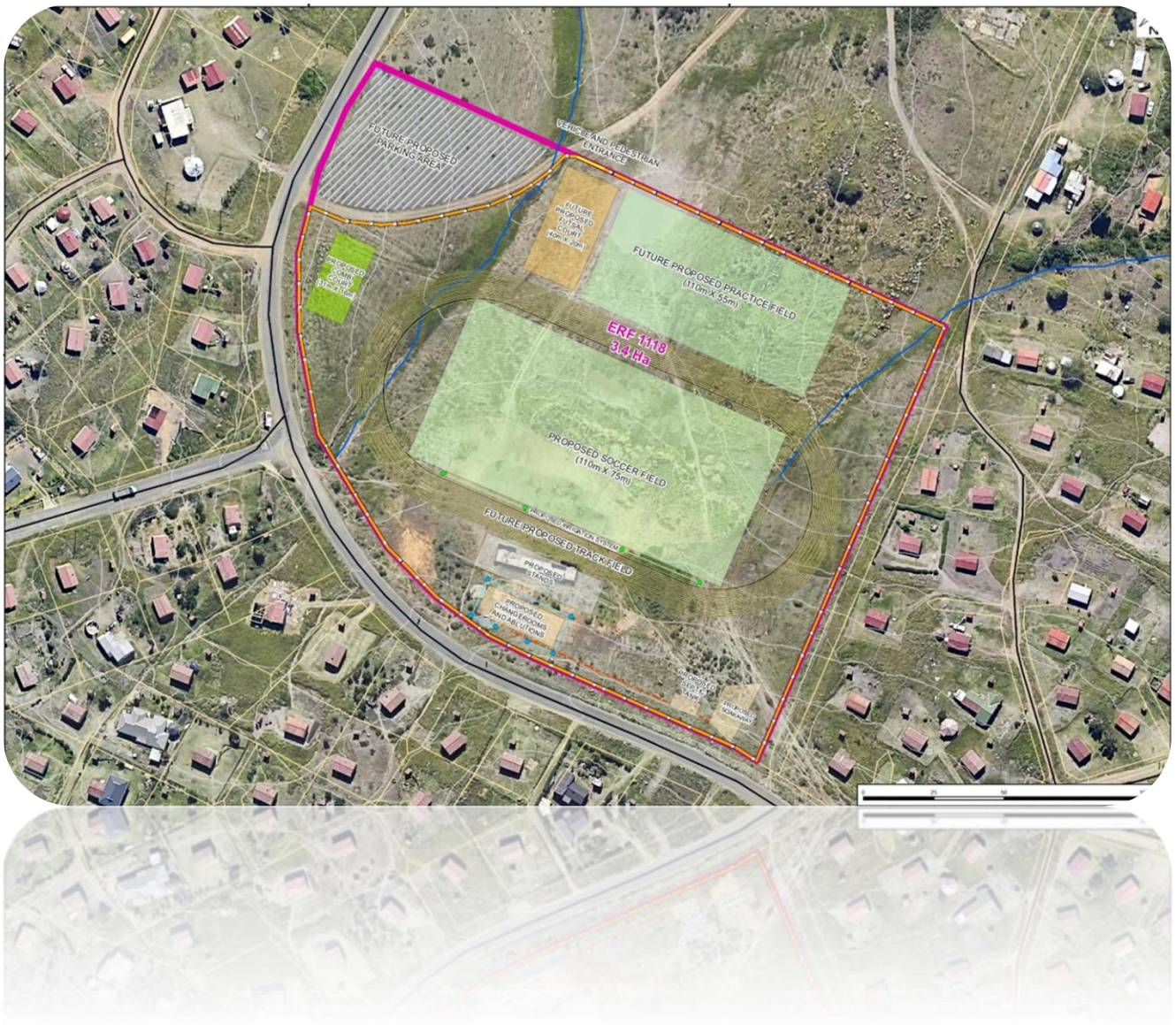
Traffic Impact Assessment

For

The Proposed Sport fields Complex in Hlomendlini, Mandeni.



Date: 16 February 2021

Report Number: NSA1262 – 2021, Revision: 00

Assessing Authority: Mandeni Municipality

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CK No. 2016/491232/07

Document Tracking Sheet

<table>
<tr><td colspan="2">Project Title</td><td colspan="3">The Proposed Sport fields Complex in Hlomendlini, Mandeni.</td><td>Project Number
NSA1262 – 2021</td></tr>
<tr><td colspan="2">Document Type</td><td colspan="4">Traffic Impact Assessment</td></tr>
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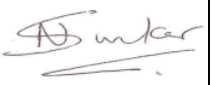
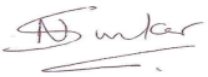
<tr><td></td><td>Prepared By</td><td>Reviewed By</td><td>Approved</td></tr>
<tr><td>Name</td><td>N. Sunker</td><td>N. Padayachee</td><td>N. Sunker</td></tr>
<tr><td>Signature</td><td>  </td><td>  </td><td>  </td></tr>
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ANNEXURE

1. Development Particulars

1.1 Development Description and Location

NSA Consulting Engineers was appointed to conduct a Traffic Impact Assessment (TIA) for the proposed Sport fields Complex in Hlomendlini, Mandeni. The site is known as Erf 1118 Hlomendlini. The site area is approximately 34 000m^2.

This report is in support of the environmental application only.

The site locality and aerial photograph is illustrated on figure 1 and 2 respectively.

