed and terminated in accordance with TIA/EIA specifications for jacket removal and pair untwist, compliance with manufacturer's minimum bend radius, and that cable ends are dressed neatly and orderly.

B. Final Inspection: Upon completion of the project, the Owner's Technical Representative will perform a final inspection of the installed cable system with the Contractor's Project Foreman. The final inspection will be performed to validate that all horizontal and backbone cables were installed as defined in the drawing package, and that the installation meets the aesthetic expectations of the District.

C. Test Verification: Upon receipt of the test documentation, the Owner reserves the right to perform spot testing of a representative sample of the cabling system to validate test results provided in the test document. Owner testing will use the same method employed by the contractor, and minor variations will be allowed to account for differences in test equipment. **If significant discrepancies are found, the Contractor will be notified for resolution**.

D. System Performance: During the three-week period between final inspection and delivery of the test and as-built documentation, the Owner will activate the cabling system as a validation of operation.

E. Final Acceptance: Completion of the installation and in-progress and final inspections, receipt of the test and as-built documentation, and successful performance of the system for a two-week period will constitute acceptance of the system.

SECTION 16820

HEARING ASSISTANCE SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Furnishing and installing a complete Hearing Assistance System.

B. Furnish, install and connect all conductors and terminal strips necessary to provide for functions and requirements specified herein, including interface cabling to Public Address - Sound System.

C. Provide all labor, engineering, design, testing, materials, components and supervision necessary to provide a complete operable installation.

D. Entire system shall be supported by shop drawings showing engineering documentation including:

1. Floor plans indicating all devices, conduit runs, wire types, and terminal cabinets and connections.

2. Block diagrams indicating all items and their point-to-point connections in a manner following floor plan layout.

E. The Hearing Assistance system shall be compatible with existing PA system and shall be approved by the School District.

F. The minimum number of receivers shall be equal to 4% of the seating, but no less than two.

G. Permanent system required at multi-purpose and portable system required at conference rooms.

1.02 RELATED SECTIONS

A. Section 16000: General Electrical Requirements

1.03 SUBMITTALS

A. Contractor shall provide following submittals and shop drawings for review and approval:

1. A complete list of equipment and materials proposed for system, with catalog cuts, technical data, manufacturers specifications and detail drawings.

2. A complete set of detailed scaled drawings of all devices/components with designations, dimensions, color, operating controls, instrument wiring and schematic diagrams of all circuits.

3. Shop drawings shall show interfaces to existing equipment, identifying numbers of wires, termination requirements, voltages, and other pertinent details. Include front elevations, dimensions, types of mounting, catalog number of locks, and finishes for terminal cabinets.

B. Operating and Servicing Manuals, Record Drawings:

1. Deliver required number of copies of operating and servicing manual. Each complete manual shall be bound in a flexible binder and all data shall be typewritten or drafted.

2. Each manual shall include all instructions necessary for proper operation and servicing of system and shall include complete 2 wire circuit diagrams of system, a wiring destination schedule for each circuit leaving console and each rack, a schematic diagram of all components, and replacement part numbers. Each manual shall also include as-built cable site plot plan and floor plans indicating all cables with conduit, and as-built coding used on each cable. Programming forms of each system shall be submitted with complete information.

3. Provide shop drawings, indicating location of equipment, conduit, cable runs and other pertinent information.

1.04 QUALITY ASSURANCE

A. Work shall conform to CCR, Title 24 Part 3, Basic Electrical Regulation and California Electrical Code, latest edition.

B. Work shall be done by a qualified sound Contractor holding C-10, C-61 and all licenses required by legally constituted authorities having jurisdiction over work. Sound Contractor shall have completed at least 5 school systems of equal scope to system described herein and shall have been engaged in business of supplying and installing specified type of systems for at least 5 years. Sound Contractor shall maintain a fully equipped service organization capable of furnishing adequate repair service to equipment.

C. Installation shall be carried out under direction of a qualified Sound Engineer and costs of all such direction shall be included in Contractor's bid. Include name and statement of qualifications with submittals.

PART 2 - PRODUCTS

2.01 GROUNDING

A. Grounding:

1. Wiring outlets and emitters shall be grounded and such grounding shall be done in compliance with requirements of California Electrical Code and as specified herein.

2. Circuits shall be grounded as recommended by manufacturer of equipment to which they are connected unless otherwise specified.

2.02 CONDUCTOR/CABLES

A. Cables for input source shall be plenum rated coax cable with Flamarrest jacket for audio application. Cable shall be Belden 1506A or equal.

2.03 KEYS AND LOCKS

A. Contractor shall provide keys and locks for all cabinets and equipment, which shall be keyed alike.

2.04 MULTI-USE HEARING ASSISTANCE SYSTEM

A. Hearing Assistance System: Infrared Hearing Assistance System shall be manufactured by Phonic Ear and consist of the following components:

1. Cat. No. PE 600E Emitter Panel must be a dual-channel system operating on both 2.3 and 2.8 MHz frequencies. The channels must be designated "CHANNEL A" for the left and "CHANNEL B" for the right AUDIO IN jacks to accept an input signal from a sound system. The emitter must have an array of 130 infrared L.E.D.'s covered by a purple acrylic lens. The infrared signal from each emitter must cover up to 4000 sq. ft. The transformer must be U.L. approved.

2. Cat. No. PE 600R Dual Channel Receiver for use by the listener with standard Walkman-style headset AT541. Receiver must be capable of being clipped to a pocket or belt. Unit must be furnished with two AA rechargeable nickel cadmium batteries. See Architectural Document for number of devices required.

3. Cat. No. PE300C Battery Charger Organizer. Unit must be capable of storing or recharging up to 12 receivers at one time. The charger must be capable of recharging the nickel cadmium batteries without removing the batteries from the receiver. A total of 4 battery chargers must be furnished for each project.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The emitter must be capable of being mounted to a wall either directly or with an adjustable wall-mounting bracket.

3.02 EXAMINATION AND OPERATION

A. Contractor shall properly instruct School Principal and other persons designated by the Principal, in correct operation of system, in presence of the District Inspector.

3.03 SPECIAL PUBLIC ADDRESS AND HEARING ASSISTANCE SYSTEM TESTS

A. Provide all instruments for testing and demonstrate, in presence of the District Inspector, that all circuits and wiring test free of shorts and grounds.

B. Furnish all labor, instruments, appliances, equipment and materials necessary to demonstrate to the District that installation performs as required and specified.

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

END OF SECTION

CAD DRAWING REQUEST FORM

Date: _____ **HMC Job Number:** _____

Project: _____ **Project Architect:** _____

We _____
Contractor

Request the following listed CAD file Sheet Numbers for use in the execution of our Work under the Contract Documents of the subject project, and hereby assume all and sole responsibility of field verification and coordination with the Work of associated trades.

The Contractor further agrees, to the fullest extent permitted by law, to indemnify and hold harmless the Architect, its officers, directors, employees and subconsultants (collectively, Architect) against any damages, liabilities or costs, including reasonable attorneys' fees and defense costs, arising from or allegedly arising from or in any way connected with the unauthorized reuse or modification of the electronic files by the Contractor or any person or entity that acquires or obtains the electronic files from or through the Contractor without the written authorization of the Architect.

Sheet No.	Dated	Sheet Title
_____	_____	_____
_____	_____	_____
_____	_____	_____

Requested File Format

☐ DWG (Auto CAD, 2006, 2008)

Requested File Deliverable

☐ CD Rom

☐ E-MAIL (Zipped Files)

_____
Contractor's E-mail address

Contractors are not required to pay for the first 5 drawings (maximum). Additional drawings available at a rate of $50.00 per drawing.

Total payment enclosed $_____, (checks made payable to HMC Architects).

Signed: _____

Title: _____

Company: _____

Address: _____

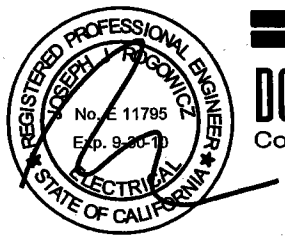
Telephone: _____

Contact: *HMC Architects Inc.*
Project Manager

END OF FORM

4

C (TV) MASTER TELEVISION ANTENNA SYSTEM SIGNAL, POWER & DATA OUTLET. MOUNT AT +96" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE ON DRAWINGS. STUB – (2)3/4"C.O. (DATA & TV) INTO ACCESSIBLE CEILING SPACE. CONNECT RECEPTACLE AS INDICATED ON DRAWINGS. "C" INDICATES CEILING MOUNTED.



DCGA ENGINEERS
Consulting Mechanical and Electrical Engineers
4750 E. Ontario Mills Pkwy
Ontario, Ca. 91764
Ph.909.987.0017
Fax 909.980.7023

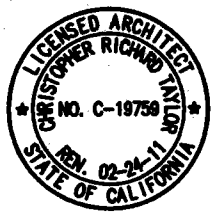
REVISED TELEVISION ANTENNA SYMBOL

Detail No.	Ref. Dwg.	Scale
–	E-0.1	NO SCALE

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

Project Title
SAN BERNARDINO CITY
UNIFIED SCHOOL DISTRICT
RAMONA-ALESSANDRO E.S.

HMC ARCHITECTS
Architecture Interiors Planning
3546 CONCOURS STREET
ONTARIO, CALIFORNIA 91764
Telephone: 909. 989. 9979
Fax: 909. 483. 1400



Project No.	Date	Drawing No.
3137117	3/11/10	AD-4E.01

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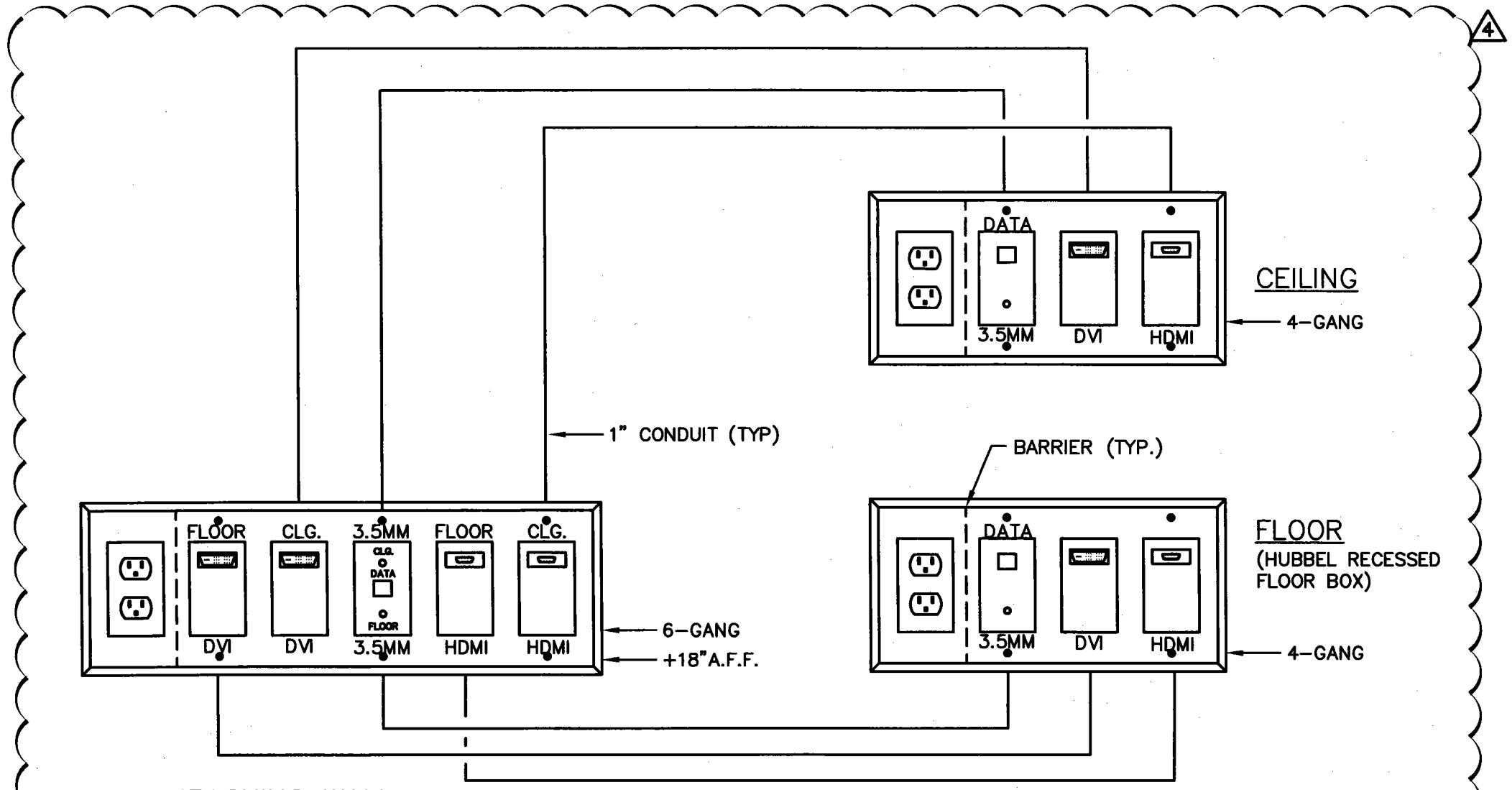

NOTES:

1. REFER TO POWER AND COMMUNICATION FLOOR PLANS FOR ADDITIONAL CIRCUITING AND CONDUIT REQUIREMENTS. DATA CABLES SHALL BE PROVIDED AND INSTALLED BY SBCUSD ERATE PROGRAM.
2. PROVIDE AND INSTALL AUDIO, HDMI AND DV1 CABLES AND PLATES AS REQUIRED. CABLES SHALL BE INSTALLED IN PATHWAYS FROM DESIGNATED CONTROL STATION AT TEACHING WALL TO FLOOR AND CEILING LOCATIONS.
3. VERIFY EXACT LOCATION OF ALL BOXES WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN.

TYPICAL CLASSROOM AUDIO/VISUAL WIRING DIAGRAM DETAIL

SCALE N.T.S. | 6

P:\SBCUSD-Mods\Ramona-Alessandro #20-03142\Dwgs\E\20-03142E41.dwg 3-11-10-11:17 AM

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REGISTERED PROFESSIONAL ENGINEER JOSEPH RAGOWICZ No. E 11795 Exp. 9-30-10 ELECTRICAL STATE OF CALIFORNIA

Detail No. 6 | Ref. Dwg. E-4.1 | Scale N.T.S.

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

ADDED AUDIO/VISUAL WIRING DIAGRAM DETAIL

Project Title
SAN BERNARDINO CITY
UNIFIED SCHOOL DISTRICT
RAMONA-ALESSANDRO E.S.

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LICENSED ARCHITECT CHRISTOPHER RICHARD LINTON NO. C-19759 REN. 02-24-11 STATE OF CALIFORNIA

Project No. 3137117
Date 3/11/10
Drawing No. AD-4E.02

P:\SBCUSD-Mods\Ramona-Alessandro #20-03142\Dwgs\E\20-03142E51.dwg 3-11-10-11:22 AM

LOCATION:

PANEL: PANEL "LBA"

AIC RATING: 14000

PANEL VOLTAGE: 208/120V

PHASE & WIRE: 3PH,4W

BUS: 225

MAINS: 225

CKT CODE: 1=(CONTINUOUS) 2=(NON-CONTINUOUS) 3=(RECEPTACLES) 4=(KITCHEN)

NO. OF EQUIP=

CIRCUIT		CKT BKR		LOAD TYPE & DESIGNATION				LOAD	PHASES			LOAD			LOAD TYPE & DESIGNATION		CKT BKR		CIRCUIT	
NO	CODE	TRIP	POLE	DESCRIPTION	MISC	REC	LITE	VA	A	B	C	VA	LITE	REC	MISC	DESCRIPTION	POLE	TRIP	CODE	NO
1	3	20	1	CLASSROOM RECEPTACLES		4		1600	3200	----	----	1600		4		CLASSROOM RECEPTACLES	1	20	3	2
3	3	20	1	CLASSROOM RECEPTACLES		4		1600	----	3200	----	1600		4		CLASSROOM RECEPTACLES	1	20	3	4
5	3	20	1	CLASSROOM RECEPTACLES		4		1600	----	----	3200	1600		4		CLASSROOM RECEPTACLES	1	20	3	6
7	3	20	1	CLASSROOM RECEPTACLES		4		1600	3200	----	----	1600		4		CLASSROOM RECEPTACLES	1	20	3	8
9	3	20	1	CLASSROOM RECEPTACLES		4		1600	----	3200	----	1600		4		CLASSROOM RECEPTACLES	1	20	3	10
11	3	20	1	CLASSROOM RECEPTACLES		4		1600	----	----	3200	1600		4		CLASSROOM RECEPTACLES	1	20	3	12
13	3	20	1	CLASSROOM RECEPTACLES		4		1600	3200	----	----	1600		4		CLASSROOM RECEPTACLES	1	20	3	14
15	3	20	1	CLASSROOM RECEPTACLES		4		1600	----	3200	----	1600		4		CLASSROOM RECEPTACLES	1	20	3	16
17	3	20	1	CLASSROOM RECEPTACLES		4		1600	----	----	3200	1600		4		CLASSROOM RECEPTACLES	1	20	3	18
19	3	20	1	OFFICES		4		720	1620	----	----	900		5		OFFICES	1	20	3	20
21	3	20	1	OFFICES		4		720	----	1620	----	900		5		OFFICES	1	20	3	22
23	3	20	1	OFFICES		6		1080	----	----	2160	1080		6		OFFICES	1	20	3	24
25	2	20	2	"FC-1"	1			125	925	----	----	800			1	"CU-1"	2	20	2	26
27	2	–	–	----	–			125	----	925	----	800			–	----	–	–	2	28
29	3	20	1	ROOF RECEPTACLE		1		180	----	----	180					SPARE	1	20		30
31		20	1	SPARE					0	----	----					SPARE	1	20		32
33		20	1	SPARE					----	0	----					SPARE	1	20		34
35		20	1	SPARE					----	----	0					SPARE	1	20		36
37				SPACE					0	----	----					SPACE				38
39				SPACE					----	0	----					SPACE				40
41				SPACE					----	----	0					SPACE				42
								TOTAL	12145	12145	11940									

NOTES:

		SUM
CONNECTED KVA	36.2	
CONN.KVA (CODE 1)	0.0	0.0
CONN.KVA (CODE 2)	1.9	1.9
CONN.KVA (CODE 3)	34.4	34.4
CONN.KVA (CODE 4)	0.0	0.0
	0.0	
FEEDER DEMAND KVA	24.0	
FEEDER DEMAND AMPS	66.3	
X'FMR. KVA	24.0	

4

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REGISTERED PROFESSIONAL ENGINEER JOSEPH J. ROGOWICZ No. E 11795 Exp. 9-30-10 ELECTRICAL STATE OF CALIFORNIA

Detail No. – | Ref. Dwg. E-5.1 | Scale N.T.S.

