



ERF 974/1 Misty Cliffs

Transport Impact Statement

Final Report

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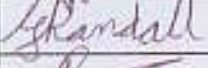

TITLE : ERF 947/1 Misty Cliffs Transport Impact Statement				
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SYNOPSIS : This Traffic Impact Statement (TISm) forms part of the requirements of the Urban Transport Act (1977). The purpose of the TISm is to determine the transport impact of the rezoning of Erf 974/1, Misty Cliffs. The TISm investigates three viable access alternatives for the proposed development.				
KEY WORDS : Transport Impact Statement, Access				
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QUALITY VERIFICATION				
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Verification	Capacity	Name	Signature	Date
By Author	Professional Staff	G Venter		05/07/2010
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TABLE OF CONTENTS	PAGE
1. INTRODUCTION	3
1.1 Terms of Reference	3
1.2 Background Information.....	4
2. EXISTING LAND-USE & ROAD NETWORK	5
2.1 Land-use.....	5
2.2 Road Network	7
3. ACCESS ALTERNATIVES	9
3.1 Alternative A	9
3.2 Alternative B	14
3.3 Alternative C	17
3.4 Access Assessment Findings.....	21
4. CONCLUSIONS & RECOMMENDATIONS.....	22
APPENDIX A: SCOPE OF WORKS.....	24
APPENDIX B: BACKGROUND INFORMATION RECEIVED.....	25

LIST OF FIGURES	PAGE
Figure 2.1: Site Location & Road Network	6
Figure 2.2: North-west Along Main Road From Erf974/1 Towards Parking Area	7
Figure 2.3: Speed Limit Signage Travelling South-east Toward Misty Cliffs	8
Figure 3.1: Alternative A – Access Locality & Sight Distance	10
Figure 3.2: Alternative A – Vehicle Turning Paths	12
Figure 3.3: Alternative A Sight Lines	13
Figure 3.4: Alternative B – Access Locality & Sight Distance	15
Figure 3.5: Alternative B – Vehicle Turning Paths	16
Figure 3.6: Alternative B Sight Lines	17
Figure 3.7: Alternative C – Access Locality & Sight Distance	18
Figure 3.8: Alternative C – Vehicle Turning Paths	19
Figure 3.9: Alternative C Sight Lines	20

LIST OF TABLES

Table 3.1: Access Alternatives Evaluation Matrix	21
Table 3.2: Access Alternatives Evaluation Matrix (Including Signage Changes)	21

1. INTRODUCTION

1.1 Terms of Reference

Jeffares & Green (Pty) Ltd were appointed by Mr Malcolm Driessel on 23 March 2010 to undertake a Transport Impact Statement (TISm) for a proposed new vehicular access to Main Road (M65) for Erf 974/1 Misty Cliffs, Cape Town.

Based on the initial information provided, the envisaged scope of works for a TISm included (see **Appendix A**):

1. Liaison with Local and Provincial Transport Authorities
2. Site visit
3. Background traffic survey
4. Trip generation analysis
5. Vehicle queuing analysis at proposed access
6. Basic geometric assessment & sketch of proposed access
7. Reporting
8. Meeting with client and/or project team

However, during initial discussions with City of Cape Town Transport Planning Officials, it was established that due to the nature of the proposed development and the land-use/road network environment, the scope of the TISm should be amended to focus more on the geometric assessment of vehicular access to Main Road and all feasible access alternatives should be assessed.

On the other hand, *background traffic surveys, trip generation analysis and vehicle queuing analysis* are of less importance for the purposes of this particular TISm, as few peak hour trips will be generated by the proposed single residential property and this section of Main Road currently does not carry significant traffic volumes, even during peak times.

As a result, the initial TISm scope was amended to take cognisance of the development circumstances and to ensure that the pertinent issues are comprehensively addressed. The following tasks constitute the revised TISm scope of works, upon which this report was based:

1. Liaison with Local and Provincial Transport Authorities
2. Site visit
3. Sight line analysis (shoulder and stopping sight distance)
4. Vehicle turn path assessment
5. Access spacing assessment
6. Future plans/road widening schemes for Main Road
7. Conceptual layout drawings of access options

8. Meeting with client and/or project team
9. A short report, summarising the above findings

The purpose of this report is to present and discuss the key findings of the assessment of viable access alternatives, as well as to provide recommendations on the way forward for this application.

1.2 Background Information

A topographical and cadastral survey was obtained from Terry McSweeney Associates Professional Land Surveyors. This information is contained in **Appendix B**.

2. EXISTING LAND-USE & ROAD NETWORK

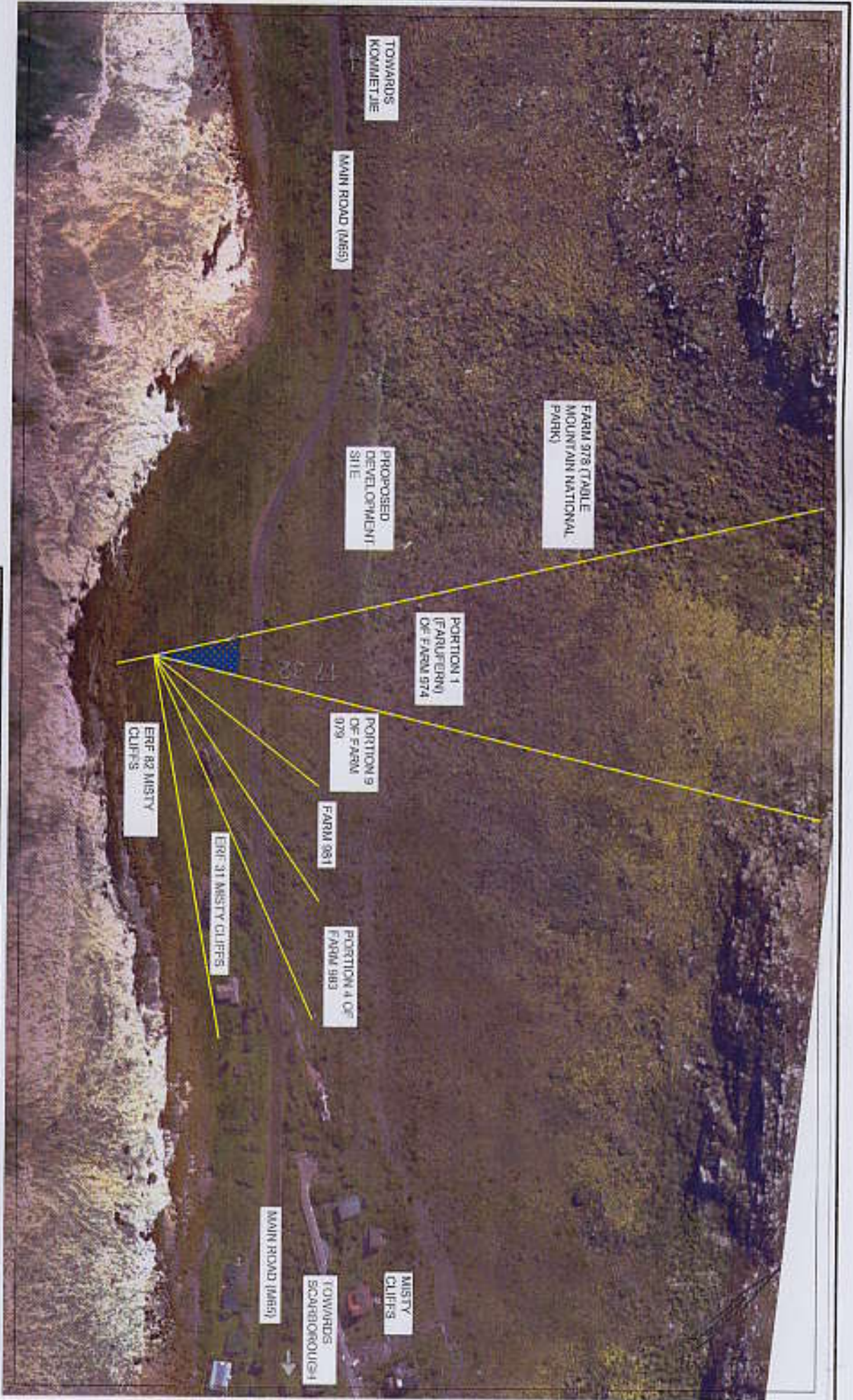
2.1 Land-use

As shown in **Figure 2.1**, Erf 974/1 (also known as Farm Farufern) is located on the north-western edge of the Misty Cliffs residential area, on the western coastline of the Cape Peninsula. Erf 974/1 is wedge-shaped, starting from a corner point near the shoreline and expanding away from the coast, into the mountainous terrain above Main Road. The majority of Erf 974/1 is located on the mountain side of Main Road, with a relatively small triangular portion (498m²) situated on the sea side.

Erf 974/1 is bordered to the south-east by land owned by the City of Cape Town (CoCT) and to the north-west by Table Mountain National Park (TMNP) land. As shown in **Figure 2.1**, two existing single residential properties, both of which gain full direct vehicular access to Main Road, lie between the below-road portion of Erf 974/1 and the rest of the Misty Cliffs residential area.

Further along Main Road, beyond Misty Cliffs, is the larger Scarborough residential area. As Erf 974/1 is currently vacant and does not accommodate any land use, there is no formal access to this property from the public road network.

A small gravel TMNP parking area adjacent to Erf 974/1 on the verge of Main Road is currently utilised by recreational walkers to park whilst hiking on the extensive trails provided in this region (see **Figure 2.2**).



