

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK



CITY OF PORTLAND BUILDING PERMIT

This is to certify that WOODWORKING & CABINETRY LLC Located At 225 INDUSTRIAL WAY

Job ID: 2012-02-3376-CH OF USE

CBL: 329- A-007-001

has permission to Change the Use Industrial & Storage to remain, add a paint spray booth to Unit #3 (C)
provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of
the Statutes of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of
the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured
before this building or part thereof is lathed or otherwise
closed-in. 48 HOUR NOTICE IS REQUIRED.

A final inspection must be completed by owner
before this building or part thereof is occupied. If a
certificate of occupancy is required, it must be

Fire Prevention Officer

 3/14/12

Code Enforcement Officer / Plan Reviewer

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY
PENALTY FOR REMOVING THIS CARD

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No: 2012-02-3376-CH OF USE	Date Applied: 2/21/2012	CBL: 329- A-007-001	
Location of Construction: 225 INDUSTRIAL WAY	Owner Name: Woodworking & Cabinetry LLC	Owner Address: 40 PORTLAND PIER # 11 PORTLAND, ME 04101	Phone: 653-8216
Business Name:	Contractor Name: Dekko LLC – Jon Sampson	Contractor Address: 40 Portland Pier #11, Portland, ME 04101	Phone: 712-9147
Lessee/Buyer's Name:	Phone:	Permit Type: BLDG alterations & change of use	Zone: I-M
Past Use: Light manufacturing and warehouse with accessory offices in units B ² -C ³ -D ⁴ under permit #10-1230	Proposed Use: To reactivate permit #10-1230 and change the use of unit C ^{#3} to be painting with a spray booth – other uses light manufacturing and warehouse with accessory offices per plan	Cost of Work: \$30.00	CEO District:
		Fire Dept: <input checked="" type="checkbox"/> Approved w/ conditions <input type="checkbox"/> Denied <input type="checkbox"/> N/A	Inspection: Use Group: F-1/51 Type: 3A IB# 2009
		Signature: <i>[Signature]</i> (SB)	Signature: <i>[Signature]</i>
Proposed Project Description: permit connected to #101230, need 3 c of o's	Pedestrian Activities District (P.A.D.)		
Permit Taken By: Gayle	Zoning Approval		

3/14/12

<p>1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.</p> <p>2. Building Permits do not include plumbing, septic or electrical work.</p> <p>3. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work.</p>	<p>Special Zone or Reviews</p> <p><input type="checkbox"/> Shoreland</p> <p><input type="checkbox"/> Wetlands</p> <p><input type="checkbox"/> Flood Zone</p> <p><input type="checkbox"/> Subdivision</p> <p><input type="checkbox"/> Site Plan</p> <p>___ Maj ___ Min ___ MM</p> <p>Date: <i>ok with conditions</i></p>	<p>Zoning Appeal</p> <p><input type="checkbox"/> Variance</p> <p><input type="checkbox"/> Miscellaneous</p> <p><input type="checkbox"/> Conditional Use</p> <p><input type="checkbox"/> Interpretation</p> <p><input type="checkbox"/> Approved</p> <p><input type="checkbox"/> Denied</p> <p>Date: <i>3/23/12</i></p>	<p>Historic Preservation</p> <p><input checked="" type="checkbox"/> Not in Dist or Landmark</p> <p><input type="checkbox"/> Does not Require Review</p> <p><input type="checkbox"/> Requires Review</p> <p><input type="checkbox"/> Approved</p> <p><input type="checkbox"/> Approved w/Conditions</p> <p><input type="checkbox"/> Denied</p> <p>Date: <i>[Signature]</i></p>
	<p>CERTIFICATION</p> <p><i>[Signature]</i> 3/23/12</p>		

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE

3-19-12 DWM Temp CO (30 Days for Site panel) Issued



Certificate of Occupancy



CITY OF PORTLAND, MAINE

Department of Planning and Urban Development
Building Inspections Division

Location: 225 INDUSTRIAL WAY

CBL: 329- A-007-00

Issued to: WOODWORKING & CABINETS LLC

Date Issued: 3/19/2012

This is to certify that the building, premises, or part thereof, at the above location, built-altered-changed as to use under Building Permit No. 2012-02-3376-CH OF USE, has had a final inspection, has been found to conform substantially to the requirements of the Building Code and the Land Use Code of the City of Portland, and is hereby approved for occupancy or use, limited or otherwise, as indicated below.

PORTION OF BUILDING OR PREMISES

APPROVED OCCUPANCY

UNIT 3, INCLUDING SPRAY PAINT BOOTH

USE GROUP F-1/S-1
TYPE 3A
IBC 2009

Limiting Conditions: This Temporary Certificate of Occupancy expires on April 19, 2012.

Approved:

3-19-2012

(Date)

Inspector

Inspections Division Director

Notice: This certificate identifies the legal use of the building or premises, and ought to be transferred from owner to owner upon the sale of the property.

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

Certificate of Occupancy Inspection

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.



PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life • www.portlandmaine.gov

Acting Director of Planning and Urban Development
Gregory Mitchell

Job ID: 2012-02-3376-CH OF USE

Located At: 225 INDUSTRIAL
WAY

CBL: 329- A-007-001

Conditions of Approval:

Zoning

1. Separate permits shall be required for any new signage.
2. This permit is being approved on the basis of plans submitted. Any deviations shall require a separate approval before starting that work.
3. All previous conditions from permit #10-1230 are still in force with the issuance of this permit.

Fire

1. The building shall comply with City Code Chapter 10.
2. This permit is being approved on the basis of the plans submitted. Any deviation from the plans would require amendments and approval.
3. Any Fire alarm or Sprinkler systems shall be reviewed by a licensed contractor[s] for code compliance. Compliance letters are required.
4. A separate Suppression System Permit is required for all new suppression systems or sprinkler work effecting more than 20 heads. The spray booth suppression system is new. This review does not include approval of sprinkler system design or installation.
5. The existing sprinkler system is required for common path of travel purposes from the mezzanine and the building code.
6. A sprinkler supervisory system shall be provided in accordance with NFPA 101, *Life Safety Code*, and NFPA 72, *National Fire Alarm and Signaling Code*. Sprinkler supervisory systems shall monitor for water flow and sprinkler supervisory signals via an approved fire alarm panel to central station. One smoke detector shall be located over the panel, a manual pull station located at the front door, and an audible water flow alarm provided.
7. A separate Fire Alarm Permit is required for the sprinkler supervisory system. This review does not include approval of fire alarm system design or installation.
8. The sprinkler supervisory system shall comply with the City of Portland Standard for Signaling Systems for the Protection of Life and Property. All fire alarm installation and servicing companies shall have a Certificate of Fitness from the Fire Department.
9. Fire Alarm and suppression systems shall be maintained. If system is to be off line over 4 hours a fire watch shall be in place. Dispatch notification required 874-8576.
10. System acceptance and commissioning must be coordinated with alarm and suppression system contractors and the Fire Department. Call 874-8703 to schedule.
11. A Knox Box is required per city ordinance.
12. A firefighter Building Marking Sign is required per the enclosed example.
13. Fire extinguishers are required per NFPA 1.

Job ID: 2012-02-3376-CH OF USE

Located At: 225 INDUSTRIAL
WAY

CBL: 329- A-007-001

14. Emergency lights and exit signs are required. Emergency lights and exit signs are required to be labeled in relation to the panel and circuit and on the same circuit as the lighting for the area they serve.
15. Any cutting and welding done will require a Hot Work Permit from Fire Department. smoke proof.

Building

1. Application approval based upon information provided by applicant. Any deviation from approved plans requires separate review and approval prior to work.
2. Equipment shall be installed in compliance with the manufacturer's specifications and the UL listing.
3. Separate permits are required for any electrical, plumbing, sprinkler, fire alarm, HVAC systems, heating appliances, including pellet/wood stoves, commercial hood exhaust systems and fuel tanks. Separate plans may need to be submitted for approval as a part of this process.



2012 02 3376

66

General Building Permit Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

Location/Address of Construction: <u>225 Industrial Way I-M</u>		
Total Square Footage of Proposed Structure/Area	Square Footage of Lot	Number of Stories
Tax Assessor's Chart, Block & Lot Chart# Block# Lot# <u>322 A 007</u>	Applicant * must be owner, Lessee or Buyer * Name <u>WOODWORKING + CABINETS LLC DBA DEKKO</u> Address <u>40 PORTLAND PIER #11</u> City, State & Zip <u>PORTLAND, ME 04101</u>	Telephone: <u>207-653-8216</u>
Lessee/DBA (If Applicable) <u>DEKKO LLC 40 PORTLAND PIER #11 PORTLAND ME 04101</u>	Owner (if different from Applicant) Name Address City, State & Zip <u>RECEIVED FEB 21 2012</u>	Cost Of Work: \$ <u>30.00</u> C of O Fee: \$ <u>225.00</u> Total Fee: \$ <u>255.00</u>
Current legal use (i.e. single family) <u>Commercial Warehouse Vacant</u> Number of Residential Units _____ If vacant, what was the previous use? <u>NEW BLDG - Vacant</u> just storage Proposed Specific use: <u>PAINTING (INCL. SPRAY BATH)</u> Is property part of a subdivision? _____ If yes, please name _____ Project description: <u>unit C will be painted vacated to paint and</u> <u>unit C B O O S S E S</u>		
RESUBMITTING FOR EXPIRED PERMIT & CHANGE USE BRY3 #101230		
Contractor's name: <u>DEKKO LLC</u>		
Address: <u>40 PORTLAND PIER #11</u>		
City, State & Zip <u>PORTLAND ME 04101</u>		Telephone: <u>207 653 8216</u>
Who should we contact when the permit is ready: <u>JON SAMPSON</u>		Telephone: <u>207 712 9147</u>
Mailing address: <u>40 PORTLAND PIER #11 PORTLAND ME 04101</u>		

Please submit all of the information outlined on the applicable Checklist. Failure to do so will result in the automatic denial of your permit.

In order to be sure the City fully understands the full scope of the project, the Planning and Development Department may request additional information prior to the issuance of a permit. For further information or to download copies of this form and other applications visit the Inspections Division on-line at www.portlandmaine.gov, or stop by the Inspections Division office, room 315 City Hall or call 874-8703.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature: [Signature]

Date: 2/21/12

This is not a permit; you may not commence ANY work until the permit is issue

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 10-1230	Issue Date:	CBL: 329 A007001
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Location of Construction: 225 INDUSTRIAL WAY	Owner Name: WOODWORKING & CABINETRY	Owner Address: 40 PORTLAND PIER # 11	Phone:
Business Name:	Contractor Name: Dekko / Walt Juve	Contractor Address: 40 Portland Pier Portland	Phone 2076538216
Lessee/Buyer's Name	Phone:	Permit Type: Alterations - Commercial	Zone: I-M

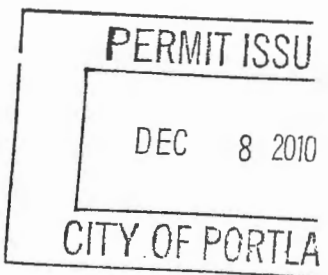
Past Use: Warehouse / Light Manufacturing -	Proposed Use: Warehouse / Light Manufacturing - build within existing structure (3) 20' x 22.5' Mezzanines w/ 3 offices w/ interior renovations	Permit Fee: \$460.00	Cost of Work: \$44,000.00	CEO District: 5
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FIRE DEPT: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied * See Conditions	INSPECTION: Use Group: F-1/S-1 Type: 3A IBC-2003
Signature: <i>(Signature)</i>	Signature: <i>(Signature) 12/8/10</i>
PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)	
Action: <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied	
Signature:	Date:

Proposed Project Description:
build within existing structure (3) 20' x 22.5' Mezzanines w/ 3 offices w/
interior renovations
units B, C & D
associated w/ permit # 08-0806

Permit Taken By: ldobson	Date Applied For: 10/01/2010	Zoning Approval
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<p>1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.</p> <p>2. Building permits do not include plumbing, septic or electrical work.</p> <p>3. Building permits are void if work is not within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..</p>	Special Zone or Reviews	Zoning Appeal	Historic Preservation
	<p><i>associated with this permit</i></p>	<p><input type="checkbox"/> Special</p>	<p><input type="checkbox"/> Historic</p> <p><input type="checkbox"/> Special Use</p> <p><input type="checkbox"/> Other</p>



CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 10-1230	Issue Date:	CBL: 329 A007001
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Location of Construction: 225 INDUSTRIAL WAY	Owner Name: WOODWORKING & CABINETRY	Owner Address: 40 PORTLAND PIER # 11	Phone:
Business Name:	Contractor Name: Dekko / Walt Juve	Contractor Address: 40 Portland Pier Portland	Phone: 2076538216
Lessee/Buyer's Name	Phone:	Permit Type: Alterations - Commercial	Zone: I-M

Past Use: Warehouse / Light Manufacturing -	Proposed Use: Warehouse / Light Manufacturing - build within existing structure (3) 20' x 22.5' Mezzanines w/ 3 offices w/ interior renovations	Permit Fee: \$460.00	Cost of Work: \$44,000.00	CEO District: 5
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Proposed Project Description: build within existing structure (3) 20' x 22.5' Mezzanines w/ 3 offices w/ interior renovations <i>units B, C & D</i>	FIRE DEPT: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied <i>* See Conditions</i>	INSPECTION: Use Group: <i>F-1/S-1</i> type: <i>3A</i> <i>IBC-2003</i>
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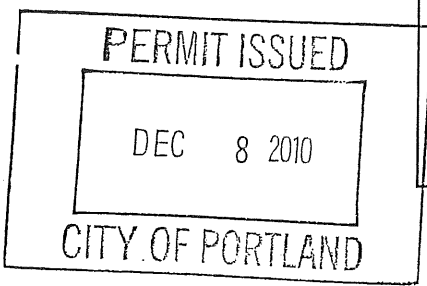
Signature: <i>(Signature)</i>	Signature: <i>WB 12/8/10</i>
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PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)

Action: <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied
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Signature:	Date:
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Permit Taken By: ldobson	Date Applied For: 10/01/2010	Zoning Approval			
<ol style="list-style-type: none"> This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules. Building permits do not include plumbing, septic or electrical work. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work. 	Special Zone or Reviews <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetland <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan	Zoning Appeal <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied	Historic Preservation <input checked="" type="checkbox"/> Not in District or Landmark <input type="checkbox"/> Does Not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied		
	Maj <input type="checkbox"/> Minor <input type="checkbox"/> MM <input type="checkbox"/> Date: <i>10/4/10</i>	Date:	Date:	Date:	



CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT _____ ADDRESS _____ DATE _____ PHONE _____

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE _____ DATE _____ PHONE _____

HELEN WATTS ENGINEERING

455 Litchfield Road
Bowdoin, ME 04287
(207) 522-9366 · fax (207) 666-3920
hcwatts@gwi.net
November 22, 2010

Mr. Walt Juve
Dekko, LLC
40 Portland Pier #11
Portland, ME 04101

Re: 225 Industrial Way, Portland, Maine
HWE P/N 10-039

Dear Walt,

This letter is to provide additional information as requested by the City of Portland Codes Enforcement office for your project to add mezzanines to the three new spaces in your building.

The building was permitted as a Type IIA building. The interior partition walls for the bathrooms and mechanical spaces were framed with wood walls and ceilings. The wood was not fire-treated. This is not permitted in Type IIA construction. The proposed mezzanines are framed with wood bearing on the existing interior walls and some new wood framing. These are also not permitted under Type IIA buildings. The pertinent building code is the 2003 IBC.

Building Use Group: F-1 (Section 306, F-1 includes millwork and woodworking)

Building Area: Existing, wood framed: est. 38'x76' = 2888SF SF not sprinkled

Ell, wood framed: 14'x38' = 532 sf

Metal building: 150'x46' = 6900 sf

Total building added = 7432 sf dry sprinkler

Total building old + new = 10320 sf

Building height (new building): (new ell + existing building): 15'-7", new metal: estimated at 30'.

All areas sprinklered. (504.2 approved automatic sprinkler system allows 20' increase in allowable height + 1 additional story). There is no 2-hour wall between new metal building and the ell, there is a 2-hour wall between the ell and the original building.

Section 505, mezzanines do not add to building area or height for Section 503.

A single means of egress is provided per 1004.2.1. The distance limitation in 1004.2.5 is met.

The mezzanine occupant load of enclosed space is less than 10.



Section 506 – this building is allowed area modifications for allowable area for having both sprinklers and frontage on public ways, but the building is below the allowable area for Type IIIA (19000 SF).

The types of construction are shown in Chapter 6. The building meets Type IIIA, max SF = 19,000 SF, max height = 75', building elements per 601, non-combustible exterior walls per 602.3, and interior walls may be any material permitted by IBC 2003.

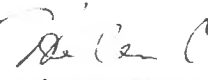
We therefore recommend that the Building Type be changed to Type IIIA.

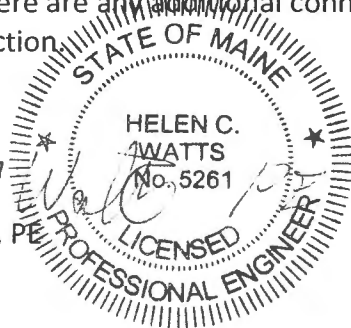
The following connection schedule is recommended for typical details for the new mezzanines:

1. At the metal-stud bearing wall between the three sections of the building: Kamco studs are assumed to be equal to Dietrich 20 gauge 6" metal studs. Where framing is supported off the metal stud walls, the header is to be SPF#2 2x12 or better, attached to the studs with Dietrich S689 EasyClip™ S-Series™ Clip Angles or equal, see: (<http://www.dietrichindustries.com/products/>, p. 100-101, Floor Framing Connections), 9 screws to header, #10 metal screws, fill all holes to the metal stud.
2. Hanger for joists to header: Assume 630(12/16) = 473 plf header or 630#/stud @ 16" OC. At the steel-stud-framed walls between the three sections of the building, install Simpson LBV1.56/11.25 Hanger, or equal, full nailing, header to LVL joist.
3. At steel beams: bolt 2x4 plate to top of steel beams to fasten a rim joist and LVL joists.
4. Columns: bolt 6x4x1/4" x 4" to bottom flange, 2 – 3/8" bolts, 4 – wood screws into column. One angle per column.
5. Columns at slab, bolt 6x4x1/4" x 4" angle to floor, 1 – 1/2" expansion bolt, 4 – wood screws to column.

Please call if there are any additional connection designs needed for any changes arising during construction.

Yours truly,


Helen C. Watts, PE
Principal



HCW/

c:\users\helen\hwe\225 ind mezz\code type + connection ltr.docx

HELEN WATTS ENGINEERING

455 Litchfield Road
Bowdoin, ME 04287
(207) 522-9366 · fax (207) 666-3920
hcwatts@gwi.net
March 9, 2012

Mr. Walt Juve
Dekko, LLC
40 Portland Pier #11
Portland, ME 04101

Re: 225 Industrial Way, Portland, Maine; HWE P/N 10-039

Dear Walt,

This letter is to provide additional information as requested by the City of Portland Codes Enforcement office for your project to use the paint spray booth in your building.


The Building Type is Type IIIA. This allows wood structural framing for the mezzanines. The building built in 2008 is sprinklered.

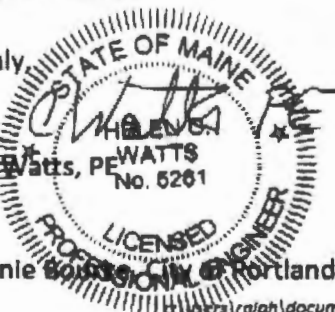
Chapter 15 of the International Fire Code defines Limited Spraying Space, Spray Booth, and Spray Rooms. 1504 specifies that Spray Booths be non-combustible, 18 gage single-skin, 20 gage double-skin, smooth interior surfaces, and personnel doors to be a minimum 30 inches wide and 80 inches high. Spray booths are to have a clear space of 3 feet around. Spray Booths may be closer to or directly against noncombustible outside walls or one hour rated interior walls.

The walls are sided with non-structural panels with an interior and exterior aluminum skin and a foam core. The panels are assumed to be Kamco panels built by Laminators Incorporated of the Omega Foam Ply type. This panel has a flame spread of less than 25 based on ASTM E84, and is therefore a Class A panel. The NFPA rating is A; the ICC construction type is A. The exterior walls therefore are considered noncombustible and the spray booth may be placed against these walls.

Please call if there are any additional connection designs needed for any changes arising during construction.

Yours truly,


Helen C. Watts, PE
Principal



e-c: Jeannie [redacted] Portland, Inspections Office
HCW/

\\users\raiph\documents\hwe\completed 2010\225 Ind mezz\code type spray booth.docx

HELEN WATTS ENGINEERING

455 Litchfield Road
Bowdoin, ME 04287
(207) 522-9366 · fax (207) 666-3920
hcwatts@gwi.net

March 13, 2012

Mr. Walt Juve
Dekko, LLC
40 Portland Pier #11
Portland, ME 04101

Re: 225 Industrial Way, Portland, Maine
HWE P/N 10-039

Dear Walt,

This letter is to provide additional information as requested by the City of Portland Codes Enforcement office for your project to use the paint spray booth in your building.

The Building Type is Type IIIA. This allows wood structural framing for the mezzanines. The building built in 2008 is sprinklered. The Commentary clarifies that load bearing exterior walls must comply with the higher of the values of Table 601 or 602, while nonbearing exterior walls need comply only with Table 602. The exterior walls are considered non-load bearing; the loads (other than self-weight) are taken by the steel framing. The wind loads are transmitted by the panels to the steel framing in the same way that glazing panels transmit wind loads; both are considered non-structural.

Chapter 15 of the International Fire Code defines Limited Spraying Space, Spray Booth, and Spray Rooms. 1504 specifies that Spray Booths be non-combustible, 18 gage single-skin, 20 gage double-skin, smooth interior surfaces, and personnel doors to be a minimum 30 inches wide and 80 inches high. Spray booths are to have a clear space of 3 feet around. Spray Booths may be closer to or directly against noncombustible outside walls or one hour rated interior walls.

The walls are sided with non-structural panels with an interior and exterior aluminum skin and a foam core. The exterior walls are Kingspan 300 GS Granitestone panels. See the attached document showing the technical data for this product. The panels are shown to have a Class 1 fire rating based on ASTM 4880; this corresponds to a 1-hour fire rating. This panel has a flame spread of less than 25 based on ASTM E84, and is therefore a Class A panel. The NFPA rating is A; the ICC construction type is A.

The exterior walls therefore are considered noncombustible and the spray booth may be placed against these walls.

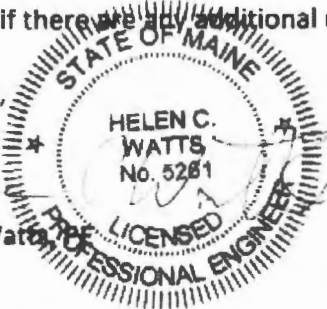
RECEIVED
MAR 14 2012
Dept. of Building Inspections
City of Portland Maine



Further, the panels meet the requirements of Table 602, as required for a Type IIIA building.

Please call if there are any additional questions.

Yours truly,



Helen C. Watts
Principal

F.E.

RECEIVED
MAR 14 2012
Dept. of Building Inspections
City of Portland Maine

Attached: 300_G5_Granitstone_Data_Sheet

e-c: Walt Juve, Jeannie Bourke, City of Portland, Inspections Office

HCW/

c:\users\ralph\documents\hwe\completed 2010\225 ind mezz\code type spray booth.docx

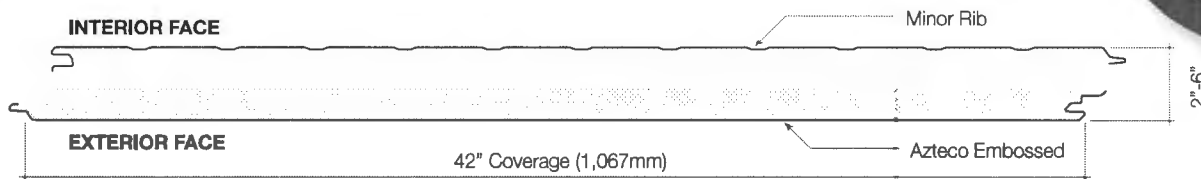
Insulated Panels

300 GS Granitstone[®]

INSULATED WALL PANEL SYSTEM

Kingspan's single component systems can increase speed of build by up to 50%

Dimensions



Specifications

Dimensions:	Panel Width – 42" / Panel Length – Minimum 10'-0"; Maximum 48'-0"
Joint Configuration:	Interlocking parallel tongue and groove
Insulation Core:	Foamed-in-place polyisocyanurate (PIR) with nominal density of 2.3-2.6 lbs./cu. ft.
Material:	Exterior – 24 gauge Azteco [®] embossed steel, AZ50 Galvalume [®] / Zinalume [®] or G90 galvanized. Also available in 22 gauge facings where extra durability is required. Interior – 26 gauge stucco embossed steel, AZ50 Galvalume [®] / Zinalume [®] or G90 galvanized. Also available in 24 and 22 gauge facings.
Finish Options:	Exterior – Standard finish consists of oven baked epoxy primer with factory applied sprayed stucco acrylic aggregate, minimum 12 mils dry film thickness. Interior – Standard finish is Valspar [®] modified polyester, USDA accepted and suited for most wash down environments. Valspar Fluorpon [®] PVDF can also be used.

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Kingspan[®]

Applications

300 GS Series Granitstone® combines the many advantages of lightweight insulated panels with the aesthetics of stucco or natural stone. Panels resemble stucco, and use an acrylic aggregate finish factory-applied over primed steel facings. Granitstone® Quartz panels provide the ultimate in natural stone appearance. Panels are also available in striated profile.

The interior face features a minor rib profile providing a clean, flat appearance that is easily washable.

300 GS Series is ideal for new and retrofit applications across commercial and industrial market sectors.

Design features

Granitstone® panels arrive to site ready for quick and easy installation, removing the need for additional sub-trades.

Granitstone® panels are designed for use with light gauge girts, steel stud or tube steel wall systems.

A wide range of standard and custom colors are available with field proven durability of over 25 years.

Customer options

Choose from 8 in-stock Granitstone® colors, 5 in-stock Quartz colors, or select a custom color to match your needs. For interior heavy wash down environments, plastisol (PVC) coatings as well as stainless steel facings are available.



Performance testing and approvals

Kingspan insulated panels meet specific building envelope performance criteria and requirements stipulated by US and Canadian building codes. Panels are tested in accordance with UL, ULC, FM and ASTM approval standards, testing methods and procedures. Kingspan insulated panels are listed by FM Global and Warnock Hersey.

Test	Procedure	Results
Fire	FM 4880	Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings, and Exterior Wall Systems
	ASTM E84	Flame Spread: 25 or Less Smoke Developed: 450 or Less
	ULC-S101	Standard Methods of Fire Endurance Tests of Building Construction and Materials
	ULC-S102	Standard Method of Test for Surface Building Characteristics of Building Materials and Assemblies
	ULC-S127	Standard Corner Wall Method of Test for Flammability Characteristics of Non-Melting Building Materials
	UBC26-4 / NFPA 285	Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
	NFPA 259	Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
Toxicity Test	State of New York, Article 15, Part 1120 of the New York State Uniform Fire Prevention Code	Kingspan panels are in compliance
Strength	FM 4881	Approval Standard for Class 1 Exterior Wall Systems
	ASTM E72 Chamber Method	Panel load / span and deflection tables are available
Thermal Transmission	ASTM C518	2" R = 15 / U = 0.067 2.5" R = 19 / U = 0.053 3" R = 24 / U = 0.042 4" R = 32 / U = 0.031 5" R = 41 / U = 0.024 6" R = 49 / U = 0.020
Air Infiltration	ASTM E283	0.003 CFM/ft ² of Panel Area at 6.24 psf
Water Penetration	ASTM E331	No Water Penetration at 20.0 psf
Fatigue Test	Subjected to 2 million alternate cycles of 20 PSF positive and negative wind loading	No metal / foam delamination or metal fatigue
Humidity Test	Sample subjected to 100% relative humidity at 140 °F for 1000 hours	No evidence of metal primer corrosion
Autoclave Test	Sample placed in an autoclave device and pressurized to 2 PSI at 212 °F for 2 1/2 hours	No evidence of delamination
Skin Delamination		No skin delamination with direct pull off pressure up to 1188 psf

Kingspan USA Deland, FL; 386-626-6789 Modesto, CA; 209-531-9000

Email: info.us@kingspanpanels.com
www.kingspanpanels.us

Issue 2: 9/2011

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Receipts Details:

Tender Information: Check , BusinessName: DEKKO, Check Number: 1264

Tender Amount: 255.00

Receipt Header:

Cashier Id: gguertin

Receipt Date: 2/23/2012

Receipt Number: 41208

Receipt Details:

Referance ID:	5360	Fee Type:	BP-C of O
Receipt Number:	0	Payment Date:	
Transaction Amount:	75.00	Charge Amount:	75.00
Job ID: Job ID: 2012-02-3376-CH OF USE - permit connected to #101230, need 3 c of o 's			
Additional Comments:			

Referance ID:	5361	Fee Type:	BP-Constr
Receipt Number:	0	Payment Date:	
Transaction Amount:	30.00	Charge Amount:	30.00
Job ID: Job ID: 2012-02-3376-CH OF USE - permit connected to #101230, need 3 c of o 's			

Additional Comments:

Referance ID:	5362	Fee Type:	BP-C of O
Receipt Number:	0	Payment Date:	
Transaction Amount:	75.00	Charge Amount:	75.00

Job ID: Job ID: 2012-02-3376-CH OF USE - permit connected to #101230, need 3 c of o 's

Additional Comments:

Referance ID:	5363	Fee Type:	BP-C of O
Receipt Number:	0	Payment Date:	
Transaction Amount:	75.00	Charge Amount:	75.00

Job ID: Job ID: 2012-02-3376-CH OF USE - permit connected to #101230, need 3 c of o 's

Additional Comments:

Thank You for your Payment!



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Receipts Details:

Tender Information: Check , BusinessName: DEKKO, Check Number: 1264

Tender Amount: 255.00

Receipt Header:

Cashier Id: gguertin

Receipt Date: 2/23/2012

Receipt Number: 41208

Receipt Details:

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Transaction Amount:	30.00	Charge Amount:	30.00
Job ID: Job ID: 2012-02-3376-CH OF USE - permit connected to #101230, need 3 c of o 's			



**Installation and
Maintenance
Manual**

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IM-100
April 2006

General Installation, Operation and Maintenance Instructions For Aerovent Products

Introduction

This manual has been prepared to guide the users of Aerovent equipment in the proper installation, operation and maintenance procedures to insure maximum equipment life and trouble-free operation.

Receiving

Products leaving the assembly plant have been inspected and are in satisfactory operating condition. The carrier assumes full responsibility for material from the time it leaves the plant until it is delivered to the user. Therefore, material should be inspected for damage immediately so that any damage claims against the carrier can be made before acceptance of the shipment. No equipment is to be returned without an authorized returned goods tag.

Handling

All products must be handled with extreme care to avoid misalignment of rotating components. Never lift a unit assembly by using the shaft, drive sheaves, wheel or motor as a point of attachment. If it is apparent that slings will not clear a portion of the product being hoisted, a spreader should be used to avoid damage.

Initial Operation

All Aerovent fans are lubricated at the factory and have been given a run-in test before shipment. Read carefully all installation and maintenance manuals before following the startup check list.

Safety Precautions

Any piece of machinery should be treated with respect and not overconfidence. Overconfidence usually leads to carelessness and carelessness leads to injury. Following is a list of DOs and DO NOTs:

DO

1. Make sure the unit is stopped and electrical power is locked out before putting hands into the inlet or outlet openings or near the belt drive. A warning sign on the START SWITCH cautioning not to start is recommended when the unit is being serviced.
2. Follow maintenance instructions.

DO NOT

1. Put hands near or allow loose or hanging clothing to be near belts or sheaves while the unit is running.
2. Put hands into inlet or outlet while the unit is running. It is sometimes difficult to tell whether or not a fan is running... be sure it is not running and cannot be operated before any inspection.

