
Architectural Diagnostics Ltd.

Building Diagnostics • Failure Analysis • Remedial Architecture • Architecture

June 7, 2011

Board of Directors
1350 Ala Moana AOA
1350 Ala Moana
Honolulu, Hawaii 96813

Air Conditioner Installation Guidelines

Dear Board Members and Owners:

At the request of the board, we are providing these guidelines to the owners when they are changing out old air conditioners or installing new air conditioners. The reason these guidelines are being established is because the majority of existing air conditioning installations indicate that they are leaking into the unit served and in some cases leaking to the unit below. These guidelines are written to help ensure condensation water is managed, and will drain to the exterior when the air conditioner is properly installed. See photo page 1

Types of Air Conditioners

It is beyond the scope of these guidelines to discuss all the types of air conditioning systems available and we will restrict the discussion to the typical systems currently used or proposed for 1350 Ala Moana. The typical systems currently installed are window air conditioners and split air conditioners. We propose to eliminate all window type air conditioners and replace with the thru-the-wall air conditioning system. There are several manufactures that make thru-the-wall air conditioning units that will fit the window or door conditions at 1350 Ala Moana. The board has determined that in order to maintain a uniform appearance that a single manufacture should be used. Although there several quality manufactures for air conditioners, when we asked our mechanical consultant which manufacturer he would recommended; he recommended Friedrich. Therefore, we are recommending Friedrich as the designated manufacturer for new and replacement installations. See photo page 4

Window Air Conditioners

Window air conditioners are normally inserted into an operable section of a window. Usually this type of air conditioner can be installed by the owner or a handyman. Problems with the window air conditioner are:

1. They cannot be adequately sealed at the perimeter and will typically leak during a rain.
2. If not installed correctly and/or properly maintained; the condensate water will leak to the interior of the unit. See photo page 1

Our recommendation is to not install any window type air conditioners because leaks are a common problem.

Split Air Conditioners

Split air conditioners have two parts: a condensing unit located on the exterior and fan coil unit located on the interior. The units are connected with pipes which have to penetrate the exterior of the building. See photo page 5

Problems with a split type system:

- 1 The exterior unit is typically fairly large and can be unsightly
- 2 Pipe runs can be an aesthetic problem and a leak problem if not correctly installed.

Because of the size of the of the condensing unit, most owners might prefer a thru-the-wall unit . If the owner selects a split type system, ensure the penetrations are tightly sealed. See detail 12, page 6

Thru-the-Wall Air Conditioners

Thru-the-wall air conditioners are basically the same as the window type units but have a manufactured sleeve which can be ordered with the unit. The installation process is as follows:

- 1 Remove the glass from the window or door.
- 2 Have the contractor form a perimeter closure out of the same material as the window frame (clear anodized aluminum).
- 3 The perimeter is to be sized to allow a 3/8 inch gap between the formed perimeter closure and the manufactured sleeve. See photo page 6
- 4 Install the equipment support legs. See photo page 3
- 5 Install the AC sleeve. See photo page 2
- 6 Install the AC unit into the sleeve. See photo page 2
- 7 Seal all joints with backer rod and sealant for a water tight installation.

Our recommendation is to install thru-the-wall type air conditioners because they can protect against leaks.

Items to be Aware of When Installing an Air Conditioner

- 1 Although there is no specific law in Hawaii ; there has been a law in place in New York since 1998 which was enacted to protect people from falling objects loosened from buildings; largely as a result of poor maintenance.

*The New York Local Law 11 of 1998 mandates the periodic inspection of the exterior walls and appurtenances of buildings greater than six stories in height. LL 11/98 and 1 RCNY 32-03 concerns the conditions including "significant deterioration, and movement observed as well as a statement concerning the apparent water-tightness of the exterior surfaces, and the deleterious effect of exterior appurtenances, including exterior fixtures, flagpoles, signs, parapets, copings, guard rails, window frames, window guards, **window air conditioners**, flower boxes, etc*

We recommend that air conditioners be water tight and securely supported and attached to the building. We recommend a licensed glazer (window installer) remove the existing glass, fabricate and install the perimeter closure and install all sealants.

