

BELMORE PARK SUBSTATION AND COMMERCIAL OFFICE PROJECT
ENVIRONMENTAL ASSESSMENT REPORT
PRELIMINARY REVIEW OF RISKS AND HAZARDS

Item	Risk Description / Element	Potential Impacts and Consequences	Proposed Mitigation Measures
Construction - Environmental / Social Risks			
	Geology / Geotechnical Risks; <ul style="list-style-type: none"> Poor Ground Conditions Settlement; Contamination and Disposal; Geological faults. 	<ul style="list-style-type: none"> Reduction of progress of works; Ground settlement, settlement of building foundations and potential cracking/structural damage to building structures; Health impacts associated with contamination issues; Adverse environmental impacts associated with ground contamination; Disruption to businesses and general public amenity. 	<ul style="list-style-type: none"> Geotechnical investigations and analysis; Building structural design based on interpreted ground conditions and known areas of risk; Dilapidation and basement survey of buildings potentially affected by building works; Contamination studies and management plans to be developed to deal with the disposal of contaminated soil.
	Hydrogeology / Groundwater <ul style="list-style-type: none"> Groundwater Chemistry, Treatment and Disposal; 	<ul style="list-style-type: none"> Contamination issues from PASS; Contamination of receiving waters; 	<ul style="list-style-type: none"> Geotechnical investigations and analysis; Building structural design based on interpreted ground conditions and known areas of risk; Contamination studies and management plans to be developed to deal with the disposal of contaminated soil.
	Surface Water <ul style="list-style-type: none"> Erosion and Sedimentation; Stormwater runoff and disposal. 	<ul style="list-style-type: none"> Pollution of waterways as a result of erosion and sedimentation; DECC sanctions and fines; Potential undermining/damage to above ground structures; 	<ul style="list-style-type: none"> Local site controls and management plans; Implementation of checking/maintenance of sedimentation and erosion controls; Water treatment before disposal. Collection and analysis of water samples during construction.
	Ecology / Flora and Fauna <ul style="list-style-type: none"> Clearing of vegetation / flora; Groundwater disposal and affect on aquatic habitat in receiving waters. 	<ul style="list-style-type: none"> Damage to aquatic ecology; Turbidity / algae blooms in receiving waters. 	<ul style="list-style-type: none"> Water treatment before disposal. Collection and analysis of water samples during construction.
	Existing / Proposed Underground Assets <ul style="list-style-type: none"> Building clearances and undermining of existing buildings and other underground services; Clearances and undermining of existing building basements. 	<ul style="list-style-type: none"> Settlement and structural damage to existing tunnels, other underground services; Collapse of existing buildings and other structures; Stray currents and electrocution. 	<ul style="list-style-type: none"> Geotechnical investigations and analysis; Review as-built data and survey from existing underground structures; Building structural design based on interpreted ground conditions; Dilapidation and basement survey of buildings potentially affected by building works;

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	Noise and Vibration / Regenerated Noise <ul style="list-style-type: none"> Surface Construction Activity; Ground Vibration / Regenerated Noise; Rock Breaking; Traffic / Construction Plant; Ventilation Plant. 	<ul style="list-style-type: none"> Structural damage to buildings; Loss of public amenity; Complaints; Sleep and general public disturbance. 	<ul style="list-style-type: none"> Limited hours of operation for surface works; Limited hours for rock-breaking activities; Noise attenuation structures used at surface; Measurement of background levels and noise monitoring during construction works; Community consultation and liaison; Investigate alternate / multiple haulage routes for spoil disposal; Selection of specialist equipment to suit likely ground conditions and minimise regenerated noise; Dilapidation and basement survey of buildings potentially affected by building works;
	Settlement / Property Impacts <ul style="list-style-type: none"> Settlement (ground, roads and buildings). 	<ul style="list-style-type: none"> Reduction of progress of works; Ground settlement, settlement of building foundations and potential cracking/structural damage to building structures; Disruption to businesses and general public amenity. 	<ul style="list-style-type: none"> Geotechnical investigations and analysis; Building structural design based on interpreted ground conditions and known areas of risk; Dilapidation and basement survey of buildings potentially affected by building works; Selection of specialist equipment to suit likely ground conditions.
	Dust / Air Quality <ul style="list-style-type: none"> Surface Works; Shaft Excavation; Trenching for cable routes; Building Excavation; Spoil stockpiles, handling and transport; Construction Ventilation; Bulk excavation (substation sites); Equipment exhausts. 	<ul style="list-style-type: none"> General health to the public and works; Air pollution; General public amenity and comfort; Breach of environmental standards; Worksite aesthetics; Public complaints. 	<ul style="list-style-type: none"> Environmental management plans; Dust suppression measures utilised on site; Covering of spoil stockpiles and trucks leaving the site; Filtration /scrubbers for ventilation plant; Regular maintenance of vehicles /plant used on site; Monitoring and measurement of air quality during construction works.
	Social Issues <ul style="list-style-type: none"> Public perception of risks associated with building (ie building collapse, fatalities etc). 	<ul style="list-style-type: none"> Loss of reputation; Increase in objections to the project; Poor publicity; Scare mongering. 	<ul style="list-style-type: none"> Community consultation; Planning / information forums; Regular project updates.

