City of Portland, Maine - Building or Use Permit Application

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

Permit No:	Issue Date:	CBL:
09-1226		211 A001001

Location of Construction:	Owner Name:	Owner Address:	Phone:
2002 Congress St	Brooklawn Memorial Pk	2002 Congress St	
Business Name:	**Contractor Name:**	**Contractor Address:**	**Phone**
Brooklawn Memorial Cemetary	Portland Airconditioning, Inc.	205 Lincoln St. S. Portland	2077674567
Lessee/Buyer's Name	**Phone:**	**Permit Type:**	**Zone:**
		HVAC	R-1

Past Use:	Proposed Use:	Permit Fee:	Cost of Work:	CEO District:
Brooklawn Memorial Cemetary	Brooklawn Memorial Cemetary / Install natural gas Triangle Tube Boiler with pvc venting on the floor.	$170.00	$14,900.00	3

FIRE DEPT: ☑ Approved ☐ Denied

*See Conditions

Signature: KG

INSPECTION: Use Group: S-1/B Type: HVAC

IMC-2003

Signature:

Proposed Project Description:
Install natural gas Triangle Tube Boiler with pvc venting on the floor.

PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)

Action: ☐ Approved ☐ Approved w/Conditions ☐ Denied

Signature: Date:

Permit Taken By:	Date Applied For:
gg	10/30/2009

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
2. Building permits do not include plumbing, septic or electrical work.
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..

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
☐ Shoreland	☐ Variance	☑ Not in District or Landmark
☐ Wetland	☐ Miscellaneous	☐ Does Not Require Review
☐ Flood Zone	☐ Conditional Use	☐ Requires Review
☐ Subdivision	☐ Interpretation	☐ Approved
☐ Site Plan	☐ Approved	☐ Approved w/Conditions
Maj ☐ Minor ☐ MM ☐	☐ Denied	☐ Denied
OK Date: 11/2/09 ABM	Date:	Date: ABM

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.

PERMIT ISSUED

SIGNATURE OF APPLICANT ADDRESS DATE NOV 2 2009 PHONE

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE DATE PHONE

City of Portland

City of Portland, Maine - Building or Use Permit

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

Permit No:	Date Applied For:	CBL:
09-1226	10/30/2009	211 A001001

Location of Construction:	Owner Name:	Owner Address:	Phone:
2002 Congress St	Brooklawn Memorial Pk	2002 Congress St	
Business Name:	**Contractor Name:**	**Contractor Address:**	**Phone**
Brooklawn Memorial Cemetary	Portland Airconditioning, Inc.	205 Lincoln St. S. Portland	(207) 767-4567
Lessee/Buyer's Name	**Phone:**	**Permit Type:**	
		HVAC	

Proposed Use:	Proposed Project Description:
Brooklawn Memorial Cemetary / Install natural gas Triangle Tube Boiler with pvc venting on the floor.	Install natural gas Triangle Tube Boiler with pvc venting on the floor.

Dept: Zoning **Status:** Approved **Reviewer:** Ann Machado **Approval Date:** 11/02/2009

Note: **Ok to Issue:** ☑

Dept: Building **Status:** Approved with Conditions **Reviewer:** Jeanine Bourke **Approval Date:** 11/19/2009

Note: **Ok to Issue:** ☑

1) All penetratios through rated assemblies must be protected by an approved firestop system installed in accordance with ASTM 814 or UL 1479, per IBC 2003 Section 712.
2) The appliance and venting shall be installed in accordance with the UL listing, IMC 2003 and NFPA 211.
3) The installation must comply with the State of Maine Gas Regulations.

Dept: Fire **Status:** Approved with Conditions **Reviewer:** Capt Keith Gautreau **Approval Date:** 11/02/2009

Note: **Ok to Issue:** ☑

1) Install shall comply with all manufacture's specifications.
2) Install shall comply with NFPA 54.
   A compliance letter is required

PERMIT ISSUED

NOV 2 2009

City of Portland

#09 1326

FILL IN AND SIGN WITH INK

PERMIT ISSUED
NOV 2 2009
City of Portland

APPLICATION FOR PERMIT
HEATING OR POWER EQUIPMENT

200 Acres

To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL 2002 Congress St Portland Use of Building Storage Date 10/30/09

Name and address of owner of appliance Brooklawn Memorial Cemetary

Installer's name and address Portland Airconditioning Inc x mail Permit

29 Washington Ave Suite C Scarborough ME 04074 Telephone 207 885-1256

RECEIVED
OCT 30 2009
Dept. of Building Inspections
City of Portland Maine

Location of appliance:

- ☐ Basement
- ☒ Floor
- ☐ Attic
- ☐ Roof

Type of Fuel:

- ☒ Gas
- ☐ Oil
- ☐ Solid

Appliance Name: Triangle Tube Boiler

U.L. Approved ☒ Yes ☐ No

Will appliance be installed in accordance with the manufacture's installation instructions? ☒ Yes ☐ No

IF NO Explain:

The Type of License of Installer:

- ☐ Master Plumber #
- ☐ Solid Fuel #
- ☐ Oil #
- ☒ Gas # PNT 434
- ☐ Other

Type of Chimney:

- ☐ Masonry Lined
  Factory built
- ☐ Metal
  Factory Built U.L. Listing #
- ☐ Direct Vent
  Type PVC Venting UL#

Type of Fuel Tank

- ☐ Oil
- ☒ Gas

Size of Tank N/A natural gas

Number of Tanks

Distance from Tank to Center of Flame feet.

Cost of Work: $ 14,900

Permit Fee: $ 170.00

Approved

Fire:

Ele.:

Bldg.:

Approved with Conditions

☐ See attached letter or requirement

Inspector's Signature

Date Approved

Signature of Installer Portland Airconditioning Inc.

White - Inspection Yellow - File Pink - Applicant's Gold - Assessor's Copy

Triangle

Solo 60
Solo 175
Solo 250
Solo 399
Water Boiler

INSTALLATION AND MAINTENANCE
MANUAL

NOTICE

Warranty Registration Card must be filled out by the customer and mailed within thirty (30) days of installation in order to gain warranty coverage.

When receiving the PRESTIGE Solo unit, any claims for damage or shortage in shipment must be filed immediately against the transportation company by the consignee.

Leave all documentation received with appliance with owner for future reference.

WARNING **If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.**

FOR YOUR SAFETY

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- WHAT TO DO IF YOU SMELL GAS
  - Do not try to light any appliance
  - Do not touch any electrical switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
  - If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qu
gas supplier.

29 WASHINGTON AVE., SUITE G □ SCARBOROUGH, MAINE 04074 □ TEL (207) 885-1256 □ FAX (207) 885-1259

PORTLAND AIR CONDITIONING

PRODUCT AND SAFETY INFORMATION

SECTION I - PRE-INSTALLATION ITEMS

SECTION II - COMBUSTION AIR AND VENTING

SECTION III - UNIT PREPARATIONS

SECTION IV - BOILER PIPING

PORTLAND
AIR CONDITIONING

29 WASHINGTON AVE., SUITE C ❐ SCARBOROUGH, MAINE 04074 ❐ TEL (207) 885-1256 ❐ FAX (207) 885-1259

SECTION IX - START-UP PREPARATION

SECTION - START-UP PROCEDURES

SECTION XI - OUTDOOR RESET CONTROL

SECTION XII - EXTERNAL MODULATING CONTROL

SECTION XIII - CHECK-OUT PROCEDURES

SECTION XIV - INSTALLATION RECORD

SECTIONS XV - MAINTENANCE SCHEDULE

SECTION XVI - MAINTENANCE PROCEDURES

REPLACEMENT PARTS

PRODUCT SPECIFICATIONS

Definitions

The following terms are used throughout this manual to bring attention to the presence of potential hazards or important information concerning the product.

DANGER

Indicates the presence of a hazardous situation which, if ignored, will result in death, serious injury or substantial property damage.

WARNING

Indicates a potentially hazardous situation which, if ignored, can result in death, serious injury or substantial property damage.

CAUTION

Indicates a potentially hazardous situation which, if ignored, may result in minor injury or property damage.

NOTICE

Indicates special instructions on installation, operation or maintenance, which are important to equipment but not related to personal injury hazards.

BEST PRACTICES

Indicates recommendations made by Triangle Tube for the installers which will help to ensure optimum operation and longevity of the equipment

NOTICE

Triangle Tube reserves the right to modify the technical specifications and components of its products without prior notice.

DANGER

Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system which has been under water.

WARNING

Should overheating occur or the gas supply fails to shut off, turn OFF the manual gas control valve external to the appliance.

WARNING

WHAT TO DO IF YOU SMELL GAS

- **Do not try to light any appliance**
- **Do not touch any electrical switch; do not use any phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

WARNING

DO NOT add cold make up water when the boiler is hot. Thermal shock can cause potential cracks in the heat exchanger.

CAUTION

When servicing the boiler:

- **Avoid electrical shock by disconnecting the electrical supply prior to performing maintenance.**

WARNING

Qualified Installer:

Prior to installing this product read all instructions included in this manual and all accompanying manuals/documents with this appliance. Perform all installation steps required in these manuals in the proper order given. Failure to adhere to the guidelines within these manuals can result in severe personal injury, death or substantial property damage.

Homeowner:

- This product should be maintained / serviced and inspected annually by a qualified service technician.
- This manual is intended for use by a qualified Installer/Service Technician.

NOTICE

Please reference the unit's model number and the serial number from the rating label, on the backside of the control panel when inquiring about service or troubleshooting.

NOTICE

Triangle Tube accepts no liability for any damage resulting from incorrect installation or from the use of components or fittings not specified by Triangle Tube.

SECTION I - Pre-Installation Items

Code Compliance

This product must be installed in accordance to the following:

- All applicable local, state, national and provincial codes, ordinances, regulations and laws.
- For installations in Massachusetts, code requires the boiler to be installed by a licensed plumber or gas fitter, and if antifreeze is utilized, the installation of a reduced pressure backflow preventer device is required in the boiler's cold water fill or make up water supply line.
- For installation in Massachusetts all direct vented appliances must comply with the guidelines as outlined on page 11.
- The National Fuel Gas Code NFPA54/ ANSI Z 223.1 - Latest edition.
- National Electric Code ANSI/NFPA 70.
- For installations in Canada -"Installation Code for Gas Burning Equipment" CGA/B149.1 or B149.2 Canadian Electrical Code Part 1 CSA C22.1.
- Standards for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1, when required.

NOTICE

The PRESTIGE Solo boiler gas manifold and gas controls meet the safe lighting and other performance requirements as specified in ANSI Z21.13 latest edition.

Determining Product Location

Before locating the PRESTIGE SOLO check for convenient locations to:

- Heating system piping
- Venting
- Gas supply piping
- Electrical service

Ensure the boiler location allows the combustion air/vent piping to be routed directly through the building and terminate properly outside with a minimum amount of length and bends.

Ensure the area chosen for the installation of the PRESTIGE Solo is free of any combustible materials, gasoline and other flammable liquids.

WARNING

Failure to remove or maintain the area free of combustible materials, gasoline and other flammable liquids or vapors can result in severe personal injury, death or substantial property damage.

Ensure the PRESTIGE Solo and its controls are protected from dripping or spraying water during normal operation or service.

The PRESTIGE Solo should be installed in a location so that any water leaking from the boiler or piping connections or relief valve will not cause damage to the area surrounding the unit or any lower floors in the structure.

Boiler Replacement

If the PRESTIGE Solo is replacing an existing boiler, the following items should be checked and corrected prior to installation:

- Boiler piping leaks and corrosion.
- Improper location and sizing of the expansion tank on the boiler heating loop.
- If applicable, level and quality of freeze protection within the boiler system.

Recommended Clearances

The PRESTIGE Solo is approved for zero clearance to combustibles, excluding vent and boiler piping.

- Boiler Piping - 1/4 inch from combustible materials.

- Reference the appropriate vent supplement for clearance requirements.

BEST PRACTICES

To provide serviceability to the unit it is recommended that the following clearances be maintained:

Top boiler jacket - 24 inches [610 mm].

Front - 24 inches [610 mm].

Bottom boiler piping - 24 inches [610 mm].

Rear - 0 inches

Sides - 6 inches [153 mm]

WARNING

If the clearances listed above cannot be maintained or the enclosure in which the boiler is installed is less than 85 cubic feet, the space must be ventilated. See page 6 for ventilation requirements.

NOTICE

When maintaining zero clearance or less than recommended clearances, some product labeling may become hidden and unreadable.

WARNING

When installing the PRESTIGE Solo in a confined space, sufficient air must be provided for proper combustion and venting and to allow, under normal operating conditions, proper air flow around the product to maintain ambient temperatures within safe limits to comply with the National Fuel Gas Code NFPA 54 - latest edition.

Residential Garage Installations

When installing the PRESTIGE Solo in a residential garage, the following special precautions per NFPA 54/ANSI Z223.1 must be taken:

- Mount the unit a minimum 18 inches [458 mm] above the floor level of the garage. Ensure the burner and ignition devices / controls are no less than 18 inches [458 mm] above the floor level.
- Locate or protect the unit in a manner so it cannot be damaged by a moving vehicle.

Boiler Freeze Protection Feature

The boiler control has a freeze protection feature built in. This feature monitors the boiler temperature and responds as follows when no call for heat is present:

- 46°F Boiler circulator is ON
- 38°F Boiler circulator is ON and burner operates at low fire
- 50°F Burner OFF and boiler circulator operates for approximately 10 minutes

CAUTION

The boiler freeze protection feature is disabled during a hard lockout, however the CH circulator will operate.

CAUTION

The boiler freeze protection feature is designed to protect the boiler. The boiler should be installed in a primary/secondary piping arrangement if it is installed in an unheated space or exposed to water temperatures of 46°F or less. See Section IV for primary/secondary piping examples. See Section IX for antifreeze guides.

SECTION II - Combustion Air and Venting

Combustion Air Contamination

WARNING

If the PRESTIGE Solo combustion air inlet is located in any area likely to cause or contain contamination, or if products, which would contaminate the air cannot be removed, the combustion air must be repiped and terminated to another location. Contaminated combustion air will damage the unit and its burner system, resulting in possible severe personal injury, death or substantial property damage.

WARNING

Do not operate a PRESTIGE Solo if its combustion air inlet is located near a laundry room or pool facility. These areas will always contain hazardous contaminants.

Pool and laundry products and common household and hobby products often contain fluorine or chlorine compounds. When these chemicals pass through the burner and vent system, they can form strong acids. These acids can create corrosion of the heat exchanger, burner components and vent system, causing serious damage and presenting a possible threat of flue gas spillage or water leakage into the surrounding area.

Please read the information listed below. If contaminating chemicals are located near the area of the combustion air inlet, the installer should pipe the combustion air inlet to an outside area free of these chemicals per SECTION V of this installation manual.

Potential contaminating products

- Spray cans containing chloro/fluorocarbons
- Permanent Wave Solutions
- Chlorinated wax
- Chlorine - based swimming pool chemicals / cleaners
- Calcium Chloride used for thawing ice
- Sodium Chloride used for water softening
- Refrigerant leaks
- Paint or varnish removers
- Hydrochloric acid / muriatic acid
- Cements and glues
- Antistatic fabric softeners used in clothes dryers
- Chlorine-type bleaches, detergents, and cleaning solvents found in household laundry rooms
- Adhesives used to fasten building products and other similar products

Areas likely to contain these products

- Dry cleaning / laundry areas and establishments
- Beauty salons
- Metal fabrication shops
- Swimming pools and health spas
- Refrigeration Repair shops
- Photo processing plants
- Auto body shops
- Plastic manufacturing plants
- Furniture refinishing areas and establishments
- New building construction
- Remodeling areas
- Garages with workshops

Ventilation and Combustion Air Requirements - Direct Vent

A Direct Vent appliance utilizes uncontamined outdoor air (piped directly to the appliance) for combustion.

For Direct Vent installations, involving only the PRESTIGE Solo, in which the minimum service clearances are maintained as listed on page 4, no ventilation openings are required.

For Direct Vent, zero clearance installations involving only the PRESTIGE Solo, the space / enclosure must provide two openings for ventilation. The openings must be sized to provide 1 square inch of free area per 1,000 BTUH of boiler input. The openings shall be placed 12 inches from the top of the space and 12 inches from the floor of the space.

For installations in which the PRESTIGE Solo shares the space with air movers (exhaust fan, clothes dryers, fireplaces, etc.) and other combustion equipment (gas or oil) the space must be provided with adequate air openings to provide ventilation and combustion air to the equipment. To properly size the ventilation / combustion air openings, the installer must comply with the National Fuel Gas Code NFPA 54, ANSI Z223.1 for installations in the U.S or CSA B149.1 and B149.2 for installations in Canada.

WARNING

The space must be provided with ventilation / combustion air openings properly sized for all make-up air requirements (exhaust fans, clothes dryers, fireplaces, etc.) and the total input of all appliances located in the same space as the PRESTIGE Solo, excluding the input of a Direct Vent PRESTIGE Solo which uses combustion air directly from the outside, thus additional free area for the openings is not required. Failure to provide or properly size the openings could result in severe personal injury, death or substantial property damage.

Ventilation and Combustion Air Requirements - Category IV

A Category IV appliance utilizes uncontaminated indoor or outdoor air (surrounding the appliance) for combustion.

BEST PRACTICES

In order to reduce the potential risks associated with indoor contaminates (listed on page 5), flammable vapors and tight housing construction (little or no infiltration air), it is recommended to pipe uncontaminated combustion air directly from the outdoors to the appliance. This practice also promotes higher system efficiency by reducing heated indoor air from being exhausted from the house and replaced by cold infiltration air into the house.

For installations in which the PRESTIGE Solo shares the space with air movers (exhaust fan, clothes dryers, fireplaces, etc.) and other combustion equipment (gas or oil) the space must be provided with adequate air openings to provide ventilation and combustion air to the equipment. To properly size the ventilation / combustion air openings, the installer must comply with the National Fuel Gas Code NFPA 54, ANSI Z223.1 for installations in the U.S or CSA B149.1 and B149.2 for installations in Canada, as referenced in this section of the manual and titled Methods of Accessing Combustion Air into a Space.

WARNING

The space must be provided with ventilation / combustion air openings properly sized for all make-up air requirements (exhaust fans, clothes dryers, fireplaces, etc.) and the total input of all appliances, including the PRESTIGE Solo when located in the same space. Failure to provide or properly size the openings could result in severe personal injury, death or substantial property damage.

Methods of Accessing Combustion Air Into A Space - Category IV

Indoor Combustion Air

NOTICE

The methods listed in this section for accessing Indoor Combustion Air assume that the infiltration rate is adequate and not less than .40 ACH. For infiltration rates less than .40 ACH, reference the NFPA 54 National Fuel Gas Code for additional guidance.

Opening Size and Location

Openings used to connect indoor spaces shall be sized and located in accordance with the following see Fig. 1:

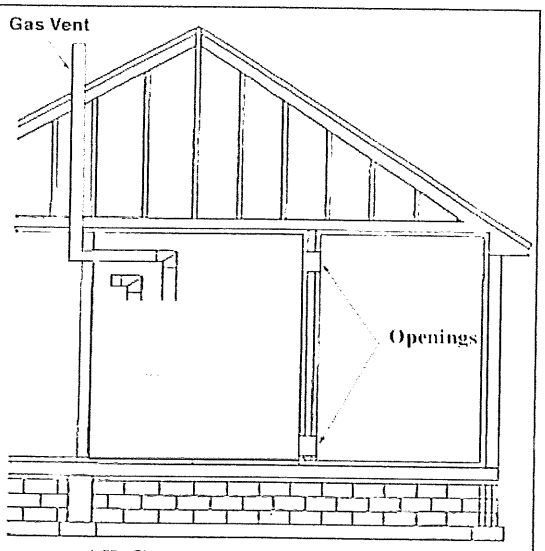


Fig. 1: All Combustion Air from Adjacent Indoor Spaces Through Indoor Combustion Openings

- Combining spaces on the same story. Each opening shall have a minimum free area of 1 sq. in./1000 Btu/hr of the total input rating of all gas utilization equipment in the space, but not less than 100 sq. inches. One opening shall commence within 12 inches of the top, and one opening shall commence within 12 inches of the bottom of the enclosure. The minimum dimension of air openings shall be not less than 3 inches.
- Combining spaces in different stories. The volumes of spaces in different stories shall be considered as communicating spaces where such spaces are connected by one or more openings in doors or floors having a total minimum free area of 2 sq. in./1000 Btu/hr of total input rating of all gas utilization equipment.

Outdoor Combustion Air

BEST PRACTICES

Isolating the combustion appliance room from the rest of the building and bringing in uncontaminated outside air for combustion and ventilation is always preferred.

Opening Size and Location

The minimum dimension of air openings shall be not less than 3 inches

Openings used to supply combustion and ventilation air shall be sized and located in accordance with the following:

One Permanent Opening Method. See Fig. 2

One permanent opening, commencing within 12 in. of the top of the enclosure, shall be provided. The equipment shall have clearances of at least 1 inch from the sides and 6 in. from the front of the appliance. The opening shall directly communicate with the outdoors or shall communicate through a vertical or horizontal duct to the outdoors or spaces that freely communicate with the outdoors and shall have a minimum free area of the following:

- 1sq. in./3000 Btu/hr of the total input rating of all equipment located in the enclosures, and
- Not less than the sum of the areas of all vent connectors in the space.

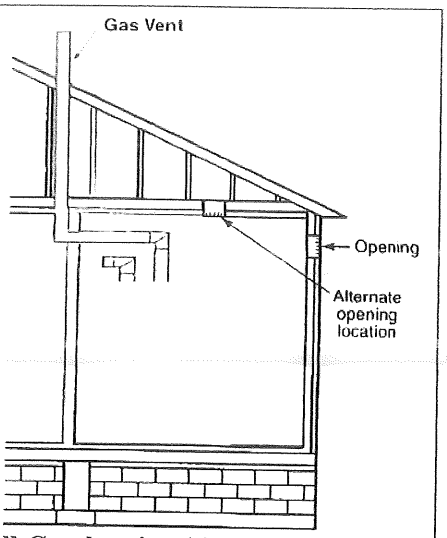


Fig. 2: **All Combustion Air from Outdoors Through One Permanent Air Opening**

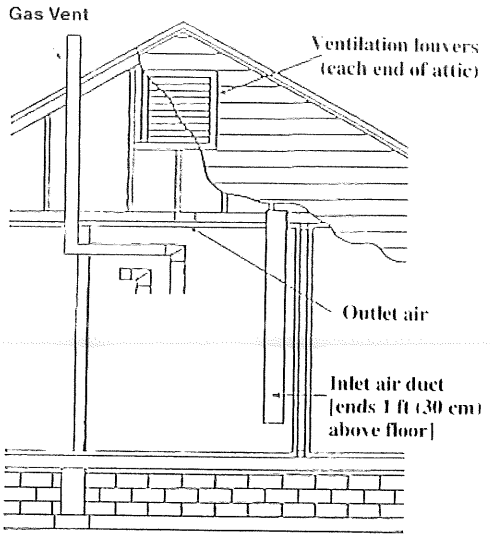


Fig. 3: **All Combustion Air from Outdoors Through Ventilated Attic**

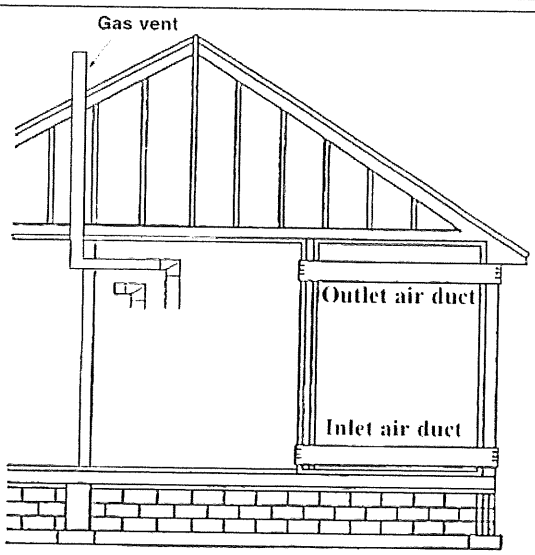


Fig. 4: **All Combustion Air from Outdoors Through Horizontal Ducts**

Two Permanent Openings Method.

Two permanent openings, one commencing within 12 in. of the top and one commencing within 12 in. of the bottom of the enclosure, shall be provided. The openings shall communicate directly, or by ducts, with the outdoors or spaces that freely communicate with the outdoors, as follows:

- Where directly communicating with the outdoors or where communication to the outdoors is through vertical ducts, each opening shall have a minimum free area of 1 sq. in./4000 Btu/hr of total input rating of all equipment in the enclosure. See Fig.3.
- Where communicating with the outdoors is through horizontal ducts, each opening shall have a minimum free area of not less than 1 sq.in./2000 Btu/hr of total input rating of all equipment in the enclosure. See Fig. 4.

Combination of Indoor and Outdoor Combustion Air

Indoor Openings: Where used, openings connecting the interior spaces shall comply with the Indoor Combustion Air section on page 7.

Outdoor Opening(s) Location. Outdoor opening(s) shall be located in accordance with the Outdoor Combustion Air section.

Outdoor Opening(s) Size. Outdoor opening(s) shall be calculated in accordance with the following:

- The ratio of the interior spaces shall be the available volume of all communicating spaces divided by the required volume.
- The outdoor size reduction factor shall be 1 minus the ratio of interior spaces.
- The minimum size of outdoor opening(s) calculated in accordance with the above outdoor air section multiplied by the reduction factor. The minimum dimension of air openings shall not be less than 3 in.

DANGER

Do not install the PRESTIGE Solo into a common vent with other gas or oil appliances. This may cause flue gas spillage or appliance malfunction, resulting in possible severe personal injury, death or substantial property damage.

Combustion Air and Vent Piping

The PRESTIGE Solo requires a Category IV venting system, which is designed for pressurized venting and condensate.

The PRESTIGE Solo is certified per ANSI Z21.13 as a Category IV or Direct Vent (sealed combustion) appliance. A Category IV appliance utilizes uncontamined indoor or outdoor air (surrounding the appliance) for combustion. A Direct Vent appliance utilizes uncontaminated outdoor air (piped directly to the appliance) for combustion.

BEST PRACTICES

In order to reduce the potential risks associated with indoor contaminates (listed on page 5), flammable vapors and tight housing construction (little or no infiltration air), it is recommended to pipe uncontaminated combustion air directly from the outdoors to the appliance. This practice also promotes higher system efficiency by reducing heated indoor air from being exhausted from the house and replaced by cold infiltration air into the house.

NOTICE

Install combustion air and vent pipe as detailed in the PRESTIGE Solo Vent Supplement included in the boiler installation envelope. Refer to optional vent kit instructions for addition vent installation instructions.

DANGER

Verify installed combustion air and vent piping are sealed gas tight and meet all provided instructions and applicable codes, failure to comply will result in severe personal injury of death.

Removal of an Existing Boiler from a Common Vent System

BEST PRACTICES

When an existing boiler is removed from a common venting system, the common venting system is likely to be too large for proper venting of the remaining appliances. At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation.

1. Seal any unused openings in the common venting system.
2. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
3. Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliance not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
4. Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.
5. Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar or pipe.
6. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers, and any other gas-burning appliance to their previous condition of use.
7. Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and/or CAN/CGA B149, Installation codes. When resizing any portion of the common venting system, the common venting system should be resized to approach the minimum size as determined using the appropriate tables in Part II of the National Fuel Gas Code ANSI Z223.1/NFPA 54 and/or CAN/CGA B149, Installation codes.

DANGER

Do not install the PRESTIGE Solo into a common vent with other gas or oil appliances. This may cause flue gas spillage or appliance malfunction, resulting in possible severe personal injury, death or substantial property damage.

Commonwealth of Massachusetts Installations Only

For direct-vent appliances, mechanical-vent heating appliances or domestic hot water equipment, where the bottom of the vent terminal and the air intake is installed below four feet above grade the following requirements must be satisfied:

1. If there is not one already present, on each floor level where there are bedroom(s), a carbon monoxide detector and alarm shall be placed in the living area outside the bedroom(s). The carbon monoxide detector shall comply with NFPA 720 (2005 Edition).
2. A carbon monoxide detector shall also be located in the room that houses the appliance or equipment and shall:
   a. Be powered by the same electrical circuit as the appliance or equipment such that only one service switch services both the appliance and the carbon monoxide detector;
   b. Have battery back-up power;
   c. Meet ANSI/UL 2034 Standards and comply with NFPA 720 (2005 Edition); and
   d. Have been approved and listed by the Nationally Recognized Testing Laboratory as recognized under 527 CMR.
3. A Product-approved vent terminal must be used, and if applicable, a Product-approved air intake must be used. Installation shall be in strict compliance with the manufacturer's instructions. A copy of the installation instructions shall remain with the appliance or equipment at the completion of the installation.
4. A metal or plastic identification plate shall be mounted at the exterior of the building, four feet directly above the location of vent terminal. The plate shall be of sufficient size to be easily read from a distance of eight feet away, and read "**Gas Vent Directly Below**".

NOTICE

Installer must provide tag identification plate and ensure the lettering meets code requirements.

For direct-vent appliances, mechanical-vent heating appliances or domestic hot water equipment, where the bottom of the vent terminal and the air intake are installed above four feet above grade the following requirements must be satisfied:

1. If there is not one already present, on each floor level where there are bedroom(s), a carbon monoxide detector and alarm shall be placed in the living area outside the bedroom(s). The carbon monoxide detector shall comply with NFPA 720 (2005 Edition).
2. A carbon monoxide detector shall:
   a. Be located in the room that houses the appliances or equipment;
   b. Be either hard wired or battery powered or both; and
   c. Shall comply with NFPA 720 (2005 Edition)
3. A Product-approved vent terminal must be used, and if applicable, a Product-approved air intake must be used. Installation shall be in strict compliance with the manufacturer's instructions. A copy of the installation instructions shall remain with the appliance or equipment at the completion of the installation.

SECTION III - Unit Preparations

Handling Instructions

The PRESTIGE Solo is generally easier to handle and maneuver once removed from the shipping carton.

To remove the shipping carton:

CAUTION

Use care not to lift the unit from, or place the unit on the front plastic control panel, damage can occur. Use care not to drop, bump or rotate the boiler upside down, as damage to the boiler will result.

1. Remove any shipping straps and open the side of the shipping carton.
2. Slide the unit with the foam inserts out of the carton.
3. Discard all packing materials.

Wall Mounting Installation

The PRESTIGE Solo should be wall mounted using the bracket provided with the boiler. The PRESTIGE Solo is not designed for floor installation. If floor installation is required an optional floor stand is available through Triangle Tube.

WARNING

The wall used for mounting the PRESTIGE Solo must be vertically plumbed and capable of supporting a minimum 130 pounds [59 kg] for the PRESTIGE Solo 60, 175 pounds [80 kg] for PRESTIGE Solo 175/250 and 250 pounds [115 Kg] for PRESTIGE Solo 399. Failure to comply with these requirements could result in personal injury, death or substantial property damage.

Wall Mounting Guidelines

1. The wall-mounting bracket is designed for stud spacing of 12 inch or 16 inch on centers. For unconventional stud spacing, a solid / secure mounting surface must be provided for installation of the bracket.
2. For applications using wood studs, install the bracket using the lag screws provided with the boiler. Ensure both lag screws are installed securely in the studs.
3. For applications using metal studs, install the bracket to the studs using 3/16" toggle bolts and washers.
4. DO NOT mount or attempt to mount the wall bracket to hollow sheet rock or lath walls using anchors. Only install boiler to studs or equivalent wood structure.
5. For applications using solid walls (rock, concrete, brick, cinder block, etc.), install the wall bracket using anchors (double expansion shields) and bolts with washers provided with the boiler.
6. The boiler is too heavy and bulky for a single person to lift and attempt to mount; a minimum of 2 people is required for mounting the boiler.

WARNING

Use extreme care not to drop the boiler or cause bodily injury while lifting or mounting the boiler onto the bracket. Once mounted verify that the boiler is securely attached to the bracket and wall. Failure to comply with the above guidelines could result in property damage, personal injury or death.

PRESTIGE Solo 60/175/250 Stud Walls - Installation

1. Locate the studs in the general area of the boiler placement.
2. Place the wall-mounting bracket on the wall centering the mounting slots with the stud centers and ensuring the upper edge of the bracket is away from the wall.
3. Level the bracket, while maintaining it's centering with the studs and use a pencil to mark the location of the mounting slots.
4. Remove the bracket from the wall and drill 1/4" diameter hole by 3" deep positioned in the center of each mark. For applications using metal studs and 3/16" toggle bolts, drill the required clearance hole.
5. Reposition the bracket onto the wall and align mounting slots/holes. Insert the two lag screws provided (or toggle bolts for metal studs) through the mounting slots/holes and loosely tighten.
6. Level bracket and tighten screws (bolts for metal studs) securely making sure not to over-tighten to avoid damaging drywall or plaster.

PRESTIGE Solo 399 Stud Walls - Installation

1. To distribute the weight of the boiler evenly when mounting onto a stud wall it is recommended to use the PRESTIGE Solo Wall Frame kit.
2. When using the wall frame to mount the boiler reference the kit installation instructions and ensure the frame is securely fastened to the wall.
3. If the structure of wall is questionable, in supporting a minimum weight of 250 pounds [115 kg.], it is recommended to use the optional floor stand.

Wall Bracket Installation - Solid Walls

1. Locate the general area of the boiler placement.
2. Place the wall-mounting bracket on the wall ensuring the upper edge of the bracket is away from the wall.
3. Level the bracket and use a pencil to mark the location of the mounting slots on the wall.
4. Remove the bracket from the wall and drill a 5/8" diameter hole by 1-3/8" deep positioned in the center of each mark.
5. Install the anchors (provided) flush or slightly recessed in the drilled holes with threaded side facing down.
6. Reposition the bracket on the wall and align mounting slots/holes. Insert the two bolts (provided) through the mounting slots/holes and loosely tighten.
7. Level bracket and tighten bolts securely.

Boiler Mounting

1. Obtain assistance in lifting the boiler onto the wall bracket.
2. Install the boiler making sure the boiler mounting lip located along the upper edge of the rear jacket panel engages the wall-mounting bracket. Ensure the boiler is seated properly and is secure.

SECTION IV - Boiler Piping

General Piping Requirements

- All plumbing must meet or exceed all local, state and national plumbing codes.
- Support all piping using hangers. DO NOT support piping by the unit or its components.
- Use isolation valves to isolate system components.
- Install unions for easy removal of the PRESTIGE Solo from the system piping.

WARNING

Use a two wrench method when tightening piping onto the boiler connections. Use one wrench to prevent the boiler piping from turning / twisting. Failure to support the boiler piping and connections in this manner could cause damage to the boiler and its components.

Pressure Relief Valve

1. The PRESTIGE Solo is supplied with a 30 psi pressure relief valve and must be piped using the PRV connection as shown in Fig. 5 page 15.

2. To avoid potential water damage to the surrounding area or potential scalding hazard due to the operation of the relief valve, the discharge piping:
   - Must be connected to the discharge outlet of the relief valve and directed to a safe place of disposal.
   - Length should be as short and direct as possible. The size of the discharge line should not be reduced, maintain the same size as the outlet of the relief valve.
   - Should be directed downward towards the floor at all times. The piping should terminate at least 6 inches [153 mm] above any drain connection to allow clear visibility of the discharge.
   - Should terminate with a plain end, not with a threaded end. The material of the piping should have a serviceable temperature rating of 250°F or greater.
   - Should not be subject to conditions where freezing could occur.
   - Should not contain any shut-off valves or obstructions. No shut-off valve should be piped between the boiler and relief valve.

WARNING

Failure to comply with the guidelines on installing the pressure relief valve and discharge piping can result in personal injury, death or substantial property damage.

Low Water Cutoff Device

- The PRESTIGE Solo is equipped with a factory installed pressure switch type Low Water Cut Off device.
- The minimum operating system pressure allowable with this device is 10 psig.
- Check local codes if a Low Water Cutoff Device is required. If so, determine if this device meets the requirements of the local codes.

NOTICE

The PRESTIGE Solo control system also senses the system water temperatures entering and exiting the heat exchanger to provide protection against low water conditions Where local codes and jurisdiction do not accept a pressure device for low water protection, the jurisdictions may accept these PRESTIGE Solo integral control functions as a means of providing low water protection.

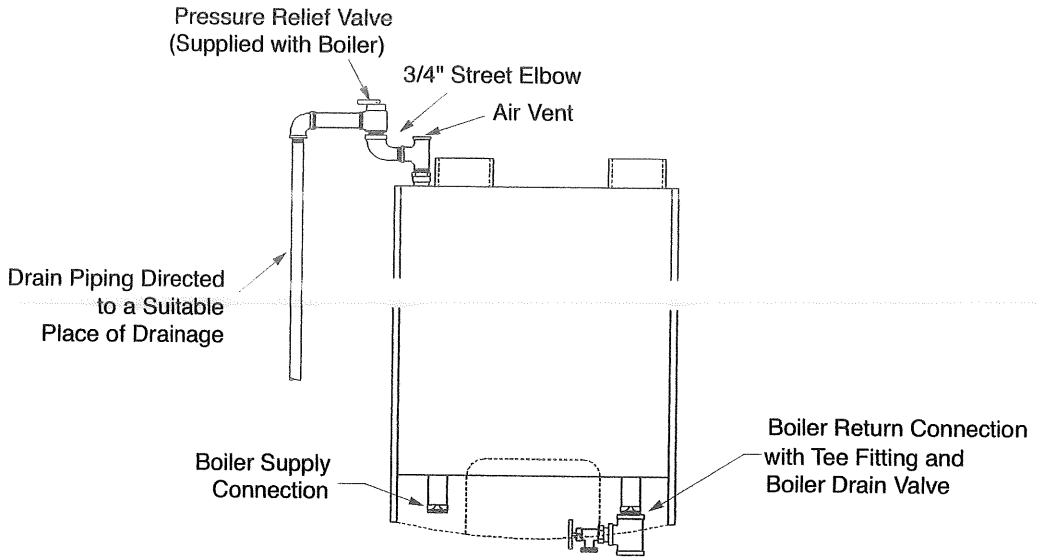


Fig. 5: Pressure Relief Valve and Boiler Drain Valve Installation

Additional Limit Control

If a separate LWCO device is required by certain local jurisdictions or when the boiler is installed above the system piping, the following guidelines must be followed:

- The LWCO device must be designed for water installations, electrode probe-type is recommended.
- The LWCO device must be installed in a tee connection on the boiler supply piping above the boiler.
- Wiring of the LWCO device to the PRESTIGE Solo is done directly onto the 24V terminal strip, reference Fig. 20 page 32 for available terminals for an external limit (manual or auto reset).

If the installation is to comply with ASME or Canadian requirements, an additional high temperature limit may be needed. Consult local code requirements to determine compliance. The limit should be installed as follows:

- Install the limit in the boiler supply piping between the boiler and any isolation valve.
- Maximum set point for the limit is 194°F.
- For wiring of the limit reference Fig. 20, page 32, using the external limit/manual reset terminals on the 24V terminal strip. This will provide a "hard" lockout requiring a manual reset of the control.

Backflow Preventer

- Use a backflow preventer valve in the make-up water supply to the unit as required by local codes.

Boiler System Piping Applications

BEST PRACTICE

It is recommended on all piping applications to utilize a primary/secondary piping arrangement as a means to provide freeze protection of the boiler, which is an integral function of the boiler control. Maintain the minimum boiler flow rate, see Graphs 2 through 5 on pages 72 & 73. For other piping arrangements, consult the Engineering Department at Triangle Tube or consult other approved/recognized design arrangements.

BEST PRACTICE

On piping applications utilizing a single zone or other recognized piping design arrangements, it is recommended that the installer uses flow/check valves with weighted seats at or near the appliance to prevent gravity circulation.

Expansion Tank and Makeup Water

Ensure the expansion tank is properly sized for the boiler volume (3 gallons [12 L] for the PRESTIGE Solo 60, 5 gallons [19 L] for the PRESTIGE Solo 175/250, 7 gallons [26 L] for PRESTIGE Solo 399) and the system volume and temperature.

CAUTION

Undersized expansion tanks will cause system water to be lost through the pressure relief valve and cause additional makeup water to be added to the system. Eventual boiler heat exchanger failure can result due to this excessive makeup water addition.

The expansion tank must be located as shown in Fig. 6 and Fig. 7 on page 18 when using a primary/secondary piping arrangement or as per recognized design methods. Refer to the expansion tank manufacturer instructions for additional installation details.

Connect the expansion tank to an air separator only if the air separator is located on the suction side (inlet) of the system circulator. Always locate and install the system fill connection at the same location as the expansion tank connection to the system.

Diaphragm Expansion Tank

Always install an automatic air vent on the top of the air separator to remove residual air from the system.

Closed-Type Expansion Tank

It is recommended to pitch any horizontal piping upwards toward the expansion tank 1 inch per 5 feet of piping. Use 3/4" piping for the expansion tank to allow air within the system to rise.

CAUTION

DO NOT install automatic air vents on a closed-type expansion tank system. Air must remain in the system and be returned to the expansion tank to provide an air cushion. An automatic air vent would cause air to be vented from the system resulting in a water-logged expansion tank.

Circulator

The PRESTIGE Solo must be supplied with a Central Heating (CH) circulator. The circulator when wired directly to the PRESTIGE Solo will allow for domestic hot water priority and to provide circulation for the freeze protection feature of the boiler control. See Graphs 2 through 5 on pages 72 & 73 for pressure drop and minimum flow rate through the boiler.

Sizing Primary Piping

See Fig. 8 through 14, pages 20 - 24, for recommended piping arrangements based on various applications. Size the piping and system components required in the space heating system, using recognized design methods.

Domestic Hot Water System Piping

See Fig. 8 , page 20 for recommended piping to a DHW system. This recommended piping configuration ensures priority is given to the production and recovery of the DHW.

The piping for the DHW is separate from the boiler system piping and does not require a primary / secondary piping configuration.

To wire the DHW circulator to the boiler control module, reference Section VIII - External Wiring.

System Piping - Zone Circulators

Connect the PRESTIGE Solo to the system piping as shown in Fig. 9 page 21 when zoning with zone circulators.

The installer must provide a separate circulator for each zone of space heating as well as the boiler circulator.

NOTICE

To ensure an adequate flow rate through the PRESTIGE Solo, the boiler supply and return piping size must be a minimum of 1 inch for the PRESTIGE Solo 60, 1-1/4 inch for the PRESTIGE Solo 175/250 and 1-1/2 inch for the PRESTIGE Solo 399.

