

ANNEXURE 6

**Letter from DEADP requiring EIA application dated 10.04.2012 &
Letter from DEADP confirming withdrawal of EIA application dated 10.02.2015**





REFERENCE NUMBER: E12/2/4/7-A2/75-3242/11
ENQUIRIES: Melanese Schippers
DATE OF ISSUE: **10 APR 2012**

The Director
Department of Transport and Public Works
PO Box 2603
CAPE TOWN
8001

Attention: Mr. F. Joubert

Tel : (021) 483 5436
Fax: (021) 483 4511

Dear Sir

APPLICABILITY OF ACTIVITY 24 OF GN. NO. R544 OF THE NEMA EIA AMENDMENT REGULATIONS 2010 WITH RESPECT TO THE PROPOSED DEVELOPMENT ON ERF 186 (FOUNDERS GARDEN), CAPE TOWN.

1. Your correspondence dated and received by this Department on 27 May 2011, this Directorate's letter dated 20 June 2011, the letter received from the City of Cape Town: Environmental Management Branch (dated 08 November 2011) in e-mailed correspondence received from Mr. M. Munro of your Departments Provincial Regeneration programme dated 02 December 2011, this Directorate's letter dated 08 December 2011 and the correspondence received from the City of Cape Town dated 04 January 2012, refer.
2. Based on the additional information and motivation received from the City of Cape Town on 05 January 2012, a meeting was held with the relevant planning and legal components within the Department.
3. The interpretation of the zoning of the property was clarified which then determines the applicability of Activity 24 of GN. No. R544 of the NEMA EIA Amendment Regulations 2010.
4. Based on the above, you are herewith informed that the proposed development will trigger Activity 24 of GN. No. R544 of the NEMA EIA Amendment Regulations 2010.
5. Written authorisation is therefore required from the competent authority prior to the undertaking of the said activity. The onus, however, rests with the applicant and his/her environmental assessment practitioner to ensure that all applicable listed activities are applied for and assessed.
6. You are hereby advised that only those activities applied for will be considered for authorisation.

7. The process to be followed in order to obtain such authorisation is contained in GN No. R. 543 of 18 June 2010. For further advice please consult this Department's NEMA Environmental Impact Assessment Regulations Guideline and Information Document Series, which can all be downloaded from the Departments website (<http://www.westerncape.gov.za/eadp>).
8. You are advised to engage with the Department at an early stage in order to facilitate your application process to ensure a more efficient process. You may also engage with the Department's Development Facilitation Unit (DFU) for assistance in this regard.
9. You are further reminded of your general duty of care towards the environment in terms of section 28(1) of NEMA which states that:

"Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorized by law or cannot be avoided or stopped, to minimise and rectify such pollution or degradation of the environment".

This Department reserves the right to revise or withdraw comments or request further information from you based on any information that might be received.

Yours faithfully



MR. ZAHIR TOEFY
DIRECTOR: LAND USE MANAGEMENT (REGION 2)



**Western Cape
Government**
Environmental Affairs and
Development Planning

**DIRECTORATE: DEVELOPMENT MANAGEMENT
REGION 1**

EIA REFERENCE NUMBERS: 16/3/1/1/A7/7/3001/14 (Basic Assessment application)
16/3/1/4/A7/7/3003/14 (Exemption application)

ENQUIRIES: MS. K. ADRIAANSE

DATE OF ISSUE: 10 FEB 2015

The Director
Western Cape Government: Transport and Public Works
P.O. Box 2603
CAPE TOWN
8000

For attention: Ms. M. S. Adams

Tel: (021) 483 5436
Fax: (021) 483 4511

Dear Madam

WITHDRAWAL OF THE APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED REZONING OF ERVEN 186 AND 187, ROGGEBAAI, CAPE TOWN TO GENERAL BUSINESS USE AND THE CONSTRUCTION OF TWO LEVELS OF UNDERGROUND PARKING ON ERF 186, ROGGEBAAI.

The Application Form for Basic Assessment dated 17 December 2013 and received by this Department on 13 January 2014, this Directorate's acknowledgement thereof dated 27 January 2014, the Application Form for Exemption dated 30 January 2014 and received by this Department on 12 February 2014, this Directorate's acknowledgement thereof dated 16 April 2014, the status update dated 03 June 2014 and received by this Department on 04 June 2014, this Directorate's acknowledgement thereof dated 06 June 2014, the status update dated and received by this Department on 31 July 2014, this Directorate's acknowledgement thereof dated 06 August 2014, the status update dated 30 September 2014 and received by this Department on 01 October 2014 and this Directorate's acknowledgement thereof dated 07 October 2014, refer.

1. On 04 December 2014, the Minister of Environmental Affairs promulgated regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), viz, the Environmental Impact Assessment ("EIA") Regulations 2014 (Government Notice No. R. 982, R. 983, R. 984 and R. 985 in Government Gazette No. 38282 of 04 December 2014). **Please note that these Regulations came into effect on 08 December 2014.**
2. Please note that this Directorate regards your application for Environmental Authorisation as having been withdrawn as your proposed development does not trigger a listed activity in terms of the NEMA EIA Regulations, 2014. This determination is based on the fact that although Erf 186 is zoned as Public Open Space which is approximately 28 051m² in extent and Erf 187 is zoned as Community Facility which is approximately 14 039m² in extent, the proposed site is located within an urban area and is not zoned for conservation use or an equivalent zoning.

3. However, should any revision of your proposed development comprise any activities that constitute a listed activity as defined in GN No. R. 983; R. 984 or R. 985 of 04 December 2014, an application for environmental authorisation must be submitted to the competent authority and authorisation obtained before such activity(ies) may commence.
4. You are reminded of your general duty of care towards the environment in terms of Section 28(1) of the NEMA which states: "Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment".

This Directorate reserves the right to revise or withdraw comments or request further information based on any information received.

Yours faithfully


HEAD OF DEPARTMENT

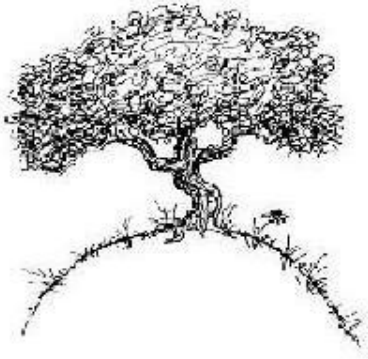
Copies to: (1) Ms. C. Muller (Sillito Environmental Consulting)
(2) Mr. D. Georgeades (City of Cape Town)
(3) Mr. A. Oosthuizen (WCG; EADP – Directorate Development Facilitation)

Fax: (021) 712 5061
Fax: (086) 201 1241
Fax: (021) 483 8311

ANNEXURE 7

Tree Report & Map – Willem Avenant (September 2014)





Willem Avenant

TREE SPECIALIST

Tree Specialist
P.O. Box 13013
Woodstock; 7915
072 434 2126

29 September 2014

For Attention:

Chantel Muller
chantel@environmentalconsultants.co.za

Site details:

Founders Garden
Foreshore
Cape Town

Tree Report

Please see inventory and map attached.

There are very few trees of any significant value on site. There exists the possibility of taking out some of the smaller, good trees, bagging them, and then replanting them on the site once construction is completed. However, this will have to be thought through, because none of the trees are particularly special or noteworthy.

It might be better to just plant large, indigenous trees on site, once construction is complete.

It is worth to note that the trees on site have been left and neglected over many years, because of this, most of them are in a very poor condition, many are dead, and the large majority are under-developed.

There are several smaller trees in the center of the site that have been moved there, mainly *Ulmus* (Chinese Elm), these trees are very small, and are mostly dead/dying, and therefore, have not been included on the inventory.





Transplanting of trees

On the inventory the transplant-ability of the trees is indicated. However, it needs to be noted that it only indicates possible or not. The trees that are indicated as not possible or worth it are trees that are dead or that are in too bad of a condition to replant.

It does not take into account the cost and practicality of moving/transplanting the trees. In most cases the trees are too big to really transplant them, as the cost incurred would be tremendous. However, it is indicated as possible.

There are various smaller trees that will not be too hard to transplant/move, but taking the cost of this into account, I feel it might be easier to rather plant large specimen trees after construction is finished.

Most of the trees on the site are not indigenous, and therefore, not really worth keeping. There are also very few special trees of note on the site, the only possible noteworthy trees are numbers 90 (*Olea*) and 145 (*Erithryna*) since they seem to be very old. Tree 64 (*Kigelia*) is also noteworthy, as it is a rather rare tree in Cape Town.

The *Schinus* trees are not very well suited for the area and are mostly in a poor condition.

Most *Ficus* trees transplant easily because they are so resilient, however, the size of most of the *Ficus* trees on this site will pose a problem.

It might be possible to give many of the trees to a large tree nursery, let them harvest the trees at their cost, and in exchange, get some specimen trees for the site.

Trees during construction:

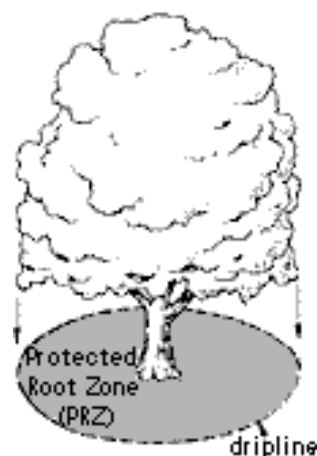
Trees can be damaged or killed by a wide variety of construction activities. Some practices lead to obvious injuries such as broken branches or torn bark. Open wounds of this type deplete a plant's energy resources and provide entry points for insects, or for diseases such as oak wilt.

The worst damage, however, often remains hidden underground. Roots are one of the most vital parts of a tree. They are responsible for nutrient and water uptake, store energy, and anchor the plant. Because they are so important, it is critical that you protect roots that lie in the path of construction.

Trees are never the same shape below ground as they are above, so it is difficult to predict the length or location of their roots. Typically, however, approximately 90-95 percent of a tree's root system is in the top 90-100 cm of soil, and more than half is in the top 30-50 cm. **The part of this root system in which construction damage should be avoided is called the Root Protection Area (RPA).**

One common method used to identify the RPA is to define it as the "dripline"--the area directly below the branches of the tree. However, many roots extend beyond the longest branches a distance equal to two or more times the height of the tree. For this reason you should protect as much of the area beyond the dripline as possible.

Unfortunately, on most sites space is limited and this rule must be bent. Just how close an activity can come without seriously threatening the survival of a tree depends on the species, the extent of damage, and the plant's health. Some healthy trees can survive after losing 50 percent of their roots. However, other species are extremely sensitive to root cutting, even outside the dripline.



Minimize the Impact of Construction Activities:

Protect trees from damage:

Preventing damage is less costly than correcting it. Post highly-visible barricades and signs around the trees and areas to be protected. The optimal size of barricaded areas varies by tree species, size, and construction project.

For recently planted trees (one to four years), the area under the branches (dripline) should be adequate.

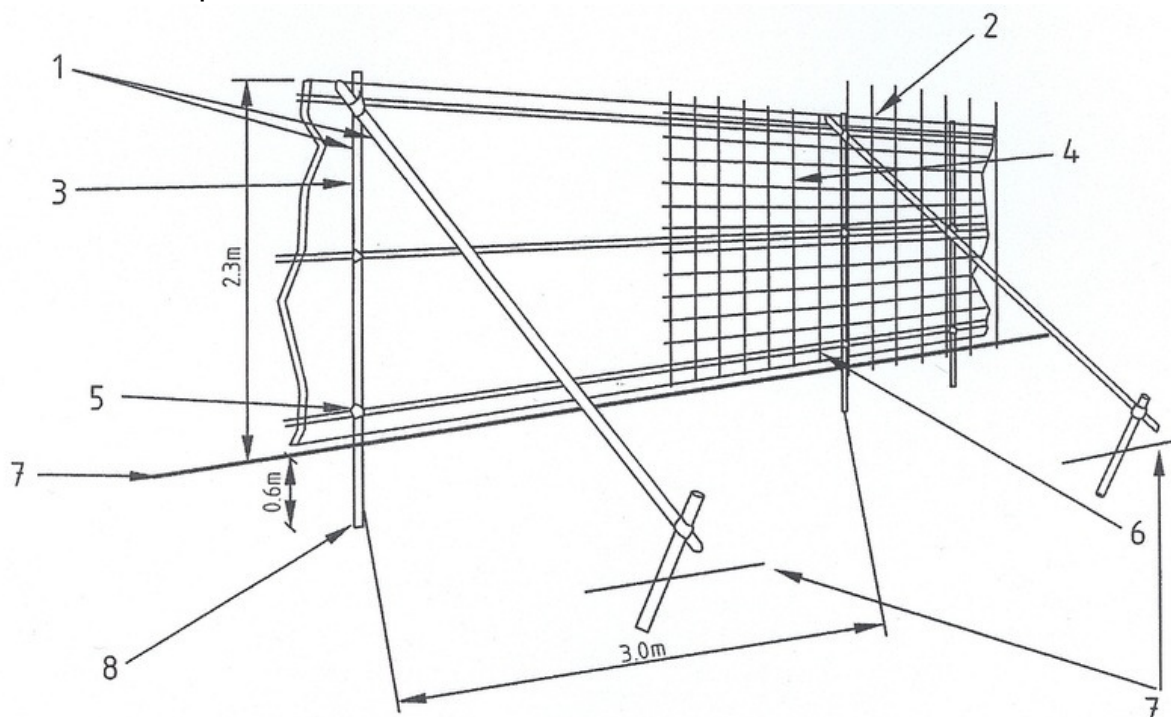
For minimal protection of trees older than four years, barricades should extend beyond the dripline; for every 2.5cm of diameter of the tree's trunk, add extend the protection area an additional 30cm.

For additional protection, a layer of wood chips can be placed around each tree prior to placement of the barricades. Examine trees and barricades at least once a week during construction.

Construction equipment can injure the aboveground portion of a tree by breaking branches, tearing the bark, and wounding the trunk. These injuries are permanent and, if extensive, can be fatal.

The RPA should be clearly marked, cordoned off with fencing and marked as an absolutely NO GO area for anyone or anything.

Please see example of barrier below:



- 1 Standard scaffold poles
- 2 Uprights to be driven into the ground
- 3 Panels secured to uprights with wire ties and, where necessary, standard scaffold clamps
- 4 Weldmesh wired to the uprights and horizontals

- 5 Standard clamps
- 6 Wire twisted and secured on inside face of fencing to avoid easy dismantling
- 7 Ground level
- 8 Approx. 0.6m driven into the ground

Grade Changes:

Moving large amounts of soil within the RPA usually kills a tree. Except where absolutely necessary, avoid disruptions to the natural contour of the site or shift them well outside the RPA.

Soil additions compact the soil around a tree and often raise the water table. You may be able to protect compaction-tolerant trees from additions of 15 cm or less of soil by using a porous fill within the RPA. Porous fill can be made by mixing one part loam, one part coarse sand, and one part shredded bark.

Deeper fills require more expensive measures. A retaining wall beyond the RPA may protect some trees. These walls preserve much of the original root system and redirect excess water away from sensitive plants. However, as a general rule, it is best to remove trees that would be buried by 15 cm or more of fill around the base.

Cutting the soil away from a tree removes vital feeder roots, eliminates nutrient-rich topsoil, and often lowers the water table. Damage caused by shallow cuts (less than 5cm) at least 90 cm away from the base of the tree may be minimal, but still can be a shock to a tree's vitality (health). If possible, avoid making the cut during hot, dry weather; water the tree (undisturbed portions) before, during, and after soil removal; and allow only hand digging inside the RPA. A shallow layer of mulch (pine needles, wood chips, or coarsely chopped twigs and bark) and clean root cuts will help wound closure and regrowth. Deeper cuts within the root zone will require construction of a retaining wall no closer than the limit of the RPA.

Soil Damage and Compaction:

Soil compaction is the single largest killer of urban trees. Tree roots need loose soil to grow, obtain oxygen, and absorb water and nutrients. Stockpiled building materials, heavy machinery, and excessive foot traffic all damage soil structure. Lacking good soil aeration, roots suffocate and tree health declines.

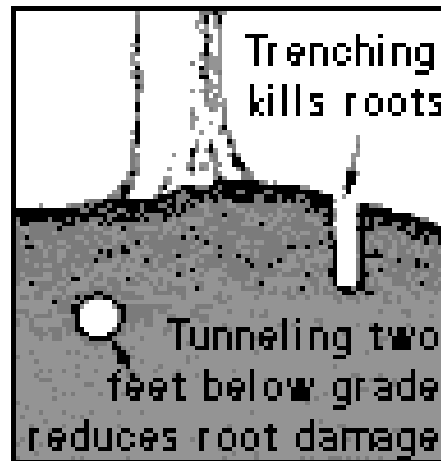
Tree roots need crumbly, well-aerated soil to grow and to obtain oxygen, water and nutrients. Lacking good soil aeration, roots suffocate and tree health declines. Leaf wilt, early autumn coloration, branch die back, overall decline and tree death are symptoms of soil compaction.

It's not common knowledge, but tree roots need air to survive. When the pore space around roots becomes so compacted the roots don't get air-(also inhibiting water uptake)-the whole tree can die.

Prevent soil compaction by carefully selecting storage areas and traffic routes (the future driveway is a good choice for both) and installing protective fences and signs. If you can, reroute traffic, install root system bridges with steel plates suspended over railroad ties or spread a layer (15cm or more) of wood chips on the soil within the RPA. Trees that are pruned or removed during the construction process should be chipped on site and the chips used for soil preservation tactics such as this. Heavy mixing trucks can be kept off tree roots by transporting concrete from the truck through conveyor pipes.

Improper handling or disposal of materials used during construction also can harm roots. For example, wood products treated with pentachlorophenol and creosote can be deadly to tree roots. Chemical spill damage can be prevented by filling fuel tanks, cleaning paintbrushes and tools, and repairing mechanical equipment well outside tree RPAs. Insist that all building debris and chemical wastes be hauled away for proper disposal, and not burned or buried on the site.

Finally, avoid changes in soil pH (acidity). Increases in pH are particularly dangerous to many species. Alkaline clays or limestones should not be used for fill or paving, and concrete should be mixed on a thick plastic tarp or outside the site. Mixing trucks should never be rinsed out on the site.

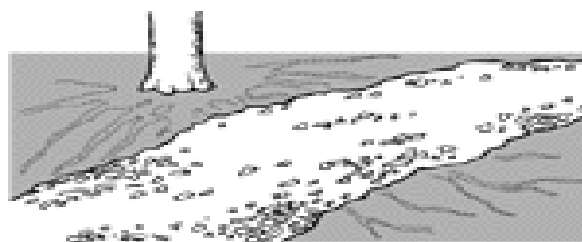


Excavation:

As much as 40 percent of a tree's root system could be cut during the installation of a nearby utility line. This reduces water and nutrient uptake, and may compromise the stability of the tree. If it is not possible to relocate the utility line outside the tree's RPA, you can reduce root damage by as much as 25 percent by tunneling under the tree's root system. When digging a trench near a tree, begin tunneling when you encounter roots larger than one inch in diameter.

Drilling single holes or bridging critical areas as opposed to cutting deep trenches saves many critical roots.

For all digging operations, insist that exposed roots be cut cleanly to promote quick wound closure and regeneration. Vibratory plows, chain trenchers, and hand tools do a better job at this than bulldozers and backhoes. Minimize damage by avoiding excavation during hot, dry weather; keeping the plants well watered before and after digging; and covering exposed roots with soil, mulch, or damp burlap/hessian as soon as possible.



Pavement/Paving:

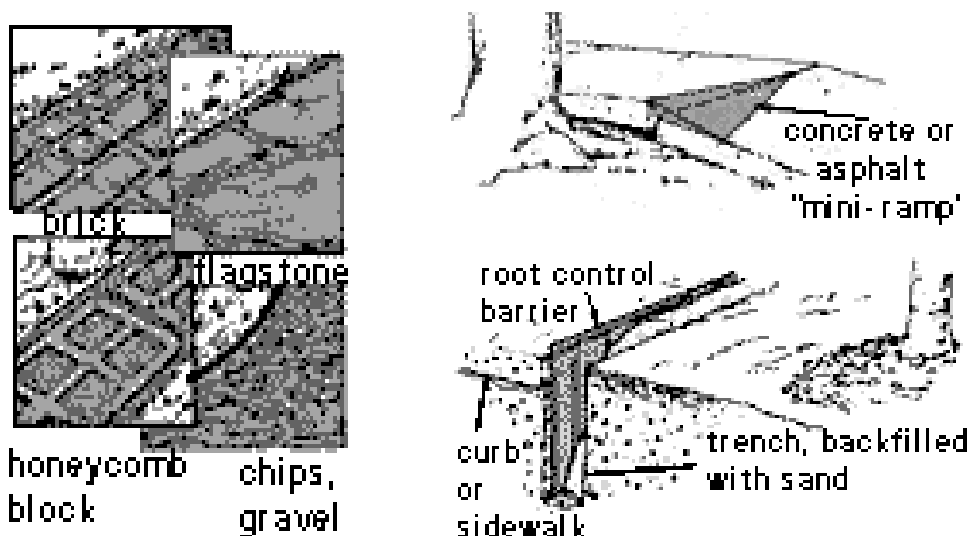
Sidewalks and driveways located too close to a tree endanger its health and may threaten pavement stability. Factors such as poor drainage and pavement flaws give roots an opportunity to expand, gain a foothold, and cause damage.

These problems can be avoided if you consider the spatial needs of a tree and its root system when designing the layout of new sidewalks and driveways. Just how much space is required depends on a tree's sensitivity to root cutting and its future size. It's best to locate sidewalks and driveways outside the anticipated RPA. At a minimum, walkways should be at least three feet from the trunk of a tree; driveways may cover up to half the distance from the tree's RPA to its trunk, as long as no excavation occurs. No tree should be boxed into an area less than 2.5 meters by 2.5 meters by 1 meter deep, with larger trees receiving at least 8.5 cubic meters of root/soil volume.

You can minimize disruption by using alternatives to conventional paving materials. In some communities, brick or flagstone walkways on sand foundations can be substituted for concrete. These materials protect soil pH and allow water and oxygen penetration. Preserve natural contouring by spanning uneven areas with wooden walkways elevated on posts. Elevated decks are excellent alternatives to concrete porches. Where additional pavement strength is needed (e.g., driveways), concrete requires less excavation than asphalt. "Structural soils" may be used under pavement to allow for both adequate pavement base strength and tree root penetration. Structural soils are composed of 80% stone chips, 20% clay-loam soil, and a polymer binding agent

There are several techniques for repairing pavement that has been damaged by protruding roots. For trees that are highly sensitive to root disturbance, consider creating a concrete or asphalt mini-ramp to smooth the uneven surface between two sidewalk sections. Local ordinances governing liability should be consulted prior to using this technique. Relocate walkways with broken concrete slabs a few feet farther from the tree. For trees that can tolerate root disturbance, a vertical underground barrier may redirect root expansion away from pavement.

All tree species are capable of causing root damage to sidewalks, foundations, or pipes.



Root pruning:

Trenching and digging in the soil near trees can cut roots, and this can damage the tree resulting in tree decline or the tree falling over. This can cause liability and safety concerns. Root pruning is more injurious to older mature trees than it is for younger more vigorous trees. Cutting roots greater than about 2.5cm diameter during trenching and digging can mean problems for the tree. In some cases roots of 2.5cm – 8cm diameter represent the major structural roots holding the tree upright.

The impact from pruning roots depends on several factors. Damage typically increases with more cuts, bigger cuts, and cuts made closer to the trunk. Root pruning, trenching, and other construction activities close to the trunk result in more injury on shallow, compacted soils or on soils that drain poorly than on well drained soils. This is due to the shallow roots common on sites with shallow soils or high water table. Trees that are leaning are poor candidates for root pruning.

Root pruning should only be done by trained professionals, before damage is caused to the roots or the tree.

Mulching:

Mulching trees and shrubs is a good method to reduce landscape maintenance and keep plants healthy. Mulch helps conserve moisture, 10 to 25 percent reduction in soil moisture loss from evaporation. Mulches help keep the soil well aerated by reducing soil compaction that results when raindrops hit the soil. They also reduce water runoff and soil erosion. Mulches prevent soil and possible fungi from splashing on the foliage, thus reducing the likelihood of soil-borne diseases. They help maintain a more uniform soil temperature (warmer in the winter and cooler in the summer) and promote the growth of soil microorganisms and earth worms.

Mulches eliminate mowing around trees and shrubs and provide a physical barrier that prevents damage from lawn mowers and weed trimmers. A 5-10 cm layer (after settling) is adequate to prevent most weed seeds from germinating. Mulch should be applied to a weed-free soil surface.

The mulched area should include as much of the root zone as possible. For individual plants, such as trees, the mulched area should extend at least 90 – 180 cm out from the base of the plant. It is advisable to pull the mulch 3-5 cm from the base of plants to prevent bark decay.