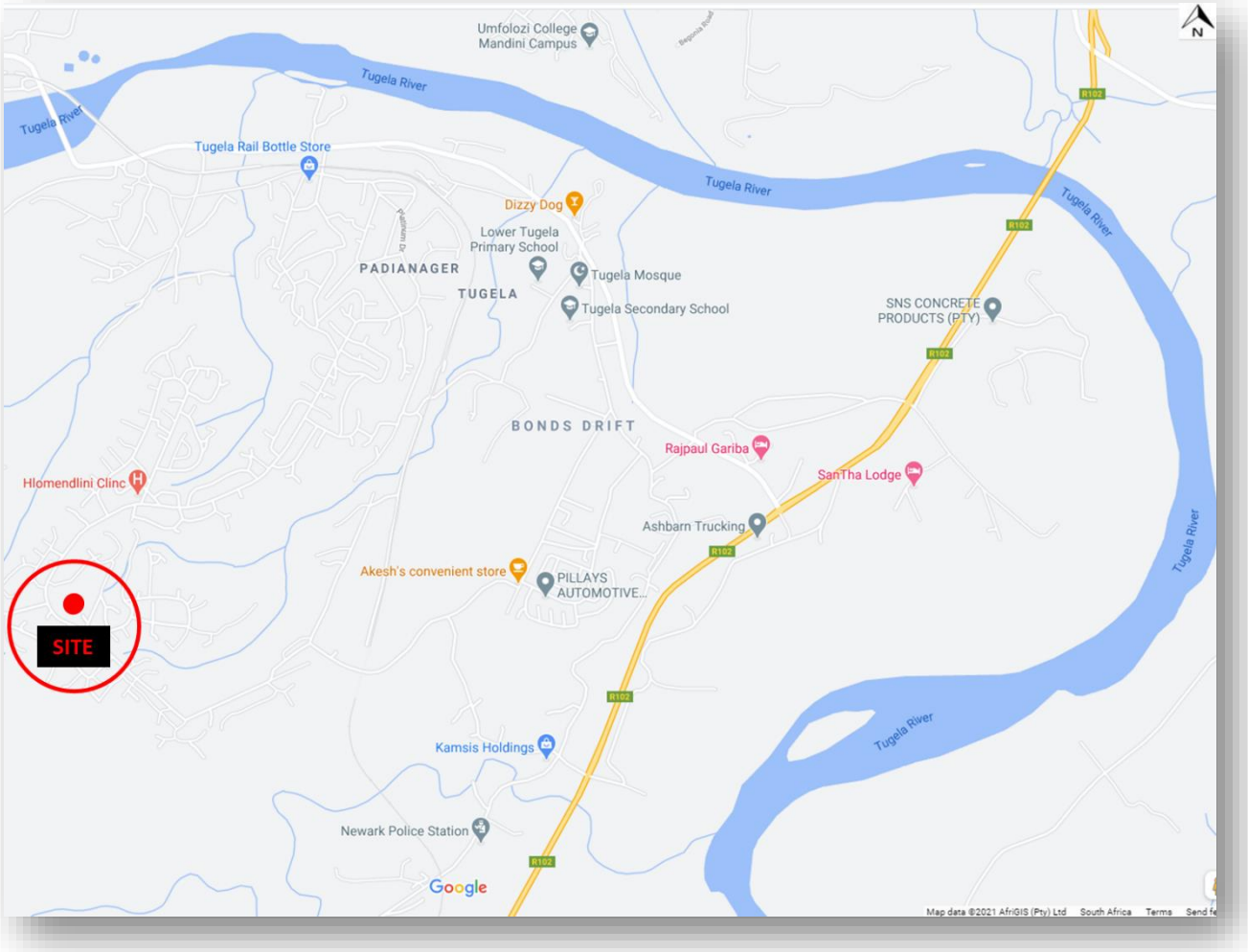

Figure 1: Locality Plan

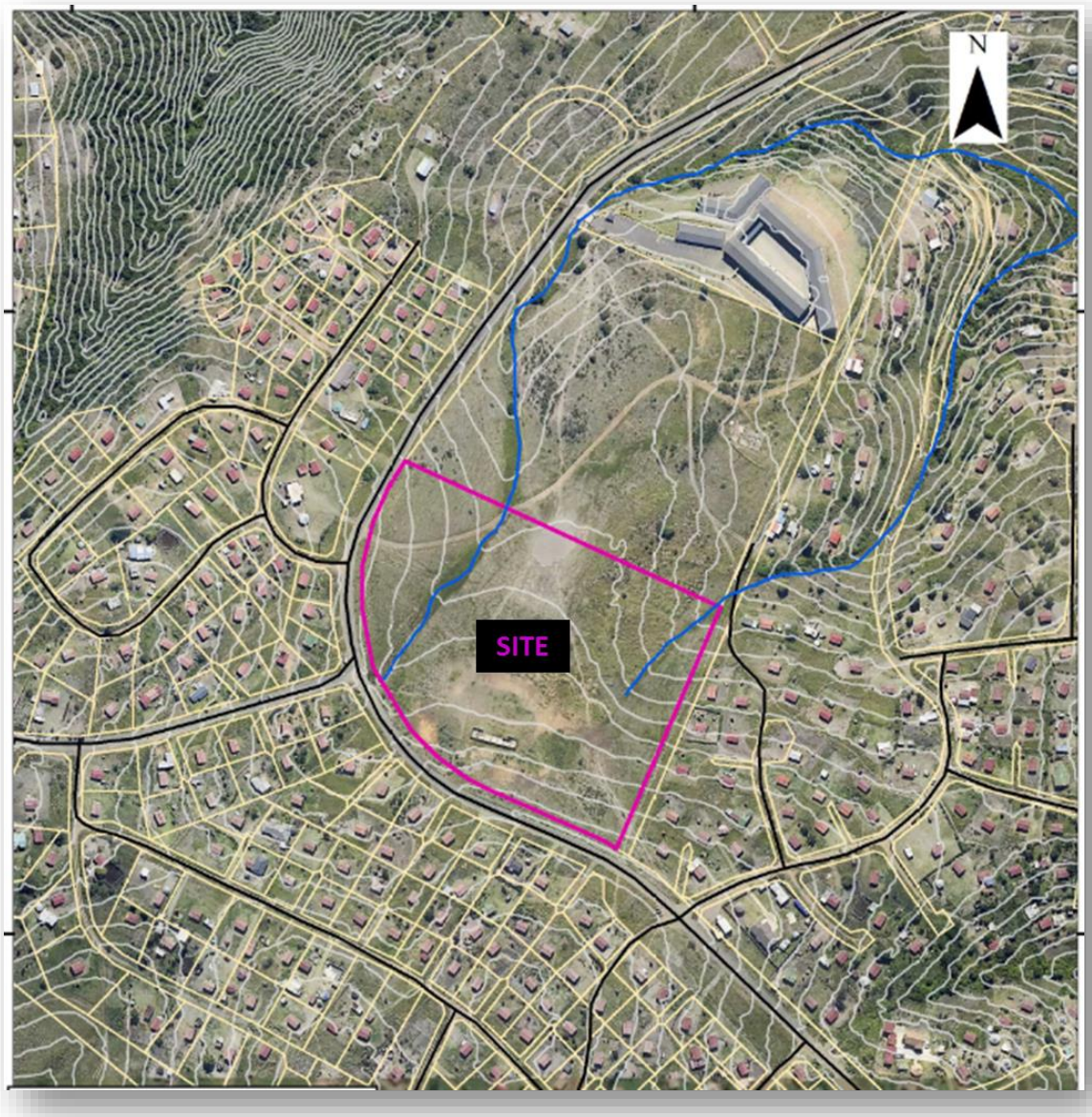

Figure 2: Aerial Photograph of Site

1.2 Land Use

Current Zoning:	Active Open Space
FAR:	N/A
Coverage:	N/A
Height:	N/A

2. Proposed Development

As per the site development plans prepared by SRK Consulting the proposed development will consist of a Community Sports Fields that will cater for a variety of sports facilities. The combined area for the proposed sporting facilities is approximately 15 600m^2. The Community Sports Fields also caters for a maximum of 200 seats stand at the main football field

Some of the sporting facilities of the proposed sport fields include:

- *Athletic Track*
- *Soccer Field*
- *Running Track*
- *Multi-Purpose Arena*
- *Futsal Courts*
- *Combo Courts*
- *Cycling Tracks*

The Site Development Plan is illustrated on Annexure C.

3. Study Area

The study consists of evaluating the impacts of the proposed development and developing mitigating measures where negative impacts exists in order to meet the requirements of the relevant authorities. In general, the scope of traffic studies is limited to intersections (and road networks) that will deteriorate significantly, due to the development-generated traffic.

It is a common cause that the traffic impacts of new developments are concentrated on the immediate transportation network with these impacts dissipating rapidly further away from the development as more access opportunities become available and traffic disperses onto the broader road network.

Consequently, the impacts of the proposed development are limited to adjacent road network, with key focus on Platinum Drive

The Road Network is illustrated in Figure 3.

Figure 3: Road Network

4. Background Information

Hlomendlini is rural area located within the Mandeni Local Municipal and is situated some 35km north of KwaDukuza. The area is noted for agriculture, mainly sugar cane. Hlomendlini can be described as an impoverished rural area where unemployment is high. Infrastructure in the area like roads are lacking maintenance and urgent repairs. Access to the area is via a single lane bridge from the P415

Table 1: Road Classification System