PROJECT TITLE
ERF 974-1 MISTY CLIFFS ACCESS
 SITE LOCATION & ROAD NETWORK
 Scale 1:1000



FIGURE 2.1

Figure 2.2: North-west Along Main Road From Erf974/1 Towards Parking Area



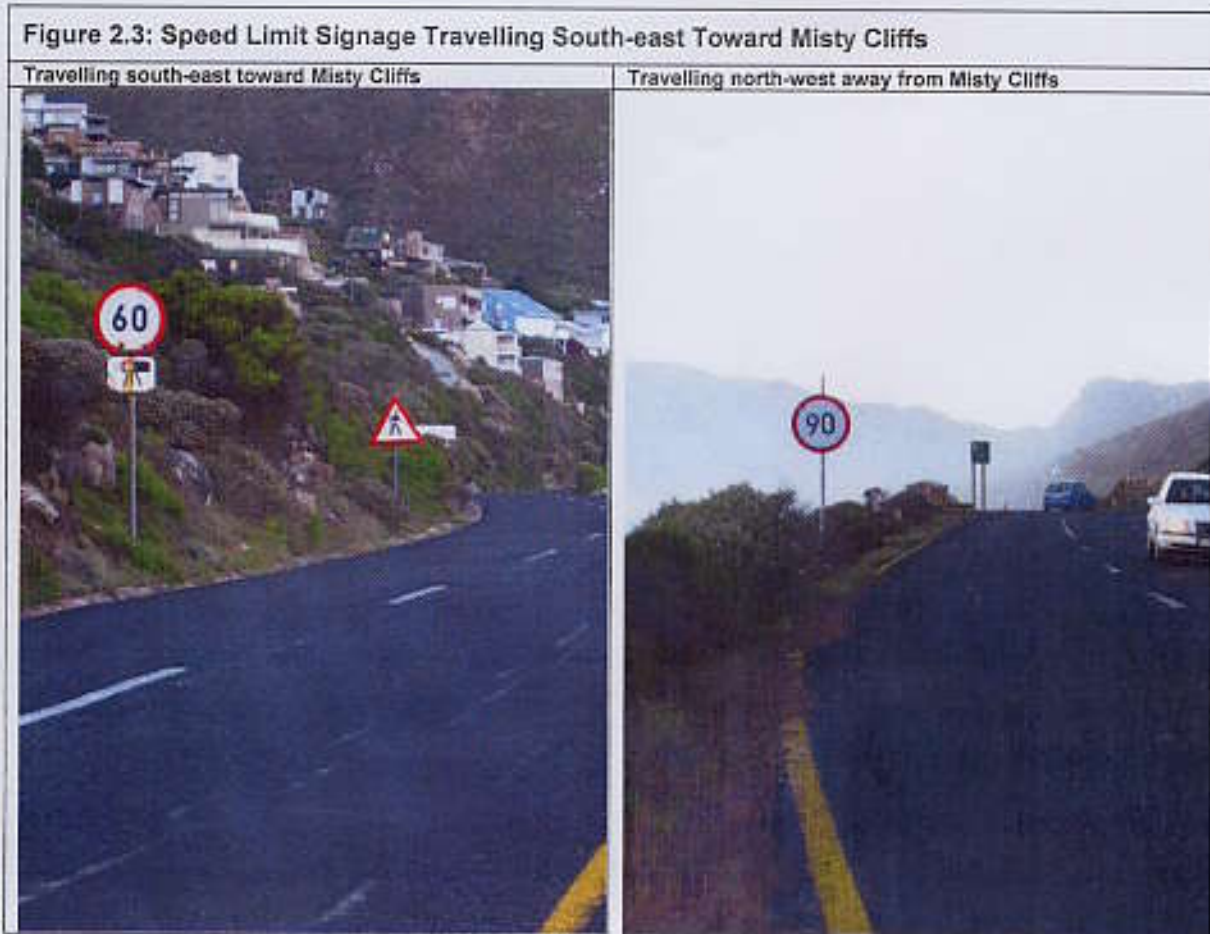
2.2 Road Network

Main Road (M65) is a Class 3 Secondary Arterial, operating in a 'suburban' development environment in the vicinity of Misty Cliffs, and a 'rural' environment toward the north-west. However, as Erf974/1 is located on the periphery of the established Misty Cliffs area, the development environment is considered to be suburban for the purposes of this TISm.

There is no significant vertical undulation in the section of Main Road in the vicinity of Erf 974/1, which is mostly flat in both directions. There are, however, several horizontal curves in Main Road to the north-west of the property, although it straightens between Erf974/1 and the Misty Cliffs area. Main Road consists of a single 3.4m wide lane in each direction (6.8m total road width), with no shoulders or sidewalks. The Main Road reserve is 17.32m wide.

It was established that there is a future road widening scheme on the northern (mountain) side of Main Road, extending from Scarborough to the north-eastern edge of the established Mist Cliffs area. As the potential future implementation of the scheme will require extensive private residential land expropriation in Misty Cliffs and Scarborough in order to accommodate the road widening, the implementation thereof is highly impractical. However, should the scheme be implemented in the future, the proposed development will not be affected, as the widening will terminate prior to reaching Erf 974/1.

The portion of Main Road between Misty Cliffs and Erf 974/1 is signposted as being a 60km/h zone for those travelling away from the suburb in a north-westerly direction, increasing to 90km/h thereafter, as shown in Figure 2.3.



Travelling towards Misty Cliffs (south-east), however, the speed limit decreases from 90km/h to 60km/h, as a residential neighbourhood is being approached.

3. ACCESS ALTERNATIVES

Four possible alternatives were considered for the purposes of this application, of which three are for access possibilities for the portion of Erf 974/1 below Main Road and one for the portion above.

After a preliminary overview of the options, as well as a site visit, the above-road access option was discarded, due to the highly sub-standard sight-lines available along Main Road, especially to the north-west. Poor visibility from this point is mainly due to the fact that the access would be located on the less-favourable position on the 'inside' of the curve of Main Road.

Although direct access to the above-road portion of land is not feasible, it is possible to take direct access to the below-road portion (as will be discussed in later sections of this document) and implement a tunnel beneath Main Road to access the above-road portion. This will, however, depend on the stance taken by Road Authorities on the registration of an access servitude beneath Main Road.

Hence, only the three below-road options were assessed in further detail, as a feasible below-road access from Main Road could also potentially be adapted to provide access to a building on the upper side of Main Road (via a tunnel, as mentioned above), if required. The details of the three access alternatives will be discussed in further detail in this section.

Stopping and shoulder sight distance assessments were conducted in accordance with the *Geometric Design of Urban Collector Roads* (CUTA, 1986). Given the geometric and operating characteristics of the road, the prescribed shoulder and stopping sight distance requirements are 120m and 80m respectively for a 60km/h zone, and 180m and 135m respectively for a 90km/h zone (CUTA, 1986).

Unfortunately the *Road Access Guidelines* (Provincial Administration Western Cape, 2002) do not publish access spacing guidance specifically for low volume driveways (as is being proposed) on a Class 3 Road such as Main Road. However, *Geometric Design of Urban Collector Roads* (CUTA, 1986) indicates that T – junction accesses to an Arterial Road should be spaced no less than 100m apart. This was hence used as guidance for the purposes of this TISM.

Each Alternative was evaluated against these geometric/planning criteria, as will be discussed in the sections to follow.

3.1 Alternative A

As shown in Figure 3.1, *Alternative A* consists of an access located directly between Main Road and the below-road portion of Erf 974/1.

The proposed access is 4m wide, which is acceptable for servicing a two-way single residential property.

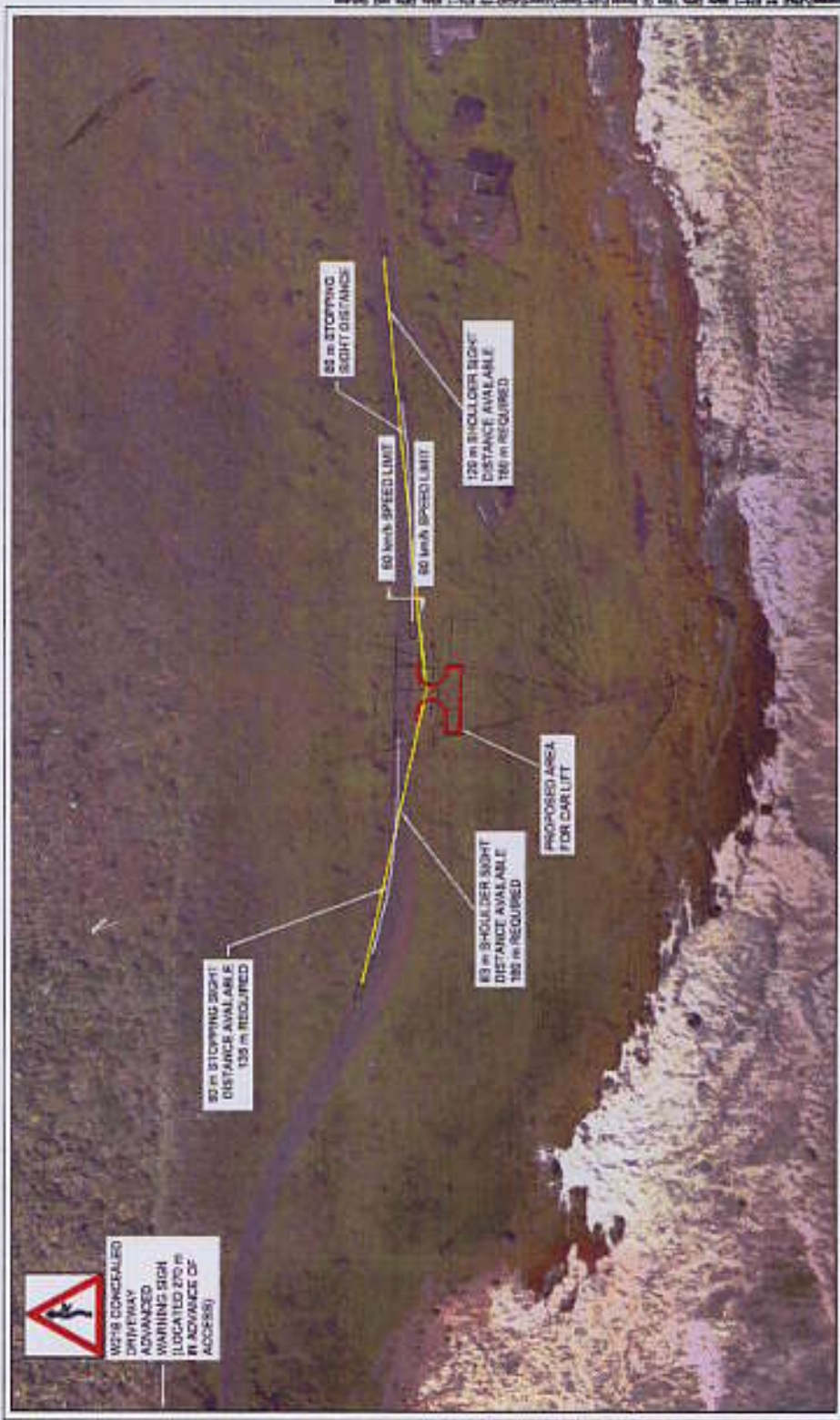


FIGURE 3.1



PROJECT: **ERF 974-1 MISTY CLIFFS ACCESS**
 TITLE: **ALTERNATIVE A--ACCESS LOCALITY AND SIGHT DISTANCE**
 Scale: 1"=100'


W-58 CONCEALED DRIVEWAY ADVANCED WARNING SIGN (LOCATED 270 FT ADVANCE OF ACCESS)

Vehicle turn path software was used to track the movement of left and right turning movements to and from the property. As shown in **Figure 3.2**, the access width and bell-mouth radii are sufficient to accommodate all such vehicular movements.