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	Traffic and Transport <ul style="list-style-type: none"> Disruption to local traffic; Haulage Routes; Road Dilapidation; Road Closures; Loading / Unloading Materials and equipment; Pedestrians and other road users; Spoil disposal; Parking; Queuing in the vicinity of construction sites; Disruption to special events. 	<ul style="list-style-type: none"> Noise and vibration; Air quality and pollution; General public safety; Erosion and sedimentation tracking onto roads; Complaints and access restrictions to local residents and businesses; Traffic congestion; Damage to roads; Loss or disruption of parking. 	<ul style="list-style-type: none"> Traffic assessment and route/intersection analysis; Traffic modelling; Traffic management plans during construction; Restrictions on working hours for loading/unloading of materials; Environmental Management Plans dealing with erosion and sedimentation; truck washes, street cleaning etc; Dilapidation surveys along affected roads/haulage routes; Assess alternate routes for haulage and general construction traffic; Rerouting of bussing and other public transport; Consultation with RTA, CoS, MoT and State Transit; Dedicated pedestrian walkways to be maintained around construction sites; Signage in and around construction sites.
	Waste Management and/or Reuse <ul style="list-style-type: none"> Control of hazardous wastes; Contamination (Surface Works); Recycling and/or Disposal; Hazardous materials associated with demolition of existing assets / buildings. 	<ul style="list-style-type: none"> Health and safety of workers and the general public; Environmental harm and contamination as a result of waste disposal; Hazardous materials associated with demolition causing damage to the environment or health of employees; Use of landfill – inefficient use of resources. 	<ul style="list-style-type: none"> Waste management plans; Contamination assessment; Assessment of options for re-use of spoil (VENM) and other waste materials; Treatment and isolation of hazardous materials during construction activities; Assessment of sites for disposal of materials; EMP to include mitigation measures for control and storage and handling of hazardous materials.
	Heritage / Archaeology <ul style="list-style-type: none"> Known heritage sites affected by works; Areas of Archaeological significance; Spoil removal; Buried or unknown heritage items. 	<ul style="list-style-type: none"> Damage to heritage buildings and other assets; Delay to works; Legal and statutory issues. 	<ul style="list-style-type: none"> Cultural and heritage assessment; Monitoring during construction; Dilapidation survey of heritage buildings; Awareness on notification and treatment during construction (eg stop work provisions).
	Visual Amenity / Landscape/Disturbance <ul style="list-style-type: none"> Construction sites; Pedestrian access and management; Night works / lighting; Waste and rubbish; Dust and air quality; Tracking of sediments onto public roadways; Noise; Parking; Visual amenity of new buildings; Urban planning; 	<ul style="list-style-type: none"> Complaints; General public disturbance and perception; Potential to delay works; Inappropriate urban design. 	<ul style="list-style-type: none"> Consultation and planning; Design review; Environmental Management Plans; Landscape design and planning.