Class 1	Freeway – High mobility, no or very limited at grade access. No traffic calming	1010veh/hr/lane
Class 2	Major Arterial / Regional Distributor – High mobility, limited at grade access (intersections), no direct property access. No traffic calming.	820veh/hr/lane
Class 3	Arterial / Major Collector – Balanced mobility and accessibility function. Traffic calming only to consist of signage and road markings.	790veh/hr/lane
Class 4	Collector – More accessibility, less mobility, direct property access. All types of traffic calming allowed.	690veh/hr/lane
Class 5	Local Street – Limited mobility, more accessibility. All types of traffic calming allowed including speed humps.	350veh/hr/lane

Source: Road Infrastructure Strategic Framework for South Africa

Source: Highway Capacity Manual 2000 – Exhibit 10-7

5. Site Investigation

Site Observations reveal the proposed development is situated next to the Newark Primary School. The area is residential in nature however there is various other land uses such as schools, spaza shops and a Hospital. The area is mainly serviced by public transport however private vehicles are also utilized. Traffic volumes are extremely low.

Figure 4: The proposed development facing East

Figure 5: The proposed development facing North

Figure 6: The proposed development facing East

6. Traffic Demand Estimation

6.1 Worst Case Scenario

Current Zoning:	Active Open Space
FAR:	N/A
Coverage:	N/A
Height:	N/A

The proposed Community Sports fields is said to be part of the Mandeni Municipality plans for future development and planning for the under privileged communities.

Please take note that the development will be analysed based of the proposed actual Community Sports Fields Only.

6.2 Assessment years

A 5 year (2024) analysis is required, i.e. in accordance with the recommendations of the COTO: South African Trip Data Manual.

6.3 Assessment Hours

The weekday morning PM Peak (15h45 – 16h45)

6.4 Existing traffic counts

Traffic counts have been conducted under normal weather conditions on Monday 01 February 2021 on Platinum Drive at the site.

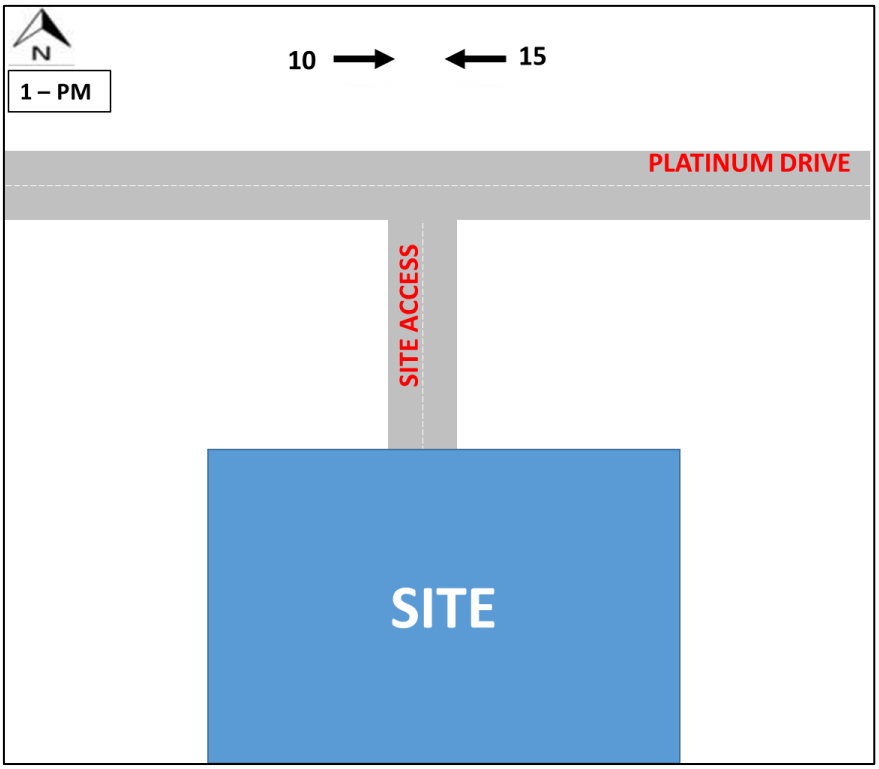

Figure 7: Existing Traffic Counts

6.5 Traffic growth rates

We have assumed 2% growth for 5 years.

