REQUEST FOR PROPOSALS EXHAUST SYSTEM West Valley High School

Throughout this document, the word "District" refers to Anderson Union High School District.

SUBJECT

Request for Proposals (RFP) for the installation of an exhaust system in the 700 building at West Valley High School.

PURPOSE

Proposals that meet the necessary requirements as outlined in the document are being sought by the District for the purpose of securing the most cost effective method of installation of an exhaust system in the 700 building at West Valley High School.

BACKGROUND

The District owns several properties in the Anderson and Cottonwood communities with a variety of structures on these properties. In an effort to provide a safe and clean learning environment for students, the District must continually repair or replace maintenance issues such as roofing, plumbing, lighting, etc. As a necessity of current school financing, the District is seeking the most cost-efficient quality resolution to installation of an exhaust system as exhibited in this RFP.

SCOPE OF WORK

The RFP is for the project as referenced in the attached document. Enlarged copies of the attached document are available at the Anderson Union High School District Office.

SCHEDULE OF EVENTS

Release of RFP to vendors	November 16, 2016
Site visit	November 28, 2016 at 10:00am West Valley High School Building 700 3805 Happy Valley Road, Cottonwood, CA
Deadline for submission of proposals	December 9, 2016 at 3:30pm AUHSD District Office 1469 Ferry Street, Anderson, CA
Opening of Proposals	December 13, 2016 at 10:00am AUHSD District Office 1469 Ferry Street, Anderson, CA

Award of bid

INQUIRIES

All inquiries should be directed to: Tim Azevedo at tazevedo@auhsd.net or (530) 378-0568.

DISTRICT RESPONSIBILITIES

- 1. The District will provide vehicle and material delivery access to the work site.
- 2. The District will provide a reasonably secure area around the work zone to avoid accidental injury to any District employees and students.
- 3. The District will provide a District employed maintenance person as a resource for information or accessibility to the facility.

VENDOR RESPONSIBILITIES

- 1. The vendor must meet or exceed all minimum qualification requirements as listed in "SCOPE OF WORK" above.
- 2. The vendor must provide verification of proper California license to perform this job.
- 3. The vendor must provide Department of Industrial Relations (DIR) number.
- 4. The vendor must provide proof of appropriate liability and workers compensation insurance.
- 5. The vendor must provide three references.

PROPOSAL

Two copies of the proposal and any other required documents must be submitted in a sealed envelope, with the wording "WVHS Building 700 Exhaust System" on the outside of the envelope:

Tim Azevedo WVHS Building 700 Roof Project 1469 Ferry Street Anderson, CA 96007

Do not fax proposals. Proposals will be received by the District at the address shown above until 3:30pm on December 9, 2016. Proposals may be hand delivered. If mailed, the proposal must be received at the address above by 3:30pm on December 9, 2016.

BASIS OF AWARD

The proposals will be opened on December 13, 2016 at 10:00am at the AUHSD District Office, 1469 Ferry Street, Anderson, California. The evaluation process will not be complete until the District has determined the best proposal based on all factors:

- 1. Meeting all requirements listed in specification.
- 2. Must have three references.
- 3. Length of time bidder has been a licensed contractor.
- 4. Prior business experience with the district will be considered.
- 5. Lowest and best bid with price being a primary factor.
- 6. Longest labor and material warranty.

The bidders will be notified accordingly.

THE DISTRICT RESERVES THE RIGHT TO:

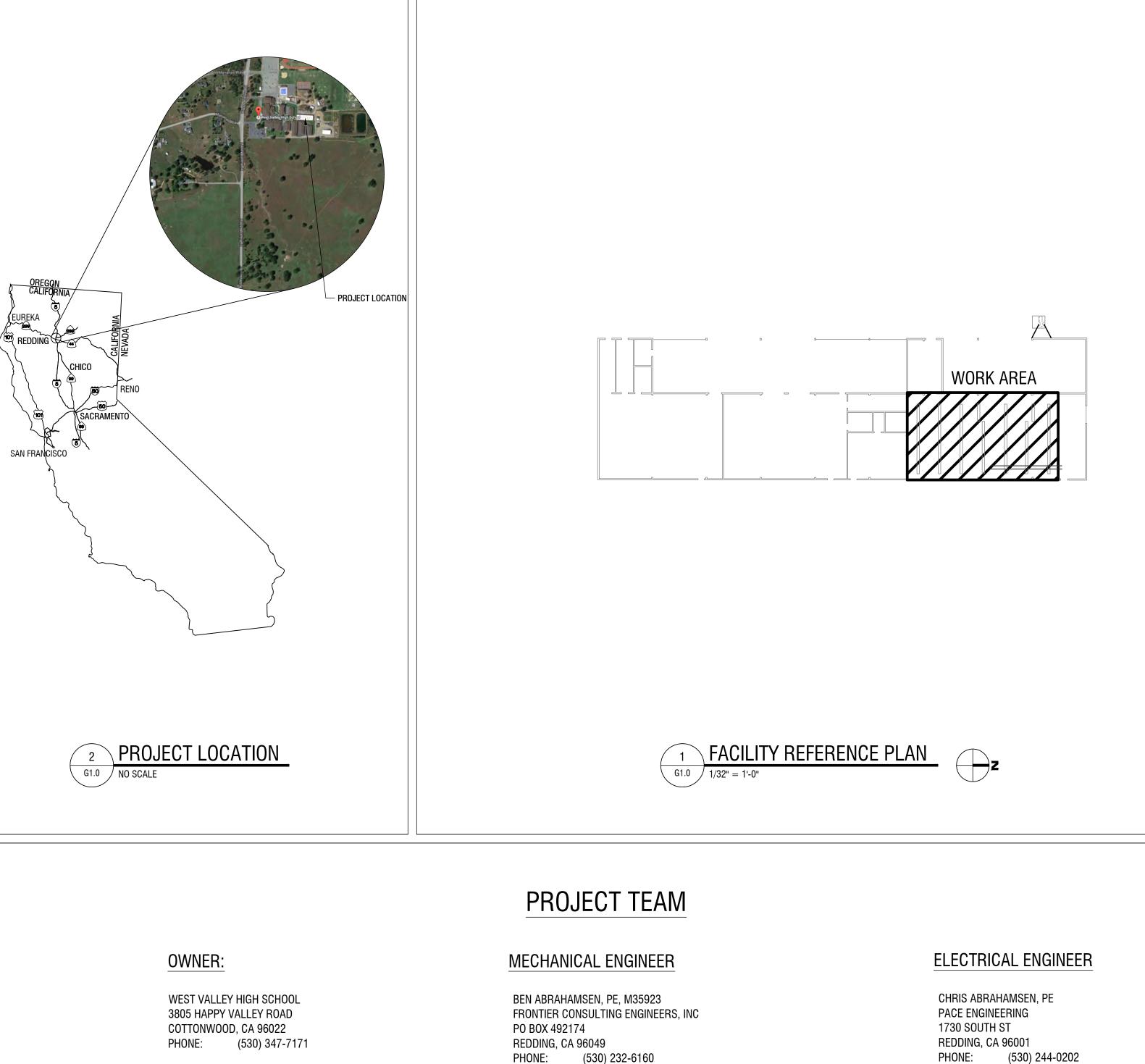
- 1. Consider all factors provided herein to determine the solution which is in the best interest of the District.
- 2. Give full and proper consideration to the service, reputation, product knowledge, and experience of all companies presenting proposals, and to disqualify any such provider it deems unqualified to provide the services requested.
- 3. Reject any and all proposals if deemed necessary.
- 4. Accept any alternative proposal believed to be in the best interest of the District.
- 5. Waive any formality in the quote submission.
- 6. Cancel any awarded bid if the service proves unsatisfactory.

TERMS OF PAYMENT

The job is to begin at the first mutually agreeable date after the awarding of the bid. Payment to the vendor will be within 30 days after the completion of work as inspected by a District representative and the submission of an invoice.

AG SHOP WELDING EXHAUST SYSTEM WEST VALLEY HIGH SCHOOL

APPLICABLE CODES & STANDARDS	
ALL WORK PERFORMED AND MATERIALS FURNISHED SHALL COMPLY WITH THE FOLLOWING CODES. <u>APPLICABLE CODES, REGULATIONS:</u> <u>2013 CALIFORNIA ADMINISTRATIVE CODE (CAC)</u> PART 1, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR) <u>2013 CALIFORNIA BUILDING CODE (CBC)</u> PART 2, TITLE 24, CCR, <i>BASED ON THE 2012 INTERNATIONAL BUILDING CODE (IBC)</i> <u>2013 CALIFORNIA ELECTRICAL CODE (CEC)</u> PART 3, TITLE 24, CCR, <i>BASED ON THE 2011 NATIONAL ELECTRIC CODE (NEC)</i> <u>2013 CALIFORNIA MECHANICAL CODE (CMC)</u> PART 4, TITLE 24, CCR, <i>BASED ON THE 2012 UNIFORM MECHANICAL CODE (UMC)</i> <u>2013 CALIFORNIA PLUMBING CODE (CPC)</u> PART 5, TITLE 24, CCR, <i>BASED ON THE 2012 UNIFORM PLUMBING CODE (UPC)</i> <u>2013 CALIFORNIA FIRE CODE (CFC)</u> PART 5, TITLE 24, CCR, <i>BASED ON THE 2012 UNIFORM PLUMBING CODE (UPC)</i> <u>2013 CALIFORNIA FIRE CODE (CFC)</u> PART 9 TITLE 24, CCR, <i>BASED ON THE 2012 INTERNATIONAL FIRE CODE (IFC)</i>	
OTHER APPLICABLE CODES AND REGULATIONS TITLE 8 - ELEVATOR SAFETY ORDERS FOR ELEVATOR SAFETY STANDARDS TITLE 19 - PUBLIC SAFETY, STATE FIRE MARSHAL, CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 22 - SOCIAL SECURITY, DIVISION 5: LICENSING AND CERTIFICATION OF HEALTH FACILITIES, HOME HEALTH AGENCIES, CLINICS AND REFERRAL AGENCIES; DIVISION 7: HEALTH PLANNING AND FACILITY CONSTRUCTION. ADA REGULATION FOR TITLE III - 2010 - STANDARDS FOR PUBLIC ACCOMMODATIONS AND COMMERCIAL FACILITIES, U.S. DEPT. OF JUSTICE. ACCREDITATION MANUAL FOR HOSPITALS - JOINT COMMISSION ON ACCREDITATION OF HEALTH CARE ORGANIZATIONS (JCAHO)	OREG CALIFO EUREKA (100) REDDING
APPLICABLE NFPA STANDARDS ADOPTED BY 2013 CBC: NFPA NO. 10 - 2010 PORTABLE FIRE EXTINGUISHERS NFPA NO. 13 - 2013 INSTALLATION OF SPRINKLER SYSTEMS NFPA NO. 14 - 2013 INSTALLATION OF STANDPIPE AND HOSE SYSTEM NFPA NO. 20 - 2013 INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION NFPA NO. 22 - 2013 WATER TANKS FOR PRIVATE FIRE PROTECTION NFPA NO. 22 - 2013 WATER TANKS FOR PRIVATE FIRE PROTECTION NFPA NO. 24 - 2013 PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES NFPA NO. 45 - 2011 FIRE PROTECTION FOR LABORATORIES USING CHEMICALS NFPA NO. 55 - 2013 COMPRESSED GASES AND CRYOGENIC FLUIDS NFPA NO. 70 - 2011 NATIONAL ELECTRICAL CODE NFPA NO. 70 - 2011 NATIONAL FIRE ALARM & SIGNALING CODE NFPA NO. 80 - 2013 FIRE DOORS AND OTHER OPENING PROTECTIVES NFPA NO. 90A - 2009 INSTALLATION OF AIR-CONDITIONING VENTILATING SYSTEMS NFPA NO. 101 - 2012 LIFE SAFETY CODE NFPA NO. 101 - 2013 EMERGENCY AND STANDBY POWER SYSTEMS	SAN FRANC
NFPA NO, 220 - 2009 TYPES OF BUILDING CONSTRUCTION APPLICABLE STANDARDS FOR FIRE RATED SYSTEMS: UL - UNDERWRITER'S LABORATORIES, FIRE RESISTIVE DIRECTORY UL - UNDERWRITER'S LABORATORIES, BUILDING MATERIALS DIRECTORY SMACNA - FIRE, SMOKE AND RADIATION DAMPER INSTALLATION GUIDE FOR HVAC SYSTEMS, 5TH EDITION WHERE THERE IS A CONFLICT BETWEEN CALIFORNIA (ADAAG) AND FEDERAL (ADA) DISABLED ACCESS REQUIREMENTS, GENERALLY THE MOST STRINGENT WILL APPLY. 1. UNIFORM FEDERAL ACCESSIBILITY STANDARD (UFAS) 2. CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (CAL OSHA)	
3. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA): HAZARD COMMUNICATIONS STANDARD	



