DOCUMENT 00 91 13

ADDENDA

NOTICE TO ALL BIDDERS: THE FOLLOWING MODIFICATIONS, ADDITIONS, DELETIONS, CLARIFICATIONS AND/OR INFORMATION ARE HEREBY MADE PART OF THE CONTRACT DOCUMENTS. ADDENDUM MUST BE ACKNOWLEGDED AS PART OF THE BIF FORM.

1. RFI QUESTIONS

1) Is there going to be a phasing schedule provided? Due to casework, doors and windows, the total project cannot be completed over summer, especially Rio Vista. If a phasing schedule is provided, we can provide accurate pricing and manpower needed to complete the project in a timely manner.
   (a) A phasing schedule will be provided as part of the milestone schedule in addendum 2 as a change to Document 00 01 15 determining Certificate of Occupancy and Project Completion expectations.

2) Can you confirm if the prequalification is mandatory for General Contractors and Subcontractors?
   (a) To bid on this Project, the Bidder is required to have been prequalified by the District. In addition, if the Project has electrical, mechanical, or plumbing components that will be performed by subcontractors performing under the following license classification(s), then each of those subcontractors that intend to bid as a first-tier subcontractor to a general contractor (prime contractor) are required to have been prequalified by the District: C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46.

3) Can you confirm if the mandatory job walk is for General Contractors only?
   (a) The job walk is mandatory for all prospective General Contractors.

4) Does this project involve a PLA?
   (a) This project is subject to a PLA,

5) Can you provide the list of prequalified General Contractors that are planning to bid?
   (a) The list of General contractors that are prequalified and able to bid can be for reviewed and download on the District's Purchasing & Warehouse Webpage: https://mdusd.org/departments/purchasing-whse/purchasing-whsew. General Contractors must be prequalified AND have attended the mandatory job walk.

6) Has there been a Hazmat Report released for this project?
   (a) Yes. The Hazmat Report for Rio Vista Elementary School was provided as part of the appendix with the Bid Documents/Specs. Hazmat Reports for Mt. Diablo and Meadow Homes Elementary Schools will be provided as part of Addendum #2.

7) What is the project duration?

(a) **Each project will have its own contract with duration. Meadow Homes and Mt. Diablo are 76 calendar days while Rio Vista is 106 calendar days from Notice to Proceed. The milestone schedule (00 01 15) can be referenced for anticipated dates.**

2. **Architect Specification and/or Drawing Clarifications – Addendum No. 1: Mt. Diablo Unified School District Modernization of Three Elementary Schools- Meadow Homes Elementary School**

END OF SECTION

ADDENDUM NO. 2

Project:	Mt Diablo Unified School District **Meadow Homes Elementary School** **Increment 1**	
19six #:	23119	
DSA #:	01-121400	File #: 7-29
Bid #:	1940	
Date:	**April 24, 2024**	

To all bidders submitting proposals for the above captioned project. This Addendum is hereby included in the Contract Documents to the same extent as though it were originally included therein. The following items modify, add to, delete from, or explain the drawings and/or specifications. The contents of this Addendum shall take precedence over the original specifications and plans.

A. NEW SPECIFICATIONS

ITEM 1. 23 08 00 COMMISSIONING OF HVAC SYSTEMS

ITEM 2. 23 09 23 DIRECT DIGITAL CONTROL SYSTEM FOR HVAC

B. NEW DRAWINGS

ITEM 1. 1MP-501 CONTROLS - MECHANICAL

C. CHANGES TO SPECIFICATIONS

ITEM 1. 01 91 00 GENERAL COMMISSIONING

D. CHANGES TO DRAWINGS

ITEM 1. 1A-251 FINISH PLAN BLDG F, G

- Revision to Floor Finishes to provide manufacturer information and product line.
- Revision to Paint Finish schedule to provide manufacturer information

ITEM 2. 1A-252 FINISH PLAN H, I

- Revision to Floor Finishes to provide manufacturer information and product line.
- Revision to Paint Finish schedule to provide manufacturer information

ITEM 3. 1A-253 FINISH PLAN J & D

- Revision to Floor Finishes to provide manufacturer information and product line.
- Revision to Paint Finish schedule to provide manufacturer information

ITEM 4. 1MP-001 – LEGENDS & NOTES -MECHANICAL & PLUMBING

- Note 29 added to GENERAL NOTES
- Sheet added to SHEET INDEX

ITEM 2. 1MP-002 – SCHEDULES – MECHANICAL & PLUMBING

- Revise sheet 1MP-002

ITEM 3. 1T-000 – TECHNOLOGY INFRASTRUCTURE COVER SHEET

- Revise TECHNOLOGY SYMBOL LEGEND

ITEM 4. 1T-010 – TECHNOLOGY INFRASTRUCTURE SITE PLAN DEMO

- Line 9 and 10 added to GENERAL NOTES

ITEM 5. 1T-020 – TECHNOLOGY INFRA. FLOOR PLANS DEMO

- Revision to SHEET NOTES
- Revision to table SHEET 1T-020
- Revision to floor plan

ITEM 6. 1T-021 – TECHNOLOGY INFRA. FLOOR PLANS DEMO

- Added table SHEET 1T-021
- Revision to SHEET NOTES
- Revision to floor plan

ITEM 7. 1T-100 – TECHNOLOGY INFRASTRUCTURE SITE PLAN NEW

- Revision to GENERAL NOTES
- Revision to line 10 in SHEET NOTES
- Revision to TECHNOLOGY INFRASTRUCTURE SITE PLAN NEW

ITEM 8. 1T-200 – TECHNOLOGY INFRA. FLOOR PLANS NEW

- Revision to GENERAL NOTES

ITEM 9. 1T-201 – TECHNOLOGY INFRA. FLOOR PLANS NEW

- Revision to GENERAL NOTES

ITEM 10. 1T-701 – TECHNOLOGY INFRASTRUCTURE SINGLE LINES

- Revision to EQUIPMENT INTERCOM SCHEDULE

ITEM 11. 1T-800 – TECHNOLOGY INFRASTRUCTURE DETAILS

- Detail 12 and 13 added to sheet

E. ATTACHMENTS

A. SPECIFICATIONS

- **23 08 00 COMMISSIONING OF HVAC SYSTEMS**
- **23 09 23 DIRECT DIGITAL CONTROL SYSTEM FOR HVAC**

B. DRAWING SHEETS

- **1A-251 FINISH PLAN BLDG F, G**
- **1A-252 FINISH PLAN H, I**
- **1A-253 FINISH PLAN J & D**

- **1MP-001 – LEGENDS & NOTES -MECHANICAL & PLUMBING**
- **1MP-002 – SCHEDULES – MECHANICAL & PLUMBING**
- **1MP-501 CONTROLS – MECHANICAL**
- **1T-000 – TECHNOLOGY INFRASTRUCTURE COVER SHEET**
- **1T-010 – TECHNOLOGY INFRASTRUCTURE SITE PLAN DEMO**
- **1T-020 – TECHNOLOGY INFRA. FLOOR PLANS DEMO**
- **1T-021 – TECHNOLOGY INFRA. FLOOR PLANS DEMO**
- **1T-100 – TECHNOLOGY INFRASTRUCTURE SITE PLAN NEW**
- **1T-200 – TECHNOLOGY INFRA. FLOOR PLANS NEW**
- **1T-201 – TECHNOLOGY INFRA. FLOOR PLANS NEW**
- **1T-701 – TECHNOLOGY INFRASTRUCTURE SINGLE LINES**
- **1T-800 – TECHNOLOGY INFRASTRUCTURE DETAILS**

C. <u>ADDED APPENDIX SHEETS</u>

- **HAZARDOUS MATERIALS REPORT – PROVIDED BY ENVIRO-S.T.A.R**

4/24/24

Mariana Alvarez Parga C-36107

SECTION 01 91 00 - GENERAL COMMISSIONING

PART 1 – GENERAL

1.1 RELATED SECTIONS

A. 23 08 00 Commissioning of HVAC Systems

1.2 DESCRIPTION OF WORK

A. Commissioning is a systematic process of ensuring that all building systems perform interactively according to the design intent and the owner's operational needs. This is achieved by beginning in the design phase and documenting design intent and continuing through construction, acceptance with actual verification of performance. The commissioning process shall encompass and coordinate the traditionally separate functions of system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training.

B. The Commissioning Authority (CA) will be directly hired by the Owner. The General Contractor that is awarded the project shall not include the cost of the Commissioning Authority in their price. The general contractor (and their sub-contractors) shall include cost for their involvement in the commissioning process as described in this section and other related commissioning sections, including completion of system readiness checklists, and demonstration of installed equipment to the commissioning team members during the functional performance testing portion of the project.

C. Commissioning during the construction phase is intended to enhance the quality of system start-up and aid in the orderly completion and transfer of systems for beneficial use by the owner. The following objectives will be documented accordingly:

1. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry accepted standards, that they meet design intent, and that they receive adequate operational checkout by installing contractors.
2. Verify and document proper performance of equipment and systems.
3. Verify that O&M documentation left on site is complete.
4. Verify that the Owner's operating personnel are adequately trained.

D. The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished product, installed and fully functional in accordance with the contract documents.

1.3 ABBREVIATIONS

A. The following are common abbreviations used in the Specifications and in the Commissioning Plan.

A/E-	Architect and design Engineers	GC-	General Contractor (prime)
CA-	Commissioning Authority (Agent)	MC-	Mechanical Contractor
CC	Controls Contractor	PC -	Plumbing Contractor
CM-	Construction Manager (the owner's representative)	PM-	Project Manager (of the Owner)
Cx-	Commissioning	SRC	System Readiness Checklist
Cx Plan-	Commissioning Plan document	Subs-	Subcontractors to General
EC-	Electrical Contractor	TAB-	Testing Adjusting and Balance Contractor
FT-	Functional Performance Test	TC-	Test Coordinator

1.4 DEFINITIONS

A. Commissioning Plan: An overall plan that provides the structure, schedule and coordination planning for the commissioning process.

B. Deferred Functional Tests: FTs that are performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions that disallow the test from being performed.

C. Deficiency: A condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents (that is, does not perform properly or is not complying with the design intent).

D. Design Narrative: Sections of either the Design Intent or Basis Of Design which describe the systems operation and principle function

E. Functional Performance Test (FT): Test of the dynamic function and operation of equipment and systems using direct observation or monitoring methods. Functional testing is the dynamic testing in all modes of systems (rather than just components) under full operation (e.g. the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure set point). The systems are run through all the control system's sequences of operation and components are verified to be responding as the sequences state. Traditional air or water test and balancing (TAB) is not functional testing, in the commissioning sense of the word. The commissioning authority develops the functional test procedures in a sequential written form, coordinates, oversees and documents the actual testing, which is usually performed by the installing contractor or vendor. Functional performance tests shall demonstrate the correct installation and operation of each component, system, and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

F. Over-written Value: Writing over a sensor value in the control system to see the response of a system (e.g., changing the outside air temperature value from 50F to 75F to verify economizer operation).

G. Sampling: Functionally testing only a fraction of the total number of identical or near identical pieces of equipment.

H. Seasonal Performance Tests: FT that are deferred until the system(s) will experience conditions closer to their design conditions.

I. Simulated Condition: Condition that is created for the purpose of testing the response of a system (e.g., applying a hair blower to a space sensor to see the response in a VAV box).

J. Simulated Signal: Disconnecting a sensor and using a signal generator to send an amperage, resistance or pressure to the transducer and DDC system to simulate a sensor value.

K. Systems Manual: Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative/operator

L. System Readiness Checklist (SRC): A checklist developed by the CA and provided to the contractor for execution. Completion of this checklist verifies the system or component has been installed in accordance with design documents and IOMs. This checklist is required before commencing functional testing. The signee for a specific contractor section in a SRC will be the same throughout the project (e.g. only one person will sign for the MC).

M. Testing Coordinator (TC): Commissioning Team member appointed by GC. TC's roles include distribution of SRCs between Subs & CA, ensure execution & completion of SRCs by Subs, collect/review completeness of SRCs for final delivery to CA, coordinate scheduling of functional tests, collect all required documents (eg O&Ms, training plans, etc) and deliver to the CA. The TC must be familiar with all of the commissioned equipment and possess good organizational skills.

1.5 COMMISSIONING PROCESS

A. The following activities describe the commissioning tasks during construction and the general order in which they occur. The CA coordinates all activities.

B. Scoping Meeting: All members of the design and construction team that will be involved in the commissioning process meet and agree on the scope of work, tasks, schedules, deliverables, and responsibilities for implementation of the Commissioning Plan.

C. Commissioning Plan: The Commissioning Plan provides guidance in the execution of the commissioning process. The Specifications take precedence over the Commissioning Plan.

D. Submittals: Equipment documentation is submitted within 30 days of approval to the CA, including detailed start-up procedures.

E. Start-Up/System Readiness Checklists (SRC): The CA works with the Subcontractors to develop startup plans and documentation formats, including providing the Subcontractors with system readiness checklists to be completed during the startup process.

F. Functional Performance Testing: The CA develops specific equipment and system functional performance test procedures. The Subcontractors review the procedures. The procedures are executed by the Subcontractors, under the direction of, and documented by the CA.

G. Deficiencies and Resolution: The CA documents items of non-compliance in materials, installation or operation. The items are corrected at the Sub's expense and the equipment or systems are retested.

H. Operations and Maintenance Documentation: The CA reviews the Operation and Maintenance documentation for completeness.

I. Training: The CA reviews the training plans and agenda provided by the Subcontractors and verifies that training is completed.

J. Commissioning Report: The CA writes the commissioning report.

1.6 SCOPE OF WORK

A. The following building systems will be included in the commissioning process for the project:

1. Division 23 (Heating Ventilation and Air Conditioning)

1.7 COMMISSIONING TEAM

A. The members of the commissioning team consist of the following members:

1. Commissioning Authority (Agent) (CA)
2. Owner's Project Manager (PM)
3. General Contractor (GC or Contractor)
4. Architect and Design Engineers (particularly the mechanical and electrical engineers)
5. Mechanical Contractor (MC)
6. Test and Balance contractor (TAB)
7. Controls Contractor (CC)
8. Any other installing subcontractors or suppliers of equipment
9. Owner's maintenance personnel
10. Inspector of Record

1.8 COMMISSIONING AUTHORITY'S RESPONSIBILITIES

A. General

1. The CA, as leader of the commissioning team, directs and coordinates the commissioning activities in conjunction with the General Contractor. All members work together to fulfill their contracted responsibilities and meet the objectives of the contract documents.

2. Within 30 days prior to equipment startup, the CA will schedule and conduct a commissioning scope meeting with the entire commissioning team in attendance. Meeting minutes will be distributed to all parties by the CA. CA will revise the Commissioning Plan to its "final" version from information gathered at the meeting and will distribute to all parties.
3. The CA will work with the CM & GC according to established protocols to schedule the commissioning activities. The CA will provide sufficient notice to the CM & GC for scheduling commissioning activities. The GC will integrate all commissioning activities into the master schedule. All parties will address scheduling problems and make necessary notifications in a timely manner to expedite the commissioning process.
4. The CA will provide the initial schedule of primary commissioning events at the commissioning scope meeting. The Commissioning Plan provides a format for this schedule, as included in the Cx Plan. As construction progresses, more detailed schedules will be developed by the GC.
5. The CA is not responsible for design concept, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CA may assist with problem-solving non-conformance or deficiencies, but ultimately that responsibility resides with the general contractor and the A/E. The primary role of the CA is to develop & coordinate the execution of a testing plan, observe & document performance—that systems are functioning in accordance with the documented design intent & in accordance with the contract documents. The Contractors will provide all tools or the use of tools to start, check-out & functionally test equipment and systems.
6. The CA will not release, revoke, alter, or enlarge on requirements of design documents.
7. The CA will not directly approve or accept any portion of construction work.

B. Construction and Acceptance Phase

1. Coordinates and directs the commissioning activities in a logical, sequential & efficient manner using consistent protocols and forms, centralized documentation, clear & regular communications & consultations with all necessary parties, frequently updated timelines & schedules and technical expertise.
2. Coordinate the commissioning work and, with the GC & CM, ensure that commissioning activities are being scheduled into the master schedule.
3. Revise the Commissioning Plan as required.

4. Plan and conduct a commissioning scoping meeting & other commissioning meetings as necessary.
5. Request and review additional information required to perform commissioning tasks, including O&M materials, contractor start-up and checkout procedures.
6. Before startup, gather & review the current control sequences & interlocks and work with contractors and design engineers until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.
7. Write and distribute System Readiness Checklists.
8. Perform site visits to observe component & system installations as needed.
9. Approve SRCs and their completion as submitted by TC for CA's review. CA shall perform selected site observation and spot checking as needed.
10. Review TAB execution plan.
11. Approve air and water systems balancing by spot testing, reviewing completed reports and by selected site observation.
12. Create the FT procedures for equipment and systems with input & review by GC/Subs. Submit to CM for review, and for approval if required.
13. Coordinate, witness and approve manual FT performed by installing contractors. Coordinate retesting as necessary until satisfactory performance is achieved.
14. Maintain a master deficiency and resolution log. Provide the CM with written progress reports and test results with recommended actions.
15. Compile and maintain a commissioning issues log.
16. Provide a final commissioning report.
17. Throughout the commissioning process, document that equipment and systems are installed and perform in accordance with design documents.

1.9 DESIGN TEAM RESPONSIBILITIES

A. Construction and Acceptance Phase

1. Attend the commissioning scope meeting.
2. Attend selected commissioning team meetings.
3. Perform normal submittal review, construction observation, as-built drawing preparation, O&M manual preparation, etc., as contracted.
4. Provide any design narrative documentation requested by the CA.
5. Review construction and issue punch lists as required.

6. Provide design intent and sequence of operation documentation as required by the CA.
7. Assist and Coordinate resolution of system deficiencies identified during commissioning or review, according to the contract documents.
8. Approve TAB report prior to distribution to the CA.
9. Prepare and submit final as-built design intent documentation for inclusion in the O&M manuals.
10. Review and approve the O&M manuals.

1.10 OWNER'S REPRESENTATIVE (PM) RESPONSIBILITIES

A. Construction and Acceptance Phase

1. Manage the contract of the CA
2. Facilitate the coordination of the commissioning work by the CA.
3. Ensure with CA & GC that commissioning activities are being scheduled into the master schedule.
4. Review the final Commissioning Plan.
5. Attend commissioning scope meeting and other commissioning team meetings.
6. Furnish to CA copies of all construction documents, addenda, change orders for commissioned equipment.
7. Review and approve CA generated FT procedures prior to testing.
8. Observe SRC completion & FT's for systems to be commissioned.
9. Review commissioning progress and deficiency reports.
10. Coordinate the resolution of non-compliance and design deficiencies identified in all phases of commissioning.
11. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.
12. Assist the GC in coordinating the training of owner personnel.
13. Provide required IP addresses to controls contractor for setting up remote access to controls systems.

1.11 GENERAL CONTRACTOR (GC) RESPONSIBILITIES

A. Construction and Acceptance Phase

1. Facilitate the coordination of the commissioning work by the CA.

2. Ensure with CA that commissioning activities are being scheduled into the master schedule.
3. Appoint TC for management of SRCs.
4. Include the cost of commissioning in the total contract price. Include all special tool and instruments (only available from vendor, specific to a piece of equipment) required for testing in base bid price.
5. Furnish a copy of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CA.
6. Provide a copy of O&Ms, startup reports, TAB reports, Title 24 forms and any other necessary documents for commissioned equipment to the CA.
7. Provide submittals for systems to be commissioned to the engineer of record and the CA.
8. In each purchase order or subcontract written, include requirements for submittal data, O&M data, commissioning tasks and training.
9. Provide equipment sequences of operation and final calibration point to point reports to the CA.
10. Ensure that all Subs execute their commissioning responsibilities according to the contract documents and schedule.
11. Attend commissioning scope meeting and other necessary meetings scheduled by the CA to facilitate the Cx process.
12. Coordinate with subs on construction progress & equipment readiness for SRC completion.
13. Coordinate with CA on construction progress & system readiness for FT completion. Provide the CA ten (10) day advance notice so that system start-up and functional testing can begin.
14. Provide input on functional test scripts.
15. Pre-test all systems and equipment using functional test scripts prior to formal testing in presence of commissioning agent.
16. Coordinate with Subs to assist in and execute functional tests for verification by the CA.
17. Resolve system deficiencies identified during commissioning process.
18. Coordinate with Subs to execute re-testing of deficient systems and equipment.
19. Coordinate the training of owner personnel. Submit an owner training plan to the CA for review and approval.

20. Video record training sessions and provide to owner.
21. Provide trend logs or remote access from the controls system to the CA for review.
22. Prepare O&M manuals, according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
23. Responsible for certifying that the work is complete and systems are operational according to design documents.
24. Complete CALGreen closeout documentation as required.

1.12 EQUIPMENT SUPPLIERS

A. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Owner to keep warranties in force.

B. Assist in equipment testing per agreements with Subs.

C. Include all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment according to these Contract Documents in the base bid price to the Contractor, except for stand-alone data logging equipment that may be used by the CA.

D. Provide equipment sequence of operation and testing procedures as requested by CA.

E. Review test procedures for equipment installed (or started up) by factory representatives.

1.13 SYSTEMS TO BE COMMISSIONED

A. The following systems will be commissioned in this project:

1. HVAC System
2. TAB Verification
3. HVAC Control Systems

1.14 COMMISSIONING DOCUMENTATION

A. Commissioning Plan: Prior to permit issuance, a commissioning plan shall be completed to document how the project will be commissioned. Provided as part of the bid documents, is binding on the Contractor. The commissioning plan provides guidance in the execution of the commissioning process. Just after the initial commissioning scoping meeting the CA will update the plan which is then considered the "final" plan, though it will continue to evolve and expand as the project progresses. The specifications will take precedence over the Commissioning Plan. The commissioning plan shall include the following:

1. General project information
2. Commissioning goals
3. Systems to be commissioned
4. Commissioning team information
5. Commissioning process activities, schedules and responsibilities

B. The Owner Project Requirements and Basis of Design shall be incorporated into the drawings, specifications and other design documents.

C. Commissioning Report: A final summary report by the CA will be provided to Owner. The report will focus on evaluating commissioning process issues. System Readiness Checklists, functional tests and monitoring reports will not be part of the final report. For each piece of commissioned equipment, the report should contain the disposition of the commissioning authority regarding the adequacy of the equipment, documentation and training meeting the contract documents in the following areas:

1. Description of Commissioning Scope
2. System Readiness Checklists and Equipment Start-Up
3. Functional Performance Testing Results
4. Training documentation and evaluation
5. Outstanding Issues
6. Recommendations

1.15 SUBMITTALS

A. The CA employs the submittals and IO&Ms to develop the SRCs and FT's. The CA shall review submittals for conformance with construction documents, OPR, & BOD. Submittals provided to the CA must have been approved by the A/E.

B. The A/E will review & approve commissioned equipment submittals for conformance to the contract documents as it relates to the commissioning process, the functional performance of the equipment, & adequacy for developing test procedures. This review shall verify compliance with equipment specifications. The A/E will notify the CM or PM of items missing or areas that are not in conformance with contract documents and which require resubmission.

C. A/E or GC shall provide a complete & approved submittal package to the CA.

D. The CA may request additional design narratives from the A/E and Controls Contractor, depending on the completeness of the design intent documentation and sequences provided in the specifications.

E. Equipment submittals to the CA do not constitute compliance for O&M manual documentation. The IO&M manuals are furnished separately by the Contractor. CA shall review them for development of the SRCs and FTs. IO&M manuals shall be provided with the approved submittals.

F. Contractor shall provide/submit the following documents to the CA:

1. Revised construction schedule including commissioning tasks.
2. Equipment submittals for all commissioned equipment.
3. Sequences of operation for all commissioned equipment.
4. Control diagrams for all commissioned equipment.
5. Final testing and balancing report.
6. Energy code compliance forms – if applicable.
7. Completed SRCs.
8. Manufacturer IO&Ms for commissioned equipment.
9. Training plan for commissioned systems.
10. As-built control sequences and construction drawings.

PART 2 – PRODUCTS

2.1 TEST EQUIPMENT

A. See Schedules on Drawings for equipment data. Furnish and install all equipment in All standard testing equipment required to perform startup and initial checkout and required functional performance testing shall be provided by the Division contractor for the equipment being tested. E.G. the MC of Division 23 shall ultimately be responsible for all standard testing equipment for the HVAC system and controls system in Division 23, except for equipment specific to and used by TAB in their commissioning responsibilities.

B. Special Tools: Special equipment, tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment, according to these Contract Documents shall be included in the base bid price to the Contractor and left on site. Stand-alone data logging equipment used by the CA shall not be subject to this requirement.

2.2 RECORDING

A. The GC shall digitally record the audio and visual of selected trainings:

1. HVAC and Controls

B. An introduction shall be made at the beginning of each recording, identifying what equipment is being illustrated, where it is located and who the trainer is.

C. Recording shall be accomplished with a tripod when possible and performed in an expert manner so that the issues being discussed are clearly illustrated and instructions clearly audible. A high quality camera shall be used and additional light provided if ambient light is insufficient.

D. Media shall be clearly labeled with the equipment, date, trainer and segment duration.

E. The digital visual and audio recording shall be bookmarked at each training with an index/table of contents provided and recorded on the DVD. The bookmarks will clearly indicate which equipment is being presented and the format will allow search and go-to functions for rapidly locating training segments.

F. An original and one copy of the recordings shall be submitted to the OWNER.

PART 3 – EXECUTION

3.1 COMMISSIONING PROCESS

A. The following narrative provides a brief overview of the typical commissioning tasks during design and construction and the general order in which they occur:

1. CA reviews updated OPR, BOD, and design documents to ensure feedback comments have been reviewed.
2. CA develops draft commissioning plan for review by the design team. After the scope meeting, the CA will update the Cx Plan and provide the final plan to the commissioning team.
3. Equipment documentation is submitted to the CA after submittal approval by the A/E.
4. The CA develops the System Readiness Checklists and provides these to the TC to be completed during the startup process.
5. In general, the checkout and performance verification proceeds from simple to complex; from component level to equipment to systems and intersystem levels with the SRCs being completed before FT's.
6. SRCs will be developed and issued after receipt of A/E approved submittals and IO&Ms by the CA.
7. Commissioning during construction begins with a scope meeting conducted by the CA where the commissioning process is reviewed with the commissioning team members.
8. TC shall deliver one set of blank SRCs to Subs. TC shall collect all completed SRCs and deliver package to CA.
9. The Subs, under their own direction, execute the system start-ups and their completion on the SRCs. The completed SRCs are returned to the TC to be returned to the CA for review.
10. The CA develops specific equipment and system FT procedures.
11. The FT procedures are executed by the Subs under the direction of the CA and documented by the CA.
12. Items of non-compliance in material, installation or setup are corrected at the Sub's expense (including the CA's time and expenses) and the system is retested. The General Contractor is responsible for collecting cost and expenses for retesting.
13. GC shall bear all costs should the CA receive any incomplete SRCs and the CA is required to complete the SRCs to support the construction schedule.

14. The CA provides functional test forms to the GC for review. Close coordination is especially required between the CA and the CC to ensure successful development of the functional tests.
15. CA witnesses all functional tests executed by the subs under the direction of the CA.
16. CA to verify control system trend capability and data storage.
17. Any required re-tests are conducted as determined by the CA. Any associated costs with re -tests, including the CA's time and expenses will be charged back to the GC and may be collected from the subs.
18. Training plans are developed and provided to the Owners representative for review.
19. Training is conducted by the Subs and verified by the CA.
20. Functional tests and training is finished before Substantial Completion.
21. Final commissioning report is written.

3.2 SYSTEM READINESS CHECKLIST

A. Procedure: The following procedures apply to all equipment to be commissioned as listed in the Commissioning Plan. Mechanical, plumbing, & electrical commissioning specification sections describe subcontractor responsibilities

B. General: The SRC for a given system must be successfully completed prior to formal functional performance testing of equipment or subsystems of the given system. The Checklist is developed as follows:

1. A/E approved submittals are provided to CA by A/E or GC.
2. IO&M manuals provided to CA by GC.
3. CA develops SRCs from IO&Ms and submittal information.

C. Execution of the SRC

1. CA provides SRC to TC.
2. Installing contractor obtains documentation from TC and any specific manufacturer start-up, including checklists from the O&M.
3. TC coordinates execution of the equipment start-up among Subs per construction schedule.
4. Subs complete start-up and complete SRCs.
5. Only individuals that have direct knowledge and witnessed the start-up shall sign and complete the SRC.

6. All completed SRCs are returned to TC to be provided to the CA for review and approval.

D. Deficiencies, Non-Conformance and Approval in Checklists and Startup

1. The Subs shall clearly list any outstanding items of the initial start-up on the SRC.

2. The SRC and any outstanding deficiencies are provided to the CA within one week of test completion.

3. The CA reviews the SRC & shall work with the Subs & vendors to correct and retest deficiencies or uncompleted items at contractor's expense (including CA's time). The installing Subs or vendors shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner. Subs shall notify the CA as items have been corrected. Start-up report shall be updated as deficiencies are resolved.

4. Items left incomplete, which later cause deficiencies or delays during functional testing may result in additional costs due to either CA interventions or construction delay liquidated damages to the responsible party. Any SRCs that required CA to complete will result in additional charges to the GC that may be collected from installing sub.

3.3 FUNCTIONAL PERFORMANCE TESTING

A. This sub-section applies to all commissioning functional testing for all divisions.

B. Equipment: The general list of equipment to be commissioned is found in the Commissioning Plan.

C. See Mechanical, plumbing, & electrical commissioning specification sections for Subs responsibilities.

D. Objectives and Scope.

1. The objective of FT's is to demonstrate that each system is operating according to the documented design intent and contract documents. FT's facilitate bringing the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems.

2. In general, each system should be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load) where there is a specified system response. Verifying each sequence in the sequences of operation is required. Proper responses to such modes and conditions as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc. shall also be tested.

E. Development of Test Procedures.

1. Before test procedures are written, the CA shall obtain all requested documentation and a current list of change orders affecting equipment or systems, including an updated points list, control sequences and parameters. Each Sub or vendor responsible to execute a test, shall provide assistance to the CA in developing the procedures (answering questions about equipment, operation, sequences, etc.). Prior to execution, the CA shall provide a copy of the test procedures to the Sub(s) who shall review the tests for feasibility, safety, equipment and warranty protection. The CA may submit the tests to the A/E for review, if requested.

F. Test Methods.

1. FT's and verification may be achieved by manual testing (persons manipulate the equipment and observe performance) or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by stand-alone data loggers.

2. Simulated Conditions. Simulating conditions (not by an overwritten value) shall be allowed, though timing the testing to experience actual conditions is encouraged whenever practical.

3. Overwritten Values. Overwriting sensor values to simulate a condition, such as overwriting the outside air temperature reading in a control system to be something other than it really is, shall be allowed, but shall be used with caution and avoided when possible. Such testing methods often can only test a part of a system, as the interactions and responses of other systems will be erroneous or not applicable. Simulating a condition is preferable. e.g., for the above case, by heating the outside air sensor with a hair blower rather than overwriting the value or by altering the appropriate setpoint to see the desired response. Before simulating conditions or overwriting values, sensors, transducers and devices shall have been calibrated.

4. Simulated Signals. Using a signal generator which creates a simulated signal to test and calibrate transducers and DDC constants is generally recommended over using the sensor to act as the signal generator via simulated conditions or overwritten values.

5. Altering Setpoints. Rather than overwriting sensor values, and when simulating conditions is difficult, altering setpoints to test a sequence is acceptable. For example, to see the AC compressor lockout work at an outside air temperature below 55F, when the outside air temperature is above 55F, temporarily change the lockout setpoint to be 2F above the current outside air temperature.
6. Indirect Indicators. Relying on indirect indicators for responses or performance shall be allowed only after visually and directly verifying and documenting, over the range of the tested parameters, that the indirect readings through the control system represent actual conditions and responses. Much of this verification is completed during completion of the start-up plan.
7. Setup. Each function and test shall be performed under conditions that simulate actual conditions as close as is practically possible. The Sub executing the test shall provide all necessary materials, system modifications, etc. to produce the necessary flows, pressures, temperatures, etc. necessary to execute the test according to the specified conditions. At completion of the test, the Sub shall return all affected building equipment and systems, due to these temporary modifications, to their pre-test condition.
8. Sampling. Multiple identical pieces of non-life-safety or otherwise non-critical equipment may be functionally tested using a sampling strategy. No sampling by Subs is allowed for SRCs or FT's. Should frequent failures during testing require more troubleshooting than verification, the CA shall stop the testing and require the responsible Sub to perform and document a checkout of the remaining units.

G. Coordination and Scheduling

1. The Subs through the TC shall provide sufficient notice to the CA of their completion schedule for the SRCs and startup of all equipment and systems. The CA shall schedule functional tests through the CM, GC and affected Subs. The CA shall direct, witness and document the FT's of all equipment and systems. The Subs shall execute the tests.
2. In general, functional testing is conducted after completion of the start-up plan. The control system is sufficiently tested and approved by the CA before it is used for TAB or to verify performance of other components or systems. The air balancing and water balancing is completed and debugged before functional testing of air-related or water-related equipment or systems. Testing proceeds from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems is checked.

H. Deficiencies, Non-Conformance, and Approval in Checklists and Startup:

1. The Subcontractors shall clearly list any items of the start-up and functional procedures not successfully completed at the bottom of the form or on an attached sheet. The procedures form and any outstanding deficiencies are provided to the CA within two days of test completion.

2. The CA reviews and verifies all functional checklists and start-up reports and recommends approval to the PM. The CA assists the Subcontractors and vendors to correct and retest deficiencies or uncompleted items, involving other members of the commissioning team as necessary.

3.4 DEFICIENCY RESOLUTION

A. Documentation

1. The CA shall witness and document the results of all FT's using the specific procedural forms developed for that purpose. Prior to testing, these forms are provided to the GC for review and approval and to the Subs for review.

B. Non-Conformance.

1. The CA shall record the results of the FT on the procedure or test form. All deficiencies shall be noted and reported to the GC and CM on a standard non-compliance form.

2. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CA. In such cases the deficiency and resolution will be documented on the procedure form.

3. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. The CA does not have the authority to overlook deficient work or loosen acceptance criteria to satisfy scheduling or cost issues.

4. If commissioning for equipment or systems is delayed by Owner occupancy requirements or other unforeseen conditions, the CA will coordinate completion with Owner's schedule. This may involve testing conducted outside of normal occupancy hours. Contractor assistance will still be required to conduct functional testing outside of normal occupancy hours without any additional cost to the owner.

5. If a deficiency is identified, the CA shall discuss the issue with the executing contractor.

a. When there is no dispute on the deficiency and the Sub accepts responsibility to correct it:

1) The CA documents the deficiency, records the Sub's response, and proceeds with remaining FT's. The Sub corrects the deficiency and certifies that the equipment is ready to be retested and coordinates retesting with the GC and CA.

2) The CA reschedules the test and the test is repeated.

b. If there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible:

1) The deficiency shall be documented with the Sub's response and a copy given to the GC and to the Sub representative assumed to be responsible.

2) Resolutions are made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive authority is with the A/E. Final acceptance authority is with the Project Manager.

3) Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency and certifies the equipment is ready for retesting. The CA reschedules the test and the test is repeated until satisfactory performance is achieved.

6. Cost of Retesting

a. The cost for the Sub to retest a functional test, if they are responsible for the deficiency, shall be borne by the Sub. If the Sub is not responsible, any cost recovery for retesting costs shall be negotiated with the GC.

b. The time for the CA and CM to direct any retesting required because a specific SRC, reported to have been successfully completed, but determined during functional testing to be faulty, will be backcharged to the GC, who may choose to recover costs from the party responsible for executing the faulty SRC.

7. The Contractor shall respond in writing to the CA and CM at least as often as commissioning meetings are being scheduled concerning the status of each apparent outstanding discrepancy identified during commissioning. Discussion shall cover explanations of any disagreements and proposals for their resolution.

8. The CA retains the original non-conformance forms until the end of the project.

C. Failure Due to Manufacturer Defect

1. If 10% of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the contract documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CM or PM. In such case, the Contractor shall provide the Owner with the following:
    a. Within one week of notification from the CM or PM, the Contractor or manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the CM or PM within two weeks of the original notice.
    b. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
    c. The CM or PM will determine whether a replacement of all identical units or a repair is acceptable.
    d. One example of the proposed repair solution will be installed by the Contractor and the CM will be allowed to test the installations for up to one week, upon which the CM or PM will decide whether to accept the solution.
    e. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

D. Approval
    1. The CA notes each satisfactorily demonstrated function on the test form. The CA recommends acceptance of each test to the Owner. The Owner gives final approval for acceptance.

3.5 OPERATIONS AND MAINTENANCE DOCUMENTATION

A. The contractor will provide the owner with complete operations and maintenance information. Contractor to provide at a minimum:

1. Basic operation (i.e. narratives of basic equipment operation, interfaces, interlocks, and interaction with other equipment & systems, initial maintenance provided by the contractor).
2. General site operating schedules (i.e. instructions for changes in major system operating schedules, instructions for changes in major system holiday and weekend schedules).
3. Basic troubleshooting (i.e. cite recommended troubleshooting procedures specific to major systems and equipment, manual operation procedures, standby/backup/bypass operation procedures, major system power fail resets and restarts, trend log listing).
4. Recommended maintenance events log (i.e. HVAC air filter replacement schedule and log, building control system sensor calibration schedule and log).

B. Electronic O&M manuals shall be provided for all commissioned systems. Electronic O&M manuals shall consist of all hard-copy O&M manual data in searchable pdf files in a logical folder structure with descriptive file names which make it clear what the manual includes. In all cases, this requires renaming the files from any O&M's cryptic numeric file names.

C. Where electronic data from the manufacturer contains data about other models and features not included in this project, the contractor shall mark the applicable model and features for the equipment in this job in the pdf, so the operations staff can readily identify what equipment model and features in the electronic O&M apply to this building.

3.6 TRAINING OF OWNER PERSONNEL

A. Coordination: The GC shall be responsible for training coordination and scheduling and ultimately for ensuring that training is completed.

B. A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report.

C. In addition to these general requirements, the specific training requirements of Owner personnel by Subs and vendors is specified in Division 21, 23 and 26 . Each Sub and vendor responsible for training will submit a written training plan to the CA for review and approval prior to training. The plan will cover the following elements:

1. System/equipment overview
2. Intended audience
3. Location of training

4. Objectives
5. Subject covered
6. Duration of training on each subject
7. Instructor for each subject
8. Instructor qualifications
9. Methods (lecture, video, site walk-through, written handouts, etc)
10. Review and demonstration of servicing/preventative maintenance
11. Review of record drawings on the system/equipment

D. For the primary HVAC equipment, the controls contractor shall provide a short discussion of the control of the equipment during the mechanical or electrical training conducted by others.

E. Training shall cover a review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal changeover, as applicable, and any emergency procedures.

F. The trainings will be tailored to the needs and skill-level of the trainees and be oriented to the specific system installed in this project.

