



Phase One Salinity Assessment

28-32 Bourke Road, Alexandria, NSW, 2015

Prepared for: Alexandria Property Development Pty Ltd c/- Johnstaff Projects (NSW) Pty Ltd

EP2515.005_v4 | 16 November 2023



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Phase One Salinity Assessment

28-32 Bourke Road, Alexandria, NSW, 2015

Alexandria Property Development Pty Ltd c/- Johnstaff Projects (NSW) Pty Ltd
Level 12, 70 Pitt Street
Sydney NSW 2000
Via email: adam.thomas@johnstaff.com.au
08 June 2022

LIMITATIONS

This Phase One Salinity Assessment was conducted on behalf of Alexandria Property Development Pty Ltd c/- Johnstaff Projects (NSW) Pty Ltd for the purpose/s stated in **Section 1**.

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Loek Munnichs
Principal Environmental Scientist
Certified Environmental Practitioner (1006) – Site Contamination (SC41007)
EP Risk Management Pty Ltd
ABN: 81 147 147 591



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Executive Summary

This Phase One Salinity Assessment has been prepared by EP Risk Management Pty Ltd to accompany a detailed State Significant Development Application (SSDA) for the proposed mental health hospital and medical centre at 28-32 Bourke Road, Alexandria, NSW 2015 in the City of Sydney Local Government Area (LGA). The Site is legally described as Lot 1-3 of SP324707.

Alexandria Property Development Pty Ltd c/- Johnstaff Projects (NSW) Pty Ltd (Johnstaff) engaged EP Risk to prepare this updated Phase One Salinity Assessment (the Assessment) for the Site, following finalisation of the proposed concept development plans. This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-59006709) dated 8 June 2023.

It is understood that Johnstaff are planning to redevelop the Site from its current industrial land use. The SSDA seeks consent for the following in accordance with the Concept SSDA approval:

- Site establishment including earthworks.
- Construction of the Alexandria Health Centre:
 - Total Gross Floor Area (GFA) of 11,436sqm
 - Maximum Floor Space Ratio (FSR) of 3.85:1
 - Maximum height of 34.95m, Maximum Reduced Level (RL). 45.4
- Ancillary development including:
 - Car parking – 77 car parking spaces distributed across basement, ground, and ground mezzanine levels.
 - Utility infrastructure and services connections.
 - Building identification signage and wayfinding signage.
 - Stormwater management.
 - Landscaping.
- Laneway for vehicle and pedestrian access along with western boundary of the site
- Operation of the Alexandria Health Centre as a mental health hospital and medical centre with ancillary uses.

The findings of this Assessment are summarised herein. The Site is not mapped within a salinity area and the salinity of the underlying aquifer ranges between 369 mg/L and 613 mg/L indicating the aquifer is relatively fresh and low salinity. During the groundwater monitoring event, it was determined that the electrical conductivity ranges from 12.6% to 74.8% and the turbidity/total suspended solids ranges from 9.1% to 50.0%.

Overall, based on the data obtained from the desktop review and the site inspection undertaken by EP Risk, the likelihood of Salinity is considered to be very low. Given the limited information on the sites Salinity potential, during the proposed development/ excavation works should saline soils be suspected or identified works should cease and qualified Environmental Consultant be contacted. Furthermore, the general Saline Soils Management Options and Strategies outlined in **Appendix B** should be followed.

This report concludes that the proposed mental health hospital and medical centre is suitable based on the available information.

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1 Introduction

1.1 Overview

Alexandria Property Development Pty Ltd c/- Johnstaff Projects (NSW) Pty Ltd (Alexandria Property Development c/- Johnstaff) engaged EP Risk Management Pty Ltd (EP Risk) to a prepare a Phase One Salinity Assessment (the Assessment) for the proposed development site located at 28-32 Bourke Road, Alexandria, NSW, 2015 (the Site). The location and boundary of the Site is shown in **Figure 1**. The Site is approximately 2,972 m² in area and currently consists of a disused factory / warehouse.

The Site comprises three (3) lots, defined as Lots 1-3 in Deposited Plan (DP) 324707 and is currently zoned as as E3: Productivity Support under the Sydney Local Environmental Plan (2012), and State Environmental Planning Policy Amendment (Land Use Zones) 2023, currency (08 September 2023).