Mulch depth depends on the type of material used and the drainage and moisture holding capacity of the soil. Sandy soils dry out quickly and often benefit from a slightly deeper mulch layer (8 – 10 cm). A site that stays moist may not benefit from mulching at all.

It is not necessary to remove the mulch when you fertilize. Apply the fertilizer over the mulch, nutrients will move with water to the roots below.

Should you require any further information regarding this matter or any other related issues, please do not hesitate to contact me.

Sincerely yours,

Willem Avenant

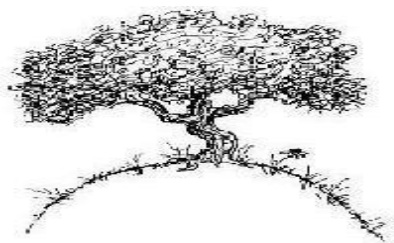
Willem Avenant



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E-mail: willemavenanttreespecialist@gmail.com
Cell: 072 434 2126







Willem Avenant

TREE SPECIALIST

Tree Specialist
 P.O. Box 13013
 Woodstock; 7915
 072 434 2126

Site: Founders Garden, Cape Town

Date: 29-Sep-14

Tree No:	Botanical Name:	Common Name:	Tree Size:	General condition:	Protected:	Indigenous:	Transplantable:
1	<i>Phoenix</i>	Canary Is Date Palm	Small	Good	No	No	Possible
2	<i>Washingtonia</i>	Bearded Palm	Large	Good	No	No	Possible
3	<i>Ficus rubiginosa</i>	Port Jackson Fig	Medium	Good	No	No	Possible
4	<i>Mixed hedge, mainly Brachylaena & Hibiscus</i>	Coastal Silver Oak and Hibiscus mix	Medium	Good	No	No	Possible
5	<i>Ceratonia siliqua</i>	Carob	Medium	Good	No	No	Not possible or worth it
6	<i>Grevillea robusta</i>	Silky Oak	Small	Moderate	No	No	Not possible or worth it
7	<i>Populus sect. Aigeiros</i>	Poplar	Large	Good	No	No	Not possible or worth it
8	<i>Populus sect. Aigeiros</i>	Poplar	Large	Good	No	No	Not possible or worth it
9	<i>Quercus suber</i>	Cork Oak	Medium	Moderate	No	No	Not possible or worth it
10	<i>Schinus molle</i>	Pepper tree	Small	Poor	No	No	Not possible or worth it
11	<i>Melia azedarach</i>	Seringa	Medium	Good	No	No	Not possible or worth it
12	<i>Casuarina equisetifolia</i>	Beefwood	Large	Good	No	No	Not possible or worth it
13	<i>Populus sect. Aigeiros</i>	Poplar	Large	Good	No	No	Not possible or worth it
14	<i>Melia azedarach</i>	Seringa	Medium	Good	No	No	Not possible or worth it
15	<i>Agonis flexuosa</i>	Willow Myrtle/Peppermint	Small	Poor	No	No	Not possible or worth it
16	<i>Agonis flexuosa</i>	Willow Myrtle/Peppermint	Large	Moderate	No	No	Not possible or worth it
17	<i>Lagunaria patersonia</i>	Pyramid tree	Medium	Good	No	No	Possible
18	<i>Agonis flexuosa</i>	Willow Myrtle/Peppermint	Small	Poor	No	No	Possible
19	<i>Ficus rubiginosa</i>	Port Jackson Fig	Medium	Good	No	No	Possible
20	<i>Ficus rubiginosa</i>	Port Jackson Fig	Medium	Good	No	No	Possible
21	<i>Quercus ilex</i>	Holm Oak	Small	Good	No	No	Possible
22	<i>Araucaria heterophylla</i>	Norfolk Island Pine	Medium	Good	No	No	Not possible or worth it
23	<i>Ficus elastica</i>	Rubber tree	Medium	Good	No	No	Possible
24	<i>Hibiscus</i>	Hibiscus	Small	Good	No	No	Possible
25	<i>Ceratonia siliqua</i>	Carob	Small	Poor	No	No	Not possible or worth it
26	<i>Melaleuca possibly quinquenervia</i>	Paperbark	Medium	Poor	No	No	Not possible or worth it
27	<i>Melaleuca possibly quinquenervia</i>	Paperbark	Medium	Poor	No	No	Not possible or worth it
28	<i>Populus sect. Aigeiros</i>	Poplar	Large	Good	No	No	Not possible or worth it
29	<i>Schinus molle</i>	Pepper tree	Small	Poor	No	No	Not possible or worth it

Tree No:	Botanical Name:	Common Name:	Tree Size:	General condition:	Protected:	Indigenous:	Transplantable:
30	<i>Quercus ilex</i>	Holm Oak	Medium	Good	No	No	Possible
31	<i>Quercus ilex</i>	Holm Oak	Medium	Good	No	No	Possible
32	<i>Lagunaria patersonia</i>	Pyramid tree	Small	Good	No	No	Possible
33	<i>Casuarina equisetifolia</i>	Beefwood	Small	Poor	No	No	Not possible or worth it
34	<i>Hibiscus</i>	Hibiscus	Small	Moderate	No	No	Possible
35	<i>Populus sect. Aigeiros</i>	Poplar	Large	Moderate	No	No	Not possible or worth it
36	<i>Casuarina equisetifolia</i>	Beefwood	Small	Poor	No	No	Not possible or worth it
37	<i>Araucaria heterophylla</i>	Norfolk Island Pine	Small	Poor	No	No	Not possible or worth it
38	<i>Schinus molle</i>	Pepper tree	Small	Poor	No	No	Not possible or worth it
39	<i>Ficus microcarpa nitida</i>	Wild Fig	Medium	Good	No	No	Not possible or worth it
40	<i>Schinus molle</i>	Pepper tree	Medium	Poor	No	No	Not possible or worth it
41	<i>Schinus molle</i>	Pepper tree	Medium	Poor	No	No	Not possible or worth it
42A	<i>Melaleuca</i>	Tea tree	Large	Moderate	No	No	Not possible or worth it
42B	<i>Melaleuca</i>	Tea tree	Large	Moderate	No	No	Not possible or worth it
43	<i>Ficus microcarpa nitida</i>	Wild Fig	Small	Moderate	No	No	Possible
44	<i>Grevillea robusta</i>	Silky Oak	Small	Moderate	No	No	Possible
45	<i>Schinus molle</i>	Pepper tree	Small	Moderate	No	No	Not possible or worth it
46	<i>Schinus molle</i>	Pepper tree	Small	Moderate	No	No	Not possible or worth it
47	<i>Schinus molle</i>	Pepper tree	Small	Moderate	No	No	Not possible or worth it
48	<i>Melaleuca</i>	Tea tree	Large	Good	No	No	Not possible or worth it
49	<i>Ficus microcarpa nitida</i>	Wild Fig	Medium	Moderate	No	No	Not possible or worth it
50	<i>Harpephyllum</i>	Wild Plum	Medium	Moderate	No	No	Not possible or worth it
51	<i>Schinus molle</i>	Pepper tree	Small	Poor	No	No	Not possible or worth it
52	<i>Schinus molle</i>	Pepper tree	Small	Poor	No	No	Not possible or worth it
53	<i>Melaleuca</i>	Tea tree	Large	Moderate	No	No	Not possible or worth it
54	<i>Schinus molle</i>	Pepper tree	Medium	Poor	No	No	Not possible or worth it
55	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Good	No	No	Not possible or worth it
56	<i>Melia azedarach</i>	Seringa	Small	Poor	No	No	Not possible or worth it
57	<i>Ficus microcarpa nitida</i>	Wild Fig	Medium	Good	No	No	Possible
58	<i>Schinus molle</i>	Pepper tree	Large	Moderate	No	No	Not possible or worth it
59	<i>Dais cotinifolia</i>	Pompom tree	Small	good	No	Yes	Possible
60	<i>Schinus molle</i>	Pepper tree	Large	Moderate	No	No	Not possible or worth it
61	<i>Cupressus</i>	Cypress	Medium	Good	No	No	Possible
62	<i>Celtis</i>	White Stinkwood	Medium	Good	No	Yes	Possible
63	<i>Celtis</i>	White Stinkwood	Medium	Good	No	Yes	Possible
64	<i>Kigelia africana</i>	Sausage tree	Medium	Good	No	Yes	Possible
65	<i>Ficus microcarpa nitida</i>	Wild Fig	Medium/Small	Good	No	No	Possible
66	<i>Casuarina equisetifolia</i>	Beefwood	Large	Poor	No	No	Not possible or worth it
67	<i>Schinus molle</i>	Pepper tree	Large	Poor	No	No	Not possible or worth it
68	<i>Schinus molle</i>	Pepper tree	Medium/Small	Poor	No	No	Not possible or worth it
69	<i>Schinus molle</i>	Pepper tree	Large	Poor	No	No	Not possible or worth it
70	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Good	No	No	Possible
71	<i>Ficus (not sure of species)</i>	Wild Fig	Small	Poor	No	No	Not possible or worth it

Tree No:	Botanical Name:	Common Name:	Tree Size:	General condition:	Protected:	Indigenous:	Transplantable:
72	<i>Ficus (not sure of species)</i>	Wild Fig	Small	Poor	No	No	Not possible or worth it
73	<i>Melaleuca possibly quinquenervia</i>	Paperbark	Medium	Poor	No	No	Not possible or worth it
74	<i>Schinus molle</i>	Pepper tree	Large	Poor	No	No	Not possible or worth it
75	<i>Celtis</i>	White Stinkwood	Medium	Good	No	Yes	Possible
76	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Good	No	No	Not possible or worth it
77	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Good	No	No	Not possible or worth it
78	<i>Casuarina equisetifolia</i>	Beefwood	Medium	Poor	No	No	Not possible or worth it
79	<i>Quercus ilex</i>	Holm Oak	Medium	Good	No	No	Possible
80	<i>Quercus ilex</i>	Holm Oak	Medium	Good	No	No	Possible
81	<i>Dead tree</i>	Dead tree	Small	Dead	No	No	Not possible or worth it
82	<i>Quercus ilex</i>	Holm Oak	Small	Good	No	No	Possible
83	<i>Strelitzia</i>	Wild Banana	Small	Good	No	No	Possible
84	<i>Callistemon</i>	Bottlebrush	Small	Good	No	No	Possible
85	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Good	No	No	Possible
86	<i>Ficus (not sure of species)</i>	Wild Fig	Small	Poor	No	No	Not possible or worth it
87	<i>Dead tree</i>	Dead tree	Small	Dead	No	No	Not possible or worth it
88	<i>Populus sect. Aigeiros</i>	Poplar	Medium	Poor	No	No	Not possible or worth it
89	<i>Casuarina equisetifolia</i>	Beefwood	Medium	Poor	No	No	Not possible or worth it
90	<i>Olea africana</i>	Wild Olive	Large	Good	No	Yes	Possible
91	<i>Dead tree</i>	Dead tree	Small	Dead	No	No	Not possible or worth it
92	<i>Dead tree</i>	Dead tree	Medium	Dead	No	No	Not possible or worth it
93	<i>Schinus molle</i>	Pepper tree	Medium	Poor	No	No	Not possible or worth it
94	<i>Ficus elastica</i>	Rubber tree	Medium	Poor	No	No	Not possible or worth it
95	<i>Lagunaria patersonia</i>	Pyramid tree	Medium/Small	Moderate	No	No	Possible
96	<i>Ficus microcarpa nitida</i>	Wild Fig	Medium	Good	No	No	Possible
97	<i>Melaleuca possibly quinquenervia</i>	Paperbark	Medium	Poor	No	No	Not possible or worth it
98	<i>Ficus elastica</i>	Rubber tree	Medium	Poor	No	No	Not possible or worth it
99	<i>Casuarina equisetifolia</i>	Beefwood	Large	Moderate	No	No	Not possible or worth it
100	<i>Casuarina equisetifolia</i>	Beefwood	Large	Dead/Dying	No	No	Not possible or worth it
101	<i>Schinus molle</i>	Pepper tree	Large	Moderate	No	No	Not possible or worth it
102	<i>Casuarina equisetifolia</i>	Beefwood	Large	Dead/Dying	No	No	Not possible or worth it
103	<i>Casuarina equisetifolia</i>	Beefwood	Small	Poor	No	No	Not possible or worth it
104	<i>Schinus molle</i>	Pepper tree	Medium	Moderate	No	No	Not possible or worth it
105	<i>Schinus molle</i>	Pepper tree	Medium	Moderate	No	No	Not possible or worth it
106	<i>Dead tree</i>	Dead tree	Small	Dead	No	No	Not possible or worth it
107	<i>Casuarina equisetifolia</i>	Beefwood	Large	Moderate	No	No	Not possible or worth it
108	<i>Casuarina equisetifolia</i>	Beefwood	Medium	Poor	No	No	Not possible or worth it
109	<i>Ficus elastica</i>	Rubber tree	Medium	Moderate	No	No	Possible
110	<i>Ficus elastica</i>	Rubber tree	Large	Moderate	No	No	Possible
111	<i>Ficus elastica</i>	Rubber tree	Medium	Moderate	No	No	Possible
112	<i>Ficus elastica</i>	Rubber tree	Large	Moderate	No	No	Possible
113	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Moderate	No	No	Possible
114	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Moderate	No	No	Possible

Tree No:	Botanical Name:	Common Name:	Tree Size:	General condition:	Protected:	Indigenous:	Transplantable:
115	<i>Ficus elastica</i>	Rubber tree	Medium/Small	Moderate	No	No	Possible
116	<i>Ficus elastica</i>	Rubber tree	Medium	Poor	No	No	Not possible or worth it
117	<i>Ficus elastica</i>	Rubber tree	Large	Poor	No	No	Not possible or worth it
118	<i>Ficus elastica</i>	Rubber tree	Medium	Poor	No	No	Not possible or worth it
119	<i>Agonis flexuosa</i>	Willow Myrtle/Peppermint	Medium	Poor	No	No	Not possible or worth it
120	<i>Syzygium</i>	Eugenia	Medium	Good	No	No	Possible
121	<i>Ficus elastica</i>	Rubber tree	Medium	Moderate	No	No	Possible
122	<i>Ficus elastica</i>	Rubber tree	Medium	Moderate	No	No	Possible
123	<i>Lagunaria patersonia</i>	Pyramid tree	Medium	Moderate	No	No	Possible
124	<i>Ceratonia siliqua</i>	Carob	Medium	Good	No	No	Possible
125	<i>Lagunaria patersonia</i>	Pyramid tree	Large	Poor	No	No	Not possible or worth it
126	<i>Ficus elastica</i>	Rubber tree	Large	Good	No	No	Possible
127	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Good	No	No	Possible
128	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Good	No	No	Possible
129	<i>Celtis</i>	White Stinkwood	Large	Poor	No	Yes	Not possible or worth it
130	<i>Ficus elastica</i>	Rubber tree	Medium	Moderate	No	No	Possible
131	<i>Ficus elastica</i>	Rubber tree	Large	Moderate	No	No	Possible
132	<i>Casuarina equisetifolia</i>	Beefwood	Medium/Small	Poor	No	No	Not possible or worth it
133	<i>Ficus elastica</i>	Rubber tree	Medium	Moderate	No	No	Possible
134	<i>Ficus elastica</i>	Rubber tree	Medium	Moderate	No	No	Possible
135	<i>Ficus elastica</i>	Rubber tree	Large	Moderate	No	No	Possible
136	<i>Ficus elastica</i>	Rubber tree	Large	Moderate	No	No	Possible
137	<i>Populus sect. Aigeiros</i>	Poplar	Large	Good	No	No	Not possible or worth it
138	<i>Dais cotinifolia</i>	Pompom tree	Medium	Moderate	No	Yes	Possible
139	<i>Ficus elastica</i>	Rubber tree	Medium	Moderate	No	No	Possible
140	<i>Ficus elastica</i>	Rubber tree	Medium	Moderate	No	No	Possible
141	<i>Ficus elastica</i>	Rubber tree	Small	Moderate	No	No	Possible
142	<i>Washingtonia</i>	Bearded Palm	Large	Good	No	No	Possible
143	<i>Meterosideros</i>	New Zealand Xmas tree	Small	Good	No	No	Possible
144	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Good	No	No	Possible
145	<i>Erythrina</i>	Coral tree	Large	Good	No	No	Possible
146	<i>Ficus microcarpa nitida</i>	Wild Fig	Large	Good	No	No	Possible
147	Mixed hedge, mainly <i>Brachylaena</i> & <i>Hibiscus</i>	Coastal Silver Oak and Hibiscus mix	Medium	Good	No	No	Possible
148	<i>Ficus rubiginosa</i>	Port Jackson Fig	Large	Good	No	No	Possible
149	<i>Washingtonia</i>	Bearded Palm	Large	Good	No	No	Possible

ANNEXURE 8

Archaeology Report – ACO Associates cc (May 2014)



DESKTOP ARCHAEOLOGICAL ASSESSMENT OF THE PROPOSED FOUNDERS GARDEN DEVELOPMENT ON ERF 186 ROGGEBAAI, CAPE TOWN FORESHORE

Prepared for

Urban Design Services cc

May 2014



ACO Associates cc
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EXECUTIVE SUMMARY

The proposed Founders Garden development on Erf 186 Roggebaai has been examined to assess the risk of impacting heritage in the course of construction and for planning/design purposes.

We have concluded that prior to the land reclamation of the late 1930's, the land would have been located offshore in approximately 2.25 - 2.5 Fathoms of water (4.1 - 4.5 meters), in the region of the old anchorage area in Table Bay.

Information on shipwreck locations in the Bay indicate that the greatest number of recorded cases were as the result of fierce north westerly gales driving ships onto the old shorelines between Milnerton Lagoon and the Castle. Few vessels are recorded as having sunk at anchor.

The changes over time to the bay's shoreline due to reclamation was driven largely by the need for additional land in order to facilitate the expansion of the town, and to provide better harbour facilities. Neither of the two main old shorelines that were created over the years are impacted by the current development proposals.

Only one "in situ" vessel has been recorded below landfill on the foreshore. Found in 1971 during the construction of the Civic Centre, it is believed to be the remains of a Dutch vessel, the *Nieuwe Rhoon*.

Minor anchorage debris dating primarily to the 19th Century have been located at other foreshore construction sites, but we have noted speculation that dredging may have taken place at some point in time when that part of the bay still functioned as the anchorage, and that may have diminished the likelihood of much material being found.

The old Municipal Pier erected in 1913 has been plotted on current planning documents and any remains of that structure will not be impacted by this development.

No harbour works are known to have existed below or in the vicinity of any of the proposed development areas.

Based on the available information and experience gained from a number of risk assessment reports (Halkett 2006, 2009, 2012, Hart 1998, 2002, 2003) and monitoring of bulk earthworks at the CTICC 1 site (Halkett 2002), and more recently monitoring of bulk excavations on Erf 247 (The new Chris Barnard Hospital site) (Seeman 2013a,b,c) we believe that the likelihood of finding significant heritage sites below the proposed development sites is low. We cannot entirely dismiss the possibility of unknown wrecks occurring below the development site, but the available evidence suggests this will not be the case. It is however possible that decontextualised anchorage debris will be found but should not provide serious mitigation issues. We must stress however, that should a shipwreck be found that is *in situ*, it will be of considerable interest to the scientific community and would require mitigation. Certain vessels are however likely to be of more interest than others.

A plan of action must be drawn up by the appointed archaeological consultant in the event of finding significant heritage in the landfill or on the old seabed.

Permits will be required from both HWC and SAHRA in order to mitigate *ad hoc* ship material during the course of monitoring the bulk earthworks at the respective sites. Guidance is required from the authorities with regard to the issuing of, and number of permits required.

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1. INTRODUCTION

This study is a Desktop Archaeological Impact Assessment of the proposed Founders Garden development on Erf 186 Roggebaai on the Cape Town Foreshore and it will be included as a component of the HIA being prepared by Urban Design Services cc. The position of the property is shown on Figure 1. This is a modified version of the report submitted for development of the CTICC2 site (Halkett 2012) due to the fact that the background historical data remains largely the same.

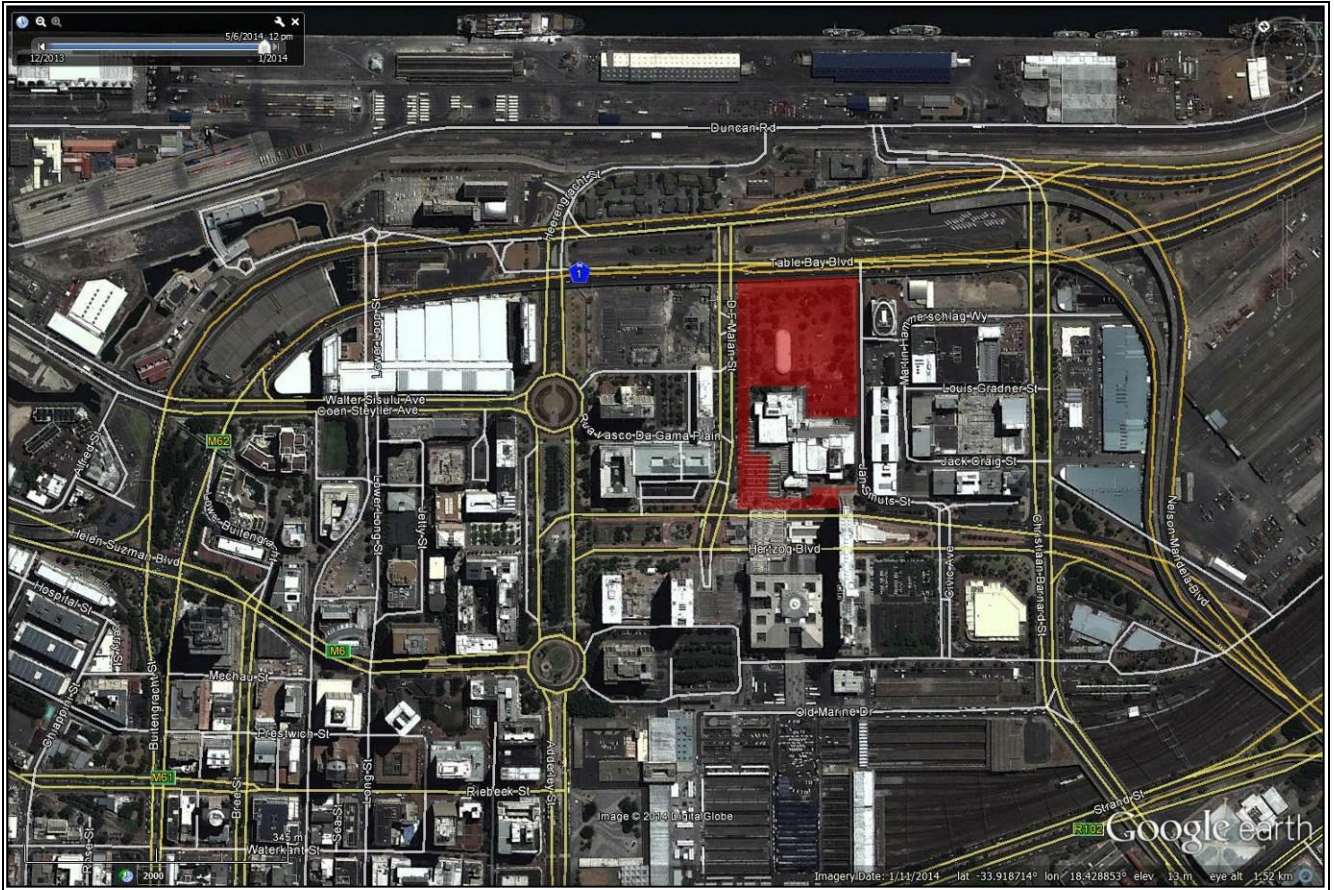


Figure 1: The location of the proposed Founders Garden development on Erf 186 Roggebaai.

1.1 Proposed development details

The proposal consists of Erf 186 Cape Town and also affects Erf 187 (Artscape). Erf 186 was zoned for Government Use in terms of the 2012 Zoning Scheme and a combination of Public Open Space and Community Facility in terms of the 2013 Zoning Scheme. The proposal is informed by an intention to extend the Artscape Cultural Precinct into the Founder's Garden area by the use of 25% of the site for outdoor recreation purposes, achieve long term income generation through commercial development opportunities and to link the extend Cultural Precinct to the City.

In April 2013, the Provincial Parliament granted permission for the rezoning of the site (Erf 186) for mixed use including residential use provided that 25 % of the site is retained for Public Open Space Purposes.

The current proposal is intended to kick-start the vision of the site. It consists of a 1500 vehicle underground car park and the expansion of the Artscape Complex to Erf 186. The Artscape precinct will therefore straddle both erven. This proposal will be fully realised in a precinct plan for Erven 186 and 187 and will encompass both sites. The proposed plans in addition to the current Artscape theatre complex will include space for the Zip Zap Circus, a ground floor retail component, office accommodation and a 110-room hotel.

