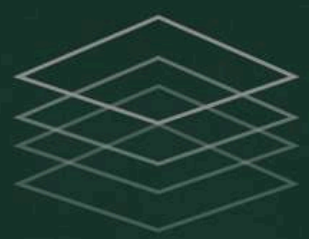


GRASS ENGG.

PITCH DECK

2026



GRASS ENGG.

M-TBM

PIPELINE MAINTENANCE

ROBOT

DEPLOYMENT-READY

Adarsh Gautam | Founder |

DPIIT Recognized Startup

Website : grassengg.in Email : operations@grassengg.in
JAMSHEDPUR 831001 --- +91 6204488701

PROBLEM STATEMENT

‘Lack of Automation in Choked Pipeline Maintenance Processes in Industrial Infrastructures’

DOMAIN : STEEL MANUFACTURING PLANTS



25+ STEEL MANUFACTURING PLANTS IN INDIA

700+ KMS OF CLOGGED PIPELINES

THESE REQUIRE DESCALING EVERY 5 YEARS.

Actual site photos





Pipeline Infrastructure of INTEGRATED STEEL PLANTS | AVG length = 30 KM

THE PIPELINE FITNESS INSPECTION IS TO BE DONE EVERY 5 YEARS.

- 1 **DISMANTLING**
- 2 **HYDROJETTING**
- 3 **INSPECTION**
- 4 **FABRICATION**

THE PIPELINE MAINTENANCE PROCESS INVOLVES 4 STEPS

PIPELINE MAINTENANCE PROCESS

1.

Dismantling
+
Hot Work
+
Logistics



1. MANUAL DISMANTLING

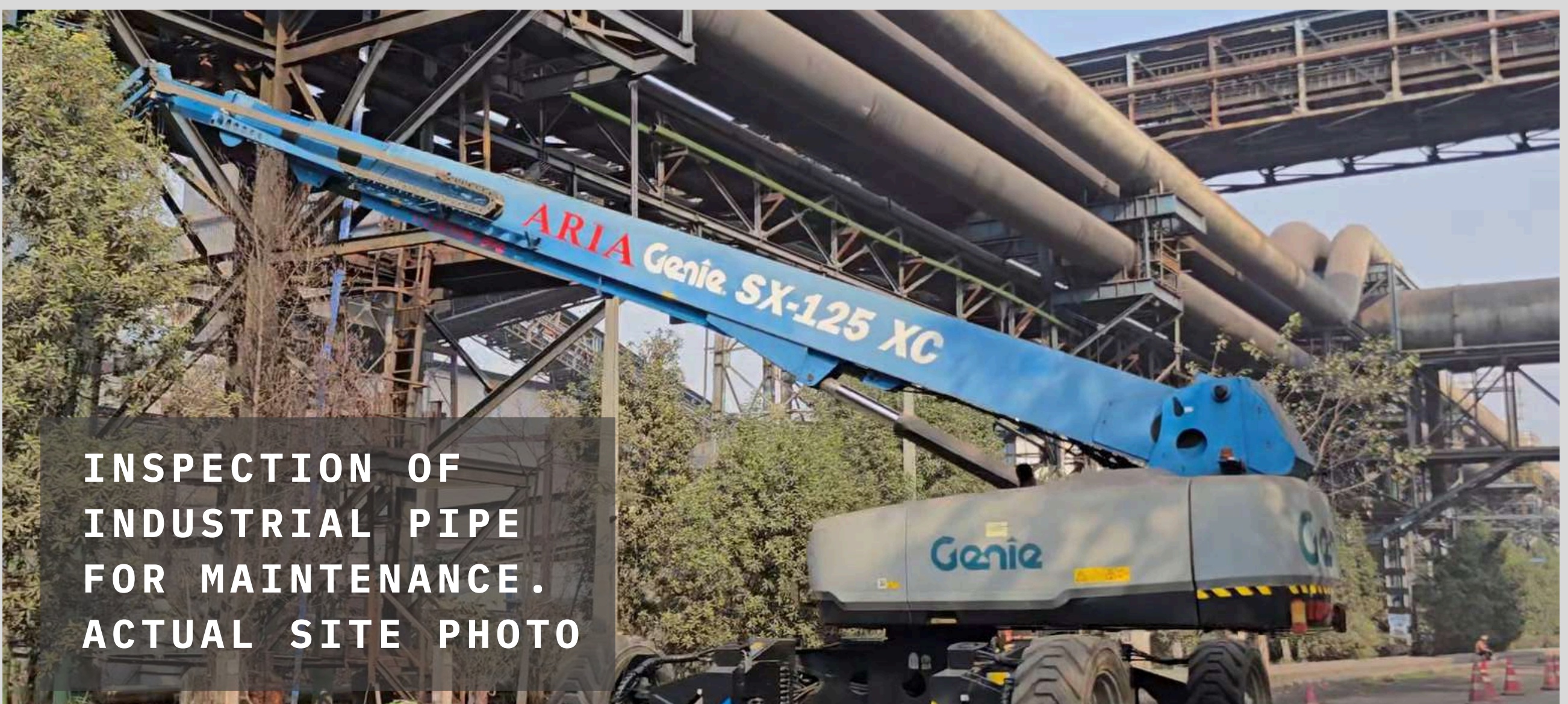


SAFETY RISKS

- **CONFINED SPACES**
- **DEBRIS SPILLAGE**
- **TOXIC ENVIRONMENT IN CASE OF GAS LINES**

DISMANTLING REQUIRES

- **SHUT DOWN PLANNING**
- **MEN AND MACHINERY**



INSPECTION OF INDUSTRIAL PIPE FOR MAINTENANCE. ACTUAL SITE PHOTO

2. HYDROJETTING



FOR
PIPELINE
FITNESS
INSPECTION

HYDROJETTING
IS REQUIRED

Hydrojetting Has it's Issues -

1. Dismantling is Mandatory in case of elevated pipelines.

2. High pressure is Mandatory.

3 . Risk of Pipe Damage is High as pressures are Highly localised.

4. Spillage of Debris and Collection challenge.

3. INSPECTION AND RE INSTALLATION



Inspection → Manual Hydrojetting



Fabrication → Repainting → Installation

KEY IMPACT FACTORS

- RESOURCE MOBILIZATION.
- WATER CONSUMPTION.
- SEVERAL KILOMETERS OF PIPELINES IN A SINGLE PLANT

SOLUTION ANALYSIS

**MODULAR
COST EFFECTIVE
INDIGENOUS**

**AUTOMATES
MULTIPROCESS
SYSTEM**

**MINIMIZES
SAFETY
RISKS**

**ROBOT
THAT**

**OPERATES
REMOTELY**

**AVOIDS
DISMANTLING**

SOLUTION: M-TBM

BY – GRASS ENGG.



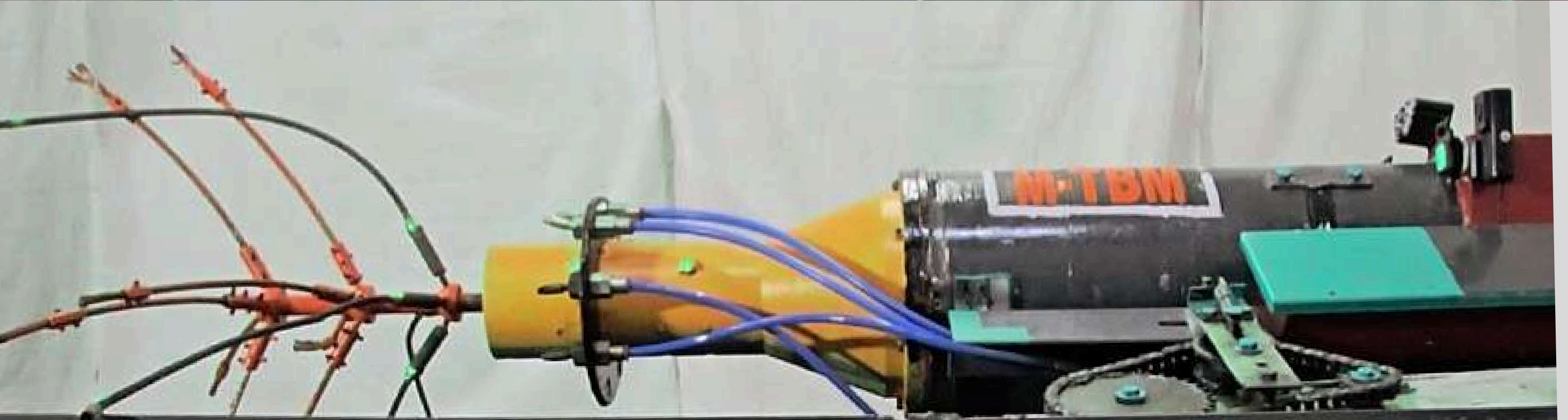
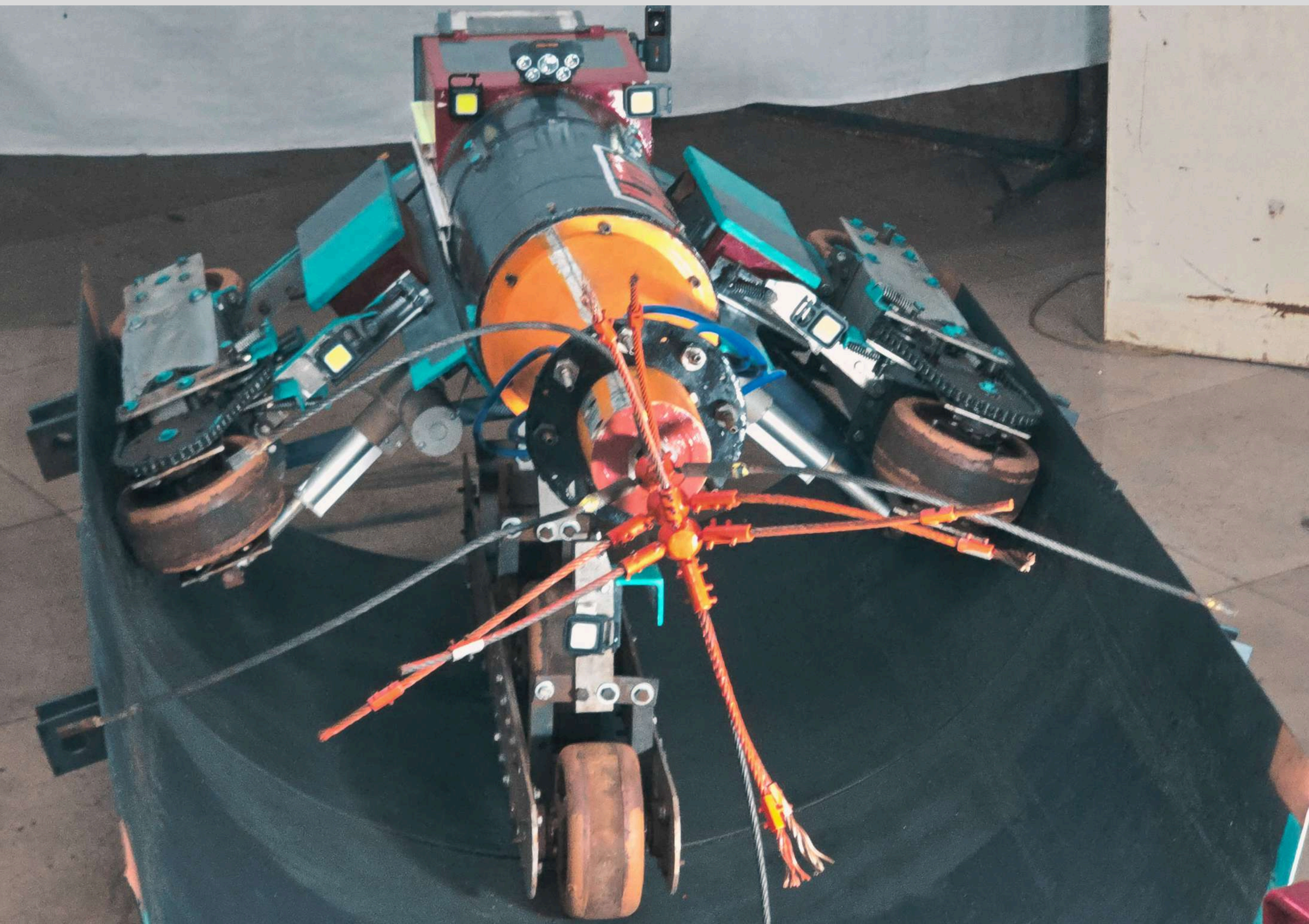
IN-SITU

