REPUBLIC OF NAMIBIA

MINISTRY OF WORKS AND TRANSPORT

Directorate of Aircraft Accident and Incident Investigations

Occurrence Reference: ACCID/11162022/01-05/

Aircraft Accident Investigation Final Report

CESSNA 206 V5-NSK

RELEASE DATE: 18 DECEMBER 2023

REPUBLIC OF NAMIBIA

MINISTRY OF WORKS AND TRANSPORT
DIRECTORATE OF AIRCRAFT ACCIDENTS AND INVESTIGATIONS

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Enquiries: Hafeni Mweshixwa Our Ref: 3/48 Date: 15th December 2023.

To : Minister of Works and Transport

From : Director of Aircraft Accident and Incident Investigations

RE: AIRCRAFT ACCIDENT REPORT

Please find attached the final report on the above subject accident. In accordance with Civil Aviation Act, 2016 (Act No. 6 of 2016),and with the International Civil Aviation Organization Annex 13 – Aircraft Accident and Incident Investigation – Standard 6.13, final reports shall be published as soon as possible in the interest of accident prevention.

It is recommended that copies of these final reports be made available to the public and other interested parties upon request. Your approval is therefore sought to release the said report.

Note : Report took long because several tests and analysis on certain aircraft components needed to be conducted in South Africa to verify findings. They were waiting on availability of a slot.

Magnus Abraham
DIRECTOR: AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATIONS

MINISTRY OF WORKS AND TRANSPORT
Directorate of Aircraft Accident & Incident Investigations
2023 -12- 15
Office of the Director
Private Bag 12042, Ausspannplatz
Republic of Namibia

MINISTRY OF WORKS & TRANSPORT
Office of the Minister
Approved
2023 -12- 18
Private Bag 13341, Windhoek
REPUBLIC OF NAMIBIA

Aircraft Accident Report

DESCRIPTION OF OCCURRENCE Runway Excursion
TYPE OF OPERATION: Private.
AIRCRAFT TYPE: Cessna 206 (V5-NSK)
LOCATION: Farm Masindi 371. Gobabis
DATE AND TIME: 16th November 2022 (12:45 UTC).

Foreword

This report presents the information, data analysis, conclusions, and safety recommendations reached during the investigation. The purpose of the investigation was to establish the circumstances surrounding this safety occurrence.

In accordance with the provisions of Annex 13 to the Convention on International Civil Aviation Organization, the accident's analysis, conclusions, and safety recommendations contained therein are intended neither to apportion blame nor to single out any individual or group of individuals. The main objective was to identify the systematic deficiencies and draw lessons, from the occurrence, which might help to prevent accidents and incidents in the future. To this end, many a time, the reader may be interested in whether or not an issue was a direct cause of the accident (that has already taken place), whereas the investigator is mainly concerned with the prevention of future accidents/incidents.

As a result, the usage of this report for any purpose other than (the latter and spirit of Annex 13 and other relevant statutes) prevention of similar occurrences in the future might lead to erroneous interpretations and applications.

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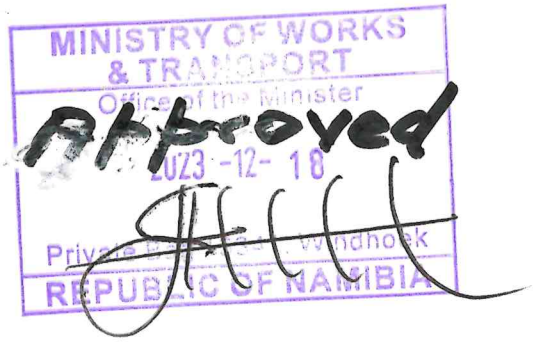
ABBREVIATION

AD	-	Airworthiness Directives
AMO	-	Aircraft Maintenance Organization
AME	-	Aircraft Maintenance Engineer
DAAII	-	Directorate of Aircraft Accident and Incident Investigation
ELT	-	Emergency Locator Transmitter
G/H	-	gallons/hr
ICAO	-	International Civil Aviation Organization
LOC-G	-	Loss of Control on Ground
NCAA	-	Namibia Civil Aviation Authority
NAMCARs	-	Namibian Civil Aviation Regulations
PPL	-	Private Pilot License
MPI	-	Mandatory Periodic Inspection
SB	-	Service Bulletins
UTC	-	Universal Time Co-ordinated



