




VIETCOMBANK-BONDAY-BEN THANH Joint Venture Co., Ltd	VIETCOMBANK TOWER PROJECT 5 ME LINH SQUARE, DISTRICT 1, HO CHI MINH CITY REQUEST FOR APPROVAL ĐỀ NGHỊ PHÊ DUYỆT	
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Issued by: Phát hành:	NGUYỄN MINH TRỌNG TRƯỜNG 	Company/ Công ty:	 BACHY SOLETANCHE VIETNAM	Date/ Ngày:	31-May-2010
To/ Gửi:	KHAW AIK HENG		APAVE VIETNAM & SOUTH EAST ASIA	Reference/ Số tham chiếu	028/BSV/RFA
CC:	NGUYEN XUAN PHONG		APAVE VIETNAM & SOUTH EAST ASIA	Response expected by/ Trả lời:	
<input type="checkbox"/> DRAWINGS <input type="checkbox"/> CALCULATION NOTE <input checked="" type="checkbox"/> METHOD STATEMENT <input type="checkbox"/> SAMPLES <input type="checkbox"/> DOCUMENT <input type="checkbox"/> OTHER					
SUBJECT: "RISK ASSESSMENT PLAN FOR DWALL & BARRETTES"					

DESCRIPTION OF APPROVAL REQUESTED/ MÔ TẢ ĐỀ NGHỊ PHÊ DUYỆT
Submission of the following/ Đề nghị sau đây: We would like to request your approval for "Risk assessment plan for Dwall & Barrettes" Supporting documents/ Các tài liệu đính kèm: - "Risk assessment plan for Dwall & Barrettes": 04 books

Received by/ Nhận:	Signature/ Ký nhận:	Date/ Ngày:
ACTION/ Xử lý:		
<input type="checkbox"/> See answer below Xem trả lời dưới đây	<input type="checkbox"/> Please give more details Yêu cầu cấp thêm chi tiết	<input type="checkbox"/> Forwarded to: Chuyển qua

RESPONSE:			
<input type="checkbox"/> Request accepted Chấp thuận		<input type="checkbox"/> Request accepted with conditions or comments below Chấp thuận với điều kiện (xem bên dưới)	
<input type="checkbox"/> Please amend according to comments below and resubmit Sửa chữa theo ý kiến bên dưới		<input type="checkbox"/> Request rejected Không chấp thuận	
Comments/ Ý kiến:			
Responded by/ Trả lời:	Signature: Chữ ký:	Date: Ngày:	
Endorsed by/ Chuẩn y:	Signature: Chữ ký:	Date: Ngày:	

Distribution:



RISK ASSESSMENT PLAN FOR DWALL & BARRETTES

VIETCOMBANK TOWER PROJECT
5 ME LINH SQUARE, DISTRICT 1, HO CHI MINH CITY, VIETNAM

**RISK ASSESSMENT PLAN
FOR DWALL & BARRETTES**

05.2010

THE ENGINEER

THE CONTRACTOR



RISK ASSESSMENT PLAN FOR DWALL & BARRETTES

Purpose

The purpose of this document is to propose to identify most of risks associated to each step of construction of the diaphragm wall, the barettes and the king posts, and the extraction of existing piles.

This document propose, for each identified potential hazard corresponding to a specific activity:

- how: to eliminate or to control it,
- what will be the training,
- what will be the required safety equipments,
- who will be in charge
- and who will inspect that the instruction is applied.

This document is evolutionary and will be updated each time a potential hazard is indentified during the site progress.

All BSV team and it subcontractors are involved in the identification of hazards.

All associated parties to the project are encouraged to to make us profit of their experiment.



Project: VIETCOMBANK TOWER
Contract / Job No.

