

# WML COAST

CONSULTING ENGINEERS

***COMPANY PROFILE***



***CIVIL • STRUCTURAL • COASTAL  
CONSULTING ENGINEERS***

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### OUR HISTORY

**WML (COAST) CONSULTING ENGINEERS** is a 100% Namibian, dynamic organization that has been involved intensively, amongst others, in all aspects of Civil Engineering Consultancy: Urban development, Industrial, Public and Commercial developments, Rural roads and Marine and Coastal Engineering.

**WML COAST CONSULTING ENGINEERS** consists of a qualified and motivated team, experienced in projects in Civil, Structural, Coastal and Port Engineering with 2 offices in Namibia and one in South Africa.

Communication can take place in English,  
German and Afrikaans.



## OUR TEAM



**BERNHARD VOLKMANN**  
Pr Eng B Eng  
(Civil and Structural)  
University of Stellenbosch (RSA)  
MSAICE MECN



**ECONIA PETRUS**  
Technician



**EMILIA JOYCE MUPWEDI**  
Engineer in Training

## OUR TEAM



**CHRIS L MWIYA**  
Senior Civil Engineering Technician



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Pr Eng B Eng  
(Civil and Structural)  
University of Stellenbosch (RSA)  
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## OUR TEAM



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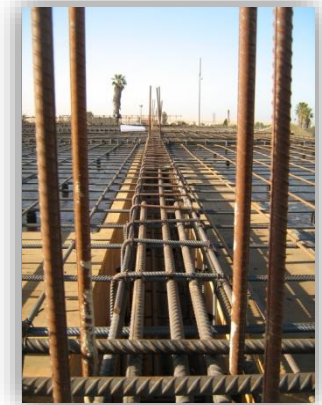
**Anke Volkmann**  
Office Administrator

## ***HUMAN RESOURCES POLICY***

**WML COAST CONSULTING ENGINEERS** subscribed unconditionally to the process of reconciliation and transformation that is taking place in Namibia. The firm is committed to achieve a personnel and equity profile which represents the demographics of this country.

**WML COAST CONSULTING ENGINEERS** has effectively invested in training program's for young Namibians since 1999:

For further details on Our Training Program please refer to Page 41 of Our Company Profile.





CONSULTING ENGINEERS

***OUR COMMITMENT***

- We aim at optimum Client satisfaction through our teamwork approach, involving the Clients during all phases of the project.
- We provide optimal Engineering, Managerial and Financial solutions.
- We apply sound economic, energy and environmental considerations.
- We promote improved and sustainable quality of life for all.
- We strive for high standards of honesty and integrity.
- We endeavor to maximize the labor component in all contracts.
- We create opportunities for participation by small and micro contractors, including their training (tendering, drawing up of payment claims, cost control, interpretation of documents and specifications).
- We encourage Co-operative Community Development.
- We train our staff members to their full potential.



## A – PROJECT MANAGEMENT

- Initial Planning
- Design
- Execution
- Financial Management Control



CONSULTING ENGINEERS  
**OUR EXPERTISE**

## B – CIVIL ENGINEERING

### B 1 Urban Development

- Feasibility Studies
- Design and Documentation of:
  - Sewerage Networks
  - Road Infrastructure
  - Water Networks
  - Storm Water Reticulation
- Water Storage & Reservoirs



## **B – CIVIL ENGINEERING**

### **B 2 Housing Development**

- Initiation
- Feasibility Studies
- Housing Proposals
- Design and Documentation
- Execution and Management of Project



## B – CIVIL ENGINEERING

### B 3 Transportation / Roads

#### 1: Rural Roads / Highways / Airports / Rehabilitation

- Low-volume / Feeder Roads
- Main roads and highways
- Feasibility Studies
- Regional Planning
- Rehabilitation
- Airports





## **B – CIVIL ENGINEERING**

### **B 4 Marine & Harbor Engineering**

- Breakwater
- Jetties
- Industrial Heavy Duty Paving
- Piling
- Coastal Engineering Investigations
- Container Terminals

## **B – CIVIL ENGINEERING**

### **B 5 Structural Engineering**

- Structural Steel and Timber Designs
- Structural Concrete Design
- Industrial, Public and Commercial Developments
- Building Services