Ministry of Works and Transport

ACCID/11162022/01-05/

DIRECTORATE OF AIRCRAFT ACCIDENT INVESTIGATION
ACCIDENT REPORT – EXECUTIVE SUMMARY

Aircraft Registration	V5-NSK	**Date of Accident**	16th November 2022	**Time of Accident**	12:45 UTC
Type of Aircraft	CESSNA 206		**Type of Operation**	Private	
Pilot- In - command License Type	PA 73520	**Age**	36	**License Valid**	VALID
Pilot-In-command Flying Experience	Total Flying Hours	149.5		**Hours on Type**	62.4
Last point of departure	Farm Masindi 371				
Next point of intended landing	FYWH				

Location of the accident site with reference to easily defined geographical points (GPS readings if possible)

GPS: 22°58'21"S 019°25'37"E Farm masindi.

Meteorological Information	Wind Direction: 030 °, Wind speed: 5 kt, Temperature: 28° C Visibility: CAVOK,				
Number of people on board	1+5	**No. of people injured**	0	**No. of people Fatally Injured**	0

Synopsis

On the 16th November 2022, at around 1245 UTC a privately owned, Namibian registered aircraft was on a take-off run on a private runway at Farm Masindi. Gobabis area. On Board were the pilot and five passengers on a private flight to Hosea Kutako International Airport.

According to the pilot, he did the pre-flight inspection and briefing to the passengers, then started the aircraft, the pilot pushed the throttle fully forward procedurally, the aircraft accelerated normally as expected. When the airspeed reached 60mph he was preparing to rotate (lift off).

The pilot noticed the fuel flow had dropped to about 18g/h and the rpm was below the 'red arc', the pilot then decided to abort the take-off as he also felt that the engine had not reached maximum power. He pulled the throttle back and closed the fuel selector and applied brakes. The aircraft was not slowing sufficiently enough so the pilot told the passengers to brace themselves then steered to the right into a thick bush avoiding hitting a big tree at the end of the runway.

No one was injured however the aircraft was substantially damaged and later declared a hull loss.

The Directorate of Aircraft Accident and Incident Investigation (DAAII) was informed telephonically by the owner. The Minister of Works and Transport was responsible for the release of the official final accident report.

The pilot was a Namibian citizen who was a holder of a valid Private Pilot License and a medical certificate, valid till 31 October 2023.

The last Annual Inspection (AI) was carried out and certified on 29/09/ 2022, in accordance with the Cessna Maintenance Manual and NAMCARS 2001 by a Namibian AMO at 16890.70 hours. The Certificate of Airworthiness was issued on 10/10/2022 and valid till 09/10/2023.

Probable Cause: Runway excursion

Contributing factor (s):

1. The decision to abort the take-off late.

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AIRCRAFT ACCIDENT REPORT

Name of Owner	: Ground Rush Aviation
Operator	: Schalk Pienaar
Manufacture	: Textron Aviation
Model	: C 206
Nationality	: Namibian Registered
Registration	: V5 - NSK
Location	: 22°58'21"S 019°25'37"E Farm Masindi.
Date	: 16th November 2022 Time: 12:45 UTC

All times given in this report are in Co-ordinated Universal Time (UTC).

Disclaimer:

The report is given without prejudice to the rights of the Directorate of Aircraft Accident and Incidents Investigations, which are reserved.

Purpose of the Investigations:

In terms of the Namibia Civil Aviation Act (Act No. 6 of 2016) and ICAO Annex 13, this report was compiled in the interest of the promotion of aviation safety and the reduction of risk of aviation accidents or incidents and **not to establish blame or legal liability.**

This report contains facts relating to aircraft accidents or incidents that have been determined at the time of issue. The report may therefore be revised should new and substantive facts are made available to the investigator (s).

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 On the 16th of November 2022, a Namibian registered aircraft was on a take-off roll from a private farm to Hosea Kutako airport. The pilot and five passengers were on board the aircraft.