This implication in terms of this Precinct Plan is that the Founder's Garden as a spatially defined component of the 1947 Foreshore plan will be substantially altered and reduced - particularly at the peripheries. Twenty-five percent however will remain as open space as required in terms of the Provincial decision (Attwell 2013).

1.2 The relevance of an archaeological impact assessment

As the entire project is located on land reclaimed from the sea, there is clearly a risk of encountering maritime remains resting on the old seabed in the course of the project,.

Since completion of the land reclamation, and despite the grand plans proposed in the 1940's, the foreshore in general and Erf 186 in particular, has remained mostly undeveloped. Narrow portions of Erf 186 almost encircle the Artscape Theatre (Erf 187) in the south west.

In recent years, several projects have been proposed on, and in the vicinity of the foreshore. Some have remained as proposals but others have been carried through to completion, of which some examples include the existing CTICC1 and adjacent hotel (Halkett 2002), the Roggebaai Canal project (Hart 2003, Cox 2003, Sharfman & Mavrodinov 2003), and though not directly in the proposed area, the remodelling of the Clock Tower Precinct at the V&A Waterfront (Schietecatte, in prep). At present, bulk earthworks are being undertaken on Erf 247 for the erection of the new Chris Barnard Hospital Seeman 2013a,b,c). While some of these developments hardly penetrate the substrate, except where foundations are required, the more substantial projects have penetrated deep into the reclaimed land, through the old seabed and into the underlying bedrock in order to provide solid foundations and often basement parking facilities.

As the greater part of the foreshore only came into existence sometime between 1938 and 1943¹, when the work on the new harbour and adjacent land reclamation was undertaken, one would expect the task of assessing potential archaeological risks/impacts to be relatively straightforward compared to sites of the inner city. While this is true to some extent, development sites on the foreshore present a set of problems that is unique to that area. It is particularly the case with the deep excavations where the possibility exists of encountering the physical traces of the towns' maritime past, trapped on the old seabed, or within the landfill material itself, some of which was derived from dredging from what used to be the middle of the bay, or within random landfill which certainly found its way onto the site.

The involvement of heritage specialists in all of the more recent larger projects where the potential to impact the maritime heritage has been identified, has meant that a substantial amount of data dealing with the heritage resources of the foreshore has been assembled. A number of earlier projects, where no formal heritage process was followed in some cases alert us to the potential for buried heritage material e.g. the shipwreck found during the building of the Civic Centre (Lightley 1976).

In compiling this desktop study, we have relied heavily on the secondary sources of archival data that have been presented in some of the abovementioned specialist reports, as well as using some of the accessible primary sources. The range of buried heritage resources varies depending on the location on the foreshore. As will be seen, the old shorelines are particularly sensitive as it was in these zones where the majority of shipwrecks came to rest. A major omission from the historical record as far as wrecks are concerned, is the complete lack of precise geographical co-ordinates for the locations. This fact bedevils any study that tries to precisely analyse the probabilities of encountering wreck material below the landfill.

Although the idea of land reclamation was first mooted as far back as the 18th century, the logistics required for large scale reclamation was only really available for the first time at the end of 19th century. As a result, two old shorelines (c1870 and c1920) now lie buried below sections of the town. The 1870 shoreline was very likely not quite the same as the one encountered by the initial European

¹Cape Town Foreshore Plan: Final report, June 1947. Cape Town Foreshore Joint Technical Committee. Presented to the Minister of Transport :10

settlers. The changes were probably small scale and localised associated primarily with the building of jetties, but also with localised waste disposal onto the beach. In addition to the artificial reclamation processes, attempts to provide safe anchorage in Table Bay through the construction of jetties, harbour facilities and wave barriers over many years, meant that the normal cycle of marine erosion and deposition of sand within the bay and along the shore was disrupted and led to both natural progression and regression of the shoreline over the years, a process which is still in progress today.

As the development proposal for Erf 186 includes the likely provision of multiple levels of basement parking, assessment will examine the likelihood of encountering structures, shipwrecks, or associated material on the sites during bulk excavations.

ACO Associates cc, in having been appointed for this task, and mindful of the general foreshore history, agreed on the following:

- Undertake a desktop review of available historical data pertaining to the site;
- Analyse the available data where possible, for the purposes of assessing potentially significant issues that may have impact on design and or construction.

2. HISTORICAL BACKGROUND

As alluded to in the introduction, the Cape Town foreshore presents a unique situation as far as heritage is concerned. Two of the major influences on the city, namely town expansion and maritime history come together at this point. When the Dutch East India Company (VOC) established the small ship refreshment station at the foot of Table Mountain in the 17th century, the officials could never have imagined the way in which the small settlement would develop into the city today. The founding of Cape Town is therefore inextricably linked to maritime trade, and the need to ensure safe moorings in a bay that by all accounts, was frequently not a safe place for a sailing vessel, or even more modern vessels for that matter.

The increasing size of the settlement was paralleled by the increase in trade and numbers of ships visiting the bay. The importance of the trade meant that harbour facilities and attempts to reduce wave action at the anchorage points have always assumed an important part in the city's civil works program. The increasing population and expansion of the town inevitably meant that more and more land was required for housing as well as commercial and industrial development. The geographical constraints of the city bowl meant that expansion possibilities were limited and notwithstanding the extension towards the southern and northern suburbs, it was inevitable that the long mooted land reclamation would become a reality.

Land reclamation was nevertheless primarily motivated by the need for larger and deeper harbour facilities. These had to be upgraded from time to time to keep pace with the increasing size and types of ships that were plying trade to our shores. It must also be noted that the early harbour works, while they certainly provided safer moorings, led to changes in the way sand movement took place in the bay. Increasing erosion took place on the eastern coastline in the second half of the 19th century and some attempts to curtail loss of land in that area led to the construction of sea walls behind which some of the earliest land reclamation took place.

The themes developed in the above paragraphs form the core of any discussion of the foreshore, and we will look at these in more detail in following sections.

2.1 Shipping in Table Bay

It is perhaps fitting that in 1647 during an assessment of the African coastline for a suitable location for a refreshment station, the VOC ship Haerlem was driven ashore by a strong wind while entering what would later be known as Table Bay. The 62 survivors established a camp in the dunes near Bloubergstrand and they remained there for a year while arrangements were made for their return to Holland. The enforced stay gave these men plenty of opportunity for exploration and on their return to

the Netherlands, they were able to give favourable reports to the VOC who chose Cape Town as the location for the replenishment station (Mavradinov 1999, Werz 2003)

While this was amongst the first reported ship wrecks in the bay, it was certainly not the last, and over the ensuing years some 360 ships (excluding for the most part the numerous small vessels that did not warrant any mention) are recorded as having been wrecked in and around Table Bay and Robben Island (Werz 2003).

A combination of geographical factors and weather have to a large degree influenced how the bay was used by visiting ships. It has also influenced the development of wharfage and harbour facilities in tandem with the need to service the ever increasing number and size of ships over the years. Harbour facilities have also had to keep pace with changes propulsion systems and increasing cargo size and type. All these factors together have determined where shipwrecks are located.

2.1.1 The SAHRA shipwreck database

A database of all shipwrecks around the South African coast is maintained by The South African Heritage Resources Agency (SAHRA). The information in the database is basic, and summarises information from archival and other sources about the locations of shipwrecks. We will discuss the both the limitations and benefits of the information in terms of the applicability to risk analyses of building projects on the foreshore.

2.1.2 Wreck locations

One of the major influences of wreck positions was the position of the popular (safe) anchorage area in Table Bay as it was used up to the end of the 19th century. A number of paintings, drawings and photographs show the anchorage tucked into the bay along its south western shoreline between the Castle and Chavonnes Battery, a position that meant that the beaches between the Castle and Milnerton Lagoon would be in direct line of prevailing wind (Plates 1 and 2).

Prior to the advent of self powered ships, it was the wind that took a heavy toll on the vessels, causing them to drag, or to loose anchor altogether and be blown with the prevailing wind and waves onto shore (the north-westerly's of winter were most serious as shallow water of the eastern shores of the bay was soon reached) (Burman 1976).

It is of interest to note that no ship is reported as having been lost while at anchor. This fact has obvious significance when looking at current planning and impact assessment as it means that the greatest likelihood of encountering shipwrecks is on the old shorelines, or in what was shallow waters very close to them (see Plates 3 and 4).

Locations of wrecks are of primary interest to us in establishing risk. As geo-referenced locations were seldom (if ever) recorded, the effectiveness of the database for impact assessment is somewhat reduced. If one takes the overall statistical pattern (based on 300 ships – Appendix 1) of the broad shipwrecks locations, we can see however that there are certain areas of the bay where stricken vessels were more likely to end up, if they did not immediately sink in the bay. This data is summarised in Table 1.

Table 1: Analysis of wreck locations in the SAHRA database (known locations) 1610 - 2006.

Zone	No
Blaauwbergstrand	1
Anchorage Table Bay	1
Wharf near Table Bay	1
Breakwater Table Bay	1
Pier	1
Rogge Bay	1
Bok Point	2
Green Point	2

Milnerton Beach	2
Oude Schip	2
Amsterdam Battery	3
Mouille Point	4
Castle & Salt River (between)	7
Harbour	8
Castle	10
Salt River/Salt River Beach	51
Woodstock Beach	88
Table Bay	96
Possibly Table Bay??	19
TOTAL	300

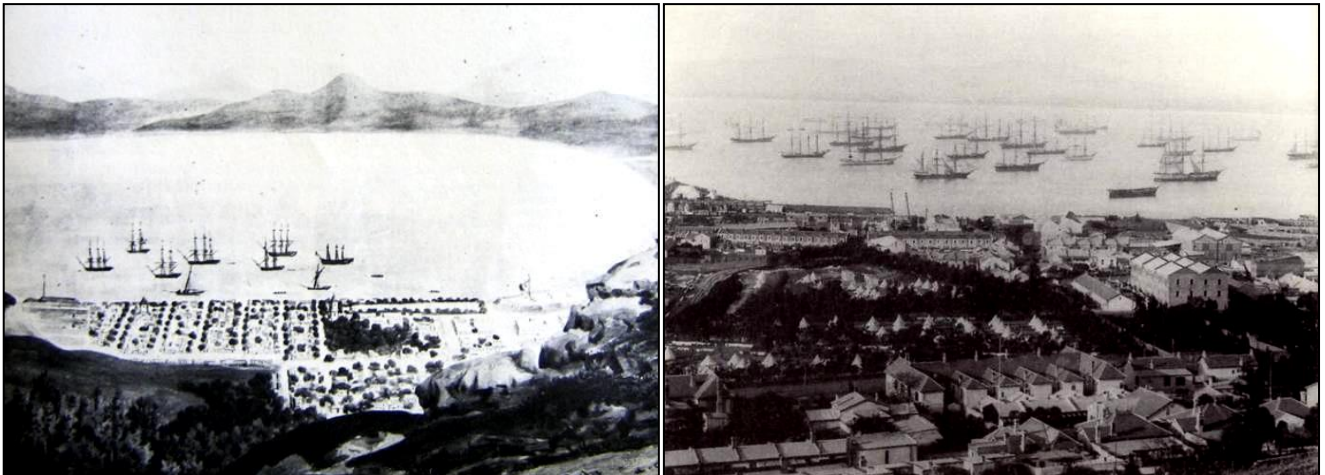


Plate 1: Sailing vessels at anchor in Table Bay, their direction presumably a prevailing north westerly wind (in Burman 1976). **Plate 2:** The popular anchorage as late as the end of the 19th century was tucked into the bay along the south western shoreline. The Anglo Boer War saw a dramatic increase of ships visiting Table Bay (CA J6085).



Plate 3: Ships stranded during the “great gale”. Watercolour by Otto Landsberg (in Veitch 1994). **Plate 4:** The remains of ships on Woodstock Beach. Probably a common sight at certain times of the year.

For various reasons, the positions of a few ships (particularly VOC vessels) are known. They may however be jealously guarded for salvage purposes, or protection by the authorities, and the locations remain unavailable to the broader public. The positions of three Dutch vessels namely the Oosterland and Waddinxveen lie off Milnerton Lagoon (Werz 2003), while a ship presumed to be the Nieuwe Rhoon was found during the bulk excavations for the Civic Centre in 1971 (Lightley 1976). All of these vessels appear to have foundered in the shallower water closer to shore. More recently, the partial remains of a sailing vessel was found during bulk excavations at the Silo 1 site at the V&A Waterfront

(Schietecatte et al, in prep). At this point in time it is not possible to offer more information about the identity, other than it was a wind powered vessel and it too lay on the old shoreline.

Almost one third of described locations in the database are very general (e.g. “Table Bay” and “Possibly Table Bay”). Mavradinov (pers com) has suggested that the unprovenanced wrecks could probably be assigned proportionately to the areas of the coast where most of the others occurred. While that may be the case, it prevents heritage practitioners making fully informed predictions with respect to risks of finding such resources during the course of building projects on reclaimed land.

In preparing the Strategic Environmental Assessment for the port of Cape Town and expansion of the container terminal stacking area, Werz (2003), using a slightly broader definition of Table Bay (to include Robben Island and vicinity) produced an analysis of wreck statistics based on nationality. While it does not assist with wreck locations *per se*, it may nevertheless be of interest from the point of view of international trade over the centuries. Some of this information is presented in Table 2.

Table 2: Recorded shipwrecks in Table Bay for the period 1610-1998 classified according to nationality

<u>Nationalities</u>	<u>Wrecks</u>	<u>Nationalities</u>	<u>Wrecks</u>
British	146	Taiwanese	2
Dutch	50	Austrian	1
American	25	Canadian	1
French	16	Greek	1
German	8	Irish	1
Portuguese	8	Korean	1
Danish	5	Russian	1
Italian	4	Sardinian	1
Swedish	3	South African	1
Norwegian	2	Uruguayan	1
Spanish	2	Nationality not specified	80
TOTAL VESSELS – 360			

2.1.3 Ship types

Out of the 27 different vessel types listed in Table 3, the ratio between wrecked sailing vessels and engine-driven vessels is approximately eight to one. Werz (2003:19) suggests that the data indicates to a certain extent that many shipping disasters in Table Bay are likely to be due to natural conditions and the level of available technology rather than human error. This is to some extent borne out by the wreck statistics in Table 4, which indicate ship losses broken down into 50 year periods.

Table 3: Recorded shipwrecks in Table Bay for the period 1610-1998 classified according to vessel types

<u>Vessel types</u>	<u>Wrecks</u>	<u>Vessel types</u>	<u>Wrecks</u>
Wooden sailing ship	110	Iron sail-steam ship	2
Barque (sailing ship)	72	Whaler (steam ship)	1
Brig (sailing ship)	42	Trawler (steam ship)	1
Schooner (sailing ship)	28	Mail steamer	2
Packet (sailing ship)	1	Motor coaster (engine driven)	1
Pinnace (sailing ship)	1	Salvage vessel (engine driven)	1
Brigantine (sailing ship)	8	Tuna catcher (engine driven)	1
Snow (sailing ship)	5	Trawler (engine driven)	2
Cutter (sailing ship)	5	Cargo boat (engine driven)	1
Whaler (sailing ship)	3	Carrier (engine driven)	1
Flute (sailing ship)	2	Fishing vessel (engine driven)	1
Corvette (sailing ship)	1	Motor vessel	10
Steamship	9	Troopship	1
Tug (steam ship)	1	Type not specified	47
TOTAL VESSELS – 360			

Table 4: Ship losses in the broader Table Bay area broken down into 50 year periods

Period	Total
1900 - 1941	19
1850 - 1899	92
1800 - 1849	120
1750 - 1799	25
1700 - 1749	26
1650 - 1699	8
1600 - 1650	2
unknown	2
TOTAL	294

Of the sailing ships category, which includes Dutch East Indiamen, merchant ships and men-of-war of other nations which are not further specified, most foundered in the period 1610 - 1850. Specific vessel types, such as the barque, brig and schooner only started appearing during the beginning of the nineteenth century. These types, although they were the most extensively used during the nineteenth century, had lost their significance before the start of the new century. From 1850 - 1860 onwards, sailing vessels were slowly replaced by steam ships as the most widely used means of water transport. The first maritime incidents involving steam ships was recorded in the period 1860 - 1869 but from then onwards, more of these vessels seem to have foundered in Table Bay than sailing ships.

2.1.4 The need for better harbour facilities

From 1840 to 1870, the number of maritime incidents in the bay reached its peak, resulting in 134 shipwrecks. This can partly be explained by increasing shipping traffic, the inadequate harbour facilities before 1870, and largely to the great gales of 1842 and 1865 (Durden 1992:31, 63-66 and also see Plates 5 and 6). Burman (1976) describes additional severe storms on 4th – 6th May 1692, 24th May 1697, 16th – 17th June 1722 (with more than 600 lives lost), 1st – 4th July 1728 and 21st May 1737 (with 205 lives lost).

Ship losses were so bad that in 1741 that the Council of Seventeen of the VOC made a rule that in the winter months between 15th May and 15th August, company ships would have to shelter in Simons Bay. In 1743 it was decided to build a mole extending out into the sea from the foot of 'the Lion's tail' (Signal Hill). Work progressed sporadically due to labour issues and the poor winter weather until 1746 when the project was abandoned (Halkett 1993, Murray 1964:5). Ship losses continued to mount into the 19th century until finally, as a result of the carnage, harbour construction eventually began on the 17th September 1860 with Prince Alfred tipping the first load of stones for the new breakwater into the sea (Burman 1976).

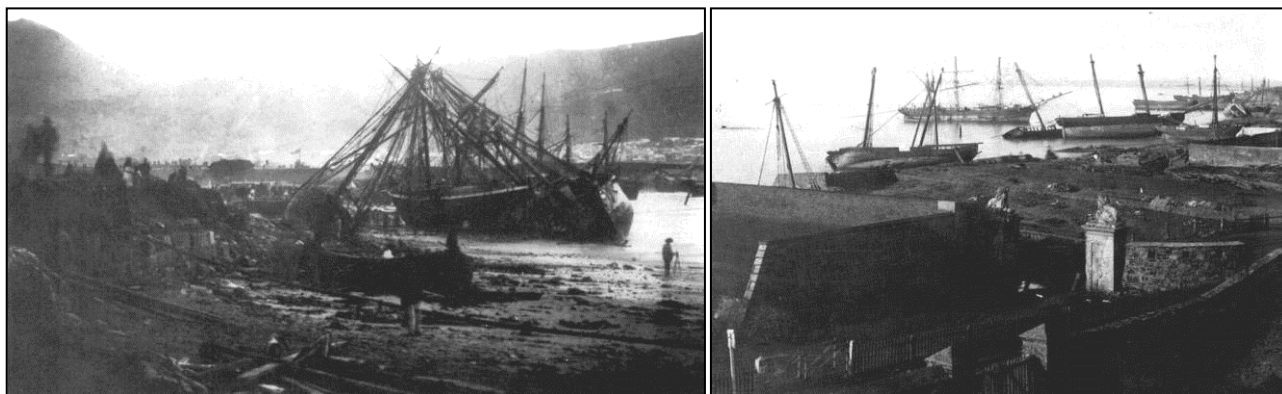


Plate 5: The aftermath of the "great gale" of 1865 (CA E3411 in Veitch 1994). **Plate 6:** Vessels stranded on the beach alongside the Imhoff Battery viewed from the Castle (CA E8007 in Newall 1993)

It is worth noting that the first lighthouse in the area (that continues to be used today) was constructed at Green Point in 1824. Despite the erection of that facility, ships continued to be wrecked at the entrance to Table Bay. The Port Captain, a Mr Bance, recommended that an additional light be placed at Mouille Point to provide additional guidance to ships. The lighthouse was completed on the 1st July 1842. This failed to help as it appears its position was wrong. A new light was built in 1865 only a few meters away from the old (Halkett 2004:6)

2.1.5 Land reclamation, harbour facilities and associated structures

The tipping of gravel for the breakwater marked the beginning of the large civil works programs to improve mooring and harbour facilities in an attempt to cut the loss of ships during the winter storms. Over the years a number of jetties had been constructed at strategic places along the shoreline to provide loading and offloading facilities for visiting ships. A number of those are shown and identified on Figure 2.

It was noticed that up to about 800 feet offshore of the southern and eastern beaches of the bay, the water was only some 5 to 6 feet deep (Figure 3).

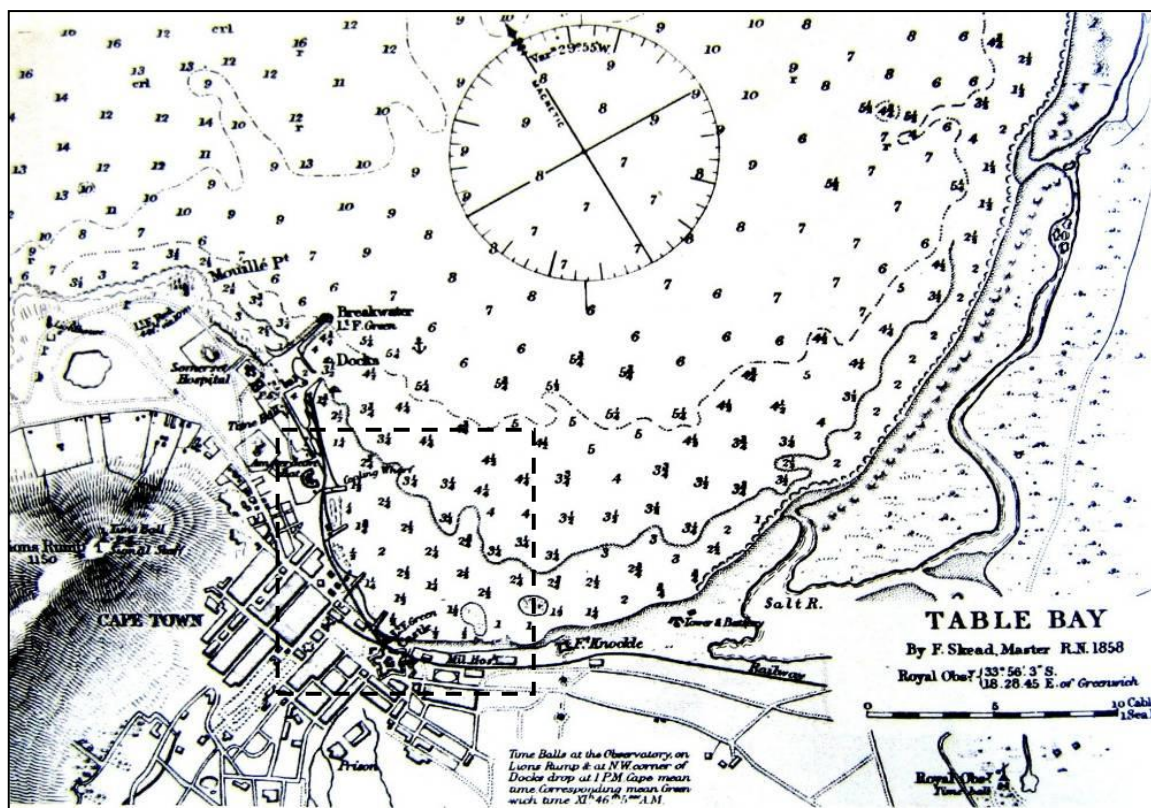


Figure 3: The bathymetry of Table Bay in 1858, as surveyed by F. Skead R.N. The area defined by the hatched polygon is shown in Figure 8 with relevance to the proposed development site

Since this was mostly too shallow to allow for the passage of larger shipping, it was considered sensible to reclaim the area and use it for the expansion of the growing city² as well as placing harbour facilities closer to deeper water. Ever since the earliest harbour construction, rocks from local quarries, and sand dredged from the harbour works were used in the land fill³. During the 1870's, an embankment was built on the south-eastern shore of Table Bay to prevent wave erosion of the beach and by 1875, 16,500 cubic yards of excavated material had been brought from the new graving dock site and dumped between the Central Wharf and the Castle (Figures 4,5 & 6). In the process, the

² Cape Archives, CCP 1/2/2/1/7, A4, 1860. In Durden, 1992

³ Cape Archives, CCP 1/2/1/2:347, 1855. In Durden, 1992



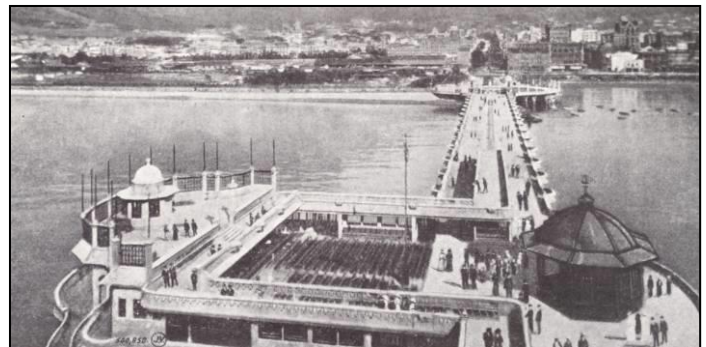
Figure 2: Table Bay harbour - historical development 1870-1985 (based on: South African Transport Services Drawing TBH 106 (1985): A-374). Proposed development site shown in red. The area between the 1920 shoreline and the existing harbour was reclaimed between 1938 and 1943. Comparison with the 1926 aerial photo in Figure 7 shows that the information with regards to the 1920 shoreline omits certain features such as the Rogge Bay fishing “harbour”.

embankment was extended seawards and five acres of reclaimed land was created.⁴

By 1884 land reclamation was a well established process and vegetation was planted to help stabilise the newly reclaimed areas. It was anticipated that this would speed up the period of stabilization and allow development to occur earlier⁵. In the 1890's, a sea wall was constructed at the edge of the newly reclaimed land which ran from the North Wharf to Rogge Bay (Figure 4). This area became known as 'Combrink's Concession' and eventually became the site of the Imperial Cold Storage building at the foot of Bree Street (Sharfman 2003:20).