- 2 The operation of an air conditioner produces condensate water. Typically this water collects in the front of the unit and then travels to the back where the water evaporates. If the unit does not have proper slope from front to back, the water will leak out the front into the room. It is important that the unit be correctly installed and maintained. There may be occasions when high temperatures and

humidly cause the air conditioner condensate pan to over flow; if the air conditioner is installed properly the water will drain to the exterior. However; if water drains to the exterior on a regular basis the unit should be inspected by a licensed mechanical contractor to determine the cause and make adjustments to the unit.

- 3 While capacity does determine how much cold air comes out of the unit, serious problems can occur when an air conditioner is oversized for a space. The more cold air that comes out of the unit, the more area it needs to circulate to avoid giving a false reading to the thermostat. The thermostat reads that the room air has reached the set temperature and shuts the compressor off. While the compressor is off, the "real" room air enters the intake grille and the thermostat reads that the room is no longer at the set temperature so it turns the compressor on again. The AC unit cycles off and on frequently which can burn out the compressor and cause elevated humidity in the space. Slightly undersized units will have a longer run times, resulting in improved dehumidification, lower humidity, and less likelihood of mold problems.

We recommend that a licensed mechanical engineer size and specify the air conditioner. A licensed mechanical contractor should install the air conditioner.

The purpose of this guideline is bring awareness to the owners regarding the installation of air conditioning units. These guidelines should provide sufficient information to a licensed mechanical engineer and/or contractor to specify and install an air conditioning unit providing adequate support with minimum risk of leakage.

If there are questions regarding these guidelines, you may contact Architectural Diagnostics for clarifications.

Sincerely,

ARCHITECTURAL DIAGNOSTICS LTD.



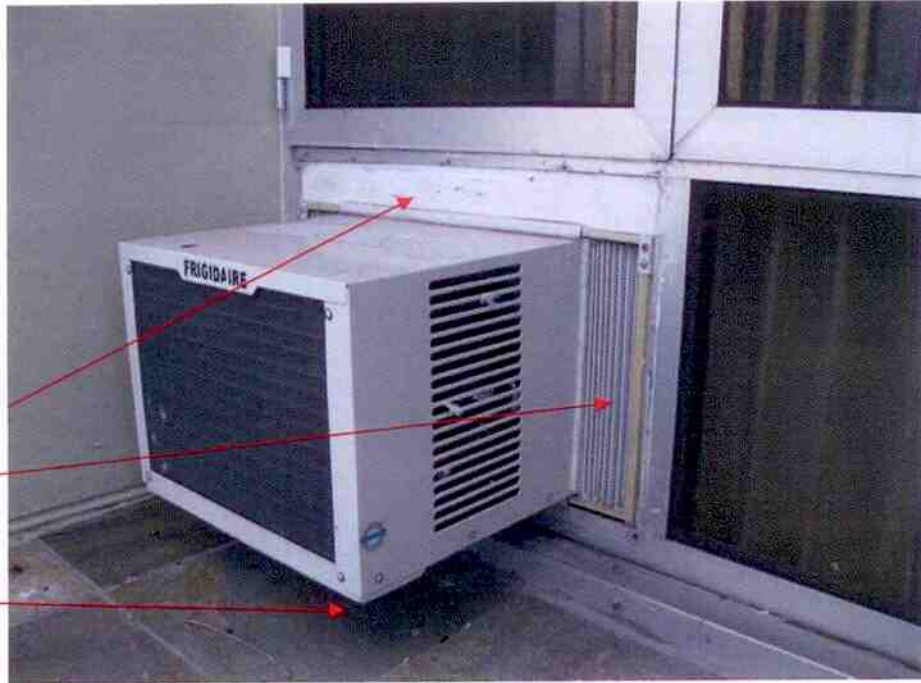
Dennis Wasson, AIA
Architect

Attachments: 6 pages of photos and diagrams

Window Air Conditioning System

Example of a window air conditioner. This installation cannot be made water tight because of poor installation of the perimeter closer and the according type side closer.

