

HAZOP Checklist for Sewage Treatment Plant

ITEMS TO BE IDENTIFIED IN THE DRAWINGS	CHECKLIST		COMMENTS
	YES	NO	
<p>1.0 Overall Layout of Treatment Plant</p> <p>1.1 General Layout</p> <ul style="list-style-type: none"> • Property are fenced and gated and the fence height. • State where these problems/impacts occur and give a description of the method employed in controlling these impacts. <ul style="list-style-type: none"> a. Odor Control b. Noise Level c. Visual (Landscape) • Are all tanks and chambers above the safe flood level and the highest flood level of the nearby rivers/drain and design to what flood return period. • Are there any buried pipelines or cables under buildings within the treatment facility and is it clearly indicated on the layout drawings. • The layout of temporary diversion and location of temporary treatment facilities. • Where is the location of the screening bins and what the basis of sizing the bins area is? • Are lifting devices provided and state what type and their location and capacity. <p>1.2 Access Road</p> <ul style="list-style-type: none"> • Is the facility located near to a public road to allow immediate access to the plant/facility? If not, state where its access route is. • Are the ingress and egress routes to and from the plant suitable for desludging tankers? • Are the entrance and exit gate nearby the public road 			
<ul style="list-style-type: none"> • Road access should be provided adjacent to the equipment or crane extended to the nearest road. • If fixed crane beam extends over the road, the minimum vertical clearance shall be 5.5m. • Adequate signage provided • Head clearance for tanker trucks entering the gate provided and what is the clearance height.\ 			

ITEMS TO BE IDENTIFIED IN THE DRAWINGS	CHECKLIST		COMMENTS
	YES	NO	
<ul style="list-style-type: none"> Sufficient turning radius on the roads to enable access and maneuverability for tankers and heavy vehicles. Location of sludge desludging area is suitable for tankers to access and empty the sludge into the chamber. 			
<p>1.3 Handrails/Guardrails and Access Ladders</p> <ul style="list-style-type: none"> Have safety handrails or grating been installed at walkways and around open holes at the plant? Toe plates and kick plates shall be fitted along the outer edges of all walkways or ladders and shall be part of the structure and not the floor panels. Toe plates shall extend 100mm above the top level of the floor panels. Floor panels shall be sized so that each panel does not weigh more than 50 kg. Handrailing provided at all places where there is potential of falling around all tanks and other places where falling height is greater than 1.5m. Is staircase provided where height is greater than 300 mm. Fixed ladder to access working areas for purposes of servicing, maintenance or normal operation works. <p>1.4 Precaution Against Damp</p> <ul style="list-style-type: none"> All wall mounted equipment is fitted with spacers to provide minimum gap of 5 mm. All holes in equipment is sealed against the ingress of water Any items exposed to weather or water shall be free of water traps and drain holes shall be provided where necessary. Electrical equipment which is not sealed against free movement of air shall be protected from condensation with anti-condensation heaters and thermostatically controlled. <p>1.5 Substation / Electricity Meter/ Lamp Post</p> <ul style="list-style-type: none"> Location of electricity meter or the substation 			

<ul style="list-style-type: none">• Is adequate street lighting provided around the plant and what is the number of lamp post provided			
--	--	--	--

ITEMS TO BE IDENTIFIED IN THE DRAWINGS	CHECKLIST		COMMENTS
	YES	NO	
<ul style="list-style-type: none"> Are all buildings and major process units at the treatment facility lighted adequately <p>1.6 Buffer Zone</p> <ul style="list-style-type: none"> The following buffer zone requirements satisfied? 30 m minimum from fence to nearest habitable building property line within residential and commercial development 20 m minimum from the fence of treatment plant to the nearest property line within industrial development 			
<p>10 m minimum from the fence of the treatment plant to the nearest habitable building property line if the proposed treatment plant is fully enclosed.</p> <p>1.7 Effluent Discharge Point</p> <ul style="list-style-type: none"> Where is the location of effluent discharge point for the facility and is it clearly indicated on the layout drawings with relation to existing receiving water bodies. <p>1.8 Water Supply</p> <ul style="list-style-type: none"> If tankers and desludging activities take place, is there provision for stand pipes for cleaning purposes. Where is the location of the stand pipe and location for toilets for operators to change and clean themselves after work. <p>2.0 Screen Chamber (Fine And Coarse Screens)</p> <p>2.1 Bar Screens</p> <ul style="list-style-type: none"> Dewatering or perforated plate or trough, provided for ease of maintenance of the screens <p>2.2 Mechanically Raked Screens</p> <ul style="list-style-type: none"> Automatic conveyor to transfer screenings to skips. Screen motor located above the high water level and access provided for maintenance. Provision of explosion proof floodlights. 			