Upon entering the driveway from Main Road, the resident/motorist will be faced with a 'hammer-head' type T – junction, where they will turn right in order to enter a park lift facility.

The park lift will rest under ground, with the top of the structure lying flush with the driveway surface. The system will be activated via a remote control, temporarily raising the submerged garage from under ground to a point where the floor is flush with the driveway surface to allow vehicle entry.

Once the vehicle is safely parked inside the unit, the driver will exit the vehicle and step aside as the park lift platform is mechanically lowered underground to store the unit and vehicle, out of sight from the surface. The resident will then cover the last few metres into the actual building on foot.

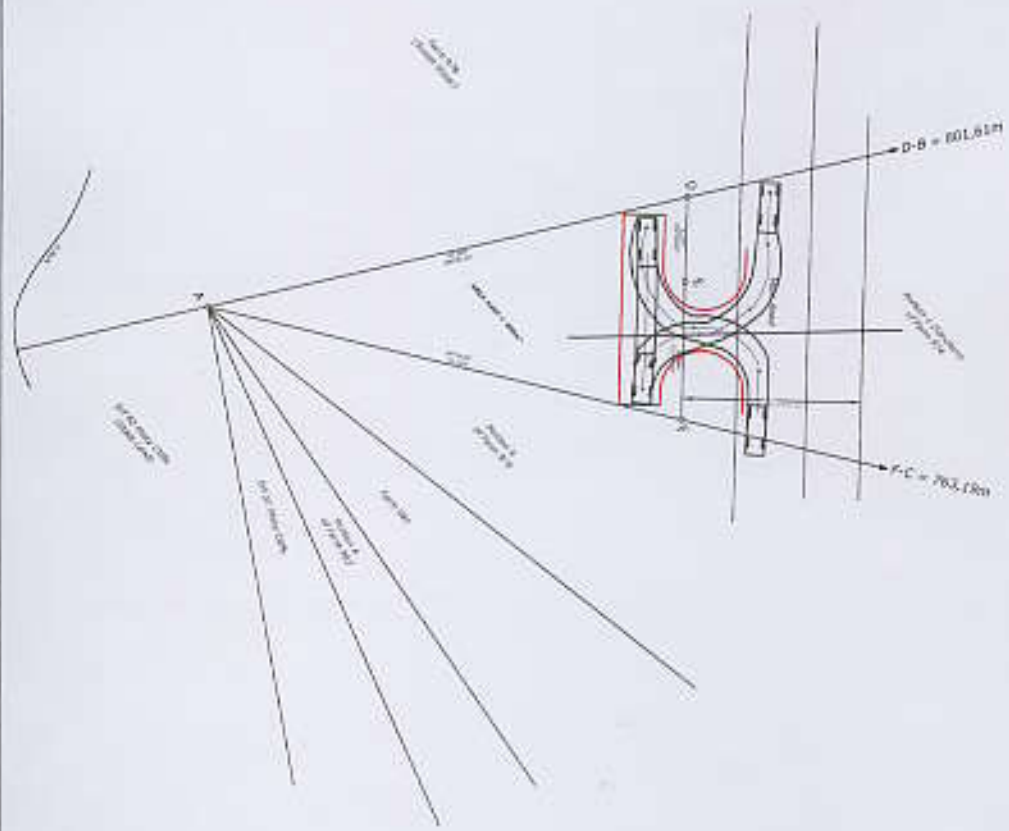
Upon egress, the resident will activate the mechanism to raise the park lift containing the vehicle from below-ground to ground level, from where the driver will enter the vehicle and reverse into the opposite leg of the hammer-head and turn right to exit the driveway in a forward motion (see **Figure 3.2**)

As this system is highly dependant on the relation of the driveway and park lift to the actual building structure, it can only be finalised at the detail design stage, in collaboration with the building's Architects and Structural Engineers.

Stopping sight distance is the distance from the point where a stationary vehicle will wait in the road to turn into the proposed access driveway, to the point where the stationary vehicle first enters an approaching motorist's line of sight.

Given the variables applicable to this section of Main Road, as well as the access location, 60m and over 80m stopping sight distance is available to the north-west and south-east of the proposed access respectively. The 60m available distance to the north-west is 75m less than the prescribed distance of 135m, as this section of the road operates at a 90km/h speed limit.

Should the speed limit be reduced to 60km/h (as it is to the south-east of Erf 974/1), the available stopping sight distance will only fall short by 20m (as only 80m will be required).



PROJECT
ERF 974-1 MISTY CLIFFS ACCESS
 TITLE
ALTERNATIVE A - VEHICLE TURNING PATHS
 Scale 1:500



FIGURE 3.2

Revised: 02/07/2010

Figure 3.3 shows the view in both directions from the approximate point on Main Road where *Alternative A* is located.



The circled area on the north-west photograph in Figure 3.3 indicates the embankment on the mountain-side of Main Road that obstructs the sight-line from the proposed access point to the north-west.

This access will be located approximately 120m from the nearest existing residential access, which is in line with the guidance discussed Section 3.

The key advantage of this proposal is the minimal disruption to the surrounding natural landscape, as no excavation or retaining structures are required. There will also be minimal impact on neighbouring properties, as the entire access is located within the bounds of Erf 974/1.

Visual intrusion will be minimal, as vehicles are stored beneath the driveway surface, with the park lift only emerging when required. It will also not be necessary to construct vehicle ramps with retaining walls and fill structures, as the driveway could remain at road level (or just below) due to the fact that the garage structure is contained underground and will not have a visual impact.

The disadvantage in this case is the sub-standard stopping sight distance to the north-west of the proposed access, which can be ascribed to a combination of roadside topography, the horizontal curve in Main Road and the 90km/h speed limit.

This shortfall could be mitigated by implementing a W216 sign on Main Road at a point 270m to the north-west of the proposed access, warning motorists of concealed driveways ahead and encouraging lower speeds upon approaching the proposed access (see Figure 3.1).

The two road signs shown in **Figure 2.4** could also be relocated further to the north-west of the proposed access to reduce the operating speed from 90km/h to 60km/h on this section of Main Road. This operating speed reduction will decrease the required stopping sight distance from 135m to 80m, leaving the proposed access only 20m short, as opposed to 75m.

It is technically possible to facilitate improved sight-distance through "day-lighting", which involves cutting a portion the obstructing embankment to allow for better sight-lines and implement a retaining wall. This is, however a visually intrusive measure, which is likely to be looked upon unfavourably by the relevant environmental management authorities, especially as it is neighbouring land that will be excavated.

3.2 Alternative B

As shown in **Figures 3.4** and **3.5**, *Alternative B* consists of an access located 30m north-west of *Alternative A* along Main Road. This option provides access to the below-road portion of Main Road via the neighbouring TMNP land, directly from the TMNP hiker parking area discussed in **Section 2.1** and is hence dependant on gaining permission to secure a land portion for a driveway through this property in order to reach Erf 974/1.

Once the driver has turned into the access, they will follow the down-sloping driveway ramp through the TMNP land in order to access Erf 974/1.

Once across the property boundary, the driveway will be 4.5m below the road surface, hence a significant retaining structure will be required between the property and the road reserve.

The purpose of lowering the vehicle this far, is that a turning shunt is required in order to allow the driver to turn around and exit the driveway in a forward motion. As there is very limited space within the bounds of the property, the turning shunt will be a small tunnel that extends under the Main Road reserve, as shown in **Figure 3.4**.

The detailed configuration of the internal circulation and placement of parking spaces and turning shunts will be greatly influenced by the architectural building proposal at a later stage and there hence may be solutions whereby vehicles park inside the building itself or on the roof thereof.

No under-ground park lift system is required in this case, as two parking spaces will be provided within the driveway layout (see **Figure 3.4**)