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Environmental / Social Risks			
	Land Use <ul style="list-style-type: none">Land use/re-use after construction.	<ul style="list-style-type: none">Inadequate use / waste of redundant land after construction works.	<ul style="list-style-type: none">Assess options for land use / development after construction works that maximise public amenity.
	Other Risks <ul style="list-style-type: none">Security.	<ul style="list-style-type: none">Damage / vandalism to construction sites and equipment;OH&S risks to workers and the general public.	<ul style="list-style-type: none">Security management plan to be developed during construction to restrict public access to worksites.

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Operating Risks			
	Structural Integrity / Settlement <ul style="list-style-type: none"> Settlement; Building collapse or other structural failures. 	<ul style="list-style-type: none"> Injury or death to maintenance workers or the general public; Ground settlement, settlement of building foundations and potential cracking/structural damage to building structures; Damage to electrical assets within the building; Disruption to businesses and general public amenity. 	<ul style="list-style-type: none"> Building structural design based on interpreted ground conditions and likely permanent groundwater and earth pressure loads during construction; Building lining to be designed to accommodate all in-service loads; Structural inspections to be undertaken regularly throughout the operation phase of the building.
	Operating Noise Impacts <ul style="list-style-type: none"> Noise from ventilation systems and other operating plant. 	<ul style="list-style-type: none"> Loss of public amenity; Complaints Sleep and general public disturbance. 	<ul style="list-style-type: none"> Noise generating operational plant to be designed with acoustic enclosures/dampers, if and where required.
	EMF, Earthing and Electrolysis <ul style="list-style-type: none"> Stray currents and electrocution. 	<ul style="list-style-type: none"> Public exposure and /or perception to EMF; Electrocution as a result of stray currents; Corrosion and/or other damage to assets adjacent to the building and substations. 	<ul style="list-style-type: none"> Design of substation structure based on the principle of prudent avoidance in regard to EMF issues; Earthing design; Use of fibre-glass and steel-fibre structural elements and support to mitigate stray currents; Monitoring of EMF levels during operation.
	Air Quality and Ventilation <ul style="list-style-type: none"> Dust and other pollutants from operating ventilation and other plant systems (eg. Oil Transformers); 	<ul style="list-style-type: none"> General health to the public and workers; Air pollution; General public amenity and comfort; Breach of environmental standards; Worksite aesthetics; Public complaints. 	<ul style="list-style-type: none"> Design of filtration systems, where required, for operating ventilation systems; Design of transformer bays will include for naturally ventilated air shafts and provision for overpressure venting from the transformer bays; Design locations of ventilation outlets to minimise exposure of nearby residents and businesses. Outlets to be located away from likely or sensitive receivers; Minimise/exclude the use of polluting generating equipment and materials during maintenance and operating tasks.
	Traffic Management during operation <ul style="list-style-type: none"> Disruption to local traffic; Material / equipment deliveries. 	<ul style="list-style-type: none"> Noise; Air quality and pollution; General public safety. 	<ul style="list-style-type: none"> Road closures / local traffic management plans during delivery of major equipment or maintenance tasks; Major equipment to be delivered during normal operating hours;
	Groundwater Management and Stormwater <ul style="list-style-type: none"> Groundwater Chemistry, Treatment and Disposal; 	<ul style="list-style-type: none"> Pollution / contamination of waterways and parklands; 	<ul style="list-style-type: none"> Design of permanent building lining to minimise water ingress; Design and construction of permanent water treatment plant to treat groundwater before disposal; Regular maintenance of WTP facilities; Regular disposal of wastes (eg. sludge) generated from water treatment Regular monitoring, testing and analysis of water samples during operation.