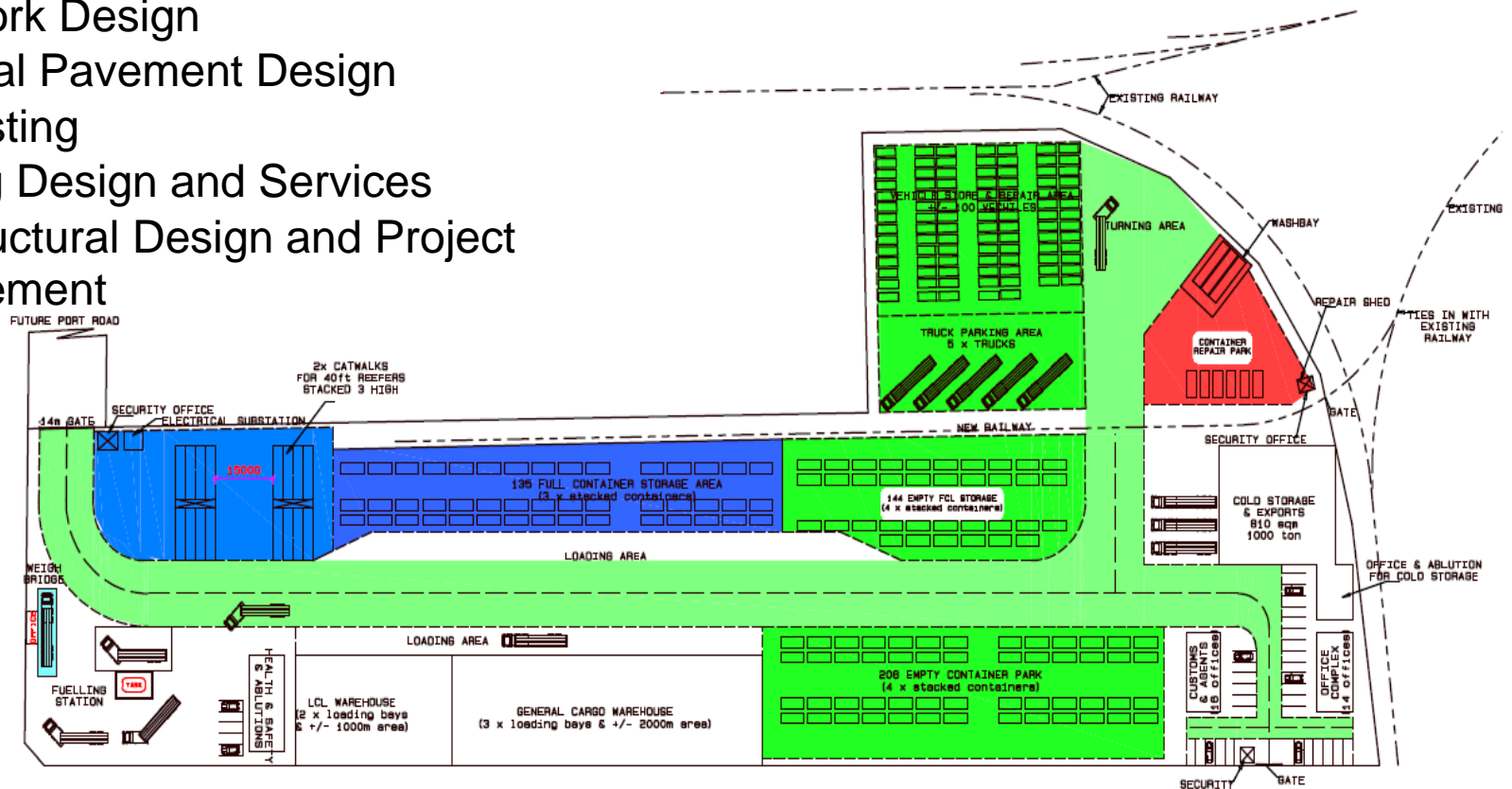


## OUR EXPERTISE

### B – CIVIL ENGINEERING

### B 6 DRY PORT PLANNING AND ENGINEERING

- Concept Layout and Planning
- Earthwork Design
- Industrial Pavement Design
- Soil Testing
- Building Design and Services
- Infrastructural Design and Project Management



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	30 million	4	NAMIBIAN PORTS AUTHORITY	2014/2020	NONE



The Namibian Ports Authority has been planning the extension of the port for several years. The EPC Contract started in 2014 and WML Coast was appointed by the main Contractor as the Structural Engineers for all the structures on the New Container Terminal on reclaimed land.

The project consisted of a five-storey operations centre building, maintenance workshop with 16t overhead crane and service pits, cargo staff ablution block, entrance gate canopies, several substations & pump houses, fueling station with bund area, and a 3300m<sup>3</sup> water reservoir.

Due to the settling nature of the reclaimed founding material, foundations were enhanced using ground beam, raft foundations and precast concrete piles. Piles were tested in accordance with the British procedure as set out in the SANS 1200.

For the Reservoir, the concrete casting sequence and joint positions were planned to avoid restraints during curing, and in turn avoiding shrinkage cracks. Trial walls were cast ensuring that the casting methods accommodate the water stops at joints.



### Type of services provided:

- Coordination with the geotechnical team for borehole data used in pile designs.
- Detail structural design of reinforced concrete piles, foundations, columns, beams, slabs and steel trusses.
- Prepare detail construction drawings and bending schedules.
- Site Supervision and quality monitoring during construction, including 3 in-situ pile tests that succeeded.
- Coordination with project team including the Architect, Mechanical Engineer, EPC Contractor, HSEQ Officers, and the Client representatives





## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	5 million	4	NAMPORT	2001	NONE



The Port of Luderitz needed a heavy duty container terminal suitable for container handling with 120ton axle load Reach Stackers.

The area available consisted of reclaimed sand. The reclaimed sand was compacted by Vibro compaction.

The most cost effective and flexible surfacing solution was to use 80mm Interlocks. due to high corrosive conditions 40Mpa strength was prescribed.

The pavement design required deep insitu vibro compaction up to 6m deep. G5 material was then brought in two layers of 150mm each and stabilized with Lime. The final 2x 150mm layers of G2 material was then brought in and stabilized with Cement.

The 80mm interlocking bricks were then laid to specification.

**Type of services provided:**

- Coordinating Geotechnical Investigation into existing soil conditions.
- Detail structural design of heavy duty interlock paving and pavement layers for 120ton axle load Reach Stackers.
- Site Supervision and quality monitoring during construction

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	15 million	4	NAMPORT	1997	NONE

The Port of Walvis Bay needed a heavy duty container terminal suitable for container handling with 120ton axle load Reach Stackers.