1.1.2 According to the pilot, that morning the pilot did a pre-flight inspection, he added 80 litres of fuel on each wing.

1.1.3 The pilot and passengers boarded the aircraft, fastened their seat belts and did the safety briefing.

1.1.4 The pilot then started the aircraft normally. On the take-off roll, the oil pressure raised as expected. The pilot looked at the manifold pressure and it indicated 23 gallons per hour (g/h), fuel pressure was 22gh and rpm was approaching 30. The pilot then turned the pitch back to bring the rpm back to below the red line. Fuel flow stayed at 22g/h and the airspeed indicator indicated 50 mph.

1.1.5 When the airspeed reached 60mph the pilot prepared to rotate. The pilot further stated that he listened to the engine and felt it was not at full power he then glanced over to the instruments and then noticed that the fuel flow was down to about 18 g/h and that the rpm had dropped below the red line. The pilot then decided to abort the take-off, by then the airspeed was close to 70mph. The pilot then pulled the throttle back and closed the fuel selector and started to apply steady pressure on the brakes and soon realized the aircraft was not slowing down quickly enough.

1.1.6 The pilot applied full pressure on the brakes and when realized the aircraft was going to overshoot the runway,

the pilot told the passengers to brace themselves and steered the aircraft to the right slightly to make an impact first with a large bush so as to avoid hitting a big tree at the right near end of the runway. The plane came to a standstill on the bush, he switched off the master and ignition and they all got out.

1.1.7 The aircraft was substantially damaged. The pilot and the passengers did not sustain any injuries.

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	0	-	0	-
Serious	0	-	0	-
Minor	0	-	0	-

1.3 Damage to Aircraft

1.3.1 The aircraft sustained substantial damage.

Figure 1: *Collapsed landing gear.*

Figure 2: Depicting damage to the lower section and propeller.

1.4 Other Damage

1.4.1 There was no other damage to the environment.

1.5 Personnel Information

1.5.1 Pilot-in-in command

Nationality		Namibian			
Licence No	PA73520	Gender	Male	Age	36
Licence valid		Valid	Type Endorsed	n/a	
Type Ratings		None			
Medical Expiry Date		31/10/2023			
Restrictions		None			
Previous Accidents		Unknown			

Total Hours	149.5
Total Past 90 Days	46.8
Total on Type Past 90 Days	45.3
Total on Type	62.4

1.6 Aircraft Information

Figure 3: *(FILE PHOTO)*

The aircraft was equipped with a Robertson STOL system. The Robertson 'STOL' Operation is designed for experienced pilots who demand the utmost in performance in emergency conditions or austere fields, R/STOL combination of wing stall fences, leading-edge modifications, symmetrically drooped ailerons and automatic trim interconnect increases the aircraft's capabilities. The system reduces up to 47% shorter takeoff and landing distances, Improves high-density altitude performance etc [1]

Airframe:

Type	Cessna U206
Serial No.	U206 1197
Manufacture	Textron
Year of Manufacture	1968
Last MPI (Date & Hours)	29/09/2022 at 16,890.70 airframe hours
Hours since Last MPI	30.6 hours
C of Airworthiness	10/10/2022 valid till 09/10/2023
Operating Categories	Standard A, C, D, E. F

[1] https://skyway-mro.com/robertson-stol-high-lift-systems/

Engine:

Manufacturer	Continental
Model	10-550-LcF
Serial No.	1009104
Hours since New	2486.1

Propeller:

Manufacturer	Hartzell
Model	HC-C3YF-1RF/F8068
Serial No.	PY207B

1.6.1 The aircraft was fitted with a continental engine model 10-550-LcF. The 550 series is air-cooled, naturally aspirated horizontally opposed 6-cylinder gasoline, fuel-injected four-stroke engine.

1.6.2 The engine (serial number 1009104) was overhauled and a release certificate FAA FORM 8130 -3 was issued on 16/02/2017 by AMO 66.

1.6.3 The last Mass and Balance was conducted on 08/02/2018 by a local AMO.

Mass and balance calculations

The operational flight plan log submitted by the pilot.