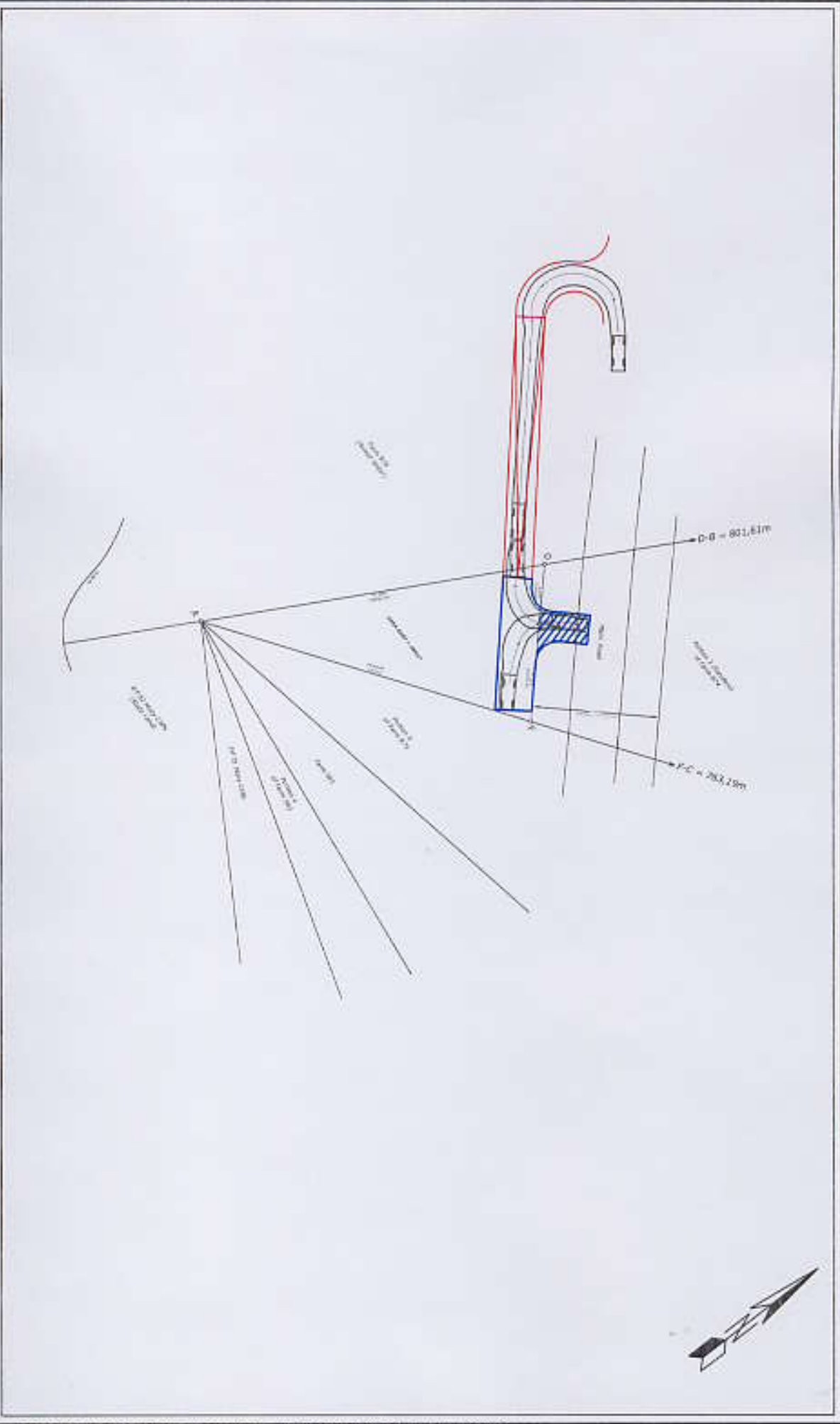
This access will be located approximately 150m from the nearest existing residential access, which is in line with the guidance discussed **Section 3**.

All vehicular movements and turns can be accommodated within the layout, as shown in **Figure 3.5**.

PROJECT: **ERF 974-1 MISTY CLIFFS ACCESS**
 TITLE: **ALTERNATIVE B - VEHICLE TURNING PATHS**
 Scale: 1:500



FIGURE 3.5



Shifting the access further north-west from Erf 974/1 allows additional sight distance in this direction, due to the embankment no longer obstructing the sight-line, as is shown in **Figure 3.6**.



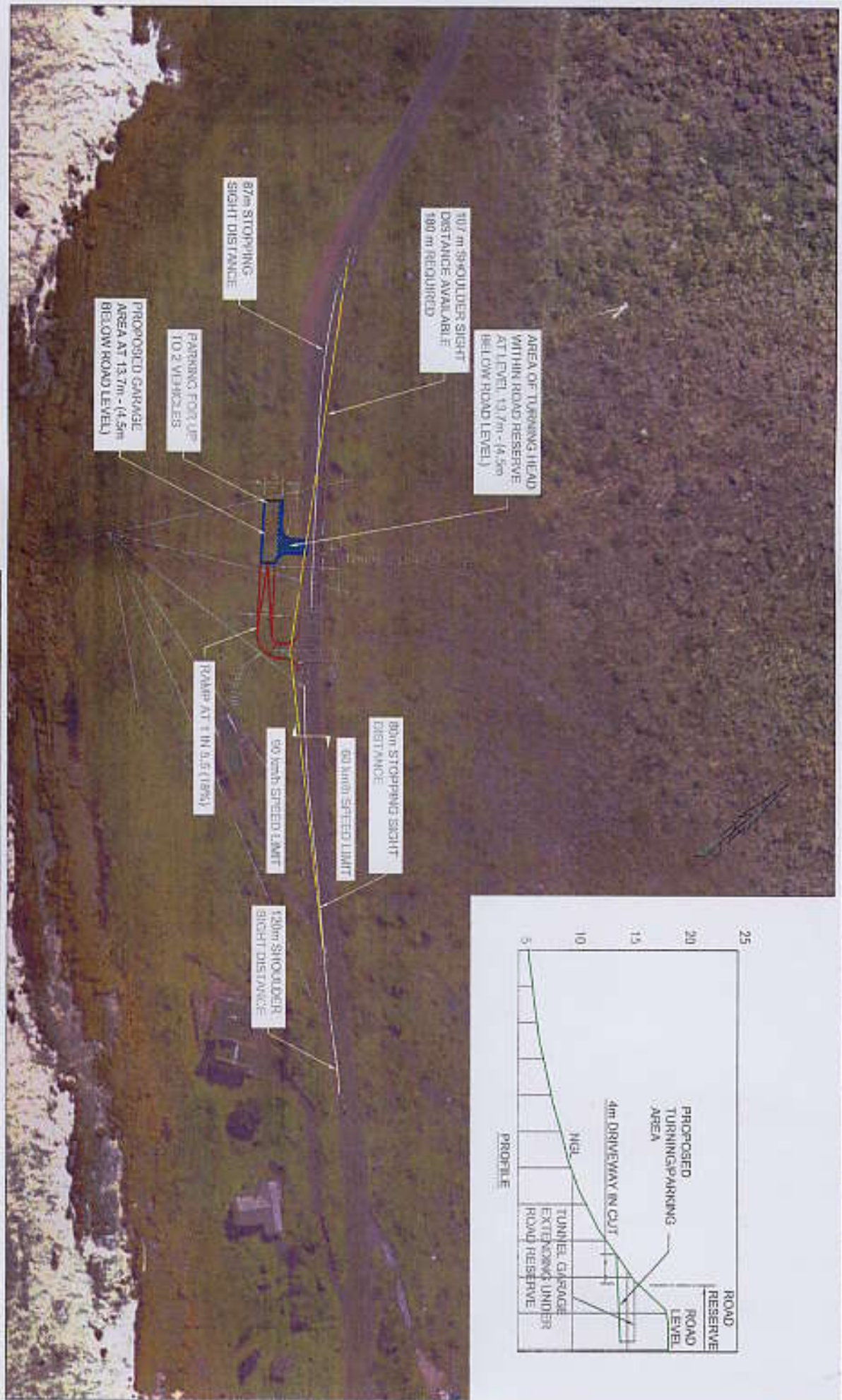
As shown in **Figure 3.4**, stopping sight distances of 80m and 135m are easily achieved to the north-west and south-east respectively, which complies fully with prescribed guidelines and is the major advantage of this alternative, in relation to the others.

A significant disadvantage, however, is that this option requires permission from the TMNP to secure a portion of their land to construct a private driveway through what is believed to be an environmentally sensitive area. Furthermore, the topography of Erf 974/1 and the TMNP land is such that significant excavation and retaining structures are likely to be required to implement the driveway, pending the architectural building proposal(s).

3.3 Alternative C

As shown in **Figures 3.7** and **3.8**, *Alternative C* consists of an access located 20m south-east of *Alternative A* along Main Road. This option provides access to the below-road portion of Erf 974/1 via the neighbouring Erf 979/9 and is hence dependant on the acquisition of this property from CoCT to utilise for access purposes.

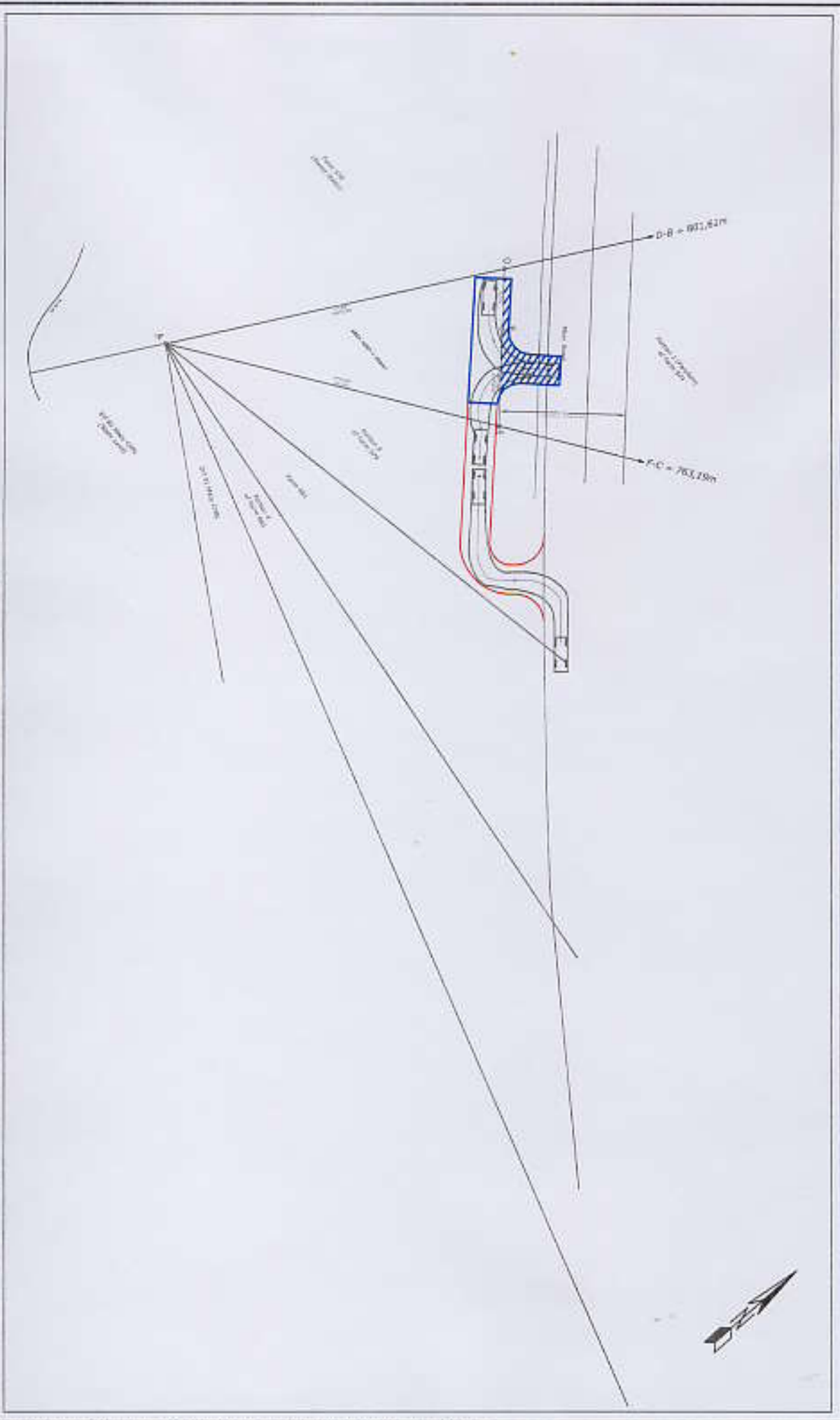
This option is similar to *Alternative B* in the sense that access is taken off the public road at a point away from Erf 974/1 and a parallel driveway needs to be constructed across neighbouring land in order to reach the property itself.



