



**LAWNDALE**  
Elementary School District

**2024 HVAC REPLACEMENT  
DISTRICT MDF & IT OFFICE**

**PROJECT No. 2024-01**

**ADDENDUM #1**

**Project:** 2024 HVAC REPLACEMENT DISTRICT MDF & IT OFFICE

**Owner:** Lawndale Elementary School District  
4161 W 147th St, Lawndale, CA 90260

**Date Issued:** April 8<sup>th</sup>, 2024

The clarifications, modifications, changes, additions, and/or deletions contained herein shall be incorporated within the construction documents for the project. Such information shall take precedence over that previously published.

## **GENERAL**

### **Item A - Addendum Acknowledgement**

Acknowledge receipt of this addendum on the space provided in the bid form.

### **Item B – Extension of bid due date**

Bid due date has been extended to Friday April 12, 2024 at 12:00 P.M.

### **Item C – Information, HVAC Unit Locations**

See map attached to this addendum.

### **Item D – Add, Bollards**

See detail attached to this addendum. Concrete footing for bollards shall be 12” square by 12” deep. Both pads shall have one bollard on each corner and one in the middle.

### **Item E – Add, Duct Work Specification**

See additional duct work specifications attached to this addendum.

### **Item F – Contractor's Questions and Answers**

Included in this addendum.

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## Contractor's Questions and Answers

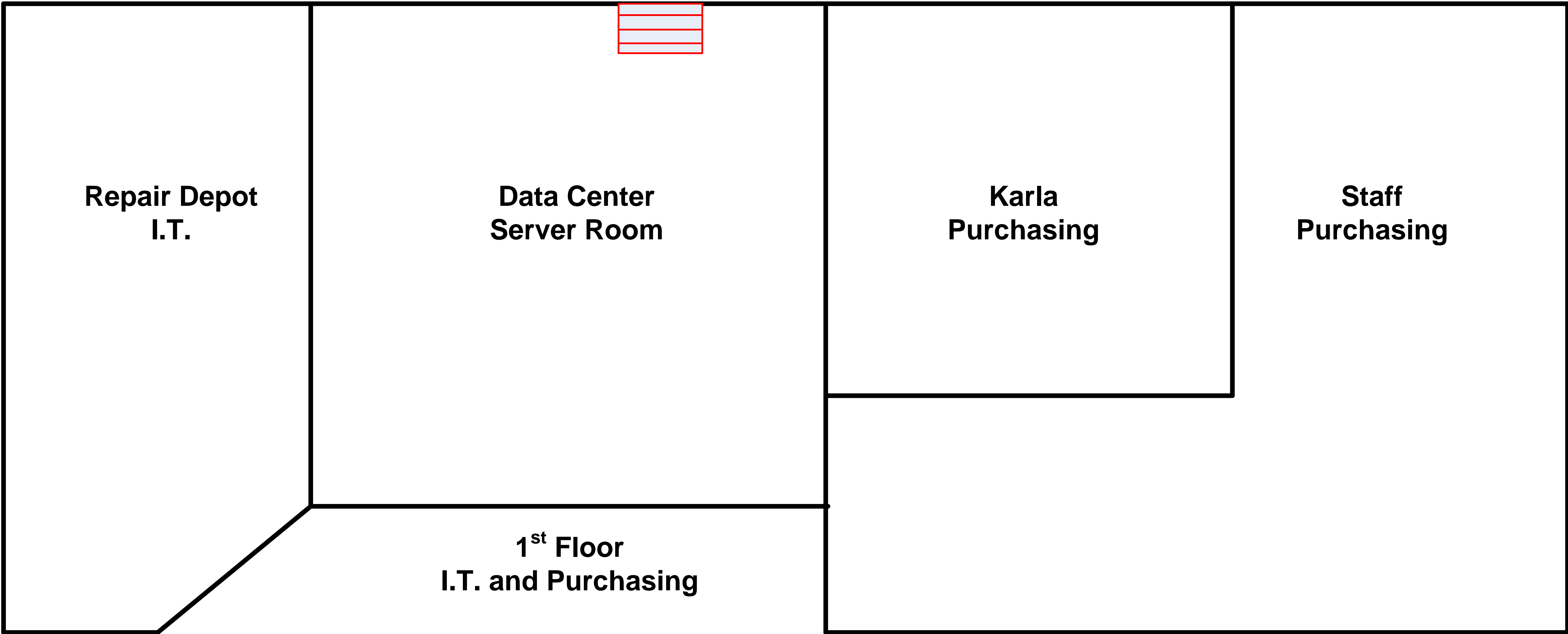
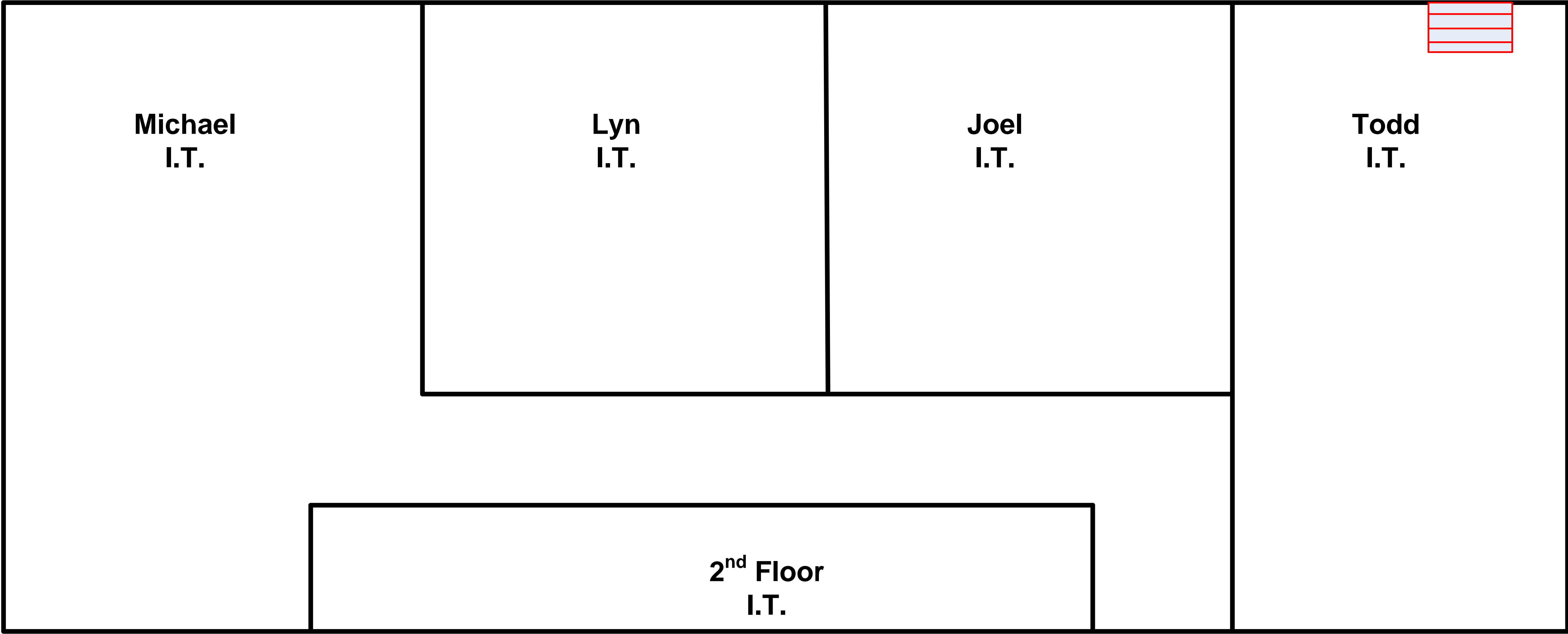
### Question #1:

“Can you please provide the concrete pad size and the rebar size  
What size of the condensation well how many feet down and how many well for three unit  
and also in job walk asking for split unit Mitsubishi or Trane unit on the spec is carrier unit  
are we precising the carrier split unit  
the package unit is carrier HP is better to be cooling only and commercial style with belt  
drive”

### Answer #1:

- A) One pad for two mini-split condensers: 2'-0" x 9'-8", minimum 24" from wall; minimum 36" inches separation between units; 4" thick pad, 2" inches above grade; # 3 rebar.  
One pad for package unit, 53" x 56", minimum 24" inches from wall; 4" think pad, 2" above grade; #3 rebar.
- B) One condensate drywell for all three units, 2' diameter, 4' deep.
- C) Carrier mini-split HVAC units as specified in the RFP.
- D) Carrier package HVAC unit as specified in the RFP.

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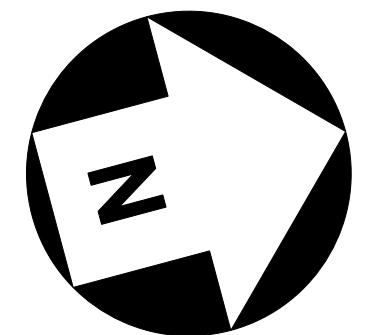
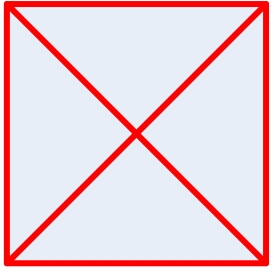