In 1913, the Cape Town Municipality built a public pier (Plates 7 - 10) at the foot of Adderley Street at the western end of the promenade. This may in part have been motivated by the desire to replace the old Central Wharf⁶ (Plate 11) which was by now almost completely buried by reclamation. Part of this old wharf and the associated earthworks is likely to have been what was excavated by archaeologists during the recent upgrade of facilities adjacent to Adderley Street at the Cape Town Station (Halkett 2010).

The Pier extended some 300 meters out into the bay and incorporated a tower, concert pavilion, restaurant, and swimming and boating facilities. It brought the townspeople to the sea and was a very popular outing for many Capetonians. It was however never a financial success despite its popularity and the demands of harbour expansion saw the last concert held on the Pier on 27 March 1938, after which it was demolished to just above the high-water mark and the remains were buried in the fill (de Kock 1999, Sharfman 2003:21).



Plates 7 & 8: The 1913 Municipal Pier at the foot of Adderley Street. The random block mole can be seen at left (both in Newal 1993, SA Library and Newal's collection)

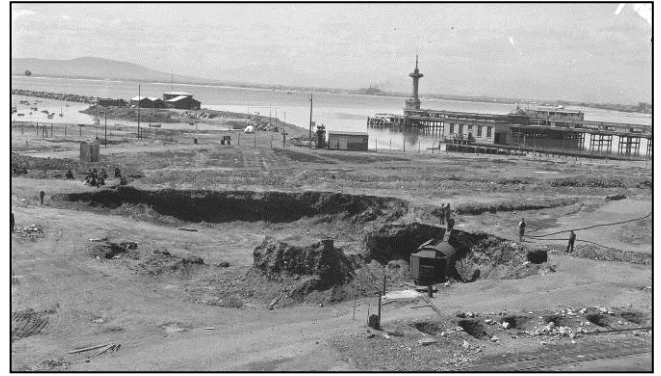
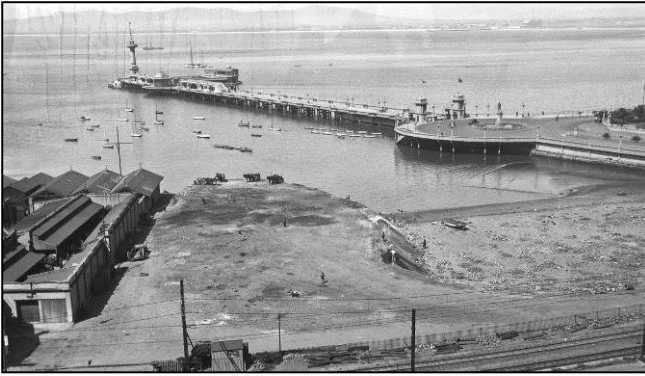


Plates 8a & b: The Pier was a popular social gathering place and concert venue. The panorama at right captures the changing coastline and cityscape.

⁴ Cape Archives, CCP 1/2/1/30, G50, 1876. In Durden, 1992

⁵ Cape Archives, CCP, 1/2/1/66, G40, 1885. In Durden, 1992

⁶ Cape Archives, CCP, 1/2/1/98, G56, 1896. In Durden, 1992



Plates 9 and 10: The 1913 Municipal Pier seen alongside the Roggebaai fishing harbour which was still in use at this time. Of interest is the horse drawn carts in the photograph at left apparently dumping material at the end of the berm (City of Cape Town: Heritage Branch CCb120_f17_i01, CCb119_f17_i01).

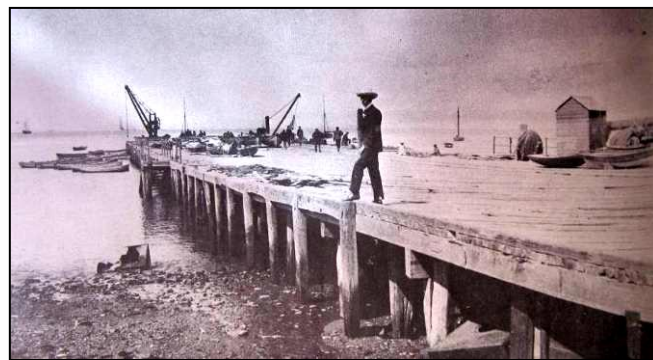


Plate 11: Photograph of the wooden jetty (Central jetty) at the end of Adderley Street c1902 (Picard 1969:118). The central jetty was constructed in the 1850's and became the central hub of harbour activities. In 1907 the jetty was extended to create a central pier and promenade. The pier was demolished in 1938 to make way for the Foreshore Reclamation Scheme (Patrick et al 2010).

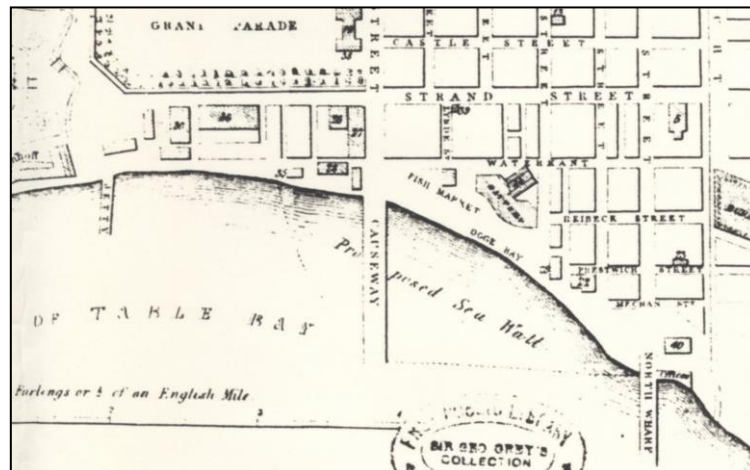


Figure 4: Map of Cape Town c1859 (provenance unknown), showing the proposed causeway and north wharf. The proposed sea wall extends from a (central) causeway to the base of the north wharf. In actual fact it appears from later maps to have been less formal than depicted here, and a small boat harbour was created in front of the fish market at Roggebaai (see Figure 7 this document).

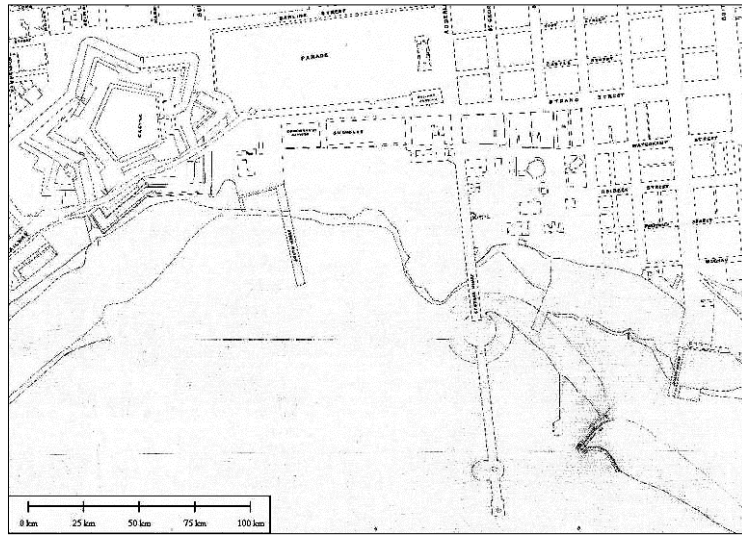


Figure 5: Detailed overlay showing c1862 and 1938 shorelines showing the proposed location of the new pier at the end of Adderley street, and the location of the old Central jetty. The earlier landfill between the Castle and Central Wharf is prominent and the later fill and sea wall (promenade) show as a faint line. (ACO map collection).

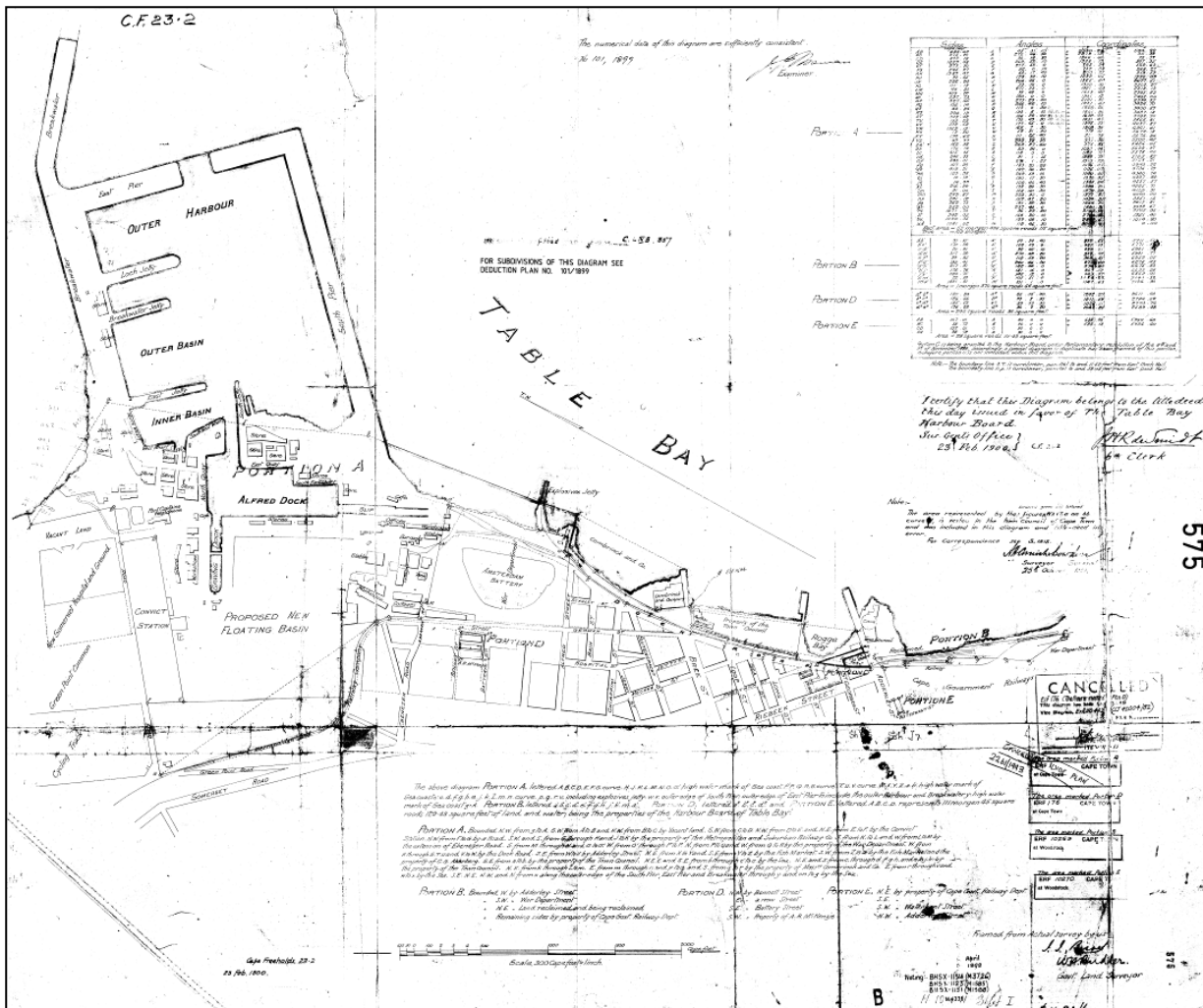


Figure 6: Survey diagram 101/1899 showing late 19th century expansion and development of the Table Bay harbour. Infilled areas between the North Wharf and Rogge Bay can be seen. Many of the maps showing the old shoreline differ in minor details with respect to the extent of landfills suggesting it was an ever changing landscape.

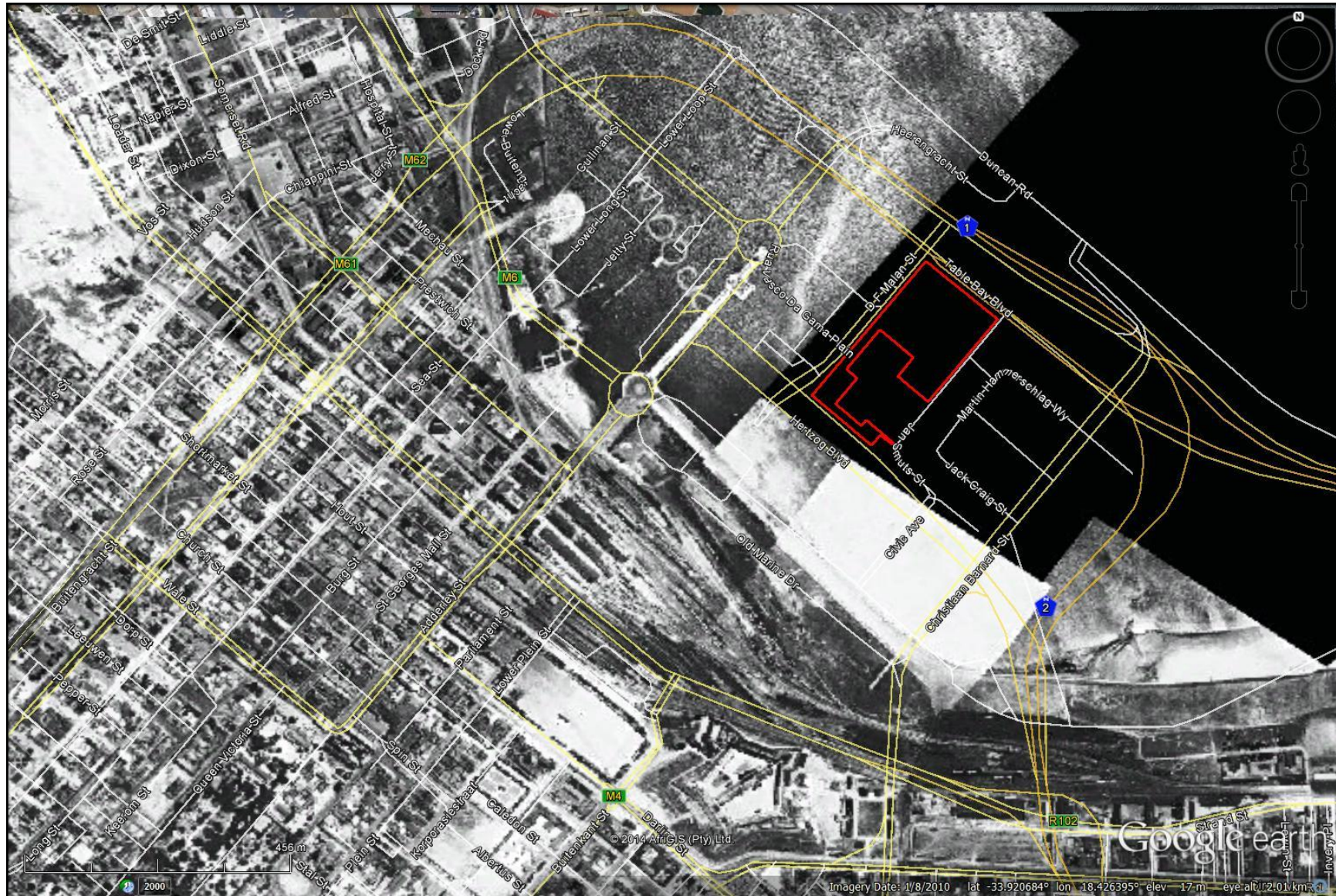


Figure 7: An extract from the 1926 aerial photo of Cape Town showing the 1913 pier (source: Jordan 2003) with current street map superimposed via Google Earth. The old Roggebaai fishing boat harbour and beach clearly visible at center. The old promenade running south east from the base of the new pier at the foot of Adderley Street. The position of Erf 186 offshore at that time is indicated by the red polygon.

From 1926 to 1932, as a result of the need for docking space for more and larger ships, a mole (the so-called “random block mole”) was constructed just northwest of the municipal pier to form a large sheltered basin. It extended in a north-easterly direction before angling to the north-west towards the end of the Victoria Basin (Spies & Du Plessis 1976, quoted in Durden 1992. See Plate 12 & 13 and Figure 2).

The mole was originally built by first dumping rubble on the seabed and then placing large six-ton concrete “wave-breakers” on top. When dismantled, the wave-breakers were removed by a crane equipped with a grab-claw and were subsequently stacked ashore (although some were found during the construction of the CTICC 1). The Municipal Pier was demolished to just above the high-water mark and the remains were buried in the fill (de Kock 1999).



Plate 12: The new southern basin in 1934 with the random block mole at right (in Newall 1993)

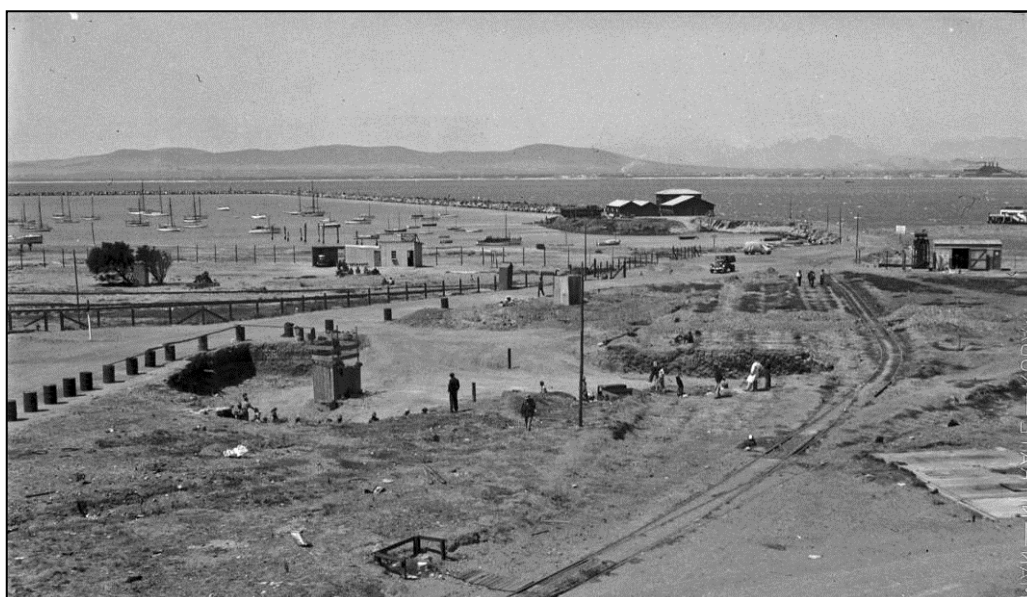


Plate 13: The Random Block Mole shown beyond an area of landfill (City of Cape Town: Heritage Branch CCb119_f45_i01)

It was soon realised that the design was flawed and liners were not properly sheltered from the strong south-easterly winds. This led in part to the announcement in 1935 by the Railways and Harbours Administration that the old mole and pier would be removed and a new dock (the Duncan Dock) would be built. Reclamation was due to add in the order of 480 acres and the dock area and 196 acres to the city (Cape Town Foreshore Plan, 1948). The new basin was to be sited some distance out in the bay and approximately 2 million m² of land needed to be reclaimed to make it accessible.

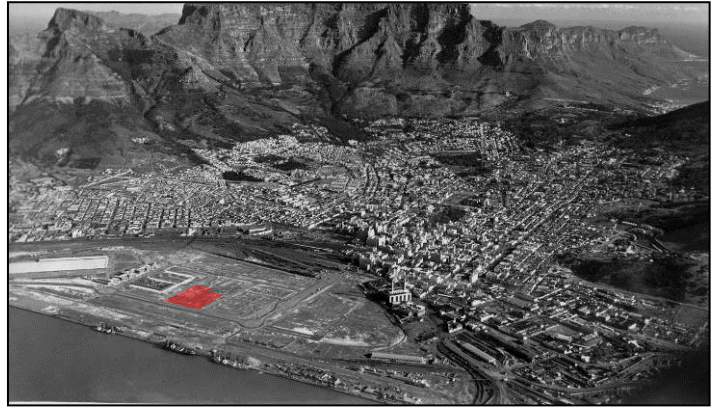
Dredging began on 10 May 1935 and, although scheduled to be completed by 1941, intervention of the war meant that final completion was delayed until 1945. Despite this the harbour was in use as early as 1943 (Plate 14).

The contract for the dredging and land reclamation was awarded to the Dutch firm Hollandse Aanneming Maatskappy. The material for this massive landfill operation was made up primarily of sand, mud and rock broken up and dredged from the bottom of the new basin. The material was loaded on barges and transported to the offloading site where a mixture of 80% water and 20% spoil was pumped through big pipes onto the area to be reclaimed. This hydraulic method was meant to assist quick consolidation of the fill. A total of 11.5 million m³ of dredged material was used in the fill, and some dune sand was also transported in trucks from around the present day airport and deposited on the site. In addition, the scheme allowed “clean and selected” building rubble from around Cape Town to be deposited on the site. Municipal waste was also used in the fill (de Kock 1999).



Plate 14: Troops parading in Adderley Street shortly after completion of the reclamation. Two aircraft carriers can be seen berthed in the newly constructed Duncan Dock. The reason for the deviation of the road to the right is unknown (South African Library).

A number of views of the newly reclaimed land are shown in Plates 15 -18 with the proposed development sites marked in red on some. A panoramic view of the area from the old Power Station is shown in Plate 19.



Plates 15 and 16: Two aerial views of the reclaimed land on the foreshore with proposed development sites shown in red. Probably late 1940's. (Photographs supplied by S. Lukey & Assoc but original source unknown)

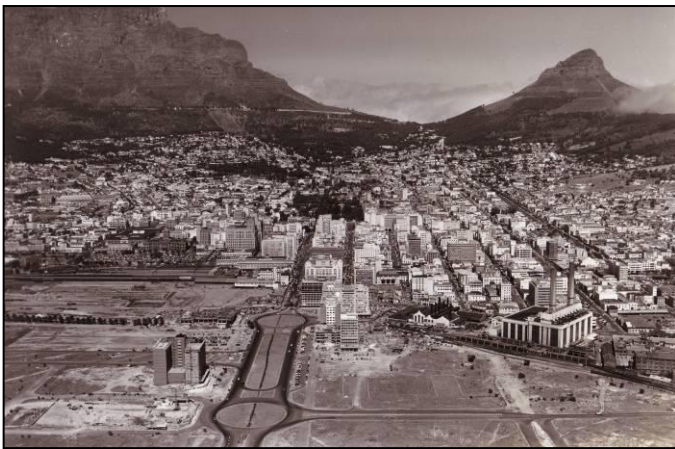


Plate 17: Aerial photographs of the lower city with new construction taking place on the reclaimed land. Photo at left predates the new station and probably dates to the late 1950's. The old promenade is marked by the line of trees on the mid left of the photo. **Plate 18:** The Sanlam building and new station can be seen in the right hand photo which would date it to the 1960's. The old promenade has almost been obliterated by this time though some trees can still be seen (Photographs supplied by S. Lukey & Assoc but original source unknown).