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

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

REVISED PANEL SCHEDULE

Project Title
SAN BERNARDINO CITY
UNIFIED SCHOOL DISTRICT
RAMONA-ALESSANDRO E.S.

HMC ARCHITECTS
3546 CONCOURS STREET
ONTARIO, CALIFORNIA 91764
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Architecture Interiors Planning

LICENSED ARCHITECT CHRISTOPHER RICHARD TAYLOR NO. C-19759 REN. 02-24-11 STATE OF CALIFORNIA

Project No. 3137117

Date 3/11/10

Drawing No. AD-4E.03

LOCATION:

PANEL: PANEL "LCA"

AIC RATING: 14000

PANEL VOLTAGE: 208/120V

PHASE & WIRE: 3PH,4W

BUS: 225

MAINS: 225

CKT CODE: 1=(CONTINUOUS) 2=(NON-CONTINUOUS) 3=(RECEPTACLES) 4=(KITCHEN)

CIRCUIT NO	CODE	CKT BKR TRIP	POLE	LOAD TYPE & DESIGNATION DESCRIPTION	MISC	REC	LITE	LOAD VA	PHASES A	B	C	LOAD VA	LITE	REC	MISC	LOAD TYPE & DESIGNATION DESCRIPTION	CKT BKR POLE	TRIP	CIRCUIT CODE	NO
1	3	20	1	CLASSROOM RECEPTACLES		4		1600	3200	-----	-----	1600		4		CLASSROOM RECEPTACLES	1	20	3	2
3	3	20	1	CLASSROOM RECEPTACLES		4		1600	-----	3200	-----	1600		4		CLASSROOM RECEPTACLES	1	20	3	4
5	3	20	1	CLASSROOM RECEPTACLES		4		1600	-----	-----	3200	1600		4		CLASSROOM RECEPTACLES	1	20	3	6
7	3	20	1	CLASSROOM RECEPTACLES		4		1600	3200	-----	-----	1600		4		CLASSROOM RECEPTACLES	1	20	3	8
9	3	20	1	CLASSROOM RECEPTACLES		4		1600	-----	3200	-----	1600		4		CLASSROOM RECEPTACLES	1	20	3	10
11	3	20	1	CLASSROOM RECEPTACLES		4		1600	-----	-----	3200	1600		4		CLASSROOM RECEPTACLES	1	20	3	12
13	3	20	1	C.R. C4, C5, C6		6		1080	1080	-----	-----					SPARE	1	20	3	14
15	3	20	1	C.R. C4, C5, C6		6		1080	-----	1080	-----					SPARE	1	20	3	16
17	3	20	1	C.R. C4, C5, C6		5		900	-----	-----	900					SPARE	1	20	3	18
19	3	20	1	C.R. C4, C5, C6		4		720	720	-----	-----					SPARE	1	20	3	20
21	3	20	1	SPARE					-----	0	-----					SPARE	1	20	3	22
23	3	20	1	SPARE					-----	-----	0					SPARE	1	20	3	24
25	3	20	1	SPARE					0	-----	-----					SPARE	1	20	3	26
27	3	20	1	SPARE					-----	0	-----					SPARE	1	20	3	28
29	3	20	1	SPARE					-----	-----	0					SPARE	1	20	3	30
31									0	-----	-----									32
33									-----	0	-----									34
35									-----	-----	0									36
37									0	-----	-----									38
39									-----	0	-----									40
41									-----	-----	0									42
NOTES:								TOTAL	8200	7480	7300								SUM	

CONNECTED KVA	23.0
CONN.KVA (CODE 1)	0.0
CONN.KVA (CODE 2)	0.0
CONN.KVA (CODE 3)	23.0
CONN.KVA (CODE 4)	0.0
	0.0
FEEDER DEMAND KVA	16.5
FEEDER DEMAND AMPS	45.5
X'FMR. KVA	16.5

SUM
0.0
0.0
23.0
0.0

4

4

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REGISTERED PROFESSIONAL ENGINEER JOSEPH TAGOWICZ No. E 11795 Exp. 9-30-10 ELECTRICAL STATE OF CALIFORNIA

Detail No. –

Ref. Dwg. E-5.1

Scale N.T.S.

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

REVISED PANEL SCHEDULE

Project Title
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT
RAMONA-ALESSANDRO E.S.

HMC ARCHITECTS
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Architecture Interiors Planning

LICENSED ARCHITECT CHRISTOPHER RICHARD VALDEZ LIC. NO. C-19759 REN. 02-24-11 STATE OF CALIFORNIA

Project No. 3137117

Date 3/11/10

Drawing No. AD-4E.04

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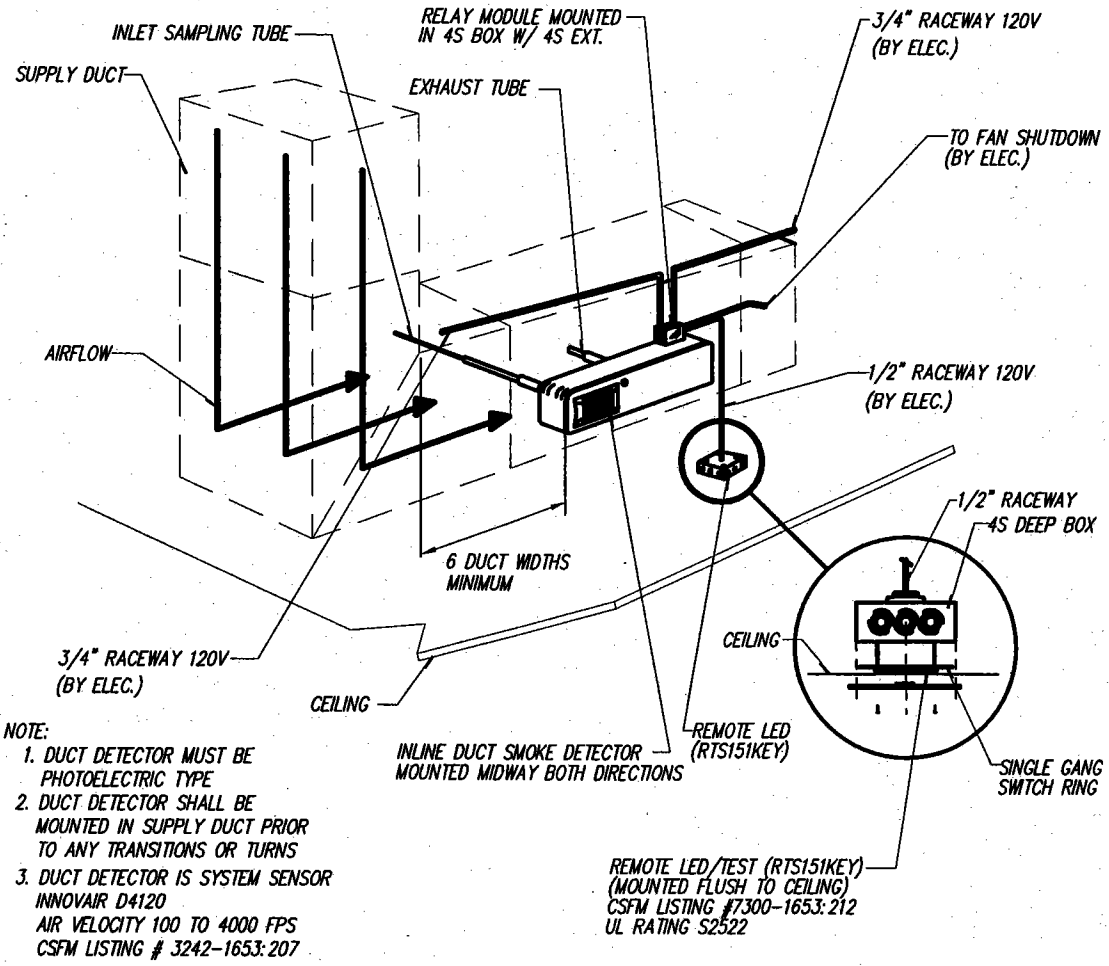


NOTE:
1. DUCT DETECTOR MUST BE PHOTOELECTRIC TYPE
2. DUCT DETECTOR SHALL BE MOUNTED IN SUPPLY DUCT PRIOR TO ANY TRANSITIONS OR TURNS
3. DUCT DETECTOR IS SYSTEM SENSOR INNOVAIR D4120
AIR VELOCITY 100 TO 4000 FPS
CSFM LISTING # 3242-1653:207

DUCT SMOKE DETECTOR MOUNTING

SCALE: NTS

6

D

REGISTERED PROFESSIONAL ENGINEER
STEVEN M. JOHNSON
No. 33209
EXP. 9-30-2011
MECHANICAL
STATE OF CALIFORNIA

SHEET M0.1 DETAIL 6

Detail No.	Ref. Dwg.	Scale
-	-	1/4" = 1'

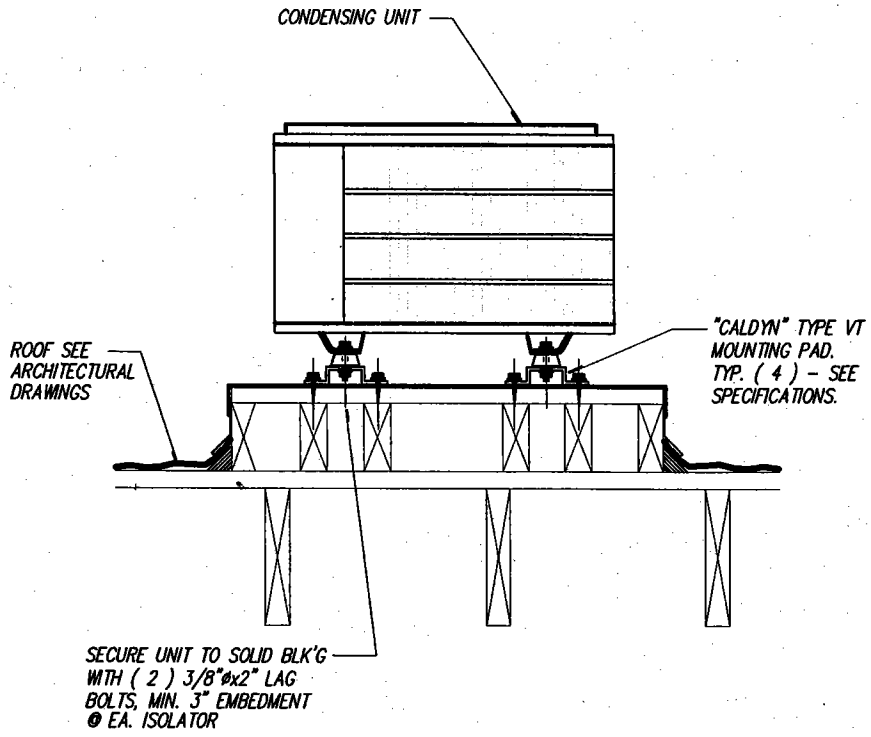
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT
777 NORTH "F" STREET
SAN BERNARDINO,CA. 92410

Project Title
RAMONA-ALESSANDRO ELEMENTARY SCHOOL MODERNIZATION
670 RAMONA AVENUE, SAN BERNARDINO, CA 92411

HMC

LICENSED ARCHITECT
CHRISTOPHER RICHARD TAYLOR
NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No. 3137117
Date 3/11/10
Drawing No. AD4M1



CONDENSING UNIT MOUNTING DETAIL

SCALE: NTS

7

REGISTERED PROFESSIONAL ENGINEER
STEVEN M. JOHNSON
No. 33209
EXP. 9-30-2011
MECHANICAL
STATE OF CALIFORNIA

SHEET M0.1 DETAIL 7

Detail No.	Ref. Dwg.	Scale
–	–	1/4" = 1'

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

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

Project Title

RAMONA-ALESSANDRO ELEMENTARY SCHOOL MODERNIZATION
670 RAMONA AVENUE, SAN BERNARDINO, CA 92411

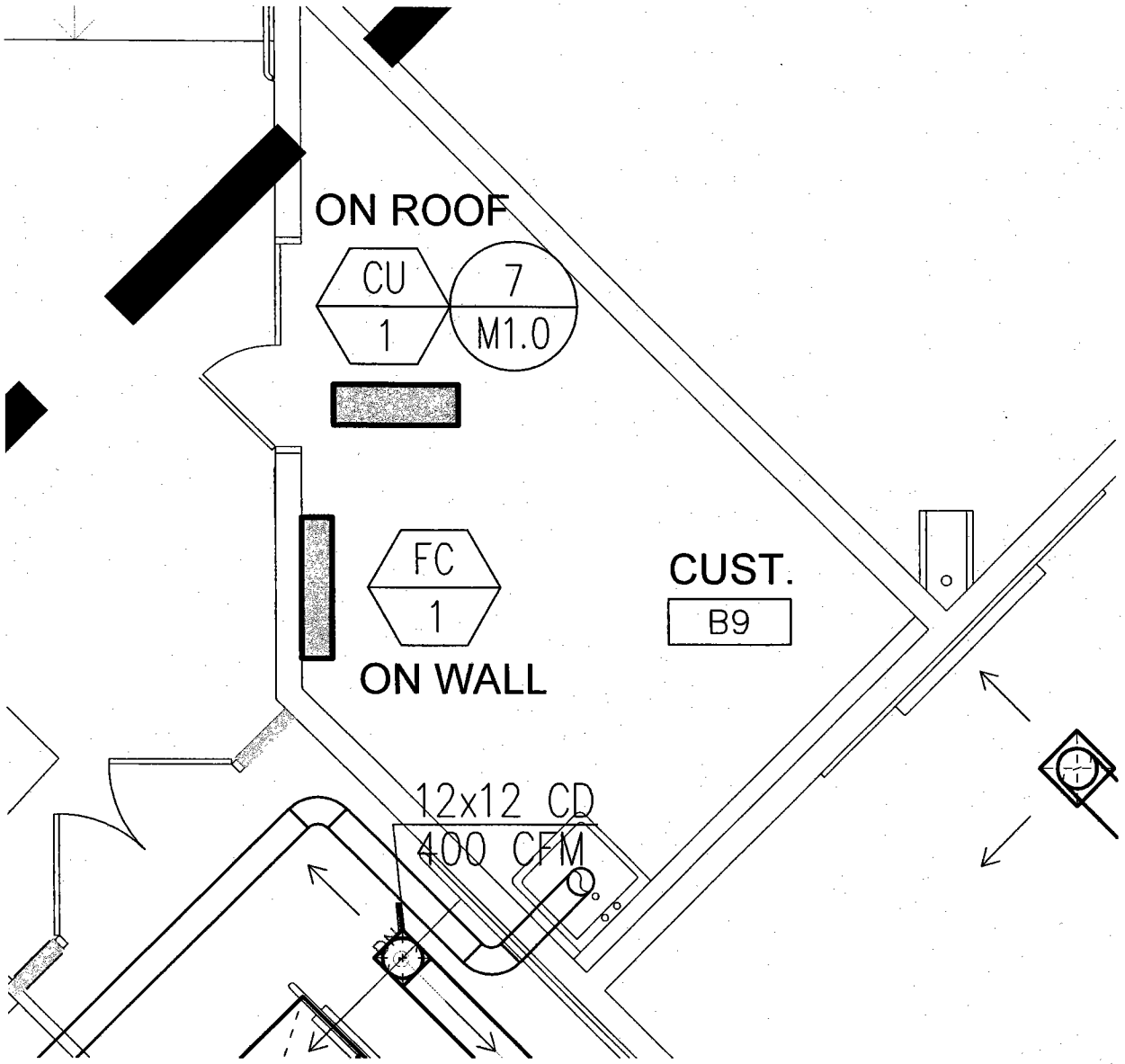
HMC

LICENSED ARCHITECT
CHRISTOPHER RICHARD TAYLOR
NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No. 3137117

Date 3/11/10

Drawing No. AD4M2



REGISTERED PROFESSIONAL ENGINEER
STEVEN M. JOHNSON
No. 33209
EXP. 9-30-2011
MECHANICAL
STATE OF CALIFORNIA

PARTIAL MECH. REMODEL PLAN SHEET M3.1

Detail No.	Ref. Dwg.	Scale
–	–	1/4" = 1'

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

Project Title
RAMONA-ALESSANDRO ELEMENTARY SCHOOL MODERNIZATION
670 RAMONA AVENUE, SAN BERNARDINO, CA 92411

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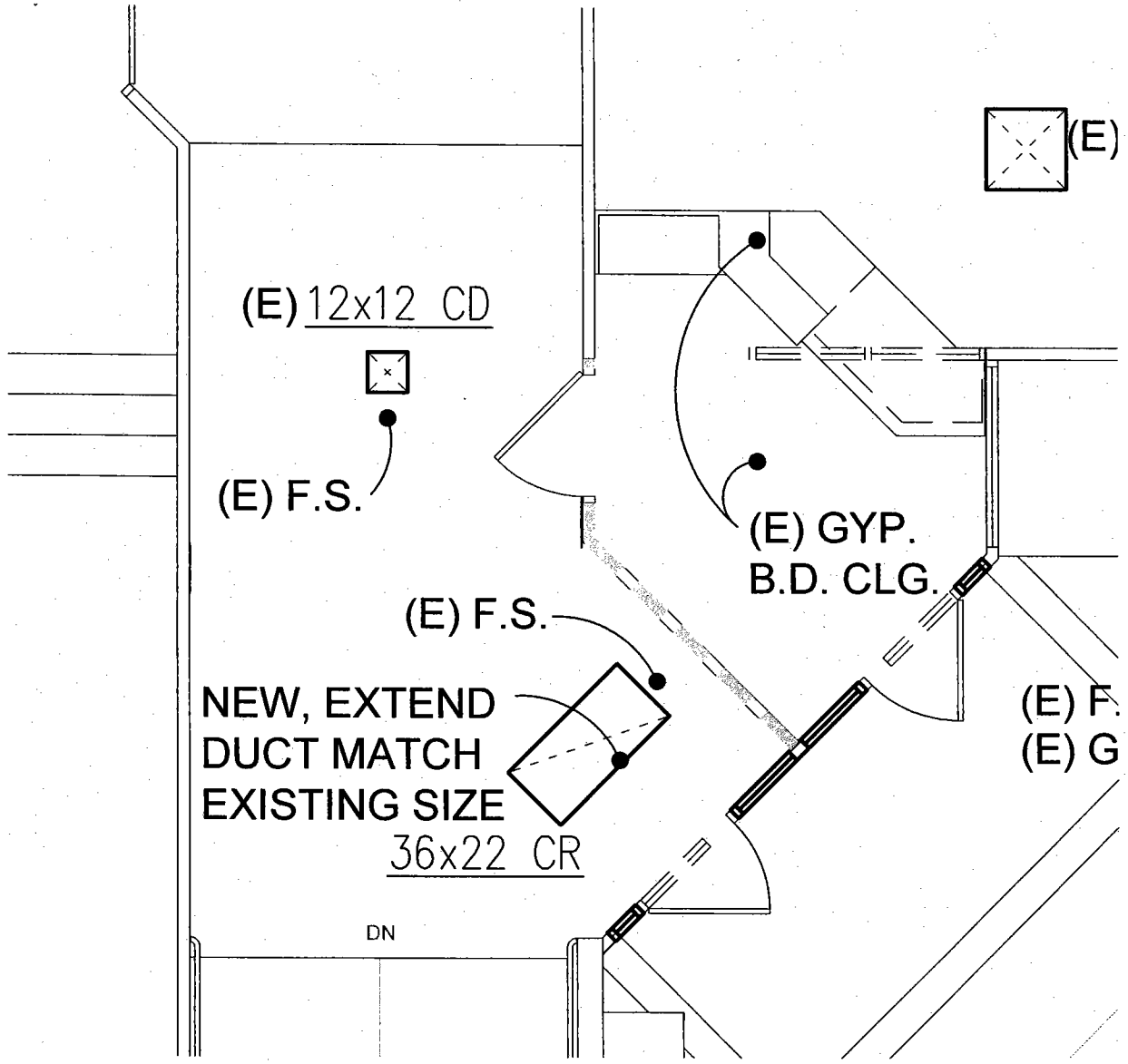
CHRISTOPHER RICHARD TAYLOR
NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No.	Date	Drawing No.
3137117	3/11/10	AD4M3