6.6 Trip generation rates

6.6.1 Worst Case Scenario

Not applicable to this statement

6.6.2 Proposed Development

Community Sports Fields – 200 Seats

The guidelines provided by COTO: South African Trip Data Manual TMH 17 Volume 1 recommends a trip rate of 150 trips/1000 Seats, 270 Trips/1000 Seats and 170 Trips/ 1000 Seats in the Weekday PM, Weekday Evening and Saturday AM respectively.

This is in conjunction with the Landuse Code 488 Sports Stadium. The total trips that will be generated in all peak periods by proposed development is illustrated on the table 2 below.

Table 2: Trip Generation – 200 Seats for the proposed Community Sports Fields

Land Use		No. of Seats	Rate	No. of Trips	Split Ratio	Split in/out
Sports Stadium	PM	200	150 trip/1000 Seats	30	90:10	27:3
	Evening	200	270 trip/1000 Seats	54	10:90	5:49
	Saturday AM	200	170 trip/1000 Seats	34	90:10	30:4

The manual has not factored in that this will be a community based sport field with the majority of people walking or using public transport to the sport fields.

6.6.3 Trip Adjustment Factor

Not applicable to this statement.

6.6.4 Pass-By and Diverted Trips

Not applicable to this statement.

6.6.5 Adjusted Trip Generation.

Not applicable to this statement.

6.6.6 Trip Reduction Factor.

The proposed development is situated is an area classified as a Low Vehicle Ownership Area as majority of the residents utilise public transport and are pedestrians. The site is situated within walking distances to the residential area and where public transport is easily available. Based on the COTO: South African Trip Data Manual TMH 17 Volume 1 a trip reduction of 30% is applicable to the proposed Community Sports Field based on the Low Vehicle Ownership of the area.

6.6.7 Summary of Trip Generation.

Summary of the trip generation for the proposed development is illustrated on Table 3 below.

Table 3: Summary of Trip Generation

Land Use		No. of Trips	Reduction Factor	Actual Trips	Split Ratio	Split in/out
Sports Stadium	PM	30	30%	20	90:10	18:2
	Evening	54	30%	38	10:90	4:34
	Saturday AM	34	30%	24	90:10	22:2

The purpose of the proposed Community Sports field is to provide well equipped sporting facilities and equipment for the community members to utilise. The development will not be utilised for large matches or contests that will bring about severe traffic volumes.

Looking at the proposed development all 200 seats will not be occupied at the same time reason being it is unlikely that all sporting facilities will be operational/ scheduled for matches at the same time.

The area surrounding the proposed development is predominantly residential in nature and is classified as a low vehicle ownership area, majority of the community members who are most likely to utilise the facility will walk to the development or travel by public transport.

6.7 Modal split

Majority of the community members would be pedestrians and utilise public transport.

7. Trip Distribution and Traffic Assignment

For any proposed development, it is necessary to identify and estimate the proportional distribution of traffic along the roads that approach the site from various areas. The trip distribution is based on the ratio of the existing traffic volumes and turning movement.

Using this method of analysis, the trip assignment and trip distribution for the proposed development, has been assigned onto the surrounding road network.

The resultant development traffic distribution and assignment diagrams are illustrated on the Figures below.