**Pipeline
Maintenance**

**DESCALING
HYDROJETTING
INSPECTION**

**WIRELESS
ROBOT**

GRASS ENGG. PRIVATE LIMITED ASSET



UN-MANNED

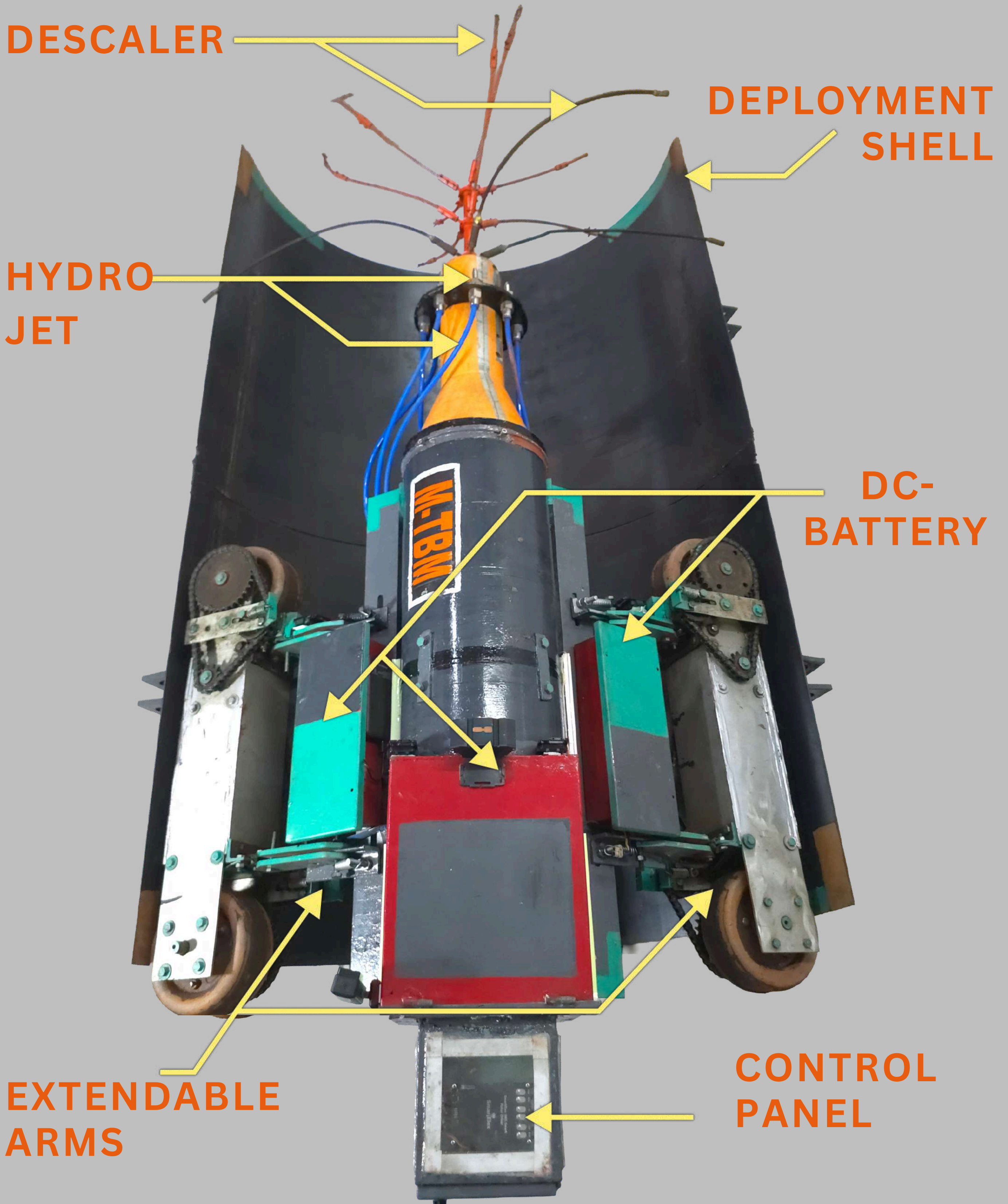
DC-POWERED

PIPELINE DN RANGE 800 - 1600

DESIGN AND CONSTRUCTION

LENGTH : 186 CM

WEIGHT : 180 KG



TOP VIEW

OPERATIONAL FEATURES

VISUAL FEED 1080p HD



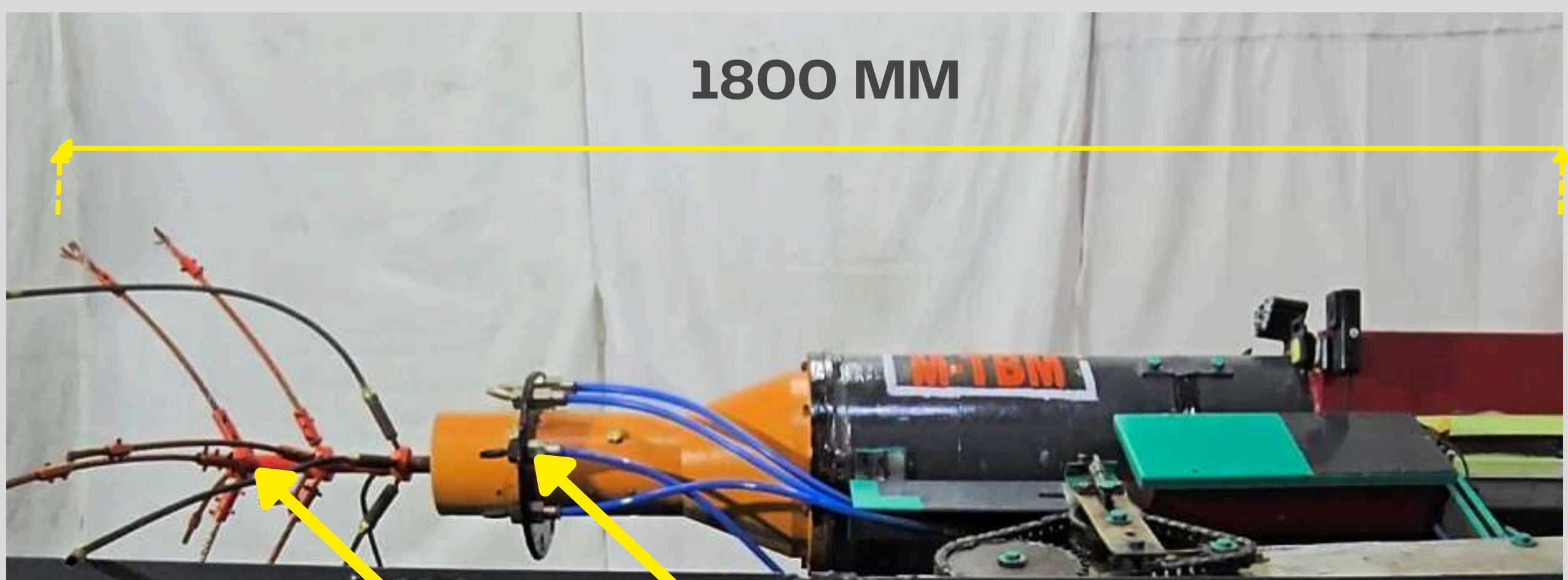
WIRELESS RC



1. TRAVERSAL

2. DESCALER

3. HYDRO-JET



1800 MM

SIDE VIEW

DE-SCALER

HYDROJET MAX PRESSURE (10) BAR

WHY M-TBM ?

REDUCES

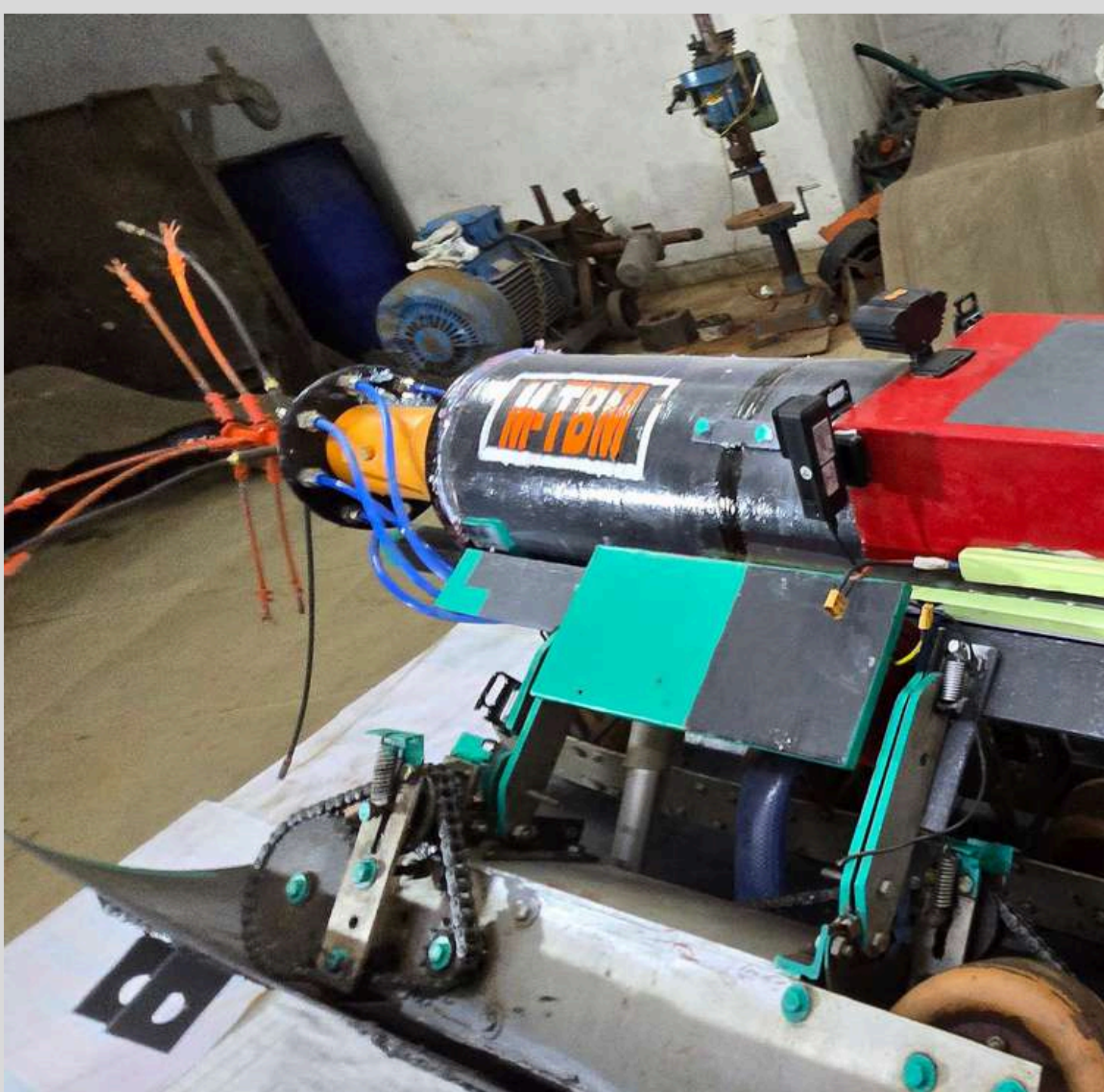
SAFETY RISKS 

INCREASES

 PIPELINE HEALTH

BY COMBINING IN-SITU DESCALING +
HYDROJETTING + VISUAL INSPECTION
+ UNMANNED MAINTENANCE.