PROJECT: **ERF 974-1 MISTY CLIFFS ACCESS**
 TITLE: **ALTERNATIVE C - ACCESS LOCALITY AND SIGHT DISTANCE**
 Scale 1:11000



FIGURE 3.7



PROJECT
ERF 974-1 MISTY CLIFFS ACCESS
 TITLE
 ALTERNATIVE C - VEHICLE TURNING PATHS
 Scale 1:500



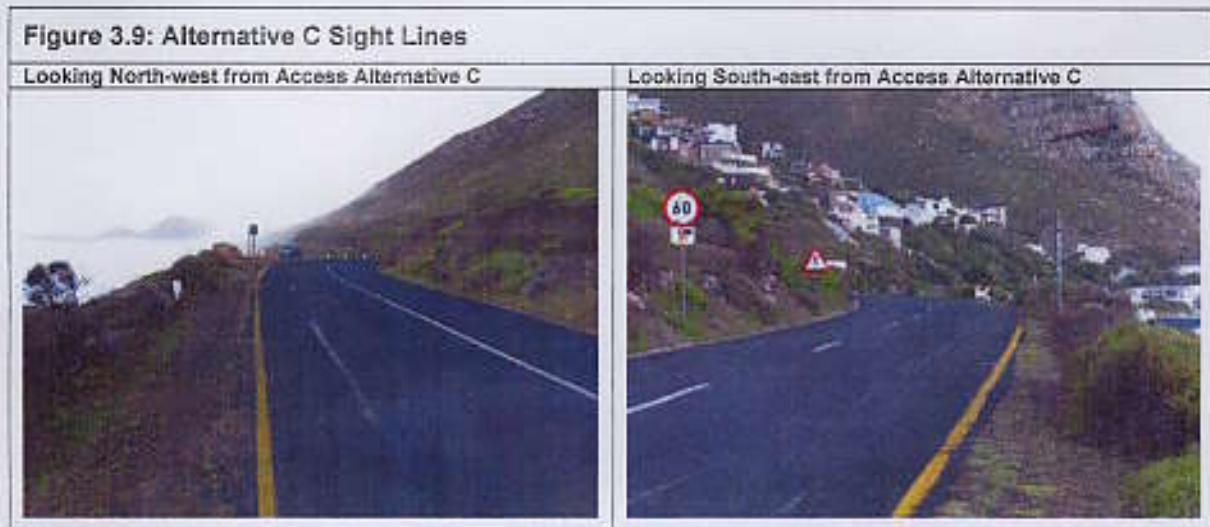
FIGURE 3.8

After turning into the driveway, the motorist will descend via a driveway ramp to a point approximately 4.5m below the road surface level. At this level there will be surface parking available and (as in *Alternative A*) the driver will be able to turn around using a tunnel shunt beneath Main Road in order to exit the driveway on a forward gear.

All vehicular movements and turns can be accommodated within the layout, as shown in **Figure 3.8**.

Figure 3.8 also shows the profile of the proposed turning shunt, as well as its relation to Main Road above. This option does not require the implementation of a park lift system, as parking space is available within the driveway layout.

Shifting the access further south-east in relation to *Alternative A* allows additional sight distance in a north-westerly direction, as shown in **Figure 3.9**.



The required stopping sight distance from this access point to the north-west is 107m and over the required 80m to the south-east respectively. The 107m north-west sight distance is less than the prescribed distance but better than that in *Alternative A*.

This access will be located approximately 100m from the nearest existing residential access, which is in line with the guidance discussed in Section 3.

The key disadvantage in this case is that this option is highly dependant on the acquisition of the neighbouring property (or a right-of-way servitude) from the CoCT in order to construct a private driveway through this area. Furthermore, the topography of Erf 974/1 and the neighbouring property is such that significant excavation and retaining structures are likely to be required to implement the driveway.

3.4 Access Assessment Findings

The findings of the access alternative assessments are summarised in Table 3.1, which highlights the key geometric criteria in determining the viability of each option, as well as other non-geometric - yet pertinent - aspects to consider in each case.

Table 3.1: Access Alternatives Evaluation Matrix

Key Criteria	Alternatives		
	A	B	C
Shoulder Sight Distance NW	-97m	MR	-73m
Shoulder Sight Distance SE	MR	MR	MR
Stopping Sight Distance NW	-75m	MR	-48m
Stopping Sight Distance SE	MR	MR	MR
Spacing from Nearest Access	120	150	100
Dependence on Adjacent Land Owners	Low	High	High
Extent of Driveway Construction	Med	High	High

MR – Meets Requirements

In terms of sight distances, B is the preferred alternative. However, B requires significant construction and is highly dependant on negotiations with neighbouring land owners. Alternative A, on the other hand, has the least impact on the natural surrounds and neighbouring properties, and does not require the construction of elaborate driveway ramps, although the park-lift system may as costly as the retaining structures of B and C. *Alternative A* is furthest from meeting the prescribed sight distances to the north-west. *Alternative C* has sub-standard sight distances, as well as requiring extensive driveway construction.

Should the proposal to introduce a W216 "Concealed Driveways" warning road sign be implemented 270m north-west of Erf 974/1, along with the relocation of the sign that lowers the speed limit from 90km/h to 60km/h further north-east on Main Road, the required stopping and shoulder sight distances will reduce significantly. Table 3.2 shows the revised sight distance shortfalls, after the two aforementioned proposals are implemented, changing the section of Main Road to the north-west of Erf 974/1 to a 60km/h zone.

Table 3.2: Access Alternatives Evaluation Matrix (Including Signage Changes)

Key Criteria	Alternatives		
	A	B	C
Shoulder Sight Distance NW	-37m	MR	-13m
Shoulder Sight Distance SE	MR	MR	MR
Stopping Sight Distance NW	-20m	MR	MR
Stopping Sight Distance SE	MR	MR	MR
Spacing from Nearest Access	120	150	100
Dependence on Adjacent Land Owners	Low	High	High
Extent of Access & Driveway Construction	Med	High	High

MR – Meets Requirements

This change makes *Alternative A* significantly more feasible, as both shoulder and stopping sight distances are marginally less than those prescribed.

4. CONCLUSIONS & RECOMMENDATIONS

Conclusions:

1. The owner of Erf 5288, Misty Cliffs (Farm Farufern) intends to develop a single residential unit on this property, which currently has no public road access.
2. Access alternatives were considered for above – and below – road options, as Main Road (M65) runs through the property itself.
3. The scope of the TISM was changed to focus more on access issues, as access spacing and sight distance are the key transportation factors in the viability of an access on this section of Main Road.
4. The option of gaining access to the above-road portion of Erf 974/1 was found to have highly sub-standard sight distance to the north-west, which would significantly compromise the safety of road users. CoCT Transport Planning Authorities were in agreement and it was hence decided to not consider this option further.
5. Three below-road alternatives (A, B and C) were assessed in detail from an access spacing and road geometry point of view.
6. Main Road consists of a 60km/h zone to the south-east of Erf974/1 and a 90km/h zone to the north-west.
7. Access spacing is sufficient for all three alternatives.
8. For all the alternatives, sight distance is adequate to the south-east, whereas *Alternatives A and C* fall short of the prescribed requirements to the north-west. *Alternative B* adheres to the sight distance requirements in both directions.
9. *Alternatives B and C* are highly dependant on co-operation from adjacent land-owners, as they need to cross portions of neighbouring land. *Alternative A*, however, is completely contained within the bounds of Erf 974/1 and does not impact directly on other properties.
10. *Alternatives B and C* will require construction of driveway ramps to take them below road level, which could potentially require significant surface excavation and retaining structures on neighbouring properties, which will in-turn have environmental implications. *Alternative A* consists of a simpler driveway configuration that makes use of a mechanical park lift system to store vehicles underground.
11. By introducing a W216 sign on Main Road at a point 270m to the north-west of the proposed access,

motorists will be warned of concealed driveways ahead and will be encouraged to lower their speed upon approaching the proposed access.

12. The point at which Main Road changes from operating at a 90km/h speed limit to a 60km/h speed limit could be relocated further to the north-west by moving the two applicable road signs. This operating speed reduction will decrease the required stopping sight distance from 135m to 80m on the section of Main Road to the north-west of the access.
13. The resulting reduction in required stopping sight distance significantly reduces the sight distance deficit for *Alternatives A and C*, making them both more viable from a geometric point of view, with ***Alternative A*** being the most viable when all variables are considered.

Recommendations:

1. The speed limit information signs on Main Road should be relocated sufficiently to the north-west of the Erf 974/1 to extend the 60km/h zone to include the section of Main Road in the vicinity of the proposed development.
2. Should recommendation 1 be implemented, ***Alternative A*** will be the most viable access option, as it will provide shoulder and stopping sight distance sight lines that are near to meeting those prescribed. In addition to geometric factors, this option will have the least impact on the natural surrounds, as well as neighbouring land.