Risk Assessment for Diaphragm Wall, Barrette & Stanchion Construction

Activity / Materials	Potential Hazard	L	S	R	P	Eliminate / Control Measures	Safety Equipment	Training	Residue Risk				Monitor & Action	Inspected By
									L	S	R	P		
1) Mobilization - Mobilize, erect and install excavation crane, service crane, backhoe, clamshell, chisel... etc.	- Failure of lifting appliances - Failure of lifting gears - Failure of backhoe - Trip / slip					Failure of lifting appliances - All cranes, backhoe should be examined and certified by RPE before using. - Do not overload the crane. Failure of lifting gears - All lifting gears should be examined & certified by RPE before using. - Operators should inspect lifting gear that being used before works, daily. - LG and lifted up loads should be checked for securely caught at the lifting hook by worker before lifting. - Workers should select the suitable lifting gear, i.e. chain sling, wire rope according to the Safe Working Load (SWL) stipulated on the certificate for the lifting activities. - Signal man should ensure sufficient communication with the operator. - Signal man should be appointed for giving signal and suitable labels should be displayed on their helmet as identification. - All workers are responsible for visual inspecting all lifting gears before using. - Monthly, all lifting gears on site are inspected and their color be changed right after completion of the checking. Any defected gear is immediately sent to reparation to an agreed supplier and re-tested, or sent to rubbish. Failure of backhoe - Backhoe operator should hold valid operation license. - To fence up the excavation area. - Do not stack any surcharge near excavation. Trip / slip - Surveyors should wear safety shoes and helmet on site. - Surveyors should aware any approach vehicle or crane during working. - Electric installation must be controlled by a confirmed electrician. - Platform must be dry,	- Safety helmet - Safety shoes - Reflective vest - Gloves - Fire extinguisher	- License - Induction - Lifting operation - Signal man - Manual handling - Specific training	- Foreman - Crane operator - Signal man - Backhoe operator - Worker - ALL	- Site in-charge - Site Safety Manager - Chief mechanic - Operators - Superintendents				
2) Site Preparations - Initial setting out. - Set up silos, bentonite pipelines, bentonite mixing plant, desanding unit, grout mixing plant, waste water treatment system, steel fabrication yard...etc. - Electric connections	- Electrocutation													



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Risk Assessment for Diaphragm Wall , Barrette & Stanchion Construction

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		L	S	R	P			L	S	R	P		
3) Existing piles extraction	<ul style="list-style-type: none"> - Collapse and fall in the trench - Disconnection between pincer of vibrator & casing - Fall of load (casing, old concrete pile...) - Fixing points on casings 					<ul style="list-style-type: none"> Collapse or fall of / into the trench <ul style="list-style-type: none"> - For depth of excavation not more than 2 meters, warning notice, warning tape and steel barrier are required. - An adequate slope should be create, function of cohesion of the soil Disconnection between pincer of vibrator & casing <ul style="list-style-type: none"> - Check & control of whole hydraulic hoses, supervise continuously if any oil leakage occurs - Casing to be secured with the single wire rope of the crane (double fixing) as the vibrator is lifted with the main hook of the crane Fall of loads, fixing points <ul style="list-style-type: none"> - Permanent inspection of lifting points fixation, supervise/verify the weld beads by experimented welder - zone around the operating range to be secured, included the outside walkway when necessary, all workers to be warned that heavy lifting is one going - whistles 	<ul style="list-style-type: none"> - Safety helmet - Safety shoes - Reflective vest - Gloves - Fire extinguisher - Steel barrier or warning tape 	<ul style="list-style-type: none"> - License - Induction - Lifting operation - Signal man - Manual handling - Specific training 				<ul style="list-style-type: none"> - Foreman - Crane operator - Signal man - Backhoe operator - Worker - ALL - 	<ul style="list-style-type: none"> - Site in-charge - Site Safety Manager - Chief mechanic - Operators - Superintendents
4) Guide Wall Construction	<ul style="list-style-type: none"> - Trip / slip - Damage to public utilities - Fall of person from height not exceeding 2 meters - Falling object - Trench flooding - Fall of concrete truck - Worker strikes by moving concrete truck - Body get caught into dangerous moving parts of steel bending machine - Eye injury while using portable 					<ul style="list-style-type: none"> Trip / slip <ul style="list-style-type: none"> - Surveyors should wear safety helmet, shoes and reflective vest on site. - Surveyors should aware any approach vehicle or crane during working. Damage to public utilities <ul style="list-style-type: none"> - To check all existing location of utilities from drawings provided by utilities companies. - To excavate very slowly, by hand when necessary. - To appoint competent person to identify and mark the actual location of existing utilities on prominent place before excavation (i.e. using cable detector). - Using trial pit method if necessary. Fall of person from height not exceeding 2 meters <ul style="list-style-type: none"> - For depth of excavation not more than 2 meters, warning notice, warning tape and steel barrier are required. Falling object <ul style="list-style-type: none"> - Do not stack any surcharge / hand tools / material near excavation. Trench flooding <ul style="list-style-type: none"> - To maintain sufficient submersible pumps for pumping-out of water. - To check stability of trench after raining / dewatering. Fall of concrete truck & worker strikes by moving concrete truck <ul style="list-style-type: none"> - Signal man should be provided to guide concrete truck for approach to discharge point 	<ul style="list-style-type: none"> - Safety helmet - Safety shoes - Reflective vest - Eye protectors - Gloves 	<ul style="list-style-type: none"> - License - Induction 				<ul style="list-style-type: none"> - Foreman - Team leader 	<ul style="list-style-type: none"> - Site in-charge - Superintendent - Safety officer



