

Format No: ER 5/10- F2, JOB SAFETY ANALYSIS (JSA), IB THERMAL POWER STATION, OPGC							
Serial No.	Dept	Equipment	Location	Job description:			
	Ash Pond	Ash Pond	Ash Pond	Name of work : Raising of embankment height for ash pond C & A from RL 208 M to RL 211 M.			
JSA performed by:	Signature	Reviewed & Approved by	Signature	Date of Issue	Date of revision		Revision No
Anil Kumar Panda		Anil Kumar Panda.		02.08.2023			
HAZARD TEXT / TYPE (For reference to identify the Hazard type)							
PHYSICAL HAZARDS	PHYSICAL HAZARDS	PHYSICAL HAZARDS	ELECTRICAL HAZARDS	CHEMICAL/ GAS HAZARDS	EXCAVATION	OTHERS	
Noise	Fall from height	Force (Push/Pull)	Shock/ Electrocutation	Flammable/ Explosive substances	Collapse/Sliding	Fire	
Radiation	Fall (Slip/Trip)	Caught in/on or between	Static electricity	Inhalation of toxic fumes	Underground live cable damage	Heavy Wind/Rain	
Confined space	Fall down/below	Struck by/against	Arc flash/ blast	Ingestion/Absorption	ERGONOMICS	Dust exposure	
Exposure to pressurized Steam/Air	Fall of Objects from height	Extreme weather (Hot/Cold)	BIOLOGICAL HAZARDS	Body/Eye Contact	Poor Posture	Oil spill	
Contact with Hot surface	Contact with moving parts	Poor illumination	Snake/Insect bite/Virus infection	Spillage	Repetitive motion	Human factor	
PPEs to be used	Safety Helmet, Safety Shoes, Safety goggle, Dust mask, Hand gloves, Ear Plug, Full body harness etc.						
Tools required	Phowrah, belcha, trowel, bucket, gainti, Excavator, HYVA, JCB, Dozer, Roller, Water Tanker, Concrete Mixer, etc						
Important Note- While deciding hazard control measures, consider hierarchy of hazard control steps in order of preference.							
SEQUENCE OF BASIC STEPS	SAFETY, HEALTH & ENVIROMENT HAZARDS	SAFE JOB STEPS / HAZARD CONTROL MEASURES				Are control Measures adequate to mitigate the risk (Yes/No)	
		Elimination/ Substitution	Engineering	Administrative	PPE		
1. Cleaning of wild grass from work site.	1.Sliping from the slope. 2.Injury due to slip of sickle.			1. A supervisor must be engaged to monitor the work properly. 2.The workers should move carefully while going down/up the slope of bank. 3.The workers must use dust mark, safety grass during dry weather to protect them shelves from ash blowing.	Wear safety helmet, shoes, safety goggle, dust mask	Yes	
2. Mobilisation of construction materials like ash brick, chips, sand, by truck / tractor to ash pond	1.Road accident 2.Tilting of vehicle as the road is narrow at places. 3.Sliping in to ash pond and drowning .	1. Narrow dyke top road will be restricted for entry of vehicles.	1. Guard posts are provided along the road edges for safe movement of vehicles	1.The drivers should have valid dring license. 2.All the vehicles should have valid documents like Fitness certificate, Insurance, R.C.Book. 3.The vehicles should not be driven more than 5 KM/hr. 4.The driver should not drive the vehicle in alchoholic condition. 5.The driver must be accompanied with an assistant. 6.No people should be allowed to sit on trolley. 7.The breaking system should be perfect. 8.Tyre in good condition. 9.The trolley rod should be in good condition. 10.While parking the vehicle for loading & Unloading, stopper should be provided on both front and rear wheel. 11.Only work during day time.		Yes	