This report has been prepared to address the Secretary’s Environmental Assessment Requirements (SEARs) issued for the project (SSD-59006709) dated 08 June 2023. Specifically, this report has been prepared to respond to the SEARs requirement issued below.

Table 1 – SEARs Requirement		
Item	Description	Section Reference
Ground and Water Conditions	Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the Site, including soil erosion, salinity and acid sulfate soils.	Conclusions regarding impacts from salinity provided in Section 5 .

Based on existing plans and information provided to EP Risk by Johnstaff, it is understood that the proposed development will be a State Significant Development (SSD) under Clause 14 of Schedule 1 of State Environmental Planning Policy (SEPP) (Planning Systems) 2021 with the Minister for Planning appointed as the consent authority.

1.2 Background

It is understood that Alexandria Property Development c/- Johnstaff are planning to redevelop the Site from its current industrial land use for the construction of a hospital. The Proposed Development involves the following, with excavation depths currently proposed to an average of 1.6 metres below ground level (mBGL), with a maximum excavation depth of 3.4 mBGL (below the existing slab assumed to be 150mm in depth):

- Site establishment including earthworks.
- Construction of the Alexandria Health Centre:
 - Total Gross Floor Area (GFA) of 11,436sqm
 - Maximum Floor Space Ratio (FSR) of 3.85:1
 - Maximum height of 34.95m, Maximum Reduced Level (RL). 45.4
- Ancillary development including:
 - Car parking – 77 car parking spaces distributed across basement, ground, and ground mezzanine levels.
 - Utility infrastructure and services connections.
 - Building identification signage and wayfinding signage.

- Stormwater management.
- Landscaping.
- Laneway for vehicle and pedestrian access along with western boundary of the site
- Operation of the Alexandria Health Centre as a mental health hospital and medical centre with ancillary uses.

1.3 Objective and Scope

The objective of the Assessment is to assess the for presence of Salinity at the Site.

The scope of work completed to achieve this included:

- A review of previous environmental investigations and external reports with regards to salinity.
- A review of the previous Site observations with regards to salinity.
- Preparation of a Phase One Salinity Assessment report summarising the findings in accordance with the Department of Land and Water Conservation (2002): *Site Investigations for Urban Salinity*.

1.4 Site Identification

The Site identification details pertinent to the Assessment are presented in **Table 2**.

Table 2 – Site Identification	
Item	Description
Site Address	28-32 Bourke Road, Alexandria, NSW, 2015 (as shown in Figure 1)
Legal Description	Lots 1, 2 and 3 in DP 324707
Approximate Site Area	2,972 m ²
Municipality	Council of the City of Sydney (Council)
Zoning	E3 – Productivity Support under Sydney Local Environmental Plan 2012 (currency 28.04.2023)
Proposed Land Use	Hospital and Medical Care Uses
Proposed Land Classification	Commercial / Industrial
Current Land Use	Vehicle and tyre storage and workshop
Current Land Classification	Commercial / Industrial

* Land classification as defined in the National Environment Protection Council (NEPC) National Environment Protection (Assessment of Site Contamination) Measure 1999 (2013 amendment).

2 Potential Disturbance Activity

The Proposed Development consists of the demolition of the existing warehouses, on-site remediation of the soil within the Site for off-site disposal and construction of the proposed development, which will involve the excavation of the soil within the Site to a maximum depth of 5.25 mAHD, measured at approximately 3.4 meters below the existing ground level (mBGL) (adopted as 8.8 mAHD from the top of the slab), for the purposes of the construction of a semi-underground car park and subservices. The proposed basement is noted to have a floor level of 7.35 mAHD (excluding subservices) below the existing slab level (8.65 mAHD), measuring approximately 1.6 mBGL (assuming a nominal slab depth of 150mm and 150 mm subgrade stabilisation).

Under the proposed development concept design, a 440 m² area is proposed to remain unexcavated. It is understood that the approximate height of the ground floor is proposed to be 10.4 mAHD, which would require an approximate infill of 638 m³ to level the height of the area above the existing ground level (adopted as 8.8 mAHD), assuming a nominal slab thickness of 150 mm and stabilisation level of 150 mm.