(530) 232-2770

FAX:



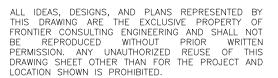
COTTONWOOD, CALIFORNIA

CONSTRUCTION DOCUMENTS

OCTOBER 14, 2016







LICENSE STAMP



CONSULTANTS

PROJECT NAME

AG SHOP VENTILATION UPGRADES

FOR

WEST VALLEY HIGH SCHOOL

3805 HAPPY VALLEY ROAD COTTONWOOD, CA 96002

REVISIONS DATE

SHEET TITLE

TITLE SHEET

CONSTR	d for: RUCTION MENTS
DATE:	10/14/20-
DRAWN BY:	F
REVIEWED BY:	E
SCALE:	AS NOTE
PROJECT NO:	2164

G1.0

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE INSTALLATION OF A NEW EXHAUST SYSTEM. THE EXISTING EXHAUST SYSTEM DOES NOT ADEQUATELY EXHAUST THE SPACE. THIS PROJECT WILL REQUIRE THE REMOVAL OF THE ONE EXISTING DUST COLLECTOR AND ASSOCIATED DUCTING AND REPLACING THE SYSTEM WITH A NEW EXHAUST FAN AND DUCTING.

A NEW EXHAUST FAN, ALONG WITH ASSOCIATED DUCTING AND ELECTRICAL CONTROLS, WILL BE INSTALLED IN THIS PROJECT.

PROJECT PHASING

THE WORK DESCRIBED IN THESE DOCUMENTS SHALL BE COMPLETED WITHOUT DISRUPTING NORMAL OPERATIONS OF THE FACILITY. ALL WORK MUST BE COORDINATED WITH THE FACILITY MANAGER PRIOR TO COMMENCING WORK.

PROJECT NOTICE

THE FINAL DESIGN DOCUMENTS ARE INTENDED TO BE USED AS A COMPLETE PACKAGE. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO FURNISH ANY SUBCONTRACTORS, MATERIAL OR EQUIPMENT SUPPLIERS ACCESS TO THE TOTAL BID PACKAGE OF FINAL DESIGN DOCUMENTS. ALL OF THE DOCUMENTS APPLY TO ALL MEMBERS OF THE GENERAL CONTRACTOR CONSTRUCTION TEAM.

THE ENGINEERS HAVE SHOWN VARIOUS PORTIONS OF THE WORK ON SEPARATE SHEETS OF DRAWINGS OR IN SEPARATE PROJECT SPECIFICATION SECTIONS FOR CLARITY. SUCH SEPARATION SHALL NOT BE CONSIDERED AS THE LIMITS OF THE WORK REQUIRED OF ANY SEPARATE TRADE. THE TERMS AND CONDITIONS OF SUCH LIMITATIONS ARE WHOLLY BETWEEN THE CONTRACTOR AND HIS SUB- CONTRACTORS.

THE FINAL PROJECT SHALL REFLECT ALL THE WORK SHOWN ON ALL DOCUMENTS WITHOUT REGARD TO WHO SHALL PROVIDE THE WORK. FOR PURPOSES OF THIS PROJECT THE ARCHITECT / ENGINEER / OWNER SHALL CONSIDER THE GENERAL CONTRACTOR AS THE SOLE PROVIDER OF ALL ITEMS NECESSARY TO COMPLETE THE PROJECT.

ITEMS SHOWN ON ONE DRAWING OR SPECIFICATION SECTION BUT NOT OTHERS SHALL BE FURNISHED IN THEIR ENTIRETY AS IF SHOWN ON ALL DOCUMENTS. - THE USE OF THESE DOCUMENTS WITHOUT THE BENEFIT OF REVIEWING THE ENTIRE PACKAGE WILL BE AT THE RISK OF THE USER.

SHEET INDEX

SHEET	DESCRIPTION
G1.0	TITLE SHEET
M0.1	MECHANICAL AND ELECTRICAL SPECIFICATIONS
M1.0	MECHANICAL LEGENDS, SCHEDULES AND DETAILS
M1.1	MECHANICAL DEMOLITION PLAN
M2.0	MECHANICAL FLOOR PLAN

PAR	T 1 -	GENERAL
1.1	INC	CLUDED
	A.	This section covers mechanical work, comple testing, documenting, and starting up equipm accompanying Plans, and the directions of the
1.2	LIC A.	ENSES, PERMITS, AND FEES The Contractor shall provide, procure, and pa
1.3	CC A.	and complete their work. DES AND STANDARDS All work shall be done in code with all applica
		and regulations. Additionally, all work shall contain a statistical st
		 California Mechanical Code. California Plumbing Code. Underwriters Laboratories.
		 Titles 8, 17, 19, 21, 24 of the California C California Electric Code.
	В.	 SMACNA Standards. ASHRAE Standards 55 and 62.1. When the Contract Documents call for materi
		the above, the Contract Document requireme applicable laws, ordinances, rules, or regulati
	C.	as permitting work in violation of said laws, ru The Contractor for this work shall furnish, with may be required for compliance with these la
1.4		labor are not specially set forth in the Contrac CENSING REQUIREMENTS
	A.	All work of Division 22 and 23 shall be perform shall be current, valid through the term of the 1. All HVAC work, which includes warm air
		systems, air conditioning systems, and o in connection with these systems, shall b
		 Air-Conditioning Contractor. All hydronic piping systems shall be perf Contractor.
1.5	SU A.	IBMITTALS General Requirements 1. Submittal lists and drawings shall include
		 Submittal lists and drawings shall include Specifications. Review of drawings and other material s
		constitute a waiver of the requirements of material submitted is acceptable in quality
		the responsibility to fit the proposed mat rearrangements or construction of other 3. All fixtures, materials, and equipment eq
		accepted. When specific names are use mentioned as standards only, but this im futures metarial and equipment or met
		fixtures, material, and equipment or meth Architect.4. Before any fixtures, materials, or equipment
		Architect for approval, a complete list of names, catalog number, capacity, size, p 5. The Contractor shall submit for the appro-
		equipment that differ from the specified i equipment with special conditions and/o
	B.	modifications of owner, plumbing, electri and equipment.
	в. С.	Submittal - Product Data 1. Submit manufacturer's product data for a Submittal - Seismic Resistance
		 Equipment manufacturer shall design, co seismic resistance requirements and sha certification.
1.6	CC A.	OPERATION WITH OTHER TRADES Cooperate fully with other trades doing work
		of the project. Refer to the Structural, Plumbi structure and equipment installation that will t work of this Section, and schedule this work a
	В.	Any work done without regard for other trade extra charges to Owner.
1.7	DIVI A.	SION OF WORK BETWEEN DIVISIONS 23 A Close coordination between the electrical and this contract. No allowance will be made for
	В.	performing your work. Confirm your scope of The division of responsibilities between trade
	c	For instance, Division 26 contractor may be n non-HVAC mechanical equipment supplied u Division 23 Responsibilities
	C.	 Assume responsibilities Assume responsibility for the proper fundamental and install all conductors and co
		 Make all terminations with the exception Furnish and install all control panels and system, including all controls transforme
		 Furnish and install motor starters for all e Install duct smoke detectors furnished by
		 Furnish and install duct smoke detectors Furnish and install all control conductors dampers and fan start controls.
	D.	10. All electrical work performed under Divis Division 26 Responsibilities
		 Furnish and install all raceways, conduit, power supply. Make all power supply terminations to m
		other mechanical devices. 3. Fire alarm contractor to furnish duct smo
1.8	AS	 Provide power to all duct smoke detector Coordinate all work with mechanical con BUILT DRAWINGS
	A.	A complete set of Contract Drawings shall be be recorded on this set, on a daily basis. The
1.9	DE A.	approval. SIGN DRAWINGS The drawings indicate diagrammatically the g
	В.	work. Field verification of scaled dimensions The Contractor shall review and compare the
		Electrical Drawings and all Owner supplied en with the conditions indicated thereon. Discre conditions, or between Drawings and Specific
1 10	VE	Architect for a determination of the modificati required, a Change Order will be prepared. RIFICATION OF EXISTING CONDITIONS AI
	Α.	Before installation of any new work, verify the to services or other existing piping, and at all
	В.	piping, electrical, or other facilities. Remove ductwork, piping, controls, fixtures, a the Drawings or as required. This included th
	C.	Patch, cap, or repair existing works affected to a live main or branch.
	D. E.	Deliver removed material to the Owner as dir offsite. Information shown relative to existing service
		of the Drawings, but shall be verified. Make r locations and conditions, without extra charge
1.11	OF A.	PERATING AND MAINTENANCE INSTRUCTI Furnish three sets of typewritten instructions piece of apparatus, bound in a hard cover loc
	В.	from manufacturer's literature. Submit data to Operating instructions shall show sequence of
	C.	of all equipment. Final acceptance of the wo material is received and approved by the Arc The Owner's authorized representative shall
1.12	AC	plumbing systems. CURACY OF DATA
	A.	The data given herein and on the Drawings a accuracy is not guaranteed. Exact locations, drawings, the building itself, and actual field of
1.14	SEIS A.	SMIC FORCE RESISTANCE: MECHANICAL, All mechanical systems and plumbing piping
	В.	Manual: Guidelines for Mechanical Systems,' Equipment: 1. Each piece of equipment installed shall I
		seismic force of 150% of the equipment' braces shown shall be minimum.
		 Equipment manufacturer shall design, comminimum seismic resistance requirement certification.
1.15	DE A.	LIVERY, STORAGE, AND HANDLING Contractor shall be responsible for delivery, s
		 Contractor shall protect the work and ma at the job site shall be protected from du exposed to weather. Protect interiors of
	P	matter. Clean both inside and outside bAny items damaged shall be repaired or
	В.	 Cleanliness of Piping and Equipment System Exercise care in storage and handling of work. Remove debris arising from cuttin
		 Piping systems shall be flushed, blown, Contractor shall be fully responsible for a
1.16	WA A.	clean systems. ARRANTIES Equipment warranties shall be provided for al
	в.	purchase date, in favor of the Owner. The contractor shall guarantee that all work u
		workmanship for a period of one year from th defective work and damage caused to work or responsibility of the Contractor, and shall be r
1.17		TERNATIVE MATERIALS AND METHODS These plans and specifications describe the g
		specifications do not preclude the submittal o and catalog numbers are stated to identify the the project.
	В.	The contractor may submit shop drawings an or installation details to accomplish the intent
		equipment, materials or installation details sh complying with the intent of the plans and spe shop drawings, and/or written description of a
1.18		name and catalog number and for each comp TE EXAMINATION
PAR	А. Т 2 -	Thoroughly examine the site and verify the action of the set of th
		IERAL All materials, appliances, and equipment sha
	D.	and of the make, brand, or quality specified o When two or more units of materials or equip be products of one manufacturer.
0.0	E.	Apply and install all items in accordance with manufacturer's instructions and the contract of
2.2	EXH A.	AUST FAN (<u>EF-1)</u> GENERAL
		 Base fan performance at standard condi Fans selected shall be capable of accon scheduled values.
		SUICANEU VAIUES.
		 Each fan shall be belt in AMCA arranger Fans are to be equipped with lifting lugs.