Project: VIETCOMBANK TOWER
Contract / Job No.

Risk Assessment for Diaphragm Wall , Barrette & Stanchion Construction										
Activity / Materials	Potential Hazard	Eliminate / Control Measures			Safety Equipment	Training	Residue Risk			Inspected By
		L	S	R			L	S	R	
electric cutter - Electric shock - Step on / stab by nails leaving in formwork	Body get caught into dangerous moving parts of steel bending machine - Emergency stop button should be installed to steel bending machine. Eye injury while using portable electric cutter - Worker should wear adequate eye protector while using electric cutter. Electric shock - 110V type powered hand tools are recommendable. Step on / stab by nails leaving in formwork or in wood pieces - All nails leaving in formwork / wood should be removed immediately.									



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Risk Assessment for Diaphragm Wall , Barrette & Stanchion Construction													
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		L	S	R	P			L	S	R			P
5) Diaphragm Wall & Barrettes Excavation	<ul style="list-style-type: none">- Failure of lifting appliances- Flying fragment during crawler moving- Body injury while guiding the hammer grab- Failure of lifting operation- Fall of person- Falling objects from excavation- Fall of drilling tool while operating (where applicable)- Plant / vehicle strike person or other subject while rotating- Dangerous moving parts of mixing plant & grout pump- Body injury due to unsafe manual handling- Dust	Failure of lifting appliances <ul style="list-style-type: none">- Worker should inspect the wire rope inside the clamshell whether in good condition before using.- Operator should carry out daily inspection for the crane and report on Form 1 weekly.- To provide fire extinguisher in dry powder at driver's cabin. Flying fragment during crawler moving <ul style="list-style-type: none">- To carry out regular inspect for the crawler to check any significant fray.- To maintain reasonable ground condition free from large gravel, wasted steel pieces and obstruction. Body injury while guiding the clamshell <ul style="list-style-type: none">- Crane operator should suspend the moving of clamshell when operator assistant is guiding the grab with wood-block.- Operator assistant should leave and stand at a safe & reasonably distance (ie. 1.5m) away from the excavated trench after positioning of wood-block.- Crane operator should pay special attention to the workers or pedestrians near to the excavated trench.- To fix an adequate length of rope to the wood-block for easy handling and prevent the wood-block from falling and to wedge the hand or fingers. Failure of lifting operation <ul style="list-style-type: none">- Operator should hold valid operator license.- All cranes should be rested on firmed ground / platform.- All cranes should be equipped with safety devices (i.e. jib angle indicators, hoist limit devices, overload cut-out devices and Automatic Safe Load Indicator).- To release any load from the hook of crane while there is unattended.- To switch-off the engine and lock-up all movable parts of crane while there is unattended.- To attach guide rope onto lifting objects to prevent waving.- Operator and kellyman are prohibited to use mobile phone or listen radio during operation. Fall of person <ul style="list-style-type: none">- To fence off the trenches under excavation / or when suspended.- To provide adequate planking for worker who work beside the excavating trench. Falling objects from excavation <ul style="list-style-type: none">- To fence off the area between the working radius of excavating crane and dump truck. Fall of Hydrofraise while manoeuvring (where applicable) <ul style="list-style-type: none">- Crane operator / foreman shall reconnoiter the path to be traveled before any movement.- Boom of crane should be hoisted to maximum angle then the Hydrofraise body is lifted up and the upper carriage turned in the chosen direction.- The Hydrofraise shall not be lifted more than necessary (i.e. generally, NOT more than 100mm above the ground / working platform.					<ul style="list-style-type: none">- Safety helmet- Safety shoes- Reflective vest- Gloves- Eye protectors- Mouth mask	<ul style="list-style-type: none">- License- Induction- Lifting operation- Kellyman- Specific training				<ul style="list-style-type: none">- Foreman- Crane operator- Kellyman- Worker	<ul style="list-style-type: none">- Site in-charge- Superintendent- Safety officer