**Legend:  
New Unit Locations**

**Wall Mount  
Mini-Split**



**Grade Level  
Package  
Unit**



Scale: NTS  
Rev. 04/4/2024

**LESD District Warehouse HVAC Project**

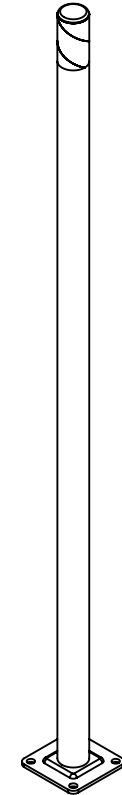
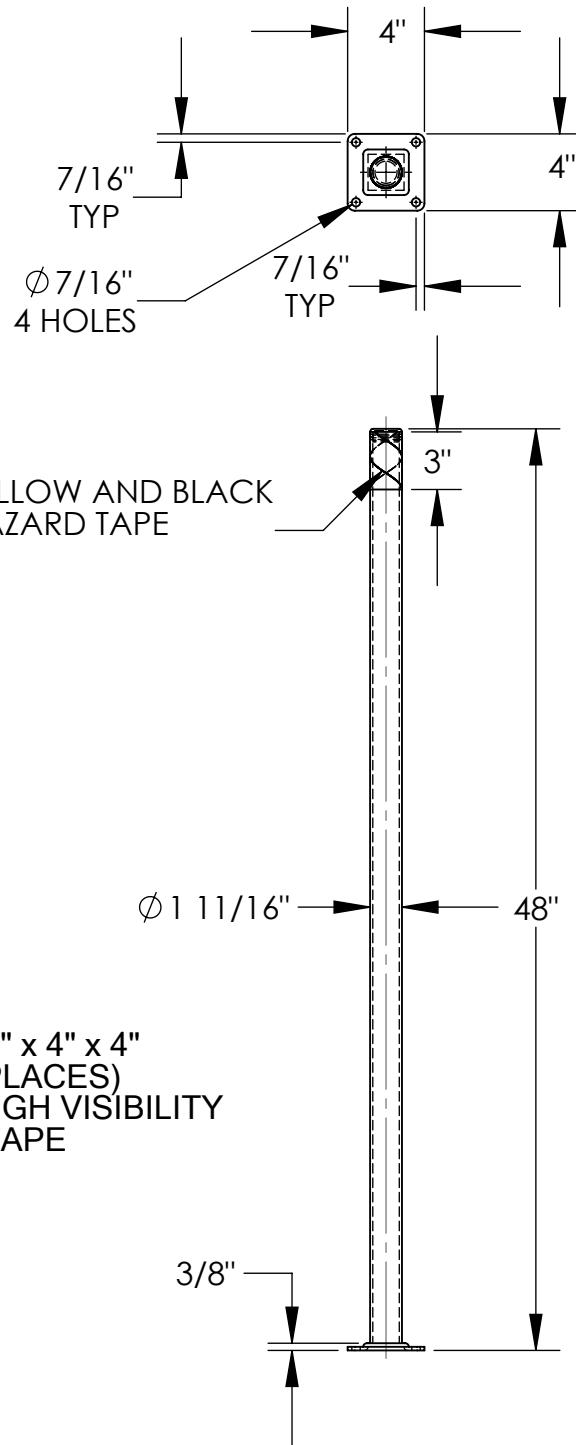
Lawndale Elementary  
School District Office  
4161 W 147th St.  
Lawndale, CA 90260  
310-973-1300

# STEEL PIPE SAFETY BOLLARD - BOL 48-2

APPROX WEIGHT: 9.84 lbs.  
 DOES NOT INCLUDE WEIGHT OF POWER OR PACKAGING!!!

\*\*\* ANY ADDITIONS, DELETIONS, OR OMISSIONS MUST BE CORRECTED ON THIS DRAWING AS THIS DRAWING WILL BE CONSIDERED ALL INCLUSIVE \*\*\*

ALL GRAPHICS PROVIDED ARE FOR REFERENCE ONLY. IF CERTAIN DIMENSIONS ARE CRITICAL PLEASE VERIFY THOSE DIMENSIONS WITH YOUR SALESPERSON



## STANDARD FEATURES

- MODEL NUMBER IS BOL-48-2
- OVERALL WIDTH IS 4 INCHES
- OVERALL LENGTH IS 4 INCHES
- OVERALL HEIGHT IS 48 INCHES
- PIPE DIA:  $1 \frac{11}{16}$
- LAG DOWN MOUNTING PLATE: 3/8" x 4" x 4"
- WITH 7/16" MOUNTING HOLES (4 PLACES)
- PAINTED SAFETY YELLOW FOR HIGH VISIBILITY
- 3" YELLOW AND BLACK HAZARD TAPE

## SPECIAL FEATURES

NONE

DIMENSION TOLERANCE  $\pm 1/4$ "

APPROVAL

I, THE UNDERSIGNED, AGREE THAT THE PRODUCT AS REPRESENTED SATISFIES DESIGN AND DIMENSION REQUIREMENTS. I ALSO ACKNOWLEDGE MY DUTY TO CONFIRM PRODUCT AND INSTALLATION COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS AND STANDARDS.  
**ALL SPECIAL UNITS ARE NON-RETURNABLE**  
 As drawn       As marked