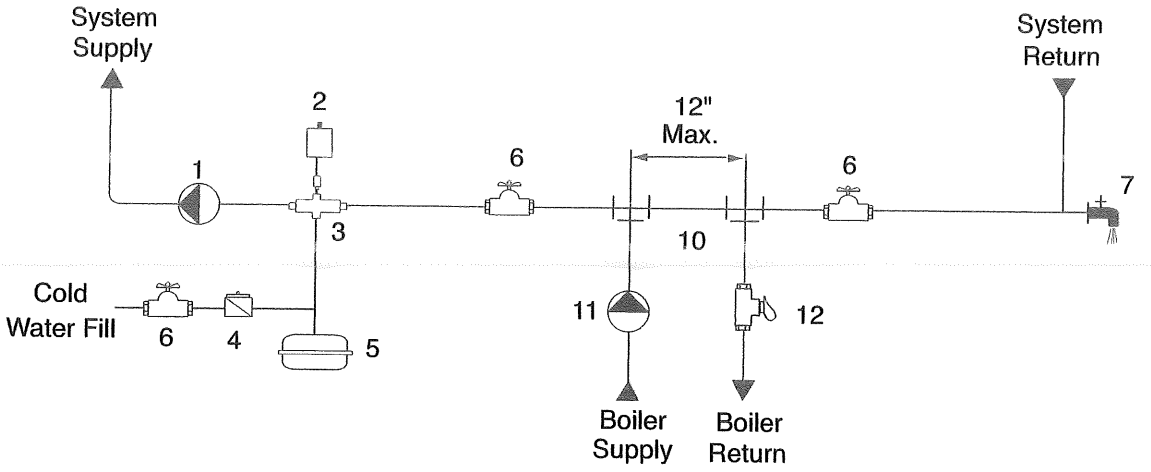
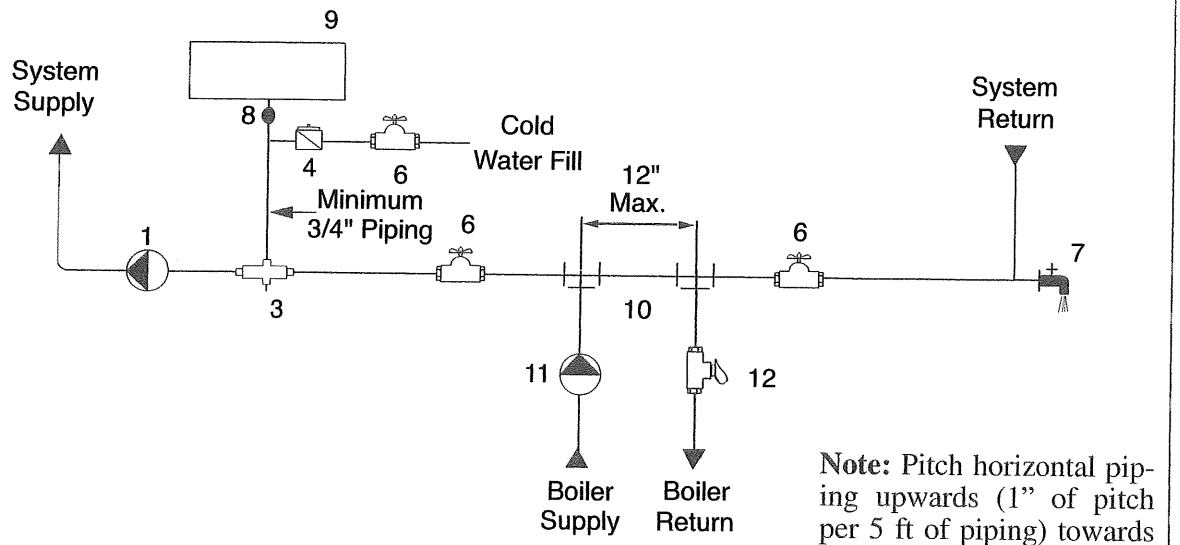


Fig. 6: Near Boiler Piping - Diaphragm Expansion Tank



Note: Pitch horizontal piping upwards (1" of pitch per 5 ft of piping) towards expansion tank.

Fig. 7 : Near Boiler Piping - Closed Type Expansion Tank

1. System circulator
2. Automatic air vent
3. Air separator
4. Automatic fill valve
5. Diaphragm expansion tank
6. Isolation valve
7. Drain/purge valve
8. Tank fitting
9. Closed type expansion tank
10. Primary/secondary connection
11. Boiler circulator
12. Flow/check valve

System Piping - Zone Valves

Connect the PRESTIGE Solo to the system piping as shown in Fig. 10 page 21 when zoning with zone valves. The primary / secondary piping ensures that the boiler loop has sufficient flow.

NOTICE

To ensure an adequate flow rate through the PRESTIGE Solo, the boiler supply and return piping size must be a minimum of 1 inch for the PRESTIGE Solo 60, 1-1/4 inch for the PRESTIGE Solo 175/250 and 1-1/2 inch for the PRESTIGE Solo 399.

System Piping - Through Boiler

In new or retrofit applications in which primary/secondary arrangement is not utilized, the PRESTIGE Solo allows this flexibility due to a lower boiler pressure drop, see Graphs 2 through 7 on pages 75 through 77.

Figure 11, page 22 illustrates a multiple zone valve system with a single system/boiler circulator. A by-pass loop with a pressure differential valve must be installed on the system piping.

Figure 12, page 22 illustrates a single zone utilizing the boiler circulator as the system circulator.

System Piping - Radiant Heating

The heat exchanger design of the PRESTIGE Solo allows operation in a condensing mode. This feature requires no regulation of the return water temperature back to the boiler in radiant heating applications.

The boiler water supply temperature can be maintained by the PRESTIGE Solo, eliminating the need for a mix system to achieve the desired temperature.

It is recommended for the installer to add a high temperature limit as shown in Fig.13 page 23. This will ensure that the primary supply temperature does not exceed the maximum allowable temperature for the radiant tubing.

BEST PRACTICE

The addition of the high temperature limit is important if the PRESTIGE Solo is connected to a domestic hot water system, which requires a high primary supply water temperature.

Size the system piping and circulator to provide the flow needed for the radiant system.

NOTICE

To ensure an adequate flow rate through the PRESTIGE Solo, the boiler supply and return piping size must be a minimum of 1 inch for the PRESTIGE Solo 60, 1-1/4 inch for the PRESTIGE Solo 175/250 and 1-1/2 inch for the PRESTIGE Solo 399.

System Piping - Special Application

If the boiler is used in conjunction with a chilled water/medium system, the boiler and chiller must be piped in parallel. Install flow/check valves to prevent the chilled medium from entering into the boiler.

If the boiler is used to supply hot water to the heating coils of an air handler where they may be exposed to chilled air circulation, install flow/check valves or other automatic means to prevent gravity circulation of the boiler water during cooling cycles.

System Piping - Multiple Units Installation

Use a balanced manifold system as the primary / secondary connection to the space heating piping as shown in Fig. 14 page 24.

Maintain a minimum of 6 inches [153 mm] of clearance between units to allow for servicing.

Refer to Figs. 6 and 7 page 18 to install air separator and expansion tank.

For the space heating piping refer to the applications mentioned in this manual or use recognized design methods.

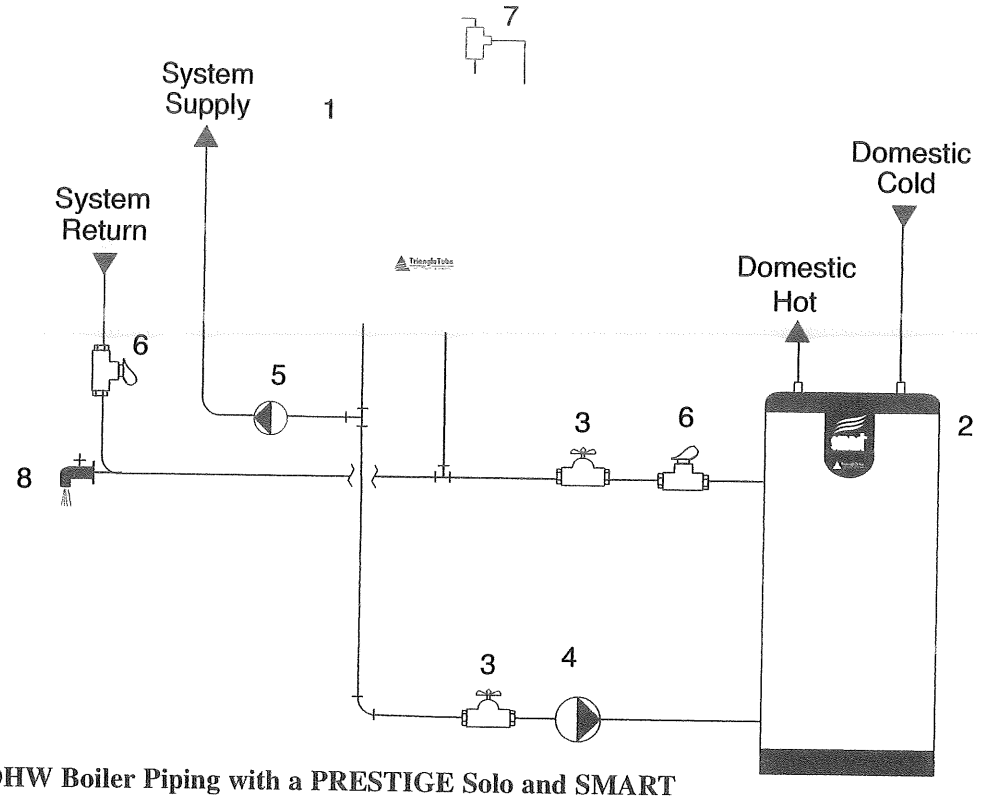


Fig. 8: DHW Boiler Piping with a PRESTIGE Solo and SMART

1. PRESTIGE Solo boiler
2. SMART water heater
3. Isolation valve
4. DHW circulator
5. CH circulator
6. Flow/check valve
7. Pressure relief valve
8. Drain/purge valve

NOTICE

The boiler system piping shown in Fig. 8 must be a "closed" system to avoid any oxygen contamination and potential failure of the outer tank of the Smart.

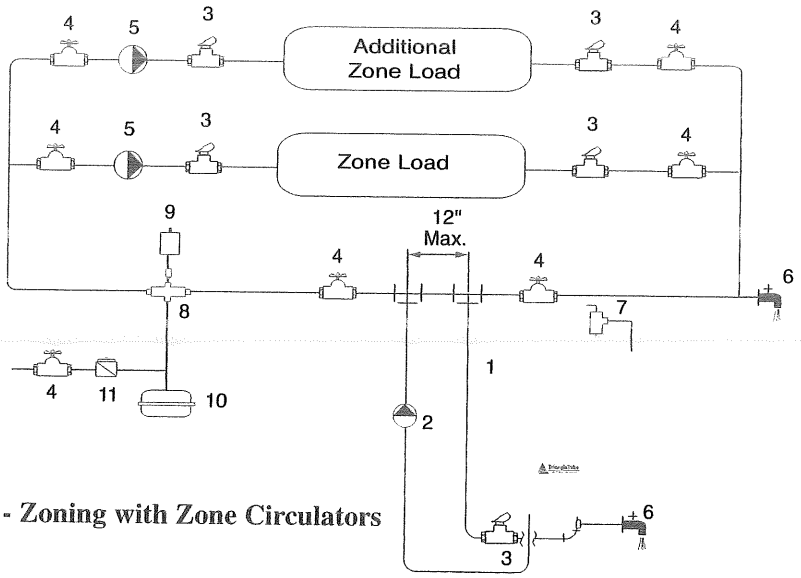


Fig. 9: CH System Piping - Zoning with Zone Circulators

1. PRESTIGE Solo boiler
2. CH circulator
3. Flow/check valve
4 Isolation valve
5. Zone circulator
6. Drain/purge valve
7. Pressure relief valve
8. Air separator
9. Automatic air vent
10. Diaphragm expansion tank
11. Automatic fill valve

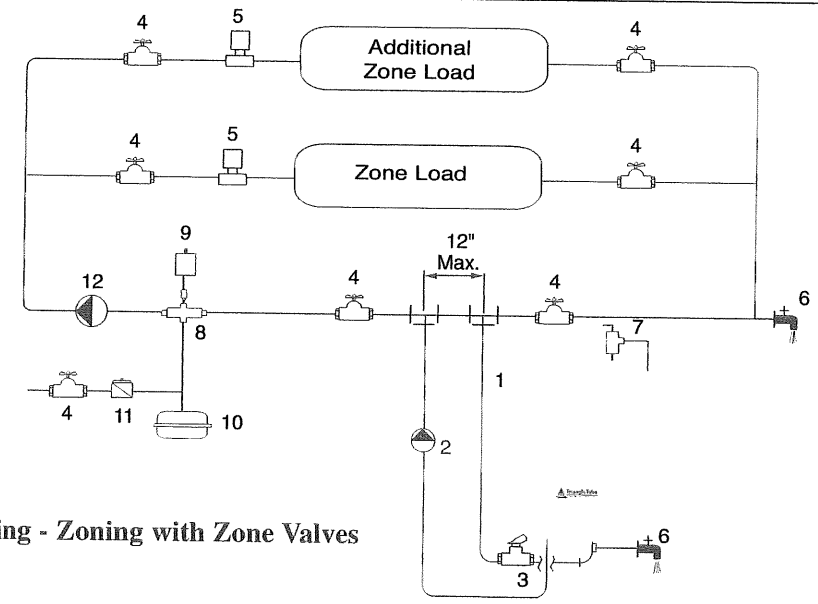
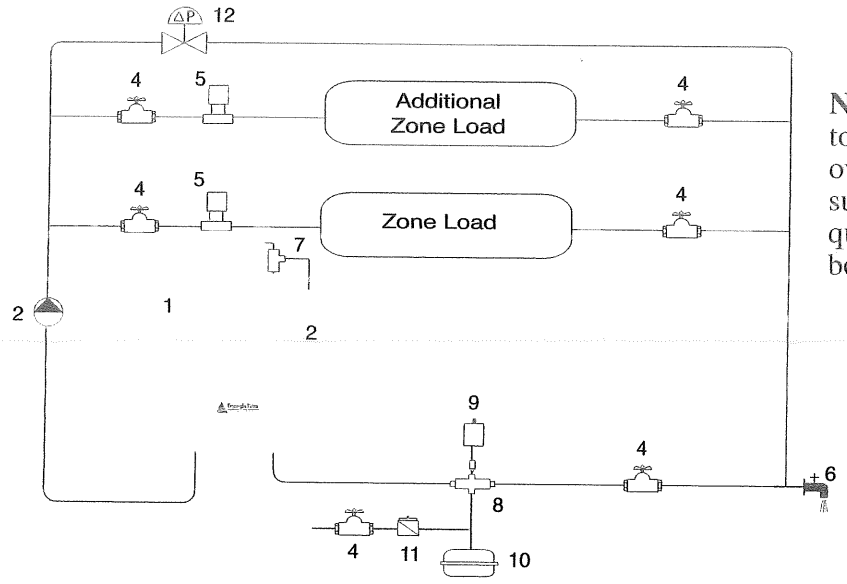


Fig. 10: CH System Piping - Zoning with Zone Valves

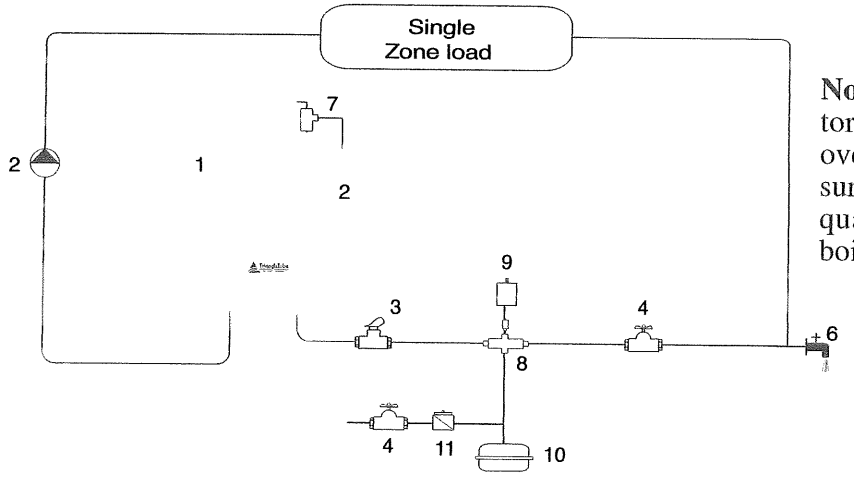
1. PRESTIGE Solo boiler
2. CH circulator
3. Flow/check valve
4 Isolation valve
5. Zone valve
6. Drain/purge valve
7. Pressure relief valve
8. Air separator
9. Automatic air vent
10. Diaphragm expansion tank
11. Automatic fill valve
12. System circulator



Note: Verify CH circulator is properly sized to overcome the system pressure drop and provide adequate flow through the boiler system.

Fig. 11: CH System Piping - Multiple Zone Valve with Single System/Boiler Circulator

1. PRESTIGE Solo boiler
2. CH circulator
4 Isolation valve
5. Zone circulator
6. Drain/purge valve
7. Pressure relief valve
8. Air separator
9. Automatic air vent
10. Diaphragm expansion tank
11. Automatic fill valve
12. Pressure Differential Valve



Note: Verify CH circulator is properly sized to overcome the system pressure drop and provide adequate flow through the boiler system.

Fig. 12: CH System Piping - Single Zone System with Single System/Boiler Circulator

1. PRESTIGE Solo boiler
2. CH circulator
3. Flow/check valve
4 Isolation valve
5. Zone valve
6. Drain/purge valve
7. Pressure relief valve
8. Air separator
9. Automatic air vent
10. Diaphragm expansion tank
11. Automatic fill valve

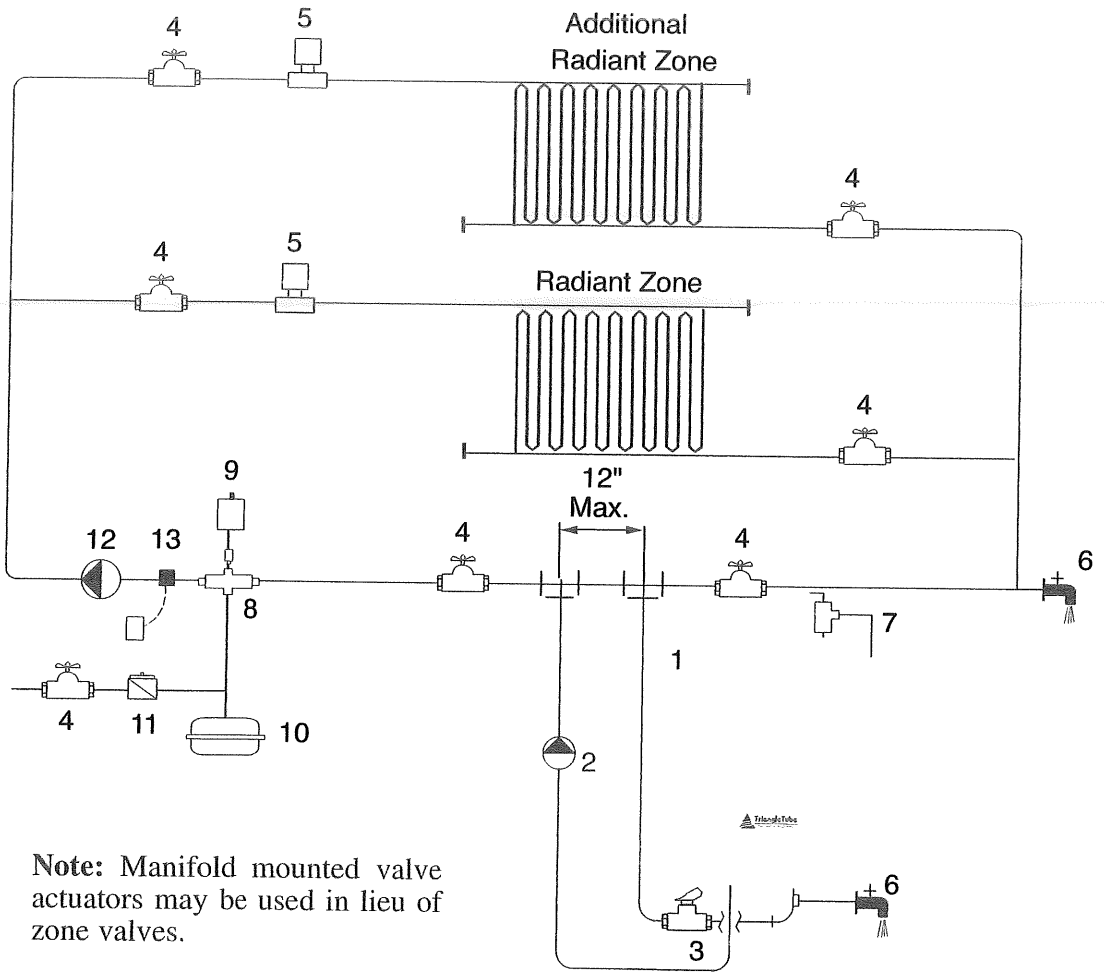
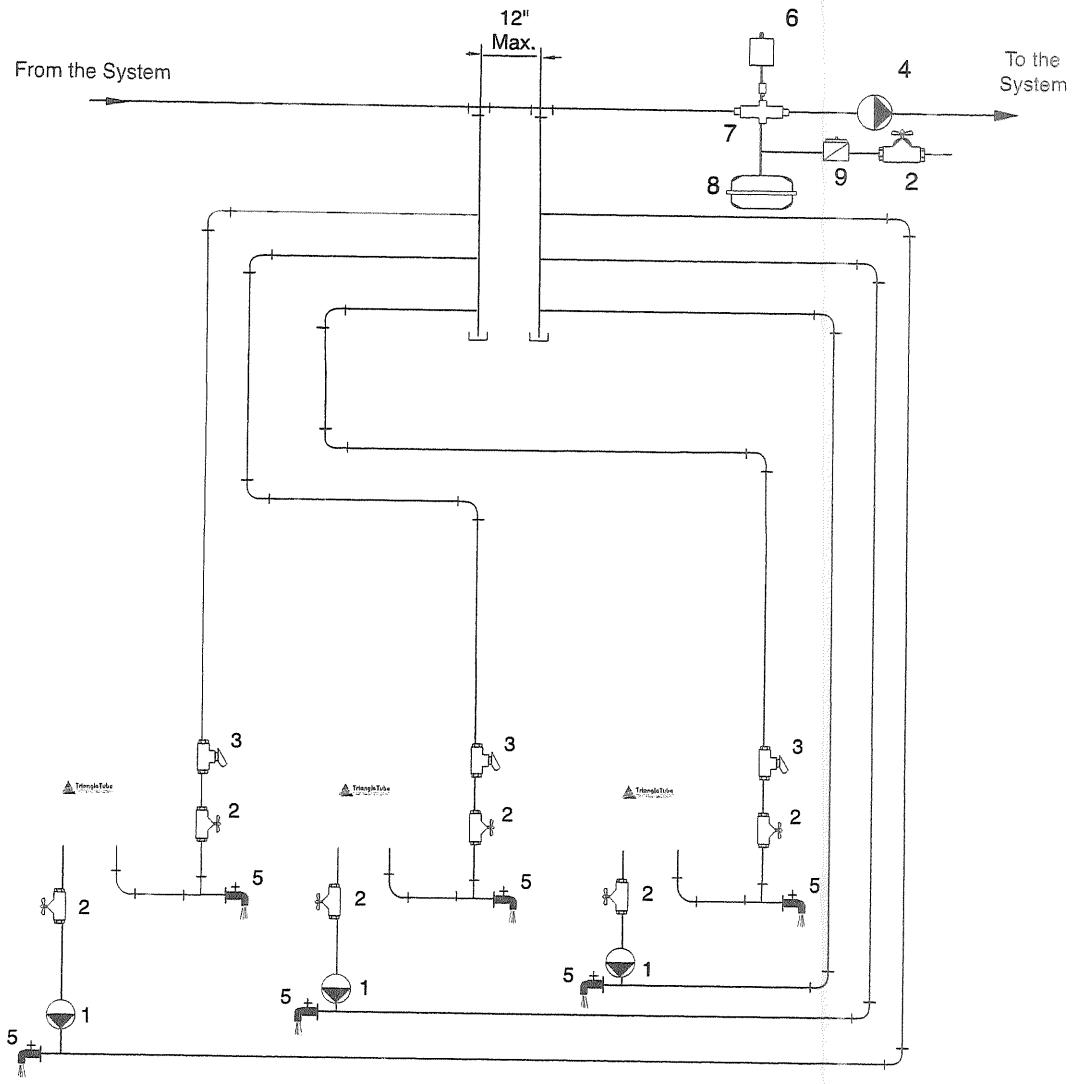


Fig. 13: CH System Piping - Radiant/Low Temp. Heating

1. PRESTIGE Solo boiler
2. CH circulator
3. Flow check valve
4. Isolation valve
5. Zone valve
6. Drain/purge valve
7. Pressure relief valve
8. Air separator
9. Automatic air vent
10. Diaphragm expansion tank
11. Automatic fill valve
12. System circulator
13. High temperature limit control



1. Boiler circulator
2. Isolation valve
3. Flow/check valve
4. System circulator
5. Drain/purge valve
6. Automatic air vent
7. Air separator
8. Diaphragm expansion tank
9. Automatic fill valve

Fig. 14: Multiple PRESTIGE Solo Boiler Piping - Primary / Secondary / Piping using Balanced Manifold System

SECTION V - Installing Vent / Combustion Air & Condensate Drain

Installing Vent and Combustion Air

DANGER

The PRESTIGE Solo must be vented and supplied with combustion air as shown in the PRESTIGE Solo Vent Supplement, included in the boiler installation envelope. Refer to optional vent kit instructions for additional vent installation instructions. Once installation is completed, inspect the vent and combustion air system thoroughly to ensure systems are airtight and comply with the instructions given in the venting supplement and are within all requirements of applicable codes. Failure to comply with the installation requirements on the venting and combustion air piping will cause severe personal injury or death.

Installing Condensate Drain Assembly

1. Locate the condensate drain assembly and install as shown in Fig. 15 page 26.

NOTICE

The installer may want to fill the condensate trap with water prior to assembling on the unit.

2. Remove the retaining nut and rubber seal from the condensate drain assembly and slide over the heat exchanger condensate drain nipple. Connect the condensate drain assembly to the retaining nut and tighten. **Hand tight only!**

WARNING

Ensure the condensate drain assembly contains the plastic seated ball. Do not install the condensate drain assembly if the ball is lost or missing, replace the entire assembly.

3. Remove the compression nut and rubber seal from the drain outlet.
4. Using 3/4" x 2' flexible PVC tube provided, slide the compression nut and rubber seal over the pipe

NOTICE

The use of 3/4" PVC or CPVC pipe is also acceptable. If 3/4" pipe is used deburr and chamfer pipe to allow mating onto the drain assembly.

5. Thread the rubber seal into the compression nut to ease installation of the pipe to the drain assembly.
6. Seat the pipe onto the drain assembly and tighten the compression nut. **Hand tight only!**

NOTICE

The installer may opt to using 13/16" ID tubing in lieu of rigid piping.

NOTICE

The drain line materials must be an approved material by the authority having jurisdiction. In absence of such authority, PVC and CPVC piping must comply with ASTM D1785 or D2845. The cement and primer used on the piping must comply with ASME D2564 or F493. For installations in Canada, use CSA or ULC certified PVC or CPVC pipe, fittings and cement/primer.

7. Continue the pipe from the drain assembly to a floor drain or condensate pump.

NOTICE

When selecting and installing a condensate pump, ensure the pump is approved for use with condensing boilers and furnaces. The pump should be equipped with an overflow switch to prevent property damage from potential condensate spillage.

8. The PRESTIGE Solo will typically produce a condensate that is considered slightly acidic with a pH content below 3.0. Install a neutralizing filter if required by authority having jurisdiction.

CAUTION

The condensate drain must remain filled and unobstructed and allow unrestricted flow of condensate. The condensate should not be subject to conditions where freezing could occur. If the condensate is subjected to freezing or becomes obstructed , it can leak, resulting in potential water damage to the boiler and surrounding area.

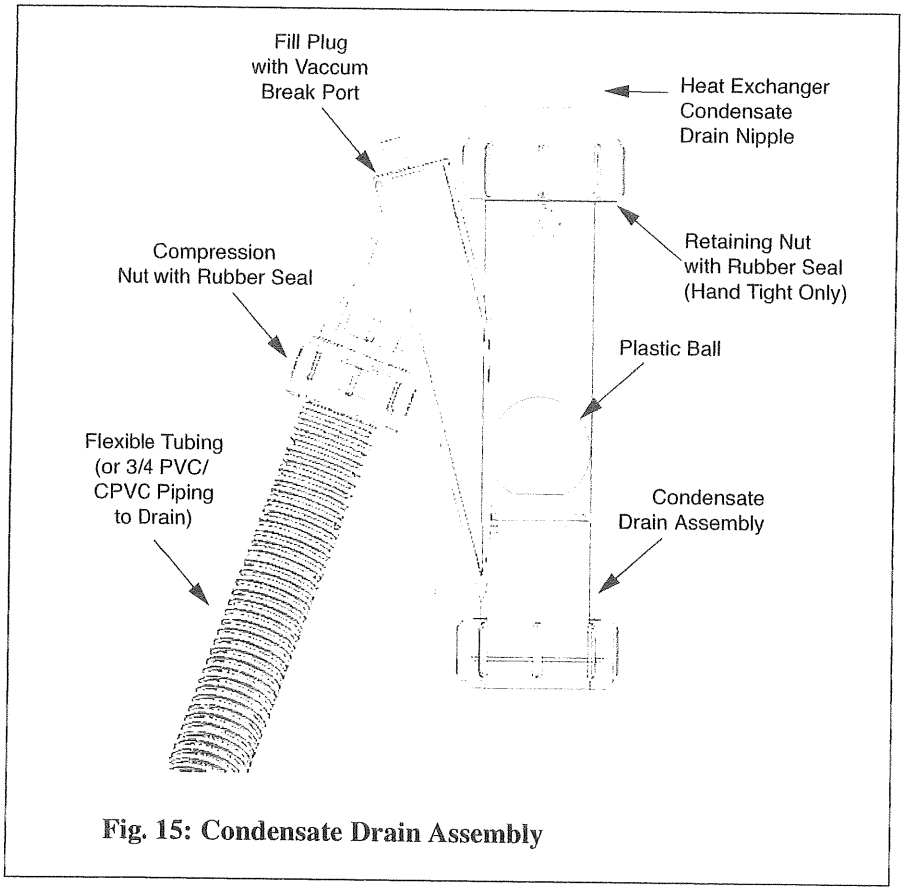


Fig. 15: Condensate Drain Assembly

SECTION VI - Gas Piping

Gas Supply Piping Connection

NOTICE

The gas supply piping must be installed in accordance to all applicable local, state and national codes and utility requirements.

1. Install a 1/2" NPT for PRESTIGE Solo 60, 3/4" NPT for PRESTIGE Solo 175/250 or 1" NPT for PRESTIGE Solo 399 pipe union at the factory supplied gas nipple, for ease of service.
2. Install a manual shutoff valve in the gas supply piping as shown in Fig. 16. For installations in Canada the installer must tag and identify the main shutoff valve.
3. Install a sediment trap (drip leg) on the gas supply line prior to connecting to the PRESTIGE Solo gas train as shown in Fig. 16.
4. Support the gas piping using hangers. Do not support the piping by the unit or its components.
5. Purge all air from the gas supply piping.
6. Before placing the PRESTIGE Solo into operation, check and test all connections for leaks.
   - Close the manual shutoff valve during any pressure test with less than 13"w.c..
   - Disconnect the PRESTIGE Solo and its gas valve from the gas supply piping during any pressure test greater than 13"w.c..

WARNING

Do not check for gas leaks with an open flame. Use a gas detection device or bubble test. Failure to check for gas leaks can cause severe personal injury, death or substantial property damage.

7. Use pipe dope compatible with natural and propane gases. Apply sparingly only to the male threads of pipe joints so that pipe dope does not block gas flow.

WARNING

Failure to apply pipe dope as detailed above can result in severe personal injury, death or substantial property damage.

WARNING

Use a two-wrench method of tightening gas piping near the unit and its gas piping connection. Use one wrench to prevent the boiler gas line connection from turning and the second to tighten adjacent piping. Failure to support the boiler gas piping connection could damage the gas line components.

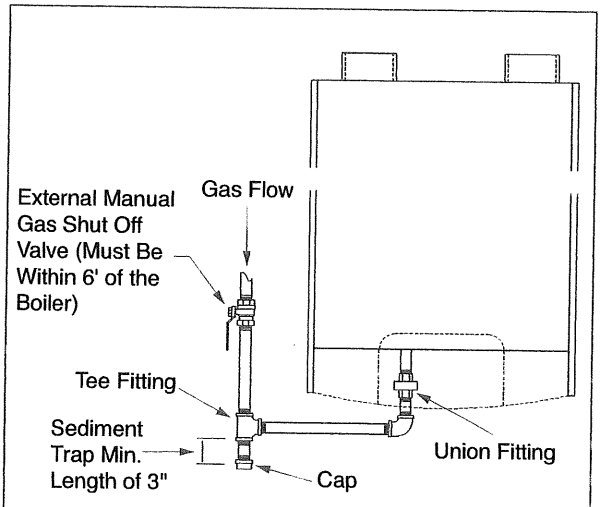


Fig. 16: Recommended Gas Supply Piping

NATURAL GAS

Pipe Sizing - Natural Gas

Refer to Table 1 for schedule 40 metallic pipe length and diameter requirements for natural gas, based on rated PRESTIGE Solo input (divide by 1,000 to obtain cubic feet per hour).

- Table 1 is based on Natural Gas with a specific gravity of 0.60 and a pressure drop through the gas piping of 0.30"w.c..
- For additional gas piping sizing information, refer to ANSI Z223.1. For Canadian installations refer to B149.1 or B149.2.

Natural Gas Supply Pressure Requirements

1. Pressure required at the gas valve inlet supply pressure port:
   - Maximum 13"w.c. at flow or no flow conditions to the burner.
   - Minimum 5"w.c. during flow conditions to the burner. Must be verified during start up and with all other gas appliances operating within the building.
2. Install 100% lockup gas pressure regulator in the gas supply line if inlet pressure can exceed 13"w.c at any time. Adjust the lock-up pressure regulator for 13"w.c maximum.

WARNING

DO NOT adjust or attempt to measure gas valve outlet pressure. The gas valve is factory-set for the correct outlet pressure. This setting is suitable for natural gas and propane and requires no field adjustment. Attempts by the installer to adjust or measure the gas valve outlet pressure could result in damage to the valve, causing potential severe personal injury, death or substantial property damage.

NOTICE

The natural gas orifice requirements are:

PRESTIGE Solo 60: 0.204" (5.2 mm)

PRESTIGE Solo 175: None Required

PRESTIGE Solo 250: None Required

PRESTIGE Solo 399: 0.339" (8.6 mm)

Table 1: Gas Piping Sizing - Natural Gas

Length of Pipe in Feet	Capacity of Schedule 40 Metallic Pipe in Cubic Feet of Natural Gas Per Hour (based on 0.60 specific gravity, 0.30" w.c. pressure drop)				
SCH 40	1/2"	3/4"	1"	1 1/4"	1 1/2"
10	132	278	520	1050	1600
20	92	190	350	730	1100
30	73	152	285	590	890
40	63	130	245	500	760
50	56	115	215	440	670
75	45	93	175	360	545
100	38	79	150	305	460
150	31	64	120	250	380

PROPANE GAS

Pipe Sizing - Propane Gas

Contact the local propane gas supplier for recommended sizing of piping, tanks and 100% lockup gas regulator.

Propane Gas Supply Pressure Requirements

1. Adjust the propane supply regulator provided by the gas supplier for 13"w.c. maximum pressure
2. Pressure required at the gas valve inlet supply pressure port:
   - Maximum 13"w.c. at flow or no flow conditions to the burner
   - Minimum 5"w.c. during flow conditions to the burner. Must be verified during start up and with all other gas appliances operating within the building.

WARNING

DO NOT adjust or attempt to measure gas valve outlet pressure. The gas valve is factory-set for the correct outlet pressure. This setting is suitable for natural gas and propane and requires no field adjustment. Attempts by the installer to adjust or measure the gas valve outlet pressure could result in damage to the valve, causing potential severe personal injury, death or substantial property damage.

WARNING

Prior to start up, ensure the unit is set to fire propane. Check the rating label for the type of fuel. Check the gas valve for propane conversion label. If there is a conflict or doubt on the burner set up, remove the gas valve and check for the propane orifice, see Fig. 17 or 18, page 30. Failure to ensure proper burner setup could result in severe personal injury, death or substantial property damage.

NOTICE

The propane orifice requirements are:

PRESTIGE Solo 60: 0.120" (3.1 mm)

PRESTIGE Solo 175: 0.221" (5.6 mm)

PRESTIGE Solo 250: 0.250" (6.3 mm)

PRESTIGE Solo 399: 0.264" (6.7 mm)

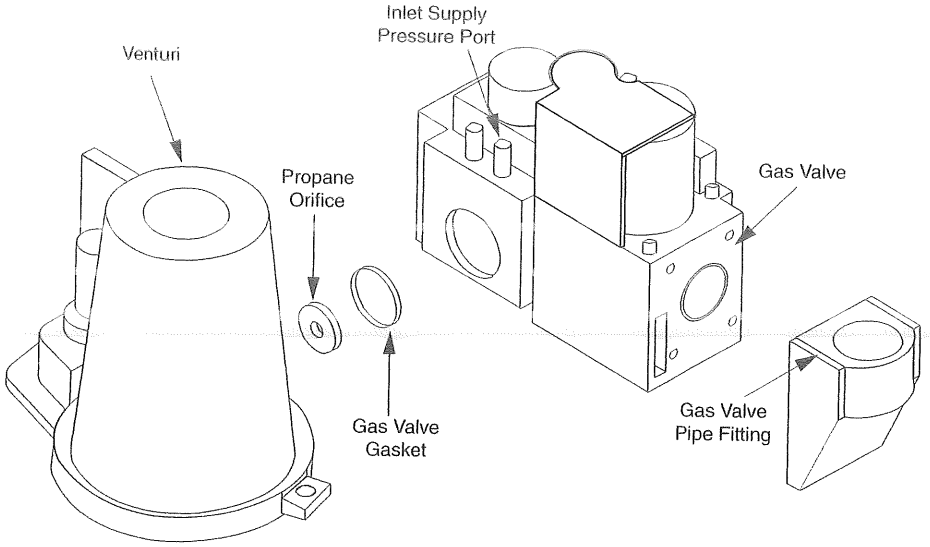


Fig. 17: Gas Valve / Venturi Assembly - PRESTIGE Solo 60/175/250

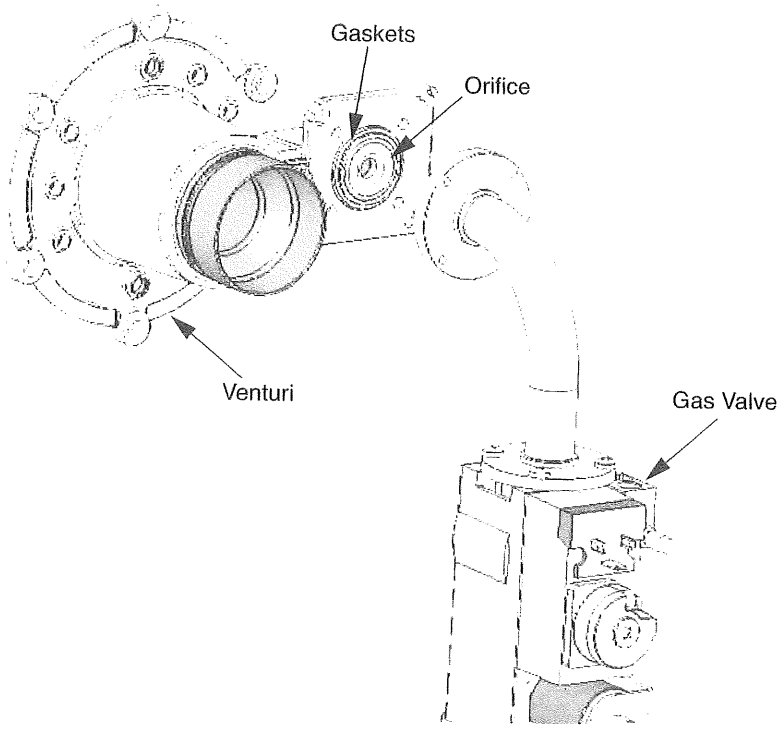


Fig. 18: Gas Valve / Venturi Assembly - PRESTIGE Solo 399

SECTION VII - Internal Wiring

WARNING

ELECTRICAL SHOCK HAZARD. For your safety, disconnect electrical power supply to the unit before servicing or making any electrical connections to avoid possible electric shock hazard. Failure to do so can cause severe personal injury or death.

CAUTION

Prior to servicing, label all wires before disconnecting. Wiring errors can cause improper and dangerous operation. Verify proper wiring and operation after servicing.

General Requirements

- Wiring must be N.E.C Class 1.
- If original wiring as supplied with the unit must be replaced, use only Type T 90°C wire or equivalent as a minimum.
- The PRESTIGE Solo must be electrically grounded as required by National Electrical Code ANSI/NFPA 70 - latest edition and / or the Canadian Electrical Code Part 1, CSA C22.1, Electrical Code.

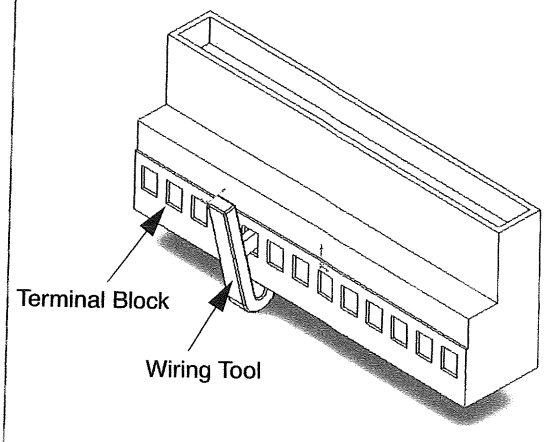


Fig. 19: Using the Wiring Tool on the Terminal Blocks

Control Module Circulator AMP Ratings

- AMP draw of the CH circulator not to exceed 2 amps.
- AMP draw of the DHW circulator not to exceed 2 amps.

Wiring Tool Instructions

1. Locate the wiring tools on the PRESTIGE Solo just below the MCBA control in a plastic bag and below the extra fuses.
2. Locate the terminal blocks on the PRESTIGE Solo below the MCBA control.

NOTICE

The 120V Terminals are located on the left set of Terminal Blocks. The 24V Terminals are located on the right set of terminal blocks.

3. Carefully pull down on the lower half of the terminal block to remove.
4. Hook the wiring tool into the desired slot of the terminal block as shown in Fig.19.
5. Push wiring tool in towards the terminal block and insert wire in slot at bottom of terminal block.
6. Repeat steps 4 & 5 until all wiring is complete.
7. Re-connect the lower half of the terminal block to the upper half.
8. Place the wiring tool back into the plastic bag or leave tool hooked to a slot on the 24V terminal block.