APPENDIX A: SCOPE OF WORKS

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10 February 2010

Willem Bührmann Associates
4 Tamboerskloof Road
Tamboerskloof
CAPE TOWN
8001

ATTENTION: MR W BÜHRMANN

Dear Sir

QUOTATION FOR REZONING ERF 974/1, MISTY CLIFFS TISM

Thank you for inviting Jeffares and Green to submit a quotation to undertake a Transport Impact Statement (TISm) for this proposed development.


The cost estimate provided is based on the following envisaged tasks that will constitute the TISm:

- Liaison with Local and Provincial Transport Authorities
- Site visit
- Background traffic survey
- Trip generation analysis
- Vehicle queuing analysis at proposed access
- Basic geometric assessment & sketch of proposed access
- Reporting
- Meeting with client and/or project team

Based on the scope of works set out above, Jeffares & Green will undertake the TISm at a total cost of R35,000 (excluding VAT).

I trust that you will find this acceptable and look forward to working with you.

Yours faithfully


G H VENTER
for : JEFFARES & GREEN (PTY) LTD

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Middelburg
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Jeffares & Green (Pty) Ltd • Reg. No. 1977/000524/07

Directors: CJ Robinson (Managing), Ms MV Makhetha, SN Makhetha, CJ Mercedes, Ms VS Maza, PA Olivier, G Poswell.
Member Firm: Consulting Engineers South Africa (CESA)



Venter, Gerrit

From: Pam Driessel [sampabx@netactive.co.za]
Sent: 23 March 2010 11:13
To: Venter, Gerrit
Subject: FW: Quotation for Misty Cliffs TISM erf 974/1

From: Pam Driessel [mailto:sampabx@netactive.co.za]
Sent: 23 March 2010 09:40 AM
To: 'venperg@jgi.co.za'
Cc: 'Willem Buhrmann'
Subject: Quotation for Misty Cliffs TISM erf 974/1

Dear Gerhard,

Thank you for the telephone conversation this morning,
I confirm that you must proceed with the work quoted for on Misty Cliffs , Ref 1005-Erf 974/1 Misty Cliffs TISM
Please keep me informed on the progress.

Kind Regards,

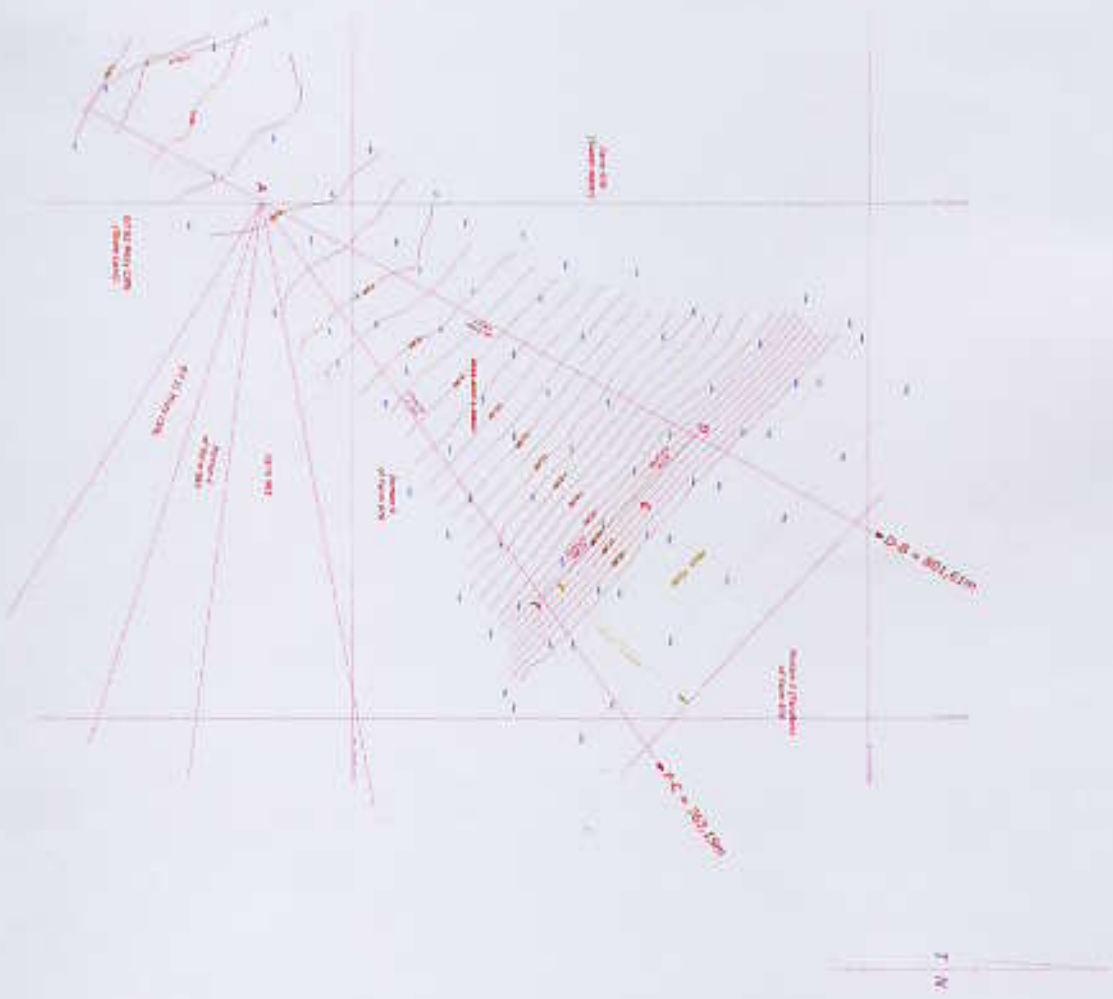
Malcolm Driessel
Tel 0215533590
Cell 0824542180
Mail sampabx@netactive.co.za

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This message has been scanned for viruses and dangerous content by **MailScanner**, and is believed to be clean.

APPENDIX B: BACKGROUND INFORMATION RECEIVED

All heights are in metres above
Mean Sea Level datum



**CAPE FARM 974/1
FARUFERN
MISTY CLIFFS
HOUSE DRIESSEL**

TERRY M. SWEENEY ASSOCIATES
PROFESSIONAL LAND SURVEYORS
DEVELOPMENT PLANNING CONSULTANTS

P.O. Box 2112, 7th Floor, New York
5, Millers Bay, 1st Floor, 7th Floor
Cape Town 7800, 7800/13
Tel: (021) 264 2340
Fax: (021) 264 0440
E-mail: tms@tmsa.co.za

REFERENCE: SCH.110

T. R. McSweeney, P/L(SA) 29 April 2008

SCALE: 1:1000

PLAN NO: SCH.110/A/REV0

LOCAL AUTHORITY
REFERENCE NO.



Data Sheet

Wöhr Parklift 461 462 463-2,0

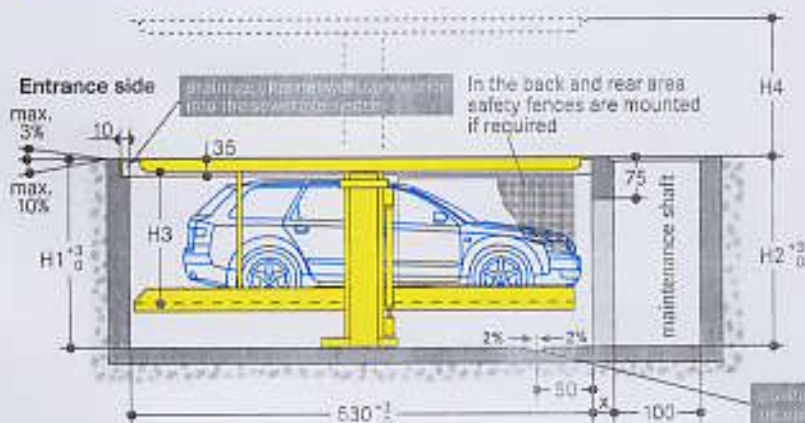
Suitable for private houses, condominium and for retrofitting of old buildings. For permanent use only!

Horizontal even platforms.

Platform load max. 2000 kg (wheel load max. 500 kg).

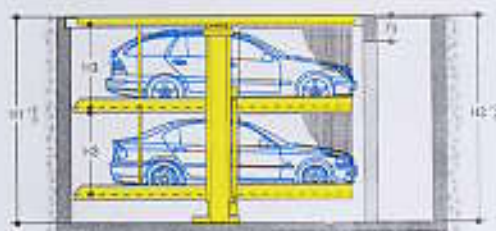
The systems are designed for snow load zone II with up to 0,75 kN/m² in accordance to DIN 1055-5.

■ Parklift 461 · 2000 kg

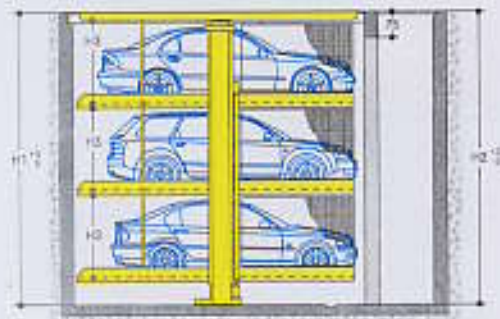


	pit depth		platform	height	max.
	front	rear	distance	H4	car
	H1	H2	H3	H4	height
Parklift 461	250	255	170	210	165
	285	290	205	245	200
Parklift 462	425	430	170	385	165
	495	500	205	455	200
Parklift 463	605	610	170	565	165

■ Parklift 462 · 2000 kg



■ Parklift 463 · 2000 kg



■ Clearance profile (standard saloon/estate car)



* The total car height includes roof rail and antenna fixture and must not exceed the mentioned max. height dimension.