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Activity / Materials	Potential Hazard	Eliminate / Control Measures			Training	Safety Equipment	Residue Risk			Monitor & Action	Inspected By
		L	S	P			L	S	R		
6) Fabricate Steel Cage - Fix & fasten U-bolts. - Insert sonic access tubes. - Transportation & storage of steel cage. - Flame cutting & welding.	- Collapse of steel cage - Electric shock - Fall of person - Waving of steel cage during transportation - Trip / slip - Hazards of flame cutting & welding works				<p>Collapse / sliding of steel cage</p> <ul style="list-style-type: none"> - To provide adequate temporary supports / bracings for steel cage during fixing process. - To limit the stacking height of steel cage. <p>Electric shock</p> <ul style="list-style-type: none"> - All sockets and plugs must be waterproof type for outdoor use. - 110V type powered hand tools are recommendable. <p>Fall of person</p> <ul style="list-style-type: none"> - Do not climb up the steel cage for slinging/fixing. <p>Waving of steel cage during transportation</p> <ul style="list-style-type: none"> - To attach guide rope to the steel cage during lifting and transportation. <p>Trip / slip</p> <ul style="list-style-type: none"> - To maintain the access free from steel debris and rubbish. <p>Hazards of flame cutting and welding works</p> <ul style="list-style-type: none"> - Welding screen to be installed to protect the others - Adequate extinguisher to be installed in the area - Keep the area free of inflammable materials 	<ul style="list-style-type: none"> - Safety helmet - Safety shoes - Eyes protectors - Gloves - Fire extinguisher 	<ul style="list-style-type: none"> - License - Induction - Using electric tools - Working at height - Lifting operation - Specific training 			<ul style="list-style-type: none"> - Foreman - Electrician - Supervisor of steel fixer - welders 	<ul style="list-style-type: none"> - Site in-charge - Superintendent - Safety officer
7) Install / Remove CWS Joints	- Hand crush by CWS joints - Spillage of concrete / cement slurry while connecting / disconnecting CWS joints - Fall of water-stop				<p>Hand crush by CWS joints</p> <ul style="list-style-type: none"> - Worker should not put their hands under / between the CWS joints when connecting in vertical position. <p>Spillage of concrete / cement slurry while connecting / disconnecting CWS joints</p> <ul style="list-style-type: none"> - Worker should aware the concrete / cement slurry may spill over from the door of locking chamber while connecting / disconnecting CWS joints. <p>Fall of water-stop</p> <ul style="list-style-type: none"> - To check the water-stop whether securely fixed or not before lifting / transportation. 	<ul style="list-style-type: none"> - Safety helmet - Safety shoes - Eyes protectors - Gloves 	<ul style="list-style-type: none"> - Induction - Specific training 			<ul style="list-style-type: none"> - Foreman - Worker 	<ul style="list-style-type: none"> - Site in-charge - Superintendent - Safety officer



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									L	S	R			P
8) Desanding - Install tremie pipes & recycling pump.	- Hazards of handling & stacking of tremie pipes - Fall of person - Wedge fingers					Hazards of handling and storage of tremie pipe - Do not walk / working on tremie pipe. - All tremie pipes should be stacked on suitable rack to prevent collapse. - Locking wire should be securely installed into the groove of tremie pipe before lifting. Fall of person - To provide adequate planking for worker who work beside the open trench. - Access ladder, guardrails and toe board should be fixed properly to the tremie pipe rack. Wedge fingers - Never keep the hand on the tremie pipe during lifting step (erection or disassembling phase)	- Safety helmet - Safety shoes - Gloves - Eye protectors	- Induction - Specific training				- Foreman - Crane operator - Worker	- Site in-charge - Superintendent - Safety officer	
9) Koden Test (if applicable)	- Fall of person					Fall of person - To provide adequate working platform and access around the trench.	- Safety helmet - Safety harness	- Induction				- Foreman	- Site in-charge - Superintendent - Safety officer	
10) Scrapping (if applicable)	- Body injury due to stabbing by wire					Hand injury due to stabbing wire - Worker should wear suitable gloves during handling of scrapping chisel.	- Safety helmet - Safety harness - Gloves	- Induction				- Foreman	- Site in-charge - Superintendent - Safety officer	