Startup Checklist

1. Inspect the equipment for any shipping damage. Remove any foreign material such as tags or packing from any moving parts or from within the fan housing.
 2. Compare the voltage, hertz, and phase stamped on the motor with the current characteristics of the line to which the motor is to be connected.
 3. Lock out the power source at the disconnect switch.
 4. Turn motor, drive, and propeller by hand to see that no misalignment has taken place in shipment. Check V-belt drive for proper alignment and belt tension.
 5. Check all bolts, screws and fasteners and tighten if necessary. Make certain all set screws, locking collars and bearing mounting bolts are secure.
 6. Secure and check clearance of access doors, belt guards and inlet and outlet guards.
 7. If equipped with dampers, check for correct linkage operation. Make sure that the operator opens or closes these control devices to the proper positions.
 8. Jog the fan electrically and note the rotation. Reverse two electrical leads, if necessary, to obtain proper rotation as marked with rotation arrow on fan. Do not allow the propeller to run backwards except momentarily.
 9. **Centrifugal Fans:** Close dampers as required for adequate system resistance to prevent the motor from overloading.
- CAUTION:** With fans that use the forward-curve or radial type of wheel, it is possible to overload the motor if the fan is operated at a lower static pressure than that which the fan is rated. Check the catalog rating of the fan for proper speed and resistance.
10. Start the fan and observe its operation.
 11. Take a motor amp reading and compare with the amp rating on the motor. (The actual running amps should not exceed motor nameplate amps x service factor, exceptions may be taken for air over motors.)

Fan Balance

Fan propellers are statically and dynamically balanced within acceptable tolerances at the factory. Damage in shipping and handling or poor installation of the unit may upset the unit balance. A propeller that is not properly balanced can lead to excessive vibration causing undue wear on the entire unit. It is recommended that after installation a vibration test be made on the fan by an experienced technician.

CAUTION: For units furnished less final drive components at customer request, the addition of drive components in the field can create critical vibration modes. Aerovent strongly recommends a final unit balance procedure after all rotating components are installed. Failure to do so voids Aerovent's warranty.

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4	LIGHTING Product Specification Product Source Manufacturer's Technical Information
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6	EXHAUST FILTERS Product Specification Product Source Manufacturer's Technical Information
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SECTION 1

GENERAL DESCRIPTION

This Section contains literature which describes your *Col-Met Spray Booths* paint spray booth in general terms. Subsequent chapters of this manual provide more detailed descriptions of the individual components of the booth as well as operating and maintenance procedures.

Product Source

Col-Met Spray Booths
1635 Innovation Drive
Rockwall, Texas 75032

Phone: 972-772-1919
Fax: 972-772-1833

GENERAL DESCRIPTION

This description covers a family of *Col-Met Spray Booths* paint booths. The following booth types are covered herein:

EZ-26 Classic Crossdraft Spray Booths

EZ-26 Modified Downdraft Spray Booths

EZ-26 Side Downdraft Spray Booths

EZ Paint Mixing Rooms

EZ Industrial Paint Spray Booths

Open Front Industrial Booths

Open Front Industrial Batch Powder Booth

Classic Crossdraft Spray Booths

Truck Trailer and Equipment Booths

Side Downdraft Spray Booths

Value Pack-25 Spray Booths

The paint spray booth itself consists of four major components: paint area, exhaust fan and chamber, product doors and, in some cases, an air make-up unit. A brief description is provided for these and other related items.

Paint Area

The paint area is the actual "booth" part of the paint spray booth. The parts are placed in this area, through the product doors, if so equipped, to be painted. Air flows from the intake filters of the booth to the exhaust filters. The booth is constructed of 18-gauge galvanized sheet metal panels which are bolted together. The booth exhaust is routed through the exhaust plenums at the exit of the booth. The exhaust fan then routes the exhaust out through the exhaust duct and discharges it at a point above the roof height of the adjacent building.

Exhaust Fan and Chambers

The booth exhaust chamber(s) is/are located as shown in the mechanical drawing package which is included in this manual. The exhaust gasses are pumped through the exhaust duct by a tube axial or vane axial fan which is powered by an ODP motor. The fan is made of spark resistant material and the motor is located out of the air stream. The exhaust chamber(s) operate(s) under a negative pressure to induce the required airflow through the exhaust filters.

Product Doors

The product doors can be filtered or solid and may be either overhead doors, bi-fold doors, or tri-fold doors. Some industrial spray booths have an open front in lieu of product doors.

Overhead doors are equipped with an intrinsically safe pneumatic safety edge. There are two 3-button controls to operate each door, one inside and one outside the booth. A chain and sprocket mechanism will let the door be operated manually also.

Air Make Up Unit (AMU)

The air make up unit supplies filtered, heated atmospheric air. This unit may be heated by natural gas, LP gas, steam coils or hot water coils. The temperature of the AMU discharge air is controlled by a thermostat. The airflow capacity of the fan and motor is matched to the airflow capacity of the spray booth exhaust fans. Some air makeup units also have the capability to provide a paint cure cycle. This cycle, employed after the paint spraying operations are complete, typically involves supplying air that is heated to the paint area of the booth to decrease paint cure times.

Heated Air Makeup Units are available optionally and are not included as part of the ETL Listing for this booth.

COMPLIANCE TO APPLICABLE CODES

This Spray Booth is designed to be in strict accordance with the National Fire Protection Association Standard Number 33, "Spray Application Using Flammable Combustible Materials. The NFPA Standard Safety Code for the Design, Construction and Ventilation of Spray Finishing Operations." This Spray Booth meets or exceeds the requirements of the Occupational Safety and Health Administration (OSHA).

MATERIAL SPECIFICATIONS

The Paint Spray Booth panels, filter racks and product doors are constructed of 18-gauge steel, conforming to ASTM A527 "Lock Forming Quality" and are hot dipped galvanized per ASTM A525.

All structural steel conforms to ASTM A36.

-WARNING-

Your safety and the safety of others is a direct result of how you operate this paint spray booth. Make sure you understand all controls and operating instructions before beginning.

BYPASSING SAFETY DEVICES

There are several safety devices provided to ensure safe operation of the paint booth. DO NOT make any attempt to override these devices. For example, DO NOT place any object on the floor mounted roll-up door limit switch in order to allow the operator to continue to paint even when the doors are open. DO NOT connect the paint guns to the breathing air supply because the breathing air lines do not have any interlocks.

PERSONAL INJURY OR DEATH

Always wear a full face supplied-air respirator or supplied-air hood operated in continuous flow mode whenever painting in the booth. Many paints can damage the human respiratory and nervous systems.

Ventilation must be maintained to ensure proper ventilation during painting and drying of product.

All parts and components must be electrically bonded and properly grounded to prevent static buildup and discharge.

FIRE OR EXPLOSION

Local fire codes prohibit smoking in the vicinity of spray painting operations. Consult the local fire marshal for posting of "NO SMOKING" signs.

Improperly maintained equipment could cause sparks which could ignite volatile fumes or liquids.

FOR YOUR SAFETY

Beware of poor electrical wiring that could cause sparks. DO NOT store flammable liquids adjacent to or inside the paint spray booth. Read all refinishing product labels and instructions.

DURING MAINTENANCE

During routine maintenance inside a paint spray booth, DO NOT use any electric powered airless spray rigs, pressure washers or similar equipment when applying a low flash point solvent or peel coating. Run the paint spray booth exhaust fan to purge dangerous vapors that could ignite or explode while cleaning or performing maintenance inside the booth.

FIRE PROTECTION

An approved fire protection system must be installed on your booth to comply with NFPA 33, Section 7.

Portable fire extinguishers must be located in or around your paint mix room per NFPA 10.

SECTION 2

DOOR LATCH

This Section contains literature pertaining to the installation, operation and maintenance of the above component.

Your *Col-Met Spray Booths* paint spray booth is provided with Brixon door latches to secure the doors in the closed position and hold contact against the foam rubber seal. These latches are pressure relief latches that will allow the spray booth doors to open in the case of an explosion. This feature also allows for ease of booth operator egress from the paint spray booth by applying moderate pressure to the door from inside the booth.

Product Specification

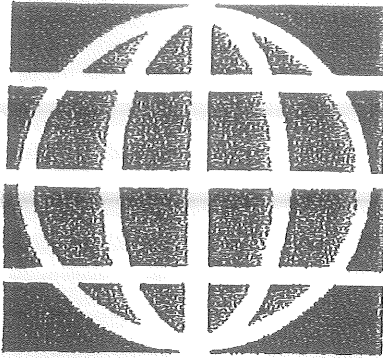
Brixon pressure relief latch, Model 83PCS – Truck Booth Product Doors
Brixon pressure relief latch, Model 2PCI – Auto Booth Product Doors & Personnel Doors

Product Source

Col-Met Spray Booths
Brixon Manufacturing Co.

Phone: 972-772-1919
Phone: 612-688-2540

**IMPORTANT:
READ
BEFORE USING**



BRIXON

**PRODUCT
INFORMATION
PACKAGE**

THE BRIXON LATCH, ITS PURPOSE, SELECTION, AND USE

The purpose of the Brixon® pressure release latch is to provide venting in the event of an internal explosion, and to maintain a positive seal in order to prevent loss of heat and/or escape of gasses under normal conditions.

Brixon® latches are Factory Mutual approved as explosion-venting door latches (1998 Factory Mutual approval Guide 8-1). Brixon® latches are designed to operate under a wide variety of conditions with a variety of options available to suit particular purposes. The user must insure that the latches are appropriate for the particular application. Any questions regarding model selections should be referred to the factory.

ADJUSTMENT

Brixon latches are designed to operate under a wide variety of conditions with a variety of options available to suite particular purposes. The user must insure that the latches are appropriate for the particular application. Any questions regarding model selections should be referred to the factory.

It is recommended that the latch release force be adjusted prior to mounting when the internal components are visible. The pressure setting should allow the latch to open at an internal pressure slightly higher than that encountered under normal operation circumstances. Caution: Factory Mutual Global requires that latches open at a maximum internal pressure of 50 lbs/ft² (244.1 kg/m²), while NFPA (National Fire Protection Association) recommends 30 lbs/ft² (146.5 kg/m²): in general, the lowest practical setting should be used.

The appropriate release pressure is obtained by the following calculations. (The formula assumes a hinged door with the latches mounted on the edge opposite the hinges.)

NOTE: Divide door area by 2 if door is hinged. Divide by 1 if not hinged. (Ex: Blow out panel).

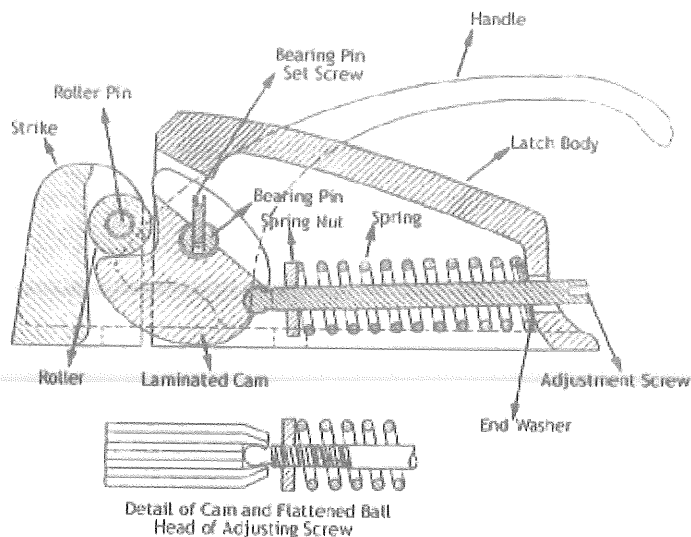
$$\frac{\text{vent area} \times \text{maximum internal pressure}}{2 \text{ (if hinged)}} = \text{force on latches at release}$$

$$\frac{\text{force on latches}}{\text{number of latches}} = \text{latch release setting for each latch}$$

EXAMPLE

2 ft. by 4 ft. hinged door, internal release pressure of
15 pounds per square foot, using two latches.

$$\frac{(2' \times 4') \times (15 \text{ lbs.})}{2} = 60 \text{ lbs/sq ft} \quad 60 \text{ lbs} / 2 = 30 \text{ lbs. setting per latch}$$



Note: Precise pressure adjustment is not possible due to the location of the strike, the amount of gasket compression, friction, etc. The listed values are a guide only, and if the release pressure is critical, the pressure must be measured directly at the door after installation for more accuracy. The estimated variance is plus or minus 2 full turns.

To adjust, have the latch in the door closed position (see illustration above), wherein one rivet which holds the laminated cam together is exposed.

Turn the adjusting screw counter-clockwise to its loosest position, making sure that the square nut does not come off the ball pin and the nut has full thread engagement. Using the Latch Release Force Adjustment Chart (above) as a guide, tighten the adjusting screw clockwise a half turn at a time until the desired pressure setting is reached. It should be possible to feel the adjusting screw slipping into the relaxed position at each half turn. For example, if you wanted 107 lbs. pressure setting on a #4 latch, you would tighten the adjusting screw 10 half turns (10×4.935) + (58 lbs. min.) = 107 lbs.

If the latch is mounted, adjustment can be made by turning the adjustment screw to its tightest position and backing off to the desired setting. Latches can be factory adjusted upon request for additional cost.

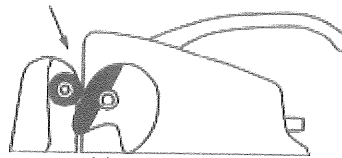
MOUNTING

The latch and strike assembly must be securely mounted so that the cam is centered on the strike roller and the assembly is perpendicular to the door-frame line. The distance between the latch and strike housing should be 1/16" to 3/32" for #91 models and #1 models (#1 model no longer for sale). The distance between the latch and strike is 1/8" to 5/32" for the #2 model. #3, #83, #93, #4, #84 and #94 latches and strikes should be spaced 1/8" to 3/16" apart.

NOTE: IF THE STRIKE IS MOUNTED TOO FAR FROM THE LATCH, THE LATCH CANNOT OPERATE PROPERLY.

Latches should be tested for proper operation after adjustment and/or installation. Ensure that the roller forces the cam of the latch into the fully open position when the door is opened and that the opened cam will contact the roller and be forced into the closed position as the door is closed. Failure to do so may cause an unanticipated rebound, since the latch and strike will not engage upon closing. Misalignment of the latch and strike may also cause this rebound.

Hinges must be strong and securely fastened to avoid horizontal &/or vertical misalignment due to "play" in the door. Additionally, the strike mounting must be sufficiently rigid so that the strike does not bend or twist upon closing. If the body moves toward the hinges, it is possible for the latch to close in the wrong position as shown below in illustration #3, resulting in very high and unsafe pressure.



(#3) Cam in wrong position from improper strike mounting

This is most likely to happen when the door is slammed (excessively) and/or the latch mechanism is dirty or corroded. In this event, the door may be more difficult to open, either by hand or in the event of an explosion. It is also a warning that maintenance is required and that a hazardous situation exists.

Because of the rather large tolerances involved in casting, each latch/strike combination must be individually aligned, and alignment must be rechecked whenever latches are replaced to avoid possible malfunctions as listed below.

In mounting the 3H, 83H, 93H, 4H, 84H, 94H or 4HD latches, it may be found that the handle stops interfere with the mounting nuts, when studs are used. If you intend to use studs, consult the manufacturer for information on modifications that may be necessary.

OPERATION

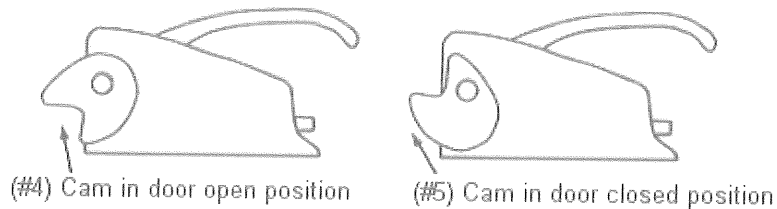
The Brixon latch operates in a manner similar to a toggle switch. When the door and latch are in the closed position, the latch will hold the door closed unless enough pressure is applied to compress the spring sufficiently to cause tripping of the cam into the open position. When the cam is in the open position, the door is free to open.

Closing is essentially the reverse of the above, with the force to reset the cam being supplied by the closing door.

The forces required for operation depend upon the settings of the latch (see ADJUSTMENT) - The higher the setting and the larger the latch, the greater the required force.

The recommended procedure for closing a door equipped with the 3H, 83H, 93H, 4H, 84H or 94H latches is to fold the handle back immediately prior to closing or, better, to first open and then close the handles. When folding the handles back, the cam should remain in the "open" position

(illustration #4). If for any reason the cam is in the "closed" position (illustration #5) while the door is open, the latch and/or its mounting is defective, and the door would rebound open instead of latching



In the event of an explosion, the latch will begin to open when the internal pressure equals the setting of the latch. However, due to inertia in the latch-door system, there will be a slight delay between application of pressure and the opening of the door (See NFPA No. 68). This might allow a considerable pressure build-up, depending upon the oven size, type, and amount of material exploding, and the time lag involved. In the event of an explosion of maximum violence, the effectiveness of the latches is reduced. However, most explosions are not of maximum violence (FM Global Approval Guide, 1998 8-1).

SUMMARY AND CAUTIONS FOR OPERATORS

1. Violent slamming is potentially hazardous and must be avoided.
2. For reasons listed above, the door may not latch when closing; beware of rebound.
3. Keep clear of the arc of the door.
4. Keep clear of the operating parts of the latch and handle, particularly the laminated cam, strike roller, both ends & handle stop of the heavy duty handles, and the stops for standard 3H, 4H, 83H, 84H, 93H, & 94H handles.

WARNINGS AND LIMITATIONS: ALL MODELS

1. In the event of an explosion, the door will open rapidly with little or no warning. It is therefore recommended that the area in the arc of the door be marked as a danger area, perhaps by "red striping", a cage, or personnel barricade.
2. If the door is closed with insufficient force to trip the cam, the door will rebound.
3. If, for some reason, the cam is the "closed" position while the door is open, the door will rebound rather than latching when closed. This could be caused by a misaligned strike (all latches) and/or a loose handle (3H and 4H latches only), or by the cam being struck and rotated accidentally while in the "open" position.
4. If excessive force is used in closing (slamming) the door, the tendency of the door to rebound may be sufficient to cause the latch (and door) to reopen.

A rebounding door would not normally cause a dangerous situation unless some aggravating condition is present. It is essential that the person closing the door is aware of the possibility of rebound, and is warned against violent slamming. The forces involved, and therefore the hazards, increase with the size and setting of the latch.

5. The door may open unexpectedly if material (such as a large casting) should fall and strike the interior of the door.

6. Brixon recommends that close attention be paid to the selection of hinges. If the hinges are not strong enough to withstand to maximum internal pressure, allowing for build-up due to time lag, the door may become a projectile.
7. The latches should be set at the lowest practical setting. Factory Mutual Global recommends a maximum venting pressure of 50 lbs./ft². Whereas NFPA recommends a maximum of 30 lbs./ft². Lower settings should always be used where practical for maximum safety.
8. Due to the inherent brittle nature of cast iron, high impact loads may fracture castings, possibly resulting in a flying fragment. This is not expected to occur under normal conditions, but is possible under unusually severe conditions.
9. Brixon latches work as low as -45°C, and up to 285°C

WARNINGS AND LIMITATIONS:

SPECIAL PRECAUTIONS FOR 3H, 4H, 83H, 84H, 93H & 94H LATCHES

#91, #1(#1 model no longer sold) and #2 latches have pull type handles which do not affect the operation of the latch. The models 3H, 4H, 83H, 84H, 93H & 94H latches have handles which open the cam when used, but also allow the cam to open without the use of the handle. The following pertains to models 3H, 4H, 83H, 84H, 93H & 94H handle-type latches:

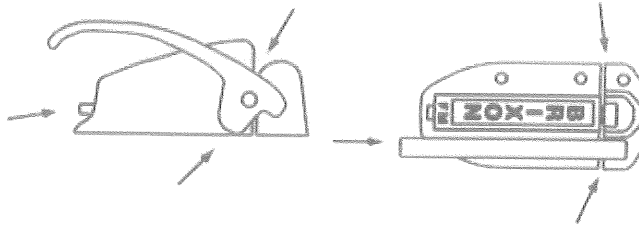
When the handle is in the "closed" (down) position, the cam operates independently of the handle.

1. When the handle is moved from the "closed" (down) position to the "open" (up) position, the cam is forced into the open position. The cam cannot be in the closed position with the handle up unless:
 - a) The handle is very loose
 - b) The internal socket set screw is broken or missing
 - c) The handle has been removed and reinstalled improperly.
 - d) The handle cross pin is broken or missing (83H, 84H, 93H & 94H)

If any of the above situations occur, a hazardous condition exists and must be corrected.

2. If the handle is up while the door is being closed, the handle will snap back into the down position. In models 3H and 4H latches manufactured prior to 1979, especially chrome-plated latches, the handle may contact the door itself with considerable force, which would create a hazard to hands placed in the same area (See diagram below). Model 3H and 4H latch handles made after 1979, (similar to old handle except with larger rectangular stops), and model 83H, 84H, 93H & 94H latches stop well above the surface of the door if the handles have not been altered.

3. Keep hands away from cams, rollers, handle stops, and away from areas between latch body and handle when closing. (See diagram below).



Old style handles: Keep hands away from this area.

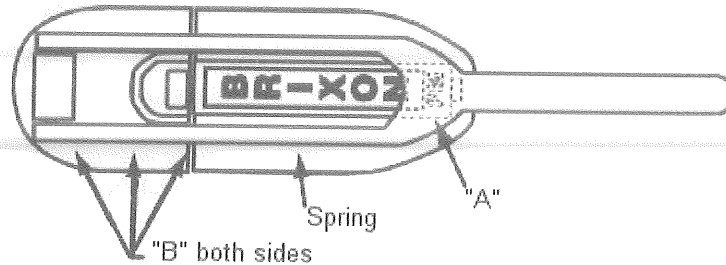
4. If the socket set screw breaks, the handle becomes inoperable. Replacement of the socket set screw with one not identical to the original may cause a hazardous condition by destroying the independence of the cam and handle. Additionally, the bearing pin, handle, and cam must not be altered or used with any other latch. Each handle is individually fitted at the factory.
5. Closing, and especially slamming, of the door with the handle up increases the possibility of shearing the internal socket set screw.

LIMITATIONS

1. The #1 die-cast zinc model (no longer for sale) is not suitable for high temperature use; the all stainless steel #91 model is available for high temperatures.
2. The #SP2A aluminum and #SP2B brass latches are recommended for spark proof applications.
3. Standard 3H, 4H, 83H, 84H, 93H & 94H handles are not designed for multiple latch applications since all handles must be opened simultaneously to avoid undue strain on the latches, doors, and/or hinges. The #4HD and #410 heavy duty handles are recommended for such applications, or Brixon can custom fabricate linked latch assemblies.
4. Brixon latches, like all other latches, will eventually wear out or need replacement due to inherent properties of the material used. The expected life depends strongly upon the conditions of use. If the latch is properly maintained, and in a non-corrosive and dry area, probable failure points are:
 - a) Cracking of the casting near the bearing pin or base holes because of impact loads. This may result in a hazard in the case of a flying fragment. This is not common, but abuse of the latches makes it more likely.
 - b) The spring may lose temper because of prolonged heating or fatigue. This is not expected to be hazardous, but the door will open and/or rebound more easily than normal.
5. If the latch is operated in an exterior or corrosive atmosphere, failure is more likely to be due to rusting of internal parts and/or castings. Corrosion of internal parts results in the probability of the latch mechanism "freezing" and is a major hazard in the event of an explosion. Corrosion of the casting will render it more prone to cracking or breaking under impact. (See "MAINTENANCE")
6. Brixon Manufacturing Co. makes no claims for corrosion resistance beyond the properties of the materials used (see "NOTICE FOR LATCHES IN EXTERIOR OR INTERIOR CORROSIVE ENVIRONMENTS" section).

7. Modifications of Brixon latches should not be made without consulting Brixon Manufacturing and without prior approval of Brixon Manufacturing Co.
8. Field repairs of Brixon latches are not recommended.
9. The following warnings pertain to Models 4HD and 410:

- a) Be sure return spring is operative to avoid crushing and denting danger at points "A" on closing.
- b) Keep hands and other objects away from interior of resistance arm (points "B").



REPLACEMENT PARTS

The following replacement parts are available from the factory:

- BODIES only (all models)
- STRIKES only (all models)
- HANDLES only - Model #1 and #2 only.

ALL OTHER REPAIR OR REPLACEMENT OF INTERNAL PARTS MUST BE DONE IN OUR FACTORY.

FOR ADDITIONAL INFORMATION AND ORDERING, CALL OR WRITE.

MAINTENANCE

Latches must have the explosion-venting feature tested periodically to insure that corrosion and/or build-up of foreign materials has not affected the mechanism. Under normal operation conditions, lubricate the bearing pin within the laminated cam with an SAE 30-50 high temperature oil EVERY TWO MONTHS.

Model 3H and 4H latches should have the set screws in the handle tightened as needed.

NOTICE FOR LATCHES IN EXTERIOR OR INTERIOR CORROSIVE ENVIRONMENTS

Regular Brixon® iron safety latches (which are designed for interior use) are not recommended for exterior or corrosive applications.

We recommend the Brixon® 90 Series all stainless steel investment cast latches for most corrosive applications.

Maintenance of all Brixon® latches is important at regular intervals.

1. Check to see that the latch is properly lubricated.
2. Open the door to make sure all parts are free to move.

The lubricating should be as follows: The crucial pivot joint, which is the bearing pin about which the laminated cam pivots, should be oiled with an SAE 30 to SAE 50 high temperature oil at least every two months. For use in cold areas we recommend using SAE 10-20 high temperature lubricant at least every two months.

If you need further information on maintenance of Brixon® latches or if you wish to replace your latches with corrosion resistant latches, contact Brixon.

Our model 91, 2, 3, 83, 93, 84 & 94 latches are available with the following options for corrosion resistance.

	Paint	Powder Coat	E-Coat	Duplex Anodize	Chrome Plate	Nickel Plate	Galvanize	Electropolish	Polished Brass & Electropolish
Iron	✓	✓	✓		✓	✓	✓		
Aluminum		✓	✓	✓					
Brass		✓	✓		✓	✓			
Stainless Steel		✓	✓					✓	✓
Steel	✓	✓	✓		✓	✓	✓		

Brixon® Model SP2B spark proof Brass, and SP2A spark proof Aluminum latches are also available for exterior or interior corrosive applications.

Iron latches can rust and could subsequently freeze up so that the latch could become a lock and would not open if there were an explosion. In prior Product Information Packages, Brixon has always warned against the use of iron latches in exterior or interior corrosive applications and if despite our warnings they continue to be used, we strongly suggest that they be replaced by a latch recommended for corrosive conditions to avoid possible accidents or injury.

ADDITIONAL INFORMATION: CORROSION

Stainless steel** internal parts should last approximately five times as long as steel parts depending on the severity of the corrosive atmosphere. Trace metals in stainless steel tend to create chromium oxide coating which can be attacked by a wet chloride ion in marine conditions, and eventually rust will occur. Only the end-user can know the severity of corrosive conditions, and proper, regular maintenance becomes even more important under severe corrosive conditions.

Aluminum will oxidize and discolor with time, but the discoloration will not affect the strength or overall life of aluminum. It may be difficult, however, to distinguish corrosion from discoloration.

Salt or corrosive atmospheres can cause aluminum to break down and become weakened. At the spot of corrosion, powdering will occur and also pitting of the latch body or strike. For this reason Brixon suggests that aluminum should be preserved with a protective coating if it is exposed to corrosive conditions. Black E Coat and Duplex anodizing are options available to preserve aluminum.

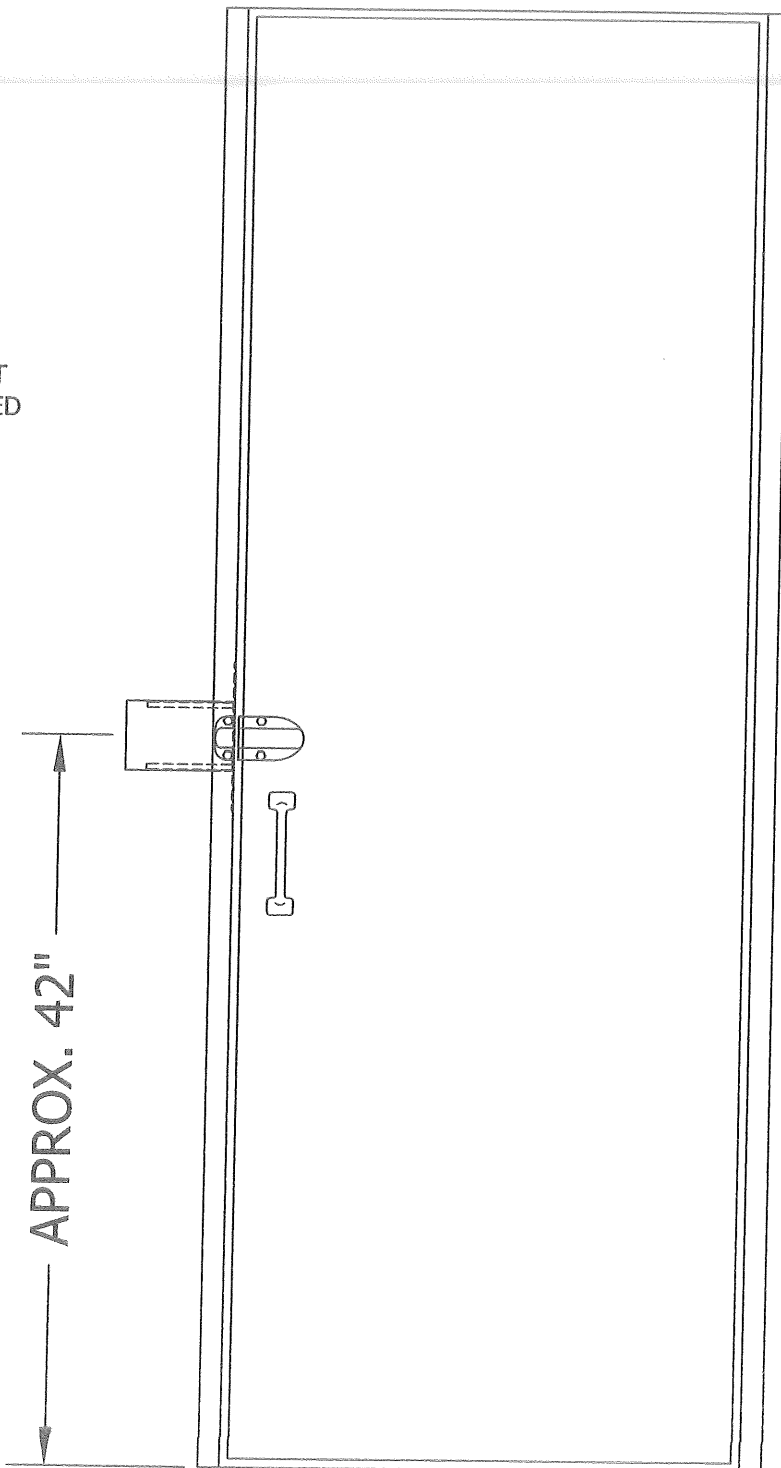
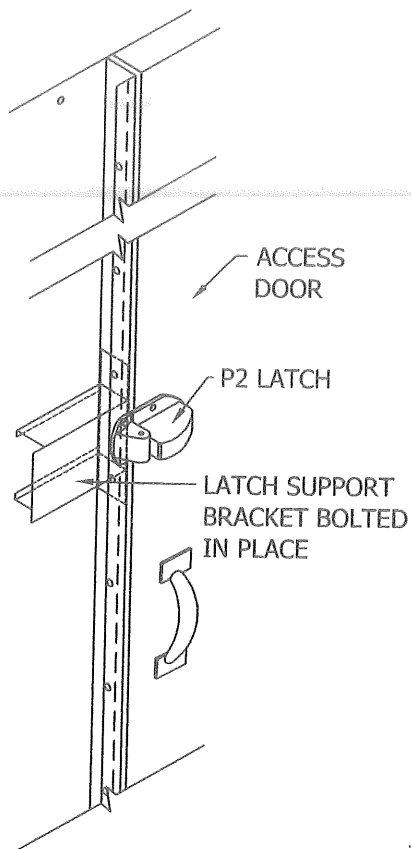
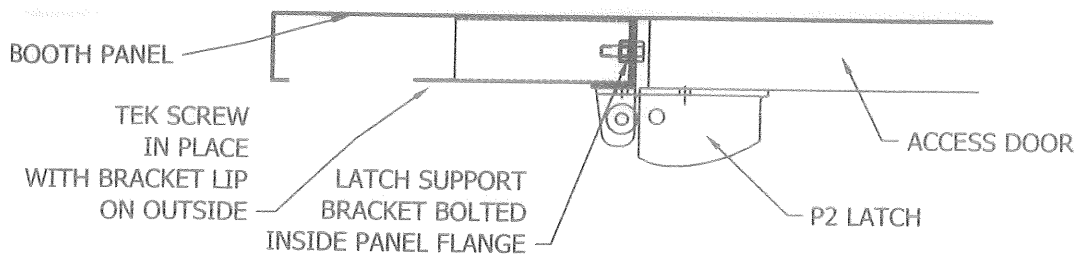
Spark proof Brass latches are corrosion resistant and are available in our #2 model only. For marine conditions with heavy salt corrosion such as on ships or on oil rigs at sea, an aluminum bronze can be special ordered in the #2 model. (See "LIMITATIONS" section.)