REGISTERED PROFESSIONAL ENGINEER
STEVEN M. JOHNSON
No. 33209
EXP. 9-30-2011
MECHANICAL
STATE OF CALIFORNIA

PARTIAL MECH. REMODEL PLAN SHEET M3.1

Detail No.	Ref. Dwg.	Scale
–	–	1/4" = 1'

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

Project Title
RAMONA-ALESSANDRO ELEMENTARY SCHOOL MODERNIZATION
670 RAMONA AVENUE, SAN BERNARDINO, CA 92411

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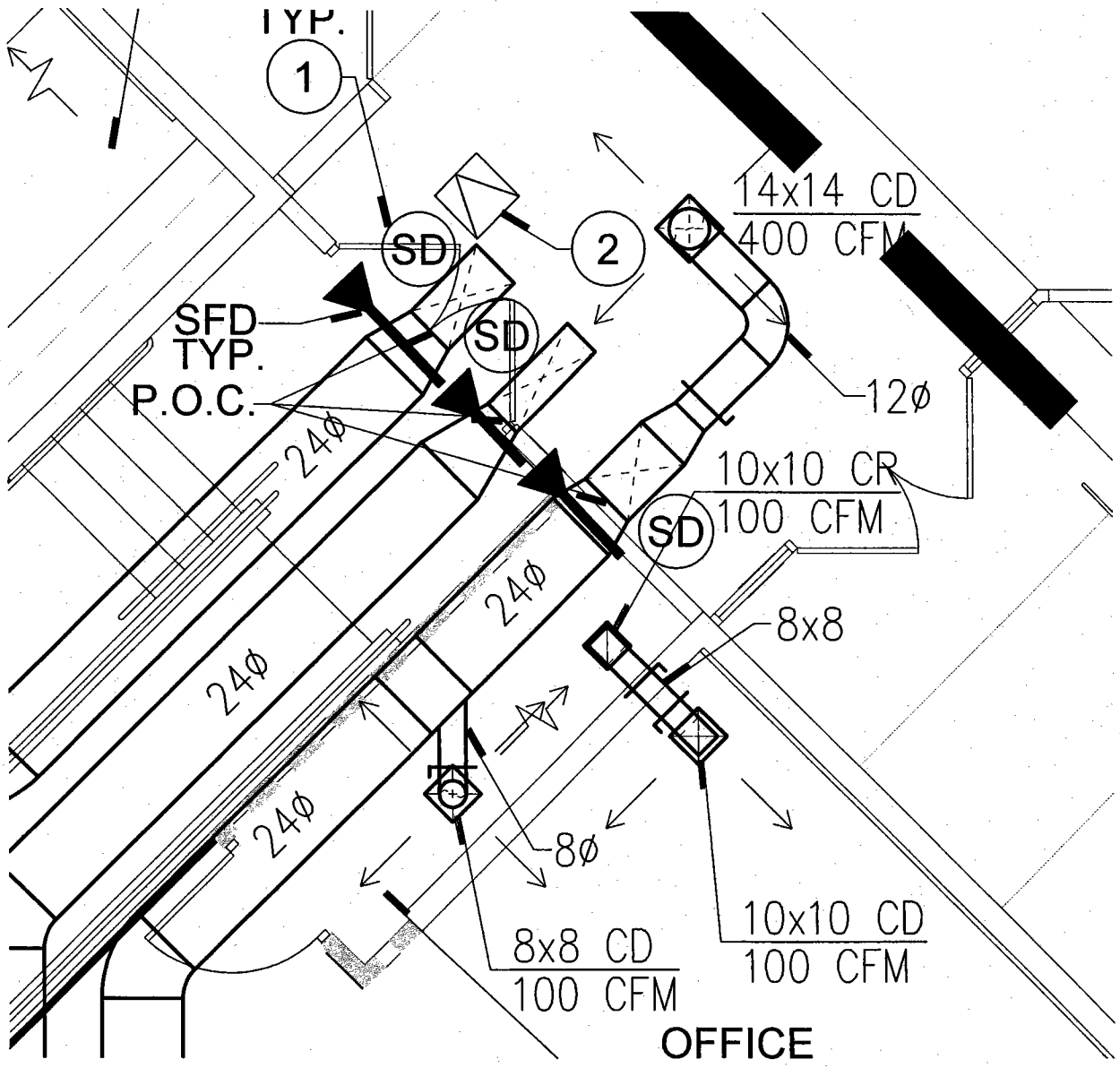
LICENSED ARCHITECT
CHRISTOPHER RICHARD TAYLOR
NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No.	Date	Drawing No.
3137117	3/11/10	AD4M4



REGISTERED PROFESSIONAL ENGINEER
STEVEN M. JOHNSON
No. 33209
EXP. 9-30-2011
MECHANICAL
STATE OF CALIFORNIA

PARTIAL MECH. REMODEL PLAN SHEET M3.1

Detail No.	Ref. Dwg.	Scale
–	–	1/4" = 1'

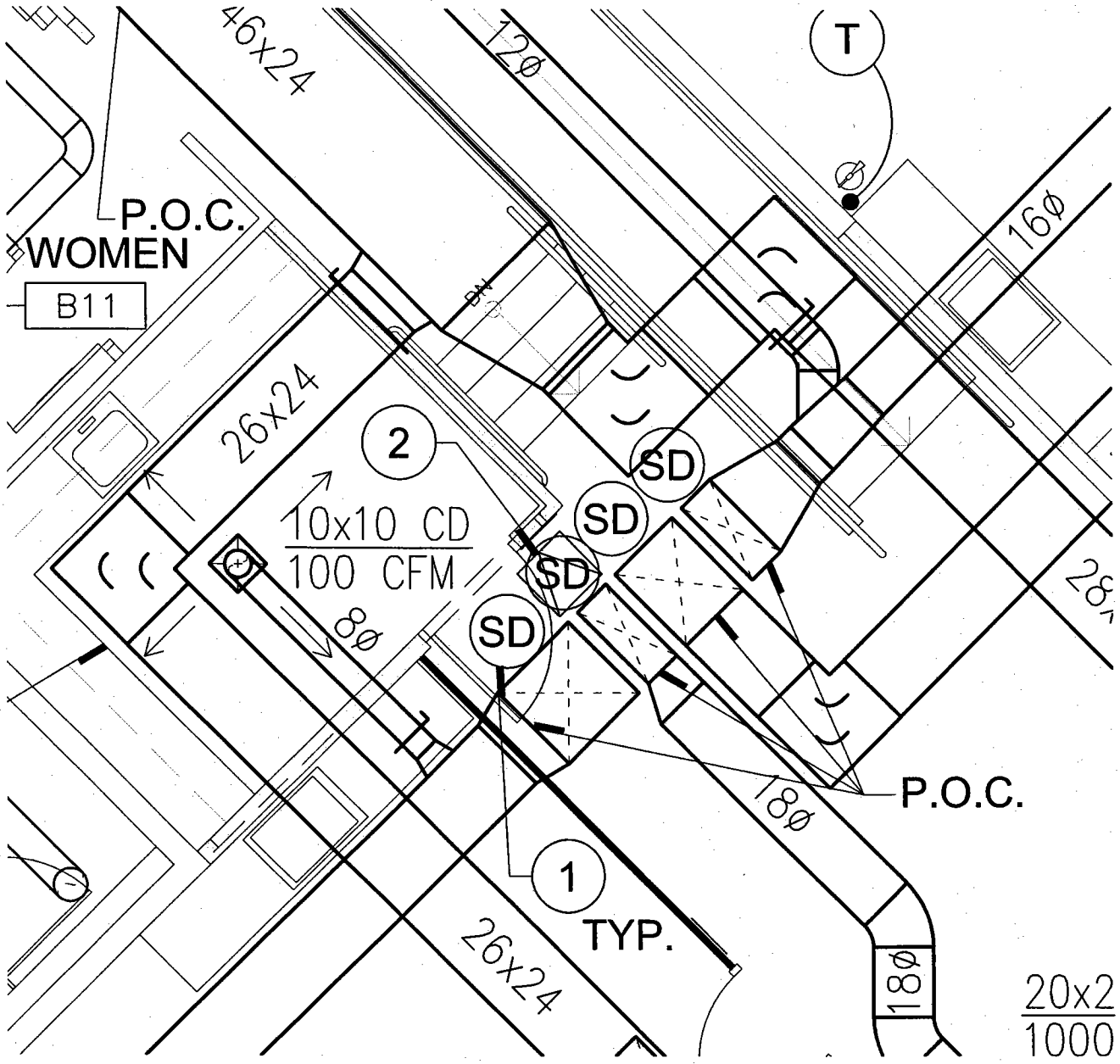
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT
777 NORTH "F" STREET
SAN BERNARDINO, CA. 92410

Project Title
RAMONA-ALESSANDRO ELEMENTARY SCHOOL MODERNIZATION
670 RAMONA AVENUE, SAN BERNARDINO, CA 92411

HMC

LICENSED ARCHITECT
CHRISTOPHER RICHARD TAYLOR
NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No.	3137117
Date	3/11/10
Drawing No.	AD4M5



REGISTERED PROFESSIONAL ENGINEER
STEVEN M. JOHNSON
No. 33209
EXP. 9-30-2011
MECHANICAL
STATE OF CALIFORNIA

PARTIAL MECH. REMODEL PLAN SHEET M3.2

Detail No.	Ref. Dwg.	Scale
–	–	1/4" = 1'

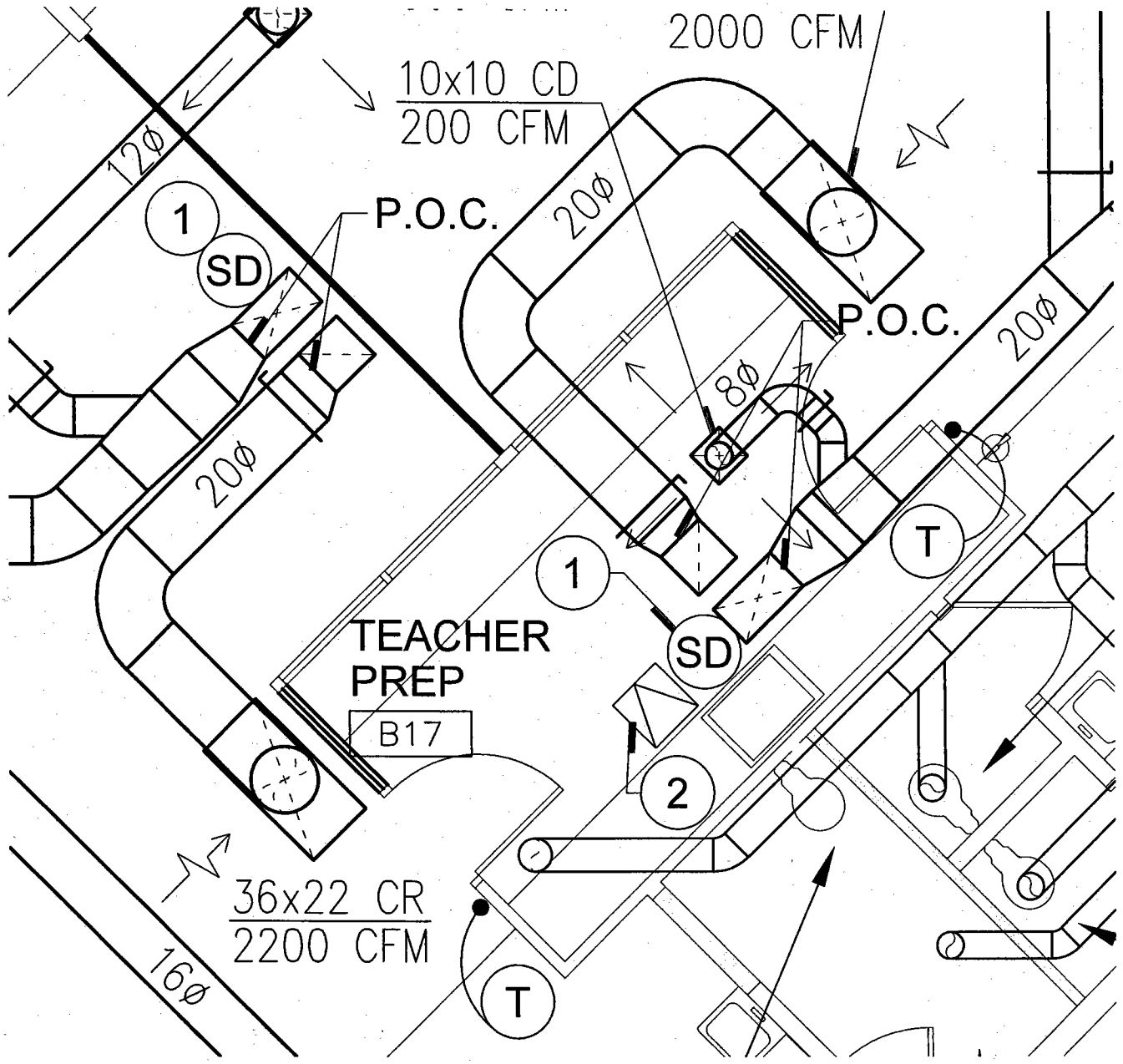
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT
777 NORTH "F" STREET
SAN BERNARDINO, CA. 92410

Project Title
RAMONA-ALESSANDRO ELEMENTARY SCHOOL MODERNIZATION
670 RAMONA AVENUE, SAN BERNARDINO, CA 92411

HMC

LICENSED ARCHITECT
CHRISTOPHER RICHARD TAYLOR
NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No.	Date	Drawing No.
3137117	3/11/10	AD4M6



REGISTERED PROFESSIONAL ENGINEER
STEVEN M. JOHNSON
No. 33209
EXP. 9-30-2011
MECHANICAL
STATE OF CALIFORNIA

PARTIAL MECH. REMODEL PLAN SHEET M3.2

Detail No.	Ref. Dwg.	Scale
–	–	1/4" = 1'

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

Project Title
RAMONA-ALESSANDRO ELEMENTARY SCHOOL MODERNIZATION
670 RAMONA AVENUE, SAN BERNARDINO, CA 92411

HMC

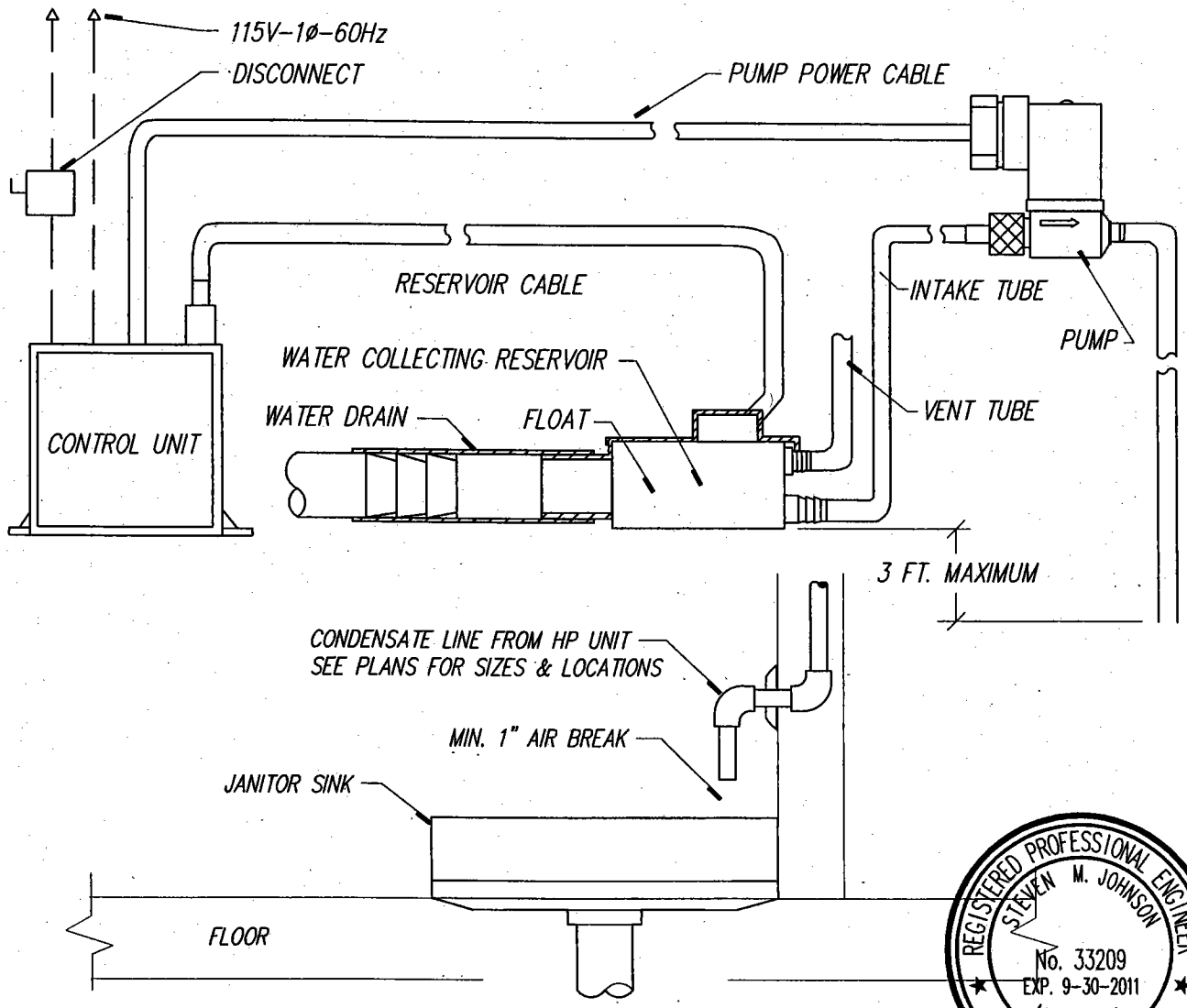
LICENSED ARCHITECT
CHRISTOPHER RICHARD TAYLOR
NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No.	Date	Drawing No.
3137117	3/11/10	AD4M7

CONDENSATE PUMP SCHEDULE

CP 1

MFR. & MODEL NO.:	LITTLE GIANT EC-250
CAPACITY:	1 GPH @ 39' TDH
RESERVOIR:	3.60" X 1.93" X 1.55"
ELECTRICAL:	115 V – 1ø – 60Hz, 0.24 AMPS, 20 WATTS
WEIGHT:	1:5 LBS.