MECHANICAL SPECIFICATIONS

Work includes furnishing, installing, calibrating, adjusting, t in accordance with these Specifications, the Enaineer for all licenses, permits, fees, etc. as required to carry on

e local, state, and federal building safety codes, ordinances, form to the latest editions of the following standards:

de of Regulations.

or construction of a higher standard than is required by s shall take precedence over the requirements of the ns. Nothing in the Contract Documents shall be interpreted

and/or regulations. ut extra charge, any additional materials and/or labor as , rules, and/or regulations though such materials and/or ocuments. ed by an appropriately licensed contractor. The licenses

tract and in the name of the contractor. eating systems and water heating pumps, ventilating work, registers, flues, humidity, and thermostatic control performed by a C-20 - Warm-Air Heating, Ventilating and med by a C-4 - Boiler, Hot Water Heating and Steam Fitting

dentifying marks assigned by the Drawings and mitted shall not be construed as complete check or

he Drawings and Specifications, but will indicate that the and utility. This review shall not relieve the Contractor of ials to the spaces provided, and to effect necessary

al in quality and utility to these herein mentioned will be in describing fixtures, materials, and equipment they are lies no right on the part of the Contractor to use other ds, unless approved as equal in quality and utility by the nt are purchased, the Contractor shall submit to the

aterials, fixtures, and equipment, giving the manufacturer's val of the Architect, shop drawings of proposed material and terials and equipment, and of any specified materials and rrangements. These drawings shall show necessary , and mechanical work required by the proposed materials

HVAC equipment, in compliance with specifications. struct, and certify that his equipment satisfies the minimum submit calculations or test results supporting his

the project as may be necessary for the proper completion , and Electrical Drawings for details of the building nd to overlap, conflict with or require coordination with the shall be moved, replaced, or redone as required, without

D 26 nechanical trades is a part of the work that is required by ssions based on incorrectly assuming another trade will be ork with the general contractor. upplying equipment in other Divisions may be different.

oning of the HVAC systems in their entirety. uit required for control of HVAC equipment.

uired to supply disconnect switches and starters for

power conductors. evices to provide a complete and functional controls

uipment specified in Division 23. e alarm contractor in buildings with fire alarm systems. buildings without fire alarm systems. nd conduit connecting duct smoke detectors to smoke

n 23 shall conform to the requirements of Division 26. isconnect switches, and conductors necessary for electrical

tors, starters, disconnect switches, control transformers, and

detectors in buildings with fire alarm systems. nd smoke dampers.

aintained at the work site, and all changes in the work shall al as-built drawings shall be submitted to the Architect for

eneral layout of the mechanical systems and other related ken from the Drawings is required. chitectural Structural Plumbing Mechanical and pment Drawings, and adjust their work to be in conformity ancies between drawings, between drawings and actual field ations, shall promptly be brought to the attention of the

is to be effected. In the event that a major modification is DEMOLITION ocation, size, and other conditions at all points of connection ations where new work will cross or pass near existing equipment that is not to remain in service as shown on removal of associated appurtenances and supports.

his demolition in concealed spaces within six (6) inches of ted by the Architect. Dispose of all other removed material based upon available records and data during preparation asonable deviations found necessary to conform to actual

vering maintenance, adjustment, and operation of each -leaf binder. Neatly obscure or cross out inapplicable data ne Architect. perations, lubrication, care, and maintenance requirements will not be made until a satisfactory submission of this

instructed in the operation and servicing of all HVAC & as exact as could be reasonably secured, but absolute stances, elevations, etc. will be governed by shop

UMBING, FIRE PROTECTION SYSTEMS ystems shall adhere to the SMACNA "Seismic Restraint Third Edition dated March 2008.

constructed and anchored to structural supports to resist a perating weight in any direction. Supports, anchors, and struct, and certify that his equipment satisfies the special

and shall submit calculations or test results supporting his age, protection, and placing of all equipment and materials. rials from damage during construction. Equipment stored water, or other damage, and be covered if equipment is

ew equipment and piping systems against entry of foreign re painting or placing equipment in operatior eplaced, at no additional cost to the Owner. aupment and piping material to be incorporated in the

threading, and welding of piping. bigged as necessary to deliver clean systems. costs, damage, and delay arising from failure to provide

equipment, with all necessary information filled in, except der this Section is free from defects in material and date of filing the Notice of Completion. Replacement of ther trades as a result of such defective work shall be the ade at no cost to the Owner.

neral scope of the mechanical systems. These plans and ive methods or materials. Manufacturer's names ype and quality of the equipment or materials required for or technical information on alternative equipment, materials the plans and specifications. Approval of the alternative I not relieve the contractor of any responsibility for ications. Submit the manufacturers' technical information

rnative methods for each item described by manufacturer's ent, equipment, material, or installation detail required al work conditions. No extra compensation will be allowed itions which affect the work.

be new and best of their respective kinds, free from defects, cepted by the Archite ent of the same type or class are required, these units shall anufacturer's written instructions. Refer conflicts between wings and specifications to the Architect for resolution

ns (density 0.075 Lb/ft3). odating static pressure and flow variations of +/-15% of ent 10 according to drawings.

nts shall be cleaned and chemically treated by a noval of grease, oil, scale, etc. Fan shall then be coated

with a minimum of 2-4 mils of Permatector (Polyester Urethane), electrostatically applied and baked. Finish color shall be RAL-7023, concrete grey. Coating must exceed 1,000-hour salt spray under ASTM B117 test method B. FAN HOUSING AND OUTLET

1. Fan housing is to be aerodynamically designed with high-efficiency inlet. engineered to reduce incoming air turbulence. 2. Fan shall be of airtight PermaLockTM construction with the scroll panel material formed and embedded into the side panels [continuously welded heavy gauge scroll construction]. All interior and exterior surface steel shall be coated with a minimum of 2-4 mils of Permatector (Polyester Urethane), electrostatically applied and baked. Finish color shall be RAL-7023, concrete grey, No uncoated metal fan parts will be allowed.

Housing and bearing support shall be constructed of welded structural steel members to prevent vibration and rigidly support the shaft and bearings. 4. An OSHA compliant belt guard shall be included to completely cover the motor pulley and belt(s). C. FAN WHEEL The fan wheel shall be of the non-overloading single width backward inclined centrifugal type.

Wheels shall be statically and dynamically balanced to balance grade G6.3 per ANSI S2.19. 2. Fan wheel shall be manufactured of single thickness blades securely riveted to a heavy gauge back plate and wheel cone. 3. The wheel and fan inlet shall be carefully matched and shall have precise running tolerances for maximum performance and operating efficiency.

. FAN MOTORS AND DRIVE Motors shall meet or exceed EISA (Energy Independence and Security Act) efficiencies. Motors to be NEMA T-frame, 1800 or 3600 RPM, Open Drip Proof (ODP) [Totally Enclosed Fan Cooled (TEI Explosion Proof (EXP)] with a 1.15 service factor.

2. Drive belts and sheaves shall be sized for 150% of the fan operating brake horsepower, and shall be eadily and easily accessible for service, if required. 3. Fan shaft to be turned and polished steel [316 stainless steel] that is sized so the first critical speed is at least 25% over the maximum operating speed for each pressure class. Fan shaft bearings shall be Air Handling Quality, bearings shall be heavy-duty grease lubricated,

self-aligning or roller pillow block type. 5 Air Handling Quality bearings to be designed with low swivel torgue to allow the outer race of the bearing to pivot or swivel within the cast pillow block. Bearings shall be 100% tested for noise and vibration by the manufacturer. Bearings shall be 100% tested to insure the inner race diameter is

within tolerance to prevent vibration. Bearings shall be selected for a basic rating fatigue life (L-10) of 80,000 hours at maximum operating speed for each pressure class {Average Life or (L-50) of 400.000 hours}. Bearings shall have Zerk fittings to allow for lubrication.