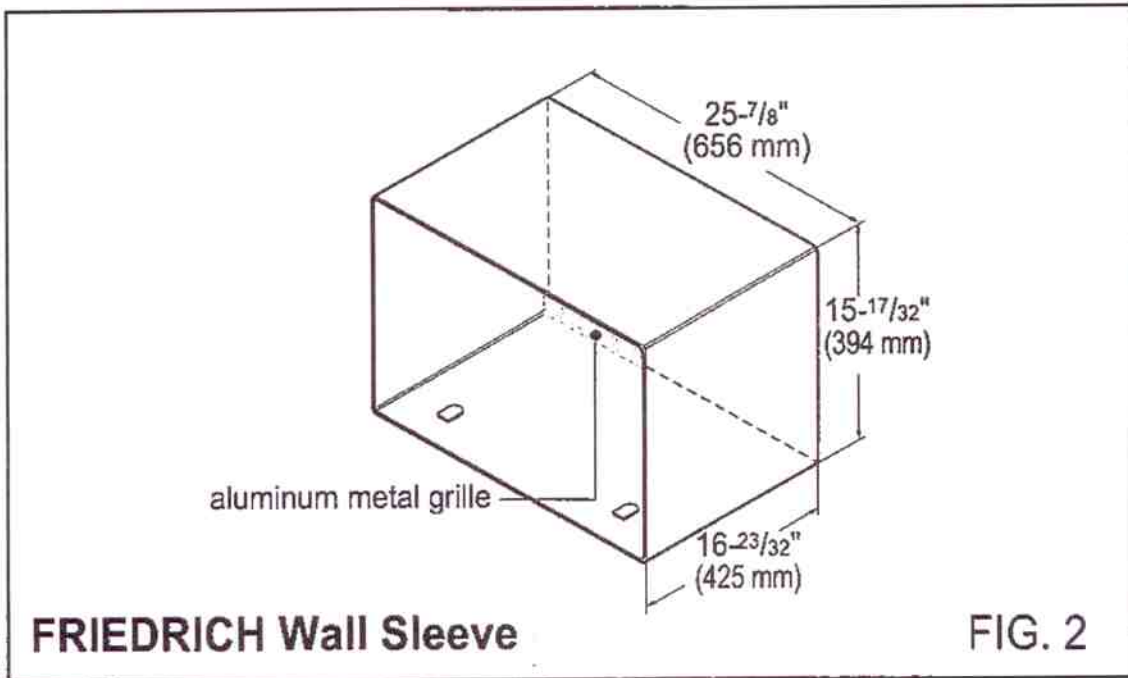
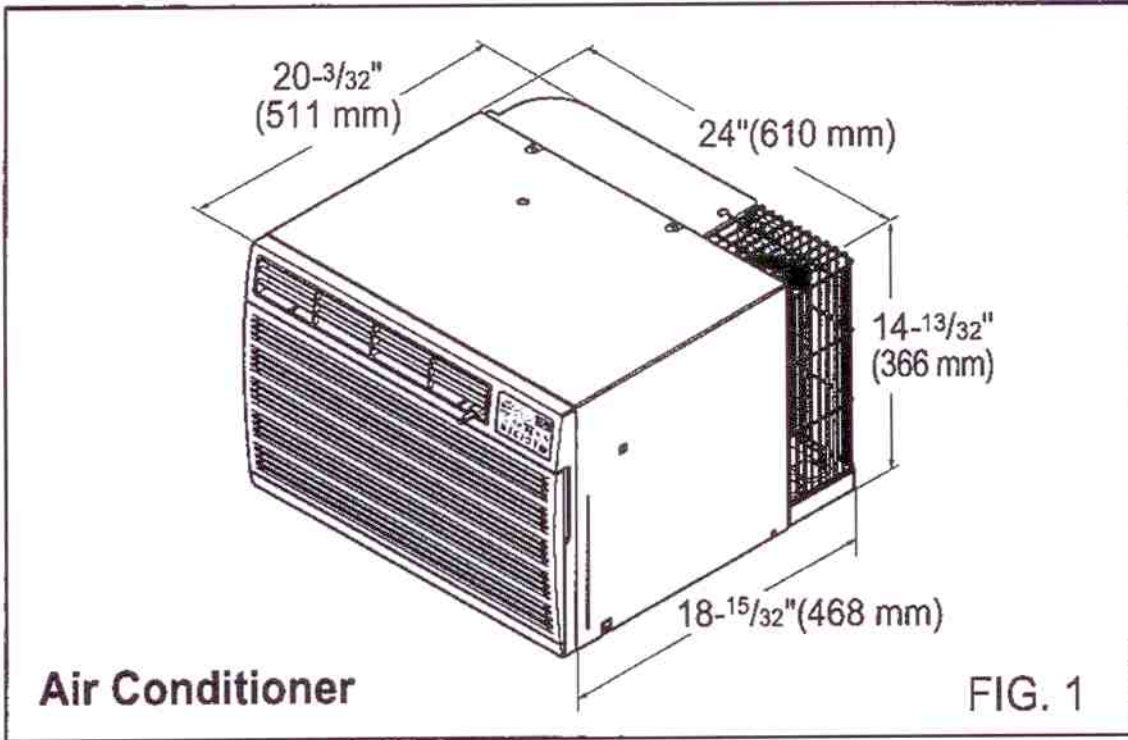
The unit is not adequately supported.