**Brixon uses the following stainless steel alloys: 15-7, 301, 302, 303 and 304, 416 (hardened & passivated), and 316.

ADDITIONAL INFORMATION: MATERIALS

	HOUSINGS			INTERNAL	SPRING	PINS
	BODIES	STRIKES	HANDLES	PARTS		
MODEL 1						
STANDARD DIECAST ZINC	Die Cast Zinc	Die Cast Zinc	Die Cast Zinc	Mild Steel Zinc Plated	Music Wire	Mild Steel Zinc Plated
STANDARD IRON	Ductile Iron	Ductile Iron	Ductile Iron	Mild Steel Zinc Plated	Music Wire	Mild Steel Zinc Plated
OPTIONAL				Stainless Steel	Stainless Steel	Stainless Steel
MODEL 2						
STANDARD IRON	Gray Iron Class 30	Gray Iron Class 30	Ductile Iron	Mild Steel Zinc Plated	Chrome Silicon	Mild Steel Zinc Plated
OPTIONAL				Stainless Steel	17-7 Stainless Steel	Stainless Steel
STANDARD ALUMINUM	Aluminum 319	Aluminum 319	Aluminum 713	Mild Steel Zinc Plated	Chrome Silicon	Mild Steel Zinc Plated
OPTIONAL				Stainless Steel	17-7 Stainless Steel	Stainless Steel
SP2	Aluminum 319	Aluminum 319	Aluminum 713	Brass	17-7 Stainless Steel	Phosphorus Bronze
SP2B	Cast Brass C83450	Cast Brass C83450	Cast Brass C88450	Brass	17-7 Stainless Steel	Phosphorus Bronze
MODEL 3						
STANDARD IRON	Gray Iron Class 30	Ductile Iron	Ductile Iron	Mild Steel Zinc Plated	Chrome Silicon	Mild Steel, Zinc Plated
OPTIONAL				Stainless Steel	17-7 Stainless Steel	Stainless Steel
STANDARD ALUMINUM	Aluminum A 356-T6	Aluminum 319	Aluminum 713	Mild Steel Zinc Plated	Chrome Silicon	Mild Steel Zinc Plated
OPTIONAL				Stainless Steel	17-7 Stainless Steel	Stainless Steel
MODEL 4						
STANDARD IRON	Ductile Iron	Ductile Iron	Ductile Iron	Mild Steel Zinc Plated	Chrome Silicon	Stainless Steel
OPTIONAL				Stainless Steel	17-7 Stainless Steel	Stainless Steel
STANDARD ALUMINUM	Aluminum A 356-T6	Aluminum 319	Aluminum 713	Mild Steel Zinc Plated	Chrome Silicon	Stainless Steel
OPTIONAL				Stainless Steel	17-7 Stainless Steel	Stainless Steel
MODEL #DB & 92						
STANDARD STAINLESS	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel

Stainless Steel Internals optional on all models except spark proof
 Duplex Anodizing optional on all Aluminum models
 E Coating optional on all Aluminum models
 Stainless Steel Body Pin standard on all #4 models
 Hot Dip Galvanizing optional on all Iron models
 Chrome Plating optional on all models



1. UNBOLT TWO BOLTS THAT CONNECT PANEL AND DOOR FRAME APPROX. 42" FROM THE FLOOR.
2. INSERT DOOR LATCH BACKET INTO PANEL FLANGE.
3. REINSERT BOLTS AND TIGHTEN.
4. SPEED TEK SCREW THE P-2 LATCH STRIKER PLATE TO THE DOOR LATCH BRACKET.
5. DRILL AND BOLT THE P-2 LATCH TO THE DOOR.
6. THE DOOR LATCH BRACKET CAN ALSO BE SPEED TEK SCREWED FROM INSIDE THE BOOTH IF NEEDED.

SECTION 3

DOOR LIMIT SWITCH

This Section contains literature pertaining to the installation, operation and maintenance of the above component.

Your *Col-Met Spray Booths* paint spray booth can be provided with an optional micro switch to indicate when a door is open on the booth. If any door is in the open position, the micro switch contact is opened which breaks the circuit for the paint air solenoid.

Per the 1995 & 2000 edition of NFPA 33, this is not a required safety feature.

Product Specification

Square D Encapsulated Micro Switch, Class 9007, Series A, Type CR53B2.

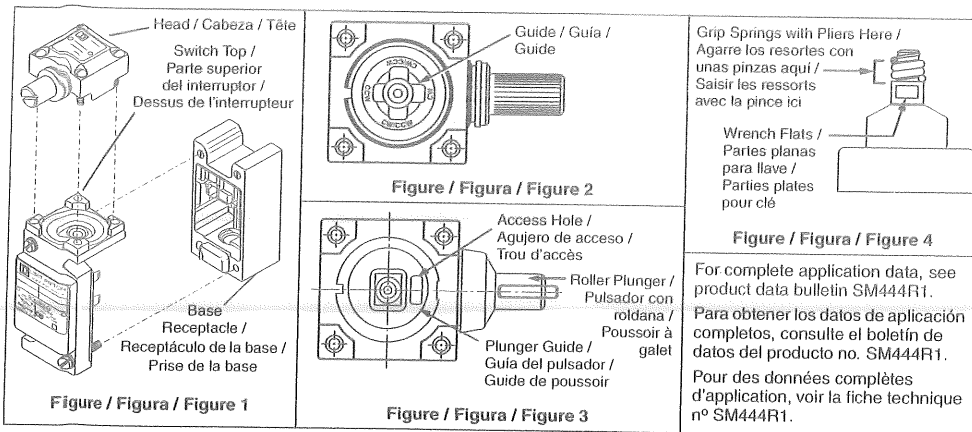
Product Source

**Col-Met Spray Booths
Grainger**

Phone: 972-772-1919
Phone: 972-988-3321



Limit Switches—Class 9007 Type C
Interruptores de límite—clase 9007 tipo C
Interrupteurs de position—classe 9007 type C



⚠ DANGER / PELIGRO / DANGER

<p>HAZARDOUS VOLTAGE</p> <p>Turn off all power supplying this equipment before working on it.</p> <p>Failure to follow this instruction will result in death or serious injury.</p>	<p>TENSION PELIGROSA</p> <p>Desenergice el equipo antes de realizar cualquier trabajo en él.</p> <p>El incumplimiento de esta precaución podrá causar la muerte o lesiones serias.</p>	<p>TENSION DANGEREUSE</p> <p>Coupez l'alimentation de cet appareil avant d'y travailler.</p> <p>Si cette précaution n'est pas respectée, cela entraînera la mort ou des blessures graves.</p>
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CONVERSION OF HEADS

Head Rotation—All Types

All heads can be rotated to one of four positions, 90° apart. See Figure 1.

- Loosen the four head mounting screws.
- Rotate the head to the desired position and tighten the screws.

Mode of Operation—Lever Types A, B, and N

The mode of operation converts easily to clockwise (CW), counterclockwise (CCW), or both (CW/CCW). See Figure 2.

- Loosen the four head mounting screws and remove the head.
- Pull up on the guide and position it so that the arrow points to the desired letters: CW, CCW, or CW/CCW.

CONVERSION DE LAS CABEZAS

Giro de la cabeza—todos los tipos

Todas las cabezas se pueden girar a una de las cuatro posiciones, 90° separadas. Vea la figura 1.

- Aloje los cuatro tornillos de montaje de la cabeza.
- Gire la cabeza a la posición deseada y apriete los tornillos.

Modo de funcionamiento—palanca tipos A, B y N

El modo de funcionamiento se puede convertir fácilmente en el sentido de las manecillas del reloj (CW) o en sentido contrario a las manecillas del reloj (CCW), o ambos (CW/CCW). Vea la figura 2.

- Aloje los cuatro tornillos de montaje de la cabeza y retire esta última.
- Jale la guía hacia arriba y colóquela de tal manera que la flecha señale las letras deseadas: CW, CCW o CW/CCW.

CONVERSION DES TÊTES

Rotation des têtes—Tous les types

Toutes les têtes peuvent être tournées à l'une des quatre positions à 90° d'intervalle. Voir la figure 1.

- Desserrer les quatre vis de montage de la tête.
- Faire tourner la tête à la position désirée et serrer les vis.

Mode de fonctionnement—levier de types A, B et N

Le mode de fonctionnement peut facilement être converti en mode sens horaire (CW), anti-horaire (CCW) ou aux deux (CW/CCW). Voir la figure 2.

- Desserrer les quatre vis de montage de la tête et enlever la tête.
- Tirer sur le guide et le placer de sorte que la flèche soit orientée vers les lettres désirées : CW, CCW ou CW/CCW.

3. Push the guide back down into the slots.
4. Reassemble the head in the desired position.
NOTE: CW or CCW refers to the operation.

Side Plunger Roller Operation— Type F

The switch comes with the roller in the vertical position. It can be rotated 90° to a horizontal position. See Figure 3.

1. Loosen the four head mounting screws and remove the head.
2. Depress and hold in the roller plunger.
3. Insert the blade of a flat-head screwdriver through the access hole in the plunger guide to hold the white nylon cam inside the head. Pull out the roller plunger.
4. Rotate the roller plunger 90° and remove the screwdriver blade.
5. Make sure the guide pin in the plunger is seated in the slot of the nylon cam and reassemble the head in the desired position.

INSTALLATION

1. When assembling or replacing the switch top assembly (Figure 1), be sure that the gasket surface is clean and in position. Tighten the switch top fastening screws securely to ensure proper sealing and electrical integrity.
2. When assembling or replacing heads (Figure 1), always tighten the head fastening screws securely to ensure proper operation and adequate sealing.
3. When connecting the conduit to the base receptacle (Figure 1), use tight fittings and apply a sealing compound to the threads for best sealing.

NOTE: On devices with maintained contact heads, the wiring diagram on the nameplate and the base casting reflects the contact status when the shaft is in the CCW position (Type C heads) or Reset position (Type H heads).

(Continued on page 4)

3. Empuje la guía en las ranuras.

4. Vuelva a ensamblar la cabeza en la posición deseada.
NOTA: CW o CCW se refieren al funcionamiento.

Funcionamiento del pulsador con roldana lateral—tipo F

El interruptor esta provisto con una roldana en posición vertical. La roldana se puede girar 90° en la posición horizontal. Vea la figura 3.

1. Afloje los cuatro tornillos de montaje de la cabeza y retire esta última.
2. Baje el pulsador con roldana y sosténgalo en esa posición.
3. Inserte la punta plana de un desarmador por el agujero de acceso en la guía del pulsador para sostener la leva de nylon blanco dentro de la cabeza y jale el pulsador con roldana hacia afuera.
4. Gire el pulsador con roldana 90° y retire la punta del desarmador.
5. Asegúrese de que la espiga de la guía en el pulsador esté bien colocada en la ranura de la leva de nylon y vuelva a ensamblar la cabeza en la posición deseada.

INSTALACION

1. Cuando instale o reemplace el ensamble de la parte superior del interruptor (figura 1), asegúrese de que esté limpia la superficie del empaque y que se encuentre en su posición. Apriete firmemente los tornillos de sujeción de la parte superior del interruptor para asegurar un cierre hermético adecuado y la integridad eléctrica.
2. Cuando instale o reemplace las cabezas (figura 1), siempre apriete firmemente los tornillos de sujeción de la cabeza para asegurar un funcionamiento correcto y el cierre hermético adecuado.
3. Cuando realice las conexiones del tubo conduit en el receptáculo de la base (figura 1), apriete los adaptadores y aplique un compuesto de cierre hermético a las roscas para obtener mejores cierres.

NOTE: En los dispositivos con cabezas de contacto sostenido, el diagrama de cableado en la placa de identificación y la pieza fundida de la base reflejan el estado del contacto cuando el eje se encuentra en la posición CCW (cabezas tipo C) o en la posición de restablecimiento (cabezas tipo H).

(Continuación en la página 4)

3. Enfoncer le guide dans les fentes.

4. Réassembler la tête dans la position désirée.
REMARQUE : CW ou CCW se réfèrent au fonctionnement.

Fonctionnement du poussoir à galet latéral—type F

L'interrupteur est fourni avec le galet en position verticale. Le galet peut être tourné de 90° à la position horizontale. Voir la figure 3.

1. Desserrer les quatre vis de montage de la tête et enlever la tête.
2. Appuyer sur le poussoir à galet et le maintenir enfoncé.
3. Introduire la lame d'un tournevis plat dans le trou d'accès du guide de poussoir pour retenir la came de nylon blanc à l'intérieur de la tête et faire sortir le poussoir à galet en le tirant.
4. Faire tourner le poussoir à galet de 90° et enlever la lame du tournevis.
5. S'assurer que la goupille de guide du poussoir est installée dans la fente de la came de nylon et réassembler la tête dans la position désirée.

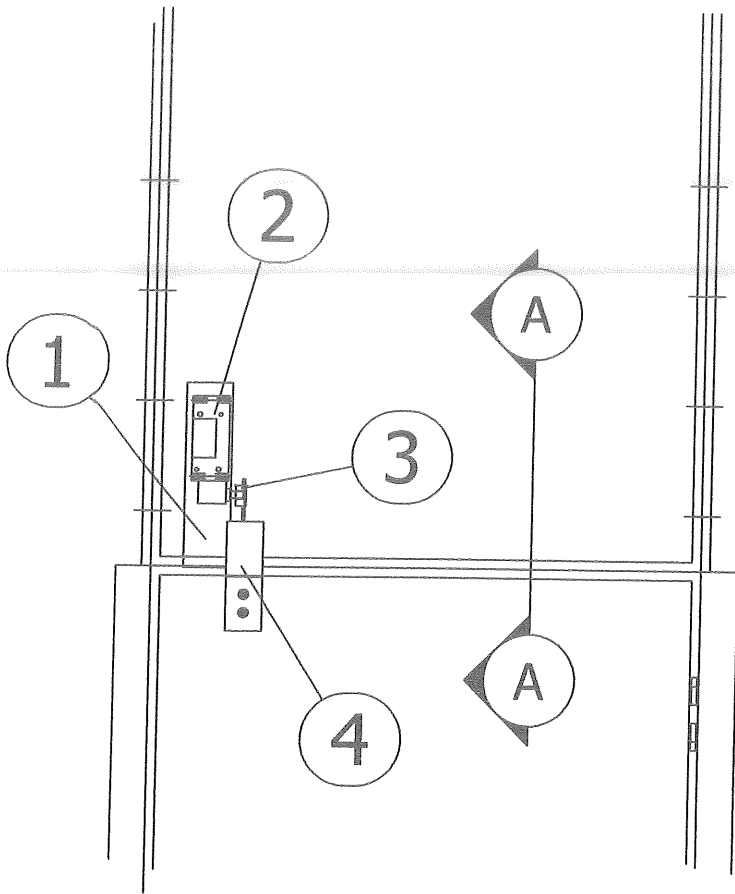
INSTALLATION

1. Lors de l'assemblage ou du remplacement de l'ensemble de dessus de l'interrupteur (figure 1), s'assurer que la surface du joint est propre et dans la bonne position. Bien serrer les vis d'attache du dessus de l'interrupteur pour assurer la bonne étanchéité et l'intégrité électrique.
2. Lors de l'assemblage ou du remplacement des têtes (figure 1), toujours serrer les vis d'attache de la tête pour assurer le bon fonctionnement et la bonne étanchéité.
3. Lors de l'installation du conduit de la prise de base (figure 1), bien serrer les adaptateurs et utiliser un produit d'étanchéité sur les filetages pour assurer une meilleure étanchéité.

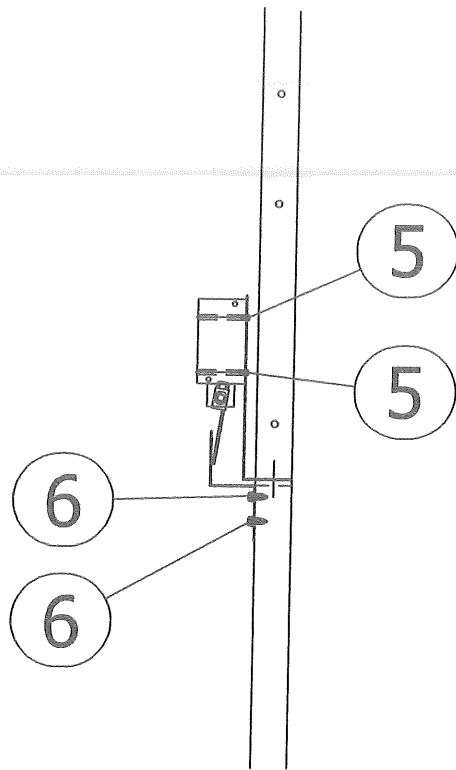
NOTE: Sur les appareils avec des têtes à contact maintenu, le schéma de câblage sur la plaque signalétique et le moulage de base indique l'état du contact lorsque l'arbre est dans la position anti-horaire (têtes de type C) ou dans la position de réinitialisation (têtes de type H).

(Suite à la page 4)

ACCESS DOOR LIMIT SWITCH INSTALLATION



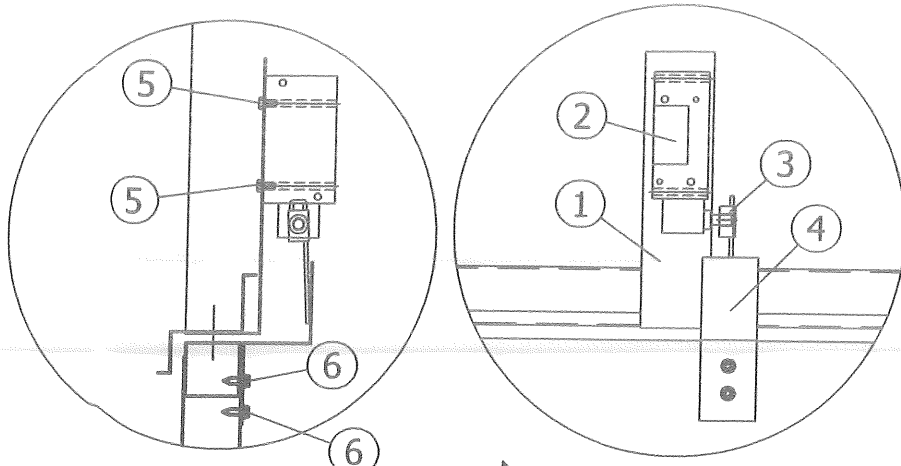
FRONT VIEW



SECTION A-A

ACCESS DOOR LIMIT SWITCH	
1	LIMIT SWITCH MOUNTING BRACKET
2	EXPLOSION PROOF LIMIT SWITCH
3	STEEL ROD LEVER ARM
4	OFFSET TRIGGER PLATE
5	#20 x 3/8" GRADE 2 HEX HEAD BOLT
6	SPEED TEK SCREW

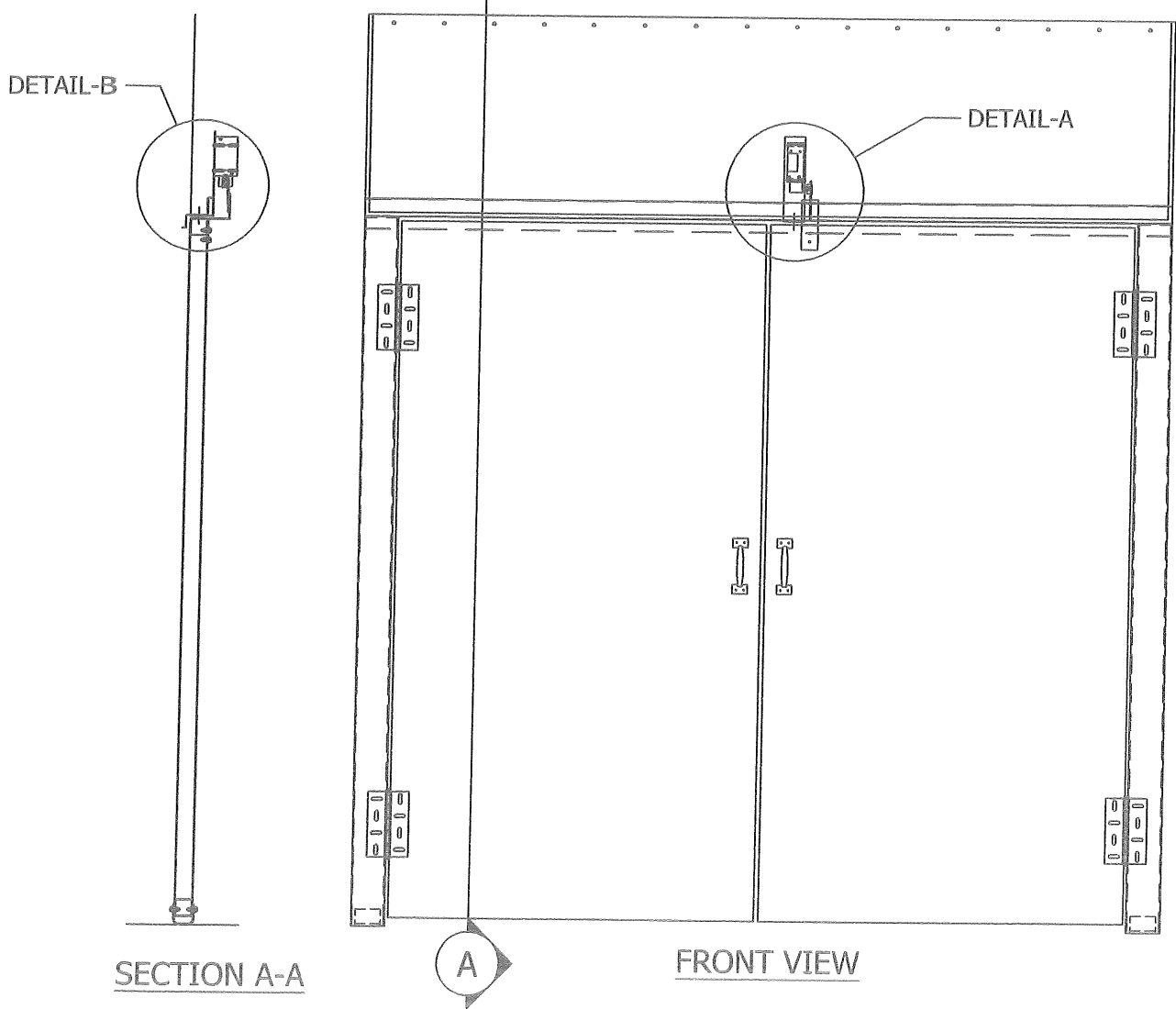
PRODUCT DOOR LIMIT SWITCH INSTALLATION



PRODUCT DOOR LIMIT SWITCH	
1	LIMIT SWITCH MOUNTING BRACKET
2	EXPLOSION PROOF LIMIT SWITCH
3	STEEL ROD LEVER ARM
4	OFFSET TRIGGER PLATE
5	#20 X 3/8" GRADE 2 HEX HEAD BOLT
6	SPEED TEK SCREW

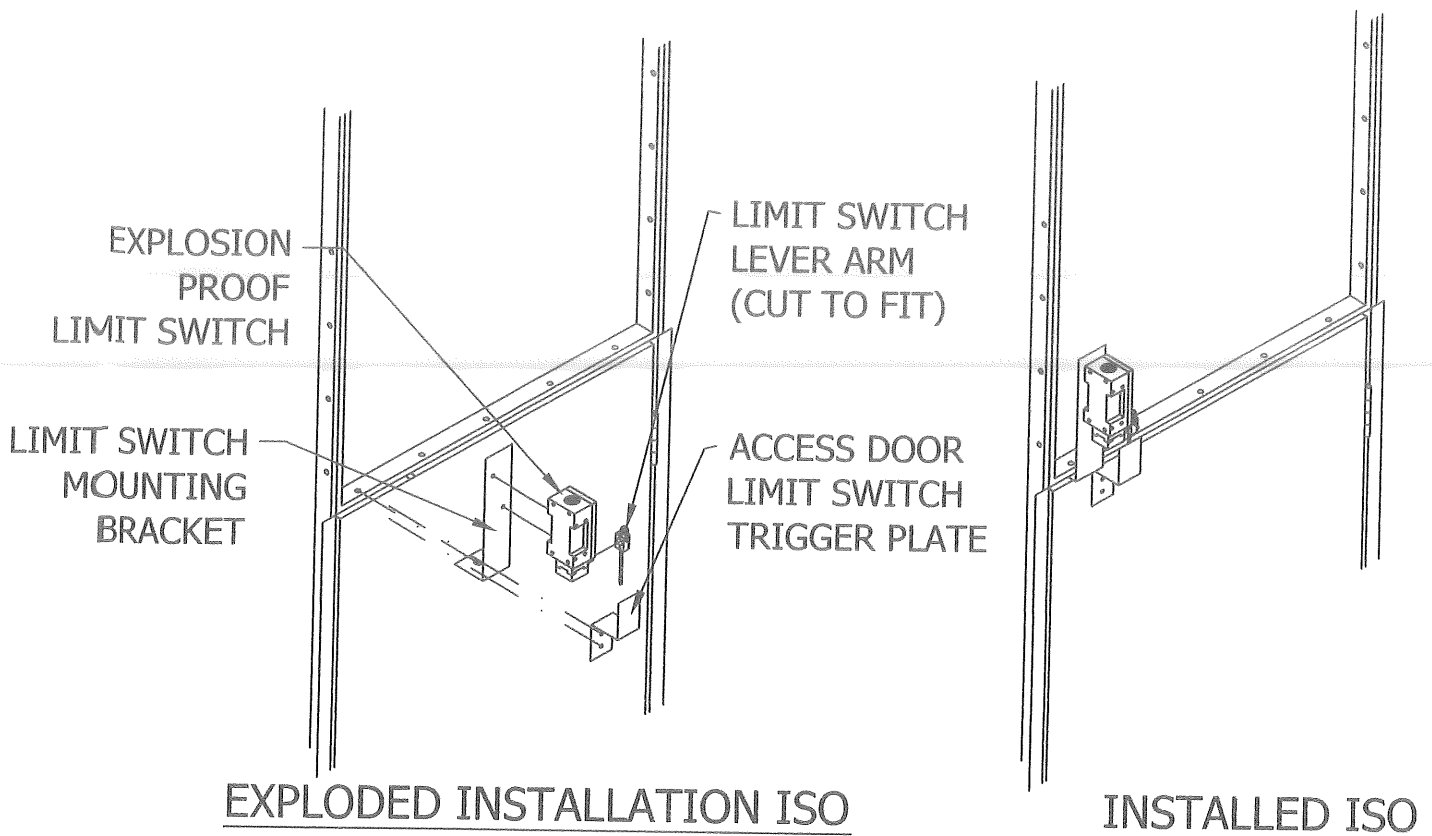
DETAIL-B
SCALE: nts

DETAIL-A
SCALE: nts

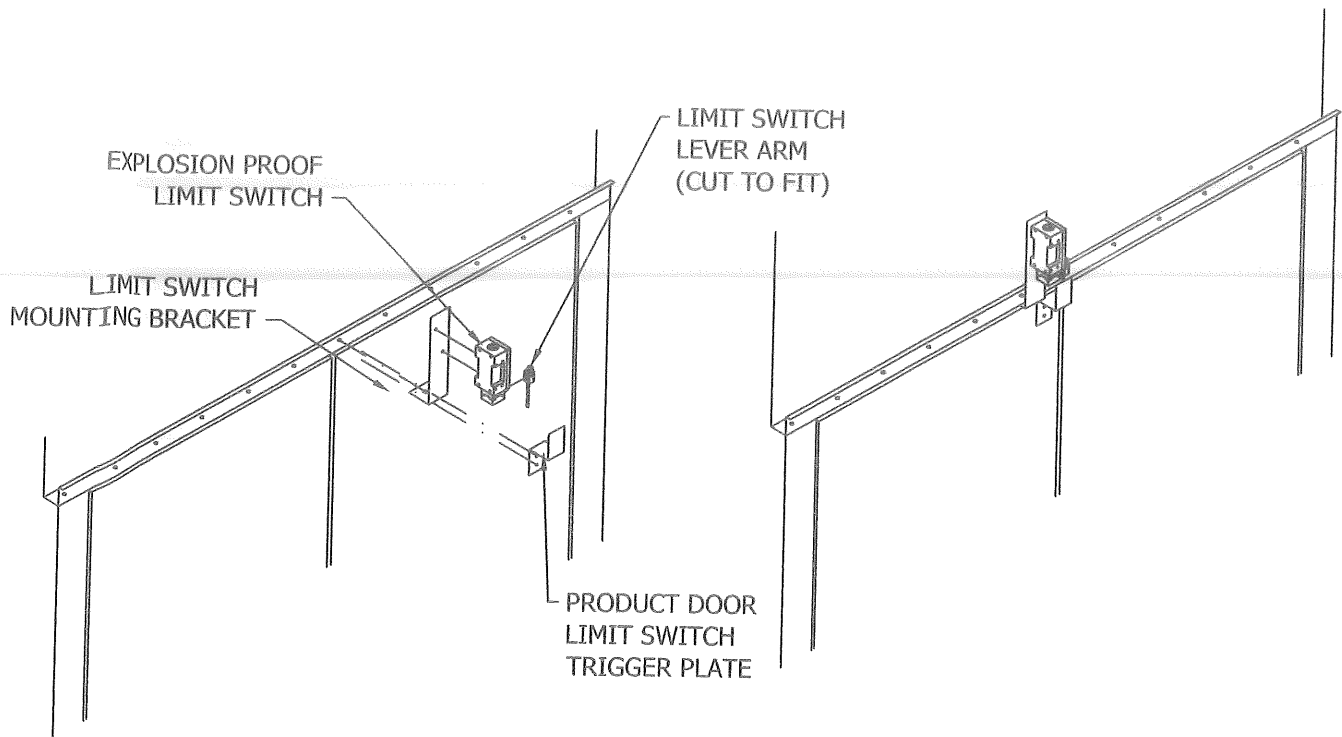


SECTION A-A

FRONT VIEW



1. BOLT LIMIT SWITCH TO LIMIT SWITCH MOUNTING BRACKET WITH 3/8" BOLTS.
2. UNBOLT BOLT IN PANEL ABOVE ACCESS DOOR ON LATCH SIDE AND BOLT THE LIMIT SWITCH MOUNTING BRACKET IN PLACE.
3. MEASURE AND CUT LIMIT SWITCH LEVER ARM TO DESIRED LENGTH.
4. ATTACH LIMIT SWITCH LEVER ARM TO LIMIT SWITCH (DO NOT TIGHTEN SET SCREW AT THIS TIME).
5. ATTACH THE ACCESS DOOR LIMIT SWITCH TRIGGER PLATE TO ACCESS DOOR WITH SELF TAPPING TEK SCREWS IN FRONT OF LIMIT SWITCH LEVER ARM.
6. MAKE FINAL ADJUSTMENTS TO LEVER ARM TO ASSURE PROPER OPERATION.
7. TIGHTEN SET SCREW ON LIMIT SWITCH LEVER ARM.



1. BOLT LIMIT SWITCH TO LIMIT SWITCH MOUNTING BRACKET WITH 3/8" BOLTS.
2. UNBOLT BOLT IN PANEL, OR DOOR STOP, ABOVE CENTER OF PRODUCT DOOR AND BOLT THE LIMIT SWITCH MOUNTING BRACKET IN PLACE.
3. MEASURE AND CUT LIMIT SWITCH LEVER ARM TO LENGTH.
4. ATTACH LIMIT SWITCH LEVER ARM TO LIMIT SWITCH (DO NOT TIGHTEN SET SCREW AT THIS TIME).
5. ATTACH THE ACCESS DOOR LIMIT SWITCH TRIGGER PLATE TO ACCESS DOOR WITH SELF TAPPING TEK SCREWS IN FRONT OF LIMIT SWITCH LEVER ARM.
6. MAKE FINAL ADJUSTMENTS TO LEVER ARM TO ASSURE PROPER OPERATION.
7. TIGHTEN SET SCREW ON LIMIT SWITCH LEVER ARM.