REGISTERED PROFESSIONAL ENGINEER
STEVEN M. JOHNSON
No. 33209
EXP. 9-30-2011
MECHANICAL
STATE OF CALIFORNIA

CONDENSATE PUMP DETAIL

PLUMBING SCHEDULE & DETAIL

Detail No.	Ref. Dwg.	Scale
–	–	1/4" = 1'

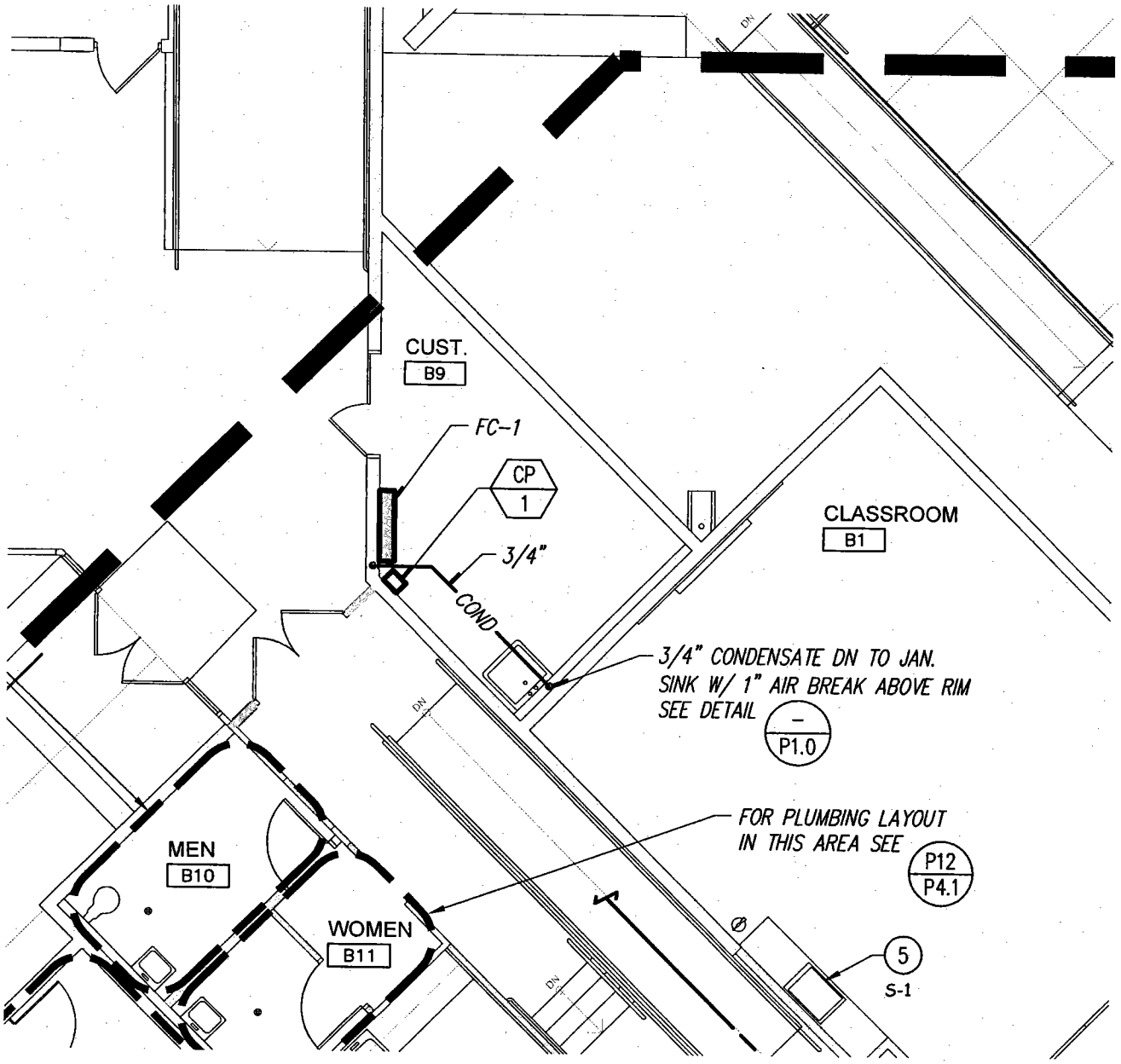
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT
777 NORTH "F" STREET
SAN BERNARDINO, CA. 92410

Project Title
RAMONA-ALESSANDRO ELEMENTARY SCHOOL MODERNIZATION
670 RAMONA AVENUE, SAN BERNARDINO, CA 92411

HMC

LICENSED ARCHITECT
CHRISTOPHER RICHARD TAYLOR
NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No.	3137117
Date	3/11/10
Drawing No.	AD4P1



REGISTERED PROFESSIONAL ENGINEER
STEVEN M. JOHNSON
No. 33209
EXP. 9-30-2011
MECHANICAL
STATE OF CALIFORNIA

PARTIAL PLUMBING FLOOR PLAN - SHEET P3.2

Detail No.	Ref. Dwg.	Scale
–	–	1/4" = 1'

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

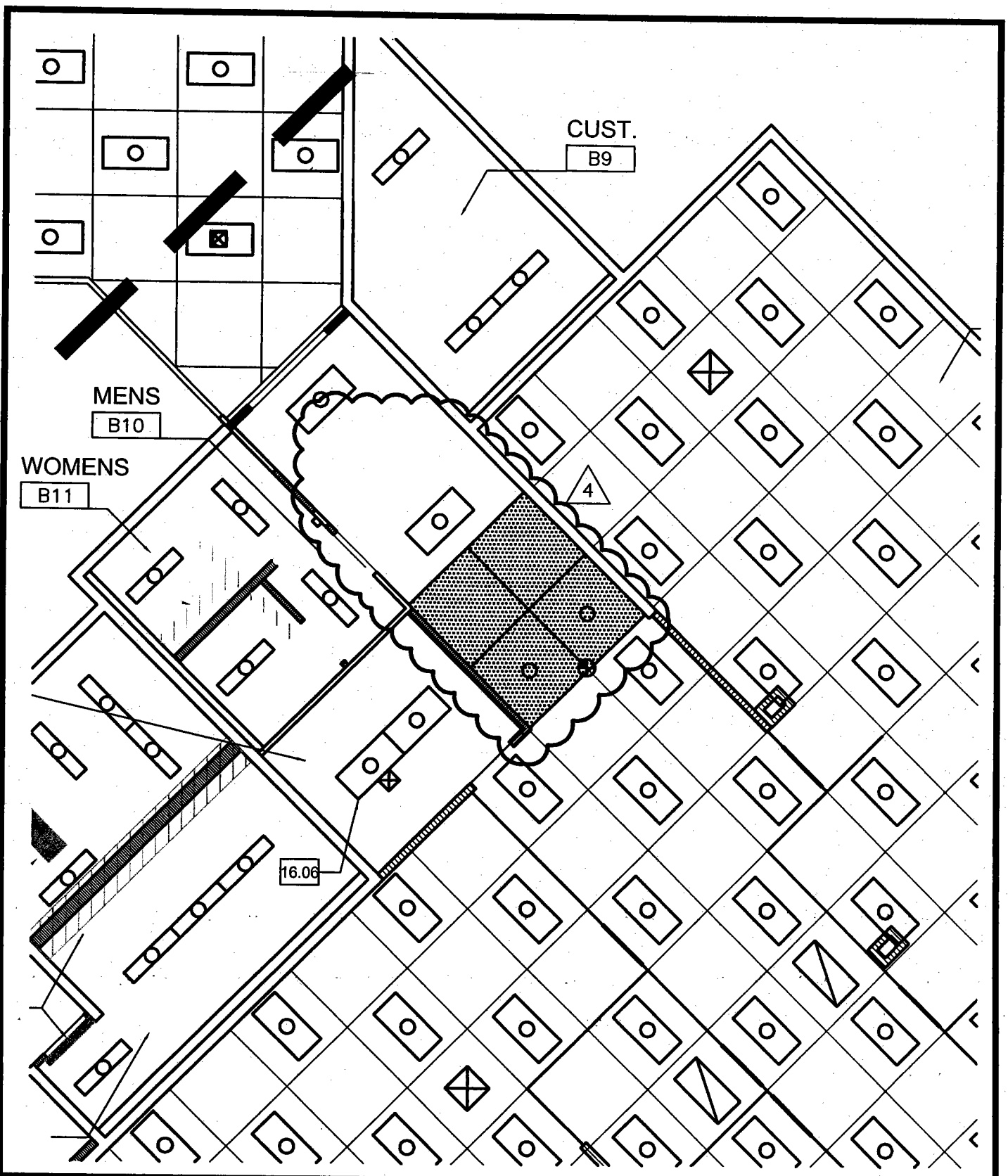
Project Title
RAMONA-ALESSANDRO ELEMENTARY SCHOOL MODERNIZATION
670 RAMONA AVENUE, SAN BERNARDINO, CA 92411

HMC

LICENSED ARCHITECT
CHRISTOPHER RICHARD TAYLOR
NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No.	3137117
Date	3/11/10
Drawing No.	AD4P2

Mar 07, 2010 - 4:01pm



AB2.2 - REFLECTED CEILING REMODEL PLAN

Detail No.	Ref. Dwg.	Scale
–	AB2.2	1/8"=1'-0"

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

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RAMONA-ALESSANDRO E.S.

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NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No.	Date	Drawing No.
3137117	3/11/10	AD-4.02

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Mar 08, 2010 - 8:24am

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4

KEYNOTES

DEMOLITION KEYNOTES

E

1.53 DEMOLITION KEYNOTE SYMBOL

1.10 REMOVE DOOR AND FRAME
1.11 REMOVE (E) CONCRETE AND/OR ASPHALT PAVING PER DETAIL C2/A9.1 AND PER DOOR SCHEDULE
1.12 REMOVE DOOR AND STOREFRONT GLAZING SYSTEM. RETAIN DOOR FOR REINSTALLATION PURPOSES. SEE REMODEL PLAN.
1.13 REMOVE WALL COMPLETELY
1.14 REMOVE PORTION OF WALL, FRAME OPENING FOR DOOR AND FRAME PER DETAIL A5 & A6/A9.2 & A6, B6, C6/A9.4
1.25 REMOVE VINYL COMPOSITION TILE AND BASE
1.26 REMOVE CARPET AND BASE
1.27 REMOVE CASEWORK
1.28 REMOVE PORTION OF EXISTING CASEWORK AND SINK
1.29 REMOVE CASEWORK AND SINK, SEE A6/A5.1 FOR NEW/EXISTING CASEWORK SIZING.
1.52 REMOVE DRINKING FOUNTAIN
1.53 REMOVE DOOR HARDWARE, PREP. DOOR FOR NEW HARDWARE
1.57 REMOVE AND RELOCATE (E) FIRE EXTINGUISHER
1.59 REMOVE (E) WALL-MOUNTED MARKER BOARD AND ACCESSORIES, RETURN TO DISTRICT

DEMOLITION LEGEND

DA2.3 - KEYNOTES	Detail No.	Ref. Dwg.	Scale
	–	DA2.3	1"=1'-0"

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT
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CHRISTOPHER RICHARD TAYLOR
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REN. 02-24-11
STATE OF CALIFORNIA

Project No. 3137117
Date 3/11/10
Drawing No. AD-4.04

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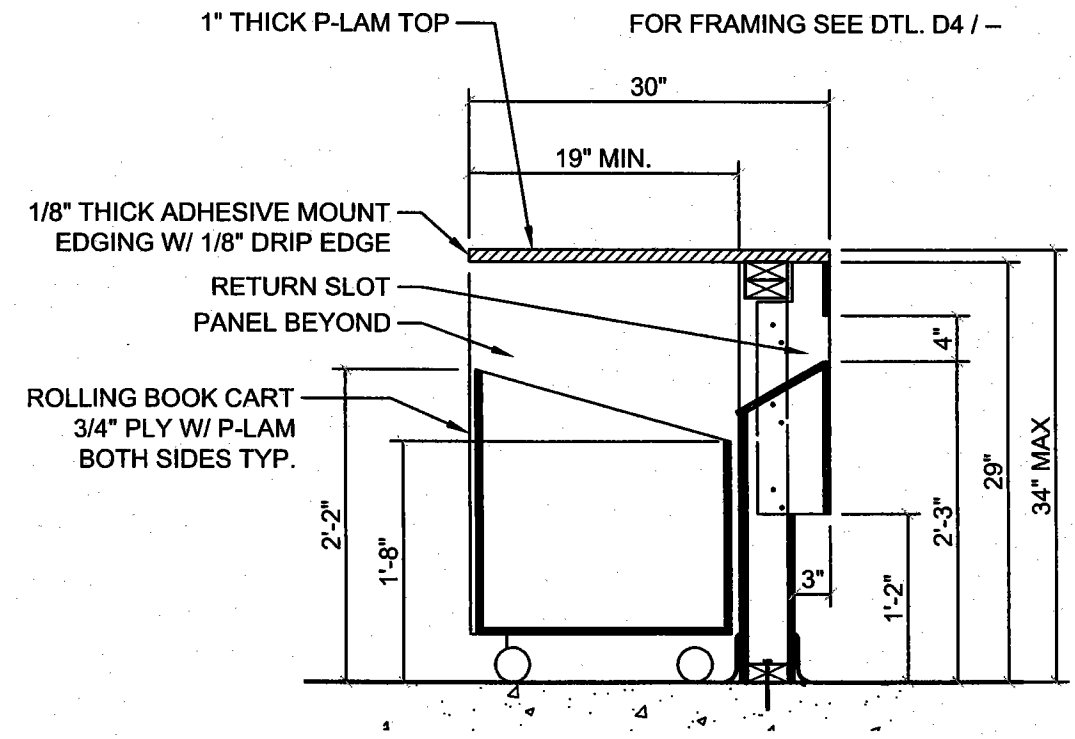

BOOK CART AND DROP AT LIBRARY

Detail No.	Ref. Dwg.	Scale
A1	A9.4	3/4"=1'-0"

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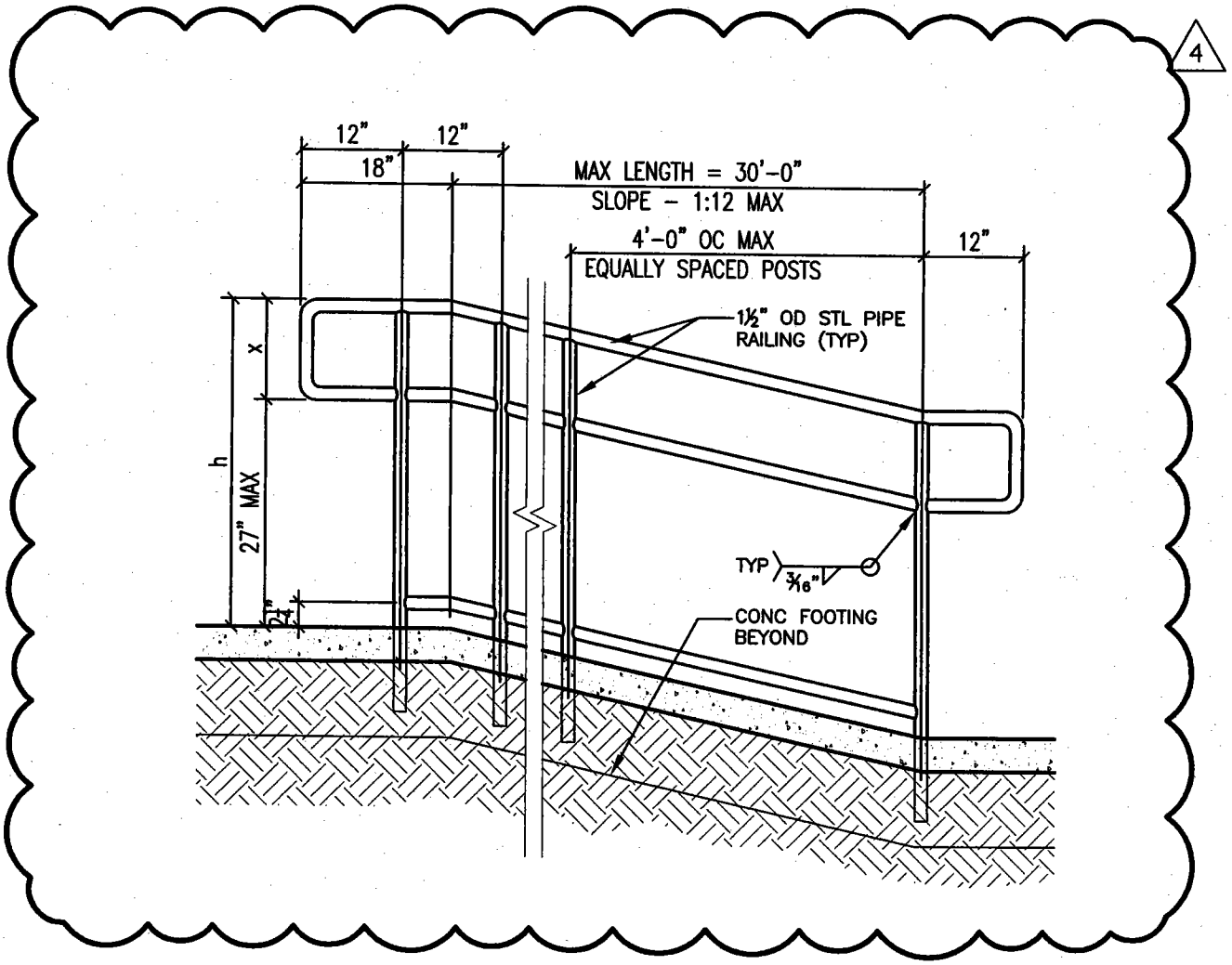
Project No.	Date	Drawing No.
3137117	3/11/10	AD-4.09