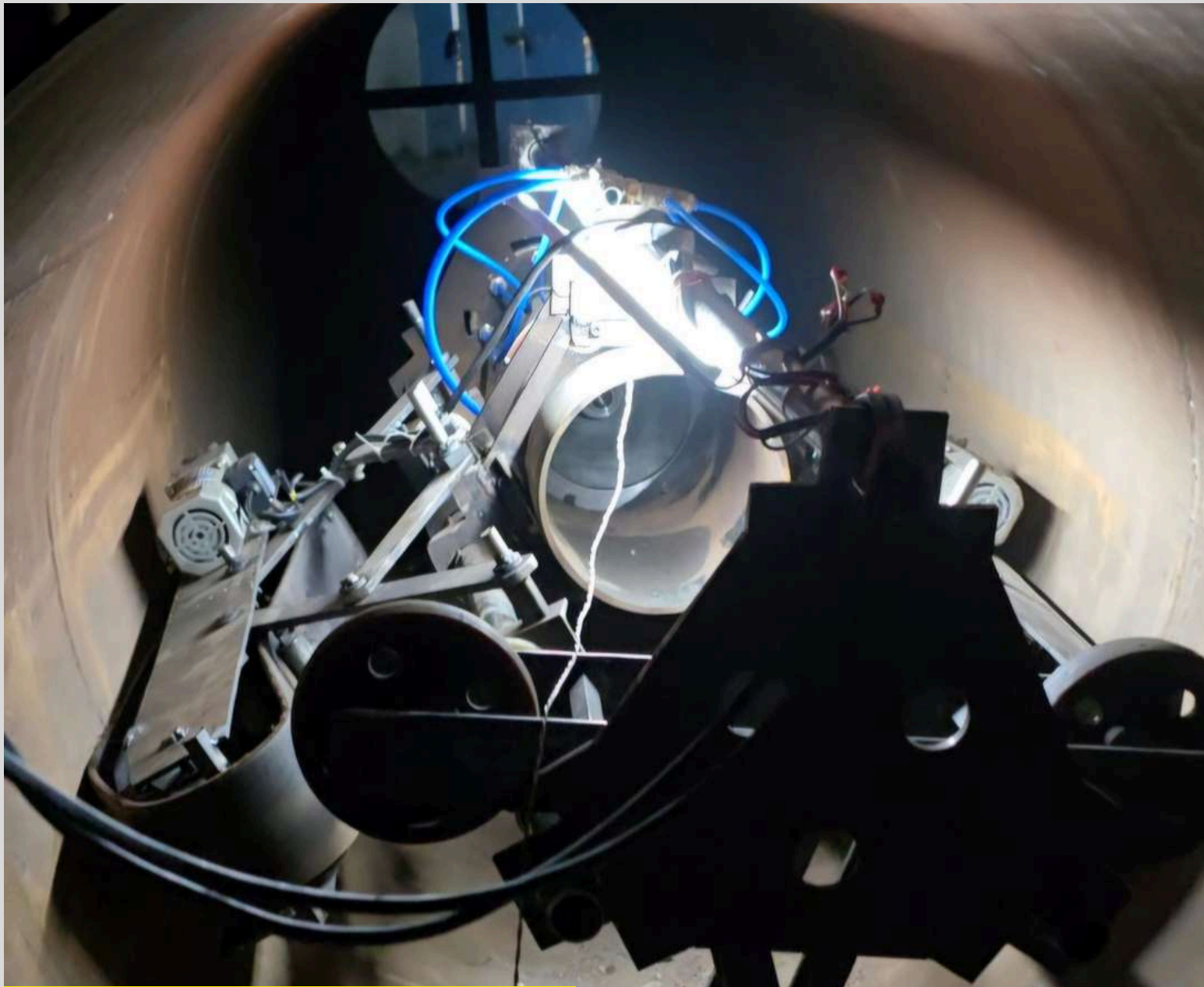
SAVES TIME , RESOURCE AND REVENUE



M-TBM TECHNICAL DETAILS

FEATURE	SPECIFICATION
Pipeline Range	800mm – 1600mm Diameter
Speed	100 meters per hour with 15-minute deployment
Power	DC powered, 3-hour battery runtime (15-min swap)
Operating Environment	Waterproof; Electrically isolated, suitable for gas-pipeline, Fire averse, operates up to 80°C and 5° inclines
Manpower Required	3 operators (controlled by one person wirelessly)

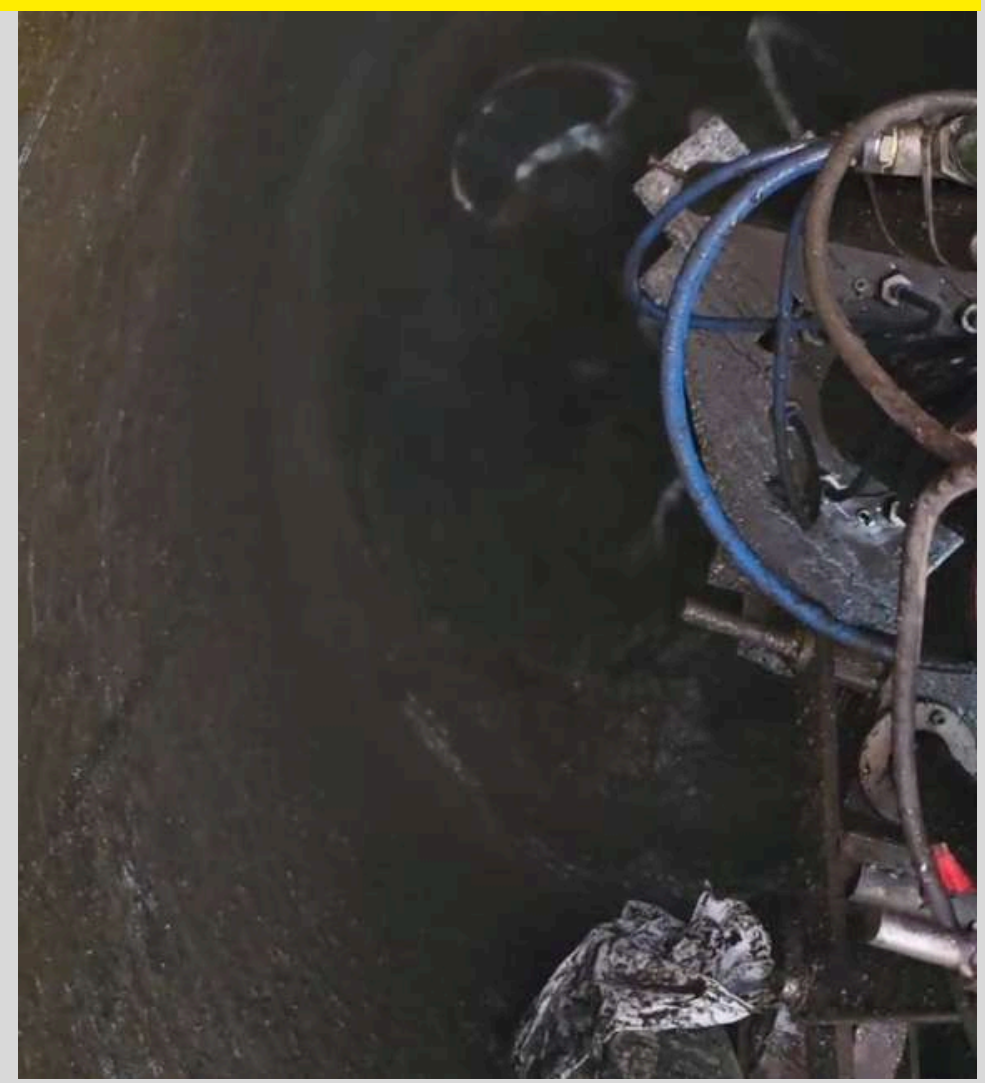
M-TBM VALIDATION & TRACTION



1st Prototype

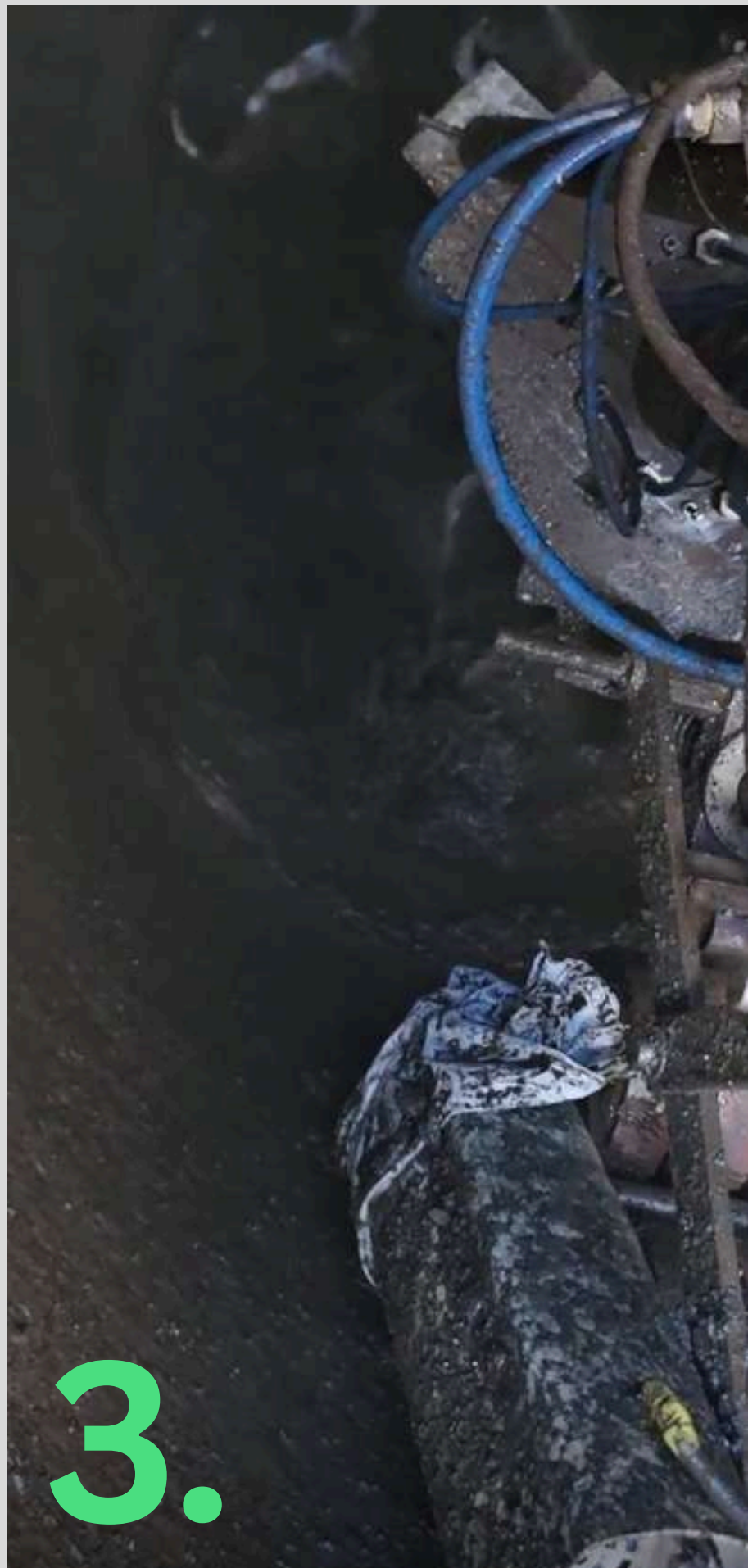


MECHANICAL TRIAL





**BEFORE
CLEANING**



Complete testing videos available at
Youtube : GRASS ENGG.

