

Employer: **Enemalta Plc**Date: **18/01/2017**

Time:

Venue:



Job ref: **MPS-MS-05-Chimney
M4 - R05**Issue date: **23/06/2017**


Works Method Statement	005	Area	Zone 05		
Description of Works	Demolition and carting away of existing Chimney M4.				



The report should be read in conjunction with preliminary reports already submitted where all relevant information on Health and Safety and established legal notices are supplied.

Works Method Statement			
Item	Description	Action	Target Date
1.0	DESCRIPTION OF AREA / STRUCTURE		
	Situated in Zone 5, the structure consists of a cast in situ reinforced concrete chimney with a height of circa 81m and a base diameter of circa 6m.		
	As can be seen in the attached / underlying photos the chimney is in very close proximity to areas which are either not indicated for demolition or areas where works are being carried out.		
	The chimney is surrounded by Turbine 8 shed edge structure to the north west which structure currently houses live wires and switchboxes and also the transformers, the west by the precipitator and to the south west by the fire hydrant tanks, all of which are in use or being dismantled. The chimney is also in very close proximity to a public road to the east.		
	Prior to dismantling, and given the most cost effective and smooth operation outlined below, the chimney should be removed once the area is clear from all dangers and live equipment.		
2.0	SAFETY PRECAUTIONS PRIOR TO WORKS		
	<ul style="list-style-type: none"> ➤ Switching off or protect all live equipment ➤ Dismantling of the precipitator and surrounding equipment, including Control Tank, Hydrogen and CO2 tanks which have been removed. ➤ Limiting controlled access of 'public' road through liaison with police, warden and SBS workers. Part of the road closer to M4 would be hoarded off as a safety measure during the ongoing works only however access to and from 3rd party property will remain accessible at all times. ➤ Placing an active emergency light after each working day at the top most area ➤ Protection of elements in the immediate vicinity of the chimney through the use of metal elements or brick walls placed around same elements. ➤ In view of the size of the scissors, the maximum foreseeable size of the material which would fall from heights always in a straight projectile is to be not more than 10-15 cm and would mostly fall on the inside of the chimney. One must add that the larger the elements the more controlled and vertical is their descent in view of weight. Although chimney is 30cm thick (concrete) the scissors which will be used are considerably smaller which would limit the size of the cut element. ➤ Area just under the chimney where contamination was noted will be cleaned following the dismantling of the chimney and will be disposed of as hazardous waste. ➤ Safety tests and certification of all material and equipment to be used 		
3.0	Environmental Issues		
	- A precautionary approach is being taken, to segregate any suspected hazardous components that might be detected during the course of works.		
	- Hazmat survey submitted at ERA clearly indicates that the innermost part of the chimney – the bricks - are to be considered as non-hazardous. This, however, does not mean that there is no flyash in the chimney. When encountered this must be treated as hazardous waste and disposed of appropriately as per waste management plan..		
	- During the works which need to be carried out in limited wind conditions, the area of demolition will be continually sprayed to limit dust dispersion. No works shall be carried out when wind speed is over force 4 and this will be measured through constant monitor of the weather forecast and also through an anemometer that will be placed at a height. As outlined in the attached presentation, water will be sprayed both from the ground up and also from a higher position than the FLY Demolition		




	<p>system in order to make sure that any dust is wetted immediately and limit the dispersion to the minimum possible.</p> <ul style="list-style-type: none"> - The sprayed water that condenses will be absorbed by the sand layer at the base of the chimney. This damp sand layer will be disposed of as hazardous waste. No water shall be allowed to flow to the sea. - An environmental monitor will be overseeing the works throughout the whole process. 		
3.0	WORKS METHODOLOGY		
	<p>The FDS (Fly Demolition System) technology was conceived and perfected over the past 10-12 years, it is summarized in radio-controlled equipment to the demolitions that operates at high altitude supported by a lifting device.</p>		
			
			
	<p>The equipment is composed of a hydraulic unit powered by a diesel engine that powers the mechanism equipped with a grinding demolition tool (grinding mill / caliper for the loader arm / bucket cement).</p> <p>In order to counteract the stresses caused by weather conditions such as wind, the equipment is equipped with two propellers at the end that allow the rotation in the horizontal plane.</p> <p>The FDS is controlled by an operator by means of a remote control which can afford to operate and handle all owned systems. Usually the operator, to have a good control on the</p>		



	<p>intervention of demolition, operates on an aerial platform in total safety. In this specific case, the operator with remote control will be located on the shed roof at a safe distance.</p> <p>Also, the operator, in order to better coordinate the tool movements with those of the lifting, is connected by radio with the crane operator.</p> <p>The weight of the equipment varies depending on the model and the type of gripper / crusher / loader bucket that you want to adopt.</p> <p>Sizing and thus the flow of the lifting are dictated by four variables:</p> <ol style="list-style-type: none"> 1. The weight of the equipment at full load ; 2. the security / income ratio that you want to adopt ; 3. the positioning of the lifting means with respect to the artefact in demolition and consequently the distance that results between the center of the fifth wheel and the area of intervention of the apparatus destructive ; 4. the height of the artefact in demolition and consequently the reach of the crane in height (the height of the article must be added 10 m , the operating space of FDS) . 		
	Works Description		
			
	<p>Task chronological order required to implement the assistance package demolition of a chimney:</p> <ul style="list-style-type: none"> ♣ A confined space entry permit will be filled and all the necessary precautions and air quality testing parameters within the chimney will be assessed prior to deployment of workers inside the chimney. 		