V5 NSK - Masindi Farm to Windhoek Eros

Flight Plan reference number : KZC

AIRCRAFT LOADING

Item	Quantity	Unit Weight (lbs)	Total Weight (lbs)	Arm (inches)	Moment (lbs-inches/1000)
Aircraft	1	2018	2018	34.8	70.1
Fuel	42 (gal)	6	252	49.0	12.3
Front	2	225	450	37.5	16.9
Centre	2	230	460	77.8	35.8
Back	2	165	330	100	33
Baggage 1	1	20	20	97	1.9
TOTAL			**3530**	**48.2**	**170.1**
Total - no fuel			*3278*	*48.1*	*157.7*

FUEL CALCULATIONS

Unusable:	4 (gal)	
Taxi:	2 (gal)	
Flying:		
Trip:	01 hours 05 min	16.2 (gal)
Approach and Landing:	00 hours 06 min	1.5 (gal)
Contingency (5%):	00 hours 04 min	0.9 (gal)
Alternate:	00 hours 00 min	0 (gal)
Final Reserve:	00 hours 45 min	11.3 (gal)
Extra:	00 hours 25 min	6.1 (gal)
TOTAL USABLE:	**02 hours 24 min**	**38 (gal)**

Figure 4 : Mass and balance calculations by pilot

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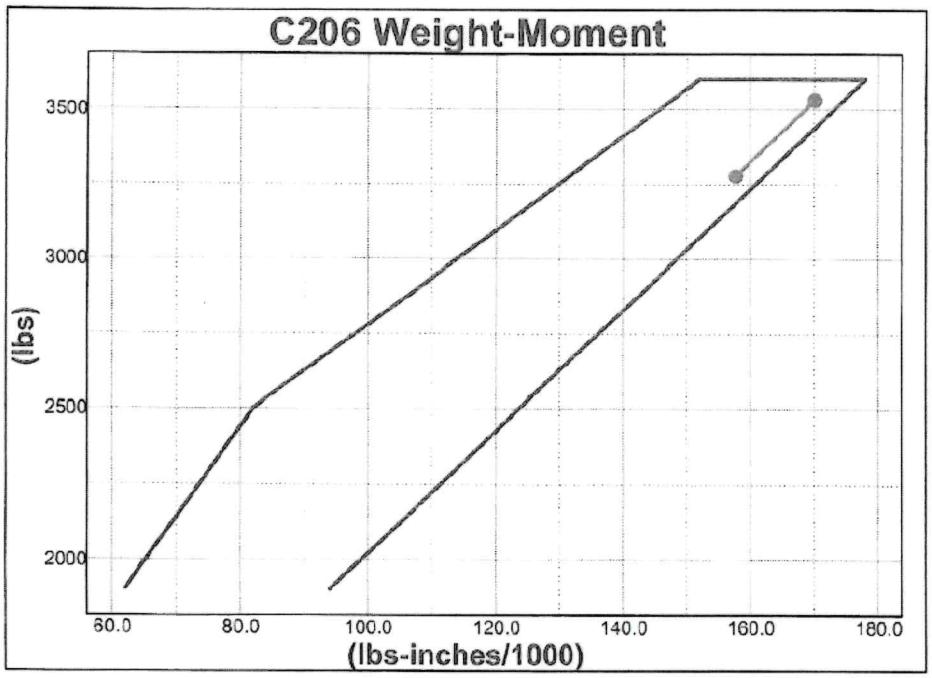

Figure 5: Weight and moment within the flight envelope

1.7 Meteorological Information

Wind direction	030°	Wind speed	5 kts	Visibility	9999
Temperature	28° C	Cloud cover	Scattered	Cloud base	10 000ft
QNH	1020				

Density altitude
Density Altitude in Feet = Pressure Altitude in Feet + (120 x (OAT°C – ISA Temperature °C)

Note: The temperature used by the pilot was 28° c the closes reported QNH 1020. The density altitude would therefore be 6720 ft.

When the investigators arrived the following day at the same time the temperature was 36^0 C, the density altitude would have been 7680ft.

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with standard navigation equipment as approved by the Regulator. There were no recorded defects with the navigational equipment prior to the flight.

1.9 Communications.

1.9.1 The aircraft was equipped with standard communication equipment as approved by the Regulator for the type. There were no recorded defects with the communication system prior to the flight.