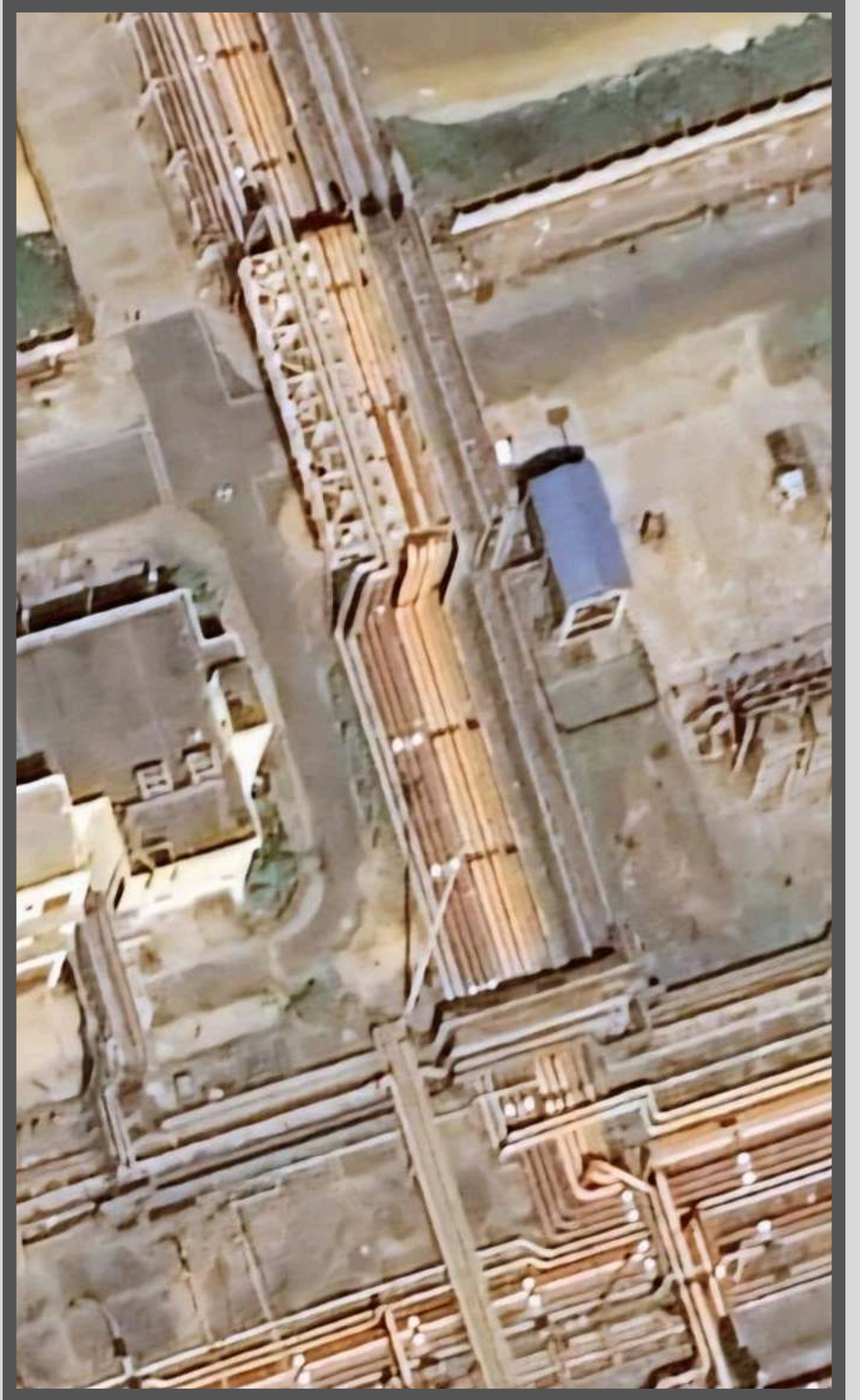
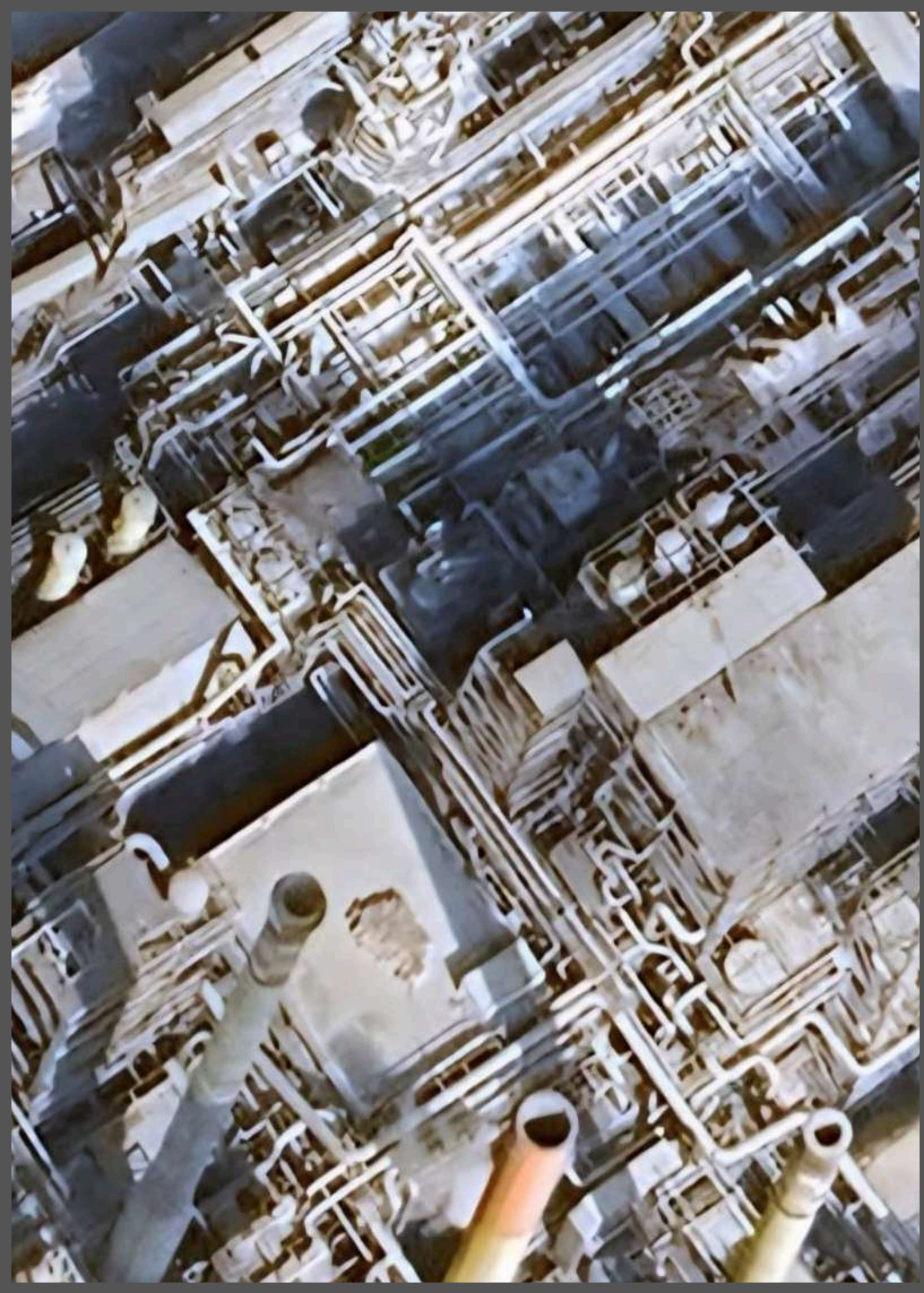
AFTER CLEANING

PRODUCT USE- CASES



Thermal Power Plants Pipeline Scale and Infrastructure.

Shows Slurry Lines Towards Ash Dyke.
Average Length = 18 Kilometers



REFINERY AND
CHEMICAL INDUSTRIAL
PIPELINE
INFRASTRUCTURE

TARGET MARKET

₹3000 – 5000 Cr +

Large, Under-served Industrial need

INTEGRATED STEEL PLANTS

SAIL BSP, DSP, RSP, IISCO , SSP , BHILAI STEEL PLANT

ACCELOR MITTALL TATA STEEL JSW STEEL PLANTS

ESL VEDANTA NIPPON STEEL JINDAL STEEL PLANTS

THERMAL POWER PLANTS

NTPC LIMITED TATA POWER RELIANCE POWER

ADANI POWER MUNDRA TPP SASAN UMPP

VINDHYACHAL STPS

OIL AND GAS REFINERIES

ONGC HMEL CPCL MRPL BPCL HPCL

NAYARA OIL IOCL RIL

MUNICIPAL CORPORATIONS

MINING COAL INDIA

COMPETITORS AND COMPARISON

Feature	Robosoft Systems	JettyRobots	M-TBM (GRASS ENGG.)
Primary Focus	HVAC Duct & Air Quality	Professional Pipeline Maintenance	Heavy Industrial Slag/Hard Deposit Descaling
Cleaning Method	Brushing & Vacuuming	Dry Ice Blasting / Brushing	Mechanical De-Scaling + High-Pressure Flushing
Mobility	Tethered (Cable)	Tethered (Power + Hose)	Wireless / Battery Operated
Power Supply	External Power Source	External Power Source	On-board Battery (No Trailing Cables)
Indigeneity	Domestic Design	European (Imported Tech)	100% Indigenous (Design to Execution)
Deployment	Manual Entry	Modular Track / Sync	Outer-Shell Lowering System
Target Sector	Commercial Real Estate	Industrial & HVAC	Steel Plants, Power Plants, Refineries

COMPETITOR ANALYSIS



Images of Jetty Bot , our Direct Competition, in the mid Diameter pipeline segments

NORWEGIAN ROBOTICS COMPANY

OUR DELIVERABLES

- **PROJECT ASSOCIATION**

- **REVENUE SHARE**

- **JOB OPPORTUNITIES**

PRIMARY REQUIREMENTS FROM INCUBATORS

- **PATENT FILING IP AND LICENSING SUPPORT**

- **MARKETING SUPPORT**

- **FUNDING TILL COMMERCIALIZATION**

- **PRODUCT ADVANCEMENT**

REVENUE MODEL

Current Stage

- **Prototype completed and operational**
- **Pre-revenue / early engagement stage**
- **In formal discussions with [NTPC Limited](#).**

Project-based deployment charges.

**Annual Maintenance Contract
(AMC)**

**Future: Leasing & Technology
Licensing**

Revenue driven by per-deployment model with strong repeat usage potential.

Financial Outlook

STRONG RECURRING REVENUE

PROJECTED REVENUE (INDICATIVE)

Year	Key Milestone	Revenue
Year 1	Pilot deployments (2-3 clients)	20-30 Lakhs
Year 2	Multiple contracts + AMC (Annual Maintenance Contract)	80 Lakhs - 1.2 Cr
Year 3	Scale across industries	2-3 Cr

**TRANSITION TO
COMMERCIAL DEPLOYMENT.**

FUNDING ASK

₹ 30 – ₹ 50 Lakh

To be utilized for:

- **PSU pilot deployments**
- **System standardization & modular scaling**
- **Operational Costs (12 months)**

Objective: Achieve pilot deployments and transition to early commercial operations within 8–12 months.

Summary

Category	Amount (₹)
Engineering Modulation (24.6%)	8,00,000
System Upgrades (20%)	6,50,000
Field Deployment (15.4%)	5,00,000
PSU Outreach (10.8%)	3,50,000
Operations (8 months) (16.9%)	5,50,000
Testing & Iteration (7.7%)	2,50,000
Misc/IP (4.6%)	1,50,000

TATA STEEL LIMITED, SALINDRAGAN INDUSTRIAL ESTATE, DURGAM CHOWK, JAIPUR PIN-302016, INDIA
Comm:RAJASTHAN PAN:AACT2901M CST:/ IGT./GST:2AACT2901M12H/
NIC:AACT2901M001 Excise Regn:AACT2901M000 Excise Range-JAIPUR ROAD RANGE

WORK ORDER

Order Date :- 21.05.2024
Release Date :- 23.05.2024

Pin Code: 831001

India

E-Mail :- aersp19@gmail.com

Phone No :- 9334310410

Fax No. :-

Quotation :- AERS01 /29.04.2024

Order Valid from 22.05.2024 to 21.05.2025

Order billing end date:-21.08.2025

Please arrange to execute the job as per details given below. Please acknowledge receipt of this order.