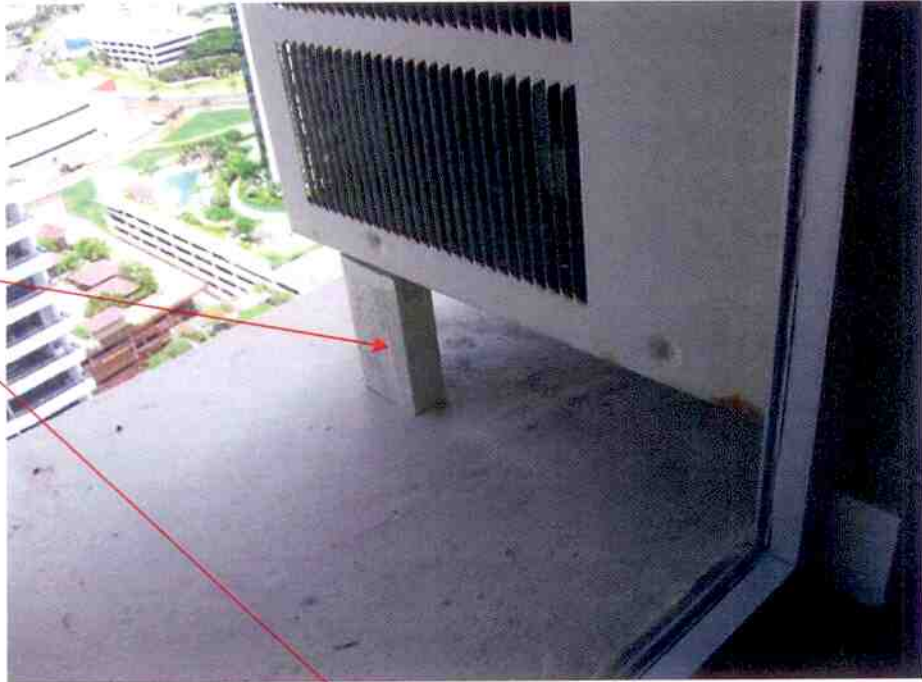
Typically the window type air conditioners that were observed; leaked to the interior of the unit.



Thru-the-wall Air Conditioning System



Even though added support may not be a requirement of the AC manufacturer, additional support for security and seismic restraint is required on all units.



