

# Enhancing Operational Efficiency and Safety Through the Replacement of Steel Pipes with Linatex Solutions

Daniel Lane | 11 Oct 2024 | ID436

## 🚩 Idea of the Month Competition Nominees

🟢 Closed with success by Daniel Lane

Approver: Daniel Lane

Implementation coordinator: Daniel Lane

Plan: Quick Wins

Classes: Commercial + Customer Centricity + Efficiency + Environmental + Health & Safety

## Problem, context, environment, status

The current pipe system at the quarry consists of steel pipes divided into six sections over a 20-meter span. These steel pipes, used to transport 0/4 MP Concrete Sand, are subject to frequent wear and tear, requiring each section to be replaced at least once yearly. This high rate of replacement leads to several operational challenges:

**Frequent Downtime:** Each steel section replacement causes 2 hours of downtime, during which the quarry loses production capacity. With six sections requiring yearly replacement, the cumulative downtime significantly impacts overall productivity and profitability.

**High Maintenance Costs:** The annual replacement of 6 steel sections incurs regular costs, including pipe materials, flanges, and labour, as well as the cost of hiring a Mobile Elevated Work Platform (MEWP) for safe access during the replacement process.

**Increased Health and Safety Risks:** The regular need for replacements increases the risk of workplace accidents, as workers are frequently required to perform high-risk tasks such as heavy lifting, working at height using MEWPs, and handling heavy steel pipes, all of which can lead to injuries.

**Reduced Equipment Lifespan:** Steel pipes are less durable in abrasive conditions than alternative materials, leading to a shorter lifespan and an ongoing cycle of costly replacements.

This current situation drives up operational costs, increases safety risks, and reduces the overall efficiency of the quarry operations. Addressing these issues requires a more durable and efficient piping solution.

## Description of the initiative

The initiative proposes replacing the existing steel pipe system at the quarry with more durable Linatex pipes. Linatex pipes are engineered to handle abrasive materials like 0/4 sand more effectively, offering a longer lifespan and significantly reducing the need for frequent replacements. By implementing a more efficient and reliable piping solution, this initiative aims to address operational downtime, high maintenance costs, and safety risks.

Critical Components of the Initiative:

### 1. Health and Safety Benefits:

Linatex pipes are lighter and easier to install than steel pipes, reducing the physical strain on workers and minimising the risks associated with heavy lifting and working at height.

Fewer replacements also mean fewer high-risk activities, significantly improving worker safety.

## 2. Environmental and Operational Improvements:

The longer lifespan of Linatex pipes results in fewer materials used over time, supporting sustainable operational practices.

## 3. Replacement of Steel Pipes:

The current system, comprising six sections of 3-meter steel pipes, and will be replaced with two sections of 10-metre Linatex pipes.

Linatex pipes are designed to last up to 8 years in high-abrasion environments, reducing the need for annual replacements.

## 4. Reduced Downtime:

The Linatex pipes require far fewer maintenance interventions, reducing the frequency of downtime from 6 separate events per year to potentially just one replacement event every eight years.

This will significantly increase production uptime and improve profitability.

## 5. Cost Savings:

By reducing frequent replacements, labour, MEWP hire, and material costs associated with steel pipes, the switch to Linatex will result in substantial savings over five years—estimated to be £78,990.

The initial cost of Linatex pipes, including installation and downtime, is quickly recouped, with a payback period of less than six months.

More consistent system performance leads to smoother operations and less disruption to production schedules.

## Expected benefits

Replacing steel pipes with Linatex pipes is expected to deliver a wide range of benefits, spanning operational efficiency, financial savings, and improved health and safety standards at the quarry.

### 1. Improved Health and Safety

**Reduced High-Risk Activities:** Fewer pipe replacements mean less frequent work at height, fewer instances of heavy lifting, and less use of MEWPs, all of which contribute to a safer working environment for employees.

**Lower Risk of Injuries:** The lighter weight of Linatex pipes and the reduced frequency of interventions will minimize the risk of musculoskeletal injuries and accidents during maintenance activities.

### 2. Sustainability and Environmental Benefits

**Reduced Material Usage:** Linatex pipes' longer lifespan results in fewer resources being used for replacements, supporting sustainable practices by reducing waste and material consumption.

**Lower Carbon Footprint:** Fewer maintenance activities and the extended durability of the Linatex system contribute to a reduced carbon footprint associated with pipe manufacturing, transportation, and installation.

### 3. Significant Cost Savings

**Lower Maintenance Costs:** Linatex pipes have a much longer lifespan (up to 8 years) than steel pipes, which require annual replacements. This will drastically reduce the yearly costs for materials, labour, and equipment hire.

**Reduced Downtime Losses:** By decreasing the frequency of pipe replacements, the quarry will minimize production downtime, saving up to £12,000 per year in lost production. Over five years, the total savings are

estimated to be £78,990.

**Quick Payback:** The initial investment of £6,000 for the Linatex system will be recouped within less than six months, providing rapid financial returns.

4. Increased Operational Efficiency

**Fewer Disruptions:** Fewer replacements will reduce production interruptions significantly, ensuring smoother and more reliable operations.

**Consistent Performance:** Linatex pipes are highly resistant to abrasive materials, leading to fewer unexpected failures or performance issues, contributing to steady and uninterrupted operations.

5. Long-Term Operational Reliability

**Enhanced Durability:** Linatex pipes provide superior resistance to wear and abrasion from transporting sand and other abrasive materials, leading to more reliable and long-lasting infrastructure.

**Fewer Emergency Repairs:** The enhanced durability reduces the likelihood of sudden failures, which typically require urgent and costly emergency repairs.

6. Summary of Benefits

By transitioning to Linatex pipes, the quarry will experience significant cost savings, improved operational efficiency, and a safer work environment. This initiative aligns with the quarry's long-term goals of increasing productivity, improving profitability, and ensuring sustainable and safe operations for the workforce.

**Financial analysis**

Title	Impact distributed over time	Forecast amount
<b>Total Cost of Project</b>	01-10-2024 – 31-12-2024	<b>-£9,300.0</b>
<b>Total Financial Gain</b>	31-12-2024	<b>£78,990.0</b>
Total cost amount		-£9,300.0
Total gains amount		£78,990.0
<b>ROI</b>		<b>£69,690.0</b>
Profitability		749%

**Resources:** [Financial Analysis of the Initiative](#)

Daniel Lane – 12 Oct 2024