Product Knowledge – GENERAL GUIDELINES FOR HIGH PRESSURE TEST PLUG APPLICATIONS

(Read through the instructions completely before starting)

WARNING Read and understand how to safely use pipe plugs and testing equipment. LANSAS® attaches SAFETY INSTRUCTIONS to every plug sold. These instructions can be downloaded from the LANSAS® website. LANSAS® also has a safety video which is available for viewing online at http://www.lansas.com/video_safety_English.htm.

- **Safety should always be of the utmost importance when installing and using Pipe Plugs.**
- Prior to doing any installation, a review of any Pipe Plug Safety Instructions, Safety Videos, Confined Space Entry requirements, and any Federal, State, or local laws regarding this type of work would be recommended.
- Make sure you know the pipe diameter/s the Pipe Plug you are using is made for. Do not attempt to use the Pipe Plug in a pipe that exceeds the maximum pipe diameter that the Pipe Plug was designed for.

1) LANSAS® High Pressure Test Plugs (045 series) have a Required Inflation Pressure of 225 psi. We recommend inflating with water using a Hydrostatic Test Pump or a Hydrostatic Hand Pump. *

   *You can plum directly into our Inflation Kits (323-30 Dura-Lift Inflation Kit works great) with a Hydrostatic Test Pump at the 1/4" (F) NPT on the Ball Valve at the bottom of the Gauge Assembly.

2) Per the LANSAS® Products Safety Instructions, Blocking / Bracing must be used to prevent the movement or complete dislodging of pipe plugs. This blocking or bracing should be designed to contain the dislodged plug and all materials behind the plug should the plug fail. Use a certified engineer for the design, construction and maintenance of a containment system.

Rubber eyelets, steel rings and metal eyes are not to be used in restraining pipe plugs. These eyelets, rings and metal eyes are designed only for lifting or lowering the plug.

In these higher pressure applications, it becomes even more important to do so ensuring that the plugs are not damaged, as well as other property and to avoid the risk of injuries to people.

BLOCKING, BRACING, OR RESTRAINING THE PIPE PLUG

The LANSAS® SAFETY INSTRUCTIONS indicate "Blocking / Bracing must be used to prevent the movement or complete dislodging of Pipe Plugs." A certified Engineer should be consulted to design, construct and maintain the containment system for safety.

A) Some of the key considerations when Blocking, Bracing or Restraining Pipe Plugs are as follows:

a. Do not "Point Load" the Pipe Plug when Blocking /Bracing. A "Point Load" is a load which is localized to a specific location on a structure.

b. Instead, use multiple points of contact on the plug in order to spread the back pressure or test pressure forces over the largest possible area on the Pipe Plug.

c. Be aware that Rubber Eyelets, Steel Rings, Metal Eye-Bolts, Eyelets, and Eye-Nuts are not to be used for restraining Pipe Plugs. These Eyelets, Steel Rings, Metal Eye-Bolts, Eyelets, and Eye-Nuts are used for the lifting or lowering of Pipe Plugs during installation or removal.

d. Know what the amount of force is that will be exerted on the Pipe Plug throughout the application.

   For example, a Pipe Plug in a 12" diameter pipe with 5 psi Back Pressure will have a total force behind that Pipe Plug of approximately 565 lbs. However, that same 12" diameter pipe with a Pipe Plug holding 100 psi of Back Pressure will have over 11,000 lbs. of force behind it.

   Consider a 24" diameter pipe with a Pipe Plug installed holding 5 psi Back Pressure will have 2,260 lbs. of force behind it, but if the plug must hold 100 psi the force becomes over 45,000 lbs.

e. Make sure to use materials that are strong enough to withstand the forces that will be exerted by the application.

f. Again, LANSAS® recommends consulting a certified Engineer to work with you to develop a containment system to insure your safety.

Here are a few pictures of Blocking/Bracing/Restraining Pipe Plugs during use. Some are High Pressure applications and some are not. While they worked for the end-users in these applications, LANSAS® does not endorse any specific method for Blocking/Bracing/Restraining. We simply wanted to give some examples of methodology.









If you need an Engineering Firm to consult with regard to Blocking, Bracing or Restraining a Pipe Plug for an application, LANSAS® has referred customers to the following company with excellent success:

Company:	**D.H. Charles Engineering, Inc. – Santa Rosa, CA**
Contact:	**Jasper Calcara, P.E. – President**
Phone:	**(707) 537-8282**
Email:	**calcara@charlesengineering.com**

3) The setup should include hose lengths to keep workers out of the DANGER-ZONE and valves at the ends of these hoses away from the plugs to control the water flow. All these hoses and

fittings must be able to withstand the working pressure of the test. It's recommended to use hoses and fittings capable of twice that working pressure.

4) Generally these tests have a high side (high point) and a low side (low point). Filling of the test pipe and the actual testing should be done from the low side (low point) while air in the pipe is bled-off from the high side (high point).

   The "High Point" (high side) plug is always installed with the 3/4" offset bypass pipe on the plug at the "APEX" or 12 O'clock position to allow the maximum amount of air to be bled off the pipe prior to conducting the Hydrostatic test. Air in the line is bad for the test.

5) Contractors usually fill the test area using a 2" or 3" Trash or Water pump from a clean source through the 2" center bypass port on the "Low Side" (low point) plug. Again, with a length of hose that keeps workers out of the "DANGER-ZONE" and a valve at the end of that hose farthest away from the plug. Close this valve when all the air has bled out of the test area and a full stream of water is flowing from the 3/4" off-set bypass port on the "High Side" (high point) plug.

6) Once the test area is filled and as much air as possible is bled-off, the Hydrostatic Test Pump would be connected if it isn't already. Usually to the 3/4" off-set bypass port on the "Low Side" (low point) plug at the valve end of a hose long enough to keep workers out of the "DANGER-ZONE). The pump is engaged to pressurize the test area to the test pressure. Once the required pressure is reached in the test area, the valve would be closed and the Hydrostatic Test Pump disconnected to begin timing the test for the required period.



MONITORING THE PIPE PLUG

Once the installation and inflation of plug is complete and you are working the application, the plug should be monitored regularly. The Required Inflation Pressure should be checked every 4 hours at a minimum on regular pipe plug applications, but more often in critical situations such as High Pressure Testing. You must always be cautious to ensure you do not endanger the application, the plug, the structure where the plug is installed and most importantly the workers on the job.

7) Once the test has been completed, the valves (both valves) on the “High Point” (high side) plug would be opened to begin bleeding off water to reduce the test pressure.

WARNING **YOU MUST ALLOW AIR TO VENT BACK INTO THE PIPE AS YOU DRAIN OFF THE WATER!**

Bleeding off water from the test area without allowing air to vent into that area can create a vacuum effect pulling the plug into the pipe and possibly damaging the Test Plug frame and / or bladder.

8) Once you have drained off water from the test area where there is no more water leaking from the ports on the high side, continue to leave these open and open the valves on the “Low Side” (low point) plug.

9) Once the test area is completely drained, the plugs can be deflated. Only deflate plugs once you are sure there is no longer any Back / Test Pressure behind the plug/s. Once the plugs are deflated, remove the Blocking / Bracing structure and then remove the plugs. Remember! Deflate the plug/s while the Blocking / Bracing are still in place for safety.

WARNING These instructions are not meant to be all inclusive, but rather to be used as building blocks to help guide in the safe use of High Pressure Test Plugs. If you have any questions, please feel free to contact LANSAS® directly.