Furthermore, based on the findings of previous contamination assessments conducted at the Site^{1,2}, remediation of soils is proposed to accompany the development plans. It is understood that an approximate 1,600 m³ is proposed for excavation within the south-western portion of the Site, to be treated and disposed off-site at a licensed facility lawfully able to accept the waste. The vertical extent of remediation in this area of the Site is proposed to be to a depth of 6.65 mAHD.

¹ EP Risk, Soil Contamination Assessment, 28-32 Bourke Road, Alexandria, NSW, 2015, ref: EP2460.002_v2, dated December 2021 (EP Risk 2021)

² EP Risk, Detailed Site Investigation, 28-32 Bourke Road, Alexandria, NSW, 2015, ref: EP2515.001_v5, dated 10 November 2023 (EP Risk 2023a).

3 Site and Surrounding Environment

3.1 Geology

According to the NSW Department of Industry, Resources & Energy, 1:100,000 scale map, the Site is underlain by Quaternary medium to fine-grained marine sand with podosols.

3.2 Soil Landscape

According to the NSW Department of Planning, Industry & Environment Soil Landscapes of the Penrith 1:100,000 Sheet, the Site is dominated by medium to very coarse-grained quartz sandstone, minor laminated mudstone and siltstone lenses of alluvial floodplain origin.

EP Risk undertook a Soil Contamination Assessment (SCA) (EP Risk 2021). The soil lithology encountered during the SCA consisted of a surface of concrete (0.0 – 0.15 mBGL) followed by a layer of FILL (0.15 to a maximum depth of 1.8 mBGL). The FILL material was underlain by a layer of natural SAND (beginning from 1.5 to 1.8 mBGL).

The FILL layer generally comprised gravelly sand, fine to medium grained, angular to sub-angular gravels, dark brown, slightly moist and loose. The underlying natural material generally consisted of a natural SAND, fine to medium grained, dark brown, moist and loose consistency. Detailed logs of encountered soil lithography are available in **Appendix C** of the SCA (EP Risk 2021)

According to the NSW Department of Planning, Industry & Environment eSPADE spatial viewer the observed material constitutes grey-brown mottled sand (TG3) and brown soft sandy iron pan (tg5). These soil landscapes are identified as having “localised salinity limitations”.

3.3 Topography and Drainage

The topography of the Site was observed to be relatively flat with a downward gradient towards the north of the Site from the south. The Site appeared consistent and level with the surrounding properties. The elevation was between approximately 8 and 9 mAHD. Groundwater was inferred to flow north-west.

3.4 Hydrogeology

According to the Geoscience Australia Hydrogeology Map of Australia, Aquifers on-site are anticipated to be porous, extensive with high productivity.

No registered groundwater bores were identified at the Site. However, approximately 340 bores were identified within 2 km of the Site. Of the approximately 340 bores, 33 of the bores are within 500 m of the Site.

A summary of the 33 bores within 500 m of the Site is presented below as outlined in the Ground water Assessment undertaken by EP Risk (2022)³ currently in preparation:

- The bores are mainly used for monitoring with two bores used for industrial purposes and were installed in the 1940s.
- The total depth of the bores range between 4.0 and 15.5 m BGL.
- The standing water levels of the bores range between 0.79 and 5.50 m BGL.

³ EP Risk, *Groundwater Impact Assessment (GWIA), 28-32 Bourke Road, Alexandria, NSW, 2015*, report ref: EP2515.004_v1, currently in preparation (EP Risk 2022).

- The salinity ranges between 369 mg/L and 613 mg/L indicating the aquifer is relatively fresh and low salinity.
- During the groundwater monitoring event conducted by EP Risk as part of a Detailed Site Investigation (EP Risk 2021), it was determined that:
 - The electrical conductivity ranges from 12.6% to 74.8%.
 - The turbidity/total suspended solids ranges from 9.1% to 50.0%.

3.5 Salinity

There was no data from the Dryland Salinity – National Assessment observed within the boundary of the Site or the dataset buffer.