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Operating Risks			
	Fire / Explosion <ul style="list-style-type: none"> Oil Transformers Substation plant and equipment. 	<ul style="list-style-type: none"> Injury to staff and/or general public; Damage to electrical infrastructure. 	<ul style="list-style-type: none"> Design of permanent fire systems included in building/substation design; Design of transformer bays will include high velocity deluge fire sprinklers; Building design allows for oil transformers to be contained in separate fire/explosion rated enclosures; Monitoring systems included in building/substation design; Access restrictions to substation facilities; Minimise / prevent the use of fire generating materials during operation; Emergency evacuation and response procedures.
	Cable / Substation Security	<ul style="list-style-type: none"> Injury to the general public; Vandalism and other damage to electrical infrastructure. 	<ul style="list-style-type: none"> Design of substation to include security measures to prevent access from unauthorised personnel; Monitoring of substation entrances; Operational security management plans to be developed.
	Operational Safety Risks	<ul style="list-style-type: none"> Injury to the operational / maintenance staff. 	<ul style="list-style-type: none"> Operational safety management plans General operating PPE; Emergency evacuation procedures.
	Other Operating Risks <ul style="list-style-type: none"> Waste / contamination; Visual amenity and landscape; Land use and zoning. Oil spillage from transformers / transformer bays 	<ul style="list-style-type: none"> Health and safety of workers and the general public; Environmental harm and contamination as a result of waste disposal; Contamination as a result of oil spillage from transformers; General public amenity and complaints. 	<ul style="list-style-type: none"> Operational waste management plans to be developed, including waste disposal protocols; Urban design of substation and other above-ground structures to take into account general public and visual amenity; Consider land-use options after construction that maximise public amenity and use. Substation design includes for oil spillage containment including bunding, capture tank and basement overflow system; Operating procedures to be developed for the removal and treatment of oil captured following a spillage.

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Construction Safety Risks			
	Building Collapse	<ul style="list-style-type: none"> ▪ Injury or death to construction personnel or members of the general public; ▪ Damage to existing underground or above-ground infrastructure. 	<ul style="list-style-type: none"> ▪ Geotechnical investigations and analysis; ▪ Building structural design based on interpreted ground conditions and known areas of risk; ▪ Selection of specialist equipment to suit likely ground conditions; ▪ Emergency response and evacuation procedures.
	Fire / Explosion / Smoke Management	<ul style="list-style-type: none"> ▪ Injury or death to construction personnel or members of the general public; ▪ Damage to existing underground or above-ground infrastructure. 	<ul style="list-style-type: none"> ▪ Fire suppression / fire engineered systems to be utilised throughout all construction sites; ▪ Control of hazardous / flammable materials. ▪ Emergency response and evacuation procedures.
	Dust / Air Quality / Ventilation	<ul style="list-style-type: none"> ▪ Injury to construction personnel or members of the general public. 	<ul style="list-style-type: none"> ▪ Design of filtration systems, where required, for construction ventilation systems; ▪ Personnel PPE such as dust masks, re-breathers; ▪ Use of dust suppression techniques such as water trucks and wetting of stockpiles or other dry/exposed areas of soil and rock; ▪ Minimise/exclude the use of polluting generating equipment and materials during construction.
	Access / Egress / Emergency Evacuation	<ul style="list-style-type: none"> ▪ Injury to construction personnel or members of the general public. 	<ul style="list-style-type: none"> ▪ Construction Safety Management Plan; ▪ Building site safety induction; ▪ Tunnel communication systems; ▪ Emergency response and evacuation procedures.
	Hazardous Materials	<ul style="list-style-type: none"> ▪ Injury to construction personnel or members of the general public. 	<ul style="list-style-type: none"> ▪ Safety Management Plan to include protocols/procedures for the control, storage and use of hazardous materials; ▪ Emergency response and evacuation procedures.
	Flooding	<ul style="list-style-type: none"> ▪ Injury to construction personnel or members of the general public. 	<ul style="list-style-type: none"> ▪ Temporary in-tunnel drainage and pump systems; ▪ Bunding of surface facilities and structures; ▪ Emergency response and evacuation procedures.
	Traffic /Plant Management	<ul style="list-style-type: none"> ▪ Injury to construction personnel or members of the general public. 	<ul style="list-style-type: none"> ▪ Construction traffic management plans; ▪ Safety Management Plans and Induction.
	General OH&S Risks and Management <ul style="list-style-type: none"> ▪ Tools and equipment; ▪ Trips and falls; ▪ Drugs and Alcohol; ▪ Electrical Hazards /Substation works; ▪ Confined spaces; ▪ Work at Heights; 	<ul style="list-style-type: none"> ▪ Injury to construction personnel or members of the general public. 	<ul style="list-style-type: none"> ▪ Construction Safety Management Plans; ▪ Construction safety inductions; ▪ Hazard and Risk Assessments; ▪ Safe Work Method Statements; ▪ Emergency response and evacuation procedures.