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

LEAD TIME WILL START UPON RECEIPT OF SIGNED APPROVAL DRAWING

DISTRIBUTOR'S NAME:		P.O.#
VESTIL MANUFACTURING		X
DRAWN BY: J.BRANDT		DATE: 07/22/08
REFERENCE: X		SCALE: 1:10
QUOTED LEAD TIME: X		QUOTE # X
		FILE NAME: 23-007-016

## SECTION 23 3113

### METAL DUCTWORK

#### PART 1 -GENERAL

##### 1.01 SECTION INCLUDES

- A. Rectangular and round metal ducts and plenums for heating, ventilating, and air conditioning system from minus 2" to plus 5" Water Gage.

##### 1.02 RELATED SECTIONS

- A. Refer to other Division 23 Sections for exterior insulation of metal ductwork; not work of this section.
- B. Refer to other Division 23 Sections for ductwork accessories; not work of this section.
- C. Refer to other Division 23 Sections for fans and air handling units; not work of this section.
- D. Refer to other Division 23 Sections for testing, adjusting, and balancing of metal ductwork systems; not work of this section.

##### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for metal ductwork materials and products.
- B. Record Drawings: At project closeout, submit record drawings of installed metal ductwork and ductwork products, in accordance with requirements of Division 01.
- C. Maintenance Data: Submit maintenance data and parts lists for metal ductwork materials and products. Include this data, product data, shop drawings, and record drawings in maintenance manual in accordance with requirements of Division 01.

##### 1.04 QUALITY ASSURANCE

- A. Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with metal ductwork systems similar to that required for project.
- B. Codes and Standards:
  - 1. SMACNA Standards: Comply with SMACNA "HVAC Duct Construction Standards, Metal and Flexible" for fabrication and installation of metal ductwork.
  - 2. ASHRAE Standards: Comply with ASHRAE Handbook, Equipment Volume, Chapter 1 "Duct Construction", for fabrication and installation of metal ductwork.
  - 3. NFPA Compliance: Comply with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems" and NFPA 90B "Standard for the Installation of Warm Air Heating and Air Conditioning Systems."
- C. Field Reference Manual: Have available for reference at project field office, copy of SMACNA "HVAC Duct Construction Standards, Metal and Flexible."

### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protection: Protect shop-fabricated and factory-fabricated ductwork, accessories and purchased products from damage during shipping, storage, and handling. Prevent end damage and prevent dirt and moisture from entering ducts and fittings.
- B. Storage: Where possible, store ductwork inside and protect from weather. Where necessary to store outside, store above grade and enclose with waterproof wrapping.

## PART 2 -PRODUCTS

### 2.01 DUCTWORK MATERIALS

- A. Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections, including those which would impair painting.
- B. Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A653/A653M, lock forming quality, with G90 zinc coating in accordance with ASTM A653/A653M; and mill phosphatized for exposed locations.

### 2.02 MISCELLANEOUS DUCTWORK MATERIALS

- A. General: Provide miscellaneous materials and products of types and sizes indicated or, where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connection of ductwork and equipment.
- B. Fittings: Provide radius type fittings fabricated of multiple sections with maximum 18-degree change of direction per section. Unless specifically detailed otherwise, use 45-degree laterals and 45-degree elbows for branch takeoff connections. Where 90-degree branches are indicated, provide conical type tees.
- C. Screws and bolts shall be cadmium plated.
- D. Duct Liner: Permacote Linacoustic (rectangular), Permacote Spiracoustic (Round), complying with Thermal Insulation Manufacturer's Association (TIMA) AHC-101; of thickness indicated. 1 inch thick; 2 inches thick above roofline, unless indicated otherwise. Or approved equal.
- E. Duct Liner Adhesive: Comply with ASTM C 916 "Specifications for Adhesives for Duct Thermal Insulation". Adhesive used on the project shall meet the requirements of CalGreen Section 5.504.4.1.
- F. Duct Liner Fasteners: Comply with SMACNA HVAC Duct Construction Standards, Article S2.11.
- G. Duct Sealant: Non-hardening, non-migrating mastic, or liquid elastic sealant, type applicable for fabrication/installation detail, as compounded, and recommended by manufacturer specifically for sealing joints and seams in ductwork. Sealant used on the project shall meet the requirements of CalGreen Section 5.504.4.1.
- H. Duct Cement. Non-hardening migrating mastic or liquid neoprene-based cement, type applicable for fabrication/installation detail, as compounded, and recommended by

manufacturer specifically for cementing fitting components, or longitudinal seams in ductwork. Cement used on the project shall meet the requirements of CalGreen Section 5.504.4.1.

