IMPROVEMENT AROUND WET WELLS

Paper Presented by :

Gary Grogan

Author:

Gary Grogan, *Operations Technician,*

'us' - Utility Services

73rd Annual Water Industry Engineers and Operators' Conference
Bendigo Exhibition Centre
31 August to 2 September, 2010

IMPROVEMENT AROUND WET WELLS

Gary Grogan, *Operations Technician*, *'us'* - Utility Services

ABSTRACT

Recent changes to workplace regulations, largely relating to safety, mean that workers now need to carry and deploy a large amount of extra equipment in order to operate and maintain existing pump stations in South East Water's network area. Gary Grogan and ***'us'*** - Utility Services have developed and installed a safety turret at Balnarring in response to the key issues which had been encountered by field crews. This paper describes the features and benefits of the pump station safety turret installed at Balnarring, Victoria, Australia, which removes a large percentage of the safety concerns, thus reducing the risk of damage to assets and injury to personnel.

KEYWORDS

Water Industry, Sewer, Pump Station, Occupational Health and Safety, Fall from Heights, Confined Space Entry, Sewer Access Device (SAD)

1.0 INTRODUCTION

South East Water has 244 sewer pump stations spread throughout their area. These pump stations are of various designs including kerbside and building. Pump stations run 24 hours a day and require programmed maintenance to ensure their optimal performance. Occasionally these stations require emergency maintenance and ***'us'*** – Utility Services personnel need to gain access to perform required tasks. This involves entering a confined space and therefore the need for appropriate safety equipment.

South East Water was faced with a number of occupational health and safety issues with regard to its traditional pump station designs.

Recent changes to safety, manual handling, confined space entry and fall from heights regulations meant that our traditional pump station designs now present additional challenges. Work crews needed to undertake significant extra work, using additional equipment in order to perform their work safely.

It was clear that there was no single application that would cover all the components involved in making our pump stations compliant to the new regulations. We needed to look for something different, beyond what was available in the market place, to come up with a design that would make our traditional pump stations compliant.

We needed something that made working around an open wet well safer and less restrictive.

This paper will detail:

- Anchor points around pump stations
- Benefits of anchor points
- Manual Handling issues
- Fall from heights
- Security for the public

2.0 DISCUSSION

Initially, ***'us'*** - Utility Services went about trying to upgrade existing pump stations, using equipment that was available on the market i.e. safety grates under the gatic lids, safety rails, fall arresters etc. We found that the Sewer Access Device (SAD) and tripod would no longer fit above some of our pump stations once safety barriers were in place. We also found that being attached to a fall arrest device became a nuisance and had the potential to create additional hazards around the work site. The majority of pump stations required the use of more than one solution to become compliant and carrying around all of the extra safety equipment started to become a logistical nightmare.

Illustrated in Figures 1 and 2 is the use of the fall arrest device, barrier, tripod and fall restraint. The operator of the tripod is required to stand behind the barrier or be attached to an anchor point by means of a lanyard. Using this method restricts the work area and requires a large amount of equipment.

Figure 1: Fall arrest barrier & tripod

Figure 2: Fall restraint

Illustrated in Figures 3 and 4 are the existing 'fall restraint anchor points' that are currently established around various pump station sites as well as the existing equipment used for working in the vicinity of open gatic lids. Crew members working in the vicinity of the opening are tethered to anchor points, using harnesses and safety lines.

Figure 3: ***Existing fall restraint anchor points.***

Figure 4: ***Gatic lids open, persons tethered to anchor points.***

Illustrated in Figure 5 are some of the issues that can be created using harnesses and safety lines when moving to and from vehicles, accessing different tools and equipment.

Figure 5: ***Fall restraint lines can become tangled and potentially create additional hazards.***

Working above the wet well and trying to go back and forth to the work vehicle (to fetch tools etc.) while wearing a harnesses and lanyard was making the job more difficult, often frustrating and very time consuming.

2.1 Balnarring Pump Station Site

The condition of South East Water's sewer pump station at Balnarring (SP819 Balnarring outfall) had attracted a number of complaints from the public, a letter from the Balnarring residents group complaining about the odour from the pump station, and from ***'us'*** - Utility Services maintenance crews. This particular configuration requires the removal of several gatic lids and beams to access the wet well, as these assets have started to become severely corroded. To address these issues alone would have required significant work, including the replacement of support beams and gatic lids.

This provided an opportunity to approach the problem differently; not only to fix the immediate problems with this pump station but to look at some of the other issues facing our traditional sewer pump stations.

Some of the key issues facing ***'us'*** - Utility Services work crews were:

- Risk of fall from heights
- Manual handling
- Public safety

2.2 Access Turret

The result of taking this new approach was the development of a new access turret, installed **above** the ground, made to measure and delivered on site. Traditional lids and beams were removed from the existing pump station and the turret was positioned over the opening; anchored permanently to the top slab.

Illustrated in Figure 6 is the operational access turret at Balnarring Pump Station which was fitted in less than half a day, allowing the pump station to operate normally throughout the installation process.

Figure 6: ***Turret with lid closed and then open, showing the ladder platform and davit arm folded down.***

Illustrated in Figure 7 is the ladder platform in the raised position, with the ladder and davit arm in both the lowered and raised positions.

Figure 7: ***Ladder and davit arm positions for confined space entry, allowing other workers to operate safely on ground level, outside the opening.***

The turret provides a number of features and benefits which help with compliance, offering a safe and efficient working environment.

Some of these features include:

- Fall from height protection while lids are open
- Allows personnel to view the opening without the need to be tethered to an anchor point
- Pumps can be removed while personnel are free to move around without any danger from falling into the wet well
- Junction boxes can be accessed from above ground, allowing the technician to work without being tethered to an anchor point
- Manual handling is no longer a problem - there are no heavy lids to deal with
- Fully-sealed, light-weight lids, allowing ease of opening
- Ladder and step access is built-in
- A built-in, tested and approved davit arm - to attach fall arrest and retrieval devices
- Removes the need to carry and install extra safety gear
- Protection for the public, by means of a physical barrier
- System is made from anticorrosive materials, protected from the weather

Illustrated in Figure 8 is one worker accessing the wet well and others operating safely on ground level.

Figure 8: ***Workers accessing the wet well using the ladder and davit arm.***

3.0 CONCLUSION

The installation of the access turret has provided a solution to our occupational health and safety issues by providing a practical device which allows maintenance personnel to carry out their works in a safe environment.

Given the introduction of these access turrets ***'us'*** – Utility Services is now much more comfortable that this device offers an efficient and effective alternative to previous methods.

We believe that the use of these access turrets will increase throughout South East Water's area and that of other water authorities.

4.0 ACKNOWLEDGEMENTS

'us' - Utility Services acknowledges the following organisations and individuals for their assistance with the development of the pump station safety turret concept and Balnarring solution:

Tankweld Engineering, Stan Sliwinski

'us' - Utility Services, Warren Roberts

Special mention to Claire Pucovski ***'us'*** - Utility Services.