G. The contractor shall record the training sessions and provide the owner with a training manual and edited DVD of the training sessions.

3.7 DEFERRED TESTING

A. Unforeseen Deferred Tests: If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the PM.

B. Additional, missing or incomplete functional testing will be done by CA and will back charge to the responsible party. GC is responsible for collecting these charges and expenses from subcontractors.

3.8 FINAL REPORT

A. The final commissioning report shall include an executive summary, list of participants and roles, brief building description, overview of commissioning and testing scope and a general description of testing and verification methods. Outstanding non-compliance items shall be specifically listed.

END OF SECTION 01 91 00

SECTION 23 08 00 - COMMISSIONING OF HVAC SYSTEMS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

B. The General Conditions, any Supplementary Conditions, Section 23 05 00, Heating Ventilation and Air Conditioning, and Division 01 are hereby a part of this Section as fully as if repeated herein.

1.2 SCOPE OF WORK

A. Work includes performing commissioning process requirements for HVAC systems including mechanical controls, assemblies, and equipment.

B. Refer to Section 01 91 00 General Commissioning Requirements for general commissioning process requirements.

1.3 DEFINITIONS

A. See 01 91 00 General Commissioning Requirements for definitions.

1.4 CONTRACTOR'S RESPONSIBILITIES

A. See 01 91 00 General Commissioning Requirements for contractors' and subcontractors' responsibilities.

B. Provide training on each piece of commissioned equipment. See 01 91 00 for training details.

1.5 CA RESPONSIBILITIES

A. See 01 91 00 General Commissioning Requirements for CA responsibilities

1.6 COMMISSIONING DOCUMENTATION

A. Provide the following information to the CA for inclusion in the commissioning plan:

1. Identification of installed systems, assemblies, equipment, and components including design changes that occurred during the construction phase.
2. Schedule for completing construction checklists and manufacturer's prestart and startup checklists for HVAC systems, assemblies, equipment, and components to be commissioned.

B. Provide the following as discussed in Section 01 91 00, General Commissioning Requirements to General Contractor:

1. Completed system readiness checklist for each piece of commissioned equipment. Completion of system readiness checklist, O&M manual start-up checklist, and any manufacturer provided field start-up checklists.
2. Verification to GC readiness certifying that HVAC systems, subsystems, equipment, and associated controls are ready for functional testing.
3. Corrective action documents resulting from issues in the Commissioning Issues Log or deficiencies found from completing the start-up plan.

1.7 SUBMITTALS

A. Updated submittals: keep the CA informed of all changes to the control system documentation made during programming and setup.

B. Certificates of readiness (completion of the system readiness checklist) to General Contractor for review by CA.

C. Written training plan for review by A/E and CA prior to training. See Section 01 91 00 General Commissioning Requirements for specific items to be included in the training plan.

D. Provide O&M manuals to GC for submission to CA. These are required prior to development of the system readiness checklists.

PART 2 – PRODUCTS

2.1 TEST EQUIPMENT

A. Provide all standard testing equipment required to perform startup and initial checkout and required functional performance testing.

B. Equipment-specific tools: where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or functional testing, provide such equipment, tools, and instruments as part of the work at no extra cost to owner; such equipment, tools, and instruments are to become the property of owner.

PART 3 – EXECUTION

3.1 PARTICIPATION

A. The contractor shall provide skilled technicians to startup and debug all systems. These same technicians shall be made available to assist the Commissioning Authority in completing the commissioning program. Contractor(s) shall ensure that the qualified technician(s) are available and present during the agreed upon schedules to complete the necessary tests, adjustments, and/or problem resolutions.

B. System performance problems and discrepancies may require additional technician time, Commissioning Authority time, reconstruction of systems, and/or replacement of system components. The additional technician time shall be made available for subsequent commissioning periods until the required system performance is obtained.

3.2 TESTING PREPARATION

A. Cooperate with the CA in development of the functional test procedures.

B. Certify that HVAC systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.

C. Certify that HVAC instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.

D. Certify that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.

E. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions) as required in functional testing.

F. Provide test holes in ducts and plenums where directed by testing and balance subcontractor to allow air measurements and air balancing. Provide approved plugs.

G. Provide temperature and pressure taps according to contract documents for testing and balance, and commissioning tests.

H. Provide input to GC on construction schedule to include division pipe and duct system testing, flushing, and cleaning. Provide input on equipment start-up and testing and balance schedule to GC. Notify the CA when these items are scheduled.

I. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.

J. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CA.

K. Certify that all related A/E punch list items are complete prior to commencing functional tests.

L. Correct deficiencies found from completing the start-up plan prior to conducting functional tests.

M. Provide full points list and keep CA informed of changes in list during programming and setup.

3.3 TESTING AND BALANCE VERIFICATION

A. Prior to performance of testing and balancing work, provide copies of reports, sample forms, checklists, and certificates to the CA.

B. Notify the CA at least ten (10) days in advance of testing and balancing Work, and provide access for the CA to witness testing and balancing Work.

C. Provide technicians, instrumentation, and tools to verify testing and balancing of HVAC systems at the direction of the CA.

D. Provide a qualified control system technician to operate the controls to assist the TAB technicians or provide sufficient training for the TAB technicians to operate the system without assistance.

E. The CA will notify testing and balancing Subcontractor five (5) days in advance of the date of field verification.

F. The testing and balancing subcontractor shall use the same instruments (by model and serial number) that were used when original data were collected.

G. Failure of an item includes not meeting acceptance criteria as discussed in 23 05 93 Testing, Adjusting, and Balancing for HVAC. Failure of more than 10 percent of selected items shall result in rejection of final testing, adjusting, and balancing report.

H. Remedy the deficiency and notify the CA so verification of failed portions can be performed

3.4 GENERAL TESTING REQUIREMENTS

A. System readiness checklists and functional test forms will be provided by CA, and executed by installing subcontractors. System readiness checklists are part of the start-up plan that will be provided by the CA to the GC. The GC will distribute the forms and ensure their completion prior to submitting back to the CA for review.

B. CA will oversee execution of the functional tests. Functional tests are provided early to obtain any comments or suggestions.

C. Provide installing technicians, instrumentation, and tools to perform commissioning test at the direction of the CA.

D. Provide skilled technicians who are familiar with this building to execute the functional tests as directed by the CA.

E. Scope of HVAC testing shall include entire HVAC installation, from central equipment for heat generation and air conditioning through distribution systems to each conditioned space. Testing shall include measuring capacities and effectiveness of operational and control functions.

F. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.

G. Tests will be performed using design conditions whenever possible.

H. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.

I. The CA may direct that set points be altered when simulating conditions is not practical.

J. The CA may direct that sensor values be altered when design or simulating conditions and altering set points are not practical.

K. If tests cannot be completed because of a deficiency outside the scope of the HVAC system, document the deficiency and report it to the CM and GC. After deficiencies are resolved, coordinate with CA to reschedule tests.

L. Installing subcontractor shall be present during all functional tests, whether sub-contractor's equipment is directly involved with the test or not. This is to speed the process of problem resolution as they are discovered during the testing process.

3.5 HVAC SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

A. HVAC Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in mechanical drawings and functional tests (provided by CA) during construction phase.

B. HVAC Distribution System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of air distribution systems; including HVAC terminal equipment and unitary equipment.

C. See 01 91 00 General Commissioning Requirements for contractor's retesting procedures.

3.6 CONTROL SYSTEM TESTING PROCEDURES

A. Provide a skilled technician who is familiar with this building to execute the functional tests as directed by the CA.

B. Demonstrate the following to the CA during testing of controlled equipment:

1. Setpoint changing features and functions
2. Sensor calibrations
3. Specified functions and features are set up, debugged, and fully operable

4. Graphic screens and value readouts are completed

5. Trend monitoring and data storage is complted

3.7 TRAINING

A. Provide training on each piece of commissioned equipment. See 01 91 00 and Division 23 for training details.

B. Trainer must be familiar with this building and equipment. Have the technicians that performed work on this building available for answering questions.

END OF SECTION 23 08 00

SECTION 23 09 23 - DIRECT DIGITAL CONTROL SYSTEM FOR HVAC

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Furnish a Schneider Electric BACnet Energy Management System (EMS) as specified herein to tie into and match the Mount Diablo Unified School District's (MDUSD) current Energy Management System Standard. The operator's workstation, all building controllers, application controllers, and all input/output devices shall communicate using the protocols and network standards as defined by ANSI/ASHRAE Standard 135-2020, BACnet. In other words, all workstations and controllers, including unitary controllers, shall be native BACnet devices. No gateways shall be used for communication to controllers installed under this section. Gateways may be used for communication to existing systems or to systems installed under other sections.

B. The native BACnet EMS shall be as specified herein and consist of a high-speed, peer-to-peer local area network of DDC controllers connected to a dedicated Server PC and other client workstation PC's and Lap Top computers as specified. All HVAC and/or Electrical system points monitored and controlled by the EMS, including the building floor plans as well as all control devices, will be depicted by point-and-click graphics.

C. Provide all necessary BACnet-compliant hardware and software to meet the system's functional specifications. Provide Protocol Implementation Conformance Statement (PICS) for Windows-based control software and every controller in system, including unitary controllers. All controller devices must be BTL tested and listed by the official BACnet Testing Laboratory, having the BTL approval mark issued.

D. All devices in this new project facility location shall be accessible from a single graphical user interface.

E. Prepare individual hardware layouts, interconnection drawings, and software configuration from project design data.

F. Design, provide, and install all equipment cabinets, panels, data communication network cables needed, and all associated hardware.

G. Furnish and install the required software to produce a complete and operational native BACnet EMS as specified herein.

H. Provide complete manufacturer's specifications for all items that are supplied. Include vendor name of every item supplied.

I. Provide supervisory specialists, including a dedicated project manager, and technicians throughout the duration of the project to assist in all phases of EMS system installation, startup, and commissioning.

J. Provide a comprehensive operator and technician training program as described herein.

K. Provide as-built documentation, operator's terminal software, diagrams, and all other associated project operational documentation (such as technical manuals) on approved media, the sum total of which accurately represents the final system.

1.2 SYSTEM DESCRIPTION

A. A distributed logic control system complete with all software and hardware functions shall be provided and installed. System shall be completely based on ANSI/ASHRAE Standard 135-2020, BACnet and achieved listing under the BACnet Testing Laboratories BACnet - Advanced Workstation Software (B-AWS). This system is to control all mechanical equipment, including all unitary equipment such as heat pumps, fan-coils, AC units, and any other listed equipment using native BACnet-compliant components. Non-BACnet-compliant or proprietary equipment or systems (including gateways) shall not be acceptable and are specifically prohibited.

B. Building controllers shall include complete energy management software, including scheduling building control strategies with optimum start and logging routines. All energy management software and firmware shall be resident in field hardware and shall not be dependent on the operator's terminal. Operator's terminal software is to be used for access to field-based energy management functions only. Provide zone-by-zone direct digital logic control of space temperature, scheduling, runtime accumulation, equipment alarm reporting, and override timers for after-hours usage.

C. All application controllers for every terminal unit (HP, UV, etc.), air handler, all central plant equipment, and any other piece of controlled equipment shall be fully programmable. Application controllers shall be mounted next to controlled equipment and communicate with building controller through BACnet LAN.

D. System Architecture:

1. EMS Contractor shall utilize Owner's IT WAN for connection from BACnet Server to all Global Controllers furnished and installed as part of this project. Connection shall be by way of BACnet/IP as defined in Addendum A (Annex J) of the ANSI/ASHRAE Standard for BACnet. Connection between all Integration Level Global Controllers, the BACnet Server and any client work stations (PC's or Lap Tops) shall be high-speed, peer-to-peer Ethernet as per Standard IEEE802.3. Owner shall furnish and maintain IT WAN infrastructure.

2. EMS Contractor shall provide and install a dedicated MS/TP LAN extending from all Global Controller's to distributed field level controller BACnet devices.

3. Distributed field level controllers are responsible for directly controlling and monitoring HVAC and Electrical system points throughout the facility.

4. The BACnet Server hosts system configurations, programming databases and stores all trend log data. The Server maintains all backup files for system configuration and programming located on Global Controller's and field level controllers and is capable of directly uploading or downloading information from the controllers.

1.3 APPROVED MANUFACTURERS

A. Approved Control Manufacturers:

1. Schneider Electric - no substitution.

2. QUALITY ASSURANCE

A. The Contractor shall be regularly engaged in the manufacturing, installation and maintenance of EMS systems and shall have demonstrated technical expertise and experience in the manufacture, installation and maintenance of EMS systems similar in size and complexity to this project.

B. The EMS system shall be designed, installed, commissioned, and serviced by manufacturer-authorized and trained personnel. System provider shall have an in-place support facility within 50 miles of the site with technical staff, spare parts inventory and necessary test and diagnostic equipment.

C. To provide the level of support and response required by the Owner, the Energy Management System Contractor shall have a fully staffed service department with the following minimum personnel and service offerings:

1. Minimum of 1 (one) Dedicated Support Technician located at a fixed location with access to a network for remote access to the site.

2. Minimum of 1 (one) Dedicated Service Dispatcher to route calls and prioritize service response.

3. Minimum of 5 (five) Dedicated Field Service Technicians. To ensure that there are personnel available to respond to service requests in a timely manner, these technicians are to be dedicated to service and not used on construction projects.

4. Maintain a 24/7 Service Call Center staffed by live operators enabling immediate response to Owner's critical emergency EMS concerns.

D. The EMS Contractor shall provide an on-site, experienced project manager for this work who is responsible for direct supervision of the installation, start up and commissioning of the EMS system.

E. EMS Contractor shall have a proven record of successful native BACnet installations and maintenance of equivalent native BACnet systems for a minimum period of 5 years utilizing the same native BACnet manufacturer's product line that the Contractor proposes to use on this project.

F. Materials and equipment shall be manufacturer's latest standard design that complies with the specification requirements.

G. All BAS peer-to-peer network controllers, central system controllers and local user displays shall be UL Listed under Standard UL 916, category PAZX.

H. All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Governing Radio Frequency Electromagnetic Interference and be so labeled.

1.4 REFERENCE STANDARDS

A. The latest edition of the following standards and codes in effect and amended as of supplier's proposal date, and any applicable subsections thereof, shall govern design and selection of equipment and material supplied:

1. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
2. ANSI/ASHRAE Standard 135-2008, BACnet.
3. Uniform Building Code (UBC), including local amendments.
4. UL 916 Underwriters Laboratories Standard for Energy Management Equipment. Canada and the US.
5. National Electrical Code (NEC).
6. FCC Part 15, Subpart J, Class A.
7. EMC Directive 89/336/EEC (European CE Mark).
8. UL-864 UUKL listing for Smoke Controls for any equipment used in smoke control sequences.

B. City, county, state, and federal regulations and codes in effect as of contract date.

C. Except as otherwise indicated, the system supplier shall secure and pay for all permits, inspections, and certifications required for his work, and arrange for necessary approvals by the governing authorities.

1.5 SUBMITTALS

A. Drawings:

1. The system supplier shall submit engineered drawings, control sequence, and bill of materials for approval.
2. Drawings shall be submitted in the following standard sizes: 11" x 17" (ANSI B).
3. Eight (8) complete sets (copies) of submittal drawings shall be provided.
4. Drawings shall be available in electronic format.

B. System Documentation - Include the following in submittal package:

1. System configuration diagrams in simplified block format.
2. All input/output object listings and an alarm point summary listing.
3. Electrical drawings that show all system internal and external connection points, terminal block layouts, and terminal identification.
4. Complete bill of materials, valve schedule and damper schedule.
5. Manufacturer's instructions and drawings for installation, maintenance, and operation of all purchased items.
6. Overall system operation and maintenance instructions—including preventive maintenance and troubleshooting instructions.
7. For all system elements—operator's workstation(s), building controller(s), application controllers, routers, and repeaters—provide BACnet Protocol Implementation Conformance Statements (PICS) as per ANSI/ASHRAE Standard 135-2020.
8. Provide complete description and documentation of any proprietary (non-BACnet) services and/or objects used in the system.
9. A list of all functions available and a sample of function block programming that shall be part of delivered system.

1.6 WARRANTY

A. Warranty shall cover all costs for parts, labor, associated travel, and expenses for a period of one (1) year from completion of system acceptance.

B. Extended Warranty – Years 2 to 5. For Characterized Control Valves (CCV), Globe Valves, Butterfly Valves, associated Valve Actuators and Damper Actuators, provide like kind replacement components for any defective material identified and returned in Years 2 to 5 from the date of system acceptance.

C. Hardware and software personnel supporting this warranty agreement shall provide on-site or off-site service in a timely manner after failure notification to the vendor.

D. This warranty shall apply equally to both hardware and software. This warranty shall apply equally to both hardware and software.

1.7 RELATED WORK IN OTHER SECTIONS

E. Refer to Division 0 and Division 1 for related contractual requirements.

F. Refer to Section 23 00 00 for General Mechanical Provisions.

G. Refer to Section 26 00 00 for General Electrical Provisions.

PART 2 – PRODUCTS

2.1 CONTROL PROGRAMMING SOFTWARE

A. All DDC programming throughout the EMS network shall adhere to the following standards:

1. Programming on all controllers must be completely operator definable and modifiable and must use a single common programming language for all control devices. Use of pre-canned, factory burned-in DDC programming on controllers is not acceptable and is grounds for rejection of EMS system.
2. Programming shall be developed in an object-oriented graphical programming environment. Line by line code programming is specifically prohibited and is not acceptable.
3. Programming must accommodate all written sequences of operations.
4. Programming shall be modifiable from any server PC, operator console PC and/or portable laptop PC workstation without requiring the burning of new chips or having to directly access the local controller. Software shall accommodate the downloading of programming via established network Ethernet or modem connections.
5. Programming must support the use of virtual software points in the same manner as all physical points are supported.
6. All programming points, virtual or real, for any specific device in the entire EMS network shall be accessible to all other network devices at any given time, regardless of physical location.
7. All programming shall adhere to the BACnet protocols for Standard Command Priorities.

8. Programming software must include a pre-developed cohesive PID (proportional-integral-derivative) algorithm whereby a user can adjust gain and anti-windup coefficients accordingly to effectively accomplish advanced sequence of operation requirements.

2.2 BUILDING (GLOBAL) CONTROLLER

A. General Requirements:

1. BACnet Conformance:
   a. Building Controller shall be approved by the BTL as meeting the BACnet Building Controller requirements.
   b. Please refer to section 22.2, BACnet Functional Groups, in the BACnet standard, for a complete list of the services that must be directly supported to provide each of the functional groups listed above. All proprietary services, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.
2. Building controller shall be of scalable design such that the number of trunks and protocols may be selected to fit the specific requirements of a given project.
3. The controller shall be capable of panel-mounted on DIN rail and/or mounting screws.
4. The controller shall be capable of providing global control strategies for the system based on information from any objects in the system, regardless if the object is directly monitored by the building controller module or by another controller.
5. The controller shall be capable of running up to six independent control strategies simultaneously. The modification of one control strategy does not interrupt the function or runtime others.
6. The software program implementing the DDC strategies shall be completely flexible and user-definable. All software tools necessary for programming shall be provided as part of project software. Any systems utilizing factory pre-programmed global strategies that cannot be modified by field personnel on-site, using a WAN or downloaded through remote communications are not acceptable. Changing global strategies using firmware changes is also unacceptable.

7. Programming shall be object-oriented using control function blocks, and support DDC functions, All flowcharts shall be generated and automatically downloaded to controller. Programming tool shall be supplied and be resident on workstation. The same tool shall be used for all controllers.
8. Programming tool shall provide means to graphically view inputs and outputs to each program block in real-time as program is executing. This function may be performed using the operator's workstation or field computer.
9. Controller shall have 6000 Analog Values and 6000 Binary Values
10. Controller IP configuration can be done via a direct USB connect with a operator's workstation or field computer.
11. Controller shall have at a minimum a Quad Core 996Ghz processor to ensure fast processing speeds.
12. Global control algorithms and automated control functions shall execute using a 64-bit processor.
13. Controller shall have a minimum of 1 GB of DDR3 SDRAM on a 533Mhz bus to ensure high speed data recording, large data storage capacity and reliability.
14. Controller shall support two on-board EIA-485 ports capable of supporting various EIA-485 protocols including but not limited to BACnet MS/TP and Modbus.
    a. Ports are capable of supporting various EIA-485 protocols including but not limited to BACnet MS/TP and Modbus.
15. Controller shall support two gigabit speed Ethernet (10/100/1000) ports.
    a. Ports are capable of supporting various Ethernet protocols including but not limited to BACnet IP, FOX, and Modbus.
16. All ports shall be capable of having protocol(s) assigned to utilize the port's physical connection
17. The controller shall have at a minimum four onboard inputs, two universal inputs and two binary inputs.
18. Schedules:
    a. Building controller modules shall provide normal seven-day scheduling, holiday scheduling and event scheduling.
    b. Each building controller shall support a minimum of 480 BACnet Schedule Objects and 480 BACnet Calendar Objects.
19. Logging Capabilities:

a. Each building controller shall log as minimum 1920 objects at 15 min intervals. Any object in the system (real or calculated) may be logged. Sample time interval shall be adjustable at the operator's workstation.

b. Logs may be viewed both on-site or off-site using WAN or remote communication.

c. Building controller shall periodically upload trended data to networked operator's workstation for long-term archiving if desired.

d. Archived data stored in database format shall be available for use in third-party spreadsheet or database programs.

20. Alarm Generation:

a. Alarms may be generated within the system for any object change of value or state (either real or calculated). This includes things such as analog object value changes, binary object state changes, and various controller communication failures.

b. Each alarm may be dialed out as noted elsewhere.

c. Alarm log shall be provided for alarm viewing. Log may be viewed on-site at the operator's terminal or off-site using remote communications.

d. Controller must be able to handle up to 1920 alarm setups stored as BACnet event enrollment objects, with system destination and actions individually configurable.

21. Demand Limiting:

a. Demand limiting of energy shall be a built-in, user-configurable function. Each controller module shall support shedding of up to 1200 loads using a minimum of two types of shed programs.

b. Load shedding programs in building controller modules shall operate as defined in section 2.1.J of this specification.

22. Tenant Activity Logging:

a. Tenant Activity logging shall be supported by building controller module. Each independent module shall support a minimum of 480 zones.

b. Tenant Activity logging shall function as defined in section 2.1.K of this specification.

B. BACnet MS/TP:

1. BACnet MS/TP LAN must be software-configurable from 9.6 to 115.4Kbps:

a. Each BACnet MS/TP LAN shall support 64 BACnet devices at a minimum

b. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

C. BACnet IP:

1. The building controller shall comply with Annex J of the BACnet specification for IP connections. This device shall use Ethernet to connect to the IP internetwork, while using the same Ethernet LAN for non-IP communications to other BACnet devices on the LAN.
2. Must support interoperability on WANs and CANs and function as a BACnet Broadcast Management Device (BBMD).
3. Each controller shall support at a minimum 128 BBMD entries.
4. BBMD management architecture shall support 3000 subnets at a minimum.
5. Shall support BACnet Network Address Translation.
6. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

D. Expansion ports:

1. Controller shall support two expansion ports.
   a. Combining the two on-board EIA-458 ports with fully loaded expansion ports the controller shall support 6 EIA-485 trunks simultaneously.
2. Expansion cards that mate to the expansion ports shall include:
   a. Dual port EIA-485 card.

E. Power Supply:

1. Input for power shall accept between 17–30VAC, 47–63Hz.
2. Optional rechargeable battery for shutdown of controller including storage of all data in flash memory.
3. On-board capacitor will ensure continuous operation of real-time clocks for minimum of 14 days.

F. Controller shall be in compliance with the following:

1. UL 916 for open energy management.
2. FCC Class B.
3. ROHS.
4. IEC 60703.

5. C-Tick Listed.

G. Controller shall operate in the following environmental conditions:

1. -4 to 149 °F (-20 to 65 °C) without optional battery, or 32 to 122 °F (0 to 50 °C) with optional battery.

2. 0 to 95% RH, non-condensing.

2.3 AUXILIARY CONTROL DEVICES

A. Temperature Sensors:

1. All temperature sensors to be solid-state electronic, interchangeable with housing appropriate for application. Wall sensors to be installed as indicated on drawings. Mount 48 inches above finished floor. Duct sensors to be installed such that the sensing element is in the main air stream. Immersion sensors to be installed in wells provided by control contractor, but installed by mechanical contractor. Immersion wells shall be filled with thermal compound before installation of immersion sensors. Outside air sensors shall be installed away from exhaust or relief vents, not in an outside air intake, and in a location that is in the shade most of the day.

B. Intelligent Room Sensor with Touch Screen:

1. Hardware:

a. Room sensor shall include:

1) Backlit touch screen LCD digital display.

2) Temperature sensor.

3) Humidity Sensor.

4) Programmable Status Light indicator.

5) CO2 Sensor (as scheduled on prints).

b. Temperature sensor shall be a Uni-Cuve Type II thermstor with an accuracy of +/- 0.36 °F (0.2 °C) at calibration point over the range of 32-158 °F or better.s

c. Humidity sensor shall have an accuracy of +/-3% from 10-90% relative humidity or better.

d. The intelligent room sensor's Smart Light shall have a minimum of four colors (Blue, Red, Amber and Green) that will cast a glow onto the wall below the sensor to be used as visual indicator to the occupants of the condition of the system. The color and on/off state of smart light shall be fully programmable.

e. CO2 Sensor shall have an accuracy of +/- 30 ppm over the range of 0-5000 ppm or better.

f. CO2 sensor shall utilize Automatic Baseline Correction to maintain sensor calibration without need for manual calibration.

g. The user shall interact with the smart sensor using a touch screen, with no buttons allowed.

h. The intelligent room sensor shall have provisions for a tamper proof installation requiring tools to be removed from the wall.

i. The touch screen shall have a surface hardness of Mohs 7 or greater to prevent being easily scratched.

j. Controller shall function as room control unit and allow occupant to raise and lower setpoint, and activate terminal unit for override use—all within limits as programmed by building operator.

2. Display Content:

a. The intelligent room sensor shall simultaneously display room setpoint, room temperature, and outside temperature at each controller.

b. The intelligent room sensor shall have the ability to add or remove from the display time-of-day, room humidity, and indoor air temp to customize the view for the customer.

c. The intelligent room sensor must have the capability to show temperatures in degrees Fahrenheit or degrees Centigrade.

d. A communication loss or improper communications wiring shall be displayed on the LCD screen to aid in trouble shooting.

e. Information about the version of firmware shall be displayable on the LCD screen.

f. A cleaning mode will be provided to allow for the touch screen to be cleaned without inadvertently making changes to system parameters.

g. The intelligent room sensor shall have the ability to display the status of a lighting zone status and control the on/off state of the zone from the touch screen using a tenant accessible display page.

h. The intelligent room sensor shall have the ability to display the status of a window zone (e.g. blinds) and control the on/off state of the zone from the touch screen using a tenant accessible display page.

i. After Hours Override shall:

1) Override time may be set and viewed in 30 minute increments.

2) Override time countdown shall be automatic, but may be reset to zero by occupant from the sensor.

3) Time remaining shall be displayed.

4) Display shall show the word "OFF" in unoccupied mode unless a function button is pressed.

3. Other Modes:

a. The intelligent room sensor shall also allow service technician access to hidden functions for advanced system configuration. This functionality shall be accessed protected with a configurable pin number.

b. Field service mode shall allow access to common parameters as dictated by the application's sequence of operations. The parameters shall be viewed and set from the intelligent room sensor with no computer or other field service tool needed.

c. Balance mode shall, if intelligent room sensor is connected to VAV controller, allow a VAV box to be balanced and all air flow parameters viewed. The balancing parameters shall be viewed and set from the intelligent room sensor with no computer or other field service tool needed.

4. Intelligent Room Sensor shall be in compliance of the following:

a. UL Standard for Safety 916

b. FCC Part 15.107 & 109, Class B, CFR47-15

c. EMC Directive 89/336/EEC (European CE Mark).

C. Wall Sensor:

1. Standard wall sensor shall use solid-state sensor identical to intelligent room sensor and shall be packaged in aesthetically pleasing enclosure. Sensor shall provide override function, warmer/cooler lever for set point adjustment and port for plug-in of Field Service Tool for field adjustments. Override time shall be stored in controller and be adjustable on a zone-by-zone basis. Adjustment range for warmer/cooler lever shall also be stored in EEPROM on controller. All programmable variables shall be available to field service tool through wall sensor port.

2.4 ELECTRONIC ACTUATORS AND VALVES:

A. Quality Assurance for Actuators and Valves:

1. UL Listed Standard 873 and C.S.A. Class 4813 02 certified.

2. NEMA 2 rated enclosures for inside mounting, provide with weather shield for outside mounting.
3. Five-year manufacturer's warranty. Two-year unconditional and three-year product defect from date of installation.

B. Actuators for damper and control valves 0.5–6 inches shall be electric unless otherwise specified, provide actuators as follows:

1. UL Listed Standard 873 and Canadian Standards Association Class 481302 shall certify actuators.
2. NEMA 2 rated actuator enclosures for inside mounting. Use additional weather shield to protect actuator when mounted outside.
3. Five-year manufacturer's warranty. Two-year unconditional and three-year product defect from date of installation.
4. Mechanical spring shall be provided when specified. Capacitors or other non-mechanical forms of fail-safe are not acceptable.
5. Position indicator device shall be installed and made visible to the exposed side of the actuator. For damper short shaft mounting, a separate indicator shall be provided to the exposed side of the actuator.
6. Overload Protection: Actuators shall provide protection against actuator burnout by using an internal current limiting circuit or digital motor rotation sensing circuit. Circuit shall insure that actuators cannot burn out due to stalled damper or mechanical and electrical paralleling. End switches to deactivate the actuator at the end of rotation are acceptable only for butterfly valve actuators.
7. A pushbutton gearbox release shall be provided for all non-spring actuators.
8. Modulating actuators shall be 24 VAC and consume 10 VA power or less.
9. Conduit connectors are required when specified and when code requires it.

C. Damper Actuators:

1. Economizer actuators shall utilize analog control 0–10 VDC; floating control is not acceptable.
2. Electric damper actuators (including VAV box actuators) shall be direct shaft-mounted and use a V-bolt and toothed V-clamp causing a cold weld effect for positive gripping. Single bolt or set-screw type fasteners are not acceptable.

3. One (1) electronic actuator shall be direct shaft-mounted per damper section. No connecting rods or jackshafts shall be needed. Small outside air and return air economizer dampers may be mechanically linked together if one (1) actuator has sufficient torque to drive both and damper drive shafts are both horizontal installed.
4. Multi-section dampers with electric actuators shall be arranged so that each damper section operates individually. One (1) electronic actuator shall be direct shaft-mounted per damper section. See below execution section for more installation details.
5. Actuator mounting for damper and valve arrangements shall comply with the following:
    a. Damper actuators: Shall not be installed in the air stream.
    b. A weather shield shall be used if actuators are located outside. For damper actuators, use clear plastic enclosure.
    c. Damper or valve actuator ambient temperature shall not exceed 122 degrees F through any combination of medium temperature or surrounding air. Appropriate air gaps, thermal isolation washers or spacers, standoff legs, or insulation shall be provided as necessary.
    d. Actuator cords or conduit shall incorporate a drip leg if condensation is possible. Water shall not be allowed to contact actuator or internal parts. Location of conduits in temperatures dropping below dew point shall be avoided to prevent water from condensing in conduit and running into actuator.
    e. Damper mounting arrangements shall comply to the following:
        1) The ventilation subcontractor shall furnish and install damper channel supports and sheet metal collars.
        2) No jack shafting of damper sections shall be allowed.
        3) Multi-section dampers shall be arranged so that each damper section operates individually. One (1) electronic actuator shall be direct shaft mounted per section.
    f. Size damper sections based on actuator manufacturer's specific recommendations for face velocity, differential pressure and damper type. In general:
        1) Damper section shall not exceed 24 ft-sq. with face velocity >1500 FPM.
        2) Damper section shall not exceed 18 ft-sq. with face velocity > 2500 FPM.

3) Damper section shall not exceed 13 ft-sq. with face velocity > 3000 FPM.

g. Multiple section dampers of two or more shall be arranged to allow actuators to be direct shaft mounted on the outside of the duct.

h. Multiple section dampers of three or more sections wide shall be arranged with a 3-sided vertical channel (8 inches wide by 6 inches deep) within the duct or fan housing and between adjacent damper sections. Vertical channel shall be anchored at the top and bottom to the fan housing or building structure for support. The sides of each damper frame shall be connected to the channels. Holes in the channel shall allow damper drive blade shafts to pass through channel for direct shaft-mounting of actuators. Open side of channel shall be faced downstream of the airflow, except for exhaust air dampers.

i. Multiple section dampers to be mounted flush within a wall or housing opening shall receive either vertical channel supports as described above or sheet metal standout collars. Sheet metal collars (12-inch minimum) shall bring each damper section out of the wall to allow direct shaft-mounting of the actuator on the side of the collar.

2.5 ENCLOSURES

A. All controllers, power supplies and relays shall be mounted in enclosures.

B. Enclosures may be NEMA 1 when located in a clean, dry, indoor environment. Indoor enclosures shall be NEMA 12 when installed in other than a clean environment. Outdoor enclosures must be either NEMA 3R or NEMA 4.

C. All temperature control panels shall be fabricated in a UL-listed panel shop. Field assembled temperature control panels are not allowed.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this section may properly commence.

B. Notify the owner's representative in writing of conditions detrimental to the proper and timely completion of the work.

C. Do not begin work until all unsatisfactory conditions are resolved.

3.2 INSTALLATION (GENERAL)

A. Install in accordance with manufacturer's instructions.

B. Provide all miscellaneous devices, hardware, software, interconnections, installation, and programming required to ensure a complete operating system in accordance with the sequences of operation and point schedules.

3.3 LOCATION AND INSTALLATION OF COMPONENTS

A. Locate and install components for easy accessibility; in general, mount 48 inches above floor with minimum three (3) feet of clear access space in front of units. Obtain approval on locations from owner’s representative prior to installation.

B. All instruments, switches, transmitters, etc., shall be suitably wired and mounted to protect them from vibration, moisture, and high or low temperatures.

C. Identify all equipment and panels. Provide permanently mounted tags for all panels.

D. Provide stainless steel or brass thermowells suitable for respective application and for installation under other sections, and sized to suit pipe diameter without restricting flow.

3.4 INTERLOCKING AND CONTROL WIRING

A. Provide all interlock and control wiring associated with the EMS system. All wiring shall be installed neatly and professionally, in accordance with all national, state and local electrical codes.

B. Provide wiring as required by functions as specified and as recommended by equipment manufacturers, to serve specified control functions. Provide shielded low capacitance wire for all communications trunks.

C. Control wiring shall not be installed in power circuit raceways. Magnetic starters and disconnect switches shall not be used as junction boxes. Provide auxiliary junction boxes as required. Coordinate location and arrangement of all control equipment with the owner's representative prior to rough-in.

D. Provide auxiliary pilot duty relays on motor starters as required for control function.

E. Provide power for all control components from nearest electrical control panel or as indicated on the electrical drawings; coordinate with electrical contractor.

F. All control wiring in mechanical, electrical, telephone and boiler rooms to be installed in raceways. Exposed control wiring shall also be installed in raceways. All other control wiring to be installed without conduit neatly and inconspicuously per local code requirements.

3.5 DDC OBJECT TYPE SUMMARY

A. Provide all database generation.

B. Displays

1. System displays shall show all analog and binary object types within the system. They shall be logically laid out for easy use by the owner. Provide outside air temperature indication on all system displays associated with economizer cycles.

C. Run Time Totalization

1. At a minimum, run time totalization shall be incorporated for each monitored supply fan, return fan, exhaust fan, hot water and chilled water pumps. Warning limits for each point shall be entered for alarm and or maintenance purposes.

D. Trend Log

1. All binary and analog object types (including zones) shall have the capability to be automatically trended.

E. Alarm

1. All analog inputs (High/Low Limits) and selected binary input alarm points shall be prioritized and routed (locally or remotely) with alarm message per owner's requirements.

F. Database Save

1. Provide backup database for all standalone application controllers on disk.

3.6 FIELD SERVICES

A. Prepare and start logic control system under provisions of this section.

B. Start up and commission systems. Allow sufficient time for startup and commissioning prior to placing control systems in permanent operation.

C. Provide the capability for off-site monitoring at control contractor's local or main office. At a minimum, off-site facility shall be capable of system diagnostics and software download. Owner shall provide phone line for this service for one (1) year or as specified.

D. Provide owner's representative with spare parts list. Identify equipment critical to maintaining the integrity of the operating system.

3.7 TRAINING

A. Provide application engineer to instruct owner in operation of systems and equipment.

B. Provide system operator’s training to include (but not be limited to) such items as the following: modification of data displays, alarm and status descriptors, requesting data, execution of commands and request of logs. Provide this training to a minimum of three persons.

C. Provide on-site training above as required, up to 24 hours as part of this contract.

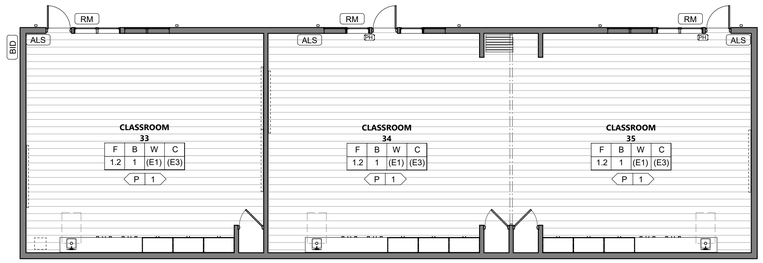
1. Provide first training session before occupancy, once all systems are functioning and tested.
2. Provide second training 4-5 months after occupancy.
3. Provide final training 11 months after occupancy. This training should focus on answering questions about controls system. Collect questions at least two (2) weeks before training and tailor training materials to address these questions.