The area available consisted of very poor reclaimed sand. A geotechnical investigation was conducted to determine to what extent the existing material could be used.

The container area had to be designed for a 20 year maintenance free lifespan. Various options from Asphalt surfacing, Concrete surfacing and 80mm thick Interlocking paving was investigated.

The most cost effective and practical solution was to use 80mm Interlocks. Due to high corrosive conditions 40Mpa strength was prescribed.

The pavement design required that 1.5m of existing material had to be removed. The in-situ material was then compacted with standard vibrating rollers. Suitable pavement layers were then brought in different layer thicknesses and stabilized with Cement and Lime. The 80mm interlocking bricks were then laid to specification.

#### Type of services provided:

- Coordinating Geotechnical Investigation into existing soil conditions.
- Detail structural design of heavy duty interlock paving and pavement layers for 120ton axle load Reach Stackers.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	7 million	4	AFRICA FINANCIAL SERVICES	2010	NONE

A Dry Port was needed by the Zambian Government for import and export as well as for container handling, stuffing and de-stuffing.

The container terminal had to be suitable for container handling with 120ton axle load Reach Stackers. A weigh bridge and strict security services had to be put in place. For phase 2 of the project, site reticulation and layout planning was done for offices, cold storage, security, on and offloading from railway trucks, heavy vehicle movements and bulk storage was also considered in the master layout planning.

One of the key problems areas was noise pollution to the surrounding residential areas and this had to be mitigated.

The area available consisted of very poor reclaimed sand. A geotechnical investigation was conducted to determine to what extent the existing material could be used. The most cost effective and practical solution, due to high corrosive conditions was to use special 40Mpa strength interlocks.

The pavement design was then done to suit long term sustainability.

### Type of services provided:

- Coordinating Geotechnical Investigation into existing soil conditions.
- Detail structural design of heavy duty interlock paving and pavement layers for 120ton axle load Reach Stackers.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	12 million	3	MERLUS FISHING	2009 / 2010	NONE

The Project consisted mainly of the structural design of a reinforced concrete jetty structure to service fishing boats.

Double mooring and two way traffic of forklifts offloading boats had to be taken into consideration during design.

The in-situ seabed material was of good quality and an open piled structure was found to be most economical.

A pre-cast beam, slab and cope unit system was developed to speed up construction.

Due to high corrosive environment in Walvis Bay special care had to be taken on cement mixes as well as cover to reinforcement.

**Type of services provided:**

- Coordination with client on load conditions that must be allowed for.
- Detail structural design of reinforced concrete piles, beams and slabs
- Prepare detail construction drawings and bending schedules
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	14 million	3	EBH NAMIBIA	2007 / 2009	NONE

The Project consisted mainly of the structural design of a reinforced concrete jetty and quay structure to service two floating docks.

EBH Namibia introduced two floating docks in the Port of Walvis Bay which required lay-by area and access quays.

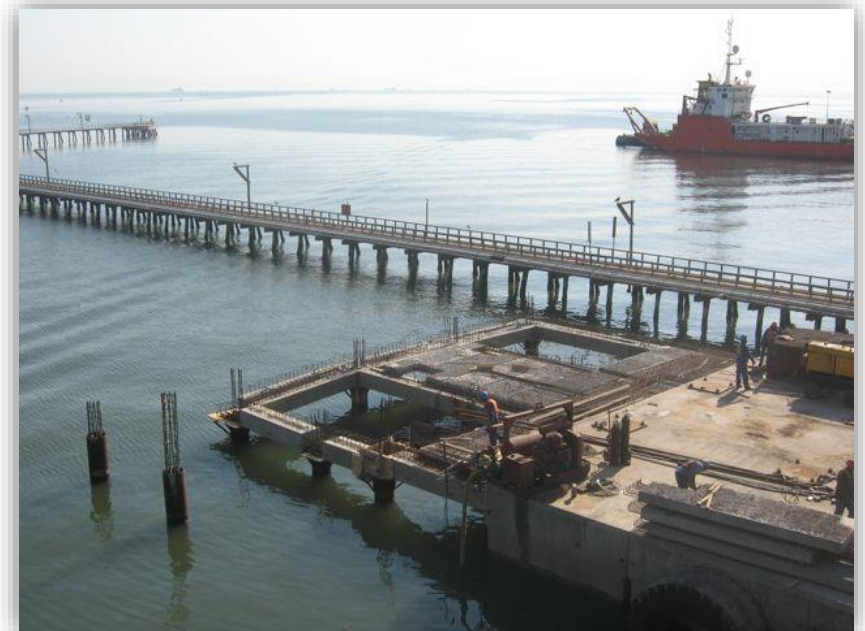
The in-situ seabed material was of good quality and an open piled structure was found to be most economical.

A pre-cast beam, slab and cope unit system was developed to speed up construction.

Due to high corrosive environment in Walvis Bay special care had to be taken on cement mixes as well as cover to reinforcement.

### Type of services provided:

- Coordination with client on load conditions that must be allowed for.
- Detail structural design of reinforced concrete piles, beams and slabs
- Checking of soil conditions
- Prepare detail construction drawings and bending schedules
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	13 million	4	NAMIBIAN AIRPORTS COMPANY	2015	NONE

The existing surfacing of the pavement at the Walvis Bay Airport taxi ways started showing signs of distress.