3. Excavation of ash from ash pond	Slip of excavator / vehicle inside the excavated pit due to collapse of ash	N.A	1. Haul road to be made inside ash pond for proper approach of excavator and vehicle 2. Rigidity of the area near the excavator to be ensured	1. Vehicles must be kept away from the excavated pit and collapsible ash. 2. Excavator must be kept away from loosely filled ash / collapsible ash / water logged area inside ash pond		Yes
4. Loading of ash in ash pond	Hitting with the Vehicles/ persons during loading.	N.A	1. Rigidity of area soil near excavator to be ensured. 2. Vehicles will be fixed with back gear alarms.	1. No person will be allowed to stay within the swing area of boom of excavator. 2. Supervisor at loading to be kept himself away from the swing area of the excavator; and must keep himself away from the approaching vehicle	Wear safety helmet, shoes, safety goggle, dust mask	Yes
5. Excavation of earth from borrow area	Slip of excavator / vehicle inside the excavated pit due to collapse of slope of excavated pit	N.A	1. Rigidity of area soil near excavator to be ensured	1. Vehicles must be kept away from the excavated pit and collapsible slope. 2. Excavator must be kept away from collapsible earth/slope.		Yes
6. Loading of earth	Hitting with the Vehicles/ persons during loading.	N.A	1. Rigidity of area soil near excavator to be ensured. 2. Vehicles will be fixed with back gear alarms.	1. No person will be allowed to stay within the swing area of boom of excavator. 2. Supervisor at loading to be kept himself away from the swing area of the excavator; and must keep himself away from the approaching vehicle	Wear safety helmet, shoes, safety goggle, dust mask	Yes
7. Transportation of ash from ash pond to filling area and earth from borrow area to ash pond site.	Blowing of dust, Inhalation of dust Air Pollution due to fugitive emission	N.A	1. Sprinkling of water	Before vehicle movement water sprinkling to be ensured	Dust mask to be used by the work men	Yes
8. Transportation of ash from ash pond to filling area and earth from borrow area to ash pond site.	Tilting of vehicle as the road is narrow at places.	1. Extreme narrow dykes of ash pond are for restricted movement of heavy vehicles	1. Guard posts are provided along both the edges of ash pond A	1. Speed of the vehicle to be limited to 10 KMPH at the embankment top 2. Vehicle to be ply on the middle of the embankment, and in circumstances it should move to the edge of the dyke.	Vehicle seat belt to be ensured	Yes
9. Transportation of ash from ash pond to filling area and earth from borrow area to ash pond site.	Road accident, Vehicle run over	N.A	1. The vehicle should be in good condition with proper Braking condition, Tyre condition, gear, horn, back horn, back light 2. Periodic maintenance of vehicles to be ensured	1. All vehicles will have valid documents like RC Book, insurance, fitness certificate 2. Driver must have valid driving license. 3. The driver must not drive in alcoholic condition. 4. The driver must have good vision 5. While parking the vehicle for loading and un loading stoppers should be provided on both front and rear wheel. 6. Flag men will be deployed at the junction point of road for traffic control		Yes
10. Transportation of ash from ash pond to filling area and earth from borrow area to ash pond site.	Blockage of road	N.A		1. The vehicle should not be parked on the road		Yes
11. Unloading of ash/earth in embankment construction	1. Slip of vehicle 2. Drowning of person in ash pond	N.A	Bund will be provided near the edge of the dumping location of the embankment. 2. No vehicle will be allowed to cross the bund 3. Back horn, back light and proper brake to be ensured.	1. Supervisor will be provided in the site for adequate supervision 2. The supervisor must keep himself away from the approaching vehicle. 3. No person will be allowed inside the equipment movement area 4. Long rope with lifebuoy will be kept ready at site for emergency.		Yes

12. Spreading of ash/earth	Hitting of dozer	N.A	1. Back horn and back light of dozer must be ensured	1. No person will be allowed in the direction of movement of dozer.		Yes
13. Rolling of earth / ash for compaction	Hitting of roller	N.A	1. Back horn and back light of roller must be ensured	1. No person will be allowed in the direction of movement of roller.		Yes
14. Reversing the truck / tractor / vehicles on the narrow dyke, and Unloading of material at site	1.Road accident 2.Tilting of vehicle as the road is narrow at places.			1. Supervisor to be deployed at site alongwith flagman for controlling the vehicle movement 2. Nobody should be allowed in the direction of movement of vehicles		Yes
15. Stacking and spreading of materials on the bund of Ash pond embankment & road.	Injury due to slip of spades,crowbar.			1.The person should be careful while stacking materials on the bund. 2.Person should stacked the materials properly so as not to cause any inconvenience to other people working in the area. 3.Person should spread the earth properly & carefully.		Yes
16. Concreting,brick masonry.	1.Falling from height while working. 2.Dust ingress in Nose & Eye during cleaning of surface. 3.Falling of materials on ground while working and create environmental hazard.		1.Scaffolding to be made properly as per requirement. 2.The ground will be cleaned immediately.			Yes
17) Excavation of earth using Excavator / JCB and manually, excavaton for sand chimney / sand blanket / pipe removal	1) Contact with live cable/equipment may cause shock/electrocution	na	The existing live cables and water pipe lines to be rerouted as needed.	Excavation clearance may please be taken before starting of excavation.	Use electric shock proof hand gloves,safety shoe safety glass,safety helmet.	Yes
18) Excavation of earth using Excavator / JCB and manually, excavaton for sand chimney / sand blanket / pipe removal	2) Fall (Slip/Trip)	na	Working site shall be cleaned properly. Hard Barricading of the excavted pit to prevnet any fall.	na	na	Yes
19) Excavation of earth using Excavator / JCB and manually, excavaton for sand chimney / sand blanket / pipe removal	3) Struck by/against	na	Experienced operator shall be deployed for dressing/excavtion.	Workers shall be instructed to work carefully.License holder & Experienced operator to be deployed for excavation. Signal (Flag) man to be deployed with provision of flags for signalling. Barricad the swing area.	Use safety helmet, shoe, hand gloves and googles.	Yes
20) Excavation of earth using Excavator / JCB and manually, excavaton for sand chimney / sand blanket / pipe removal	4) Fall (Down/Below) after excavation	na	5) Barricade the excavted area after excavation	Barricade the excavted area with hard barication.	na	Yes
21) Sand filling, back filling, hammering,PCC and other cement conncrete works.	1) Body/Hand injury	na	Work carefully.	Take rest in between. Avoid bad posture.	na	Yes
	2) Contact with cement dust/Irritation on hand/leg	na	na	na	Safety goggles, dust mask and hand gloves to be used. RUBBER-WET CEMENT & COTTON-DRY CEMENT	Yes
	3) Struck by against.	na	Work carefully.	Deploy trained workmen	na	Yes
22) Working with mixture machine.	1) Contact with moving equipments.	na	Gaurding of the rotating shaft of mixture machine. Loose clothes should not be wear near by.	Keep distance from the movable/swing area of the machine. Used only experience worker . Barrcade the working area of mixture machine.	na	Yes
	1) Body/Hand injury	na	Gaurding of the cutting machine.	Deploy trained workmen	Use safety helmet, shoe, hand gloves.	Yes
	2) Cutting of hand					Yes