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		L	S	R				L	S	R		
11) Install Steel Cages - Splice steel cages & sonic access tubes. - Handling of steel cages. - Flame cutting & welding.	- Steel cages fall into excavated trench - Squeeze hand / fingers during splicing of steel cages - Hazards of flame cutting & welding				Steel cages fall into excavated trench - To adopt proper anchorage method for suspension of steel cages during installation. Squeeze hand / fingers during splicing of steel cages - Use suitable hand tool to align the rebar of steel cages. Hazards of flame cutting & welding - Welding screen to be installed to protect the others - Adequate extinguisher to be installed in the area - Keep the area free of inflammable materials	- Safety helmet - Safety shoes - Gloves - Fire extinguisher	- Induction - Specific training				- Foreman - Worker	- Site in-charge - Superintendent - Safety officer
12) Concreting - Concrete vehicle parking. - Extract & remove tremie pipes.	- Concrete truck strike person - Fall of person - Spillage of concrete slurry - Fall of equipment / material				Concrete truck strike person - Assign person to guide concrete truck in approach to discharge point. - To limit the maximum speed of site access. Fall of person - Open trench should be fully protected. - To fence off the open trench after concreting operation and backfill with suitable material a.s.a.p. Spillage of concrete slurry - Workers involving concreting operation should wear suitable eye goggles. Fall of equipment / material - To fence off the loading and unloading area of tremie pipe / equipment.	- Safety helmet - Safety shoes - Eye protectors - Gloves	- Induction - Specific training				- Foreman - Worker	- Site in-charge - Superintendent - Safety officer



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Activity / Materials	Potential Hazard	L	S	R	P	Eliminate / Control Measures	Safety Equipment	Training	Residue Risk			Monitor & Action	Inspected By
									L	S	R		
13) Fabricate Steel Stan- chions - Set up steel stanchion fa- brication yard. - Splicing of steel stan- chions. - Install shear studs by weld- ing. - Handling of steel stan- chions.	- Failure of lifting appliances - Failure of lifting gears - Hazards of flame cutting & welding works					Failure of lifting appliances - All cranes should be examined and certified by RPE before using. - Do not overload the crane. - Operator should carry out daily inspection for the crane and report on Form 1 weekly. Failure of lifting gears - To provide fire extinguisher in dry powder at driver's cabin. - All lifting gears should be examined & certified by RPE before using. - Operators should inspect lifting gear that being used before works daily. - LG and lifted up loads should be checked for securely caught at the lifting hook by worker before lifting. - Workers should select the suitable lifting gear, i.e. chain sling, wire rope according to the Safe Working Load (SWL) stipulated on the certificate for the lifting activities. - Signal man should ensure sufficient communication with the operator. - Signal man should be appointed for giving signal and suitable labels should be displayed on their helmet as identification. - All workers are responsible for visual inspecting all lifting gears before using	- Safety helmet - Safety shoes - Reflective vest - Gloves - Fire extinguisher - Eye protectors	- Induction - Lifting operation - Signal man			- Foreman - Crane operator - Signal man - Worker - Welder	- Site in-charge - Superin- tendent - Safety officer	
Hazards of flame cutting and welding works - Please refer to above chapters													