A geotechnical investigation was conducted to determine what the extend and the reason for the problem was.

Rehabilitation methods had to be designed taking into consideration that the areas are used on a daily basis by aircraft. The most cost effective options were evaluated.

In-situ material was tested to determine whether it can be re-used or even modified to comply to required standards for the loading criteria.

### Type of services provided:

- Coordinating Geotechnical Investigation into existing soil conditions.
- Detail structural design of pavement layers
- Prepare tender documentation and call for tenders



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	5 million	3	NHE National Housing Enterprise	2008 / 2009	NONE

The Project consisted mainly of providing service infrastructure for 316 erven in Kuisebmond, Walvis Bay.

The insitu material consisted of a silty sand and gypsum with the watertable as shallow as 800mm.

The roads were gravel roads constructed from imported gypsum gravel subbase And base layers, with water, sewer and electrical reticulations complete.

### Type of services provided:

- Coordination with client on traffic that will use the roads
- Detail structural pavement design for normal vehicles
- Prepare detail construction drawings.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	18 million	3	WALVIS BAY MUNICIPALITY	2010 / 2011	NONE

The Project consisted mainly of the structural design of roads for a new heavy industrial area for the Walvis Bay Municipality.

The area will service heavy industrial workshops and special care had to be given in the design for turning movements of interlink trucks as well as mobile cranes.

A combination of surfacing options was considered for straight moving vehicles as well as turning movements.

A heavy duty pavement was designed with 80mm interlocking bricks used on intersections or where turning movements will take place and a 40mm Medium Graded Asphalt surfacing and a Cape seal was used for specific straight travelling vehicles.

### Type of services provided:

- Coordination with client on traffic that will use the roads
- Detail structural pavement design for heavy vehicles
- Prepare detail construction drawings.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction





## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	51 million	3	DUNES DEVELOPMENT (PTY) LTD	2011	NONE

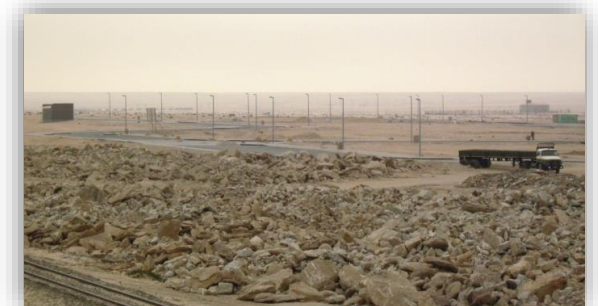
The Project consisted mainly of the civil design of roads, sewer, water and stormwater reticulation to new township developments for Dunes Development (Pty) Ltd in Swakopmund.

The construction site was rocky therefore, explosive were used to make way for the new services.

A combination of surfacing options was used for straight moving vehicles as well as turning movements.

### Type of services provided:

- Coordination with client on traffic that will use the roads
- Detail structural pavement design for normal vehicles
- Prepare detail construction drawings.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	46 MIL	3	WALVIS BAY MUNICIPALITY	2015 / 2017	NONE



The Project consisted mainly of surfacing existing gypsum gravel roads to bitumen standard in and around Walvis Bay.

These areas included residential areas as well as light industrial areas.

All roads were surfaced with a Cape seal, using 13mm chipping stone.

**Type of services provided:**

- Site Supervision and quality monitoring during construction
- Prepare detail construction drawings.
- Prepare tender documentation and call for tenders.



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	123 million	3	WALVIS BAY MUNICIPALITY	2012 / 2016	NONE

The Project consisted mainly of the structural design of roads, sewer, water and stormwater reticulation for a new heavy industrial area and three residential areas for the Walvis Bay Municipality.

The Industrial area has over 410 000 cbm of dunesand material that has to be brought in to obtain the Final fill level. The area will service heavy industrial workshops. 80mm interlocking bricks used on intersections or where turning movements will take place and a Cape seal was used.

The Residential areas are in Kuisebmond, Narraville and Meersig. Each extension has tarred roads with paved pavements.

### Type of services provided:

- Coordination with client on traffic that will use the roads
- Detail structural pavement design for heavy vehicles
- Prepare detail construction drawings.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/ end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	33 million	3	WALVIS BAY MUNICIPALITY	2015 / 2017	NONE

The Project consisted mainly of the Structural Design of Roads, Sewer, Water and Stormwater reticulation for a new residential area in Kuisebmond, Walvis Bay.

This extension was constructed with tarred roads to bitumen standard with paved pavements using 60mm interlocking bricks.

### Type of services provided:

- Coordination with client on traffic that will use the roads
- Prepare detail construction drawings.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	12 million	3	EKANGO SALT REFINERS	2010 / 2011	NONE

The Project consisted mainly of the structural design of a reinforced concrete structure 22m high to accommodate a salt refinery plant.

The building had to be build on very poor soil conditions which consisted of old salt contaminated sand. The contaminated soil had to be excavated up to 1m deep and spoiled. New G5 quality material was imported and compacted to specification.

To avoid any uneven settlements a raft type foundation was designed.

Special care had to be given to punching shear as fairly high point loads was introduced by the 60 ton salt silos hanging from the beams.

A reinforced concrete column, beam and slab structure was then designed and constructed.

Due to high corrosive conditions special care had to be given to type of cement used as well as cover to reinforcement.

A premixed cement mix with fly ash was used to make concrete mix denser.