BEST PRACTICE

When wiring the PRESTIGE Solo allow additional length of wire for the access panel to swing open during servicing.

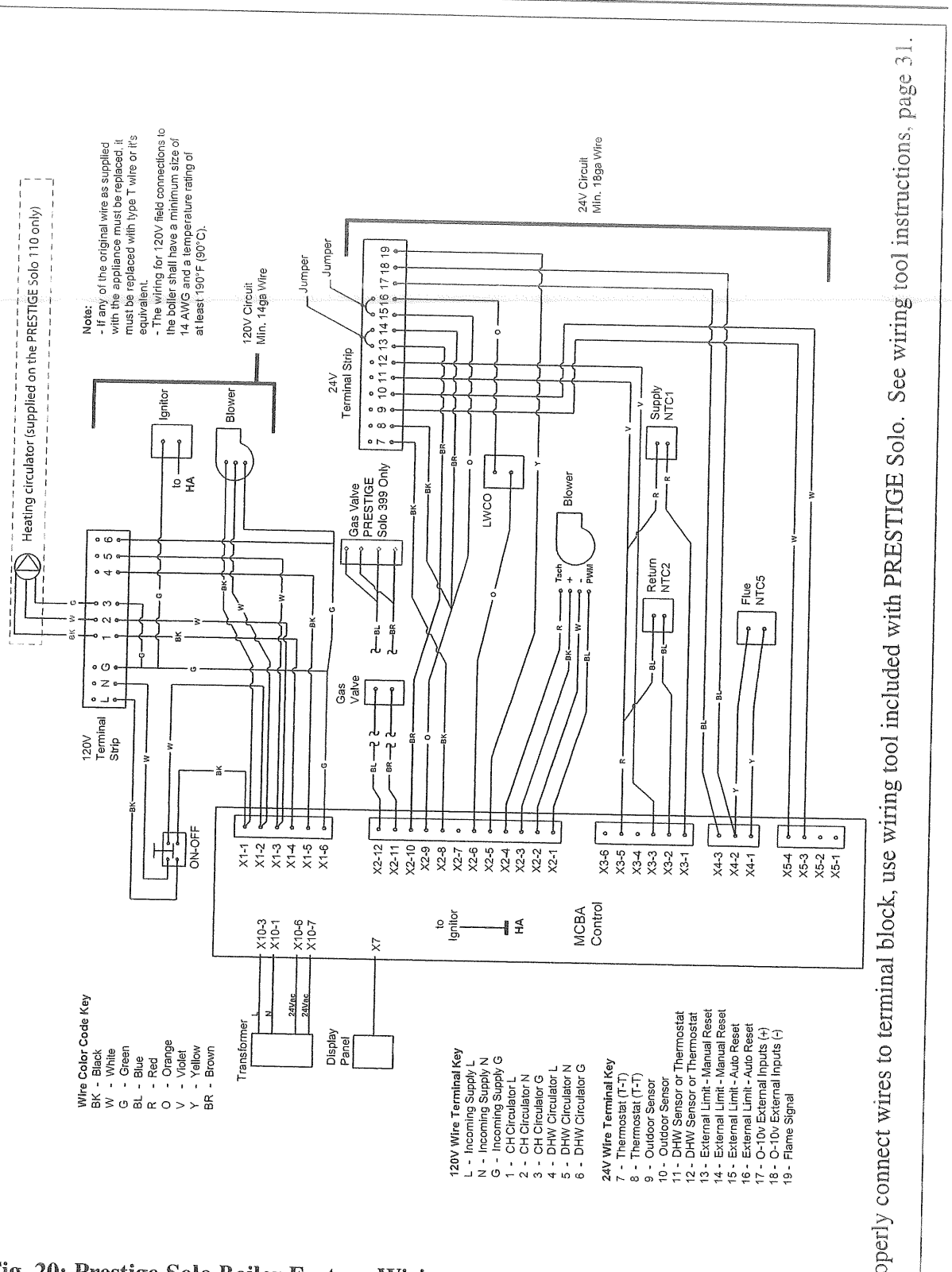


Fig. 20: Prestige Solo Boiler Factory Wiring

To properly connect wires to terminal block, use wiring tool included with PRESTIGE Solo. See wiring tool instructions, page 31.

SECTION VIII- External Wiring

Installation Compliance

All field wiring made during installation must comply with:

- National Electrical Code NFPA 70 and any other national, state, provincial or local codes or requirements.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1, and any other local codes.

WARNING

ELECTRICAL SHOCK HAZARD. Before making any electrical connections to the PRESTIGE Solo, disconnect electrical power supply at the service panel. Failure to comply can cause severe personal injury or death.

Line Voltage Connections

1. Connect a 120 VAC/15A service to the 120V terminal strip on the wiring panel below the PRESTIGE Solo control module, as shown in Fig. 20, page 32.
2. Route the incoming 120 VAC power wire through the provided openings in the bottom jacket panel.
3. The unit is provided with a service switch located on the front panel, check local code requirements for compliance.

NOTICE

If local electrical codes or conditions require an additional service switch, the installer must provide and install a fused disconnect or 15 amp (minimum) service switch.

Domestic Hot Water Aquastat Wiring

1. Connect the DHW thermostat (aquastat) to the 24V terminal strip on the wiring panel located below the PRESTIGE Solo control module as shown in Fig. 20, page 32.
2. Route all wiring through the provided openings, in the bottom jacket panel. Allow enough wire for access panel to swing open during servicing.

Thermostat Wiring

NOTICE

Isolate 120V wiring from 24V wiring to prevent any potential electrical "noise".

1. Connect room thermostat or the end switch (isolated contact only) of a relay control panel to the 24V terminal strip on the wiring panel below the PRESTIGE Solo control module, as shown in Fig. 20, page 32.
2. For proper operation install the room thermostat on an inside wall away from influences of heat and cold, i.e. water pipes, areas of draft, lighting fixtures and fireplaces.
3. Set the thermostat anticipator (if applicable) as follows:
   - Set for 0.2 amps when wired directly to the PRESTIGE Solo.
   - Set to match the total electrical power requirements of the connected devices when wired to zone relays or other devices. Refer to the relay manufacturers' specifications and the thermostat instructions for additional information on the anticipator setting.

NOTICE

When making low voltage connections to the Prestige, ensure no external voltage is present in the thermostat circuits. If external voltage is present, provide an isolated contact to prevent damage to the boiler control.

CH and DHW Circulator

1. Connect the CH primary circulator to the PRESTIGE Solo 120 V terminals 1,2 and 3 as shown in Fig. 20, page 32.
2. Connect the DHW circulator to the PRESTIGE Solo 120 V terminals 4, 5 and 6 as shown in Fig. 20, page 32.
3. Maximum circulator continuous current draw is 2A for each circulator.

System Circulator - Zone Valve Application

To energize the system circulator shown as item 12 in Fig. 10 page 21 reference Fig. 21. Installer to provide a Transformer / Relay such as Honeywell R8285 or equivalent and Zone Valves with isolated end switch such as Honeywell V8043 or equivalent.

External Modulating Control

The PRESTIGE Solo firing rate can be controlled by an external modulating boiler controller. See page 32 for wiring and Page 54 for control module setup.

Outdoor Reset Control

The PRESTIGE Solo may operate with a variable boiler operating temperature using the Triangle Tube outdoor sensor, see pages 50 through 53 for installation and set-up.

NOTICE

If the installer opts for a fixed operating temperature for the boiler system, the outdoor sensor is not required and should not be installed.

Additional 24V Limit Wiring

The PRESTIGE Solo provides 24V terminal connections for additional limit controls as shown in Fig. 20 page 32. These limit terminal connections will provide a "hard" lockout requiring a manual reset of the PRESTIGE Solo control, or a "soft" lockout in which the PRESTIGE Solo will automatically reset.

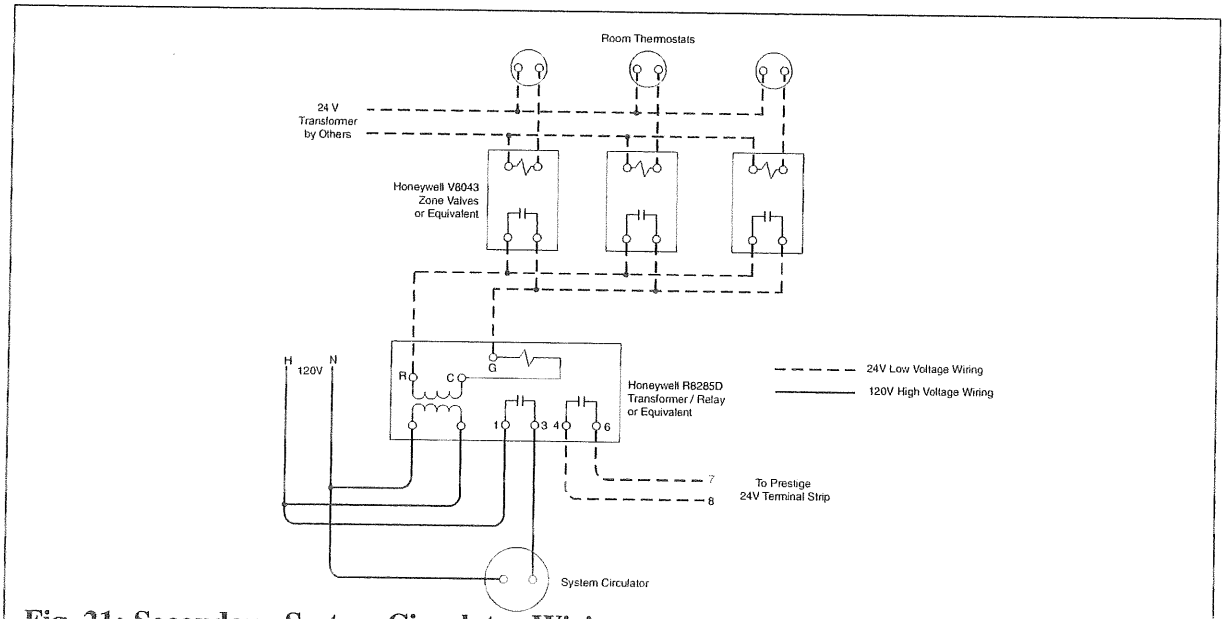
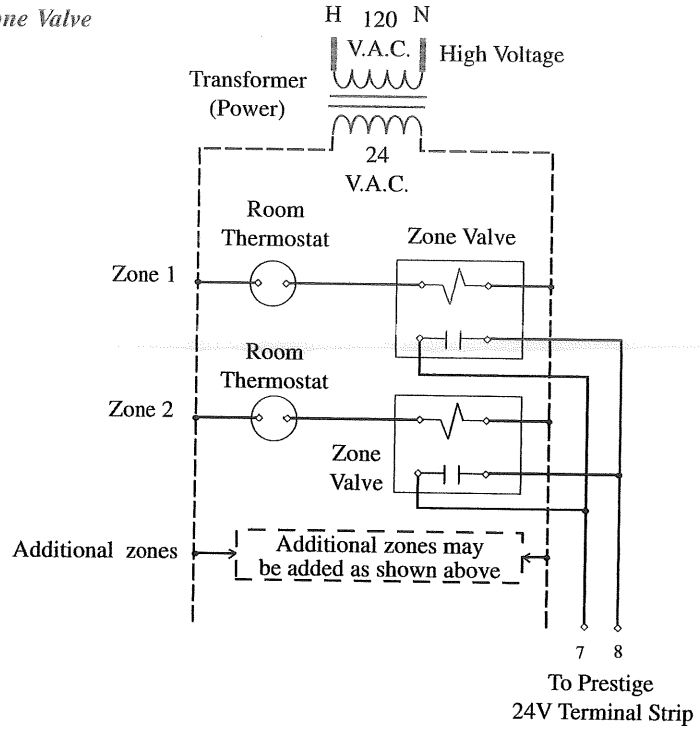
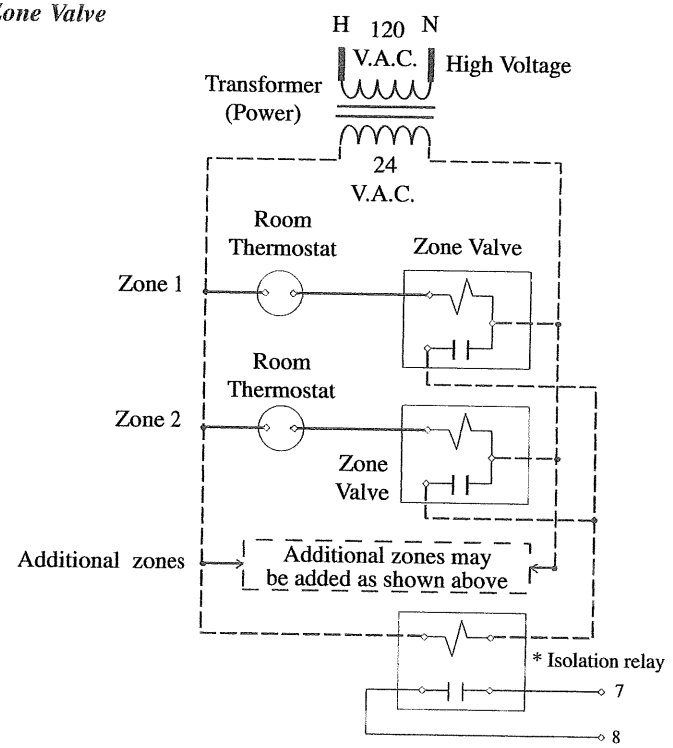


Fig. 21: Secondary System Circulator Wiring

4 Wire Zone Valve



3 Wire Zone Valve



NOTICE:

*Use isolation relay on 3-wire zone valve with non-isolated end switch. Transformer and the Prestige MCBA control can burn out if isolation relay is not used.

Fig. 22: Multiple Zone Field Wiring Using Zone Valves

Fig. 23: Field Wiring with Zone Circulators

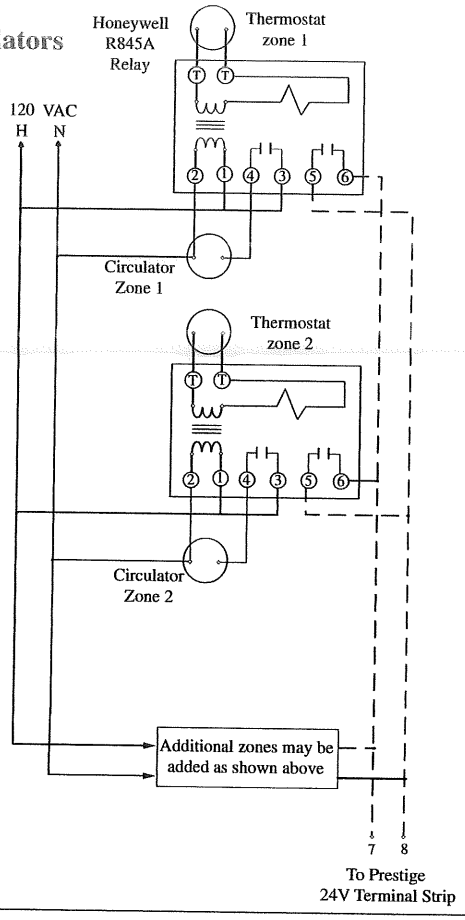
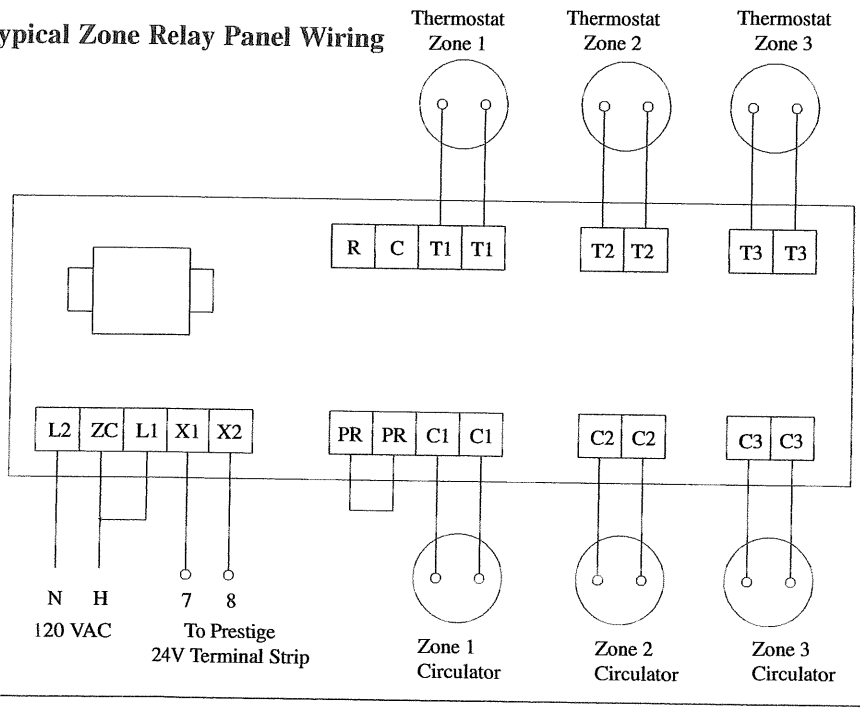


Fig. 24: Typical Zone Relay Panel Wiring



SECTION IX - Start-Up Preparation

Check Boiler System Water Chemistry

WARNING

Do not use petroleum-base cleaning or sealing compounds in the boiler system. Damage to seals and gaskets in the system components could occur, resulting in substantial property damage.

NOTICE

System water including additives must be practically non-toxic, having a toxicity rating or Class of 1, as listed in Clinical Toxicology of Commercial Products.

Water pH Level 6.0 to 8.0

Maintain the boiler water pH between 6.0 and 8.0. Check using litmus paper or contact a water treatment company for a chemical analysis.

If the pH does not meet this requirement, do not operate the PRESTIGE Solo or leave the unit filled until the condition is corrected.

Water Hardness Less Than 7 Grains

For areas with unusually hard water (hardness above 7 grains) consult a water treatment company.

Chlorinated Water

Do not use the PRESTIGE Solo to heat a swimming pool or spa directly.

Maintain the chlorine level of the water at levels considered safe for drinking.

Flush Boiler and Domestic System to Remove Sediment

The installer must flush the boiler system to remove any sediment to allow proper operation of the PRESTIGE Solo .

Flush the systems until the water runs clean and is free of sediment.

For zoned systems, each zone should be flushed through a purge valve. Purge valves and isolation valves should be installed on each zone to allow proper flushing of the system.

Check and Test Antifreeze

For boiler systems containing antifreeze solutions, follow the antifreeze manufacturer's instructions in verifying the inhibitor level and to ensure the fluid characteristics are within specification requirements.

Due to the degradation of inhibitors over time, antifreeze fluids must be periodically replaced. Refer to the manufacturer of the antifreeze for additional instructions.

NOTICE

System water including additives must be practically non-toxic, having a toxicity rating or Class of 1, as listed in Clinical Toxicology of Commercial Products.

Use of Antifreeze in the Boiler System

WARNING

NEVER use automotive or ethylene glycol antifreeze or undiluted antifreeze in the primary system as freeze protection. This can cause severe personal injury, death or substantial property damage if ignored.

Determine the antifreeze fluid quantity using the system water content volume and following the antifreeze manufacturer instructions.

The water volume of the PRESTIGE Solo is approximately 3 gallons [12 L] for PRESTIGE Solo 60 or 5 gallons [19 L] for PRESTIGE Solo 175/250 or 7 gallons [26 L] for PRESTIGE Solo 399 . Remember to include the volume of the expansion tank.

Check with local codes requirements for the installation of backflow preventers or actual disconnection from the boiler's cold water fill or make up water supply line.

NOTICE

Massachusetts Code requires the installation of a backflow preventer if antifreeze is used.

Ensure the concentration of antifreeze to water does not exceed a 50/50 ratio.

NOTICE

System water, including additives, must be practically non-toxic, having a toxicity rating or Class of 1, as listed in Clinical Toxicology of Commercial Products.

Filling the Boiler System

1. Close the boiler drain valve located on the bottom of the unit and any manual or automatic air vent in the system.
2. Open all system isolation valves.
3. Fill the boiler system to correct system pressure. Correct pressure will vary with each application.

NOTICE

Typical residential system fill pressure is 12 psi. System pressure will increase when system temperature increases. Operating pressure of the system should never exceed 25 psi.

4. Purge air and sediment in each zone of the boiler system through the purge valve. Open air vents to allow air to be purged in the zones.
5. Once the system is completely filled and purged of all air and sediment, check the system pressure and check/repair any leaks.

WARNING

Unrepaired system leaks will cause continual makeup water to be added to the boiler. Continual makeup water could cause mineral buildup within the heat exchanger, reducing the heat transfer, causing possible heat buildup and eventual heat exchanger failure.

Check Low Water Cut-Off Device

- The PRESTIGE Solo is provided with a factory installed LWCO device that measures system pressure of more than 10 psi.
- Remove the front jacket panel and check for continuity across the low water cut-off device wire terminals. The contacts should be closed when system pressure is greater than 10 psi. See item 6, on Fig. 27 page 66 (PRESTIGE Solo 60) or on Fig. 27A page 67 (PRESTIGE Solo 175/250) or Fig. 27B page 68 (PRESTIGE Solo 399) for location of the LWCO.

Check For Gas Leaks

WARNING

Prior to start-up and during initial operation, smell near the floor and around the unit for gas odorant or any unusual odor. Do not proceed with the start-up if there is any indication of a gas leak. Any leaks found must be repaired immediately.

WARNING

Propane installations only - The propane supplier mixes an odorant with the propane to make its presence detectable. In some cases the odorant can fade and the gas may no longer have an odor.

Prior to start-up of the unit and periodically after start-up have the propane supplier check and verify the odorant level.

Check Thermostat Circuit

- Disconnect the external thermostat wires from the 24V terminal strip on the wiring panel.
- Connect a voltmeter across the wire ends of the external thermostat wiring.
- Close each thermostat, zone valve and relay in the external circuit one zone at a time and check the voltage reading across the wire ends.
- There should **NEVER** be voltage measured at the wire ends.
- If voltage is measured at the panel under any condition, check and correct the external wiring.

NOTICE

In systems using 3-wire zone valves, backfeed of voltage to the unit is a common problem. Use an isolation relay to prevent voltage from the external circuit entering the PRESTIGE Solo control panel.

- Reconnect the external thermostat wires to the 24V terminal strip on the wiring panel.

Inspection of Condensate Drain Assembly

1. Inspect and ensure the Condensate Drain Assembly is properly installed as described on page 25 and shown in Fig. 15 on page 26.
2. Remove the plug from the Condensate Drain Assembly and fill with fresh water.

NOTICE

The condensate drain assembly must be filled with water when the PRESTIGE Solo is in operation. The condensate drain assembly prevents flue gas emissions from entering the condensate line. Failure to ensure trap is filled with water could result in severe personal injury or death.

3. Re-Install plug in condensate drain assembly.

SECTION - Start-Up Procedures

Final Checks Before Start-Up

☐ Read page 45 through 48 regarding the operation of the PRESTIGE Solo control.

☐ Verify the PRESTIGE Solo and the boiler system are full of water and all system components are correctly set for operation, including the minimum flow rate through the boiler, see pages 79 through 81.

☐ Verify Start-up Preparation items outlined on pages 37 thru 39 have been completed.

☐ Verify all electrical connections are correct and securely fastened.

☐ Inspect vent and combustion air piping for signs of deterioration from corrosion, physical damage or sagging. Verify combustion air and vent piping are intact and correctly installed and supported. Reference the PRESTIGE Solo vent supplement.

☐ Verify burner configuration - Propane only.

- Check for proper labeling on the gas valve and the rating label for propane configuration.
- If there is doubt on the burner configuration, remove the gas valve and check for proper propane gas orifice size: 0.120" or 3.1 mm for PRESTIGE Solo 60, 0.221" or 5.6mm for PRESTIGE Solo 175, 0.250" or 6.3 mm for PRESTIGE Solo 250 or 0.264" or 6.7 mm for PRESTIGE Solo 399. Refer to Figs. 17 & 18, page 30 for location of the propane gas orifice.

NOTICE

For natural gas applications the Prestige 60 requires an orifice: 0.204" (52mm), and the Prestige 399 requires and orifice: 0.330" (8.6 mm)

☐ Ensure the vent Condensate Drain Assembly is filled with water.

PRESTIGE Solo Start-Up

1. Turn the ON-OFF switch located on the front control panel to the OFF position. Turn ON the electrical supply/service to the unit.
2. Read and follow the Operating Instructions outlined on page 42.

If PRESTIGE Solo Does Not Start Correctly

1. Verify DHW (parameter 2) and CH (parameter 3) systems are turned ON or set to "01". Read the Boiler Display Standby and Parameter Section of the manual starting on page 47 for more information.
2. Check for loose electrical connections, blown fuse (external or internal to the MCBA Control) or open service switch.
3. Check continuity across the L.W.C.O device for a closed circuit. See item 5 on Fig. 27, page 66 and item 6 Fig. 27A, page 67 and Fig. 27B, page 68.
4. Is the external limit control (if applicable) open? Ensure the external limit is reset to the closed position.
5. Is the gas supply valve(s) open at the unit and meter?
6. Is incoming gas supply pressure at the unit more than 5"w.c. and less than 13" w.c. for natural or propane with all gas appliances ON or OFF.
7. Are the heating thermostats set above room temperature?

If none of these conditions correct the problem, refer to the PRESTIGE Solo Trouble-Shooting Guide or contact Triangle Tube Tech Service.

Check the PRESTIGE Solo and System

☐ Check Boiler Piping.

Check Boiler system piping and components for leaks. If found, shut down the unit and repair immediately.

Purge any remaining air from the system piping. Air in the system piping will interfere with circulation creating heat distribution problems and system noise.

☐ Check Vent Piping and Combustion Air Piping.

Check for gas-tight seal at every connection and seam of the venting and combustion air piping.

WARNING

Venting system must be sealed gas-tight to prevent flue gas spillage and potential carbon monoxide emissions, which will result in severe personal injury or death.

☐ Check Gas Piping

Check around the unit for gas odor following the procedure outlined in this manual on Page 39.

WARNING

If any gas leaks are found or suspected, shut the unit down immediately. Use a gas detection device or bubble test to locate the source of the gas leak and repair at once. Do not operate the unit until the leak is corrected. Failure to comply with this procedure could result in severe personal injury, death or substantial property damage.

☐ Verify Flame Pattern and Combustion

Check the flame pattern through the inspection port of the heat exchanger. The flame should be blue and stable. The flame should be the length of the burner head openings.

WARNING

The combustion testing and adjustments must be performed by a qualified installer, service agency or the gas supplier. All combustion measurements must be performed with calibrated equipment to ensure proper reading and accuracy.

Test for CO2 or O2 and for CO during high firing rate. To manually place the boiler into high fire mode, reference page 45. The combustion reading should be within the range listed in Table 2. **The CO level should not exceed 100 ppm when combustion is correct.**

WARNING

The combustion levels should be measured at high firing rate, refer to page 45 of the PRESTIGE Solo control section on how to set the firing rate. If the combustion levels are not within the range given in Table 2 for the firing rate, shut the boiler down and contact Triangle Tube Engineering Department. Failure to comply with this requirement could result in severe personal injury, death or substantial property damage.

Table 2: Recommended Combustion Levels

	Natural Gas All Models	Propane Solo 60/175/250	Propane Solo 399
O2 Min.	2.30%	2.70%	3.70%
O2 Max.	5.30%	4.70%	5.20%
CO2 Min	8.80%	10.70%	10.00%
CO2 Max	10.50%	12.00%	11.00%
CO Max	100 ppm	100 ppm	100 ppm

☐ Measure Input - Natural Gas Only

1. Ensure the boiler is firing at maximum firing rate. To manually place the boiler into high fire mode, reference page 45.
2. Operate the unit for approximately 10 minutes.
3. Turn off all gas appliances within the building, except the PRESTIGE Solo.
4. At the gas meter, record the time required to use one cubic foot of gas.

FOR YOUR SAFETY READ BEFORE LIGHTING

WARNING **If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. **DO NOT** try to light the burner by hand.

B. BEFORE OPERATING, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to turn the external manual gas valve. Never use tools. If the valve will not turn by hand, don't try to repair it; call a qualified service technician. Force or attempted repair may result in a fire or explosion.

D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above. This appliance is equipped with an ignition device which automatically lights the burner. DO NOT try to light the burner by hand.
2. Set room thermostat(s) to lowest setting. Turn the external manual gas valve handle clockwise ↷ "CLOSE" (valve handle shall be perpendicular to gas piping).
3. Turn the service switch on the PRESTIGE control panel OFF.
4. Remove the front jacket panel on the unit.
5. Turn the external manual gas valve handle counter clockwise ↶ to "OPEN" gas supply (valve handle shall be parallel to gas piping).
6. Wait five (5) minutes to clear out any gas. If you then smell gas in the jacket enclosure or around the unit, STOP! Follow "B" in the safety information above. If you don't smell gas, go to the next step.
7. Turn the service switch on the PRESTIGE control panel "ON".
8. Set room thermostat(s) to desired setting(s).
9. The PRESTIGE control panel display will show a sequence of numbers (0,1,2,3,4,etc.) as the left digit. Sequence digit 3 or 4 indicates the boiler is firing. Sequence digit 0 means there is no call for heat (all external thermostats are satisfied).
10. If the unit will not operate with a call for heat and the system piping is not hot, follow the instructions "To Turn Off Gas to Appliance", below and call your service technician or gas supplier.
11. Replace the front jacket panel. Make sure the panel is seated firmly in place and all mounting screws are tightened.

TO TURN OFF GAS TO APPLIANCE

1. Set the room thermostat to lowest setting.
2. Turn the service switch on the PRESTIGE control panel to "OFF"
3. Turn the external manual gas valve handle clockwise ↷ to "CLOSE".

5. Calculate Natural gas input using the following equation:

   3600 x 1000 / number of second recorded for one cubic foot of gas = BTU/H.

6. The BTU/H calculated should approximate the input rating listed on the unit.

Set Boiler CH Set Point

1. Press the MODE button until the display shows PARA. This is the parameter mode of the control.
2. Press the STEP button until the first digit on the display shows "4". The last three digits on the display shows the CH Maximum Boiler Operating Setpoint.
3. Press the "+" or "-" button to change the setting.

NOTICE

When an outdoor sensor is used, the setting of Parameter 4 is the CH setpoint when the outdoor temperature is at or below 0°F. When the outdoor temperature is above 0°F, the PRESTIGE Solo control will calculate the boiler setpoint between the minimum and maximum temperature settings.

4. Press the "STORE" button to save the setting.

Operation Verification - Space Heating

NOTICE

Digits and characters shown as [8888], in the following outline, represent the control panel display. The last three digits on the display represent the measured boiler water temperature and may differ from what is shown in the manual.

1. Disconnect the DHW (Domestic Hot Water) thermostat wiring from the PRESTIGE Solo or turn down DHW tank aquastat (if used) to ensure the boiler does not receive a DHW call for heat.
2. Set the room thermostat to the lowest setting.
3. Turn off power to the boiler, wait a few seconds and turn on power to the boiler.
4. The following displays should occur:

   [U1.22] Software version

   [A140] Self check on power up

   [0140] No call for heat

5. Initiate a call for heat by raising the set point of the room thermostat to the highest setting. The following display should occur.

   [5140] This is a fan / air flow check. The burner blower will be energized momentarily prior to the prepurge cycle.

   [1140] This is the prepurge cycle. The burner blower and the CH (Central Heating) circulator become energized. The blower has a 10 second prepurge cycle.

   [2140] This is the ignition cycle. The control module will energize and open the gas valve and begin the spark for ignition.

   - If the burner flame proves, the burner will continue to fire at the ignition fan speed for approximately 10 seconds to stabilize the flame.
   - If the burner flame is not proven the control module will repeat the ignition sequence. If the flame is not proven after five attempts the control will lockout and the display will show [E-02]
   - To verify flame failure lockout, close the manual shut off valve on the gas supply piping to the boiler and repeat ignition sequence. When verification is completed, ensure the manual shut off valve is returned to the open position.

[3140] This is the normal CH operation cycle. After the flame is proven and stabilized the burner will fire at low input for approximately 1 minute. After this time period, the control module will begin to modulate the burner firing rate based on actual boiler outlet temperature and the set point temperature.

6. Allow the boiler to operate and allow the boiler outlet temperature to reach the set point temperature.

   [6100] This begins the burner shutdown and post purge cycle. The CH circulator will continue to run until the room thermostat is satisfied.

7. Lower the room thermostat set point below the room temperature to end the call for heat.

   [1100] This begins a post purge cycle. When the room thermostat is satisfied, the boiler will shutdown. The control module will close the gas valve and the blower will continue for 30 seconds for a post purge cycle before shutting down. If another call for heat is initiated, the boiler will remain off for an additional 30 seconds before starting a new ignition sequence.

   [7100] The CH circulator will continue to run for a 1 minute post pump cycle.

   [0100]The boiler is in standby MODE waiting for a call for heat.

8. Verify the operation of the boiler by repeating the operational sequence several times.

9. Return the room thermostat to a desired setting. Reconnect the DHW wiring or return the DHW aquastat to desired setting, placing the DHW system into operation.

Operation Verification - Domestic Hot Water (if applicable)

1. As outlined in the verification for space heating, repeat STEPS 2 through 4.

2. Raise the DHW aquastat setting to initiate a call for heat. As in the space heating operation the display should show:

   [5140] This is a fan / air flow check. The burner blower will be energized momentary prior to the prepurge cycle.

   [1100] This is prepurge cycle. The burner blower and DHW circulator become energized and the 10 second prepurge cycle begins.

   [2100] The boiler will begin the ignition sequence. The same sequence of establishing flame, trail for ignition and attempts for ignition as described in the space heating applies for domestic water heater.

   [4100] This indicates normal operation for DHW. The burner will begin modulating its input to maintain the DHW set point. The burner will not go into the low input rate for the 1 minute flame stabilization period that occurs in CH mode.

3. Lower the DHW aquastat to satisfy the call for heat.

   [1100] The post purge cycle begins. The control module closes the gas valve and the blower continues for a 30 second post purge.

   [8100] The DHW circulator will continue for a 30 second post pump cycle. If another DHW call for heat is initiated the boiler ignition sequence will begin immediately.

   [0100] Boiler is in standby MODE waiting for a CH or DHW call for heat.

4. Verify the DHW operation of the boiler by repeating the outlined operation sequence several times.

5. Return the DHW aquastat and room thermostat to the desired setting.

Boiler Control Display

Standby Mode StbY

This is the standard mode for the PRESTIGE Solo. The control automatically returns to this mode after 20 minutes if no keys have been pressed on the display. Any parameters that were modified are then stored.

The first character shows (on left side of display) the current status of the boiler depending on the condition of both the boiler and the burner. The last 3 characters indicate the boiler supply temperature.

If the burner is blocked due to a "soft" lockout, the display alternates between a 9 followed by the boiler supply temperature and a "b" with a two digit error code.

TO TEMPORARILY PLACE THE BURNER INTO HIGH FIRE TEST MODE: press the MODE button until "StbY" is displayed. Then press and hold both the MODE and "+" buttons simultaneously until the first digit flashes "H".

While in the test mode:

- high limit will function
- boiler CH circulator will function
- domestic circulator will not function
- the test mode will time out in approximately 10 minutes

TO TEMPORARILY PLACE THE BURNER INTO LOW FIRE TEST MODE: press the MODE button until "StbY" is displayed. Then press and hold both MODE and "-" buttons simultaneously until the first digit flashes "L".

TO DEACTIVATE THE HIGH OR LOW FIRE TEST MODE: press the MODE button until "StbY" is displayed. Then press and hold both the "+" and "-" buttons simultaneously to deactivate the high or low fire test mode.

Display	Boiler function
H180	Test function: Burner on, high fire mode
L180	Test function: Burner on, low fire mode

NOTICE

If the "+" button is held in, the CH system (parameter 3) will be turned OFF and the display will show "cOFF". Press and hold the "+" button to turn the CH system back ON, the display will show "c" followed by CH set point. If the "-" button is held in while in the "StbY" mode, domestic system (parameter 2) will be turned OFF and the display will show "dOFF". Press and hold "-" button to turn the domestic system back ON, the display will show "d" followed by domestic set point temperature.

Standby Mode Display

Display	Boiler function
0:00	STANDBY, no demand for heat
1:00	Fan prepurge or post purge cycle
2:00	Ignition sequence
3:00	Burner ON for space heating (CH)
4:00	Burner ON for domestic hot water (DHW)
5:00	Pre-check for air flow prior to prepurge cycle
6:00	Burner OFF due to reaching temperature setpoint
7:00	Space Heating (CH) post pump cycle
8:00	Domestic hot water (DHW) post pump cycle
9:00	Burner blocked:
b 18	Supply temperature too high (202°F) . Burner will remain OFF until temperature drops below 200°F
b 19	Return temperature too high (202°F). Burner will remain OFF until temperature drops below 200°F
b 24	Return temperature is higher than supply temperature. Burner will remain OFF until corrected.
b 25	Supply temperature increased too quickly. Burner will remain OFF for a 10 minute period. Burner will recycle, increasing waiting period 1 minute for a max. 15 minutes
b 26	Factory supplied LWCO device or external limit (terminals 15 & 16) is OPEN. Burner off for 150 seconds, auto reset.
b 28	No blower signal
b 29	Blower signal present with no demand, Burner will remain OFF until condition terminates
b 30	Temperature difference between the supply and return is more than 72°F. Burner will remain OFF for 150 seconds. Burner will recycle increasing wating period 1 minute for a max. 20 cycle.
b 33	Indirect water heater temperature sensor is short-circuited. Burner OFF until corrected.
b 38	Indirect water heater temperature sensor is "open" or disconnected. Burner OFF until corrected.
b 35	Flue temperature sensor is short-circuited. Burner OFF until corrected
b 40	Flue temperature senor is "open" Burner OFF until corrected.
b 52	Flue temperature greater than 240°F but less than 250°F. Burner off for 150 seconds
b 65	Wait for the blower to start
b:16	Power frequency deviation
b:18	Flame current signal lost

Setting The Boiler Parameters

Parameter mode PARA

To access PARAMETER mode when the system is in STANDBY mode, press the MODE button once.

Key:	Display	
MODE	PARA	Pressing MODE once

To scroll through the list of parameters, simply press the "STEP" button. The first digit is the parameter number followed by the parameter value. To modify a parameter value, use the + or - keys. Then press "STORE" to save the value you just changed. The display flashes once to confirm the data has been stored.

To activate the parameters you changed, press "RESET". However, if you do not press a key, the system returns to STANDBY mode after 20 minutes and automatically stores the changes.

Note 1: This parameter is factory set to 140°F. It is important to note the control adds 46°F to this setting, therefore the actual domestic hot water boiler setpoint is 140°F + 46°F = 186°F.

Key:	Display	Description of parameters
STEP	1.140	Domestic Hot Water Setting **(See Note 1)**
STEP	2. 01	DHW Application Selection **(See Note 2)**
STEP	3. 01	CH Application Selection **(See Note 3)**
STEP	4.186	CH Maximum Boiler Operating Setpoint

Note 2: This parameter should not be changed from the factory setting of 01. The performance of the DHW will be affected and can become unreliable.

Note 3: This parameter should not be changed from the factory setting of 01. The performance of the CH (Central/Space Heating) will be affected and can become unreliable.

Accessing Boiler Information

Information mode INFO

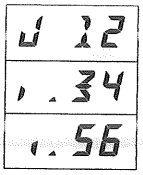
To switch from STANDBY mode to INFORMATION mode, press MODE twice.

Key:	Display	
MODE	PAR.A	Pressing MODE once
MODE	INFO	Pressing MODE twice

Press STEP until the system displays the information you need. The first digit is the information item number followed by the items value. The decimal point located behind the first position flashes to indicate that the boiler is in INFO mode.

NOTICE

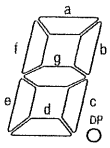
The ignition counters and burner hours are split into three two digit numbers. For example:



Write the numbers down from left to right to arrive at 123,456 CH ignitions.

NOTICE

In the INFO Mode a temperature reading of -22 typically indicates an "open" circuit. A temperature reading of 240 typically indicates a short-circuit.



Display Digit Segments

Item	Value
1	Supply Water Temperature °F
2	Return Water Temperature °F
3	DHW Water Temperture °F (Optional)
4	Outdoor Temperture °F (Optional)
5	Flue Temperature °F
6	Boiler Setpoint °F
7	Rate of Increase of Supply Water Temperature °F/Sec.
8	Rate of Increase of Return Water Temperature °F/Sec.
9	Rate of Increase of DHW Water Temperature °F/Sec.
A	Not Used
B	Not Used
C	Not Used
D	Not Used
E	Ionization Current in micro-ampere
F	Analog Input Voltage
G	Not Used
H	MCBA Internal Temperture °F
I	CH Ignition Counter (100 thousands / 10 thousands)
Seg. e	CH Ignition Counter (thousands / hundreds)
Seg. c	CH Ignition Counter (ten / ones)
J	CH Ignition Hours (100 thousands / 10 thousands)
Seg. e	CH Ignition Hours (thousands / hundreds)
Seg. c	CH Ignition Hours (ten / ones)
L	DHW Ignition Counter (100 thousands / 10 thousands)
Seg. e	DHW Ignition Counter (thousands / hundreds)
Seg. c	DHW Ignition Counter (ten / ones)
N	DHW Burner Counter (100 thousands / 10 thousands)
Seg. e	DHW Burner Counter (thousands / hundreds)
Seg. c	DHW Burner Counter (ten / ones)

Error (Hard Lockout) Mode

If a serious fault occurs, the system enters a hard lockout condition which requires a manual reset by pressing the RESET button. A hard lock is indicated by displaying an E for the first digit, followed by the error code.

For a detailed description of the error codes, reference the PRESTIGE Solo Troubleshooting Guide.

CAUTION

The boiler freeze protection feature is disabled during a Hard Lockout, however the CH circulator will operate.

CAUTION

During a hard lockout or low water condition the boiler will not re-start without service. If the heating system is left unattended in cold weather appropriate safeguards or alarms should be installed to prevent property damage.