4 Site Condition

4.1 Site Inspection

The site has a primary frontage along the northern boundary to Bourke Road of 40m. The site currently accommodates a single storey warehouse building used for the purposes of vehicle repairs as shown in **Figure 1**. EP Risk field personnel conducted an inspection of the Site and immediate surroundings. The following features were observed:

- The Site is located within a known industrial area, situated on Bourke Road between Bowden Street to the west, Wyndham Street to the east and O’Riordan Street to the south.
- The Site was accessible by vehicle and foot from Bourke Road to the south.
- The Site comprised of one (1) industrial warehouse with internal offices on the ground and mezzanine level. The warehouse itself is divided into two adjoining rooms (western and eastern sections), accessible through an open wall at the centre of the warehouse. The Site is currently occupied by a tyre fitting and dent repair business (Sydney City Tyres).
- All areas were paved with concrete throughout. The concrete slab extended to a depth of approximately 0.15 mBGL across the site. A double concrete slab was encountered at the western end of the Site.
- No bare soil patches were identified throughout the site.
- No evidence of salt crystals were present on the ground surface throughout the site.
- No Vegetation was present within the site; thus, no salinity indicator vegetation species were observed.
- Visible black surface staining on concrete flooring was observed throughout the site, there was also evidence of disturbance in the concrete flooring. This was deemed to be caused by the site usage as an automotive repair shop.

Site photographs taken during the Site inspection and soil sampling are provided as **Appendix A**.

4.2 Surrounding Land Use

The site is located within a primarily industrial area. Surrounding land use within a 1 km radius comprised of the following:

To the North

- Bourke Road running southwest to east;
- Australian Metal Co scrapyard;
- Fire Station (Fire and Rescue NSW Alexandria Fire Station) to the northeast; and
- Rail Operations Centre (Transport NSW) to the northeast.

To the South

- Taxi Depot to the south;
- O'Riordan Street running south to northeast; and
- Head Office of Australian Red Cross.

To the East

- Café Mecca;
- Green Square Train Station;
- Car repair and maintenance; and
- Corner of Bourke Road and O'Riordan Street.

To the West

- Industrial Properties; and
- Bowden Street running northwest off Bourke Road.

5 Conclusions

Alexandria Property Development Pty Ltd c/-Johnstaff engaged EP Risk to a prepare a Phase One Salinity Assessment (the Assessment) of the proposed development site located at 28-32 Bourke Road, Alexandria, NSW, 2015 (the Site). The location and boundary of the Site is shown in **Figure 1**. The Site is approximately 2,972 m² in area and currently consists of a disused factory / warehouse.

The findings of the Phase One Salinity Assessment, which comprised a desktop review of Site history, current land uses, and Site inspection, are presented below:

- The Site is underlain by Quaternary medium to fine-grained marine sand with podosols.
- According to the NSW Department of Planning, Industry & Environment eSPADE spatial viewer the observed material constitutes grey-brown mottled sand (tg3) and brown soft sandy iron pan (tg5). These soil landscapes are identified as having “localised salinity limitations”.
- The Site is dominated by medium to very coarse-grained quartz sandstone, minor laminated mudstone and siltstone lenses of alluvial floodplain origin.
- The Site has an approximate elevation of 8 – 12 m AHD and slopes gradually from the southern to northern portion of the Site.
- The aquifers on-site are anticipated to be porous, extensive with high productivity.
- No registered groundwater bores were identified at the Site. However, approximately 340 bores were identified within 2 km of the Site. Of the approximately 340 bores, 33 of the bores are within 500 m of the Site.
 - The bores are mainly used for monitoring with two bores used for industrial purposes and were installed in the 1940s.
 - The total depth of the bores range between 4.0 and 15.5 m BGL.
 - The standing water levels of the bores range between 0.79 and 5.50 m BGL.
 - The salinity ranges between 369 mg/L and 613 mg/L indicating the aquifer is relatively fresh and low salinity.

The Site is not mapped within a salinity area and the salinity of the underlying aquifer ranges between 369 mg/L and 613 mg/L indicating the aquifer is relatively fresh and low salinity. During the groundwater monitoring event, it was determined that the electrical conductivity ranges from 12.6% to 74.8% and the turbidity/total suspended solids ranges from 9.1% to 50.0%.

Overall, based on the data obtained from the desktop review and the site inspection undertaken by EP Risk, the likelihood of Salinity is considered to be very low.