3.8 DEMONSTRATION

A. Demonstrate complete operating system to owner's representative.

B. Provide certificate stating that control system has been tested and adjusted for proper operation.

END OF SECTION 23 09 23

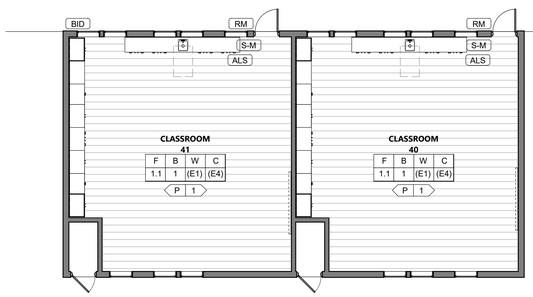


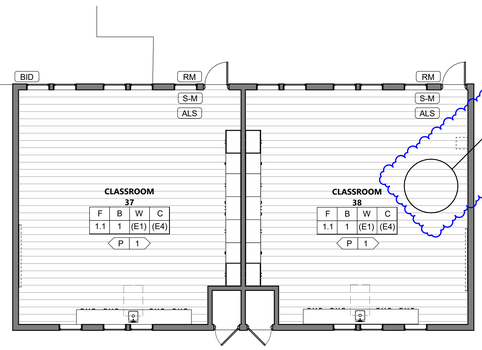
BLDG F - FINISHES

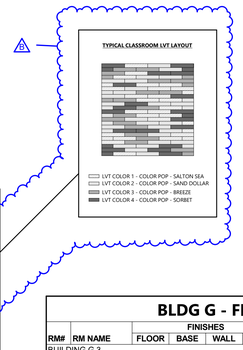
RM#	RM NAME	FINISHES FLOOR	BASE	WALL	CEILING	DOORS
BUILDING F						
33	CLASSROOM	1.2	1	(E1)	(E3)	PAINTING OF (E) DOOR FRAME
34	CLASSROOM	1.2	1	(E1)	(E3)	PAINTING OF (E) DOOR FRAME
35	CLASSROOM	1.2	1	(E1)	(E3)	PAINTING OF (E) DOOR FRAME

TRUE NORTH

FINISH PLAN - BUILDING F | 1/8" = 1'-0" | **1**







BLDG G - FINISHES

RM#	RM NAME	FINISHES FLOOR	BASE	WALL	CEILING	DOORS
BUILDING G.3						
37	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
38	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
BUILDING G.4						
40	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
41	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME

TRUE NORTH

FINISH PLAN - BUILDING G.3 & G.4 | 1/8" = 1'-0" | **2**

LEGEND - FINISHES GENERAL NOTES

1. CONTRACTOR RESPONSIBLE FOR FIELD VERIFYING MATERIAL DIMENSIONS AT EACH PARTITION IN THE FIELD AS RELATED TO THE OVERALL FINAL PARTITION DIMENSION, PRIOR TO DOOR AND WINDOW SUBMITTALS.
2. FOR MATERIAL FINISHES AND LOCATION OF FINISHES, REFER TO FINISH PLAN, INTERIOR ELEVATIONS AND FINISH SCHEDULE.
3. SPECIFICATIONS SHALL SUPERCEDE DIMENSIONS IN THIS DETAIL AS NECESSARY; CONTRACTOR TO VERIFY.

LEGEND - FLOOR FINISHES

1 - LUXURY VINYL TILE

2 - CERAMIC TILE

B

FLOOR FINISHES (F)

(F)	DESCRIPTION	COLOR	SPEC SECTION	REMARKS
(E#)	EXISTING FLOOR	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1.1	LVT COLOR 1	ID LATITUDE - LAUREL OAK		TARKETT
1.2	LVT (MULTICOLOR)	SEE 2/1A251 FOR COLORS		TARKETT - COLOR POP
1.3	LVT COLOR 3	TBD		TARKETT
1.4	LVT COLOR 4	TBD		TARKETT
3	CERAMIC TILE	-		COVE BASE

BASE FINISHES (B)

(B)	DESCRIPTION	COLOR	SPEC SECTION	REMARKS
(E#)	EXISTING BASE	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	4" RUBBER BASE	TBD		JOHNSONITE
2	6" CERAMIC TILE BASE	TBD		WITH INTEGRAL COVE

WALL FINISHES (W)

(W)	DESCRIPTION	COLOR	SPEC SECTION	REMARKS
(E#)	EXISTING WALL	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	5/8" TYPE 'X' GYP BD	PAINT		
2	CERAMIC WALL TILE	TBD		DALTILE
3	TACKBOARD	TBD		CLARIDGE TACK WALL

CEILING FINISHES (C)

(C)	DESCRIPTION	COLOR	SPEC SECTION	REMARK
(E#)	EXISTING CEILING	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	5/8" TYPE "X" GYP BD	TBD		SHERWIN WILLIAMS
2	5/8" WATER RESISTANT TYPE "X" GYP BD	TBD		SHERWIN WILLIAMS
3	SUSPENDED ACOUSTIC CEILING, 24" x 24" TILES	-		EXISTING TO REMAIN
4	GLUE-UP ACOUSTICAL TILE	-		EXISTING TO REMAIN

A

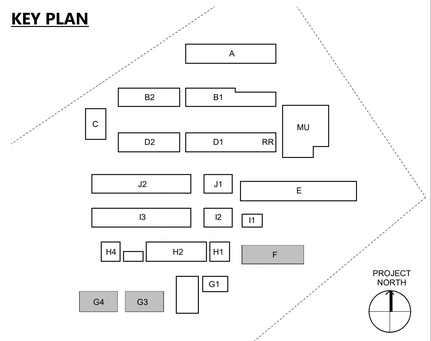
PAINT (P)

(P)	DESCRIPTION	COLOR	SPEC SECTION	REMARK
(E#)	EXISTING PAINT	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	INTERIOR WALL PAINT	SW7757 HIGH REFLECTIVE WHITE	SHADOW SEMIGLOSS	SHERWIN WILLIAMS
2	INTERIOR ACCENT WALL PAINT	TBD	SHADOW SEMIGLOSS	SHERWIN WILLIAMS
3	EXTERIOR DOOR FRAME PAINT	TBD		SHERWIN WILLIAMS
4	EXTERIOR MECHANICAL DOOR PAINT	TBD		SHERWIN WILLIAMS
5	INTERIOR DOOR FRAME PAINT	TBD		SHERWIN WILLIAMS

LEGEND - SIGNAGE

- RM — ROOM NAME / NUMBER SIGN, SEE DETAIL 2/1A-503
- S-1 — TOILET ROOM DOOR SIGN, SEE DETAIL 16/1A-503
- S-2 — TOILET ROOM WALL SIGN, SEE DETAILS 11/1A-503
- S-X — TACTILE "EXIT" SIGN (INTERIOR), SEE DETAILS 7/1A-503
- S-XR — TACTILE "EXIT ROUTE" SIGN (INTERIOR), SEE DETAILS 18/1A-503
- S-M — "MAXIMUM OCCUPANCY" SIGN (INTERIOR), SEE DETAIL 15/1A-503
- S-F — "FIRE SPRINKLER RISER INSIDE" SIGN, SEE DETAIL
- ALS — ASSISTIVE LISTENING SIGN, SEE DETAIL 14/1A-503
- EAR — EXTERIOR AREA FOR ASSISTED RESCUE SIGN, SEE DETAIL
- AES — ACCESSIBLE ENTRANCE SIGN, SEE DETAIL 19/1A-503
- BID — BUILDING IDENTIFICATION, SEE DETAIL 20/1A-503

KEY PLAN



AGENCY APPROVAL DSA# 01-121400

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PROFESSIONAL STAMP

LICENSED ARCHITECT
MARIANA ALVAREZ PARGA
C-36107
REN. 01-31-25
STATE OF CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION
	12-19-2023	DSA SUBMITTAL
A	04-16-2024	ADDENDUM
B	Date 4	ADDENDUM

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MOUNT DIABLO UNIFIED SCHOOL DISTRICT
1936 Carlotta Drive
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MEADOW HOMES ES MODERNIZATION
1371 Detroit Ave
Concord, CA 94520

SHEET TITLE
FINISH PLAN - BLDG F, G

INCREMENT: INC.1

DRAWN BY: ZF JOB NUMBER: 23119.01

SHEET NO.
1A-251

DATE: APRIL 17, 2024

CONSTRUCTION DOCUMENTS

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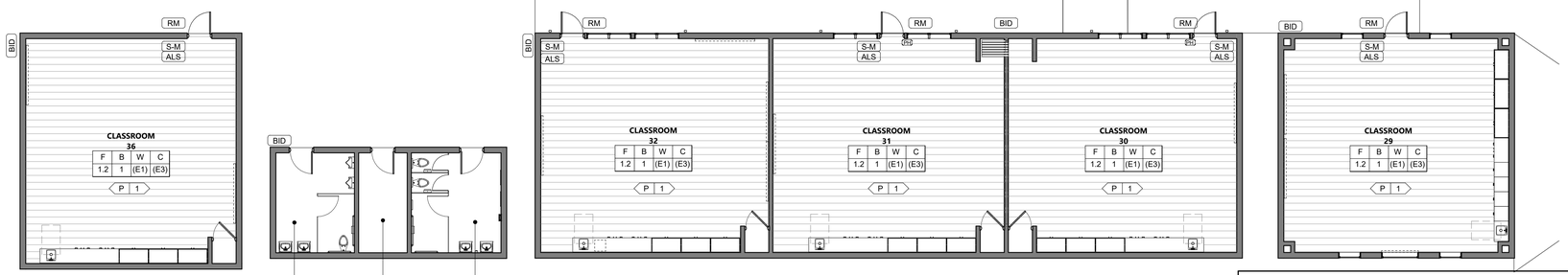
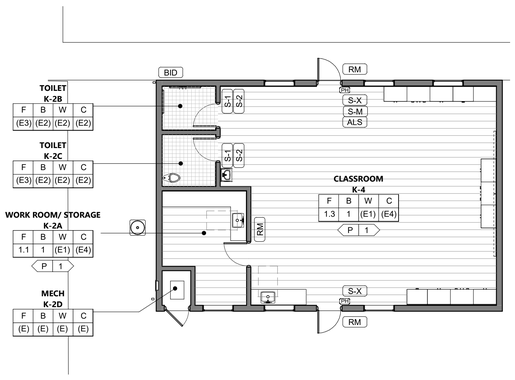


BLDG H - FINISHES

RM#	RM NAME	FINISHES FLOOR	BASE	WALL	CEILING	DOORS
BUILDING H.1						
29	CLASSROOM	1.2	1	(E1)	(E3)	PAINTING OF (E) DOOR FRAME
BUILDING H.2						
30	CLASSROOM	1.2	1	(E1)	(E3)	PAINTING OF (E) DOOR FRAME
31	CLASSROOM	1.2	1	(E1)	(E3)	PAINTING OF (E) DOOR FRAME
32	CLASSROOM	1.2	1	(E1)	(E3)	PAINTING OF (E) DOOR FRAME
BUILDING H.3						
C4	CUST	(E)	(E)	(E)	(E)	
T7	GIRLS	(E)	(E1)	(E)	(E)	
T9	BOYS	(E)	(E1)	(E)	(E)	
BUILDING H.4						
36	CLASSROOM	1.2	1	(E1)	(E3)	PAINTING OF (E) DOOR FRAME

TRUE NORTH

FINISH PLAN - BUILDING H | 1/8" = 1'-0" | 1

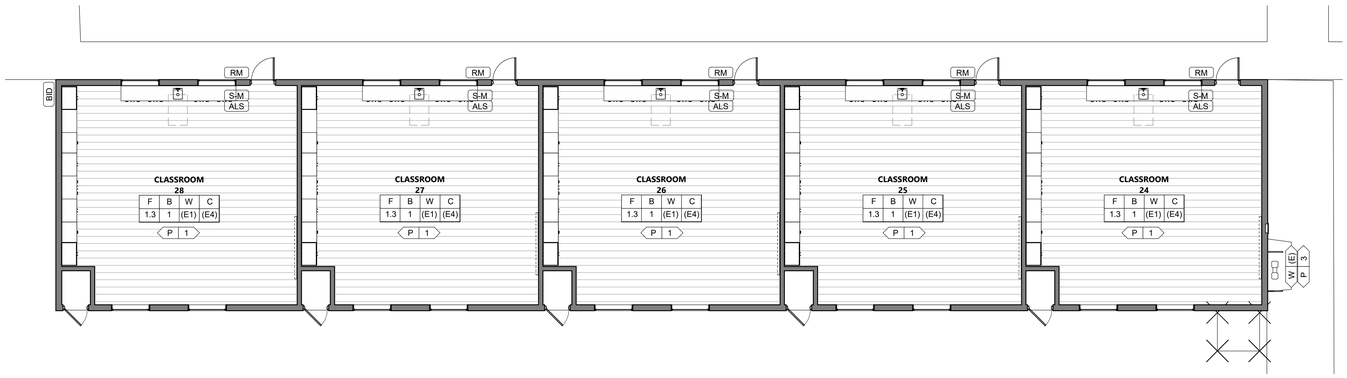


BLDG I - FINISHES

RM#	RM NAME	FINISHES FLOOR	BASE	WALL	CEILING	DOORS
BUILDING I.2						
K-2A	WORK ROOM/ STORAGE	1.1	1	(E1)	(E4)	
K-2B	TOILET	(E3)	(E2)	(E2)	(E2)	
K-2C	TOILET	(E3)	(E2)	(E2)	(E2)	
K-2D	MECH	(E)	(E)	(E)	(E)	
K-4	CLASSROOM	1.3	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
BUILDING I.3						
24	CLASSROOM	1.3	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
25	CLASSROOM	1.3	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
26	CLASSROOM	1.3	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
27	CLASSROOM	1.3	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
28	CLASSROOM	1.3	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME

TRUE NORTH

FINISH PLAN - BUILDING I.2 | 1/8" = 1'-0" | 2



TRUE NORTH

FINISH PLAN - BUILDING I.3 | 1/8" = 1'-0" | 3

LEGEND - FINISHES GENERAL NOTES

1. CONTRACTOR RESPONSIBLE FOR FIELD VERIFYING MATERIAL DIMENSIONS AT EACH PARTITION IN THE FIELD AS RELATED TO THE OVERALL FINAL PARTITION DIMENSION, PRIOR TO DOOR AND WINDOW SUBMITTALS.
2. FOR MATERIAL FINISHES AND LOCATION OF FINISHES, REFER TO FINISH PLAN, INTERIOR ELEVATIONS AND FINISH SCHEDULE.
3. SPECIFICATIONS SHALL SUPERCEDE DIMENSIONS IN THIS DETAIL AS NECESSARY; CONTRACTOR TO VERIFY.

LEGEND - FLOOR FINISHES

1 - LUXURY VINYL TILE

2 - CERAMIC TILE

FLOOR FINISHES (F)

(F)	DESCRIPTION	COLOR	SPEC SECTION	REMARKS
(E#)	EXISTING FLOOR	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1.1	LVT COLOR 1	ID LATITUDE - LAUREL OAK		TARKETT
1.2	LVT (MULTICOLOR)	SEE 2/1A251 FOR COLORS		TARKETT- COLOR POP
1.3	LVT COLOR 3	TBD		TARKETT
1.4	LVT COLOR 4	TBD		TARKETT
3	CERAMIC TILE	-		COVE BASE

BASE FINISHES (B)

(B)	DESCRIPTION	COLOR	SPEC SECTION	REMARKS
(E#)	EXISTING BASE	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	4" RUBBER BASE	TBD		JOHNSONITE
2	6" CERAMIC TILE BASE	TBD		WITH INTEGRAL COVE

WALL FINISHES (W)

(W)	DESCRIPTION	COLOR	SPEC SECTION	REMARKS
(E#)	EXISTING WALL	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	5/8" TYPE 'X' GYP BD	PAINT		
2	CERAMIC WALL TILE	TBD		DALTILE
3	TACKBOARD	TBD		CLARIDGE TACK WALL

CEILING FINISHES (C)

(C)	DESCRIPTION	COLOR	SPEC SECTION	REMARK
(E#)	EXISTING CEILING	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	5/8" TYPE "X" GYP BD	TBD		SHERWIN WILLIAMS
2	5/8" WATER RESISTANT TYPE "X" GYP BD	TBD		SHERWIN WILLIAMS
3	SUSPENDED ACOUSTIC CEILING, 24" x 24" TILES	-		EXISTING TO REMAIN
4	GLUE-UP ACOUSTICAL TILE			EXISTING TO REMAIN

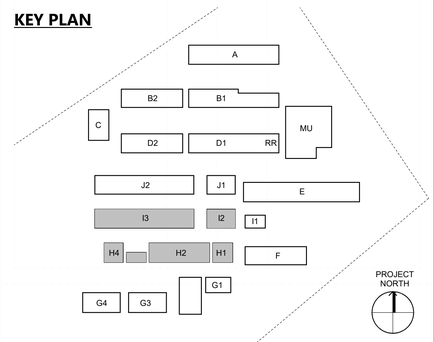
PAINT (P)

(P)	DESCRIPTION	COLOR	SPEC SECTION	REMARK
(E#)	EXISTING PAINT	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	INTERIOR WALL PAINT	SW7757 HIGH REFLECTIVE WHITE	SHADOW SEMIGLOSS	SHERWIN WILLIAMS
2	INTERIOR ACCENT WALL PAINT	TBD	SHADOW SEMIGLOSS	SHERWIN WILLIAMS
3	EXTERIOR DOOR FRAME PAINT	TBD		SHERWIN WILLIAMS
4	EXTERIOR MECHANICAL DOOR PAINT	TBD		SHERWIN WILLIAMS
5	INTERIOR DOOR FRAME PAINT	TBD		SHERWIN WILLIAMS

LEGEND - SIGNAGE

- RM — ROOM NAME / NUMBER SIGN, SEE DETAIL 2/1A-925
- S-1 — TOILET ROOM DOOR SIGN, SEE DETAIL 9/1A-925
- S-2 — TOILET ROOM WALL SIGN, SEE DETAILS 11/1A-925
- S-X — TACTILE "EXIT" SIGN (INTERIOR), SEE DETAILS 7/1A-925
- S-XR — TACTILE "EXIT ROUTE" SIGN (INTERIOR), SEE DETAILS 18/1A-925
- S-M — "MAXIMUM OCCUPANCY" SIGN (INTERIOR), SEE DETAIL 15/1A-925
- S-F — "FIRE SPRINKLER RISER INSIDE" SIGN, SEE DETAIL
- ALS — ASSISTIVE LISTENING SIGN, SEE DETAIL 6/1A-925
- EAR — EXTERIOR AREA FOR ASSISTED RESCUE SIGN, SEE DETAIL
- AES — ACCESSIBLE ENTRANCE SIGN, SEE DETAIL 19/1A-925
- BID — BUILDING IDENTIFICATION, SEE DETAIL 20/1A-925

KEY PLAN



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PROFESSIONAL STAMP

LICENSED ARCHITECT
MARINA ALVAREZ PARGA
C-36107
REN. 01-31-25
STATE OF CALIFORNIA

REVISIONS

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B	Date 4	ADDENDUM

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MEADOW HOMES ES MODERNIZATION
1371 Detroit Ave
Concord, CA 94520

SHEET TITLE
FINISH PLAN - BLDG H, I

INCREMENT: INC.1

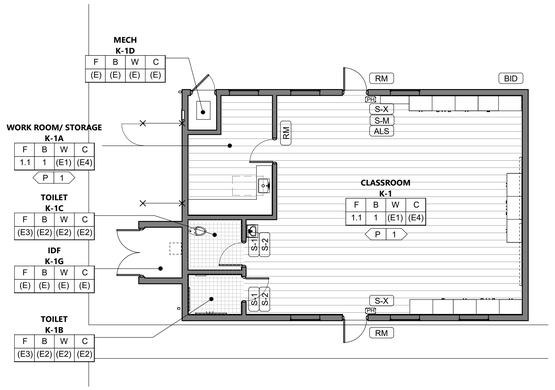
DRAWN BY: ZF JOB NUMBER: 23119.01

SHEET NO.
1A-252

DATE: APRIL 17, 2024

CONSTRUCTION DOCUMENTS

FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23119_MTDUSD_MEADOW HOMES ES MOD_INC01_A22.rvt
DATE PLOTTED: 4/24/2024 3:07:30 PM



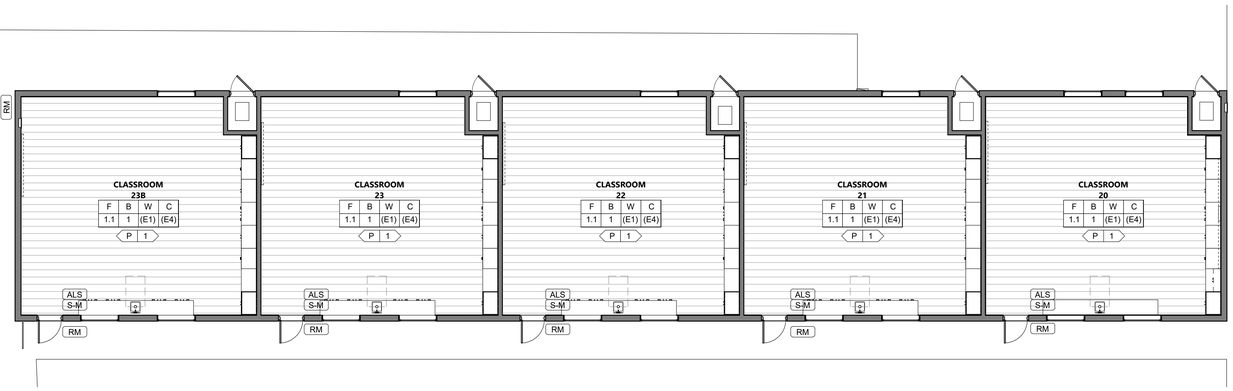
TRUE NORTH

BLDG J - FINISHES

RM#	RM NAME	FINISHES FLOOR	BASE	WALL	CEILING	DOORS
BUILDING J.1						
K-1	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING EXTERIOR DOOR FRAME
K-1A	WORK ROOM/ STORAGE	1.1	1	(E1)	(E4)	
K-1B	TOILET	(E3)	(E2)	(E2)	(E2)	
K-1C	TOILET	(E3)	(E2)	(E2)	(E2)	
K-1D	MECH	(E)	(E)	(E)	(E)	
K-1G	IDF	(E)	(E)	(E)	(E)	
BUILDING J.2						
20	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
21	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
22	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
23	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME
23B	CLASSROOM	1.1	1	(E1)	(E4)	PAINTING OF (E) DOOR FRAME

FINISH PLAN - BUILDING J.1

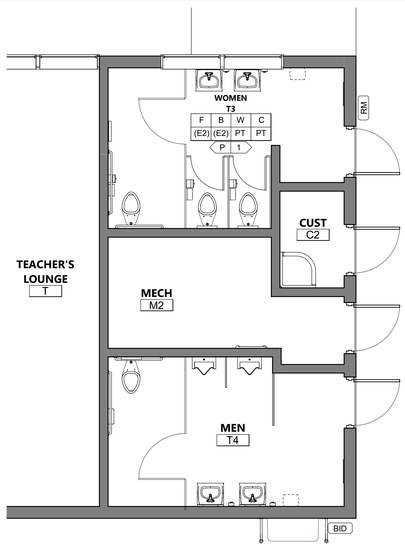
1/8" = 1'-0" | 1



TRUE NORTH

FINISH PLAN - BUILDING J.2

1/8" = 1'-0" | 2



TRUE NORTH

BLDG D - FINISHES

RM#	RM NAME	FINISHES FLOOR	BASE	WALL	CEILING	NOTES
BUILDING D.1						
T3	WOMEN	(E2)	(E2)	PT	PT	

FINISH PLAN - BUILDING D.1

1/4" = 1'-0" | 3

LEGEND - FINISHES GENERAL NOTES

1. CONTRACTOR RESPONSIBLE FOR FIELD VERIFYING MATERIAL DIMENSIONS AT EACH PARTITION IN THE FIELD AS RELATED TO THE OVERALL FINAL PARTITION DIMENSION, PRIOR TO DOOR AND WINDOW SUBMITTALS.
2. FOR MATERIAL FINISHES AND LOCATION OF FINISHES, REFER TO FINISH PLAN, INTERIOR ELEVATIONS AND FINISH SCHEDULE.
3. SPECIFICATIONS SHALL SUPERCEDE DIMENSIONS IN THIS DETAIL AS NECESSARY; CONTRACTOR TO VERIFY.

LEGEND - FLOOR FINISHES

1 - LUXURY VINYL TILE

2 - CERAMIC TILE

FLOOR FINISHES (F)

(F)	DESCRIPTION	COLOR	SPEC SECTION	REMARKS
(E#)	EXISTING FLOOR	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1.1	LVT COLOR 1	ID LATITUDE - LAUREL OAK		TARKETT
1.2	LVT (MULTICOLOR)	SEE 2/A261 FOR COLORS		TARKETT - COLOR POP
1.3	LVT COLOR 3	TBD		TARKETT
1.4	LVT COLOR 4	TBD		TARKETT
3	CERAMIC TILE	-		COVE BASE

BASE FINISHES (B)

(B)	DESCRIPTION	COLOR	SPEC SECTION	REMARKS
(E#)	EXISTING BASE	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	4" RUBBER BASE	TBD		JOHNSONITE
2	6" CERAMIC TILE BASE	TBD		WITH INTEGRAL COVE

WALL FINISHES (W)

(W)	DESCRIPTION	COLOR	SPEC SECTION	REMARKS
(E#)	EXISTING WALL	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	5/8" TYPE 'X' GYP BD	PAINT		
2	CERAMIC WALL TILE	TBD		DALTILE
3	TACKBOARD	TBD		CLARIDGE TACK WALL

CEILING FINISHES (C)

(C)	DESCRIPTION	COLOR	SPEC SECTION	REMARK
(E#)	EXISTING CEILING	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	5/8" TYPE "X" GYP BD	TBD		SHERWIN WILLIAMS
2	5/8" WATER RESISTANT TYPE "X" GYP BD	TBD		SHERWIN WILLIAMS
3	SUSPENDED ACOUSTIC CEILING, 24" x 24" TILES	-		EXISTING TO REMAIN
4	GLUE-UP ACOUSTICAL TILE			EXISTING TO REMAIN

PAINT (P)

(P)	DESCRIPTION	COLOR	SPEC SECTION	REMARK
(E#)	EXISTING PAINT	MATCH EXISTING ADJACENT		GC TO REPAIR IF DAMAGED DURING CONSTRUCTION
1	INTERIOR WALL PAINT	SW7757 HIGH REFLECTIVE WHITE	SHADOW SEMIGLOSS	SHERWIN WILLIAMS
2	INTERIOR ACCENT WALL PAINT	TBD	SHADOW SEMIGLOSS	SHERWIN WILLIAMS
3	EXTERIOR DOOR FRAME PAINT	TBD		SHERWIN WILLIAMS
4	EXTERIOR MECHANICAL DOOR PAINT	TBD		SHERWIN WILLIAMS
5	INTERIOR DOOR FRAME PAINT	TBD		SHERWIN WILLIAMS

LEGEND - SIGNAGE

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- S-2 — TOILET ROOM WALL SIGN, SEE DETAILS 11/A-922
- S-X — TACTILE "EXIT" SIGN (INTERIOR), SEE DETAILS 7/A-922
- S-XR — TACTILE "EXIT ROUTE" SIGN (INTERIOR), SEE DETAILS 18/A-922
- S-M — "MAXIMUM OCCUPANCY" SIGN (INTERIOR), SEE DETAIL 15/A-922
- S-F — "FIRE SPRINKLER RISER INSIDE" SIGN, SEE DETAIL
- ALS — ASSISTIVE LISTENING SIGN, SEE DETAIL 14/A-922
- EAR — EXTERIOR AREA FOR ASSISTED RESCUE SIGN, SEE DETAIL
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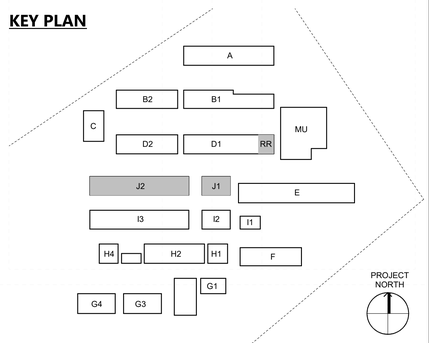

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PROFESSIONAL STAMP

LICENSED ARCHITECT MARINA ALVAREZ-TARGA C-36107 REN. 01-31-25 STATE OF CALIFORNIA

REVISIONS

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1371 Detroit Ave
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SHEET TITLE
FINISH PLAN - BLDG J & D

INCREMENT: INC.1

DRAWN BY: ZF JOB NUMBER: 23119.01

SHEET NO.
1A-253

DATE: APRIL 17, 2024

CONSTRUCTION DOCUMENTS

DATE PLOTTED: 4/24/2024 3:07:33 PM FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23119_MTDUSD_MEADOW HOMES ES MOD_INC01_A22.rvt

SYMBOL LEGEND

SINGLE LINE SYMBOL	DOUBLE LINE SYMBOL	DESCRIPTION
		LONG SWEEP 90° ELBOW - RECTANGULAR, ROUND OR OVAL
		45° ELBOW - RECTANGULAR, ROUND OR OVAL
		30° ELBOW - RECTANGULAR, ROUND OR OVAL
		90° ELBOW - RECTANGULAR DUCT WITH TURNING VANES
		45° LATERAL - ROUND TO ROUND OR OVAL TO OVAL
		90° TAKEOFF WITH 45° TAPER - RECTANGULAR TO RECTANGULAR (FOR BRANCH TAKEOFF LONGER THAN 50'-0", USE 15)
		90° TAKEOFF WITH 45° ELONGATED TEE - ROUND TO ROUND
		Y BRANCH - ROUND OR OVAL DUCT
		90° RADIUS SPLIT - RECTANGULAR DUCT, PROVIDE SPLITTER DAMPER, X/Y PROPORTIONAL SPLIT
		90° RECTANGULAR SPLIT - RECTANGULAR DUCT, PROVIDE SPLITTER DAMPER, X/Y PROPORTIONAL SPLIT
		TRANSITION - RECTANGULAR TO ROUND OR RECTANGULAR TO OVAL
		FLEXIBLE DUCT - ROUND
		FLEXIBLE DUCT - RECTANGULAR

SINGLE LINE SYMBOL	DOUBLE LINE SYMBOL	DESCRIPTION
		SECTION AT SUPPLY AIR OR MAKE-UP AIR DUCT UP
		SECTION AT RETURN AIR OR COMBUSTION AIR DUCT UP
		SECTION AT EXHAUST AIR OR RELIEF AIR DUCT UP
		SUPPLY AIR DUCT DOWN
		RETURN AIR DUCT DOWN
		EXHAUST AIR DUCT DOWN
		ROUND DUCT UP - SUPPLY, RETURN OR EXHAUST
		ROUND DUCT DOWN - SUPPLY, RETURN OR EXHAUST
		CEILING DIFFUSER - ONE, TWO, THREE AND FOUR WAY THROW
		CEILING - RETURN AND EXHAUST REGISTERS
		SIDEWALL - SUPPLY DIFFUSER, RETURN AND EXHAUST REGISTERS
		MANUAL BALANCE DAMPER WITH DUCT ACCESS DOOR
	M	MOTORIZED BALANCE DAMPER WITH DUCT ACCESS DOOR
FSD OR F/D	FSD OR F/D	FIRE DAMPER WITH DUCT ACCESS DOOR FIRE/SMOKE DAMPER WITH DUCT ACCESS DOOR
24 x 12	24 x 12	ACOUSTICALLY LINED DUCT. DIMENSIONS ARE INSIDE
	12x12 CD-1 300	REGISTER NECK SIZE AND TAG DESIGN CFM
		PANEL AT T-BAR CEILING

SYMBOL	ABBRV.	IDENTIFICATION
	CW	COLD WATER (DOMESTIC)
	HW	HOT WATER
	HWR	HOT WATER RETURN
	V	VENT
TP	TP	TRAP PRIMER LINE
W	S OR W	SOIL OR WASTE ABOVE GRADE
W	S OR W	SOIL OR WASTE BELOW GRADE
AW	AW	ACID WASTE
GW	GW	GREASE WASTE
RWL	RWL	RAIN WATER LEADER
OD	OD	OVERFLOW DRAIN
CD	CD	CONDENSATE DRAIN
E		CAP
CONT	CONT	CONTINUATION
OR		BALL VALVE
OR		VALVE
	CKV	CHECK VALVE
	T&PRV	TEMP. & PRESS. RELIEF VALVE
	GPR	GAS PRESSURE REGULATOR
		CIRCULATION PUMP (DOMESTIC)
WHA	WHA	WATER HAMMER ARRESTOR
TP	TP	TRAP PRIMER ACCESS PANEL
GCO/FCO	GCO/FCO	GRADE CLEAN-OUT/FLOOR CLEAN-OUT
WCO	WCO	WALL CLEAN-OUT
HB	HB	HOSE BIBB
		UNION
AN	AN	PIPE ANCHOR
		FLEXIBLE CONNECTOR

SYMBOL	ABBRV.	IDENTIFICATION
	P.O.C.	POINT OF CONNECTION
		REMOVE EXISTING
		LINE BREAK
		TEE DOWN
		90 DOWN
		CONCENTRIC & ECCENTRIC REDUCERS
AD	AD, AP	ACCESS DOOR, ACCESS PANEL
MAV	MAV	MANUAL AIR VENT
T	T	THERMOSTAT MOUNTED @ 48" AFF. MAX.
CO2	CO2	CARBON DIOXIDE (CO2) SENSOR
	AD	AREA DRAIN
	FD	FLOOR DRAIN
	FS	FLOOR SINK
OR	VB	VALVE IN BOX
	TH	THERMOMETER
	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
	DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
FC A-1		EQUIPMENT DESIGNATION
		TAG NUMBER
1 MP2.1		SECTION 1 / SHEET MP2.1

MEP COMPONENT ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON DSA APPROVED CONSTRUCTION DOCUMENTS. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC, SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTER 13, 26 AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
3. TEMPORARY, MOVABLE, OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH THE REFERENCED NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS:

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.

B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL

THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL, AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTION 13.6.5, 13.6.6, 13.6.7, 13.6.8, AND 2022 CBC, SECTIONS 1617A.1.24, 1617A.1.25, AND 1617A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G., HCAI OPM FOR 2013 CBC OR LATER), COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP [X] MD [X] PP [ ] E [ ] - OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.