### Type of services provided:

- Detail structural design of reinforced concrete columns, beams and slabs.
- Checking of soil conditions
- Design of floating raft foundation
- Prepare detail construction drawings and bending schedule
- Site Supervision and quality monitoring during construction



### C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	10 million	3	SCORPION ZINK	2001 / 2002	NONE



The Project consisted mainly of the structural design of a reinforced concrete column and beam structure.

The structure had to accommodate one 25ton and one 20ton overhead crane.

The in-situ founding material was reclaimed sea sand behind a sheet pile quay wall in the Port of Lüderitz.

Standard foundations could therefore not be used and piles had to be driven up to rock level.

Concrete piles with pile caps were used to accommodate the vertical forces and bending moments.

**Type of services provided:**

- Coordination with client on load conditions that must be allowed for overhead cranes.
- Detail structural design of reinforced concrete piles, beams and steel trusses.
- Prepare detail construction drawings and bending schedules
- Site Supervision and quality monitoring during construction



### C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	300 million	3	NAMPORT	/	Inros Lackner AG & Enviro Solutions

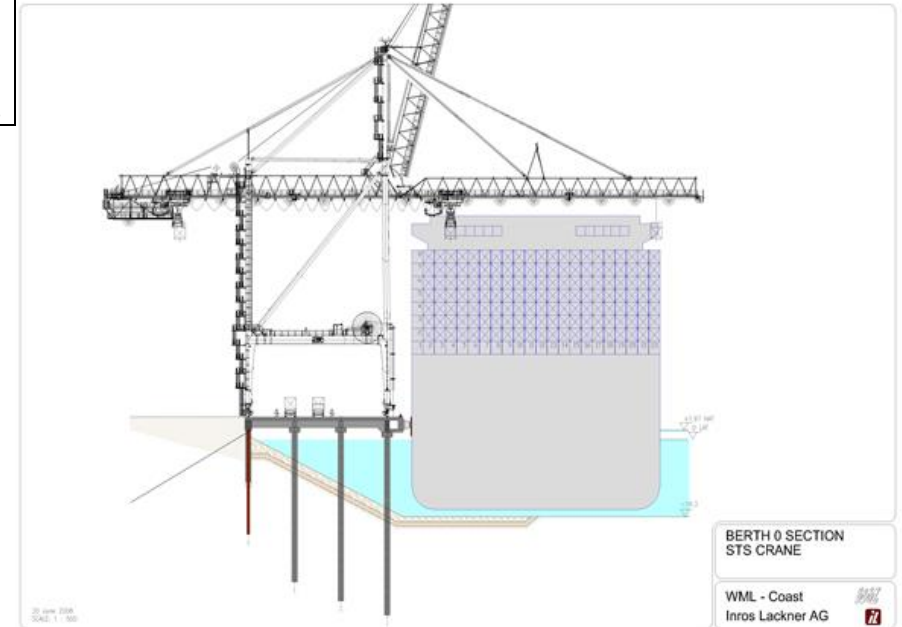
Namport has initiated a master plan study on the future development of the Ports of Lüderitz and Walvis Bay carried out by HPC in 2007. Based on this study Namport has launched another Tender for consultancy services covering the preparation of the design, feasibility study and tender documents on the new Berth 0/1 and to develop concepts including feasibility assessments for a Ship Repair Hub and a dedicated Fish Terminal primarily replacing the landing of fish at berth 4/5.

The Structural Concept for the project entitled:

- The structure is an open piled reinforced concrete quay structure.
- The quay accommodates STS cranes with a rail gauge of 30.48m.
- The structure will be supported on cased reinforced concrete piles. The pile grid will consist of 4 pile rows 10.16m apart and transverse spacing of 6m.
- Laterally the structure will be anchored with post tensioned concrete beams and rear reinforced concrete anchor wall.
- Along the landside edge a reinforced concrete sheet pile cut off wall will be installed to retain backfill.
- Along the seaside edge bollards and fenders will be installed.
- Services will be contained in a service duct along the seaside edge.

**Type of services provided:**

- Detailed condition survey of existing structure including UTM and analysis of concrete.
- Deflection tests with heavy crane to observe structural behaviour under load.
- Structural analysis of existing structure and with modifications.
- Detail design of pile upgrading, crane pads, composite structural elements, fenders, new piles, corrosion protection.



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast (Pty) Ltd	ANGOLA	4.5 million	3	Cabinda Gulf Oil Company (CABGOC)	2005 / 2007	NONE

This project primarily involves the reconstruction of the existing dock at Malongo, Cabinda, Angola to remain serviceable for a further 30 year term. The jetty was originally constructed in 1963 and consists of an open piled steel structure with concrete rib and block infill deck.

The project commenced with a thorough investigation regarding the status quo of the existing structure taking stock of factors such as pile bearing capacity, deck capacity, corrosion of steel, fenders, bathymetry and a host of related issues. The investigation proceeded to determine future operational requirements and options for repair and upgrade. Important was that the dock must remain operational throughout the reconstruction process.

Design options were narrowed and it was resolved that the entire deck is to be replaced with a new concrete deck constructed as composite with remaining steel beams. Capping beams are to be reconstructed as deep composite beams to facilitate adding piles at a later date. A range of other improvements will also be incorporated such as inner pile grouting, adding crane pads for heavy lifts, adding fenders at certain locations, widening the dock to facilitate larger turning circles for long trucks, etc.