Display	Hard Lockout
E 00	Flame detected prior to burner startup
E 02	Failed ignition after 5 attempts
E 03	Gas valve harness not properly connected
E 04	Power supply lost after lockout occured
E 05	Internal control failure
E 06	Internal control failure
E 07	Internal control failure
E 08	Internal control failure
E 09	Internal control failure
E 11	Internal control failure
E 12	External limit (terminals 13 & 14) is OPEN
E 13	Internal control failure
E 14	Internal control failure
E 15	Internal control failure
E 16	Internal control failure
E 17	Internal control failure
E 18	Supply Temperature exceeds 212°F
E 19	Return Temperature exceeds 212° F
E 25	Supply Temperature increased too rapidly
E 28	No blower signal present
E 29	Blower signal does not reset to zero
E 31	Supply Temperature sensor is short circuited
E 32	Return Temperature sensor is short circuited
E 35	Flue Temperature sensor is short circuit
E 36	Supply Temperature sensor is OPEN
E 37	Return Temperature sensor is OPEN
E 40	Flue Temperature sensor is OPEN
E 44	Internal control failure
E 52	Flue Temperature exceeds 250° F
E 60	Internal control error - failure to read parameters
E 61	Internal control failure
E 65	Inadequate power supply to the fan
E113	Invalid power frequency
E115	Internal control failure
E122	Supply or Return Temperature sensor drift
E123	Supply or Return Temperature failure
E124	Supply or Return Temperature not changing

SECTION XI - Outdoor Reset Control

The boiler setpoint for a heating call can be fixed or vary with the outdoor temperature. If the application requires a constant supply temperature from the boiler, the outdoor temperature sensor should not be connected to the boiler. If an outdoor temperature sensor is connected to the boiler, the outdoor reset function is automatically enabled and will vary the CH setpoint with the change in outdoor temperature. The outdoor reset function has no affect on the DHW setpoint during a domestic call.

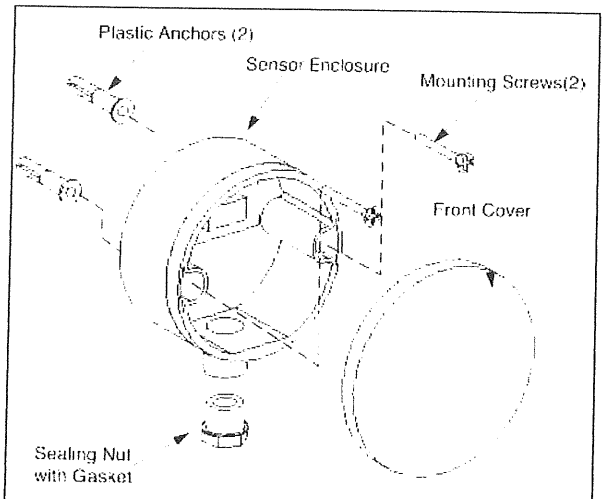


Fig. 25: Sensor Enclosure and Components

Mounting the Outdoor Sensor

1. Remove the front cover and mounting screws / anchors from the sensor enclosure.
2. When mounting the enclosure the exterior wall selected should represent the heat load of the building. Typically a northern or northeastern wall will suit most buildings. A southern facing wall may suit buildings that have large glass walls or windows on the southern face.
3. Ensure the sensor enclosure is shielded from direct sunlight or the effects of heat or cold from other sources (exhaust fans, appliance vents...) to prevent false temperature sensing.
4. Mount the sensor enclosure at an elevation on the exterior wall to prevent accidental damage or tampering.
5. Avoid mounting the enclosure in areas subjected to excessive moisture.
6. Once an area on the exterior wall has been determined, to affix the enclosure use the enclosure as a template to mark the location of the mounting screws.
7. Using a 3/16" drill bit, drill 2 pilot holes on the marked locations.
8. Tap the enclosed plastic anchors into the pilot holes. Use care not to damage the anchors.
9. Mount the sensor enclosure using the screws provided.

Wiring the Sensor

1. Remove the sealing nut and sealing gasket from the sensor enclosure.
2. Route two 18 gauge wires through the sealing nut and gasket. Connect the wires to the sensor terminals 1 and 2.
3. Re-insert the sealing gasket and tighten the sealing nut to the sensor enclosure.
4. Route the sensor wire back to the PRESTIGE Solo boiler, ensuring the wires are not run parallel to telephone or power cables.

NOTICE

If the sensor wires are located in an area with sources of potential electromagnetic interference (EMI) the sensor wires should be shielded or the wires should be routed in a grounded metal conduit. If using shielded cable, the shielding should be connected to the common ground of the unit.

5. Connect the sensor wires to the outdoor sensor terminals on the 24V terminal strip located inside the boiler enclosure (see boiler wiring diagram, Fig. 20 page 32).

Summer / Winter Switch at Boiler

If required the CH (Central Heating) system can be turned off at the boiler, similar to a manual summer / winter switch by pressing and holding the "+" button while in the "Stby" mode. The display will show "cOFF". Pressing and holding the "+" button turns the CH system back on. The display will show "c" followed by the CH set point temperature.

WARNING

If a parameter setting is changed but the STORE button is not pressed to save the setting, the MCBA will automatically store the setting after 20 minutes. Ensure all parameters are at their factory settings or appropriately revised for the application prior to commissioning the boiler. Failure to comply could result in erratic or unreliable operation of the Prestige boiler.

NOTICE

Once a parameter setting has been revised and stored pressing the STEP button will display the setting of the next parameter without showing P_XX. To avoid confusion, it is advisable to continue pressing the STEP button until Parameter 46 is reached. The next press of the STEP button will cause the display to roll over to Parameter 1. Continue pressing the STEP button until the next parameter to be adjusted is reached and revise the setting.

Adjusting Outdoor Reset Curve

Parameters 4, 10, 11, & 12 define the settings of the outdoor reset curve. See Graph 1 and Table 3, page 53 for an example of modifying the outdoor reset curve.

CH Maximum Boiler Operating Setpoint (Parameter 4)

Factory Setting	Minimum Setting	Maximum Setting
186°F	86°F	194°F

If an outdoor temperature sensor is not connected to the boiler, the boiler setpoint for a heating call will be set to the CH Maximum Boiler Operating Setpoint. If an outdoor temperature sensor is connected, the CH Maximum Boiler Operating Setpoint becomes the boiler setpoint on the CH Reset Curve Coldest Day. The outdoor temperature can be monitored on the boiler display via item 4 of the INFO menu.

CH Minimum Boiler Operating Setpoint (Parameter 10)

Factory Setting	Minimum Setting	Maximum Setting
86°F	60°F	140°F

This parameter is not applicable if an outdoor sensor is not connected to the boiler. When an outdoor temperature sensor is connected, the CH Minimum Boiler Operating Setpoint becomes the boiler setpoint on the CH Reset Curve Warmest Day.

CH Reset Curve Coldest Day (Parameter 11)

Factory Setting	Minimum Setting	Maximum Setting
00°F	(-)22°F	50°F

This parameter is not applicable if an outdoor sensor is not connected to the boiler. When an outdoor temperature sensor is connected, the CH Reset Curve Coldest Day is the coldest design temperature of the heating system.

CH Reset Curve Warmest Day (Parameter 12)

Factory Setting	Minimum Setting	Maximum Setting
64°F	60°F	78°F

This parameter is not applicable if an outdoor sensor is not connected to the boiler. When an outdoor temperature sensor is connected, the CH Reset Curve Warmest Day is the warmest design temperature of the heating system.

Entering MCBA Access Code

The installer must enter the MCBA Access Code to adjust the advanced parameter settings of the MCBA. The Access Code can be entered as follows:

1. Press the MODE button until the display shows *STBY*.
2. Press and hold the MODE and STEP buttons together for 2 to 3 seconds until the display shows *CODE*.
3. Press the STEP button once and the display will show *C_XX* where *XX* represents a random number.
4. Press the "+" or "–" buttons to change the number displayed to read *C_54*.. Press and hold the "+" or "–" button to rapidly change the number.
5. When the display reads *C_54*, press the STORE button to save the Access Code. The display should flash to indicate that the Access Code was saved.

After the Access Code has been entered, the advanced parameters can be accessed by pressing the MODE button until the display shows *PAAA*. Once the display shows *PAAA*, press the STEP button to reach the appropriate parameter. The display should follow the following sequence:

Press STEP once- *1140*
Press STEP x2 - *2_01*
Press STEP x3 - *3_01*
Press STEP x4 - *4186*
Press STEP x5 - *P_10*
Press STEP x6 - *P_11* Etc.....

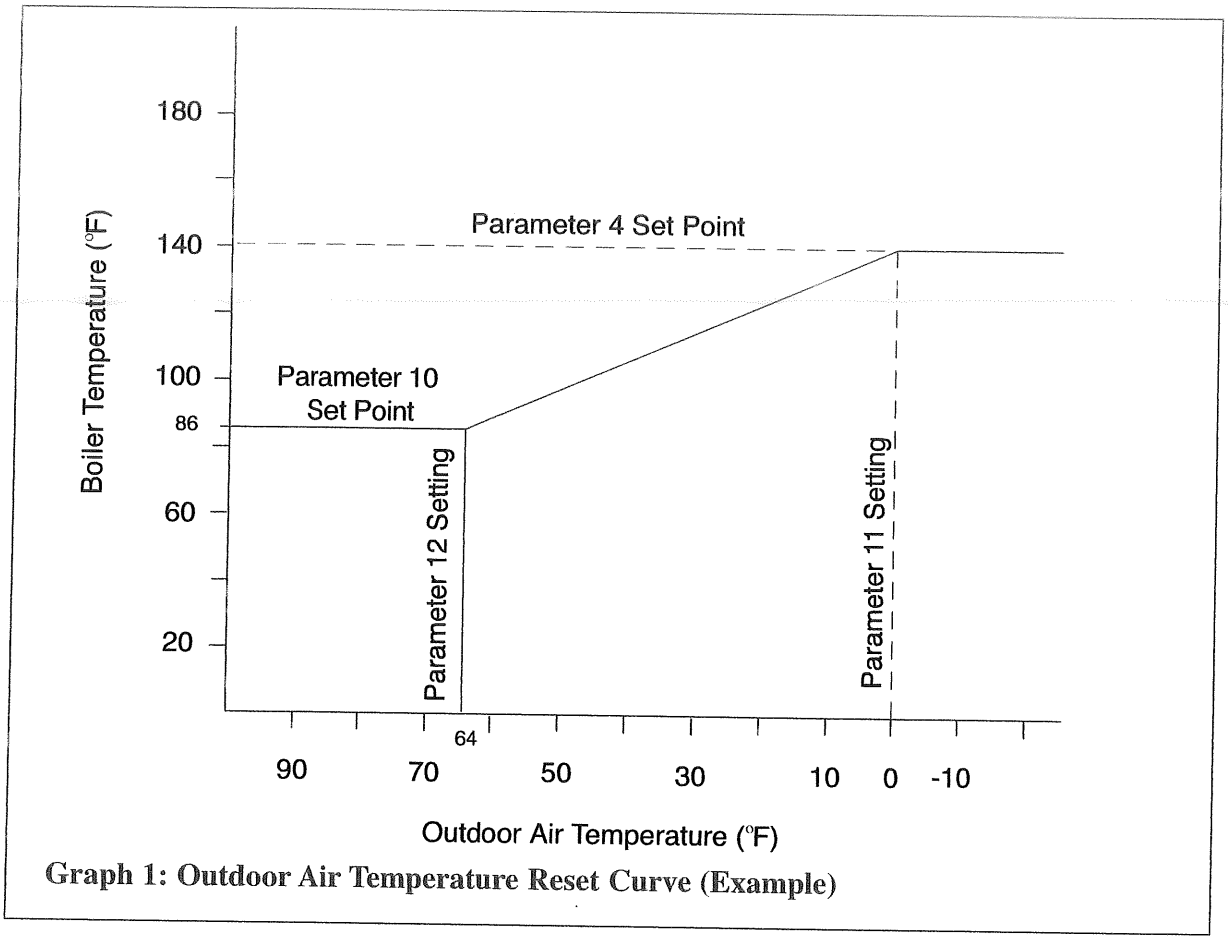
After Parameter 4, the display will show P followed by the parameter number. Once a particular parameter is reached, the display will change to show the current setting of that parameter.

NOTICE

The actual parameter values displayed on the display may vary depending on the application, but the sequence will always occur in the order shown.

Changing a Parameter Setting

1. Use the "+" or "–" button to change the parameter setting.
2. Press the STORE button to save the change. The display should flash to indicate that the change was saved.
3. Press the RESET button to leave the Access Code mode.



Graph 1: Outdoor Air Temperature Reset Curve (Example)

Table 3: Outdoor Air Temperature Reset (Example)

Outdoor Temperature	Boiler Target Temp. Based on Outdoor Temp.
0°F or Lower	140°F
23°F	122°F
40°F	108°F
64°F or Higher	86°F

Graph 1 illustrates Parameter 4 adjusted to 140°F target temperature at 0°F outdoor air temperature

Note: Factory setting of Parameter 4 is 186°F.

SECTION XII - EXTERNAL MODULATING CONTROL

The boiler can directly accept an analog 0-10 VDC signal to control the firing rate from an external modulating boiler controller.

Wiring the Modulating Controller

Run two 18 gauge wires from the external modulating boiler controllers 0-10 VDC boiler output to the external input terminals on the low voltage terminal strip inside the boiler. (see boiler wiring diagram, Fig. 20 page 32). This signal will both enable and modulate the boiler. No wiring is required at the thermostat (T-T) terminals 7 and 8 of the boiler.

NOTICE

Ensure that the polarity of the connections from the external modulating boiler controller to the boiler is correct. Reversed polarity could lead to erratic and/or no response from the boiler controller.

Parameter Adjustment

The Prestige MCBA control module must be programmed to accept the 0-10 VDC signal from the external modulating boiler control.

CH Operating Signal Section (Parameter 45)

Factory Setting	Revised Setting
00	02

Follow the procedure for entering the MCBA Access Code on page 52, and then change the setting of Paramater 45 from the factory setting of 00 to 02.

NOTICE

Ensure that Parameter 4 is set above the highest setpoint of the external modulating control. Paramater 4 is a boiler high temperature limit when using an external modulating controller.

Programming of External Modulating Control

The external modulating control must be programmed to send 1.8 VDC to enable the boiler and run it at low fire, and 10 VDC to run the boiler at high fire. Once the control enables the boiler, it must wait 2 minutes to allow the burner to stabilize before modulating the boiler.

FACTORY SETTING FOR PARAMETERS

1	140°F	DHW Setting
2	01	DHW Application Selection
3	01	CH Application Selection
4	186°F	CH Maximum Boiler Operating Setpoint
10	86°F	CH Minimum Boiler Operating Setpoint
11	00°F	CH Reset Curve Coldest Day
12	64°F	CH Reset Curve Warmest Day
13	-22°F	Frost Protection Setpoint
18	32°F	CH Block Temperature Setting
19	00 Minutes	Boost Feature Setting
20	00°F	Parallel Shift Value
21	46°F	Setpoint Value Addition for DHW
32	01 Minutes	CH Circulator Post Pump Time Period
33	03 x 10.2 Sec.	DHW Circulator Post Pump Time Period
38	02°F	DHW On Differential
39	06°F	DHW Off Differential
40	03 x 10.2 Sec.	CH Call Blocking Time
41	00 x 10.2 Sec.	DHW Call Blocking Time
42	00 x 10.2 Sec.	DHW to CH Call Blocking Time
43	00 Minutes	DHW Priority Timeout
45	00	CH Operating Signal Selection
46	2	DHW Operating Signal Selction

SECTION XIII- Check-Out Procedures

NOTICE

Perform the following check-out procedures as outlined and check off items as completed. When procedures are completed, the installer should complete the installation record on page 57.

Check-Out Procedures

- ☐ Boiler system water chemistry checked and verified as outlined on page 37.
- ☐ The boiler air vent and any automatic air vents placed within the system are open one full turn.
- ☐ Air is purged from the heating zones and boiler system piping.
- ☐ If applicable, confirm that the burner has been properly configured for Propane as outlined on page 29.
- ☐ Thermostat circuit wiring checked and verified that no voltage is present to the low voltage terminals as outlined on page 39.
- ☐ Operating Instructions on page 42 were followed during start-up.
- ☐ Combustion levels and flame pattern verified as outlined on page 41.
- ☐ Measured the rate of input on Natural Gas as outlined on page 41.
- ☐ Checked the incoming gas pressure to the PRESTIGE Solo to ensure a minimum pressure of 5"w.c during flow conditions to all gas appliances and a maximum pressure of 13"w.c during non-flow conditions for Natural and Propane.
- ☐ Adjusted balancing valves and system limit controls to provide design temperatures to the primary space heating system.
- ☐ In multiple zone applications, adjusted for correct flow of boiler water to each zone.
- ☐ Checked and verified room thermostat(s) function properly and the thermostat(s) heat anticipator (if used) was properly set.
- ☐ Observed several operating cycles for proper operation of the PRESTIGE Solo and the system.
- ☐ Set the room thermostat(s) to the desired room temperature.
- ☐ Reviewed all instructions shipped with the PRESTIGE Solo with the homeowner or maintenance personnel.
- ☐ Completed the Installation Record on page 57.
- ☐ Ensure all manuals and other documents are returned to the Installation envelope and given to the owner for safekeeping.

SECTION XIV - Installation Record

PRESTIGE Model Number: _____

Serial Number: _____

Date of Installation: _____

Fuel: ☐ Natural Gas ☐ Propane

Measured Rate of Input: _____ Btu/hr

Combustion Readings:

CO_2 _____ %

O_2 _____ %

CO _____ ppm

The following items were completed during installation:

- ☐ Installation instructions have been followed and completed
- ☐ Check-out procedures have been followed and completed
- ☐ Information regarding the unit and installation received and left with owner / maintenance personnel.

Installer Information

(Company) _____

(Address) _____

(Address) _____

(Phone Number) _____

SECTION XV - Maintenance Schedule

Service Technician

At least on an annual basis the following maintenance should be performed by a qualified service technician:

General

- Attend to any reported problems.
- Inspect the interior of the boiler jacket area; clean and vacuum if necessary.
- Clean the condensate drain assembly and fill with fresh water.
- Check for leaks: water, gas, flue and condensate.
- Verify flue vent piping and air inlet piping are in good condition, sealed tight and properly supported.
- Check boiler water pressure, piping and expansion tank.
- Check control settings.
- Check ignition electrode (sand off any white oxide; clean and reposition).
- Check ignition wiring and ground wiring.
- Check all control wiring and connections.
- Check burner flame pattern (stable and uniform).

Additional items if combustion or performance is poor:

- Clean heat exchanger and flue ways.
- Remove burner assembly and clean burner head using compressed air only.

Once the maintenance items are completed, review the service with the owner.

Owner Maintenance

Periodically:

- Check the area around the unit.
- Check and remove any blockage from the combustion air inlet and ventilation openings.
- Check the temperature and pressure gauges.

Monthly:

- Check vent piping.
- Check combustion air inlet piping.
- Check the pressure relief valve.
- Check the condensate drain system.

Every 6 months:

- Check boiler piping and gas supply piping for corrosion or potential signs of leakage.
- Operate the pressure relief valve.

WARNING

Follow the maintenance procedures given throughout this manual. Failure to perform the service and maintenance or follow the directions in this manual could result in damage to the PRESTIGE Solo or in system components, resulting in severe personal injury, death or substantial property damage.

SECTION XVI - Maintenance Procedures

Maintenance Procedures

WARNING

The PRESTIGE Solo should be inspected and serviced annually, preferably at the start of the heating season, by a qualified service technician. In addition, the maintenance and care of the unit as outlined on page 58 and further explained on pages 59 through 64 should be performed to assure maximum efficiency and reliability of the unit. Failure to service and maintain the PRESTIGE Solo and the system components could result in equipment failure, causing possible severe personal injury, death or substantial property damage.

NOTICE

The following information provides detailed instruction for completing the maintenance items outline in the maintenance schedule on page 58. In addition to this maintenance, the PRESTIGE Solo should be serviced at the beginning of the heating season by a qualified service technician.

Reported Problems

Any problems reported by the owner should be checked, verified and corrected before proceeding with any maintenance procedures.

Check Surrounding Area

Verify that the area surrounding the PRESTIGE Solo is free of combustible / flammable materials or flammable vapors or liquids. Remove immediately if found.

Verify that combustion air inlet area is free of any contaminates. Refer to the materials listed on page 5 of this manual. If any of these products are in the area from which the unit takes its combustion air, they must be removed immediately or the combustion air intake must be relocated to another area.

Inspect Burner Area

Remove the boiler front jacket panel and venturi inlet elbow.

Vacuum any dirt or debris from the burner/blower components.

Re-install venturi inlet elbow and front jacket panel when completed.

WARNING

Do not use solvents to clean any of the burner components. The components could be damaged, resulting in unreliable or unsafe operation.

Check System Piping

Inspect all piping (water and gas) on the boiler system for leaks and verify that the piping is leak free and properly supported.

Inspect the fittings and components on the unit and verify they are leak free.

WARNING

Eliminate all boiler water system leaks. Continual fresh make-up water will reduce the heat exchanger life causing boiler failure. Leaking water may also cause severe property damage to the surrounding area. Inspect the gas supply piping using the procedure outlined on Page 41.

Clean Condensate Drain Assembly

1. Loosen the retaining nut from the condensate drain assembly and disconnect the assembly from the boiler.
2. Empty any water from the trap and drain assembly. Flush with fresh water as necessary to clean.
3. Check the drain piping from the condensate drain assembly to the drain. Flush to clean as necessary.
4. Reassemble the condensate drain assembly onto the boiler by tightening the retaining nut with rubber seal onto the boiler. Hand tight only.
5. Remove the fill plug on the condensate drain assembly and fill with water. See Fig. 15 on page 26.
6. Replace the fill plug on drain assembly.

Check Ventilation Air Openings

Verify that all ventilation openings to the mechanical room or building are open and unobstructed. Check the operation and wiring of any automatic ventilation dampers.

Check and verify the vent discharge and the combustion air intake are free of debris and obstructions.

Inspect Vent and Combustion Air Piping

Visually inspect the venting system and combustion air piping for blockage, deterioration or leakage. Repair any deficiencies.

Verify that the combustion air inlet piping is connected, sealed and properly supported.

WARNING

Failure to inspect the vent system and combustion air inlet piping and to have any conditions repaired, can result in severe personal injury or death.

Check Boiler System

Verify all system components are correctly installed and operating properly.

Check the cold fill pressure for the system, typical cold water fill pressure is 12 psig.

Verify the system pressure, as the unit operates at high temperature, to ensure the pressure does not exceed 25 psig. Excessive pressure reading indicates expansion tank sizing is incorrect or system performance problems.

Inspect air vent and air separators in the system. Remove the caps on automatic air vents and briefly depress the valve stem to flush vent. Replace the cap when completed. Ensure vents do not leak, replace any leaking vents.

Check Expansion Tank

Refer to Section IV - Boiler Piping for recommended location of the expansion tank and air eliminators.

Closed -Type Tank:

- Ensure tank is partially filled with water leaving an air gap as a cushion. Refer to the manufacturer's instruction for proper fill level.
- Ensure the tank is fitted with a device that reduces gravity circulation of air-saturated tank water back into the system. This device prevents air from bubbling up through the water as it returns from the system.
- Ensure no automatic air vents are used in the system. This will allow air to escape from the system instead of returning to the tank.

Diaphragm Tank:

- Ensure the system contains a minimum of one automatic air vent. Recommended location of the air vent should be atop an air eliminator.
- Remove the tank from the system and check the charge pressure. For residential applications the charge pressure is typically 12 psig. If tank does not hold a charge pressure, then the membrane is damaged and the tank should be replaced.

Check Boiler Relief Valve

Inspect the relief valve and lift the lever to verify flow at least annually or as recommended on the warning tag of the valve.

WARNING

Before manually operating the pressure relief valve, ensure the discharge piping is directed to a suitable place of disposal to avoid a potential scald hazard. The discharge piping must be full size without restriction and installed to permit complete drainage of both the valve and line.

If after closing the valve, the valve fails to seat properly or continually weeps, replace the relief valve. Ensure the cause of the relief valve to weep is the valve itself, not due to system over-pressurization caused by an expansion tank that is waterlogged or undersized.

Inspection of Ignition Electrode

Remove the ignition electrode from the burner mounting plate.

Remove any white oxides accumulated on the electrode using fine grit sandpaper or steel wool. If the electrode does not clean to a satisfactory condition, replace the ignitor.

When replacing the ignition electrode, ensure the gasket is in good condition and correctly positioned, replace gasket if necessary.

Check Ignition Wiring and Ground Wiring

Inspect the burner wiring from the burner control module to the ground terminal behind the control panel.

Ensure wiring is in good condition and securely connected.

Check ground continuity of the wiring to the boiler jacket or piping using a continuity meter.

Replace and correct ground wire if ground continuity is not completed and satisfactory.

Check Expansion Tank

Refer to Section IV - Boiler Piping for recommended location of the expansion tank and air eliminators.

Closed -Type Tank:

- Ensure tank is partially filled with water leaving an air gap as a cushion. Refer to the manufacturer's instruction for proper fill level.
- Ensure the tank is fitted with a device that reduces gravity circulation of air-saturated tank water back into the system. This device prevents air from bubbling up through the water as it returns from the system.
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Inspection of Ignition Electrode

Remove the ignition electrode from the burner mounting plate.

Remove any white oxides accumulated on the electrode using fine grit sandpaper or steel wool. If the electrode does not clean to a satisfactory condition, replace the ignitor.

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Check Ignition Wiring and Ground Wiring

Inspect the burner wiring from the burner control module to the ground terminal behind the control panel.

Ensure wiring is in good condition and securely connected.

Check ground continuity of the wiring to the boiler jacket or piping using a continuity meter.

Replace and correct ground wire if ground continuity is not completed and satisfactory.

Check Control Wiring

Inspect all control wiring. Ensure wiring is in good condition and properly connected.

Check Control Settings

1. Set the control display to PARAMETER mode and check all boiler settings. Adjust setting as necessary see page 47.
2. Check any external limit control settings (if used). Adjust settings as necessary.

Perform Start-up and Checkout Procedures

Start the unit and perform the start-up procedure as listed in this manual.

Verify the cold water fill pressure is correct and the operating pressure of the boiler is within normal operating range.

Complete the checkout procedures as referenced in this manual.

Check Burner Flame

Inspect the burner flame through the observation port on the heat exchanger.

If flame pattern is not fully blue and covers the entire burner surface during high fire, shut the unit down and allow it to cool thoroughly before disassembly.

Close the external manual gas valve on the gas supply line and disconnect the gas piping and rectifier plug.

Disconnect the wiring harness connectors from the blower and remove the blower retaining screws or nuts. Remove the blower from the unit.

Remove the mounting nuts securing the burner mounting plate to the heat exchanger and set aside.

Carefully remove the burner mounting plate assembly from the heat exchanger. Ensure combustion chamber insulation is not damaged during removal of burner mounting plate assembly. See WARNING on page 64.

Remove the burner head mounting screws and remove the burner head. Inspect the burner head for deterioration. Use compressed air or a vacuum to clean the burner head.

Remove the venturi and gas valve assembly from the blower.

Use a vacuum cleaner or compressed air to clean the interior of the blower assembly. Inspect the blower blades to ensure they are clean and not damaged.

Re-assemble the venturi and gas valve onto the blower. Ensure the venturi gasket is in good condition, positioned correctly and replace gasket if necessary.

Re-assemble the burner head onto the burner mounting plate. Ensure the burner head gasket is in good condition, positioned correctly and replace gasket if necessary.

Re-assemble the burner mounting plate assembly onto the heat exchanger. Ensure the burner plate gasket and combustion chamber insulation is in place and not damaged, replace gasket and insulation if necessary. See WARNING on page 64.

Re-assemble the blower onto the burner mounting plate and reconnect the wiring harness connectors.

Re-assemble the gas supply connection and rectifier to gas valve. Open the external manual gas valve. Check gas piping for any leaks as outlined on page 41 and repair if necessary. Place the unit back into service.

Check Flame Signal

The flame signal can be read from item E of the information mode. It should be a min. 3µ A –DC.

Check the ignitor for fouling or damaged insulation if a low flame signal is read.

Check ground wiring and continuity as a cause for low flame signal. Replace ignitor if conditions are satisfactory.

Check Combustion Levels

Refer to page 41 of this manual for measuring combustion levels and burner adjustments.

Check Flue Gas Temperature

1. Adjust the boiler to fire at HIGH fire, see page 45. Place the control display to INFORMATION mode, see page 47 for procedures.
2. The flue gas temperature is indicated on the display when the first digit is 5. The measured temperature (shown as the last 3 digits) should not be more than 54°F higher than the measured supply water temperature.
3. The measured supply water temperature is indicated on the information display when the first digit is 1 and the temperature shown as the last 3 digits.
4. If the measured flue gas temperature is higher than 54°F over the supply water temperature, shut the boiler down and follow the procedures listed below to clean the heat exchanger.

Clean Heat Exchanger

1. Shut down the boiler:
   - Follow the instructions on Page 42 "To Turn Off Gas to Appliance"
   - Do not drain the boiler unless the boiler will be subject to freezing conditions.
   - Do not drain the boiler if freeze protection fluid is used in the system.
2. Allow the boiler to cool down to room temperature before servicing.
3. Disconnect the gas piping and rectifier plug to the gas valve.
4. Disconnect the wiring harness connectors from the blower and remove the blower retaining screws or nuts. Remove the blower from the unit.
5. Remove the mounting nuts securing the burner mounting plate to the heat exchanger and set aside.
6. Carefully remove the burner mounting plate assembly from the heat exchanger. Ensure combustion chamber insulation is not damaged during removal of burner mounting plate assembly. See WARNING on page 64.
7. Carefully remove the combustion chamber insulation from the heat exchanger and set aside. See WARNING on page 64.
8. Use a vacuum cleaner, compressed air or water to remove any accumulation from the heat exchanger flue ways. Do not use any solvent.
9. Re-install the combustion chamber insulation onto the heat exchanger.
10. Re-assemble the burner mounting plate assembly onto the heat exchanger. Ensure the burner plate gasket and combustion chamber insulation is in place and not damaged, replace gasket and insulation if necessary. See WARNING on page 64.
11. Re-assemble the blower onto the burner mounting plate and reconnect the wiring harness connectors.
12. Reconnect the gas piping and rectifier to gas valve. Check for leaks, repair if necessary.
13. Close isolation valves on the boiler water piping to isolate the boiler from the heating system.

14. Attach a hose to the boiler drain valve and flush the boiler thoroughly with fresh water by using the purge valves to allow water to enter through the make-up water line to the boiler.
15. Once the boiler has been completely flushed, return the boiler and system piping back to operation.
16. Perform the required startup and checkout procedures as outlined on pages 37 to 57.

Review With Owner

Ensure the owner understands the importance to perform the maintenance schedule specified in this manual.

Remind the owner of the importance to call a licensed contractor should the unit or system exhibit any unusual behavior.

Handling Previously Fired Combustion Chamber Insulation

WARNING

The combustion chamber insulation contains ceramic fibers, which are classified as a possible human carcinogen. When exposed to extremely high temperatures, the ceramic fibers, which contain crystalline silica, can be converted into cristobalite.

Avoid Breathing and Contact with Skin and Eyes

When removing or repairing the combustion chamber insulation follow these precaution measures:

1. Use a NIOSH approved respirator which meets OSHA requirements for cristobalite dust, similar to N95. Contact NIOSH at 1-800-356-4676 or on the web at www.cdc.gov/niosh for latest recommendations.
2. Wear long sleeved, loose fitting clothing, gloves and eyes protection.
3. Assure adequate ventilation.
4. Wash with soap and water after contact.
5. Wash potentially contaminated clothes separately from other laundry and rinse washing machine thoroughly.
6. Discard used insulation in an air tight plastic bag.

NIOSH Stated First Aid:
Eye/Skin: Immediately irrigate
Breathing: Clean fresh air

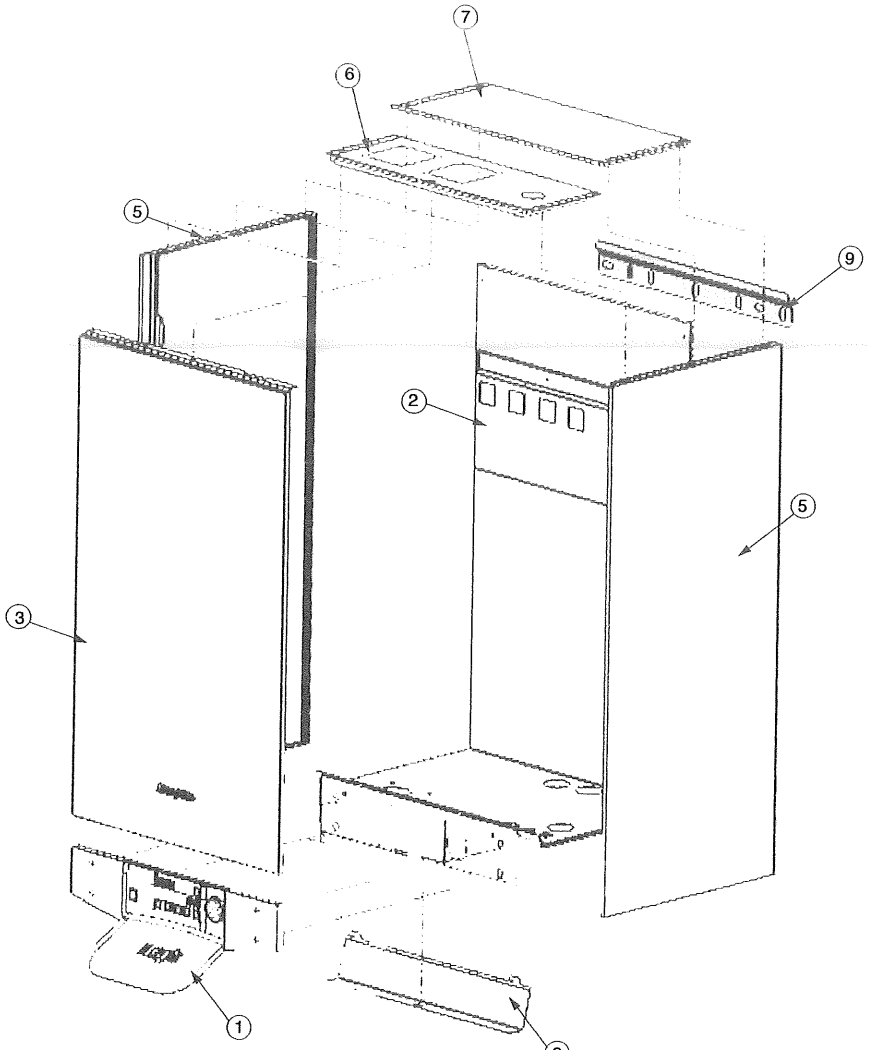


Fig. 26: PRESTIGE Solo Jacket Components

Item	Part # PRESTIGE Solo 60	Part # PRESTIGE Solo 175/250	Part # PRESTIGE Solo 399	Description
1	PSCS01			Display/Control Panel
1A	--	--	PSCS02 (Left) PSCS03 (Right)	Display/Control Panel Extensions (Not Shown)
2	PSJKT01B	PSJKT03B	PSJKT04B	Base Panel
3	PSJKT01F		PSJKT02F	Front Jacket Panel
5	PSJKT02S		PSJKT03S	Side Jacket Panel (Left and Right)
6	PSJKT01T	PSJKT03T	PSJKT05T	Top Jacket Panel
7	PSJKT02T	PSJKT04T	PSJKT06T	Top Jacket Access Panel
8	PSJKT03		PSJKT04	Control Cover Panel
9	PSRKIT21			Wall Mounting Bracket with Hardware

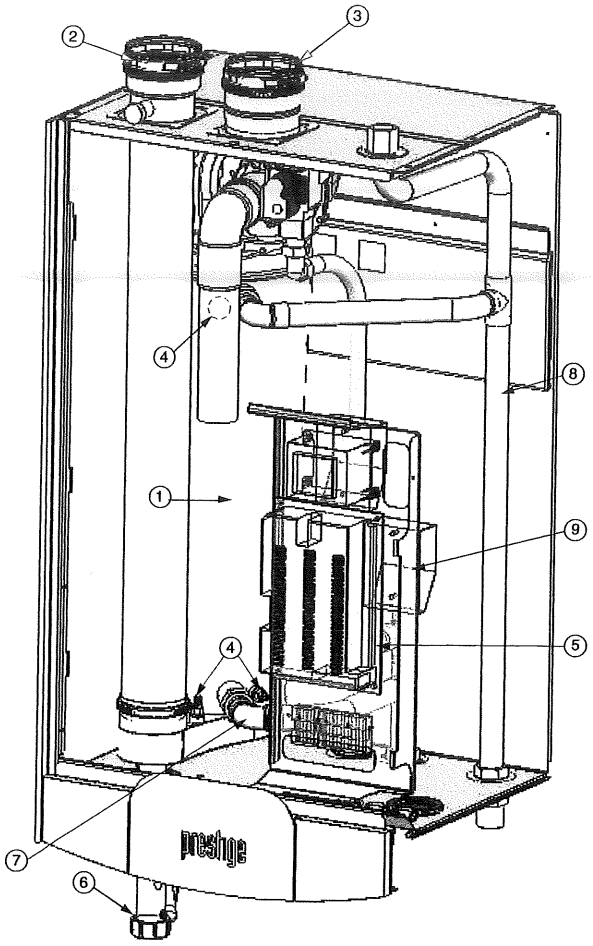


Fig. 27: PRESTIGE Solo 60 Internal Components

Item	Part No.	Description
1	PSRKIT01	Heat Exchanger Body
2	PSRKIT02	Vent Outlet Adapter
3	PSRKIT03	Combustion Air Inlet Adapter
4	PSRKIT04	NTC Sensor (NTC1, NTC2 and NTC5)
5	PGRKIT20	LWCO Pressure Device
6	PSRKIT05	Condensate Drain Assembly
7	PSRKIT06	Boiler Piping - Return Assembly
8	PSRKIT52	Boiler Piping - Supply Assembly
9	PSRKIT17	Pressure Gauge and Fitting

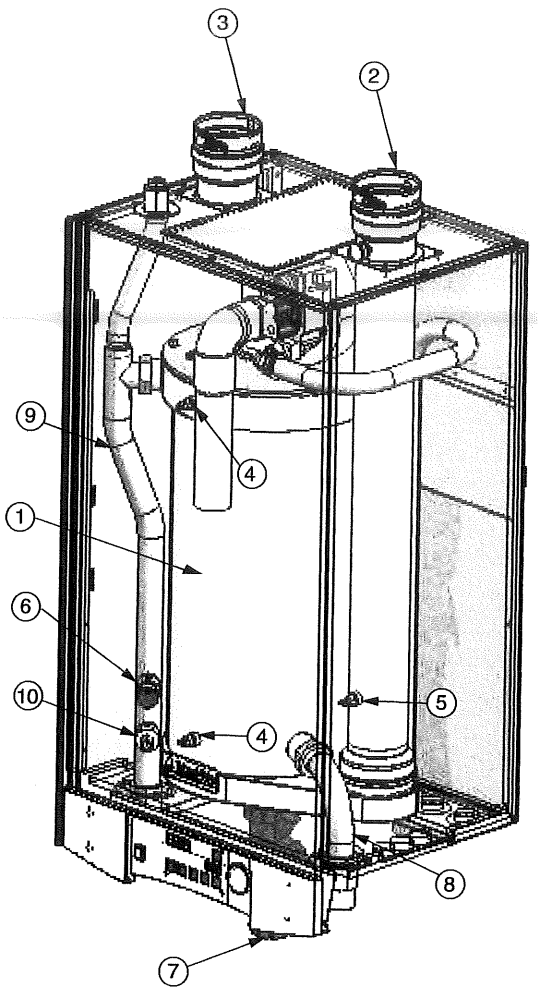


Fig. 27A: PRESTIGE Solo 175/250 Internal Components

Item	Part No. PRESTIGE Solo 175/250	Description
1	PSRKIT25	Heat Exchanger Body Solo 175
	PSRKIT26	Heat Exchanger Body Solo 250
2	PSRKIT27	Vent Outlet Adapter
3	PSRKIT03	Combustion Air Inlet Adapter
4	PSRKIT04	Supply & Return NTC Sensor (NTC1, NTC2)
5	PSRKIT34	Flue NTC Sensor (NTC5)
6	PGRKIT20	LWCO Pressure Device
7	PSRKIT05	Condensate Drain Assembly
8	PSRKIT28	Boiler Piping - Return Assembly
9	PSRKIT29	Boiler Piping - Supply
10	PSRKIT17	Pressure Gauge and Fitting

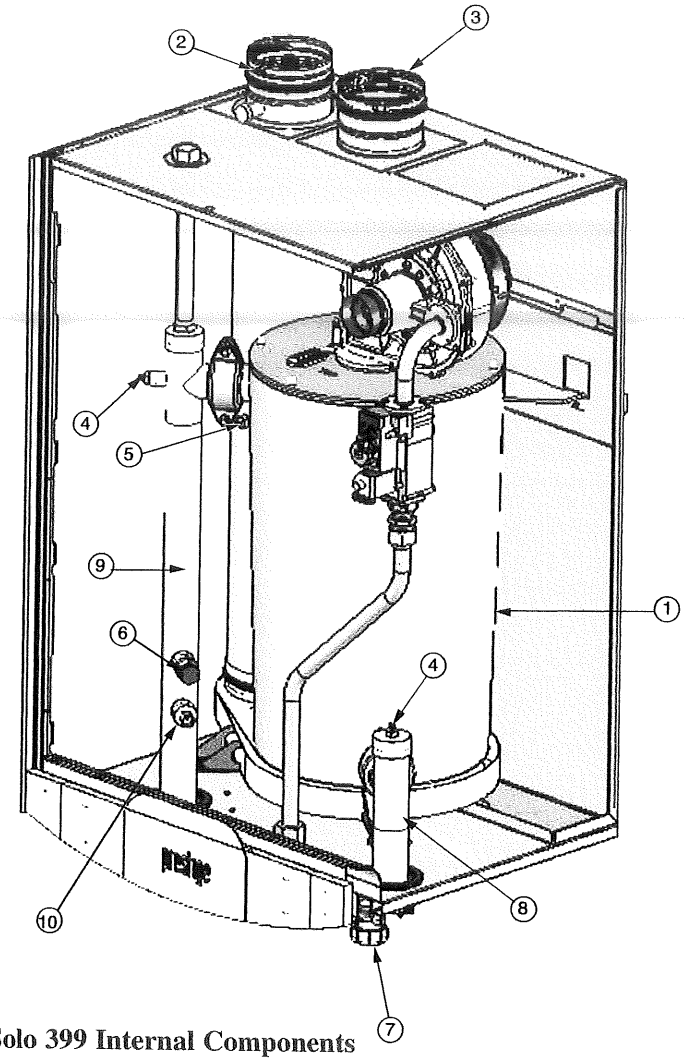


Fig. 27B: PRESTIGE Solo 399 Internal Components

Item	Part No. PRESTIGE 399	Description
1	PSRKIT44	Heat Exchanger Body
2	PSRKIT45	Vent Outlet Adapter
3	PSRKIT46	Combustion Air Inlet Adapter
4	PSRKIT47	Supply & Return NTC Sensor (NTC1, NTC2)
5	PSRKIT34	Flue NTC Sensor (NTC5)
6	PGRKIT20	LWCO Pressure Device
7	PSRKIT05	Condensate Drain Assembly
8	PSRKIT48	Boiler Piping - Return Assembly
9	PSRKIT49	Boiler Piping - Supply Assembly
10	PSRKIT17	Pressure Gauge and Fitting