1.10 Aerodrome Information

1.11 The accident occurred during daylight at the private Farm Masindi, Gobabis Area.

1.12 The accident occurred at GPS co-ordinates S 22° 58'38.21", E 019°25'20 37"

Aerodrome Location	Farm Masindi Gobabis Area	
Aerodrome Co-ordinates	S 22° 58'21 00 & E 019° 25'37 02	
Aerodrome Elevation	4410 ft	
Runway Designations	06	24

Runway Dimensions	950 m	25m
Runway Used	06	
Runway Surface	gravel	
Approach Facilities	none	
Visual aid	none	

1.11 Flight Recorders

1.11.1 The Aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR) nor was it required by the relevant aviation regulations.

1.12 Wreckage Distribution and Impact Information

There were no parts that detached from the aircraft.

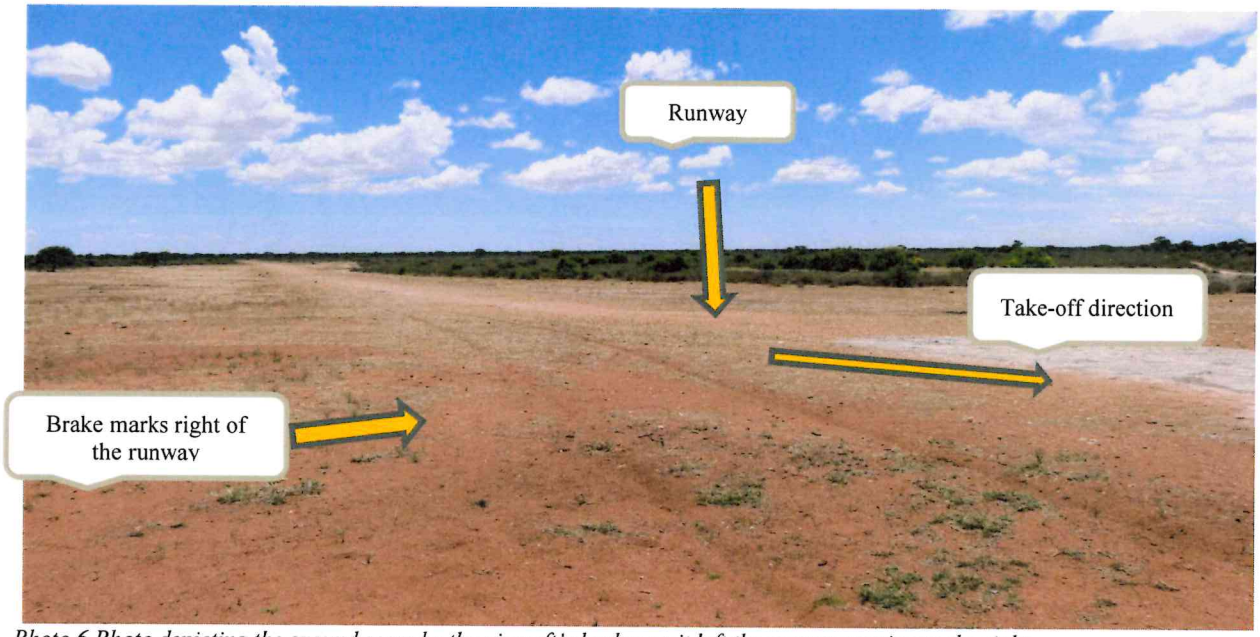

Photo 6 Photo depicting the ground scars by the aircraft's brakes as it left the runway veering to the right.

Photo 7 Photo depicting the aircraft's impact with the vegetation

The aircraft tracks indicated that the aircraft left the runway and veered to the right and collided with a thick bush. The nose gear and right main gear were substantially damaged.

1.13 Medical and Pathological Information

1.13.1. The pilot medical certificate was valid.

1.14 Fire

1.14.1. There was no pre- or post-impact fire.

1.15 Survival Aspects.

1.15.1 The pilot and the passengers were properly restrained by making use of the aircraft-equipped safety harness and did not sustain any injuries during the impact sequence.