Indent By :- OP Utilities - Mechanical

Item No. :- 00010 Desc:- ROBOTIC CLEANING OF CO GAS LINE
Cost Center :- KU3080 (Util BPG Maintenance)
Requisitioner:- 702347 (SHAILESHKUMAR), Tel:8292344287, Email:shailesh.kumar3@tatasteel.com

All CGST-SGST/IGST @ 18% Creditable

Item Details

Info record PO text :

1. Vendor has to follow all the safety and EMS norms of the Tata steel while executing the job. 2. Vendor has to provide all safety appliances along with tools and tackles to the workmen and adhere to guidelines during execution of job. 3. Vendor is required to develop the tools for in situ cleaning of mucks along with its transportation to nearest collection point with considering all safety precautions. 4. All necessary equipment's required for above said cleaning is to be arranged by the Vendor. 5. Robotic cleaning to be carried out in sync with department representatives. 6. Vendor is required to share the time frame details against following activities. Design & Development of the equipment. Simulation & Trial. Transportation & availability of the same at site. Insitu cleaning and submission of report (Soft copy & Hard Copy). 7. After successful trial of the equipment with the satisfaction of the dept, vendor will raise the memo for billing. 8. Vendor is required to make own arrangement for transporting and execution of the job. 9. As the job is of critical nature and accomplishment is required in timely manner, expertise to execute the job is needed. 10. Vendor will not claim bills if the trial doesn't become successful, But TSK Utilities will enable the vendor to make subsequent trials with all safety precautions to make it successful. 11. For any clarification Mr. Jitendra Kumar Mishra, M- 9040094612 may be contacted.

Shopping Cart No - 1003566363

Delivery date

Day 15.05.2024

SrNo.	SrvLnNo	SrvNo.	Brief Description
1	10	USCMSP08C876	ROBOTIC CLEANING GAS LINE

Service Long Text :

Short Text :

ROBOTIC CLEANING GAS LINE

Long Text :

Media : Cog Line Cleaning

Pipe Diameter : 1200-1600 Mm

Cleaning Method : Mechanized

Working Height : Any

Location Of Work : Inside Works

Crane Approach : Not Applicable

Lifting Equipment Supply By : Tsl

Debris Disposal By : Vendor

Debris Disposal Location : Within Tsl

Applicable Standard : Ems 14001

Scaffolding Supply By : Tsl

Tools Tackles Supply By : Vendor

Additional Details :

The excavation method

The excavation method used by the mini tunnel boring machine (m-TBM), involves the following

steps:

? Cutting the Face: The m-TBM's cutting head, equipped with disc cutters & other types of cutting tools, is pressed against the tunnel face. The rotating cutters chip away at the deposition material, creating a continuous cutting process.

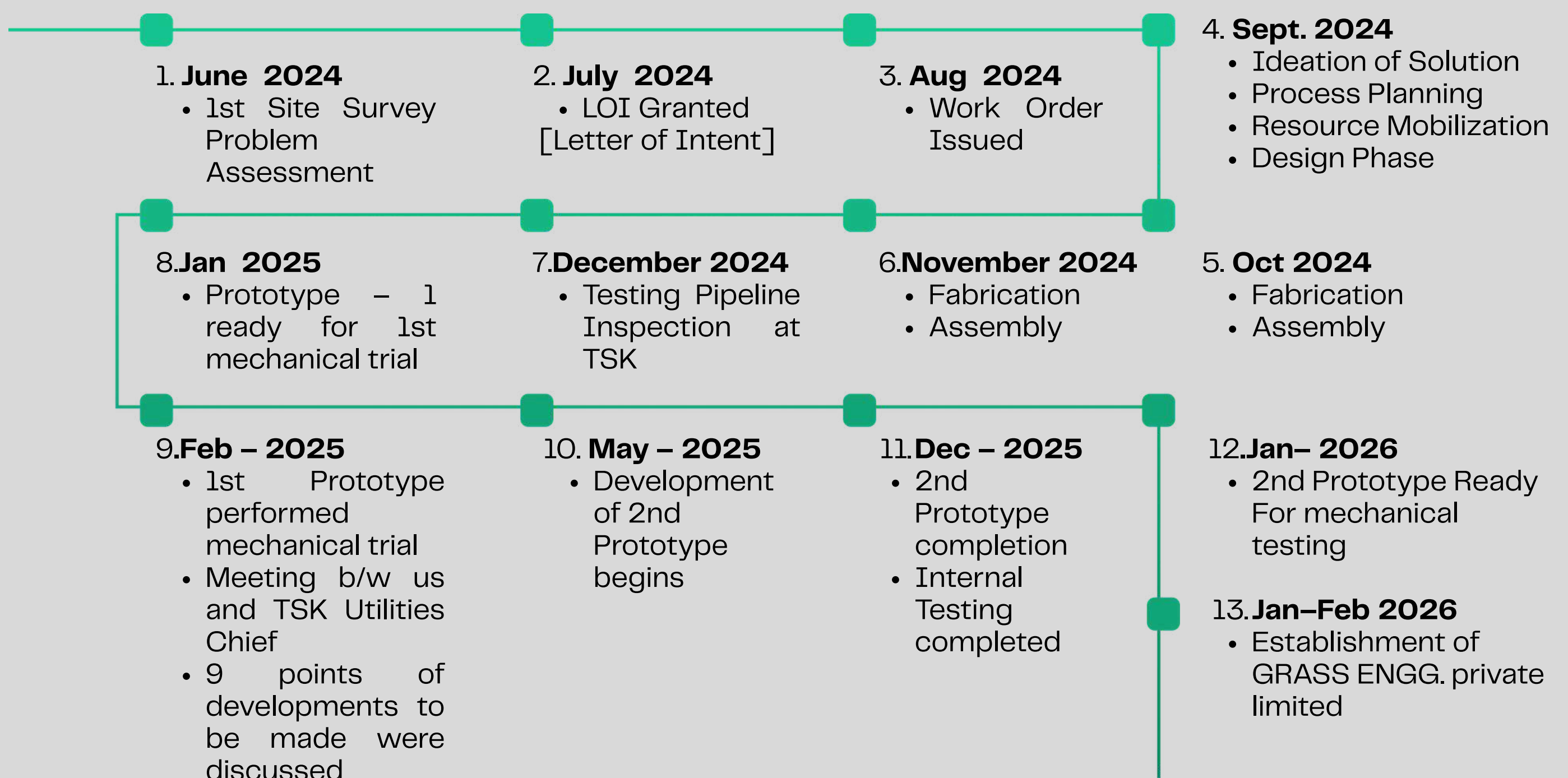
? Removal of Excavated Material: As the m-TBM progresses, the excavated material needs to be removed from the tunnel. Various methods can be employed, depending on the specific m-TBM design. TBMs generally have a conveyor system that transports the excavated material to the back of the machine, where it is then transported away.

Depending on the nature of deposition, we may also use a system of augers to remove the material.

? Support Systems: To ensure the stability of the tunnel during excavation, support systems are implemented. This can involve the installation of temporary support structures, directly onto the tunnel walls. The exact method of support depends on the project requirements.

? Advancement of the TBM: The TBM pushes forward, either by thrusting against the