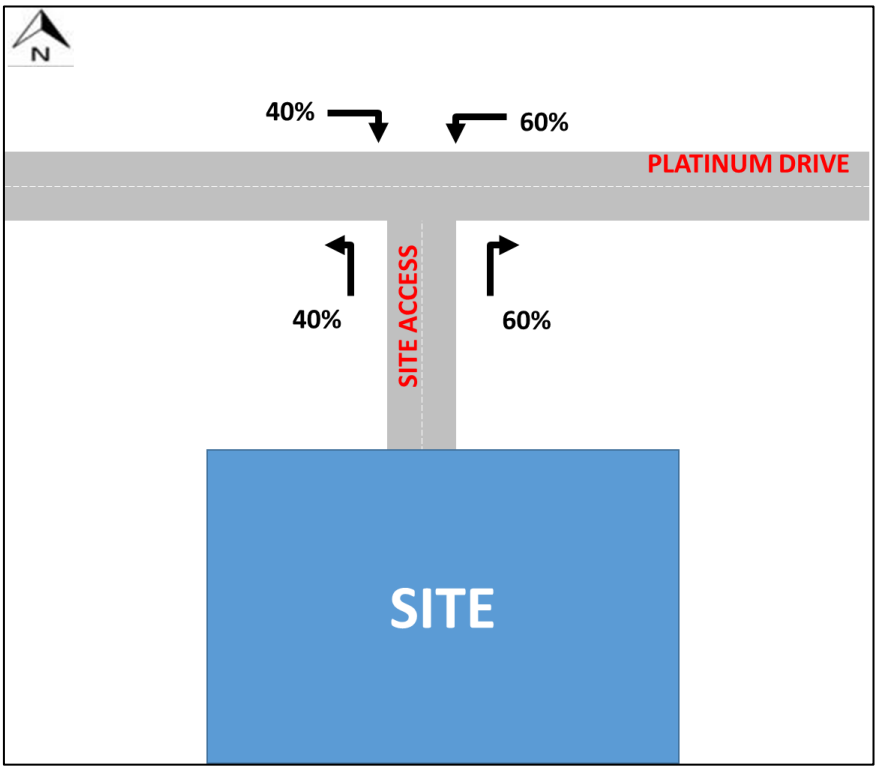

Figure 8: Trip Distribution

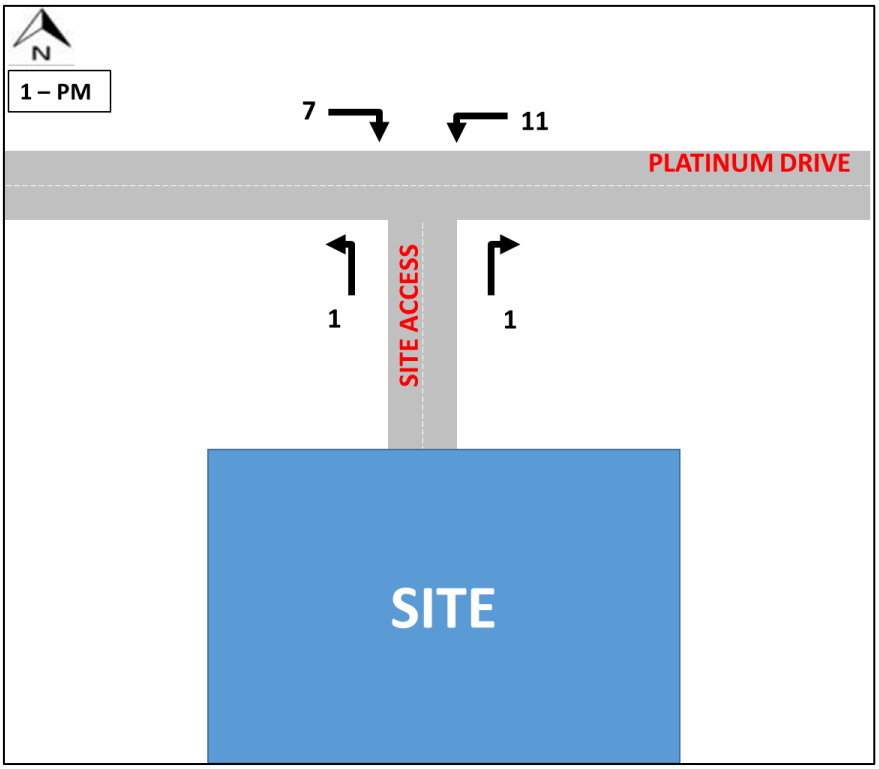

Figure 9: Trip Assignment

8. Total Traffic Demand

The total traffic demand which includes background traffic and development traffic for the 2021 analysis year and the forecasted 2026 analysis year diagrams is shown in Figures 12 and 13 respectively.

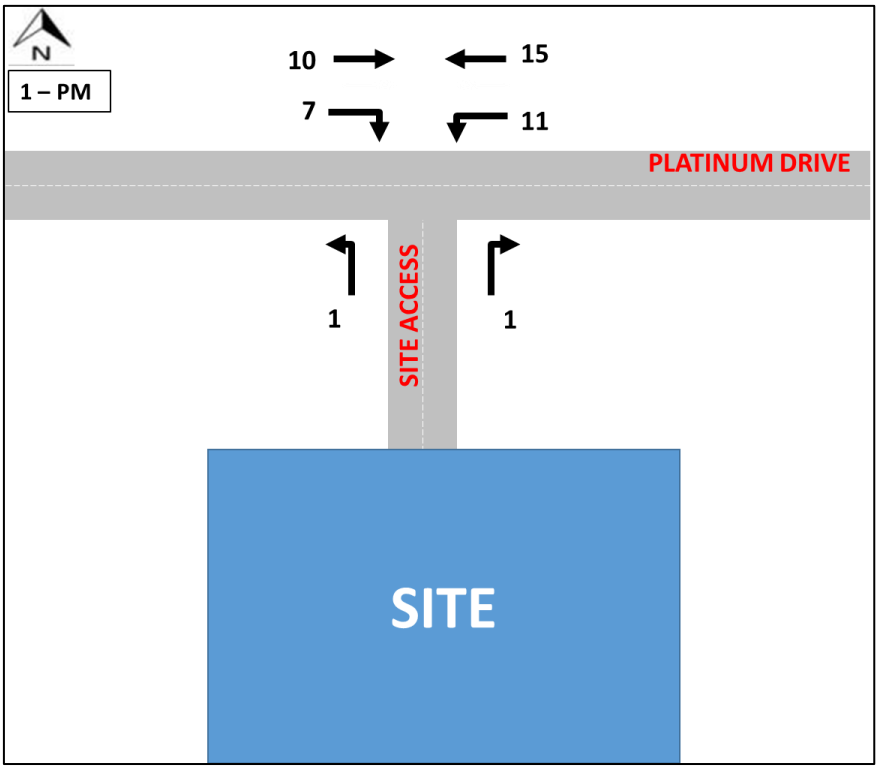

Figure 10: Existing 2021 plus Development

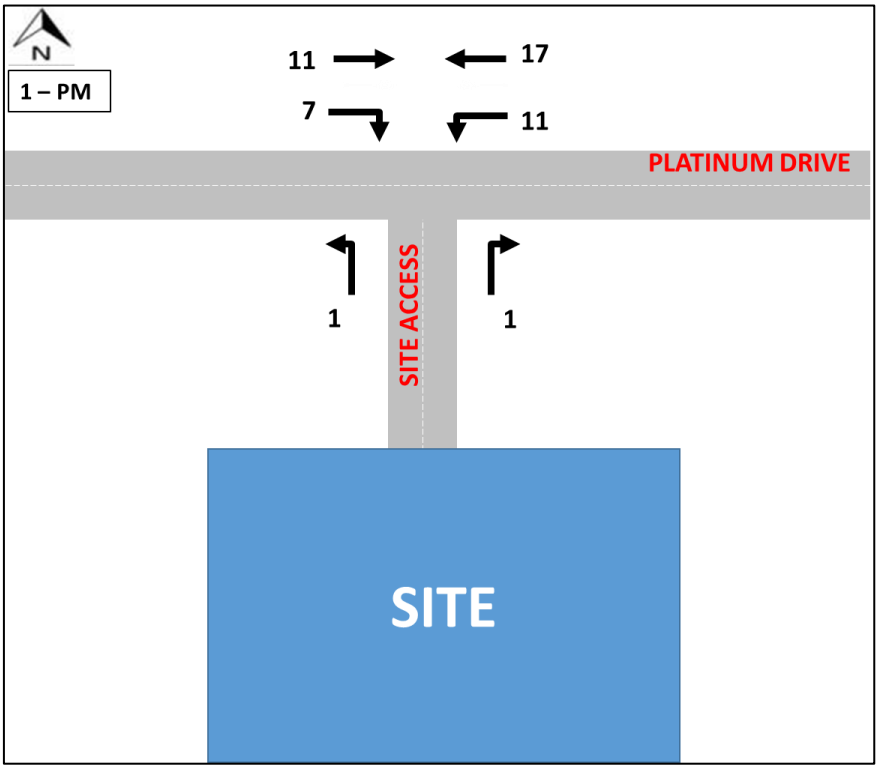

Figure 11: Forecasted 2026 plus Development

9. Demand Side Mitigation

Not applicable to this Statement.