DUCTWORK B. Sheet Metal Ductwork - Spiral

- Round ducts shall be spiral, United McGill or equal. All transverse joints and longitudinal seams shall have Class "B" seals. All branches in round duct systems shall be made with factory fabricated reducing wye branches. Duct turns shall be made with standard, factory fabricated, three-piece Supports
- Supports for horizontal ducts and plenums shall be fabricated per Figures 5-5 and 5-6 and Tables 5-1. 5-2, and 5-3. The maximum distance between hangers shall be eight feet for rectangular ducts and twelve feet for round ducts. Attachments to the structure shall be made with adequately sized lag bolts for straphangers and adequately sized machine bolts and side beam brackets for rod hangers Supports for vertical ducts shall be band iron strap or angle bracket type per Figure 5-8 and 5-9.
- E. Specialties: 1. Duct Access Doors: Including those for removing filters, duct access doors shall be as detailed in Figure 7-2 with sash locks, piano hinges, and gaskets. Access doors shall have an unobstructed full swing. 2.4 DUCTWORK ACCESSORIES
- E. Screens Install removable bird screens at all outside intakes and exhaust air discharges. Screens shall be fabricated from 1/2" x 14 gauge mesh secured in full frames. Screens and frames shall be constructed of the same material as the duct, hood, or equipment to which attached.
- 1. Tape all joints airtight using Hardcast type "DT" pressureless tape and "HD-20" adhesive, per manufacturer's directions. 2.7 REGISTERS, GRILLES, AND DIFFUSERS
- A. Air terminals shall be Titus, equivalent Nailor, or approved equal, as scheduled on the Drawings. B. All terminals shall be steel and shall be factory painted "off-white," unless otherwise noted. Air terminals for installation in gypsum board shall have a 1" border for surface mounting. PART 3 - EXECUTION
- INSTALLATION. GENERAL
- A. Provide all necessary cutting in connection with the work of the Section. No cutting shall be done without the approval of the Architect. Comply with requirements specified in Cutting and Patching Section B. No structural members shall be drilled, bored, or notched in a manner that will impair their structural
- C. All penetrations of concrete or masonry shall be made with core drills. 3.2 EQUIPMENT STARTUP
- A. Notify the Owner's representative a minimum of two weeks prior to equipment startup date to allow for Owner's personnel to be present during startup. B. Manufacturer must provide a service technician to supervise rigging of the units to ensure proper fit.
- C. Unit must be checked out, tested and placed into operation by the installing contractor under the supervision of an authorized representative of the factory.
- D. Controls contractor must be present during startup to ensure that factory-installed controls have been adequately installed, wired, and integrated into the building managements system.
- E. Provide minimum eight (8) hours of training time with Owner's maintenance personnel to thoroughly review new equipment, maintenance requirements, and equipment controls. F. During startup, the full functionality of the equipment shall be demonstrated to the satisfaction of the
- Owner's representative, including heating, mechanical cooling, economizer cooling, zone modulation, and all emergency shutdown features. 3.3 EQUIPMENT, GENERAL REQUIREMENTS
- A. Equipment shall operate quietly and without objectionable vibration. Such problems, other than from m conditions, shall be the C at the direction of the Architect. B. Install equipment to provide good appearance, easy access, and adequate space to allow replacement
- and maintenance. Provide bases, supports, anchor bolts, and other items required to achieve this. nstallation shall be level, above moisture level, and adequately braced C. Thoroughly lubricate equipment before operating. Repair of damage resulting from failure to comply with
- this requirement shall be the Contractor's responsibili D. Connections to piping shall be secured and properly aligned and all utility and control connections shall be properly isolated from the building structure by means of vibration isolators and flexible connections. Any equipment not meeting this requirement will be modified and reinstalled at no expense to the Owner.
- E. Move equipment into building through available openings. Dismantle equipment where necessary to accomplish this. After reassembly, test equipment to verify its satisfactory operating condition
- 3.5 DUCTWORK A. All ductwork shall be installed within spaces provided where possible. Ducts shall be installed true to line and grade, fully secured to structural faming with specified hangers and supports, insulated, and vibration isolated, where required.
- B. Each section of supply air ductwork shall be cleaned at the shop, dust and oil free, using a degreasing agent and detergent and sealed airtight at both ends with visqueen and tape. Supply ducts shall be additionally cleaned with a disinfecting solution. Ends of all supply and internally insulated exhaust dusts shall be kept sealed until the time they are jointed. When duct sections are joined, wipe down all interior surfaces with a clean tack cloth. If tack cloth shows any dust, then re-clean duct as described above. The intent is that no foreign matter be allowed to enter the ductwork at any time after factory cleaning and luring constructior
- CONTROLS A. This Contractor shall provide all required control components, including but not limited to thermostats, temperature sensors, static pressure sensors, humidity sensors, damper actuators, valve actuators, unitary controllers, relays, and low-voltage wiring, such that the Owner is provided with a fully functional control
- B. Where work is performed in an existing building, this Contractor shall integrate all control modifications into the existing building control system, if applicable. Specific requirements shall be coordinated with Owner and approved by Architect prior to installation
- C. Installation of the system shall be made under the supervision of the manufacturer of the equipment, or his factory authorized representative TEST. INSPECTIONS
- A. Make all necessary control adjustments and balancing of air and water flows. Operate the entire system for a period of time not less than three (3) working days for the purpose of proving satisfactory performance. During this period, instruct such persons as the Owner and/or Architect may designate in the proper operation of the systems. Should further adjustment prove necessary, operating tests shall be epeated until a satisfactory test is obtained.
- This Contractor shall not allow or cause any work of this Section to be covered or enclosed until it has been inspected, tested, and approved by the Architect and the authorities having jurisdiction over the work. Should any of this work be enclosed or covered up before such inspection, testing, and approval, this Contractor shall uncover the work, have the necessary inspections, tests, and approvals made and, at no expense to the Owner, make all repairs necessary to restore both his work and that of other contractors which may have been damaged to be in conformity with the Contract Documents. CLEANUP
- A. Upon completion of the work of this Section, remove all material, debris, and equipment associated with or used in the performance of this work.

TESTING, ADJUSTING, AND BALANCING

- A. Provide all supervision, personnel, instruments, calibration, equipment, and all other materials necessary to perform balancing and testing, and compile test data including calculations and services necessary for the heating, ventilating, and air conditioning systems for this project, all in accordance with the project Drawings and Specifications and as specified herein. GENERAL
- A. Mechanical Contractor will employ a Testing, Adjusting, and Balancing (TAB) Agency that is certified by Associated Air Balancing Council (AABC), National Environmental Balancing Bureau (NEBB), or Testing, Adjusting, and Balancing Bureau (TABB). B. The TAB Agency shall be responsible for inspecting, balancing, adjusting, testing, and logging the data of
- the performance of fans, all dampers in the duct systems, all air distribution devices, and the flows of water through all coils. Existing equipment unless specifically mentioned otherwise, shall not in the scope of the TAB work A completely operable system shall be placed into operation each day during testing and balancing.
- The TAB Agency shall utilize instrumentation which meets the requirements of ASHRAE 111, Section 5, nstrumentation" F The Mechanical Contractor shall be responsible for certifying in writing that the system as scheduled for balancing, is operational and complete. Completeness shall include not only the physical installation, but the Mechanical Contractor's certification that the prime movers are installed in good working order, and
- that full load performance has been preliminary tested under the certification of the Mechanical Contractor. Before any testing and balancing is started, a complete report shall be sent to the TAB Agency by the Mechanical Contractor. The Mechanical Contractor shall be responsible for making all modifications to recertify discrepancies
- reported by the TAB Contractor as indicating non-compliance with the Contract Documents. By completing the work on time, the Mechanical Contractor shall provide sufficient time before the completion date so that balancing can be accomplished. If construction deficiencies are encountered which preclude obtaining optimum conditions, the deficiencies will be recorded and given to the Owner's representative. The TAB Agency is advised that deficiencies in
- the HVAC construction are often encountered during final TAB services, and should include in the bid an amount deemed advisable to compensate for time in identifying the deficiencies A. The TAB Agency will balance, test, and adjust the systemic components to obtain optimum conditions in
- each conditioned space in the building. If construction deficiencies are encountered which preclude obtaining optimum conditions, the deficiencies will be recorded and given to the Owner's representativ The TAB Agency is advised that deficiencies in the HVAC construction are often encountered during final TAB services, and should include in the bid an amount deemed advisable to compensate for time in identifying the deficiencies.
- 5. The report shall be complete with logs, data, and records as required herein and all logs, data, and records shall be typed, produced, on white bond paper, and bound. Transmit four copies directly to the Owner's Representative to be distributed to the Mechanical Contractor, Controls Contractor, Engineer, and record
- C. The report shall contain the following general data in a format selected by the TAB Agency for clarity and ease of reference. Project Title.
- Project Location. 3. Project Architect (Firm name and address).
- Project Mechanical Engineer (Name). TAB Field Test Engineer (Name).
- 6. TAB Agency (Firm name and address). 7. Inclusive dates tests were performed and date of report. 8. Calibration Certificates of each instrument used along with specific ID numbers (i.e., serial numbers).
- SUBMITTALS A. Submittal No. 15950 (1) - TAB Agenda
- 1. The TAB Contractor shall submit a complete agenda, which shall outline in full the testing methods and locations for each HVAC system and/or device that is within the scope of the TAB work. The agenda shall represent the total system balance report, less field test data. Areas of intended field test puts shall be represented by fully labeled blank spaces 2. The TAB Agenda shall also indicate the proposed test methods, instrumentation devices and all applicable calibration certificates
- B. Submittal No 15950 (2) TAB Report 1. Provide Test and Balance Report as indicated herein.
- AIR SYSTEMS REQUIREMENTS A. In addition to the above data in its appropriate format, the Test and Balance Report shall include the following data:
- 1. Ground mounted Exhaust Fan (EF-1) a. Manufacturer and model.
- b. Size. c. Motor hp, voltage, phase, cycles, full load amps.
- d. Location and local identification data. e. Identification tag listed in schedules on drawings and specifications.
- f. Exhaust airflow (cfm). g. Fan RPM
- h. Motor current readings at each fan. PART 2 - PRODUCTS (not used)
- PART 3 EXECUTION .1 GENERAL PROCEDURES
- A. During the balancing, the temperature regulation shall be adjusted for proper relationship between controlling instruments and calibrated. The correctness of the final setting shall be proved by taking hourly
- readings for a period of one successive 8-hour day, in a typical room on each separately controlled zone, after tenant moves in. The total variation shall not exceed 2 degrees from the preset medium temperature during the temperature survey period. (This will be done only on systems that are totally operational).
- AIR SYSTEMS PROCEDURES A. The TAB Agency shall perform the following tests and balance the air systems in accordance with the following requirements:
- Test and adjust blower and motor rpm to design requirements. 2. Test and record motor full load amperes and corresponding voltage.

Test and record system static pressures, suction and discharge.

Test and adjust system for design cfm of outside air.

Adjust all zones to proper design cfm, supply and return

1. Seal all openings in duct section and plenum to be tested.

Start blower and gradually open damper on suction side of blower

inspector. Tests shall be made before duct sections are concealed

B. Points and areas for recheck shall be selected by the Owner's Representative.

the report, except that special air systems may require a complete recheck for safety reasons

submitted, and new inspection tests made, all at no additional cost to the Owner.

5. Determine account of air leakage and make repairs as required.

airflow, and system outdoor airflow shall be l

contractor with specific set points.

by Mechanical Contractor)

A. The report shall contain the following data

TEST AND BALANCE REPORT

pecified above

FINAL ACCEPTANCE

Certified Repor

acceptance.