Given the limited information on the sites Salinity potential the following recommendations should be implemented for the future proposed development:

- During the proposed development/ excavation works should saline soils be suspected or identified works should cease and qualified Environmental Consultant be contacted. Furthermore, the general Saline Soils Management Options and Strategies outlined in **Appendix B** should be followed.

Figures

28-32 Bourke Road, Alexandria

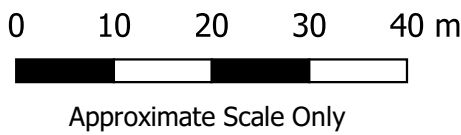
Legend
[Red outline] Site boundary



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Phase One Salinity Assessment 28-32 Bourke Road, Alexandria, NSW 2015

Job No: EP2515
Date: 01/06/2022
Drawing Ref: EP2515.005 Fig. 1
Version No: v1



Coordinate System: WGS 84
Drawn by: HB Checked by: OG
Scale of regional map not shown
Source: Nearmap / OpenStreetMap



Figure 1 - Site Location

Appendix A

Photo Log



Plate 1 – Eastern portion of warehouse, facing north, concrete, slab observed throughout the Site.



Plate 2 – Eastern portion of warehouse, facing south, concrete slab observed throughout the Site.



Plate 3 – Western Portion of warehouse, south extent, facing south, concrete, slab observed throughout the Site.



Plate 4 – Western Portion of warehouse, exterior, facing north, concrete slab observed throughout the Site.

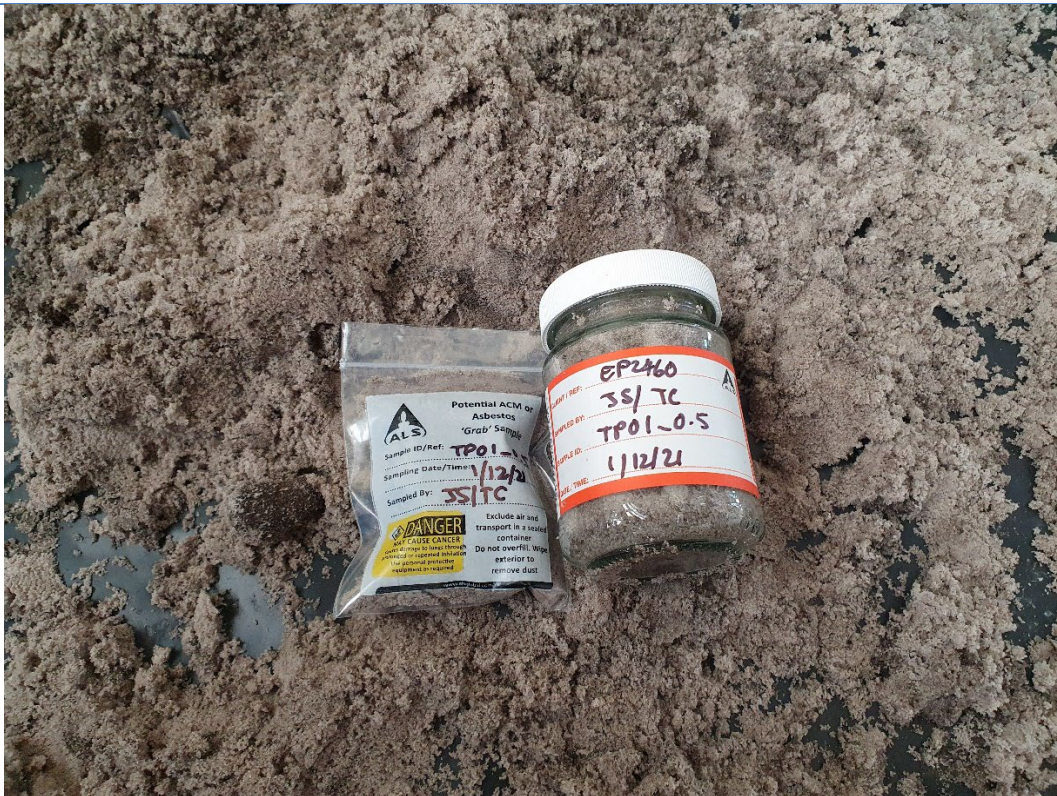


Plate 5 – Representative image of Soil material observed during SCA (EP Risk 2021): sand, fine to medium grained, grey, slightly moist, loose consistency.