MP [ ] MD [ ] PP [ ] E [ ] - OPTION 2: SHALL COMPLY WITH THE APPLICABLE HCAI PRE-APPROVAL (OPM #) #0295-13, "UNISTRUT" OR #0052-13, "B-LINE/TOLCO"

ABBREVIATIONS

&	AND
°F	DEGREES FAHRENHEIT
AAV	AUTOMATIC AIR VENT
AC	AIR CONDITIONER
AD	ACCESS DOOR
AFF	ABOVE FINISH FLOOR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AL	ACOUSTICALLY LINED
AMP	AMPERE
AN	PIPE ANCHOR
AP	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECT / ARCHITECTURAL
AW	ACID WASTE
BDD	BACK DRAFT DAMPER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BTWN	BETWEEN
CA	COMBUSTION AIR
CD	CONDENSATE DRAIN
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CIRC	CIRCULATING
℄	CENTERLINE
CLG	COOLING, CEILING
CLR	CLEAR
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUED, CONTINUATION
COOL	COOLING
COP	COEFFICIENT OF PERFORMANCE
CW	COLD WATER
D/L	DOOR LOUVER
DB	DRY BULB
DCV	DOUBLE CHECK VALVE
DF	DRINKING FOUNTAIN
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DWGS	DRAWINGS
(E)	EXISTING
EA	EXHAUST AIR
EAD	EXHAUST AIR DAMPER
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
ELEC	ELECTRICAL
ELEV	ELEVATION
ENT	ENTERING
EQ	EQUAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EW	ENTERING WATER
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EXT	EXTERIOR
FD	FLOOR DRAIN
FFE	FINISHED FLOOR ELEVATION
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FS	FLOOR SINK
FT	FEET
FT HD	FEET HEAD
FTR	FLUE THRU ROOF
G	GAS - LOW PRESSURE
GA	GAUGE
GAL	GALLON
GPM	GALLONS PER MINUTE
GPR	GAS PRESSURE REGULATOR
GW	GREASE WASTE PIPING
HP	HORSEPOWER
HR	HOUR
HTG	HEATING
HW	HOT WATER
HWR	HOT WATER RETURN
HZ	HERTZ
IE	INVERT ELEVATION
IN	INCH
INV	INVERT
KW	KILOWATTS
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LVR	LOUVER
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MAD, MD	MANUAL AIR DAMPER
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MCP	MECHANICAL CONTROL PANEL
MECH	MECHANICAL
MFR	MANUFACTURER
MPG	GAS - MEDIUM PRESSURE
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
(N)	NEW
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER
P/T	PRESSURE/TEMPERATURE
PD	PRESSURE DROP
PH	PHASE
PLF	POUNDS PER LINEAR FOOT
POC	POINT OF CONNECTION
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSI (G) (A)	POUNDS PER SQUARE INCH (GAUGE) (ABSOLUTE)
QTY	QUANTITY
RA	RETURN AIR
RAD	RETURN AIR DAMPER
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RM	ROOM
RP	REDUCED PRESSURE
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RV	RELIEF VALVE
SA	SUPPLY AIR
SC	SENSIBLE COOLING
SD	SMOKE DAMPER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SM	SHEET METAL
SOV	SHUT-OFF VALVE
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SQ	SQUARE
SQFT, FT²	SQUARE FEET
SQIN, IN²	SQUARE INCHES
STRUCT	STRUCTURAL
T	THERMOSTAT, "X" INDICATES DEVICE CONTROLLED. 48" AFF (TO TOP OF STAT)
TC	TOTAL COOLING
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE
TH	THERMOMETER
THRU	THROUGH
TP	TRAP PRIMER
TSP	TOTAL STATIC PRESSURE
TV	TURNING VANES
TW	TEMPERED WATER
TYP	TYPICAL
UL	UNDERWRITER'S LABORATORIES
UON	UNLESS OTHERWISE NOTED
V	VOLT OR VENT
VB	VALVE IN VALVE BOX
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
W	WATTS OR WASTE
W/	WITH
WB	WET BULB
WC	WATER COLUMN
WH	WATER HEATER
WT	WEIGHT

GENERAL NOTES

1. CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMISSION OF FINAL BID TO VERIFY ALL EXISTING SITE CONDITIONS WHICH MAY AFFECT THE COMPLETION OF THE INSTALLATION. ALL METHODS AND REQUIREMENTS FOR INSTALLATION SHALL BE DETERMINED PRIOR TO BID DATE. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF RECORD OF ANY REQUIRED MODIFICATIONS WHICH ARE NOT REFERENCED ON THESE PLANS PRIOR TO SUBMITTING BID. SUBMITTAL OF THE CONTRACTOR'S BID DEMONSTRATES THE CONTRACTOR'S AWARENESS OF ALL SITE CONDITIONS AND REQUIRED WORK TO BE PERFORMED.
2. CONTRACTOR SHALL INCLUDE AND PROVIDE IN BID ALL LABOR AND MATERIALS NECESSARY FOR A COMPLETE AND OPERATIONAL INSTALLATION OF ALL SYSTEMS.
3. THE DRAWINGS INCLUDED IN THIS SET ARE DIAGRAMMATIC. THEY ARE REPRESENTATIVE OF THE ENGINEER OF RECORD'S DESIGN INTENT FOR ALL EQUIPMENT AND RELATED PIPING ETC. INDIVIDUAL POWER NEEDS, CONTROLS AND OTHER CONNECTIONS SHALL BE COORDINATED AND COMPLETED/ PROVIDED FOR COMPLETE SYSTEM OPERATION BY CONTRACTOR.
4. EQUIPMENT LOCATIONS AND PIPE ROUTING ARE NOT PRECISE AND SHALL BE COORDINATED, VERIFIED, AND DETERMINED IN THE FIELD. CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND ROUTE PIPING IN LOCATIONS WHICH MEET CODE REQUIREMENTS AND DO NOT INTERFERE WITH ANY BUILDING STRUCTURES, UTILITIES, OR OTHER TRADE EQUIPMENT.
5. (E) DUCTWORK AND ITEMS TO BE REMOVED ARE SHOWN HATCHED. SEE LEGEND. COORDINATE CLOSELY WITH (N) DUCTWORK AND P.O.C.'S SHOWN. ALL OTHER (E) DUCTWORK, ETC. TO REMAIN.
6. ALL EQUIPMENT, EQUIPMENT CONNECTIONS, PIPING, MOUNTING LOCATIONS ETC. ARE TO BE VERIFIED WITH OWNER'S REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO BEGINNING OF THE ROUGH-IN.
7. ALL WORK SHALL BE PERFORMED TO STATE, LOCAL, NATIONAL AND DISTRICT STANDARDS AND CODES. COORDINATE SPECIFIC REQUIREMENTS WITH DISTRICT STANDARDS AND AUTHORITY HAVING JURISDICTION.
8. ALL EQUIPMENT SHALL BE NEW AND CLEARLY LABELED AND IDENTIFIED. LABELS SHALL NOT BE COVERED BY OTHER CONSTRUCTION ELEMENTS.
9. UNLESS OTHERWISE NOTED IN CONTRACT DOCUMENTS, CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT AND WORK FOR A PERIOD OF ONE YEAR.
10. UNLESS OTHERWISE NOTED OR REFERENCED ON THE DRAWINGS, EVERYTHING IS NEW.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED SAW CUTTING, CORE DRILLING, PATCHING, REFINISHING, ETC. AS REQUIRED FOR INSTALLATION OF SYSTEMS. ANY PENETRATIONS OR OPENINGS MADE IN WALLS OR STRUCTURES SHALL BE PATCHED AND/OR SEALED AS REQUIRED TO MAINTAIN THE INTEGRITY OF THE WALL OR STRUCTURE.
12. CONTRACTOR IS RESPONSIBLE FOR COMPLETING ALL FINAL CONNECTIONS TO OWNER FURNISHED EQUIPMENT AND SHALL INCLUDE THE PRICE OF INSTALLING ALL CONNECTIONS AS REQUIRED IN THEIR BIDS.
13. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE APPROVAL OF THE ENGINEER OF RECORD. ALL APPROVALS BY THE ENGINEER OF RECORD MUST BE SECURED PRIOR TO COMPLETION OF ANY PURCHASE ORDERS OR ROUGH-IN WORK.
14. THESE DRAWINGS AND ASSOCIATED SPECIFICATIONS ARE TO BE CONSIDERED CONTRACT DOCUMENTS FOR AGENCY REVIEW/ APPROVAL AND CONTRACTOR BIDDING PURPOSES.
15. AT THE COMPLETION OF THE PROJECT THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A COMPLETE SET OF AS-BUILT DRAWINGS.
16. ANY AND ALL WORK THAT REQUIRES AN INTERRUPTION TO BUILDING SERVICES(S) (ELECTRICAL/ HVAC/ PLUMBING ETC.) MUST BE COORDINATED WITH THE DISTRICT A MINIMUM OF 48 HOURS IN ADVANCE. ANY SERVICE DOWNTIME SHALL NOT OCCUR DURING SCHOOL OPERATION HOURS.
17. IN INSTANCES WHERE A CONFLICT BETWEEN THE DRAWINGS AND THE SPECIFICATIONS AND INSTALLATION MANUALS FOR THE PROJECT EXISTS, THE CONTRACTOR SHALL ADHERE TO THE MORE STRINGENT REQUIREMENT.
18. ANY EXISTING BUILDING STRUCTURES OR SURFACES DAMAGED BY DEMOLITION OR DURING INSTALLATION ACTIVITIES SHALL BE REPAIRED, PATCHED, AND/OR REFINISHED TO THE SATISFACTION OF THE OWNER.
19. FURNISH AND INSTALL MANUAL AIR DAMPERS AT ALL DUCT BRANCH TAKEOFFS TO A SINGLE SUPPLY DIFFUSER.
20. FOR ALL VOLUME DAMPERS LOCATED ABOVE CEILINGS, PROVIDE 12" LONG 1/2" WIDE FLUORESCENT ORANGE TAPE TO MARK DAMPER LOCATIONS.
21. ALL DUCTWORK, CONDUITS, BOXES, SURFACE MOUNTED RACEWAYS, SUPPORT DEVICES, AND ASSOCIATED FITTINGS SHALL BE MOUNTED IN CONCEALED LOCATIONS ABOVE CEILINGS, DUCTS, TRUSSES, BEAMS, ETC. WHERE WORK HAS TO BE INSTALLED IN EXPOSED LOCATIONS, IT SHALL BE PAINTED TO MATCH THE ADJACENT SURFACES OR PER ARCHITECT'S DIRECTION.
22. CONTRACTOR SHALL PREPARE AND SUBMIT THE CALIFORNIA ENERGY COMMISSION TITLE 24 CERTIFICATE OF ACCEPTANCE FORMS RELATED TO INSTALLED EQUIPMENT AND SYSTEMS.
23. SAFETY: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
24. CONTRACTOR'S EQUIPMENT: COORDINATE WITH OWNER'S REPRESENTATIVE FOR APPROVED LOCATION OF JOB SITE ACCESS, PARKING, AND LOCATION OF CONTRACTOR'S EQUIPMENT AND MATERIAL STORAGE AREA. COORDINATE WITH OWNER FOR LOCATION AND PROCEDURES.
25. ALL BUILDING MATERIALS MUST BE ASBESTOS FREE.
26. CONSTRUCTION SCHEDULING: CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION OPERATIONS WITH OWNER'S REPRESENTATIVE PRIOR TO SCHEDULING AND START OF THE WORK. CONTRACTOR SHALL PROVIDE PROTECTION TO ALL EXISTING SPACES AND SYSTEMS WHICH ARE IN USE, ADJOINING THE PROJECT, AND NOT PART OF THE PROJECT.
27. TITLE 24 COMPLIANCE: THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK IS TO BE IN ACCORDANCE WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS (2022 CBC). SHOULD ANY CONDITIONS BE DISCOVERED NOT COVERED BY THE CONTRACT DOCUMENTS WHERE IN THE FINISHED WORK DOES NOT COMPLY WITH 2022 CBC, A CONSTRUCTION CHANGE DOCUMENT OR A SEPARATE SET OF PLANS AND SPECIFICATIONS, DETAILING AND SPECIFYING THE REQUIRED WORK, SHALL BE SUBMITTED TO AND APPROVED BY THE DSA BEFORE PROCEEDING WITH THE WORK.
28. INSTALLER QUALIFICATIONS: EACH EMPLOYEE SHALL BE CERTIFIED BY MANUFACTURER FOR PROPER INSTALLATION OF SYSTEMS, INCLUDING, BUT NOT LIMITED TO, EQUIPMENT, PIPING, CONTROLS, AND ACCESSORIES INDICATED AND FURNISHED FOR INSTALLATION. INSTALLER CERTIFICATION SHALL BE VALID AND CURRENT FOR DURATION OF PROJECT. INSTALLER SHALL HAVE DEMONSTRATED PAST EXPERIENCE WITH PRODUCTS BEING INSTALLED FOR PERIOD WITHIN FIVE (5) CONSECUTIVE YEARS BEFORE TIME OF BID.

B

29. THE CALIFORNIA ENERGY CODE SECTION 10-103 REQUIRES ACCEPTANCE TESTING ON ALL NEWLY INSTALLED LIGHTING CONTROLS, MECHANICAL SYSTEMS, ENVELOPES, AND PROCESS EQUIPMENT AFTER INSTALLATION AND BEFORE PROJECT COMPLETION. AN ACCEPTANCE TEST IS A FUNCTIONAL PERFORMANCE TEST TO HELP ENSURE THAT NEWLY INSTALLED EQUIPMENT IS OPERATING AND IN COMPLIANCE WITH THE ENERGY CODE.LIGHTING CONTROLS ACCEPTANCE TESTS MUST BE PERFORMED BY A CERTIFIED LIGHTING CONTROLS ACCEPTANCE TEST TECHNICIAN (ATT). MECHANICAL SYSTEM ACCEPTANCE TESTS MUST BE PERFORMED BY A CERTIFIED MECHANICAL ATT FOR PROJECTS SUBMITTED ON OR AFTER OCTOBER 1, 2021.ENVELOPE AND PROCESS EQUIPMENT ACCEPTANCE TESTS SHALL BE PERFORMED BY THE INSTALLING CONTRACTOR, ENGINEER/ARCHITECT OF RECORD OR THE OWNER'S AGENT.A LISTING OF CERTIFIED ATT CAN BE FOUND AT: HTTPS://WWW.ENERGY.CA.GOV/PROGRAMS-AND-TOPICS/PROGRAMS/ACCEPTANCE-TEST-TECHNICIAN-CERTIFICATION-PROVIDER-PROGRAM/ACCEPTANCE.THE ACCEPTANCE TESTING PROCEDURES MUST BE REPEATED. AND DEFICIENCIES MUST BE CORRECTED BY THE BUILDER OR INSTALLING CONTRACTOR UNTIL THE CONSTRUCTION/INSTALLATION OF THE SPECIFIED SYSTEFROM CONFORM AND PASS THE REQUIRED ACCEPTANCE CRITERIA.PROJECT INSPECTORS WILL COLLECT THE FORMS TO CONFIRM THAT THE REQUIRED ACCEPTANCE TESTS HAVE BEEN COMPLETED.

DSA GENERAL NOTES

1. THE INTENT OF THE CONTRACT DOCUMENTS IS TO MODERNIZE THE SCHOOL'S CAMPUS. SHOULD ANY CONDITIONS DEVELOP NOT COVERED BY THE CONTRACT DOCUMENTS, A CONSTRUCTION CHANGE DOCUMENT DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY DSA BEFORE PROCEEDING WITH THE WORK.
2. THE SEISMIC SUPPORT AND ANCHORAGE OF THE EQUIPMENT DESCRIBED ON THESE DRAWINGS HAVE BEEN ENGINEERED BY THE ENGINEER OF RECORD FOR CONFORMANCE WITH APPROPRIATE BUILDING CODES. THE ENGINEER OF RECORD WAS NOT RESPONSIBLE FOR THE EQUIPMENT DESIGN.
3. ALL MECHANICAL AND PLUMBING EQUIPMENT SHALL BE BRACED OR ANCHORED TO RESIST A HORIZONTAL FORCE ACTING IN ANY DIRECTION USING THE CRITERIA FROM CHAPTER 16A CALIFORNIA BUILDING CODE (CBC) 2022.
4. WHERE ANCHORAGE DETAILS ARE NOT SHOWN ON THE DRAWINGS, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER AND THE FIELD REPRESENTATIVE OF THE DIVISION OF THE STATE ARCHITECT.
5. NO DEMOLITION SHALL BEGIN UNTIL PLANS INCLUDING THE DEMOLITION WORK HAVE BEEN APPROVED BY DSA.

LIST OF GOVERNING CODES

2022 CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24, C.C.R.
2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24, C.C.R.
2022 CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24, C.C.R.
2022 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24, C.C.R.
2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24, C.C.R.
2022 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24, C.C.R.
2022 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24, C.C.R.
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24, C.C.R.
2022 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24, C.C.R.
TITLE 19, C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.

ALL SECTION NUMBERS BELOW REFER TO GROUP 1, CHAPTER 4, PART 1, TITLE 24, C.C.R.
1. ADDENDA, CONSTRUCTION CHANGES PER SECTION 4-338.
2. INSPECTOR APPROVED BY DSA. INSPECTOR AND CONTINUOUS INSPECTION OF WORK PER SECTION 4-333(b) AND 4-342.
3. TESTS AND TESTING LABORATORY PER SECTION 4-335.
4. SPECIAL INSPECTION PER SECTION 4-333(c).
5. CONTRACTOR SHALL SUBMIT VERIFIED REPORTS PER SECTION 4-336 AND 4-343(c).
6. ADMINISTRATION OF CONSTRUCTION PER PART 1, TITLE 24, C.C.R. - DUTIES OF ARCHITECT, STRUCTURAL ENGINEER OR PROFESSIONAL ENGINEER PER SECTION 4-333(a) AND 4-341.
7. GOVERNING CODES: TITLE 24.
8. A COPY OF PARTS 1, 2, 3, 4, AND 5 OF TITLE 24 SHALL BE KEPT AVAILABLE IN THE FIELD DURING CONSTRUCTION.
9. DSA SHALL BE NOTIFIED OF START OF CONSTRUCTION PER SECTION 4-331.
10. SUPERVISION BY THE DIVISION OF THE STATE ARCHITECT PER SECTION 4-334.

DRAWING INDEX

1MP-001 LEGENDS & NOTES - MECHANICAL & PLUMBING
1MP-002 SCHEDULES - MECHANICAL & PLUMBING
1MP-003 SCHEDULES - MECHANICAL & PLUMBING
1MP-201 BLDG F & D.1 - DEMO & NEW FLOOR PLANS - MECHANICAL & PLUMBING
1MP-202 BLDGS G.3-G.4 - DEMO & NEW FLOOR PLANS - MECHANICAL & PLUMBING
1MP-203 BLDGS H.1 - H.4 - DEMO & NEW FLOOR PLANS - MECHANICAL & PLUMBING
1MP-204 BLDG I.2 & I.3 - DEMO & NEW FLOOR PLANS - MECHANICAL & PLUMBING
1MP-205 BLDG J.1 & J.2 - DEMO & NEW FLOOR PLANS - MECHANICAL & PLUMBING
1MP-301 BLDGS D.1 & H.1 - DEMO & NEW ROOF PLAN - MECHANICAL & PLUMBING
1MP-501 CONTROLS - MECHANICAL
1MP-601 DETAILS - MECHANICAL & PLUMBING
1MP-602 DETAILS - MECHANICAL & PLUMBING
1MP-801 T24 - MECHANICAL
1MP-802 T24 - MECHANICAL

B

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PROFESSIONAL STAMP

REGISTERED PROFESSIONAL ENGINEER — MEIN SERTTY — No. M31059 — EXP. JUNE 30, 2025 — MECHANICAL — STATE OF CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION
	04-01-2024	BID SET
A	04-15-2024	ADDENDUM 1
B	04-24-2024	ADDENDUM 2

THE ARCHITECT DOES NOT REPRESENT THAT THESE PLANS OR THE SPECIFICATIONS ARE SUITABLE FOR ANY SITE OTHER THAN THE ONE FOR WHICH THEY WERE SPECIFICALLY PREPARED. THE ARCHITECT DISCLAIMS RESPONSIBILITY FOR THESE PLANS AND SPECIFICATIONS IF THEY ARE USED IN WHOLE OR IN PART AT ANY OTHER SITE. WRITTEN DIMENSIONS ON THESE DRAWINGS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS.

PROJECT OWNER & TITLE

GAS FIRED FURNACE SCHEDULE BLD-I (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	GAS HEATING		AIRFLOW CFM	ESP IN. W.G.	OUTSIDE AIR MIN. CFM	OUTSIDE AIR MAX. DCV CFM	AFUE %	MOTOR	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
				INPUT MBH	OUTPUT MBH						HP	V / PH	MCA	MOCP			
F-I-K2	CLASS RM K2	CARRIER	58S81A090E2120	88	71	1,320	0.7	250	500	80	1	115 / 1	13	20	150	4/1MP-602	1, 2, 3, 4
F-I-24	CLASS RM 24	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4
F-I-25	CLASS RM 25	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4
F-I-26	CLASS RM 26	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4
F-I-27	CLASS RM 27	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4
F-I-28	CLASS RM 28	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4

1. PROVIDE WITH TYPE B VENT KIT.
2. PROVIDE WITH 2" THICK MERV 13 FILTERS.
3. CONNECT TO SCHNEIDER THERMOSTAT, SEE 1MP-501.
4. PROVIDE ECONOMIZER CONTROLLER & SENSORS COMPATIBLE W/ SCHNEIDER CONTROLS, SEE 1MP-501.

COOLING COILS SCHEDULE BLD-I (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	CONDENSING UNIT	NOMINAL CAPACITY TONS	COOLING	REFRIGERANT PIPING		WEIGHT LBS	NOTES
						TOTAL MBH	LIQUID	GAS		
CC-I-K2	F-I-K2	CARRIER	CAPMP6121ALA	CU-I-K2	5	63.01	3/8"	7/8"	100	1
CC-I-24	F-I-24	CARRIER	CAPMP4821ALA	CU-I-24	3.5	34.45	3/8"	7/8"	85	1
CC-I-25	F-I-25	CARRIER	CAPMP4821ALA	CU-I-25	3.5	34.45	3/8"	7/8"	85	1
CC-I-26	F-I-26	CARRIER	CAPMP4821ALA	CU-I-26	3.5	34.45	3/8"	7/8"	85	1
CC-I-27	F-I-27	CARRIER	CAPMP4821ALA	CU-I-27	3.5	34.45	3/8"	7/8"	85	1
CC-I-28	F-I-28	CARRIER	CAPMP4821ALA	CU-I-28	3.5	34.45	3/8"	7/8"	85	1

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.

CONDENSING UNITS SCHEDULE BLD-I (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	COOLING COIL	NOMINAL CAPACITY TONS	COOLING	REFRIGERANT PIPING		SEER	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
						TOTAL MBH	LIQUID	GAS		V / PH	MCA	MOCP			
CU-I-K2	OUTSIDE	CARRIER	24ABB360A005	CC-I-K2	5	59.40	3/8"	7/8"	13	208 / 3	21.4	30	200	3/1MP-601	1, 2, 3, 4, 5
CU-I-24	OUTSIDE	CARRIER	24ABB342A005	CC-I-24	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5
CU-I-25	OUTSIDE	CARRIER	24ABB342A005	CC-I-25	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5
CU-I-26	OUTSIDE	CARRIER	24ABB342A005	CC-I-26	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5
CU-I-27	OUTSIDE	CARRIER	24ABB342A005	CC-I-27	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5
CU-I-28	OUTSIDE	CARRIER	24ABB342A005	CC-I-28	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.
2. FURNISHED W/ KSACY0101AAA CYCLE PROTECTOR KIT. FIELD INSTALLED.
3. FURNISHED W/ KAALP0401PUR LOW PRESSURE SW KIT. FIELD INSTALLED.
4. FURNISHED W/ KAAHI0501PUR HIGH PRESSURE SW KIT. FIELD INSTALLED.
5. FURNISHED W/ KAACH1201AAA CRANKCASE HEATER KIT. FIELD INSTALLED.

GAS FIRED FURNACE SCHEDULE BLD-J (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	GAS HEATING		AIRFLOW CFM	ESP IN. W.G.	OUTSIDE AIR MIN. CFM	OUTSIDE AIR MAX. DCV CFM	AFUE %	MOTOR	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
				INPUT MBH	OUTPUT MBH						HP	V / PH	MCA	MOCP			
F-J-K1	CLASS RM K1	CARRIER	58S81A090E2120	88	71	1,320	0.7	250	500	80	1	115 / 1	13	20	150	4/1MP-602	1, 2, 3, 4
F-J-20	CLASS RM 20	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4
F-J-21	CLASS RM 21	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4
F-J-22	CLASS RM 22	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4
F-J-23A	CLASS RM 23A	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4
F-J-23B	CLASS RM 23B	CARRIER	58SU0B080M21–20	80	64	1,260	0.8	200	400	80	1	115 / 1	14.2	20	150	4/1MP-602	1, 2, 3, 4

1. PROVIDE WITH TYPE B VENT KIT.
2. PROVIDE WITH 2" THICK MERV 13 FILTERS.
3. CONNECT TO SCHNEIDER THERMOSTAT, SEE 1MP-501.
4. PROVIDE ECONOMIZER CONTROLLER & SENSORS COMPATIBLE W/ SCHNEIDER CONTROLS, SEE 1MP-501.

COOLING COILS SCHEDULE BLD-J (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	CONDENSING UNIT	NOMINAL CAPACITY TONS	COOLING	REFRIGERANT PIPING		WEIGHT LBS	NOTES
						TOTAL MBH	LIQUID	GAS		
CC-J-K1	F-J-K1	CARRIER	CAPMP6121ALA	CU-J-K1	5	63.01	3/8"	7/8"	100	1
CC-J-20	F-J-20	CARRIER	CAPMP4821ALA	CU-J-20	3.5	34.45	3/8"	7/8"	85	1
CC-J-21	F-J-21	CARRIER	CAPMP4821ALA	CU-J-21	3.5	34.45	3/8"	7/8"	85	1
CC-J-22	F-J-22	CARRIER	CAPMP4821ALA	CU-J-22	3.5	34.45	3/8"	7/8"	85	1
CC-J-23A	F-J-23A	CARRIER	CAPMP4821ALA	CU-J-23A	3.5	34.45	3/8"	7/8"	85	1
CC-J-23B	F-J-23B	CARRIER	CAPMP4821ALA	CU-J-23B	3.5	34.45	3/8"	7/8"	85	1

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.

CONDENSING UNITS SCHEDULE BLD-J (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	COOLING COIL	NOMINAL CAPACITY TONS	COOLING	REFRIGERANT PIPING		SEER	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
						TOTAL MBH	LIQUID	GAS		V / PH	MCA	MOCP			
CU-J-K1	OUTSIDE	CARRIER	24ABB360A005	CC-J-K1	5	59.40	3/8"	7/8"	13	208 / 3	21.4	30	200	3/1MP-601	1, 2, 3, 4, 5
CU-J-20	OUTSIDE	CARRIER	24ABB342A005	CC-J-20	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5
CU-J-21	OUTSIDE	CARRIER	24ABB342A005	CC-J-21	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5
CU-J-22	OUTSIDE	CARRIER	24ABB342A005	CC-J-22	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5
CU-J-23A	OUTSIDE	CARRIER	24ABB342A005	CC-J-23A	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5
CU-J-23B	OUTSIDE	CARRIER	24ABB342A005	CC-J-23B	3.5	41.00	3/8"	7/8"	13	208 / 3	18.0	30	190	3/1MP-601	1, 2, 3, 4, 5

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.
2. FURNISHED W/ KSACY0101AAA CYCLE PROTECTOR KIT. FIELD INSTALLED.
3. FURNISHED W/ KAALP0401PUR LOW PRESSURE SW KIT. FIELD INSTALLED.
4. FURNISHED W/ KAAHI0501PUR HIGH PRESSURE SW KIT. FIELD INSTALLED.
5. FURNISHED W/ KAACH1201AAA CRANKCASE HEATER KIT. FIELD INSTALLED.

PACKAGED AIR CONDITIONING UNITS SCHEDULE (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	POWER EXHAUST	COOLING MBH		GAS HEATING MBH		AIRFLOW CFM	ESP IN. W.G.	OUTSIDE AIR MIN. CFM	OUTSIDE AIR MAX. DCV CFM	FAN RPM	MOTOR BHP	SEER	AFUE %	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
					TOTAL	SENSIBLE	INPUT	OUTPUT									V / PH	MCA	MOCP			
AC-H-29	CLASS RM 29 ROOF	CARRIER	48GCDJ05C3M5-0A4A0	PE-H-29	49.91	37.84	60	49	1,600	1.25	200	400	2,251	1.23	17.4	81	208 / 3	24	30	1015	2/1MP-601	1, 2, 3, 4, 5, 6, 7, 8

1. WEIGHT INCLUDES ALL OPTIONS AND ACCESSORIES.
2. FURNISHED W/ MICROMETL CA-CAR-537-TRN-S44-24 CURB ADAPTER.
3. CONNECT TO SCHNEIDER THERMOSTAT, SEE 1MP-501.
4. PROVIDE WITH LOUVERED HAIL GUARDS, UN POWERED CONVENIENCE OUTLET, AND HINGED ACCESS PANELS.
5. PROVIDE WITH MERV 13 FILTERS.
6. VERTICAL DISCHARGE CONFIGURATION.
7. FURNISHED W/ WITH ULTRA LOW LEAK ECONOMIZER W/ POWERED EXHAUST. INCLUDE ECONOMIZER / POWERED EXHAUST CONTROLLER & SENSORS COMPATIBLE W/ SCHNEIDER CONTROLS, SEE 1MP-501.
8. PROVIDE MANUFACTURER SMOKE DETECTOR FIELD INSTALLED IN SUPPLY DUCT, WIRED TO SHUT DOWN UPON DETECTION OF SMOKE, PER 2022 CMC 608 & COORDINATE W/ ELECTRIC CONTRACTOR.

POWER EXHAUST SCHEDULE

TAG	MANUFACTURER	MODEL NO.	AC UNIT SERVED	AIRFLOW CFM	ESP IN. W.G.	MOTOR HP	ELECTRICAL			WEIGHT LBS	NOTES
							V / PH	MCA	MOCP		
PE-H-29	CANFAB	1118-MPE16A-3R39	AC-H-29	1600	0.05	0.5	208 / 3	2.75	4.95	SEE NOTE 2	1, 2

1. PROVIDE WITH MODULATING SPEED POWER EXHAUST AND PRESSURE TRANSDUCER TO CONTROL TO BUILDING PRESSURE.
2. POWER EXHAUST WEIGHT INCLUDED IN AC UNIT TOTAL WEIGHT. SEE AC UNIT SCHEDULE.

GAS FIRED FURNACE SCHEDULE BLD-F (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	GAS HEATING		AIRFLOW CFM	ESP IN. W.G.	OUTSIDE AIR MIN. CFM	OUTSIDE AIR MAX. DCV CFM	AFUE %	MOTOR	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
				INPUT MBH	OUTPUT MBH						HP	V / PH	MCA	MOCP			
F-F-33	CLASS RM 33	CARRIER	59SU5B080M21-20	80	78	1,260	0.8	200	400	95	1	115 / 1	13.8	20	165	1/1MP-601	1, 2, 3, 4, 5
F-F-34	CLASS RM 34	CARRIER	59SU5B080M21-20	80	78	1,260	0.8	200	400	95	1	115 / 1	13.8	20	165	1/1MP-601	1, 2, 3, 4, 5
F-F-35	CLASS RM 35	CARRIER	59SU5B080M21-20	80	78	1,260	0.8	200	400	95	1	115 / 1	13.8	20	165	1/1MP-601	1, 2, 3, 4, 5

1. PROVIDE VENT W/ CONCENTRIC TERMINATION.
2. PROVIDE WITH 2" THICK MERV 13 FILTERS.
3. CONNECT TO SCHNEIDER THERMOSTAT, SEE 1MP-501.
4. PROVIDE ECONOMIZER CONTROLLER & SENSORS COMPATIBLE W/ SCHNEIDER CONTROLS, SEE 1MP-501.
5. FURNISHED W/ P908-0001 CD NEUTRALIZER KIT. FIELD INSTALLED.

COOLING COILS SCHEDULE BLD-F (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	CONDENSING UNIT	NOMINAL CAPACITY TONS	COOLING	REFRIGERANT PIPING		WEIGHT LBS	NOTES
						TOTAL MBH	LIQUID	GAS		
CC-F-33	F-F-33	CARRIER	CAPMP4821ALA	CU-F-33	3.5	34.45	3/8"	7/8"	85	1
CC-F-34	F-F-34	CARRIER	CAPMP4821ALA	CU-F-34	3.5	34.45	3/8"	7/8"	85	1
CC-F-35	F-F-35	CARRIER	CAPMP4821ALA	CU-F-35	3.5	34.45	3/8"	7/8"	85	1

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.

CONDENSING UNITS SCHEDULE BLD-F (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	COOLING COIL	NOMINAL CAPACITY TONS	COOLING	REFRIGERANT PIPING		SEER	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
						TOTAL MBH	LIQUID	GAS		V / PH	MCA	MOCP			
CU-F-33	OUTSIDE	CARRIER	24SCA542W003	CC-F-33	3.5	45.42	3/8"	7/8"	14.5	208 / 1	32.8	50	200	3/1MP-601	1, 2, 3, 4, 5
CU-F-34	OUTSIDE	CARRIER	24SCA542W003	CC-F-34	3.5	45.42	3/8"	7/8"	14.5	208 / 1	32.8	50	200	3/1MP-601	1, 2, 3, 4, 5
CU-F-35	OUTSIDE	CARRIER	24SCA542W003	CC-F-35	3.5	45.42	3/8"	7/8"	14.5	208 / 1	32.8	50	200	3/1MP-601	1, 2, 3, 4, 5

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.
2. FURNISHED W/ KSACY0101AAA CYCLE PROTECTOR KIT. FIELD INSTALLED.
3. FURNISHED W/ KAALP0401PUR LOW PRESSURE SW KIT. FIELD INSTALLED.
4. FURNISHED W/ KAAHI0501PUR HIGH PRESSURE SW KIT. FIELD INSTALLED.
5. FURNISHED W/ KAACH1601AAA CRANKCASE HEATER KIT. FIELD INSTALLED.

GAS FIRED FURNACE SCHEDULE BLD-H (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	GAS HEATING		AIRFLOW CFM	ESP IN. W.G.	OUTSIDE AIR MIN. CFM	OUTSIDE AIR MAX. DCV CFM	AFUE %	MOTOR	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
				INPUT MBH	OUTPUT MBH						HP	V / PH	MCA	MOCP			
F-H-30	CLASS RM 30	CARRIER	59SU5B080M21-20	80	78	1,260	0.8	200	400	95	1	115 / 1	13.8	20	165	1/1MP-601	2, 3, 4, 5, 6
F-H-31	CLASS RM 31	CARRIER	59SU5B080M21-20	80	78	1,260	0.8	200	400	95	1	115 / 1	13.8	20	165	1/1MP-601	2, 3, 4, 5, 6
F-H-32	CLASS RM 32	CARRIER	59SU5B080M21-20	80	78	1,260	0.8	200	400	95	1	115 / 1	13.8	20	165	1/1MP-601	2, 3, 4, 5, 6
F-H-36	CLASS RM 36	CARRIER	58S81A090E2120	88	71	1,320	0.7	200	400	80	1	115 / 1	13	20	140	1/1MP-601	1, 2, 3, 4

1. PROVIDE WITH TYPE B VENT KIT.
2. PROVIDE WITH 2" THICK MERV 13 FILTERS.
3. CONNECT TO SCHNEIDER THERMOSTAT, SEE 1MP-501.
4. PROVIDE ECONOMIZER CONTROLLER & SENSORS COMPATIBLE W/ SCHNEIDER CONTROLS, SEE 1MP-501.
5. PROVIDE VENT W/ CONCENTRIC TERMINATION.
6. FURNISHED W/ P908-0001 CD NEUTRALIZER KIT. FIELD INSTALLED.

COOLING COILS SCHEDULE BLD-H (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	CONDENSING UNIT	NOMINAL CAPACITY TONS	COOLING	REFRIGERANT PIPING		WEIGHT LBS	NOTES
						TOTAL MBH	LIQUID	GAS		
CC-H-30	F-H-30	CARRIER	CAPMP4821ALA	CU-H-30	3.5	34.45	3/8"	7/8"	85	1
CC-H-31	F-H-31	CARRIER	CAPMP4821ALA	CU-H-31	3.5	34.45	3/8"	7/8"	85	1
CC-H-32	F-H-32	CARRIER	CAPMP4821ALA	CU-H-32	3.5	34.45	3/8"	7/8"	85	1
CC-H-36	F-H-36	CARRIER	CAPMP4821ALA	CU-H-36	4.0	45.90	3/8"	7/8"	85	1

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.

CONDENSING UNITS SCHEDULE BLD-H (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	LOCATION	MANUFACTURER	MODEL NO.	COOLING COIL	NOMINAL CAPACITY TONS	COOLING	REFRIGERANT PIPING		SEER	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
						TOTAL MBH	LIQUID	GAS		V / PH	MCA	MOCP			
CU-H-30	OUTSIDE	CARRIER	24SCA542W003	CC-H-30	3.5	45.42	3/8"	7/8"	14.5	208 / 1	32.8	50	200	3/1MP-601	1, 2, 3, 4, 6
CU-H-31	OUTSIDE	CARRIER	24SCA542W003	CC-H-31	3.5	45.42	3/8"	7/8"	14.5	208 / 1	32.8	50	200	3/1MP-601	1, 2, 3, 4, 6
CU-H-32	OUTSIDE	CARRIER	24SCA542W003	CC-H-32	3.5	45.42	3/8"	7/8"	14.5	208 / 1	32.8	50	200	3/1MP-601	1, 2, 3, 4, 5
CU-H-36	OUTSIDE	CARRIER	24SCA548W003	CC-H-36	4.0	47.55	3/8"	7/8"	14.5	208 / 1	32.8	50	200	3/1MP-601	1, 2, 3, 4, 5

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.
2. FURNISHED W/ KSACY0101AAA CYCLE PROTECTOR KIT. FIELD INSTALLED.
3. FURNISHED W/ KAALP0401PUR LOW PRESSURE SW KIT. FIELD INSTALLED.
4. FURNISHED W/ KAAHI0501PUR HIGH PRESSURE SW KIT. FIELD INSTALLED.
5. FURNISHED W/ KAACH1601AAA CRANKCASE HEATER KIT. FIELD INSTALLED.
6. FURNISHED W/ KAACH1201AAA CRANKCASE HEATER KIT. FIELD INSTALLED.

SPLIT SYSTEM SCHEDULE (OWNER FURNISHED CONTRACTOR INSTALLED)

TAG	MANUFACTURER	MODEL	LOCATION	COOLING	HEATING	AIRFLOW CFM	REFRIGERANT PIPING		SEER	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
				TOTAL MBH	TOTAL MBH		LIQUID	GAS		V / PH	MCA	MOCP			
IU-J-K1	TRANE MITSUBISHI ELECTRIC	TPKA0A0121LA10A	IDF K-1G	12.0	LOCK OUT HEATING	385	1 / 4"	1 / 2"	21.3	208 / 1	—	—	30	4/1MP-601	1, 2, 3
OU-J-K1	TRANE MITSUBISHI ELECTRIC	TRUZA0121KA70NA	OUTSIDE			—				208 / 1	11	28	95	3/1MP-601	4, 5, 6, 7

1. WALL MOUNTED PER MANFC. DIRECTIONS. INDOOR UNIT POWERED BY OUTDOOR UNIT.
2. FURNISHED W/ TAR-40MAAU DELUXE MA REMOTE CONTROLLER. SCHEDULE FOR OCCUPIED HOURS. FURNISHED W/ PAC-UKPRC001-CN-1 BACNET INTERFACE FOR CONNECTION TO CAMPUS CONTROL SYSTEM, SEE 1MP-501.
3. FURNISHED W/ CONDENSATE PUMP
4. MOUNT ON 4" CONC. HOUSE KEEPING PAD
5. OUTDOOR CONDENSING UNITS TO BE LOCATED WITH PROPER CLEARANCES AND MUST PREVENT RE-CIRCULATION OF AIR. COORDINATE WITH MANUFACTURER AND ARCHITECT.
6. PROVIDE W/ REFRIGERATION LINE SET
7. FURNISHED W/ INSITU® SPRAY COAT ES2 SPRAY-APPLIED, ANTI-CORROSION COIL AND CABINET COATING

AGENCY APPROVAL DSA# 01-121400

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PROFESSIONAL STAMP

REGISTERED PROFESSIONAL ENGINEER — JUSTIN SCHMITT — No. M31059 — EXP. JUNE 30, 2025 — MECHANICAL — STATE OF CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION
A	04-01-2024	BID SET
B	04-15-2024	ADDENDUM 1
	04-24-2024	ADDENDUM 2

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PROJECT OWNER & TITLE
MOUNT DIABLO UNIFIED SCHOOL DISTRICT
1936 Carlotta Drive
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MEADOW HOMES ES MODERNIZATION
1371 Detroit Ave
Concord, CA 94520

SHEET TITLE
SCHEDULES - MECHANICAL & PLUMBING

DRAWN BY: RR JOB NUMBER: 23119.01

SHEET NO.
1MP-002

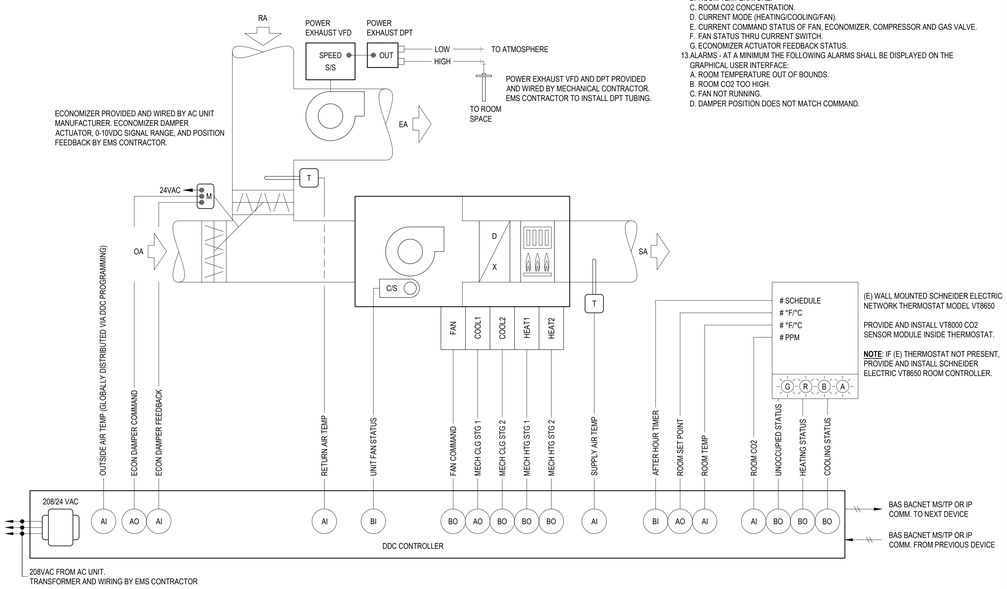
DATE: APRIL 17, 2024

CONSTRUCTION DOCUMENTS

DATE PLOTTED: 4/17/2024 9:29 PM FILE LOCATION: E:\Shared Drives\HVAC\19-6 Nineteen Six\23145 - Meadow Homes ES Mod\03 Dwgs\Meadow Homes ES Mod Inc 1.dwg