- I. Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.
- J. Flexible ducts: Manufacturer based upon Casco Model Silent Flex II. Equal products by Thermaflex or approved equal. Insulated flexible ductwork shall be a factory fabricated assembly composed of a high carbon spring steel wire with a non-corrosive zinc coating spiral helix permanently bound to a spun-bonded nonwoven nylon interior liner and supporting a fiberglass insulating blanket with a polyethylene jacket vapor barrier. Working pressure: + 1-1/2" W.G. minimum, complying with UL 181; with factory installed metal collar connectors, maximum length 5 feet. Suspend at maximum 2'-0" O.C.
- K. Under slab Ducts: For ductwork placed in concrete slabs, or under slabs on grade, fabricate ductwork of one of the following materials:
  - 1. Galvanized Steel.

### **2.03 SHOP FABRICATED LOW PRESSURE DUCTWORK**

- A. Shop-fabricate ductwork in 4, 8, 10 or 12-ft lengths, unless otherwise indicated or required to complete runs. Preassemble work in shop to greatest extent possible so as, to minimize field assembly of systems. Disassemble systems only to extent necessary for shipping and handling. Match-mark sections for reassembly and coordinated installation.
- B. Shop-fabricate ductwork of gages and reinforcement complying with SMACNA "HVAC Duct Construction Standards". Ducts shall be fabricated of galvanized sheet metal no less than 24 Gauge.
- C. Fabricate duct fittings to match adjoining ducts, and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to associated duct width; and fabricate to include turning vanes in elbows where shorter radius is necessary. Limit angular tapers to 30 degrees for contracting tapers and 20 degrees for expanding tapers.
- D. Fabricate ductwork with accessories installed during fabrication to the greatest extent possible. Refer to Division 23 Section "Ductwork Accessories" for accessory requirements.
- E. Fabricate ductwork with duct liner in each section of duct where indicated. Laminate liner to internal surfaces of duct in accordance with instructions by manufacturers of lining and adhesive and fasten with mechanical fasteners.

### **2.04 FACTORY FABRICATED LOW PRESSURE DUCTWORK**

- A. General: At Installer's option, provide factory-fabricated duct and fittings, in lieu of shop-fabricated duct, and fittings.
- B. Material: Galvanized sheet steel complying with ASTM A517, lock forming quality, with ASTM A525, G90 zinc coating, mill phosphatized.
- C. Gage: 24-gage minimum for round and oval ducts and fittings, 4" through 24" diameter.
- D. Elbows: One-piece construction for 90 degrees and 45-degree elbows 14" and smaller. Provide multiple gore construction for larger diameters with standing seam circumferential joint.

- E. Divided Flow Fittings: 90-degree tees, constructed with saddle tap spot welded and bonded to duct fitting body.
- F. Manufacturers: Subject to compliance with requirements, provide factory-fabricated ductwork of one of the following or equal:
  - 1. Semco Mfg., Inc.
  - 2. United Sheet Metal Div. United McGill Corp.
  - 3. Or approved equal.

## **2.05 DOUBLE WALL DUCTWORK CONSTRUCTION.**

- A. General: All ductwork installed on the exterior of the building shall be fabricated and installed per requirements of the detail in section 3.07.

## **PART 3 -EXECUTION**

### **3.01 INSPECTION**

- A. General: Examine areas and conditions under which metal ductwork is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

### **3.02 INSTALLATION OF METAL DUCTWORK**

- A. General: Assemble and install ductwork in accordance with recognized industry practices which will achieve air-tight (5% leakage for systems rated 3" and under; 1% for systems rated over 3") and noiseless (no objectionable noise) systems capable of performing each indicated service. Install each run with minimum number of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of type, which will hold ducts true-to-shape, and to prevent buckling. Support vertical ducts at every floor.
- B. Field Fabrication: Complete fabrication of work at project as necessary to match shop-fabricated work and accommodate installation requirements.
- C. Routing: Locate ductwork runs, except as otherwise indicated, vertically and horizontally and avoid diagonal runs wherever possible. Locate runs as indicated by diagrams, details, and notations or, if not otherwise indicated, run ductwork in shortest route which does not obstruct useable space or block access for servicing building and its equipment. Hold ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building. Limit clearance to 1/2" where furring is shown for enclosure or concealment of ducts, but allow for insulation thickness, if any.

Where possible, locate insulated ductwork for 1" clearance outside of insulation. Wherever possible in finished and occupied spaces, conceal ductwork from view, by locating in mechanical shafts, hollow wall construction or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.

- D. Electrical Equipment Spaces: Do not route ductwork through transformer vaults and their electrical equipment spaces and enclosures.
- E. Penetrations: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet

metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-1/2". Fasten to duct and substrate.

- F. Where ducts pass through fire-rated floors, walls, or partitions, provide fire stopping between duct and substrate.
- G. Coordination: Coordinate duct installations with installation of accessories, dampers, coil frames, equipment, controls, and other associated work of ductwork system.
- H. Installation: Install metal ductwork in accordance with SMACNA HVAC Duct Construction Standards.