3.3 DUCT LEAKAGE TEST

3. Make pitot tube traverse of main supply ducts and obtain design cfm at fans.

. Test and adjust each diffuser, grille, and register to within 10% of design requirement

9. Each grille, diffuser, and register shall be identified as to location and area.

resultant velocity, required cfm and test resultant cfm after adjustments.

onduct test as follows and as recommended in SMACNA Balancing Manual

3. Close damper on blower suction side to prevent excessive build-up of pressure.

PART 1 GENERAL

6. Adjust all main supply and return air ducts to proper design cfm. System supply airflow, system return

10. Size, type, and manufacturer of diffusers, grilles, registers, and all tested equipment shall be identified and listed. Manufacturer's ratings on all equipment shall be used to make required calculations. 11. Readings and test of diffusers, grilles, and registers shall include required for velocity and test

12. TAB Agency shall check all controls to ensure they are operating as specified. Provide the control A. All ductwork shall be tested for leaks, using necessary instruments before insulating any ductwork.

2. Connect test apparatus to test section of cuts, using a flexible duct connection or hose (fitting provided 6. Leakage factor allowable shall be 5% based on the total operating cfm of the section of duct under

7. Tested sections of ductwork shall be visually marked with certification sticker and initials of field test 1. A listing of the measured air quantities at each outlet corresponding to the temperature tabulation

2. Air quantities at each return and exhaust air handling device (only if ducted return systems). 3. Static pressure readings entering and leaving each supply, return and exhaust fan, filter, and coil of the system. These readings shall be related to fan curves in terms of cfm handled. 4. Motor current readings at each fan and pump. The voltages at the time of the readings shall be listed.

A. At the time of final inspection, the Balancing Agency shall recheck, in the presence of the Owner's Representative, specific and random selections of data, i.e., water and air quantities, recorded in the

Measurement and test procedures shall be the same as approved for work forming basis of Certified D. Selections for recheck, specific plus random, will not normally exceed 25% of the total number tabulated in

E. If random tests elicit a measured flow deviation of 10% or more from that recorded in the Certified Report on 10% or more of the selected recheck stations, the report shall be automatically rejected. In the event the report is rejected, all systems shall be readjusted and tested, new data recorded, new Certified Report

Following final acceptance of the Certified Report by the Owner's Representative, the settings of all valves, splitter. dampers. and other adjustment devices shall be permanently marked by the TAB Agency, so that adjustment can be restored if disturbed at any time. Devices shall not be marked until after final

ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL INTENT OF PLANS:

- A. ELECTRICAL PLAN DRAWINGS SHOW ONLY GENERAL LOCATIONS OF EQUIPMENT DEVICES AND RACEWAY UNLESS. SPECIFICALLY DIMENSIONED. THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER ROUTING OF RACEWAY SUBJECT TO THE APPROVAL OF THE ENGINEER. MAKE ADJUSTMENTS AS NECESSARY TO WIRING, CONDUIT DISCONNECTS, BRANCH CIRCUIT PROTECTION, AND OTHER AFFECTED MATERIAL OR EQUIPMENT TO ACCOMMODATE ACTUAL EQUIPMENT SUPPLIED FOR THIS PROJECT CODES, PERMITS, AND REGULATIONS:
- A. DO ALL WORK AND INSTALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA ELECTRICAL CODE (CEC), APPLICABLE STATE AND LOCAL LAWS AND ORDINANCES, AND THE POWER COMPANY. CONFLICTS, IF ANY, WILL BE RESOLVED AT THE DISCRETION OF THE ENGINEER. PART 2 - PRODUCTS
- A. UNLESS OTHERWISE INDICATED, PROVIDE ALL FIRST-QUALITY NEW MATERIALS, FREE FROM ANY DEFECTS, AND SUITABLE FOR THE INTENDED USE AND THE SPACE PROVIDED. PROVIDE MATERIALS APPROVED BY UL WHEREVER STANDARDS HAVE BEEN ESTABLISHED BY THAT ORGANIZATION. FURNISH AND INSTALL ALL INCIDENTAL ITEMS NOT SPECIFICALLY SHOWN OR SPECIFIED WHICH ARE REQUIRED BY GOOD PRACTICE TO PROVIDE THE COMPLETE YSTEMS SPECIFIED HEREIN. WHERE TWO OR MORE UNITS OF THE SAME CLASS OF MATERIAL OR EQUIPMENT ARE REQUIRED, PROVIDE PRODUCTS OF A SINGLE MANUFACTURER. COMPONENT PARTS OF MATERIALS OR EQUIPMENT NEED NOT BE PRODUCTS OF THE SAME MANUFACTURER.
- EQUIPMENT FINISH: A. UNLESS OTHERWISE INDICATED, FINISH FOR ELECTRICAL EQUIPMENT AND ENCLOSURES SHALL BE MANUFACTURER'S STANDARD GRAY OR ANSI 61 GRAY OVER A PRIMER AND RUST INHIBITOR.
- JUNCTION AND PULL BOXES: A. LARGE SHEET STEEL BOX: NEMA 1. 1. BOX: CODE-GAUGE, GALVANIZED STEE
- COVER: FULL ACCESS, SCREW TYPE. 3. MACHINE SCREWS: CORROSION-RESISTANT LARGE WEATHERPROOF: NEMA 3R.
- 1. BOX: GALVANIZED STEEL COVER: SCREW WITH PROVISIONS FOR PAD LOCKING EMBOSSED MOUNTING HOLES ON BACK OF ENCLOSURE
- 4. NO GASKETING. CONDUIT AND TUBING: A. GALVANIZED RIGID STEEL CONDUIT (GRS):
- MEET REQUIREMENTS OF ANSI C80.1 AND UL 6. MATERIAL: HOT-DIP GALVANIZED, WITH CHROMATED PROTECTIVE LAYER.
- B. ELECTRIC METALLIC TUBING (EMT): MEET REQUIREMENTS OF ANSI C80.3 AND UL 797. MATERIAL: HOT-DIP GALVANIZED, WITH CHROMATED AND LACQUERED PROTECTIVE LAYER.
- C. PVC SCHEDULE 40 CONDUIT: 1 MEET REQUIREMENTS OF NEMA TC2 AND UL 651 2. UL LISTED FOR CONCRETE ENCASEMENT, UNDERGROUND DIRECT BURIAL, CONCEALED OR DIRECT SUNLIGHT
- EXPOSURE, AND 90°C D. FLEXIBLE METAL, LIQUID-TIGHT CONDUIT:
- 1. UL 360 LISTED FOR 105°C INSULATED CONDUCTORS. 2. MATERIAL: GALVANIZED STEEL, WITH AN EXTRUDED PVC JACKET.
- A. GALVANIZED RIGID STEEL: MEET REQUIREMENTS OF UL 514B.
- 2. TYPE: THREADED, GALVANIZED. SETSCREW FITTINGS NOT PERMITTED. MATERIAL: MALLEABLE IRON WITH INSULATED THROAT B. ELECTRIC METALLIC TUBING:
- MEET REQUIREMENTS OF UL 514B. 2. TYPE: STEEL BODY AND LOCK NUTS WITH STEEL OR MALLEABLE IRON COMPRESSION NUTS.
- C. PVC CONDUIT: 1. MEET REQUIREMENTS OF NEMA TC-3 AND UL 514B. D. FLEXIBLE METAL, LIQUID-TIGHT CONDUIT: INSULATED THROAT AND SEALING O-RINGS
- 2.6 CONDUCTORS: A. ALL CONDUCTORS SHOWN SHALL BE NEW UNLESS OTHERWISE INDICATED.
- B. CONDUCTOR TYPE: . 120VAC AND 277VAC LIGHTING: SOLID COPPER 120 AC RECEPTACLE CIRCUITS: SOLID COPPEI
- 3. ALL OTHER CIRCUITS: STRANDED COPPER. C. INSULATION: TYPE THHN/THWN, 90°C DRY OR 75°C WET.
- CONDUCTOR ACCESSORIES: 1. GENERAL PURPOSE, FLAME RETARDANT: 7 MIL, VINYL PLASTIC, RATED FOR 90°C MINIMUM MEETING
- REQUIREMENTS OF UL 510. 2. FLAME RETARDANT, COLD AND WEATHER RESISTANT: 8.5 MIL, VINYL PLASTIC. B. CABLE TIES 1. NYLON, ADJUSTABLE, AND SELF-LOCKING
- WIRING DEVICES A. MANUAL SWITCH: NEMA WD 1 AND FS WS896E. 2. SPECIFICATION GRADE, TOTALLY ENCLOSED, AC TYPE, WITH QUIET TUMBLER SWITCHES AND SCREW
- 3. RATING: 20A. 120/277VAC.
- 4. COLOR: TO BE DETERMINED. DISCONNECT SWITCH, INDIVIDUAL, 0 TO 600 VOLTS: A. NEMA KS 1.
- B. QUICK-MAKE, QUICK-BREAK, MOTOR RATED, LOAD-BREAK, HEAVY-DUTY (HD) TYPE WITH EXTERNAL MARKINGS CLEARLY INDICATING ON/OFF POSITIONS. C. ENCLOSURE: NEMA 12, INDUSTRIAL USE, NEMA 3R, DENOTED BY WP. UNLESS OTHERWISE SHOWN D. INTERLOCK: ENCLOSURE AND SWITCH TO PREVENT OPENING COVER WITH SWITCH IN THE ON POSITION.
- E. LOCKABLE IN THE OPEN POSITION. PROVIDE TAG READING "DO NOT OPEN UNDER LOAD." PART 3 - EXECUTION A. COORDINATE ELECTRICAL WORK WITH THE OWNER AND THE WORK OF OTHER TRADES TO AVOID CONFLICTS,
- ERRORS, DELAYS, AND UNNECESSARY INTERFERENCE DURING CONSTRUCTION. A PROTECTION DURING CONSTRUCTION:
 A. FOLLOWING INSTALLATION, PROTECT MATERIALS, EQUIPMENT, AND INSULATION FROM CORROSION, PHYSICAL
- DAMAGE, AND MOISTURE. CAP CONDUIT RUNS DURING CONSTRUCTION WITH MANUFACTURED SEALS. KEEP OPENINGS IN BOXES OR EQUIPMENT CLOSED DURING CONSTRUCTION. MATERIAL AND EQUIPMENT INSTALLATION:
- A. FOLLOW THE MANUFACTURER'S INSTALLATION RECOMMENDATIONS UNLESS OTHERWISE INDICATED, FOLLOW THE ENGINEER'S DECISION, WHEREVER ANY CONFLICT ARISES. KEEP COPY OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AVAILABLE ON THE JOBSITE FOR REVIEW AT ALL TIMES CUTTING AND PATCHING:
- A. DO NOT CUT OR NOTCH ANY STRUCTURAL MEMBER OR BUILDING SURFACE WITHOUT SPECIFIC APPROVAL OF THE ENGINEER. FOLLOWING SUCH WORK, RESTORE SURFACES NEATLY TO NEW CONDITION USING SKILLED CRAFTSMEN OF THE TRADES INVOLVED. CLEANING AND TOUCH-UP PAINTING:
- A. KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH. UPON COMPLETION OF WORK, REMOVE MATERIALS, SCRAPS, AND DEBRIS FROM THE PREMISES AND FROM THE INTERIOR AND EXTERIOR OF ALL DEVICES AND EQUIPMENT. REFINISH DAMAGED SURFACES TO NEW CONDITION USING SKILLED CRAFTSMEN OF THE TRADES INVOLVED.
- RACEWAY SYSTEM: A. UNLESS OTHERWISE SPECIFIED OR INDICATED, WIRING SHALL CONSIST OF INSULATED CONDUCTORS INSTALLED IN RACEWAYS OF THE TYPES INDICATED: B. EXTERIOR, EXPOSED: GALVANIZED RIGID STEEL. C. INTERIOR, EXPOSED:
- 1. GALVANIZED RIGID STEEL: ALL AREAS EXCEPT AS INDICATED BELOW. ELECTRIC METALLIC TUBING: 6 FEET OR MORE ABOVE THE FLOOR. D. INTERIOR. CONCEALED (NOT EMBEDDED IN CONCRETE):
- 1. ELECTRIC METALLIC TUBING: ALL OTHER LOCATIONS. E. FOR EQUIPMENT WHERE FLEXIBLE CONNECTION IS REQUIRED TO MINIMIZE VIBRATION:
- FLEXIBLE METAL, LIQUID-TIGHT CONDUIT. LENGTH: 18-INCH MINIMUM, 60-INCH MAXIMUM OF SUFFICIENT LENGTH TO ALLOW MOVEMENT OR ADJUSTMENT OF EQUIPMENT. F BOX TYPE (ALL BACEWAY SYSTEMS)
- 1. EXTERIOR LOCATIONS: WEATHERPROOF TYPE 3R.
- INTERIOR DRY LOCATIONS: SHEET STEEL, TYPE 1.
 G. SUPPORT BOXES INDEPENDENTLY OF CONDUIT BY ATTACHMENT TO BUILDING STRUCTURE OR STRUCTURAL MEMBER. INSTALL BAR HANGERS IN FRAME CONSTRUCTION, OR FASTEN BOXES DIRECTLY WITH WOOD SCREWS ON WOOD, BOLTS AND EXPANSION SHIELDS ON CONCRETE OR BRICK, TOGGLE BOLTS ON HOLLOW MASONRY UNITS, AND MACHINE SCREWS OR WELDED THREADED STUDS ON STEELWORK
- RACEWAY INSTALLATION: A. CONDUIT AND TUBING SIZES SHOWN ARE BASED ON THE USE OF COPPER CONDUCTORS. B. MAINTAIN RACEWAY ENTIRELY FREE OF OBSTRUCTIONS AND MOISTURE.
- C. FOLLOW STRUCTURAL SURFACE CONTOURS WHEN INSTALLING EXPOSED RACEWAYS. AVOID OBSTRUCTION OF PASSAGEWAYS. RUN EXPOSED RACEWAYS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, OR NTERSECTIONS OF VERTICAL PLANES. D. INSTALL WATERTIGHT CONDUIT SEALING BUSHINGS IN OUTDOOR, UNDERGROUND, OR WET LOCATIONS.
- E. ALL METAL CONDUIT TO BE REAMED, BURRS REMOVED, AND CLEANED BEFORE INSTALLATION OF CONDUCTORS, WIRES, OR CABLES. F. FOR EMPTY CONDUITS INSTALL A NYLON PULL CORD TO BE USED FOR FUTURE INSTALLATIONS.
- RACEWAY PENETRATIONS A. MAKE AT RIGHT ANGLES, UNLESS OTHERWISE SHOWN. B. NOTCHING OR PENETRATION OF STRUCTURAL MEMBERS, INCLUDING FOOTINGS AND BEAMS, NOT PERMITTED. C. FIRE-RATED WALLS, FLOORS, OR CEILINGS: FIRE-STOP OPENINGS AROUND PENETRATIONS TO MAINTAIN FIRE-RESISTANCE RATING
- RACEWAY SUPPORT A. SUPPORT FROM STRUCTURAL MEMBERS ONLY, AT INTERVALS NOT EXCEEDING CEC REQUIREMENTS, AND IN ANY CASE NOT EXCEEDING 10 FEET. DO NOT SUPPORT FROM PIPING, PIPE SUPPORTS, OR OTHER RACEWAYS. 3. WALL BRACKETS AND ASSOCIATED HARDWARE IN CONTACT WITH CONCRETE OR MASONRY SHALL BE STAINLESS STEEL. PROVIDE GALVANIZED STEEL AT ALL OTHER LOCATIONS. STRAP HANGERS AND CEILING TRAPEZE
- NCLUDING HARDWARE, SHALL BE GALVANIZED STEEL C. PROVIDE AND ATTACH WALL BRACKETS, STRAP HANGERS, OR CEILING TRAPEZE AS FOLLOWS: WOOD: WOOD SCREWS. HOLLOW MASONRY UNITS: TOGGLE BOLTS CONCRETE OR BRICK: EXPANSION SHIELDS, OR THREADED STUDS DRIVEN IN BY POWDER CHARGE, WITH LOCK
- WASHERS AND NUTS. 4. STEELWORK: MACHINE SCREWS. D NAILS OR WOODEN PLUGS INSERTED IN CONCRETE OR MASONRY FOR ATTACHING RACEWAY NOT PERMITTED. DO NOT WELD RACEWAYS OR PIPE STRAPS TO STEEL STRUCTURES. DO NOT USE WIRE IN LIEU OF STRAPS OR
- 3.9 RACEWAY BENDS: A. INSTALL CONCEALED RACEWAYS WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE. B. AVOID FIELD-MADE BENDS AND OFFSETS, BUT WHERE NECESSARY, MAKE WITH ACCEPTABLE HICKEY OR BENDING
- MACHINE. DO NOT HEAT METAL RACEWAYS TO FACILITATE BENDING. 3.10 EXPANSION/DEFLECTION FITTINGS: A. PROVIDE ON ALL RACEWAYS AT STRUCTURAL EXPANSION JOINTS.
- TERMINATION AT ENCLOSURES: A. SHEET METAL BOXES, CABINETS, AND ENCLOSURES:
- GALVANIZED RIGID STEEL CONDUIT: PROVIDE ONE LOCK NUT EACH ON INSIDE AND OUTSIDE OF ENCLOSURE.
- INSTALL GROUNDING BUSHING. PROVIDE BONDING JUMPER FROM GROUNDING BUSHING TO EQUIPMENT GROUND BUS OR GROUND PAD; IF NEITHER GROUND BUS NOR PAD EXISTS, CONNECT JUMPER TO LAG BOLT ATTACHED TO METAL ELECTRIC METALLIC TUBING: PROVIDE GLAND COMPRESSION. INSULATED CONNECTORS
- FLEXIBLE METAL CONDUIT: PROVIDE TWO SCREW TYPE, INSULATED, MALLEABLE IRON CONNECTORS. A. DO NOT SPLICE INCOMING SERVICE CONDUCTORS AND BRANCH POWER DISTRIBUTION CONDUCTORS NO. 6 AWG AND LARGER UNLESS SPECIFICALLY INDICATED OR APPROVED BY ENGINEER
- B. CONNECTIONS AND TERMINATIONS: INSTALL WIRE NUTS ONLY ON SOLID CONDUCTORS.
 INSTALL NYLON SELF-INSULATED CRIMP CONNECTORS AND TERMINATORS FOR CIRCUIT CONDUCTORS NO. 6
- AWG AND SMALLER C. DO NOT USE SOLDERED MECHANICAL JOINTS.
- D. SPLICES AND TERMINATIONS: 1. INDOORS: USE GENERAL PURPOSE, FLAME RETARDANT TAPE. OUTDOORS: USE FLAME RETARDANT, COLD- AND WEATHER-RESISTANT TAPE.
- E. CAP SPARE CONDUIT WITH UL LISTED END CAPS. . CABINETS AND PANELS: REMOVE SURPLUS WIRE, BRIDLE AND SECURE.
- WHERE CONDUCTORS PASS THROUGH OPENINGS OR OVER EDGES IN SHEET METAL, REMOVE BURRS CHAMFER EDGES AND INSTALL BUSHINGS AND PROTECTIVE STRIPS OF INSULATING MATERIAL TO PROTECT THE 3.13 GROUNDING:
- A. UNLESS OTHERWISE INDICATED, GROUND ALL EXPOSED NONCURRENT-CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, RACEWAY SYSTEMS, AND THE NEUTRAL OF ALL WIRING SYSTEMS IN ACCORDANCE WITH THE CEC. STATE, AND OTHER APPLICABLE LAWS AND REGULATIONS. 4 OPERATIONAL READINESS TEST (ORT)
- A. TESTING, TEST PLANS, AND TEST REPORTS SHALL BE PROVIDED BY THE CONTRACTOR AS SPECIFIED HEREIN. THE CONTRACTOR SHALL PROVIDE LABOR, INSTRUMENTS, AND OTHER MATERIAL TO COMPLETE THE TEST. B. THE ENTIRE INSTALLED ELECTRICAL SYSTEM SHALL BE CERTIFIED (INSPECTED, TESTED, AND DOCUMENTED) THAT IT IS READY FOR OPERATION. THE OBJECTIVE OF THIS TEST IS TO DEMONSTRATE THAT THE ELECTRICAL SYSTEM IS COMPLETE AND READY FOR USE.