HANDRAIL / RAILING AT RAMP

Detail No.	Ref. Dwg.	Scale
E1	A9.1	3/4"=1'-0"

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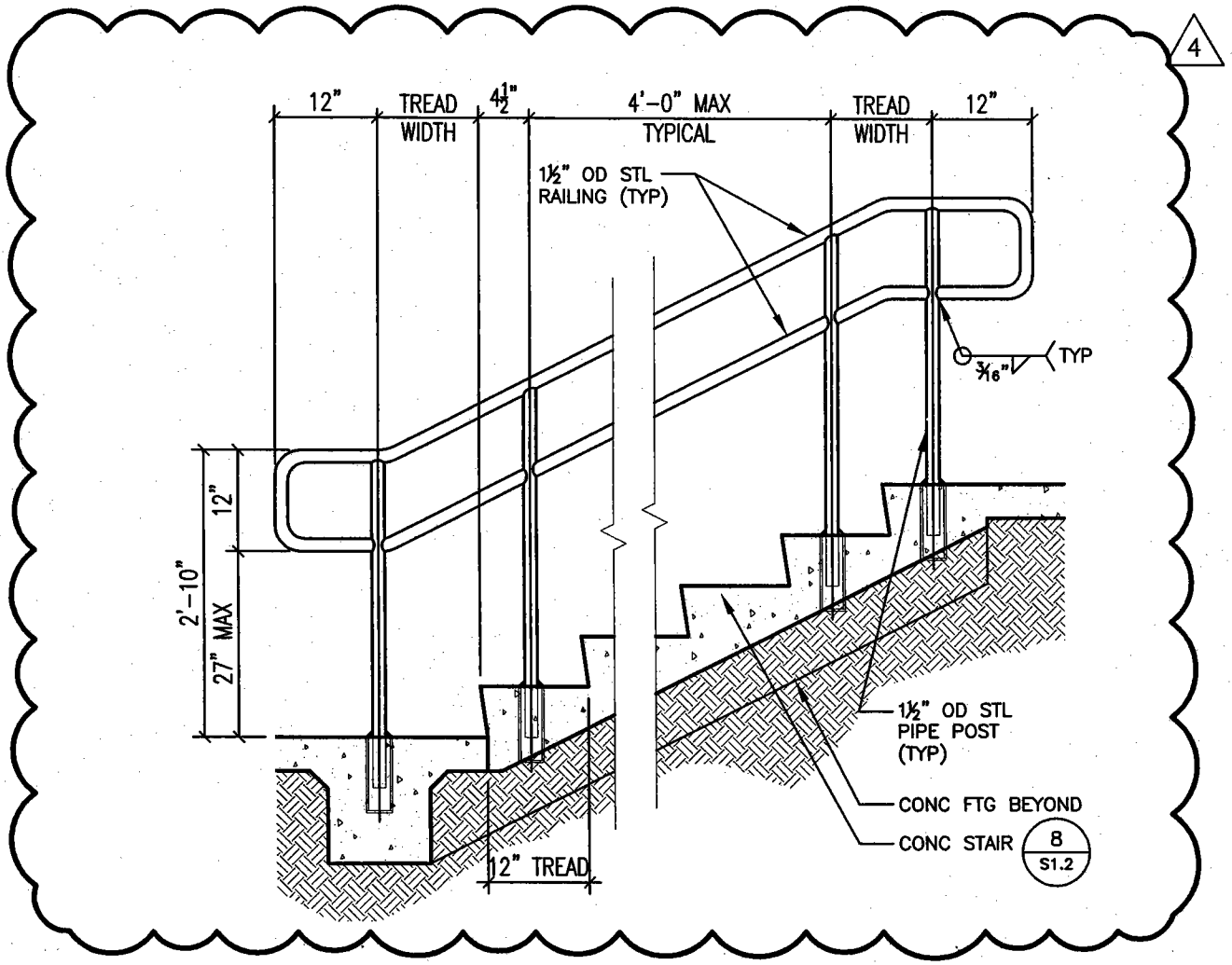
Project No.	Date	Drawing No.
3137117	3/11/10	AD-4.10



HANDRAIL / RAILING AT STAIR

Detail No.	Ref. Dwg.	Scale
E4	A9.4	1/2"=1'-0"

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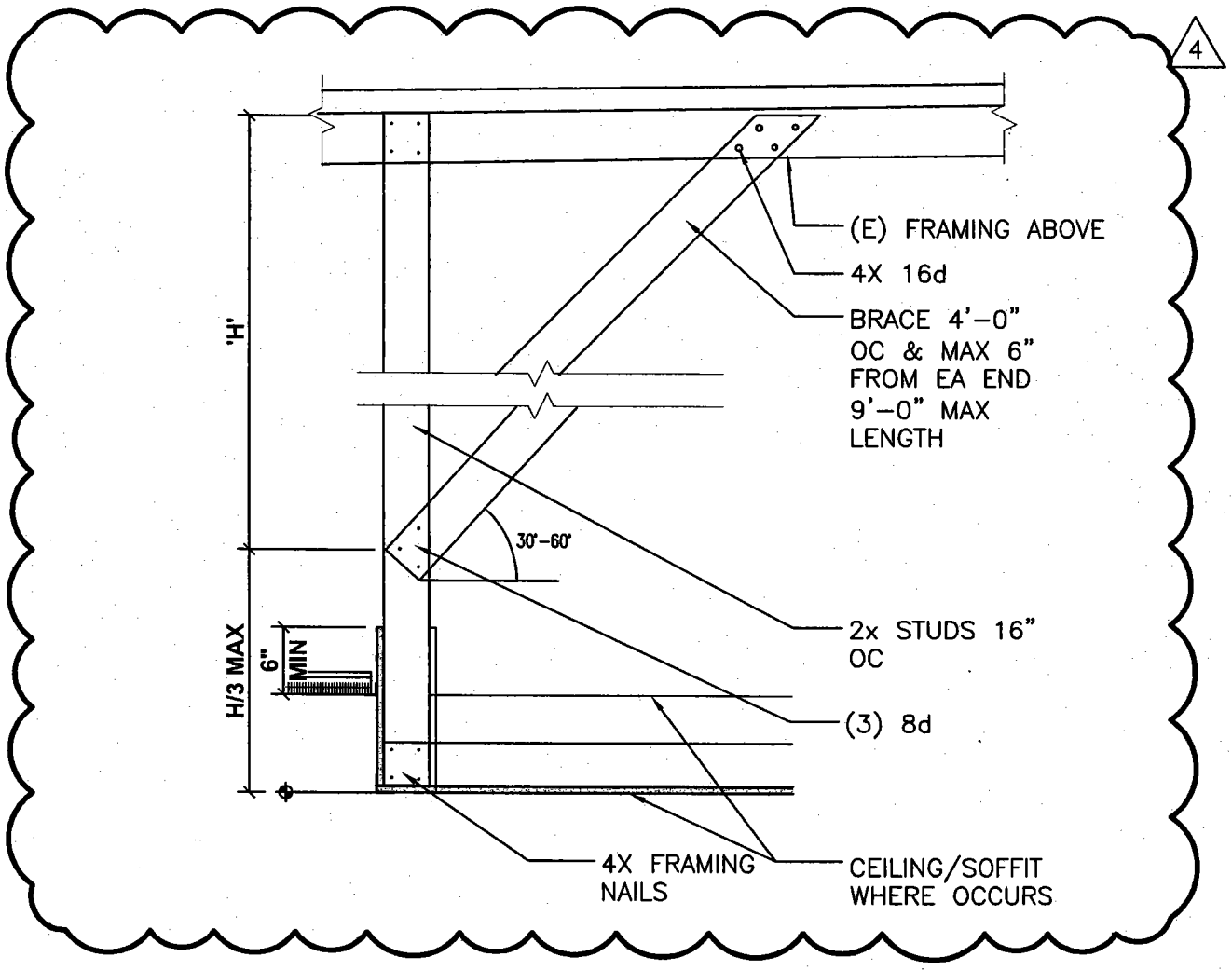
Project No.	Date	Drawing No.
3137117	3/11/10	AD-4.11



SOFFIT FRAMING

Detail No.	Ref. Dwg.	Scale
A3	A9.3	3/4"=1'-0"

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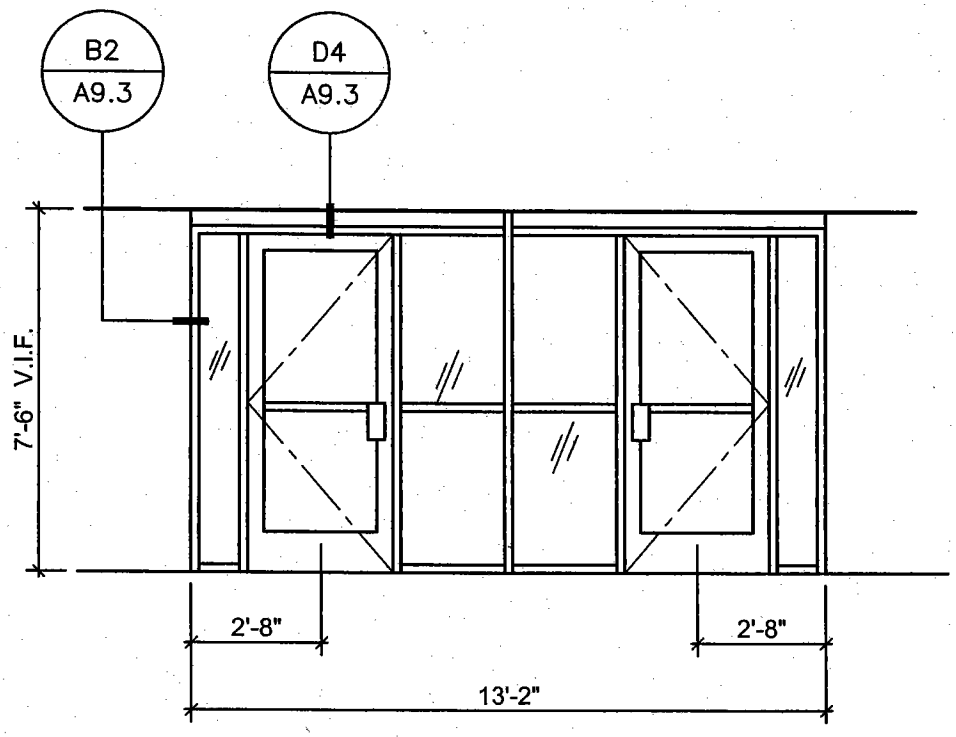
Project No.	Date	Drawing No.
3137117	3/11/10	AD-4.12

4



NOTE:

1. PROVIDE NEW ALUMINUM STOREFRONT AT ENTRY. COORDINATE WITH DOOR SCHEDULE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD PRIOR TO FABRICATION / INSTALLATION.
3. ALL GLAZING TO BE TEMPERED.

ALUMINUM STOREFRONT AT ENTRY

Detail No.	Ref. Dwg.	Scale
B6	A4.5	1/4"=1'-0"

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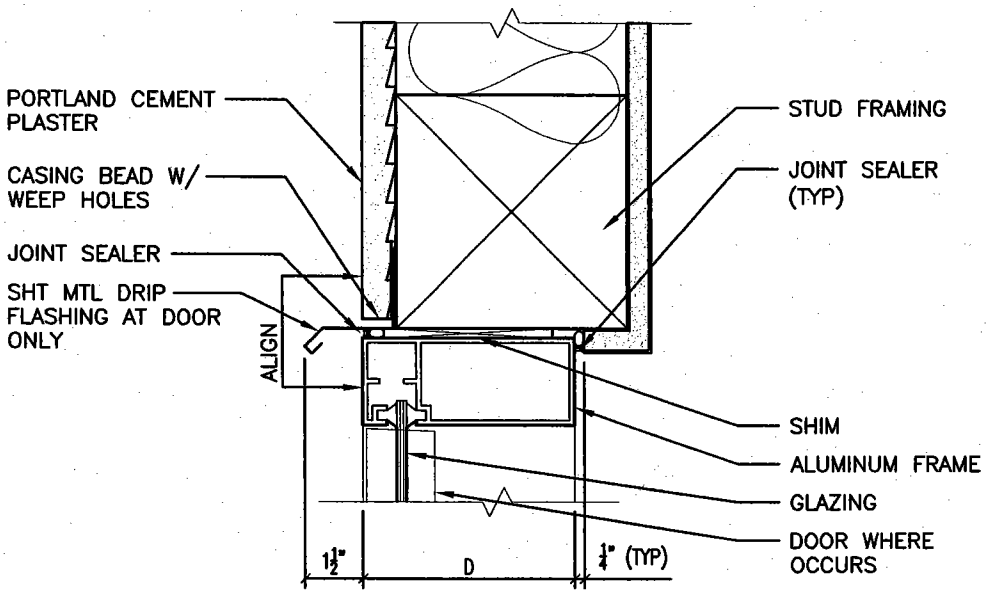
Project No.	Date	Drawing No.
3137117	3/11/10	AD-4.14

4



ALUMINUM FRAME HEAD AT EXT. PLASTER

Detail No.	Ref. Dwg.	Scale
D4	A9.3	N.T.S.

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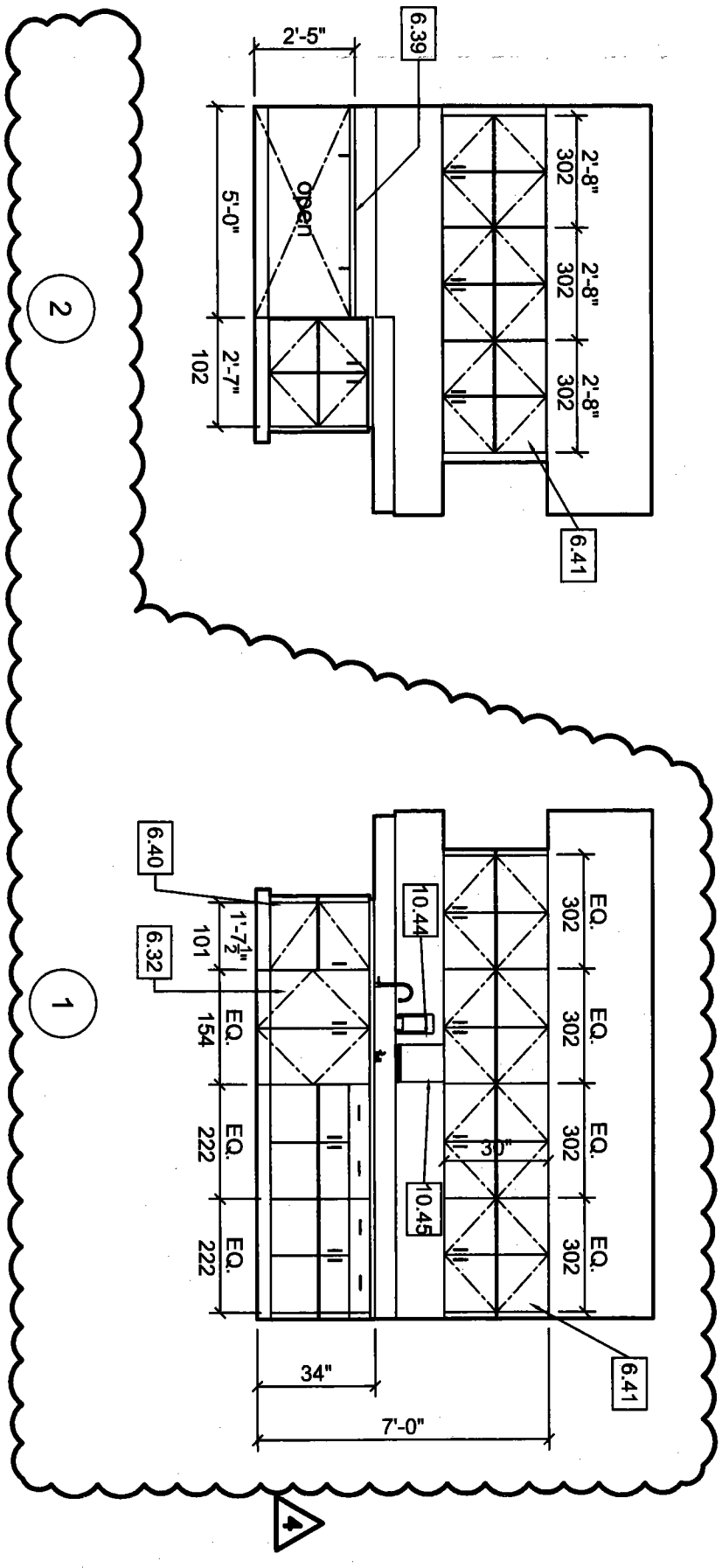
Project No.	Date	Drawing No.
3137117	3/11/10	AD-4.15



Drawing No. AD-4.01	Date 3/11/10	Project No. 3137117	TEACHERS PREP. ROOM B12	Detail No. E3	Ref. Dwg. A5.2	Scale 1/4"=1'-0"