### **3.03 INSTALLATION OF DUCT LINER**

- A. General: Install duct liner in accordance with SMACNA HVAC Duct Construction Standards.

### **3.04 INSTALLATION OF FLEXIBLE DUCT**

- A. Maximum Length: For any duct run using flexible ductwork, do not exceed 5'-0" extended length.
- B. Installation: Install in accordance with Section III of SMACNA "HVAC Duct Construction Standards, Metal and Flexible".
- C. Bends in flexible ducts shall have a radius of not less 1.5 times the internal diameters.

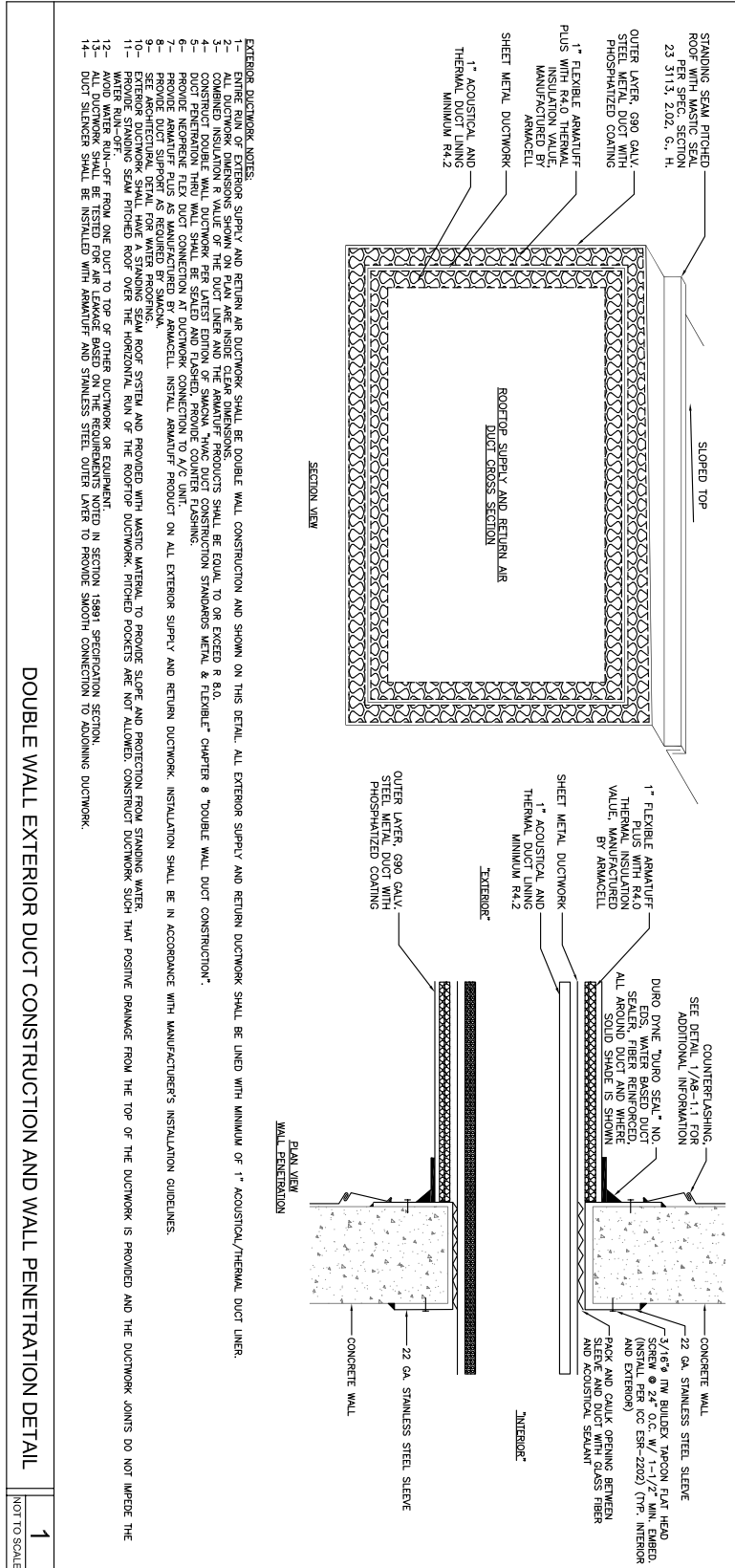
### **3.05 EQUIPMENT CONNECTIONS**

- A. General: Connect metal ductwork to equipment as indicated; provide flexible connection for each ductwork connection to equipment mounted on vibration isolators, and/or equipment containing rotating machinery. Provide access doors as indicated.

