



## Value Engineering Checklist



CAST IRON SOIL PIPE INSTITUTE  
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[www.CISPI.org](http://www.CISPI.org)

## Maximum Working Temperature

Will system exceed 140° F by design or accident? Boiler condensate, commercial kitchen, washing machine, autoclaves?

YES NO

**Fact:** PVC maximum working temperature is 140° F.

**Fact:** CISP systems maximum working temperature is 212° F. Cast iron can withstand temperatures of well beyond 212°. A CISP system is only limited by the gasket material.

## Thermal Expansion

What is the air temperature at the time of installation?

What is the maximum temperature of the system?

What is the potential maximum change in temperature?

YES NO

Does contractor have expansion couplings and/or offsets figured into bid?

YES NO

Access to expansion couplings for possible replacement/maintenance?

**Fact:** PVC will expand 3.6" per 100' of pipe with a 100° F temperature change.

**Fact:** CISP will expand 0.745" per 100' of pipe with a 100° F temperature change.

## Sound Attenuation

Will anyone be sleeping, convalescing, studying or working in the facility (i.e., hotels, dormitories, hospitals, schools, libraries, retirement, convalescing facilities, shared-wall condos & apartments, correctional facilities, quiet work areas, etc.)?

YES NO

**Fact:** PVC requires added insulation wrap and isolation brackets for quiet performance required in many buildings.

**Fact:** Cast iron requires no insulation wrap because of its natural noise-dampening qualities with consistent sound performance levels in the 25-dB range (utilizing neoprene gaskets).

## Underground Installation

YES    NO

Will contractor be installing PVC with ASTM D 2321 protocol?

YES    NO

Will contractor be supervised during installation of underground PVC to assure required trench width, trench bottom and proper soil compaction.

YES    NO

Does contractor have proper backfill material figured into his bid?

YES    NO

Will the DWV system be installed under concrete? Are the consequences of an under-slab failure significant?

**Fact:** As a flexible piping system, PVC requires greater care in underground applications. It is dependent upon proper compaction of the surrounding soil (soil pipe mechanism) in order to withstand an external load. PVC pipe is considered to be in a failed condition when earth or live loads have caused the pipe to deflect beyond a certain point, generally 5%.

**Fact:** Calculating maximum burial depths for flexible piping systems is more complex and requires the use of the Iowa Formula, pipe stiffness values for the system employed and knowledge of local soil conditions. Additional information on the Iowa Formula is available within the Uni-Bell Handbook of PVC Pipe.

**Fact:** As a rigid material, CISP fails when it crushes. Rigid piping systems can be evaluated with a ring crush test, and the derived values can be used to verify that the pipe will withstand the required external load.

## Hanger Spacing

YES    NO

Has the cost of additional hangers and their installation been considered?

**Fact:** Model Plumbing Codes require PVC DWV pipe to be supported horizontally every four feet.

**Fact:** CISP offers greater structural strength, significantly reducing hanger requirements and providing consistent fall. Cast iron needs to be supported within 18" of each joint and every 10 feet horizontally.

## Plenum Spaces

Does the building utilize plenum spaces for return air?

YES NO

 

If wrapping PVC to meet ASTM E84 is permitted by code, will a post-cable/tele-comm/HVAC installation inspection occur to make sure pipe/fitting wrap is not damaged or disturbed?

YES NO

 

**Fact:** PVC used for sanitary drain, waste, vent and storm drainage should not be installed in a plenum.

**Fact:** Cast iron is a noncombustible product which can be installed in a return air plenum.

## Firewall Penetration

Has contractor added the cost of fire-stopping materials and labor, or will that be passed along to another trade?

YES NO

 

**Fact:** PVC requires listed fire-stop materials or collars conforming to the requirements of ASTM E 814 on both sides of the fire-rated wall. The collars utilize intumescent fire-stopping materials.

**Fact:** Cast iron requires installers to only seal the annular space between the wall and the pipe. Typically, mineral wool batting and fire-resistant caulking are used to fill the annular space.

If you answered **YES** to any of these questions, please consult a Cast Iron Soil Pipe Institute representative to further discuss the best material for your project.

You may download this checklist at [www.cispi.org](http://www.cispi.org)