PROJECT TIMELINE

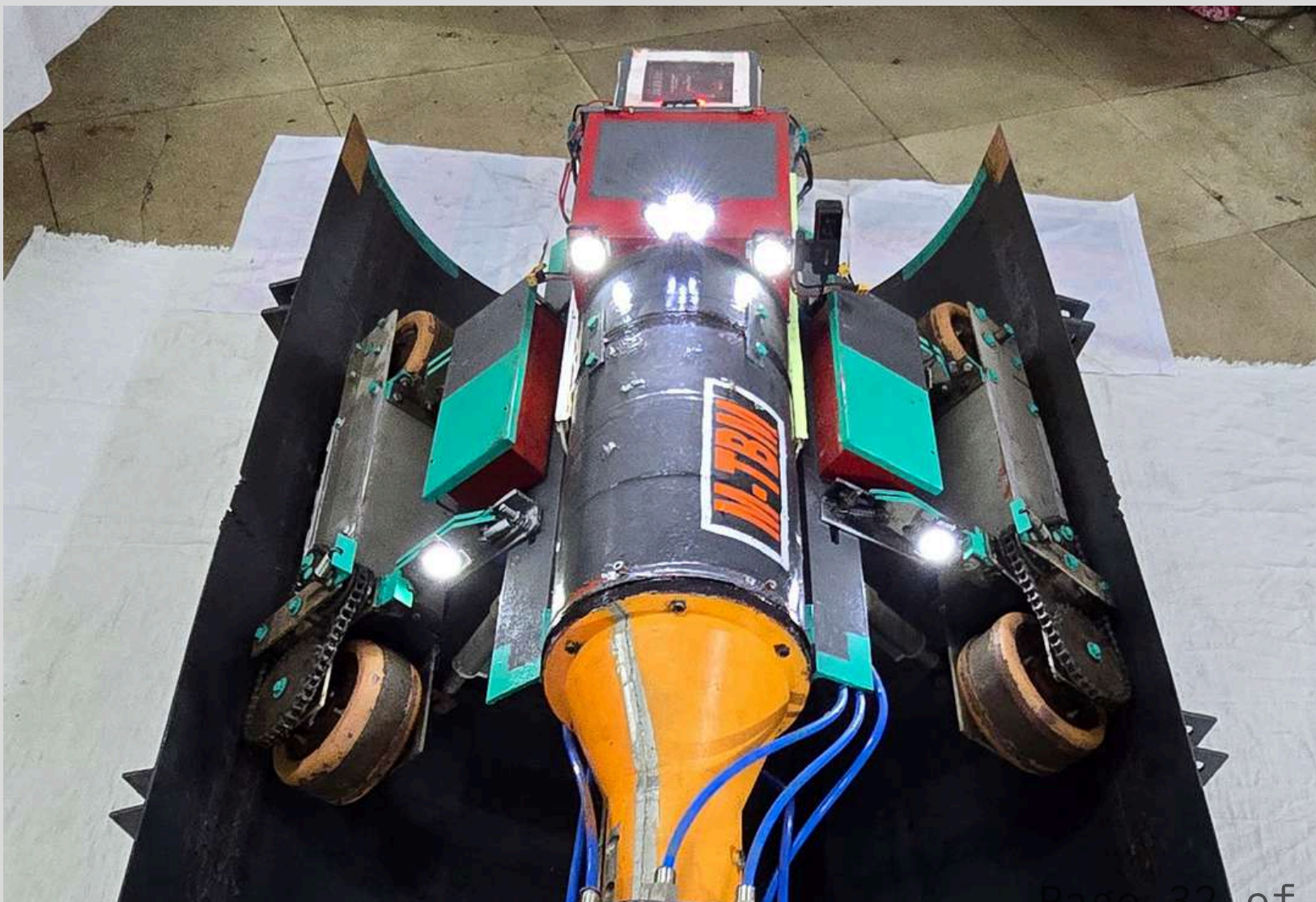
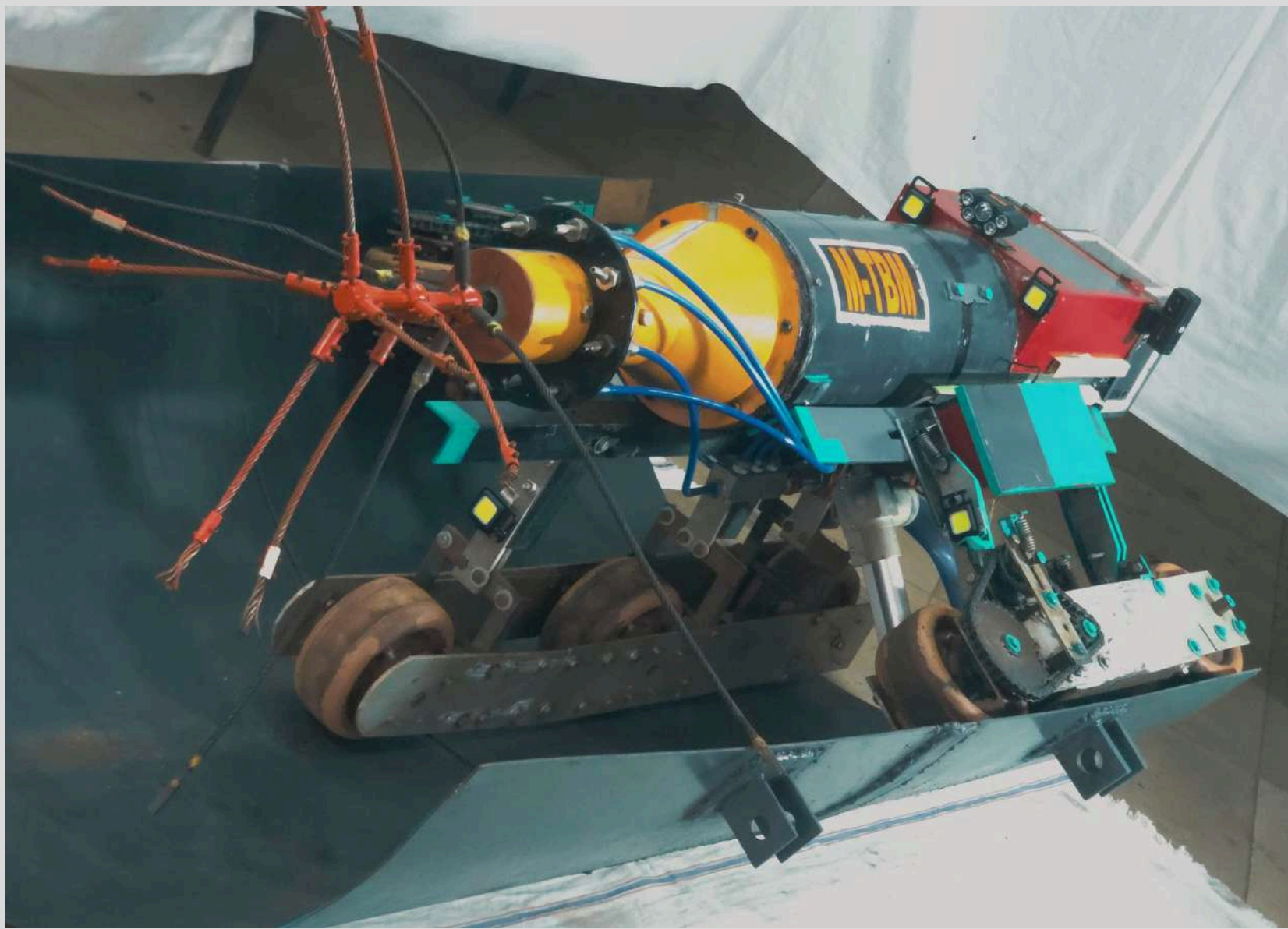
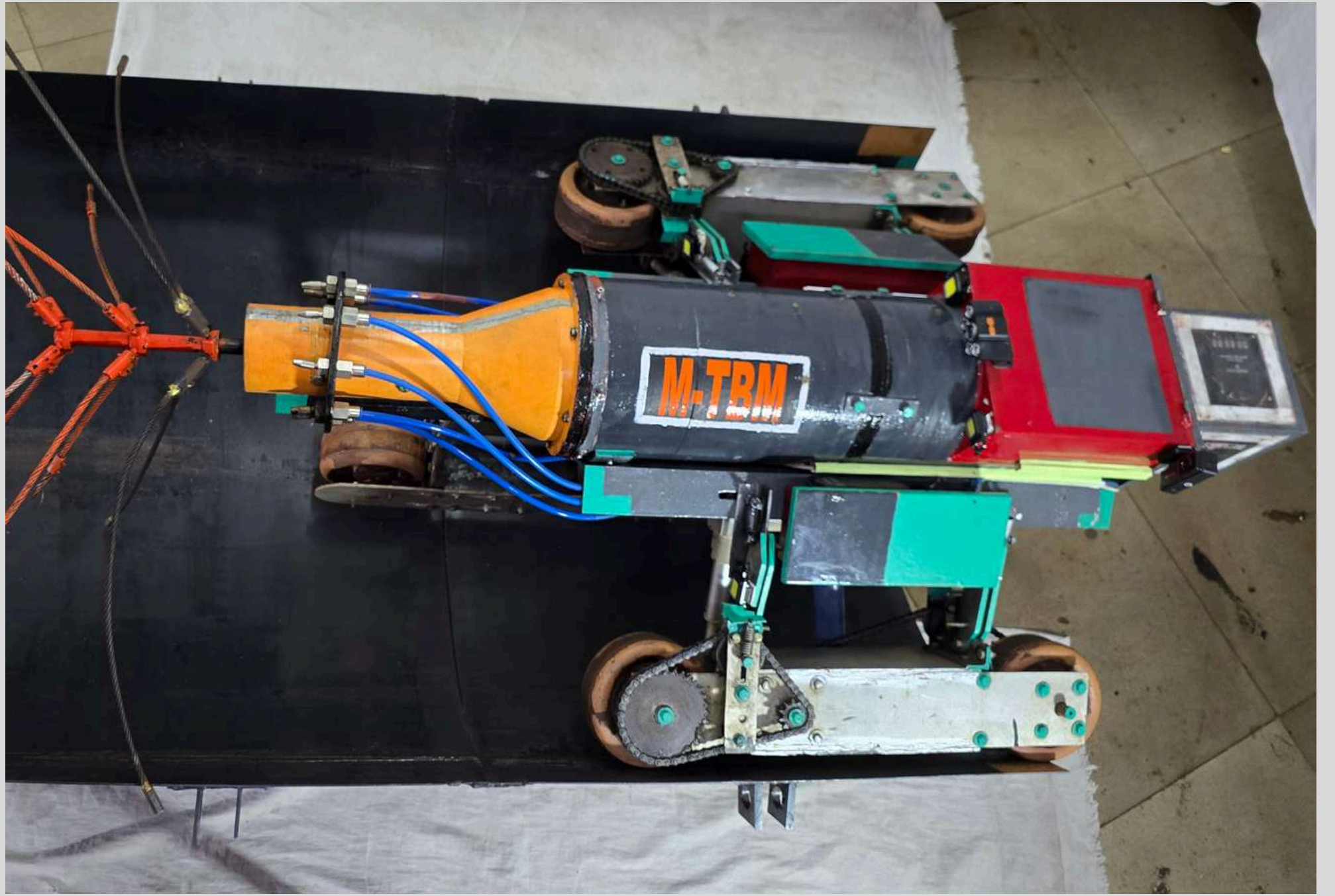


