Groeneveld Civils Report 2025

Introduction

Water management is a critical aspect of civil engineering and construction. Inadequate drainage compromises the stability of foundations, increases maintenance costs, and creates hazardous conditions for workers and the surrounding community. During my experiential learning at Groeneveld Civils, I was directly involved in drainage and paving activities that highlighted the technical, logistical, and managerial dimensions of construction practice.

This reflection is guided by learning principles, focusing on what I observed, how I participated, the mistakes and challenges encountered, and the broader professional lessons gained. My experience demonstrated how practical conditions such as weather, soil type, labour management, plant scheduling, and deadlines interact with design intent, safety, and quality control.

Importance of Drainage and Water Management

From the jump, I realised that drainage involves both surface and subterranean water. Pipes must always be laid to fall which means there should be some sort of gradient , otherwise water stagnates, causing long-term structural and environmental issues.We experienced heavy rainfall caused trenches to flood and created muddy, unstable conditions. This not only slowed excavation but also required additional processes such as water removal, trench protection, and the application of waterproof membranes.

The muddy environment also made the movement of plant (such as TLB) difficult, while workers faced increased risks of slips and falls. I learned that temporary works such as sand pathways and stabilised access routes were essential for both productivity and safety. Gumboots were issued as personal protective equipment (PPE), highlighting how health and safety measures must adapt to environmental realities.

It reinforced the idea that a lot of construction work is based on conditions and adaptation to the site environment versus theoretical practice that takes place in perfect conditions

Technical Processes in Pipework and Drainage Installation

Pipe Preparation and Jointing

The primary material used was uPVC pipes, which were cut with hacksaws to create perforated pipes for subsurface drainage. Joints were waterproofed using specialised adhesives to prevent infiltration under wet conditions. This exercise taught me how even small lapses in workmanship can compromise an entire drainage line, as weak joints allow water ingress or leakage.

Layering and Membrane Protection

Drainage trenches were carefully constructed with layered stone: coarse gravel, medium aggregate, and fine stone. Over this, geotextile material (Bidim) was placed to filter soil particles and prevent clogging of the system. The bidim was overlapped, cut, and tied with wire to ensure continuity. This layering system shows how principles that were learned inthe classroom are directly implemented on site in terms of drainage.

Waterlogged backfill was removed, and dry backfill was imported from other areas. This highlighted the cost and time implications of unsuitable site conditions. Moreover, when a section of trench was excavated too deeply, additional sand and stone were wasted in backfilling. This mistake demonstrated the importance of supervision, accuracy in setting out, and careful excavation control.

Pipe Damage and Repairs

During backfilling, one pipe cracked under the force of the TLB driving into the trench to drop stone, requiring full replacement. Although seemingly minor, this illustrated how improper handling or inadequate protection during backfilling can undo prior work. From a reflective standpoint, it showed me that construction works done must be protected while the next is executed.

Compaction and Moisture Control

Backfill was done by plant and then rolled by heavier plant. However, excessive soil moisture made it difficult to positively compact the soil as it felt as if it was consistently shrinking as it lost was water . This revealed how soil properties interact with construction practice and understanding those properties allows you to find solutions to mitigat those issues

Teamwork, Communication, and Morning Briefings

Every morning began with team meetings where tasks, risks, and targets were discussed. These included the meeting with the main contractor WBHO and also meeting withing the Groenveld company. I realised that these meetings were more than routine but they set expectations, allocated accountability, and aligned the workforce.

Effective communication is essential to prevent errors and delays. Workers were reminded of safety protocols, and supervisors outlined the sequence of activities. These briefings also became platforms to applaud good performance, reinforcing positive culture, while also calling out shortcomings when necessary.

This process taught me that leadership in construction involves balancing encouragement with accountability, ensuring both morale and discipline are maintained.

Inspections and Safety Drills

Inspections were conducted regularly to identify completion milestones and detect errors early. For instance, flushing newly laid pipes with water was used to confirm correct flow and gradients. These inspections not only verified workmanship but also built confidence in the system's long-term reliability.

Additionally, fire drills and safety inspections were carried out in the internal aspect of the building. Although not directly related to drainage, these exercises highlighted that construction sites are holistic environments where multiple systems drainage, fire, structural safety must be integrated and checked simultaneously.The fire drills were in preparation for a fire safety audit completed by the fire inspector.

Plant and Machinery: Scheduling and Site Logistics

The use of plant was another critical learning area. Machines had to be scheduled carefully, positioned correctly, and managed so as not to damage newly completed work or sink into muddy areas. This required a fine balance between using manual labour (more adaptable in tight or soft conditions) and mechanised work (faster but riskier in unstable ground).

I observed that mismanagement of plant placement could cause rework, safety hazards, or even mechanical breakdowns. Tight deadlines often meant extended hours, including Saturdays and overtime. This created logistical challenges of providing transport for workers after hours, and also required accurate recording for payment purposes. I realised that construction management extends beyond technical concerns into labour welfare, logistics, and human resource administration.

Paving Operations

The second stage of work involved paving above drainage systems. The process began with trimming the backfilled earth to correct levels, compacting, and adding suitable dry sand. Using the wrong sand proved problematic: fine sand held too much water, compromising paving stability and longevity.

Bricks were laid according to measured patterns ensuring bedding with . Cuts were made to accommodate curves and corners, and plumbness and levels were constantly checked. Once completed, sand was brushed into joints, and the surface cleaned.

A key lesson here was that paving cannot be executed in wet conditions; rain leads to instability and wasted effort. This taught me the importance of sequencing and weather planning in project programming.