SECTION 4

FLUORESCENT LIGHT FIXTURES

This Section contains literature pertaining to the installation, operation and maintenance of the above component. Tempered safety glass provided with the light fixtures is to be caulked to light frame at time of installation.

Your *Col-Met Spray Booths* paint spray booth is provided with LDPI, Inc. fluorescent light fixtures. Below are the specifications for these light fixtures.

Product Specification

S&G Type:	LDPI Model 1100-A rear access, sealed & gasketed, 4-tube fluorescent light fixture. LDPI Model 1101-A front access, sealed & gasketed, 4-tube fluorescent light fixture.
Open Type:	LDPI Model 390229 open type, 4-tube fluorescent light fixture.
Bulb Size:	48" long, 32 watt
Bulb Type:	T -8
Power Requirements:	All lights provided are dual voltage (120VAC & 277VAC)

Product Source

Col-Met Spray Booths
LDPI, Inc.

Phone: 972-772-1919
Phone: 800-657-6956

SECTION 5

EXHAUST FANS

This section contains literature pertaining to the installation, operation and maintenance of the above component.

Your *Col-Met Spray Booths* paint spray booth is equipped with a Aerovent Fan tubeaxial fan for exhausting air from the paint booth. This type of fan was designed specifically for use in applications such as paint spray booths where the fan drive motor must be located out of the air stream. The fan blades are constructed of non-sparking aluminum for added safety. The fan and drive motor have been sized for the specific size of your booth, in accordance with all applicable environmental and safety requirements.

Product Specification

Type:	Tubeaxial with AMCA Spark Resistant Construction
Manufacturer:	Aerovent
Model:	Refer to the enclosed spray booth drawings.
Nominal Diameter:	12" – 42" *
Airflow:	1700 – 30,000 CFM *
Motor:	ODP
Power:	3/4 – 10 HP *
Fan RPM:	Refer to the enclosed spray booth drawings.

Product Source

Col-Met Spray Booths
Aerovent

Phone: 972-772-1919
Phone: 763-551-7500

* Refer to the enclosed spray booth drawings for specifics on your booth.

Typical Specifications

Model BTABD, Arrangement 9 – Belt Driven

Fans, where indicated on drawings and schedules, shall be Model BTABD, Arrangement 9, V-belt driven, axial flow type as manufactured by Aerovent, Minneapolis, Minnesota, and shall be of the size and capacity as indicated in the fan schedules. Model BTABD fans have been tested in an AMCA registered laboratory in accordance with AMCA 210 and AMCA 300 test codes for both air and sound. In addition each unit shall be factory run tested and final trim balanced prior to shipment.

CONSTRUCTION — Fan casings shall be welded of ASTM A-1011 low carbon, commercial quality 12-gauge hot rolled steel in sizes through 20" diameter, 10-gauge hot rolled steel from 24" diameter through 28" diameter, and 7-gauge hot rolled steel on sizes greater than 30" in diameter. Inlet and outlet flanges shall be integrally rolled mechanically from fan casing sheet steel to insure concentricity and alignment. Accuracy and uniformity of the fan casing shall be insured through the use of welding jigs and fixtures. The motor base plate shall be fabricated of minimum 3/16" steel plate and welded to the exterior of the fan casing.

PROPELLERS — Propellers shall be constructed of non-sparking, die cast aluminum hubs and blades. Fan blade pitch angle shall be preset at the factory. Propellers shall be secured to the fan shaft with a taper lock bushing.

SHAFT & BEARINGS — All fans shall be supplied with a shaft of AISI C-1045 steel material that has been properly turned, ground, and polished for accuracy. The shaft shall be supported by a matched set of non-lubricable bearings that are housed in a cast aluminum monoblock. All fan bearings are to have an L-10 minimum life as defined by AFBMA of at least 60,000 hours.

DRIVES — Fan drives shall include cast iron sheaves and non-static conducting belts. Fans equipped with motors up to and including five horsepower will be furnished with a variable pitch type drive sheave to allow for minor speed adjustment of the fan propeller during system balance. Fans equipped with larger motors will be furnished with a fixed drive sheave. A belt guard is to be provided to afford personnel safety and general traffic protection.

MOTORS — Fan motors shall be manufactured in accordance with current applicable standards of IEEE and NEMA. They shall be foot-mounted, NEMA standard, TEFC or ODP, continuous duty, ball bearing with class "B" insulation.

BALANCING — The propeller assembly shall be statically and dynamically balanced in accordance with ANSI/AMCA 204-05 "Balance Quality and Vibration Levels for Fans" to Fan Application Category BV-3, Balance Quality Grade G6.3. In addition, belt driven fan propellers shall be balanced on the fan shaft after final assembly in the fan casing, in the manufacturing facility to the following peak velocity values, filter-in, at the fan test speed:

Fan Application Category	Rigidly Mounted (In/Sec)	Flexibly Mounted (In/Sec)
BV-3	0.15	0.20

Final test room vibration levels in the axial, vertical, and horizontal planes shall be recorded and a written copy shall be available upon request.

FINISH — The fan housing, after fabrication, shall be cleaned and chemically pretreated by a phosphatizing process and shall be painted inside and out with two coats of air dry enamel.

All Aerovent fan assemblies are statically and dynamically balanced to Balance Quality Grade G6.3. Each fan is factory run and tested for vibration in accordance with ANSI/AMCA 204-96 "Balance Quality and Vibration Levels for Fans" to Fan Application Category BV-3, to the following peak velocity values, filter-in, at the fan test speed:

Fan Application Category	Rigidly Mtd. (in./sec.)	Flexibly Mtd. (in./sec.)
BV-3	0.15	0.20

Vibration measurements, when possible, should be taken at each fan shaft bearing in two planes perpendicular to the axis of rotation (planes to have 90 degree interval), and one measurement parallel to the axis of rotation. On direct drive units, the perpendicular measurements will be taken at each end of the motor or casing, taking care not to take measurements on the fan shroud on TEFC motors. The axial measurement can be taken on the motor foot or mounting base. In some cases, primarily on axial flow units, it will not be possible to take measurements at the bearings or motor. On these units, the measurements should be taken on the inner shell near the bearings. If this is not possible, then take the readings on the outer shell near the bearing locations.

If vibration is excessive, shut down the fan and determine the cause.

Common Causes of Excessive Vibration

1. Support structure not sufficiently rigid or level. Vibration amplified by resonance in ductwork or support structure.
2. V-belt drive misalignment. Belt tension is too tight or too loose.
3. Bearing locking collar or mounting bolts loose. Propeller set screw loose.
4. Material accumulation on propeller.
5. **Centrifugal Fans:** Wheel rubbing on inlet cone.

Motors

Most integral horsepower totally-enclosed motors have drain plugs in the end bells for drainage of condensation. On all roof ventilators, the bottom or lower plug has been removed for continuous drainage.

All other style fans are shipped with the drain plugs installed. The user should remove the proper drain plug. For horizontally mounted units with the motor in the airstream, remove the downstream drain plug. For vertically mounted units, remove the bottom or lower drain plug.

With motors supplied by the user, drain plugs may not have been provided. Check with the motor manufacturer regarding drainage and condensation.

Lubrication Instructions for Ball Bearing Motors

Grease-lubricated bearings, as furnished, are adequate for a long period of operation without relubrication. A good maintenance schedule for regreasing will vary widely depending on motor size, speed and environment.

The table below suggests relubrication intervals for motors on normal, steady running, light duty indoor loads in relatively clean atmosphere at 40°C (105°F) ambient temperature or less. Fractional horsepower motors follow a schedule similar to that shown under frames 143T to 215T.

Motor Lubrication Intervals

TYPE OF ENCLOSURE	INSULATION	FRAME SIZE		
		143T-215T	254T-326T	364T-449T
Open-DP	B	2 yrs.	18 mos.	1 yr.
Enclosed-FC	B	18 mos.	1 yr.	9 mos.
Open-DP	F			
Enclosed-NV	B	1 yr.	9 mos.	6 mos.
Enclosed-FC	F			
Open-DP	H			
Enclosed-Lint	B	9 mos.	6 mos.	3 mos.
Free-FC	F			
Enclosed-NV	H			
Enclosed-Lint	F			

NOTE: For motors over 1800 RPM, use 1/2 of tabled period. For heavy duty, dusty locations, use 1/2 of tabled period. For severe-duty high vibration/shock, use 1/3 of tabled period.

VOLUME - REFERENCE TABLE

SHAFT DIAMETER (AT FACE OF BRACKET)	AMOUNT OF GREASE TO ADD
3/4" to 1 1/4"	1/8 cu. in. or 0.1 oz.
1 1/4" to 1 7/8"	1/4 cu. in. or 0.2 oz.
1 7/8" to 2 3/8"	3/4 cu. in. or 0.6 oz.
2 3/8" to 3 3/8"	2 cu. in. or 1.6 oz.

Motors with no provision for lubrication are equipped with sealed bearings and require no maintenance. Motors mounted in inaccessible locations are provided with extended grease lines to facilitate lubrication if provisions for lubrication are provided. The bearings are equipped with relief fittings to prevent over-lubrication. The grease lines are filled with lubricant at the factory.

Procedure for Relubrication

1. Stop motor.
2. Remove grease relief plugs in bearing housings.
3. Grease with hand gun until new grease appears at relief hole.
4. Run motor for ten (10) minutes before replacing relief plugs.

CAUTION: Do not over-lubricate. This is a major cause of bearing and motor failure. Make sure dirt and contaminants are not introduced when adding grease.

Type of Grease

Lubricate with the following greases or their equivalent:

- Amoco Rykon Premium #2
- Chevron BRB-2 - Standard Oil or Calif.
- SRI-2 - Standard Oil Company
- Alvacin #2 - Shell Oil Company
- Mobilith AW2

For motors lubricated with special greases, check lubrication tag on motor.

Lubrication Instructions for Fan Ball Bearings

Bearings and grease lines on belt driven fans are lubricated in assembly. When lubrication is required, add grease slowly while the shaft is rotating until grease comes rapidly out of the seal.

For extreme conditions, lubricate according to experience. For normal conditions, lubricate the bearings with Mobilith AW2 or an equivalent.

Bearings and grease lines on axial fans that are ordered for high moisture or above normal temperatures have been lubricated with a special lubricant, Plastilube #2. Lubricate at regular intervals with Plastilube #2 as indicated in the special lubrication chart listed below. Plastilube #2 is available from Sulflo, Inc. 1158 Erie Avenue, North Tonowanda, New York 14120.

Special Lubrication Frequency For High Temperature and High Moisture

AIRSTREAM TEMPERATURE	HOURS
TO 350°F	5000
TO 350°F	1500
TO 500°F	1000
WET ATMOSPHERE AT ROOM TEMPERATURE	1000 TO 1500

Storage of Equipment

Fan Bearings

Since bearings tend to "breathe" on equipment stored in areas with other than a constant temperature, moisture will condense internally. Therefore, it is necessary to keep the bearings completely full of grease and periodically rotated to make certain that all internal parts are coated with grease. Even a full bearing will eventually pick up moisture and, therefore, must be periodically purged with new grease.

Grease should be purged from the bearings to remove condensed moisture, and the fan wheel rotated by hand every thirty (30) days. This procedure should be done more often if weather is severe or if there is a wide variation in temperature.

CAUTION IN PURGING: The fan should be rotated while increasing and high pressure pneumatic greasers should be avoided. See "Lubrication Instructions for Fan Ball Bearings."

To rotate the fan, follow the procedure listed below:

The blade marked number 1 should be rotated to top center. The blade number and date should be recorded in a log book which is to be stored in a protective pouch attached to the fan. During storage, the fan propeller should be rotated by hand at

least ten (10) revolutions every thirty (30) days to circulate the lubricant in the bearings in the motor or on the fan shaft. After the tenth revolution, stop with a blade at top center which is not the same one as is listed for the previous date in the log book.

Fans which are V-belt driven should be prepared for storage as follows:

Carefully remove the belts, coil them (without kinks) in matched sets and place them in a heavy carton. Mark the carton with fan identification and store the carton in a dry, well-ventilated area. Belts must not be left exposed to sunlight or subjected to storage ambient conditions exceeding 85°F, 70% relative humidity. Belts which show signs of deterioration should be replaced prior to startup. Before reinstalling belts, review the section on "Belt Tension."

NOTE: Procedures for storage of Aerovent equipment as outlined above are intended as a general guide only. Storage conditions will vary depending on the location. Common sense and practical experience should determine to what extent the above procedures will be followed.

Motors

Motors must be stored under cover in a clean, dry, vibration-free location. Remove sufficient packaging material to allow circulation of air around the motor. Maintain the temperature of the windings a few degrees above that of the surrounding air to protect against condensation. If the motor is equipped with internal heaters, the heaters should be energized throughout the storage period to prevent moisture condensation. If the motor does not have internal heaters, this can be accomplished using any other safe, reliable method of heating. Measure and record the ambient air temperature and winding temperature monthly.

In the event that the motor is not equipped with internal heaters and space heating equipment is unavailable, wrap the motor as tightly as possible with heavy duty polyethylene. Employ bags of desiccant (such as silica gel) in the motor to minimize moisture problems. Check the desiccant regularly and replace it periodically as dictated by climate requirements.

To prevent rusting of bearing parts, the rotor must be rotated at regular intervals (30 days) to assure these parts are well covered with oil or grease.

Prior to energizing the motor, it is to be inspected and meggered by a motor manufacturer's field service engineer. The charges for this service to the customer will be in accordance with the manufacturer's published service rates in effect at the time of the inspection.

In addition, it is strongly recommended that the motor manufacturer be contacted for specific long-term storage instructions.

Lubrication Frequency for Horizontal Shaft Installations (see Note ① for vertical shaft installations)

SHAFT SIZE (INCHES)	LUBRICATION FREQUENCY ①									
	OPERATING SPEED (RPM)									
	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
1/2 - 1	6	6	6	6	6	6	4	4	2	2
1 1/2 - 1 3/4	6	6	6	6	6	6	4	4	2	2
1 3/4 - 2 1/8	6	6	6	4	4	2	2	2	1	1
2 1/8 - 2 3/8	6	4	4	2	2	1	1	1		
2 3/8 - 3	6	4	4	2	2	1	1			
3 - 3 1/2	6	4	2	1	1	1				
3 1/2 - 4	6	4	2	1	1					

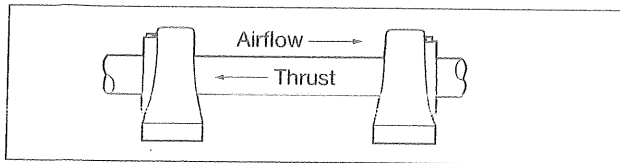
NOTES: ① Reduce this lubrication frequency schedule by half for vertical shaft installations.
② Consult manufacturer for specific recommendations.

Fan Bearing Replacement Procedure

It is important to follow the assembly and alignment procedure when making an installation of replacement bearings. Inspect the shaft for wear at the bearing mounting positions. Shaft diameter should not be undersized more than commercial ground and polished tolerances. Excessive undersizing will result in rapid wear.

1. Place new bearings loosely on the shaft. Locking collars may be located on either end of the bearings for ease of installation. The illustration shows one locking collar on the drive end and one locking collar on the fan end which is typical for a tubeaxial type fan. A typical SWSI centrifugal fan would have both collars mounted on the sheave side of the bearings. Drop the mounting bolts in place, snug them and adjust the position of the shaft with proper spacing at either end.
2. Center both ends of the shaft in the housing of tubeaxial fans using the propeller as a guide. On centrifugal fans, the shaft is positioned 90° to the scroll side with the wheel inlet centered in the scroll inlet. Use the clearance in the mounting holes for horizontal adjustment and shims, if necessary, for vertical adjustment.

Figure 1. Two Bearing Drive



3. Tighten the bearings to the base plate and check the position of the shaft again. Before tightening the locking collars, be sure the shaft and bearings are in proper alignment. The shaft should slide freely end to end.
4. Tighten the eccentric cam locking collar of the bearing at the propeller/wheel end. (The locking collar design provides a positive lock of the wide inner ring bearing to the shaft. To tighten, turn the locking collar in the direction of shaft rotation to the lock position, then tighten the collar set screw.) Repeat this procedure for the sheave end locking collar on DWDI and open wheel centrifugals. For other fan types, proceed to Step 5.
5. Axial flow propellers and single inlet centrifugal wheels with back plates exert an air thrust toward the fan inlet. To help balance the bearing loading, we allow the fan end bearing, (belt driven units) to carry the majority of this thrust loading while the sheave end bearing carries most of the radial load. (Direct coupled units would be just the opposite.) To accomplish this, grasp the sheave end of the shaft and pull or push on it toward the fan inlet. At the same time, tap the locking collar of the sheave end bearing (fan end on direct coupled units) in the opposite direction with a soft mallet.
6. The final step is to tighten the sheave end bearing eccentric cam locking collar while maintaining constant pressure on the shaft toward the fan inlet.

For special heavy duty bearings, a spring locking collar is used. The two knurled cup-point set screws extend through the inner ring of the bearing and lock firmly onto the shaft. Tighten the propeller end collar first, then take hold of the sheave end of the shaft, pull and then tighten the locking collar. The locking collar is tightened by using the two set screws mentioned above.

Replacing Fan Belts

Worn belts may be easily replaced without removing the fan from the system.

1. Loosen the motor hold-down bolts and move the motor toward the fan. (This is done by turning a jackscrew which is a part of the motor base on models having larger motors.) The belt may be slipped off the motor sheave and then easily removed from the sheave on the propeller shaft.
2. Check the numbers on the belt and make the replacement with a belt having the same length and section.
3. Adjust the motor outward to tighten the belt (see instructions on belt tension, below) and tighten the motor hold-down bolts. Be sure that the motor is not cocked at an angle and that the end face of the motor sheave is parallel to the end face of the driven sheave.

Belt Tension Procedure

Belt tension is very important to the proper operation of a fan and to the service life of a V-belt drive. A new fan will be received with its belts properly adjusted; however, all V-belts stretch in the first few hours of operation. It is necessary to readjust the belt tension after eight hours of running. After 100 hours the belts should again be adjusted. Thereafter, periodic inspection is recommended so belts may be adjusted or replaced when necessary.

1. To adjust the belts, loosen the motor hold-down bolts. Tighten the belt using the motor base adjusting screw until the belt appears to be taut. You should be able to deflect the belt slightly by squeezing the two sides between thumb and forefinger and the belt should snap back into position when released.
2. Retighten the motor hold-down bolts and start the fan. If the belt screeches on startup it is too loose and should be tightened further.
3. Allow the fan to run for a while, stop the fan, and check the temperature of the sheave with your hand. If the sheave is too hot to touch, the belt is probably too tight.

V-belt drives on Aerovent fans are purposely sized to handle considerably more load than would be necessary for normal drive design. This is done to prolong the life of the drive and provide for minimum maintenance. Belts should be replaced when they have obviously become worn, even though they are still operating. A badly worn belt will also cause undue wear of the sheave. Replace belts when they show definite signs of wear; otherwise the sheaves will become worn to the point where they also must be replaced. Never put new belts on a badly worn sheave. This will reduce the capacity of the drive and cause excessive belt wear.

Most Aerovent fans are provided with an adjusting screw as a part of the motor base for easy setting of belt tension. However, small fans or fans using small horsepower motors may have only a slotted base plate. When the belt tension is adjusted by moving a motor on a slotted base, be sure to block the motor tightly and squarely before tightening the hold-down bolts, keeping the motor sheave in line with the belt. The motor sheave must be parallel to and in line with the fan sheave.

When you make replacement of belts on a multi-groove drive, be sure they are used in a matched set. If you are not sure the belts are matched, observe them in operation. The tight side should be perfectly straight and the belts should run smoothly and in line. The slack side should bow out and also be in line. If one of the belts extends out considerably farther than another, it is an indication that the belts are not matched and should be changed. If there is only a slight difference, the normal stretching in the first hours of operation will equalize the belt lengths and the belts will be well matched.

Adjusting Variable Pitch Sheaves

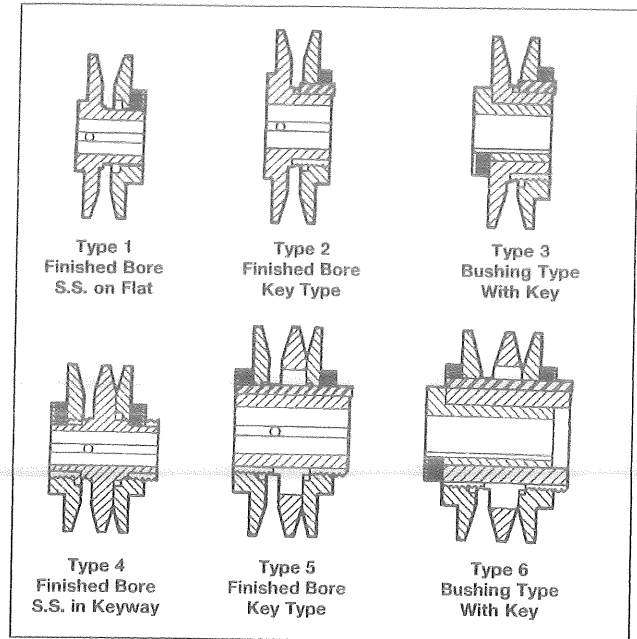
Many Aerovent belt driven fans are furnished with variable-pitch motor sheaves. Sheaves may be adjusted for lower fan speeds without concern of overloading motors. When adjusting sheaves to increase the fan speed, check the motor current to be sure the motor is not overloaded. Keep the motor current within the nameplate and service factor ratings.

The sheaves used are easily adjusted. They come in various styles, depending upon the size drive and motor shaft. They are all fitted with hollow head knurled point safety set screws.

The following steps should be taken to adjust the pitch diameter.

1. Release belt tension and remove the belt or belts from the sheave.
2. Loosen the set screw and remove the key holding the adjustable half of the groove (keys used on styles 2, 3, 5 and 6 only). With styles 3 and 6, it may be necessary to remove the sheave from the shaft to remove the key.
3. Rotate the adjustable half of the sheave out for a smaller pitch diameter (decreased speed) or in for a larger pitch diameter (increased speed). Each one-half turn will change the pitch diameter one-tenth of an inch. Adjust two-groove sheaves the same amount on each groove. 4L or A belts will operate satisfactorily with the sheave fully closed to a maximum of five full turns open. 5L or B belts will operate satisfactorily with the sheave one full turn open to a maximum of six full turns open. (This will insure full contact of the sheave in the groove.)
4. Replace the key and tighten the set screw to lock the sheave half in position.
5. Replace the belts and tighten to the proper tension. If an extreme amount of adjustment has been made, it may be necessary to replace belts with another length.

Figure 2. Types of Sheaves

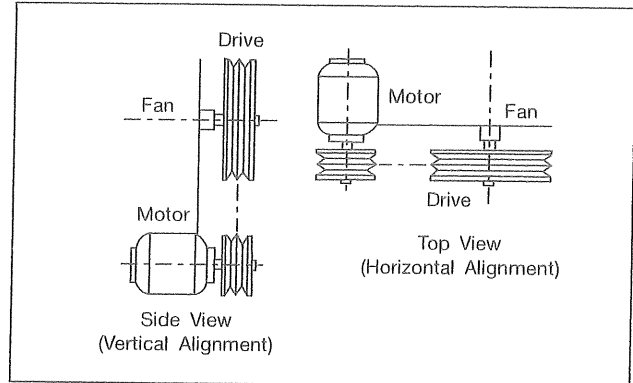


V-Belt Drive Alignment

Proper alignment and balance of the V-belt is as important as a well-balanced propeller. To insure smooth fan operation, the following should be checked:

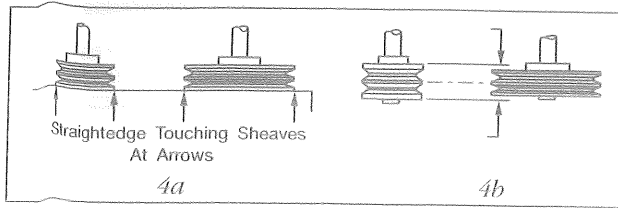
1. The fan and motor sheaves must be in axial alignment. Shafts are parallel in both the vertical and horizontal planes (Figure 3).

Figure 3. Fan and Motor Sheave Axial Alignment



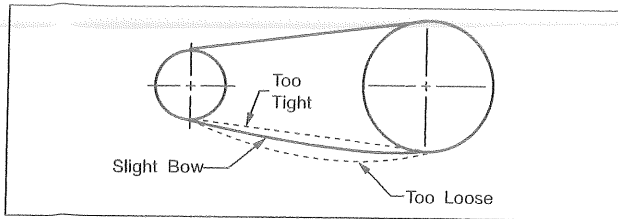
2. The fan motor sheave must be in radial alignment. When sheaves are of equal width, align with a straightedge (Figure 4a). When sheaves are of unequal width, align the center of the sheaves (Figure 4b).

Figure 4. Sheave Alignment



3. Sheaves must have no noticeable eccentricity.
4. Belts must have the proper tension. Belts either too loose or too tight cause vibration and excessive wear (Figure 5). See instructions for belt tension adjustment procedure.
5. After proper installation of drives, recheck the complete assembly for smoothness of operation.

Figure 5. Proper Belt Tension



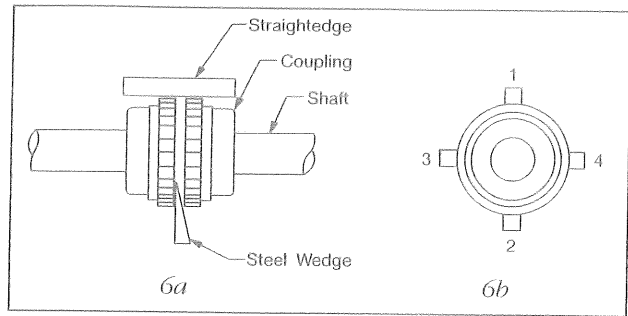
Flexible Couplings

Direct-coupled fans, which are received factory assembled, on a common base plate, are accurately aligned before shipment. However, base plates are flexible to some extent and therefore must not be relied upon to maintain the factory alignment. Realignment is necessary after the fan has been leveled, grouted, and the foundation bolts tightened. Also, check the lubricant, where applicable, following the manufacturer's recommendations for the type and amount of lubricant.

For field installation, the coupling should be mounted as follows:

1. Remove dirt or rust from fan and motor shafts and coat with grease or oil for ease of mounting.
2. Check fan and fan shaft alignment, making sure that the bearings are secure. Mount the fan shaft coupling half flush to the end of the shaft and secure.
3. Mount the motor shaft coupling half flush to the end of the shaft and secure.
4. Move the motor into position, with the coupling faces separated by the coupling manufacturer's specified gap.
5. With a straightedge, tapered wedge, or a feeler gauge, check for parallel and angular alignment (Figure 6a).
6. Align the shafts until a straightedge appears to be parallel to the shafts. Repeat at three additional points at approximately 90° from each other (Figure 6b). Recheck the hub separation gap.
7. For more accurate alignment, use a dial indicator clamped on one hub. With the dial button resting on the other hub, rotate the hub on which the indicator is clamped and observe the indicator reading. Take readings at four locations, 90° apart. With correct alignment, the faces of the couplings should be parallel within 0.002".
8. Once proper alignment is assured, secure the motor, examine the alignment, complete the assembly, and lubricate the coupling (when required) before putting the unit into operation.

Figure 6. Flexible Coupling Alignment



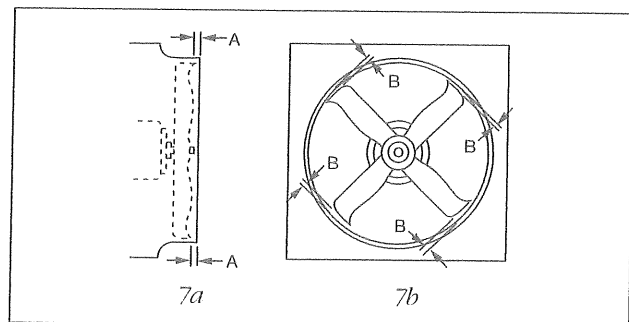
Propeller/Wheel Alignment

Fans, which are received factory assembled, have the propellers already aligned and in place before shipment. However, fans being flexible to some extent are sometimes subject to movement during shipment. To insure smooth operation and proper performance, the following propeller alignment should be checked before putting a fan into operation.

Propeller Fan Alignment

The fan shaft should be centered and parallel to the fan casing. Center by checking gap (B) between the propeller tip and the fan casing. Repeat at three additional points at approximately 90° from each other (Figure 7b). Parallelism can be observed by measuring the axial distance (A) from one blade to the end of the fan casing at four points at approximately 90° from each other (Figure 7a).

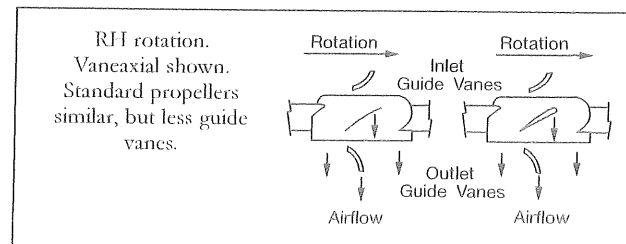
Figure 7. Propeller Fan Alignment



Do not confuse parallelism with blade track (axial deviation of one blade to another). Blade track can be checked by measuring the axial distance from one point on the fan casing to the same point on each blade as it passes by. (Some blades are mistracked for balancing.)

While checking the propeller alignment, it is good practice to check its rotation. Normally the fan rotation is marked by arrows on both the propeller and the fan casing. If omitted, obliterated, or misapplied, check for proper rotation as in Figure 8.

Figure 8. Checking for Proper Rotation



SECTION 6

EXHAUST FILTERS

This Section contains literature pertaining to the installation, operation and maintenance of the above component.

Your *Col-Met Spray Booths* paint spray booth is provided with a Columbus air filtration system. This system is designed to efficiently remove paint particulates from the exhaust and recirculation air streams.

Additional literature has been included for the exhaust filters.

Product Source

Col-Met Spray Booths
Columbus

Phone: 972-772-1919
Phone: 740-983-2552



SPECIFICATION SHEET

PRODUCT: SUPRA II MINI-MESH

I. PERFORMANCE DATA *

<u>COATING</u>	<u>TYPICAL ARRESTANCE RANGE</u>	<u>HOLDING CAPACITY</u>
High-Solids Bake Enamel	98.5% - 99.5%	5.80 @ 0.20" w.c.
Waterborne Bake Enamel	97.5% - 99.0%	7.80 @ 0.50" w.c.

II. CONSTRUCTION **

<u>"Large Diamond" Paper;</u>	3 Layers
<u>"Small Diamond" Paper</u>	1 Layer
<u>"Mini Mesh" Paper</u>	1 Layer
<u>Polyester;</u>	1 Layer

III. UNDERWRITERS LABORATORY INC. CLASSIFICATION

Classified as to Flammability Only, Class 2

^a Note: Tests were conducted using modified ASHRAE STANDARD 52-76 test apparatus and procedures (0.5" H₂O test endpoint). Test filter consisted of 20" x 20" pads or pockets, held in a frame/grid module, as used in the field. Overspray was generated by an air atomizing gun with an initial air velocity of 150 fpm. Actual resistances, arrestances and holding capacities may differ due to the variations in paint make-up, mixing ratios, viscosities, booth conditions, etc.

** See Columbus Industries sales literature for nominal sizes (length, width, and depth) available

STANDARDS FOR NFPA 33

2000 Edition

CHAPTER 3

OPERATIONS

(Taken from the 2000 Edition of the NFPA 33 with an effective date of August 18, 2000)

3.1.1 GENERAL REQUIREMENTS FOR THE OPERATION OF SPRAY APPLICATION EQUIPMENT

manufacturers' specifications and the requirements of this standard. **Maintenance shall be the responsibility of the users of the apparatus and processes.**

A.9.1 The materials used in spray applications processes can create serious fire hazards. Flammable and combustible liquids can form explosive mixtures in air. In addition, flammable and combustible liquids can be ignited by a spark or flame.

Flammable and combustible liquids can form explosive mixtures in air. In addition, flammable and combustible liquids can be ignited by a spark or flame. These materials, vapors, and combustion products, including residues, can spread rapidly and can produce intense heat and smoke. Properly designed equipment can do much to lessen these hazards, but cannot eliminate them. Careful attention to safety procedures, proper operation, maintenance of equipment, and daily cleaning are essential to a safe operation.

Inspections and some type of periodic maintenance of equipment are a part of the maintenance procedures. It is also important that any inspections of spray application equipment be conducted by competent and reliable personnel who are familiar with the equipment and the materials used.