10. Traffic Impact Assessment Scenarios

Not applicable to this Statement.

11. Proposed Improvements

Not applicable to this Statement.

12. Site Impact Assessment

12.1 Accesses

The proposed developments will gain access via Platinum Drive. The access points will need to be a minimum of 6.0 meters wide to accommodate two-way vehicle movements. All gates to remain open during normal operating hours.

According to the UTG 7: Geometric Design of Urban Local Residential Roads, the manual requires a minimum sight distance of 45m for a design speed of 40km/h. The sight distance at the access point is in excess of 45m.

The access will be designed in accordance with the Mandeni Municipality standards and specifications. All driveway ramps are to have a maximum gradient of 15% with a minimum 30m vertical curve radius.

The access bellmouths and at minimum the first 10 m of the access must be constructed to blacktop or premix standards. This will prevent the road edges from breaking.

The proposed access position is illustrated on figure 12 below.

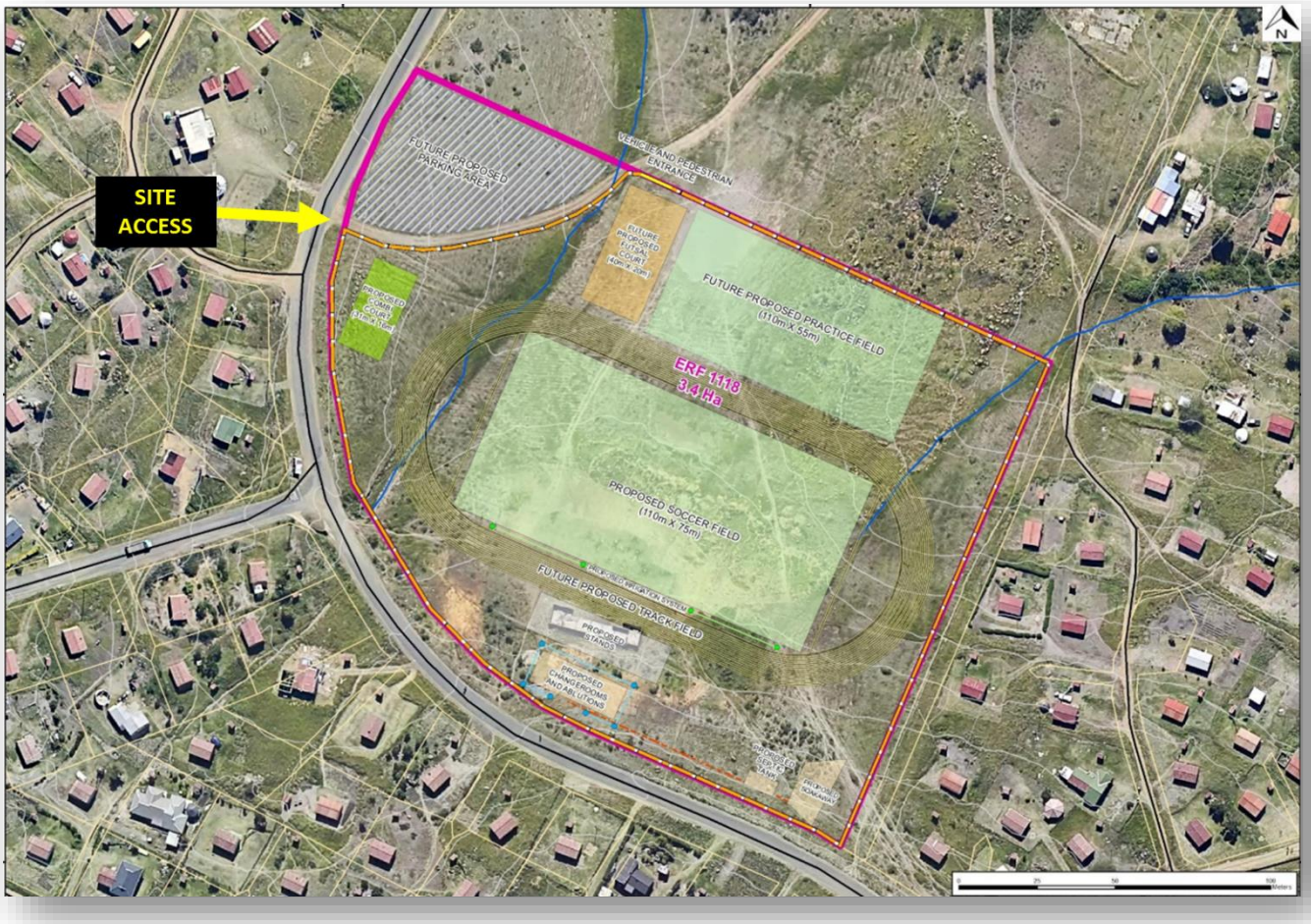

Figure 12: Access Position

Table 4: Intersection of Platinum Drive and Site Access Peak Intersection SIDRA Analysis

Intersection No.1: Platinum Drive and Site Access								
			Approach	**Road Name**	**Average Delay**	**LOS**	**V/C Ratio**	**Queue Length**
2021	Existing 2021	PM	South	Site Access	Not Required			
			East	Platinum Drive				
			West	Platinum Drive				
			Overall Intersection					
	Existing 2021 plus Mitigation	PM	South	Site Access	No Mitigation			
			East	Platinum Drive				
			West	Platinum Drive				
			Overall Intersection					
	Existing 2021 plus Development	PM	South	Site Access	7.8	A	0.002	0.0
			East	Platinum Drive	2.3	A	0.014	0.0
			West	Platinum Drive	2.3	A	0.010	0.2
			Overall Intersection		2.6	A	0.014	0.2
	Existing 2021 plus Development plus Mitigation	PM	South	Site Access	No Mitigation			
			East	Platinum Drive				
			West	Platinum Drive				
			Overall Intersection					
2026	Forecast 2026	PM	South	Site Access	7.8	A	0.002	0.0
			East	Platinum Drive	2.2	A	0.015	0.0
			West	Platinum Drive	2.2	A	0.010	0.3
			Overall Intersection		2.4	A	0.015	0.3
	Forecast 2026 plus Mitigation	PM	South	Site Access	No Mitigation			
			East	Platinum Drive				
			West	Platinum Drive				
			Overall Intersection					

The intersection (Site Access) will operate under acceptable conditions during the existing plus development and the forcasted 2026 conditions as stipulated in the Highway Capacity Manual 2000 Table 17.2 un-signalised intersections. All queues will be maintained within the development.