### Type of services provided:

- Detailed condition survey of existing structure including UTM and analysis of concrete.
- Deflection tests with heavy crane to observe structural behaviour under load.
- Structural analysis of existing structure and with modifications.
- Detail design of pile upgrading, crane pads, composite structural elements, fenders, new piles, corrosion protection.
- Detail construction planning in conjunction with logistics, operational requirements, truck and crane operations.
- Once the construction has been completed, a detailed operational and maintenance schedule will be produced.





## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast (Pty) Ltd	ANGOLA	0.8 million (estimated)	2	Cabinda Gulf Oil Company (CABGOC)	2005 / 2006	NONE

This project entailed a detailed investigation towards the condition of the existing dock and to determine options towards upgrading to deal with a range of commodities ranging from containerized goods, bagged bulk, break bulk and piping. The jetty was originally built in 1955 for typical loads not exceeding around 7 ton.

The dock was surveyed in detail to establish 'as built' layout and features. Investigation included items such as estimating pile bearing capacity, structural capacity, vessel berthing forces and a host of related issues. A bathymetric survey was also performed to verify depths and potential need for dredging.

A variety of upgrade options related to a range of operational scenarios was developed. The final option for upgrading will depend on logistical requirements and alternative harbour developments

### Type of services provided:

- General condition survey of 'as built' layout and structural condition of steel members.
- Structural analysis of existing dock and of various upgrade scenarios.
- Detailed design of minimum upgrade option to enable use of specific crane and truck operations.



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	6 million	3	NAMPORT	2004 / 2005	NONE

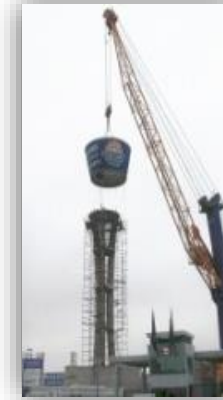
The Port of Walvis Bay experienced water supply and water pressure problems when all the port users were using water simultaneously. An investigation was needed on how to solve the problem and to design a new system to provide water at sufficient flow capacity as well as at sufficient pressure.

Pressure and flow measurements were taken at different points in the port to determine problem areas. It was found that the supply pressure of the water and the pipe sizes in the port was too small. The pressure problem could be solved by building an elevated water reservoir and increase the water pipe sizes to the quay and other large water users in the port e.g. the Cold Storage Facilities.

A few concept designs were done because the briefing from the client was that the water tower should also be aesthetically pleasing. Due to limitations of capacity of the biggest cranes available for construction locally a system was developed where a large ground reservoir was built with a pump system feeding a smaller elevated 450cubm concrete reservoir 35m high. From this elevated reservoir water then flow under gravitation to the quayside through a new 350m water pipe.

### Type of services provided:

- Coordinating Geotechnical Investigation for new water tower.
- Analysing water usage and water requirements for Port of Walvis Bay
- Detail structural design of elevated concrete water tower and water reservoir to satisfy future water usage of port.
- Analysing water reticulation system and design new water pipe sizes to serve existing quays.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	9 million	4	DORMAC	2011 / 2012	NONE

The Project consisted mainly of the structural design of a reinforced concrete structure 19m high to accommodate two 25 ton overhead cranes inside the building. As well as lifting the existing building structure 15m high to accommodate a 10 ton overhead crane, but will only be build in phase 2 of construction.

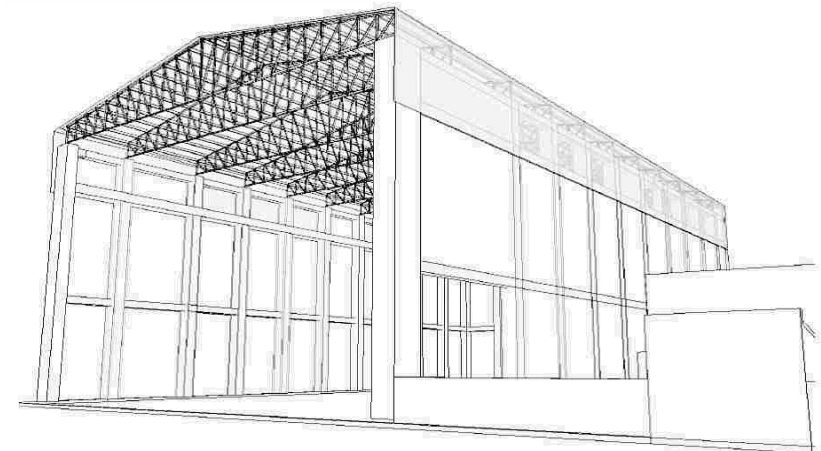
The in-situ founding material was reclaimed sea sand and clay sand where further ground tests had to be done.

Structure also had to be designed so that the doors could be as high as possible as well as removable for certain projects of the Client.

Roof trusses had to span 18m as large areas were needed for Marine & Engineering production.

### Type of services provided:

- Coordination with client on load conditions that must be allowed for overhead cranes.
- Detail structural design of reinforced concrete footings, columns, beams and steel trusses.
- Prepare detail construction drawings and bending schedules
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	12 million	4	PESCANOV A	2009 / 2010	NONE

The Project consisted mainly of the structural design of reinforced concrete column and beam structure. The design of cold store and freezer room floor slabs.

Concrete retaining wall for the container loading bays was designed.