The frequency of the inspections depends on the individual components of the equipment. Control valves or other control mechanisms for approved fire protection systems on a weekly or even monthly basis. However, this frequency would not be sufficient for the equipment used in spray application processes. As a minimum, this should be done at the beginning of each operating shift.

Similarly, the build-up of residues would be an item that also would need to be checked on a per-shift basis. Individual plant operations might dictate that either of these items (air flow and residue build-up) be checked every few hours.

8.1.1* Spray application operations shall not be conducted outside of the predetermined spray area.

- A.8.1.1 The use of the term *predetermined* is intended to convey the idea that one cannot arbitrarily locate or conduct spray application operations without thought to the hazards and special requirements that such operations demand. Requirements regarding electrical equipment and ventilation are of primary concern. This standard also specifies requirements that can vary based on the type of equipment used, the type of material being spray applied, and even the type of operation. Any spray application operation should also consider the storage, handling, and even distribution of the coating materials used in the process. Certainly there are other factors, but these examples should adequately explain the need for predetermining the spray area and why operations should be confined to those areas.

8.1.2 Inspection of extinguishing systems shall be conducted to ensure that the performance of the extinguishing system components will not be affected by overspray and residues. .

8.2* Combustible Deposits. All spray areas shall be kept free of the accumulation of deposits of combustible residues. Combustible coverings (tint paper, plastic, etc.) and strippable coatings shall be permitted to be used to facilitate cleaning operations in spray areas. If residue accumulates to excess in nooks, crevices or other discharge points, or other spray areas, then all spraying operations shall be discontinued until conditions are corrected.

- A 8.2 When spray finishing any work piece, there is frequently a portion of the spray that does not deposit directly on the object or material being coated, but deposits on adjacent surfaces as residue material. This is referred to as overspray. Many of these residues are highly combustible, igniting at very low temperatures or spontaneously, resulting in fast-spreading fires. To limit the duration and intensity of fires, the accumulation of deposits must be minimized and controlled as much as practical. The accumulation of residues represents one of the more significant challenges to fire control.

Cleaning. The interior of spray booths, exhaust fan blades, and exhaust ducts should be regularly cleaned to avoid the accumulation of residues. Either spray operators should be allowed adequate time for cleaning or a dedicated cleaning crew should be provided for cleaning at the close of each day's operation.

If equipment is so designed that, during cleanup, hose streams or fixed water nozzles can be used in ducts and spray booths without water damage to building and contents, cleaning operations are greatly facilitated. Many plants have found that by coating the interior of the spray booth with a suitable soap-like or water-soluble material immediately after cleaning, adhesive spray deposits can be removed on the following day with the use of water streams. Other materials, such as plastics that can be readily peeled off the interior of the spray booth, can also be used to facilitate cleaning of the overspray residue.

Properly maintained water-wash booths offer lower fire loading than dry booths. In order to maintain this advantage, it is necessary to perform regular and scheduled maintenance. This maintenance schedule should be recorded and the records filed. When the nozzles, jets or orifices, eliminator packs, and strainer screens become fouled with accumulated sludge or overspray, combustible residues will be deposited on the interior of the exhaust duct and fan blades. The nozzles, jets, orifices, and eliminator packs should be inspected each work shift. Strainer screens should be removed and cleaned each work shift.

The booth interior, exhaust stack, and fan blades should be checked periodically and accumulations of overspray and dirt should be removed as required. Exhaust ducts or stacks should not be entered for cleaning or repairs unless they are free from flammable vapors and have been thoroughly wet down.

8.3 High Pressure Hose Lines. High pressure hose lines that convey flammable or combustible coating material in "airless" spray application operations shall be inspected frequently and shall be repaired or replaced, as necessary. Hose lines and equipment shall be located so that, in the event of a leak or rupture, coating material will not be discharged into any space having a source of ignition.

8.4 Maintenance Procedures.

8.4.1 Maintenance procedures shall be established to ensure that overspray collector filters are replaced before excessive restriction to airflow occurs. Overspray collectors shall be inspected after each period of use, and clogged filters shall be discarded and replaced.

8.4.2 All discarded overspray collector filters, residue scrapings, and debris contaminated with residue shall be removed immediately to a well-detached location or placed in a water-filled metal container and disposed of at the close of the day's operation unless maintained completely submerged in water.

8.5* Waster Containers. Approved metal waste cans shall be provided wherever rags or waste are impregnated with sprayed material and all such rags are waste deposited therein immediately after use. The contents of waste and shall be disposed of at least once daily at the end of each shift.

- A.8.5 Many fires originated from the spontaneous ignition of fabric and waste impregnated with coating materials. When sprayed articles are rubbed with rags or waste, all unclean rags and waste should be immediately placed in approved waste cans and removed from the premises at least daily at the close of each shift. When employees change clothes on plant premises, soiled clothing should be kept in metal lockers provided in a segregated dressing room.

8.6 Clothing. Employee's clothing contaminated with sprayed material shall be left on the premises overnight unless kept in metal lockers.

8.7 Cleaning Solvents.

8.7.1 Solvents for cleaning operations shall have flash points above 100 F (37.8 C).
Exception: Solvents having flash points not less than those used in spray operations

shall be permitted to be used for cleaning spray nozzles and auxiliary equipment.

8.7.2 Cleaning operations using flammable or combustible solvents shall be conducted inside spray areas with ventilating equipment operating or in other adequately ventilated locations that meet the requirements of 4.3.5.

(See attachment)

8.7.3 Spray gun cleaners using flammable or combustible solvents shall conform to the requirements of 4.3.5

(See attachment)

8.8* Spontaneous Ignition Hazards. The same spray booth shall not be alternately used for different types of coating materials if the combination of the materials is conducive to spontaneous ignition, unless all deposits of the first-used coating material are removed from the booth and exhaust ducts prior to spraying with the second coating material.

- A.8.8 Bleaching compounds, such as hydrogen peroxide, hypochlorites, perchlorates, or other oxidizing compounds, can cause fires when in contact with organic finishing materials. Hence, if bleaching compounds are to be used in spray booths, these booths should be thoroughly cleaned and used only for this purpose. The alternate use of spray booths for bleaching compounds and other finishing materials, or the alternate use of lacquers containing nitrocellulose and other types of finishing materials containing drying oils, such as varnishes, oil-based stains, air-drying enamels, primers, and so forth, without first thoroughly removing all traces of deposits can result in a spontaneous ignition fire.

8.9* Chlorinated Solvents. Coating material containing chlorinated solvents shall not be used with spray application apparatus or fluid-handling equipment if the chlorinated solvent will come into contact with aluminum within a piping system, pump, enclosed container, or any enclosure that is capable of being pressurized by the potential reaction. This shall apply even if the container or system has been constructed with pressure relief devices.

- A.8.9 Stricter environmental regulation has given to the increased use of chlorinated solvents such as 1,1,1-trichloroethane and methylene chloride. These solvents are not photochemically reactive and, therefore, can be useful in helping to meet standards regarding volatile organic emissions. However, these solvents have a well-documented characteristic of being chemically reactive with aluminum. The reaction that occurs is unpredictable both in terms of when it will occur and to what degree it will proceed. In most situations there is no apparent reaction. Other situations have noted effects ranging from simple corrosion to catastrophic explosion-like failure accompanied by considerable shrapnel and a fireball. Understanding and controlling the subsequent hazard is hindered by this unpredictability. While there is some understanding of the actual reaction, the following factors acting as independent variables have been found to have an effect on the initiation and rate of reaction:

- (1) Heat
- (2) Pressure
- (3) Ratio of aluminum surface to volume of solvent, presence of moisture (condensation), aluminum alloy content, metal content of the coating, and the introduction of other solvents or materials

Therefore, the only assuredly safe condition is to keep these materials separate.

It is important to realize that aluminum has been used as a primary material for spray equipment construction over many years. Incorporating these solvents into existing spray systems cannot be done safely without first determining the construction material of the equipment, and then replacing those components where contact with aluminum and chlorinated solvents will occur within a pressurized device (e.g., pumps, heaters, piping, fluid valves, spray gun cups).

8.10 Smoking. "NO SMOKING OR OPEN FLAMES" signs in large letters on contrasting color background shall be conspicuously posted at all spray areas and paint storage rooms.

8.11* Hot Work. Welding, cutting, and other spark-producing operations shall not be permitted in or adjacent to spray areas until a written permit authorizing such work has been issued. The permit shall be issued by a person in authority following his or her inspection of the area to ensure that precautions have been taken and will be followed until the job is completed.

- *A.8.11 Reporting.* If repairs or changes are to be made to equipment, care should be taken to see that all residue deposits are removed and the area wet down with water beforehand in order to avoid a fire. During such repairs, no spraying should be conducted, all flammable and combustible liquids and portable combustible material should be removed from the vicinity, and suitable fire extinguishers should be kept readily available.

The use of welding or cutting torches should be prohibited except under the supervision of a competent person familiar with the fire hazard involved. See NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*.

FIGURE 4.3.4 Class I (or Class II), Division 2 locations adjacent to an enclosed spray booth or spray room.

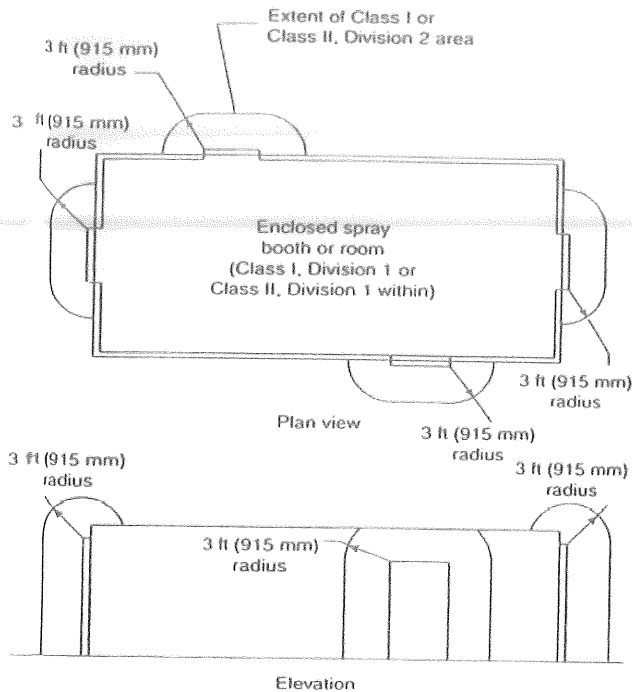


FIGURE 4.3.5 Electrical area classification around an open container.

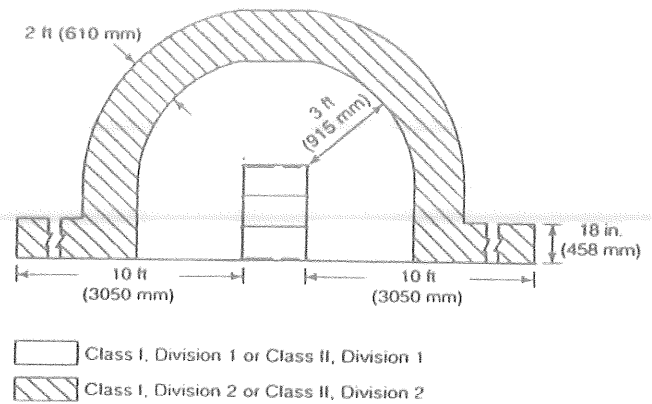
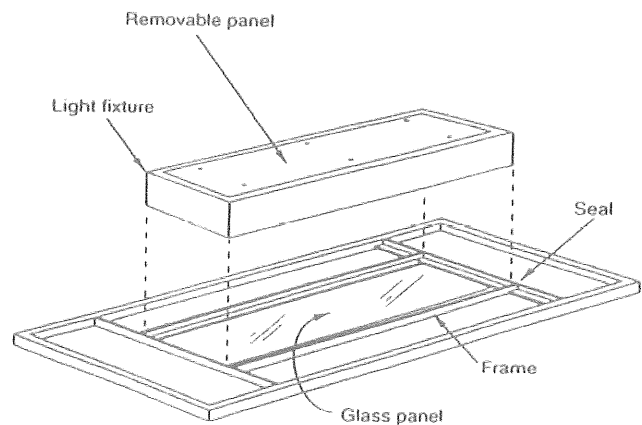


FIGURE 4.4.1 Example of a light fixture mounted outside of the spray area and serviced from outside the spray area.



4.3.5 Where spray application equipment, spray gun cleaners, and supply containers are located in an area that is ventilated at a rate that is sufficient to maintain the concentration of ignitable vapors in the area at or below 25 percent of the lower flammable limit, the area within 3 ft (915 mm) in all directions from any open container or equipment and extending to the floor or grade level shall be classified as Class I, Division 1 or Class II, Division 1, whichever is applicable. The area extending 2 ft (610 mm) beyond the Division 1 location shall be classified as Class I, Division 2 or Class II, Division 2, whichever is applicable. In addition, the area within 10 ft (3050 mm) horizontally of the perimeter of such open container or equipment up to a height of 18 in. (458 mm) above the floor or grade level shall be classified as Class I, Division 2 or Class II, Division 2, whichever is applicable. Electrical wiring and utilization equipment installed in these areas shall be suitable for the location, as shown in Figure 4.3.5.

4.4 Light Fixtures.

4.4.1 Light fixtures that are attached to the walls or ceilings of a spray area, but are outside of any classified area and are separated from the spray area by glass panels that meet the requirements of Section 3.5 shall be suitable for use in ordinary hazard (general purpose) locations, as shown in Figure 4.4.1. Such fixtures shall be serviced from outside the spray area.

4.4.2 Light fixtures that are attached to the walls or ceilings of a spray area; are located within the Class I, Division 2 or Class II, Division 2 location; and are separated from the spray area by glass panels that meet the requirements of Section 3.5 shall be suitable for use in that location, as shown in Figure 4.4.1. Such fixtures shall be serviced from outside the spray area.

4.4.3 Light fixtures that are an integral part of the walls or ceiling of a spray area shall be permitted to be separated from the spray area by glass panels that are an integral part of the fixture. Such fixtures shall be listed for use in Class I, Division 2 or Class II, Division 2 locations, whichever is applicable and as shown in Figure 4.4.3, and also shall be listed for accumulations of deposits of combustible residues. Such fixtures shall be permitted to be serviced from inside the spray area.

SECTION 7

INTAKE FILTERS

This Section contains literature pertaining to the installation, operation and maintenance of the above component.

Your *Col-Met Spray Booths* paint spray booth is provided with a Columbus Industries intake air filtration system. This system is designed to efficiently remove dust and other particulate matter from the air entering the paint booth.

Additional literature has been included for the intake filters.

Product Specification

Panel Filter Type SL-3C

These self-supporting panels are designed for 99% efficiency on 10-micron particles and larger. The media features a tackifier for maximum particle entrapment and efficiency. The SL-3C series conforms to UL 900, Class 1, is environmentally compliant with most landfill regulations and has a maximum continuous operating temperature of 212°F with peaks to 250°F.

Product Source

Col-Met Spray Booths
Columbus

Phone: 972-772-1919
Phone: 740-983-2552

SECTION 8

EXHAUST FILTER MANOMETER

This Section contains literature pertaining to the installation, operation and maintenance of the above component.

Your *Col-Met Spray Booths* paint spray booth is provided with an exhaust filter manometer. This device is used to measure the pressure drop across the exhaust filters as an indication of the condition of the filters.

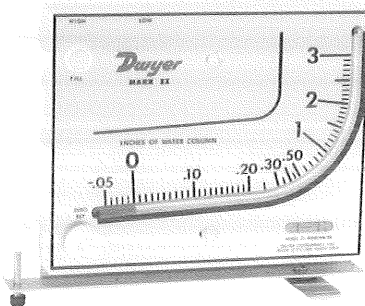
Product Specification

Dwyer Mark II Model No. 25 inclined-vertical manometer.

Product Source

Col-Met Spray Booths
Dwyer Instruments, Inc.

Phone: 972-772-1919
Phone: 219-872-8000



Mark II Model No. 25
inclined-vertical manometer,
(shown with optional A-612 portable stand)

Dwyer Mark II Manometers come in a variety of ranges. Make sure the oil being used is for the correct manometer.

Mark II #25, 27, MM-80 and M-700 Pa use red gage oil (specific gravity 0.826).

Mark II #26, 28 and MM180 use blue gage oil (specific gravity 1.9).

If additional oil is required, call or fax nearest Dwyer office listed at bottom of page.

INSTALLATION

Position manometer on a vertical surface. Drill two 1/8" or 9/64" holes on a vertical line 315/16" apart. Loosely mount manometer with self-tapping screws provided. Adjust gage until level bubble is centered in level vial, then secure the manometer tightly.

For portable use, order optional A-612 Portable Stand.

FILLING

Turn the zero set knob counterclockwise until it stops, then turn clockwise 3 full turns. This puts zero in approximately the middle of the travel adjustment in either direction. Remove the fill plug and fill with gage fluid until fluid reaches zero on scale. Minor adjustments can be made to adjust zero by adjusting zero knob. Replace fill plug. If gage is overfilled, remove excess by inserting pipe cleaner through the fill port to blot up excess oil.

MAINTENANCE

Check oil level regularly and adjust zero with zero adjust knob. Be sure tubing connections are disconnected and gage is open to atmosphere before adjusting zero.

Clean with mild soap and water. Avoid any cleaning fluids which may result in damaging the gage.

ACCESSORIES

Each Mark II manometer includes two tubing connectors for 1/8" pipe or sheet metal ducts, two mounting screws, 3/4 oz. bottle of indicating fluid, red and green pointer flags, 8' of double column tubing and instructions.

DWYER INSTRUMENTS, INC.

P.O. BOX 373 • MICHIGAN CITY, INDIANA 46361, U.S.A.

Phone: 219/879-8000

Fax: 219/872-9057

www.dwyer-inst.com

e-mail: info@dwyer-inst.com

SECTION 9

AIR SOLENOID VALVE

This Section contains literature pertaining to the installation, operation and maintenance of the above component.

As a built-in safety feature, your *Col-Met Spray Booths* paint spray booth is provided with a two-way solenoid valve for the purpose of insuring that pressurized air is only available to the spray gun if the paint booth is operating properly.

The function of this valve is to interrupt the supply of compressed air to the painting equipment under certain conditions. This is done to prevent painting from occurring when the booth is not operating as designed or if any booth doors are open. The air solenoid valve is electrically interlocked with the booth intake and exhaust fans. If the optional switches are purchased, it is also interlocked with the product doors and personnel doors. If a fan is not operating properly, or if a door is open for longer than a few seconds, the air solenoid valve will shut off the flow of pressurized air to the spray gun.

The unit should be installed down stream of any regulators and filters and upstream of the painting equipment. It should be located as close as possible to the fitting to which the painting equipment connects in order to insure rapid loss of supply pressure.

Product Specification

Solenoid Valve:

Goyen two-way air safety valve,
Model 12QW2-EUBNA-7281, ½" NPT

Product Source

Col-Met Spray Booths
Goyen Valve Corporation

Phone: 972-772-1919
Phone: 816-333-7333

General Service 2 WAY SOLENOID VALVES

Normally Closed • 1/4" to 1/2" N.P.T.

Description:

Internal Pilot Operated valves that feature "Q" Series coils for general service applications, as a less expensive alternate to the BW Series valves.

Applications:

Dishwashers, Car Wash Equipment, Irrigation, Water Treatment, Cooling, Laundry Equipment.

Operation:

Valve closed when de-energized, open when energized.

Construction:

Valve body is forged Brass. Core tube and internal components of 300 & 400 series Stainless Steel. Shading Ring is copper. Standard elastomers are Buna N rubber. Viton® is available as an option.

Installation:

Valves may be mounted in any position. For maximum life, it is recommended that

valves be mounted with solenoid vertical and upright.

Coil Enclosures:

Refer to reverse side.

Standard Voltages:

24, 110, 220 volts, AC, 50Hz
24, 120, 208, 240 volts, AC, 60Hz
12, 24, 32, 110, 220 volts, DC

Standard Coil:

Continuous Duty molded Class A with 6 UNC Screw Terminals and Junction-Box Enclosure.

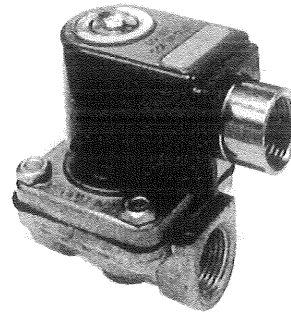
Temperature:

Fluid: -30°F (-34°C) to +180°F (+82°C)
Ambient: +77°F (+25°C)

Approvals:

Models provided with standard coil enclosure are U.L. Listed under Guide No. Y10Z, File No. MH9011, others are pending approval.

Basic Valve Style



MODEL 12QW2-D

How To Order:

Select valve Model Number appropriate to pipe size, orifice and coil enclosure desired. Example: 6QW2-D. Complete ordering number by adding required coil voltage and frequency. Example: 6QW2-D-24/60.

SPECIFICATIONS

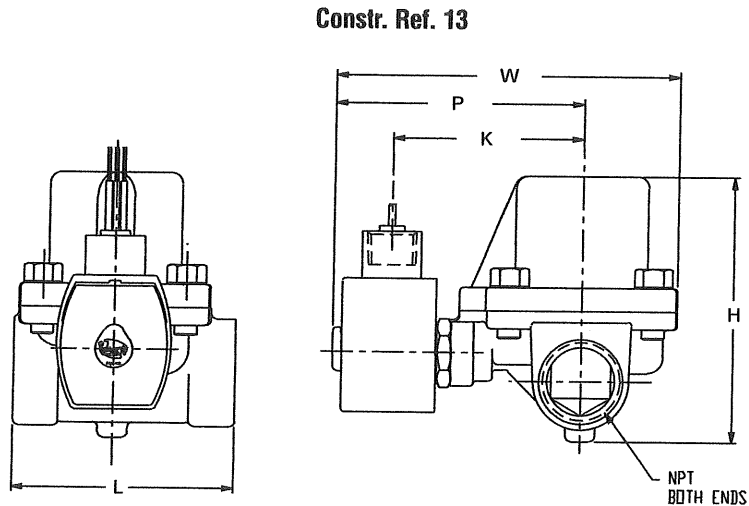
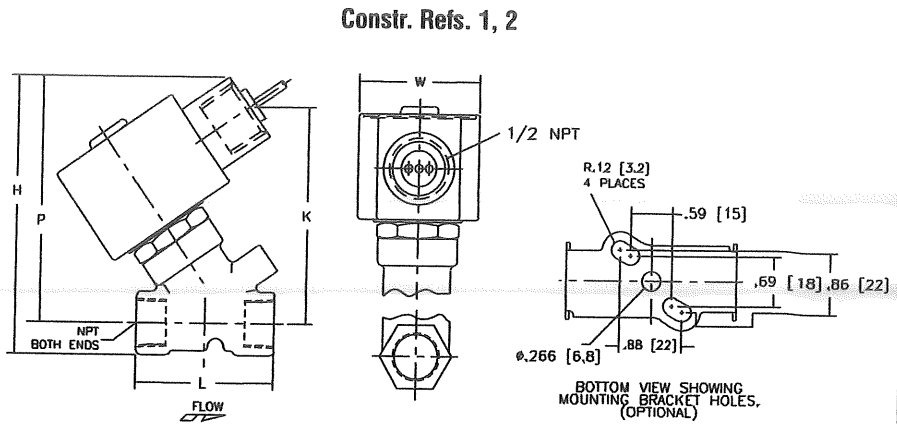
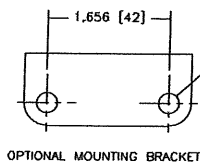
Model No.	Pipe Size	Pressure		Cv	Orifice Ø		Height		Width		Length	
		kPa	PSI		mm	ins	mm	ins	mm	ins	mm	ins
6QW2 *	1/4"	20-1000	3-150	1.1	6.3	1/4"	79.4	3.13	41.3	1.63	61.4	2.42
6QW2 * -D											87.9	3.46
6QW2 * -F											61.4	2.42
6QW2 * -R											75.2	2.96
6QW2 * -T											61.4	2.42
10QW2 *	1/2"	20-1000	3-150	2.1	9.5	1/2"	80.2	3.16	41.3	1.63	63.0	2.48
10QW2 * -D											89.5	3.52
10QW2 * -F											63.0	2.48
10QW2 * -R											76.6	3.02
10QW2 * -T											63.0	2.48
12QW2 *	3/4"	20-1000	3-150	3.5	12.7	1/2"	92.0	3.63	58.0	2.28	71.7	2.82
12QW2 * -D											98.2	3.87
12QW2 * -F											71.7	2.82
12QW2 * -R											85.5	3.37
12QW2 * -T											71.7	2.82

* Alternate elastomers of Viton® are obtained by the insertion of V into Model Number. Example: 6QW2-V-D-24/60.

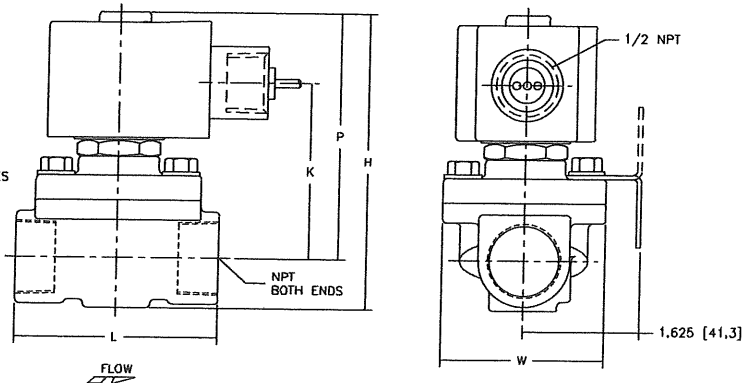
Dimensions: inches (mm)

Constr. Ref. No.		H	K	L	P	W
1*	ins.	3.85	3.00	1.91	3.41	1.69
	mm	98	76	49	87	43
2*	ins.	4.17	3.25	2.28	3.63	1.69
	mm	106	83	58	92	43
13	ins.	4.44	3.22	3.75	4.19	5.81
	mm	113	82	95	106	147
5	ins.	3.84	2.31	2.75	3.28	2.28
	mm	98	59	70	83	58
6*	ins.	3.38	1.94	2.75	2.80	2.28
	mm	86	49	70	71	58
7	ins.	4.19	2.50	2.81	3.47	2.39
	mm	106	64	71	88	61
8	ins.	4.13	2.47	2.81	3.44	2.29
	mm	105	63	71	87	58
9*	ins.	3.66	2.10	2.81	2.96	2.28
	mm	93	53	71	75	58
10*Ⓞ	ins.	5.25	X	2.81	4.59	2.31
	mm	133	X	71	117	59
11*	ins.	4.16	2.66	3.84	3.52	2.75
	mm	106	68	98	89	70
12	ins.	5.64	3.15	3.75	4.01	3.36
	mm	143	80	95	102	85
15*	ins.	5.34	X	3.75	4.47	3.84
	mm	136	X	95	114	98
16	ins.	5.64	3.15	3.66	4.01	3.56
	mm	143	80	93	102	90
18	ins.	6.11	3.30	4.38	4.16	3.92
	mm	155	84	111	106	100
20*	ins.	7.33	3.71	5.06	4.57	4.87
	mm	186	94	129	116	124
21*	ins.	7.33	3.71	5.50	4.57	4.87
	mm	186	94	140	116	124
23	ins.	4.35	2.65	2.75	3.79	2.28
	mm	110	67	70	96	58
24	ins.	5.06	X	3.78	4.44	2.75
	mm	129	X	96	113	70
25	ins.	4.64	2.81	2.81	3.94	2.28
	mm	118	71	71	100	58
26	ins.	6.53	X	3.75	4.91	3.19
	mm	166	X	95	125	81
27	ins.	8.22	X	5.50	5.47	4.87
	mm	209	X	140	139	124
28	ins.	6.53	X	3.66	4.91	3.19
	mm	166	X	93	125	81
29	ins.	7.03	X	4.38	5.06	4.40
	mm	179	X	111	129	112

Ⓞ Valves must be mounted with solenoid vertical and upright.
* DC dimensions slightly larger.



Constr. Refs. 5-9, 11, 20, 21, 23, 25, 37,38

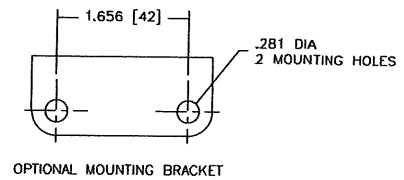
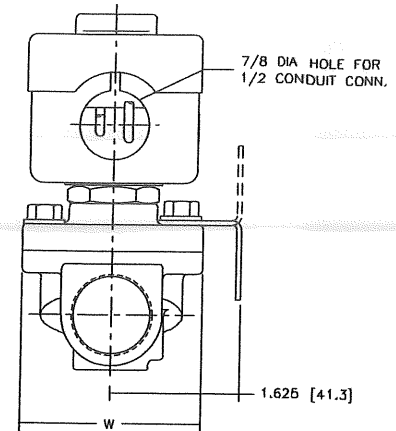
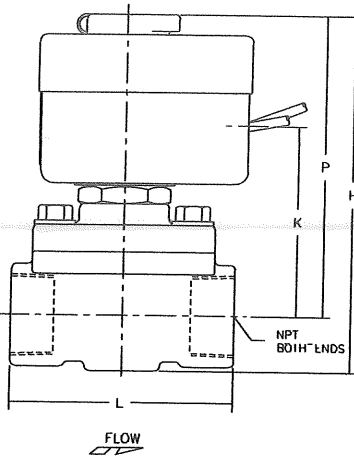


Dimensions: inches (mm)

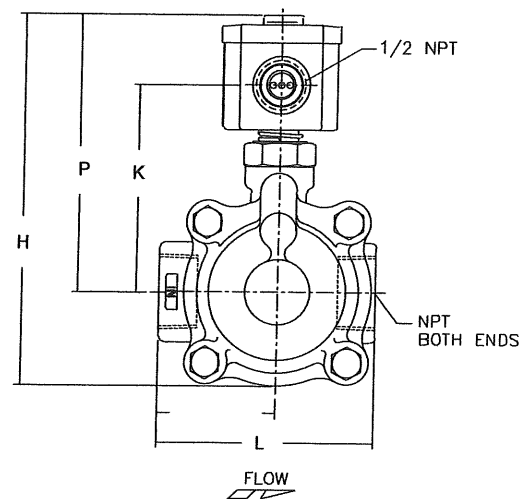
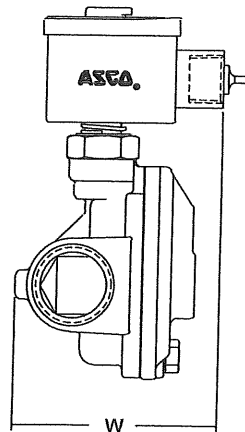
Constr. Ref. No.		H	K	L	P	W
30	ins.	8.22	X	5.06	5.47	4.87
	mm	209	X	129	139	124
31	ins.	5.25	X	3.75	4.44	3.25
	mm	133	X	95	113	83
32	ins.	5.69	X	3.66	4.69	3.25
	mm	145	X	93	119	83
33	ins.	6.06	X	4.38	4.94	3.91
	mm	154	X	111	125	99
34	ins.	6.91	X	3.75	6.09	3.25
	mm	176	X	95	155	83
35	ins.	7.34	X	3.66	6.34	3.25
	mm	186	X	93	161	83
36	ins.	7.66	X	4.38	6.56	3.91
	mm	195	X	111	167	99
37	ins.	4.61	2.75	2.81	3.89	2.39
	mm	117	70	71	99	61
38	ins.	4.61	2.75	2.81	3.89	2.39
	mm	117	70	71	99	61
39	ins.	5.42	2.31	2.75	4.86	3.80
	mm	138	59	70	123	97
40	ins.	5.20	3.29	2.81	4.50	2.28
	mm	132	83	71	114	58
41	ins.	5.13	3.10	3.75	4.32	3.25
	mm	130	79	95	110	83
42	ins.	6.43	4.40	3.93	5.62	3.25
	mm	163	112	100	143	83
43	ins.	5.57	3.35	3.66	4.57	3.25
	mm	142	85	93	116	83
44	ins.	5.90	3.57	4.38	4.79	3.91
	mm	150	91	111	122	99
45	ins.	5.26	3.17	3.75	4.38	3.84
	mm	134	81	95	111	98
46	ins.	4.95	3.10	3.84	4.31	2.75
	mm	126	79	98	110	70
47	ins.	6.43	3.59	3.75	4.81	3.52
	mm	163	91	95	122	90
48	ins.	6.43	3.59	3.66	4.81	3.73
	mm	163	91	93	122	95
49	ins.	6.91	3.75	4.38	4.96	4.40
	mm	176	95	111	126	112
50	ins.	8.13	4.15	5.06	5.37	4.87
	mm	207	105	129	136	124
51	ins.	8.13	4.15	5.50	5.37	5.18
	mm	207	105	140	136	132

IMPORTANT: Valves may be mounted in any position, except as noted in specifications table.