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- REVISIONS

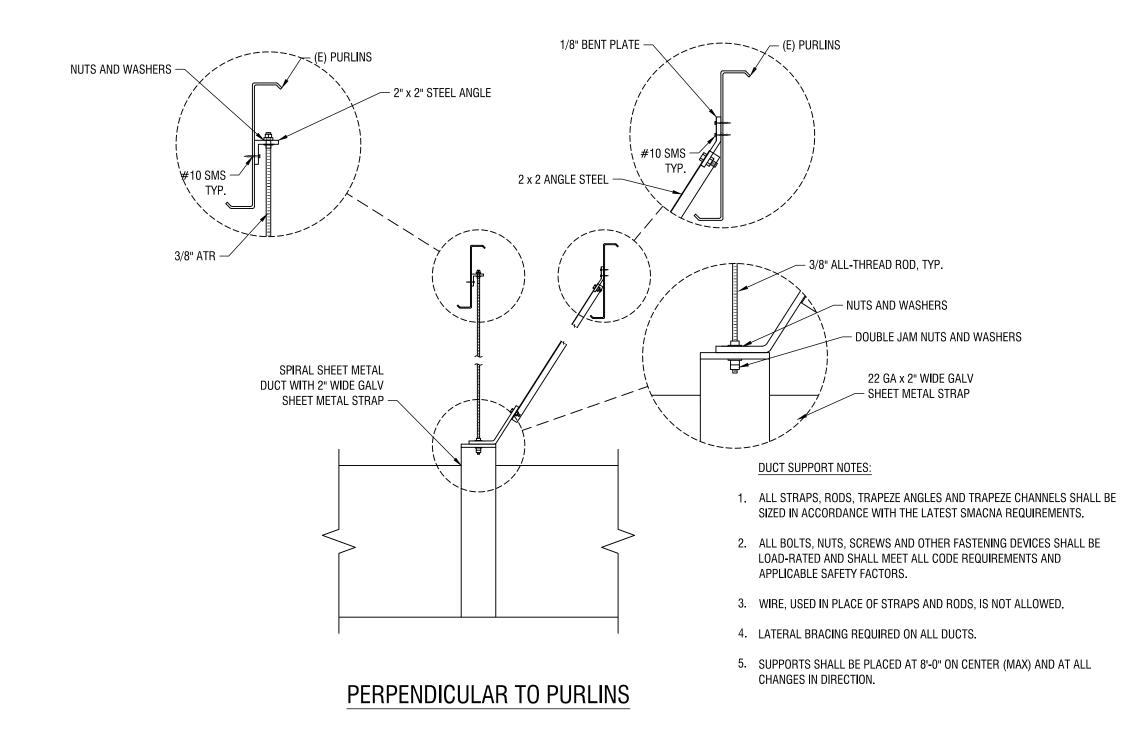
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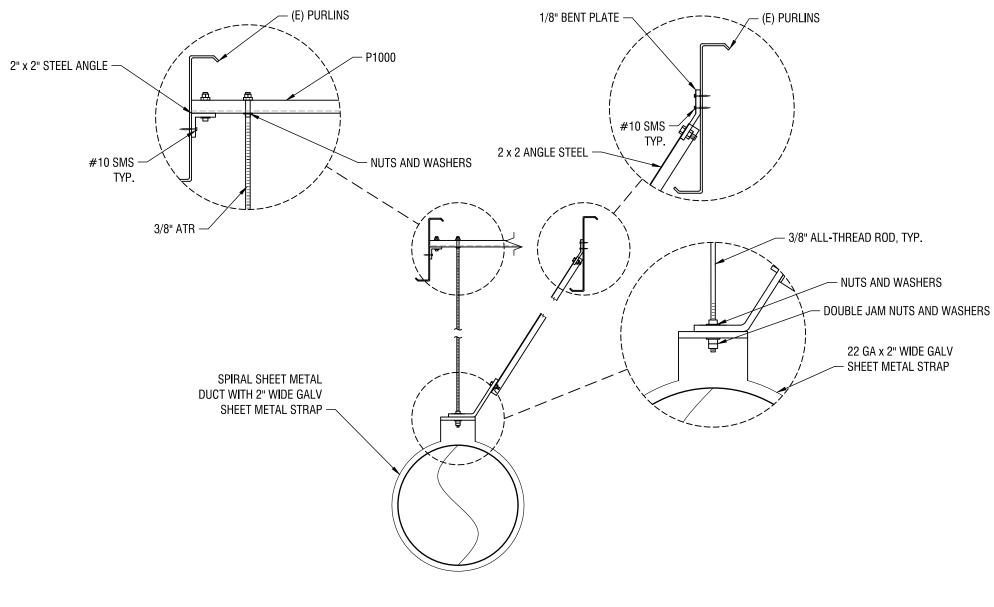
SHEET TITLE

MECHANICAL AND ELECTRICAL SPECIFICATION

ISSUED FOR:
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DOCUMENTS

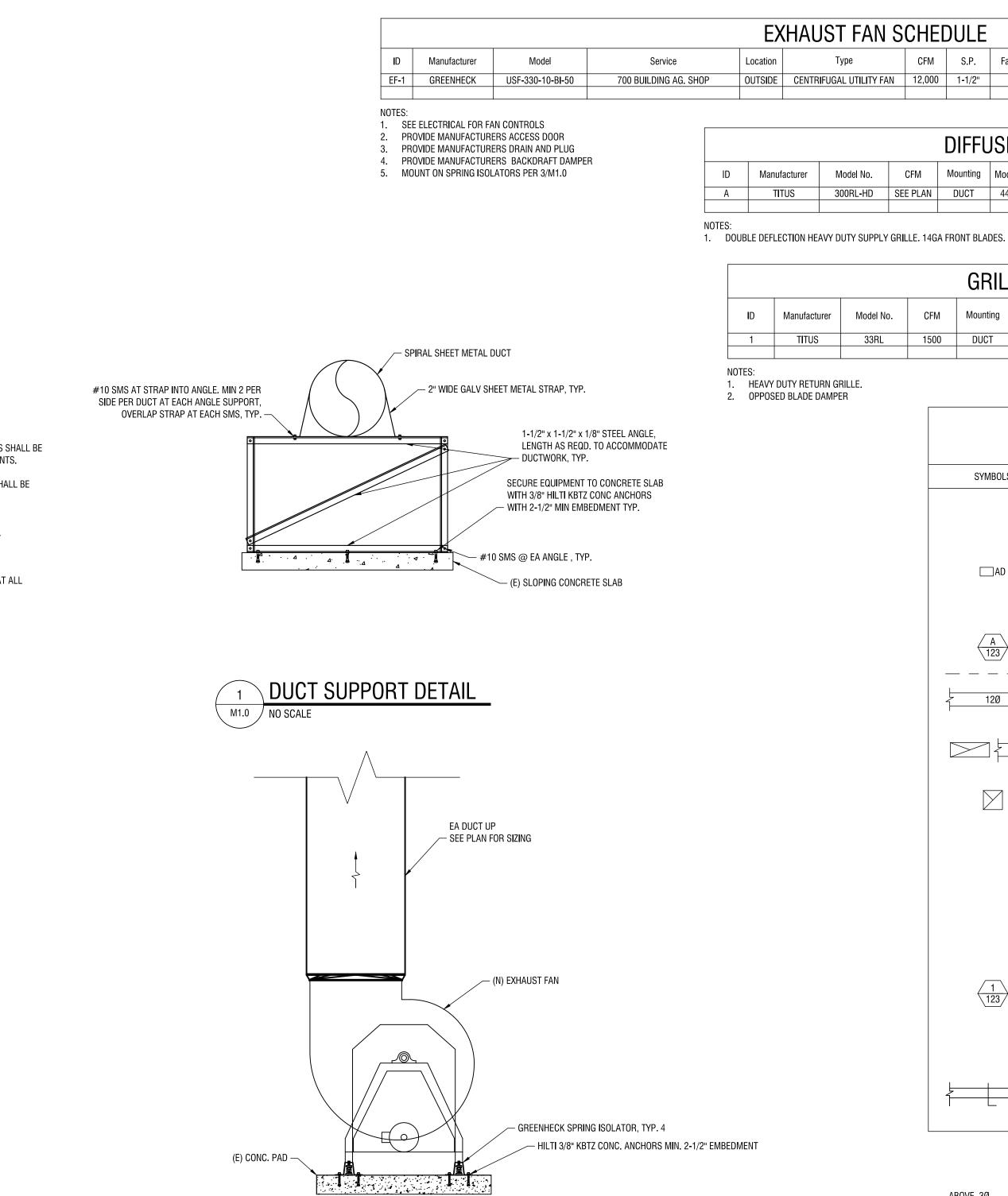
DATE:	10/14/2016
DRAWN BY:	RB
REVIEWED BY:	BA
SCALE:	AS NOTED
PROJECT NO:	21649





PARALLEL TO PURLINS

2 DUCT HANGING DETAIL M1.0 NO SCALE



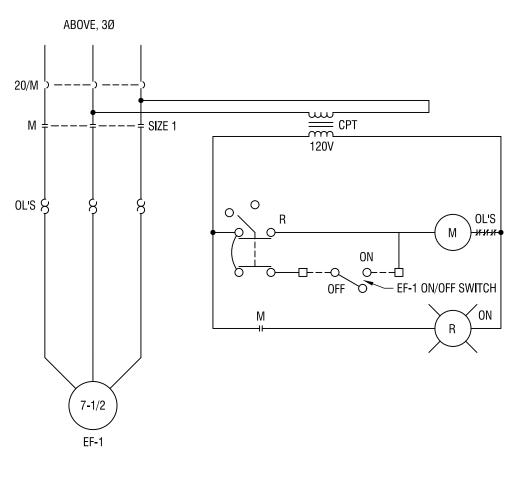


AN S	CHEE	DULE								
	CFM	S.P.	Fan RPM	Fan Drive	N Volts	lotor Data Phase	HP	Max. Sones	Weight Lbs.	Notes
TY FAN	12,000	1-1/2"	916	BELT	460	3	7.5	69	875	1 - 5

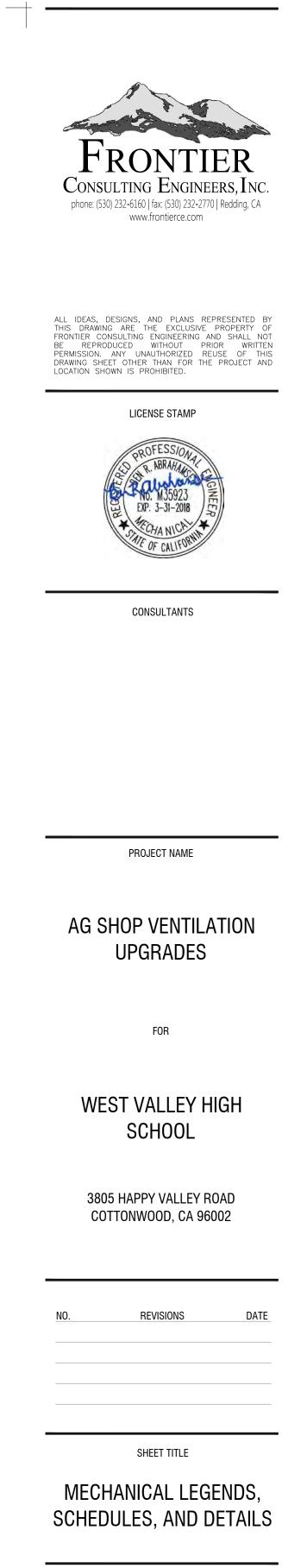
		DIFFL	JSER S	CHEDUL	.E			
).	CFM	Mounting	Module Size	Face Size	Neck Size	Material	Finish	Notes
D	SEE PLAN	DUCT	44" x 20"	42" x 18"	N/A	ALUMINUM	#01	1