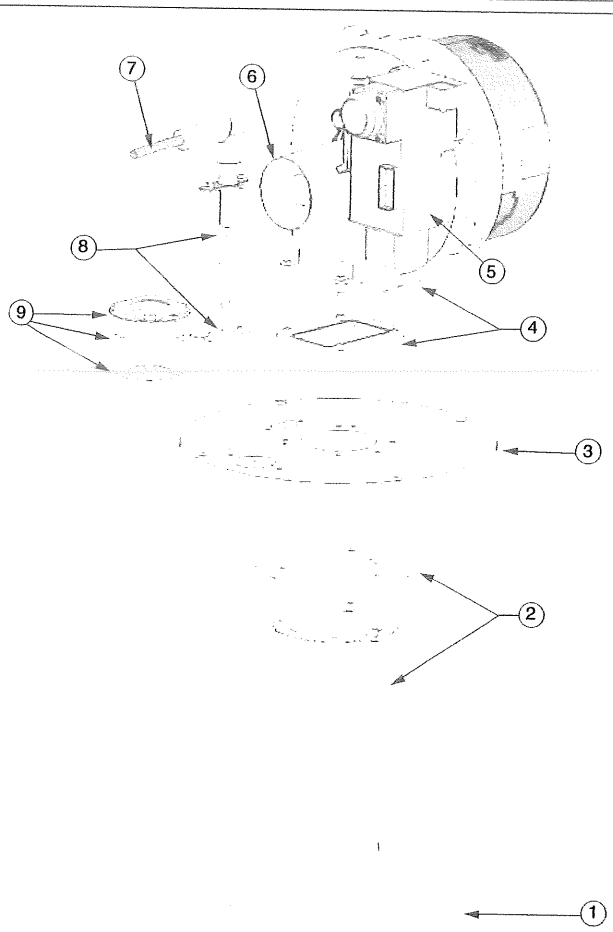


Fig. 28: PRESTIGE Solo 60/175/250 Burner Components

Item	Part No. PRESTIGE Solo 60	Part No. PRESTIGE Solo 175/250	Description
1	PSRKIT09	PSRKIT30	Combustion Chamber Insulation
2	PSRKIT11	PSRKIT31	Burner Head with Gasket
3	PSRKIT12	PSRKIT32	Burner Plate
4	PSRKIT55	PSRKIT13	Blower with Gasket
5	PGRKIT01		Gas Valve
6	--		Venturi - 055 (Solo 60) - 052 (Solo 175) - 051 (Solo 250)
7	PSRKIT14		Ignition Cable
8	PSRKIT15		Igniter with Gasket
9	PSRKIT16		Sight Glass Assembly (Glass, Gasket and Bracket)
10	--		Propane Orifice- Not Shown
11	--		Burner Plate Gasket - Not Shown
12	PGRKIT15		Gas Valve Rectifier Plug - Not Shown

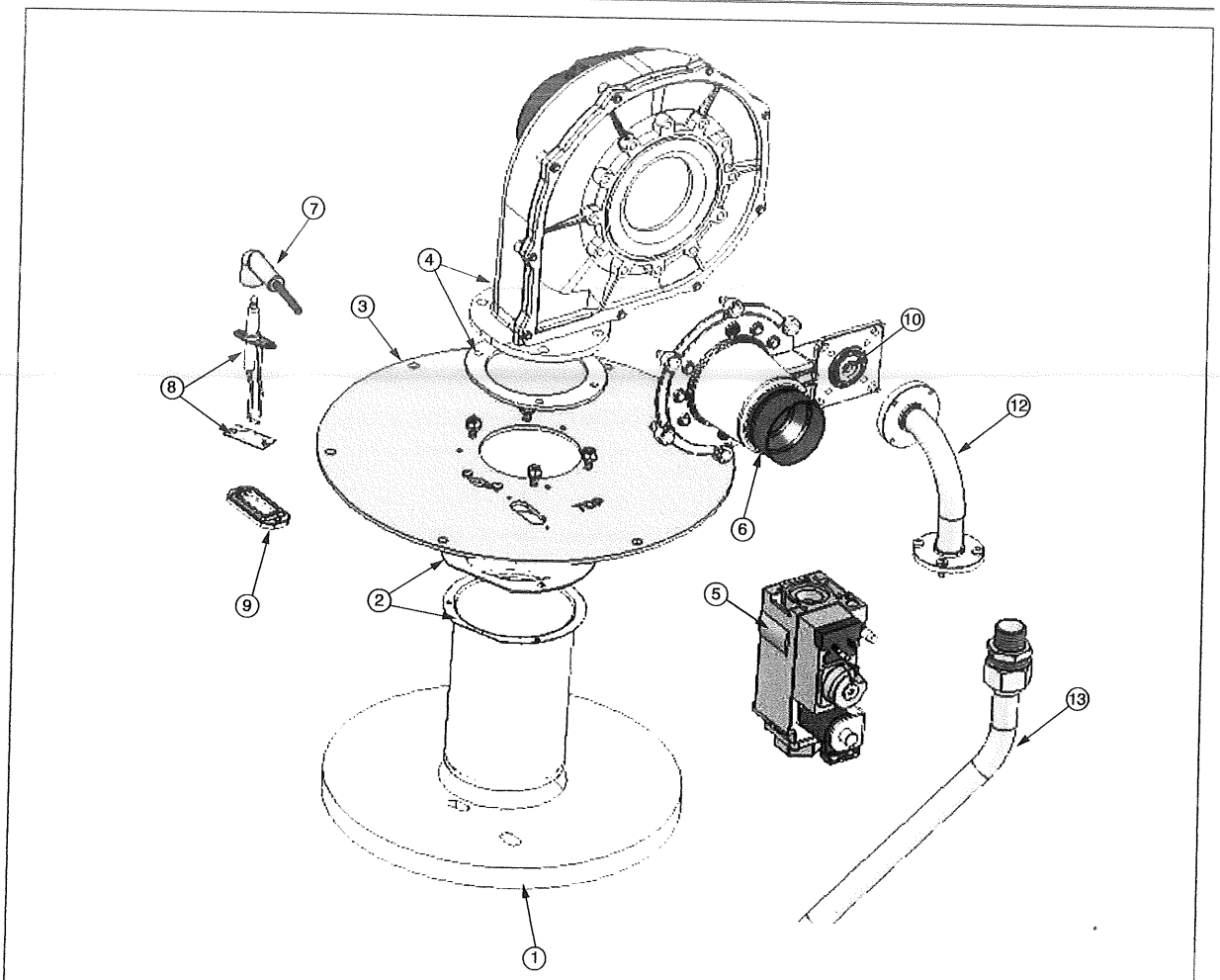


Fig. 28A: PRESTIGE Solo 399 Burner Components

Item	Part No. PRESTIGE Solo 399	Description
1	PSRKIT37	Combustion Chamber Insulation
2	PSRKIT38	Burner Head with Gasket
3	PSRKIT39	Burner Plate
4	PSRKIT40	Blower with Gasket
5	PSRKIT41	Gas Valve
6	--	Venturi -
7	PSRKIT14	Ignition Cable
8	PSRKIT15	Igniter with Gasket
9	PSRKIT16	Sight Glass Assembly (Glass, Gasket and Bracket)
10	--	Propane Orifice - Not Shown
11	--	Burner Plate Gasket - Not Shown
12	PSRKIT42	Gas Valve Piping
13	PSRKIT43	Gas Supply Piping

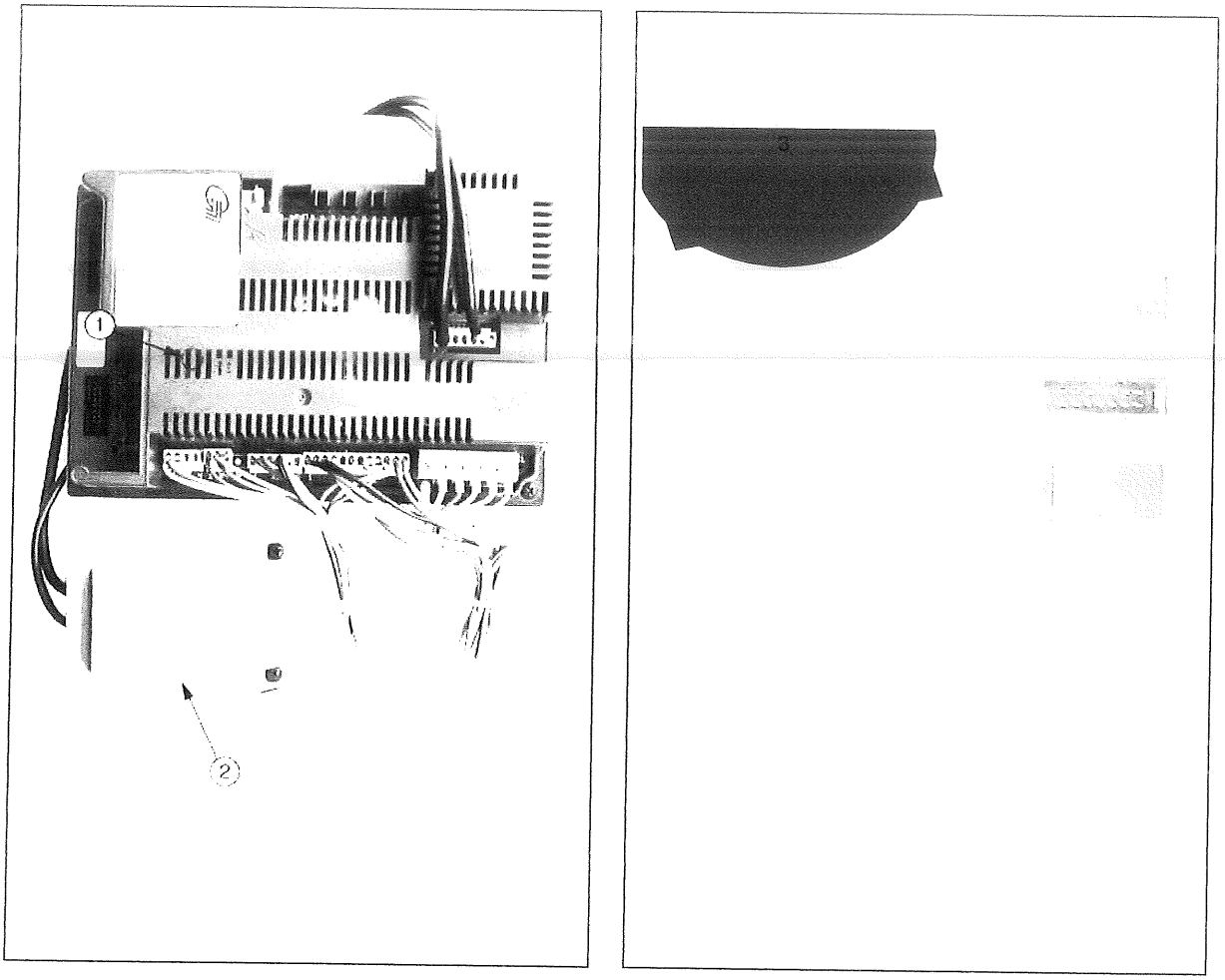
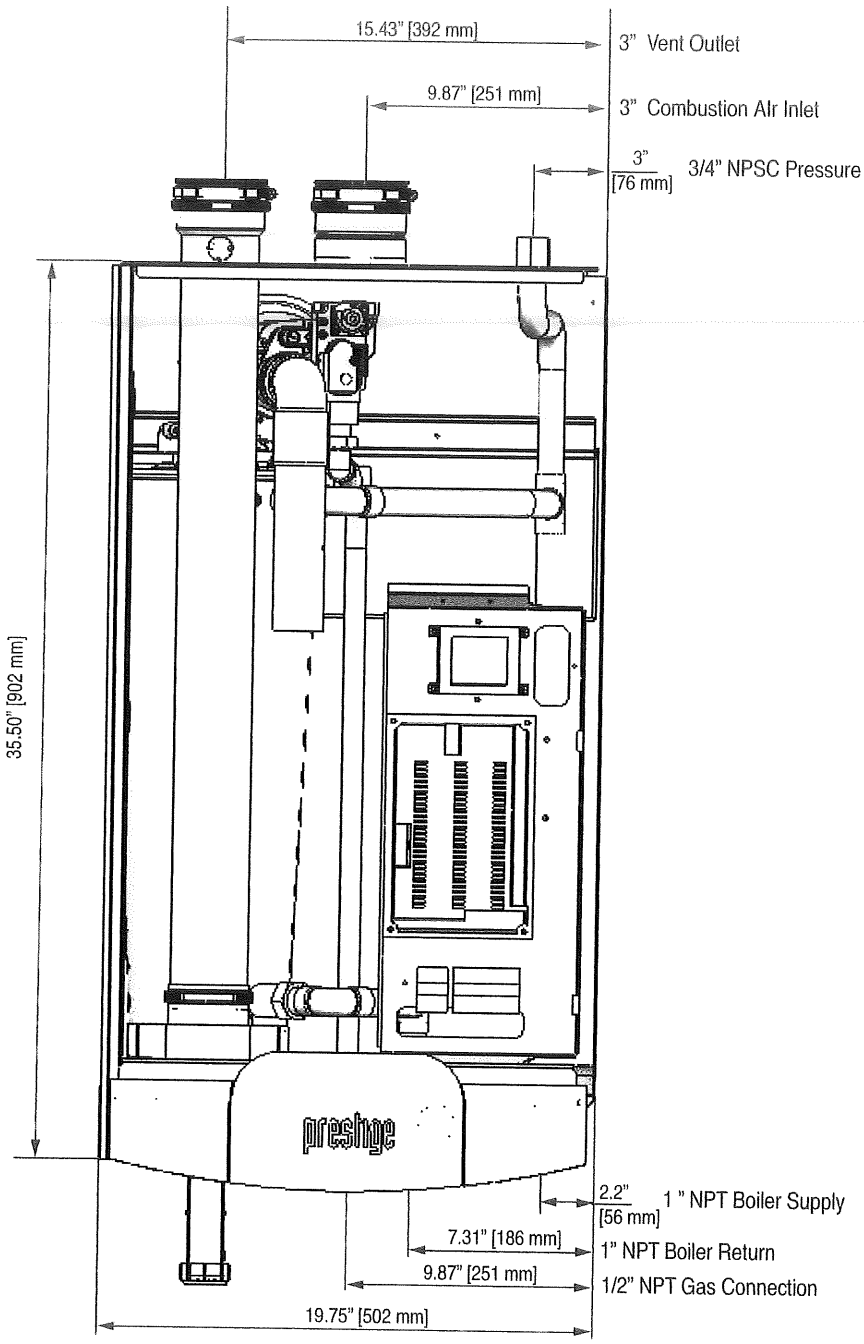
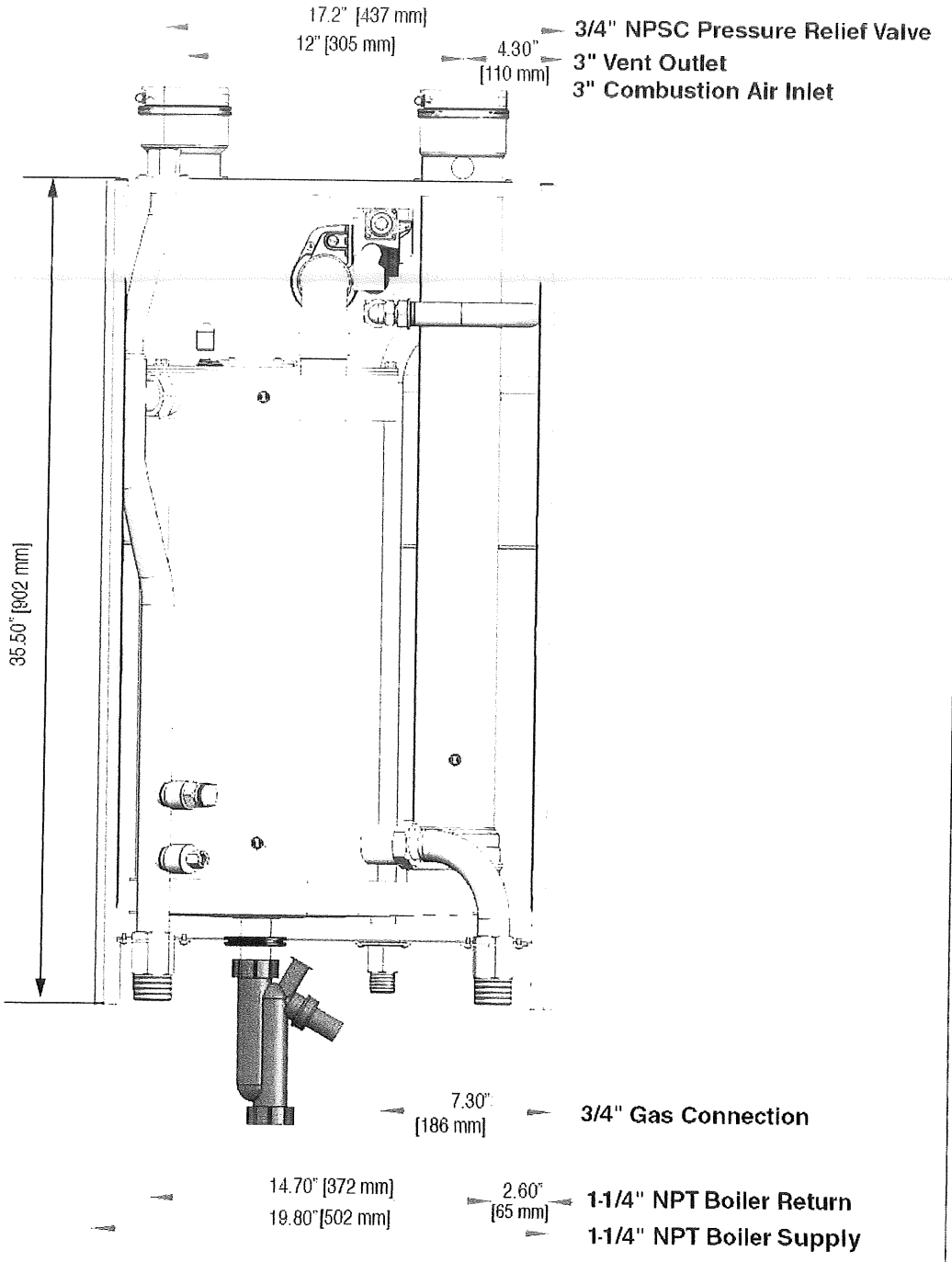


Fig. 29: PRESTIGE Solo Electronic Components

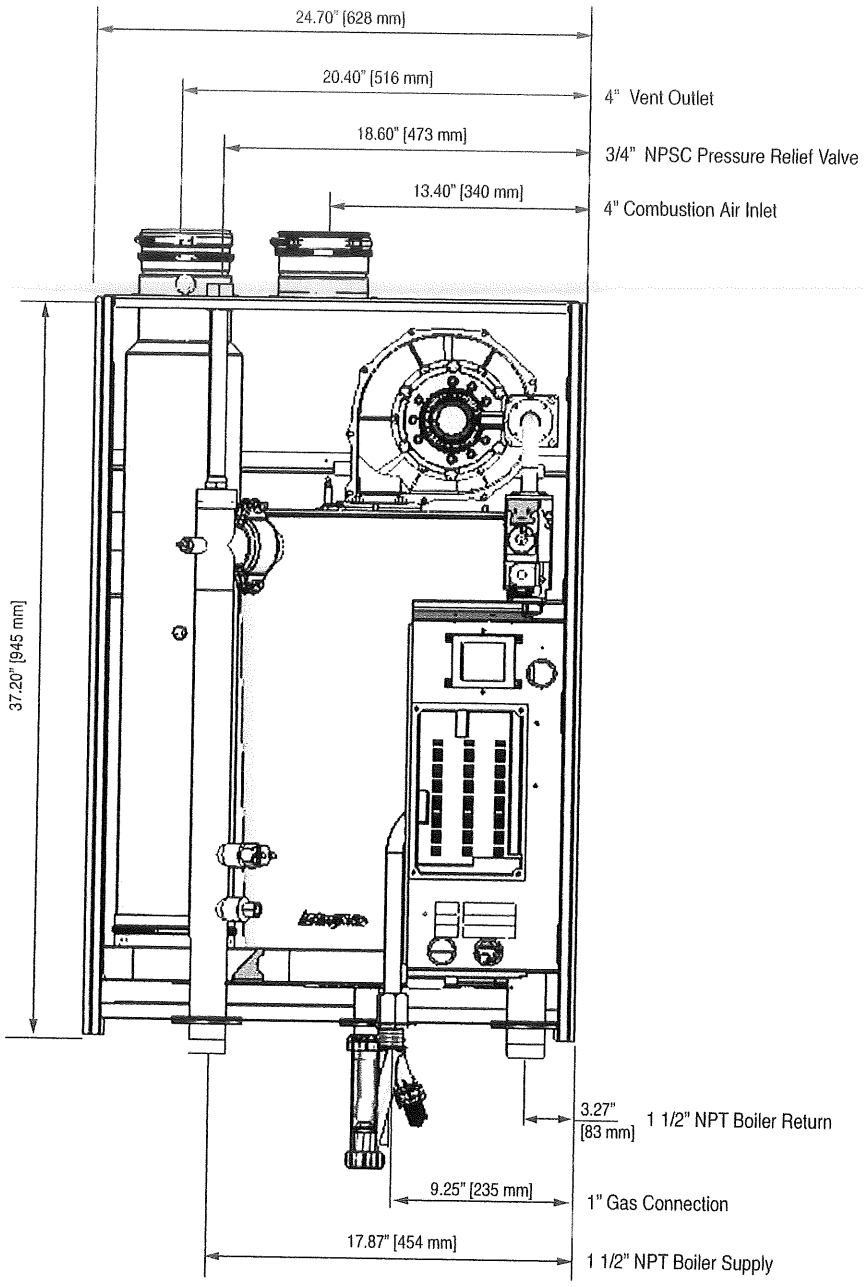
Item	Part No.	Description
1	PSRKIT50	Prestige Control Module
2	PSRKIT19	Transformer with Surge Protection
3	PSRKIT20	Prestige Control Module Display



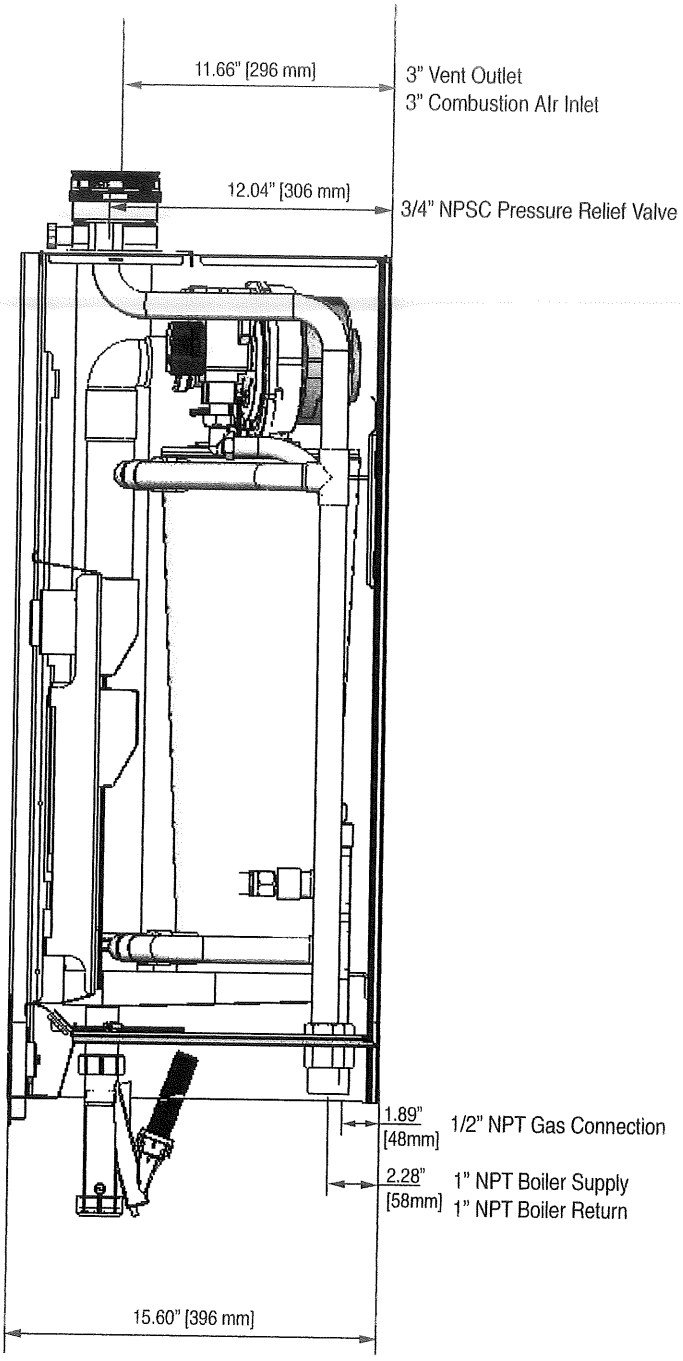
Front View PRESTIGE Solo 60



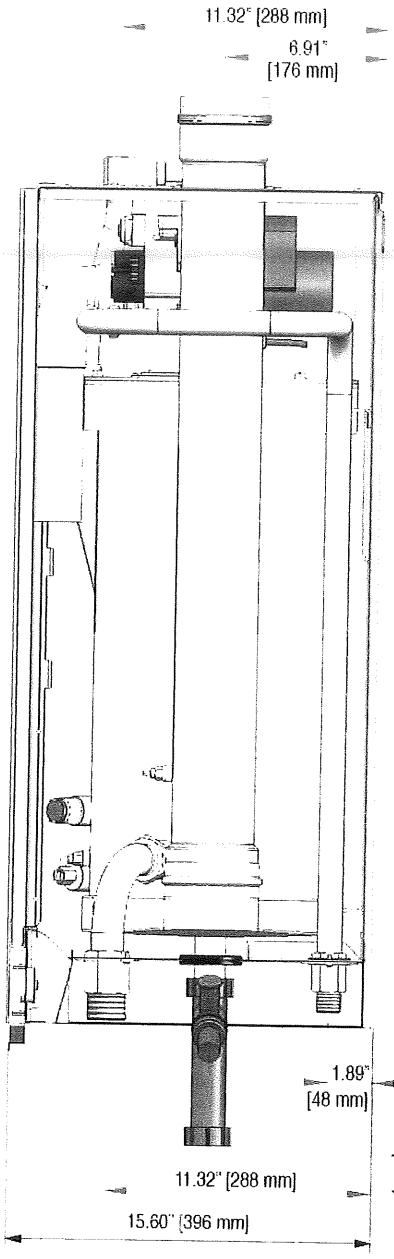
Front View PRESTIGE Solo 175/250



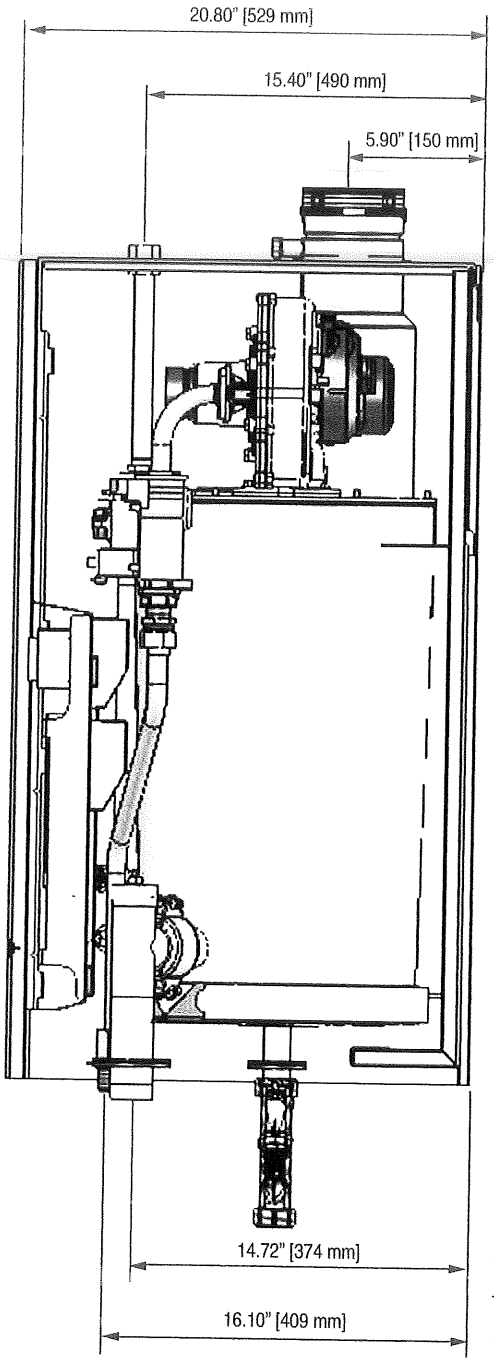
Front View PRESTIGE Solo 399



Side View PRESTIGE Solo 60



Side View PRESTIGE Solo 175/250



Side View PRESTIGE Solo 399

SOLO 60	Natural	60,000	54,000	47,000	95%	95 / 43
	Propane				95%	95 / 43
SOLO 175	Natural	170,000	154,000	134,000	95%	131 / 60
	Propane				95%	131 / 60
SOLO 250	Natural	245,000	223,000	194,000	95%	142 / 65
	Propane				95%	142 / 65

SOLO 399	Natural	399,000	379,000	330,000	94.1%	95.1%	225 / 102
	Propane						

Note 1: The heating capacity of the PRESTIGE Solo 60/175/250 is based on the test requirements of the U.S. Department of Energy.

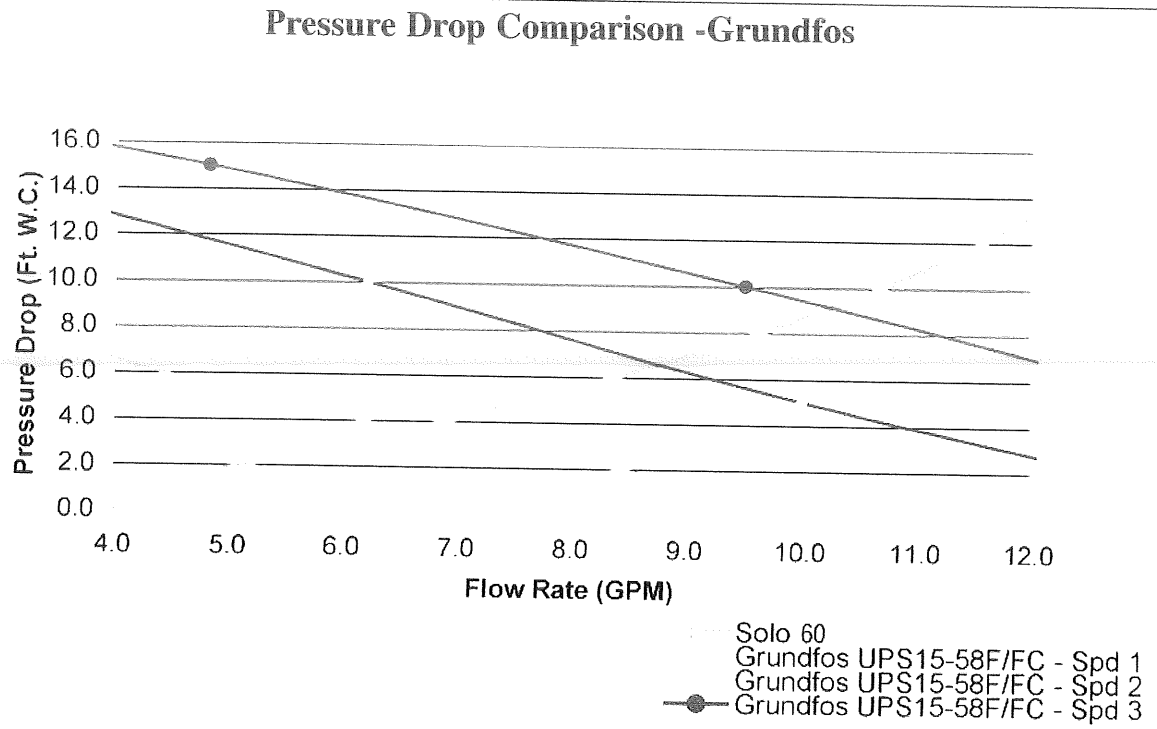
Note 2: The IBR rating is based on a piping and pick up allowance of 1.15. This allowance should be sufficient for the standard radiation requirements for a building load.

Note 3: Based on the given AFUE the PRESTIGE Solo 60/175/250 meets the energy efficiency guidelines established by Energy Star.

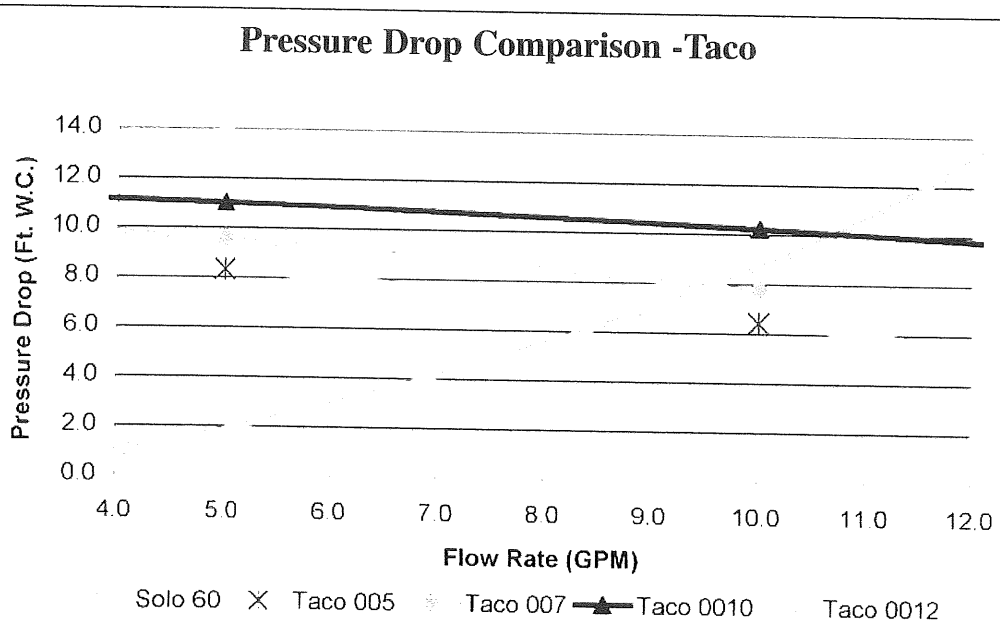
Note 4: Input and output ratings are shown for sea level applications. The PRESTIGE Solo automatically derates the input at approximately 2% for every 1,000 Ft. of altitude. No alterations to the boiler or burner system is required.

Note 5: PRESTIGE Solo 399 output rating is based off of the thermal efficiency.

DOE ENERGY STAR H I=B=R C ETL LISTED US

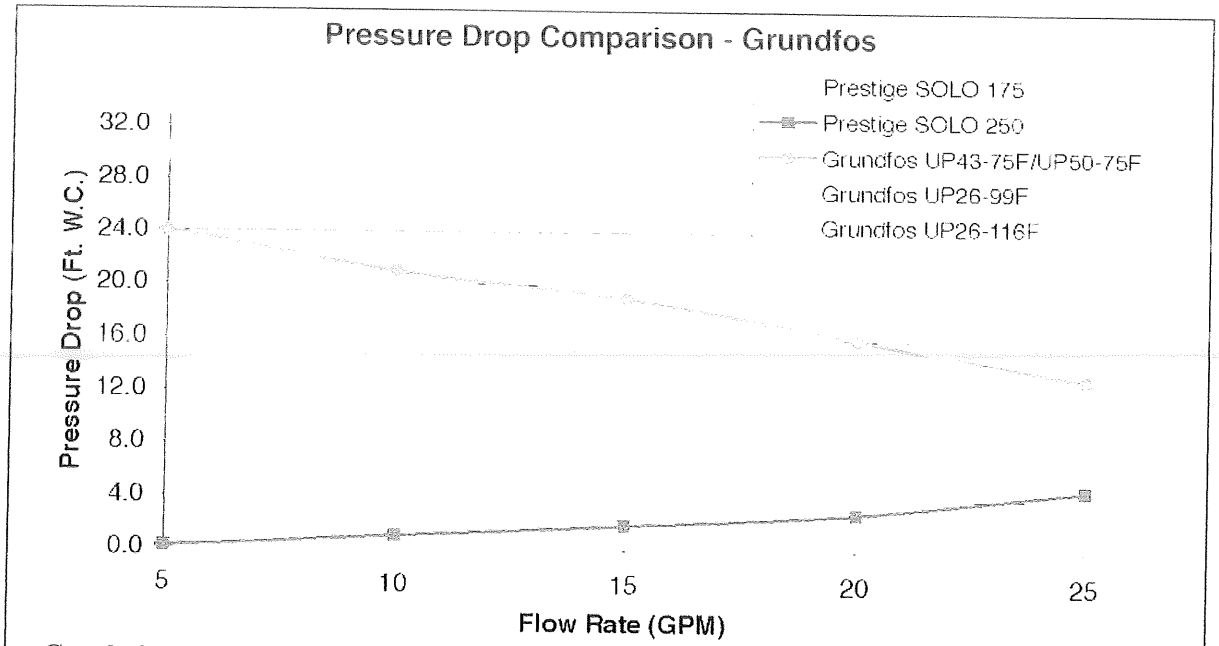


Graph 2: Pressure Loss Through Boiler-Grundfos Circulator

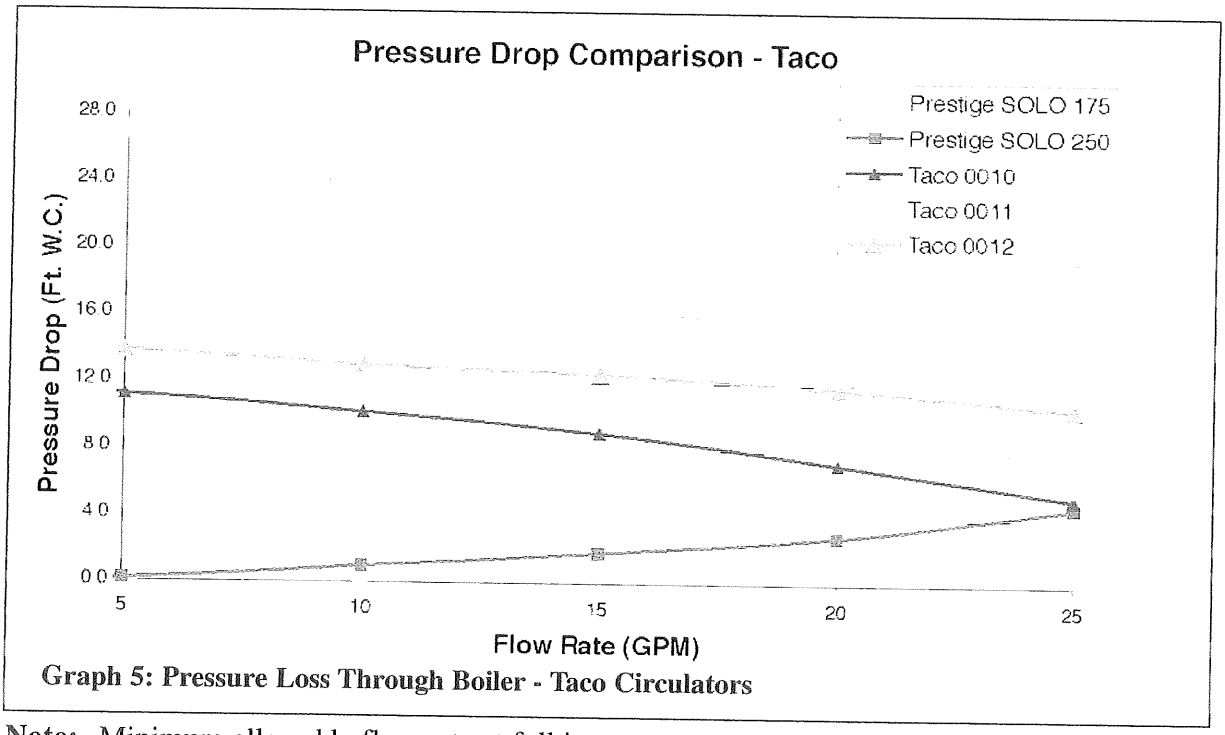


Graph 3: Pressure Loss Through Boiler-Taco Circulators

Note: Minimum allowable flow rate at full input:
- 3 gpm SOLO 60



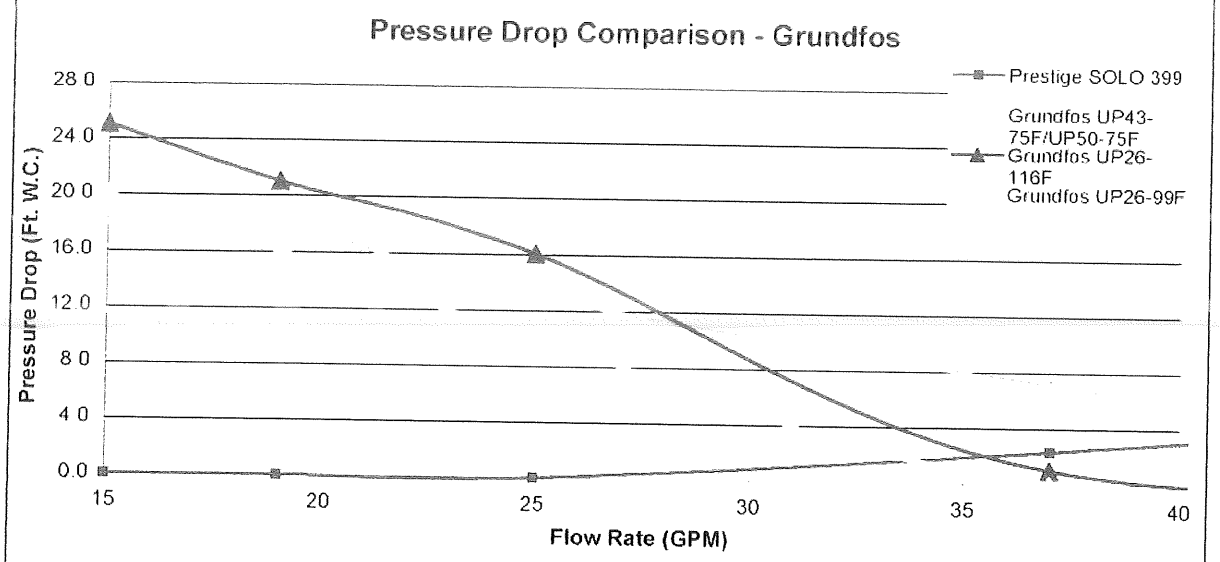
Graph 4: Pressure Loss Through Boiler - Grundfos Circulators