Roof trusses had to span 25m as large areas were needed for fish processing.

**Type of services provided:**

- Coordination with client on load conditions that must be allowed for, especially freezing equipment in roof space.
- Detail structural design of reinforced concrete footings, columns, beams and steel trusses.
- Prepare detail construction drawings and bending schedules
- Site Supervision and quality monitoring during construction



Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	13 million	3	HANGANA SEAFOOD (PTY) LTD	2009 / 2010	NONE

The Project consisted mainly of the structural design of reinforced concrete column and beam structure. The design of cold store, freezer rooms and blast freezer floor slabs.

The in-situ founding material was reclaimed sea sand and special care had to be given to that.

Roof trusses had to span 28m as large areas were needed for fish processing.

**Type of services provided:**

- Coordination with client on load conditions that must be allowed for, especially freezing equipment in roof space.
- Detail structural design of reinforced concrete footings, columns, beams and steel trusses.
- Prepare detail construction drawings and bending schedules
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

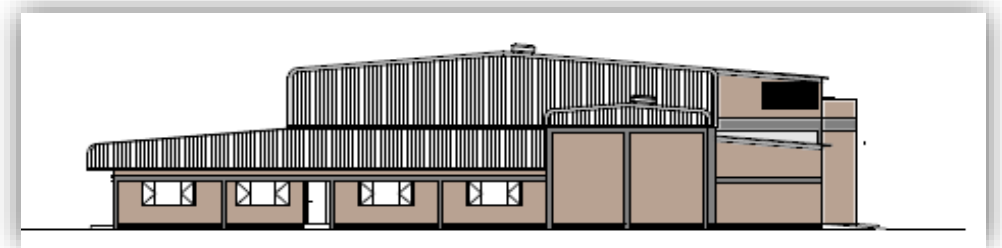
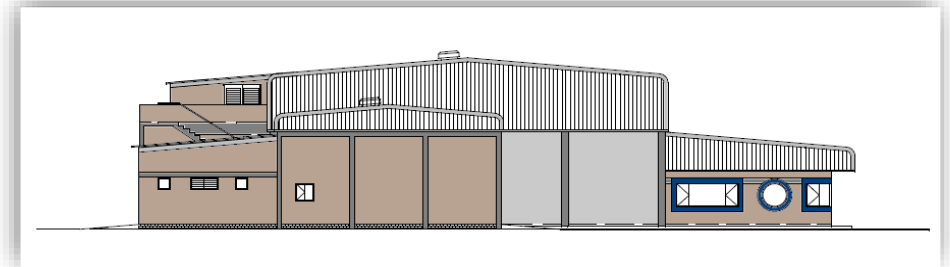
Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	12.2 million	3	OMANKETE SEAFOOD PROCESSORS (PTY) LTD	2010	NONE

The Project consisted mainly of the structural design of reinforced concrete column and beam structure. The design of cold store, freezer rooms and blast freezer floor slabs.

Roof trusses had to span 15m as large areas were needed for fish processing.

**Type of services provided:**

- Coordination with client on load conditions that must be allowed for, especially freezing equipment in roof space.
- Detail structural design of reinforced concrete footings, columns, beams and steel trusses.
- Prepare detail construction drawings and bending schedules
- Site Supervision and quality monitoring during construction



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	40 million	4	BOTSWANA DRY PORT	2010/Ongoing	NONE



A Dry Port was needed by the Botswana Government for import and export as well as for container handling, stuffing and de-stuffing in the Port of Walvis Bay.

The container terminal had to be suitable for container handling with 120ton axle load Reach Stackers. A weigh bridge, Security offices, Future Cold store, strict security for bonded areas, offices, customs, bulk warehousing and new Electrical and Civil services reticulation had to be planned. Heavy Traffic movement, turning circles was investigated for optimum land usage.

The area available consisted of very poor clay silt material. The area was also only 700mm above the water table and a proper geotechnical investigation and design was required to accommodate the Employers requirements

The most cost effective and practical solution due to high corrosive conditions, was to use a special mix for interlock surfacing.

The pavement design was done to meet the long term sustainability requirements from the Employer.

### Type of services provided:

- Coordinating Geotechnical Investigation into existing soil conditions.
- Detail structural design of heavy duty interlock paving and pavement layers for 120ton axle load Reach Stackers.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction



Ref. 1	Project title					
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	10 million	3	Seawork Fishing	2019	NONE



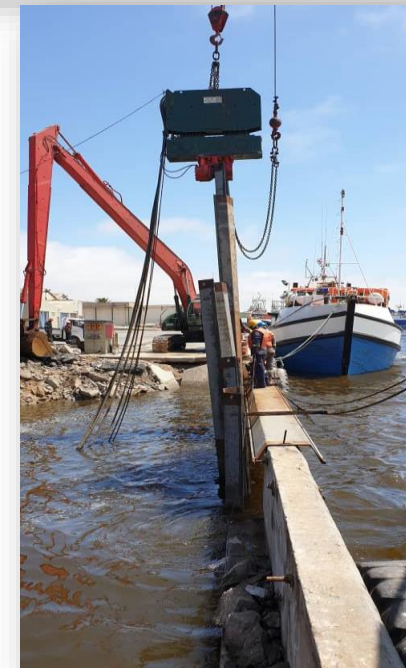
**A Concrete Sheet pile wall collapsed at a Fishing Factory.  
The toe of the sheet pile wall was undermined and caused the collapse.**