		GRIL	LE SC	HEDUL	E			
odel No.	CFM	Mounting	Module Size	Face Size	Neck Size	Material	Finish	Notes
33RL	1500	DUCT	32" x 14"	30" x 12"	N/A	ALUMINUM	#01	1

	MECHANICAL LEGENDS							
SYMBOLS	ABBREVIATIONS							
	ABC	ABOVE CEILING						
	AFF	ABOVE FINISHED FLOOR						
AD	AD	ACCESS DOOR						
	BHP	BRAKE HORSE POWER						
	CFM	CUBIC FEET PER MINUTE						
$\left(\begin{array}{c} A \\ 123 \end{array} \right)$		DIFFUSER TAG						
	D	DEMO						
		DUCT (ROUND DUCT, DIAMETER IN INCHES)						
	EC	EVAPORATIVE COOLER						
EA	EA	EXHAUST AIR DUCT						
	EF	EXHAUST FAN						
		EXHAUST GRILLE						
	(E), EX	EXISTING						
	ESP	EXTERNAL STATIC PRESSURE						
	FLA	FULL LOAD AMPS						
	МОСР	MAXIMUM OVER CURRENT PROTECTION						
	MCA	MINIMUM CIRCUIT AMPACITY						
	Ν	NEW						
	OA	outside air						
		REGISTER/GRILLE TAG						
	TSP	TOTAL STATIC PRESSURE						
	ТҮР	TYPICAL						
	VIF	VERIFY IN FIELD						
		VOLUME DAMPER - MANUAL OPERATION						

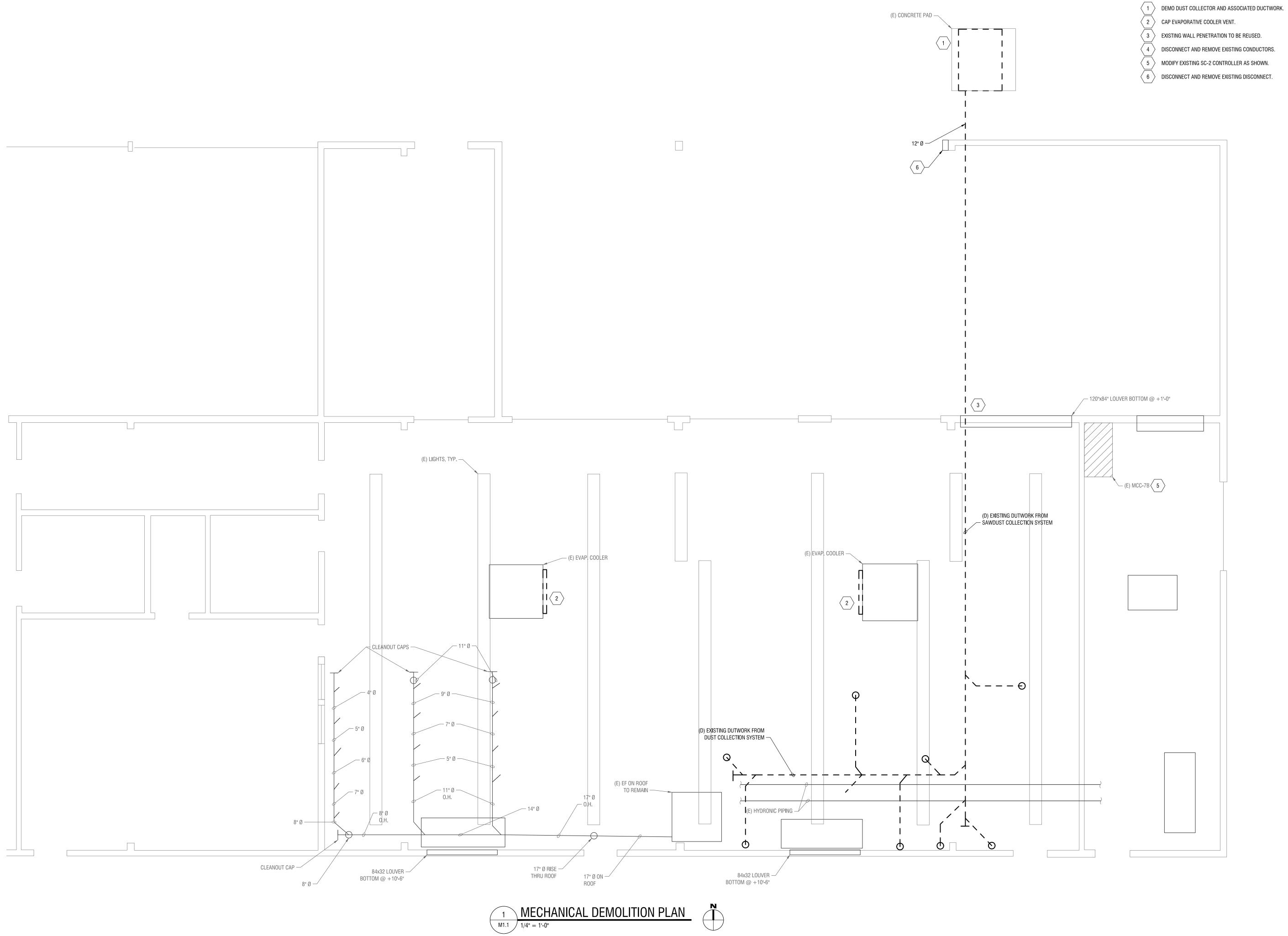






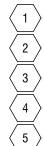
	RUCTION MENTS
DATE:	10/14/2016
DRAWN BY:	RB
REVIEWED BY:	BA
SCALE:	AS NOTED
PROJECT NO:	21649

M1.0



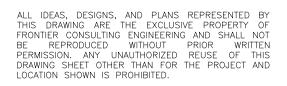


KEYED NOTES



- EXISTING WALL PENETRATION TO BE REUSED.
- DISCONNECT AND REMOVE EXISTING CONDUCTORS.
- MODIFY EXISTING SC-2 CONTROLLER AS SHOWN.





LICENSE STAMP

CONSULTANTS

PROJECT NAME

AG SHOP VENTILATION UPGRADES

FOR

WEST VALLEY HIGH SCHOOL

3805 HAPPY VALLEY ROAD COTTONWOOD, CA 96002

REVISIONS DATE NO.

SHEET TITLE

MECHANICAL DEMOLITION PLAN

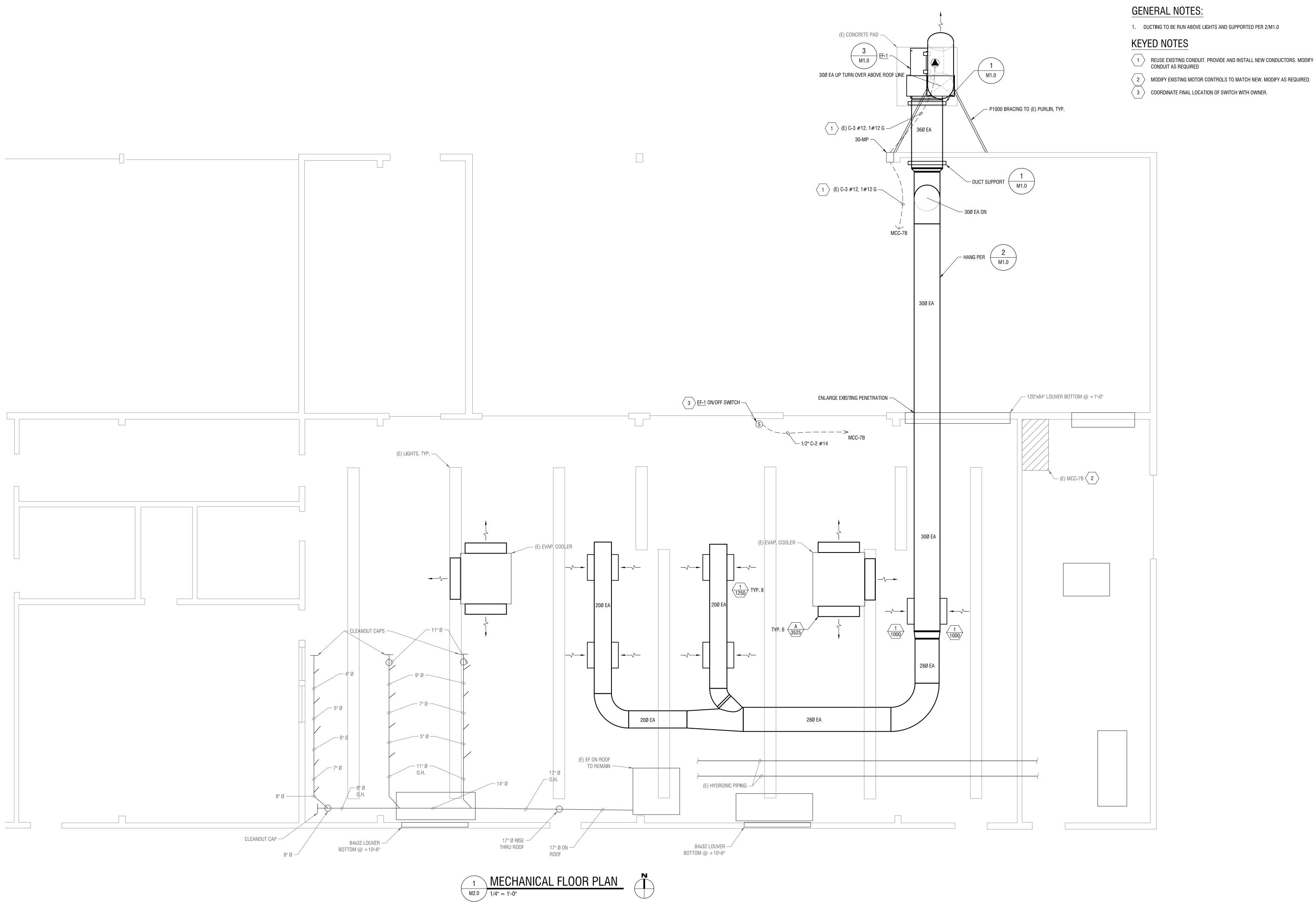
ISSUED FOR: CONSTRUCTION DOCUMENTS	
DATE:	10/14/201
DRAWN BY:	R
REVIEWED BY:	В

SCALE:

PROJECT NO:

AS NOTED 21649

M1.1









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CONSULTANTS

PROJECT NAME

AG SHOP VENTILATION UPGRADES

FOR

WEST VALLEY HIGH SCHOOL

3805 HAPPY VALLEY ROAD COTTONWOOD, CA 96002

REVISIONS DATE

SHEET TITLE

MECHANICAL FLOOR PLAN

ISSUEI CONSTF	D FOR: RUCTION	
DOCUMENTS		
DATE:	10/14/2016	
DRAWN BY:	RB	
REVIEWED BY:	BA	
SCALE:	AS NOTED	
PROJECT NO:	21649	

M2.0