Plate 6 – Representative image of Soil material observed during SCA (EP Risk 2021): Gravelly sand, medium grained, angular to sub-angular gravels, light brown, slightly moist and loose.



Plate 7 – Representative image of Soil material observed during SCA (EP Risk 2021): Gravelly clayey sand, low to medium plasticity, fine to medium grained, angular to sub-angular gravels, dark brown with red mottling, slightly moist, soft, loose consistency.

Appendix B

SALINE SOILS MANAGEMENT OPTIONS AND
STRATEGY

Saline Soil Management Options and Strategy

- The relevant guidance to medium sized developments in localities with moderate salinity potential and high dryland salinity risk is outlined in the following documents:
- Western Sydney Regional Organisation of Councils Ltd (2003, Amended 2004) Western Sydney Salinity Code of Practice.
- Department of Infrastructure, Planning and Natural Resources (2003): Building in a Saline Environment.
- Department of Infrastructure, Planning and Natural Resources (2003): Roads and Salinity.
- Department of Infrastructure, Planning and Natural Resources (2004): Waterwise Parks and Gardens.
- Department of Land and Water Conservation (2002): Site Investigations for Urban Salinity.
- Liverpool City Council: Liverpool Development Control Plan (LDCP) (2008).

With reference to the recommendations of the management of soils with known or high dryland salinity risk from the documents above, it is considered the disturbance of potentially saline soils in the event of future development of the Site would be likely. The management options recommended for future development are outlined herein.

Earthworks

Care must be taken to avoid the reversing or mixing the soil profile and disturbance of natural drainage patterns during earthworks operations across the Site which may negatively impact on the salinity profile.

Consideration should be given to the requirements of the LDGP (2008) regarding management of salinity issues and discussion with council officers is recommended prior to commencing earthworks. EP Risk considers salinity issues are highly dependent on the nature of the proposed development and prior consent from Council should be sought for the proposed methodology.

Water Inputs

Underground water carrying pipes (including wastewater) and on-site sewerage systems (if relevant) should be properly installed to eliminate leaks with regular maintenance and/or checking for leaks. Changes to the on-site water balance may have an adverse effect to salinity potential.

According to the LDGP (2008):

“The Salinity Management Response shall be based on site conditions and the proposed development. It shall include controls to protect buildings and also strategies to protect infrastructure, including roads and underground services and to manage the water cycle. A Response shall assume worst-case scenario for salinity on the site”

Stormwater and Drainage

The following should be considered in the design of stormwater and drainage systems on-site (if required):

- The design slope of exposed/open concrete slabs and surrounding areas should be designed to minimise ponding and the potential for increased infiltration.
- Slab, foundations and retaining walls designed to allow good drainage / minimise water logging.

- Existing areas of waterlogging and poor drainage should be remedied prior to development construction.
- Design and layout of retaining walls, driveways and service connections reduces cut, minimises impediment of natural groundwater flows and provides for good drainage.
- Guttering and down pipes properly connected and maintained.

Vegetation

The following should be considered in the design in regard to vegetation on the Site:

- Areas of established vegetation are to be maintained and protected.
- Landscaping plans should adopt principles outlined in the Department of Infrastructure, Planning and Natural Resources (2004): Waterwise Parks and Gardens document.
- Irrigation systems should be properly installed to avoid leakage and 'smart' sprinkler systems considered.
- Re-use non-saline soils sources from the Site or imported into the Site in landscaped gardens where practicable.
- Building Construction and Design.

Given the Site is considered to contain soils with high dryland salinity risk, there is a requirement to minimise the exposure to these soils to building materials. Where buildings are to be constructed directly on susceptible or exposed areas, then consideration of the following precautions should be adopted in the construction process:

- Install a properly constructed damp proof course beneath buildings, paths and driveways.
- Consideration should be given to the need for salt resistant bricks and construction materials where applicable.
- Susceptible construction materials should be avoided, i.e. porous materials.

The following should be considered in the design of roads and pavement:

- Inclusion of appropriate sub-surface drainage that doesn't divert moisture to road layers.

Choose road materials that are not susceptible to corrosion.