1.15.2 This was a survivable accident.

1.16 Tests and Research.

1.16.1. The engine was transported to an AMO in Wonderboom Airport Pretoria, South Africa. The AMO with certificate number AMO227 did a teardown. The engine was stripped and inspected no abnormalities were detected.

1.16.2 The magnetos were bench tested and found in good working condition, the fuel system was tested and was found to be satisfactory. The propeller governor was bench tested and no abnormalities were observed.

1.17 Organizational and Management Information.

1.17.1. The aircraft was flown by a PPL holder who is also a game farm owner and hunter. He sold an all-inclusive package that involved hunting. Meals, accommodation as well as transfers from the airport.

1.17.2. The investigations looked into the documentation of the aircraft.

1.18 Additional Information

1.18.1 None

1.19 Useful or Effective Investigation Techniques.

1.19.1 Not applicable.

2. ANALYSIS

2. 1. Operations

The pilot was also a freelance professional hunter and the owner of the game hunting safaris.
The investigations revealed that the hunting package included game hunting, accommodation, meals and transfers to and from the airport and between hunting areas.

Commercial operations require a higher level of pilot training and certification, aircraft maintenance procedures, and operational safety rules, this type of operations require pilots to have Commercial Pilot License with enhanced training and experience.

Package tours should be required to fall under air charter operations where an Air Operators Certificate (AOC) is required. An AOC which is a certificate authorizing an operator to carry out specified commercial air transport operations, greatly enhances safety for these activities since sufficient experience is required, a quality system to ensure that all applicable regulations are followed, and sufficient insurance to cover the injury or death of any passenger carried.

2.2 Aircraft.

The last MPI was completed on 29/09/2022 at 16 890.70 airframe hours. The aircraft had flown a total of 30.6 hours since its last MPI. The aircraft was issued a Certificate of Airworthiness on 10 /10/2022 with an expiry date of 09/10/2023.

There were no recorded defects before the flight. The aircraft was equipped with standard navigation and communication by the regulator for the Aircraft type.

2.3 Density Altitude

Taking density altitude into account, the speed and all parameters described by the pilot, a successfully takeoff could have been possible.

2. 4. Organization

The tech log/Flight folio book which is a journey record book is used for recording details of each flight including
journey log:

1. Aircraft registration;
2. date;
3. name(s) of crew member(s);
4. fuel uplift
5. place of departure;
6. place of arrival;
7. time of departure (off-block time);
8. time of arrival (on-block time);
9. hours of flight;
10. nature of flight;
11. **incidents, observations (if any); and**
12. commander's signature (or equivalent)

The journey logbook/ flight folio is a good record to indicate any technical faults, this information can be used to establish trends which is useful for proactive maintenance and action. The records are also used for reactive investigation therefore are required to be kept in triplicate in case the logbook is damaged or lost.
The colour-coded record book, which was issued in triplicate, was found with all triplicate copies still attached defeating the purpose it was intended for. One copy is intended to be kept at the maintenance organization, where it is used track and establish safety trends and the other at the owners/pilot's premises.

3. CONCLUSION

3.1 Findings

3.1.1 The maintenance records indicated that the aircraft was certified equipped and maintained in accordance with existing regulations and approved procedures.

3.1.2 The flight folio, which is issued in triplicate, was found with all three colour-coded pages on the same book, the duplicate records were not kept on separate files.

3.1.3 The aircraft's Certificate of Airworthiness was valid.

3.1.4 There was no evidence of airframe failure or system malfunction prior to the accident as none was recorded on the flight folio, apart from the 'Hobbs meter defective'.

3.1.5 The engine was bench tested at all power settings, magnetos were removed and underwent more testing and no anomalies were detected.

3.1.6 The pilot had a valid Private Pilot Licence.

3.2. Cause/s

3.2.1. Runway excursion

3.3 Contributing factor

3.3.1 The decision to abort the take-off late.

4.0 Safety Recommendations

4.1 None

Compiled by:

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Hafeni Mweshixwa

Investigator-in-Charge

Date: 14 DECEMBER 23

Released by:

……..

Hon John Mutorwa, MP

MINISTER: MINISTRY OF WORKS AND TRANSPORT

Date: 18 DECEMBER 2023

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