• Provision of emergency stop button at a convenient and visible location			
---	--	--	--

ITEMS TO BE IDENTIFIED IN THE DRAWINGS	CHECKLIST		COMMENTS
	YES	NO	
<ul style="list-style-type: none"> • A working platform for ease of operations and maintenance. 			
<ul style="list-style-type: none"> • Provision of hand rail or guard (Refer to item 1.3) • Location of screening bins must be near the screen area. • Bins provided should have adequate capacity and must be equipped with leachate collection tray and covers to prevent odour release. Bins should be provided with rollers. <p>2.3 General</p> <ul style="list-style-type: none"> • Provision of staircase access with sufficient width (Refer to item 1.3) • All screen chamber sumps to be fully open at the top for good ventilation • Inlet penstock provided to isolate the inlet works for maintenance purposes. • All drive units shall be weatherproof <p>3.0 Pump Sump</p> <ul style="list-style-type: none"> • Emergency overflow pipe to by-pass the influent sewage during power failure (away from residents) and location of overflow pipe discharge. • Provision of crane for maintenance purposes • Sufficient access to the pump station either from the top surface or via entry from the screen chamber • Is dry well provided with force ventilation and air outlet shall be located adjacent to pump motors to assist cooling • Lighting systems shall be interconnected with ventilation • Provision of handrails and MS grating (Refer to item 1.3) • If the valve chamber is located in the sump, the opening of the valve chamber shall be enclosed with MS grating 			

<ul style="list-style-type: none">• Provision of working space or platform for ease of operation in both wet well and valve chamber			
---	--	--	--

ITEMS TO BE IDENTIFIED IN THE DRAWINGS	CHECKLIST		COMMENTS
	YES	NO	
<ul style="list-style-type: none"> • Dry well adequately lit and it should be weather proof, vapour proof and explosion proof. • Miscellaneous Issue 			
<p>4.0 Grit Chamber</p> <ul style="list-style-type: none"> • Provision of working platform along the grit channel. 			
<ul style="list-style-type: none"> • Provision of handrails or guardrail at exposed sumps or elevated working areas (Refer to item 1.3). • Provision of grit storage bin or skip with rollers, perforated tray and covers • Easy access to the grit removal facility by dump trucks and sufficient maneuver space (Refer item 1.2). • To provide a chute to remove the grit into the skips. • To provide sufficiently big grit chamber for ease of maintenance. • To provide a drain pipe to drain water into the pump sump to avoid ponding. • Provide steps into the chamber (pump). • Misc Issues <p>5.0 Grease Chamber</p>			

<ul style="list-style-type: none">• Provision of working platform along the grease chamber• Provision of hopper to collect scum and grease• Provision of handrails or guardrail at exposed sumps or elevated working areas. (Refer to item 1.3)• Provision of grease storage tank with rollers and with drain pipes and valves at the bottom of the tank for removal of settled solids• Easy access to the grease removal facility by dump trucks and sufficient maneuver space. (Refer to item 1.2)• Staircases must not be beneath the walkway (staircase need to be away from walkway)• Miscellaneous Issue		
--	--	--

ITEMS TO BE IDENTIFIED IN THE DRAWINGS	CHECKLIST		COMMENTS
	YES	NO	
<p>6.0 Blower Room/Control Panel Or Room</p> <ul style="list-style-type: none"> • Provision of acoustic enclosures for blowers including acoustic door • Provision of exhaust fan with silencer to circulate air around the blower room. 			
<ul style="list-style-type: none"> • Toilet facilities to be isolated from the blower room due to heat and noise hazards. 			
<ul style="list-style-type: none"> • Provision of lifting davit for maintenance of the blowers. • Provision of rotating strobe light at the control room to indicate malfunction of blower or other equipment. • Provision of adequate space for blower removal or installation during maintenance. • Water storage tank to be located in such a way that water will not splash on the control panels. • Control panels in the Blower/Control Panel room is to be isolated from the blower room • Allow at least 900 mm access space even when cabinet doors and the like are open. • Miscellaneous Issue 			
<p>7.0 Balancing Tanks</p> <ul style="list-style-type: none"> • Sufficient walking or working space along the tanks • Provision of handrails or guards if the tanks are elevated. (Refer to item 1.1 on handrail and guard rail) • Miscellaneous Issue 			
<p>8.0 Primary / Secondary Clarifier</p>			
<p>9.0 Biological Treatment System</p>			

ITEMS TO BE IDENTIFIED IN THE DRAWINGS	CHECKLIST		COMMENTS
	YES	NO	
<p>10.0 Sludge Thickener</p> <ul style="list-style-type: none"> • Provision of adequate walking or working space • Provision of potable/clean water for regular cleaning of the overflow weir • Provision of force main type of pipe from the thickener to the sludge holding tank • Desludging pipe provided to be situated above ground • All sludge holding tanks to be on sloped flooring <p>11.0 Sludge Holding Tank</p> <ul style="list-style-type: none"> • Adequate access for desludging tanker. (Refer to item 1.2 on access road) 			
<ul style="list-style-type: none"> • Provision of desludging pipe (if the sludge holding tank is elevated) appropriately positioned. • Sufficient walking or working space along the sludge holding tank. (Refer to item 1.3). • Provision of handrails or guards if the sludge holding tank is elevated. (Refer to item 1.1 on handrail and guard rail) • Provision of desludging pipe either by force main or gravity flow • All sludge holding tanks to have isolating facilities. • Each sludge holding tank to have separate feeding pipes with individual isolating valves. • The top level of holding tanks to be approximately 6 inches above ground should the tank be below ground level. • Overflow pipe from sludge holding tank to the aeration tank to be of sufficient diameter to prevent possibility of the pipe choking. • Miscellaneous Issues 			