Equipment leg supports for new air conditioner installations

Security/Seismic Heavy-Duty Leg Assemblies



SECURITY/SEISMIC EQUIPMENT LEGS STAINLESS STEEL

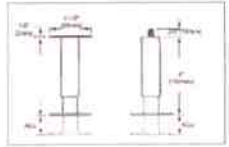


Ready modified to meet ISO/ASME seismic restraint requirements. Plus, add a 1/2" (3mm) threaded hole in diameter for an earthquake resistant bolt with 1/2" (13mm) diameter horizontal hole through the portion which allows leg to be drilled & anchored into structural substrate.

Security/Seismic Equipment Legs are specifically designed for Marine, Trawl and structural applications where installations require Secured Floor Fastened Adjustable Legs on equipment that may be subjected to sudden movement or shifting. Equipment Legs are available in both 1-3/8" (41mm) and 2" (50mm) O.D. models with a protruding threaded end of which 2-1/2" (63mm) 11 gauge (3mm) square steel mounting plate. The 3-1/2" (89mm) dia. flanges top face has 11,000" (279mm) dia. hole fastening holes on 2-1/2" (63mm) centers.

FLOOR FASTENED STAINLESS STEEL SECURITY/SEISMIC EQUIPMENT LEGS

MODEL NO.	DESCRIPTION
AS7-9803-C	1-3/8" (41mm) O.D. WITH FLOOR MOUNTING PLATE
AS8-9803-C	2" (50mm) O.D. WITH 1/2" (13mm) HORIZONTAL BOLT
AS9-9802-C	2" (50mm) O.D. WITH WELDED MOUNTING PLATE
AS9-9803-C	2" (50mm) O.D. WITH 1/2" (13mm) HORIZONTAL BOLT



OPERATIONAL INFORMATION

- * FLOOR MOUNTING PLATE IS NOT INCLUDED IN THIS LISTING. SEE SPECIFICATIONS FOR FLOOR MOUNTING PLATE.
- * EQUIPMENT LEGS ARE NOT TO BE USED ON CONCRETE SURFACES WITHOUT AN EPOXY ANCHORING SYSTEM.
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Thru-the-wall Air Conditioning System

UNI-FIT® THRU-THE-WALL AIR CONDITIONERS

26" SLEEVE

Universal fit for easy replacement in existing 26" sleeves



Features

- Rotary compressors provide quiet, dependable performance
- Six-way air flow control
- Stale air exhaust
- Auto restart
- Washable/reusable filter
- Seacoast protection



Digital Control Features

- 12 hour programmable timer
- Money Saver® setting saves money by conserving energy

Uni-Fit®

COOLING	HEATING
8,000-13,000 BTU/h	3,850-11,200 BTU/h
Up to 9.6 EER	

Sleeve Dimension	Friedrich USC Sleeve
Height (inches)	15 1/2
Width (inches)	25 7/8
Depth (inches)	16 3/4

Units are shown without USC sleeve (USC sleeves sold and shipped separately)