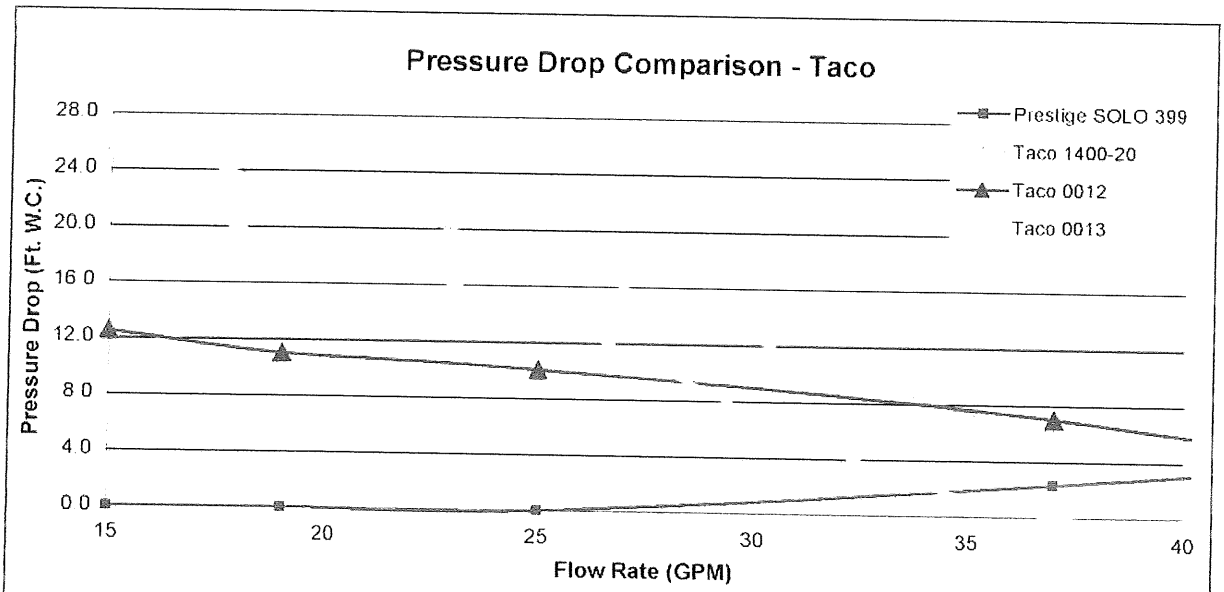
Graph 5: Pressure Loss Through Boiler - Taco Circulators

Note: Minimum allowable flow rate at full input:

- 8 gpm SOLO 175
- 12 gpm SOLO 250



Graph 6: Pressure Loss Through Boiler - Grundfos Circulators



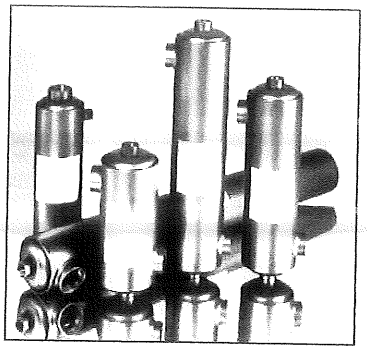
Graph 7: Pressure Loss Through Boiler - Taco Circulators

Note: Minimum allowable flow rate at full input:

- 19 gpm SOLO 399

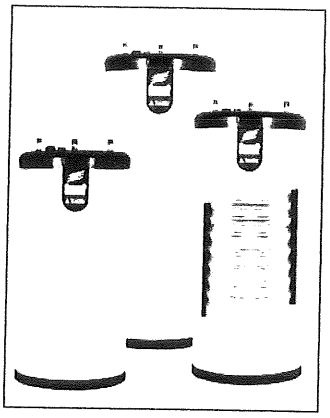
Additional quality water heating equipment available from Triangle Tube

Maxi-Flo and Spa Heat Exchangers



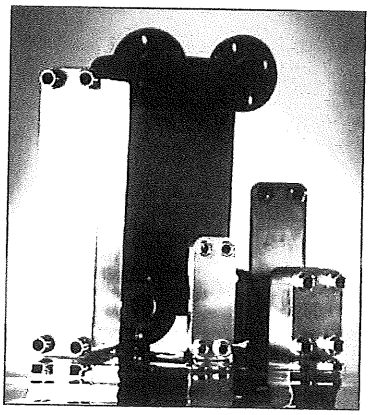
- Construction of high quality corrosion resistant stainless steel (AISI 316) or titanium
- Specially designed built-in flow restrictor to assure maximum heat exchange
- Compact and light weight
- Available in 5 sizes that can accommodate any size pool or spa

SMART Indirect Fired Water Heaters



- Exclusive Tank-in-Tank design
- Stainless steel construction
- Available in 8 sizes and 2 models
- Limited LIFETIME residential warranty
- 15 year limited commercial warranty
- Self cleaning/self descaling design

TTP Brazed Plate Heat Exchangers



- For domestic water, snow melting, radiant floor, refrigeration
- Plates made of stainless steel, with a 99.9 % copper and brazed, ensuring a high resistance to corrosion
- Self cleaning and self descaling
- Computerized sizing available from Triangle Tube/Phase III
- Available in capacities from 25,000 BTU/hr to 5,000,000 BTU/hr

CERTIFIED ISO 9001 2000 STANDARD

Triangle

Freeway Center - 1 Triangle Lane - Blackwood, NJ 08012
Tel: (856) 228 8881 - Fax: (856) 228 3584
http://www.triangle tube.com
E-mail: Info@triangle tube.com

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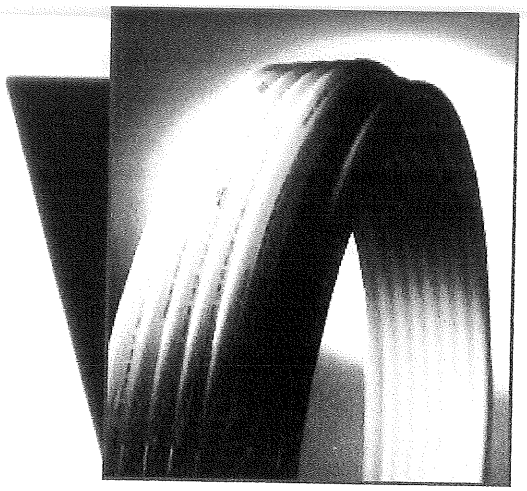
Fittings
Brass Insert Fittings
PAL Insert Fittings
MANABLOC

HVAC&R
HRH
Other Applications

Tech Support
FAQ's
Code Approvals
Standards & Listings

Material



CANPEX™ *OXY* tubing is ideally suited for HRH applications. Its light weight and flexibility make installation of hydronic heat exchanger loops fast and easy.

For in-slab systems, CANPEX™ *OXY* tubing is simply attached directly to the reinforcement mesh. For under-floor (staple-up) and above-floor (suspended floor with or without poured topping) the tubing is attached to the flooring with tubing clamps or heat transfer plates.

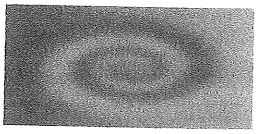
CANPEX™ *OXY* tubing is manufactured to nationally recognized industry standards (ASTM F876 and F877). CANPEX™ *OXY* tubing is available in both standard, non-barrier and premium oxygen barrier* versions. Both tubing types are approved for conveyance of potable water in the event that the hydronic heating system will be connected to the drinking water system.

CANPEX™ *OXY* is available in 3/8" through 1" sizes. Common tubing sizes are 1/2" for residential applications and 3/4" for commercial and snow-melt systems. Supply/return transfer lines use the 3/4" and 1" sizes.

* Oxygen barrier tubing is used for those hydronic applications where the total amount of oxygen ingress into the system must be limited. Barrier tubing may be required by water heating unit manufacturer. For a more detailed discussion of oxygen barrier tubing see the Vanguard Pipe & Fittings Ltd. Hydronic Radiant Heating System Installation Instructions.

Tour

Top of Page



ASSOCIATED DESIGN PARTNERS INC.

Transmittal Note

1

To:

Jeanie Bourke
Planning & Urban Development
389 Congress St., Room 308
Portland, ME 04101

Reply to:

Assoicated Design Partners, Inc
80 Leighton Road
Falmouth, Maine 04105
tel. (207) 878-1751 fax. (207) 878-1788
email. adp@adpengineering.com

These documents are issued to you for:	
Progress	
Comment	
Approval	
Information	
Construction	x
Records	
As noted	
Revision Purposes	
Client Review	
Bidding	

Job Title:	**Brooklawn Cemetary**
ADP Job #	**09314**

Remarks:

211-A-001

Drawing / Document No.	Revision	No. of Copies		Date	Title / Description	Comments
		Prints	Repros			
			1	1/18/2010	Special Inspection Package	

Copies have been forwarded for information as follows:

Complete Sets	No.	Transmittal Note Only

Issued By: Aaron Wilson/Betsy

Date 1/18/2010

RECEIVED
JAN 20 2010
Dept. of Building Inspections
City of Portland Maine

STATEMENT OF SPECIAL CONSTRUCTION MONITORING

PROJECT: **STORAGE BUILDING**
Brooklawn Memorial Park, Portland, Maine

PERMIT APPLICANT: **Jim Biskup – Biskup Construction**
APPLICANT'S ADDRESS: **16 Danielle Dr, Windham, ME 04062**

STRUCTURAL ENGINEER OF RECORD
Foundations: **Associated Design Partners, Inc**
Pre-Fabricated Steel Building: **Package Industries, Inc.**

CONTRACTOR: **Biskup Construction**

This Statement of Special Construction Monitoring is submitted as a condition for building permit issuance in accordance with Section 1704.0 of the 2003 International Building Code. It includes the Schedule of Special Construction Monitoring and Testing as applicable to this project. Also included is a listing of agents and other approved agencies to be retained for conducting the monitoring and testing applicable to this project.

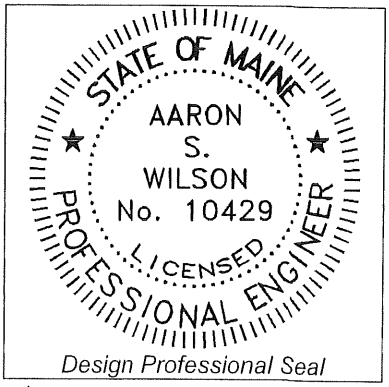
The Special Construction Monitoring Coordinator shall keep records of all observations listed herein, and shall furnish field reports to the Registered Design Professional of Record. All discrepancies shall be brought to the immediate attention of the Contractor for correction, and to the Registered Design Professional of Record. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the Registered Design Professional of Record. Interim reports shall be submitted to the Registered Design Professional of Record monthly, unless more frequent submissions are requested.

The Special Construction Monitoring program does not relieve the Contractor of his or her responsibilities. Job site safety is solely the responsibility of the Contractor. Materials and activities covered under the monitoring schedule are not to include the Contractor's equipment and methods used to erect or install the materials listed.

Prepared by:

Aaron S. Wilson
(type or print name)

Signature 1/13/10 Date



Design Professional Seal

Owner's Authorization:

Signature Date

Building Official's Acceptance:

Signature Date

SPECIAL CONSTRUCTION MONITORING AGENTS

This Statement of Special Construction Monitoring / Quality Assurance Plan includes the following building systems:

- ☒ Soils and Foundations
- ☐ Cast-in-Place Concrete Retaining walls
- ☐ Precast Concrete
- ☐ Masonry
- ☒ Structural Steel
- ☐ Cold-Formed Steel Framing
- ☐ Spray Fire Resistant Material
- ☒ Wood Construction
- ☐ Exterior Insulation and Finish System
- ☐ Mechanical & Electrical Systems
- ☐ Architectural Systems
- ☐ Special Cases

AGENT	FIRM	CONTACT INFORMATION
1. Engineer of Record (Foundations & Wood Framing)	**Associated Design Partners**	**80 Leighton Rd** **Falmouth ME 04105** **Ph: 878-1751**
2. Special Construction Monitoring Coordinator	**Associated Design Partners**	**80 Leighton Rd** **Falmouth ME 04105** **Ph: 878-1751**
3. Field Monitor	**S.W. Cole**	**286 Portland Road** **Gray, ME 04039-9586** **P: (207) 657.2866**
4. Testing Agency	**S.W. Cole**	**286 Portland Road** **Gray, ME 04039-9586** **P: (207) 657.2866**
5. Engineer of Record (Pre-Fab Metal Building)	**Package Industries, Inc**	**15 Harback Rd** **Sutton, MA 01590** **PH. (508) 865-5871**

Note: The testing agency shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.

QUALITY ASSURANCE FOR LATERAL SYSTEMS

Quality Assurance for Seismic Requirements

Seismic Design Category	*B*
Quality Assurance Plan Required (Y/N)	*N*

If seismic design category C, and plan is not required, explain (see exceptions to 1705.1)

Description of seismic force resisting system and designated seismic systems:
Ordinary Steel Moment Frames, Ordinary Concentric Steel Braced Frames.

Quality Assurance for Wind Requirements

Basic Wind Speed (3 second gust)	*94MPH*
Quality Assurance Plan Required (Y/N)	*N*

Description of wind force resisting system and designated wind resisting components:
Ordinary Steel Moment Frames, Ordinary Concentric Brace Frames at metal building.

Statement of Responsibility

Each contractor responsible for the construction or fabrication of a system or component designated above must submit a Statement of Responsibility in accordance with section 1705.3, and 1706.3 of the 2003 IBC code.

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Agency Number* on the Schedule.

PE/SE	Structural Engineer – a licensed SE or PE specializing in the design of building structures
PE/GE	Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT	Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination

American Concrete Institute (ACI) Certification

ACI-CFTT	Concrete Field Testing Technician – Grade 1
ACI-CCI	Concrete Construction Inspector
ACI-LTT	Laboratory Testing Technician – Grade 1&2
ACI-STT	Strength Testing Technician

American Welding Society (AWS) Certification

AWS-CWI	Certified Welding Inspector
AWS/AISC-SSI	Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Certification

ASNT	Non-Destructive Testing Technician – Level II or III.

International Code Council (ICC) Certification

ICC-SMSI	Structural Masonry Special Inspector
ICC-SWSI	Structural Steel and Welding Special Inspector
ICC-SFSI	Spray-Applied Fireproofing Special Inspector
ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector

National Institute for Certification in Engineering Technologies (NICET)

NICET-CT	Concrete Technician – Levels I, II, III & IV
NICET-ST	Soils Technician - Levels I, II, III & IV
NICET-GET	Geotechnical Engineering Technician - Levels I, II, III & IV

Exterior Design Institute (EDI) Certification

EDI-EIFS	EIFS Third Party Inspector

TABLE 1 – SCHEDULE OF SPECIAL CONSTRUCTION MONITORING

MATERIAL / ACTIVITY		EXTENT of MONITORING (Continuous, Periodic, Other, Exempt, None)	COMMENTS	AGENT #	DATE COMPLETED	REV #
1704.3 STEEL CONSTRUCTION						
1. Material Verification of high strength bolts, nuts, and washers.	a. Identification markings to conform to ASTM standards specified in the approved construction documents.	Periodic	Provide inspection reports for field installed bolts to Agent 5 also.	3	12/7/2009	
	b. Manufacturers Certificate of Compliance required.	Other	Fabricator to provide Certificate to Agent 1.	5	12/7/2009	
2. Inspection of High – Strength Bolting	a. Bearing type connections	Periodic	Provide inspection reports to Agent 5 also.	3	12/23/2009	
	b. Slip – critical connections	None	No S-C connections in building			
3. Material Verification of structural steel	a. Identification marking to conform to ASTM standards specified in the contract documents.	Exempt	Fabricator is AISC certified.			
	b. Manufacturers certified mill test Reports.	Exempt	Fabricator to provide Certificate to Agent 1.	5	12/7/2009	
4. Material Verification of weld filler materials:	a. Identification marking to conform to AWS standards specified in the contract documents.	Exempt	Fabricator is AISC certified.			
	b. Manufacturers Certificate of Compliance required.	Exempt	No field welding. Shop welding performed by AISC certified fabricator			
5. Inspection of Welding – Structural Steel	a. Single Pass fillet welds < 5/16"	Exempt	No field welding. Shop welding performed by AISC certified fabricator			
	b. Roof deck attachment	Periodic	Provide inspection reports to Agent 5 also.	3	12/23/2009	
6. Inspection of Steel Frame Joint details for compliance with approved documents.	a. Bracing / moment frame connections	Periodic	Provide inspection reports to Agent 5 also.	3	12/23/2009	
	b. Member locations	Periodic	Provide inspection reports to Agent 5 also.	3	12/23/2009	
	c. Application of joint details at each connection.	Periodic	Provide inspection reports to Agent 5 also.	3	12/23/2009	

TABLE 1 – STATEMENT OF SPECIAL INSPECTIONS, cont.

MATERIAL/ACTIVITY		EXTENT of INSPECTION (Continuous, Periodic, Other, None)	COMMENTS	AGENT #	DATE COMPLETED	REV #
1704.4 CONCRETE CONSTRUCTION						
1. Inspection of reinforcing steel, including placement.		Periodic		3	10/29/2009 11/4/2009	
2. Inspection of reinforcing steel welding		None	No welding of rebar specified in contract drawings			
3. Inspect bolts embedded into concrete prior to and during placement of concrete where allowable loads have been increased.		None	Allowable loads have not been increased for lateral loads.			
4. Verify concrete mix design(s)		Periodic	SER to review and approve mix design(s) prior to delivery. Field agent to verify delivery ticket matches approved mix design.	1,3	10/29/2009 11/4/2009	
5. Sample fresh concrete for strength tests, perform slump and air content tests, and determine temperature of concrete.		Continuous		3,4	11/5/2009 11/12/2009	
6. Inspection of concrete placement for proper techniques.		Continuous		3	10/29/2009 11/4/2009	
7. Inspection for maintenance of specified curing temperature and techniques.		Periodic		3	10/29/2009 11/4/2009	
1704.5 MASONRY CONSTRUCTION - **Level 1 Special Inspection for non-essential facility – 1704.5.2**						
1. As Masonry Construction begins, the following shall be verified to ensure conformance	a. Proportions of site-prepared mortar	None				
	b. Construction of mortar joints	None				
	c. Location of reinforcement	None				
	d. Pre-stressing technique	None	No pre-stressing in building			
	e. Grade and size of pre-stressing tendons.	None	No pre-stressing in building			
2. The Inspection program shall verify the following:	a. Size and location of structural elements.	None				
	b. Type, size, and location of embedded anchors.	None				
	c. Size, grade, and type of reinforcing	None				

TABLE 1 – STATEMENT OF SPECIAL INSPECTIONS, cont.

MATERIAL/ACTIVITY		EXTENT of INSPECTION (Continuous, Periodic, Other, None)	COMMENTS	AGENT #	DATE COMPLETED	REV #
1704.5 MASONRY CONSTRUCTION - Level 1 Special Inspection for non-essential facility – 1704.5.2						
2. The Inspection program shall verify the following, cont:	d. welding of reinforcing bars	None				
	e. Protection of Masonry during cold weather (temp. below 40 deg F.)	None				
	f. Application and measurement of pre-stressing reinforcement	None	No pre-stressing in building			
3. Prior to grouting, the following shall be verified to ensure compliance.	a. Grout space is clean	None				
	b. Placement of reinforcement	None				
	c. Proportions of site-prepared grout	None				
	d. Construction of mortar joints	None				
4. Grout placement shall be verified to ensure compliance with code and construction document provisions.		None				
5. Preparation of any grout specimens, mortar specimens and/or prisms shall be observed		None				
6. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.		None				
1704.6 WOOD CONSTRUCTION						
1. Horizontal Diaphragms and Vertical Shearwalls	a. Inspect sheathing size, grade, and thickness for conformance with construction documents.	Periodic	Mezzanine Diaphram and shearwalls	3	12/23/2009	
	b. Inspect sheathing fastener size and pattern for conformance with construction documents.	Periodic	Mezzanine Diaphram and shearwalls	3	12/23/2009	
	c. Verify attachment to supporting elements is per contract documents.	Periodic	Mezzanine Diaphram and shearwalls	3	12/23/2009	
2. Wood truss fabricator certification / quality control procedures	Verify shop fabrication and quality control procedures for wood truss plant.	None				
3. Material Grading	Verify material grading for sawn lumber for compliance with construction documents. Verify manufactured lumber (LVL'S, PSL's) for conformance with construction documents.	None				

TABLE 1 – STATEMENT OF SPECIAL INSPECTIONS, cont.

MATERIAL/ACTIVITY		EXTENT of INSPECTION (Continuous, Periodic, Other, None)	COMMENTS	AGENT #	DATE COMPLETED	REV #
1704.6 WOOD CONSTRUCTION						
4. Wood Connections	Verify that connections are made as shown in the contract documents. For connections not specifically detailed, verify conformance with IBC 2003 Ch. 23	None				
5. Framing	Verify that framing is installed in accordance with construction documents.	Periodic	Mezzanine I-joists	3	12/23/2009	
6. Pre-Fabricated Wood Trusses	Inspect truss and all bracing installation. Bracing to be installed per fabricator's recommendations and BCSI 1-03	None				
1704.7 SOILS						
1. Site Preparation	Inspect preparation of site for conformance with Geotechnical recommendations prior to placement of prepared fill.	Periodic		3	10/30/2009 10/27/2009 10/28/2009	
2. Fill Placement	During Fill Placement verify that material and lift thickness comply with approved Geotechnical report.	Periodic		3	10/30/2009 10/27/2009 10/28/2009	
3. In-Place Soil Density	Verify compliance of in-place compacted dry density with approved Geotechnical report.	Periodic		3	10/30/2009 10/27/2009 10/28/2009	
1704.7 PILE FOUNDATIONS	Record installation and testing of procedures of each pile. Submit reports to building official and EOR. Reports to include pile tip cutoff elevation relative to a common benchmark.	None	No Piles on Job			
1704.10 ARCHITECTURAL WALL PANELS AND VENEERS	Verify compliance of attachment of interior and exterior Architectural veneers to supporting structure for building in Seismic Design Category E or F.	None	Building is Seismic Design Category B			

TABLE 1 – STATEMENT OF SPECIAL INSPECTIONS, cont.

MATERIAL/ACTIVITY		EXTENT of INSPECTION (Continuous, Periodic, Other, None)	COMMENTS	AGENT #	DATE COMPLETED	REV #
1704.11 SPRAYED FIRE-RESISTANT MATERIAL	a. Verify conformance of the prepared surface with manufacturer's specifications prior to application of material.	None	No Sprayed Fire-Resistant material in building.			
	b. Verify that substrate's ambient temperature meet manufacturer's specifications.	None				
	c. Verify that material thickness meets design specifications.	None				
	d. Verify that the material density meets the design specifications. Test in accordance with ASTM E 605.	None				
	e. Verify that bond strength between material and substrate is greater than or equal to 150 psf. Test in accordance with ASTM E 736 and IBC 2003 1704.11.5.1 – 1704.11.5.2	None				
1704.12 EXTERIOR AND INSULATION AND FINISH SYSTEMS (EIFS)	Verify conformance of EFIS installation with manufacturers and design specifications.	None	No EIFS on building.			
1704.13 SPECIAL CASES COLD FORMED METAL FRAMING						
1. Framing	Verify member size, thickness, material, and spacing is in accordance with design specifications and drawings.	None				
2. Framing Connections	Verify that member connections are in accordance with design specifications and drawings.	None				
3. Welding	Verify welding of cold formed members is in accordance with design specifications and AWS standards.	None				

TABLE 1 – STATEMENT OF SPECIAL INSPECTIONS, cont.

MATERIAL/ACTIVITY		EXTENT of INSPECTION (Continuous, Periodic, Other, None)	COMMENTS	AGENT #	DATE COMPLETED	REV #
4. Light Gage Trusses	a. Verify that light gage trusses are design in accordance with the loads specified on the contract documents.	None				
	b. Verify that light gage trusses and truss bracing is installed per manufacturers specifications, contract documents, and BCSI 1-03 guidelines.	None				
1704.10 SMOKE CONTROL						
	a. Test ductwork for leakage and recode device locations prior to concealment of mechanical systems.	None				
	b. Prior to building occupation, perform pressure difference testing, flow measurements and detection, and control monitoring.	None				

Package Industries, Inc.
Manufacturer of the *Package Steel Building System*™
It's Just a Better Package™

15 Harback Road
Sutton, Massachusetts
01590

(800) 225-7242
(508) 865-5871
(FAX) 865-9130

www.packagesteel.com
sales@packagesteel.com

December 7, 2009

Mr. Jim Biskup, President

Biskup Construction Company, Inc.

16 Danielle Drive

Windham, ME 04062

Re: Brooklawn Cemetery, Portland ME, (Job No. 909-020/10004)

Dear Jim,

This letter is to confirm that the above reference project has been fabricated in strict accordance with the design documents prepared by Package Industries, Inc.'s AISC – Metal Building Certified Quality Systems Manual. This certification attests that the building is exempt from the special inspection requirement (Section 1705) of the IBC 2003 Code.

Please call if you should have further questions.

Charles W. Embden

Charles Embden, P.E.

Chief Engineer

12/7/09

STATE OF MAINE
CHARLES W. EMBDEN
No. 11521
LICENSED
PROFESSIONAL ENGINEER

CERTIFICATE OF CONFORMANCE

TO: PACKAGE INDUSTRIES INC.
Attn; HOWARD HATCH
15 Harback Road
Sutton, MA 01590

PO #: 24137
DATE OF SHIPMENT: 09/11/09
ITEM #: LCSA0500150CP
ITEM DESCRIPTION: 1/2-13 X 1-1/2" A307 HEX BOLT PLAIN

QUANTITY: 1500
LOT #: ANHN20080023
COUNTRY OF ORIGIN: CHINA

The above described material was produced in accordance with the applicable standards and/or applicable specifications as designated on purchase order and/or drawing that are current for these parts on the date on which the inquiry and/or order was placed.

William H. Rex
William H. Rex
Operations Manager

Item # Bolt 1/2 X 1 1/2
Phy. _____
Chem. C.O.C
Dim: _____
R. c. Date 9/15/09
Sig _____

Nadell-Natco

Nadell-Natco Industries Inc.
7825 Hub Parkway, Valley View, Ohio 44125
(216) 447-0165 • (800) 321-4862

CERTIFICATE OF CONFORMANCE

TO: PACKAGE INDUSTRIES INC.
Attn; HOWARD HATCH
15 Harback Road
Sutton, MA 01590

PO #: 24137
DATE OF SHIPMENT: 09/11/09
ITEM #: LCSA0500150CP
ITEM DESCRIPTION: 1/2-13 X 1-1/2" A307 HEX BOLT PLAIN

QUANTITY: 3500
LOT #: 2KL2830
COUNTRY OF ORIGIN: CHINA

The above described material was produced in accordance with the applicable standards and/or applicable specifications as designated on purchase order and/or drawing that are current for these parts on the date on which the inquiry and/or order was placed.

William H. Rex
William H. Rex
Operations Manager

Item # Bolt 1/2 X 1 1/2
Phy. _____
Chem. C. O. C
Dim: ✓
Rec. Date 9/15/09
Sign HH

Hodell-Natco Industries, Inc.
7825 Hub Parkway, Valley View, Ohio 44125
(216) 447-0165 • (800) 321-4862

CERTIFICATE OF CONFORMANCE

TO: PACKAGE INDUSTRIES INC.
Attn; HOWARD HATCH
15 Harback Road
Sutton, MA 01590

PO #: 24137
DATE OF SHIPMENT: 09/11/09
ITEM #: FHXN050CP
ITEM DESCRIPTION: 1/2-13 FINISH HEX NUT PLAIN

QUANTITY: 5000
LOT #: 100182
COUNTRY OF ORIGIN: CHINA

The above described material was produced in accordance with the applicable standards and/or applicable specifications as designated on purchase order and/or drawing that are current for these parts on the date on which the inquiry and/or order was placed.

William H. Rex
William H. Rex
Operations Manager

Item # NUT 1/2 X 13
Phy.
Chem. C.O.C.
Dim: ✓
Rec. Date 9/15/09
Sign HH

Hadell-Nitco Industries, Inc.
7825 Hub Parkway, Valley View, Ohio 44125
(216) 447-0165 • (800) 321-4862

Stelfast Inc.
22979 Stelfast Parkway
Strongsville, Ohio
44149

Report of Chemical and Physical Properties

THHN/063CP

Issued To: Hodell-Natco
64 Servistar Industrial Way
WESTFIELD, MA
01085

Purchase Order: 4009284
Stelfast Order: SO 124557
Certificate #: 337,992

Quantity: 2,000
Part #: A2HHO0625C
Description: 5/8-11 2h Hvy.Hx.Nuts

Lot Number: N0920082HPL
Heat Number: 330900094

Chemical Analysis

C	Mn	P	S	Si	Cr	Mo	V	B	Ni	Cu
0.43	0.73	0.003	0.007	0.19						

✓

Mechanical Properties

Grade of Steel	1045
Minimum Tempering Temp.	535 DEGREES C
Result of 24 Hr. Temper Test	98- 99 HRB
Hardness (Core)	27- 28 HRC
Proof Load	39,550 Lbf
Macro Etch Test	S2, R2, C2
Grade Markings	ASTM A194(06a)- 2H

Item # NUT 5/8X11 A325
Phy. ✓
Chem. ✓
Dim: ✓
Rec. Date 9/15/09

****** END OF REPORT *****

We hereby certify that the above data is a true copy of the data furnished to us by the producing mill or the data resulting from tests performed in approved laboratories.

This certificate applies to the product shown on this document, as supplied by Stelfast Inc. Alterations to the product by our customer or a third party will render this certificate void.

Robert D. Meagher
ROBERT D. MEAGHER
QUALITY MANAGER

July 07, 2009

NUCOR
FASTENER DIVISION

Post Office Box 6100
Saint Joe, Indiana 46785
Telephone 260/337-1600

LOT NO.
254985A

CUSTOMER NO/NAME
253 HODELL-NATCO IND

NUCOR ORDER # 677414
CUST PART # A3DB0630175CP

TEST REPORT SERIAL# FB325118
TEST REPORT ISSUE DATE 3/19/09
DATE SHIPPED 7/10/09
CUSTOMER P.O. # 4009619
NAME OF LAB SAMPLER: FRANKLIN A. NEAL, LAB TECHNICIAN

A325 A

**********CERTIFIED MATERIAL TEST REPORT**********

NUCOR PART NO	QUANTITY	LOT NO.	DESCRIPTION
160210	900	254985A	5/8-11 X 1 3/4 A325 HVY HX STRUC SCREW PLAIN

MANUFACTURE DATE 3/17/09

--CHEMISTRY

MATERIAL GRADE -1036ML

MATERIAL NUMBER	HEAT NUMBER	**CHEMISTRY COMPOSITION (WT% HEAT ANALYSIS) BY MATERIAL SUPPLIER C	MN	P	S	SI
RM025113	NU 848416	.36	.76	.010	.021	.23
	MIN	.30	.60			.10
	MAX	.52		.040	.050	.30

NUCOR STEEL - NEBRASKA
A2LA NO: 780.01 EXP: 2010-11-30
FOR CHEMICAL TESTING

--MECHANICAL PROPERTIES IN ACCORDANCE WITH ASTM A325-06

SURFACE HARDNESS (R30N)	CORE HARDNESS (RC)	PROOF LOAD 19200 LBS	TENSILE STRENGTH 6 DEG-WEDGE (LBS)	STRESS (PSI)
N/A	26.1	PASS	32410	143407
N/A	28.7	PASS	32650	144469
N/A	30.1	PASS	30890	136681
N/A	27.9			
AVERAGE VALUES FROM TESTS	28.2	PRODUCTION LOT SIZE	31983	35000 PCS 141519

--VISUAL INSPECTION IN ACCORDANCE WITH ASTM A325-06 4 PCS. SAMPLED LOT PASSED
HEAT TREATMENT - AUSTENITIZED, OIL QUENCHED & TEMPERED (MIN 800 DEG F)

--DIMENSIONS PER ASME B18.2.6-2003

CHARACTERISTIC	#SAMPLES TESTED	MINIMUM	MAXIMUM
Width Across Corners	8	1.1920	1.2020
Grip Length	8	0.3500	0.4200
Head Height	8	0.3850	0.3900
Threads	8	PASS	PASS

Item # Bolt 5/8X13/4 A325
Phy. ✓
Chem. ✓
Dim: ✓
Rec. Date 9/15/09
Sign: [illegible]

ALL TESTS ARE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE METHODS PRESCRIBED IN THE APPLICABLE SAE AND ASTM SPECIFICATIONS. THE SAMPLES TESTED CONFORM TO THE SPECIFICATIONS AS DESCRIBED/LISTED ABOVE AND WERE MANUFACTURED FREE OF MERCURY CONTAMINATION. NO HEATS TO WHICH BISMUTH, SELENIUM, TELLURIUM, OR LEAD WAS INTENTIONALLY ADDED HAVE BEEN USED TO PRODUCE THE BOLTS.
THE STEEL WAS MELTED AND MANUFACTURED IN THE U.S.A. AND THE PRODUCT WAS MANUFACTURED AND TESTED IN THE U.S.A.
WE CERTIFY THAT THIS DATA IS A TRUE REPRESENTATION OF INFORMATION PROVIDED BY THE MATERIAL SUPPLIER AND OUR TESTING LABORATORY. THIS CERTIFIED MATERIAL TEST REPORT RELATES ONLY TO THE ITEMS LISTED ON THIS DOCUMENT AND MAY NOT BE REPRODUCED EXCEPT IN FULL.

ACCREDITED

MECHANICAL FASTENER
CERTIFICATE NO. A2LA 139-01
EXPIRATION DATE 12/31/09

NUCOR FASTENER
A DIVISION OF NUCOR CORPORATION

BOB HAYWOOD
QUALITY ASSURANCE SUPERVISOR

TO: Package Industries, Inc.

Invoice # 327474
Print Date: November 17, 2009

ATTN HOWARD HATCH

Coil 26X43.06 - WHITE

Taylor STEEL
2260 Industrial Trace
Lordstown, OH 44481
330-824-8600

Certification (ASTM A792/A924/A755)

Taylor Tag	Processor ID	Mill Serial #	CustPO#	Weight	Thicknes	Width	Yield	Tensile	Elongation	Grade	Coating Wgt	RB
126019-002	1738102	800750200G	24005	7,060	0.0190	43.060	55,580	65,320	23.300	SS Grade	AZ50	0

Heat #	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	Nb	Ti	V	Sn	B	N
F83742 GRAY	0.1200	0.4000	0.0130	0.0140	0.0070	0.0300	0.0200	0.0400	0.0050	0.0370	0.0000	0.0010	0.0000	0.0000	0.0000	0.0050

Taylor Tag	Processor ID	Mill Serial #	CustPO#	Weight	Thicknes	Width	Yield	Tensile	Elongation	Grade	Coating Wgt	RB
126051-003	1752603	801500100G	24095	6,770	0.0190	43.060	55,970	67,750	27.000	SS Grade	AZ50	0

Heat #	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	Nb	Ti	V	Sn	B	N
F83743 WHITE	0.1300	0.4100	0.0110	0.0120	0.0070	0.0300	0.0200	0.0300	0.0040	0.0360	0.0000	0.0010	0.0010	0.0000	0.0000	0.0050

Taylor Tag	Processor ID	Mill Serial #	CustPO#	Weight	Thicknes	Width	Yield	Tensile	Elongation	Grade	Coating Wgt	RB
126051-004	1752604	801500100G	24095	5,000	0.0190	43.060	55,970	67,750	27.000	SS Grade	AZ50	0

Heat #	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	Nb	Ti	V	Sn	B	N
F83743 WHITE	0.1300	0.4100	0.0110	0.0120	0.0070	0.0300	0.0200	0.0300	0.0040	0.0360	0.0000	0.0010	0.0010	0.0000	0.0000	0.0050

Taylor Tag	Processor ID	Mill Serial #	CustPO#	Weight	Thicknes	Width	Yield	Tensile	Elongation	Grade	Coating Wgt	RB
126052-001	1752701	801500200G	24095	7,080	0.0190	43.060	55,970	67,750	27.000	SS Grade	AZ50	0

Heat #	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	Nb	Ti	V	Sn	B	N
F83743 WHITE	0.1300	0.4100	0.0110	0.0120	0.0070	0.0300	0.0200	0.0300	0.0040	0.0360	0.0000	0.0010	0.0010	0.0000	0.0000	0.0050

Taylor Tag	Processor ID	Mill Serial #	CustPO#	Weight	Thicknes	Width	Yield	Tensile	Elongation	Grade	Coating Wgt	RB
126052-002	1752702	801500200G	24095	7,030	0.0190	43.060	55,970	67,750	27.000	SS Grade	AZ50	0

Heat #	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	Nb	Ti	V	Sn	B	N
F83743 WHITE	0.1300	0.4100	0.0110	0.0120	0.0070	0.0300	0.0200	0.0300	0.0040	0.0360	0.0000	0.0010	0.0010	0.0000	0.0000	0.0050

Above physical and element analysis produced by Taylor Steel and or mill testing facilities and is correct to the best of our knowledge

PRODUCT CERTIFICATION

✓ To: Bob Boucher

Wheeling-Nisshin

CUSTOMER NAME: COILPLUS CONNECTICUT	SPECIFICATION STANDARD: ACR.G@.NO SK SS-GR50C1 AZ55 ACR DRY ✓	ASTM: A792-08 ✓	GL37750250
PRODUCT NAME: GALVALUME PLUS@ SHEET	ORDER NUMBER: 146561- 1	BILL OF LADING NUMBER: 519017	INVOICE NUMBER: 879254
SIZE: .0235IN * 30.0000IN * COIL	CUST PO#: 531251	TR.FIRM PO#: 134608	SHIP DATE: 10/22/09
		CUSTOMER SPECIFICATION	

PACKING NUMBER	Vendor Coil #	HEAT NUMBER	HARDNESS	OLSEN	Y.P. PSI	T.S. PSI	EL (%)	R VALUE	BEND TEST	COATING WEIGHT
8046100000G		F93199			56890	67250	22.1		OK	
8046200000G ✓		F93199			59840	70210	23.6		OK	
					✓	✓	✓			

HEAT NUMBER	C (%)	Mn (%)	S (%)	P (%)	Si (%)	Al (%)	Cu (%)	Ti (%)	Cb (%)	Ni (%)	Cr (%)	Mo (%)	V (%)	N (%)	B (%)	
F93199	.200	.750	.009	.012	.013	.038	.030	.003	.000	.010	.04	.005	.001	.006	.000	
F93199	.200	.750	.009	.012	.013	.038	.030	.003	.000	.010	.04	.005	.001	.006	.000	

Item# Coil.24X28.88 GALV.
Phy. ✓
Chem. ✓
Dim: ✓
Rec. Date 11/3/09
Sign

GALVALUME@ PLUS is a registered trademark of BIEC International, Inc.

This is to certify that the above test results are on record for the described materials.

STATE OF WEST VIRGINIA

County Of BROOKE

Quality Assurance Department

The foregoing instrument was acknowledged before me

This _____ day of _____, _____ by _____

My commission expires on _____

Notary Public

(Affix Stamp Here)

OLYMPIC STEEL
1 EASTERN STEEL ROAD
MILFORD, CT USA
PHONE: 203-878-9381

METALLURGICAL TEST REPORT

>>>>>> CERTIFICATE OF ANALYSIS AND TESTS <<<<<< CERT#: 84252

Sold To: PACKAGE INDUSTRIES INC
15 HARBACK ROAD
SUTTON, MA 01590

Ship To: PACKAGE INDUSTRIES INC
15 HARBACK ROAD
SUTTON, MA 01590

Sales Order:	109133 - 02	B/L No:	210565	Release:	3
Reference:	TROCCHIO, MICHAEL	2nd B/L:		Cus Ord #:	24094 1005
				Cus Name:	PACKAGE INDUSTRIES INC

Date: 02-Oct-2009

Description of Material and Specification

Galvanized Coil A653/SS55
.0560"X14.0000"X ID20"x60"

0571X14NUC REV 0

TAG#: 20116131,20116132

HEAT#: 1815103-08/NUCOR CORPORATION

Chem Elem Symbol / Elem Content Value:

<C : .22> <MN : .83> <P : .009> <S : .003> <SI : .03> <AL : .025> <V : .004> <CB : .001> <CU : .13> <NI : .05> <CR : .04> <MO : .01> <N : .005> <TI : .001> <B : 0> <CA : .003> <SN : .007>

YIELD STRENGTH	MIN:	56200 PSI	MAX	58000	PSI
TENSILE STRENGTH	MIN:	77500 PSI	MAX	80100	PSI
ELONGATION 2"	MIN:	22 %	MAX	26	%
ROCKWELL B	MIN:	80 HRB	MAX	80	HRB

Item# Coil 16 X 14
Phy.
Chem.
Dim:
Rec. Date 10/5/09
Sign

We hereby certify the above is correct as contained in the records of the corporation

Branch Certification Manager

USER: RPRIGGE@SEMSP01
REPORT: ST

02-Oct-2009 4:53 PM

GERDAU AMERISTEEL

CARTERSVILLE STEEL MILL
384 OLD GRASSDALE RD NE
CARTERSVILLE GA 30121 USA
(770) 387–3300

Chemical and Physical Test Report

Made and Melted in USA

G–140173

SHIP TO	INVOICE TO	SHIP DATE
BUSHWICK WHSE 560 N. WASHINGTON AVENUE 203 333–3653 BRIDGEPORT, CT 06604	BUSHWICK METALS INC ACCTS PAYABLE 185 GREAT NECK ROAD ST–320 GREATNECK, NY 11021	09/15/09 CUST. ACCOUNT NO 40206708

PRODUCED IN: CARTERSVILLE

SHAPE + SIZE	GRADE	SPECIFICATION	SALES ORDER	CUST P.O. NUMBER
W8 X 15#	A57250/992	ASTM A572 GR50–07, ASTM A992 –06A, ASTM A709 GR50–06A	9164112–42	JZ–617FF–42

HEAT I.D.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Nb	B	N	Sn	Al	Ti	Ca	Zn	C Eqv
G902292	.16	1.01	.016	.025	.20	.26	.11	.05	.020	.016	.001	.0005	.0100	.008	.001	.00100	.00060	.00480	.372

Mechanical Test: Yield 54700 PSI, 377.14 MPA Tensile: 75500 PSI, 520.55 MPA %El: 22.2/8in, 22.2/200MM
Customer Requirements CASTING: STRAND CAST
Mechanical Test: Yield 55900 PSI, 385.42 MPA Tensile: 77800 PSI, 536.41 MPA %El: 22.4/8in, 22.4/200MM
Customer Requirements CASTING: STRAND CAST

PRODUCED IN: CARTERSVILLE

SHAPE + SIZE	GRADE	SPECIFICATION	SALES ORDER	CUST P.O. NUMBER
W8 X 13#	A57250/992	ASTM A572 GR50–07, ASTM A992 –06A, ASTM A709 GR50–06A	9164112–40	JZ–617FF–40

HEAT I.D.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Nb	B	N	Sn	Al	Ti	Ca	Zn	C Eqv
G903512	.16	.90	.013	.021	.20	.25	.09	.04	.023	.016	.002	.0003	.0101	.009	.001	.00100	.00050	.00520	.349

Mechanical Test: Yield 54900 PSI, 378.52 MPA Tensile: 76900 PSI, 530.21 MPA %El: 22.1/8in, 22.1/200MM
Customer Requirements CASTING: STRAND CAST
Mechanical Test: Yield 55000 PSI, 379.21 MPA Tensile: 75600 PSI, 521.24 MPA %El: 22.7/8in, 22.7/200MM
Customer Requirements CASTING: STRAND CAST

Item # W8X15
Phy. ✓
Chem. ✓
Dim: ✓
Rec. Date 10/5/09
Sign

All manufacturing processes including melt and cast, occurred in USA. MTR complies with EN10204 3.1B

Bhaskar Yalamanchili
Quality Director
Gerdau Ameristeel

THE ABOVE FIGURES ARE CERTIFIED EXTRACTS FROM THE ORIGINAL CHEMICAL AND PHYSICAL TEST RECORDS AS CONTAINED IN THE PERMANENT RECORDS OF COMPANY.