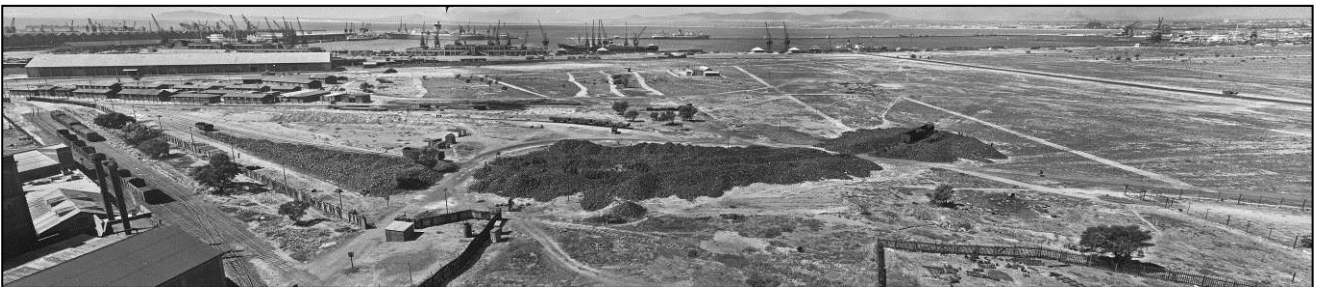


Plate 19: Broad panorama over the landfill area (City of Cape Town: Heritage Branch)

Following the completion of the reclamation, the South African Railways and Harbour Administration appointed the British planner, F Longstreth Thompson and Professor L.W. Thornton White of UCT as advisers while the municipality used the services of the French planner, E.E. Beaudouin (Longstreth Thompson & White 1940, Bickford Smith et al 1999:152). The "Gateway to Africa" concept envisaged by Beaudouin hoped to link a new civic centre with the iconic sites of Parliament and the Public Gardens (see Plate 20). By 1943 it seemed that Government and the city had differences of opinion mainly to do with the location of the new station, probably because the roof would block vistas from the harbour. After the war, the implementation of the foreshore plan was the task of the city engineer, Mr Solly Morris. One of his major concerns was traffic circulation in and around the city which were at

odds with Beaudouin's concepts. The implementation dragged on into the 1960's with submission and rejection of numerous planning reports and proposals until eventually we ended up with the somewhat unsatisfactory planning that is evident today (Bickford Smith et al 1999:152).

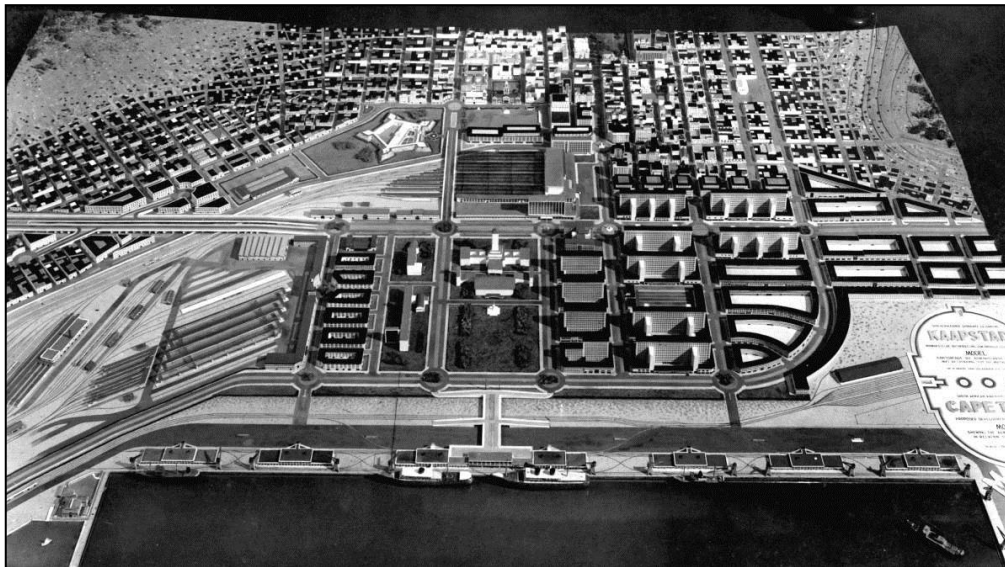


Plate 20: A photograph of the model of the proposed layout of the foreshore (source unknown - included with a number of loose photographs in a second hand copy of the 1940 Foreshore Scheme report in ACO possession)

3. ASSESSMENT OF POTENTIAL RISK FACTORS FOR DEVELOPMENT

3.1 Shipwrecks

The analysis of available historical information has indicated that the proposed development lies on reclaimed land above a part of the bay that would have been between approximately 600 meters from the old shoreline (in about 1870). The approximate position of the development site is indicated in red on the depth chart below and suggests that sea depth in the area of Erf 186 would have been in the order of 4.1 – 4.5 meters (2.25 - 2.5 Fathoms). It is worth bearing in mind when the parking basement/foundation depth is discussed as it will be in that range where material may be found on the old seabed during bulk excavations.

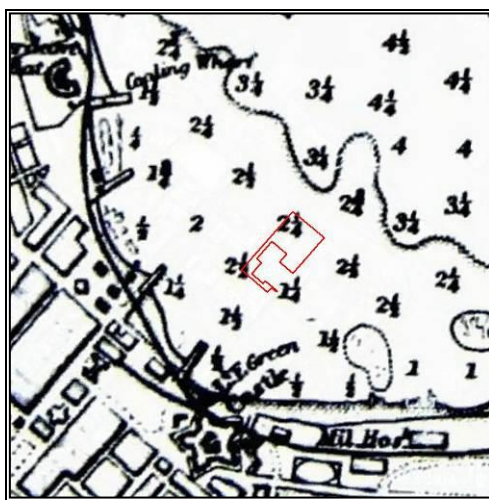


Figure 8: An extract from a plan showing the bathymetry of Table Bay in 1858, as surveyed by F. Skead R.N (see also Figure 2). Although the date on the chart suggests that it was prepared in 1858, some of the landmarks that have been included indicate that the map is probably from sometime after 1860. Depths in fathoms (1 fathom = 1.8288 meters). Sceptre Reef appears in front of the old Military Hospital at Woodstock.

As we have indicated, few ships in Table Bay are recorded as having sunk at anchor, but rather most appear to have dragged or lost anchors in the heavy winter gales, and gone aground or were wrecked on the old shorelines between the Castle and Milnerton lagoon. None of these old shorelines lie below the proposed development site although the traditional anchorage point would have been at and around this point.

In order to illustrate the statistics more graphically, Durden (1992) presented shipwreck positions plotted in relation to the old shorelines (Figure 9, 10). One could look at his data and assume from it that he has used co-ordinates to achieve the distribution. Rather he has made an attempt to convert rough landmark data into positions to facilitate the use of GIS technology. Turner (1988) has presented Latitude and Longitude co-ordinates for a number of wrecks but similarly, these can also be no more than rough guesses.

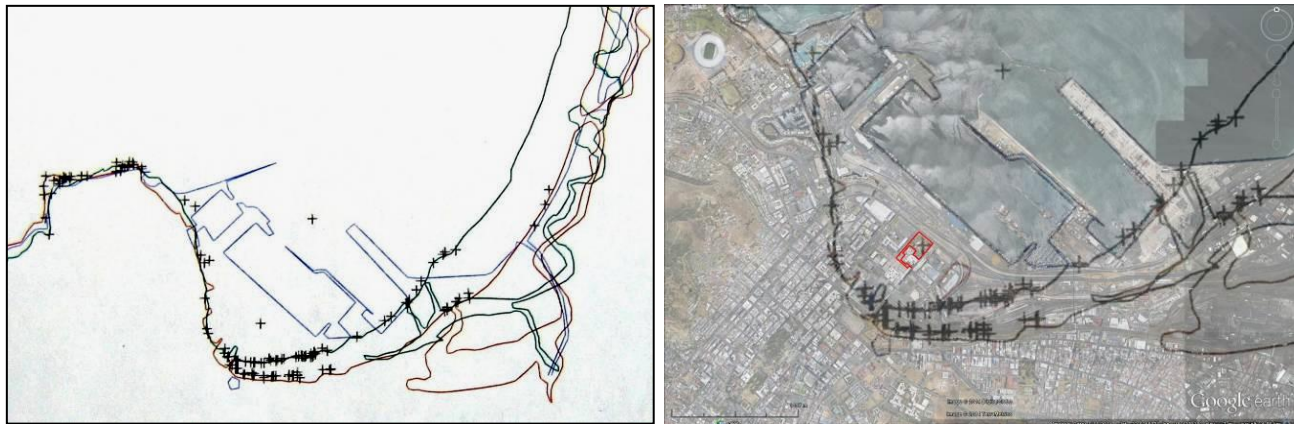


Figure 9: Map overlay of Table Bay showing approximate locations of 19th century shipwrecks (Durden 1992).
Figure 10: Overlay of Durden's shipwreck data on a current aerial photograph of a portion of Cape Town. The proposed development site shown in red. The "x" within the development site is believed to be incorrectly placed. It should be over the Civic Centre as it most likely represents the Dutch vessel "Nieuwe Rhoon" described by Lightley (1976).

Despite the fact that Durden's plots are to be viewed with a degree of circumspection, his map of the shoreline nevertheless gives some idea of the distribution of wrecks as described. The map also shows the changes in shoreline that occurred over time. By overlaying a portion of the Durden wreck distribution over a current aerial photograph of Cape Town (using the Google Earth software) (Figure 10, we achieve a very graphic demonstration of the most likely areas where wrecks will be found.

The almost complete lack of major reefs or rocky shoreline along the eastern and southern shores of the bay (except for the so-called Sceptre Reef see Figure 8 (and also Hart 1998:21), meant that vessels grounded on the beach could sometimes be successfully refloated. Many however could not and were instead salvaged. Both the ships timbers and fittings and the cargoes were valuable and were removed for resale. Frequent auctions of the grounded vessels and salvaged items were advertised in the local press (Figure 11). The significance of these auctions for the likelihood of finding wrecks below landfill lies in the fact that shoreline wrecks were mostly salvaged! If fragments were left behind for whatever reason, they are only likely to represent fragments of the original vessel and its cargo. Material that remained would probably have been inaccessible due to having been quickly buried by beach deposits (see Lightley 1976). Even to this day, fragments of vessels are exposed from time to time on Milnerton Beach.

We disagree with the findings of Sharfman and Mavradinov (2003:22) with reference to the CTICC 1 project, that there would be a "strong likelihood that the remains of wrecks will be found". Although we now have the benefit of hindsight, it would seem unreasonable to have reached this conclusion with the available shipwreck data evidence, which is much the same as we still rely on today.

The Cape Argus.

Vol. IX.—No. 1,265.]

CAPE TOWN, SATURDAY, MAY 20, 1865.

Published on Tuesdays, Thursdays, and Saturdays. Price, 1s. 6d. in the Country, including Postage; Monthly, 15s. 6d. per year to Non-subscribers.

NOTICE.

LADY WOODHOUSE suggests that in consequence of the preparations for the Ball in honor of B. M. HENDERSON, she will not be able to receive Visitors on MONDAY, the 22nd instant. JOHN RIVERS, Government House, 18th May, 1865.

G. S. Holmes & Co.,
AGENTS FOR THE
Shakers of New Bedford and Fairbanks,
AND
United States Underwriters.

Royal Mail Service.

WESTERN ROUTE.
THE Union Steamship Company's well-known Steamship **BRITON**, Capt. J. W. B. COOPER, is appointed to leave the Cape for the Bay of Bengal on WEDNESDAY, the 24th inst., at 4 o'clock. The date of her return to the Cape will be notified in due season. For Freight and Passage, apply to the Company's Agents, WM. ANDERSON & Co.

For Natal, Mauritius, and Hong-Kong.

THE splendid new clipper Steamship **ALBA**, 1200 tons, Capt. J. W. B. COOPER, is appointed to leave the Cape for the Bay of Bengal on MONDAY, the 22nd inst., at 4 o'clock. The date of her return to the Cape will be notified in due season. For Freight and Passage, apply to the Agents, WM. ANDERSON & Co.

For Algon Bay and East London.

THE Union Steamship Company's well-known Steamship **BRITON**, Capt. J. W. B. COOPER, is appointed to leave the Cape for Algon Bay and East London on MONDAY, the 22nd inst., at 4 o'clock. For Freight and Passage, apply to the Agents, WM. ANDERSON & Co.

For Calcutta.

THE splendid Twin Screw Steamship **ALBA**, 1200 tons, Capt. J. W. B. COOPER, is appointed to leave the Cape for Calcutta on MONDAY, the 22nd inst., at 4 o'clock. The date of her return to the Cape will be notified in due season. For Freight and Passage, apply to the Agents, WM. ANDERSON & Co.

For Mossel Bay & Port Beaufort.

THE fine clipper **MARK ECHO**, Capt. J. W. B. COOPER, is appointed to leave the Cape for Mossel Bay and Port Beaufort on MONDAY, the 22nd inst., at 4 o'clock. For Freight and Passage, apply to the Agents, WM. ANDERSON & Co.

For Freight or Charter.

THE A. I. Bark **OSBORNE**, 1000 tons, Capt. J. W. B. COOPER, is appointed to leave the Cape for Freight or Charter on MONDAY, the 22nd inst., at 4 o'clock. For Freight or Charter, apply to the Agents, WM. ANDERSON & Co.

For Port Elizabeth.

THE fine clipper **MARK ECHO**, Capt. J. W. B. COOPER, is appointed to leave the Cape for Port Elizabeth on MONDAY, the 22nd inst., at 4 o'clock. For Freight and Passage, apply to the Agents, WM. ANDERSON & Co.

Passage to America.

THE SHIPART UNION will take Steerage Passengers to Boston, should a sufficient number be secured, on SATURDAY, the 27th inst.—Apply to G. S. HOLMES & Co.

For London.

THE magnificent A 1 Ship **DUNBAR CASTLE**, 3000 tons, Capt. J. W. B. COOPER, is appointed to leave the Cape for London on MONDAY, the 22nd inst., at 4 o'clock. The date of her return to the Cape will be notified in due season. For Freight and Passage, apply to the Agents, WM. ANDERSON & Co.

Albion Hotel

CORNER OF
Strand-street and Long-street.
THE OLDEST, BEST, & MOST MODERATE
FIRST-CLASS BILLIARD TABLE.

CENTRAL HOTEL.

Lanchren and Dining Rooms.

Supper from 11 till 12 o'clock. DINNERS from 12 till 1 o'clock.
CHOP and STEAKS any hour during the day.
BILLIARDS, one of the best Tables.—The Room kept select.
MRS. SARATTA, Proprietress.

Postponement.

THE SALE of Mr. GIBSON KEITH'S Property, at ROSEBURY LODGE, Sea Point, has been postponed, and will be re-announced by J. A. B. SYKES, Agent.

Victoria Regatta Club.

NOTICE.
A SPECIAL MEETING of the Members of the Victoria Regatta Club will be held at 7 o'clock, on TUESDAY, the 27th inst., at the Victoria Regatta Club, to consider the following Proposition:—That the Club should purchase a new Regatta Boat, and that the Club should purchase a new Regatta Boat, and that the Club should purchase a new Regatta Boat. By order of the Committee, W. G. BULL, Secretary.

Commissariat Notice.

SEALED Tenders, to be received at the Office of the Commissariat, on TUESDAY, the 27th inst., from any of the Banks to the Colony who may be willing to undertake the Commissariat Account for the Military Expedition of the Command from the 1st August next.

NOTICE.

D. B. FLECK, intending to remove on the 1st June next to the House of Messrs. FLETCHER & Co., Advertiser, will request Tenders for the hire of his property in the Colony to be sent to him on the 1st of May.

MECHANICS' INSTITUTE.

Under the distinguished Patronage of His Excellency the Governor, Sir P. E. BOURKE, K.C.B., and Lady BOURKE.

Monday Evening next, May 22.

At the Custom-house Yard, on MONDAY NEXT, MR. JONES WILL SELL, BY PUBLIC AUCTION, THE PORTION OF THE CARGO LANDED FROM SAID SHIP, CONSISTING OF,

STRANDED SHIP "RUBENS,"

CAPT. ROBERTS, FROM LIVERPOOL, AT THE CUSTOM-HOUSE YARD, ON MONDAY NEXT, MR. JONES WILL SELL, BY PUBLIC AUCTION, THE PORTION OF THE CARGO LANDED FROM SAID SHIP, CONSISTING OF,

SHIP'S STORES AS UNDER,

1 Case of Bread and Fruit
1 Case of Soap
1 Case of Tea
1 Case of Coffee
1 Case of Sugar
1 Case of Rice
1 Case of Flour
1 Case of Beans
1 Case of Peas
1 Case of Lentils
1 Case of Oats
1 Case of Barley
1 Case of Potatoes
1 Case of Turnips
1 Case of Carrots
1 Case of Onions
1 Case of Apples
1 Case of Pears
1 Case of Grapes
1 Case of Figs
1 Case of Dates
1 Case of Raisins
1 Case of Currants
1 Case of Prunes
1 Case of Plums
1 Case of Peaches
1 Case of Nectarines
1 Case of Apricots
1 Case of Cherries
1 Case of Walnuts
1 Case of Almonds
1 Case of Pistachios
1 Case of Macadamia Nuts
1 Case of Brazil Nuts
1 Case of Pineapples
1 Case of Oranges
1 Case of Lemons
1 Case of Limes
1 Case of Citrus Fruit
1 Case of Melons
1 Case of Cucumbers
1 Case of Cabbages
1 Case of Potatoes
1 Case of Turnips
1 Case of Carrots
1 Case of Onions
1 Case of Parsnips
1 Case of Radishes
1 Case of Beets
1 Case of Spinach
1 Case of Kale
1 Case of Lettuce
1 Case of Cress
1 Case of Mint
1 Case of Basil
1 Case of Parsley
1 Case of Coriander
1 Case of Dill
1 Case of Fennel
1 Case of Anise
1 Case of Mustard
1 Case of Pepper
1 Case of Cloves
1 Case of Nutmeg
1 Case of Mace
1 Case of Cardamom
1 Case of Vanilla
1 Case of Saffron
1 Case of Turmeric
1 Case of Ginger
1 Case of Cayenne
1 Case of Mustard
1 Case of Pepper
1 Case of Cloves
1 Case of Nutmeg
1 Case of Mace
1 Case of Cardamom
1 Case of Vanilla
1 Case of Saffron
1 Case of Turmeric
1 Case of Ginger
1 Case of Cayenne

WRECKED BARK "City of Peterborough,"

Captain WRIGHT, bound to London.

THIS MORNING,

AT 10 O'CLOCK, BEHIND THE CASTLE, THE REMAINS OF THE ABOVE VESSEL, WITH HER STORES, TACKLE, AND APPAREL.

WRECKED SCHOONER "FERNANDE."

MR. H. D. JONES WILL SELL, BY PUBLIC AUCTION, THE PORTION OF THE CARGO LANDED FROM SAID SHIP, CONSISTING OF,

THIS MORNING,

AT 10 O'CLOCK, AT THE BEACH BEHIND THE CASTLE, THE WRECKED SCHOONER "FERNANDE," TOGETHER WITH SUCH CARGO AS MAY BE ON THE BEACH, FOR ACCOUNT OF THE UNDERWRITERS OR WHOMSOEVER IT MAY CONCERN.

WRECKED CUTTER "GEM."

MR. JONES WILL SELL BY PUBLIC AUCTION, THE CUTTER "GEM," AS SHE NOW LIES ON THE BEACH BEHIND THE CASTLE, TOGETHER WITH SUCH CARGO AS MAY BE ON BOARD.

WRECKED STEAMER "ATHENS."

MR. JONES WILL SELL BY PUBLIC AUCTION, AT THE MOULLE LIGHT-HOUSE, FOR ACCOUNT OF WHOM IT MAY CONCERN, THIS DAY (SATURDAY), AT 2 O'CLOCK, THE WRECK OF THE ABOVE STEAMER, TOGETHER WITH MACHINERY, STORES, APPAREL, AND FURNITURE; ALSO, SUCH CARGO AS MAY BE SAVED.

WRECKED SCHOONER "BENJAMIN MILLER."

MR. R. D. JONES WILL SELL, BY PUBLIC AUCTION, THE ABOVE VESSEL, AS SHE NOW LIES ON THE BEACH AT THE BACK OF THE CASTLE, THIS DAY, AT 10 O'CLOCK, FOR ACCOUNT OF WHOM IT MAY CONCERN.

WRECKED BARK "DEANE."

A PUBLIC SALE OF THE ABOVE WRECK, AS SHE NOW LIES ON THE BEACH BEYOND THE CASTLE, WILL TAKE PLACE ON THE SPOT, ON TUESDAY MORNING NEXT, 23RD INSTANT, AT 10 O'CLOCK.

WRECKED BRIG "JANE."

MR. R. D. JONES WILL SELL BY PUBLIC AUCTION, FOR ACCOUNT OF WHOM IT MAY CONCERN, NEAR THE CASTLE, THIS DAY (SATURDAY), AT 11 O'CLOCK, THE HULL, MASTS, SPARS, AND STORES OF THE BRIG "JANE," CAPTAIN PICOT, 231 TONS REGISTER, AS SHE LIES ON THE BEACH TOGETHER WITH THE CARGO ON BOARD, CONSISTING OF A QUANTITY OF WELSH STEAM COALS.

WRECKED STEAMER "ATHENS."

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THE LATE DISASTERS IN TABLE BAY.

PUBLIC MEETING.

NOTICE is hereby given that a PUBLIC MEETING will be held in the large Hall of the Commercial Exchange, On Monday, 22nd inst., AT 11 O'CLOCK A.M., for the purpose of considering the best means of relieving the existing distress caused by the late disastrous Gales in Table Bay.

The Hon'ble WILLIAM PORTER, Esq., has consented to take the Chair.

THOS. WATSON, Vice-President Chamber of Commerce, Cape Town, 19th May, 1865.

WRECKED BARK "City of Peterborough,"

Captain WRIGHT, bound to London.

THIS MORNING,

AT 10 O'CLOCK, BEHIND THE CASTLE, THE REMAINS OF THE ABOVE VESSEL, WITH HER STORES, TACKLE, AND APPAREL.

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WRECKED SCHOONER "BENJAMIN MILLER."

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WRECKED SCHOONER "BENJAMIN MILLER."

MR. R. D. JONES WILL SELL, BY PUBLIC AUCTION, THE ABOVE VESSEL, AS SHE NOW LIES ON THE BEACH AT THE BACK OF THE CASTLE, THIS DAY, AT 10 O'CLOCK, FOR ACCOUNT OF WHOM IT MAY CONCERN.



Wrecked Schooner "Benjamin Miller."

MR. R. D. JONES WILL SELL, BY PUBLIC AUCTION, THE ABOVE VESSEL, AS SHE NOW LIES ON THE BEACH AT THE BACK OF THE CASTLE, THIS DAY, AT 10 O'CLOCK, FOR ACCOUNT OF WHOM IT MAY CONCERN.

THE ABOVE VESSEL

AS SHE NOW LIES ON THE BEACH AT THE BACK OF THE CASTLE, THIS DAY, AT 10 O'CLOCK, FOR ACCOUNT OF WHOM IT MAY CONCERN.

THIS DAY, AT 10 O'CLOCK,

FOR ACCOUNT OF WHOM IT MAY CONCERN. SATURDAY, 20th May, 1865.

WRECKED BARK "DEANE."

A PUBLIC SALE OF THE ABOVE WRECK, AS SHE NOW LIES ON THE BEACH BEYOND THE CASTLE, WILL TAKE PLACE ON THE SPOT, ON TUESDAY MORNING NEXT, 23RD INSTANT, AT 10 O'CLOCK.

BEYOND THE CASTLE

WILL TAKE PLACE ON THE SPOT, ON TUESDAY MORNING NEXT, 23RD INSTANT, AT 10 O'CLOCK.

ON TUESDAY MORNING NEXT, 23RD INSTANT,

AT 10 O'CLOCK.

At the same time will be sold the following Cargo:

90 Pounds
8 Cases Plough Points
5 Barrels Charms
15 Cases Hay Cutters
15 Cases Axes
15 Hacks
6 - Axe Handles
7 Bundles of Ladders
1010 Barrels of Flour
32 Cases of Cheese

20 Cases Saranapis
10 Bales of Hops
20 Cases of Oysters
75 Barrels of Hoof
200 Cases Kerosene Oil
40 Boxes Gold Leaf Tobacco
200 Kegs of Nails
6 Kegs of Hide Poison
100 Oats
3,000 Hospital Stoves.

The Sale of the Cargo will be continued on the Parade after the Sale on the Beach.

DEANE & JOHNSON.

SALE OF

Wrecked Brig "JANE."

MR. R. D. JONES WILL SELL BY PUBLIC AUCTION, FOR ACCOUNT OF WHOM IT MAY CONCERN, NEAR THE CASTLE, THIS DAY (SATURDAY), AT 11 O'CLOCK, THE HULL, MASTS, SPARS, AND STORES OF THE BRIG "JANE," CAPTAIN PICOT, 231 TONS REGISTER, AS SHE LIES ON THE BEACH TOGETHER WITH THE CARGO ON BOARD, CONSISTING OF A QUANTITY OF WELSH STEAM COALS.

BORRADAILE THOMPSON, HALL, & Co. Agents.

THIS DAY (Saturday),

AT 11 O'CLOCK,

the HULL, MASTS, SPARS, AND STORES OF THE BRIG "JANE," CAPTAIN PICOT, 231 TONS REGISTER, AS SHE LIES ON THE BEACH TOGETHER WITH THE CARGO ON BOARD, CONSISTING OF A QUANTITY OF WELSH STEAM COALS.

BORRADAILE THOMPSON, HALL, & Co. Agents.