SEQUENCE OF OPERATION

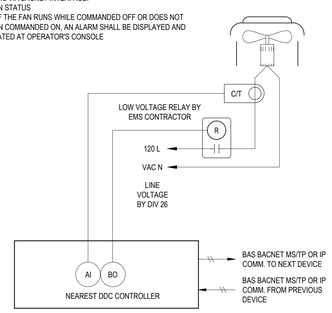
1. SYSTEM OVERVIEW
   A. AC UNIT WILL BE DIRECTLY CONTROLLED BY ITS OWN DEDICATED EMS (ENERGY MANAGEMENT SYSTEM) UNITARY CONTROLLER.
   B. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED ELECTRONIC ZONE TEMPERATURE SENSOR WITH INTEGRAL CO2 SENSOR.
   C. ELECTRONIC ZONE TEMPERATURE SENSOR SHALL HAVE A TOUCH SCREEN LCD INTERFACE WHICH INCLUDES: 1) PUSHBUTTONS FOR WARMER/COOLER SETPOINT CONTROL; 2) VISUAL DISPLAY OF ROOM TEMPERATURE, ROOM CO2 AND AMBIENT OSA TEMPERATURE; AND 3) PUSHBUTTON AFTER-HOURS OVERRIDE TIMER CONTROL WITH USER ADJUSTABLE DURATION. THE AFTER-HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.
2. UNIT FAN OPERATION
   A. WHEN THE ZONE IS IN OCCUPIED MODE OR IN AFTER-HOURS MODE, THE FAN SHALL RUN CONTINUOUSLY.
   B. DURING THE UNOCCUPIED MODE AS DETERMINED BY EMS TIME SCHEDULE, THE UNIT FAN CYCLES WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE UNOCCUPIED SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.
3. MINIMUM OUTDOOR AIR VENTILATION
   A. WITH REFERENCE TO MECHANICAL EQUIPMENT SCHEDULE OSA DESIGN REQUIREMENTS, THE AIR BALANCER SHALL PROVIDE THE EMS SYSTEM WITH INFORMATION FOR TWO (2) SEPARATE MINIMUM OUTDOOR AIR (DESIGN OA CFM) DAMPER SETPOINTS: ONE FOR LOW FAN SPEED AND ANOTHER FOR HIGH FAN SPEED. DESIGN OSA CFM IS LISTED ON EQUIPMENT SCHEDULE.
4. DEMAND CONTROL VENTILATION
   A. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED CO2 SENSOR TO MONITOR ZONE CO2 CONCENTRATION.
   B. DURING OCCUPIED MODE A PROPORTIONAL CONTROL LOOP SHALL BE USED TO MAINTAIN THE CO2 CONCENTRATION BELOW 1,000 PPM (ADJUSTABLE). AS CO2 CONCENTRATION VARIES BETWEEN 800 PPM (ADJUSTABLE) AND 1,000 PPM (ADJUSTABLE), THE OUTSIDE AIR DAMPER SHALL MODULATE BETWEEN MINIMUM OSA SETPOINT AND FULLY OPEN.
   C. SHOULD THE CO2 SENSOR FAIL TO OPERATE WITHIN ACCEPTABLE RANGE, THE OUTSIDE AIR DAMPER SHALL BE SET TO 30% (ADJUSTABLE) MORE THAN MINIMUM OUTSIDE AIR SETPOINT.
5. AUTOMATIC DEMAND SHED CONTROLS
   A. EMS SHALL BE PROGRAMMED WITH CAPABILITY TO IMPLEMENT CENTRALIZED DEMAND SHED FOR ALL NON-CRITICAL ZONES. CRITICAL ZONES SHALL NOT BE IMPACTED BY DEMAND SHED CONSERVATION MEASURES.
   B. UPON THE ACTIVATION OF A DEMAND SHED COMMAND FROM THE EMS SERVER, THE THERMOSTATS OCCUPIED COOLING AND HEATING SETPOINTS SHALL BE OFFSET UP AND DOWN BY 4°F OR MORE.
   C. IN ADDITION TO THE IMPLEMENTATION OF AUTOMATIC DEMAND SHED CONTROL STRATEGIES, THE EMS SHALL ALLOW FOR SYSTEM-WIDE GLOBAL ADJUSTMENT TO ALL COOLING AND HEATING SETPOINTS FROM MAIN EMS SERVER APART FROM DEMAND SHED CONSERVATION MEASURES AND SHALL ALLOW FOR ALL GLOBAL SETPOINT CHANGE COMMANDS TO BE DEACTIVATED.
6. ZONE PRE-OCCUPANCY PURGE
   A. THE EMS SHALL SCHEDULE THE ZONE TO BE IN OCCUPIED MODE ONE HOUR PRIOR TO THE ACTUAL TIME OF ANTICIPATED OCCUPANCY.
7. ECONOMIZER CONTROL
   A. EMS UNITARY CONTROLLER SHALL BE DIRECTLY CONNECTED TO DISCHARGE AIR AND RETURN AIR TEMPERATURE SENSORS. GLOBAL DDC PROGRAMMING SHALL BE USED TO BROADCAST CENTRALIZED AMBIENT OUTSIDE AIR TEMPERATURE.
   B. EMS UNITARY CONTROLLER SHALL ALSO BE DIRECTLY CONNECTED TO ECONOMIZER (OUTSIDE/RETURN AIR) DAMPER ACTUATOR, INCLUDING POSITION FEEDBACK SIGNAL.
   C. SEE MINIMUM OUTDOOR AIR VENTILATION FOR OUTSIDE AIR DAMPER MINIMUM CFM SETPOINT.
   D. THE EMS UNITARY CONTROLLER SHALL CONTINUOUSLY COMPARE THE CURRENT OSA TEMPERATURE TO THE ESTABLISHED AIR ECONOMIZER HIGH LIMIT SHUT OFF (ECON LOCK OUT) TEMPERATURE SET POINT (ADJUSTABLE) AND RETURN AIR TEMPERATURE.
   E. WHEN CURRENT OSA TEMP IS LESS THAN OR EQUAL TO ECON LOCK OUT TEMP AND THE RETURN AIR TEMPERATURE, EMS UNITARY CONTROLLER SHALL USE THE OUTSIDE AIR FOR FREE COOLING.
   F. WHEN THE OUTDOOR AIR DAMPER IS OPEN 100% FOR MORE THAN 5 MINUTES (ADJUSTABLE) AND THE NEED-COOLING SIGNAL CONTINUES TO INCREASE OR REACHES A MAXIMUM OF 100%, MECHANICAL COOLING WILL BE ACTIVATED.
   G. THE ECONOMIZER WILL REMAIN IN USE DURING MECHANICAL COOLING AS LONG AS DISCHARGE AIR TEMPERATURE REMAINS ABOVE 55°F (ADJUSTABLE) AND CURRENT OSA TEMP IS LESS THAN ECON LOCK OUT TEMP AND RETURN AIR TEMP.
   H. WHEN OSA TEMP IS ABOVE ECON LOCK OUT TEMP OR RETURN AIR TEMP, ECONOMIZER WILL BE DEACTIVATED AND ECONOMIZER SHALL BE COMMANDED TO MINIMUM CFM SETPOINT.
   I. ECONOMIZER WILL BE COMMANDED TO MINIMUM CFM SETPOINT WHEN UNIT IS IN HEATING MODE.
   J. WHEN UNIT FAN IS NOT OPERATING, OUTSIDE AIR DAMPER SHALL BE COMMANDED CLOSED.
   K. NOTE: ALL POWER EXHAUST FAN OPERATIONS SHALL BE CONTROLLED BY SEPARATE NON-EMS EXTERNAL DEVICES AS PROVIDED BY MANUFACTURER.
   L. POWER EXHAUST (PE) SHALL MONITOR BUILDING PRESSURE INSIDE ROOM.
   M. PE FAN SHALL MODULATE TO MAINTAIN ROOM PRESSURE SETPOINT OF 0.03" (ADJ.).
8. HEATING OPERATION
   A. THE CONTROLLER COMPARES THE HEATING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-HEATING CONTROL SIGNAL TO STAGE A GAS REGULATING VALVE ON THE UNIT.
   B. ECONOMIZER SHALL BE COMMANDED TO MINIMUM CFM SETPOINT AND MECHANICAL COOLING SHALL BE LOCKED OUT DURING HEATING MODE.
9. COOLING OPERATION
   A. THE CONTROLLER COMPARES THE COOLING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-COOLING SIGNAL.
   B. THE FIRST STAGE OF COOLING WILL ENABLE THE ECONOMIZER TO PROVIDE FREE COOLING FOR AS LONG AS POSSIBLE.
   C. THE SECOND STAGE WILL ENABLE THE COMPRESSOR(S).
   D. MECHANICAL HEATING SHALL BE LOCKED OUT DURING COOLING MODE.
10. FAULT DETECTION DIAGNOSTICS
   A. THE EMS DDC CONTROLLER SHALL MONITOR FAULT STATUS OF THE FOLLOWING FAULT DETECTION DIAGNOSTIC CONDITIONS AND BROADCAST RESULTS VIA EMS NETWORK.
   B. UNIT NOT ECONOMIZING WHEN ENABLED - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS DOES NOT MATCH THE COMMANDED ECONOMIZER SETPOINT WHEN THE ECONOMIZER IS ENABLED FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.
   C. UNIT ECONOMIZING WHEN DISABLED - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS INDICATES THAT THE ECONOMIZER DAMPER IS OPEN BEYOND THE MIN CFM SETPOINT WHEN THE ECONOMIZER IS NOT ENABLED FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.
   D. DAMPER MODULATION FAULT - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK PERCENT DOES NOT MATCH THE COMMANDED ECONOMIZER DAMPER PERCENT FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.
   E. EXCESS OUTDOOR AIR - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS INDICATES THAT THE ECONOMIZER DAMPER IS OPEN BEYOND MIN CFM SETPOINT IN HEATING MODE, AN ALARM SHALL BE GENERATED AND BROADCAST.
11. SETPOINTS
   A. OCCUPIED HOURS SETPOINTS SHALL BE 68°F TO 74°F. (USER ADJUSTABLE AT THERMOSTAT WITHIN THIS RANGE).
   B. UNOCCUPIED HOURS SETPOINTS SHALL BE 60°F HEATING AND 90°F COOLING.
   C. DEADBAND SHALL BE 2°F.
12. MONITORING - THE FOLLOWING CONDITIONS SHALL BE MONITORED AND DISPLAYED AT BMS OPERATOR WORKSTATION/GRAPHICAL USER INTERFACE:
   A. SUPPLY, RETURN AND OUTSIDE AIR TEMPERATURES.
   B. ROOM TEMPERATURE.
   C. ROOM CO2 CONCENTRATION.
   D. CURRENT MODE (HEATING/COOLING/FAN).
   E. CURRENT COMMAND STATUS OF FAN, ECONOMIZER, COMPRESSOR AND GAS VALVE.
   F. FAN STATUS THRU CURRENT SWITCH.
   G. ECONOMIZER ACTUATOR FEEDBACK STATUS.
13. ALARMS - AT A MINIMUM THE FOLLOWING ALARMS SHALL BE DISPLAYED ON THE GRAPHICAL USER INTERFACE:
   A. ROOM TEMPERATURE OUT OF BOUNDS.
   B. ROOM CO2 TOO HIGH.
   C. FAN NOT RUNNING.
   D. DAMPER POSITION DOES NOT MATCH COMMAND.



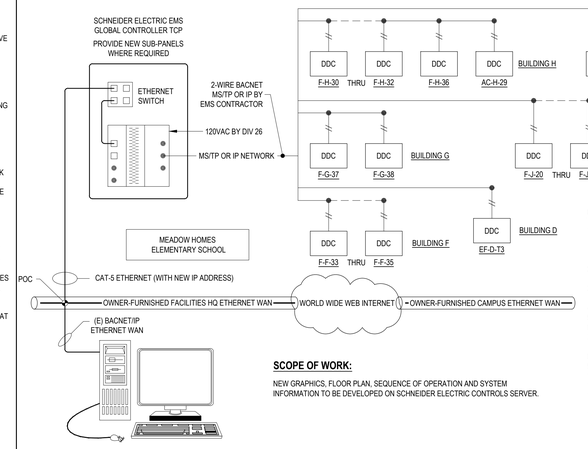
4 PACKAGED AC UNIT CONTROL SCHEMATIC

SEQUENCE OF OPERATION

1. THE EXHAUST FAN SHALL OPERATE DURING NORMAL BUILDING OCCUPANCY HOURS BY EMS TIMECLOCK.
2. MONITORING - THE FOLLOWING CONDITIONS SHALL BE MONITORED BY THE EMS VIA BACNET INTERFACE:
   A. FAN STATUS
3. ALARM - IF THE FAN RUNS WHILE COMMANDED OFF OR DOES NOT RUN WHEN COMMANDED ON, AN ALARM SHALL BE DISPLAYED AND ANNUNCIATED AT OPERATOR'S CONSOLE



5 EXHAUST FAN CONTROL SCHEMATIC



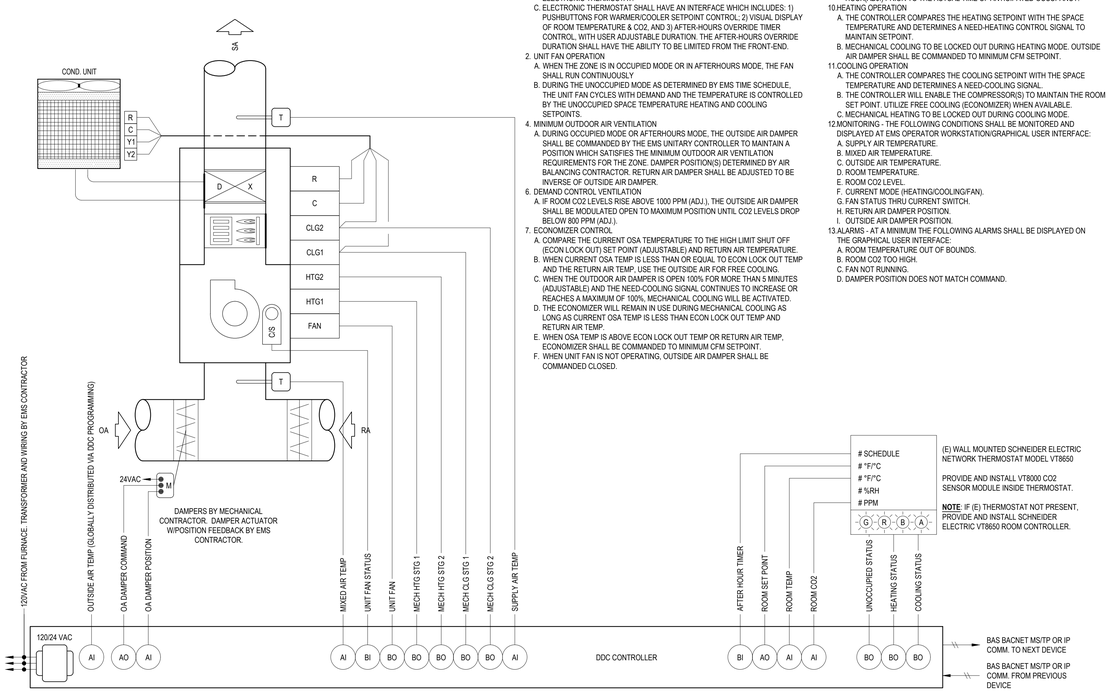
SCOPE OF WORK:

NEW GRAPHICS, FLOOR PLAN, SEQUENCE OF OPERATION AND SYSTEM INFORMATION TO BE DEVELOPED ON SCHNEIDER ELECTRIC CONTROLS SERVER.

GENERAL NOTES

1. THE CONTROLS CONTRACTOR SHALL HAVE THE RESPONSIBILITY AS THE EXPERT IN THE PROPER APPLICATION OF CONTROL COMPONENTS AND DDC SYSTEMS. THE FINAL DESIGN, INSTALLATION, AND OPERATION OF THE CONTROL SYSTEM IS THE RESPONSIBILITY OF THE CONTROLS CONTRACTOR. CONTROLS CONTRACTOR SHALL VISIT THE SITE BEFORE BIDDING AND DETERMINE THE REQUIRED NUMBER OF CONTROL PANELS AND OPTIMAL LOCATION FOR EACH.
2. THE CONTROLS CONTRACTOR SHALL MAKE ADDITIONS AND/OR MODIFICATIONS TO THE DESIGN AS REQUIRED AT NO ADDITIONAL COST. CONTROLS CONTRACTOR SHALL WORK WITH THE MECHANICAL ENGINEER AND OBTAIN APPROVAL FOR ANY NECESSARY REVISIONS.
3. CONTROLS CONTRACTOR SHALL COORDINATE EXACT REQUIREMENT FOR CONTROL HARDWARE WITH ALL ASSOCIATED TRADES AND OWNER. REFER TO DRAWINGS FOR PRELIMINARY OPERATING SEQUENCES.
4. CONTROLS CONTRACTOR SHALL SUBMIT DETAILED SEQUENCES FOR ENGINEER'S REVIEW AND APPROVAL.
5. CONTROLS CONTRACTOR SHALL PROVIDE AS-BUILT CONTROLS, WIRING DIAGRAMS, "AS-BUILT" DRAWINGS, SYSTEM START-UP, AND PROGRAMMING.
6. CONTROLS CONTRACTOR TO WIRE COMMUNICATION BUS FROM NETWORK ROUTER TO ALL LOCAL BACNET CONTROLLERS.
7. CONTROLS CONTRACTOR TO PROVIDE THE NETWORK ROUTER, TEMPERATURE CONTROL PANELS, AND ALL LOCAL CONTROL PANELS FOR ALL EQUIPMENT AS REQUIRED.
8. CONTROLS CONTRACTOR TO PROVIDE ALL TEMPERATURE WIRING FOR ALL TEMPERATURE CONTROL WORK.
9. PROVIDE EMT CONDUIT AND JUNCTION BOXES FOR ALL TEMPERATURE CONTROL WORK RUNNING IN WALL SPACES.
10. PROVIDE RIGID CONDUIT FOR ALL EXTERIOR TEMPERATURE CONTROL WORK.
11. USE PLENUM RATED CABLE AND "J" HOOKS FOR ALL ABOVE CEILING AND FURRED SPACE TEMPERATURE CONTROL WORK.
12. ELECTRICAL CONTRACTOR TO PROVIDE ALL POWER WIRING FOR TEMPERATURE CONTROL PANELS AND LINE VOLTAGE THERMOSTATS. CONTROLS CONTRACTOR SHALL COORDINATE REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
13. MECHANICAL/CONTROLS CONTRACTOR TO COORDINATE WITH ELECTRICAL AND VERIFY CIRCUITS ARE CORRECT BEFORE WIRING CONTROLS.
14. MECHANICAL/CONTROLS CONTRACTOR TO PROVIDE ALL CONTROL COMPONENTS NECESSARY TO FULFILL THE DESIGN INTENT OF THE DRAWINGS.

1 EMS SYSTEM ARCHITECTURE



SEQUENCE OF OPERATION

1. SYSTEM OVERVIEW
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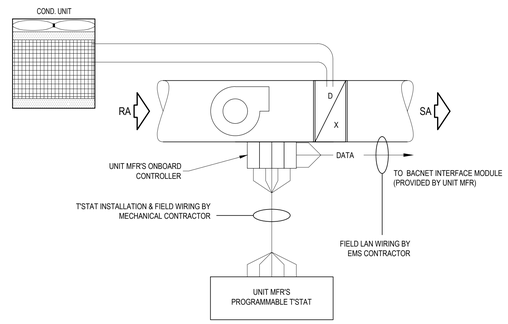
   B. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED ELECTRONIC THERMOSTAT.
   C. ELECTRONIC THERMOSTAT SHALL HAVE AN INTERFACE WHICH INCLUDES: 1) PUSHBUTTONS FOR WARMER/COOLER SETPOINT CONTROL; 2) VISUAL DISPLAY OF ROOM TEMPERATURE & CO2, AND 3) AFTER-HOURS OVERRIDE TIMER CONTROL, WITH USER ADJUSTABLE DURATION. THE AFTER-HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.
2. UNIT FAN OPERATION
   A. WHEN THE ZONE IS IN OCCUPIED MODE OR IN AFTERHOURS MODE, THE FAN SHALL RUN CONTINUOUSLY.
   B. DURING THE UNOCCUPIED MODE AS DETERMINED BY EMS TIME SCHEDULE, THE UNIT FAN CYCLES WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE UNOCCUPIED SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.
3. MINIMUM OUTDOOR AIR VENTILATION
   A. DURING OCCUPIED MODE OR AFTERHOURS MODE, THE OUTSIDE AIR DAMPER SHALL BE COMMANDED BY THE EMS UNITARY CONTROLLER TO MAINTAIN A POSITION WHICH SATISFIES THE MINIMUM OUTDOOR AIR VENTILATION REQUIREMENTS FOR THE ZONE. DAMPER POSITION(S) DETERMINED BY AIR BALANCING CONTRACTOR. RETURN AIR DAMPER SHALL BE ADJUSTED TO BE INVERSE OF OUTSIDE AIR DAMPER.
4. DEMAND CONTROL VENTILATION
   A. IF ROOM CO2 LEVELS RISE ABOVE 1000 PPM (ADJ.), THE OUTSIDE AIR DAMPER SHALL BE MODULATED OPEN TO MAXIMUM POSITION UNTIL CO2 LEVELS DROP BELOW 800 PPM (ADJ.).
5. ECONOMIZER CONTROL
   A. COMPARE THE CURRENT OSA TEMPERATURE TO THE HIGH LIMIT SHUT OFF (ECON LOCK OUT) SET POINT (ADJUSTABLE) AND RETURN AIR TEMPERATURE.
   B. WHEN CURRENT OSA TEMP IS LESS THAN OR EQUAL TO ECON LOCK OUT TEMP AND THE RETURN AIR TEMP, USE THE OUTSIDE AIR FOR FREE COOLING.
   C. WHEN THE OUTDOOR AIR DAMPER IS OPEN 100% FOR MORE THAN 5 MINUTES (ADJUSTABLE) AND THE NEED-COOLING SIGNAL CONTINUES TO INCREASE OR REACHES A MAXIMUM OF 100%, MECHANICAL COOLING WILL BE ACTIVATED.
   D. THE ECONOMIZER WILL REMAIN IN USE DURING MECHANICAL COOLING AS LONG AS CURRENT OSA TEMP IS LESS THAN ECON LOCK OUT TEMP AND RETURN AIR TEMP.
   E. WHEN OSA TEMP IS ABOVE ECON LOCK OUT TEMP OR RETURN AIR TEMP, ECONOMIZER SHALL BE COMMANDED TO MINIMUM CFM SETPOINT.
   F. WHEN UNIT FAN IS NOT OPERATING, OUTSIDE AIR DAMPER SHALL BE COMMANDED CLOSED.
8. AUTOMATIC DEMAND REDUCTION CONTROLS
   A. EMS SHALL BE PROGRAMMED WITH CAPABILITY TO IMPLEMENT CENTRALIZED DEMAND SHED FOR ALL NON-CRITICAL ZONES UPON CALL FOR AUTOMATIC DEMAND REDUCTION. CRITICAL ZONES SHALL NOT BE IMPACTED BY DEMAND SHED CONSERVATION MEASURES.
9. ZONE PRE-OCCUPANCY PURGE
   A. THE EMS SHALL SCHEDULE THE ZONE TO BE IN OCCUPIED MODE ONE HOUR(ADJ.) PRIOR TO THE ACTUAL TIME OF ANTICIPATED OCCUPANCY.
10. HEATING OPERATION
   A. THE CONTROLLER COMPARES THE HEATING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-HEATING CONTROL SIGNAL TO MAINTAIN SETPOINT.
   B. MECHANICAL COOLING TO BE LOCKED OUT DURING HEATING MODE. OUTSIDE AIR DAMPER SHALL BE COMMANDED TO MINIMUM CFM SETPOINT.
11. COOLING OPERATION
   A. THE CONTROLLER COMPARES THE COOLING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-COOLING SIGNAL.
   B. THE CONTROLLER WILL ENABLE THE COMPRESSOR(S) TO MAINTAIN THE ROOM SET POINT. UTILIZE FREE COOLING (ECONOMIZER) WHEN AVAILABLE.
   C. MECHANICAL HEATING TO BE LOCKED OUT DURING COOLING MODE.
12. MONITORING - THE FOLLOWING CONDITIONS SHALL BE MONITORED AND DISPLAYED AT EMS OPERATOR WORKSTATION/GRAPHICAL USER INTERFACE:
   A. SUPPLY AIR TEMPERATURE.
   B. MIXED AIR TEMPERATURE.
   C. OUTSIDE AIR TEMPERATURE.
   D. ROOM TEMPERATURE.
   E. ROOM CO2 LEVEL.
   F. CURRENT MODE (HEATING/COOLING/FAN).
   G. FAN STATUS THRU CURRENT SWITCH.
   H. RETURN AIR DAMPER POSITION.
   I. OUTSIDE AIR DAMPER POSITION.
13. ALARMS - AT A MINIMUM THE FOLLOWING ALARMS SHALL BE DISPLAYED ON THE GRAPHICAL USER INTERFACE:
   A. ROOM TEMPERATURE OUT OF BOUNDS.
   B. ROOM CO2 TOO HIGH.
   C. FAN NOT RUNNING.
   D. DAMPER POSITION DOES NOT MATCH COMMAND.

2 FURNACE / CONDENSING UNIT CONTROL SCHEMATIC



SEQUENCE OF OPERATION:

1. EACH INDOOR FAN COIL SHALL BE CONTROLLED BY MANUFACTURER'S WALL MOUNTED THERMOSTAT AND OPERATE UNDER OWN INTERNAL CONTROL TO MAINTAIN ROOM SETPOINT.
2. EACH FAN COIL SHALL BE CONNECTED TO SCHNEIDER ELECTRIC EMS THROUGH BACNET INTEGRATION CARD.
3. FAN COIL OCCUPANCY SCHEDULES, OCCUPIED SETPOINTS, AND UNOCCUPIED SETPOINTS SHALL BE SET BY THE EMS. COORDINATE SCHEDULES AND SETPOINTS WITH DISTRICT REPRESENTATIVE.
4. EMS SYSTEM SHALL DISPLAY FAN COIL GRAPHIC AND AS A MINIMUM SHALL DISPLAY STATUS OF POINTS LISTED IN INTEGRATION TABLE BELOW.
5. THERMOSTATS SHALL ALLOW MANUAL LOCAL OVERRIDE AFTER-HOURS.
6. THERMOSTATS SHALL BE PROGRAMMED TO RESTRICT RANGE OF HEATING AND COOLING SETPOINT ADJUSTABLE AT THE THERMOSTAT. COORDINATE ALLOWABLE RANGE WITH DISTRICT REPRESENTATIVE.

MINIMUM BACNET POINT INTEGRATION POINTS PER ZONE
ON/OFF STATUS
ON/OFF COMMAND
MODE STATUS
MODE COMMAND
FAN SPEED STATUS
FAN SPEED COMMAND
SET POINT STATUS
SET POINT COMMAND
ROOM TEMP STATUS

3 SPLIT SYSTEM CONTROL SCHEMATIC

AGENCY APPROVAL DSA# 01-121400

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PROFESSIONAL STAMP

REGISTERED PROFESSIONAL ENGINEER — RICHARD M. RUTHERFORD — No. M31059 — EXP. JUNE 30, 2025 — MECHANICAL — STATE OF CALIFORNIA

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PROJECT OWNER & TITLE

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SHEET TITLE

CONTROLS - MECHANCIAL

DRAWN BY: RR JOB NUMBER: 23119.01

SHEET NO.

1MP-501

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B

ABBREVIATIONS:

REVISED: 09/20/2023

A	AMPERE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ANN	ANNUNCIATOR
AP	ACCESS POINT
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BICSI	BUILDING INDUSTRY CONSTRUCTION SERVICE INTERNATIONAL
BLDG	BUILDING
C	CONDUIT
CAB	CABINET
CAT	CATEGORY
CATV	CABLE TELEVISION
CD	CANDELA
CFCI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CL	CENTER LINE
CO	CARBON MONOXIDE
DN	DOWN
(E)	EXISTING
EMT	ELECTRICAL METALLIC TUBING
EOL	END OF LINE
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FTC	FIRE TERMINAL CABINET
GRC	GALVANIZED RIGID CONDUIT
G OR GB	GROUND BOX
IACP	INTRUSION ALARM CONTROL PANEL
IDF	INTERMEDIATE DISTRIBUTION FRAME
IMC	INTERMEDIATE METAL CONDUIT
J OR JB	JUNCTION BOX
MEP	MECHANICAL / ELECTRICAL / PLUMBING
MDF	MAIN DISTRIBUTION FRAME
MPOE	MINIMUM PONT OF ENTRY
(N)	NEW
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NTS	NOT TO SCALE
N/A	NOT APPLICABLE
OFE	OWNER FURNISHED EQUIPMENT
OFCI	OWNER FURNISHED/CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED/OWNER INSTALLED
OSP	OUTSIDE PLANT
PVC	POLYVINYL CHLORIDE
RCDD	REGISTERED COMMUNICATION DISTRIBUTION DESIGNER
RCWY	RACEWAY
RM	ROOM
SR	SURFACE RACEWAY
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRIGHTERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
V	VOLTS
W	WATT
WP	WEATHERPROOF

TECHNOLOGY SYMBOL LEGEND:

ALL EQUIPMENT AND MATERIALS ARE CONTRACTOR FURNISHED, INSTALLED AND CONFIGURED (UNO)

SYMBOL	DESCRIPTION	MFG/MODEL	PART NUMBER	NOTES / DETAIL REFERENCES
R	DATA RACK	PANDUIT	SEE 27 10 00	SEE SINGLE LINE; 1/1T-601, 2/1T-601
G	GROUND BOX	EXISTING	EXISTING	N/A
J	JUNCTION BOX	EXISTING	EXISTING	N/A
– – – –	UNDERGROUND CONDUIT	EXISTING	EXISTING	N/A
———	CONDUIT (EMT & GRC)	COMMERCIAL GENERIC	N/A	GREY = EXISTING; 9/1T-601, 10/1T-601
E	CONDUIT STUB	COMMERCIAL GENERIC	N/A	GREY = EXISTING; 8/1T-601
2300	SURFACE RACEWAY	WIREMOLD	WM2300	N/A; 1/1T-601
	J-HOOK (SINGLE/STACKED)	PANDUIT	SEE 27 05 00	N/A; 3/1T-601
5400	SURFACE RACEWAY	WIREMOLD	WM5400	GREY = EXISTING; 1/1T-601
#	CAT6A DATA DROP LOCATION (# = QTY) - DATA PERMANENT LINK	PANDUIT	SEE 27 15 00	N/A; 7/1T-601
M	MODULAR PLUG DATA PERMANENT LINK, CAT6A JACK / CABLE / MOD PLUG	PANDUIT	SEE 27 15 00	N/A
B	FUTURE DATA LOCATION. PATHWAY ONLY WITH BLANK COVER	N/A	N/A	N/A
AP	DATA LOCATION, CAT6A JACK/CABLE, CEILING, QTY-2	PANDUIT	SEE 27 15 00	N/A; 5/1T-601, 6/1T-601
AP	CEILING MOUNTED WIRELESS ACCESS POINT	ARUBA	SEE 27 15 00	OFCI
WP AP	DATA LOCATION, CAT6A JACK/CABLE, EXTERIOR, QTY 2	PANDUIT	SEE 27 15 00	N/A; 12/1T-601
WP AP	EXTERIOR WALL MOUNTED WIRELESS ACCESS POINT	ARUBA	SEE 27 15 00	OFCI
W	DATA LOCATION, CAT6A JACK / CABLE	PANDUIT	SEE 27 15 00	+48 AFF, PHONE PLATE; 13/1T-601
W	PHONE HANDSET EQUIPMENT (WALL MOUNT)	POLY	SEE 27 21 00	OFCI
CAM-# TYPE	DATA LOCATION, CAT6A JACK / CABLE	PANDUIT	SEE 27 15 00	N/A; 6/1T-601, 2/1T-601, 9/1T-601, 11/1T-601
CAM-# TYPE	NETWORK CAMERA	AXIS	SEE 28 20 00	OFCI
NVR	NETWORK VIDEO RECORDER	EXISTING	EXISTING	N/A
STC	SIGNAL TERMINAL CABINET	EXISTING	EXISTING	N/A
TGB	GROUND BUS BAR	PANDUIT	SEE 27 10 00	N/A; 4/1T-601, 5/1T-601
DC	CAT6A DATA DROP LOCATION - DROP CEILING INTERCOM SPKR/IP MOD	ATLAS	SEE SHEET 1T-701	OFCI; 4/1T-601
SIZE1	CAT6A DATA DROP LOCATION (QTY = 1) - IP CLOCK/SPEAKER/IP MODULE COMBO BOX	ATLAS	SEE SHEET 1T-701	OFCI; 10/1T-601
	CAT6A DATA DROP LOCATION - WALL MOUNTED SPEAKER/IP MODULE	ATLAS	SEE SHEET 1T-701	OFCI; 8/1T-601
	CAT6A DATA DROP LOCATION - EXTERIOR INTERCOM SPEAKER/IP MODULE	ATLAS	SEE SHEET 1T-701	OFCI; 11/1T-601
TEL	PHONE HANDSET EQUIPMENT	POLY	SEE 27 21 00	OFCI
IC-HE	INTERCOM CONTROL HEADEND	EXISTING	EXISTING	N/A
IP-CON	INTERCOM CONSOLE	ATLAS	SEE SHEET 1T-701	N/A

TECHNOLOGY SCOPE OF WORK:

1. THE CONTRACTOR SHALL FULLY RE-CABLE THE DATA NETWORK, INCLUDING COPPER AND FIBER, UTILIZING A COMBINATION OF NEW AND EXISTING PATHWAY.
2. THE CONTRACTOR SHALL PROVIDE ALL DATA NETWORK EQUIPMENT, LICENSES, SOFTWARE, AND ACCESSORIES FOR A COMPLETE AND FULLY OPERATIONAL DATA NETWORK SYSTEM.
3. ALL EQUIPMENT SHALL BE NEW AND CONTRACTOR FURNISHED, UNO.
4. THE CONTRACTOR SHALL REMOVE OLD OR ABANDONED DATA NETWORK AND AUDIO/VISUAL COMPONENTS, INCLUDING DEVICES, MOUNTS, ENCLOSURES, WIRE AND PATHWAY.
5. THE CONTRACTOR SHALL COORDINATE CUTOVERS AND ACTIVATION/COMMISSIONING OF NEW SYSTEMS WITH DISTRICT REPRESENTATIVE AND DISTRICT STAFF.

ANCHORAGE AND BRACING NOTES:

APPLICABLE CODE: 2022 CBC REVISED: 03/12/2024

MEP COMPONENT ANCHORAGE NOTE:

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA APPROVED CONSTRUCTION DOCUMENTS. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26 THRU 30:

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY, MOVEABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
3. TEMPORARY, MOVEABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH THE REFERENCES NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS:

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENTS.
B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTION SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE:

PIPING, DUCTWORK AND ELECTRICAL SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTIONS 13.3 AS DEFINED IN ASCE 7-16 SECTIONS 13.6.5,13.6.6, 13.6.7, 13.6.8 AND 2022 CBC SECTIONS 1617A.1.24, 1617A.1.25 AND 1617A.1.26

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTIONS SYSTEM ARE A NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G., OSHPD OPM FOR 2013 CBC OR LATER), COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPES (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP ☐ MD ☐ PP ☐ E ☒ OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.
MP ☐ MD ☐ PP ☐ E ☐ OPTION 2: SHALL COMPLY WITH THE APPLICABLE OSHPD PRE-APPROVED (OPM #)

PROJECT CODES AND STANDARDS

PARTIAL LIST OF APPLICABLE CODES AND STANDARDS EFFECTIVE JANUARY 1, 2022:
2022 CALIFORNIA ADMINISTRATIVE CODE (CAC), CCR, TITLE 24, PART 1
2022 CALIFORNIA BUILDING CODE (CBC), CCR, TITLE 24, PART 2 (2018 INTERNATIONAL BUILDING CODE WITH CALIFORNIA AMENDMENTS)
2022 CALIFORNIA ELECTRICAL CODE (CEC), CCR, TITLE 24, PART 3 (2017 NATIONAL ELECTRICAL CODE WITH CALIFORNIA AMENDMENTS)
2022 CALIFORNIA MECHANICAL CODE (CMC), CCR, TITLE 24, PART 4 (2018 UNIFORM MECHANICAL CODE, WITH CALIFORNIA AMENDMENTS)
2022 CALIFORNIA PLUMBING CODE (CPC), CCR, TITLE 24, PART 5 (2018 UNIFORM PLUMBING CODE, WITH CALIFORNIA AMENDMENTS)
2022 CALIFORNIA ENERGY CODE, CCR, TITLE 24, PART 6
2022 CALIFORNIA FIRE CODE (CFC), CCR, TITLE 24, PART 9 (2018 INTERNATIONAL FIRE CODE WITH CALIFORNIA AMENDMENTS)
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, CCR, TITLE 24, PART 11
2022 CALIFORNIA REFERENCED STANDARDS CODE, CCR, TITLE 24, PART 12
2022 NFPA 72: NATIONAL FIRE ALARM AND SIGNALING CODE, NATIONAL FIRE PROTECTION ASSOCIATION
2019 NFPA 720: STANDARD FOR THE INSTALLATION OF CARBON MONOXIDE (CO) DETECTION AND WARNING EQUIPMENT.

PROJECT NOTES:

PRODUCT ORDERING
1. ANY PRODUCTS WITH LONG LEAD TIMES SHALL BE BROUGHT TO THE PROJECT MANAGER'S ATTENTION.
2. PRODUCT ORDERING SHALL ONLY OCCUR AFTER APPROVED PRODUCT SUBMITTALS, APPROVED SUBSTITUTION REQUEST (IF ANY) AND APPROVED SHOP DRAWINGS.

INSTALLATION
1. ANY DISCREPANCIES BETWEEN THE DESIGN DOCUMENTS AND GOVERNING CODE / STANDARDS SHALL BE BROUGHT TO THE PROJECT MANAGER'S ATTENTION.
2. A STAMPED SET OF APPROVED DESIGN DOCUMENTS AND SHOP DRAWINGS SHALL BE ONSITE AT ALL TIMES.
3. CONTRACTOR SHALL CONSTANTLY MAINTAIN ONSITE REDLINE DRAWINGS AND BE AVAILABLE FOR INSPECTION BY THE INSPECTOR OF RECORD.
4. ANY PENETRATIONS THROUGH RATED ASSEMBLIES REQUIRE MATERIALS / EQUIPMENT APPROVED TO MAINTAIN THE RATING OF THE ASSEMBLY.
5. ALL WIRING SHALL BE CONNECTED TO DEVICES, NO SPLICING IS ALLOWED.
6. ALL LOW-VOLTAGE CABLING SHALL BE IN CONDUIT, RACEWAY OR OPEN AIR ON J-HOOKS / CABLE TRAY FOR ABOVE CEILINGS.
7. POWER FOR LOW-VOLTAGE SYSTEMS TO BE DEDICATED TO EACH SYSTEM AND WORK TO BE PERFORMED BY A LICENSED ELECTRICIAN.
8. LOW VOLTAGE EQUIPMENT, CABINETS AND ACCESSORIES TO BE MOUNTED PER MANUFACTURER'S INSTRUCTIONS. NO SINGLE DEVICE SHALL EXCEED 20 POUNDS IN WEIGHT WITHOUT SPECIAL MOUNTING DETAILS.
9. CONTRACTOR SHALL REQUEST A PUNCH WALK INSPECTION 10 WORKING DAYS PRIOR TO FINAL INSPECTION.
10. PRIOR TO FINAL INSPECTION CONTRACTOR SHALL PROVIDE PRINTED REDLINES FOR USE BY THE INSPECTORS.
11. AT THE FINAL INSPECTION THE CONTRACTOR SHALL PROVIDE A SATISFACTORY TEST OF THE ENTIRE SYSTEM(S) IN PRESENCE OF THE DESIGNER/ENGINEER, INSPECTOR OF RECORD, THE OWNER OR THE OWNER'S REPRESENTATIVE.
12. THE CONTRACTOR SHALL PROVIDE OWNER WITH SYSTEM OPERATION TRAINING.