Manholes and Supporting Systems

Manhole construction was an important component of the drainage system. Trenches were excavated, bases built in brickwork, and upper sections cast with concrete rings and covers. However, one significant mistake occurred: the architect's levels were incorrect, causing a manhole to be set at the wrong height. To rectify this, the top ring and several courses of brickwork were dismantled and re-built.

This error illustrated the domino effect of design inaccuracies on site work. It reinforced the need for cross-checking design levels and site conditions before construction.

Additionally, sprinkler systems were installed by digging shallow trenches in already completed areas. These had to be flagged for connection points, connected to the water supply, and tested. This showed how secondary systems are often integrated after primary works, requiring careful coordination to avoid damaging earlier work.This work was done by a different company.

Leadership, Labour Management, and Conflict Resolution

Working with site labour revealed the human dimension of construction. Not all workers were punctual, compliant, or skilled. Some made errors, others disobeyed instructions, and disputes occasionally arose. I learned that leadership required balancing firmness and fairness, this promotes competence and consistency while also addressing misconduct.

A dispute over overtime pay created tension among workers. The project manager personally intervened and resolved the issue directly. This act demonstrated the importance of visible leadership and responsiveness in maintaining workforce cohesion.

Through this, I understood that effective leadership in construction is not purely technical but is also ethical, and grounded in building trust.

Broader Reflections and Learning Outcomes

Reflecting on these experiences, several broader insights emerged:

1. Technical Integration

Drainage systems combine geotechnical, hydraulic, and material science principles, which must all be understood and respected during installation. This is why it is important as a project manager to understand different parts of the construction project.

2. Adaptability to Site Conditions

Weather and soil conditions demand flexibility and innovative problem-solving, such as creating temporary paths with earth and using different excavation methods

3. The Cost of Mistakes

Errors such as over-excavation, cracked pipes, or wrong manhole levels carry both material and time penalties. Precision and supervision are crucial to avoiding these.

4. Safety and Welfare

Gumboots, PPE, overtime transport, and fire drills showed me that safety is multi-layered and is important in protecting both physical well-being and legal compliance.

5. Leadership and Communication

Morning briefings, conflict resolution, and performance recognition emphasised that construction management is as much about people as it is about engineering.

6. Practical Wisdom

Exposure to day-to-day challenges deepened my appreciation for site-level realities that textbooks cannot fully capture.

Conclusion

My experience with drainage and paving works at Groeneveld provided invaluable exposure to the complexities of construction. I learned not only the technical sequence of laying pipes, backfilling, compacting, and paving, but also the challenges imposed by weather, soil conditions, and human factors.

Mistakes, such as over-excavation and incorrect manhole levels, reinforced the need for precision and cross-checking. Safety practices, leadership in managing workers, and logistical planning around plant and overtime highlighted the managerial dimension of engineering practice.

Ultimately, this reflection demonstrates that construction is an integrative discipline, combining technical knowledge, adaptive problem-solving, and strong leadership. My practical training broadened my perspective, equipping me with a deeper understanding of the realities of working under pressure and in difficult conditions.

Date	Start Time	End Time	Total Hours	Activities
Week 1				
16 June 2025	–	–	–	Public Holiday
17 June 2025	07:30	16:30	8	Site induction, safety briefing, drainage trench excavation, pipe laying prep
18 June 2025	07:30	16:30	8	uPVC pipe jointing & waterproofing, trench protection, geotextile placement
19 June 2025	07:30	16:30	8	Backfilling with gravel layers, compaction trials, moisture control issues
20 June 2025	07:30	16:30	8	Pipe flushing inspection, plant scheduling, cracked pipe replacement
Week 2				
23 June 2025	07:30	16:30	8	Manhole excavation, base construction, correction of levels
24 June 2025	07:30	16:30	8	Manhole works, concrete rings & cover installation, inspection for flow
25 June 2025	07:30	16:30	8	Backfilling with imported dry soil, compaction, safety checks

26 June 2025	07:30	16:30	8	Morning briefing, risk assessments, paving base preparation with sand
27 June 2025	07:30	16:30	8	Brick paving in patterns, joint filling, rain delays addressed
Week 3				
30 June 2025	07:30	16:30	8	Paving continuation, cutting bricks for corners/curves, surface finishing
01 July 2025	07:30	16:30	8	Sprinkler trenching & connection coordination with subcontractors
02 July 2025	07:30	16:30	8	Inspections: pipe gradients, paving stability, safety drills
03 July 2025	07:30	16:30	8	Plant & machinery placement coordination, overtime labour management
04 July 2025	07:30	16:30	8	Final paving works, compaction, quality control checks
Week 4				
05 July 2025	07:30	16:30	8	Safety drills (fire & site), WBHO coordination, labour briefings
06 July 2025	07:30	16:30	8	Drainage maintenance checks, conflict resolution on overtime pay
07 July 2025	07:30	16:30	8	Leadership exposure: communication, risk allocation, performance review
08 July 2025	–	–	–	Sick Leave
09 July 2025	–	–	–	Sick Leave
Week 5				
12 July 2025	07:30	16:30	8	Site cleanup, paving inspections, addressing defective areas
13 July 2025	07:30	16:30	8	Final compaction, sand brushing into joints, pathway stability tests
14 July 2025	07:30	16:30	8	Completion of manhole adjustments, secondary system coordination

15 July 2025	07:30	16:30	8	Closing inspections, labour welfare management, safety review
16 July 2025	07:30	16:30	8	Reflection on drainage & paving sequence, documentation of lessons learned

Total hours = 168