3.1.1 Categories of significance

It is not believed that every single wreck has equal significance. Those that are well preserved with intact cargoes are believed to be of greatest historical and scientific value, but in general terms, significance must usually be established on a case by case basis. Older vessels (where little or no other documentary evidence is available) would be of considerable interest in terms of the information that can be gained about construction methods. For example, if an unknown 15th Century Portuguese ship was uncovered, even if fragmentary, would be of considerable historical interest.

The worst case scenario from a planning and construction point of view would be to find a vessel that was carrying slaves at the time of its wrecking, particularly if bodies were never removed and buried on land. Such vessels did anchor at the Cape and were lost from time to time, for example, the *Pacquet Real*, a slave ship that was wrecked in 1818 on Woodstock beach (Cox 1995). In this case the bodies were recovered and buried near Fort Knokke.

In such a scenario, there would undoubtedly be lengthy delays, not only due to requirements of the legislation, but the sensitivities around slave issues would likely elicit vociferous public debate. SAHRA does have the power to declare such a site as a National Heritage site. Although we cannot exclude the possibility of such a discovery, we consider it unlikely.

An in situ vessel with cargo would also result in delays, but would be more straightforward in management terms.

3.2 Anchorage debris

This is material that is jettisoned from moored vessels, or that is lost as a result of damage and/or sinking. It can include items of cargo, but could also consist of pieces of the ships themselves, or anchors. While heavy items such as anchors and cannon barrels are unlikely to drift far, other items can move about as a result of shifting sand due to tides and currents.

3.2.1 Categories of significance

It is difficult to determine what may be found on the old seabed. Anchors, cargo and fragments of vessels are probably most likely (anchors were found previously on the *Arabella Hotel* (now the *Westin*) site during bulk excavations (Halkett 2002, and at the *Silo 1* site at the *Waterfront Schietecatte* in prep). Significance would be determined on a case by case basis. The recovery of such items is unlikely to result in significant delays. We believe it to be highly unlikely (although they cannot be ruled out) that individual human remains will be found on the old seabed.



Plates 21 & 22: Two anchors were recovered from the lower rubble fill during bulk earthworks at the CTICC 1 site. The admiralty pattern anchor shown at left is made from wrought iron and has curved arms tipped with flukes. These were used throughout the 19th century. The anchor at right had lost its arms although the mechanism at the top of the shank was well preserved. Neither anchor had a stock (an “L” shaped iron bar that passed through the shank just below the chain ring at right angles to the arms. This device prevented the anchor from lying flat on the seabed and ensured it dug into the sandy bottom).

3.3 Heritage material in the landfill

Two categories of landfill were described for the reclamation. The lowest consisted of old seabed material that was dredged from the site of Duncan Dock and pumped as slurry into the reclamation area, while the second category included material which was placed on top of the dredged material. The origin is not precisely known but includes *inter alia*, clean builders rubble, and large amounts of local Malmsbury Shale rock. According to Werz (2003:16), shipwreck materials were uncovered during the dredging process although the original location is unknown. Larger items are likely to have been removed or moved out of the way of the operation and it is more likely that smaller items would have found their way into the fill. A wide range of items from various ages could be found. From having monitored the bulk excavations at both the CTICC 1 site, we know that refuse and some industrial waste was included in the landfill process. Monitoring of the recent bulk earthworks on Erf 247 (Chris Barnard Hospital), immediately to the north west of the Founders Garden site (Seeman 2013a,b,c), has provided a well-placed window with regards to the sub-surface deposits and heritage content and will also be discussed below.

3.3.1 Stratigraphy at the CTICC 1 site

Despite the size of the earthmoving area, the sequence of deposits remained more or less the same across the whole site (Halkett 2002:2). In contrast to official records of the landfill, we recognised five stratigraphic land fill units that can be described as follows (see also Plates 23 & 24):

- Upper rubble: this is a landfill made up largely of building debris and from the smell in places, also industrial waste;
- Dredged sand: landfill consisting of dredged seabed material, white in colour and rich in water rounded marine shell. Clearly of marine origin, this cannot be the dune sand reported to have been brought from near the airport and it must have been used elsewhere (see Cox 2000 and Sharfman & Mavradinov 2000);
- Lower rubble: earlier landfill containing much rocky material and other debris. This appears to have been submerged or waterlogged and had a strong sulfurous aroma;
- Old seabed: this was marked by a relatively thin deposit (on average 80cm thick) of black/grey clay also having a strong sulfurous aroma;
- Bedrock: Malmsbury Shale.



Plates 23 & 24: At left two types of fill consisting of the lower rock rich deposits (from the base of Duncan Dock?) and sea/dune sand above. A thick dark layer in the photograph at right, was interpreted as the old seabed, upon which was a build up of organic debris and coal residue (Photographs: ACO Associates archive).

3.3.2 Artefactual material observed at the CTICC 1 site

Very small quantities of 19th century refined earthenwares were found in both the upper and lower rubble deposits, while by contrast, not a single fragment of any 18th century material was observed.

Dark green bottle glass was found occasionally in the seabed material but the impression was that these were chance finds from occasional discard. Lumps of coal were also found in the seabed material.

The lack of any 18th century artefacts in the seabed unit and other factors, particularly the absence of an *in situ* marine stratigraphy (we would have expected the white sand to lie on top of the basal seabed clays), suggests that dredging has occurred in the past. This may have occurred during the 19th century prior to the establishment of the harbour when ships were still loaded and unloaded via the numerous jetties jutting out into the bay in the vicinity, or may relate to the more recent landfilling event. Whatever the case, the lack of any shipwreck material may be the result of this earlier intervention.

Our observations at the CTICC 1 site suggest the opposite filling sequence to be true. Rock and rubble laid down first (from many sources no doubt, but primarily Malmesbury Shale). Subsequently dredged sand was pumped on top.

3.3.3 Stratigraphy at Erf 247 (Hospital site)

According to Seeman (2013a,b,c) the reclamation material consisted predominantly of marine sediments throughout, with a single brown organic and rubbish layer encountered at approximately 1.5 meters below surface separating two episodes of marine sand filling. The white marine sediment covered the entire site to a depth of approximately 3.5 meters below surface (Plates 25 and 26). This material is consistent with the material that was interpreted as dredged marine sediment at the CTICC1 site (Halkett 2002). Grey gravelly sand with numerous white mussel shell fragments was found in the deeper lift shaft excavation that progressed to a depth of approximately 6 meters below surface.



Plates 25 and 26: Bulk earthworks at Erf 247 in progress. A number of key buildings provide reference points. The uniform nature of the sub-surface deposits is clearly visible

3.3.4 Artefactual material observed at Erf 247 (Hospital site)

According to Seeman (2013a,b,c), no artefactual was observed or recovered during her 4 monitoring visits conducted between July and September 2013.

3.3.5 Categories of significance

Like with anchorage debris, significance of the material will be assessed on a case by case basis. The recovery of these types of items is unlikely to result in significant project delays but may require conservation in some cases or to be placed in storage (eg anchors). Any items recovered could be used for display purposes.

3.4 Harbour facilities and other structures

Werz (2003) listed two other categories of material that he considered as potential risks in the container expansion assessment. One category consisted of historical harbour works, while the other, stone age artefacts, is discussed below under "Other Material". We do not believe that any harbour works will be encountered below Erf 186, as we are confident that we know the position of all such structures. The end of the old Municipal Pier that was built in 1913 will similarly not be impacted.

3.4.1 Other Material

Werz (2003) also noted the possibility of finding pre-historical material. While prehistoric remains have been located in the bay before, these were in the form of isolated Early Stone Age stone artefacts and we do not believe that they represent any risk to the project. They are easily recorded and mitigated.

4. LEGISLATION

Shipwrecks and associated material of any type is protected by the National Heritage Resources Act of 1999 (NHRA). Although the act devolves responsibility for most provincial heritage matters to the Provincial Heritage Resources Authority (PHRA), shipwrecks remain a national issue and fall under the jurisdiction of the South African Heritage Resources Agency (SAHRA). Permission is required from that organisation to disturb or remove shipwrecks or associated material (if found). Some relevant sections of the NHRA are:

Definitions

2. In this Act, unless the context requires otherwise—

(i) "alter" means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or other decoration or any other means; (xiii)

(ii) "archaeological" means—

(a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;

(b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;

(c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation; and.....

Protected areas

28. (1) SAHRA may, with the consent of the owner of an area, by notice in the *Gazette* designate as a protected area—

(a) such area of land surrounding a national heritage site as is reasonably necessary to ensure the protection and reasonable enjoyment of such site, or to protect the view of and from such site; or

(b) such area of land surrounding any wreck as is reasonably necessary to ensure its protection; or.....

Archaeology, palaeontology and meteorites

35. (1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

If the project requires an Environmental Impact Assessment (EIA) to be undertaken, this report could be submitted as fulfillment of the heritage component. If no EIA is required, it must be determined if

the development falls within the requirements for a stand alone Heritage Impact Assessment (HIA) or not. A portion of Section 38 of the NHRA is reproduced below:

- 38.** (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—
- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
 - (b) the construction of a bridge or similar structure exceeding 50 m in length;
 - (c) any development or other activity which will change the character of a site—
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
 - (d) the re-zoning of a site exceeding 10 000 m² in extent; or
 - (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.
- (2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1)—
- (a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
 - (b) notify the person concerned that this section does not apply.
- (3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:
- (a) The identification and mapping of all heritage resources in the area affected;
 - (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;
 - (c) an assessment of the impact of the development on such heritage resources;
 - (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
 - (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
 - (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
 - (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.

To determine if a Heritage Impact Assessment is required, and what if any specialist topics need to be assessed in the course of preparing such an assessment is determined by preparation and submission of a “Notice of Intent to Develop” form to Heritage Western Cape.

5. CONCLUSION

Having considered the available information, we feel that we can make some statements regarding the potential to encounter heritage material during bulk earthworks on Erf 186 at Roggebaai.

While the lack of precision with respect to wreck locations means that we can never rule out the possibility of encountering significant remains on the site, evidence at our disposal suggests that the area of the bay over which the proposed developments are proposed, was not an area where ships are recorded as having sunk (notwithstanding numerous unaccounted wreck locations). We believe it can be demonstrated that most ships were wrecked as a result of losing anchors and being driven onto shore by the fierce north-westerly winds that blow in the bay in the winter months. Few descriptions of shipwrecks list them as having sunk at the anchorage.

In the event of remains being found, the worst case scenarios from a development perspective would involve the discovery of *in situ* wrecks containing the physical remains of slaves and or other human remains, and/or well preserved structural details and cargoes. One cannot definitively say what vessels or cargo's may be significant, though in broadest terms, we may assume that older vessels would be of greater interest to the scientific community.

In our opinion, the likelihood of finding decontextualised anchorage/shipwreck debris on the old seabed, and/or shipwreck debris within the landfill is higher than finding a substantial shipwreck. The potential risk to development of such decontextualised finds is considerably less than for an *in situ* shipwreck. Some thought may be given to display of such material if it is in such quantity and of a suitable nature, within any development on the site. Anchors have been found at similar development sites.

In the course of archaeological monitoring of bulk earthworks at Erf 247 immediately to the north west of the Founders Garden site, no heritage material was observed or recovered.

No structures relating to harbours and harbour works are known to occur below the proposed development site.

6. RECOMMENDATIONS

- A specialist archaeological team must be appointed to the project to monitor the bulk earthworks at the proposed project site. A monitoring schedule must be drawn up by the appointed archaeological company in consultation with the construction and bulk earthworks contractors and project manager;
- The task of recovering, recording and conserving the smaller day to day finds will fall to this team. They will monitor the earthworks and alert the project managers and construction crew if significant finds are recognised that will require mitigation;
- A plan of action should be prepared in advance of the commencement of bulk earthworks that addresses the procedures to be followed in the event of the discovery of significant heritage material (shipwrecks). This plan must take into account the lack of adequate local facilities to deal with conservation and storage necessitated by large scale wreck recovery projects. The Maritime archaeological unit from SAHRA should be involved in the drafting of such a plan;
- While the appointed archaeological team may assist with mitigation, in the case of the discovery of a shipwreck, specialist maritime archaeologists may have to be appointed. Permit/s will have to be issued by SAHRA for such work;
- Any human remains located can only be removed with the permission of SAHRA;
- The HIA/archaeological component should be submitted to SAHRA (Maritime Unit) for comment. They should specifically indicate if a separate permit will be required to mitigate "day to day" maritime related finds identified during monitoring (i.e. decontextualised anchors and other anchorage debris, cargo);
- A permit/s must be issued by Heritage Western Cape for the ongoing "day to day" mitigation of non-maritime finds found during the monitoring process. HWC must indicate if more than one permit will be required (i.e. by individual development site - erf) or if one permit can be issued to cover the multiple erf's making up the development.

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APPENDIX 1: Partial list of shipwrecks for Table Bay by area

(Source SAHRA shipwreck database - excludes vessels where no specific wreck site is described)

(Additional data for each vessel is available but was not required for this project – additional fields include cargo, crew, brief notes about the circumstances of loss etc)

Ship Name	Wreck Date	Area	Place
Conde de Souza	1842/01/01	Amsterdam Battery	(rocks below) Amsterdam Battery
Amazon	1810/11/15	Amsterdam Battery	Amsterdam Battery
Cerberus	1821/03/10	Blaauwbergstrand	Blaauwbergstrand
Curlew	1940/03/02	Bok Point	Bok Point
Newport	1857/06/07	Castle	(near) Imhoff Battery
Rory Brown	1857/06/07	Castle	(opposite) Imhoff Battery
Albatross	1842/09/09	Castle	(near) Imhoff Battery
Saldanha Bay Packet	1842/08/28	Castle	Imhoff Battery
Orange Grove	1828/06/15	Castle	n/a
Sterrenschans	1793/05/20	Castle	Castle
Nieuwe Rhoon	1776/01/31	Castle	Castle Jetty
Zoetigheid	1722/06/17	Castle	(near & beyond) Castle
Schotsche Lorrendraaier	1722/06/17	Castle	(near) Castle
Zwarte Leeuw	1696/12/01	Castle	(near) Castle Jetty
Rotterdam	1722/06/17	Castle & Salt River	Between
Standvastigheid	1722/06/17	Castle & Salt River	Between
Maria Johanna	1865/05/17	Castle & Salt River (between)	(between) Castle & Salt River
Frederick Bassil	1865/05/17	Castle & Salt River (between)	(between) Castle & Salt River
Star of the West	1865/05/17	Castle & Salt River (between)	(between) Castle and Salt River
Royal Arthur	1865/05/17	Castle & Salt River (between)	South Wharf
Jane	1865/05/17	Castle & Salt River Woodstock Beach?)	Between
Vis	1740/05/06	Green Point	(South of) Lighthouse
Disa	1967/09/27	Green Point	Green Point
Tiger	1899/11/30	Harbour	Harbour
Pembroke Castle	1888/09/10	Harbour	Alfred Dock
Svanen	1880/02/24	Harbour	Harbour
China	1874/07/29	Harbour	Patent Slip
Ham 107	1939/01/01	Harbour	Harbour
George Schwalbe	1902/01/01	Harbour	Fish Harbour
Penelope	1809/04/16	Milnerton Beach	Milnerton Beach
Winton	1934/07/28	Milnerton Beach	North of Lighthouse
Cambrian	1861/01/01	Mouille Point	Rocks outside harbour
Ellen Rawson	1857/06/14	Mouille Point	Mouille Point
Fenisowles	1819/10/21	Mouille Point	Mouille Point/Three Anchor Bay
Harvest Capella	1987/10/07	Oude Schip	Oude Schip
Argonaut	1796/01/01	Oude Schip	Oude Schip
Dunvegan Castle	1902/10/01	Pier	Pier
Neree	1878/07/21	Rogge Bay	(opposite) Sailor's Home
Dash	1833/01/23	Rogge Bay??	Amsterdam Battery
Panmure	1891/08/04	Salt River	Opposite East side of the mouth
Maria	1790/04/12	Salt River	(near) Salt River
Fijenoord	1736/07/01	Salt River	(near) Salt River Mouth
Addison	1722/06/17	Salt River	Salt River Mouth
Sierra Pedrosa	1889/10/30	Salt River Beach	(north of) Salt River Mouth
Jeanne	1878/07/19	Salt River Beach	Salt River Mouth
Jupiter	1872/10/06	Salt River Beach	Salt River Beach
Kate 3	1862/08/08	Salt River Beach	Salt River Mouth
Frigga	1862/01/19	Salt River Beach	Salt River Mouth (north of)/Milnerton
Sir Henry Pottinger	1860/06/01	Salt River Beach	Salt River Mouth
Defence	1857/03/05	Salt River Beach	Salt River Mouth Btwn Mouth & Rietvlei
Sandwich	1853/08/10	Salt River Beach	Salt River ("new"mouth)/Diep River
Cockburn	1850/09/16	Salt River Beach	(near) Salt River Mouth

Israel	1847/04/09	Salt River Beach	Salt River Beach
Waterloo	1842/08/28	Salt River Beach	Salt River Mouth
Abercrombie Robinson	1842/08/28	Salt River Beach	Salt River Mouth
Papineaux	1840/08/26	Salt River Beach	Salt River Mouth
Emerald	1833/09/03	Salt River Beach	Salt River Mouth
Sarah	1822/07/10	Salt River Beach	(near) Salt River Mouth
Emma	1821/01/04	Salt River Beach	Salt River Beach
India	1821/01/04	Salt River Beach	Salt River Mouth
Elizabeth	1819/10/07	Salt River Beach	Salt River Beach
Columbia	1796/06/04	Salt River Beach	(near) Salt River Beach
La Ceres	1776/10/15	Salt River Beach	Salt River Mouth
De Jonge Thomas	1773/06/10	Salt River Beach	Salt River Mouth
Voorzichtigheid	1757/06/08	Salt River Beach	Salt River Mouth
Westerwyk	1737/05/21	Salt River Beach	Salt River Mouth
Duinbeek	1737/05/21	Salt River Beach	Salt River Mouth
Flora	1737/05/21	Salt River Beach	Salt River Mouth
Goudriaan	1737/05/21	Salt River Beach	Salt River Mouth
Paddenburg	1737/05/21	Salt River Beach	Salt River Mouth
Rodenrijs	1737/05/21	Salt River Beach	Salt River Mouth
Iepenrode	1737/05/21	Salt River Beach	(near) Salt River Mouth
De Buys	1737/05/20	Salt River Beach	Salt River Mouth area
Haerlem	1728/12/04	Salt River Beach	Salt River Beach
Middenrak	1728/07/03	Salt River Beach	(near & north of) Salt River
Stabroek	1728/07/03	Salt River Beach	Salt River Mouth
Nightingale	1722/06/16	Salt River Beach	(south of) Salt River Mouth
Waddingsveen	1697/05/24	Salt River Beach	Salt River Mouth
Oosterland	1697/05/24	Salt River Beach	Salt River Mouth
Goede Hoop	1692/06/04	Salt River Beach	Salt River Mouth
Orange	1692/06/04	Salt River Beach	Salt River Mouth
La Marachele	1660/05/19	Salt River Beach	Fort Duijnhoop & Salt River Mouth (btwn)
Mauritius Eiland	1644/02/21	Salt River Beach	Salt River Mouth
Lys de Bretagne Cameret	1967/07/23	Salt River Beach	Salt River Beach
City of Lincoln	1902/08/14	Salt River Beach	Salt River Mouth
Brutus	1902/08/14	Salt River Beach	(north of) Salt River Mouth
Le Victor	1782/09/24	Salt River Beach/Milnerton Beach (?)	Salt River Mouth /Milnerton Beach (?)
Kate	1862/08/08	Salt River Mouth	Just east of
Ho ergeest	1692/06/10	Salt River Mouth	Near Salt River Mouth
Benjamin Miller	1865/05/17	Salt River/Woodstock Beach	Between Castle & Salt River Mouth
Pitcairn Island	1898/09/01	Table Bay	Table Bay
Broderick Castle	1896/09/05	Table Bay	Table Bay
Drotning Sofia	1892/01/01	Table Bay	Table Bay
Oni 2	1888/02/07	Table Bay	Table Bay
Arab	1880/06/10	Table Bay	Table Bay
Oni	1875/01/01	Table Bay	Table Bay
Foundling	1874/11/22	Table Bay	(Near) Table Bay
Susan Pardew	1871/01/01	Table Bay	Table Bay
Duke of Buccleugh	1870/08/10	Table Bay	Table Bay
Madagascar	1868/07/01	Table Bay	Table Bay
Jonquille	1868/07/01	Table Bay	Table Bay
Otago	1867/06/01	Table Bay	Table Bay
Wasp	1867/03/25	Table Bay	Breakwater
Stag	1865/05/17	Table Bay	Anchorage
Briton	1865/05/17	Table Bay	Table Bay
Royal Minstrel	1865/05/17	Table Bay	Table Bay
Water Kelpie	1865/05/17	Table Bay	Table Bay
Libra	1865/01/01	Table Bay	Table Bay
Deutan	1863/02/20	Table Bay	Table Bay
Wavery	1862/02/01	Table Bay	Table Bay
Merilla	1862/01/01	Table Bay	Table Bay
Fanny and Leoncine	1860/01/01	Table Bay	Table Bay

W E Malcolm	1858/09/01	Table Bay	Table Bay
Fox	1857/06/20	Table Bay	Table Bay
Gentana	1857/06/06	Table Bay	Table Bay
Marie Sarah	1857/01/01	Table Bay	Table Bay
Dordrecht	1856/12/01	Table Bay	Table Bay
Canopus	1854/01/01	Table Bay	Table Bay
Bosphorus	1853/01/27	Table Bay	Table Bay
Morayshire	1851/10/12	Table Bay	Table Bay
Thomas Cart	1851/10/01	Table Bay	Table Bay
London	1850/07/18	Table Bay	n/a
Prince Charlie	1850/07/06	Table Bay	Table Bay
Royal Charlie	1850/07/01	Table Bay	Woodstock Beach
Zafiro	1849/01/01	Table Bay	Table Bay
Blackstone	1846/01/04	Table Bay	Table Bay
Bella Angela	1844/09/10	Table Bay	Table Bay
Henrequetta	1844/02/05	Table Bay	Table Bay
Josephine	1844/01/29	Table Bay	Table Bay
Soudade	1843/10/30	Table Bay	Table Bay
Unknown 42	1843/10/23	Table Bay	Table Bay
Commandant	1843/08/23	Table Bay	Table Bay
Gaika	1842/09/09	Table Bay	Table Bay
Hamilton Ross	1842/08/28	Table Bay	Table Bay
Clyde	1842/05/04	Table Bay	n/a
Port Boat	1842/02/26	Table Bay	Table Bay
Orion	1842/01/01	Table Bay	Table Bay
Frances	1840/08/18	Table Bay	Mouille Point
Roxburgh Castle	1838/07/01	Table Bay	Table Bay
Falcon	1836/12/31	Table Bay	Table Bay
Emperor Alexander	1835/05/25	Table Bay	Table Bay
Cendieu	1831/07/20	Table Bay	Table Bay
Ellen	1830/06/03	Table Bay	Table Bay
Bride	1828/08/20	Table Bay	Table Bay
Nautilus	1826/03/31	Table Bay	Table Bay
Narwal	1826/01/01	Table Bay	Table Bay
Lady East	1824/01/01	Table Bay	Table Bay
Ceres	1823/01/01	Table Bay	Table Bay
Triangle	1822/08/11	Table Bay	Table Bay
Good Intent	1822/07/21	Table Bay	Table Bay
Olive Branch	1822/07/21	Table Bay	Table Bay
Royal George	1822/07/21	Table Bay	Table Bay
Sun	1822/07/21	Table Bay	Table Bay
De African	1821/05/28	Table Bay	Table Bay
Penisowles	1819/01/01	Table Bay	Table Bay
Industrie	1818/01/01	Table Bay	Anchorage
William	1818/01/01	Table Bay	Table Bay
Winnifred & Maria	1817/08/21	Table Bay	(near) Table Bay Wharf
Valentine	1812/11/01	Table Bay	Table Bay
Resolution	1812/01/01	Table Bay	Table Bay
Reliance	1809/12/16	Table Bay	Table Bay
Creole	1809/01/31	Table Bay	Table Bay
Twee Gysberts	1808/11/21	Table Bay	Table Bay
Atlantic	1806/01/28	Table Bay	Table Bay
Charles	1805/11/04	Table Bay	Table Bay
Elizabeth	1805/11/04	Table Bay	Table Bay
Hunter	1805/11/03	Table Bay	Table Bay
O'Harmonie	1799/11/05	Table Bay	Table Bay
Prize	1799/11/05	Table Bay	Table Bay
Oldenburg	1799/11/05	Table Bay	Table Bay
Sierra Leone	1799/11/05	Table Bay	Table Bay
Jefferson	1798/05/09	Table Bay	Table Bay
Good Hope	1798/03/17	Table Bay	Table Bay