	<p>♣ supply and sand stretched / crushed material over the wooden planks to a thickness of about 20/30 cu.m in order to create a falling bed of material – for disposal purposes this material will be considered as hazardous;</p> <p>♣ arrival on site and placement of suitable self-propelled crane reach and scope (it is assumed a crane with a rated capacity of 250-400 tons) in advance;</p> <ul style="list-style-type: none"> - The lower opening of the chimney will be closed off with a flexible access way in order not to allow material shooting down the chimney to project outside in a frontal way. Any material which accumulates in this lower area will be removed periodically through the opening of the area. <p>♣ the metal ladders and platforms will be removed first through hot cutting. These will be cut by personnel within man-cages and each small section will be hoisted down along with the man-cage but supported directly from the crane jib. 25.00m.</p> <ul style="list-style-type: none"> - Once all the metal and electric wires have been removed the demolition of the actual chimney structure will take place as outlined hereunder: <ol style="list-style-type: none"> 1. Personnel inside a man-cage will be hoisted down to not more than 8m inside the chimney and remove the internal skin of bricks only. Bricks will be dropped to the base of the chimney. Photographic evidence will be carried out before and after the removal of the brick skin. 2. Following the removal of the bricks, a man-cage, measuring circa 5.5m x 1.2m, certified by an engineer, will be placed on the top of the chimney and kept safely attached from the crane at all times. The cage will house 2 persons, a compressor and also hand mechanical tools such as jigger which will be used to demolish by hand the cast in situ rim measuring circa 500mm x 300mm. The procedure is likely to take 4 days. The cage is provisioned with an openable floor hatch from where the personnel can demolish the concrete rim whilst always being protected from within the cage. The same procedure will be used for the nib situated around 600mm below the top rim should the use of the shear cutter fail to carry out the demolition of the same nib. 3. The photos will be evaluated with the environmental monitors and Enemalta to determine whether there are deposits of flyash in the interstitial area. Any deposits detected will be removed manually. 4. Materials that have been dropped will be segregated as appropriate always under the control of the environmental monitor. 5. The bricks removed from the base of the chimney will be placed in appropriate banded area. 6. The state of the concrete will also be monitored from the photographic evidence by the environmental monitor and Enemalta. 7. Once it is agreed that the concrete is clean, the fly system will be engaged to start removal of the actual concrete structure. 8. 		
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	<p>9. Once the first 6-8m vertical skin has been removed, the fly system will be put into practice and the concrete and reinforcement removed as per methodology outlined in this method statement.</p> <p>10. The inert material will be visually inspected by the environmental monitors and Enemalta personnel and carted to an approved disposal facility.</p> <p>11. This procedure will be used for all the chimney or up till circa 20m above base level following which the shear cutter might be used depending on speed and effectiveness of the fly system vis a vis reverting to shear cut. This will be assessed during the ongoing works.</p> <p>♣ during demolition activities a "fog cannon" (from vertically higher position down to fly system); will ensure the mitigation of dust and possibly and dispersion of particles</p> <p>♣ demolition of the remaining part of the chimney (from 0,00m share at + 25.00m) through the use of a track excavator equipped with hydraulic tongs armed / concrete crusher;</p> <p>♣ all the material once placed on the ground in cumulation, will be categorized, loaded and returned to a destination authorized centres (recovery / treatment / disposal).</p>		
	<p>- The last 25m of chimney will be removed through the use of sheer cutting equipment which is capable of cutting through reinforced concrete. Again, same precautions mentioned above, both in terms of H&s and environmental will be taken during the works.</p>		
4.0	TIMEFRAMES		
	Preparatory works and protection of surrounding areas – 2 days		
	Careful and localized Demolition and carting away – 20 days		
	Cleaning of area – 2day		
	Earmarked date of commencement: 1st August 2017		

AREA Photographic survey			
Ref	Photo	Area / Zone	Status

				
			<p>Yellow areas to remove prior to commencement of works on demolition.</p>	
			<p>Room on the right to be protected both horizontally and vertically through metal sheeting.</p>	

			Protection through the installation of solid walls (metal or bricks) of transformers	
			LAST 25/30m will be demolished using scissors heavy machinery and limit wind impact.	

Other Works related					
Ref	Area / Zone	Description	Completion date	Notification	Status
		Adequate protection of surrounding Enemalta assets. (tanks, fire engine room, transformers) and by adequate we mean steel elements placed at an incline in order to avoid 90 deg impact.			
		Full separation of the chimney from any other area / element.			
		Placing of a soft bed underneath to minimize impact of falling objects.			
		Access control of public road.			

Further information required from entities				
Ref	Area / Zone	Description	Notification	Status

		liaising with warden / police		
		liaising with Customs to which the road leads.		

Personnel / machinery earmarked for use				
Zone	Area	Description	Number	
		Fly machine and crane driver	2	
		Dumping truck and driver	2	
		helpers	2	
		sheer cutting machine and operator	1	
		TOTAL	7	

Attachments:

- ☐ Drawings (specify)
☐ Other (specify)

Minutes prepared by:

George Farrugia

Approved:

Y / N