CONTRACTOR FURNISHED DOCUMENTS:

SEE SECTION 27 00 00 FOR MORE INFORMATION / REQUIREMENTS

PRODUCT SUBMITTALS
1. SUBMIT PRODUCT MATERIALS SUBMITTALS PER 27 00 00 REQUIREMENTS
2. ANY PROPOSED ALTERNATIVE PRODUCTS REQUIRE A WRITTEN PRODUCT SUBSTITUTION REQUEST.

SHOP DRAWINGS
1. SUBMIT SHOP DRAWINGS PER 27 00 00 REQUIREMENTS
2. SHOP DRAWINGS ARE REQUIRED FOR MDF/IDF DATA RACK LAYOUTS, MDF/IDF WALL ELEVATIONS, AUDIO-VISUAL SYSTEMS AND INTERCOM SYSTEMS.
3. DESIGN DOCUMENTS ARE AS ACCURATE AS POSSIBLE, BUT SHALL BE CONSIDERED AS DIAGRAMMATIC.
4. SHOP DRAWINGS SHALL PRESENT A LEVEL OF DETAIL FOR A COMPLETE, BUILDABLE AND OPERABLE SYSTEM.
5. SHOP DRAWINGS ALLOW THE CONTRACTOR TO MAKE CORRECTIONS FOR ERRORS/OMISSIONS IN DESIGN DOCUMENTS.
6. IN CASE OF DOUBT OF WORK INTENDED, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REQUEST INSTRUCTIONS FROM THE PROJECT MANAGER.
7. APPROVED SHOP DRAWINGS ARE REQUIRED PRIOR TO START OF WORK. ANY WORK STARTED PRIOR TO SHOP DRAWING APPROVAL SHALL BE AT CONTRACTOR'S OWN RISK.
8. CONTRACTOR IS RESPONSIBLE FOR A COMPLETE AND OPERABLE SYSTEM AND ANY COMPONENT(S) NEEDED FOR A COMPLETE AND OPERABLE SYSTEM AFTER SHOP DRAWING APPROVAL SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

CONTRACTOR CERTIFICATION
1. STRUCTURED DATA CABLING AND INTERCOM SYSTEMS REQUIRE CERTIFIED INSTALLERS. CONTRACTOR TO PROVIDE CERTIFICATIONS PRIOR TO START OF WORK.
2. CONTRACTOR SHALL ONLY PROVIDE WORK FOR SYSTEMS THAT THEY POSSESS CURRENT AND VALID CERTIFICATIONS.

CLOSEOUT DOCUMENTS
1. DOCUMENTS PER 27 00 00 REQUIREMENTS
2. UPDATED PRINTED AS-BUILT DRAWINGS
3. TYPED RECORD OF COMPLETION

TECHNOLOGY SHEET INDEX:

SHEET	DESCRIPTION
1T-000	TECHNOLOGY INFRASTRUCTURE COVER SHEET
1T-010	TECHNOLOGY INFRASTRUCTURE SITE PLAN DEMO
1T-020	TECHNOLOGY INFRASTRUCTURE FLOOR PLANS DEMO
1T-021	TECHNOLOGY INFRASTRUCTURE FLOOR PLANS DEMO
1T-100	TECHNOLOGY INFRASTRUCTURE SITE PLAN NEW
1T-200	TECHNOLOGY INFRASTRUCTURE FLOOR PLANS NEW
1T-201	TECHNOLOGY INFRASTRUCTURE FLOOR PLANS NEW
1T-700	TECHNOLOGY INFRASTRUCTURE SINGLE LINES
1T-701	TECHNOLOGY INFRASTRUCTURE SINGLE LINES
1T-800	TECHNOLOGY INFRASTRUCTURE DETAILS
1T-801	TECHNOLOGY INFRASTRUCTURE DETAILS
1T-802	TECHNOLOGY INFRASTRUCTURE DETAILS

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PROFESSIONAL STAMP

LICENSED ARCHITECT
MARIANA ALVAREZ PARGA
C-36107
REN. 01-31-25
STATE OF CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION
2	ADD-002	2024-04-19

THE ARCHITECT DOES NOT REPRESENT THAT THESE PLANS OR THE SPECIFICATIONS ARE SUITABLE FOR ANY SITE OTHER THAN THE ONE FOR WHICH THEY WERE SPECIFICALLY PREPARED. THE ARCHITECT DISCLAIMS RESPONSIBILITY FOR THESE PLANS AND SPECIFICATIONS IF THEY ARE USED IN WHOLE OR IN PART AT ANY OTHER SITE. WRITTEN DIMENSIONS ON THESE DRAWINGS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS.

PROJECT OWNER & TITLE
MT DIABLO UNIFIED SCHOOL DISTRICT
1936 Carlotta Way
Concord, CA 94519

MEADOW HOMES ELEMENTARY SCHOOL MODERNIZATION

1371 Detroit Ave.
Concord, CA 94520

SHEET TITLE
TECHNOLOGY INFRASTRUCTURE COVER SHEET

INCREMENT 1

DRAWN BY: JG/CC JOB NUMBER: 23119.01

SHEET NO.
1T-000

DATE: MARCH 12, 2024

CONSTRUCTION DOCUMENTS

DATE PLOTTED: 12/7/2023 12:00:25 PM FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23120_MTDUSD_MT DIABLO ES MOD_A22.rvt



GENERAL NOTES:

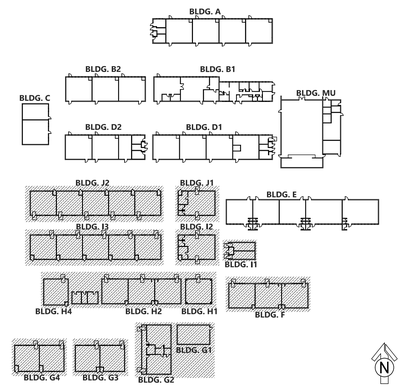
1. CONTRACTOR TO REMOVE AND DISPOSE OF ALL (E) DATA NETWORK COPPER AND FIBER CABLING FROM ENDPOINT TO ENDPOINT, INCLUDING WITHIN CONDUITS AND PULL BOXES.
2. CONTRACTOR TO REMOVE AND DISPOSE OF ALL (E) ANALOG TELEPHONE CABLING FROM WALL PLATES TO 66-BLOCKS. PROVIDE BLANK WALL PLATE AT ALL LOCATIONS, RETURN ANALOG PHONES TO DISTRICT.
3. CONTRACTOR TO REMOVE AND RETURN TO DISTRICT ALL (E) VIDEO PROJECTORS, A/V CABLING, CONTROL PANELS, INPUT STATIONS, AND LAPTOP DESKS. PATCH AND PREP FOR PAINT.
4. CONTRACTOR TO REMOVE AND DISPOSE OF ALL UNUSED OR ABANDONED SURFACE RACEWAY. PATCH AND PREP FOR PAINT.
5. CONTRACTOR TO RETURN REMOVED EQUIPMENT IN EXISTING WORKING ORDER. CARE SHALL BE TAKEN NOT TO DAMAGE REMOVED EQUIPMENT. EQUIPMENT SHALL BE LABELED WITH SITE NAME AND BOXED UP PRIOR TO RETURNING TO DISTRICT.
6. ALL EQUIPMENT SHALL BE RETURNED TO MDUSD. CONTACT DISTRICT REPRESENTATIVE COORDINATE RETURN PROCEDURE.
7. CONTRACTOR TO PROVIDE (N) BLANKING PLATES AND/OR (N) CHANNEL COVERS FOR (E) DATA LOCATIONS REMOVED FROM SURFACE RACEWAY AS A RESULT OF DEMO.
8. CONTRACTOR TO REMOVE AND RETURN TO DISTRICT ALL (E) WIRELESS APS AND MOUNTS. PATCH AND PREP FOR PAINT.
9. CONTRACTOR TO REMOVE AND DISPOSE OF ALL (E) ANALOG INTERCOM AND CLOCK CABLING FROM ENDPOINT TO ENDPOINT, INCLUDING WITHIN CONDUITS AND PULL BOXES.
10. CONTRACTOR TO REMOVE AND RETURN TO DISTRICT ALL (E) ANALOG CLOCKS, SPEAKERS, AND SURFACE BACKBOXES. PATCH AND PREP FOR PAINT.

TECHNOLOGY INFRASTRUCTURE SITE PLAN DEMO

SCALE: 1"=20'

0 20 40

KEY PLAN



AGENCY APPROVAL DSA# 01-121407

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LICENSED ARCHITECT MARIANA ALVAREZ PARGA C-36107 REN. 01-31-25 STATE OF CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION
2	ADD-002	2024-04-19

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MEADOW HOMES ELEMENTARY SCHOOL MODERNIZATION
1371 Detroit Ave.
Concord, CA 94520

SHEET TITLE

TECHNOLOGY INFRASTRUCTURE SITE PLAN DEMO

INCREMENT 1

DRAWN BY: JG/CC JOB NUMBER: 23119.01

SHEET NO.

1T-010

DATE: MARCH 12, 2024

CONSTRUCTION DOCUMENTS

DATE PLOTTED: 12/7/2023 12:00:25 PM FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23120_MTDUSD_MT DIABLO ES MOD_A22.rvt

SHEET NOTES:

1. DEMO (E) IDF CABINET, BACKBOARD, AND OTHER DATA EQUIP. ON WALL, AS OCCURS. PATCH AND PREP FOR PAINT. DEMO ALL (E) DATA DROPS AND FIBER TERMINATING AT THIS IDF.
2. DEMO (E) LCD TV, INCLUDING MOUNT, DECORA WALL CONTROLLER, AS OCCURS, INPUT PLATE, AS OCCURS, AND LOW VOLTAGE CABLING WITHIN SURFACE RACEWAY. REMOVE PORTION OF SURFACE RACEWAY SERVING TV LOCATION. PATCH AND PREP FOR PAINT, AND PROVIDE (N) BLANKING PLATES AND/OR END CAPS FOR ALTERED SURFACE RACEWAY.
3. DEMO (E) PROJECTOR SCREEN AND/OR MOUNT INCLUDING WALL REINFORCEMENTS. PATCH AND PREP FOR PAINT.
4. DEMO (E) SHORT THROW VIDEO PROJECTOR, MOUNT, LOW VOLTAGE CABLING, AND INPUT PLATE. REMOVE PORTION OF SURFACE RACEWAY SERVING PROJECTOR LOCATION. PATCH AND PREP FOR PAINT, AND PROVIDE (N) BLANKING PLATES AND/OR END CAPS FOR ALTERED SURFACE RACEWAY.
5. DEMO (E) COAX WALL PLATE. DEMO COAX CABLE FROM ENDPOINT TO ENDPOINT, INCLUDING WITHIN CONDUITS AND PULL BOXES. PROVIDE (N) BLANK COVER AT WALL PLATE LOCATION.
6. DEMO (E) CRT TV AND MOUNT. PATCH AND PREP FOR PAINT.
7. DEMO (E) WALL BRACKET AND NEATLY WRAP WIRING ABOVE T-BAR. REMOVE (E) NETWORK SWITCH AND DELIVER TO DISTRICT IN GOOD CONDITION.
8. DEMO (E) WIRELESS AP. MOUNT, CABLING, AND SURFACE RACEWAY. PATCH AND PREP FOR PAINT, AND PROVIDE (N) BLANKING PLATES AND/OR END CAPS FOR ALTERED SURFACE RACEWAY.
9. DEMO (E) EXTERIOR CAMERA, MOUNT, CABLING, AND PATHWAY IF UNUSED. WATERPROOF ANY PENETRATIONS. PATCH AND PREP FOR PAINT.
10. DEMO (E) CLOCK/SPEAKER COMBO UNIT. DEMO ANALOG CLOCK CABLE AND INTERCOM CABLE TO HEADEND. REMOVE BACKBOX FROM WALL. PATCH AND PREP FOR PAINT.

SHEET NOTES (CONT):

11. DEMO (E) CLOCK. DEMO ANALOG CLOCK CABLE TO HEADEND.
12. DEMO (E) SPEAKER. DEMO INTERCOM CABLE TO HEADEND. REMOVE BACKBOX FROM WALL. PATCH AND PREP FOR PAINT.
13. DEMO (E) CLOCK/SPEAKER COMBO UNIT AND SURFACE BACKBOX. DEMO ANALOG CLOCK AND INTERCOM CABLE TO HEADEND. PATCH AND PREP FOR PAINT.
14. DEMO (E) DROP CEILING INTERCOM SPEAKER. DEMO INTERCOM CABLE TO HEADEND. PROVIDE REPLACEMENT CEILING TILE TO MATCH EXISTING.

GENERAL NOTES:

1. CONTRACTOR TO REMOVE AND DISPOSE OF ALL (E) DATA NETWORK COPPER AND FIBER CABLING FROM ENDPOINT TO ENDPOINT, INCLUDING WITHIN CONDUITS AND PULL BOXES.
2. CONTRACTOR TO REMOVE AND DISPOSE OF ALL (E) ANALOG TELEPHONE CABLING FROM WALL PLATES TO 66-BLOCKS. PROVIDE BLANK WALL PLATE AT ALL LOCATIONS, RETURN ANALOG PHONES TO DISTRICT.
3. CONTRACTOR TO REMOVE AND RETURN TO DISTRICT ALL (E) VIDEO PROJECTORS, A/V CABLING, CONTROL PANELS, INPUT STATIONS, AND LAPTOP DESKS. PATCH AND PREP FOR PAINT.
4. CONTRACTOR TO REMOVE AND DISPOSE OF ALL UNUSED OR ABANDONED SURFACE RACEWAY. PATCH AND PREP FOR PAINT.
5. CONTRACTOR TO RETURN REMOVED EQUIPMENT IN EXISTING WORKING ORDER. CARE SHALL BE TAKEN NOT TO DAMAGE REMOVED EQUIPMENT. EQUIPMENT SHALL BE LABELED WITH SITE NAME AND BOXED UP PRIOR TO RETURNING TO DISTRICT.
6. ALL EQUIPMENT SHALL BE RETURNED TO MDUSD. CONTACT DISTRICT REPRESENTATIVE COORDINATE RETURN PROCEDURE.
7. CONTRACTOR TO PROVIDE (N) BLANKING PLATES AND/OR (N) CHANNEL COVERS FOR (E) DATA LOCATIONS REMOVED FROM SURFACE RACEWAY AS A RESULT OF DEMO.
8. CONTRACTOR TO REMOVE AND RETURN TO DISTRICT ALL (E) WIRELESS APS AND MOUNTS. PATCH AND PREP FOR PAINT.
9. CONTRACTOR TO REMOVE AND DISPOSE OF ALL (E) ANALOG INTERCOM AND CLOCK CABLING FROM ENDPOINT TO ENDPOINT, INCLUDING WITHIN CONDUITS AND PULL BOXES.
10. CONTRACTOR TO REMOVE AND RETURN TO DISTRICT ALL (E) ANALOG CLOCKS, SPEAKERS, AND SURFACE BACKBOXES. PATCH AND PREP FOR PAINT.

SHEET 1T-020

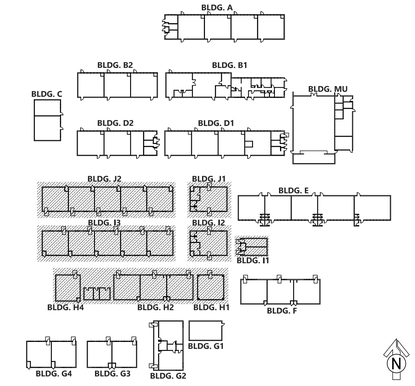
LOCATION	TAG ID	DESCRIPTION
A	233900	4 EA. THHN, 1 EA. 18/2
	233831	3 EA. THHN, 1 EA. 18/2
B	233832	1 EA. 18/2
	233833	1 EA. 18/2
	233834	4 EA. THHN
	233835	3 EA. THHN
C	233840	2 EA. 18/2
	233814	2 EA. 18/2
	122815	4 EA. THHN
D	233811	3 EA. 18/2
	233812	3 EA. 18/2
	233813	6 EA. THHN
E	233836	2 EA. 18/2
	233837	2 EA. 18/2
	233838	3 EA. THHN
	233839	3 EA. THHN
F	233816	3 EA. 18/2
	233817	3 EA. 18/2
	233818	7 EA. THHN
G	233935	34 EA. CAT5E
	233936	1 EA. CAT5E
	233937	4 EA. CAT5E
	233938	1 EA. 25 PAIR
	233939	1 EA. 15 PAIR
	233940	1 EA. 25 PAIR
	233950	4 EA. 18/3
	233851	11 EA. 18/2
	233852	5 EA. CAT5
	233853	5 EA. 5 PAIR
	233854	5 EA. 5 PAIR
	233855	1 EA. RG59
	233856	1 EA. RG8
	233857	4 EA. RG59
	233858	6 EA. THHN
	233859	6 EA. THHN
	233860	2 EA. CAT5E
	233949	1 EA. RG8

BUILDINGS J1, J2, I1, I2, I3, H1, H2 AND H3

SCALE: 1/8"=1'

0 4 8 12 16

KEY PLAN



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LICENSED ARCHITECT MARIANA ALVAREZ PARGA C-36107 REN. 01-31-25 STATE OF CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION
1	ADD-002	2024-04-19

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PROJECT OWNER & TITLE

MT DIABLO UNIFIED SCHOOL DISTRICT
1936 Carlotta Way
Concord, CA 94519

MEADOW HOMES ELEMENTARY SCHOOL MODERNIZATION
1371 Detroit Ave.
Concord, CA 94520

SHEET TITLE

TECHNOLOGY INFRA. FLOOR PLANS DEMO

INCREMENT 1

DRAWN BY: JG/CC JOB NUMBER: 23119.01

SHEET NO.

1T-020

DATE: MARCH 12, 2024

CONSTRUCTION DOCUMENTS

FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2022/23120_MTDIUSD_MT DIABLO ES MOD_A22.rvt

DATE PLOTTED: 12/7/2023 12:00:25 PM

SHEET 1T-021		
LOCATION	TAG ID	DESCRIPTION
A	233871	21 EA. CAT5E
	233872	6 EA. CAT5E
	233873	4 EA. 18/2
	233874	4 EA. 18/2
B	233919	2 EA. 18/2, 8 EA. THHN
C	233931	1 EA. 18/2, 4 EA. THHN
	233932	1 EA. 18/2, 4 EA. THHN
	233933	9 EA. CAT5
	233934	14 EA. CAT5
D	233877	1 EA. RG8
	233878	2 EA. RG6
	233879	6 EA. THHN
	233880	3 EA. THHN
	233801	4 EA. CAT5

SHEET NOTES:

1. DEMO (E) IDF CABINET, BACKBOARD, AND OTHER DATA EQUIP. ON WALL, AS OCCURS, PATCH AND PREP FOR PAINT. DEMO ALL (E) DATA DROPS AND FIBER TERMINATING AT THIS IDF.
2. DEMO (E) LCD TV, INCLUDING MOUNT, DECORA WALL CONTROLLER, AS OCCURS, INPUT PLATE, AS OCCURS, AND LOW VOLTAGE CABLING WITHIN SURFACE RACEWAY. REMOVE PORTION OF SURFACE RACEWAY SERVING TV LOCATION. PATCH AND PREP FOR PAINT, AND PROVIDE (N) BLANKING PLATES AND/OR END CAPS FOR ALTERED SURFACE RACEWAY.
3. DEMO (E) PROJECTOR SCREEN AND/OR MOUNT INCLUDING WALL REINFORCEMENTS. PATCH AND PREP FOR PAINT.
4. DEMO (E) SHORT THROW VIDEO PROJECTOR, MOUNT, LOW VOLTAGE CABLING, AND INPUT PLATE. REMOVE PORTION OF SURFACE RACEWAY SERVING PROJECTOR LOCATION. PATCH AND PREP FOR PAINT, AND PROVIDE (N) BLANKING PLATES AND/OR END CAPS FOR ALTERED SURFACE RACEWAY.
5. DEMO (E) COAX WALL PLATE. DEMO COAX CABLE FROM ENDPOINT TO ENDPOINT, INCLUDING WITHIN CONDUITS AND PULL BOXES. PROVIDE (N) BLANK COVER AT WALL PLATE LOCATION.
6. DEMO (E) CRT TV AND MOUNT. PATCH AND PREP FOR PAINT.
7. DEMO (E) WALL BRACKET AND NEATLY WRAP WIRING ABOVE T-BAR. REMOVE (E) NETWORK SWITCH AND DELIVER TO DISTRICT IN GOOD CONDITION.
8. DEMO (E) WIRELESS AP, MOUNT, CABLING, AND SURFACE RACEWAY. PATCH AND PREP FOR PAINT, AND PROVIDE (N) BLANKING PLATES AND/OR END CAPS FOR ALTERED SURFACE RACEWAY.
9. DEMO (E) EXTERIOR CAMERA, MOUNT, CABLING, AND PATHWAY IF UNUSED. WATERPROOF ANY PENETRATIONS. PATCH AND PREP FOR PAINT.
10. DEMO (E) CLOCK/SPEAKER COMBO UNIT. DEMO ANALOG CLOCK CABLE AND INTERCOM CABLE TO HEADEND. REMOVE BACKBOX FROM WALL. PATCH AND PREP FOR PAINT.
11. DEMO (E) CLOCK. DEMO ANALOG CLOCK CABLE TO HEADEND.
12. DEMO (E) SPEAKER. DEMO INTERCOM CABLE TO HEADEND. REMOVE BACKBOX FROM WALL, PATCH AND PREP FOR PAINT.
13. DEMO (E) CLOCK/SPEAKER COMBO UNIT AND SURFACE BACKBOX. DEMO ANALOG CLOCK AND INTERCOM CABLE TO HEADEND. PATCH AND PREP FOR PAINT.
14. DEMO (E) DROP CEILING INTERCOM SPEAKER. DEMO INTERCOM CABLE TO HEADEND. PROVIDE REPLACEMENT CEILING TILE TO MATCH EXISTING.

GENERAL NOTES:

1. CONTRACTOR TO REMOVE AND DISPOSE OF ALL (E) DATA NETWORK COPPER AND FIBER CABLING FROM ENDPOINT TO ENDPOINT, INCLUDING WITHIN CONDUITS AND PULL BOXES.
2. CONTRACTOR TO REMOVE AND DISPOSE OF ALL (E) ANALOG TELEPHONE CABLING FROM WALL PLATES TO 66-BLOCKS. PROVIDE BLANK WALL PLATE AT ALL LOCATIONS, RETURN ANALOG PHONES TO DISTRICT.
3. CONTRACTOR TO REMOVE AND RETURN TO DISTRICT ALL (E) VIDEO PROJECTORS, A/V CABLING, CONTROL PANELS, INPUT STATIONS, AND LAPTOP DESKS. PATCH AND PREP FOR PAINT.
4. CONTRACTOR TO REMOVE AND DISPOSE OF ALL UNUSED OR ABANDONED SURFACE RACEWAY. PATCH AND PREP FOR PAINT.
5. CONTRACTOR TO RETURN REMOVED EQUIPMENT IN EXISTING WORKING ORDER. CARE SHALL BE TAKEN NOT TO DAMAGE REMOVED EQUIPMENT. EQUIPMENT SHALL BE LABELED WITH SITE NAME AND BOXED UP PRIOR TO RETURNING TO DISTRICT.
6. ALL EQUIPMENT SHALL BE RETURNED TO MDUSD. CONTACT DISTRICT REPRESENTATIVE COORDINATE RETURN PROCEDURE.
7. CONTRACTOR TO PROVIDE (N) BLANKING PLATES AND/OR (N) CHANNEL COVERS FOR (E) DATA LOCATIONS REMOVED FROM SURFACE RACEWAY AS A RESULT OF DEMO.
8. CONTRACTOR TO REMOVE AND RETURN TO DISTRICT ALL (E) WIRELESS APS AND MOUNTS. PATCH AND PREP FOR PAINT.
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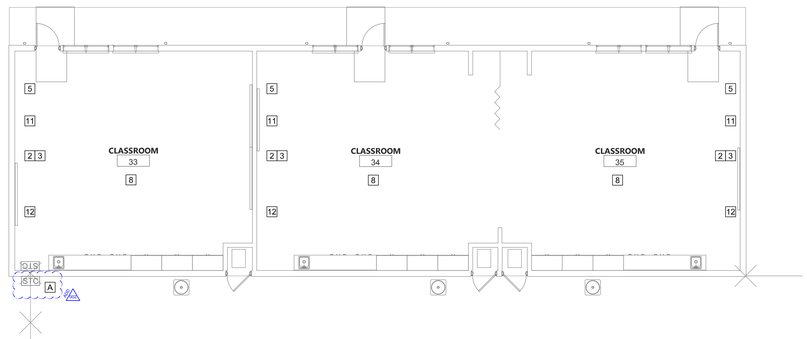
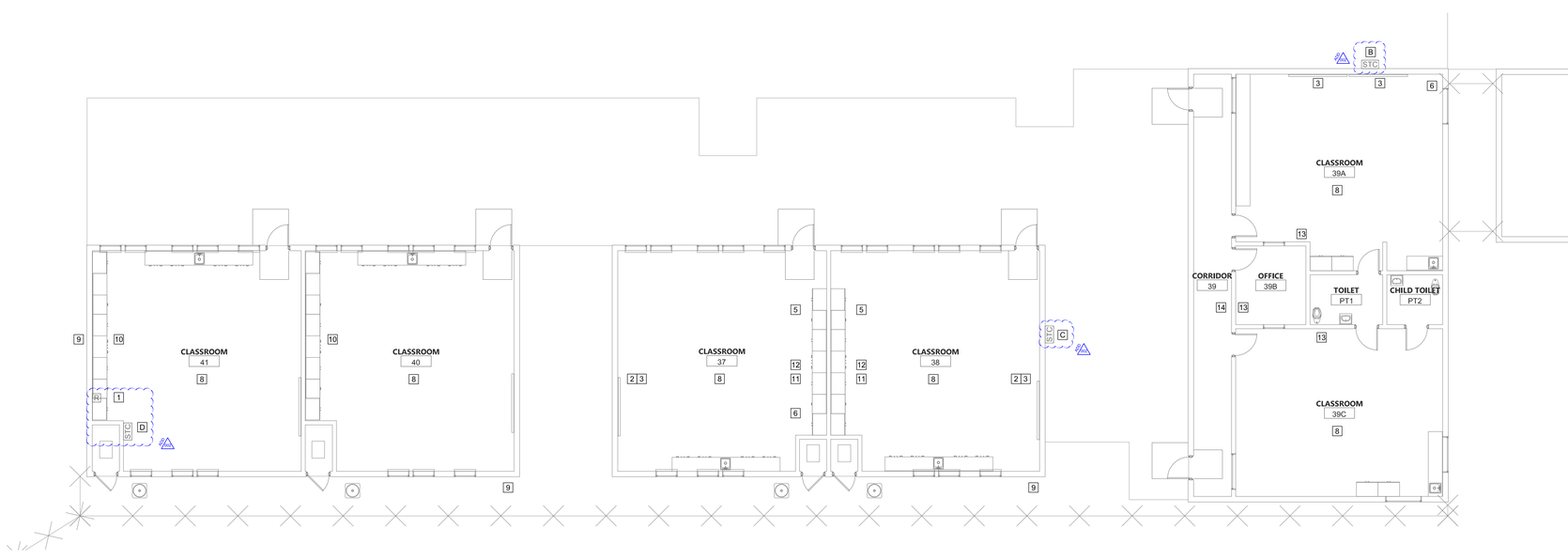


BUILDING F

SCALE: 1/8"=1'

0 4 8 12 16

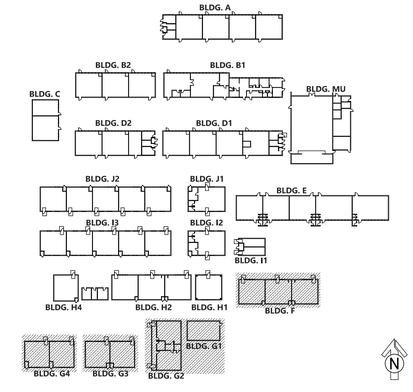


BUILDINGS G1, G2, G3 AND G4

SCALE: 1/8"=1'

0 4 8 12 16

KEY PLAN



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REVISIONS

NO.	DATE	DESCRIPTION
2	ADD-002	2024-04-19

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MEADOW HOMES ELEMENTARY SCHOOL MODERNIZATION
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Concord, CA 94520

SHEET TITLE

TECHNOLOGY INFRA. FLOOR PLANS DEMO

INCREMENT 1

DRAWN BY: JG/CC JOB NUMBER: 23119.01

SHEET NO.

1T-021

DATE: MARCH 12, 2024

CONSTRUCTION DOCUMENTS

DATE PLOTTED: 12/7/2023 12:00:25 PM FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23120_MTDUSD_MT DIABLO ES MOD_A22.rvt



TECHNOLOGY INFRASTRUCTURE SITE PLAN NEW

SCALE: 1"=20'

0 20 40

CONDUIT QTY. AND SIZE:

1. (E) 1 EA. 1-1/4" CONDUITS.
2. (E) 1 EA. 2" CONDUITS.
3. (E) 2 EA. 2" CONDUITS.
4. (E) 3 EA. 2" CONDUITS.
5. (E) 4 EA. 2" CONDUITS.
6. (E) 2 EA. 4" CONDUITS.

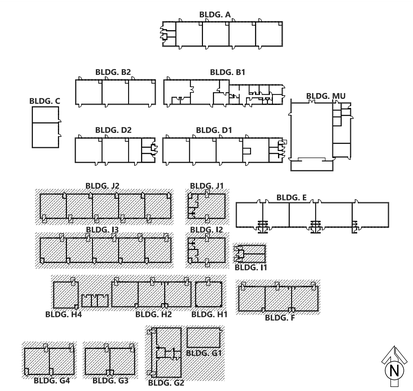
GENERAL NOTES:

1. CONTRACTOR TO FURNISH AND INSTALL ALL PATHWAY, CABLING, ENCLOSURES, MOUNTS, TERMINATIONS, AND ACCESSORIES REQUIRED FOR COMPLETE AND FULLY OPERATIONAL TECHNOLOGY SYSTEMS.
2. CONTRACTOR TO INSTALL AND MAKE OPERATIONAL ALL OWNER-FURNISHED ACTIVE EQUIPMENT AS NOTED IN THE PLANS AND SPECIFICATIONS.
3. ALL ACTIVE EQUIPMENT FURNISHED BY THE OWNER WILL BE PROGRAMMED BY THE OWNER.

SHEET NOTES:

1. INSTALL OWNER-PROVIDED ARUBA #J9993A 8-PORT SFP+ MODULE INTO (E) ARUBA 5406R CORE SWITCH SLOT D.
2. REMOVE (E) "LB" CONDUIT FITTING AT DATA CONDUIT THIS LOCATION. REWORK DATA CONDUIT WITH 90 DEGREE SWEEP FITTING PRIOR TO PULLING (N) FIBER.
3. PROVIDE (N) 4" CONDUIT STUB FROM (E) DATA J-BOX TO MDF.
4. INTERCEPT (E) EMPTY 2" CONDUIT AT WALL WHERE IT ENTERS THE ROOM. PROVIDE END FITTING AND BUSHING. REMOVE REMAINDER OF CONDUIT TO (E) MDF RACK.
5. PROVIDE (N) WALL MOUNTED LIU UNIT AND FIBER PATCH CORDS FOR TEMPORARY CONNECTION TO (E) CORE SWITCH. LEAVE (30) FOOT SERVICE LOOP IN ALL NEW FIBER FOR FUTURE RELOCATION DURING MDF REWORK IN INCREMENT 2.
6. UTILIZE (E) EMPTY 2" CONDUIT FOR (N) FIBER TO THIS IDF.
7. UTILIZE (E) 2" CONDUIT CONTAINING (E) FIBER FOR ALL (N) FIBER RUNS, THIS SEGMENT. PULL (E) SECURITY CABLE BACK TO GROUND BOX, RE-PULL THROUGH ANY ADJACENT CONDUIT, AND RE-TERMINATE AND TEST.
8. PROVIDE (N) 2" CONDUIT OVERHEAD BETWEEN BUILDINGS. SEE DETAIL.
9. INSTALL OWNER-PROVIDED IP CONSOLE PHONE AT ADMIN DESK.
10. INSTALL OWNER-PROVIDED VOIP PHONES IN ALL INC. 2 CLASSROOMS AND ADMIN AREAS PRIOR TO DEMO OF ANY (E) ANALOG PHONE SYSTEM COMPONENTS. UTILIZE ANY AVAILABLE (E) DATA DROP.

KEY PLAN



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REVISIONS

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SHEET TITLE

TECHNOLOGY INFRASTRUCTURE SITE PLAN NEW

INCREMENT 1

DRAWN BY: JG/CC JOB NUMBER: 23119.01

SHEET NO.

1T-100

DATE: MARCH 12, 2024

CONSTRUCTION DOCUMENTS

DATE PLOTTED: 12/7/2023 12:00:25 PM FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23120_MTDUSD_MT DIABLO ES MOD_A22.rvt

SHEET NOTES:

1. PROVIDE (N) CAT6A DATA DROP, QUANTITY INDICATED.
2. ROUTE (N) CABLING VIA (E) SURFACE RACEWAY TO ACCESSIBLE CEILING. PROVIDE (N) DATA PLATES AND DATA PLATE RACEWAY ADAPTERS.
3. ROUTE (N) CABLING VIA (E) SURFACE RACEWAY TO ROOM STC. PROVIDE (N) DATA PLATES AND DATA PLATE RACEWAY ADAPTERS.
4. ROUTE (N) CABLING VIA (E) CONDUIT TO ROOM STC.
5. ROUTE (N) CABLING VIA (E) CONDUIT STUB TO ACCESSIBLE CEILING.
6. ROUTE (N) CABLING VIA (E) CONDUIT TO IDF LOCATION.
7. PROVIDE (N) 2 EA. CAT6A DATA DROP FOR WIRELESS AP AT ACCESSIBLE CEILING. SEE DETAIL.
8. PROVIDE (N) 2 EA. CAT6A DATA DROP FOR WIRELESS AP AT HARD LID CEILING. PROVIDE (N) WM2300 SURFACE RACEWAY TO AP LOCATION. SEE DETAIL.
9. PROVIDE (N) 2 EA. CAT6A DATA DROP FOR WIRELESS AP AT HARD LID CEILING. PROVIDE (N) WM2300 SURFACE RACEWAY BETWEEN AP LOCATION AND (E) DATA WALL BOX AS NOTED. AT (E) DATA WALL BOX, PROVIDE WM EXTENSION RING WITH BLANK COVER.
10. PROVIDE (N) BLANK COVER PLATE AT (E) DATA WALL BOX.
11. ROUTE (N) CABLING VIA (N) WM2300 TO ACCESSIBLE CEILING.
12. REMOVE (E) CAMERA PRIOR TO EXTERIOR PAINTING. PROVIDE (N) CAT6A DATA DROP VIA (E) PATHWAY. RE-MOUNT CAMERA AND MAKE WATERPROOF. RE-AIM CAMERA IN PRESENCE OF DISTRICT REPRESENTATIVE.
13. PROVIDE (N) CAT6A DATA DROP FOR (N) WALL MOUNTED PANORAMIC NETWORK CAMERA. SEE DETAIL. AIM CAMERA VIEWS IN PRESENCE OF DISTRICT REPRESENTATIVE.

SHEET NOTES (CONT.):

14. PROVIDE (N) 2 EA. CAT6A DATA DROP VIA (N) PATHWAY AND PENETRATION. MOUNT OWNER-PROVIDED WIRELESS AP AND MAKE WATERPROOF. SEE DETAIL.
15. MOUNT OWNER-PROVIDED WIRELESS AP. SEE DETAIL.
16. PROVIDE (N) IDF ENCLOSURE. SEE SINGLE LINE FOR DETAILS.
17. PROVIDE (N) 1 EA. CAT6A DATA DROP FOR WALL MOUNTED VOIP PHONE WITH PHONE HANGER WALL PLATE.
18. PROVIDE (N) WM2300 HORIZONTALLY ALONG WALL FROM (E) SURFACE RACEWAY TO DIRECTLY BELOW (N) WALL PHONE LOCATION. PROVIDE (N) CUT IN BOX AT WALL PHONE LOCATION, FISH CABLE BETWEEN (N) CUT IN BOX AND (N) WM2300.
19. PROVIDE (N) WM2300 BETWEEN WALL PHONE LOCATION AND NEAREST (E) DATA WALL BOX AS NOTED. PROVIDE WM EXTENSION RING TO TRANSITION FROM WALL BOX TO (N) WM2300.
20. PROVIDE (N) WM2300 BETWEEN WALL PHONE LOCATION AND NEAREST (E) SURFACE RACEWAY.
21. PROVIDE (N) CUT IN BOX AT WALL PHONE LOCATION, FISH CABLE BETWEEN (N) CUT IN BOX AND (E) OR (N) SURFACE RACEWAY OR ACCESSIBLE CEILING.
22. UTILIZE (E) TELEPHONE BACKBOX AND CONDUIT STUB TO ACCESSIBLE CEILING.
23. PROVIDE (N) CAT6A DATA DROP FOR (N) CORNER MOUNTED MULTIDIRECTIONAL NETWORK CAMERA. SEE DETAIL. AIM CAMERA VIEWS IN PRESENCE OF DISTRICT REPRESENTATIVE.
24. PROVIDE (N) WALL MOUNT FOR (E) MULTIDIRECTIONAL NETWORK CAMERA. TERMINATE KEYSTONE IN (N) MOUNT.

SHEET NOTES (CONT.):

25. MOUNT OWNER-PROVIDED VOIP PHONE HANDSET ON WALL HANGER PLATE. UTILIZE MFG. PROVIDED WALL MOUNT HARDWARE AND PATCH CABLE.
26. PROVIDE (N) 1 EA. CAT6A DATA DROP FOR IP CLOCK/SPEAKER COMBO. PROVIDE (N) COMBO SURFACE BACKBOX. TERMINATE DATA DROP IN BISCUIT BLOCK MOUNTED IN SURFACE BACKBOX. MOUNT OWNER-PROVIDED CLOCK/SPEAKER COMBO UNIT. PROVIDE (N) 1 EA. CAT6A PATCH CABLE.
27. PROVIDE (N) 1 EA. CAT6A DATA DROP FOR IP EXTERIOR SPEAKER. PROVIDE (N) EXTERIOR SURFACE BACKBOX AND MAKE WATERPROOF. TERMINATE DATA DROP IN BISCUIT BLOCK MOUNTED IN SURFACE BACKBOX. MOUNT OWNER-PROVIDED EXTERIOR SPEAKER UNIT. PROVIDE (N) 1 EA. CAT6A PATCH CABLE.
28. ROUTE CABLING VIA SAME SURFACE RACEWAY SERVING WIRELESS AP LOCATION.
29. REMOVE (E) CLOCK. ROUTE (N) CABLING VIA (E) CONDUIT STUB TO ABOVE T-BAR AT (E) CLOCK LOCATION.
30. REMOVE (E) CLOCK/SPEAKER COMBO UNIT. PROVIDE (N) CUT-IN BOX AND FISH (N) CABLING FROM ACCESSIBLE CEILING.
31. PROVIDE (N) PENETRATION TO INTERIOR, MAKE WATERPROOF, AND ROUTE CABLING ABOVE T-BAR.
32. PROVIDE (N) PENETRATION TO INTERIOR, MAKE WATERPROOF, AND ROUTE CABLING VIA (N) WM2300.