Zeeland	1793/05/22	Table Bay	Table Bay
Helena Louisa	1790/04/12	Table Bay	Table Bay
Erfrprins van Augustenburg	1790/04/12	Table Bay	Table Bay
Guardian	1789/12/24	Table Bay	Table Bay
Lucia Emerentia	1786/01/01	Table Bay	Table Bay
De Knokke	1786/01/01	Table Bay	Table Bay
Namen	1722/06/17	Table Bay	Table Bay
Greenrust	1717/01/01	Table Bay	Table Bay
Oliphant	1656/04/17	Table Bay	Table Bay
Sir John Mudie	?	Table Bay	Harbour
Pamela Ann	1977/11/01	Table Bay	Bok Point
Grootvlei	1970/01/01	Table Bay	Table Bay
Cape Matapan	1960/04/20	Table Bay	Table Bay
Rugeley	1941/08/01	Table Bay	Table Bay
Protea	1934/01/01	Table Bay	Table Bay
Clan Sutherland	1920/06/14	Table Bay	Table Bay
Canton	1909/01/01	Table Bay	Table Bay
Irene	1906/01/04	Table Bay	Table Bay
Kaiser	1902/08/14	Table Bay	Table Bay
Annenan	1902/06/09	Table Bay	Table Bay
Canada Cape	1912/06/05	Table Bay Harbour	South Arm (No 3 Berth)
Victoria	1737/05/21	Woodstock /Salt River Beach	Woodstock / Salt River Beach
La Scravick	1967/07/101	Woodstock Beach	Woodstock Beach
Ryvingen	1902/05/130	Woodstock Beach	(near) Woodstock Mole
Prince Badouin	1892/05/03	Woodstock Beach	Woodstock Beach
Etta Loring	1878/07/23	Woodstock Beach	Papendorp
Caledonian	1878/07/18	Woodstock Beach	Papendorp
Galatea	1865/06/17	Woodstock Beach	(beyond) Castle
Alacrity	1865/05/17	Woodstock Beach	(beyond)
Clipper	1865/05/17	Woodstock Beach	(near) Battery
Fernande	1865/05/17	Woodstock Beach	(between) Castle / Salt River
Figilante	1865/05/17	Woodstock Beach	(between) Castle / Salt River
Kehrweider	1865/05/17	Woodstock Beach	Castle (beyond)
Isabel	1865/05/17	Woodstock Beach	(between) Castle / Salt River
Gem	1865/05/17	Woodstock Beach	Woodstock Beach
Deane	1865/05/17	Woodstock Beach	Woodstock Beach
Esther	1865/05/17	Woodstock Beach	Woodstock Beach
Grahamstown	1864/05/26	Woodstock Beach	(behind) Military Hospital
Lucy Johnson	1862/09/22	Woodstock Beach	(near) Military Hospital
Susan	1862/09/21	Woodstock Beach	(near) Military Hospital (near)
Marietta	1862/08/09	Woodstock Beach	Papendorp (opposite Military Hospital)
Crystal Palace	1862/08/08	Woodstock Beach	Fort Knokke/Sceptre Reef
Sarah Charlotte	1860/07/03	Woodstock Beach	(near) Military Hospital
William James	1857/06/10	Woodstock Beach	Castle Battery (near)/Imhoff Battery
Christabel	1857/06/08	Woodstock Beach	(near) Castle/Military Hospital
Jessie MacFarlane	1857/06/07	Woodstock Beach	(near) Fort Knokke
Gitana	1857/06/07	Woodstock Beach	(below) Imhoff Battery
Anne Jane	1856/08/06	Woodstock Beach	n/a
Seagull	1854/07/15	Woodstock Beach	Woodstock Beach
Courier	1852/05/18	Woodstock Beach	(near) Imhoff Battery
Fanny	1851/07/30	Woodstock Beach	South Wharf (near)/near Imhoff Battery
Royal Albert	1850/06/25	Woodstock Beach	(near) Military Hospital
Arab	1850/06/01	Woodstock Beach	Military Hospital/Hospital Lines
Francis Speight	1846/01/07	Woodstock Beach	(near) Craig's Tower
Diana	1846/01/07	Woodstock Beach	Imhoff Battery
Fairfield	1842/09/09	Woodstock Beach	Hospital Lines
Hen Hoyle	1842/09/09	Woodstock Beach	(near) Hospital Lines
Reform	1842/09/09	Woodstock Beach	(below) Imhoff battery
John Bagshaw	1842/09/09	Woodstock Beach	(near) South Wharf
Speedy	1842/07/13	Woodstock Beach	Imhoff Battery

Arion	1842/07/13	Woodstock Beach	(near) Imhoff Battery
Howard	1840/07/16	Woodstock Beach	Castle (near)
Antelope	1837/08/18	Woodstock Beach	South Wharf
Candian	1831/07/17	Woodstock Beach	Off-shore Reef
Rambler	1831/07/17	Woodstock Beach	Woodstock Beach
Usk	1831/07/17	Woodstock Beach	Woodstock Beach
Cal p ie	1831/07/17	Woodstock Beach	Woodstock Beach
Sir James Saumarez	1831/07/16	Woodstock Beach	Military Hospital/Hospital Lines
Vine	1831/07/16	Woodstock Beach	Woodstock Beach
Alfred	1830/07/04	Woodstock Beach	(near) South Wharf
Silence	1830/06/04	Woodstock Beach	(near) South Wharf
Walsingham	1829/04/16	Woodstock Beach	(near) Military Hospital
Importer	1828/06/15	Woodstock Beach	Woodstock Beach
Woodburne	1826/08/08	Woodstock Beach	Woodstock Beach
San Antonio	1824/08/04	Woodstock Beach	(near) Military Hospital
Jane	1823/11/01	Woodstock Beach	Woodstock Beach
Lavinia	1822/07/21	Woodstock Beach	(near) Military Hospital
Leander	1822/07/21	Woodstock Beach	(near) Military Hospital
Adriatic	1822/07/21	Woodstock Beach	Sea Lines (off)
Anna	1821/01/04	Woodstock Beach	n/a
Prins Willem I	1819/07/26	Woodstock Beach	(near) Merchant's Wharf
Rambler	1818/05/18	Woodstock Beach	(near) Castle
Pacquet Real	1818/05/18	Woodstock Beach	Jetty (South Wharf?)
Jane	1818/05/18	Woodstock Beach	Opposite Castle (near wharf)
Tarlton	1818/05/17	Woodstock Beach	(near) Castle
John	1818/01/01	Woodstock Beach	Woodstock Beach
Woodbridge	1816/11/05	Woodstock Beach	(near) South Wharf
Concord	1816/11/05	Woodstock Beach	Woodstock Beach
Discovery	1816/07/29	Woodstock Beach	(near) Fort Knokke /Black River Mouth
Clipper	1811/12/28	Woodstock Beach	(near) Battery
La Espirance	1808/12/01	Woodstock Beach	Woodstock Beach
Hoop	1808/10/24	Woodstock Beach	n/a
L'Atalante	1805/11/03	Woodstock Beach	Charlotte Battery
Hannah	1799/11/05	Woodstock Beach	Castle (near)
Sceptre	1799/11/06	Woodstock Beach	Scepter Reef opposite Fort Knokke
Anubis	1799/11/05	Woodstock Beach	Woodstock Beach
Avenhoorn	1788/05/17	Woodstock Beach	n/a
Gouda	1722/06/17	Woodstock Beach	Castle (near)
Lakeman	1722/06/17	Woodstock Beach	Castle (near)
Am	1722/06/17	Woodstock Beach	Castle (under the)
Jaeger	1619/07/27	Woodstock Beach	Woodstock Beach
George Thomas	?	Woodstock Beach	n/a
City of London	1902/01/01	Woodstock Beach	Woodstock Beach
Alice	1901/07/15	Woodstock Beach	Beach
America	1900/05/29	Woodstock Beach	Woodstock Beach
Chandos	1722/04/17	Woodstock Beach?	Castle (near)
Nossa Senhora D'Guia	1819/05/02	Woodstock Beach/ Amsterdam Battery?	Woodstock Beach/Amsterdam Battery?
Redbreast	1878/07/20	Woodstock Beach/Papendorp	(near) Fort Knokke
Formosa Estrella	1861/02/19	n/a - possibly Table Bay??	n/a
Aberfoyle	1847/08/18	n/a - possibly Table Bay??	n/a
Ann & Mary	1843/08/23	n/a - possibly Table Bay??	n/a
Waterloo	1842/09/09	n/a - possibly Table Bay??	n/a
Anna	1841/11/01	n/a - possibly Table Bay??	n/a
Saudade	1841/03/14	n/a - possibly Table Bay??	n/a
Amelia	1840/11/20	n/a - possibly Table Bay??	n/a
Jehovah	1840/01/17	n/a - possibly Table Bay??	n/a
Ada	1828/06/14	n/a - possibly Table Bay??	n/a
Antonio	1824/08/04	n/a - possibly Table Bay??	n/a
Antelope	1822/07/10	n/a - possibly Table Bay??	n/a
Neptune	1821/11/12	n/a - possibly Table Bay??	n/a

Sophia Johanna	1821/10/18	n/a - possibly Table Bay??	n/a
Duke of Marlborough	1821/06/10	n/a - possibly Table Bay??	n/a
Elizabeth	1818/01/01	n/a - possibly Table Bay??	n/a
Young Phoenix	1816/07/29	n/a - possibly Table Bay??	n/a
Restaurador	1812/01/19	n/a - possibly Table Bay??	n/a
Sir T Gambier	1810/07/07	n/a - possibly Table Bay??	n/a
Abby and Sally	1807/12/06	n/a - possibly Table Bay??	n/a

ANNEXURE 9

Wind Impact Assessment - MacHoy (June 2014 Rev 1)





Mackenzie Hoy Consulting Acoustics Engineers

if you have a problem that nobody else can solve....

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26th May 2014

Rev 0

19th June 2014

Rev 1

Founders Garden, Cape Town: Report On The Effect Of Wind On The Proposed Development On Pedestrians At Ground Level And The Effect That New Structures On The Site Will Have On Existing Wind Patterns.

1. Introduction

- a. This report was written at the request of Faisel Moosa, Kayad Knight Piesold tel: 021 555 0400, info@kayad.com and Aamena Desai of Design Space Africa tel: 021 419 0601, Aamena@designspaceafrica.com.
- b. The report examines the effect of wind on the proposed development on pedestrians at ground level and the effect that new structures on the site will have on existing wind patterns.
- c. Our findings and recommendations (further detailed in this document) are as follows:

- i. The wind from the South/South East is the prevailing wind for this area of the City of Cape Town during summer and North West in winter.
- ii. The development will not have a significant effect on the wind patterns where the wind is from the North West, provided that construction is as per the site bulk drawings as reviewed by us. This applies both to wind at ground level and at 20 m above ground level (approximately 2m above the traffic height of the N1/N2 incoming and outgoing freeway.)
- iii. The development will not have a significant effect on the wind patterns at ground level where the wind is from the South / South East, provided that construction is as per the site bulk drawings as reviewed by us. This applies to wind at ground level only.
- iv. The development will have a significant effect on the wind patterns at 20 m above ground level (approximately the traffic height of the N1/N2 incoming and outgoing freeway.) where the wind is from the South / South East. The development will cause a wind shadow which will cause the wind speed on the N1/N2 outgoing elevated freeway to oscillate between 15 m/s (54 km/h) and 2 m/s (7,2 km/h) over a period of about 68 seconds.
- v. The proposed development at Founders Garden (adjacent to the Arts Cape) is partially responsible for the effect of (iv) above.

- vi. It is possible to reduce the effect of (iv) above. This will require further design but will not affect the bulk mass of the building.

2. Background and Present Situation

- a. The site is located between DF Malan and Jan Smuts Street, Cape Town.
- b. A further development, Erf 156 Roggebaai, is proposed two city blocks South of the development.



Location Plan for Erf 156 Roggebaai

- c. It is proposed to redevelop the site with a 60 m high building, approximately square in foot print.
- d. Mackenzie Hoy Consulting Engineers were appointed to:
 - i. Provide a description of the current wind conditions in Cape Town (baseline environment i.e. the environment that may be affected by the development).
 - ii. Identify any relevant legislation/guidelines/standards relating to wind that need to be considered during the initiation and completion of the development.
 - iii. Describe the environmental issues and potential impacts of the wind conditions created by the development for pedestrians and motorists and non fuel powered vehicles.
 - a. Where they will be located as a result of the development.
 - b. Where they are presently located and how the new structures will alter existing wind patterns and affect them.
 - iv. Describe the environmental issues and potential impacts of wind conditions created by the development on surrounding structures based on given building massing.
 - v. Assess potential cumulative impacts of wind on the city bowl where the city bowl is affected by wind effect of the new development.
 - vi. Provide a real-time computer model indicating wind flows from various directions as predicted in the development.

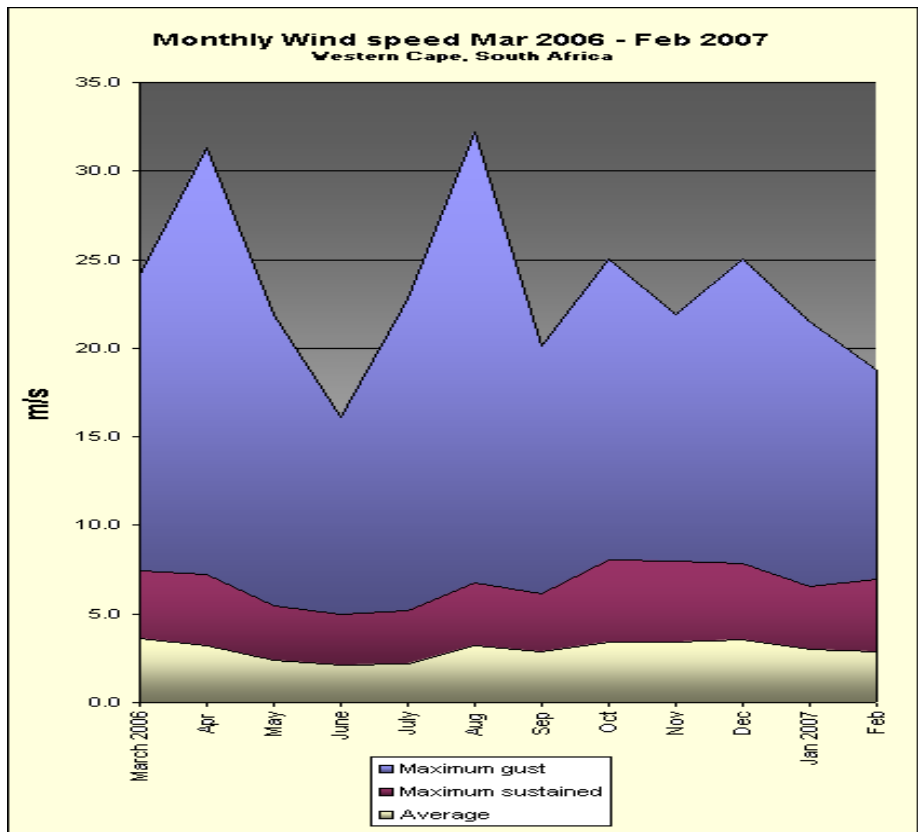
- vii. Recommend relevant mitigation measures for the design construction and operational phases of the development to negate or reduce negative impacts and to enhance any positive impacts.

e. It is noted that:

- i. That Mackenzie Hoy scope of work is not to supplant the design of the building response to wind as per SABS 0160 (South African Standard Code of Practice for The general procedures and loadings to be adopted in the design of buildings, Pretoria, 1989), or to undertake any work which will in any way determine the structural strength of the building as this work will be undertaken by the structural engineers.

3. Analysis of Existing Wind Conditions: A description of the current wind conditions in Cape Town (baseline environment i.e. the environment that may be affected by the development).

- a. The wind in the area of the development is generally from the South / South East in summer and from the North West in winter.



The graph above shows a wind profile for March 2006 to February 2007. Note that the maximum gust speed exceeds the average speed by up to 5.5 times.

- b. We have located the nearest recording weather station to the proposed site. The maximum wind speed recorded over the past three years is 62 km/h with a gust velocity of 96 km/h. This corresponds to wind speeds of 17 m/sec and 26 m/sec, wind being from the South / South East.

c. The effects of wind on pedestrians is summarized in the table below:

Table 1: Effects of Wind On People

Beaufort Number	Description	Wind Speed at 1.75 m height (m/s)	Effect
1	Calm	0 - 0.1	None
2	Light Air	0.2 - 1	No noticeable wind
3	Light breeze	1.1 - 2.3	Wind felt on face
4	Gentle breeze	2.4 - 3.8	Hair disturbed, clothing flaps, newspaper difficult to read
5	Moderate Breeze	3.9 - 5.5	Raise dust and loose paper hair disarranged
6	Fresh Breeze	5.6 - 7.5	Force of wind felt on body, danger of stumbling when entering a windy zone
7	Strong Breeze	7.6 - 9.7	Umbrellas used with difficulty, hair blows straight, difficult to walk steadily, sideways wind force about equal to forward walking force, wind noise on ears unpleasant
8	Near Gale	9.8 - 12	Inconvenience felt when walking
9	Gale	12.1 - 14.5	Generally impedes progress great difficulty with balance in gusts
10	Strong Gale	14.6 - 17.1	People blown over

- d. It is common experience that wind does not blow with constant speed. Wind is made up of three components:

U = Mean wind speed

k = Peak factor

σ = Standard deviation of wind speed (turbulence)

U_e = Equivalent wind speed.

These are related as follows:

$$U_e = U + k\sigma$$

As an example, for:

$$U = 10 \text{ m/s}$$

$$k = 3$$

$$\sigma = 3 \text{ m/s}$$

Then the equivalent wind speed $U_e = 19 \text{ m/sec}$

- e. There is evidence that winds at the site under consideration can do considerable damage. At the start of the 2009 Argus Cycle Tour, tents and cyclists were blown over in Hertzog Boulevard due to 60 km/h / 17 m/sec winds.
- f. Of importance is the fact that wind gusts last for no more than between 3 and 10 seconds. Thus while a maximum wind gust speed of 97 km/h / 26 m/s may exist on the site, it does not persist for a very long period.

- g. An hourly mean wind speed multiplied by 1.1 will convert the hourly wind speed to a 10-min mean. A multiplier of about 0.7 will convert a 3-s peak gust wind speed to 10-min mean wind speed. Thus in this case the 26 m/s gust speed should be associated with a 10 minute mean of 18 m/s and an hourly mean of 16,5 m/s.
- h. Wind increases with height as it is subject to fewer impediments by buildings and other landscapes.
- i. It is important, for this study, that we examine not only winds at high speed but also winds at lower speeds since the distribution over an area may be different at the two. speeds.
- j. The geometry of wind distribution is also dependant on building shape.
- k. In summary:
 - i. On site the winds to be considered are from the North West and South / South East.
 - ii. We will consider winds which are “Strong Gale” (15 m/s).
 - iii. We will examine the wind effects at ground level (2 m above ground) and the wind distribution at 20 m above ground level, being the approximate vehicle height of the N1/N2 adjacent elevated freeway.

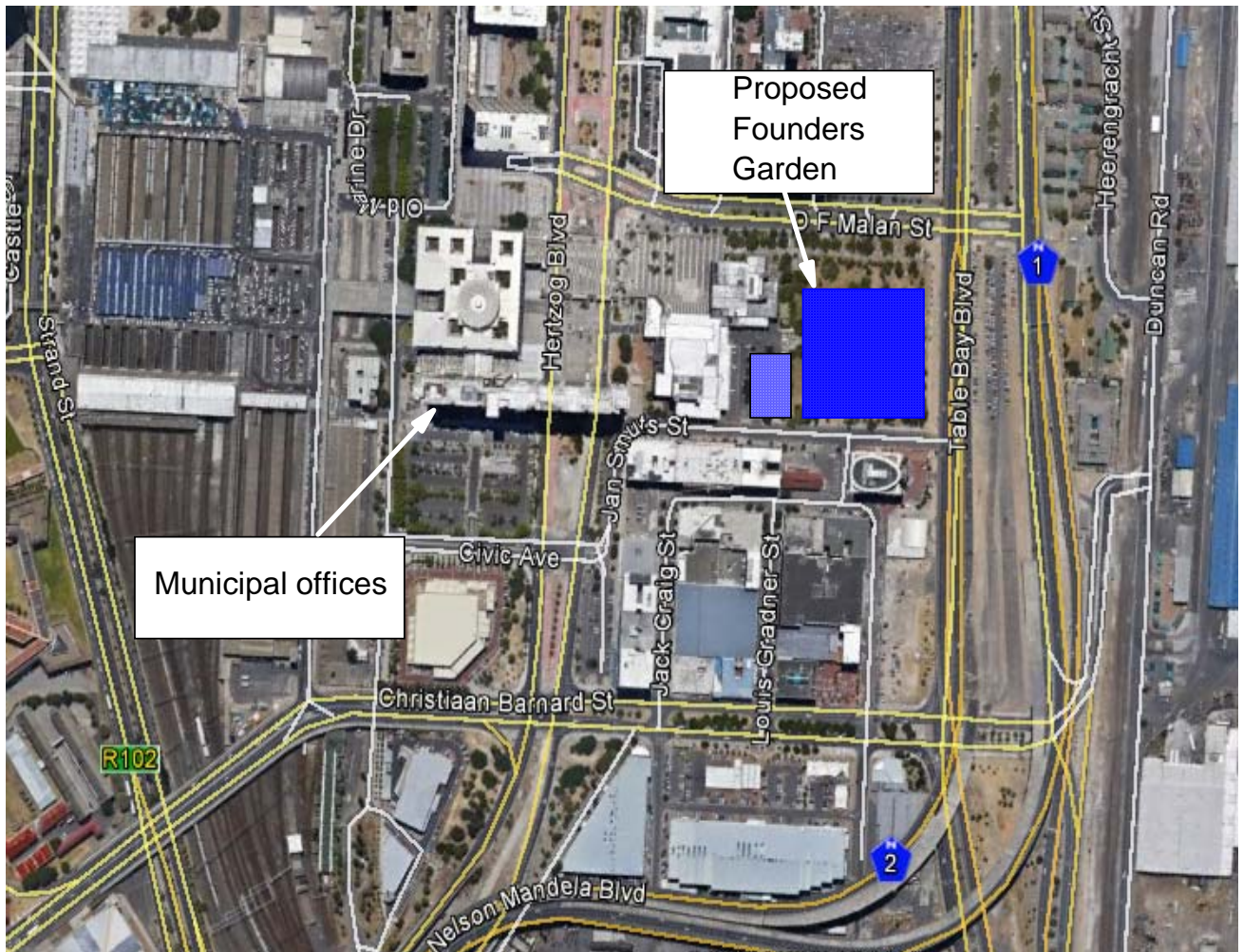
4. Relevant legislation/guidelines/standards relating to wind that needs to be considered during the initiation and completion of the development.

- a. The only legislation relating to wind in South Africa is SABS 0160 (South African Standard Code of Practice for the general procedures and loadings to be adopted in the design of buildings, 1989).
- b. The Code of Practice For the Application of The National Building Regulations (SABS 0400) requires that structures be designed to take account of wind loading.
- c. The Occupational Health and Safety Act (As revised 2006) carries a general prohibition of any employer requiring an employer to do work which may threaten the health or safety of an employee.