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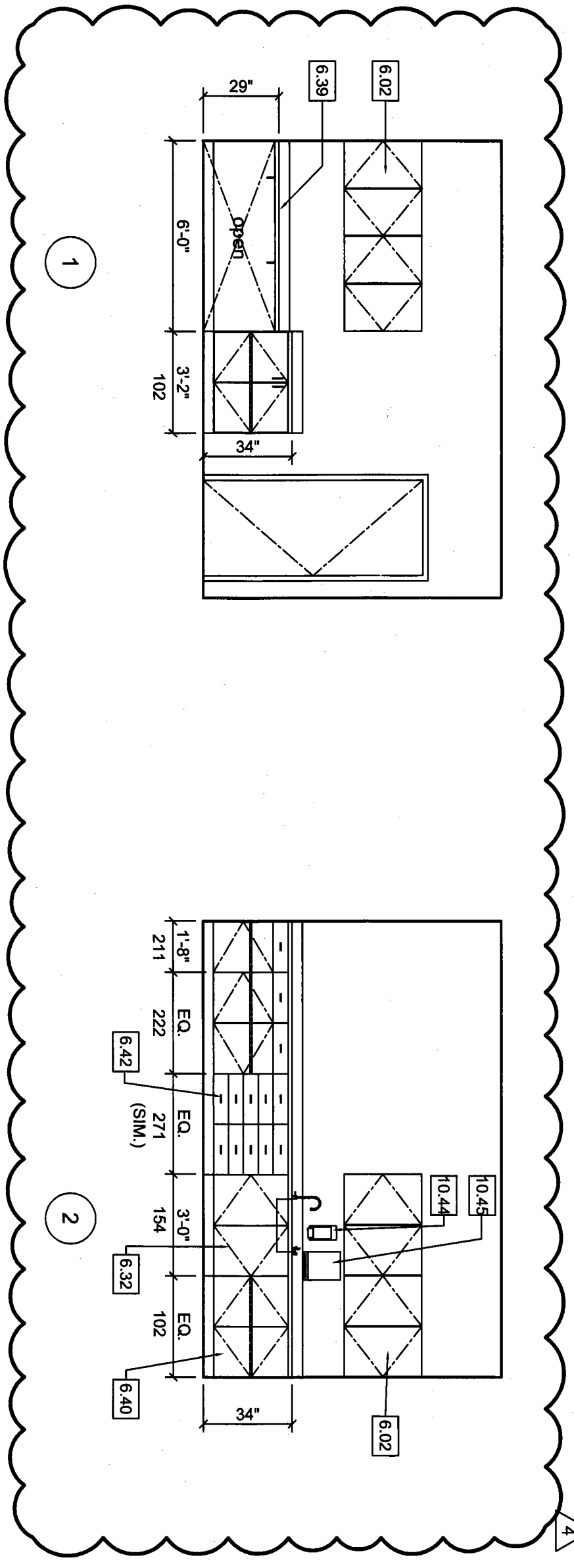

Drawing No. AD-4.03	Date 3/11/10	Project No. 3137117	TEACHERS PREP. ROOM C9	Detail No. B3	Ref. Dwg. A5.2	Scale 1/4"=1'-0"

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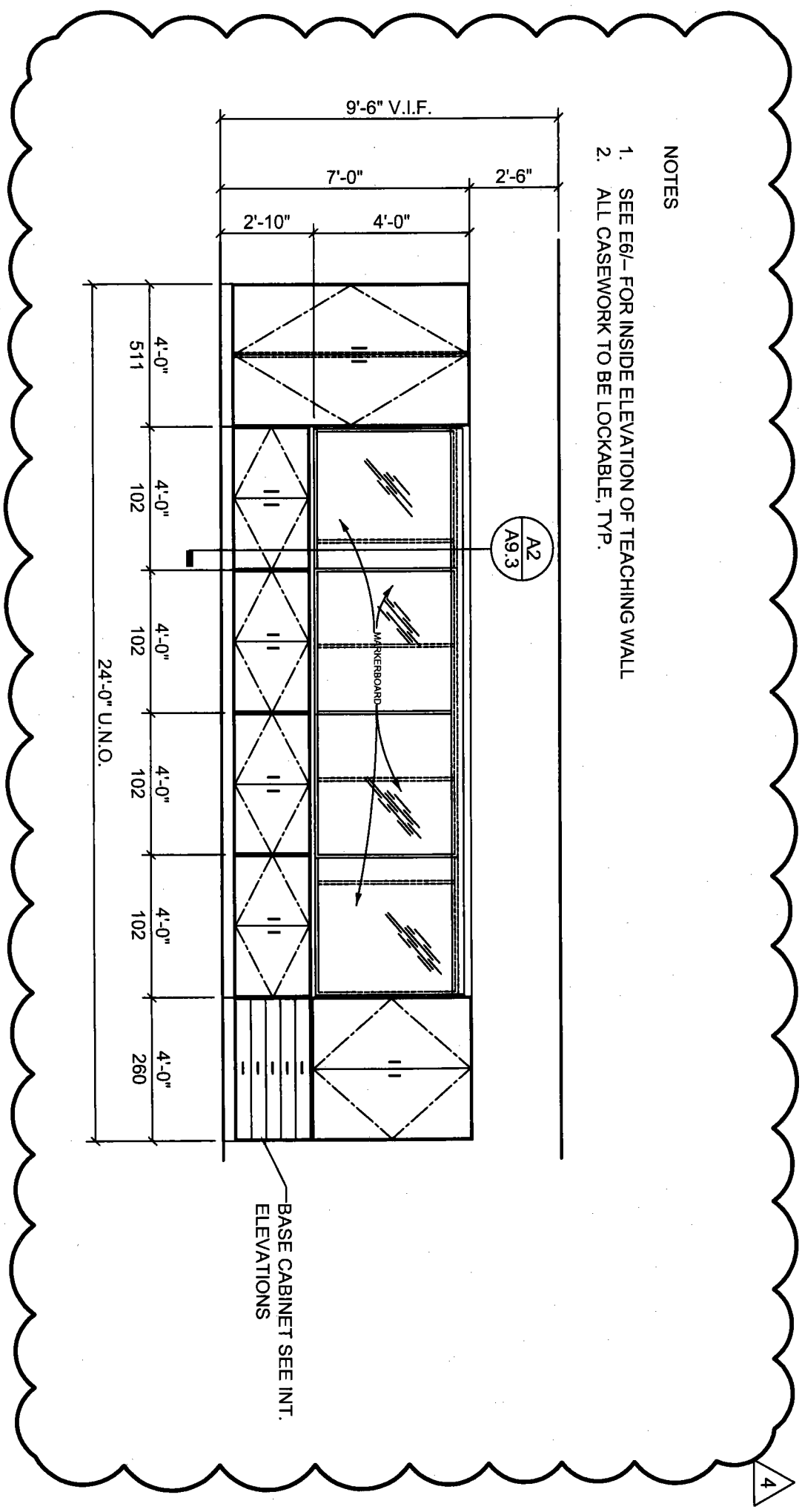

NOTES

1. SEE E6/– FOR INSIDE ELEVATION OF TEACHING WALL
2. ALL CASEWORK TO BE LOCKABLE, TYP.

TEACHING WALL

Detail No.	Ref. Dwg.	Scale
E4	A5.3	1/4"=1'-0"

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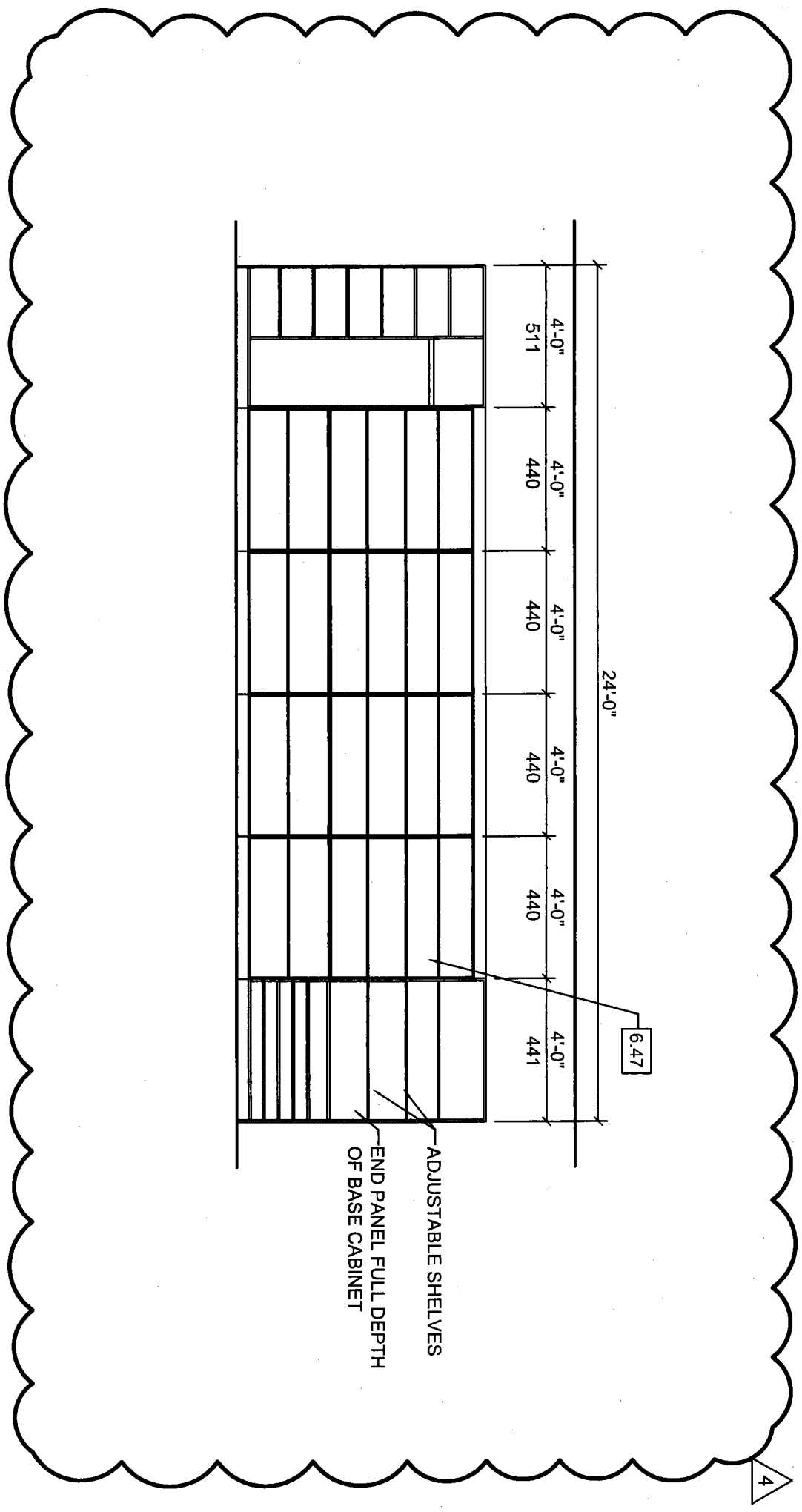
Drawing No. AD-4.06
Date 3/11/10
Project No. 3137117



TEACHING WALL INT. ELEVATION

Detail No.	Ref. Dwg.	Scale
E6	A5.3	1/4"=1'-0"

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REN. 02-24-11
STATE OF CALIFORNIA
NO. C-19759

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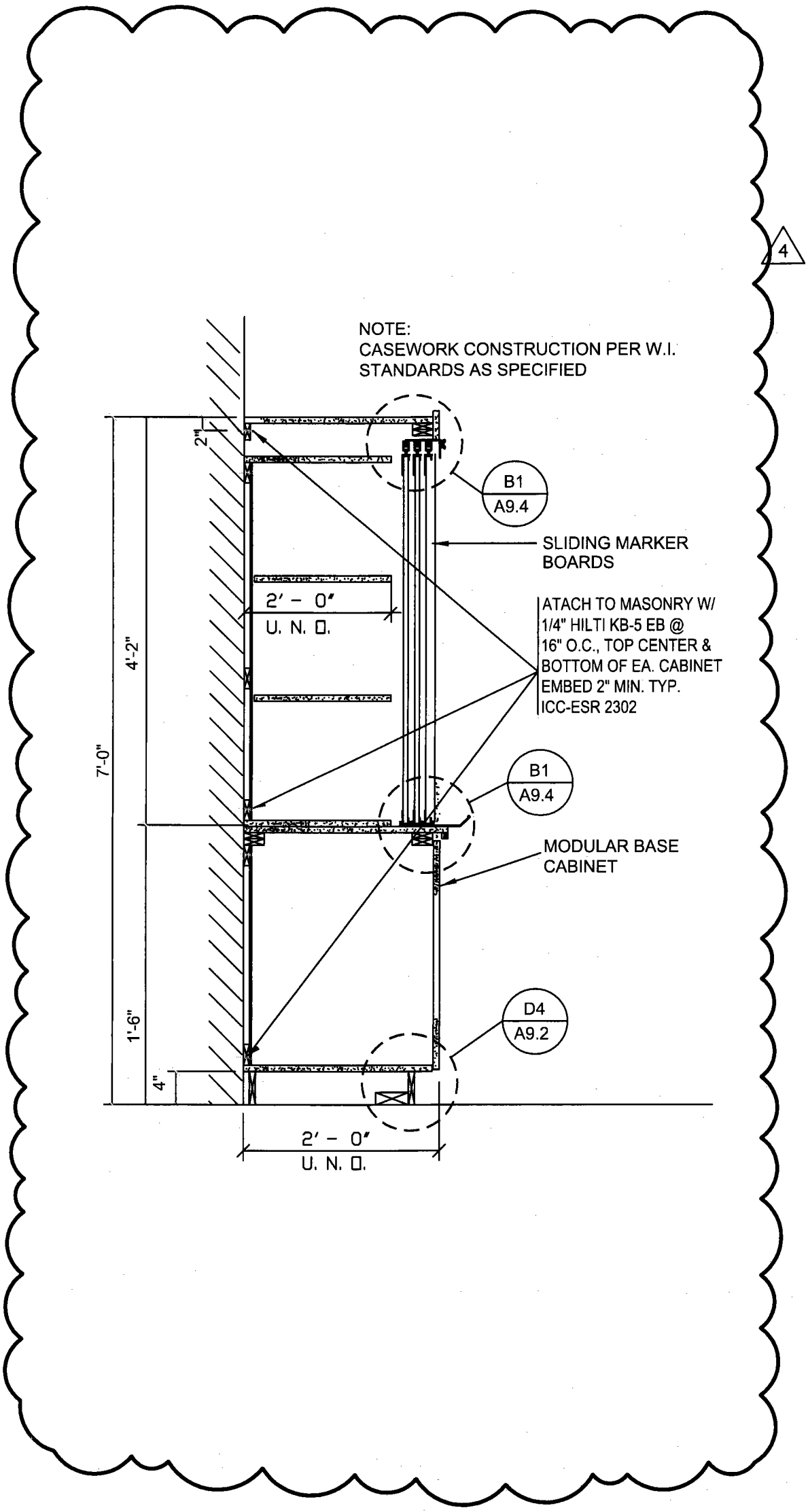
UNIFIED SCHOOL DISTRICT

Project No. 3137117
Date 3/11/10
Drawing No. AD-4.07



SECTION AT TEACHING WALL

Detail No.	Ref. Dwg.	Scale
A2	A9.3	1/2"=1'-0"

Project Title
SAN BERNARDINO CITY
UNIFIED SCHOOL DISTRICT
RAMONA-ALESSANDRO E.S.

Drawing No. AD-4.08
Date 3/11/10
Project No. 3137117

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

8 9 10 11 12 13 4 14

DOOR SCHEDULE

DOOR NO.	DOOR OPENING	DOOR TYPE	DOOR MATERIAL	DOOR/FRAME FINISH	COLOR	GLAZING	FIRE RATING MINUTES	FRAME TYPE	FRAME MATERIAL	HARDWARE	DETAILS HEAD	DETAILS JAMB STRIKE	DETAILS JAMB HINGE	DETAILS THRESHOLD	PANIC HARDWARE	SIGNAGE	REMARKS
M100	6'–0"x7'–0"	(E)	(E)	–	–	–	–	(E)	(E)	(E)	–	–	–	–	(E)	–	PROVIDE 90° SWING INHIBITOR AT SIGNAGE
M117	6'–0"x7'–0"	(E)	(E)	–	–	–	–	(E)	(E)	(E)	–	–	–	–	(E)	–	PROVIDE 90° SWING INHIBITOR AT SIGNAGE
M118	3'–0"x7'–0"	B	SC	P	–	TG	–	A	MP	16A	A17/A9.2	A17/A9.2	A17/A9.2	–	NA	E14/A9.2	
M118b	3'–0"x7'–0"	(E)	(E)	–	–	–	–	(E)	(E)	(E)	–	–	–	–	(E)	J14/A9.1	CONTRACTOR TO REMOVE (E) THRESHOLD
M119	3'–0"x7'–0"	B	SC	P	–	TG	–	A	MP	16A	A17/A9.2	A17/A9.2	A17/A9.2	J4/A9.2	NA	E14/A9.2	
M119b	3'–0"x7'–0"	(E)	(E)	–	–	–	–	(E)	(E)	(E)	–	–	–	–	(E)	J14/A9.1	CONTRACTOR TO REMOVE (E) THRESHOLD
M120	3'–0"x7'–0"	B	SC	P	–	TG	–	A	MP	16A	A17/A9.2	A17/A9.2	A17/A9.2	J4/A9.2	NA	E14/A9.2	
M120b	3'–0"x7'–0"	(E)	(E)	–	–	–	–	(E)	(E)	(E)	–	–	–	–	(E)	J14/A9.1	CONTRACTOR TO REMOVE (E) THRESHOLD
M121	3'–0"x7'–0"	B	SC	P	–	TG	–	A	MP	16A	A17/A9.2	A17/A9.2	A17/A9.2	J4/A9.2	NA	E14/A9.2	
M121b	3'–0"x7'–0"	(E)	(E)	–	–	–	–	(E)	(E)	(E)	–	–	–	–	(E)	J14/A9.1	CONTRACTOR TO REMOVE (E) THRESHOLD
M122	3'–0"x7'–0"	B	SC	P	–	TG	–	A	MP	16A	A17/A9.2	A17/A9.2	A17/A9.2	J4/A9.2	NA	E14/A9.2	
M122b	3'–0"x7'–0"	(E)	(E)	–	–	–	–	(E)	(E)	(E)	–	–	–	–	(E)	J14/A9.1	CONTRACTOR TO REMOVE (E) THRESHOLD
M123	3'–0"x7'–0"	B	SC	P	–	TG	–	A	MP	16A	A17/A9.2	A17/A9.2	A17/A9.2	J4/A9.2	NA	E14/A9.2	
M123b	3'–0"x7'–0"	(E)	(E)	–	–	–	–	(E)	(E)	(E)	–	–	–	–	(E)	J14/A9.1	CONTRACTOR TO REMOVE (E) THRESHOLD

NOTE:
1. DOOR RATING IS IN MINUTES

MAX. EFFORT TO OPERATE DOORS SHALL NOT EXCEED THE FOLLOWING:
INTERIOR DOORS – 5 POUNDS
EXTERIOR DOORS – 5 POUNDS
FIRE DOORS – 15 POUNDS
PER TITLE 24, PART 2, SEC. 1133B.2.5

BLD'G M

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GENERA

1. ALL EXIT FROM THE KEY OR A
2. POST SIGI "THIS DOC THE BUILI
3. FIRE RATE BY A TIGI CONTROL PROTECTI(DOOR SC THE DOOF APPROVEL THE MANU MATERIALS DOORS SI ACTIVATED OF SMOKI
4. BRAILLE SI CONTRACTE DOTS SHAI WITH 2/1(SHALL BE ABOVE THI
5. REFER TO UNDER–CU
6. FIELD VER
7. ALL FINISH AND TITLE
8. MOUNTING BE 30" TC T–24, SEC
9. ALL HARDV OF C.C.R., & 1008.1.
10. THRESHOLI SECT. 113
11. FLOOR ST(PATH OF (PER DSA
12. PANIC HAF

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SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

Detail No. –
Ref. Dwg. A8.1
Scale N.T.S.