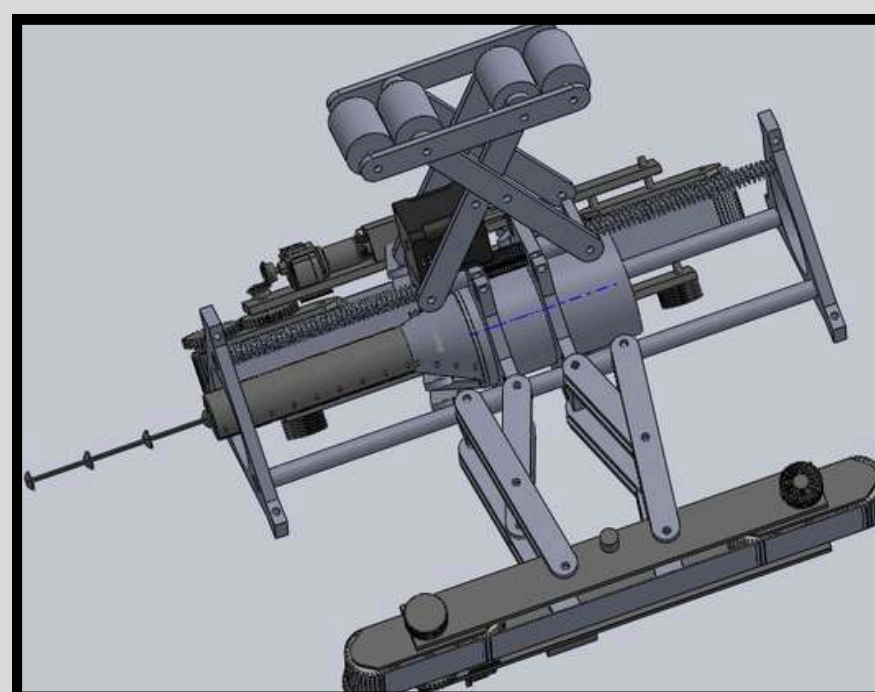
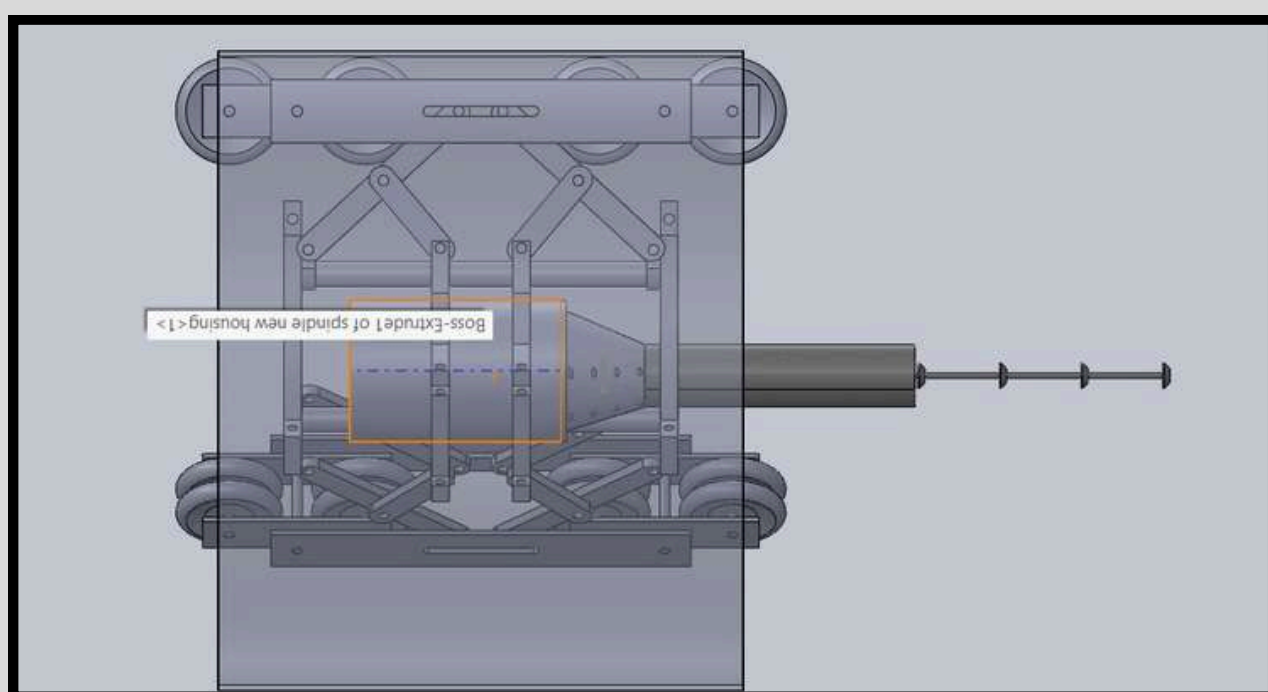
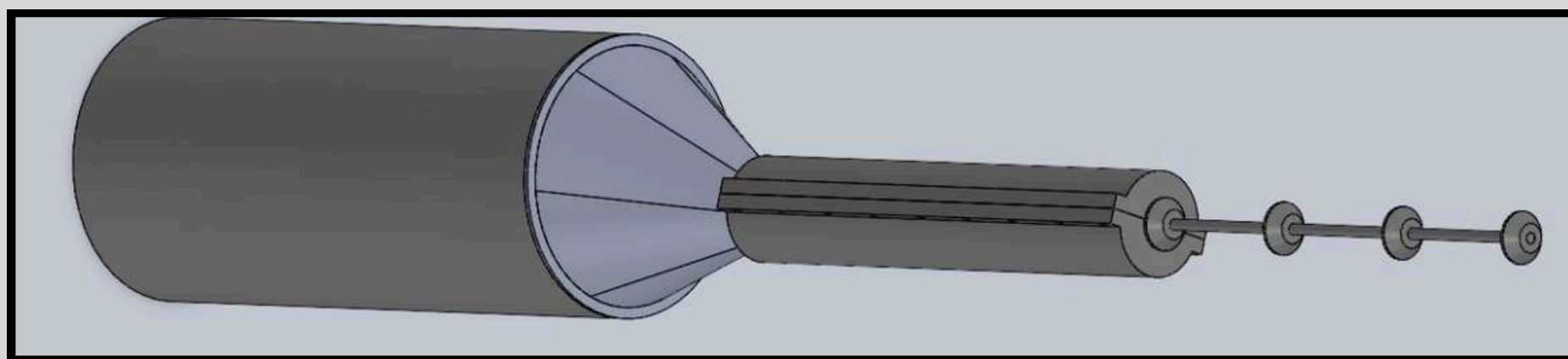
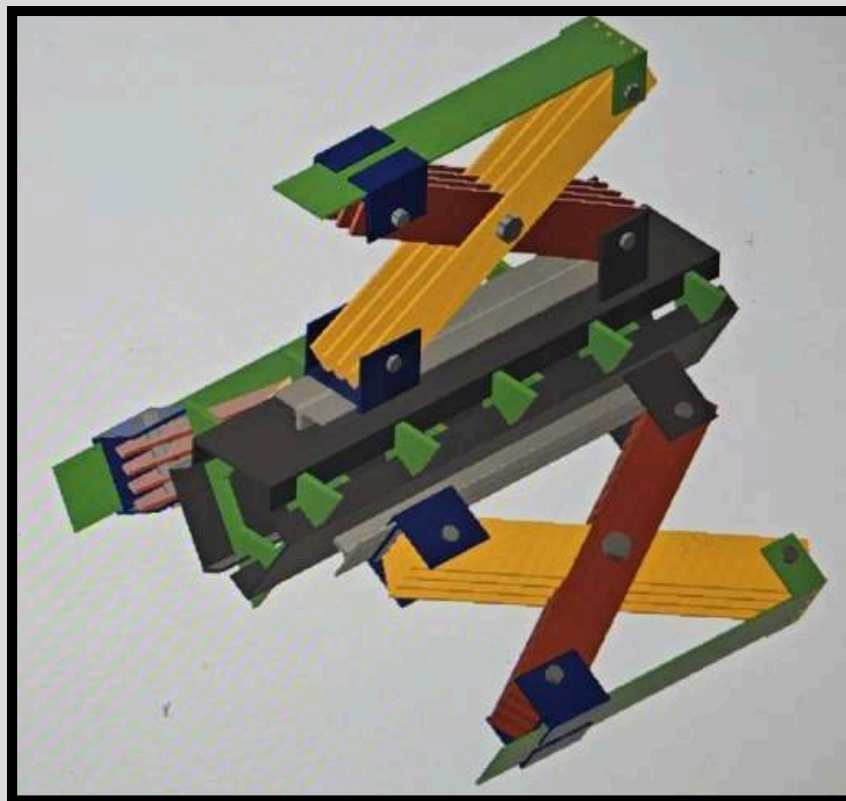
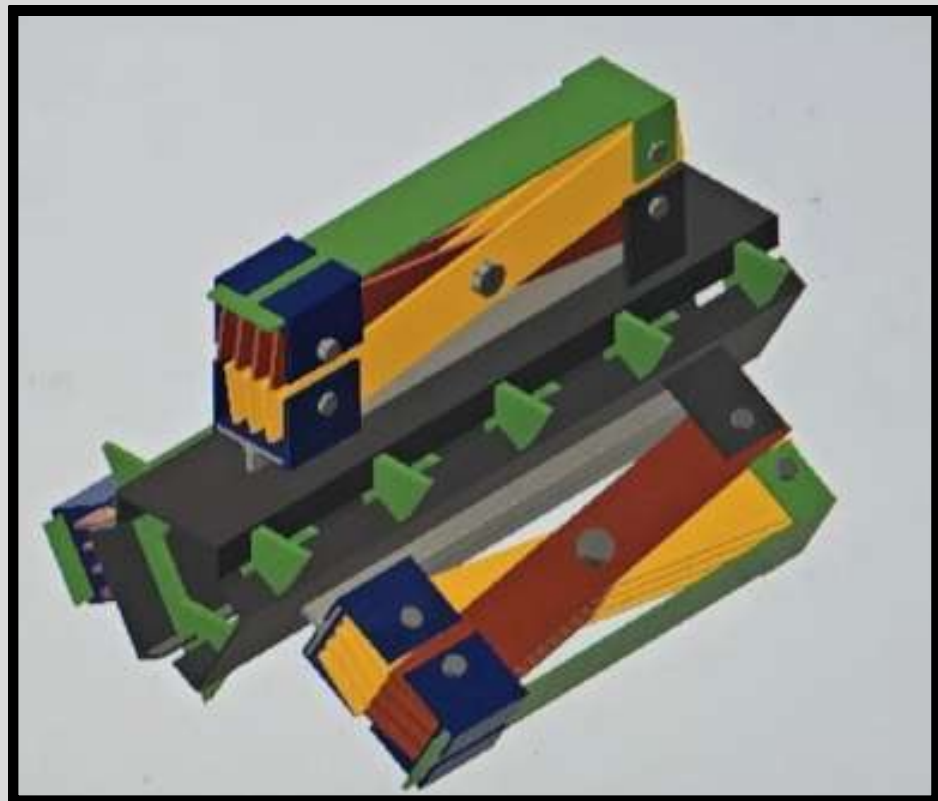
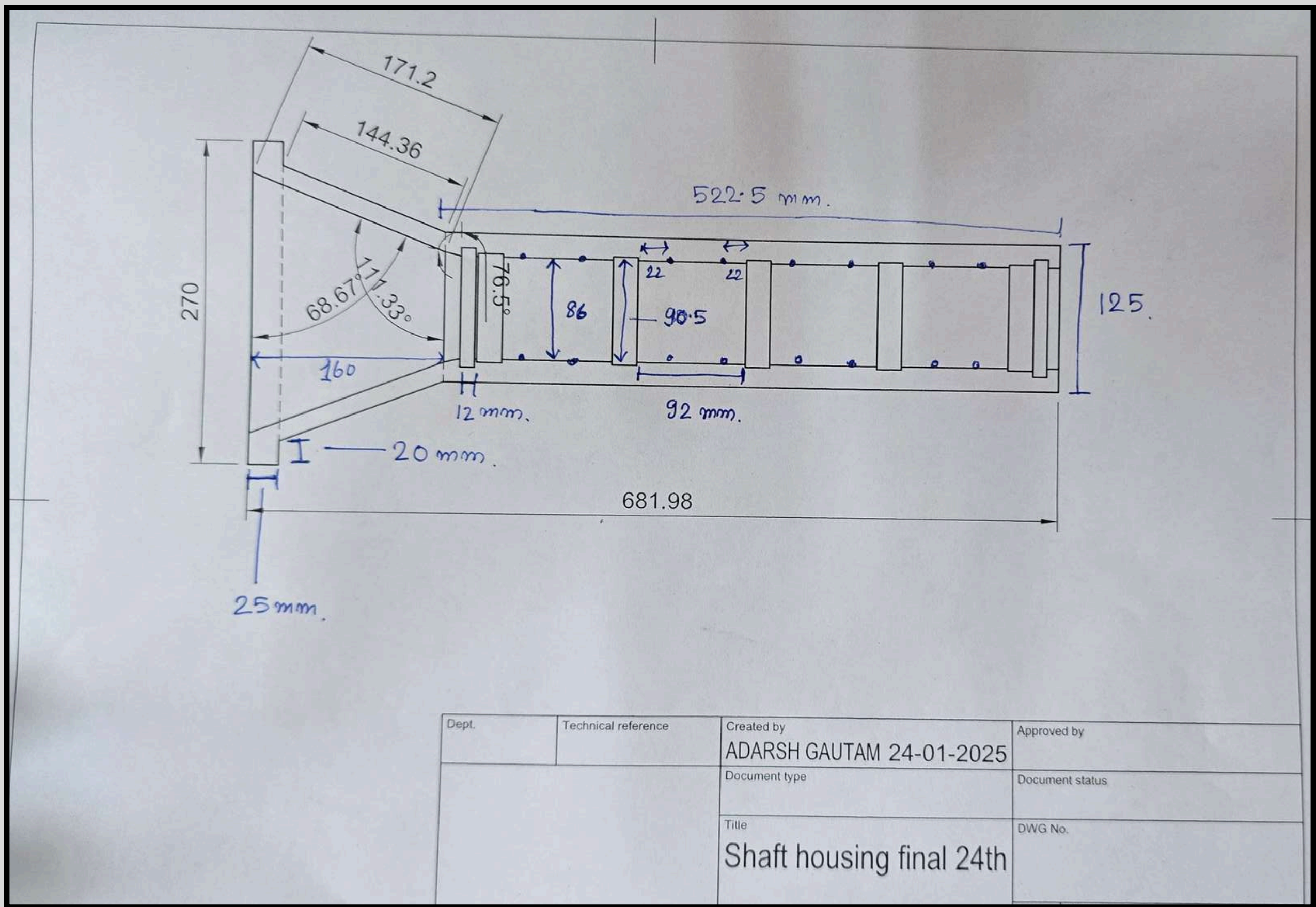
STAGE OF THE STARTUP