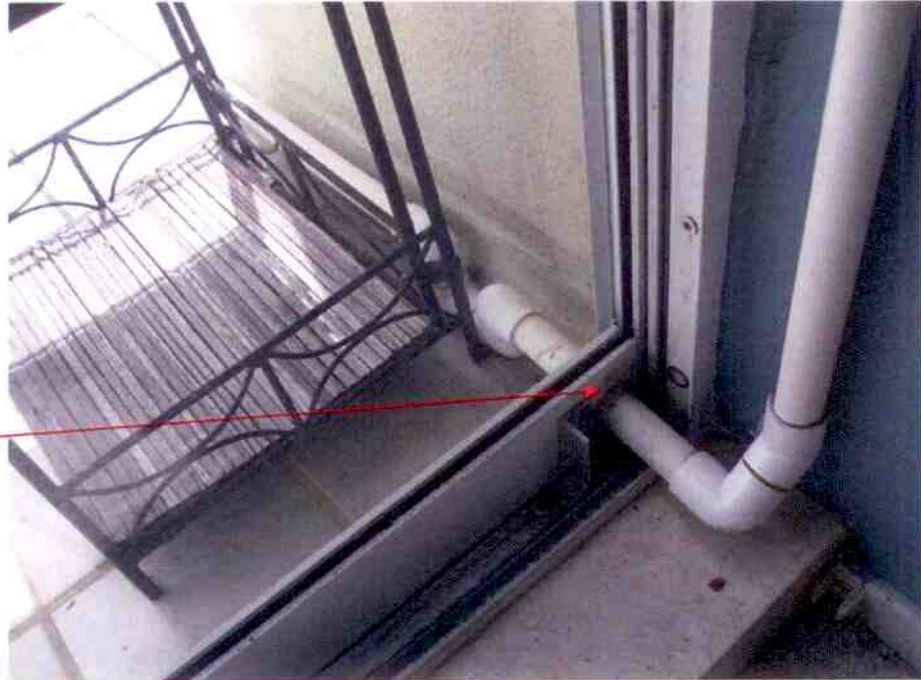
Split Type Air Conditioning System


These are examples of a split type air conditioning system. The pipe penetrates the wall from the exterior unit and to the interior fan unit.

Holes should not be drilled through the window frame as installed here.

The correct way to install the pipe is shown on detail 12 on page 6. The glass is removed and replaced with .25 inch thick aluminum sheet. The sheet should be pre-drilled for the pipe penetration. A water tight connection is accomplished with a special fitting.

This work should be done by a licensed professional.

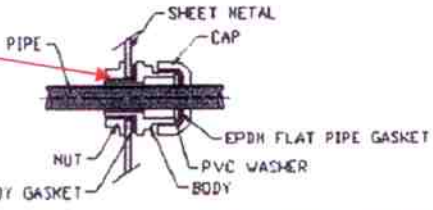




Sigrist Pipe Exit Seals


Models 2025 Through 3001

Sigrist Enterprises LLC
1-425-865-0777
pete@pipechasehousing.com
pipechasehousing.com