Metallurgical Services Manager
CARTERSVILLE STEEL MILL

NUCOR STEEL - BERKELEY
P.O. Box 2259
Mt. Pleasant, S.C. 29464
Phone: (843) 336-6000

CERTIFIED MILL TEST REPORT

10/12/09 3:06:54

100% MELTED AND MANUFACTURED IN THE USA
All beams produced by Nucor-Berkeley are cast and rolled to a fully killed and fine grain practice.

Sold To: BUSHWICK METALS, INC.
185 GREAT NECK ROAD, STE.320

GREAT NECK, NY 11021

Ship To: BUSHWICK IRON & STEEL CO., INC
560 N. WASHINGTON AVE.

BRIDGEPORT, CT 06604

Customer #.: 695 - 3

B.o.L. #...: 777113

SPECIFICATIONS: Tested in accordance with ASTM specification A6/A6M and A370.
AASHTO : M270-50-05
ASTM : A992-06a;A36-08/A529-05-50/A572-07-50/A709-0950S/A709-345M

Description	Heat# / Grade(s) / Test	Yield/ Tensile Ratio	Yield (PSI) (MPa)	Tensile (PSI) (MPa)	Elong %	C / Cr / ******	Mn / Mo / ******	P / Sn / ******	S / B / ******	Si / V / N	Cu / Nb / ******	Ni / ****** / CI	CE1 / CE2 / Pcm
W14X30	2910236	.83	55000	66600	23.71	.06	.80	.008	.035	.21	.18	.05	.22
.045" 00.00"	A992-06a		379	459		.04	.00	.0083	.0003	.003	.028		.2697
W360X44		.81	54000	66700	24.64					.0054		4.36	.1288
813.7160m			372	460		1 Piece(s)		Customer PO: J21006				Inv#:	0
W8X13	1906791	.84	58900	69900	24.28	.06	.85	.006	.039	.20	.15	.04	.23
.045" 00.00"	A992-06a		406	482		.04	.00	.0083	.0002	.002	.032		.2772
W200X19.3		.85	59600	70400	25.28					.0062		3.88	.1307
813.7160m			411	485		12 Piece(s)		Customer PO: JZ-931				Inv#:	0

6 Heat(s) for this MTR.

Item# W8X13
Phy. ✓
Chem. ✓
Dim: ✓
Rec. Date 10/15/09
Sign

Elongation based on 8" (20.32cm) gauge length. 'No Weld Repair' was peformed.
CI = 26.01Cu+3.88Ni+1.20Cr+1.49Si+17.28P-(7.29Cu*Ni)-(9.10Ni*P)-33.39(Cu*Cu)
Pcm = C+(Si/30)+(Mn/20)+(Cu/20)+(Ni/60)+(Cr/20)+(Mo/15)+(V/10)+5B

CE1 = C+(Mn/6)+((Cr+Mo+V)/5)+((Ni+Cu)/15)
CE2 = C+((Mn+Si)/6)+((Cr+Mo+V+Cb)/5)+((Ni+Cu)/15)

I hereby certify that the contents of this report are accurate and correct. All test results and operations performed by the material manufacturer are in compliance with material specifications, and when designated by the Purchaser, meet applicable specifications.

Bruce A. Work
Metallurgist

GERDAU AMERISTEEL

CARTERSVILLE STEEL MILL
384 OLD GRASSDALE RD NE
CARTERSVILLE GA 30121 USA
(770) 387-3300

Chemical and Physical Test Report

Made and Melted in USA

G-140173

SHIP TO	INVOICE TO	SHIP DATE
BUSHWICK WHSE 560 N. WASHINGTON AVENUE 203 333-3653 BRIDGEPORT, CT 06604	BUSHWICK METALS INC ACCTS PAYABLE 185 GREAT NECK ROAD ST-320 GREATNECK, NY 11021	09/15/09 CUST. ACCOUNT NO 40206708

PRODUCED IN: CARTERSVILLE

SHAPE + SIZE	GRADE	SPECIFICATION	SALES ORDER	CUST P.O. NUMBER
W8 X 10#	A57250/992	ASTM A572 GR50-07, ASTM A992 -06A, ASTM A709 GR50-06A	9164112-36	JZ-617FF-36

HEAT I.D.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Nb	B	N	Sn	Al	Ti	Ca	Zn	C Eqv
G903533	.15	.90	.014	.016	.20	.29	.09	.05	.024	.015	.001	.0003	.0102	.009	.001	.00100	.00120	.00370	.343

Mechanical Test: Yield 59800 PSI, 412.31 MPA Tensile: 77500 PSI, 534.34 MPA %El: 23.9/8in, 23.9/200MM
Customer Requirements CASTING: STRAND CAST
Mechanical Test: Yield 57400 PSI, 395.76 MPA Tensile: 77400 PSI, 533.65 MPA %El: 23.3/8in, 23.3/200MM
Customer Requirements CASTING: STRAND CAST

Item # W8X10
Phy. ✓
Chem. ✓
Dim: ✓
Rec. Date 10/15/09
Sign

All manufacturing processes including melt and cast, occurred in USA. MTR complies with EN10204 3.1B

Bhaskar Yalamanchili
Quality Director
Gerdau Ameristeel

THE ABOVE FIGURES ARE CERTIFIED EXTRACTS FROM THE ORIGINAL CHEMICAL AND PHYSICAL TEST RECORDS AS CONTAINED IN THE PERMANENT RECORDS OF COMPANY.

Metallurgical Services Manager
CARTERSVILLE STEEL MILL

11/27/2009 From: INFRA-METALS
SIZE:
HEAT #:
PROD:
To:
LINE #:
ID #:
Q6:

CMC STEEL ALABAMA
101 S 50TH STREET
BIRMINGHAM AL 35212-3525

CERTIFIED MILL TEST REPORT

For additional copies call
800-637-3227

We hereby certify that the test results presented here are accurate and conform to the reported grade specification

Marcus W. McCluney - CMC Steel AL

HEAT NO.:1002190
SECTION: FLAT 1/4x5 40'0" A529-55
GRADE: ASTM A529-05 Grade 55
ROLL DATE: 08/05/2009
MELT DATE: 07/31/2009

SOLD TO:
Infra-Metals/Wall
8 Pent Hwy
Wallingford CT
US 06492-2336
8002434410
2032942993

SHIP TO:
Infra-Metals/Wall
8 Pent Hwy
Wallingford CT
US 06492-2336
8002434410
2032942993

Delivery#: 80182910
BOL#: 70057485
CUST PO#: C2011K
CUST P/N:
DLVRY LBS / HEAT: 9180.000 LB
DLVRY PCS / HEAT: 54 EA

Characteristic	Value
C	0.20%
Mn	0.87%
P	0.013%
S	0.032%
Si	0.19%
Cu	0.36%
Cr	0.16%
Ni	0.18%
Mo	0.039%
V	0.018%
Cb	0.001%
Sn	0.015%
B	0.0004%
Ti	0.001%
N	0.0067%
Carbon Equivalent	0.38%
Carbon Eq A529	0.46%
Yield Strength test 1	59.0ksi
Tensile Strength test 1	82.5ksi

Characteristic	Value
Elongation test 1	25%
Elongation Gage Lgth test 1	8IN
Yield Strength test 2	61.4ksi
Tensile Strength test 2	81.0ksi
Elongation test 2	24%
Elongation Gage Lgth test 2	8IN

Characteristic	Value

Item # 1/4 X 5
Phy.
Chem.
Dim.
Rec. Date 11-3-09
Sign

THIS MATERIAL IS FULLY KILLED, 100% MELTED AND MANUFACTURED IN THE USA, WITH NO WELD REPAIR OR MERCURY CONTAMINATION IN THE PROCESS.
REMARKS :

09/01/2009 18:37:41

11/27/2009 From: INFRA-METALS To:
SIZE: LINE #: ID #:
HEAT #: Q6:
PROD:

Nucor Steel 9/30/2009 3:56:27 AM Fax Server

NUCOR
BAR MILL GROUP
DARLINGTON DIVISION
(843) 393-5841

Mill Certification
9/30/2009

Nucor Steel - South Carolina
300 Steel Mill Road
DARLINGTON, SC 29540
(843) 393-5841
Fax: (843) 395-8701

Sold To: INFRA-METALS CO
8 PENT HWY
WALLINGFORD, CT 06492
(800) 243-4410
Fax: (203) 294-2993

Ship To: INFRA-METALS CO
8 PENT HWY TRACK 953
WALLINGFORD, CT 06492
(800) 243-4410
Fax: (203) 294-2993

Customer P.O.	C2002KFF	Sales Order	103823.5
Product Group	Merchant Bar Quality	Part Number	532506004805730
Grade	ASTM A572/A572M-07 GR 50 TY2, A709-08 GR 50	Lot ID	DL09104017
Size	1/4x6" Flat	Heat ID	DL0910401707
Practice	1/4x6" Flat 40' A572 Gr50 TY2	B/L Number	C1-515141
Description	A572 Gr50 TY2	Load Number	C1-204248
Customer Spec.		Shipped Pcs.	

I hereby certify that the material described herein has been manufactured in accordance with the specifications and standards listed above and that it satisfies those requirements.

C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb
0.21%	1.00%	0.005%	0.026%	0.19%	0.34%	0.08%	0.10%	0.020%	0.013%	0.003%

Yield 1: 56000 (386) Psi (MPa) Tensile 1: 78000 (538) Psi (MPa) Elongation: 26 %in 8"(% in 203.3mm)
Yield 2: 57000 (393) Psi (MPa) Tensile 2: 78000 (538) Psi (MPa) Elongation 26 % in 8"(% in 203.3mm)

1. WELDING OR WELD REPAIR WAS NOT PERFORMED ON THIS MATERIAL
2. MELTED AND MANUFACTURED IN THE USA
3. MERCURY, RADIUM, OR ALPHA SOURCE MATERIALS IN ANY FORM HAVE NOT BEEN USED IN THE PRODUCTION OF THIS MATERIAL

Item # 1/4 x 6
Phy.
Chem.
Dim:
Rec. Date 11-3-09
Sign

James H. Blew
Division Metallurgist

NBMG-10 May 12, 2009

CMC STEEL ALABAMA
101 S 50TH STREET
BIRMINGHAM AL 35212-3525

CERTIFIED MILL TEST REPORT

For additional copies call
800-637-3227

We hereby certify that the test results presented here are accurate and conform to the reported grade specification

Marcus W. McCluney - CMC Steel AL

HEAT NO.:1002871 SECTION: FLAT 3/8x6 40'0" A529-55 GRADE: ASTM A529-05 Grade 55 ROLL DATE: 09/23/2009 MELT DATE: 09/19/2009	S O L D T O	Infra-Metals/Wall 8 Pent Hwy Wallingford CT US 06492-2336 8002434410 2032942993	S H I P T O	Infra-Metals/Wall 8 Pent Hwy Wallingford CT US 06492-2336 8002434410 2032942993	Delivery#: 80202923 BOL#: 70064436 CUST PO#: C2055K CUST P/N: - DLVRY LBS / HEAT: 9180.000 LB DLVRY PCS / HEAT: 30 EA

Characteristic	Value	Characteristic	Value	Characteristic	Value
C	0.19%	Elongation test 1	23%		
Mn	0.84%	Elongation Gage Lgth test 1	8IN		
P	0.013%	Yield Strength test 2	57.9ksi		
S	0.029%	Tensile Strength test 2	81.3ksi		
Si	0.26%	Elongation test 2	24%		
Cu	0.40%	Elongation Gage Lgth test 2	8IN		
Cr	0.17%				
Ni	0.14%				
Mo	0.039%				
V	0.019%				
Cb	0.000%				
Sn	0.018%				
B	0.0005%				
Ti	0.001%				
N	0.0098%				
Carbon Equivalent	0.37%				
Carbon Eq A529	0.46%				
Yield Strength test 1	55.9ksi				
Tensile Strength test 1	81.1ksi				

Item # 3/8x6
Phy. ✓
Chem. ✓
Dim: ✓
Rec. Date 11-30-09
Sign

THIS MATERIAL IS FULLY KILLED, 100% MELTED AND MANUFACTURED IN THE USA, WITH NO WELD REPAIR OR MERCURY CONTAMINATION IN THE PROCESS.
REMARKS :

10/09/2009 19:24:03

11/27/2009 From: INFRA-METALS
SIZE:
HEAT #:
PROD:
LINE #:
To:
ID #:
Q6: -

11/27/2009 From: INFRA-METALS To:
SIZE: LINE #: ID #:
HEAT #: Q6:
PROD:

Nucor Steel 9/30/2009 3:56:27 AM Fax Server

NUCOR
BAR MILL GROUP
DARLINGTON DIVISION
(843) 393-5841

Mill Certification
9/30/2009

Nucor Steel - South Carolina
300 Steel Mill Road
DARLINGTON, SC 29540
(843) 393-5841
Fax: (843) 395-8701

Sold To: INFRA-METALS CO
8 PENT HWY
WALLINGFORD, CT 06492
(800) 243-4410
Fax: (203) 294-2993

Ship To: INFRA-METALS CO
8 PENT HWY TRACK 953
WALLINGFORD, CT 06492
(800) 243-4410
Fax: (203) 294-2993

Customer P.O.	C2002KFF	Sales Order	103745.15
Product Group	Merchant Bar Quality	Part Number	535006004805730
Grade	ASTM A572/A572M-07 GR 50 TY2	Lot ID	DL0910401705
Size	1/2x6" Flat	Heat ID	DL0910401705
Product	1/2x6" Flat 40' A572 GR50 TY2	Mill Test #	C1-515141
Description	A572 Gr50 TY2	Load Number	C1-204248
Customer Spec		Customer Part #	

I hereby certify that the material described herein has been manufactured in accordance with the specifications and standards listed above and that it satisfies those requirements.

C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb
0.21%	1.00%	0.005%	0.026%	0.19%	0.34%	0.08%	0.10%	0.020%	0.013%	0.003%

Yield 1: 55000 (379) Psi (MPa)
Yield 2: 55000 (379) Psi (MPa)

Tensile 1: 79000 (545) Psi (MPa)
Tensile 2: 80000 (552) Psi (MPa)

Elongation: 27 %in 8"(% in 203.3mm)
Elongation 26 % in 8"(% in 203.3mm)

1. WELDING OR WELD REPAIR WAS NOT PERFORMED ON THIS MATERIAL
2. MELTED AND MANUFACTURED IN THE USA
3. MERCURY, RADIUM, OR ALPHA SOURCE MATERIALS IN ANY FORM HAVE NOT BEEN USED IN THE PRODUCTION OF THIS MATERIAL

Item # 1/2 X 6
Phy. ✓
Chem. ✓
Dim: ✓
Rec. Date 11-3-09
Sign

James H. Blew
Division Metallurgist

NBMG-10 May 12, 2009

11/06/2009 From: INFRA-METALS
SIZE:
HEAT #:
PROD:

To:

LINE #:

ID #:
Q6:

CMC STEEL ALABAMA
101 S 50TH STREET
BIRMINGHAM AL 35212-3525

CERTIFIED MILL TEST REPORT

For additional copies call
800-637-3227

We hereby certify that the test results presented here are accurate and conform to the reported grade specification

Marcus W. McCluney - CMC Steel AL

HEAT NO.:1002757 SECTION: FLAT 1/4x8 40'0" A529-55 GRADE: ASTM A529-05 Grade 55 ROLL DATE: 09/19/2009 MELT DATE: 09/12/2009	S O L D T O	Infra-Metals/Wall 8 Pent Hwy Wallingford CT US 06492-2336 8002434410 2032942993	S H I P T O	Infra-Metals/Wall 8 Pent Hwy Wallingford CT US 06492-2336 8002434410 2032942993	Delivery#: 80202923 BOL#: 70064436 CUST PO#: C2055K CUST P/N: DLVRY LBS / HEAT: 9248.000 LB DLVRY PCS / HEAT: 34 EA	

Characteristic	Value	Characteristic	Value	Characteristic	Value
C	0.22%	Elongation test 1	30%		
Mn	0.87%	Elongation Gage Lgth test 1	8IN		
P	0.014%	Yield Strength test 2	57.6ksi		
S	0.027%	Tensile Strength test 2	83.1ksi		
Si	0.21%	Elongation test 2	28%		
Cu	0.35%	Elongation Gage Lgth test 2	8IN		
Cr	0.14%				
Ni	0.12%				
Mo	0.043%				
V	0.020%				
Cb	0.000%				
Sn	0.012%				
B	0.0003%				
Ti	0.001%				
N	0.0094%				
Carbon Equivalent	0.39%				
Carbon Eq A529	0.47%				
Yield Strength test 1	57.3ksi				
Tensile Strength test 1	75.1ksi				

Item # 1/4 x 8
Phy. ✓
Chem. ✓
Dim:
Rec. Date 11-6-09
Sign

THIS MATERIAL IS FULLY KILLED, 100% MELTED AND MANUFACTURED IN THE USA, WITH NO WELD REPAIR OR MERCURY CONTAMINATION IN THE PROCESS.

REMARKS :

10/09/2009 19:24:03

F5183200 (AFP Rev 04-08)

Severstal Sparrows Point, LLC

QUALITY & CUSTOMER TECHNICAL SERVICES

REPORT OF TEST AND ANALYSIS

REQ. JOB CONTRACT NO.	PURCHASE ORDER DATE	PURCHASE ORDER NO.
	07/06/09	PPA11250

VENDOR	SHIPMENT NO.	MILL ORDER NO.	INVOICE NO.
SEVERSTAL SPARROWS POINT, LLC SPARROWS POINT PLANT SPARROWS POINT, MARYLAND 21219	405-08329	427 32992	405-08329
	VEHICLE IDENTIFICATION		DATE SHIPPED 10/08/09

SOLD TO
METALS USA CARBON FLAT ROLLED
FLAT ROLLED-PHILADELPHIA
11200 ROOSEVELT BLVD
PHILADELPHIA PA 19116

SHIP TO
METALS USA-FLAT ROLLED-PHILADELPHIA
11200 ROOSEVELT BLVD
PHILADELPHIA PA 19116

SPECIFICATION DESCRIPTION

THICKNESS	TYPE	WIDTH	LENGTH
.1780	M	60	

STEEL CHAR: HOT ROLLED HIGH STRENGTH LOW ALLOY STEEL DRY COILS-ME-TEMPER ROLLED
SPEC CODE : ASTM A1011/A1011M LATEST REVISION HSLAS CLASS 1 GR 50

NOTE	QUANTITY Pieces	QUANTITY Packages	Actual Weight	Coil/Lift Serial No.	Heat Number and/or TEST Identification	Yield	Tensile Strength	ELONG In.	ELONG %	Bend	
	1		47090	267692T	402P5691	57,100	68,600	2	30.0		FRONT

Item # 3/16 X 60 X 240
Phy. ✓
Chem. ✓
Dim. ✓
Rec. Date
Sign

MELTED & MANUFACTURED IN THE USA

NOTES

Heat Number	CHEMICAL ANALYSIS C	Mn	P	S	B	SI	CU	NI	CR	SN	MO	V	TI	AL
402P5691	.07	.68	.013	.006	.0001	.014	.030	0.02	0.03	.006	.001	.001	.003	.055

I certify that the above results are a true and correct copy of actual results contained in records maintained by Severstal SP, LLC and are in full compliance with the requirements of the specification cited. This test report cannot be altered and must be transmitted intact with any subsequent third party test reports, if required.

MANAGER, QUALITY/CUSTOMER TECHNICAL SERVICES
J. P. ECKSTEIN

DATE 10/08/09 11:05

PER

F5183200 (AFP Rev 04-08)

Severstal Sparrows Point, LLC

QUALITY & CUSTOMER TECHNICAL SERVICES

REPORT OF TEST AND ANALYSIS

REQ. JOB CONTRACT NO.	PURCHASE ORDER DATE	PURCHASE ORDER NO.
	07/06/09	PPA11250

VENDOR	SHIPMENT NO.	MILL ORDER NO.	INVOICE NO.
SEVERSTAL SPARROWS POINT, LLC SPARROWS POINT PLANT SPARROWS POINT, MARYLAND 21219	405-08329	427 32992	405-08329
	VEHICLE IDENTIFICATION		DATE SHIPPED 10/08/09

SOLD TO
METALS USA CARBON FLAT ROLLED
FLAT ROLLED-PHILADELPHIA
11200 ROOSEVELT BLVD
PHILADELPHIA PA 19116

SHIP TO
METALS USA-FLAT ROLLED-PHILADELPHIA
11200 ROOSEVELT BLVD
PHILADELPHIA PA 19116

SPECIFICATION DESCRIPTION

THICKNESS	TYPE	WIDTH	LENGTH
.1780	M	60	

STEEL CHAR: HOT ROLLED HIGH STRENGTH LOW ALLOY STEEL DRY COILS-ME-TEMPER ROLLED
SPEC CODE : ASTM A1011/A1011M LATEST REVISION HSLAS CLASS 1 GR 50

NOTE	QUANTITY Pieces	QUANTITY Packages	Actual Weight	Coil/Lift Serial No.	Heat Number and/or Test Identification	Yield	Tensile Strength	ELONG In.	ELONG %	Bend	
	1		47090	267692T	402P5691	57,100	68,600	2	30.0		FRONT

Item # 3/16 X 60 X 24R
Phy. ✓
Chem. ✓
Dim. ✓
Rec. Date
Sign

MELTED & MANUFACTURED IN THE USA

NOTES

Heat Number	CHEMICAL ANALYSIS C	Mn	P	S	B	SI	CU	NI	CR	SN	MO	V	TI	AL
402P5691	.07	.68	.013	.006	.0001	.014	.030	0.02	0.03	.006	.001	.001	.003	.055

I certify that the above results are a true and correct copy of actual results contained in records maintained by Severstal SP, LLC and are in full compliance with the requirements of the specification cited. This test report cannot be altered and must be transmitted intact with any subsequent third party test reports, if required.

MANAGER, QUALITY/CUSTOMER TECHNICAL SERVICES
J. P. ECKSTEIN

DATE 10/08/09 11:05

PER

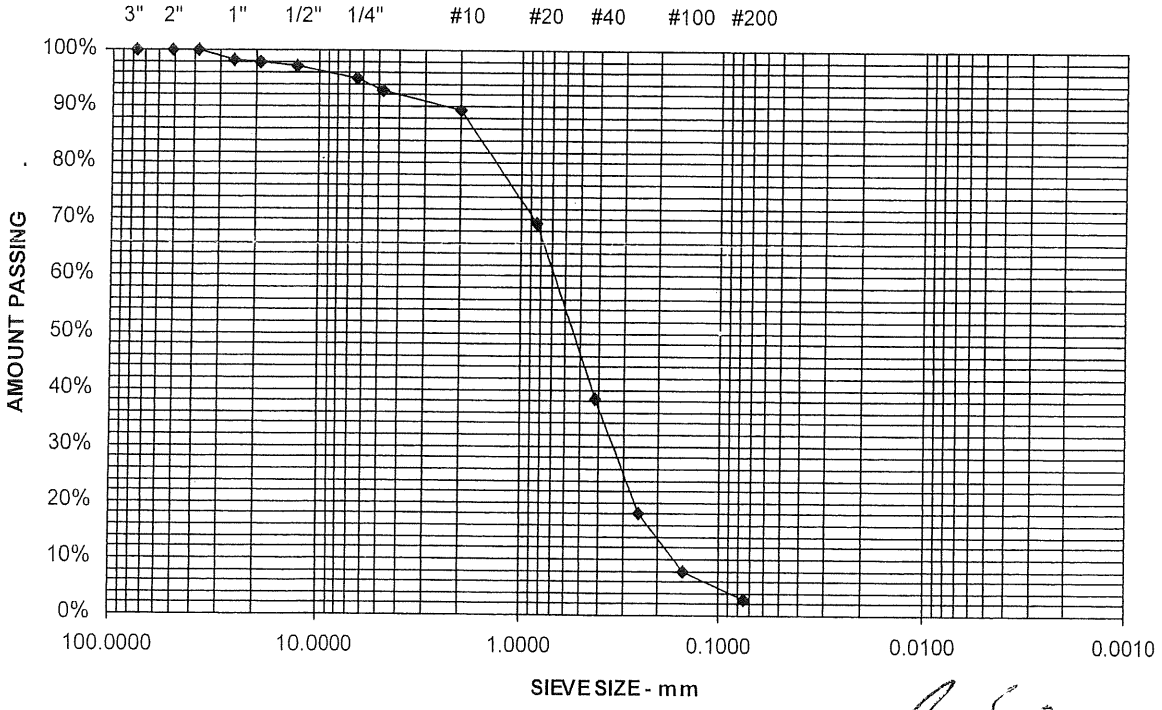
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND, ME - BROOKLAWN MEMORIAL PARK GARAGE - MATERIALS TESTING	Project Number	07-1059.1
Client	BISKUP CONSTRUCTION, INC.	Lab ID	11640G
Material Type	PORTLAND SAND	Date Received	10/30/2009
Material Source	PORTLAND SAND & GRAVEL	Date Completed	11/4/2009
		Tested By	JUSTIN BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	SPECIFICATIONS (%)
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	98	
19.0 mm	3/4"	98	
12.5 mm	1/2"	97	
6.3 mm	1/4"	95	
4.75 mm	No. 4	93	
2.00 mm	No. 10	89	
850 um	No. 20	69	
425 um	No. 40	39	
250 um	No. 60	18	
150 um	No. 100	8	
75 um	No. 200	3.0	



Comments

Roger E. Domingo

286 Portland Road, Gray, ME 04039-9586 • Tel (207) 657-2866 • Fax (207) 657-2840 • www.swcole.com

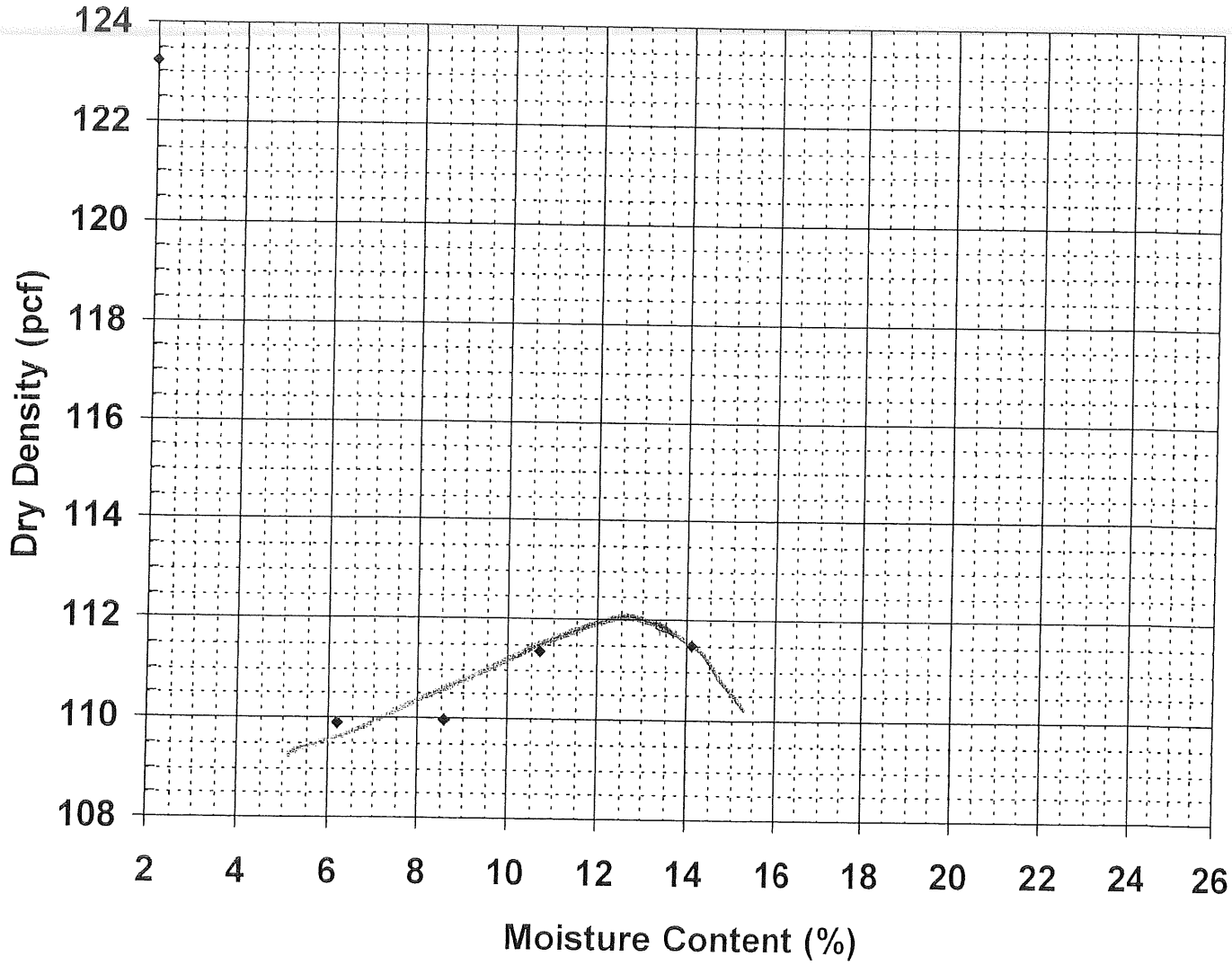
S.W.COLE ENGINEERING, INC.

Report of Moisture-Density

Method ASTM D-1557 MODIFIED Procedure A

Project Name	PORTLAND, ME - BROOKLAWN MEMORIAL PARK GARAGE - MATERIALS TESTING	Project Number	07-1059.1
Client	BISKUP CONSTRUCTION, INC.	Lab ID	11640G
Material Type	PORTLAND SAND	Date Received	10/30/2009
Material Source	PORTLAND SAND & GRAVEL	Date Completed	11/4/2009
		Tested By	JUSTIN BISSON

Moisture-Density Relationship Curve



Maximum Dry Density (pcf)	112.3	Corrected Dry Density (pcf)	114.6
Optimum Moisture Content (%)	12.6	Corrected Moisture Content (%)	11.8
Percent Oversized	7.2%		

Comments

Roger E. Domingo

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S.W.COLE ENGINEERING, INC.

Report of Field Density

ASTM D6938

Project: PORTLAND, ME - BROOKLAWN MEMORIAL PARK GARAGE - MATERIALS TESTING

Project Number: 07-1059.1

Client: BISKUP CONSTRUCTION, INC.

Field Density Test Results

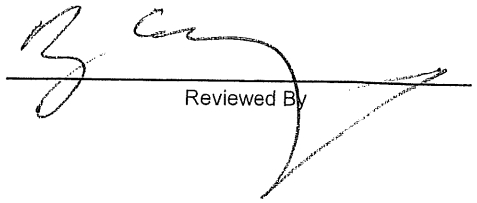
Test #	Test Date	Tech	Test Location	Elev Feet	Test Depth	Lab ID	Dry Density	Moisture Content Percent	Compaction Percent	Required Compaction
1	11/9/2009	TA	EXT COLUMN LINE D BETWEEN 1 & 2	18" BFG	12	11640G	111.3	2.9	97.1	92
2	11/9/2009	TA	INT COLUMN LINE 1 BETWEEN C & D	18" BFG	12	11640G	112.3	2.8	98.0	95
3	11/9/2009	TA	INT COLUMN LINE D BETWEEN 2 & 3	18" BFG	12	11640G	114.4	2.7	99.8	95
4	11/9/2009	TA	INT COLUMN LINE 5 BETWEEN B & C	18" BFG	12	11640G	111.4	2.9	97.2	95
5	11/9/2009	TA	INT COLUMN LINE A BETWEEN 4 & 5	18" BFG	12	11640G	110.1	3.5	96.1	95
6	11/9/2009	TA	EXT COLUMN LINE A BETWEEN 4 & 5	18" BFG	12	11640G	112.1	2.7	97.8	92
7	11/9/2009	TA	EXT COLUMN LINE D BETWEEN 2 & 3	18" BFG	12	11640G	114.5	2.3	99.9	92
8	11/9/2009	TA	EXT COLUMN LINE A BETWEEN 1 & 2	18" BFG	12	11640G	113.3	2.4	98.9	92

Laboratory Compaction Test Reference

Lab ID	Date Received	Material Source	Material Type	Method	Max Dry Density PCF	Optimum Moisture Content (%)	Comments
11640G	10/30/2009	Portland Sand & Gravel	Portland Sand	ASTM D-1557 Modified A	114.6	11.8	

Elevation Notes:
BFG- BELOW FINISH GRADE

Comments:
EXT - EXTERIOR
INT - INTERIOR



S.W.COLE ENGINEERING, INC. • Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

DAILY CONSTRUCTION REPORT

Project: Brooklawn Memorial Park Garage
Client: Biskup Construction
Client's Rep.: Jim Biskup

SWCE Project No.: 07-1059.1
Date: 10-27-09
Weather: Overcast, 35 - 50.

Work in Progress: Eastern Excavation: Excavation for building foundations.

General Observations, Discussions, Etc: As requested, we made a site visit to make subgrade observations in accordance with the city's special inspection requirements. Foundation excavation was in progress when we arrived on site with approximately half of the building footprint dug. The excavation was being made with a Link Belt 240LX equipped with a smooth edged bucket to minimize disturbance to native clayey soils. Soils observed at subgrade consisted of hard brown silty clay with penetrometer strengths of 9-ksf. Subgrade was dry except for very minor seepage in the northwest corner from an existing sandy trench backfill material that was encountered. We understand that the excavation is being made 6-inches below bottom of footings to accommodate ¾-inch crushed stone overlying geotextile fabric. Eastern Excavation indicated that excavation should be completed tomorrow mid-morning at which time fabric and stone will be placed and compacted. A follow up site visit is planned to observe the remaining subgrade soils tomorrow. Conditions observed were consistent with our expectations based on the geotechnical findings.

On Site: 3:15 – 3:30
Attachments: Photo
Sheet: 1 of 1

SWC Rep.: KBG
Rev. by: RED

P:\2007\07-1059.1 M - Biskup Construction - Portland, ME - Brooklawn Memorial Park Garage - CMT & SI - RED\DFRs\DFR 10-27-09 subgrade.doc

RED

GRAY, ME OFFICE
286 Portland Road, Gray, ME 04039, Tel (207) 657-2866, Fax (207) 657-2840, (E) infogray@swcole.com, (I) www.swcole.com


Link-Belt

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DAILY CONSTRUCTION REPORT

Project: Brooklawn Memorial Park Garage Portland Maine
SWCE Project No.: 07-1059.1
Client: Biskup Construction
Date: 10-28-09
Client's Rep.: Jim Biskup
Weather: Overcast, 40 - 50.
Work in Progress: Eastern Excavation: Excavation for building foundations.
General Observations, Discussions, Etc: As scheduled, we made a site visit to perform subgrade observations on foundation excavations. Consistent with yesterday's observations, soils at subgrade remained native undisturbed hard brown silty clay. At the time of our visit, Eastern Excavation was in the process of placing a minimum of 6-inches of crushed stone overlying woven geo-textile fabric along 1-line. A 4-inch perforated ADS drain pipe was being installed integrally with the ¾-inch crushed stone. We understand from conversations with Eastern Excavation that after the stone is finish graded that a vibratory plate compactor will be used to densify the material. We recommended to Eastern Excavation that the foundation drain and the overlying crushed stone be covered with geo-textile fabric prior to placing backfill. At the time of our visit, Biskup Construction was on site performing survey layout to establish wall lines. We requested that they check the excavation to confirm that it is oversized a minimum of 12-inches beyond the edge of footings in all areas prior to casting concrete foundations. We reminded Paul with Eastern Excavation the that the drain pipe should be installed outside the area of influence of the footings.

Most of the surficial organic strata appears to have been removed from below the interior slab. We understand that Eastern Excavation will perform the final cut to slab proposed subgrade after the foundation walls have been placed. Based on observations of the materials exposed in the sidewalls of the footing excavation, it appears that there may be up to 2-feet of existing fill soils underlying the slab. The fill observed on the east side of the proposed structure appears to consist primarily of medium dense gravelly sand while the fill on the westerly side appears to be clay with some sand and traces of gravel. No loose material or heavy organic matter was observed in the fills. We recommended to Sid (Biskup Construction) and Todd (Brooklawn Memorial Park) that some heavy root structure observed south of D-line between 4 and 5-lines and traces of wood, glass and brick observed north of 4, A be over-excavated and replaced with additional compacted structural fill. Where additional structural fill is placed it should transition gradually (3:1 or flatter) to the bottom of the designed section. In our discussion, we indicated that our typical recommendations include removal of all fill from below buildings. However, given that the majority of the soils visible appeared well compacted and generally free of organic matter, consideration could be given to leaving most of the fill in place provided the owner understands and accepts the associated risks which could possibly include post-construction settlement or cracking of the slab. Todd Jensen representing Brooklawn Memorial indicated that the he felt comfortable with the existing soils given the type and use of the proposed structure. We requested that S.W. Cole Engineering be notified when the slab subgrade has been exposed to allow additional observations to be performed.

On Site: 10:30 – 11:50
SWC Rep.: KBG
Attachments: Photos
Rev. by: PFK
Sheet: 1 of 1

P:\2007\07-1059.1 M - Biskup Construction - Portland, ME - Brooklawn Memorial Park Garage - CMT & SI - RED\DFRs\DFR 10-28-09 subgrade.doc

GRAY, ME OFFICE
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FILL

S.W.COLE ENGINEERING, INC.

Concrete Construction Observation Report

Project Name/Location:	Brooklawn Memorial Parking Garage	**Project No:**	07-1059.1
Client/Client's Rep.:	Biskup Construction	**Date:**	10-29-09
Concrete Contractor:	CCI	**Sheet:**	1 of 1
Placement Location:	Footing: line 1, A to D. Line D, 1 to 5, Line 5 A to D.	**SWCE Rep.:**	VLT
Placement Type:	Footing ☒ Wall ☐ Column ☐ Slab ☐ Other ☐	**Arrived at Site:**	12:45pm
		Left Site:	2:15pm

PRE PLACEMENT OBSERVATIONS	In Compliance		N/O	Comments
Bar Size (diameter, length, bend and anchorage)	Yes ☒	No ☐	☐	As required
Location (# of bars, spacing, and cover)	Yes ☒	No ☐	☐	Acceptable
Splicing (weld joint, overlap)	Yes ☒	No ☐	☐	Acceptable
Stability (wiring, chairs, and spacers)	Yes ☒	No ☐	☐	As required
Reinforcement free from mud, oil, rust, or other nonmetallic coatings	Yes ☒	No ☐	☐	Acceptable
Reinforcement appears in conformance to specifications	Yes ☒	No ☐	☐	Acceptable
Soil subgrade prepared in accordance with project specifications	Yes ☒	No ☐	☐	Crushed stone & fabric

Referenced Drawings	Date	Page	Rev.	ASTM	GRADE
Assoc. Design Partners	9/29	F-1		A 615 ☒	40 ☐ 50 ☐ 60 ☒
Assoc. Design Partners	9/29	F-2		A 616 ☐	75 ☐
Assoc. Design Partners	9/29	F-3		A 617 ☐	
				A 706 ☐	6"x6" WWF ☐

CONCRETE PLACEMENT OBSERVATIONS	In Compliance		N/O	Comments
Required mix used	Yes ☒	☐	☐	3000psi, ¾" MRWR
Placement and consolidation of concrete observed	Yes ☒	☐	☐	Acceptable
Concrete properly conveyed to all areas of placement	Yes ☒	☐	☐	Direct Discharge
Depth of layer maximum limits not exceeded	Yes ☒	☐	☐	One layer
Internal vibration (depth of insertion, spacing, time, vertical insertion, no conveyance of concrete by vibration)	Yes ☐	☐	☒	W/ shovel
Even layering around openings and embedments	Yes ☒	☐	☐	Acceptable
Removal of temporary ties and spacers	Yes ☐	☐	☐	N/A

FIELD TESTING OF CONCRETE PERFORMED Yes ☒ No ☐

*CYLINDER SET NO: 106-1 ←*refer to associated concrete test report*

POST PLACEMENT OBSERVATIONS	In Compliance		N/O	Comments
Specified finish	Yes ☒	☐	☐	Trowel
Protection of surfaces from cracking due to rapid drying	Yes ☐	☐	☒	
Proper curing procedures implemented	Yes ☐	☐	☒	

NON-CONFORMANCE ITEMS OBSERVED Yes ☐ No ☒

Non-Conformance Item Description:

Action Taken by SWCE:

Persons Notified:

Notes:

SWCE advised Biskup of test results. Slump 3". Air 4.5%. Conc. temp. 63°. CCI did not use a mechanical vibrator. CCI used a shovel to tamp and consolidate concrete at footings. CCI will use a mechanical vibrator when concrete placed at walls.

Attachments: Photos

Reviewed By: RED

10.29.2009

10.29.2009

10.29.2009

S.W.COLE ENGINEERING, INC.

09314

Project Name PORTLAND, ME - BROOKLAWN MEMORIAL PARK GARAGE - MATERIALS TESTING

Project Number 07-1059.1

Project Manager ROGER DOMINGO

Client BISKUP CONSTRUCTION, INC.

Date 11/5/2009

ASSOCIATED DESIGN PARTNERS INC
AARON S. WILSON
80 LEIGHTON ROAD
FALMOUTH, ME 04105

Phone Number 207-878-1751
Fax Number 207-878-1788

Results Being Reported

CONCRETE CYLINDER COMPRESSION TEST - ASTM C39/AASHTO T22

Copy To:

BISKUP CONSTRUCTION, INC. - JIM BISKUP

Remarks: MAIL

S. W. COLE ENGINEERING, INC.

BY: Roger E. Domingo

S.W.COLE ENGINEERING, INC.