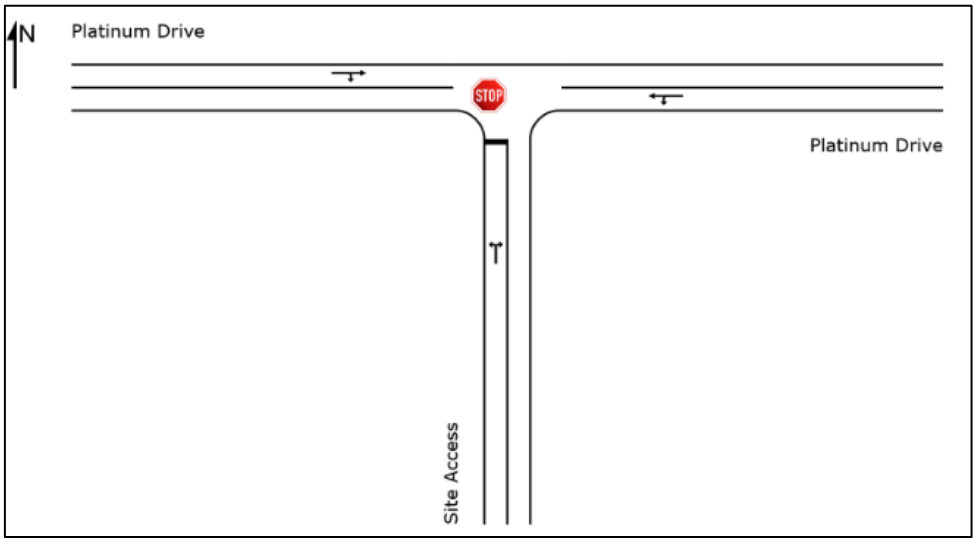

Figure 13: Intersection Layout of Platinum Drive and Site Access

12.2 Heavy/ Delivery Vehicles

The land use of the proposed development is Sports Fields therefore heavy and delivery vehicles are not applicable to this statement.

12.3 Parking

Ample parking is a significant factor for any successful development. Parking should be adequate in number and design to facilitate easy manoeuvrability.

The minimum parking requirement is a town planning item and hence the final amount of parking that is required will be determined by the Mandeni Municipality's town planning department.

All parking facilities, accesses and driveways are to be designed and dimensioned in accordance with the schedule of guidelines for off-street parking.

13. Pedestrians and Public Transport

13.1 Public Transport

The road network surrounding the proposed development operates as public transport routes. There is a significant amount of public transport vehicles that service the area. There is adequate parking within the sport fields for taxis to park

13.2 Pedestrians

All roads surrounding the proposed development have adequate sidewalks.

14. Transport requirements and Cost

Not applicable to this Statement.

15. Recommendations

1. The proposed developments is situated on Erf 1118 Hlomendlini
2. The combined site area is approximately 34 000m^2.
3. The proposed development is zoned Active Open Space
4. The proposed development will accommodate 200 seats for the proposed sporting facilities which will have a combined area of 15 600m^2.
5. The development will be phased as it is dependent on funding
6. The trips for the proposed actual community sports field is illustrated as below.

Summary of Trip Generation

Land Use		No. of Trips	Reduction Factor	Actual Trips	Split Ratio	Split in/out
Sports Stadium	PM	30	30%	20	90:10	18:2
	Evening	54	30%	38	10:90	4:34
	Saturday AM	34	30%	24	90:10	22:2

7. It is noted that the majority of patrons utilising these sport fields will either be pedestrians or utilise public transport
8. All parking requirements is discussed in section 12.3 of the report.
9. All parking facilities, accesses and driveways are to be designed and dimensioned in accordance with the schedule of guidelines for off-street parking.
10. The proposed developments will gain access via Platinum Drive. The access will need to be a minimum of 6 meters wide to accommodate two-way vehicle movements. All gates to remain open during normal operating hours.

11. The access bellmouths and at minimum the first 10 m of the access must be constructed to blacktop or premix standards. This will prevent the road edges from breaking.
12. The internal roads will remain as a gravel road until such time the local authority has the funds available
13. All mitigating measures are illustrated in Section 14.
14. All driveway ramps to have a maximum gradient of 15% with a minimum 30m vertical curve radius.
15. All internal roads are to be designed in conjunction with the Guidelines for Human Settlement planning and Design (Red Book).

ANNEXURE A

Traffic Counts

TRAFFIC SURVEY

CLIENT: NSA CONSULTING ENGINEERS

SITE: PLATINUM DRIVE

DATE: MONDAY 1 FEBRUARY 2021
UNITS: CLASSIFIED

PM PEAK

APPROACH FROM	EAST															TOTAL
NAME	PLATINUM DRIVE															
MOVEMENT	LEFT TURN					STRAIGHT					RIGHT TURN					ALL
TIME	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	MOVEMENTS
15:00 - 15:15	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	3
15:15 - 15:30	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
15:30 - 15:45	0	0	0	0	0	3	2	0	0	5	0	0	0	0	0	5
15:45 - 16:00	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	3
16:00 - 16:15	0	0	0	0	0	3	1	0	0	4	0	0	0	0	0	4
16:15 - 16:30	0	0	0	0	0	2	2	0	0	4	0	0	0	0	0	4
16:30 - 16:45	0	0	0	0	0	2	2	0	0	4	0	0	0	0	0	4
16:45 - 17:00	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	3
17:00 - 17:15	0	0	0	0	0	4	1	0	0	5	0	0	0	0	0	5
17:15 - 17:30	0	0	0	0	0	2	3	0	0	5	0	0	0	0	0	5
17:30 - 17:45	0	0	0	0	0	2	2	0	0	4	0	0	0	0	0	4
17:45 - 18:00	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
TOTAL	**0**	**0**	**0**	**0**	**0**	**26**	**18**	**0**	**0**	**44**	**0**	**0**	**0**	**0**	**0**	**44**