■ Notes

1. Car width max. 190 cm (see width details page 2). In case of special platform widths narrower than 230 and 460 cm respectively, the maximum vehicle width is reduced accordingly. For cars with two outside mirrors, a minimum platform width of 250 cm or 500 cm is recommended.
2. The upper platform is a welded construction (manufactured acc. to EN ISO 13920 with the tolerance class C). Finishes are available at the customer's request, for example sand bedding/pavement slabs, sand bedding/pebbles, topsoil/lawn a.s.o. Please contact Wöhr for details of maximum allowed loadings.
3. When lowered, the upper platform is even to floor level and can be driven over by cars (max. weight 2600 kg, wheel load max. 650 kg). On special conditions the upper platforms of Parklift 461 and 462 may be used as parking places – please contact Wöhr.
4. In case higher loading is required e.g. passage for fire brigade, please contact Wöhr.
5. A locked key arrangement ensures that the unit is always left in the lowered position after each use.
6. A separate maintenance shaft with ladder is required. A safe maintenance access with a door has to be provided by the customer – please contact Wöhr. This shaft is important for ventilation and passage to the pit and can also house the hydraulic power pack.
7. At the edge of the pit a 10 cm wide, yellow-black marking according to ISO 3864 has to be provided by the customer (see 'statics and construction requirements' on page 3).
8. The manufacturer reserves the right to modify or alter above specifications.



Width dimensions

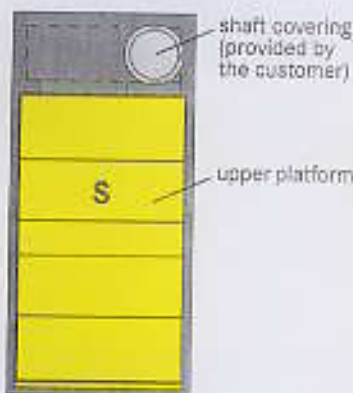
All dimensions shown are minimum. Construction tolerances must be taken into consideration. All dimensions in cm.
Alle Maße in cm.

The access to the Parklift is possible with max. 3% declination and max. 10% inclination.

If not stated differently in the offer, platform widths of 230cm or 460cm will be delivered. Bigger/smaller platform widths can be delivered at additional price.

Top view closed pit

Single unit

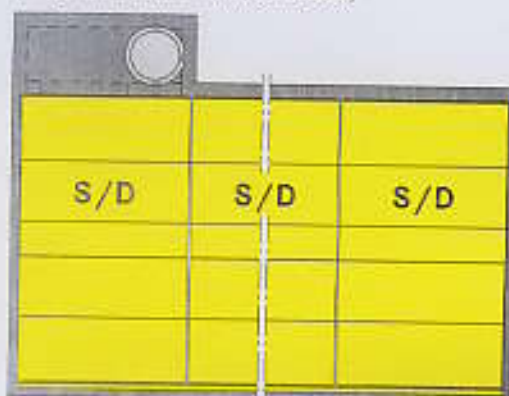


Entrance side

Double unit

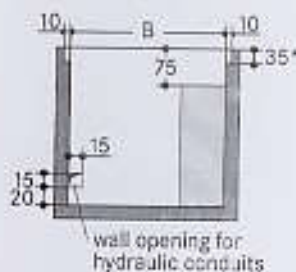


Row arrangement
(Single- and Doubleunits are combinable)

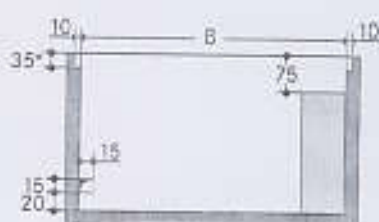


Pit dimensions

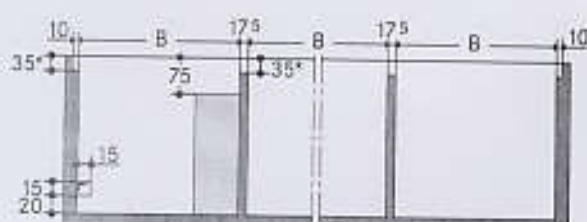
Single unit
(front view)



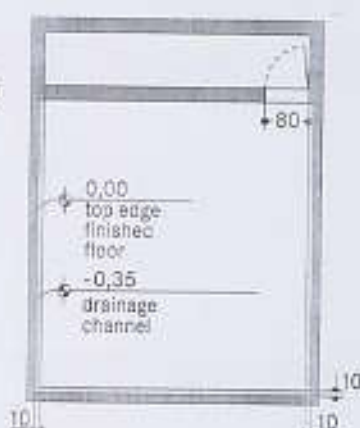
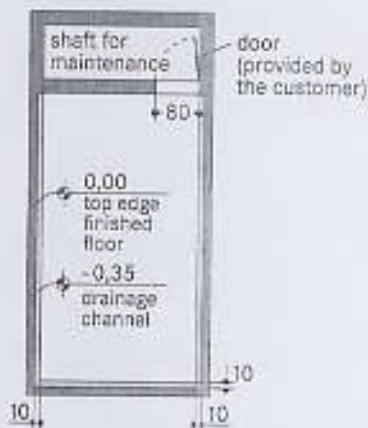
Double unit



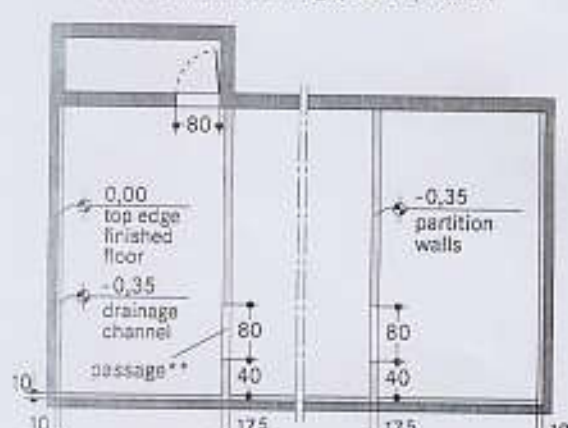
Row arrangement



(top view)



* Measure 35 cm upon upper edge platform pavement



** The passageway to the neighbour units must have the identical height like the passageway of the maintenance shaft in the pit.

Space required B	gives clear platform width	
	parking levels	upper platform
275	230	290
285	240	300
295	250	310
305	260	320
315	270	330

Space required B	gives clear platform width	
	parking levels	upper platform
505	460	520
525	480	540
545	500	560
565	520	580
585	540	600

A rectangular angle is required from the sidewalls to the front side. Max. tolerances are 1 cm!

Important notes

Attention:

If sides or the back are freely accessible, a safeguard is necessary (safety fences, marking, electrical hauling cable counter, or similar). This is planned dependent on project.

Self maximum platform widths are not installed, difficulties might arise when entering or exiting the cars on the parking units. This depends on the car type, the access and the individual driving behaviour.

Cars wider than 190 cm should be parked on platforms 270/500 cm width only for entering/exiting at drivers position.

Pit edge

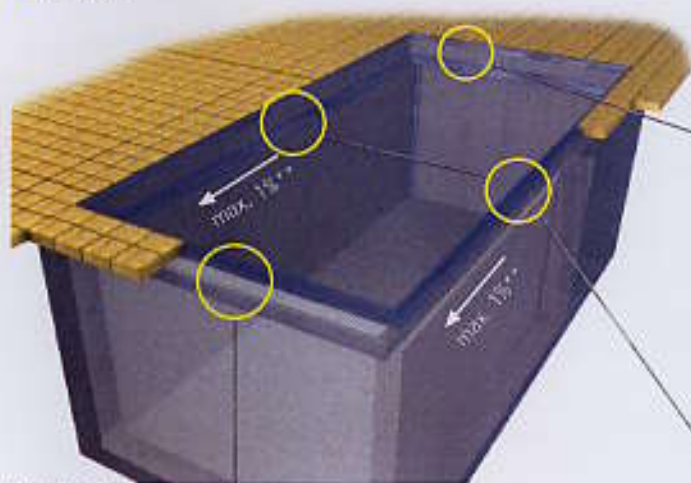


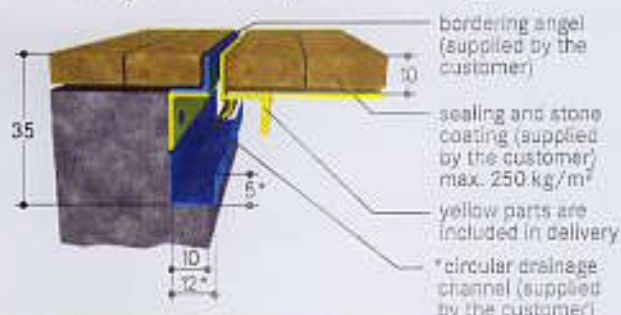
Illustration with stone coating (without Parklift)

** max. 1% slope of drainage channel to entrance side

Pit edge rear (with stone coating)



Pit edge entrance side (with stone coating)



Pit edge lateral (with stone coating)



Installation

For the installation a crane has to be provided by the customer.

For installations in underground car parks or roofed areas a mobile crane must be provided by the client, min. hook height 5 m.

Parklift 461:

hook clearance min. 400 cm over height of entrance
crane load approx. 700 kg

Parklift 462 and Parklift 463:

hook clearance min. 700 cm over height of entrance
crane load approx. 1400 kg

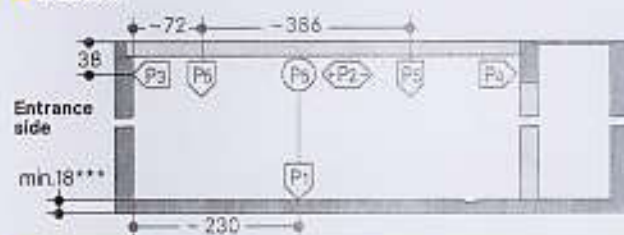
Statics and construction requirements

Bearing loads are transmitted to the pit floor by base plates, fixed by heavy duty anchor bolts to a depth of approximately 10-12cm. When fixing to waterproof concrete floors chemical anchors are employed (to be advised by Wöhr). Concrete quality according to the static requirements of the building, but for the dowel fastening we require a concrete quality of min. C20/25. The walls of the pit must be formed of

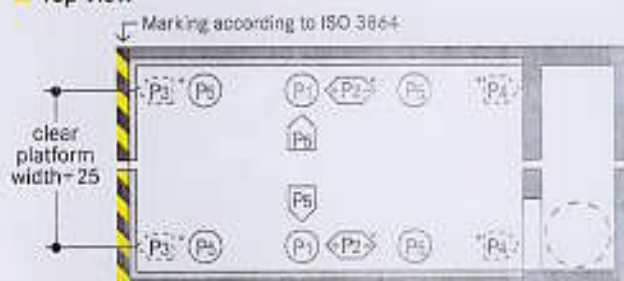
concrete and must be perfectly flat and vertical without any protrusions. Tolerance in the evenness and angularity must be taken additionally into consideration.