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										L	S	R			P
14) Deliver Steel Stanchion to Pile Position - Lift & unload steel stanchions. - Transportation of steel stanchions	- Failure of lifting operation - Fall of steel stanchion due to incorrect lifting manner - Traffic incident due to over-length of steel stanchion					Failure of lifting operation - Operator should hold valid operator license. - All cranes should be rested on firm ground / platform. - All cranes should be equipped with safety devices (i.e. jib angle indicators, hoist limit devices, overload cut-out devices and Automatic Safe Load Indicator). - To release any load from the hook of crane while there is unattended. - To switch-off the engine and lock-up all movable parts of crane while there is unattended. - To attach guide rope on to lifting objects to prevent waving. - Operator and signal man are prohibited to use mobile phone or listen radio during operation. Fall of steel stanchion due to incorrect lifting manner - Handle & lift the steel stanchion using its designed & correct lifting points due to its heavy weight. Traffic incident due to over-length of steel stanchion - Make sure the length of fabricated steel stanchion can be transported on public road. - Ensure the steel stanchions are properly fixed on lorry before transportation.		- Safety helmet - Safety shoes - Reflective vest - Gloves	- Induction - Lifting operation - Signal man - Specific training	- Foreman - Crane operator - Signal man - Worker	- Site in-charge - Superintendent - Safety officer				
15) Install Steel Stanchion - Fix the guide frame on the temporary casing top. - Insert the steel stanchion into guide frame and adjust its orientation, verticality and level.	- Same as point 13 & 14 above concerning lifting - Fall of person, wedge fingers - Fall of equipment / material - Hazards of flame cutting & welding works					Fix the guide frame on top of temporary casing - Open trench should be fully protected. Insert the steel stanchion into guide frame and adjust its orientation, verticality and level - To fence off the area - To wear adequate gloves - To withdraw its hands when lifting order is given Hazards of flame cutting and welding works - Please refer to above chapters		- Safety helmet - Safety shoes - Reflective vest - Gloves - Safety harness	- Induction - Lifting operation - Signal man - Specific training	- Foreman - Crane operator - Worker - Signal man	- Site in-charge - Superintendent - Safety officer				



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									L	S	R	P		
16) Optical Survey Check & Fix the Steel Stanchion Position - Optical survey checking. - Minor adjustment of steel stanchion position by liner plate. - Fix the steel stanchion in correct position by welding.	- Body injury due to unsafe manual handling - Hazards of flame cutting & welding - Trip / slip					Body injury due to unsafe manual handling - Correct manual handling method should be implemented. - Material heavier than 16kg should be handled by TWO persons or by means of mechanical equipment. Hazards of flame cutting & welding - Please refer to Risk Assessment ref. S-RA001 / Rev.0 (General Welding & Flame Cutting) under separated cover. Trip / slip - Surveyors should wear safety shoes and helmet on site. Surveyors should aware any approach vehicle or crane during working - To fence off the open trench after concreting operation and backfill with suitable material a.s.a.p.	- Safety helmet - Safety shoes - Reflective vest - Gloves - Safety harness - Eye protectors - Fire extinguisher	- Induction				- Foreman - Worker - Welder	- Site in-charge - Superintendent - Safety officer	
17) Remove the Guide Frame after Initial Setting of Pile Concrete - Cut & remove the guide frame & liner plates	- Same as point 15					Same as point 15	- Safety helmet - Safety shoes - Reflective vest - Gloves - Safety harness - Eye protectors	- Induction				- Foreman - Worker - Welder	- Site in-charge - Superintendent - Safety officer	
18) Sonic Logging Test - Transportation of instrument to test location.	- Trip / slip					Trip / slip - Technician should aware of uneven ground condition during transportation of instrument.	- Safety helmet - Safety shoes	- Induction				- Foreman	- Site in-charge - Superintendent - Safety officer	



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Risk Assessment for Diaphragm Wall, Barrette & Stanchion Construction

[illegible]

L = Likelihood	S = Severity	R = Risk (L x S = R)	P = Priority
1. Highly unlikely	1. Slightly harmful	1	TRivial (= commonplace)
2. Unlikely	2. Harmful	2	Tolerable
3. Likely	3. Extremely harmful	3-4	Moderate
		6	SUBstantial
		9	INTolerable
			<ul style="list-style-type: none"> - No action is required, but keep continuing monitor. - No additional control is required. - Efforts should be made to reduce the risk. - Considerable resources may have to be allocated to reduce the risk. - Works should not be started until the risk is reduced



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		L	S	P			L	S	P		

Prepared by:	Date:	Reviewed by:	Date:	Endorsed by:	Date:
Safety Officer – (NAME)		Supervisor – (NAME)		Project Manager – (NAME)	

*This risk assessment has been reviewed and addendum (highlighted) is added.