Report of Concrete Compressive Strength

ASTM C-31 & C-39

Project Name: PORTLAND, ME - BROOKLAWN MEMORIAL PARK GARAGE - MATERIALS TESTING

Project Number: 07-1059.1

Client: BISKUP CONSTRUCTION, INC.

Client Contract Number:

General Contractor:

Concrete Supplier: DRAGON PRODUCTS

PLACEMENT INFORMATION

Date Cast: 10/29/2009 **Time Cast:** 1:40 **Date Received:** 10/30/2009

Placement Location: FOOTING LINE 1, A TO D, LINE 1 TO 5, LINE 5 A TO D

Placement Method: DIRECT DISCHARGE

Cylinders Made By: VLT

Placement Vol. (yd³): 18.5

Aggregate Size (in): 3/4

INITIAL CURING CONDITIONS

Temperatures

Minimum (°F) **Maximum (°F)**

DELIVERY INFORMATION

Admixtures: MRWR - GLENIUM

TEST RESULTS

Slump (in) (C-143): **Slump WR:** 3/4

Air Content (%) (C-231): **Air WR:** 4.5

Air Temp (°F): 59

Conc. Temp (°F) (C-1064): 63

Load Number: 1

Mixer Number: 190

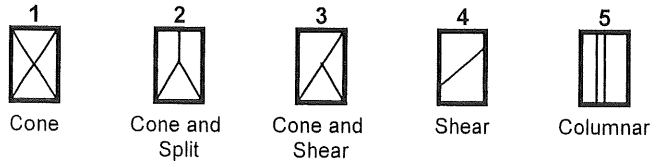
Ticket Number: 3933404

Cubic Yards: 10

Design (psi): **3000**

Cylinder Designation	Cylinder Weight (lbs)	Cylinder Diameter (in)	Cross Sectional Area(In)²	Date Of Test	Cure Type	**Age (days)**	Fracture Type	Load (kips)	**Strength (psi)**
116-1A		4.00	12.57	11/5/2009	Lab	**7**	4	55.6	**4430**
116-1B				11/26/2009	Lab	**28**			
116-1C				11/26/2009	Lab	**28**			
116-1D				Hold	Lab				

Fracture Types



Remarks:

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09314

S.W.COLE ENGINEERING, INC.

Project Name PORTLAND, ME - BROOKLAWN MEMORIAL PARK GARAGE - MATERIALS TESTING

Project Number 07-1059.1 Project Manager ROGER DOMINGO

Client BISKUP CONSTRUCTION, INC. Date 11/12/2009

ASSOCIATED DESIGN PARTNERS INC
AARON S. WILSON
80 LEIGHTON ROAD
FALMOUTH, ME 04105

Phone Number 207-878-1751
Fax Number 207-878-1788

Results Being Reported

CONCRETE CYLINDER COMPRESSION TEST - ASTM C39/AASHTO T22

Copy To:

BISKUP CONSTRUCTION, INC. - JIM BISKUP

Remarks: MAIL

S. W. COLE ENGINEERING, INC.

BY: _____

Roger E. Domingo

S.W.COLE ENGINEERING, INC.

Report of Concrete Compressive Strength

ASTM C-31 & C-39

Project Name: PORTLAND, ME - BROOKLAWN MEMORIAL PARK GARAGE - MATERIALS TESTING

Project Number: 07-1059.1

Client: BISKUP CONSTRUCTION, INC.

Client Contract Number:

General Contractor:

Concrete Supplier: DRAGON PRODUCTS

PLACEMENT INFORMATION

Date Cast: 11/4/2009 **Time Cast:** 11:40 **Date Received:** 11/6/2009

Placement Location: FOUNDATION WALLS

Placement Method: PUMP

Cylinders Made By: JJR

Placement Vol. (yd^3): 55

Aggregate Size (in): 3/4

INITIAL CURING CONDITIONS

Temperatures

Minimum (°F) **Maximum (°F)**

DELIVERY INFORMATION

Admixtures: MRWR

TEST RESULTS

Slump (in) (C-143): **Slump WR:** 6.25

Air Content (%) (C-231): **Air WR:** 6.5

Air Temp (°F): 55

Conc. Temp (°F) (C-1064): 63

Load Number: 3

Mixer Number: 172

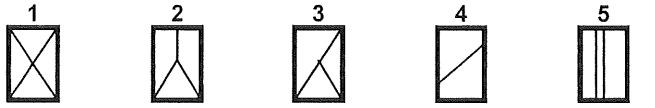
Ticket Number: 3933448

Cubic Yards: 12

Design (psi): **3000**

Cylinder Designation	Cylinder Weight (lbs)	Cylinder Diameter (in)	Cross Sectional Area(In)²	Date Of Test	Cure Type	**Age (days)**	Fracture Type	Load (kips)	**Strength (psi)**
116-2A		4.00	12.57	11/11/2009	Lab	**7**	4	34.2	**2720**
116-2B				12/2/2009	Lab	**28**			
116-2C				12/2/2009	Lab	**28**			
116-2D				Hold	Lab				

Fracture Types



Remarks:

S.W.COLE ENGINEERING, INC.

Concrete Construction Observation Report

Project Name/Location:	Brooklawn Memorial Parking Garage	**Project No:**	07-1059.1
Client/Client's Rep.:	Biskup Construction	**Date:**	11-04-09
Concrete Contractor:	CCI	**Sheet:**	1 of 1
Placement Location:	Entire placement for walls	**SWCE Rep.:**	JJR
Placement Type:	Footing ☐ Wall ☒ Column ☐ Slab ☐ Other ☐	**Arrived at Site:**	8:00ampm
		Left Site:	1:30pm

PRE PLACEMENT OBSERVATIONS	**In Compliance**	**N/O**	**Comments**
Bar Size (diameter, length, bend and anchorage)	Yes ☒ No ☐	☐	As required
Location (# of bars, spacing, and cover)	Yes ☒ No ☐	☐	Acceptable
Splicing (weld joint, overlap)	Yes ☒ No ☐	☐	Acceptable
Stability (wiring, chairs, and spacers)	Yes ☒ No ☐	☐	As required
Reinforcement free from mud, oil, rust, or other nonmetallic coatings	Yes ☒ No ☐	☐	Acceptable
Reinforcement appears in conformance to specifications	Yes ☒ No ☐	☐	Acceptable
Soil subgrade prepared in accordance with project specifications	Yes ☐ No ☐	☐	N/A

Referenced Drawings	**Date**	**Page**	**Rev.**	**ASTM**	**GRADE**
Assoc. Design Partners	9/29	F-1		**A 615** ☒	**40** ☐ **50** ☐ **60** ☒
Assoc. Design Partners	9/29	F-2		**A 616** ☐	**75** ☐
Assoc. Design Partners	9/29	F-3		**A 617** ☐	
				A 706 ☐	**6"x6" WWF** ☐

CONCRETE PLACEMENT OBSERVATIONS	**In Compliance**	**N/O**	**Comments**
Required mix used	Yes ☒ ☐	☐	3000psi, ¾" MRWR
Placement and consolidation of concrete observed	Yes ☒ ☐	☐	Acceptable
Concrete properly conveyed to all areas of placement	Yes ☒ ☐	☐	Pump Northeast
Depth of layer maximum limits not exceeded	Yes ☒ ☐	☐	
Internal vibration (depth of insertion, spacing, time, vertical insertion, no conveyance of concrete by vibration)	Yes ☒ ☐	☐	Handheld Vibrator
Even layering around openings and embedments	Yes ☒ ☐	☐	Acceptable
Removal of temporary ties and spacers	Yes ☐ ☐	☐	N/A

FIELD TESTING OF CONCRETE PERFORMED Yes ☒ No ☐

***CYLINDER SET NO:** 106-2 A-D ←**refer to associated concrete test report*

POST PLACEMENT OBSERVATIONS	**In Compliance**	**N/O**	**Comments**
Specified finish	Yes ☒ ☐	☐	Trowel
Protection of surfaces from cracking due to rapid drying	Yes ☐ ☐	☒	
Proper curing procedures implemented	Yes ☐ ☐	☒	

NON-CONFORMANCE ITEMS OBSERVED Yes ☐ No ☒

Non-Conformance Item Description:

Action Taken by SWCE:

Persons Notified:

Notes:

SWCE advised Sid Page of Biskup that the concrete had been over the 90 minute time frame stated in the specifications. Initial air for load 1 was at 10%. Approximately 25 minutes later Mark West of Dragon came on site and requested another air test. Test showed that the air was now at 7%. Sid Page allowed the pour to continue.

Attachments: Photos

Reviewed By: RED

S.W.COLE ENGINEERING, INC.

Report of Concrete Compressive Strength

ASTM C-31 & C-39

Project Name: PORTLAND, ME - BROOKLAWN MEMORIAL PARK GARAGE - MATERIALS TESTING

Project Number: 07-1059.1

Client: BISKUP CONSTRUCTION, INC.

Client Contract Number:

General Contractor:

Concrete Supplier: DRAGON PRODUCTS

PLACEMENT INFORMATION

Date Cast: 10/29/2009 **Time Cast:** 1:40 **Date Received:** 10/30/2009

Placement Location: FOOTING LINE 1, A TO D, LINE 1 TO 5, LINE 5 A TO D

Placement Method: DIRECT DISCHARGE

Cylinders Made By: VLT

Placement Vol. (yd^3): 18.5

Aggregate Size (in): 3/4

INITIAL CURING CONDITIONS

Temperatures

Minimum (°F) **Maximum (°F)**

DELIVERY INFORMATION

Admixtures: MRWR - GLENIUM

TEST RESULTS

Slump (in) (C-143): **Slump WR:** 3/4

Air Content (%) (C-231): **Air WR:** 4.5

Air Temp (°F): 59

Conc. Temp (°F) (C-1064): 63

Load Number: 1

Mixer Number: 190

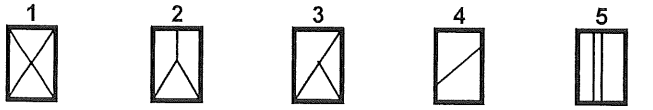
Ticket Number: 3933404

Cubic Yards: 10

Design (psi): **3000**

Cylinder Designation	Cylinder Weight (lbs)	Cylinder Diameter (in)	Cross Sectional Area(In)²	Date Of Test	Cure Type	Age (days)	Fracture Type	Load (kips)	Strength (psi)
116-1A		4.00	12.57	11/5/2009	Lab	**7**	4	55.6	**4430**
116-1B		4.00	12.57	11/30/2009	Lab	**32**	4	71.0	**5650**
116-1C		4.00	12.57	11/30/2009	Lab	**32**	4	68.0	**5410**
116-1D				Hold	Lab				

Fracture Types



Remarks: Due to the holiday testing was moved to Monday 11-30-09

S.W.COLE ENGINEERING, INC.

Report of Concrete Compressive Strength

ASTM C-31 & C-39

Project Name: PORTLAND, ME - BROOKLAWN MEMORIAL PARK GARAGE - MATERIALS TESTING

Project Number: 07-1059.1

Client: BISKUP CONSTRUCTION, INC.

Client Contract Number:

General Contractor:

Concrete Supplier: DRAGON PRODUCTS

PLACEMENT INFORMATION

Date Cast: 11/4/2009 **Time Cast:** 11:40 **Date Received:** 11/6/2009

Placement Location: FOUNDATION WALLS

Placement Method: PUMP

Cylinders Made By: JJR

Placement Vol. (yd^3): 55

Aggregate Size (in): 3/4

INITIAL CURING CONDITIONS

Temperatures

Minimum (°F) **Maximum (°F)**

DELIVERY INFORMATION

Admixtures: MRWR

TEST RESULTS

Slump (in) (C-143): **Slump WR:** 6.25

Air Content (%) (C-231): **Air WR:** 6.5

Air Temp (°F): 55

Conc. Temp (°F) (C-1064): 63

Load Number: 3

Mixer Number: 172

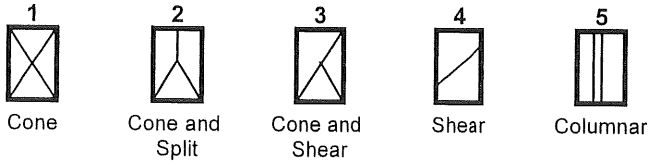
Ticket Number: 3933448

Cubic Yards: 12

Design (psi): **3000**

Cylinder Designation	Cylinder Weight (lbs)	Cylinder Diameter (in)	Cross Sectional Area(In)²	Date Of Test	Cure Type	Age (days)	Fracture Type	Load (kips)	Strength (psi)
116-2A		4.00	12.57	11/11/2009	Lab	**7**	4	34.2	**2720**
116-2B		4.00	12.57	12/2/2009	Lab	**28**	4	57.2	**4550**
116-2C		4.00	12.57	12/2/2009	Lab	**28**	4	59.8	**4760**
116-2D				Hold	Lab				

Fracture Types



Remarks:

S.W.COLE ENGINEERING, INC. • Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

DAILY CONSTRUCTION REPORT

Project: Brooklawn Memorial Park Garage Portland Maine
Client: Biskup Construction
Client's Rep.: Jim Biskup

SWCE Project No.: 07-1059.1
Date: 12-23-09
Weather: Overcast, 10 - 20.

Work in Progress: Biskup Construction and subcontracted trades: Building fit up.

General Observations, Discussions, Etc: As scheduled by our client, we made a site visit to make observations of the wood and steel structural framing in accordance with the special inspection requirements. We met with Sid Page (general contractor) on site and reviewed the available project documents.

Our observations of the steel components were based on Package Industries Inc plans FSHT-1, FSHT-2 and FSHT-3 dated 10-19-09, it appeared that the bracing and structural fasteners had been installed as detailed. No field welding was required for the steel pre-engineered structure and all of the bolted connections were called out as "snug tight".

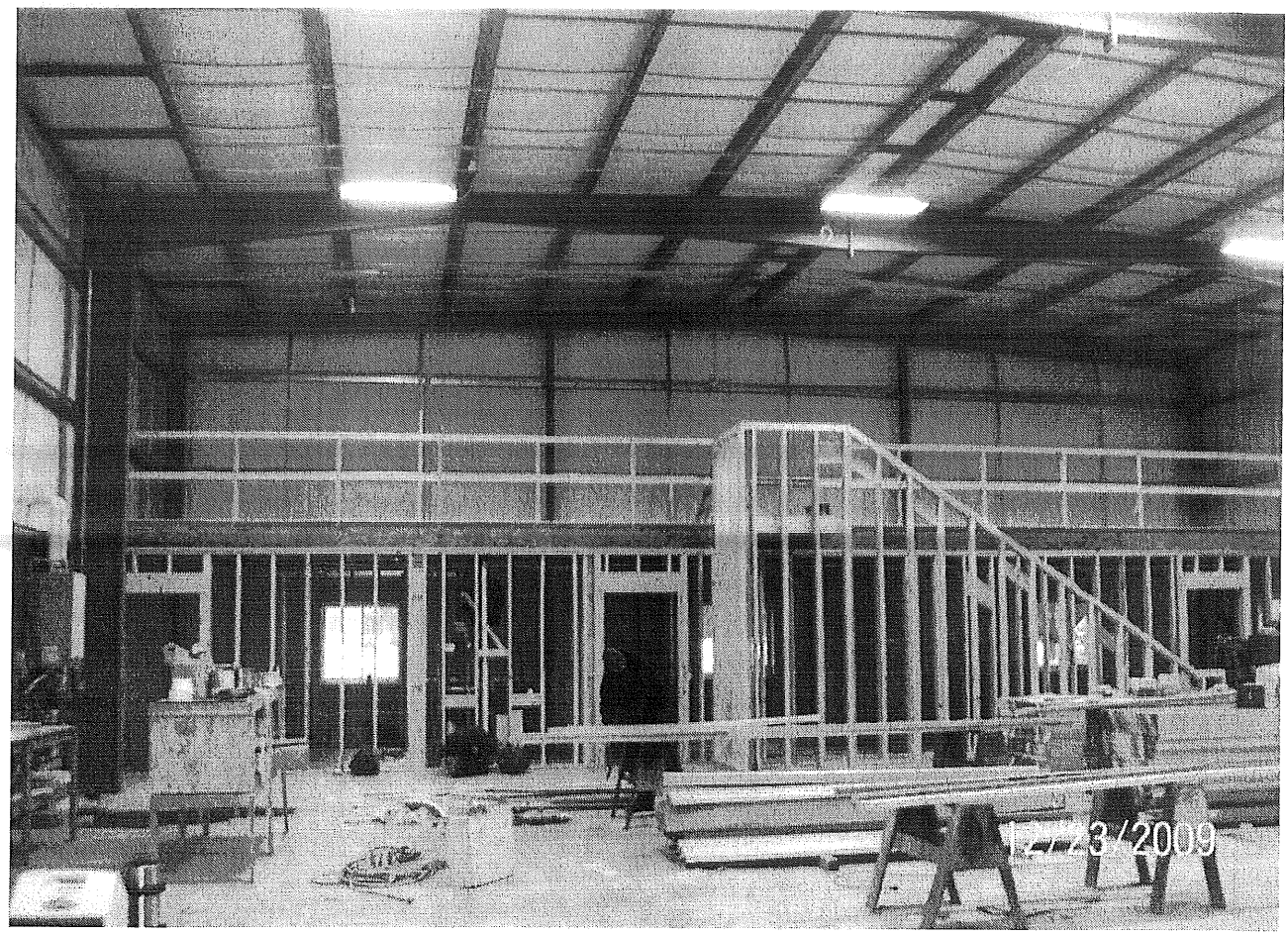
We referenced Associated Design Partners structural drawings F-1 through F-4 dated 9-29-09 when making observations of the wood framed portion of the building. General construction and fastening appeared to be in accordance with the project documents. However, we noted that the blocking specified in the shear walls (detail A4 on F-4) had not been installed and on the mezzanine floor sheathing the parameter fastener pattern was 12-inches on center rather than the 6-inches specified on B4 sheet F-4. Sid indicated that these few issues would be addressed. At the time of our visit the two shear walls running front to back were not sheathed due to ongoing utility work and pending inspections from the city.

On Site: 7:15 – 8:15
Attachments: Photos
Sheet: 1 of 1

SWC Rep.: KBG
Rev. by: RED

P:\2007\07-1059.1 M - Biskup Construction - Portland, ME - Brooklawn Memorial Park Garage - CMT & SI - RED\DFRs\DFR 12-23-09 Framing.doc

GRAY, ME OFFICE
286 Portland Road, Gray, ME 04039, Tel (207) 657-2866, Fax (207) 657-2840, (E) infogray@swcole.com, (I) www.swcole.com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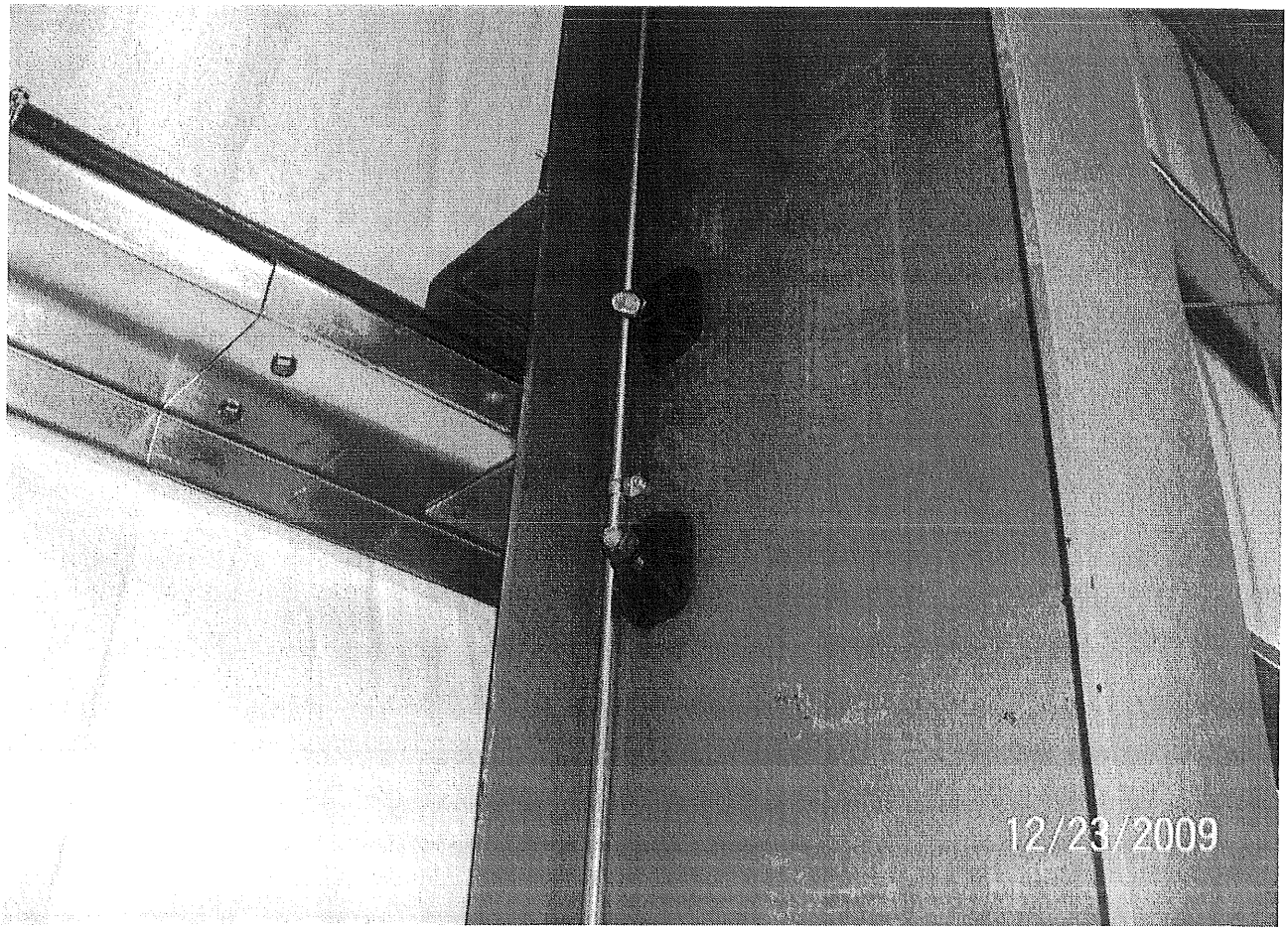
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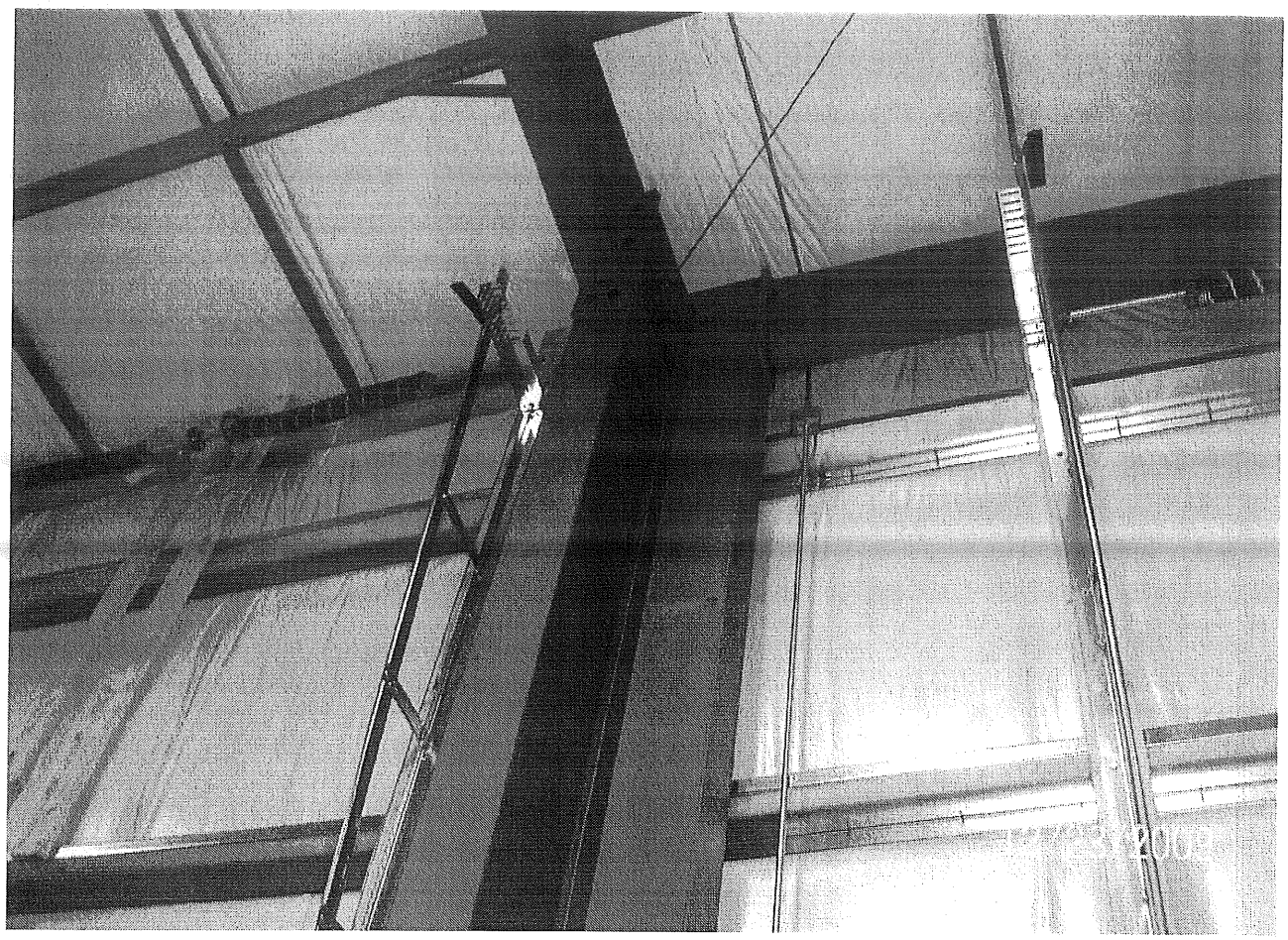
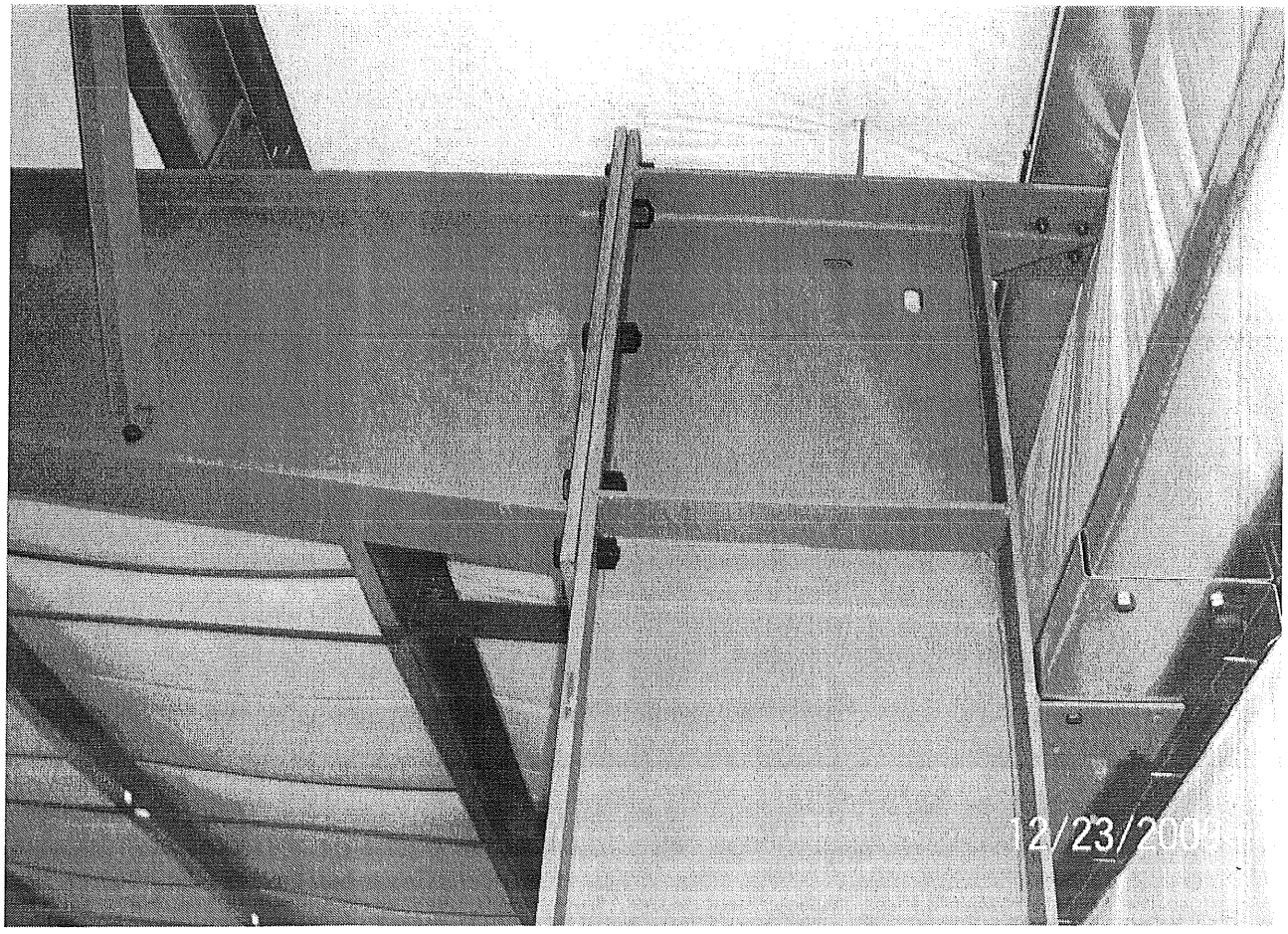



11-7/8"
SPACING
SIMPLE SPAN
MULTIPLE SPAN
12/23/2009


AdvanTech
12/23/2009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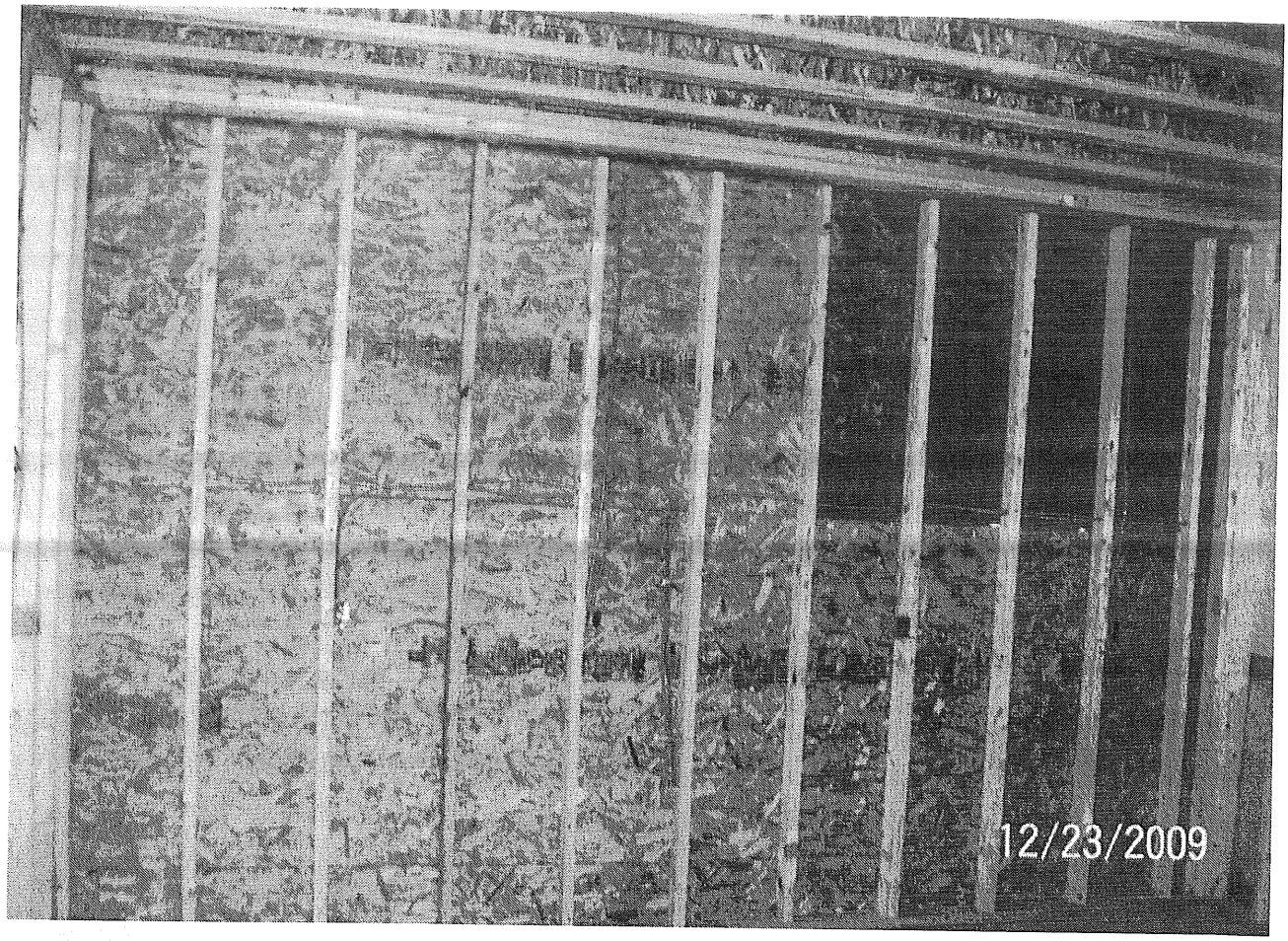
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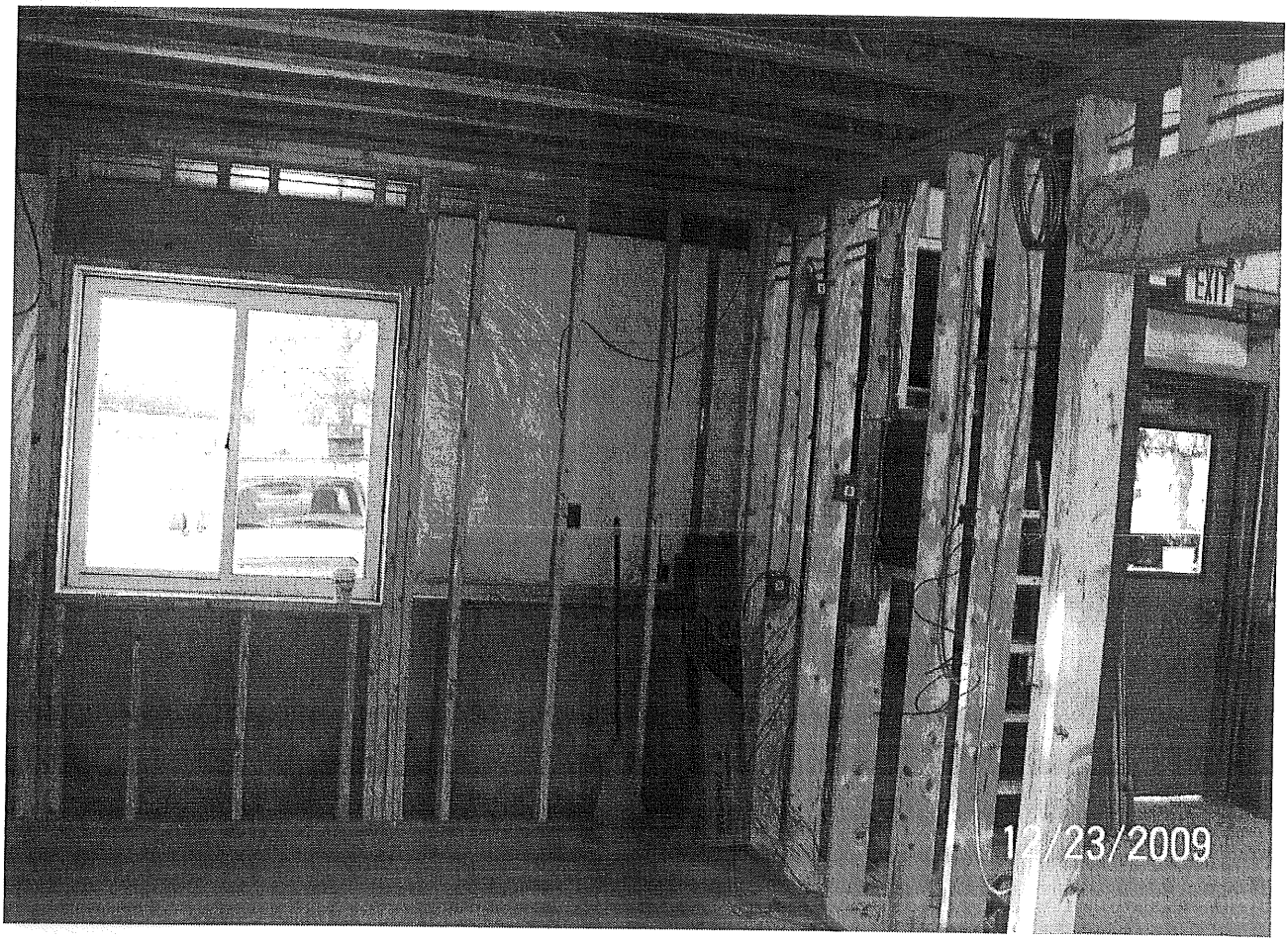
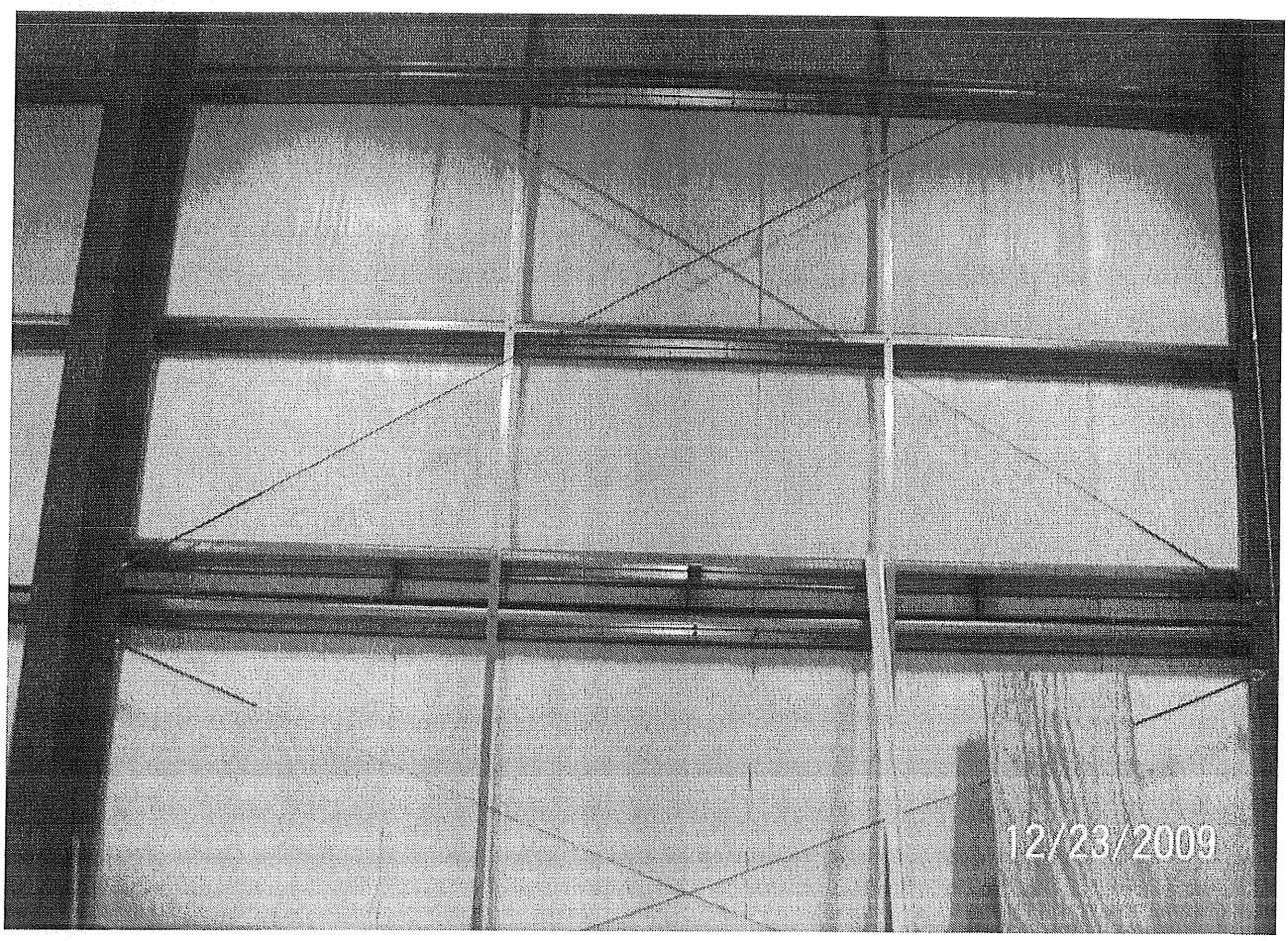

EXIT
12/23/2009


12/23/2009

BISKUP CONSTRUCTION, INC.

16 DANIELLE DRIVE WINDHAM, MAINE 04062

TEL. (207) 892-9800 FAX (207) 892-9895

PORTLAND FIRE DEPARTMENT

Project Name: Brooklawn Memorial Park

Contact: Bob Sanford

Project Address: 2002 Congress Street

Phone Number: 773-7679

Architect: James Streeter PE

General Contractor: Biskup Construction, Inc.

Please see attached plans for NFPA and IBC classifications and additional information.

State of Maine
Department of Public Safety
Construction Permit

Reviewed for Barrier Free

Not Sprinkled

18638

BROOKLAWN MEMORIAL PARK

Located at: 2002 CONGRESS STREET

PORTLAND

Occupancy/Use: STORAGE

Permission is hereby given to:

BROOKLAWN MEMORIAL PARK

2002 CONGRESS STREET
PORTLAND, ME 04102

to construct or alter the afore referenced building according to the plans hitherto filed with the Commisioner and now approved.

No departure from application form/plans shall be made without prior approval in writing. This permit is issued under the provision of Title 25, Chapter 317, Section 2448 and the provisions of Title 5, Section 4594 - F.

Nothing herein shall excuse the holder of this permit for failure to comply with local ordinances, zoning laws, or other pertinent legal restrictions. Each permit issued shall be displayed/available at the site of construction.

This permit will expire at midnight on the *23 rd of March 2010*

Dated the 24 th day of September A.D. 2009

Commissioner

Copy-1 Owner

Comments:

BROOKLAWN MEMORIAL PARK

2002 CONGRESS STREET
PORTLAND, ME 04102