GENERAL NOTES:

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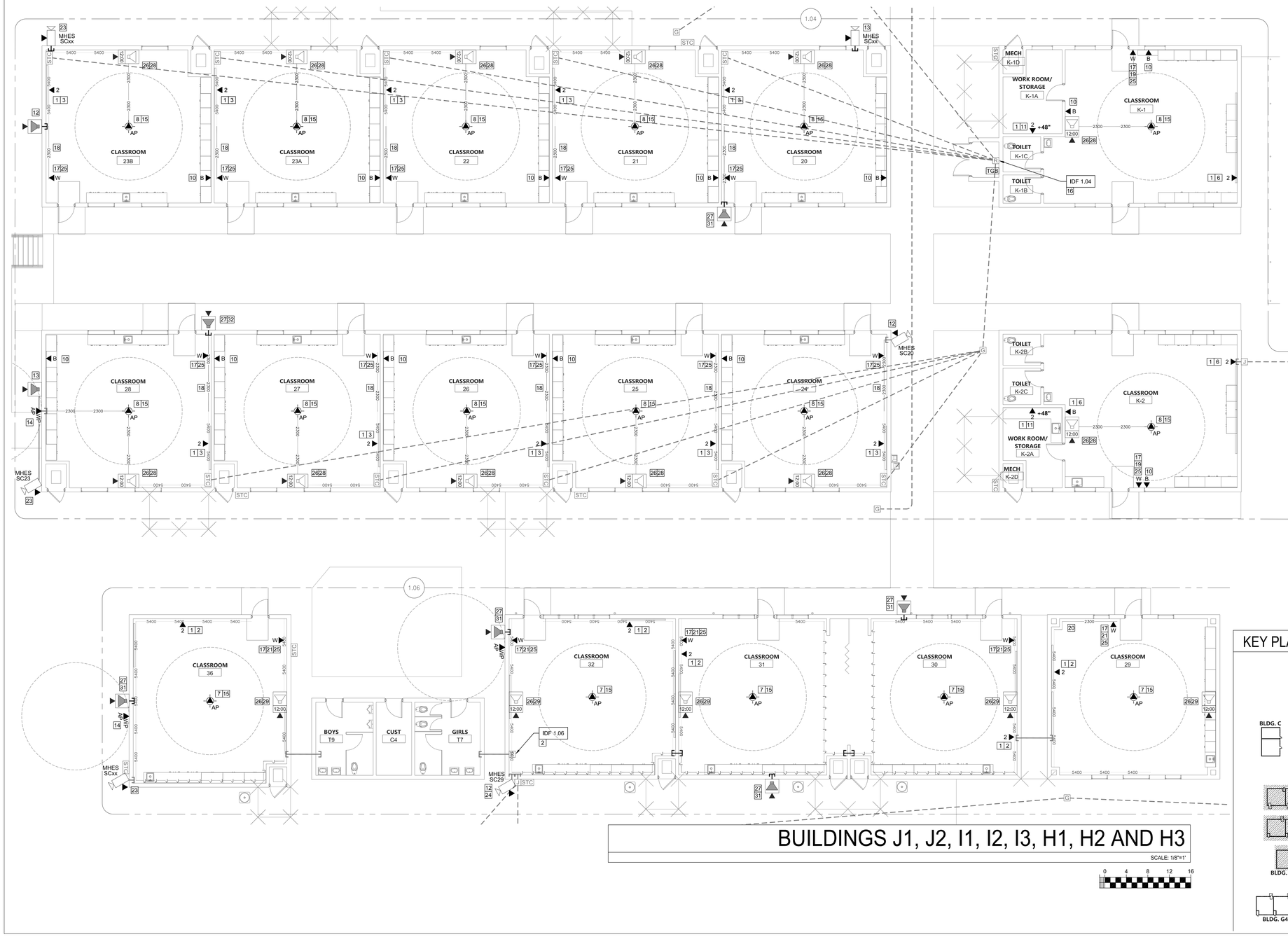
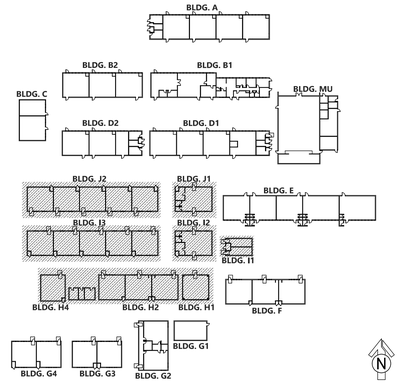


BUILDINGS J1, J2, I1, I2, I3, H1, H2 AND H3

SCALE: 1/8"=1'

0 4 8 12 16

KEY PLAN



AGENCY APPROVAL DSA# 01-121407

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JOHNNY KAGSTROM
Signature
EXPIRES 12/31/24
Regis. No.163629

PROFESSIONAL STAMP

LICENSED ARCHITECT MARIANA ALVAREZ PARGA C-36107 REN. 01-31-25 STATE OF CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION
1	ADD-002	2024-04-19

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PROJECT OWNER & TITLE

MT DIABLO UNIFIED SCHOOL DISTRICT
1936 Carlotta Way
Concord, CA 94519

MEADOW HOMES ELEMENTARY SCHOOL MODERNIZATION

1371 Detroit Ave.
Concord, CA 94520

SHEET TITLE

TECHNOLOGY INFRA. FLOOR PLANS NEW

INCREMENT 1

DRAWN BY: JG/CC JOB NUMBER: 23119.01

SHEET NO.

1T-200

DATE: MARCH 12, 2024

CONSTRUCTION DOCUMENTS

FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23120_MTDUSD_MT DIABLO ES MOD_A22.rvt

DATE PLOTTED: 12/7/2023 12:00:25 PM

SHEET NOTES:

1. PROVIDE (N) CAT6A DATA DROP, QUANTITY INDICATED.
2. ROUTE (N) CABLING VIA (E) SURFACE RACEWAY TO ACCESSIBLE CEILING. PROVIDE (N) DATA PLATES AND DATA PLATE RACEWAY ADAPTERS.
3. ROUTE (N) CABLING VIA (E) SURFACE RACEWAY TO ROOM STC. PROVIDE (N) DATA PLATES AND DATA PLATE RACEWAY ADAPTERS.
4. ROUTE (N) CABLING VIA (E) CONDUIT TO ROOM STC.
5. ROUTE (N) CABLING VIA (E) CONDUIT STUB TO ACCESSIBLE CEILING.
6. ROUTE (N) CABLING VIA (E) CONDUIT TO IDF LOCATION.
7. PROVIDE (N) 2 EA. CAT6A DATA DROP FOR WIRELESS AP AT ACCESSIBLE CEILING. SEE DETAIL.
8. PROVIDE (N) 2 EA. CAT6A DATA DROP FOR WIRELESS AP AT HARD LID CEILING. PROVIDE (N) WM2300 SURFACE RACEWAY TO AP LOCATION. SEE DETAIL.
9. PROVIDE (N) 2 EA. CAT6A DATA DROP FOR WIRELESS AP AT HARD LID CEILING. PROVIDE (N) WM2300 SURFACE RACEWAY BETWEEN AP LOCATION AND (E) DATA WALL BOX AS NOTED. AT (E) DATA WALL BOX, PROVIDE WM EXTENSION RING WITH BLANK COVER.
10. PROVIDE (N) BLANK COVER PLATE AT (E) DATA WALL BOX.
11. ROUTE (N) CABLING VIA (N) WM2300 TO ACCESSIBLE CEILING.
12. REMOVE (E) CAMERA PRIOR TO EXTERIOR PAINTING. PROVIDE (N) CAT6A DATA DROP VIA (E) PATHWAY. RE-MOUNT CAMERA AND MAKE WATERPROOF. RE-AIM CAMERA IN PRESENCE OF DISTRICT REPRESENTATIVE.
13. PROVIDE (N) CAT6A DATA DROP FOR (N) WALL MOUNTED PANORAMIC NETWORK CAMERA. SEE DETAIL. AIM CAMERA VIEWS IN PRESENCE OF DISTRICT REPRESENTATIVE.

SHEET NOTES (CONT.):

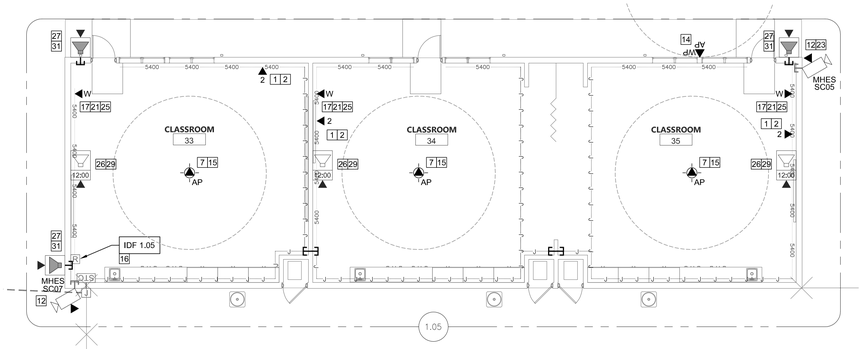
14. PROVIDE (N) 2 EA. CAT6A DATA DROP VIA (N) PATHWAY AND PENETRATION. MOUNT OWNER-PROVIDED WIRELESS AP AND MAKE WATERPROOF. SEE DETAIL.
15. MOUNT OWNER-PROVIDED WIRELESS AP. SEE DETAIL.
16. PROVIDE (N) IDF ENCLOSURE. SEE SINGLE LINE FOR DETAILS.
17. PROVIDE (N) 1 EA. CAT6A DATA DROP FOR WALL MOUNTED VOIP PHONE WITH PHONE HANGER WALL PLATE.
18. PROVIDE (N) WM2300 HORIZONTALLY ALONG WALL FROM (E) SURFACE RACEWAY TO DIRECTLY BELOW (N) WALL PHONE LOCATION. PROVIDE (N) CUT IN BOX AT WALL PHONE LOCATION, FISH CABLE BETWEEN (N) CUT IN BOX AND (N) WM2300.
19. PROVIDE (N) WM2300 BETWEEN WALL PHONE LOCATION AND NEAREST (E) DATA WALL BOX AS NOTED. PROVIDE WM EXTENSION RING TO TRANSITION FROM WALL BOX TO (N) WM2300.
20. PROVIDE (N) WM2300 BETWEEN WALL PHONE LOCATION AND NEAREST (E) SURFACE RACEWAY.
21. PROVIDE (N) CUT IN BOX AT WALL PHONE LOCATION, FISH CABLE BETWEEN (N) CUT IN BOX AND (E) OR (N) SURFACE RACEWAY OR ACCESSIBLE CEILING.
22. UTILIZE (E) TELEPHONE BACKBOX AND CONDUIT STUB TO ACCESSIBLE CEILING.
23. PROVIDE (N) CAT6A DATA DROP FOR (N) CORNER MOUNTED MULTIDIRECTIONAL NETWORK CAMERA. SEE DETAIL. AIM CAMERA VIEWS IN PRESENCE OF DISTRICT REPRESENTATIVE.
24. PROVIDE (N) WALL MOUNT FOR (E) MULTIDIRECTIONAL NETWORK CAMERA. TERMINATE KEYSTONE IN (N) MOUNT.

SHEET NOTES (CONT.):

25. MOUNT OWNER-PROVIDED VOIP PHONE HANDSET ON WALL HANGER PLATE. UTILIZE MFG. PROVIDED WALL MOUNT HARDWARE AND PATCH CABLE.
26. PROVIDE (N) 1 EA. CAT6A DATA DROP FOR IP CLOCK/SPEAKER COMBO. PROVIDE (N) COMBO SURFACE BACKBOX. TERMINATE DATA DROP IN BISCUIT BLOCK MOUNTED IN SURFACE BACKBOX. MOUNT OWNER-PROVIDED CLOCK/SPEAKER COMBO UNIT. PROVIDE (N) 1 EA. CAT6A PATCH CABLE.
27. PROVIDE (N) 1 EA. CAT6A DATA DROP FOR IP EXTERIOR SPEAKER. PROVIDE (N) EXTERIOR SURFACE BACKBOX AND MAKE WATERPROOF. TERMINATE DATA DROP IN BISCUIT BLOCK MOUNTED IN SURFACE BACKBOX. MOUNT OWNER-PROVIDED EXTERIOR SPEAKER UNIT. PROVIDE (N) 1 EA. CAT6A PATCH CABLE.
28. ROUTE CABLING VIA SAME SURFACE RACEWAY SERVING WIRELESS AP LOCATION.
29. REMOVE (E) CLOCK. ROUTE (N) CABLING VIA (E) CONDUIT STUB TO ABOVE T-BAR AT (E) CLOCK LOCATION.
30. REMOVE (E) CLOCK/SPEAKER COMBO UNIT. PROVIDE (N) CUT-IN BOX AND FISH (N) CABLING FROM ACCESSIBLE CEILING.
31. PROVIDE (N) PENETRATION TO INTERIOR, MAKE WATERPROOF, AND ROUTE CABLING ABOVE T-BAR.
32. PROVIDE (N) PENETRATION TO INTERIOR, MAKE WATERPROOF, AND ROUTE CABLING VIA (N) WM2300.

GENERAL NOTES:

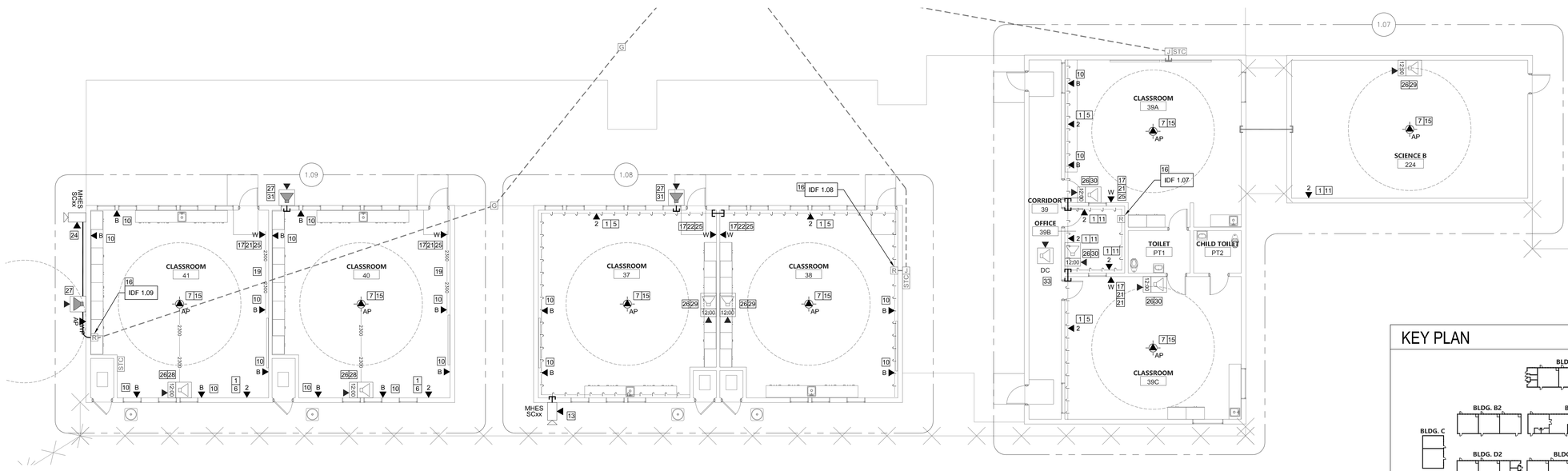
1. CONTRACTOR TO FURNISH AND INSTALL ALL PATHWAY, CABLING, ENCLOSURES, MOUNTS, TERMINATIONS, AND ACCESSORIES REQUIRED FOR COMPLETE AND FULLY OPERATIONAL TECHNOLOGY SYSTEMS.
2. CONTRACTOR TO INSTALL AND MAKE OPERATIONAL ALL OWNER-FURNISHED ACTIVE EQUIPMENT AS NOTED IN THE PLANS AND SPECIFICATIONS.
3. ALL ACTIVE EQUIPMENT FURNISHED BY THE OWNER WILL BE PROGRAMMED BY THE OWNER.



BUILDING F

SCALE: 1/8"=1'

0 4 8 12 16



BUILDINGS G1, G2, G3 AND G4

SCALE: 1/8"=1'

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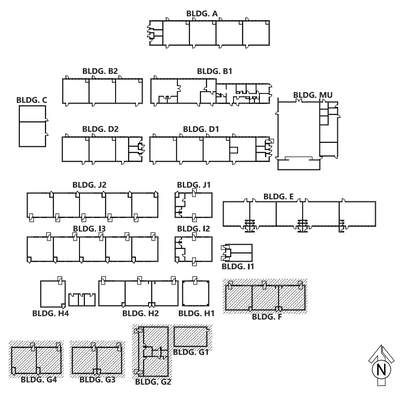
KEY PLAN



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SHEET TITLE

TECHNOLOGY INFRA. FLOOR PLANS NEW

INCREMENT 1

DRAWN BY: JG/CC JOB NUMBER: 23119.01

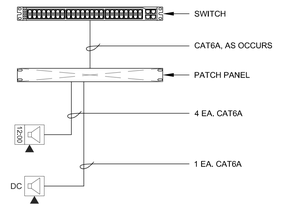
SHEET NO.

1T-201

DATE: MARCH 12, 2024

CONSTRUCTION DOCUMENTS

DATE PLOTTED: 12/7/2023 12:00:25 PM FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23120_MTDUSD_MT DIABLO ES MOD_A22.rvt



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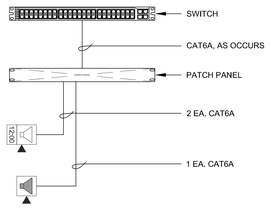

6 IDF 1.08 - CLASSROOM 38
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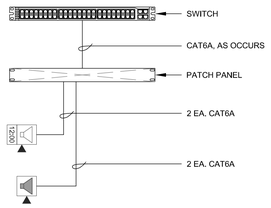
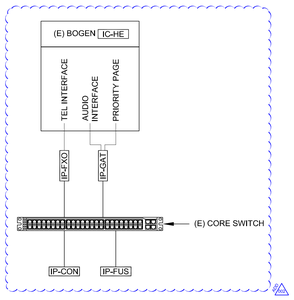
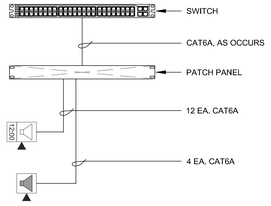


7 IDF 1.09 - CLASSROOM 41
SCALE: NONE

EQUIPMENT INTERCOM SCHEDULE: ALL EQUIPMENT AND MATERIALS ARE CONTRACTOR FURNISHED, INSTALLED AND CONFIGURED (UNO)				
SYMBOL	DESCRIPTION	MODEL	PART NUMBER	NOTES / DETAIL REFERENCES
IDF	IP CLOCK/SPEAKER COMBO	ATLAS	IP-SDMF	OFCI
	SURFACE BACKBOX		IP-SEST-SD	N/A
	IP SPEAKER (EXTERIOR)	ATLAS	IP-HVP	OFCI
	SURFACE BACKBOX		IP-SEST-HVP	N/A
	IP SPEAKER	ATLAS	IP-SM	OFCI
	SURFACE BACKBOX		IP-SEST-SD	N/A
DC	IP SPEAKER (DROP CEILING)	ATLAS	IP-22SYSM	OFCI
IP-CON	IP CONSOLE PHONE	ATLAS	IP-CONSOLE-GH	OFCI
IP-GAT	IP TO ANALOG GATEWAY	ATLAS	IP-ZCM1RMK	OFCI
IP-FXO	FXO VOIP GATEWAY	AUDIOCODES	MP114/4O/SIP	N/A
IP-FUS	FUSION APPLIANCE	INFORMACAST	IPTA-IFS	OFCI
	1U RACK SHELF	PANDUIT	SRM19FM1	N/A



1 MDF 1.00 - BUILDING B1
SCALE: NONE



2 IDF 1.04 - OUTSIDE CLASSROOM K-1
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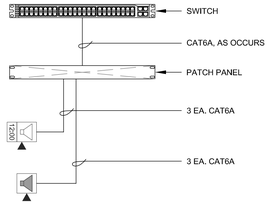

3 IDF 1.05 - CLASSROOM 33
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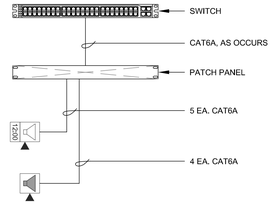
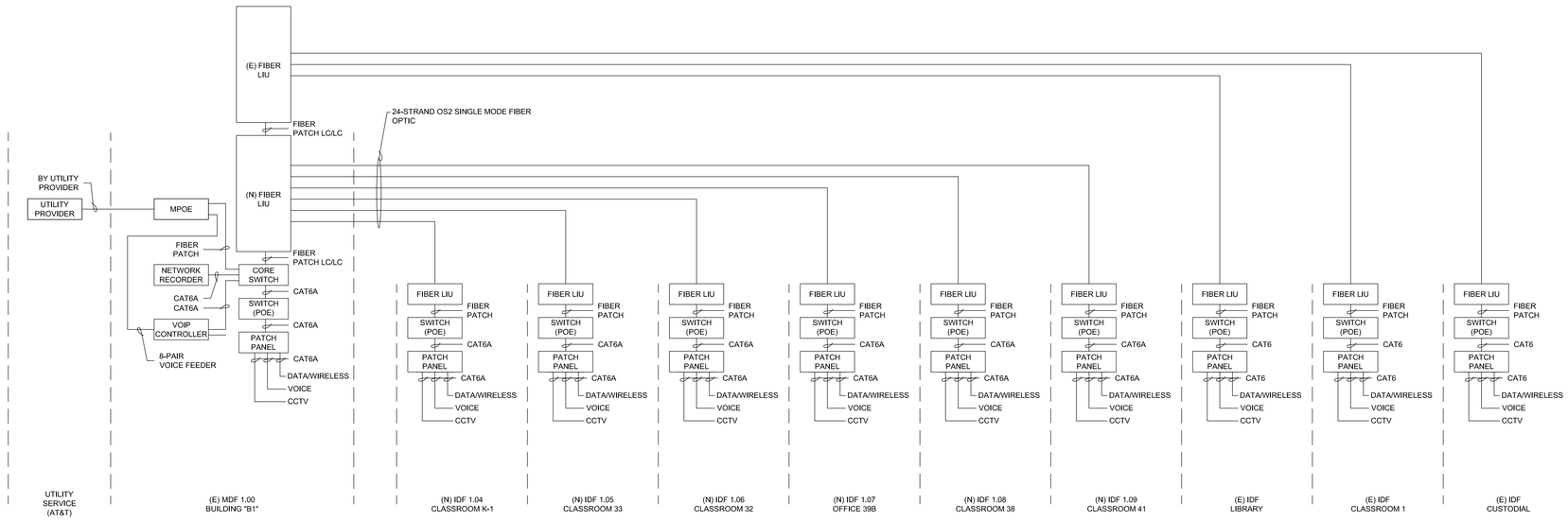


4 IDF 1.06 - CLASSROOM 32
SCALE: NONE

1 INTERCOM NETWORK SINGLE LINE DIAGRAM
SCALE: NONE



1 DATA/VOICE/CCTV NETWORK SINGLE LINE DIAGRAM
SCALE: NONE

AGENCY APPROVAL DSA# 01-121407

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SHEET TITLE
TECHNOLOGY INFRASTRUCTURE SINGLE LINES

INCREMENT 1

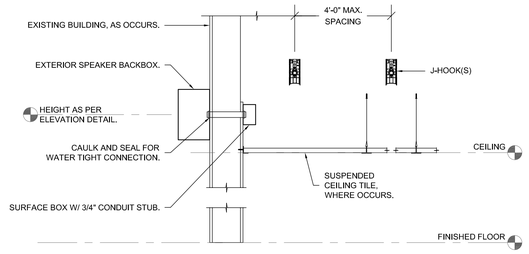
DRAWN BY: JG/CC JOB NUMBER: 23119.01

SHEET NO.
1T-701

DATE: MARCH 12, 2024

CONSTRUCTION DOCUMENTS

DATE PLOTTED: 12/7/2023 12:00:25 PM FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23120_MTDUSD_MT DIABLO ES MOD_A22.rvt



11 EXTERIOR INTERCOM SPEAKER MOUNTING DETAIL
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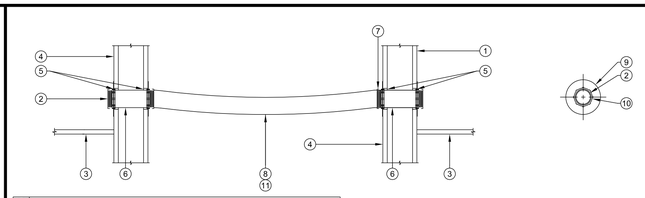
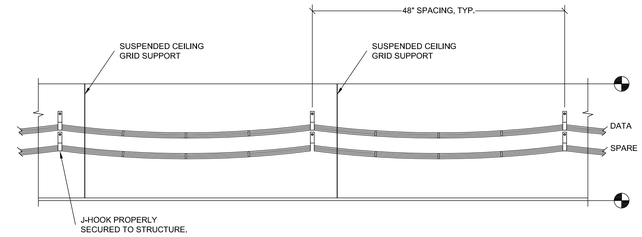


1	INTERIOR WALL.
2	SCREW ON BUSHING.
3	T-BAR CEILING.
4	EXTERIOR WALL.
5	CAULKING ACCORDING TO FIRE RATING, TYP.
6	RIGID CONDUIT NIPPLE.
7	FLEX CONDUIT END FITTING.
8	2" FLEX CONDUIT.
9	REDUCING WASHER.
10	LOCKING RING.
11	4" MIN. RELATIVE MOVEMENT.

7 FLEX CONDUIT INSTALLATION BETWEEN BUILDINGS DETAIL - ABOVE T-BAR CEILING PENETRATION
SCALE: NONE

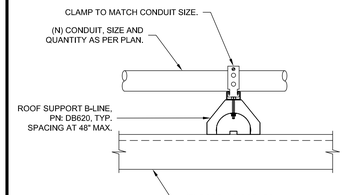


3 J-HOOK PATHWAY ABOVE CEILING DETAIL
SCALE: NONE

NOT USED

NOT USED

NOT USED



10 CONDUIT ON ROOF DETAIL
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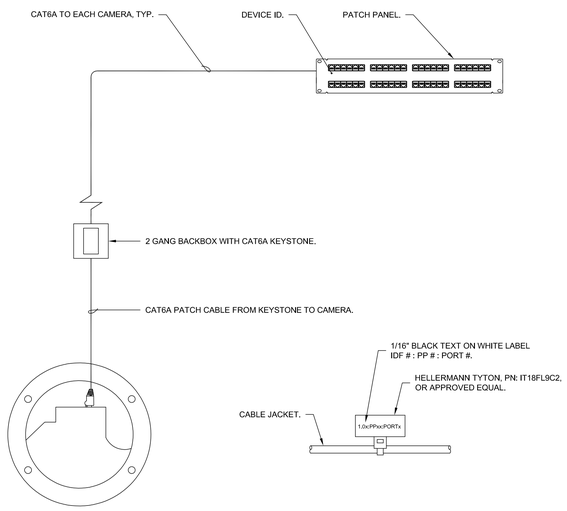
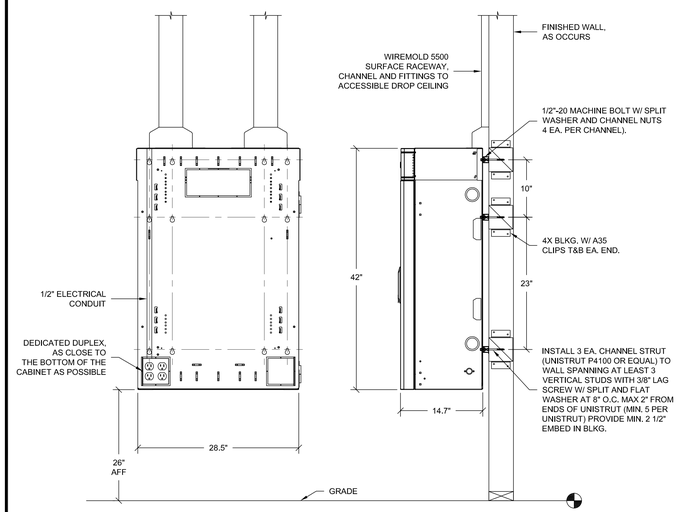
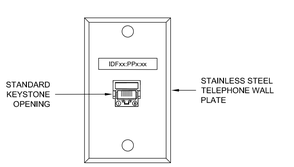


6 CCTV NETWORK SEGMENT DETAIL
SCALE: NONE

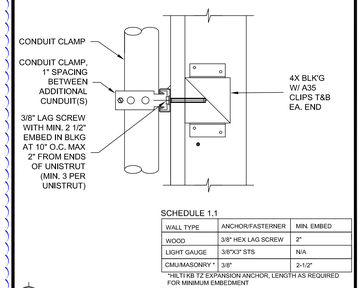


NOTES:
1. 3RU TOTAL LOAD CAPACITY = 200 LBS.
2. 6RU TOTAL LOAD CAPACITY = 300 LBS.

2 TELECOMMUNICATIONS WALL CABINET, 3RU + 6RU (100 LBS. MAX LOADING)
SCALE: NONE



13 TELEPHONE WALL PLATE DETAIL
SCALE: NONE

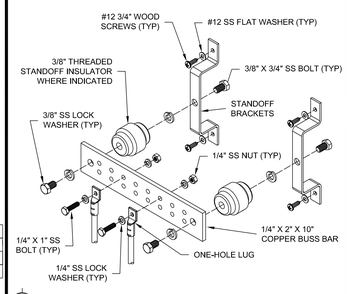


SCHEDULE 1.1

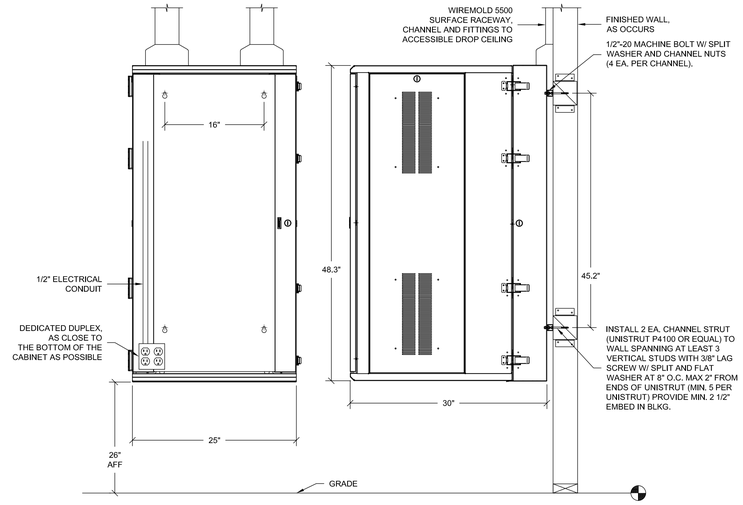
WALL TYPE	ANCHOR/FASTERNER	MIN. EMBED
WOOD	3/8" HEX LAG SCREW	2"
LIGHT GAUGE	3/8"X3" STS	N/A
CMU/MASONRY *	3/8"	2-1/2"

*HILTI KB TZ EXPANSION ANCHOR, LENGTH AS REQUIRED FOR MINIMUM EMBEDMENT

9 CONDUIT SUPPORT DETAIL - VERTICAL
SCALE: NONE

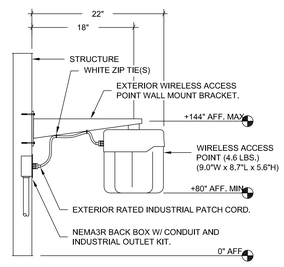


5 MAIN GROUND BAR DETAIL
SCALE: NONE



NOTES:
1. TOTAL LOAD CAPACITY = 350 LBS.

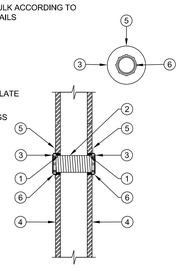
1 TELECOMMUNICATIONS WALL CABINET, 26RU
SCALE: NONE



NOTE:
1) ASSEMBLY DOES NOT EXCEED 20 LBS.

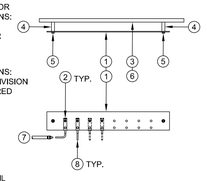
12 EXTERIOR WALL MOUNTED WIRELESS ACCESS POINT DETAIL
SCALE: NONE

1. DRAFT STOP OR FIRE CAULK ACCORDING TO WALL PENETRATION DETAILS
2. ALL THREAD CONDUIT
3. SCREW ON BUSHING
4. WALL
5. REDUCING WASHER OR PLATE
6. SCREW ON LOCKING RINGS FRONT & BACK (TYP.)



8 CONDUIT SLEEVE PENETRATION DETAIL
SCALE: NONE

1. BARE COPPER GROUND BUS BAR
2. TYPICAL 2 HOLE LUGS, SECURE TO BAR WITH 2-5/6" BOLTS,WITH NAMEPLATES MOUNTED ABOVE. PROVIDE NUMBER OF LUGS AS REQUIRED
3. 1" FIRE RATED PLYWOOD BACKBOARD
4. PROVIDE ISOLATION SUPPORT SPACERS AS REQUIRED
5. 3/8" WOOD LAG SCREW, 1" MIN. EMBED
6. MOUNTING LOCATION PER PLAN
7. MAIN BONDING CONDUCTOR FOR TELECOMMUNICATIONS: #4 AWG TO GROUNDING ELECTRODE SYSTEM (PER ELECTRICAL)
8. BONDING CONDUCTOR(S) FOR TELECOMMUNICATIONS: #6 AWG TO DIVISION 27, DIVISION 28 EQUIPMENT AS REQUIRED



4 GROUND BUS BAR DETAIL
SCALE: NONE

AGENCY APPROVAL DSA# 01-121407

911 W HEDDING ST., SUITE 101
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REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER
BICSI
JOHNNY KAGSTROM
EXPIRES 12/31/24
Regis. No.163629

PROFESSIONAL STAMP

LICENSED ARCHITECT
MARIANA ALVAREZ PARGA
C-36107
REN. 01-31-25
STATE OF CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION
1	ADD-002	2024-04-19

THE ARCHITECT DOES NOT REPRESENT THAT THESE PLANS OR THE SPECIFICATIONS ARE SUITABLE FOR ANY SITE OTHER THAN THE ONE FOR WHICH THEY WERE SPECIFICALLY PREPARED. THE ARCHITECT DISCLAIMS RESPONSIBILITY FOR THESE PLANS AND SPECIFICATIONS IF THEY ARE USED IN WHOLE OR IN PART AT ANY OTHER SITE. WRITTEN DIMENSIONS ON THESE DRAWINGS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS.

PROJECT OWNER & TITLE
MT DIABLO UNIFIED SCHOOL DISTRICT
1936 Carlotta Way
Concord, CA 94519
MEADOW HOMES ELEMENTARY SCHOOL MODERNIZATION
1371 Detroit Ave.
Concord, CA 94520

SHEET TITLE
TECHNOLOGY INFRASTRUCTURE DETAILS
INCREMENT 1

DRAWN BY: JG/CC JOB NUMBER: 23119.01

SHEET NO.
1T-800
DATE: MARCH 12, 2024

CONSTRUCTION DOCUMENTS

DATE PLOTTED: 12/7/2023 12:00:25 PM FILE LOCATION: Autodesk Docs://Mt. Diablo USD - Modernization Projects 2023/23120_MTDUSD_MT DIABLO ES MOD_A22.rvt

Enviro-S.T.A.R.
Environmental - Safety, Training And Resources, Inc.
246 30th Street, Ste. 102, Oakland, CA 94611

ASBESTOS & LEAD IN PAINT SURVEY REPORT

Mount Diablo Unified School District
Meadow Homes Elementary School
1371 Detroit Ave.,
Concord, CA 94520

Prepared for:

Mount Diablo Unified School District
Ms. Melanie Koslow
Director of Facilities & Bonds
Maintenance & Operations
1480 Gasoline Alley
Concord, CA 94520

Enviro-S.T.A.R. Project No. 23-419
September 7, 2023

Prepared by:



Ralph P. Guzman
Certified Asbestos Consultant #93-0965
CDPH: #I/A, #4063 PM #4064

Telephone: (510) 568-5996 *Fax: (510) 568-7993*

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- Lead in Paint Sample Laboratory Report & Chain-of-Custody Sheet
- Lead in Ceramic Tile Sample Laboratory Report & Chain-of-Custody Sheet

ASBESTOS & LEAD IN PAINT SURVEY REPORT

Mount Diablo Unified School District
Meadow Homes Elementary School
1371 Detroit Ave.,
Concord, CA 94520

1.0 Introduction

Enviro-STAR, Inc., is pleased to submit the Asbestos-Containing Materials (ACM's) and Lead in Paint survey conducted at Meadow Homes Elementary School, located at 1371 Detroit Ave., Concord, CA 94520. The purpose of the survey was to inspect and collect suspect asbestos and lead in paint samples of the materials subject to disturbance during the planned school renovation work. The survey was conducted on September 7, 2023.

The survey focused on the collection of the following building construction materials for the presence of asbestos and lead:

- Vinyl floor tiles & associated mastic;
- Linoleum;
- Vinyl sheeting;
- Vinyl base cove & adhesive;
- Drywall & taping mud;
- Ceramic tile grout;
- Ceiling acoustical tiles;
- Ceiling tile adhesive;
- Window putty; and
- Carpet glue.

The renovation work will entail the removal and/or disturbing the materials listed above, throughout the school classrooms and ancillary facilities.

A total of thirty-one (31) suspect asbestos materials were collected, that include: vinyl floor tile and associated mastics, linoleum, window putty, drywall texture skim coat, drywall taping mud, and ceiling tiles.

Additionally, ten (10) representative paint samples were collected from various painted components.

Ceramic tile was collected from the Admin Office Unit-sex restroom and analyzed for lead content.

2.0 Asbestos Sampling Methodology

Representative asbestos bulk samples were collected from the materials identified above. Sampling of the suspected ACM was performed in a manner that is consistent with industry standards. The samples were collected using hand tools which are routinely decontaminated between each sampling to prevent

cross contamination. The individual samples were placed into a separate, clean ziploc sample bags and assigned a unique sample identification number. The number and type of sample collected was chosen in a "manner sufficient to determine" asbestos content for the materials subject to being disturbed during the renovation and reconstruction activities.