Constr. Refs. 10, 15, 24, 26-36



Constr. Refs. 12, 16, 18



Note: Valve must be mounted with solenoid vertical and upright.

SECTION 10

MECHANICAL DRAWINGS

This manual covers a broad family of paint spray booths. While similar in operation and function, there are some physical differences between the different models of booths. The as-built drawings for your particular booth are found in a separate package which was shipped with your spray booth. Please remove the drawings from this package and place in this section of your spray booth manual for future reference.

ELECTRICAL SCHEMATIC

As above, this manual covers a broad family of paint spray booths. There are some physical differences in the electrical systems between the different booth models. Some booths do not require a separate control panel, operating instead from a motor starter and light switch. Some booths require a control panel. If your booth has a control panel, the electrical schematic for your control panel may be found inside the control panel enclosure. **Control Panels must be located a minimum of 5 feet from all booth openings.** Please make a copy of this schematic and place in this section of your manual.

SECTION 11

MAINTENANCE

This Section contains booth maintenance procedures and techniques which will extend the life of your *Col-Met Spray Booths* paint spray booth and its components and make booth operation a smooth, routine occurrence.

GENERAL MAINTENANCE PROCEDURES

General Instructions -

Operational maintenance and repair instructions for the various mechanical components of your *Col-Met Spray Booths* paint spray booth are described in the manufacturer's data incorporated in this manual. Please review the applicable safety precautions before performing any maintenance work on the booth's equipment. Safety should always be the first and most important concern of any personnel performing work or supervising personnel who are working on the booth components.

Fans and Motors -

Periodically check the fan belts for proper tension and for signs of wear.

If a booth fails to function properly during normal operation, or if a component fails to come on line during booth startup, then troubleshooting will be necessary to identify the cause of the problem. It is necessary for the troubleshooter to be familiar with the logic of the control system as well as to be able to read the control diagrams. The operator must be able to utilize the theory of simple solutions. The theory of simple solutions says that, in any complex system which fails to function, it is usually a simple component that is easy to replace or adjust that has failed. This usually means that a loose wire, a burned fuse, a broken fan belt or a dirty filter is the first place the operator should look.

A good preventative maintenance program will help keep your booth on line.

The manufacturer's data sheets included in this manual contain specific information regarding repair of their components.

Routine Fan Maintenance-

Do not attempt to perform maintenance on a fan unless the electrical supply has been completely disconnected. If a disconnect switch has not been provided, remove all fuses from the circuit and lock the fuse panel so that the fuses cannot be accidentally replaced.

Under normal circumstances, handling clean air, the system will require cleaning about once a year. However, the fan should be checked at regular intervals to detect any unusual accumulation of material.

The fan wheel should be specifically checked for buildup of material or dirt which may cause an imbalance with resulting undue wear on bearings and v-belt drives. A regular maintenance program must be established as needed to prevent this buildup.

A regular inspection of the rotating assembly should be made to detect any indication of weakening of the motor because of corrosion, erosion or metal fatigue.

Excessive Vibration -

Check for material buildup on the fan wheel. Generally this will show up as material flaking off the fan wheel which will cause an imbalance. This imbalance may lead to fatigue failure of the wheel. Never allow a fan to operate if the amplitude of the vibration is above the maximum safe limit. Contact the fan manufacturer for this information if it is not included in the maintenance instructions.

High Motor Temperatures -

Check to make sure that the cooling air to the motor has not been diverted or blocked by dirty guards or similar obstacles. Check the input power for high or excessive amperage draws. An increase in power requirements may indicate that some major change has been made in the system.

High Bearing Temperatures -

This condition is usually caused by improper lubrication - either "over" or "under." In every case, if the cause of the trouble is not easily determined, experienced personnel should examine the equipment before it is put back into service.

Lubrication -

The manufacturers of fans used in spray booth applications do not always use the same brand of electric motor on a given fan model. Due to the variance in these motors, refer to the motor manufacturer's literature for instructions regarding lubrication of the motor bearings. The lubrication requirements and the relubrication intervals and procedures will be stated in this literature.

Caution -

Lubricate motors only when they are at a standstill. Use only clean grease. Remove and replace drain plugs only when the motors are at a standstill. Do not mix different types of grease.

ENVIRONMENTAL LIMITATIONS OF SPRAY BOOTH COMPONENTS

Tubeaxial fan -

Maximum Air Temperature	200° F
Minimum Air Temperature	-20° F (due to moisture freezing)

Air Solenoid Valve -

Maximum Air Temperature	150° F
Minimum Air Temperature	32° F (due to moisture freezing)

Control Panel - NEMA 12-

Ballast Minimum Air Temperature	50° F (due to hard starting)
---------------------------------	------------------------------

Filters -

Intake;	250° F and 100% relative humidity
Exhaust;	No listing published

Manometer - Dwyer 25 -

Maximum Ambient Air Temperature	140° F
Minimum Air Temperature	-70° F (freezing point of liquid)
Maximum Internal Pressure	10 PSI

FILTER CHANGE OUT PROCEDURE

Traditional booth paint filter systems are designed with single stage media and are expected to span a pressure drop range of approximately 1" WC from new to change-out. A characteristic of most paint filtration systems designed to meet new EPA regulations is that in addition to more efficiently trapping small particles they are structurally stiffened to withstand higher pressure drops. This can be used to extend operating time until change-out for improved economics. With any given filter system, the booth design flow criteria will determine pressure drops for new filters, pressure drop operating range and, ultimately, change-out pressure drop. The beginning overall pressure drop will steadily increase as paint is sprayed until it reaches the point where filter changes are required.

DO NOT change filters by appearance only instead rely on the gauges.

DAILY VISUAL INSPECTION IS REQUIRED PRIOR TO USING YOUR BOOTH.

Pressure drops for unused filters are related to design filter face velocity. With the overall pressure drop operating range known, it has been learned in practice that for lowest operating cost the filters are not necessarily changed at equal time intervals. It is also evident that the lifetime of a particular filter is related not only to the basic filter material weave, but also to other factors such as: the actual paint sprayed; the booth geometry such as distance from gun to filter; paint gun type; and operator habits, such as the addition of thinner and spray pressure.

Manometer Setup

- 1) Install manometer as described in manometer section.
- 2) With clean exhaust filters in booth, start booth.
- 3) Place "green" pointer flag at the point the red oil reaches on the indicating tube scale of the manometer. This is the "Clean Filter" position on the manometer.
- 4) Shutdown booth.
- 5) Cover 50% of the exhaust filters on each exhaust plenum with cardboard, plastic tarp, etc.
- 6) Start booth.
- 7) Place "red" pointer flag at the point the red oil reaches on the indicating tube scale of the manometer. This is the "Dirty Filter" position on the manometer.

Determining Exhaust Filter Condition

- 1) The exhaust filter condition is acceptable when the red oil in the indicating tube scale is between the two arrows.
- 2) When the red oil exceeds the "red" pointer flag, the exhaust filters must be changed.
- 3) If a different exhaust filter media is to be used, the setup procedure must be done again.

FANS

OPERATION CHECKLIST

- Verify that proper safety precautions have been followed.
- Electrical power must be locked off.

CHECK FAN MECHANISM COMPONENTS:

- Nuts, bolts and set screws are tight.
- Mounting connections are properly lubricated.
- Bearings are properly lubricated.
- Wheel, drives and fan surfaces are clean and free of debris.
- Rotating assembly turns freely and does not rub.
- Drives on correct shafts, properly aligned and properly tensioned.

CHECK FAN ELECTRICAL COMPONENTS:

- Motor is wired for proper supply voltage.
- Motor is properly sized for power of rotating assembly.
- Motor is properly grounded.
- All leads are properly insulated.

TRIAL "BUMP":

- Turn on power just long enough to start assembly rotating.
- Check rotation for agreement with rotation arrow.
- Listen for any unusual noise.

RUN UNIT UP TO SPEED:

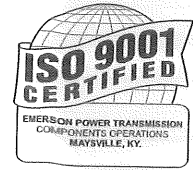
- Bearing temperatures are acceptable (<180° F) after one to two hours of operation.

AFTER ONE WEEK OF OPERATION:

- Check all nuts, bolts and set screws and tighten if necessary.
- Readjust drive tension if necessary.

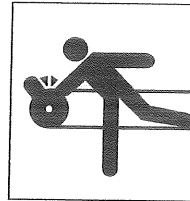


V-BELT INSTALLATION INSTRUCTIONS



V-Belt Alignment

Before installing the bushings, refer to EPT Form No. F20-23 for QD® instructions and Form No. 4013 for Split Taper instructions. After installing the bushings in the sheaves and the resulting assemblies onto the shafts, use a straight edge, piano wire or string placed on the outside face of both sheaves to adjust parallel offset and angular alignments. The straight edge, piano wire or string should be close to the shafts and contact each sheave in two places. The objective is to have the shafts parallel and the center lines of the two sheaves in line. See Figure 1 below.



WARNING

Disconnect power before installation and maintenance. Failure to do so can result in severe injury or death.

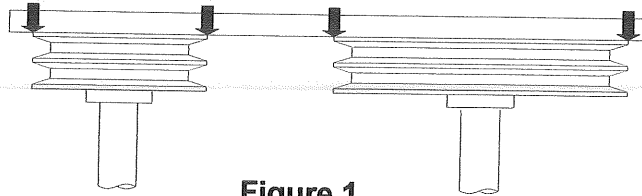


Figure 1

Belt drives should be aligned as perfect as possible to maximize drive life. The practical maximum misalignment is stated as the angle at which the belt enters the sheave. This angle is a result of both angular and parallel offset misalignment, and is 1/2 degree.

V-Belt Sheave Installation

- Step 1: Loosen moveable base bolts (or motor base bolts) and move sheaves close to facilitate installation of belt. See Table 1 for minimum installation allowance.
 If the design has fixed, non-moveable centers (not a recommended design) do the following:
 A. Mount one sheave onto the shaft loosely and put the belt on it.
 B. Put the other sheave into the belt loop and slip it onto the other shaft (bushing loosely installed).
 C. Align the drive and tighten the bushings.
- Step 2: Move all the slack in multiple belt drives to one side, then remove the slack (increase centers). Then rotate sheaves several revolutions by hand to equalize belt tensions.
- Step 3: Tension belts as outlined on reverse side of this page.
- Note: If BROWNING® Tension Checker is used, only 35 lbs maximum force (F) can be obtained. If higher forces are required, use other means such as dead weights or hydraulic pressure to apply a known force.

CAUTION

Do not pry or otherwise force belts onto sheave. Doing so can result in permanent damage to the belt.

TABLE 1 CENTER DISTANCE ALLOWANCE

Belt No.	Allowance for Installation				Allowance for Initial Tensioning and Subsequent Take-Up
	4L, A	5L, B	C	D	
26 - 35	.8	1.0	-	-	1.0
38 - 55	.8	1.0	1.5	-	1.5
60 - 85	.8	1.3	1.5	-	2.0
90 - 112	1.0	1.3	1.5	-	2.5
120 - 144	1.0	1.3	1.5	2.0	3.0
158 - 180	-	1.3	2.0	2.0	3.5
195 - 210	-	1.5	2.0	2.0	4.0
240	-	1.5	2.0	2.5	4.5
220 - 300	-	1.5	2.0	2.5	5.0
330 - 390	-	-	2.0	2.5	6.0
420 and over	-	-	2.3	3.0	1 1/2% of Belt Length
	3V	5V	8V		All Sections
250 - 475	.5	-	-	-	1.0
500 - 710	.8	1.0	-	-	1.2
750 - 1060	.8	1.0	1.5	-	1.5
1120 - 1250	.8	1.0	1.5	-	1.8
1320 - 1700	.8	1.0	1.5	-	2.2
1800 - 2000	-	1.0	1.8	-	2.5
2120 - 2240	-	1.2	1.8	-	2.8
2360	-	1.2	1.8	-	3.0
2500 - 2650	-	1.2	1.8	-	3.2
2800 - 3000	-	1.2	1.8	-	3.5
3150	-	1.2	1.8	-	4.0
3350 - 3550	-	1.5	2.0	-	4.0
3750	-	-	2.0	-	4.5
4000 - 5000	-	-	2.0	-	5.5
5600	-	-	2.0	-	6.0

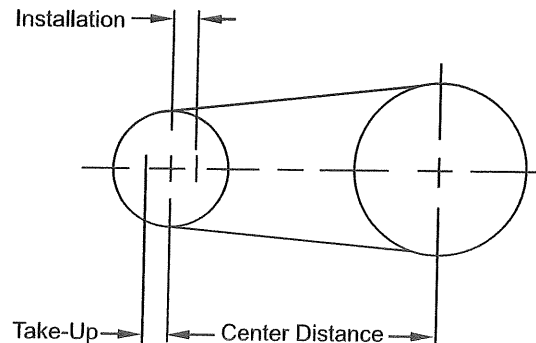


Figure 2

V-BELT SHEAVE INSTALLATION INSTRUCTIONS

Tensioning V-Belts

Calculate or measure the belt span length as shown in Figure 3. Calculate the required deflection by multiplying this number by 1/64. For example, if the belt span is 32 inches, $32 \times 1/64 = 1/2$ inch deflection. Increase the belt tension by increasing the center distance (or adjusting the idler, if present). Apply the force listed in Table 2 evenly across the width of the belt at the center of the belt span. A strip of keystone or similar material may be used to help distribute the force evenly across the belt width. Drives with shock loading or other unusual conditions may require increased hours of operation. Always check to be sure bearings can handle the loads. Excessively high or low tensions will affect belt life. Recheck belt tensions after 24 hours of operation.

TABLE 2
SHEAVE DIAM - INCHES
DEFLECTION FORCE - LBS.

Belt Cross Section	Smallest Sheave Diameter Range	RPM Range	Belt Deflection Force			
			Super Gripbelts and Unnotched Gripbands		Gripnotch Belts and Notched Gripbands	
			Used Belt	New Belt	Used Belt	New Belt
A,AX	3.0 - 3.6	1000-2500	3.7	5.5	4.1	6.1
		2501-4000	2.8	4.2	3.4	5.0
	3.8 - 4.8	1000-2500	4.5	6.8	5.0	7.4
		2501-4000	3.8	5.7	4.3	6.4
5.0 - 7.0	1000-2500	5.4	8.0	5.7	8.4	
	2501-4000	4.7	7.0	5.1	7.6	
B,BX	3.4 - 4.2	860-2500	-	-	4.9	7.2
		2501-4000	-	-	4.2	6.2
	4.4 - 5.6	860-2500	5.3	7.9	7.1	10.5
		2501-4000	4.5	6.7	6.1	9.1
	5.8 - 8.6	860-2500	6.3	9.4	8.5	12.6
		2501-4000	6.0	8.9	7.3	10.9
C,CX	7.0 - 9.0	500-1740	11.5	17.0	14.7	21.8
		1741-3000	9.4	13.8	11.9	17.5
	9.5 - 16.0	500-1740	14.1	21.0	15.9	23.5
		1741-3000	12.5	18.5	14.6	21.6
D	12.0 - 16.0	200-850	24.9	37.0	-	-
		851-1500	21.2	31.3	-	-
3V,3VX	2.2 - 2.4	1000-2500	-	-	3.3	4.9
		2501-4000	-	-	2.9	4.3
	2.65 - 3.65	1000-2500	3.6	5.1	4.2	6.2
		2501-4000	3.0	4.4	3.8	5.6
	4.12 - 6.90	1000-2500	4.9	7.3	5.3	7.9
		2501-4000	4.4	6.6	4.9	7.3
5V,5VX	4.4 - 6.7	500-1749	-	-	10.2	15.2
		1750-3000	-	-	8.8	13.2
		3001-4000	-	-	5.6	8.5
	7.1 - 10.9	500-1740	12.7	18.9	14.8	22.1
		1741-3000	11.2	16.7	13.7	20.1
	11.8 - 16.0	500-1740	15.5	23.4	17.1	25.5
1741-3000		14.6	21.8	16.8	25.0	
8V	12.5 - 17.0	200-850	33.0	49.3	-	-
		851-1500	26.8	39.9	-	-
	18.0 - 22.4	200-850	39.6	59.2	-	-
		851-1500	35.3	52.7	-	-

Belt Cross Section	Smallest Sheave Diameter Range	Belt Deflection Force	
		Used Belt	New Belt
3L	1.25 - 1.75	3/8	5/8
	2.00 - 2.25	3/4	1 1/4
	2.50 - 3.00	1	1 1/2
4L	2.10 - 2.80	5/8	1
	3.00 - 3.50	1 5/8	2 1/2
	3.70 - 5.00	2	3
5L	3.00 - 4.20	1 1/2	2 5/8
	4.50 - 5.20	2 1/2	3 1/2

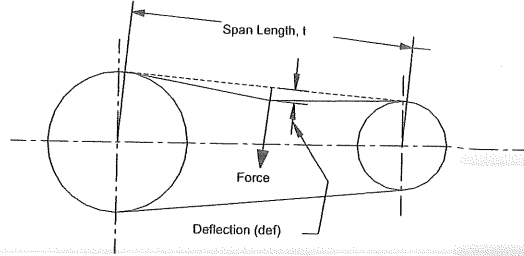
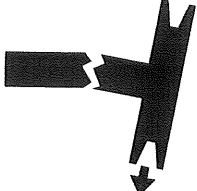
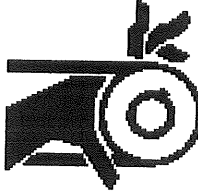


Figure 3



CAUTION

To avoid damage, supporting structure including shafts and bearings must be designed to handle transmitted loads and belt tension(s).



WARNING

Operating drives without guards in place can result in severe injury or death.

Note: For gripbands (multiple or banded belts), the belt deflection force in the above tables must be multiplied by the number of ribs in the gripband. Lay a narrow steel bar such as keystone across the gripband belt and apply the belt deflection force to the bar such that all the individual ribs are deflected evenly.

General Notes

Do not install new belts in worn sheave grooves. Such sheaves should be replaced with new ones to insure a proper fit of the belts in the grooves. Keep belts clean. Do not use belt dressing.

When replacing belts on a drive, be sure to replace the entire set with a new set of matched belts. Failure to do this may result in premature breakage of new (and probably shorter) belts.

Keep extra belts stored in a cool, dark, dry place.

Have questions? Contact Technical Services at 1-800-626-2093.

SECTION 12

BOOTH CONTROL PANEL

This Section contains literature pertaining to the installation, operation and maintenance of the above component.

PAINT SPRAY BOOTH CONTROL PANEL

Your *Col-Met Spray Booths* paint spray booth may be equipped with an optional pre-wired electrical control panel. Refer to the electrical control drawings for the electrical schematic and component Bill of Material. Also shown on this drawing is the wiring required at the time of installation. No spare parts are provided with this control panel.

This panel and its associated wiring must be installed under the supervision of a licensed electrician.

The cabinet that houses the controls is either NEMA 1 or NEMA 12 rated. It is not suitable for installation in a Class I, Division II area. Refer to Chapter 4 in the NFPA 33 Standard and consult with the local authority having jurisdiction for the definition of this area for your paint spray booth.

SECTION 13

WARRANTY

This Section contains the Warranty for your *Col-Met Spray Booths* paint spray booth.

WARRANTY AND SERVICE

I – Warranty:

Col-Met Spray Booths has a full one year Warranty on all parts and materials. This warranty does not extend to include labor costs for the replacement of parts or materials covered under warranty.

If a part is believed defective, please notify our Customer Service Department. A replacement item shall be shipped and regular freight shall be paid by Col-Met.

If Col-Met requires the defective part to be returned, appropriate return freight costs shall be paid by Col-Met.

IMPORTANT: Before returning the defective part(s), you must first get an RGA (Return of Goods Authorization) from our Customer Service Department. A copy of the RGA document **MUST** be included with the returned item(s).

The Seller warrants to Buyer that the equipment mentioned herein shall be free from defects of materials or workmanship under normal use and maintenance for a period of one (1) year from date of shipment. The liability of Seller under this warranty shall be limited to the repair or replacement, at Seller's option, of any part or component which may prove to be defective under normal use, service and maintenance after Seller, in its sole discretion, determines same to be defective. Said warranty is conditioned upon Buyer giving Seller immediate written notice of an alleged defect and refraining from the attempted repair of alleged defects without prior written consent of Seller. The Seller makes no warranty whatsoever with respect to accessories or components not supplied by Seller. For any components purchased by Seller for use on or in conjunction with the equipment which is the subject of this contract, the Seller extends to the Buyer only the same warranty granted to Seller by the component vendor or manufacturer.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY OTHER WARRANTIES (EXPRESS OR IMPLIED) INCLUDING WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND OF ANY NON-CONTRACTUAL LIABILITIES INCLUDING PRODUCT LIABILITIES BASED ON NEGLIGENCE OR STRICT LIABILITY. EVERY FORM OF LIABILITY FOR DIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES OR LOSS IS EXPRESSLY EXCLUDED AND DENIED. IN NO CASE SHALL **COL-MET SPRAY BOOTHS** LIABILITY ON THIS WARRANTY EXCEED THE AMOUNT OF THE PURCHASE PRICE.

The performance and safety of the equipment mentioned herein is contingent upon proper installation, the use of suitable process materials and operation and maintenance by properly trained personnel.

During the warranty period, **Col-Met Spray Booths** will repair or replace, free of charge, any parts that **Col-Met Spray Booths** has verified to be defective in materials or workmanship. If inspection of the equipment does not disclose any defect in workmanship of material, repairs will be made at a reasonable charge, which will include the costs of labor, materials and transportation.

II – Returning Items for Credit:

Col-Met Spray Booths will take back any standard stocked items returned and issue a credit, less a 15% handling and restocking fee. Customer is responsible for all Freight Charges and the item **MUST** be returned in its original condition. If the item is damaged in transit you will not receive credit. Col-Met will mark the Bill of Lading "Damaged" and send you pictures of the damaged item. For custom or non-stock special order items you must contact our Customer Service Department to determine if the item may be returned. Any restocking charges shall be determined on a case by case basis.

If an item needs to be returned, Col-Met will issue you an RGA (Return Goods Authorization) form. Please ensure that a copy is sent back with returned item(s). Without an RGA the product may be lost or returned to stock with no credit issued. Please note that in some cases the freight may be more than the item is worth when credit is received.

III – Back-Charges for Material & Labor:

Col-Met Spray Booths shall not be held responsible for any Back-Charges incurred for materials or labor without prior written consent.

Should a problem arise, please notify Col-Met immediately. Once the issue is investigated, should costs be incurred, an amount shall be agreed on by both parties before-hand. Do NOT attempt modifications or repairs without prior consent as this may void further warranty repairs or credit. Col-Met will not accept Back-Charges associated with late delivery.

PLEASE ADDRESS WARRANTY REPAIRS TO:

Col-Met Spray Booths
1635 Innovation Drive
Rockwall, TX 75032

Attention: Gene Clemmons – Customer Service Manager
Phone: (972) 772-1919 – Ext. 9429
Fax: (972) 772-1833
E-mail: gene@colmetsb.com

FOR ALL ELECTRICAL AND GAS CONTROL SERVICE ISSUES PLEASE DIRECT TO:

Attention: Mark Corona – Controls Engineering Manager
Phone: (972) 772-1919
Fax: (972) 772-1833
E-mail: mark@colmetsb.com

IV – Receiving, Unpacking, and Reporting Missing Items:

When receiving and unloading equipment check for damage. If damage is found, not on Bill of Lading "FREIGHT DAMAGE." If you have damage, make a list of items that must be replaced and notify the Col-Met Customer Service Department immediately. Replacement parts are usually shipped within one or two business days.

If you find no damage and it is possible, please unpack all items on found on Packing List. In some cases you may not have room to check off all panels but you must check the Hardware box (bolts, filters, door parts, gasket materials, etc.). Check ALL items as soon as possible and notify Col-Met Customer Service Department of missing items and discrepancies immediately. Col-Met will NOT pay for overnight freight on shorted items. If overnight freight charges are necessary, the buyer shall be accountable for freight costs.

For quality control reasons Col-Met's Shipping Department takes pictures of all items as they are packed. We can also verify if the item was properly checked off the Packing List, which, per company policy, requires two independent checks. If Col-Met finds the reported shortage in our records it will be assumed that the item is on the jobsite and has been misplaced during offloading. If the buyer insists the reported items are still missing, replacement parts will be shipped AND invoiced accordingly.

Items that can be shipped UPS usually take from one to three days to receive, depending on distance. Items too large for UPS will ship via LTL. This shipping method typically takes from one to five days to reach the shipping destination.

SECTION 14

INSTALLATION PROCEDURES

This Section contains information pertaining to the installation of your *Col-Met Spray Booths* paint spray booth.

Product Source

Col-Met Spray Booths

Phone: 972-772-1919
Fax: 972-772-1833
E-mail: sales@colmetsb.com
Web Site: www.colmetsb.com

GENERAL:

This instruction manual is a guide for installing a variety of paint booths. The assembly drawings enclosed are specifically for the paint booth you have purchased. This drawing is an exploded isometric showing the relationship of each panel or part to the next one. A packing list of all components is provided and should be used in addition to the drawing when uncrating your booth to correctly identify all components.

All DAMAGES MUST be reported within 24 hours of receipt and a freight claim filed with the carrier.

PRELIMINARY:

COL-MET booths are manufactured in accordance with NFPA 33, UFC 45 and NEC 516. However, local codes and regulations may apply to the installation and use of this product. It is recommended that all permits and approvals be obtained prior to installation and use of the spray booth.

1. Tools needed:

- Pry Bar
- Claw Hammer
- Drift Pin
- Assorted Wrenches (pneumatic tools are more efficient)
- Drill with 3/8" bit
- Screw Driver
- 2" x 4" Studs (or other suitable support method) for Supporting walls and gables during installation.
- 2 Ladders (8' – 10')
- *Hint: A Drywall Lift can be rented inexpensively and will Save time.*

2. Uncrate and inventory all spray booth components to ensure all of the parts are accounted for. Each component is numbered on the exploded view. Stack all common panels together.
3. The floor surface of the booth must be non-combustible material of such character as to facilitate the safe cleaning and removal of residues. The floor surface of the booth must be flat and level to avoid problems with erection and alignment of panels.
4. Using a chalk line, mark the dimensional outline of the booth on the floor.
5. Follow the step-by-step instructions provided.

Planning Ahead

While planning the exact location of your new paint booth, keep the following specifications in mind, as they are Your Responsibility:

- A.) Clearances between other work areas and combustible storage areas must be held as follows:
- 1.) 3 ft. minimum clearance at all sides and sealed entry ways (i.e., door ways).
 - 2.) 5 ft. minimum clearance at all non-sealed entry ways (i.e., the open face of the IB booth or a silhouette openings).
- B.) A minimum of a 10 ft. clearance must be held between the exhaust stack of the booth and the intake of another apparatus. NFPA 33 dictates a minimum discharge clearance of 5' from the nearest combustible material; however, stack height requirements vary with individual states and can be up to 1½ times the building's roof height from grade.
- C.) A minimum of a 10 ft. clearance must be held between the intake of this booth and the exhaust of any other apparatus.
- E.) Permits are not included. It is the responsibility of the end user to acquire all permits to install a booth.
- F.) A fire suppression system is not included with the booth. Generally this is supplied and installed by a licensed local installer.
- G.) The fan, motor, & drive are included; however, the motor starter, wiring, conduit, and light switches are not. (The electrician wiring the booth normally supplies these items)
- H.) Don't forget to verify the electrical current available. All fans on Col-Met paint booths with electrical motors larger than 1 horsepower will require three phase electricity as standard power unless the single phase option is ordered.

Please Read:

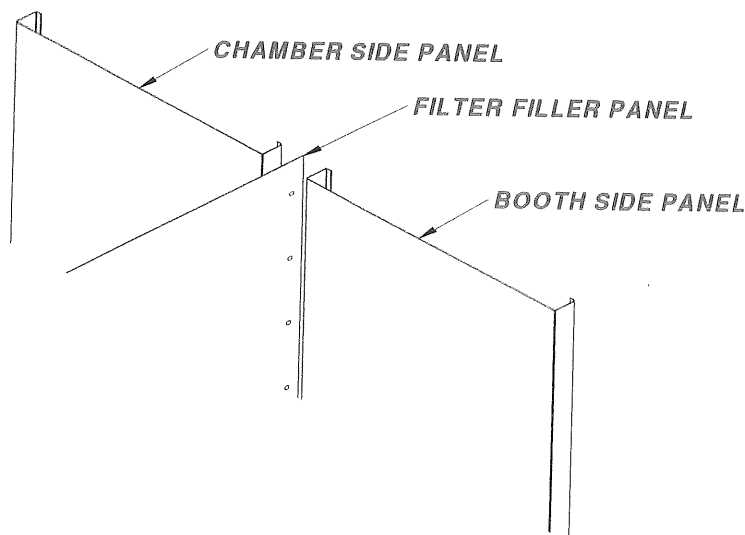
Under no circumstances shall this booth be considered a load bearing structure. DO NOT walk on, stand on or use the spray booth as a support structure before, during, or after installation.

***Hints:** When assembling the booth, you should leave the bolts FINGER TIGHT ONLY until each section is assembled. All flanges should face outward. The nut end of the bolt should protrude outward (bolt heads inside the booth). Use a drift pin to align panel holes when two or more panels are difficult to align by hand. Floor anchors should be used at a minimum of every 12 inches apart.*

Following your chalk line, lay out all floor channel for the exhaust chamber and all the walls. As you attach the wall panels together, they will also bolt to the floor channel.

Starting with the exhaust chamber at either rear corner, bolt one corner panel and one rear wall corner panel together. Bolt opposite rear sidewall panel to rear wall panel. Bolt all rear wall panels in place. Once you have assembled the rear and sidewalls of the chamber, bolt the tie channel along the top edge of these panels.

Place exhaust fan panel above the side and rear wall panels and bolt in place. Bolt (sandwich) filter filler panels between the sidewall and roof panels and the exhaust chamber.



Following the exploded view drawings, continue alternately assembling wall panels and roof panels to each other until you reach the front end of the booth. Finish off the roof section by attaching the fire curtain if needed. If booth has front doors, no fire curtain is needed.

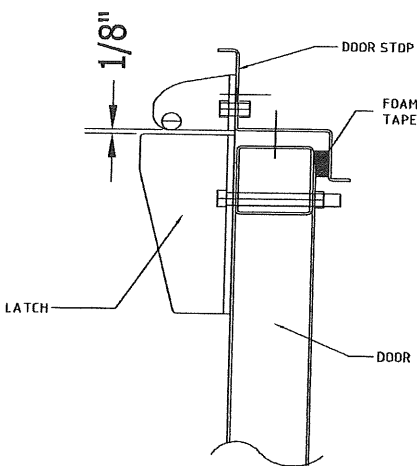
While assembling the work area of the booth, if an I-Beam is encountered, make sure the booth has been assembled accurately before anchoring.

Roof and gabled ends should be installed so the rest of the booth can support them.

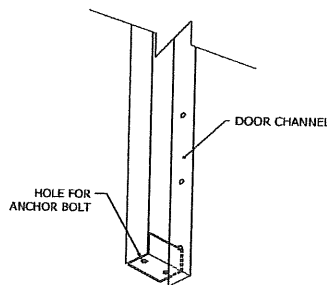
The remaining bolts that are not tight should be tightened now. Be sure the walls are plumb and true to your chalk-line before tightening. ALL bolts should be double checked to ensure that the main structure is tightly assembled.

Caulk all panel joints inside the booth with the caulk provided. Note: do not use a silicone caulk as this can cause finishing problems later.

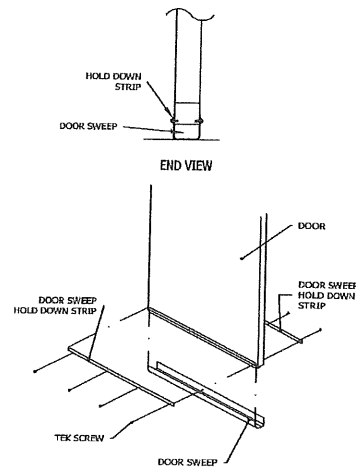
If your booth is supplied with a Personnel Door or Front Filter Doors, apply foam gasket to perimeter of all door openings. Attach all door hardware and adjust latches. Level door with doors off, then re-attach doors to hinges.