23) Cutting bending and placing of  
TMT reinforcement & Shuttering  
works

3) Contact with fire sparks	na	na	na	Face shield attachd with safety helmet shall be used and appron shall also be used required.	Yes
4) Power supply with authorized sources	na	Used RCCB distrution board with prvision of earthing and weather protecion.	na		

	5) Exposure to dust	na	na	na	Use safety googles and nose mask.	Yes
	6) Irritation on hand/legs	na	na	na	Use rubber hand gloves and gum boot.	Yes
24. Lifting and Shifting of material / pipe by Hydra	Fall of object (Material)		Before engaging the hydra physical inspection to be done. Use certified lifting tools(Sling,Chain Block, D Shackels,). Don't lift load above of rated capacity. . Barricade the lifting/working area to prohibited the movement of people.	Do not work or move under any hanging load. Maintain proper distance from moving hydra. Use of hydra should be under experienced supervision. Deploy experienced rigger. Proper signalling to be use whenever any material will lift		
	Struck by/against the hydra/ material		Deploy traffic controller (Signal man) to control the movement of people.	Barricade the lifting/working area to prohibit the movement of people. Ensure the working personel should maintain proper distance from moving hydra.		
	Contact with live cable/wiring/elect. Board.		Electric supply if any shall be made off.			
25. Erection of structural materials / MS Pipe	Body/hand/leg/other body part injury		Deploy trained workmen		Use handgloves along with helmet, shoe, glass, earplug & dustmask.	
	Fall (Slip/Trip)		Clean the site properly;		use full body harness and anchor properly.	
	Fall from height.		Deploy trained scaffolders for erection & dismantling of the scaffolding.			
	Fall of objects from height.		The scaffolding area shall be barricaded.			
	Exposure to Dust	Use dust mask & safety glass				
Review the job while execution	1. Identify while working	1. Take appropriate action.				
26.Transportation of geomembrane	1.Blowing of dust due to movement	1. Sprinkling of water & use of dust mask by workmen.				
	2.Air pollution due to fugitive	2. All vehicles will have valid documents like R.C.Book, Insurance, Fitness				
27. Reversing the Vehicle on the	1. Hitting with the Vehicles/	3.The driver will have valid driving licence and shall not drive in alcholic condition.				
	2.Tilting of vehicle as the road is	4. Adequate Supervision to be made for navigation.				
	4.Blowing of dust due to movement	5.The vehicle should limit the speed to 10 KM/Hr on the dyke.				
		6.The driver must be accompanied with an assistant/helper.				
		7.Vehicle should not to be parked on the road.				
		8.The braking system should be perfect.				
		9.Tyre in good condition.				
		10.The vehiles should move on specific route as approved by Engg.-in-charge				
		11.Drivers eye test to be carried out.				
28.Maintenance of vehicles.	1.Oil spillage/ leakage.	1.Defect is to be attended as early as possible.				
		2.Spillage of oil is to be contained & cleaned.				
29.Installation & welding of	1.Damage to Geomembrane	1.No equipment or tools cause damage to the geomembrane by handling, trafficking				
		2. No personnel working on the geomembrane shall smoke, wear damaging shoes,				
		3.The method used to unroll the panels shall not cause scratches or crimps in the				
		4.Adequate loading (I.e. sand bags or similar items that will not damage the				
		5.Direct contact with the geomembrane shall be kept to a minimum. Trafficking on				
		6.Panels layouts are the responsibility of the Contractor. Panels shall be arranged				
		7.Geomembrane deployment shall only proceed between ambient temperatures of 5				
		8.Where fusiion welding is proposed for joints				
		9.The welding equipment used shall be capable of continuously displaying the				
5. Review the job while execution	1. Identify while working	1. Take appropriate action.				

Emergency Safety measure for the job if any: First-Aid box should be kept at site. Emergency telephone No. Fire - 777,222257 and Hospital 600,222243

should be intimated to the workmen. This should be discussed with all. A responsible person should be present throughout the working hours for supervision

and carrying out the instruction of Engg.-in-charge at any instant of time. No workmen will be allowed in alcholic condition or without safety PPEs in the working area. Consider hazard during summer drinking water,ORS powder,Rest shed etc should be provided at site.