The specified lengths to the support points are mean values. Please contact us for exact positions for any variations on the standard units.

Section



Top view



* The force P2 is only given when the pillars are fitted to the side walls. The forces P3 and P4 come only into effect when the pillars can not be fitted to the side walls.

** All static loadings include the weight of the car.

*** The loading capacity of the base plate must be proved by a structural engineer. Possibly stronger base plate could be necessary.

Statics

Parklift 461 - 2000 kg

Single unit	Double unit
P1 = + 84 kN**	P1 = + 137 kN (upper platform with stone coating)
P2 = ± 13 kN	P2 = ± 16 kN
P3 = + 13 kN	P3 = + 16 kN
P4 = + 13 kN	P4 = + 16 kN
P5 = + 11 kN	P5 = + 11 kN

Parklift 462 - 2000 kg

Single unit	Double unit
P1 = + 104 kN**	P1 = + 172 kN (upper platform with stone coating)
P2 = ± 9 kN	P2 = ± 12 kN
P3 = + 9 kN	P3 = + 12 kN
P4 = + 9 kN	P4 = + 12 kN
P5 = + 12 kN	P5 = + 12 kN

Parklift 463 - 2000 kg

Single unit	Double unit
P1 = + 106 kN**	P1 = + 180 kN (upper platform with stone coating)
P2 = ± 9 kN	P2 = ± 11 kN
P3 = + 9 kN	P3 = + 11 kN
P4 = + 9 kN	P4 = + 11 kN
P5 = + 12 kN	P5 = + 13 kN

Electrical data

Item	Performance	Quantity	Designation	Position	Frequency
1	by customer	1 unit	electric motor	in the feed cable	
2	by customer	15 stick	type or automatic circuit breaker acc. to DIN VDE 0100 p. 430 - 3 x 25 A slow blow (5.5 kW power pack) - 3 x 32 A slow blow (2 x 5.5 kW power pack)	in the feed cable	1 x per power pack
3	by customer	as locally required	acc. to local power supply regulations 3 Ph + N + PE*	feed cable to main switch	1 per power pack
4	by customer	1 unit	separate feed cable (230 V) with lighting and power outlet	from feed cable into the maintenance shaft	1 x per Parklift
5	by customer	1 unit	marked main switch, lockable to prevent unauthorised switching on	outside the pit, max. 20 m away from operating device	1 x per power pack
6	by customer	as locally required	PVC control cable with marked strands and protective conductor 5 x 2.5 ² / 5 x 4 ¹	from main switch to hydraulic power pack	1 x per power pack
7	by customer	each 10 m	equipotential bonding safety lead out connection	concrete floor/ rear wall	
8	by customer	1 unit	equipotential bonding safety compliant to the DIN EN 60204 standard	from the lead-out connection to the system	1 per Parklift
9.1	by customer	as locally required	empty pipe DN40 with taut wire	close pit/operating device	1 x per Parklift
9.2	by customer	as locally required	empty pipe DN40 with taut wire	for feed cable to power pack	1 x per Parklift
10	by customer	as locally required	switch post		1 x per Parklift

Items 11–17 are included in W&H's scope of delivery unless otherwise specified in the offer/order.

* DIN VDE 0100 part 410 + 430 (not under permanent load)
3 PH + N + PE (three-phase current)

The electrical components supplied by the manufacturer must be connected in accordance with the appropriate wiring diagram and local regulations. German VDE electrical requirements must be adhered to, in order to validate the TÜV tested circuit.

The electrical supply to the power pack(s) must be provided prior to or during installation to

enable our fitters to complete their work satisfactorily and to check the correct functioning of the units.

In compliance with the DIN EN 60204 standard provisions, all systems must be connected directly on site with an earthed equipotential bonding. The lead-out connection must be at a 10 m distance.

Noise protection

Outdoor installation:
The basis is the German DIN 4109 »Noise insulation in buildings«. According to DIN 4109 equipment, machinery and plant used in joint technical facilities in buildings must be provided with adequate protection against air-borne and solid-borne sound.

Indoor installation:
Basis is the German DIN 4109 »Noise protection in buildings«.

With the following conditions required 30 dB (A) in rooms can be provided:

- noise protection package from our accessory
- insulation figure of the construction of min. $R_w = 57$ dB

- walls which are bordering the parking systems must be done as single wall and deflection resistant with min. $m^2 = 300$ kg/m²

- solid ceiling above the parking systems with min. $m^2 = 400$ kg/m²

At differing constructional conditions additional sound absorbing measures are necessary.

The best results are reached by separated sole plates from the construction.

Increased noise protection:
If increased noise protection must be provided planning has to be confirmed on a project basis by W&H (further building measures are required).

Operating device

The position of the operating device depends on the project (switch post, house wall). From

bottom of the shaft to the operating device an empty pipe DN40 with taut wire is necessary.

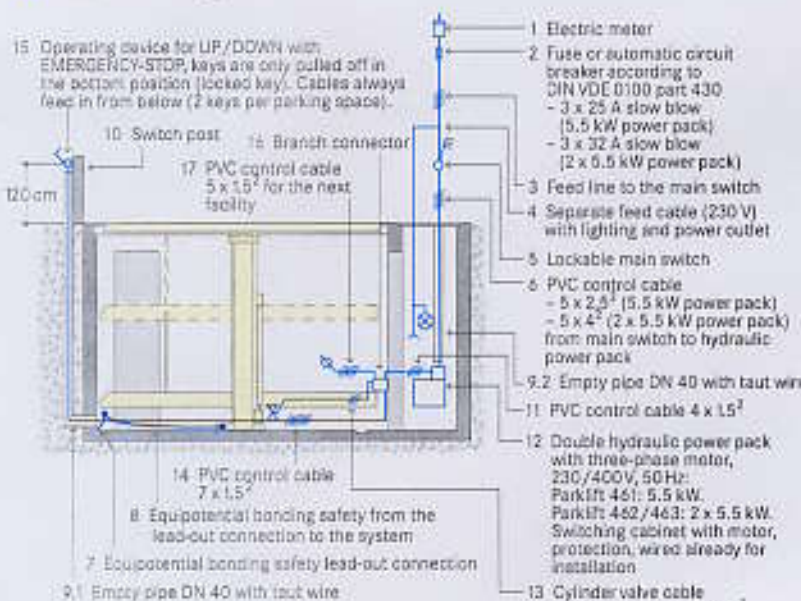
Conformity test

All our systems are checked according to EC machinery directive 2006/42/EC and EN 14010.

Dimensions

All dimensions shown are minimum. Construction tolerances must be taken into consideration. All dimensions in mm.

Installation diagram



Temperature

The installation is designed to operate between +5° and +40°C. Atmospheric Humidity: 50% at +40°C. If the local circumstances differ from the above please contact W&H.

Hydraulic power pack

The power pack will be placed in the shaft for maintenance.

Illumination

Illumination has to be considered acc. to local requirements by client. Illumination in the shaft for maintenance minimum 80 Lux.

Railings

During the building phase the pit has to be safeguarded by the customer.

Drainage (to be performed by the customer)

- 1) At the pit edge drainage channel formed in the concrete with connection to the sewerage system is necessary (see page 1).
- 2) For locations with particularly exposed conditions we recommend an additional drainage channel around the outside of the pit.
- 3) We recommend the provision of a drainage channel at the rear of the pit which can either incorporate a pump sump.
- 4) To prevent any possibility of contamination of the ground water we recommend giving the pit floor an oil resistant coating as a means of protecting the environment. If this is to be connected to the sewerage system, it is advisable to provide oil and/or petrol separators.

Ventilation

We recommend to provide a ventilation system in consultation with heating/ventilation/air conditioning engineers with the aim of obtaining continuous air exchange, reducing air humidity,

preventing condensate and reducing moisture from cars (rain, snow, ice etc.). This helps considerably to reduce or to prevent corrosion and malfunctions due to corrosion.

Maintenance

Regular maintenance by qualified personnel can be provided by means of an Annual Service Contract.

Protection against corrosion

Independent of a maintenance workings has to be carried out acc. to W&H Cleaning and Maintenance Instruction regularly.

Clean up galvanized parts and platforms of dirt and road salt as well as other pollution (corrosion danger)

Pit must be always ventilated and deaerated well.

Maintenance Shaft

A separate shaft for maintenance with an entrance to the pit is necessary. On aerial garages a shared maintenance shaft may be suitable but will depend on individual projects. The covering and ladder for the shaft is the clients responsibility.

Nov 2009

Stacksafe® by Albrecht Machinery

We are all affected by the unsafe environment we live in. On the other hand, we invest millions in getting a better lifestyle by buying properties on our beautiful Atlantic seaboard. On the one hand we want spacious living, rather than using the little we own in accommodating our cars. How frustrating is it to come to our car parked on the road and find it has been broken in or stolen!

Land is getting expensive and can cost R10-20,000 per m². A typical single carport is 6 m x 3.5 m (= 21 m²) which represents a land value of R150,000. If you need space for two, the amount doubles. And this amount does not include the cost of putting up a proper garage!

But most property owners wish to have space for parking at least 2 cars off-street, but many DON'T have that space. The trade off is to give up living space or have off street parking. The Stacksafe® parking system offers a simple and effective solution to this dilemma. It is simple and requires very little maintenance.

We can accommodate a single or double deck system in an area of 3.55 x 5.8.

During the day the cars are parked on the roof. One or two platforms below can accommodate one or two cars stacked on top of each other. Any car can be accessed and the others need not be moved. If the access to the road can be securely sealed off, up to three cars can be parked safely off-street.

If one can accommodate a width of 5.45 m ie an extra 2.5m width, four or six cars can be parked side by side.

We are looking for our first customer. Ideally

- he/she is a homeowner, who has a great need for more off-street parking, and
- has the required space as described above for one or two cars side by side. MOST IMPORTANT is the either the available space is at least 0.5 m away from the existing house or wall foundations or the house on the plot is still to be built

We would offer a special deal on this first unit. Please Contact Kai 082 375 1111



2 cars parked on lower level . 2 cars can be parked on roof plus 2 on upper deck



Stacksafe with no parked on roof. 2 or 4 cars can be parked on decks below ground level