**DOOR LATCH
AND SEAL DETAIL**



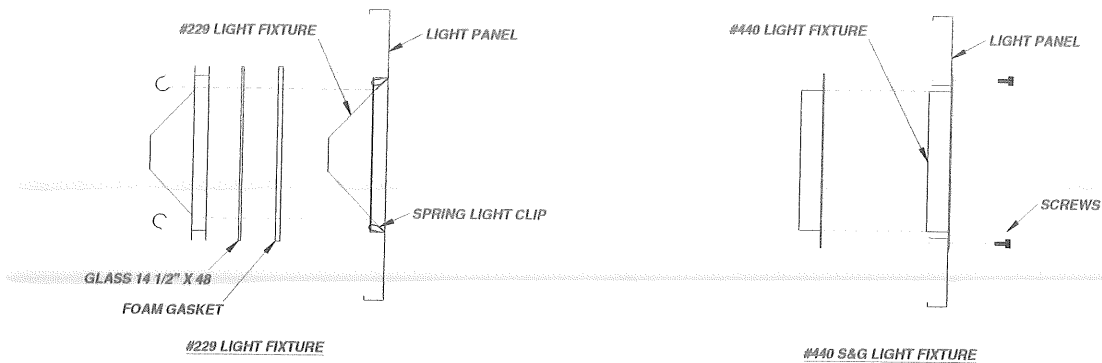
**DOOR FRAME
BASE DETAIL**



**PRODUCT DOOR
DOOR SWEEP DETAIL**

Light installation

Most industrial booths are supplied with a Class I Division II light fixture that bolts in place. If your booth is supplied with open-type light fixture, apply foam gasket material around all window frame openings. Place glass against the gasket, then place the light fixture over the glass and use the provided springs to secure the fixture. (It is best to have assistance with this procedure). The bulbs required for the fixtures are T-8 (32watts).



The fan and motor assembly will bolt to the exhaust roof panel. Use the fan as a template and drill 3/8" diameter holes corresponding with the fan flange to attach the fan to the booth. Don't forget to install fan panel stiffeners (if they are supplied) after you know where to position your fan.

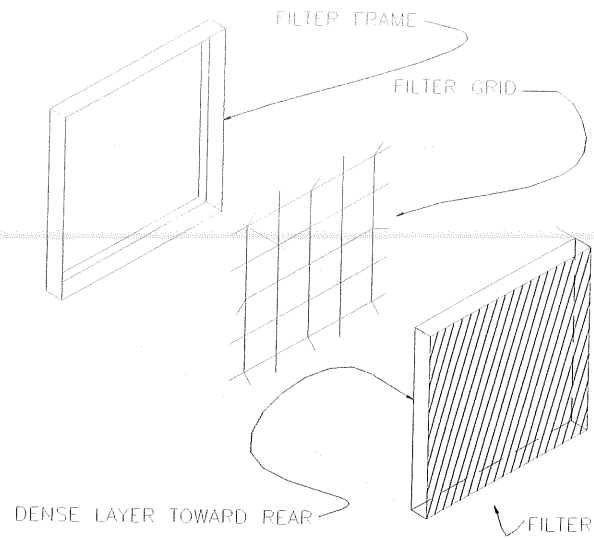
It is recommended that you have a licensed electrician wire the fan motor, air solenoid valve and lights.

Manometer is installed near the exhaust chamber. One side of the manometer tubing installs in the interior of the booth and the other tube installs in the exhaust chamber. Mount unit on the outside of exhaust chamber approximately 5' above floor level. Carefully read follow the installation instructions that come with the Manometer.

Initial calibration of manometer is made with booth totally shut down; adjust knob until gauge reads "0" inches. (Knob is on bottom left hand corner of manometer.) Install all new, clean exhaust filters; turn on all exhaust fans, close all doors and mark the gauge reading as "clean" (green arrow supplied with manometer), then turn exhaust fans off. Using cardboard, cover up every other exhaust filter, until 50% of all exhaust filters are covered up. Turn on all exhaust fans, close all doors and mark the gauge reading as "dirty" (red arrow supplied with manometer). This procedure simulates the filters loaded with paint, and establishes a base line for future filter replacement.

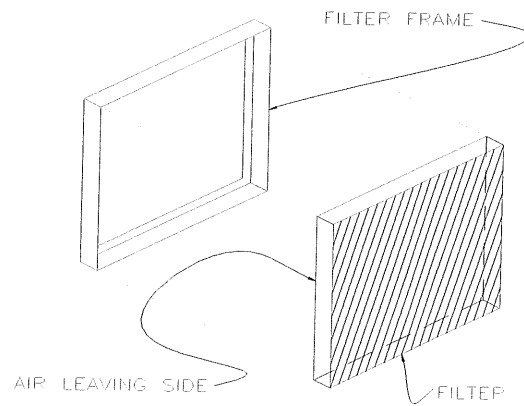
Exhaust filter installation.

Install one wire grid in each filter cell with the prongs facing into the booth; the exhaust filters will be attached to the prongs.



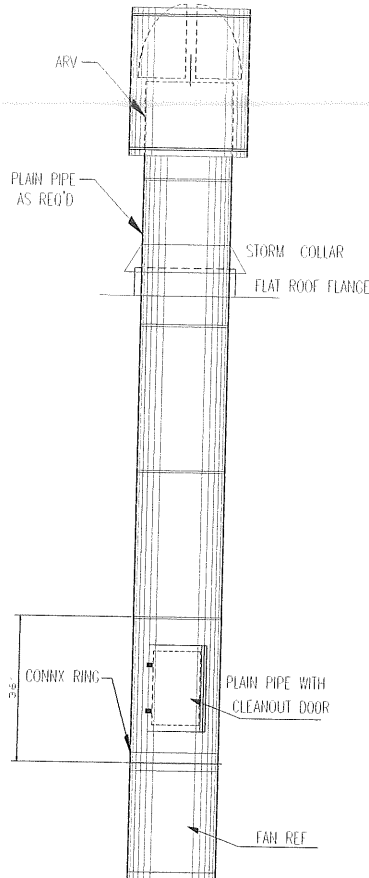
Intake filter installation.

If your booth has an intake plenum; simply insert the intake filter into the filter grid. The side that states "Air Leaving Side" on filter goes toward the inside of the booth.



Exhaust Duct

If you purchased the optional exhaust ductwork; we suggest you have the flashing professionally installed as this entails cutting a hole in the roof of your building. To assemble the ductwork, first bolt the pipe with connecting ring to the exhaust fan, the rest of the ductwork is crimped on one end to interlock with the next section. Your ARV (Automatic Damper) will be mounted on top. The storm collar will attach to the duct above the flashing to make it weather proof.

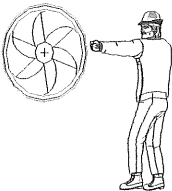
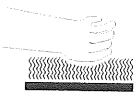



Where more than 25' of piping is required, the static pressure (resistance) is increased and the air flow may be hindered when using the standard exhaust unit recommended for use with the booth. Where a piping arrangement of an unusual nature is employed or where two or more elbows are used, a similar condition may exist. Therefore, if either of these situations arises, contact the booth manufacturer's engineering department for correct recommendations. We recommend exhaust piping, including the canopy (if used), should extend a minimum of 6' above the highest point of the building. There should be an access door just above the exhaust unit and another just below each elbow.

Checklist

Check the following items prior to start up:

- 1.) Motors wired for proper voltage.
- 2.) All fans and motors turn freely.
- 3.) Lubricate all bearings. (Motor, Fan etc...)
- 4.) Check installation of exhaust fan for proper airflow direction. Generally airflow is out of booth.
- 5.) Listen for excessive or unusual noise when booth is operating.
- 6.) With booth operating, open any door for 30 seconds and see if paint air gun will shut down. This will verify proper safety operation of the booth.

<u>AREA</u> <i>Indicates where hazards can occur.</i>	<u>Hazard</u> <i>Indicates what can happen if precautions are not observed.</i>	<u>Safeguards</u> <i>Indicates how to avoid the hazard and what special protective clothing, equipment and precautions will be used</i>
<p><u>MOVING PARTS</u></p> 	<p><i>Loose items, or parts of the body may get caught and cause serious injury or damage.</i></p>	<p><i>Keep hands and all items away from the fan blades. A guard is NOT placed over the fan housing. A mesh type guard will act as an accumulation point for combustible residues and become a fire hazard.</i></p>
<p><u>HOT PARTS</u></p> 	<p><i>Motors get hot when running. Serious burns may result if touched.</i></p>	<p><i>Never touch the motor during, or immediately after operation of the fan.</i></p>
<p><u>ELECTRICAL HAZARD</u></p> 	<p><i>Electrical currents can cause serious injuries.</i></p>	<p><i>Always turn electricity OFF before attempting repair or maintenance of the fan or motor.</i></p>

HOOD @ ICE SHIELD
OUTSIDE BLDG

OUTSIDE WALL @ 6" LEDGES

20"

COMPRESSED AIR
INLET (FED BY STL. PIPE
@ DRYER + REGULATOR,

UNIT #3
225 IND,
WAY

RECEIVED
MAR 08 2012
Dept. of Building Inspections
City of Portland Maine

BOOTH 20'-2"
X 15'-0"
CH. 9'-0"

STL PIPE

55" DR
FILTERS

36" Ø DUCT

FILTERS

LIGHTS

WALL LIGHT
CEILING LIGHT

15 CFM
3Ø COMPRESSOR

SPRAY BOOTH PLCE MENT
UNIT #3. 225 INDUSTRIAL WAY

FIRE SUPPR.
(DUCT)

FAN MOTOR

FIRE SUPPR
BOOTH)

36" Ø
DUCT

FILTERS

DUCT

1 HR. FIRE WALL

FIRE PULL

36"

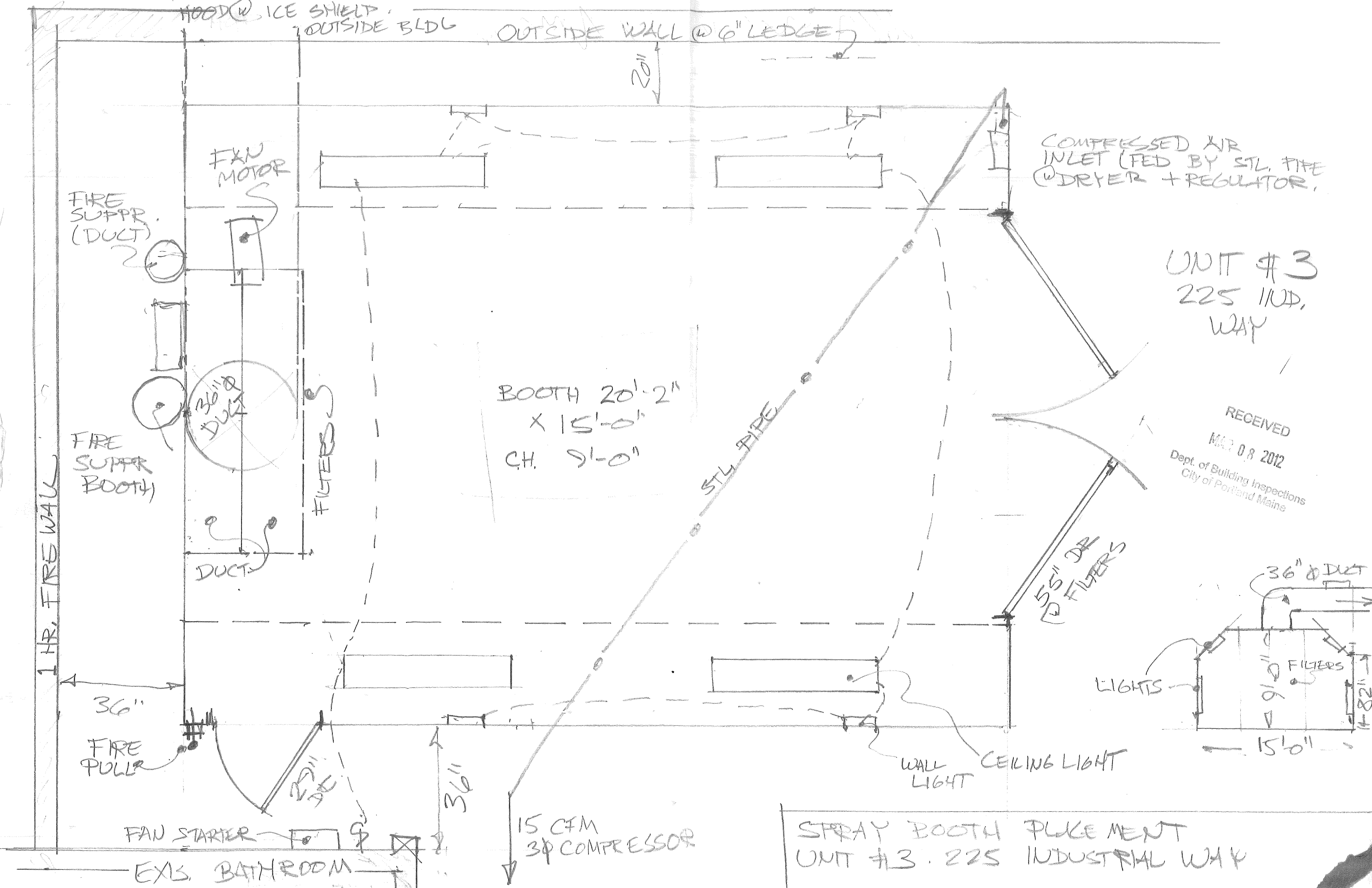
FAN STARTER

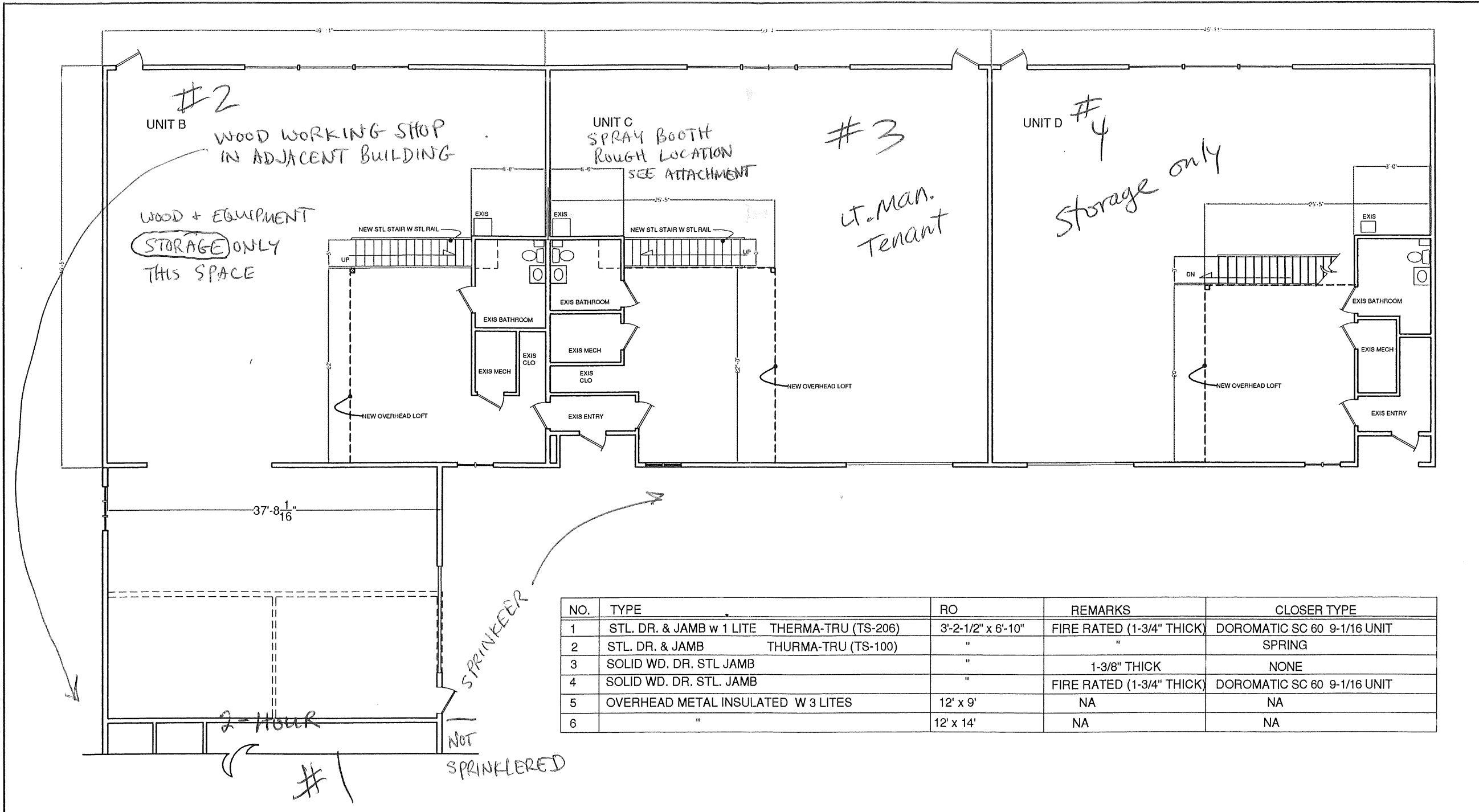
EXIS. BATHROOM

36"

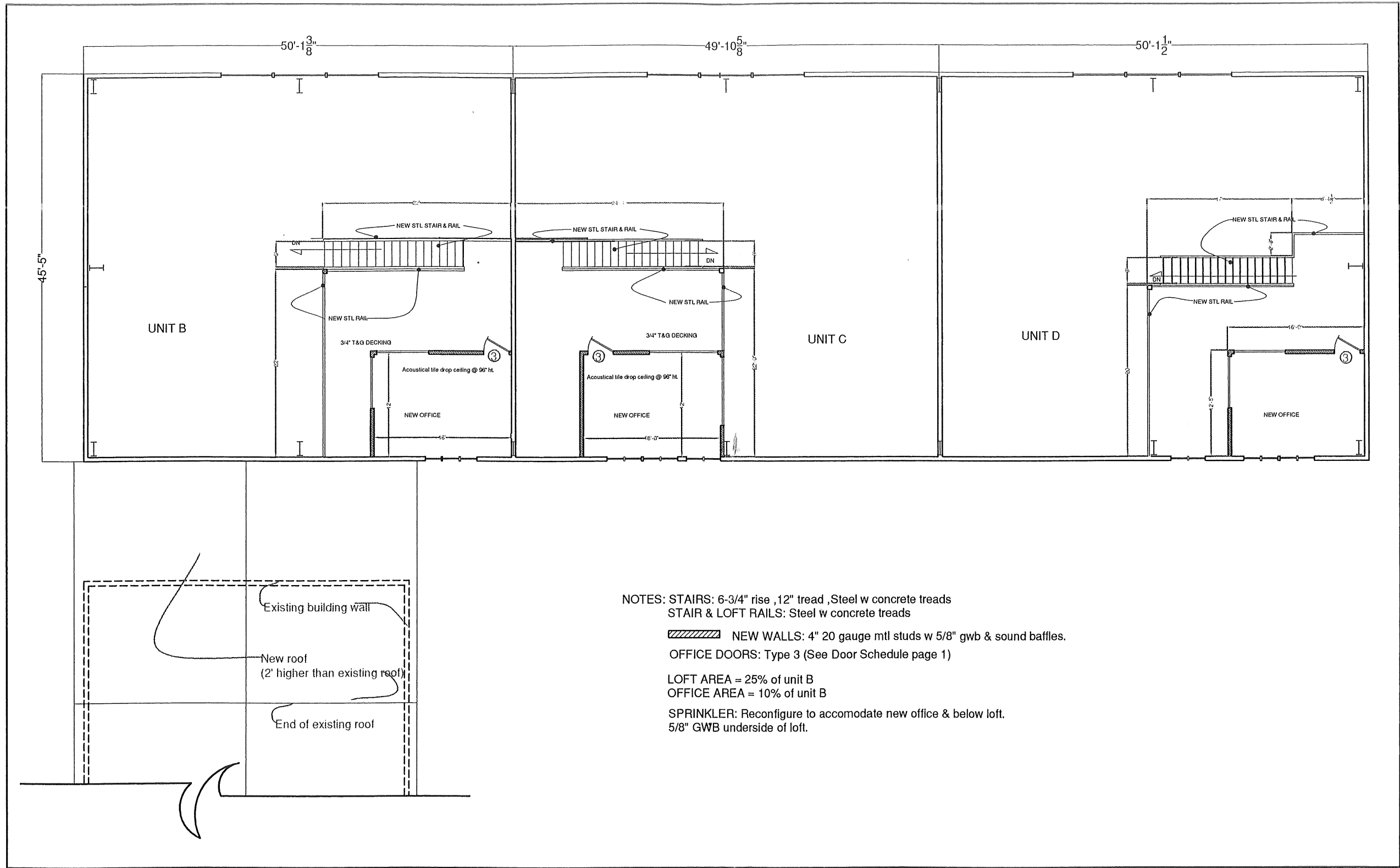
15'-0"

4'-82"

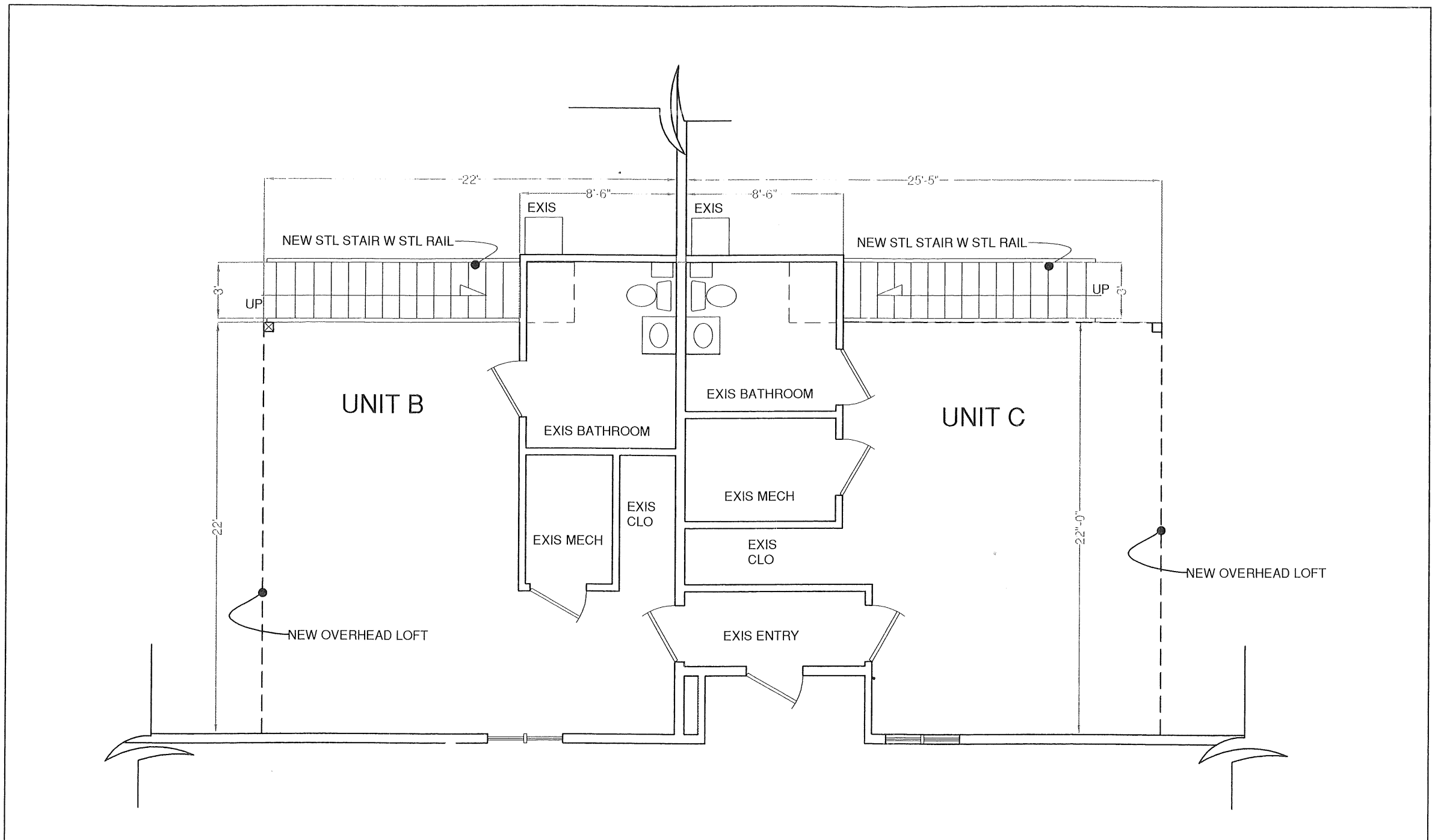




NO.	TYPE	RO	REMARKS	CLOSER TYPE	
1	STL. DR. & JAMB w 1 LITE	THERMA-TRU (TS-206)	3'-2-1/2" x 6'-10"	FIRE RATED (1-3/4" THICK)	DOROMATIC SC 60 9-1/16 UNIT
2	STL. DR. & JAMB	THURMA-TRU (TS-100)	"	"	SPRING
3	SOLID WD. DR. STL JAMB	"	"	1-3/8" THICK	NONE
4	SOLID WD. DR. STL. JAMB	"	"	FIRE RATED (1-3/4" THICK)	DOROMATIC SC 60 9-1/16 UNIT
5	OVERHEAD METAL INSULATED W 3 LITES	"	12' x 9'	NA	NA
6	"	"	12' x 14'	NA	NA



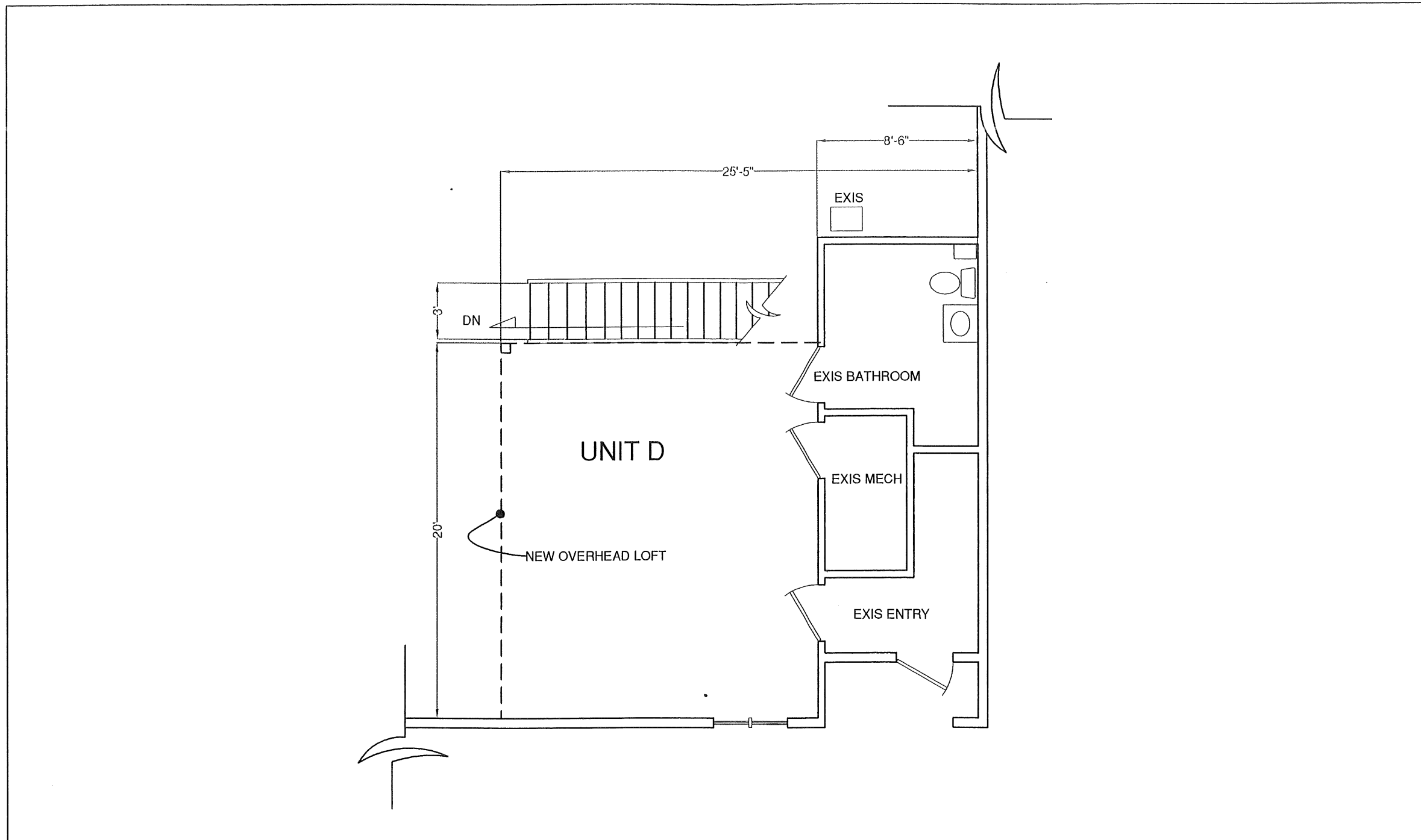
NOTES: STAIRS: 6-3/4" rise , 12" tread , Steel w concrete treads
 STAIR & LOFT RAILS: Steel w concrete treads
 ▨ NEW WALLS: 4" 20 gauge mtl studs w 5/8" gwb & sound baffles.
 OFFICE DOORS: Type 3 (See Door Schedule page 1)
 LOFT AREA = 25% of unit B
 OFFICE AREA = 10% of unit B
 SPRINKLER: Reconfigure to accomodate new office & below loft.
 5/8" GWB underside of loft.