5. A real time computer model indicating wind flows from various directions as predicted in the development.

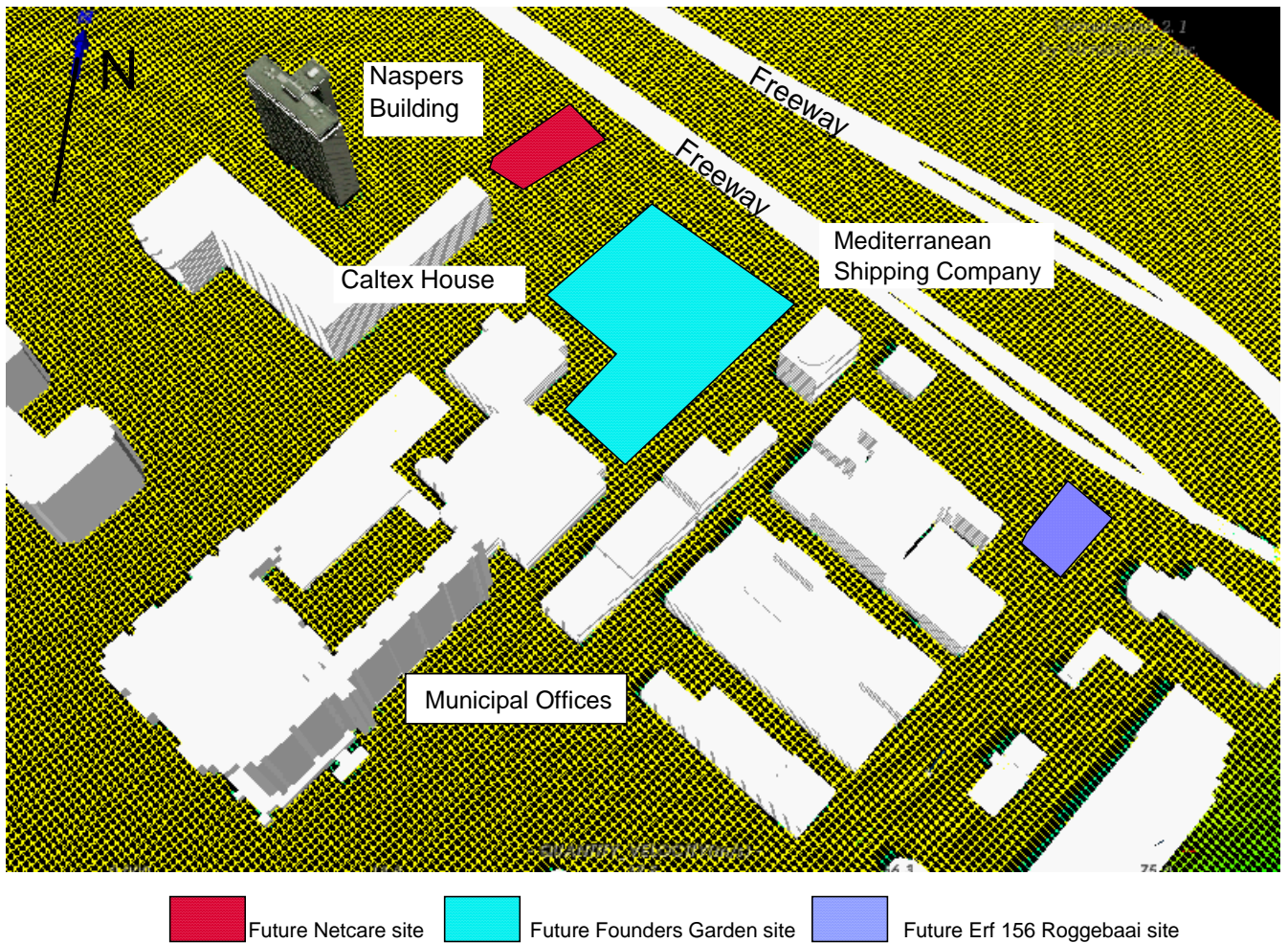
- a. A real time model showing existing and predicted wind flows is contained in a separate computer presentation, forming part of this report.
- b. To view the live model, please follow the instructions in Appendix A. Further, set out below are “freeze frames” from the real time study with comments explaining what effects are predicted.

Summarised Results: “Freeze Frames”



Location Plan for Founders Garden

Basic Wind Model



Basic Wind Model: Includes Proposed Founders Garden, Netcare Building (under construction), N1 and N2 freeways and associated buildings.

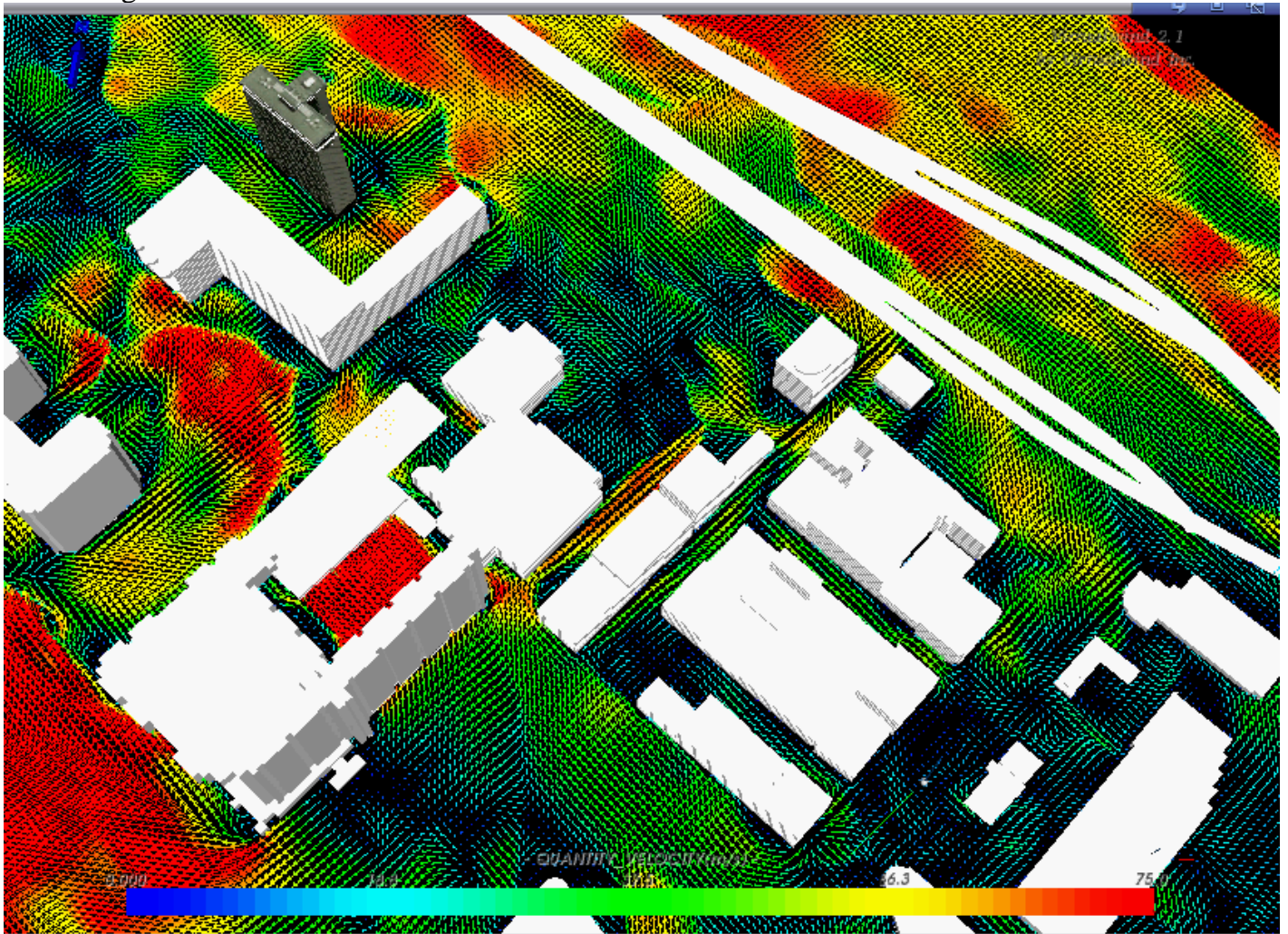
Excluded is the development at Erf 156 Roggebaai and the Cape Town International Conference Centre Extension.


In the studies that follow, “freeze frames” are presented of live streaming videos of wind distribution. The videos themselves can be viewed - refer to the memory stick forming part of this report and to Appendix A.

Wind from South South East (SSE) at 15m/s: Existing situation

Page I: Wind from the SSE at 15 m/s at ground level: wind distribution without Founders Garden development or Netcare or 156 Roggebaai. This is the worst condition / highest velocity of ground level wind distribution with Founders Garden development excluded from the wind map. Note the strong East going vortex from the Mediterranean Shipping Company Building under the freeway, the very high winds under the Municipal offices and the East going vortex from the Caltex Building. The two vortices dissipate under the freeways.

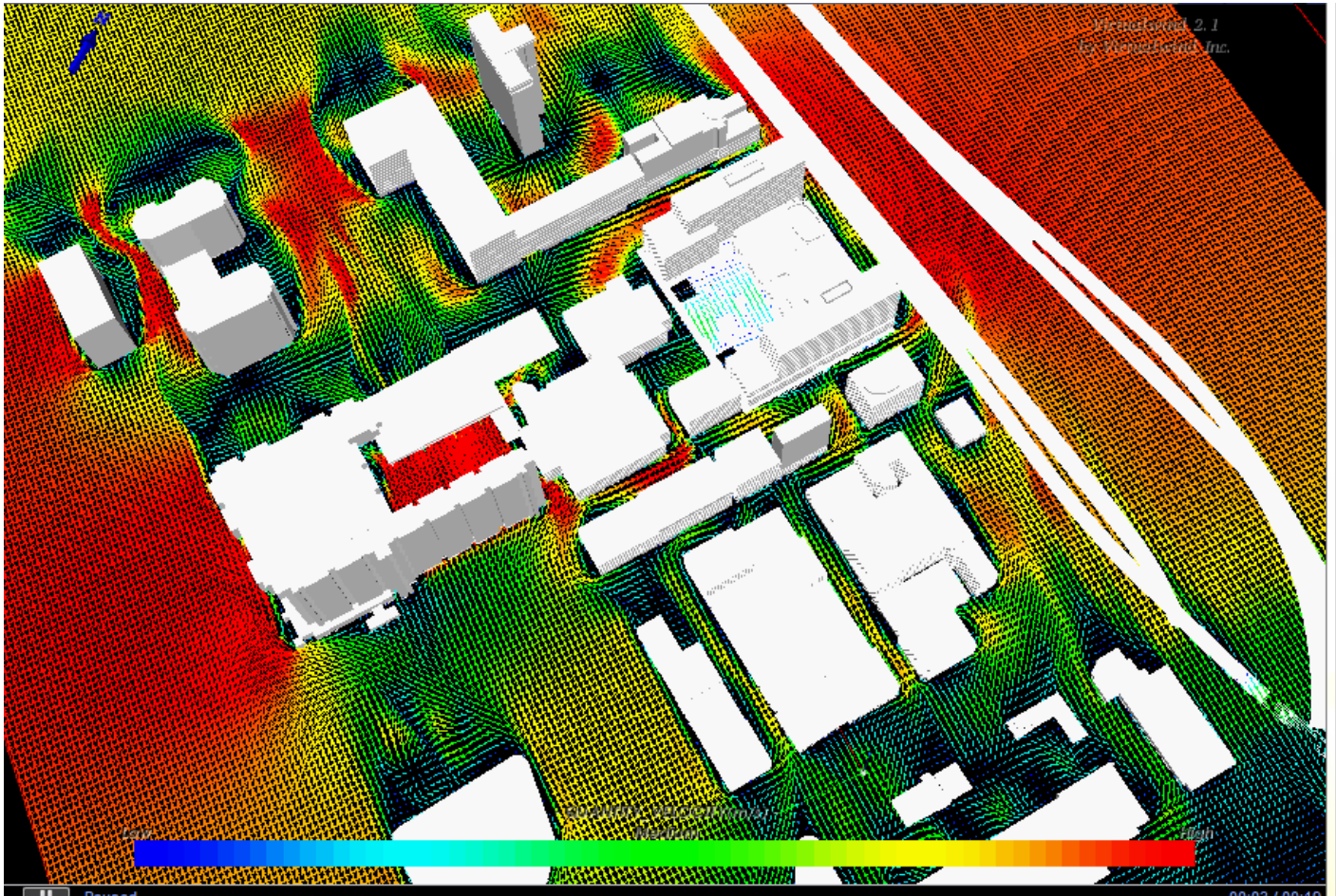
Page I



See Video  06. Wind-SE-15ms-GroundLevel-NoBuilding

Page II: Wind from the SSE at 15 m/s at ground level: wind distribution with Founders Garden development and Netcare Building included in the model. This is the worst condition / highest velocity of wind at ground level

Page II



See Video: [15. Wind-SE-Iso-GroundLevel-15ms-FoundersGarden_NetCare&FoundersExpansion](#)

Notes:

- a. Very high winds under the Municipality building.
- b. High wind between Founders Garden building and Caltex House / Netcare building.
- c. The effect of the increase in building massing is to deflect much of the ground wind North North East (NNE) under the freeways. Since the deflected wind meets the

incident wind from the SSE the wind velocity increases (maximum as above) and then dissipates to a minor degree.

- d. Thus for incident wind from SSE the area South East (SE) of the Municipality and Founders Garden will always be calm and the area under the freeways always windy with high gust velocity under and North East of the freeways.
- e. The area South West (SW) of the Municipality will always be windy for a wind from the SSE.

Page III: Wind from the SSE at 15 m/s at 20 m above ground level (i.e. 2 m above the Freeway) : wind distribution with Founders Garden development and including Netcare building. This is the worst condition / highest velocity of wind at 20m above ground.

Page III



See Video: [16. Wind-SE-Iso-FreewayLevel-15ms-FoundersGarden_NetCare&FoundersExpansion](#)

Notes:

- a. The effect of the increase in building massing is to deflect much of the wind North North East (NNE) over the freeways. Since the deflected wind meets the incident wind from the SSE the wind velocity increases (maximum as above) and then dissipates to a minor degree. The outgoing freeway lanes will be turbulent with high gusts and will affect two wheeled traffic.

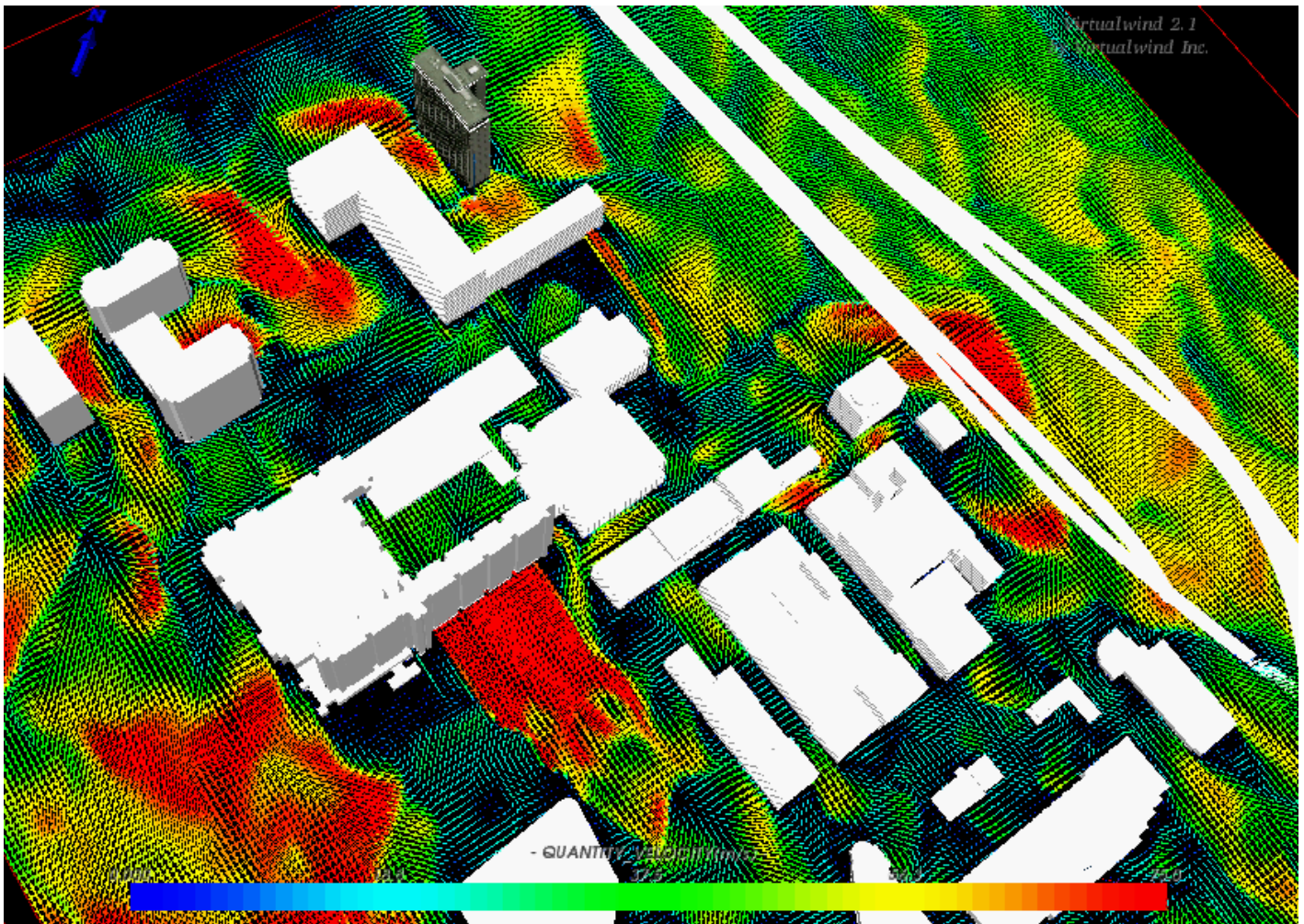
- b. There is an oscillating vortex incident on incoming freeway lanes. This is caused by the Founders Garden building. The vortices are strong and intermittent

- e. The Mediterranean Shipping Company building close to the N1/N2 freeway and deflects wind towards it but not in great quantity

Wind from North West (NW) at 15m/s: Existing situation

Page IV: Wind from the NW at 15 m/s at ground level: wind distribution without Founders Garden development or Netcare or 156 Roggebaai. This is the worst condition / highest velocity of ground level wind distribution with Founders Garden development excluded from the wind map. Note the strong East going vortex from the Mediterranean Shipping Company Building under the freeway and the very high winds under the Municipality Building. The two vortices dissipate under the freeways.

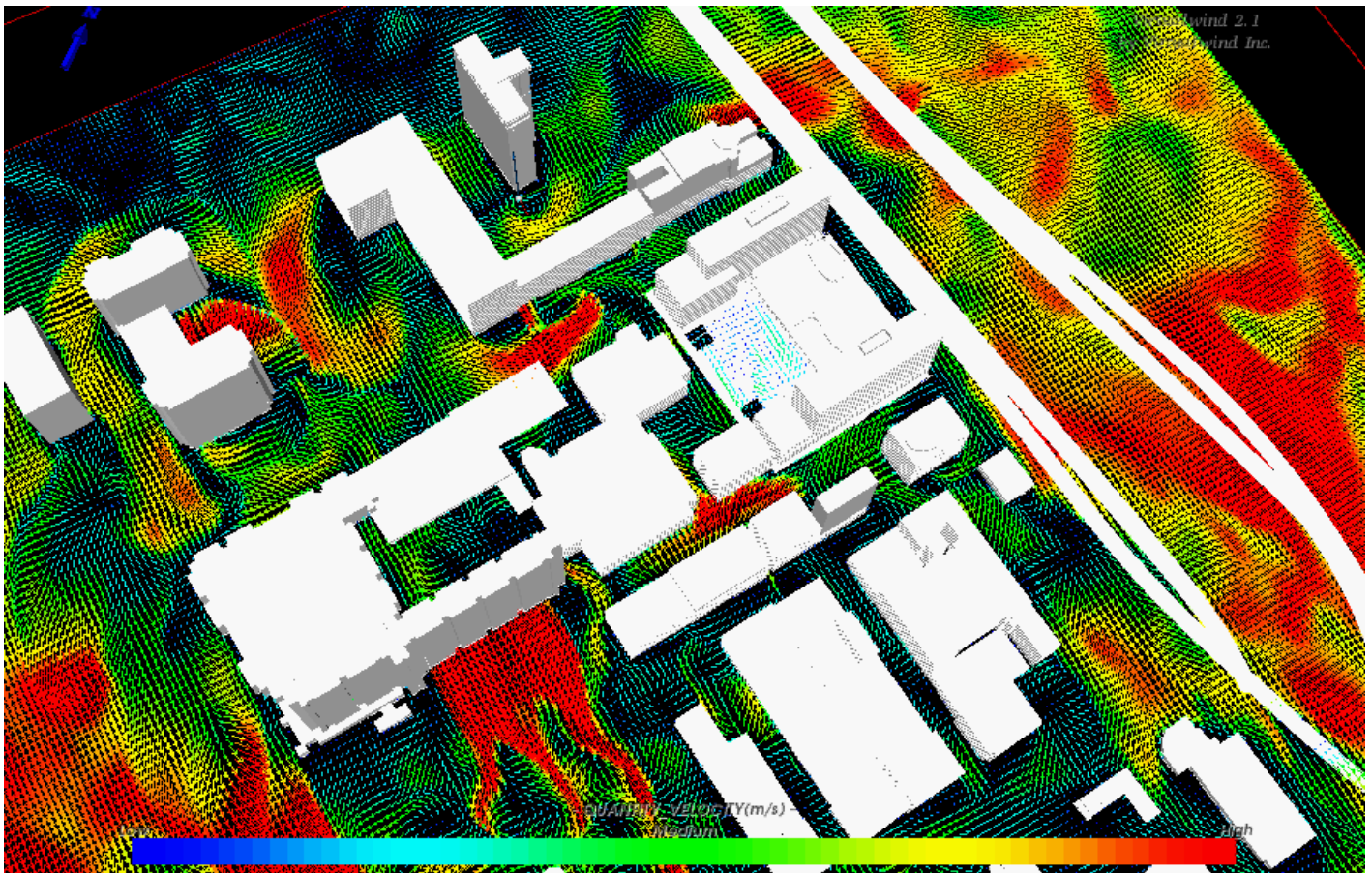
Page IV



See Video: [05. Wind-NW-15ms-GroundLevel-NoBuilding](#)

Page V: Wind from the NW at 15 m/s at ground level: wind distribution with Founders Garden development and Netcare development included. This is the worst condition / highest velocity of ground level wind distribution.

Page V



See Video: [13. Wind-NW-Iso-GroundLevel-15ms-FoundersGarden_NetCare&FoundersExpansion](#)

Notes:

- a. The effect of the increase in building massing is to deflect much of the wind South South East (SSE) under the freeways. Since the deflected wind meets the incident wind from the NW the wind velocity increases (maximum as above) and then dissipates to a large degree.
- b. High winds flow under the Municipality building.
- c. Extremely turbulent conditions SE of Caltex house and between the Standard Bank towers.

Page VI: Wind from the NW at 15 m/s at 20 m above ground level (i.e 2m above Freeway level): wind distribution with Founders Garden development and Netcare development included. This is the worst condition / highest velocity of ground level wind distribution.

Page VI



See Video: [14. Wind-NW-Iso-FreewayLevel-15ms-FoundersGarden_NetCare&FoundersExpansion](#)

Notes:

- a. The effect of the increase in building massing is to deflect much of the wind South East (SE) over the freeways. Since the deflected wind meets the incident wind from the NW the wind velocity increases (maximum as above) and then dissipates to a minor degree. The outgoing freeway lanes will be turbulent with high gusts and will affect two wheeled traffic.
- b. There is an oscillating vortex incident on incoming freeway lanes. This is caused by the Founders Garden building. The vortices are strong and intermittent

- 6. Environmental issues and potential impacts of the wind conditions created by the development for pedestrians and motorists and non fuel powered vehicles.**
- 6.1 The wind from the South/South East is the prevailing wind for this area of the City of Cape Town during summer and North West in winter.
- 6.2 The cumulative effect of the Founders Garden development and the Netcare development is to block wind paths from both the SSE and the NW. The result will be that the area +/- 2m above ground level to the NE of the Freeways will always be windy with high gust occurrence, regardless of wind direction. High winds will flow under the Municipality building.
- 6.3 The cumulative effect of the Founders Garden development and the Netcare development is to block wind paths from both the SSE and the NW. The result will be that the area 20 m above ground level (+/- 2m above Freeway level) will always be windy with high gust occurrence, regardless of wind direction. The outgoing freeway lanes will be turbulent with high gusts and will affect two wheeled traffic. The wind shear that will arise over the N1/N2 outgoing freeway as above has the potential to cause vehicle loss of control and the consequences thereof.
- 6.4 Further calculations indicate that the Founders Garden development will cause a wind shadow / wind vortex which will cause the wind speed on the N1/N2 outgoing elevated freeway to oscillate between 15 m/s (54 km/h) and 2 m/s (7,2 km/h) over a period of about 68 seconds.

6.5 The area South West (SW) of the Municipality will always be windy for a wind from the SSE. Compared to current conditions, the degree of wind effect will be more extensive and widespread – very high wind gusts will occur to the SSW of the Standard Bank building.

7. Recommend relevant mitigation measures for the design construction and operational phases of development to negate or reduce negative impacts and to enhance any positive impacts.

7.1 The following developments are planned in the area adjacent to the N1/N2 elevated freeway.

- CTICC Extension
- Founders Garden
- Netcare
- Erf 156 Roggebaai

7.2 All of the above developments will affect the wind distribution over the N1/N2 free way in such a manner as to pose a threat to traffic. As a consequence it is probable that a case can be made to the City of Cape Town and others that a wind barrier must be erected along the road length adjacent to the above developments. The matter must be discussed with all the developers as the potential consequences if no action is taken will be severe.

7.3 Note that mitigation measures will not affect building massing requirements.

Mackenzie Hoy

T.E. Mackenzie-Hoy Pr.Eng.

Professional Registration No. 840428

For

Mackenzie Hoy and Associates

Consulting Engineers: Acoustics, Wind and Electrical Power Systems.

Appendix A:

To view the video presentation:

- Step 1:** Place the flash drive into any available USB port on either a laptop or computer.
- Step 2:** Navigate to “My Computer” on your desktop and locate the flash drive – double click to view contents.
- Step 3:** Click on the appropriate file to view the video.