LESSON LEARNED

04/2016	BELL HOLES

DATE: ***June 2016*** ***ISSUED BY:*** ***QHSE DEPARTMENT***

OBJECT: ***BELL HOLES CONSTRUCTION***

DESCRIPTION:

During construction activities of pipelines and plants, a several number of welds should be performed, mainly manually, inside the excavation. Following the personnel must enter inside Bell Holes for carry out tests and coating activities. It is a good practice to properly prepare Bell Holes in order to carry out any activity in a safe manner.
The main risks for activities performed inside Bell Holes are:

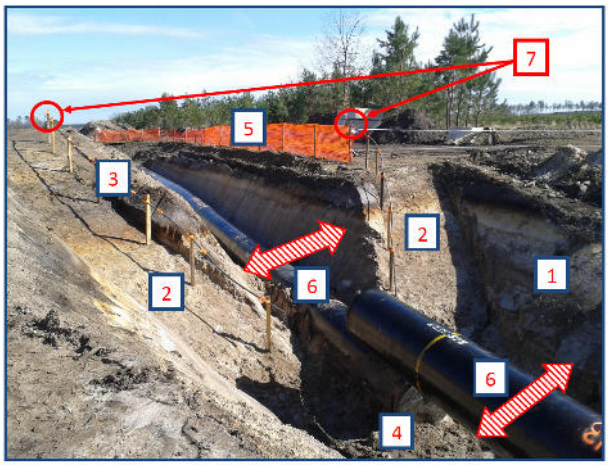
1. **Instability of excavation walls;**
2. **Falling from height;**
3. **Slips, trips and falls;**
4. **Falling of objects;**
5. **Crushing;**
6. **Difficult access / exit.**

PURPOSE

- *Reduce / eliminate the risk factors;*
- *Give guidelines for the proper construction of bell holes during activities inside excavations.*

SOLUTION

Depending on the type of soil and the environment in which activity is carried out, bell holes should be prepared considering indications of a typical bell holes with the following features:



1	Sloping according to the angle of repose of the ground.
2	2 access ramps stable and free of obstacles
3	Stable handrails along the ramp
4	Bed of the bell hole dry and stable
5	Stable railing, 1m high, visible and made of consistent material
6	Warning tape at the ends of the Bell Hole to avoid access to trench
7	Bell Holes validation to authorize personnel entry

N.B.: For excavation depths greater than 1.5 m, the sloping angle should not be less than the angle of ground natural slope, otherwise it should be protected.
To prevent falling objects and debris, it is necessary that the excavated material and related equipment, including machinery, should be placed at least 1 meter away from the edge of the excavation.

ADDITIONAL SOLUTION TO BE TAKEN IN SPECIFIC CASES TO REDUCE RISK

1. Use of sheet piles with hydraulic function and/or with soil support function; special reinforcement frameworks must be internally welded to the stability of the entire structure; access must be guaranteed by adequate stairs;
2. Use of trench box with soil support function; access must be guaranteed by adequate stairs.