### **3.06 ADJUSTING AND CLEANING**

- A. Clean ductwork internally, unit by unit as it is installed, of dust and debris. Clean external surfaces of foreign substances, which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.
- B. Temporary closure: At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, or the period of rough installation, or during storage on the construction site and until final startup of the heating and cooling equipment, provide temporary closure of duct openings and protection of mechanical equipment during construction. All duct and other related air distribution component openings shall be covered with polyethylene film, tape, plastic, sheet metal or other methods acceptable to the enforcing agency which will prevent entrance of dust and debris.
- C. Balancing: Refer to Division 23 Section "Testing, Adjusting and Balancing" for air distribution balancing of metal ductwork; not work of this section. Seal any leaks in ductwork that become apparent in balancing process.

### **3.07 DOUBLE WALL DUCTWORK CONSTRUCTION AND INSTALLATION DETAIL.**



**DOUBLE WALL EXTERIOR DUCT CONSTRUCTION AND WALL PENETRATION DETAIL**

1  
NOT TO SCALE

**END OF SECTION 23 3113**

## SECTION 23 3300

### DUCTWORK ACCESSORIES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Types of ductwork accessories required for project include the following:
  - 1. Dampers.
    - a. Low pressure manual dampers.
    - b. Control dampers.
    - c. Counterbalanced relief dampers.
  - 2. Fire and smoke dampers.
  - 3. Turning vanes.
  - 4. Duct hardware.
  - 5. Duct access doors.
  - 6. Flexible connections.

##### 1.02 RELATED SECTIONS

- A. Refer to other Division 23 Sections for testing, adjusting, and balancing of ductwork accessories; not included in work of this section.
- B. Division 23 Section "Metal Ductwork."
- C. Division 23 Section "HVAC Identification."

##### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data for each type of ductwork accessory including dimensions, capacities, and materials of construction; and Installation Instructions.

##### 1.04 QUALITY ASSURANCE

- A. Codes and Standards:
  - 1. SMACNA Compliance: Comply with applicable portions of SMACNA "HVAC Duct Construction Standards, Metal and Flexible".
  - 2. Industry Standards: Comply with ASHRAE recommendations pertaining to construction of ductwork accessories, except as otherwise indicated.
  - 3. UL Compliance: Construct, test, and label fire dampers in accordance with UL Standard 555 "Fire Dampers and Ceiling Dampers".
  - 4. Fire dampers shall bear California State Fire Marshal Listing Number.
  - 5. NFPA Compliance: Comply with applicable provisions of NFPA 90A "Air Conditioning and Ventilating Systems", pertaining to installation of ductwork accessories.

## **PART 2 - PRODUCTS**

### **2.01 DAMPERS**

- A. Manufacturers: Subject to compliance with requirements set forth in construction documents, provide dampers of one of the following:
  - 1. Ruskin Manufacturing Co.
  - 2. Air Balance Co.
  - 3. Pottorff Company, Inc.
- B. Low Pressure Manual Dampers: Provide dampers of single blade type and of multi-blade type, constructed in accordance with SMACNA "HVAC Duct Construction Standards". "Jiffy" type dampers are not acceptable.

### **2.02 BACKDRAFT DAMPERS**

- A. General: Provide back-draft dampers of types and sizes indicated. Construct casings of 0.090-thickness aluminum with mitered corners.
- B. Blades, 0.025" formed aluminum with extruded vinyl edge seals. Bearings, Zytel. Linkage, 1/8" x 1/8" aluminum tie bars concealed in frame.
- C. Counterbalance: Zinc plated bar on blades (except top blade). Adjustable for final setting Mill finish
- D. Control Dampers: Refer to Division 23 section "Sequence of Operation" for control dampers; not work of this section.
- E. Counterbalanced Relief Dampers: Provide dampers with parallel blades, counterbalanced and factory-set to relieve at indicated static pressure. Construct blades of 16-ga aluminum provide 1/2" diameter ball bearings, 1/2" diameter steel axles spaced on 9" centers. Construct frame of 2" x 1/2" x 1/8" steel channel for face areas 25 sq. ft. and under; 4" x 1-1/2" x 16-ga channel for face areas over 25 sq. ft. Provide galvanized steel finish on frame with aluminum touch-up.
- F. Manufacturer: Subject to compliance with requirements, provide dampers of one of the following:
  - 1. Air Balance, Inc.
  - 2. Ruskin Mfg. Co.
  - 3. Pottorff Company, Inc.

### **2.03 FIRE AND SMOKE DAMPERS**

- A. California State Fire Marshal approved, designed, and constructed in accordance with NFPA 90A and UL Standard 555 and bear stamp showing compliance.
- B. Fire Dampers: Provide fire dampers, of types and sizes indicated. Construct casings of 11-ga galvanized steel. Provide fusible link rated at 160 to 165 degrees F. (71 to 74 degrees C.) (unless otherwise indicated.) Provide damper with positive lock in closed position, and with the following additional features.
  - 1. Damper Blade Assembly: Curtain type.

- A. Manufacturer: Subject to compliance with requirements, provide fire and smoke dampers of one of the following:
  - 1. Air Balance, Inc.
  - 2. Ruskin Mfg. Co.
  - 3. Pottorff Company, Inc.