**The collapsed area had to be stabilized to prevent further damage while repair methods were designed and investigated.**

**The collapsed structure was replaced and repaired with steel sheet piles and new anchors were Installed**

**Type of services provided:**

- Coordination with Client on temporary stabilization and safe guarding of the rest of the structure to avoid further damage due to sea swells and wave action
- Detail design of repair proposals
- Cost evaluations to obtain most practical, quickest, safest and most suitable repair procedure.
- Prepare tender documentation and call for tenders.
- Site Supervision and quality monitoring during construction





## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title		Langer Heinrich Mine Restart Project			
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	Inspection 247,528.37  Constr. Estimate	4	LANGER HEINRICH URANIUM (PTY) LTD	5 Oct 2020 / 04 Dec 2020	none



The Langer Heinrich Mine (LHM) has been in care and maintenance since May 2018. During this period a significant amount of deterioration of the civil and structural members were noted, and there was a need for further investigation.

The LHM restart project involved a conditions assessment on the civil and steel superstructures and buildings.

On site findings were recorded with photo cameras, Microsoft OneNote and notebooks, and incorporated in concise reports. Reports included all the information gained from site and the laboratory. Tables of findings with quick reference to the corresponding photograph and site position for easy future locating of anomalies were also included. Findings included deteriorating concrete, rusted reinforcing, salt ingress, rusted steel structures, missing steel members, and damages to steel members.

The concrete damages were suspicious and further expertise on concrete failure were involved. Core samples were obtained and sent to a laboratory for further investigation to obtain the best solution for the repair methods and future durability of the structures.

Interactive cost estimates were prepared in Microsoft Excel to assist in cost estimations and prioritizing repairs.

### Type of Services Provided:

- Visual inspection and records that identify the critical repairs
- Tables that categorize the findings
- Coordinating the further concrete investigations
- Recommendations and design of typical repairs
- Quantities and cost estimates of repairs per category



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title		Annual Structural Integrity Inspections			
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	50 000	2	NAMIBIA DRYDOCK & SHIP REPAIRS (NAMDOCK) Pty Ltd	Nov 2015 – June 2021	none



Namdock uses steel ramps and a concrete jetty structure to access the 3 floating ship repair docks in Walvis Bay. These structures play an important role in the daily ship repair activities and are subject to heavy and routine loading and a corrosive environment.

The Project entailed the Structural integrity inspections and reports and are done annually to monitor the structural state of the elements. Typical damages include corroded steel, bent and buckled steel members, rusted reinforcing in reinforced concrete (spalling), and other concrete damages.

Visual inspections are done to record such findings and a concise report with recommendations are provided to assist the employer with effective repairs at the lowest possible cost.

### Type of Services Provided:

- Onsite inspections by Engineer and Technician
- Recording of all findings using cameras and note books
- Coordinating of further testing as needed.
- Reports and recommendations
- Work packages with repair specifications, tender process and repair supervision



## CONSULTING ENGINEERS C: PROJECTS / EXPERIENCE

Ref. 1	Project title		Consultancy Services for structural inspection of plant structures			
Name of legal entity	Country	Overall project value (NAD)	No of staff provided	Name of client	Dates (start/end)	Name of partners if any
WML Coast Consulting Engineers (Pty) Ltd	NAMIBIA	345,060.48	4	CNNC Rössing Uranium Limited (RUL)	11 May 2020 / 31 Aug 2020	none

The structures at CNNC Rössing Uranium Limited support the processing, crushing and tailings plant and are crucial for the daily uranium processing activities. RUL started processing uranium in the 1970's and some of these structures date back decades and are constantly subject to heavy and dynamic loads from (among others) crushers, mills, tanks and conveyors.

Inspections on these structures were done to ensure that all damages are identified, noted and reported simply and accurately. Reports included recommendations for the rehabilitation and/or rebuild of structures to be conducted safely, timeously, structurally effective, and at the lowest possible cost.

The structural inspection was conducted over a period of roughly a month and the concise reports and cost estimates followed. Findings were photographed, recorded, mapped and categorized from most to least critical using a risk assessment. The most critical findings formed part of the cost estimate used by the employer for budgeting purposes.

Items were identified specifically looking at the overall structural impact, with a focus on safety hazard taking the highest priority.

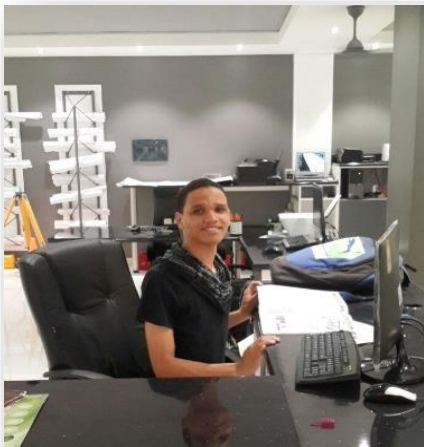
### Type of Services Provided:

- Detail structural inspection and documentation
- Risk based prioritization of defects
- Design suitable repair methods and procedures
- Develop work packages for critical structural repairs



### ***D: NAMIBIAN STUDENT TRAINING PROGRAM***

**WML COAST CONSULTING ENGINEERS** is committed in creating opportunities for young pre-graduate Namibians to experience Civil Engineering through our structured training program. We believe that our training program creates a stepping stone for previously disadvantaged Namibian in becoming Civil and Structural Engineers.



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