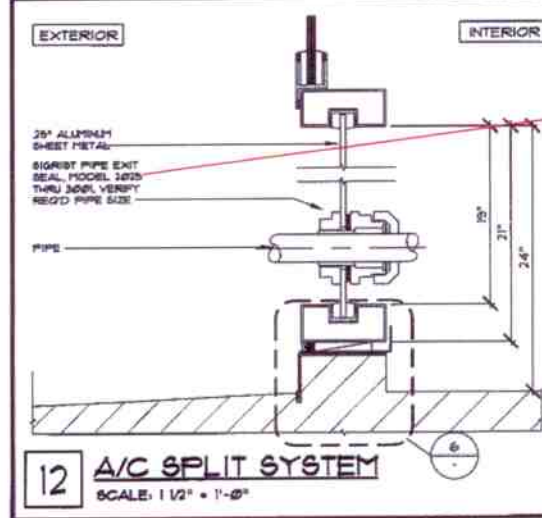
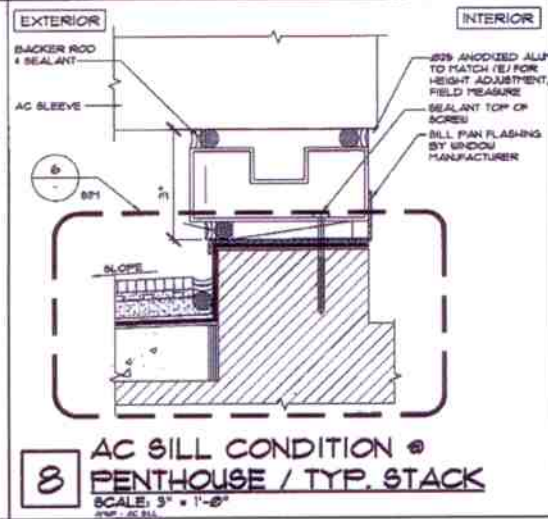
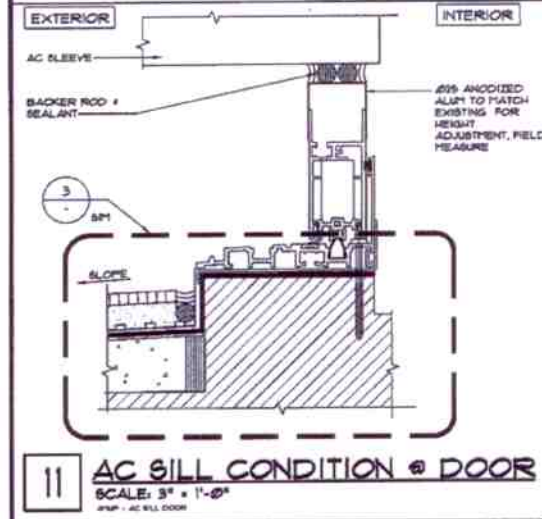
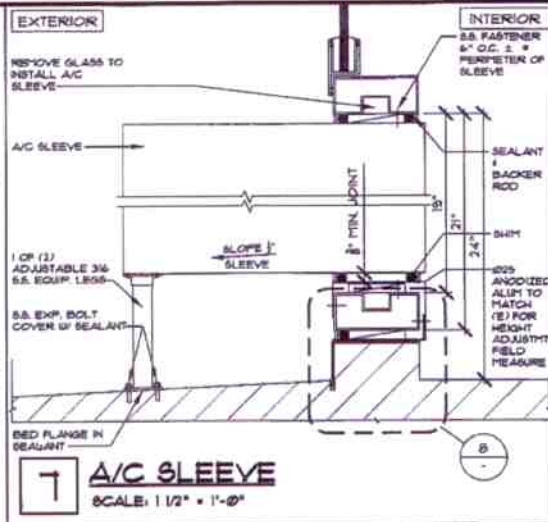
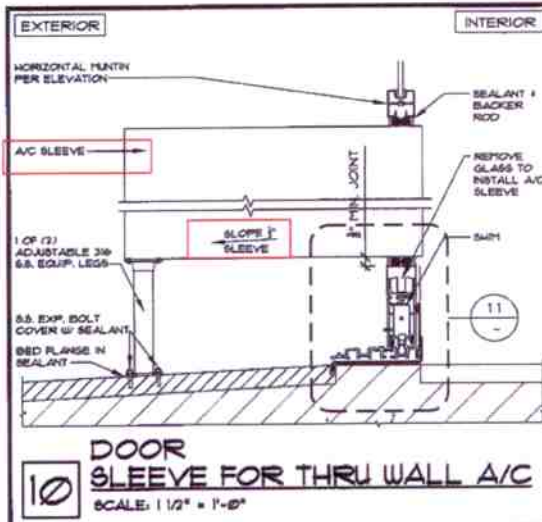
Details

- Maximum wall thickness 3/4 inch.
- Color : White
- High UV protected PVC Plastic
- Minimum outside pipe size 1/4 inch.
- Maximum outside pipe size 1 5/8 inch.



WARNING : This Pipe Seal is not designed to be a water fitting. Never use this product in a water system.

Each seal is designed to work on a range of pipe sizes. There are 10 seals to cover all pipe sizes between 1/4 inch to 1 5/8 inch out side diameter. Each seal range is in 1/8 inch increments. The first seal has a range from 1/4 inch to 3/8. Any out side pipe size that fall on or between 1/4 inch and 3/8 inch will fit this seal. This pattern continues up to 1 5/8 inch OD. The cap will fit any seal body in the event a pipe



Sigrist Pipe Exit Seals Models 2025 Through 3001

Sigrist Enterprises LLC
1-425-865-0777
pete@pipeexithousing.com
pipeexithousing.com

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