#### **2.04 TURNING VANES**

- A. Manufactured Turning Vanes: Provide turning vanes constructed of 1-1/2" wide curved blades set at 3/4" O.C., supported with bars perpendicular to blades set at 2" O.C., and set into side strips suitable for mounting in ductwork.
- B. Acoustic Turning Vanes: Provide acoustic turning vanes constructed of airfoil shaped aluminum extrusion with perforated faces and fiberglass fill.
- C. Manufacturer: Subject to compliance with requirements, provide turning vanes of one of the following:
  - 1. Aero Dynen Co.
  - 2. Airsan Corp.
  - 3. Anemostat Products Div.; Dynamics Corp. of America
  - 4. Barber-Colman Co.
  - 5. Duro Dyne Corp.
  - 6. Environmental Elements Corp. Subs, Koppers Co., Inc
  - 7. Hart & Cooley Mfg. Co.
  - 8. Register & Grille Mfg. Co., Inc.
  - 9. Souther, Inc.

#### **2.05 DUCT HARDWARE**

- A. General: Provide duct hardware, manufactured by one manufacturer for all items on project, for the following:
  - 1. Test Holes: Provide in ductwork at fan inlet and outlet, and elsewhere as indicated, duct test holes, consisting of slot and cover, for instrument tests.
  - 2. Quadrant Locks: Provide for each damper, quadrant lock device on one end of shaft; and end bearing plate on other end for damper lengths over 12". Provide extended quadrant locks and end extended bearing plates for externally insulated ductwork.
- B. Manufacturer: Subject to compliance with requirements, provide duct hardware of one of the following:
  - 1. Ventfabrics, Inc.
  - 2. Young Regulator Co.

#### **2.06 DUCT ACCESS DOORS**

- A. General: Provide duct access doors where required.
- B. Construction: Construct of same or greater gage as ductwork served, provide insulated doors for insulated ductwork. Provide flush frames for un-insulated ductwork, extended frames for externally insulated duct. Provide one side hinged and other side with one handle-type latch for doors 12" high and smaller, 2 handle-type latches for larger doors.
- A. Manufacturer: Subject to compliance with requirements, provide duct access doors of

one of the following:

1. Air Balance Inc.
2. Duro Dyne Corp.
3. Register & Grille Mfg. Co., Inc.
4. Ruskin Mfg. Co.
5. Ventfabrics, Inc.
6. Zurn Industries, Inc.; Air Systems Div.

## **2.07 FLEXIBLE CONNECTORS**

- A. General: Provide flexible duct connections wherever ductwork connects to vibration-isolated equipment. Construct flexible connections of neoprene-coated flameproof fabric crimped into duct flanges for attachment to duct and equipment. Make airtight joint. Provide adequate joint flexibility to allow for thermal, axial, transverse, and torsional movement, and, also capable of absorbing vibration of connected equipment.
- B. Manufacturer: Subject to compliance with requirements, provide flexible connections of one of the following:
  1. American/Elgen Co.; Energy Div
  2. Duro Dyne Corp.
  3. Flexaust (The) Co
  4. Ventfabrics, Inc.

## **PART 3 - EXECUTION**

### **3.01 INSPECTION**

- A. Examine areas and conditions under which ductwork accessories will be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

### **3.02 INSTALLATION OF DUCTWORK ACCESSORIES**

- A. Install ductwork accessories in accordance with manufacturer's installation instructions, with applicable portions of details of construction as shown in SMACNA standards, and in accordance with recognized industry practices to ensure that products serve intended function.
- B. Install turning vanes in square or rectangular 90-degree elbows in supply and exhaust air systems, and elsewhere as indicated.
- C. Install access doors to open against system air pressure, with latches operable from either side, except outside only where duct is too small for person to enter.
- D. Coordinate with other work, including ductwork, as necessary to interface installation of ductwork accessories properly with other work.

### **3.03 FIELD QUALITY CONTROL**

- A. Operate install ductwork accessories to demonstrate compliance with requirements. Test for air leakage while system is operating. Repair or replace faulty accessories, as required to obtain proper operation and leak proof performance.

**3.04 ADJUSTING AND CLEANING**

- A. Adjusting: Adjust ductwork accessories for proper settings, install fusible links in fire dampers and adjust for proper action.
  - 1. Label access doors in accordance with Division 23 Section "HVAC Identification".
  - 2. Final positioning of manual dampers is specified in Division 23 Section "Testing, Adjusting, and Balancing".
- B. Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

**3.05 EXTRA STOCK**

- A. Furnish extra fusible links to Owner, one link for every 10 installed of each temperature range; obtain receipt.

**END OF SECTION 23 3300**

**NEW HVAC UNIT at DISTRICT WAREHOUSE  
LAWNDALE ELEMENTARY SCHOOL DISTRICT**