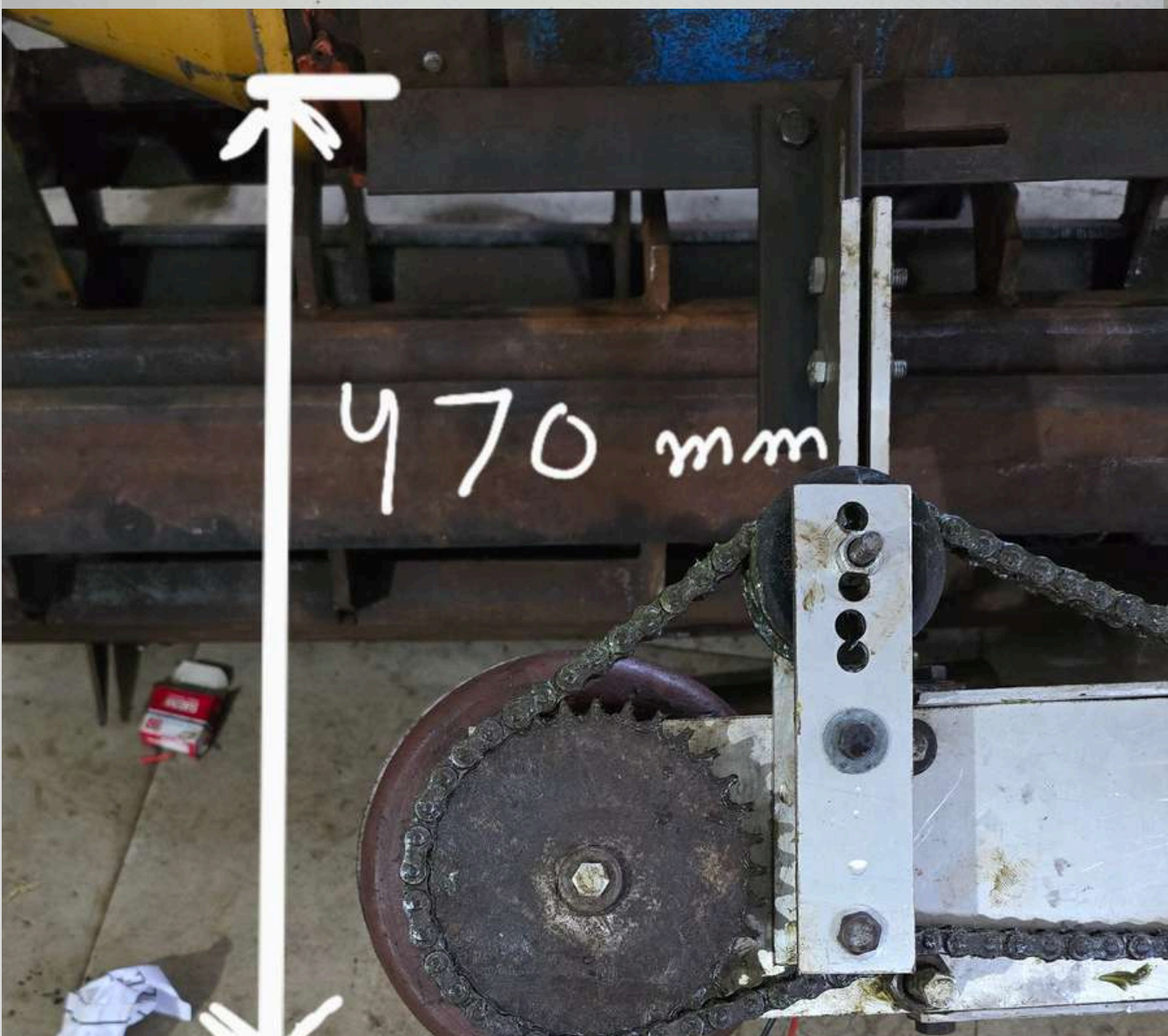
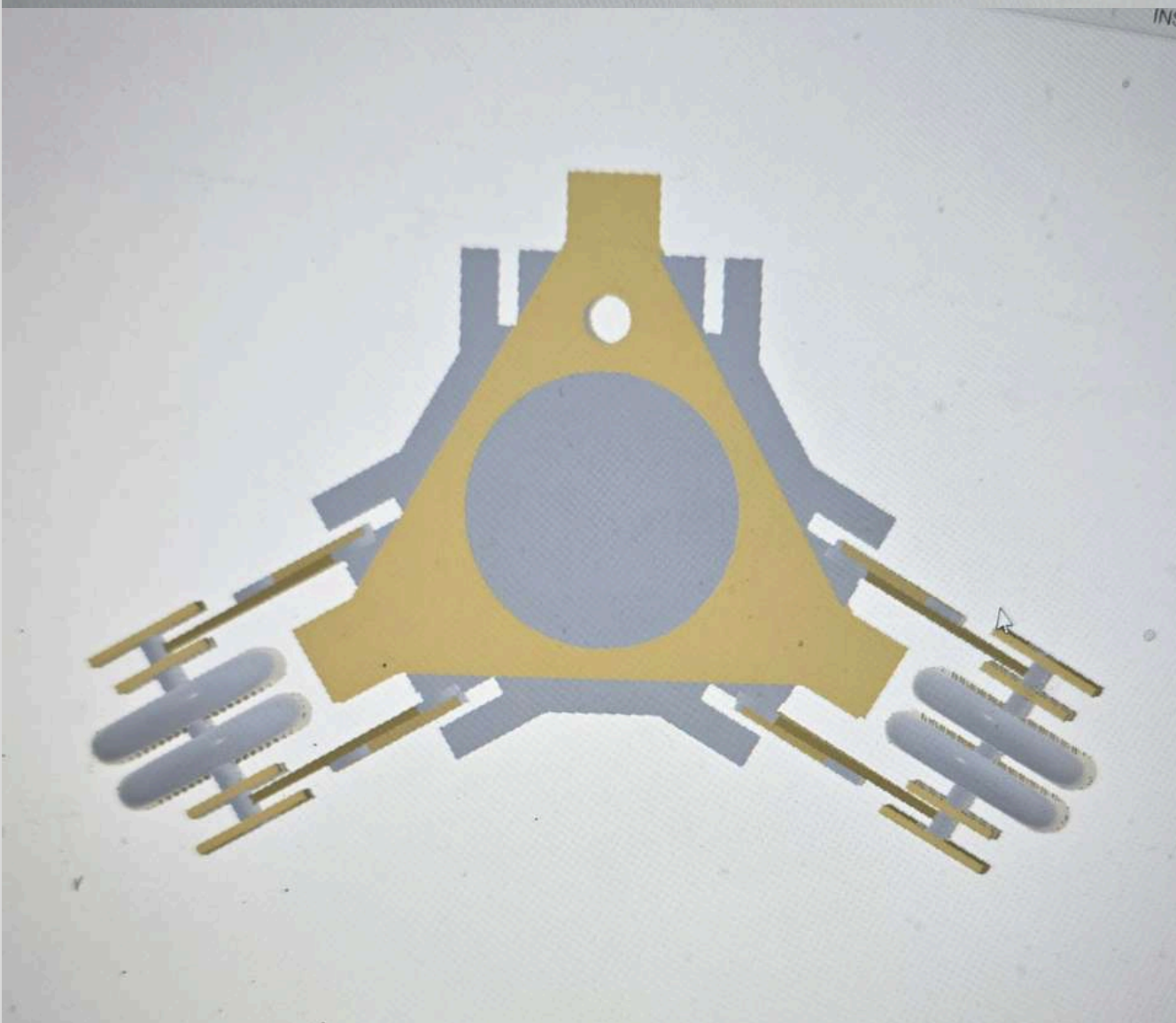
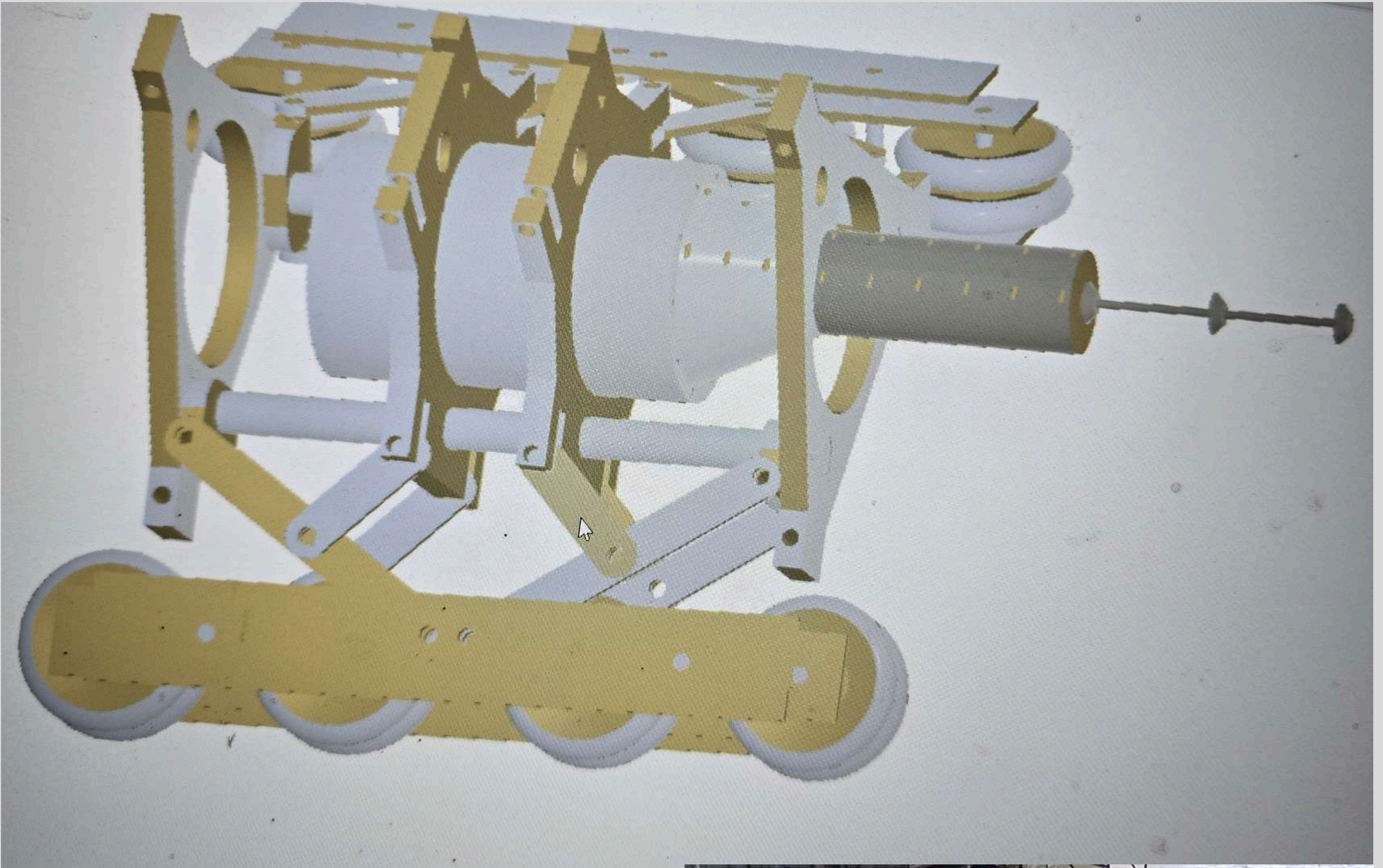
GRASS ENGG. is currently in the **Validation / Early Scaling stage**. We have transitioned our proprietary **M-TBM** from a laboratory concept to a field-proven industrial solution through the following milestones:

- **Technical Validation:** Recently cleared the rigorous **TECHNICAL ENGINEERING** evaluation by **NTPC HYDERABAD**, confirming the machine's readiness for critical utility pipelines.
- **Operational Proof of Concept (PoC):** Successfully completed **On-site MECHANICAL testing** at **Tata Steel Kalinganagar**, demonstrating the ability to replace manual hazardous labor with automated precision **DESCALING**
- **Market Readiness:** Transitioning from early adopter feedback into formal pilot contract negotiations with **Tier-1** industrial stakeholders

PICTURE LIBRARY







TEAM – GRASS ENGG.

GRASS ENGG. is driven by a lean, execution-focused core team supported by a broader ecosystem of industry mentors, fabrication partners, and suppliers.

The organization is led by **Adarsh Gautam (Founder & Managing Director)**, has a Bachelor's in **Mechanical Engineering** and is responsible for conceptualizing and developing indigenous industrial infrastructure platforms, including the **M-TBM, Kinetic systems**, and **Marine Technologies**. He oversees Technical direction, Research, Execution Planning, and Industry outreach.

The core team is supported by specialists handling key functional areas: **Digital Systems & IT** – Website development, UI/UX design, and digital infrastructure By **Mr. Sameer Singh**.

Visual Communication & Brand Design – Design language, presentations, Website design and technical documentation
Mr. Shailesh Kunwar & Mr. Pushpesh Kunwar

In addition, **GRASS ENGG.** benefits from foundational support and strategic backing, ensuring continuity and long-term operational stability.

Beyond the core team, the organization operates within a strong external network comprising:
Fabrication and Machining partners
Suppliers and vendors
Industry mentors and institutional contacts

This distributed model enables **GRASS ENGG.** to maintain low overhead, high flexibility, and real execution capability, allowing rapid development and deployment of engineering solutions.

Manufacturer : GRASS ENGG. Pvt. Ltd

(Engineering solutions focused on safety, automation, and indigenous development)

Contact Information

GRASS ENGG. Pvt. Ltd.

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India, 831001.

+91 6204488701

operations@grassengg.in

Website : <https://grassengg.in/>

Youtube : [@GRASSENGG](#)

For technical discussions or partnership inquiries regarding the M-TBM Project, please contact us directly via email with project details.



THANK
YOU

#STARTUP INDIA

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