3.0 Asbestos Laboratory Analytical Method

Material identification of the suspect asbestos samples was performed by EMSL Analytical, Inc., 464 McCormick St., San Leandro, CA, using Polarized Light Microscopy with Dispersion Staining (PLM/DS) in accordance with the U.S. EPA "Method for the Determination of Asbestos in Bulk Building Materials" (EPA-600/R-93/116, July, 1993).

4.0 Interpretation of Results

None Detected

When "None Detected" appears on a report, it means that asbestos was not observed and that, if present, it exists in concentrations less than the limit of reliable detection (< 1%) and/or the fiber dimensions are too small for accurate optical microscopic resolution by normal PLM methodology.

Trace Asbestos

Reported results are the microscopist's visual estimate by area of asbestos concentration. These estimates are then formulated into results given in percent of asbestos by weight. Results for heterogeneous samples examined by component are reported as a composite. For example, if sheetrock joint compound percentage was 2-3% asbestos, the composite result may be reported as <1% (Trace), asbestos for the sheetrock system. The lower limit of reliable detection for the PLM method is 1%. Samples which contain more than 1% asbestos are reported in 1% ranges.
Samples which contain asbestos in a concentration lower than the limit of reliable detection (<1%) are reported as <1% (Trace) asbestos. For a lower limit of detection, "point counting" gravimetry is used. This method is described below.

Point Counting

Bay Area Air Quality Management District (BAAQMD) require point counting results to be reported on their removal notifications for certain materials with PLM results of less than 10% asbestos or assume these materials are ACM. Point counting is conducted by the EPA Method 600/R-93/116 or 600/M4-82-020. This method involves ashing the sample in a furnace and then re-weighing it to determine the amount of material lost on ignition. Acidified water is added and the sample is ultrasonicated to break up solid materials. This material is then filtered, dried, weighed and the filter residue is then analyzed by PLM. Laboratory protocol states that the limit of detection for point counting using 1000 points, is 0.10 area estimates. This point count is then multiplied by the reduction factor (RF) to obtain the actual percentage of asbestos. Percentage levels of 0.1% or greater up to 1%, are considered to be Asbestos Containing Construction Materials (ACCM) by Cal/OSHA.

5.0 Asbestos Material Categories

Federal regulations provide "categories" to classify asbestos material types. In California, Air Quality Management Districts require ACM be listed by category in their notification forms. Table 1 below,

which provides the asbestos sampling results, also provides categories for these materials.

The **Regulated Asbestos Containing Material (RACM)** category designation is for friable asbestos, sprayed on or troweled-on surfacing, fireproofing or thermal system insulation (TSI).

The **Category I** designation is used for non-friable materials such as: tar based roofing, mastics, putties, paints, vinyl floor tile and resilient sheet flooring (excepting the friable paper backing). Note vinyl floor Tile and associated mastic are considered to be friable by some mechanical removal or demolition means.

The **Category II** designation is used for certain other types of non-friable materials such as: Transite pipe and panels, cementitious products, gaskets, clapboard, siding shingles, or any non-friable materials that would be rendered friable by mechanical means during removal. Category I materials may be demolished in place depending upon the means of demolition.

6.0 Asbestos Laboratory Results

According the laboratory analysis results (see Table I) the following materials were analyzed as containing asbestos:

- Interior window putty,
- Drywall texture skim coat,
- Drywall taping mud, and
- Black mastic.

The following materials were analyzed as Asbestos not detected:

- 12" x 12" gray vinyl floor tile & mastic;
- Plaster & skim coat;
- Window putty;
- 12" x 12" nailed acoustical tile;
- 12" x 12" acoustical tile & adhesive;
- Vinyl base cove & adhesive; and
- Leveling compound.

TABLE I
ASBESTOS SAMPLING RESULTS

Sample No.	Location	Description	Asbestos Results	NESHAP Category
0907-01	Room #1 - Floor	12" 12" gray vinyl tile & black mastic	Tile: ND Mastic: ND	n/a n/a
0907-02	Room #1 - Interior window	Putty	ND	n/a

TABLE I ASBESTOS SAMPLING RESULTS				
Sample No.	**Location**	**Description**	**Asbestos Results**	**NESHAP Category**
0907-03	Room #1 - Upper wall, near rear door	Plaster & skim coat	Plaster: ND Skim coat: ND	n/a n/a
0907-04	Room #2 - Floor	12" 12" gray vinyl tile & black mastic	Tile: ND Mastic: ND	n/a n/a
*0907-05	Room #2 - Interior window	Putty	ND	n/a
0907-06	Admin Office - Floor	12" 12" gray vinyl tile & yellow glue	Tile: ND Mastic: ND	n/a n/a
0907-07	Admin Office - Ceiling	12" x 12" nailed perforated acoustical tile	ND	n/a
0907-08	Admin Office - Floor	Black vinyl base cove	ND	n/a
*0907-09	Admin Office - Interior window	Putty	**<1% Chry	Assumed RACM
0907-10	Library Office - Wall	Texture skim coat	**2% Chry**	I
0907-11	Library Office #1- Wall	Taping mud	**2% Chry**	I
0907-12	Library - E. Wing - Ceiling	Brn. Tile adhesive	ND	n/a
0907-13	Library - E. Wing - Ceiling	White plaster-like substrate	ND	n/a
0907-14	Library - E. Wing - Floor	Black mastic under carpet	**<1% Chry**	Assumed I
0907-15	Library - E. Wing - Floor	Residual base cove adhesive	ND	n/a
0907-16	Room #5- Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Tile: ND Mastic: ND	n/a n/a

TABLE I ASBESTOS SAMPLING RESULTS				
Sample No.	**Location**	**Description**	**Asbestos Results**	**NESHAP Category**
0907-17	Room #6- Floor	12" x 12" Lt. Gray vinyl tile & yellow glue	Not analyzed	---
0907-18	Room #7- Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Not analyzed	---
0907-19	Room #14 - Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Not analyzed	---
0907-20	Room #14 - Wall	Plaster & skim coat	ND	n/a
0907-21	Room #13 - Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Not analyzed	---
0907-22	Room #12 - Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Not analyzed	---
0907-23	Room #11 - Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Not analyzed	---
0907-24	Room #10 - Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Not analyzed	---
0907-25	Teacher's lounge - Floor	12" x 12" Lt. Gray vinyl tile & yellow glue	Not analyzed	---
0907-26	Multi-Use Bldg. - Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Tile: ND Mastic: ND	n/a n/a
0907-27	Multi-Use Bldg. - Floor, ladder storage under stage	Residual leveling compound	ND	n/a
0907-28	Room #19 - Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Not analyzed	---

TABLE I
ASBESTOS SAMPLING RESULTS

Sample No.	Location	Description	Asbestos Results	NESHAP Category
0907-29	Room #18 - Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Not analyzed	---
0907-30	Room #16 - Floor	12" x 12" Lt. Gray vinyl tile & Yellow glue	Not analyzed	---
0907-31	Room #15 - Floor	12" x 12" Lt. Gray vinyl tile & black mastic	Not analyzed	---

Footnotes:
Method of Analysis - (PLM) Polarized Light Microscopy EPA/600/R-93/116, 1993.
Chry - Chrysotile Asbestos
Note: Several 12" x 12" gray vinyl floor tile samples were not analyzed. This was due to the tile being homogeneous to other vinyl tile that was analyzed as None Detect for asbestos.

* According to EPA's asbestos sampling and interpretation of results "when a homogeneous material tests positive for asbestos, all similar materials are assumed to contain asbestos, even if reported as None Detect for asbestos".

**According to NESHAP regulations, refer to this report: Section 4.0 Interpretation of Results, Point Counting, samples with a result of <10% are considered RACM unless "point count" analysis determines the result to be <1%.

7.0 Applicable Regulatory Agencies

The United States Environmental Protection Agency (USEPA) classifies a building material as asbestos-containing when the material is found to contain asbestos in quantities of greater than one-percent (>1%) by weight. This classification is the same as Cal-OSHA's (State of California-Occupational Safety and Health Administration) definition of an **Asbestos-Containing Material (ACM).** However, Cal-OSHA has an additional classification for manufactured materials found to contain asbestos in quantities between 0.1% to 1% (one tenth to one percent) by weight. According to Cal-OSHA's Asbestos Construction Standard CCR Title 8, Section 1529 this material is classified as **"Asbestos-Containing Construction Material (ACCM)"**.

Cal-OSHA and Bay Area Air Quality Management District (BAAQMD) require notification if the ACM will be disturbed in quantities set forth by these respective agencies. Additionally, Cal-OSHA classification of manufactured building materials as ACM and/or ACCM (when the ACCM will be disturbed by renovation activities and in quantities of greater than one hundred (100) feet requires removal of the ACCM to be performed by a contractor who is a DOSH registered asbestos contractor. The ACM / ACCM removal work must be performed utilizing appropriate work practices,

proper engineering controls, respirator protection and workers under medical surveillance, with the appropriate medical an training certificates.

8.0 Lead-Based Paint Survey

Ten (10) representative paint chip samples were collected from various components subject to disturbance during the renovation construction phases. The samples were delivered to EMSL Analytical, Inc., 464 McCormick St., San Leandro, CA 94577. The samples were analyzed by Flame Atomic Absorption Spectrometry with EPS's "Standard Operating Procedures for Lead in Paint by Hotplate, or, Microwave-based Acid digestion and Atomic Absorption or inductively Coupled Plasma Emission Spectrometry" (1991), EPA/600/B-91/213. NDIS Document No. PB92-114172.

9.0 Lead-Based Paint Results

California Department of Public Health (CDPH) and the US Environmental Protection Agency (USEPA) defines LBP as *"paint or other surface coatings that contain an amount of lead equal to, or in excess of one milligram per square centimeter (1.0 mg/cm^2) or equal to or in excess of half of one percent (0.5%); or equal to or in excess of 5,000 ppm (parts per million)".* Detectible lead below these levels are known as LCP.

According to the laboratory results seven (7) paint samples were identified as Lead-Based Paint (LBP) ; three (3) were reported as Lead-Containing Paint (LCP) other two were analyzed at "below the limit of detection", as noted in Table II.

TABLE II
PAINT CHIP SAMPLE RESULTS

Sample No.	Location	Description	Results	
			Weight Percent (%)	ppm
0907-01Pb	Room #1 - Interior window frame	Yellow paint	**0.58**	**5,800**
0907-02Pb	Room #1 - Exterior window frame	Green paint	*0.24*	*2,400*
0907-03Pb	Room #1 - Rear door, wooden stop	Yellow paint	**1.0**	**10,000**
0907-04Pb	Room #1 - Rear exterior window frame	Green paint	*0.27*	*2,700*
0907-05Pb	Library- interior window frame	Yellow paint	*0.37*	*3,700*
0907-06Pb	Room #14- West exterior wall, plywood	Yellow paint	*0.25*	*2,500*
0907-07Pb	Room #14- Interior window frame	White paint	*0.23*	*2,300*

TABLE II PAINT CHIP SAMPLE RESULTS				
Sample No.	**Location**	**Description**	**Results** **Weight Percent (%)**	**ppm**
0907-08Pb	Room #14 - Exterior window frame	green paint	*0.16*	*1,600*
0907-09Pb	Room #19- Interior door wood trim	White paint	*0.43*	*4,300*
0907-10Pb	Room #15- interior window frame	White paint	*0.29*	*2,900*

Footnotes:

A. Method of Analysis - Flame Atomic Absorption Spectrometry with EPA's "Standard Operating Procedures for Lead in Paint by Hotplate - or - Microwave-based Acid digestion and Atomic Absorption or Inductively Coupled Plasma Emission Spectrometry" (1991), EPA/600/B-91/213, NTIS Document No. PB92-114172.

Bold denotes LBP!
Italics denotes LCP **Bold denotes LBP!**
Italics denotes LCP

10.0 Lead in Ceramic Tile Results

Ceramic wall tile samples were collected from the Administration Office Uni-sex restroom and analyzed for the presence of lead. The sample was analyzed by EMSL Analytical. According to the laboratory, the ceramic tile TTLC was reported as containing lead above 50 ppm. The sample was characterized for lead to determine proper disposal method. The waste characterization may entail several analytical procedures to determine if the waste is: Construction debris; California Restricted waste; or, RCRA (Resource, Conservation, and Recovery Act) federal waste. Listed below are the limits of the analytical procedures:

- TTLC (Total Threshold Limit Concentration): 1,000 ppm is considered RCRA federal waste. DTSC requires additional analysis for samples with results above 50 ppm but below 1,000 ppm;
- STLC (Soluble Threshold Limit Concentration): 5 mg/L; and
- TCLP (Toxicity Characteristic Leaching Procedure): 5mg/L.

TABLE III LEAD IN CERAMIC TILE SAMPLE RESULTS			
Sample No.	**Location**	**Description**	**Results**
TTLC			**mg/Kg**
0909-01CT	Administration Office, Uni-sex restroom - Wall	4" x 4" yellow ceramic tile	113
STLC			**mg/L**
0909-01CT	Administration Office, Uni-sex restroom - Wall	4" x 4" yellow ceramic tile	**5.88**
TCLP			**mg/L**
0909-01CT	Administration Office, Uni-sex restroom - Wall	4" x 4" yellow ceramic tile	<0.40

11.0 Conclusions and Recommendations:

Asbestos:

- The drywall with taping mud and the window putty are considered friable, hence, if "point count" re-analysis is not performed, these materials are RACM and must be reported to BAAQMD..

- Cal/OSHA's CCR Title 8, Section 1529 - Asbestos in Construction considers the drywall with asbestos taping mud, vinyl tile and mastic removal as Class II type of abatement work. The work must be performed within a negative pressure enclosure with a two-stage personnel decontamination system contiguous to the containment.

- Should the abatement of the vinyl floor tile and/or mastic be performed using "mechanical means", BAAQMD considers this material RACM and must be notified ten days in advance of the abatement work.

- The work should be over-seen by a Certified Asbestos Consultant to ensure regulatory compliance; provide the necessary inspections; the collection of perimeter air samples; conduct final visual inspection and the collection of final air clearances, prior to releasing the area to other contractors.

Lead in Paint:

- Lead-Based Paint (LBP) was identified on interior and exterior painted components as noted on Table II, above. Lead-Containing Paint (LCP) was also identified on

several painted components.

- The disturbance of LBP & LCP is regulated by Cal/OSHA's Title 8, California Code of Regulations (CCR) 1532.1 - Lead in Construction Standard. These requirements include, but not limited to, employee training, employee air monitoring, biological monitoring, dust control and the use of safe work practices.

- California Department of Public Health (CDPH), Title 17, California Code of Regulations, Division 1, Chapter 8: Accreditation, Certification, and Work Practices for Lead-Based Paint and Lead Hazards, also regulates the abatement of components coated with LBP. These requirements Training, certification and proper work practices.

- Department of Toxic Substances Control (DTSC) regulates the disposal of hazardous waste and requires characterization of LBP and LCP components that contain greater than 50 ppm of lead by TTLC analysis, prior to disposal. The analytical characterization determines if the waste will be disposed of as either: construction waste; California Restricted Hazardous Waste or Federal (RCRA) Waste.

- The ceramic tile (4" x 4" yellow ceramic tile) collected from the Administration Office Uni-Sex restroom wall was submitted for TTLC analysis. The lab reported the result at 113 mg/kg. Sample results above 50 mg/kg require additional testing. The sample was re-analyzed by STLC and was reported at 5.88 mg/L. Levels above 5.0 mg/L are considered to be California Restricted Hazardous Waste. This sample was also analyzed by TCLP with a result of <0.40 mg/L. The TCLP threshold is 5.0 mg/L, hence, not a federal waste. All similar ceramic tile subject to disturbance should be treated, handled and disposed of as California Restricted Hazardous Waste.

Should you have any questions of require further assistance, please do not hesitate to contact me at (925) 285-3717.

Sincerely,



Ralph P. Guzman
BS, IH
Certified Asbestos Consultant #93-0965
CDPH: I/A, #4063 PM #4064

Attachments

ASBESTOS (PLM), LEAD PAINT (AA)
&
LEAD IN CERAMIC TILE SAMPLE DATA

Laboratory Report
&
Chain-of-Custody

EMSL Analytical, Inc.
464 McCormick Street San Leandro, CA 94577
Tel/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order: 092319702
Customer ID: ENST62
Customer PO: 23-419
Project ID:

Attention: Ralph Guzman
Enviro - S.T.A.R., Inc.
2194 Edison Ave
Suite I
San Leandro, CA 94577

Phone: (925) 285-3717
Fax: (925) 944-1583
Received Date: 09/09/2023 9:00 AM
Analysis Date: 09/13/2023
Collected Date: 09/07/2023 - 09/08/2023

Project: 23-419 - MDUSD - MEADOW HOMES ELEMENTARY SCHOOL, 1371 DETROIT AVE., CONCORD, CA

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
0907-01-VCT *092319702-0001*	RM# 1 - FLOOR - 12" X 12" GRAY VCT & BLACK MASTIC	Gray Non-Fibrous Homogeneous		15% Ca Carbonate 60% Matrix 25% Non-fibrous (Other)	None Detected
0907-01-Mastic *092319702-0001A*	RM# 1 - FLOOR - 12" X 12" GRAY VCT & BLACK MASTIC	Black Non-Fibrous Homogeneous		80% Matrix 20% Non-fibrous (Other)	None Detected
0907-02 *092319702-0002*	RM# 1 - INTERIOR WINDOW - PUTTY	Tan Non-Fibrous Homogeneous		15% Ca Carbonate 60% Matrix 25% Non-fibrous (Other)	None Detected
0907-03-Plaster *092319702-0003*	RM# 1 - UPPER WALL, NEAR REAR DOOR - PLASTER & SKIM COAT	White Non-Fibrous Homogeneous		40% Quartz 40% Ca Carbonate 20% Non-fibrous (Other)	None Detected
0907-03-Skim Coat *092319702-0003A*	RM# 1 - UPPER WALL, NEAR REAR DOOR - PLASTER & SKIM COAT	White Non-Fibrous Homogeneous		60% Ca Carbonate 25% Perlite 15% Non-fibrous (Other)	None Detected
0907-04-VCT *092319702-0004*	RM# 2 - FLOOR - 12" X 12" GRAY VCT & BLACK MASTIC	Gray Non-Fibrous Homogeneous		15% Ca Carbonate 60% Matrix 25% Non-fibrous (Other)	None Detected
0907-04-Mastic *092319702-0004A*	RM# 2 - FLOOR - 12" X 12" GRAY VCT & BLACK MASTIC	Black Non-Fibrous Homogeneous		80% Matrix 20% Non-fibrous (Other)	None Detected
0907-05 *092319702-0005*	RM# 2 INTERIOR WINDOW - PUTTY	Gray Non-Fibrous Homogeneous		15% Ca Carbonate 60% Matrix 25% Non-fibrous (Other)	None Detected
0907-06-VCT *092319702-0006*	ADMIN OFFICE - FLOOR - 12" X 12" GRAY VCT & YELLOW GLUE	Gray Non-Fibrous Homogeneous		15% Ca Carbonate 60% Matrix 25% Non-fibrous (Other)	None Detected
0907-06-Glue *092319702-0006A*	ADMIN OFFICE - FLOOR - 12" X 12" GRAY VCT & YELLOW GLUE				Insufficient Material
0907-07 *092319702-0007*	ADMIN OFFICE - CEILING - 12" X 12" PERFORATED, NAILED ACOUSTIC TILE	Tan Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
0907-08 *092319702-0008*	ADMIN OFFICE - FLOOR BLACK VINYL BASE COVE	Black Non-Fibrous Homogeneous		80% Matrix 20% Non-fibrous (Other)	None Detected
0907-09 *092319702-0009*	ADMIN OFFICE - INTERIOR WINDOW - PUTTY	Gray Non-Fibrous Homogeneous		80% Ca Carbonate 20% Non-fibrous (Other)	<1% Chrysotile
0907-10-Skim Coat 1 *092319702-0010*	LIBRARY OFFICE # 1 - WALL - TEXTURE SKIM COAT	Beige Non-Fibrous Homogeneous		80% Ca Carbonate 18% Non-fibrous (Other)	2% Chrysotile

Initial report from: 09/13/2023 15:47:05

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Tel/Fax: (510) 895-3675 / (510) 895-3680
http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order: 092319702
Customer ID: ENST62
Customer PO: 23-419
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
0907-10-Skim Coat 2 *092319702-0010A*	LIBRARY OFFICE # 1 - WALL - TEXTURE SKIM COAT	White Non-Fibrous Homogeneous		80% Ca Carbonate 20% Non-fibrous (Other)	None Detected
0907-11 *092319702-0011*	LIBRARY OFFICE # 1 - WALL - TAPING MUD	Beige Non-Fibrous Homogeneous		80% Ca Carbonate 18% Non-fibrous (Other)	2% Chrysotile
0907-12 *092319702-0012*	LIBRARY E. WING - CEILING - BRN TILE ADHESIVE	Brown Non-Fibrous Homogeneous		80% Matrix 20% Non-fibrous (Other)	None Detected
0907-13-Plaster 1 *092319702-0013*	LIBRARY E. WING - CEILING - WHITE PLASTER LIKE SUBSTANCE	White Non-Fibrous Homogeneous		40% Quartz 40% Ca Carbonate 20% Non-fibrous (Other)	None Detected
0907-13-Plaster 2 *092319702-0013A*	LIBRARY E. WING - CEILING - WHITE PLASTER LIKE SUBSTANCE	White Non-Fibrous Homogeneous		60% Ca Carbonate 20% Perlite 20% Non-fibrous (Other)	None Detected
0907-14-Mastic *092319702-0014* *Result includes a small amount of inseparable attached material*	LIBRARY E. WING - FLOOR - BLACK MASTIC UNDER CARPET	Tan/Black Non-Fibrous Homogeneous		80% Matrix 20% Non-fibrous (Other)	<1% Chrysotile
0907-14-Foam *092319702-0014A*	LIBRARY E. WING - FLOOR - BLACK MASTIC UNDER CARPET	Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
0907-14-Carpet *092319702-0014B*	LIBRARY E. WING - FLOOR - BLACK MASTIC UNDER CARPET	Tan/Black Fibrous Homogeneous	95% Synthetic	5% Non-fibrous (Other)	None Detected
0907-15 *092319702-0015*	LIBRARY E. WING - FLOOR - RESIDUAL BASE COVE ADHESIVE	Brown Non-Fibrous Homogeneous		80% Matrix 20% Non-fibrous (Other)	None Detected
0907-16-VCT *092319702-0016*	RM # 5 - FLOOR - 12" X 12" LT. GRAY W/ BLACK MASTIC	Gray Non-Fibrous Homogeneous		15% Ca Carbonate 60% Matrix 25% Non-fibrous (Other)	None Detected
0907-16-Mastic *092319702-0016A*	RM # 5 - FLOOR - 12" X 12" LT. GRAY W/ BLACK MASTIC	Black Non-Fibrous Homogeneous		80% Matrix 20% Non-fibrous (Other)	None Detected
0907-17 *092319702-0017*	RM # 6 - FLOOR - 12" X 12" LT. GRAY W/ YELLOW MASTIC				Not Analyzed
0907-18 *092319702-0018*	RM # 7 - FLOOR - 12" X 12" LT. GRAY W/ BLACK MASTIC				Not Analyzed
0907-19 *092319702-0019*	RM # 14 - FLOOR - 12" X 12" LT. GRAY W/ BLACK MASTIC				Not Analyzed
0907-20-Plaster *092319702-0020*	RM # 14 - UPPER WALL - PLASTER & SKIM COAT	White Non-Fibrous Homogeneous		40% Quartz 40% Ca Carbonate 20% Non-fibrous (Other)	None Detected
0907-20-Skim Coat *092319702-0020A*	RM # 14 - UPPER WALL - PLASTER & SKIM COAT				Layer Not Present

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EMSL Order: 092319702
Customer ID: ENST62
Customer PO: 23-419
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Type
0908-21 *092319702-0021*	RM # 13 - FLOOR - 12" X 12" LT. GRAY VCT & BLACK MASTIC				Not Analyzed
0908-22 *092319702-0022*	RM # 12 - FLOOR - 12" X 12" LT. GRAY VCT & BLACK MASTIC				Not Analyzed
0908-23 *092319702-0023*	RM # 11 - FLOOR - 12" X 12" LT. GRAY VCT & BLACK MASTIC				Not Analyzed
0908-24 *092319702-0024*	RM # 10 - FLOOR - 12" X 12" LT. GRAY VCT & BLACK MASTIC				Not Analyzed
0908-25 *092319702-0025*	TEACHERS LOUNGE - FLOOR - 12" X 12" LT. GRAY VCT & YELLOW GLUE				Not Analyzed
0908-26 *092319702-0026*	MULTI-USE FLOOR - 12" X 12" LT. GRAY VCT & YELLOW GLUE				Not Analyzed
0908-27-Leveling Compound *092319702-0027*	MULTI-USE - FLOOR LADDER STORGE - RESIDUAL LEVELING COMPOUND	White Non-Fibrous Homogeneous		80% Ca Carbonate 20% Non-fibrous (Other)	None Detected
0908-27-Mastic *092319702-0027A*	MULTI-USE - FLOOR LADDER STORGE - RESIDUAL LEVELING COMPOUND	Tan Non-Fibrous Homogeneous		80% Matrix 20% Non-fibrous (Other)	None Detected
0908-28 *092319702-0028*	RM # 19 - FLOOR - 12" X 12" LT. GRAY VCT & BLACK MASTIC				Not Analyzed
0908-29 *092319702-0029*	RM # 18 - FLOOR - 12" X 12" LT. GRAY VCT & BLACK MASTIC				Not Analyzed
0908-30 *092319702-0030*	RM # 16 - FLOOR - 12" X 12" LT. GRAY VCT & YELLOW GLUE				Not Analyzed
0908-31 *092319702-0031*	RM # 15 - FLOOR - 12" X 12" LT. GRAY VCT & BLACK MASTIC				Not Analyzed

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EMSL Order:	092319702
Customer ID:	ENST62
Customer PO:	23-419
Project ID:	

Analyst(s)
Stacy Trinh Le (27)

Cecilia Yu, Laboratory Manager
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from: 09/13/2023 15:47:05

092319702

Environmental - Safety, Training, And Resources, Inc.
DBA: Enviro-STAR
SAMPLING CHAIN-OF-CUSTODY FORM

Date 09/07/23

Turn-Around-Time: 24 Hr ☐ 72 Hrs ☐ Routine ☐

Client: MDUSD
Project No: 23-419

Location: Meadow Homes Elementary School, 1371 Detroit Ave., Concord, CA
I. H.: R. P. Guzman

Sample No.	Analysis	Location	Description	*s.f./l.f.	*F	*N/F
0907-01	PLM	RM# 1 - FLOOR	12"X12" GRAY VCT & BLACK MASTIC			
0907-02		" - INTERIOR WINDOW	PUTTY			
0907-03		" - UPPER WALL, NEAR REAR DOOR	PLASTER & SKIM COAT			
0907-04		RM# 2 - FLOOR	12"X12" GRAY & VCT & BLACK MASTIC			
0907-05		" - INTERIOR WINDOW	PUTTY			
0907-06		ADMIN OFFICE - FLOOR	12"X12" GRAY VCT & YELLOW GLUE			
0907-07		" - CEILING	12"X12" PERFORATED, NAILED ACOUSTICAL TILE			
0907-08		" - FLOOR	BLACK VINYL BASE COVE			
0907-09		" - INTERIOR WINDOW	PUTTY			
0907-10		LIBRARY OFFICE #1 - WALL	TEXTURE SKIM COAT			

Page 1 of 3

* sf = estimated square footage lf = estimated linear footage F = Friable NF = Non-Friable

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OrderID: 092319702

092319702

OrderID: 092319702

Environmental - Safety, Training, And Resources, Inc.
DBA: Enviro-STAR
SAMPLING CHAIN-OF-CUSTODY FORM

Date: 09/07/23

Turn-Around-Time:		
48 HR	24 Hr.	☐
	72Hrs	☐
	Routine	☐

Client: MDUSD
Project No: 23-419

Location: Meadow Homes Elementary School, 1371 Detroit Ave., Concord, CA
I. H.: R. P. Guzman

Sample No.	Analysis	Location	Description	*s.f./l.f.	*F	*N/F
0907-11	PLM	LIBRARY OFFICE #1 · WALL	TAPING MUD			
-12		" E. WING · CEILING	BRN TILE ADHESIVE			
-13		" " " - 1	WHITE PLASTER-LIKE SUBSTRATE			
-14		" " " - FLOOR	BLACK MASTIC UNDER CARPET			
-15		" " " - FLOOR	RESIDUAL BASE COVE ADHESIVE			
-16		R. #5 - FLOOR	12"x12" LT. GRAY w/ BLACK MASTIC			
-17		R #6 - FLOOR	" " " " w/ YELLOW MASTIC			
-18		R #7 - FLOOR	" " " " w/BLACK MASTIC			
19		R #14 - FLOOR	" " " " " "	"		
-20		R #14 - UPPER WALL	PLASTER & SKIM COAT			

Page 2 Of 3

* sf = estimated square footage lf = estimated linear footage F = Friable NF = Non-Friable

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092319702

Environmental - Safety, Training, And Resources, Inc.
DBA: Enviro-STAR
SAMPLING CHAIN-OF-CUSTODY FORM

Date: 09/08/23

Turn-Around-Time:	
48HR	24 Hr. ☐
	72Hrs ☐
	Routine ☐

Client: MDUSD
Project No: 23-419

Location: Meadow Homes Elementary School, 1371 Detroit Ave., Concord, CA
I. H.: R. P. Guzman

Sample No.	Analysis	Location	Description	*s.f./l.f.	*F	*N/F
0908-21	PLM	RM #13 - FLOOR	12"X12" LT. GRAY VCT # BLACK MASTIC			
-22		RM #12 - FLOOR	" " " " "	"		
-23		RM #11 - FLOOR	" " " " "	"		
-24		RM #10 - FLOOR	" " " " "	"		
-25		TEACHER'S LOUNGE - FLOOR	" " " " # YELLOW GLUE			
-26		MULTI-USE - FLOOR	" " " " "	"		
-27		" " - " LADDER STORAGE	RESIDUAL LEVELING COMPOUND			
-28		R1 #19 - FLOOR	12"X12" LT. GRAY VCT # BLACK MASTIC			
-29		R3 #18 - FLOOR	" " " " "	"		
-30		R #16 - FLOOR	" " " " # YELLOW GLUE			
-31		RM #15 - "	" " " " # BLACK MASTIC			

* sf = estimated square footage lf = estimated linear footage F = Friable NF = Non-Friable

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OrderID: 092319702

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EMSL Order:	092319608
CustomerID:	ENST62
CustomerPO:	23-419
ProjectID:	

Attn: **Ralph Guzman**
Enviro - S.T.A.R., Inc.
2194 Edison Ave
Suite I
San Leandro, CA 94577

Phone:	(510) 568-5996
Fax:	(510) 568-7993
Received:	9/9/2023 09:00 AM
Collected:	9/7/2023

Project: **23-419 - MSUSD - MEADOW HOMES ELEMENTARY SCHOOL, 1371 DETROIT AVE., CONCORD, CA**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Weight*	*Lead Concentration*
0907-01PB	*092319608-0001*	9/7/2023	9/12/2023	0.1725 g	0.58 % wt
	Site: RM #1 INTERIOR WINDOW FRAME - YELLOW PAINT				
0907-02PB	*092319608-0002*	9/7/2023	9/12/2023	0.253 g	0.24 % wt
	Site: RM #1 EXTERIOR WINDOW FRAME - GREEN PAINT				
0907-03PB	*092319608-0003*	9/7/2023	9/12/2023	0.2515 g	1.0 % wt
	Site: RM #1 REAR DOOR, WOOD STOP - YELLOW PAINT				
0907-04PB	*092319608-0004*	9/7/2023	9/12/2023	0.25 g	0.27 % wt
	Site: RM #1 REAR EXTERIOR WINDOW FRAME - GREEN PAINT				
0907-05PB	*092319608-0005*	9/7/2023	9/12/2023	0.1537 g	0.37 % wt
	Site: LIBRARY INTERIOR WINDOW FRAME - YELLOW PAINT				
0907-06PB	*092319608-0006*	9/7/2023	9/12/2023	0.2524 g	0.25 % wt
	Site: RM # 14 WEST EXTERIOR WALL, PLYWOOD - YELLOW PAINT				
0907-07PB	*092319608-0007*	9/7/2023	9/12/2023	0.1344 g	0.23 % wt
	Site: RM # 14 INTERIOR WINDOW FRAME - WHITE PAINT				
0907-08PB	*092319608-0008*	9/7/2023	9/12/2023	0.2531 g	0.16 % wt
	Site: RM # 14 EXTERIOR WINDOW FRAME - GREEN PAINT				
0907-09PB	*092319608-0009*	9/7/2023	9/12/2023	0.1823 g	0.43 % wt
	Site: RM # 19 INTERIOR DOOR WOOD TRIM - WHITE PAINT				
0907-10PB	*092319608-0010*	9/7/2023	9/12/2023	0.182 g	0.29 % wt
	Site: RM # 15 INTERIOR WINDOW FRAME - WHITE PAINT				

Cecilia Yu, Laboratory Manager
or other approved signatory

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* Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.
Samples analyzed by EMSL Analytical, Inc San Leandro, CA AIHA LAP, LLC-ELLAP Accredited #101748

Initial report from 09/12/2023 10:56:25

092319608

Environmental - Safety, Training, And Resources, Inc.
DBA: Enviro-STAR
SAMPLING CHAIN-OF-CUSTODY FORM

OrderID: 092319608

Page 1 of 1
Date 09/07/23

Turn-Around-Time:	24 Hr. ☐
	72Hrs ●
	Routine ☐

Client: MDUSD
Project No: 23-419

Location: Meadow Homes Elementary School, 1371 Detroit Ave., Concord, CA
I. H.: R. P. Guzman

Sample No.	Analysis	Location	Description	*s.f./l.f.	*F	*N/F
0907-01Pb	LGAD AA	RM#1 INTERIOR WINDOW FRAME	YELLOW PAINT			
0907-02Pb		" EXTERIOR WINDOW FRAME	GREEN PAINT			
0907-03Pb		" REAR DOOR, WOOD STEP	YELLOW PAINT			
0907-04Pb		" REAR EXTERIOR WINDOW FRAME	GREEN PAINT			
0907-05Pb		LIBRARY INTERIOR WINDOW FRAME	YELLOW PAINT			
0907-06Pb		RM#14 WEST EXTERIOR WALL, PLYWOOD	YELLOW PAINT			
0907-07Pb		" INTERIOR WINDOW FRAME	WHITE PAINT			
0907-08Pb		" EXTERIOR WINDOW FRAME	GREEN PAINT			
0907-09Pb		RM-19 INTERIOR DOOR WOOD TRIM	WHITE PAINT			
0907-10Pb		RM-15 INTERIOR WINDOW FRAME	WHITE PAINT			

Page 1 of 1

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EMSL Order:	092319605
CustomerID:	ENST62
CustomerPO:	23-419
ProjectID:	

Attn: **Ralph Guzman**
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Phone:	(510) 568-5996
Fax:	(510) 568-7993
Received:	9/9/2023 09:00 AM
Collected:	9/7/2023

Project: **23-419 - MDUSD - MEADOW HOMES ELEMENTARY SCHOOL, 1371 DETROIT AVE., CONCORD, CA**

Test Report: Total Threshold Limit Concentration (7000B)

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Weight (g)*	*Lead Concentration*
0907-01CT	*092319605-0001*	9/7/2023	9/12/2023	0.5179 g	130 mg/Kg
	Site: ADMIN OFFICE UNISEX R/R - 4" X 4" YELLOW CERAMIC TILE				

Cecilia Yu, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA Method SW 846 7000B replaces EPA 7420 for lead analysis and is an equivalent method. CA ELAP 1628, AIHA LAP, LLC-ELLAP Accredited #101748

Initial report from 09/12/2023 18:03:07

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EMSL Order:	092319605
CustomerID:	ENST62
CustomerPO:	23-419
ProjectID:	

Attn: **Ralph Guzman**
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2194 Edison Ave
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San Leandro, CA 94577

Phone:	(510) 568-5996
Fax:	(510) 568-7993
Received:	9/9/2023 09:00 AM
Collected:	9/7/2023

Project: **23-419 - MDUSD - MEADOW HOMES ELEMENTARY SCHOOL, 1371 DETROIT AVE., CONCORD, CA**

Test Report: Soluble Threshold Limit Concentration

Client SampleDescription	*Collected*	*Analyzed*	*RDL*	*Lead Concentration*
0907-01CT	9/7/2023		0.4 mg/L	5.88 mg/L
092319605-0001	Site: ADMIN OFFICE UNISEX R/R - 4" X 4" YELLOW CERAMIC TILE			

Cecilia Yu, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 09/15/2023 16:35:53

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EMSL Order:	092319605
CustomerID:	ENST62
CustomerPO:	23-419
ProjectID:	

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San Leandro, CA 94577

Phone:	(510) 568-5996
Fax:	(510) 568-7993
Received:	9/9/2023 09:00 AM
Collected:	9/7/2023

Project: **23-419 - MDUSD - MEADOW HOMES ELEMENTARY SCHOOL, 1371 DETROIT AVE., CONCORD, CA**

Test Report: Toxicity Characteristic Leachate Procedure (1311/7000B)

Client SampleDescription	*Collected*	*Analyzed*	*RDL*	*Lead Concentration*
0907-01CT	9/7/2023		0.40 mg/L	<0.40 mg/L
092319605-0001	Site: ADMIN OFFICE UNISEX R/R - 4" X 4" YELLOW CERAMIC TILE			

Cecilia Yu, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from 09/19/2023 15:37:02

#092319605

OrderID: 092319605

Environmental - Safety, Training, And Resources, Inc.
DBA: Enviro-STAR
SAMPLING CHAIN-OF-CUSTODY FORM

Page 1 of 1
Date: 09/07/23

Turn-Around-Time:	24 Hr. ☐
	72Hrs ☑
	Routine ☐

Client: MDUSD
Project No: 23-419
Location: Meadow Homes Elementary School, 1371 Detroit Ave., Concord, CA
I. H.: R. P. Guzman

Sample No.	Analysis	Location	Description	*s.f./l.f.	*F	*N/F
0907-01CT	TTLC Pb	ADMIN. OFFICE - UNI-SEX R/R	4"x4" YELLOW CERAMIC TILE			
		*HOLD FOR POSSIBLE STLC & TCLP				
		*AUTHORIZE MILLING OF SAMPLE				

Page 1 Of 1

* sf = estimated square footage lf = estimated linear footage F = Friable NF = Non-Friable

Instructions: e-mail rpg@enviro-star.com Call with verbal results (925) 285-3717

Relinquished by: R P Guzman 09/08/23 0900 **Date/Time**
Received by: DB 09092023-0900 **Date/Time**

Relinquished by: _____ **Date/Time**
Received by: _____ **Date/Time**

246 30th St., Suite 102 Oakland, CA 94611 Telephone (510) 568-5996 Fax (510) 568-7993