DOOR SCHEDULE

Project Title
SAN BERNARDINO CITY
UNIFIED SCHOOL DISTRICT
BRADLEY E.S. DEFERRED MAINTENANCE

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Project No.
3137117

Date
3/11/10

Drawing No.
AD-4.16

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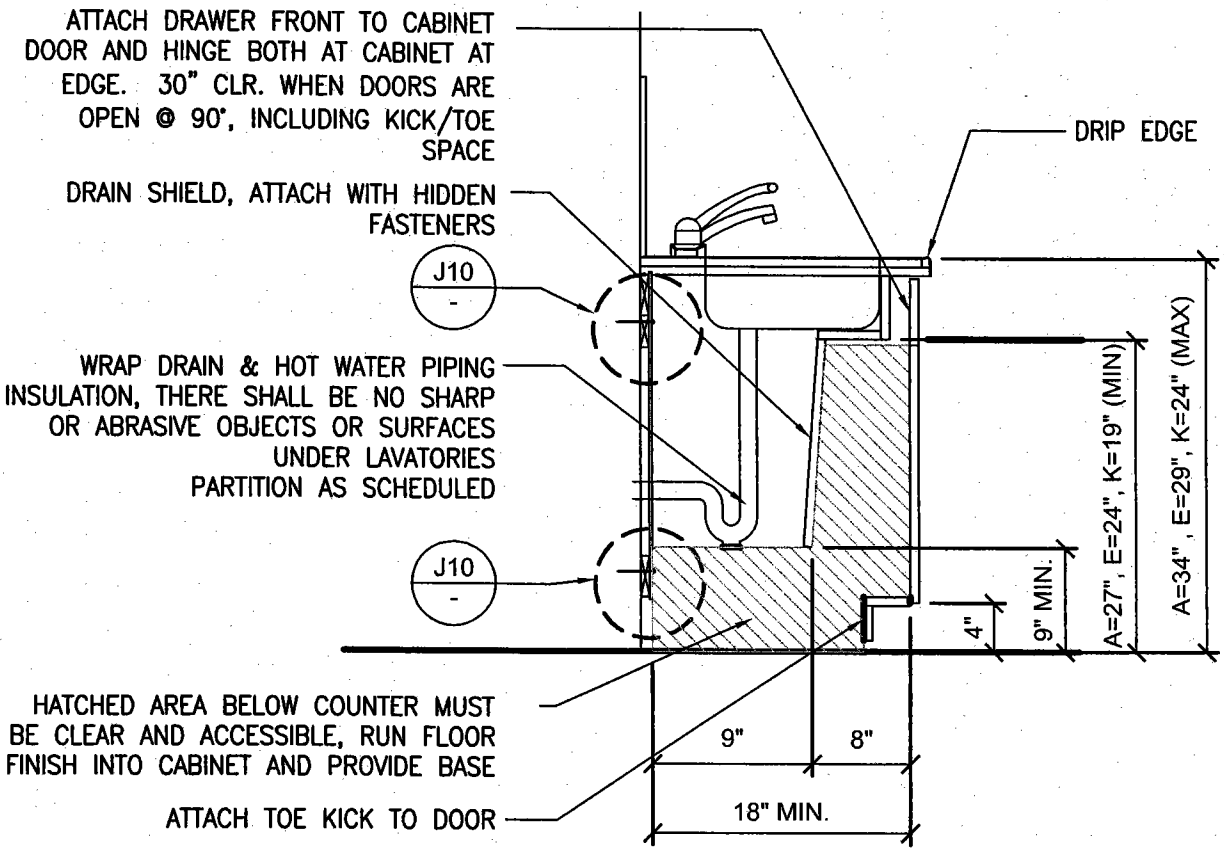

A = ADULT
E = ELEMENTARY
K = KINDERGARTEN AND PRESCHOOL

ACCESSIBLE SINK / CASEWORK

Detail No.	Ref. Dwg.	Scale
N4	A9.2	3/4"=1'-0"

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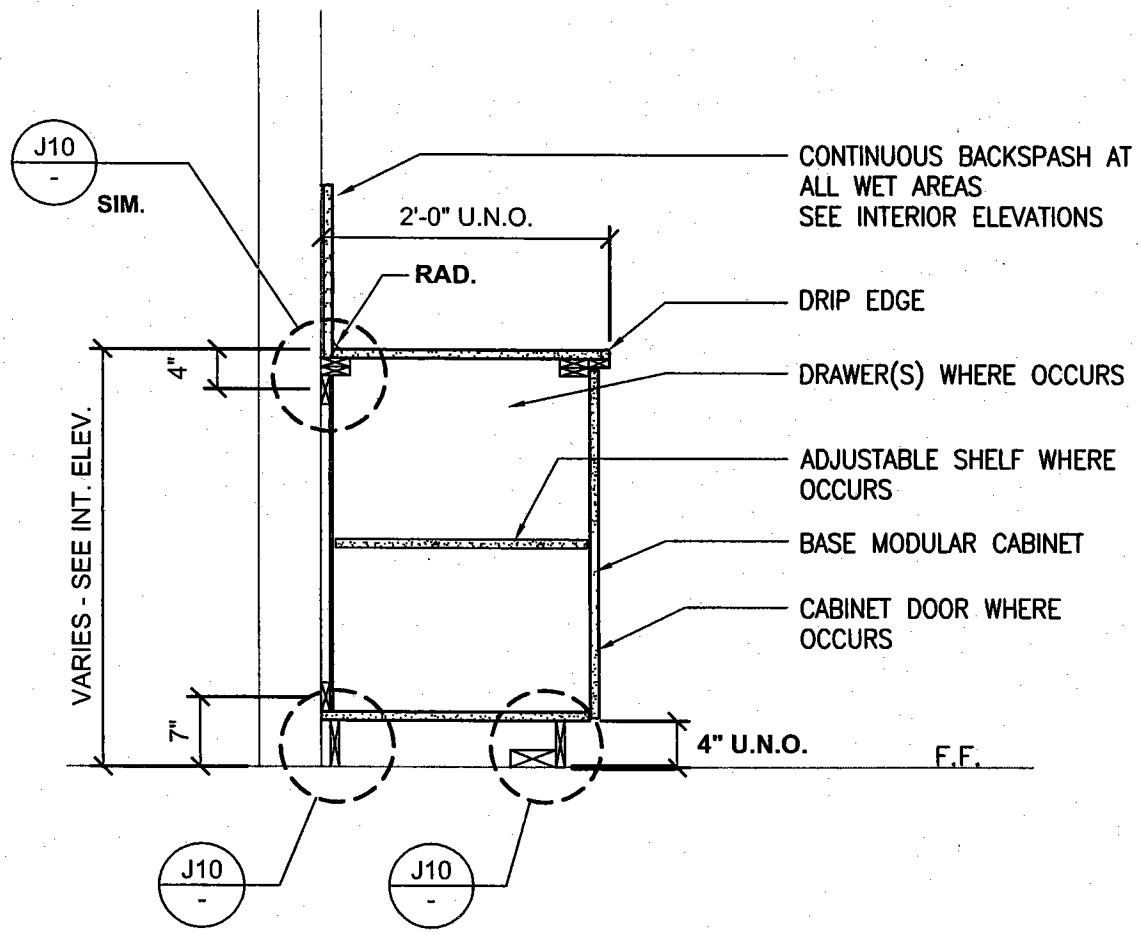
Project No.	Date	Drawing No.
3137206	3/11/10	AD-4.17

4



NOTES:

1. SEE INTERIOR ELEVATIONS FOR SPECIFIC BASE MODULAR CABINET ELEMENTS (SHELVES, DRAWERS, CABINET DOORS, ETC.)

BASE CABINET

Detail No.	Ref. Dwg.	Scale
N11	A9.2	3/4"=1'-0"

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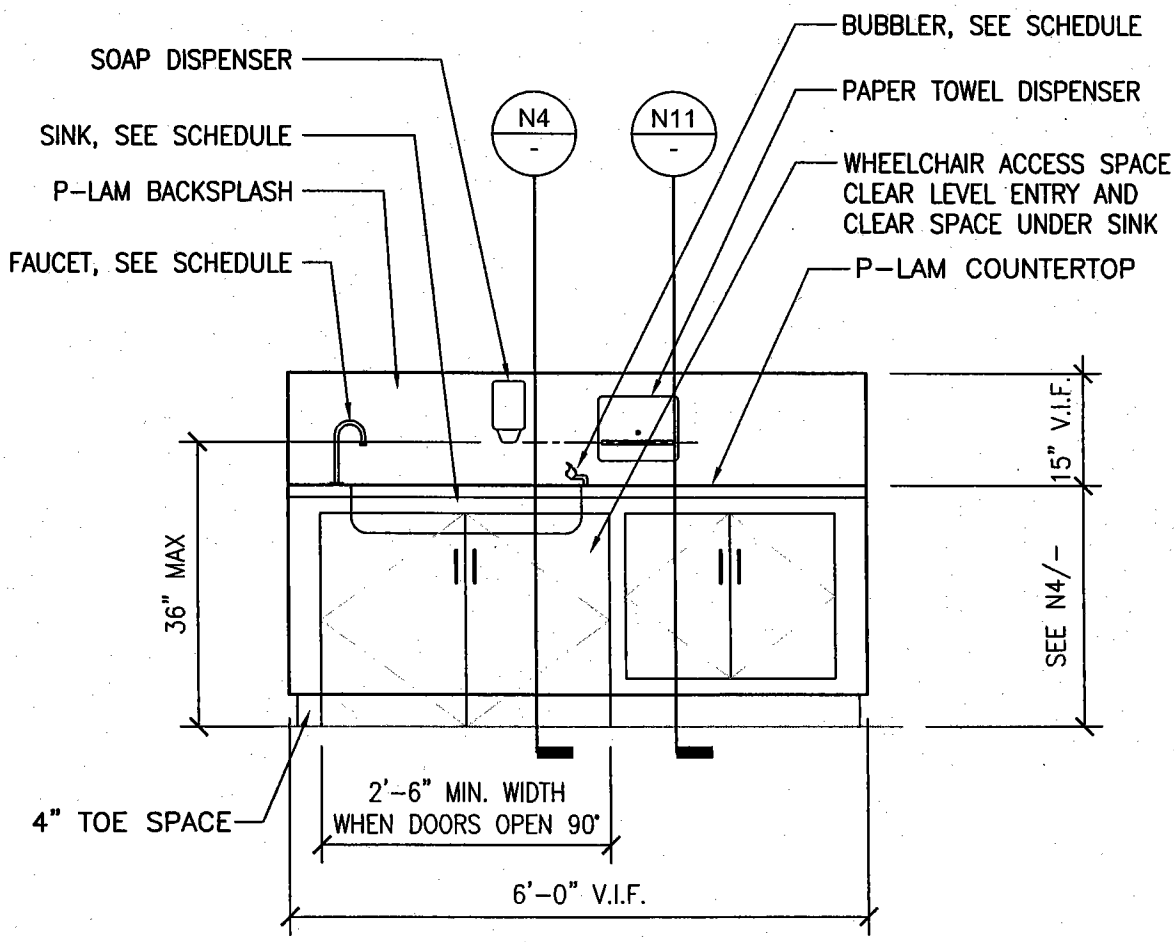
Project No.	Date	Drawing No.
3137206	3/11/10	AD-4.18

4



NOTE:
DIMENSION REFLECTS ADA STANDARDS FOR ELEMENTARY HEIGHTS

ACCESSIBLE SINK / CASEWORK INTERIOR ELEVATION

Detail No.	Ref. Dwg.	Scale
N7	A9.2	3/4"=1'-0"

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UNIFIED SCHOOL DISTRICT
BRADLEY E.S. DEFERRED MAINTENANCE

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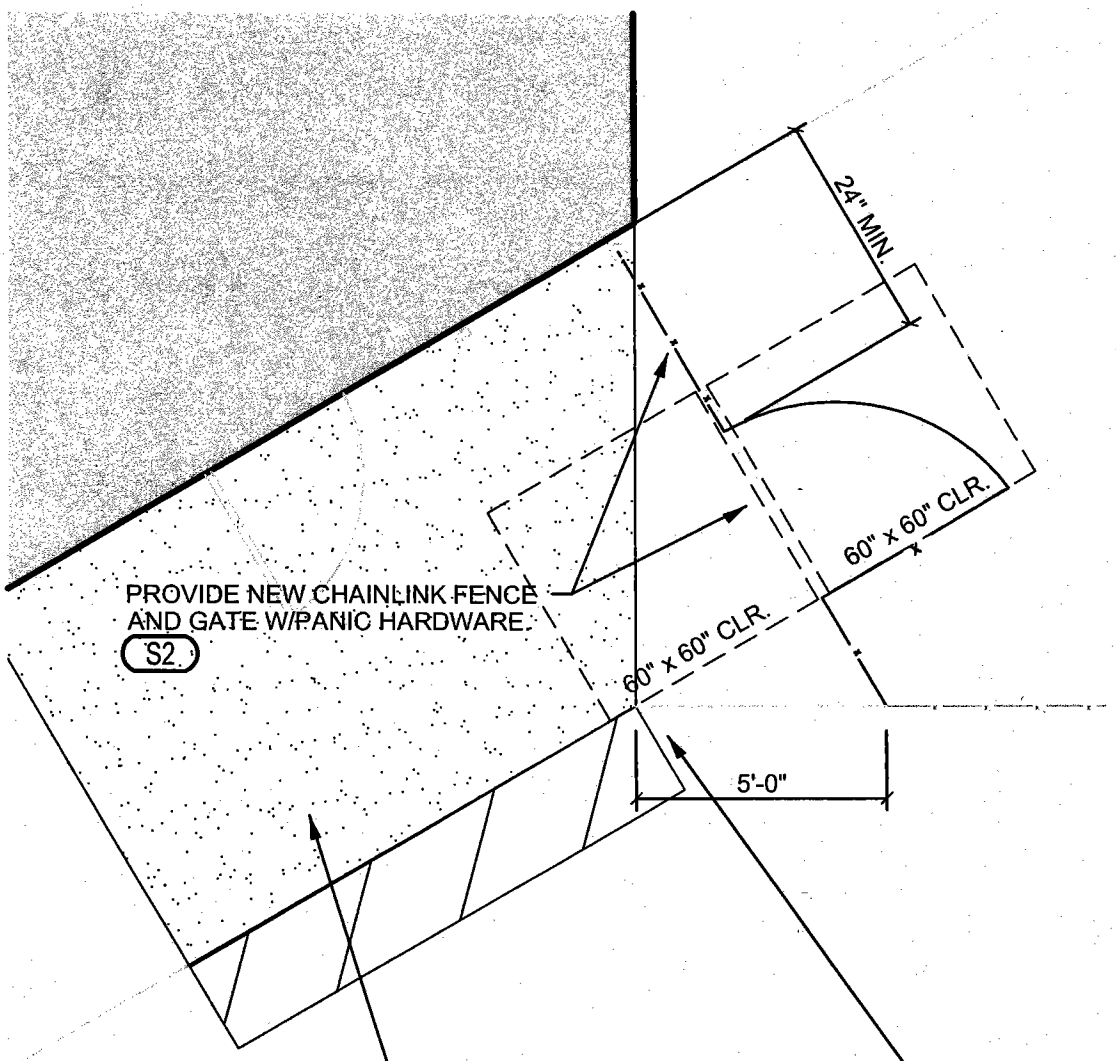
LICENSED ARCHITECT
CHRISTOPHER RICHARD TAYLOR
LIC. NO. C-19759
REN. 02-24-11
STATE OF CALIFORNIA

Project No.	Date	Drawing No.
3137206	3/11/10	AD-4.19

4



ENLARGED GATE PLAN - BUILDING M

Detail No.	Ref. Dwg.	Scale
A17	A1.1	14"=1'-0"

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

Project Title
SAN BERNARDINO CITY
UNIFIED SCHOOL DISTRICT
BRADLEY E.S. MODERNIZATION

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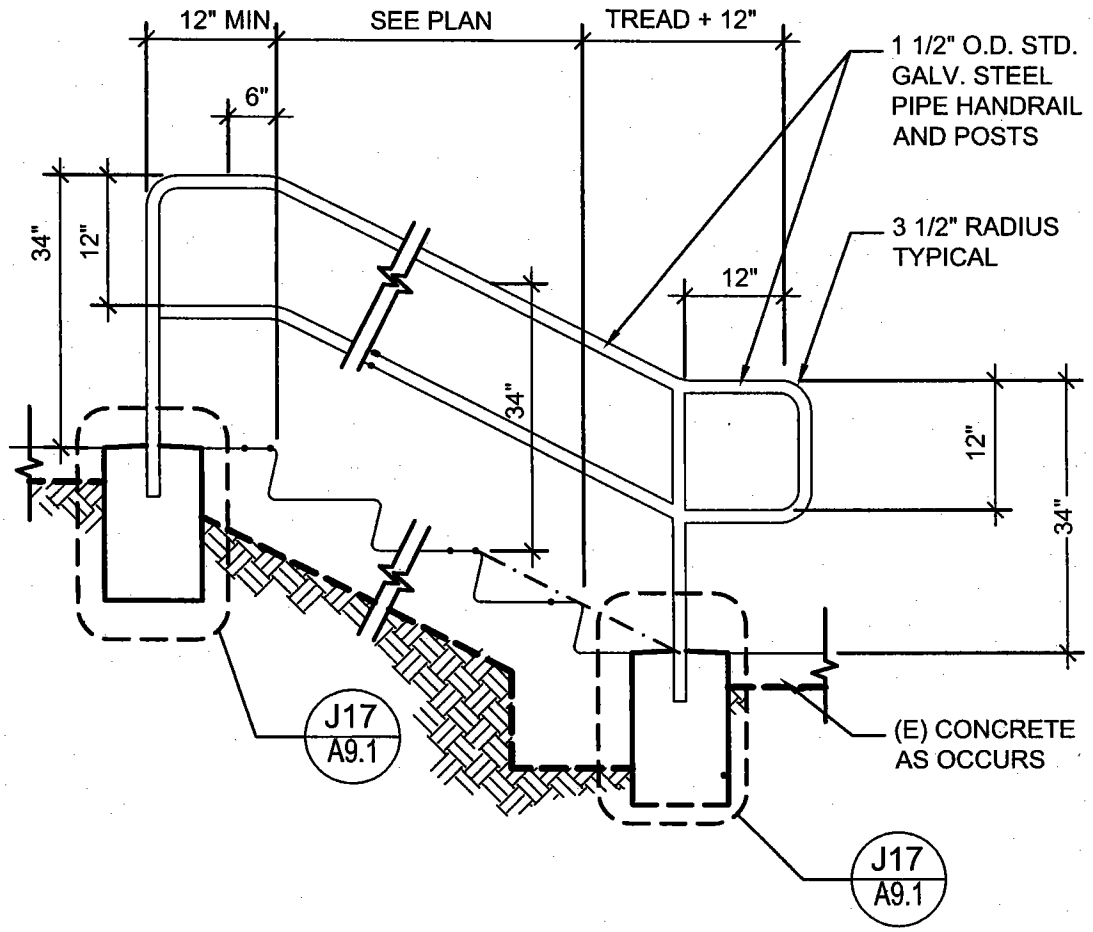
Project No.	Date	Drawing No.
3137106	3/11/10	AD-4.20

4



HANDRAILS AT STAIRS

Detail No.	Ref. Dwg.	Scale
J11	A9.1	N.T.S.