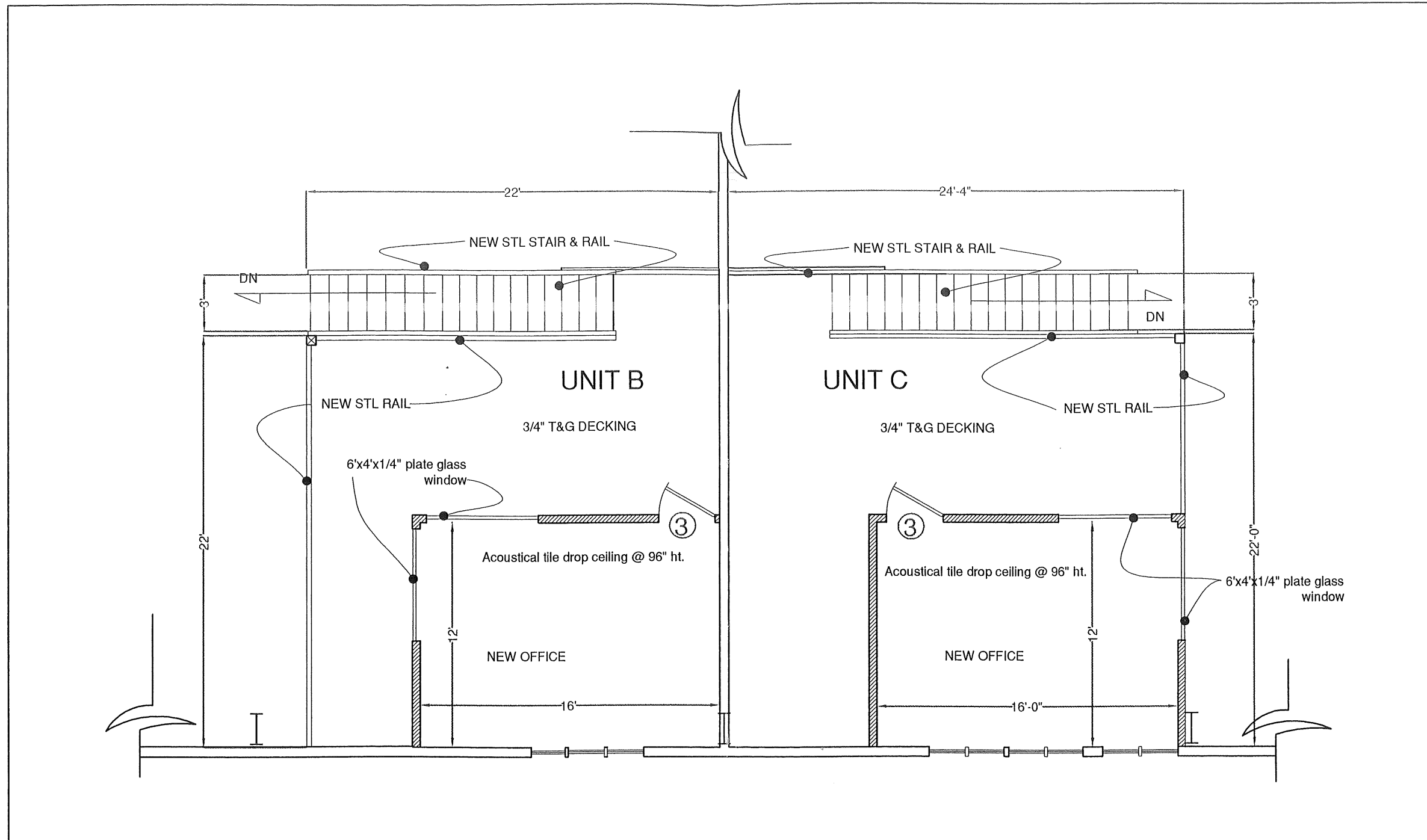
MAIN FLOOR

UNIT B + C

3/8



DEKKO LLC	MAIN FLOOR/LARGER SCALE	UNIT D	NOT TO SCALE $\frac{4}{8}$
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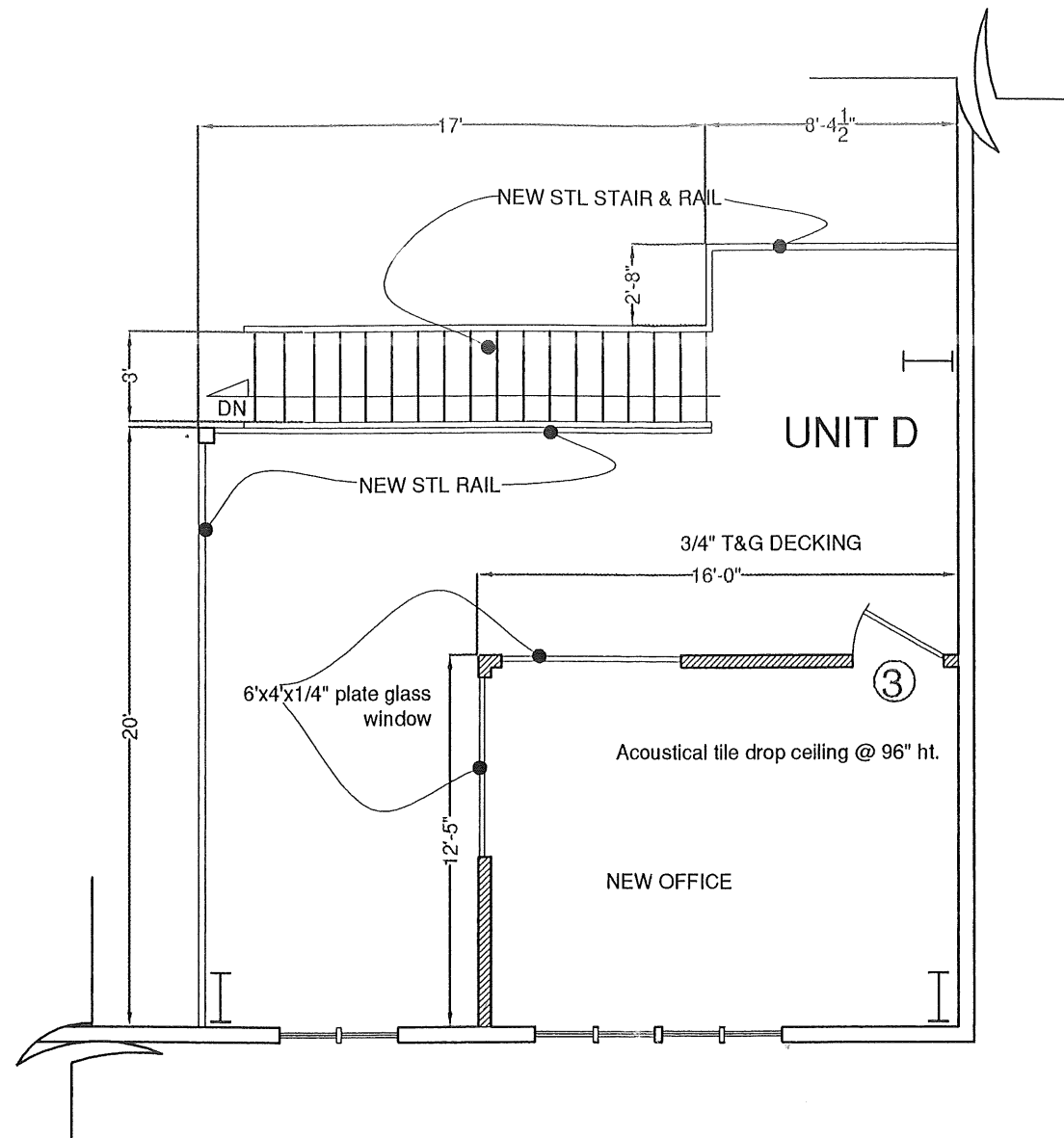
DEKKO LLC

LOFTS / LARGER SCALE

UNITS B & C

NOT TO SCALE

5/8



DEKRO LLC

LOFTS/LARGER SCALE

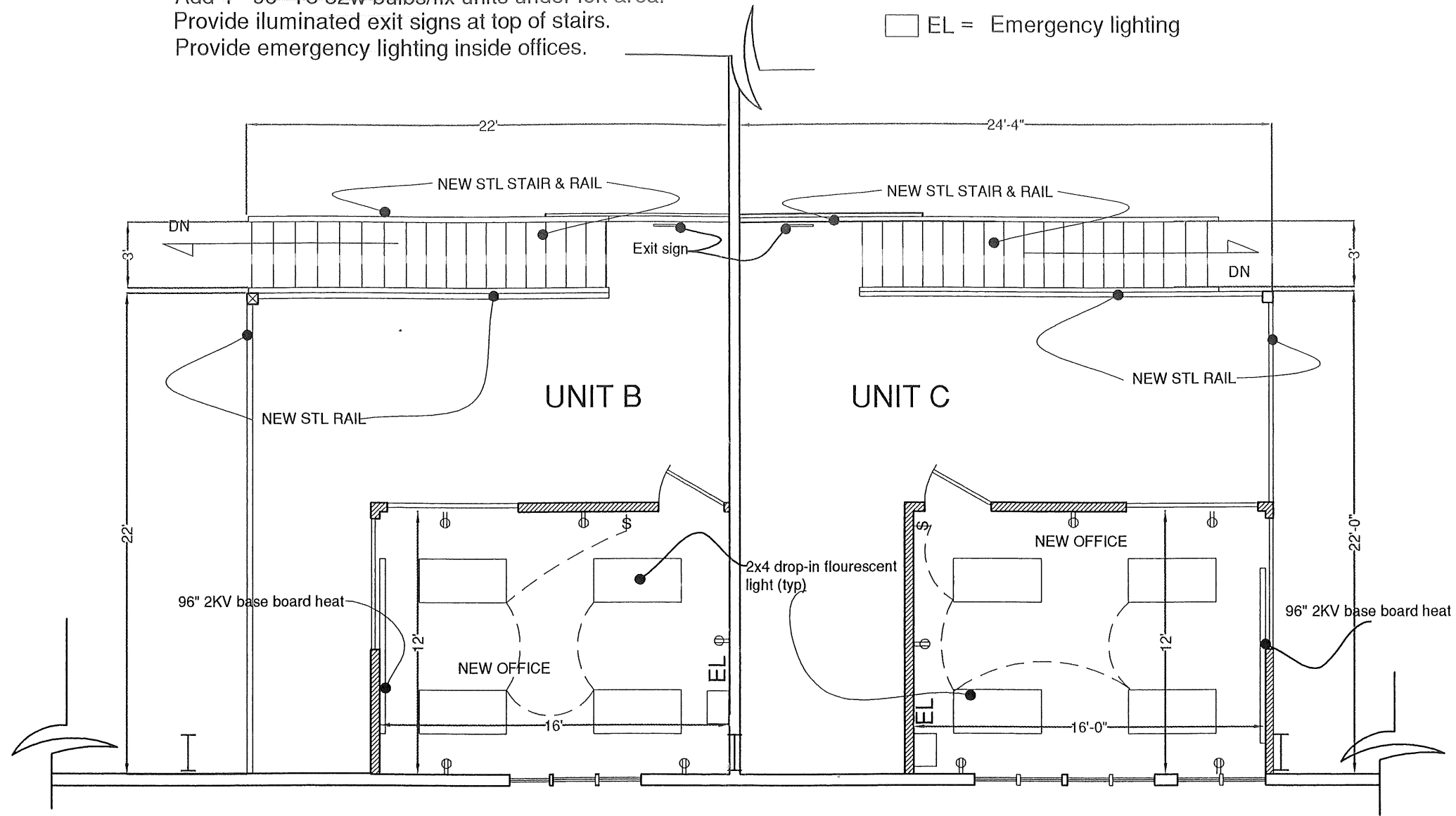
UNIT D

NOT TO SCALE

6/8

ELECTRICAL NOTES: Remove exis. warehouse lights over office.
 Add 4 - 96" T8 32w bulbs/fix units under loft area.
 Provide illuminated exit signs at top of stairs.
 Provide emergency lighting inside offices.

□ EL = Emergency lighting



DEKKO LLC

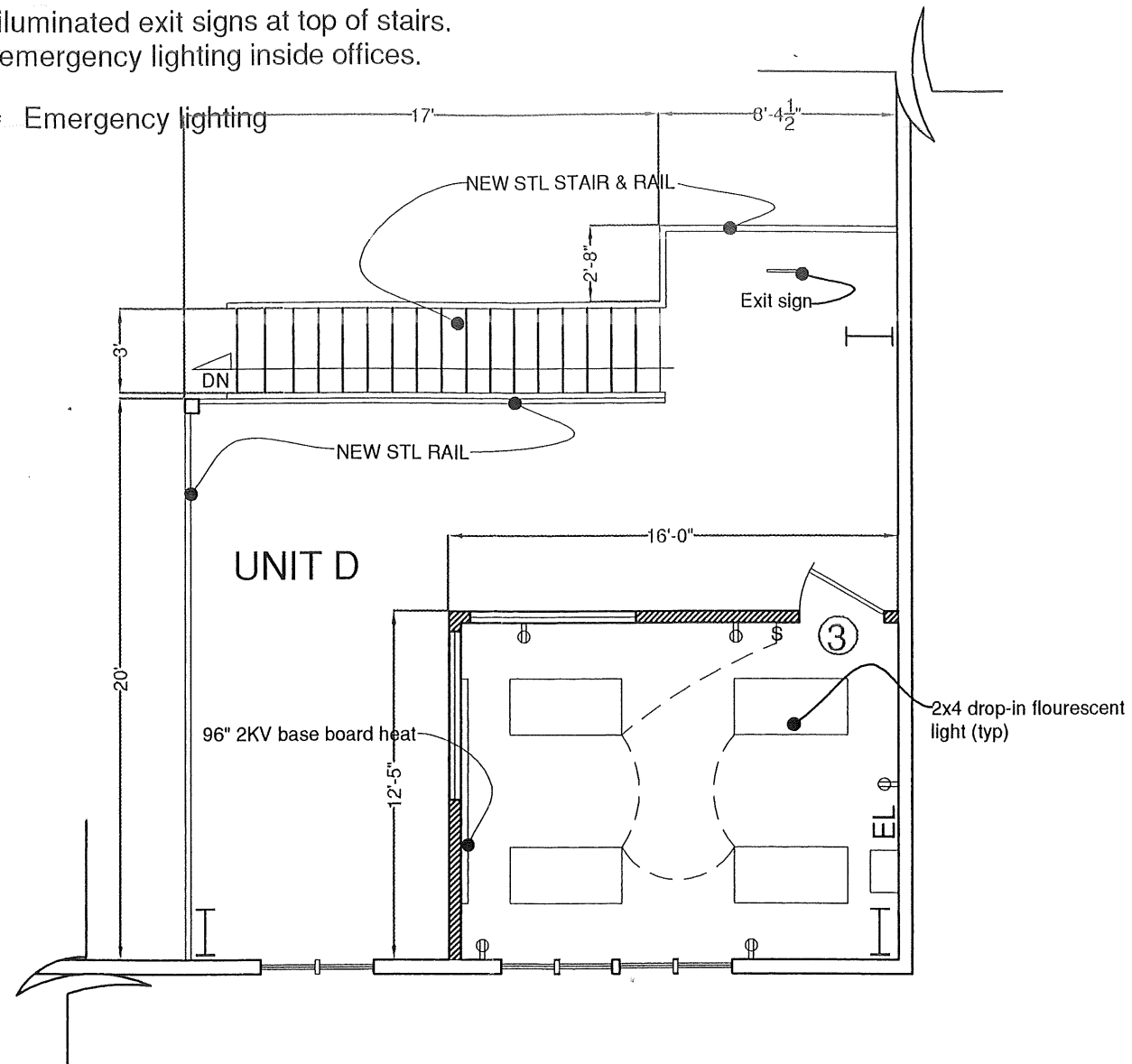
ELECTRICAL

UNIT B+C

NOT TO SCALE 7/8

ELECTRICAL NOTES: Remove exis. warehouse lights over office.
 Add 4 - 96" T8 32w bulbs/fix units under loft area.
 Provide illuminated exit signs at top of stairs.
 Provide emergency lighting inside offices.

□ EL = Emergency lighting



DEKKO LLC

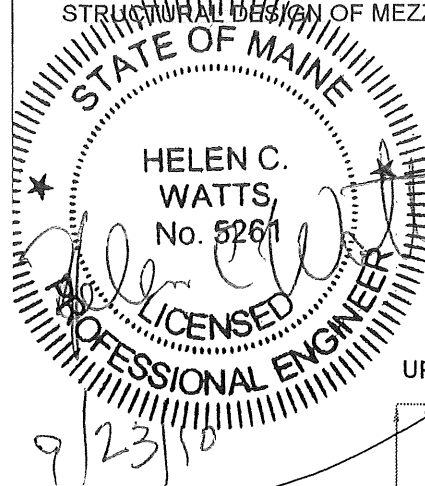
ELECTRICAL

UNIT D

NOT TO SCALE 8/8

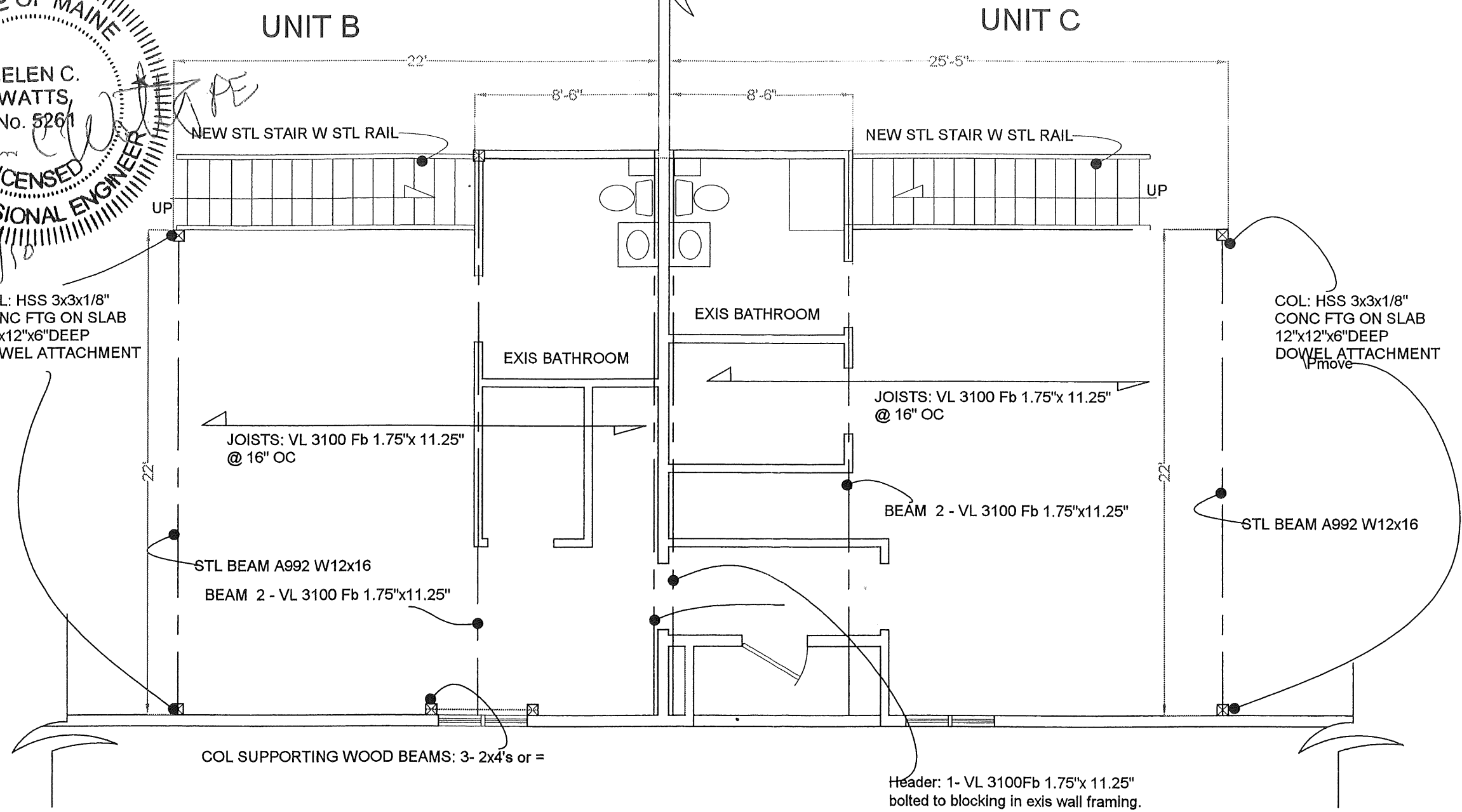
Helen C. Watts, PE
 Helen Watts Engineering
 455 Litchfield Rd., Bowdoin, ME
 207-522-9366

STRUCTURAL DESIGN OF MEZZ MEMBERS ONLY



Special Inspection and Testing is not required.
 The structure will be inspected by the structural engineer
 before the framing is enclosed with drywall.

NOTE: Mezzanines, 225 Industrial Way, Portland, ME
 City of Portland Ordinances, based on IBC 2006.
 Live load: 50 psf



DEKKA LLC

MEZZANINES, 225 INDUSTRIAL WAY

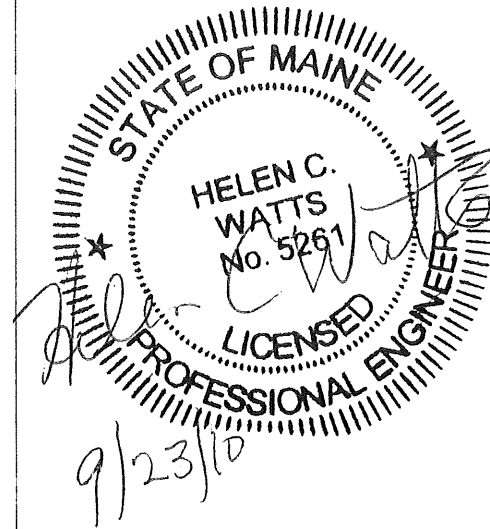
STRUCTURAL

NOT TO SCALE

S
1

Helen C. Watts, PE
Helen Watts Engineering
455 Litchfield Rd., Bowdoin, ME
207-522-9366

STRUCTURAL DESIGN OF MEZZ MEMBERS ONLY
Special Inspection and Testing is not required.
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PE

COL: HSS 3x3x1/8"
CONC FTG ON SLAB
12"x12"x6" DEEP
DOWEL ATTACHMENT

STL BEAM A992 W12x16

JOISTS: VL 3100 Fb 1.75"x 11.25"
@ 16" OC

BEAM 2 - VL 3100 Fb 1.75"x11.25"

Header: 1 - VL 3100Fb 1.75" x 11.25"
supported by new wall framing
(Independent of exis. metal bldg. structure)
New 2x6 wall located on exis. conc. knee wall.

NOTE: Mezzanines, 225 Industrial Way, Portland, ME
City of Portland Ordinances, based on IBC 2006.
Live load: 50 psf

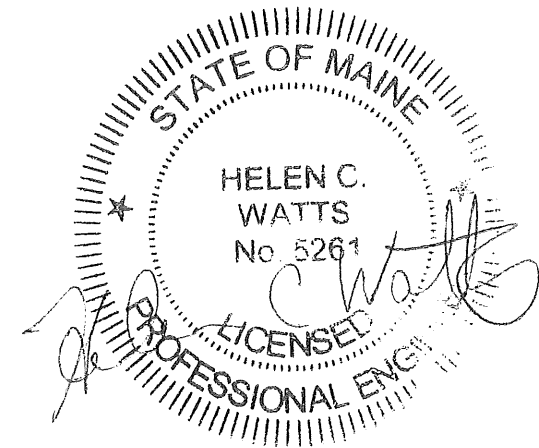
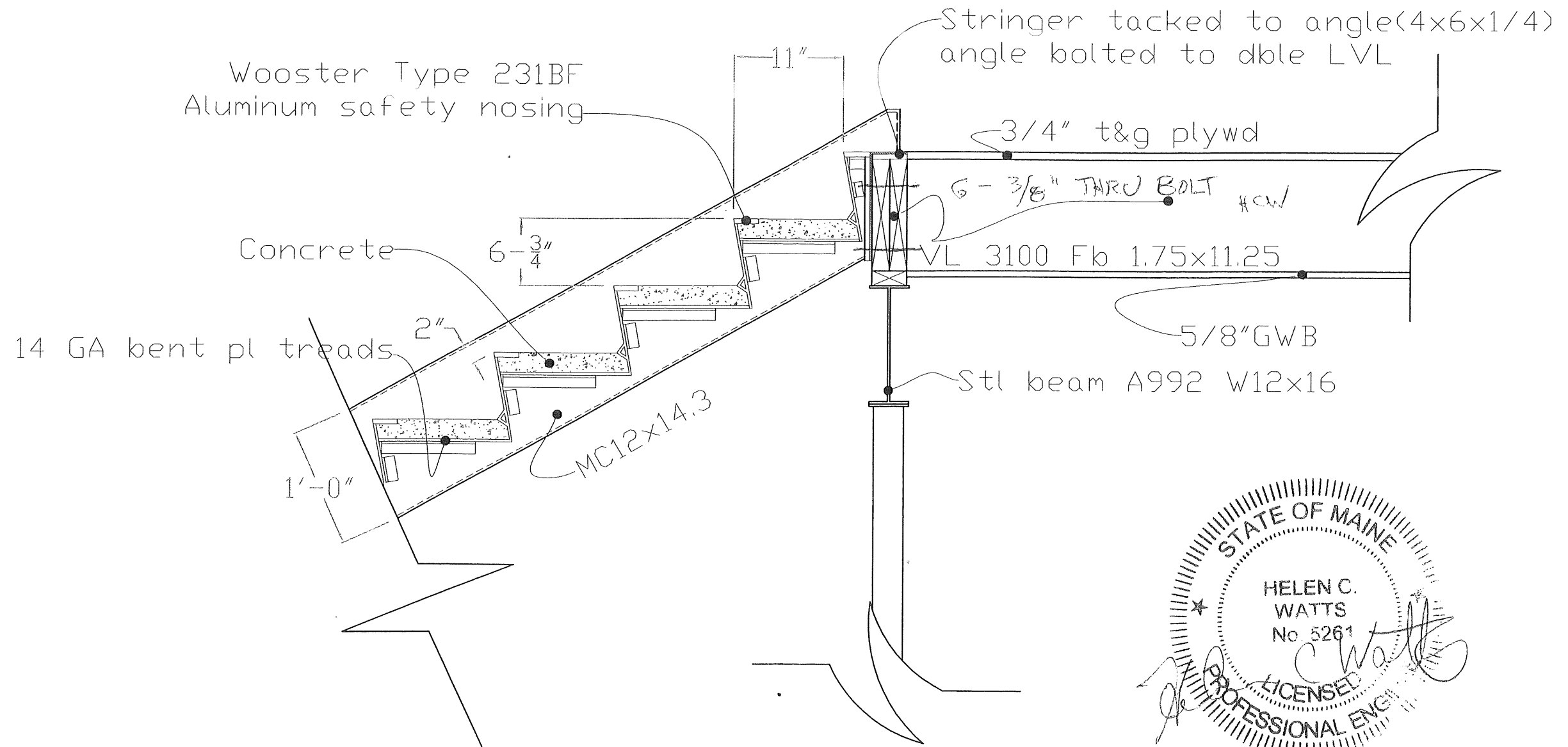
DEKKA LLC

MEZZANINES, 225 INDUSTRIAL WAY

STRUCTURAL

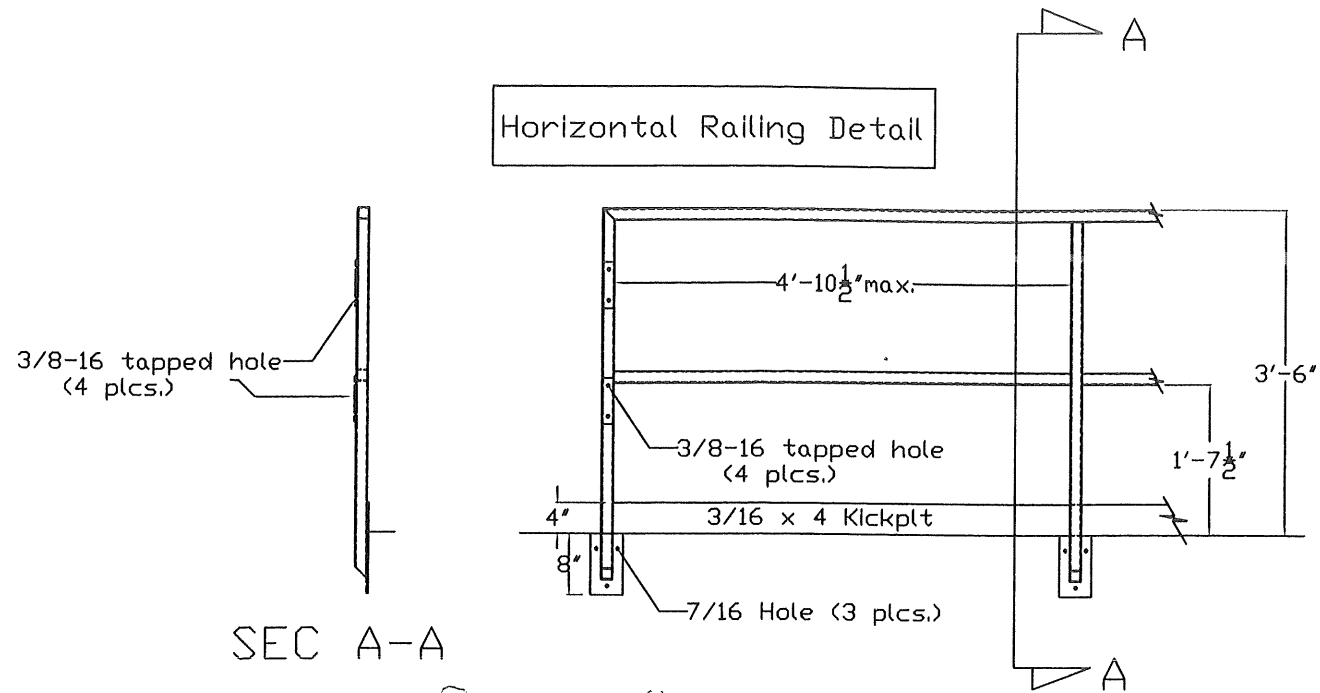
NOT TO SCALE

S/2



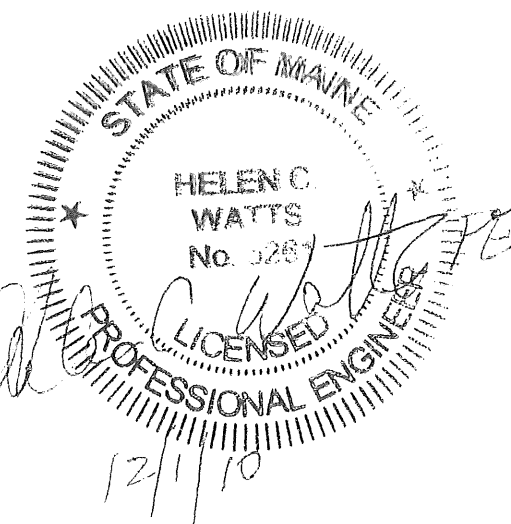
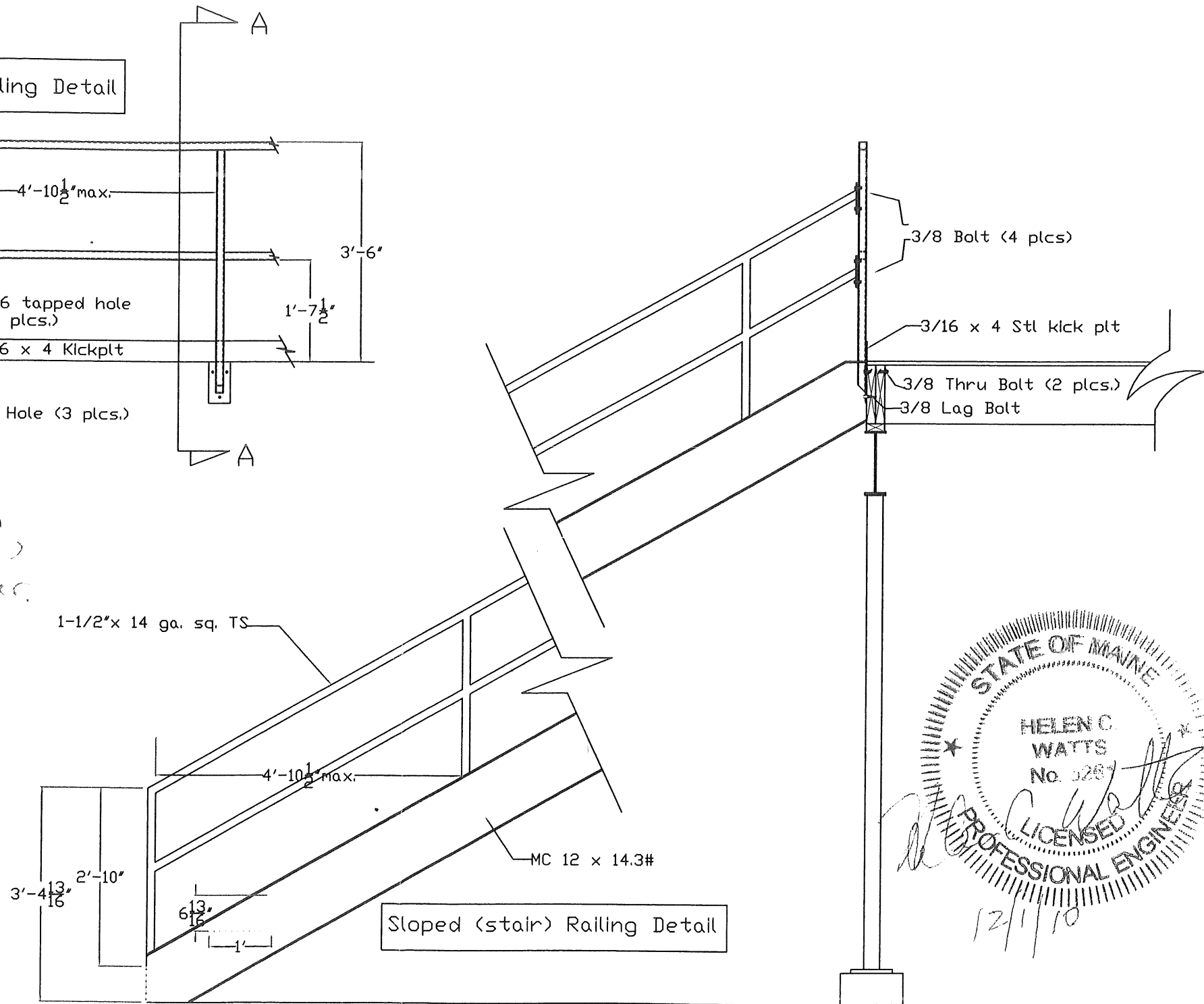
15/3

Horizontal Railing Detail



Fasten to floor with
clip angle L2x2x1/4x2",
3/8" KWIKBOLT EA. Stringer.
-haw

NOTE:
stair rail bolted to
tapped 3/8" holes
in stair carriage



Handwritten signature/initials.