PM PEAK

APPROACH FROM	WEST															TOTAL
NAME	PLATINUM DRIVE															
MOVEMENT	LEFT TURN					STRAIGHT					RIGHT TURN					ALL
TIME	C	T	H	B	TOTAL	C	T	H	B	TOTAL	C	T	H	B	TOTAL	MOVEMENTS
15:00 - 15:15	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
15:15 - 15:30	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
15:30 - 15:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
15:45 - 16:00	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
16:00 - 16:15	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	3
16:15 - 16:30	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
16:30 - 16:45	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	3
16:45 - 17:00	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
17:00 - 17:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
17:15 - 17:30	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
17:30 - 17:45	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	3
17:45 - 18:00	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
TOTAL	**0**	**0**	**0**	**0**	**0**	**14**	**11**	**0**	**0**	**25**	**0**	**0**	**0**	**0**	**0**	**25**

ANNEXURE B

Sidra Output Files

MOVEMENT SUMMARY

Site: [Platinum Drive and Site Access Existing PM + DEV (Site Folder: General)]

NSA 1262 Intersection of Platinum Drive and Site Access
Site Category: Proposed Design 1
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Access														
1	L2	1	0,0	1	0,0	0,002	8,1	LOS A	0,0	0,0	0,07	0,94	0,07	51,9
3	R2	1	0,0	1	0,0	0,002	7,6	LOS A	0,0	0,0	0,07	0,94	0,07	51,4
Approach		2	0,0	2	0,0	0,002	7,8	LOS A	0,0	0,0	0,07	0,94	0,07	51,7
East: Platinum Drive														
4	L2	11	0,0	12	0,0	0,014	5,5	LOS A	0,0	0,0	0,00	0,25	0,00	56,3
5	T1	15	0,0	16	0,0	0,014	0,0	LOS A	0,0	0,0	0,00	0,25	0,00	57,8
Approach		26	0,0	27	0,0	0,014	2,3	NA	0,0	0,0	0,00	0,25	0,00	57,1
West: Platinum Drive														
11	T1	10	0,0	11	0,0	0,010	0,0	LOS A	0,0	0,2	0,07	0,24	0,07	57,6
12	R2	7	0,0	7	0,0	0,010	5,5	LOS A	0,0	0,2	0,07	0,24	0,07	55,5
Approach		17	0,0	18	0,0	0,010	2,3	NA	0,0	0,2	0,07	0,24	0,07	56,7
All Vehicles		45	0,0	47	0,0	0,014	2,6	NA	0,0	0,2	0,03	0,28	0,03	56,7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [Platinum Drive and Site Access 2026 PM (Site Folder: General)]

NSA 1262 Intersection of Platinum Drive and Site Access
Site Category: Proposed Design 1
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Access														
1	L2	1	0,0	1	0,0	0,002	8,1	LOS A	0,0	0,0	0,08	0,94	0,08	51,9
3	R2	1	0,0	1	0,0	0,002	7,6	LOS A	0,0	0,0	0,08	0,94	0,08	51,4
Approach		2	0,0	2	0,0	0,002	7,8	LOS A	0,0	0,0	0,08	0,94	0,08	51,7
East: Platinum Drive														
4	L2	11	0,0	12	0,0	0,015	5,5	LOS A	0,0	0,0	0,00	0,23	0,00	56,4
5	T1	17	0,0	18	0,0	0,015	0,0	LOS A	0,0	0,0	0,00	0,23	0,00	57,9
Approach		28	0,0	29	0,0	0,015	2,2	NA	0,0	0,0	0,00	0,23	0,00	57,3
West: Platinum Drive														
11	T1	11	0,0	12	0,0	0,010	0,0	LOS A	0,0	0,3	0,07	0,23	0,07	57,7
12	R2	7	0,0	7	0,0	0,010	5,5	LOS A	0,0	0,3	0,07	0,23	0,07	55,6
Approach		18	0,0	19	0,0	0,010	2,2	NA	0,0	0,3	0,07	0,23	0,07	56,9
All Vehicles		48	0,0	51	0,0	0,015	2,4	NA	0,0	0,3	0,03	0,26	0,03	56,9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

ANNEXURE C

Site Development Plan

38190 38340 38490

-3230400

-3230550

N

FUTURE PROPOSED PARKING AREA

VEHICLE AND PEDESTRIAN ENTRANCE

FUTURE PROPOSED FUTSAL COURT (40m X 20m)

PROPOSED COMBI COURT (31m X 16m)

FUTURE PROPOSED PRACTICE FIELD (110m X 55m)

ERF 1118
3.4 Ha

PROPOSED SOCCER FIELD (110m X 75m)

PROPOSED IRRIGATION SYSTEM

FUTURE PROPOSED TRACK FIELD

PROPOSED STANDS

PROPOSED CHANGEROOMS AND ABLUTIONS

PROPOSED SEPTIC TANK

PROPOSED SOAKAWAY

0 25 50 100 Meters

Legend
- Contours (2m)
- Proposed Irrigation System
- Potable Water
- Sewer Line
- Rivers
- Road Network
- Entrance
- Fence
- Future Proposed Track Field
- Future Combi Court
- Proposed Soakaway
- Proposed Septic Tank
- Proposed Changerooms and Ablutions
- Proposed Stands
- Future Proposed Futsal Court
- Future Proposed Practice Field
- Proposed Soccer Field
- Future Proposed Parking Area
- Cadastral
- Study Area

Data Source:	
Scale: 1:1,200	
Projection: TM	Datum: HH94
Central Meridian/Zone: Lo31	
Date: 09/12/2020	Compiled by: NODA
Project No: 559426	Fig No: 2

srk consulting

HLOMENDLINI SPORTSFIELD PRELIMINARY DESIGN REPORT

PROPOSED LAYOUT

Path: C:\Users\noda\Desktop\566508_NEWCASTLE_ENERGEY_ENV_VHUY\8GIS\GISPROJ\MXD\SWMP\559426_MANDENI_HLOM_SF_W4_F2_20201209.mxd

Revision: A Date: 09 12 2020