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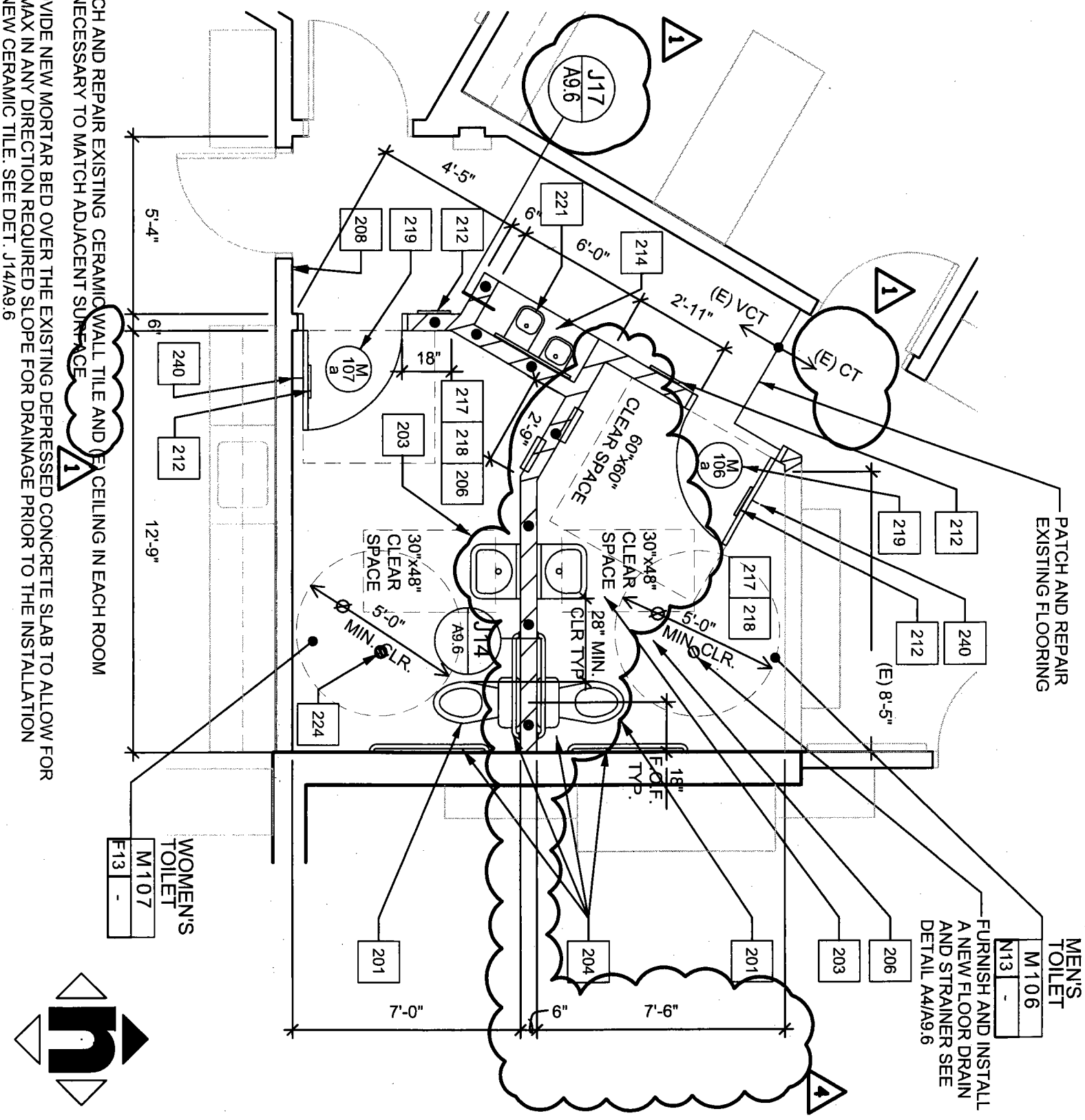
Project No.	Date	Drawing No.
3137106	3/11/10	AD-4.22

NOTES:

1. PATCH AND REPAIR EXISTING CERAMIC WALL TILE AND CEILING IN EACH ROOM AS NECESSARY TO MATCH ADJACENT SURFACE
2. PROVIDE NEW MORTAR BED OVER THE EXISTING DEPRESSED CONCRETE SLAB TO ALLOW FOR 2% MAX IN ANY DIRECTION REQUIRED SLOPE FOR DRAINAGE PRIOR TO THE INSTALLATION OF NEW CERAMIC TILE. SEE DET. J14/A9.6



DOOR SCHEDULE

Detail No.	Ref. Dwg.	Scale
L5	A4.1M	1/4"=1'-0"

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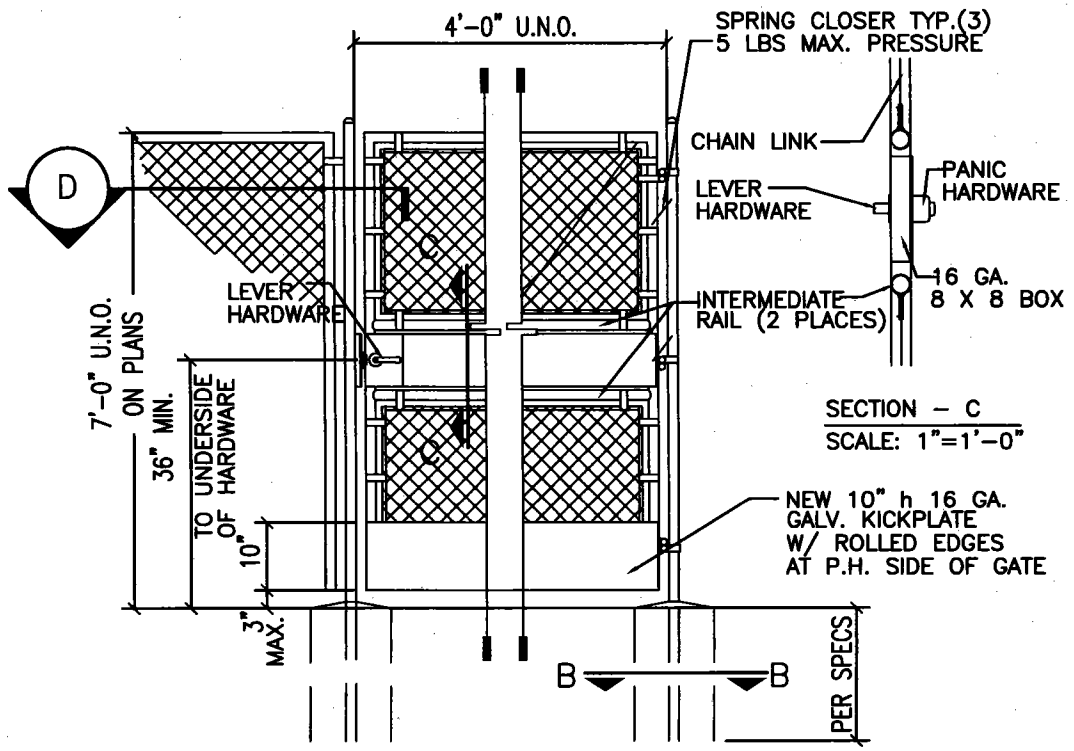
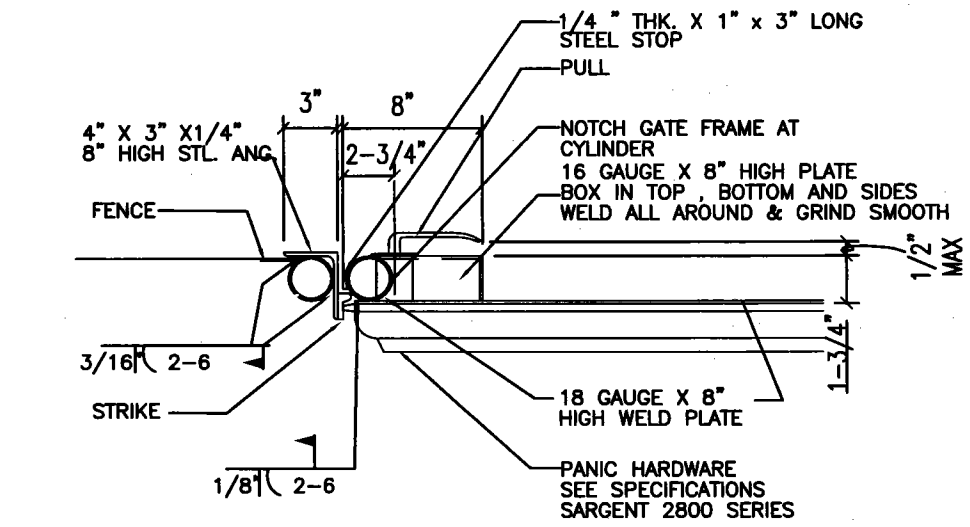
Project No. 3137106
Date 3/11/10
Drawing No. AD-4.21

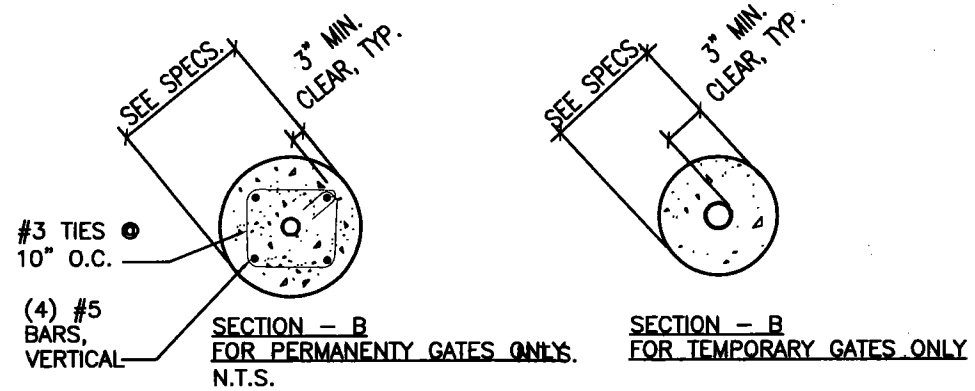


SECTION – C
SCALE: 1"=1'–0"

NOTE FOR ALL GATES:
1– GATES IN P.O.T. MUST COMPLY W/ EXIT DOOR REQUIREMENTS (SEC. 1133B.2). LEVER AND HARDWARE PER SPECS. PROVIDE KICK PLATES. 5LBS. MAX. PRESSURE TO OPERATE AND STRIKE SIDE CLEARANCE.
2– PAINT FENCE/GATE TO MATCH (E) ADJACENT FENCE COLOR.



D LEVER DETAIL



SECTION – B
FOR PERMANENTY GATES ONLY.
N.T.S.

SECTION – B
FOR TEMPORARY GATES ONLY

Detail No.	Ref. Dwg.	Scale
N17	A9.1	N.T.S

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT
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SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

CHAIN-LINK GATE WITH PANIC HARDWARE

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LICENSED ARCHITECT
CHRISTOPHER RICHARD VALLOR
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STATE OF CALIFORNIA

Project No.
3137106

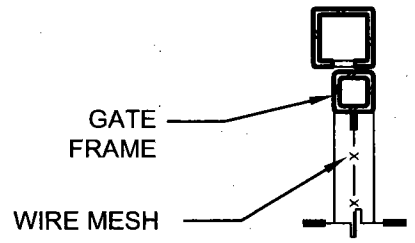
Date
3/11/10

Drawing No.
AD-4.23

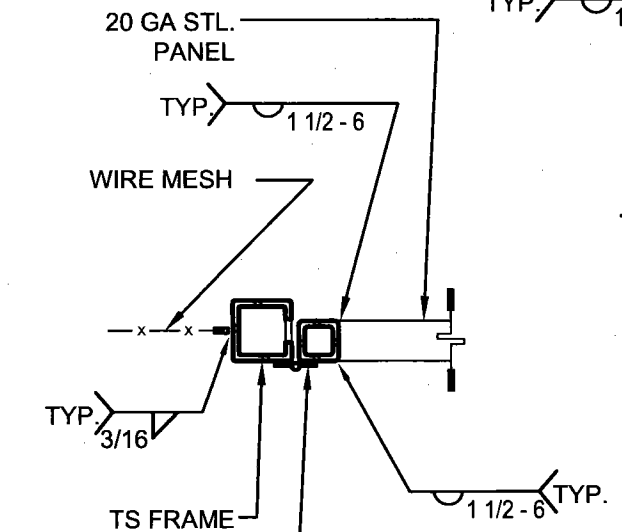
CERAMIC TILE AT METAL WALL PANEL | J4 | INTERIOR NON-RATED WALL | J7

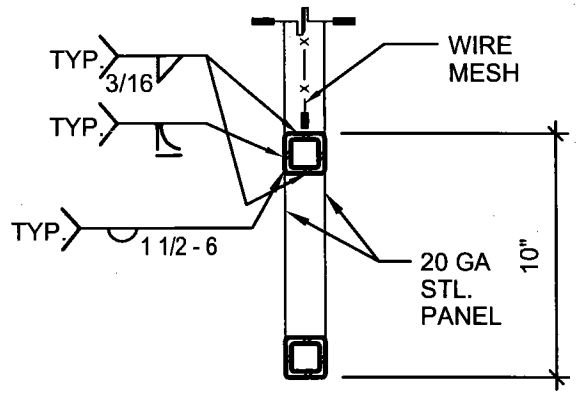
HALF

4 SCALE

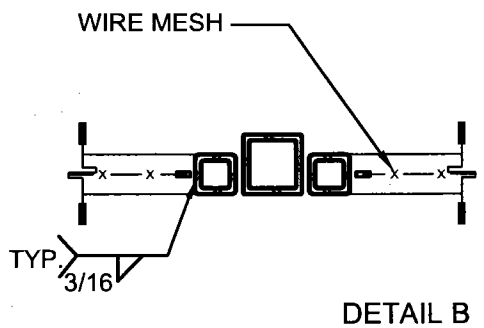


DETAIL A

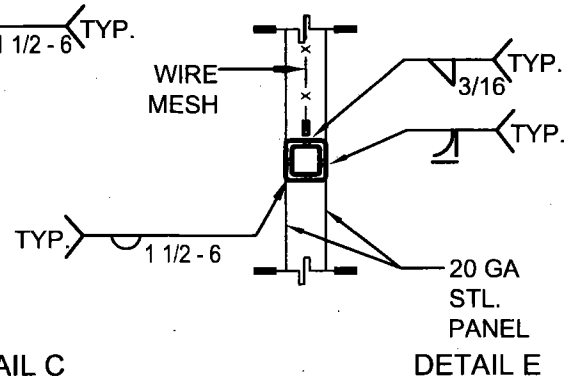




DETAIL D

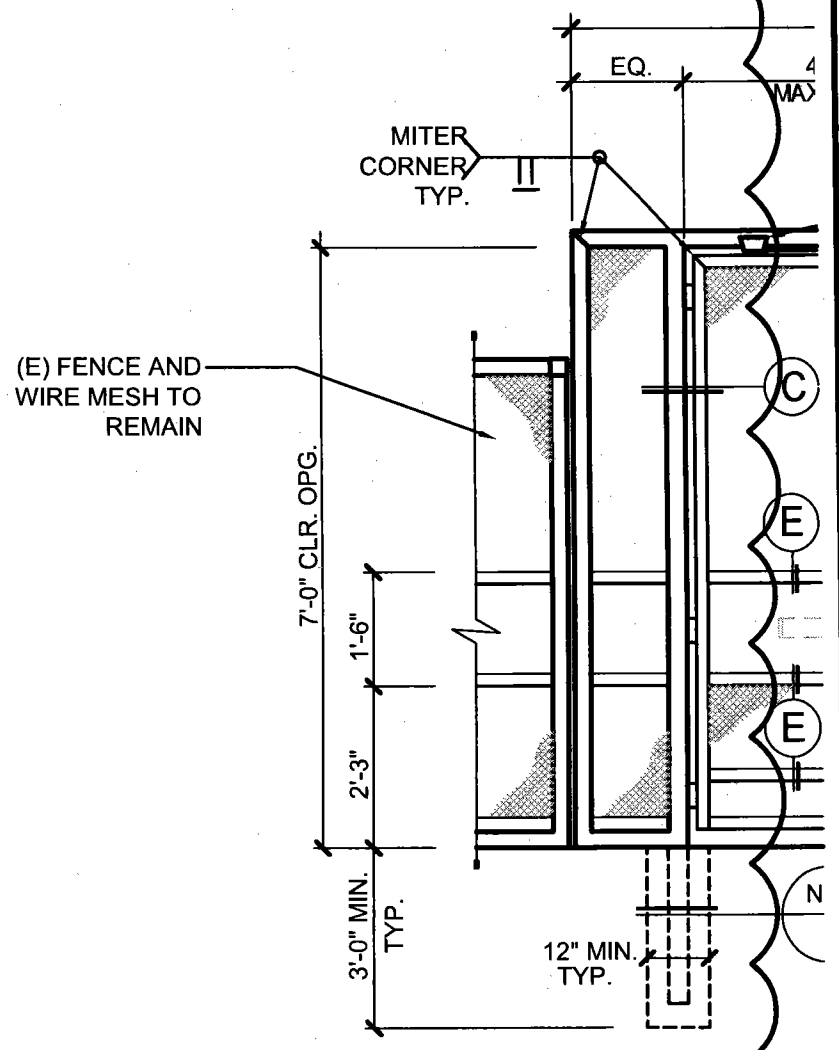


DETAIL B



DETAIL C

DETAIL E



ORNAMENTAL METAL GATE

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Project No.
3137106

Date
3/11/10

Drawing No.
AD-4.24

Detail No. E11 | Ref. Dwg. A9.4 | Scale N.T.S

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