SCHOOL LANE RAILWAY BRIDGE AND ROAD DRAINAGE

Report prepared by
The Society of Sri Lankan Engineers and Scientist in the UK
January 2014

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IMPROVEMENTS AT MALIGAWATTE TO RAILWAY EFFICIENCY AND SCHOOL LANE DRAINAGE

Report prepared by the Society of Sri Lankan Engineers & Scientists (SSLES) in the UK

INTRODUCTION

At present there is a significant delay in trains starting at the scheduled time from Fort Railway Station caused by the late arrival of the empty trains from Maligawatte Yard. The construction of three additional tracks over the School Lane Railway Bridge will enable the free movement of trains to and from the Yard thus speeding up the train services on the existing main lines from Colombo Fort.

There is an additional benefit to the local population as a result of this project as there is an opportunity to improve the drainage at School Lane. At present, in rainy conditions, water stagnates up to a height of three feet (1 metre) under the railway bridge for several days causing a major health and safety hazard for pedestrians and motorists.

This report refers mainly to improving the drainage under the School Lane Railway Bridge.

WORK UNDERTAKEN IN THE PAST

This matter was taken up by the railway authorities and in 1967-69 works were started to improve the service. Boundary walls were built along Jayantha Weerasekera Mawatha in Maradana with a view to extend the bridge at School Lane to accommodate three more tracks. Engineering plans were drawn for the first ever pre-stressed railway bridge. Further twenty two pre-stressed concrete beams were cast at State Development and Construction Corporation and were stored at the railway concrete yard.

Rs 125,000 was allocated at that time to shift the 33 000 kV electric cables out of the railway reservation so that earth filling and laying of the three new tracks could commence. Excavation work was carried out for the construction of the abutments to extend the bridge. Also payment has been made for the shifting of a gas pipeline within the proposed bridge foundation area.

SSLES' PROPOSALS

1. RAILWAY IMPROVEMENT

The twenty two concrete beams are still stored at Dematagoda Railway Yard. They cannot be used at School Lane as originally proposed because the adjoining road levels have been raised. However these beams can be used elsewhere by the Railways.
Construct three additional tracks over the School Lane Bridge to minimize delays to main line trains waiting for track clearance.

BENEFITS

1. Delays caused to trains leaving Colombo will be reduced and trains will run on time as scheduled.
2. The management of empty coaches will be improved saving staff time and cost.
3. Saving on fuel as delays waiting for track clearance is greatly reduced.
4. Improved train efficiency will enable passengers to attend to their duties and business on time benefitting the country's economy.

It can be seen that if the additional tracks are laid over the School Lane Railway Bridge there are significant benefits for a relatively low cost.

2. DRAINAGE IMPROVEMENT

Even if the Railway Authorities do not want additional tracks at the present time, the drainage improvements could be done keeping space for future bridge abutment extension thus enabling construction of three additional tracks.

The existing "open" drain, which is covered with loose slabs, should be replaced with concrete or other suitable pipes under School Lane and a sump under the Keera Kotuwa Road. (see drawing 1, 2 & 3 for drainage proposal). The flow in the drainage pipes will be controlled by a *Hydrobrake Optimum (see annexure),* and non-return plastic gullies. Implementation of this proposal will greatly reduce the stagnation of water at this location.

BENEFITS

1. Children and adults could walk under the School Lane Bridge without having to wade through stagnant foul water.
2. Motor vehicles could be driven under the bridge without foul water entering them.
3. By removing the flooding hazard the health and wellbeing of local people using School Lane will be improved.

COST ESTIMATE

Estimate for drainage works is Rs 9.00 Million.

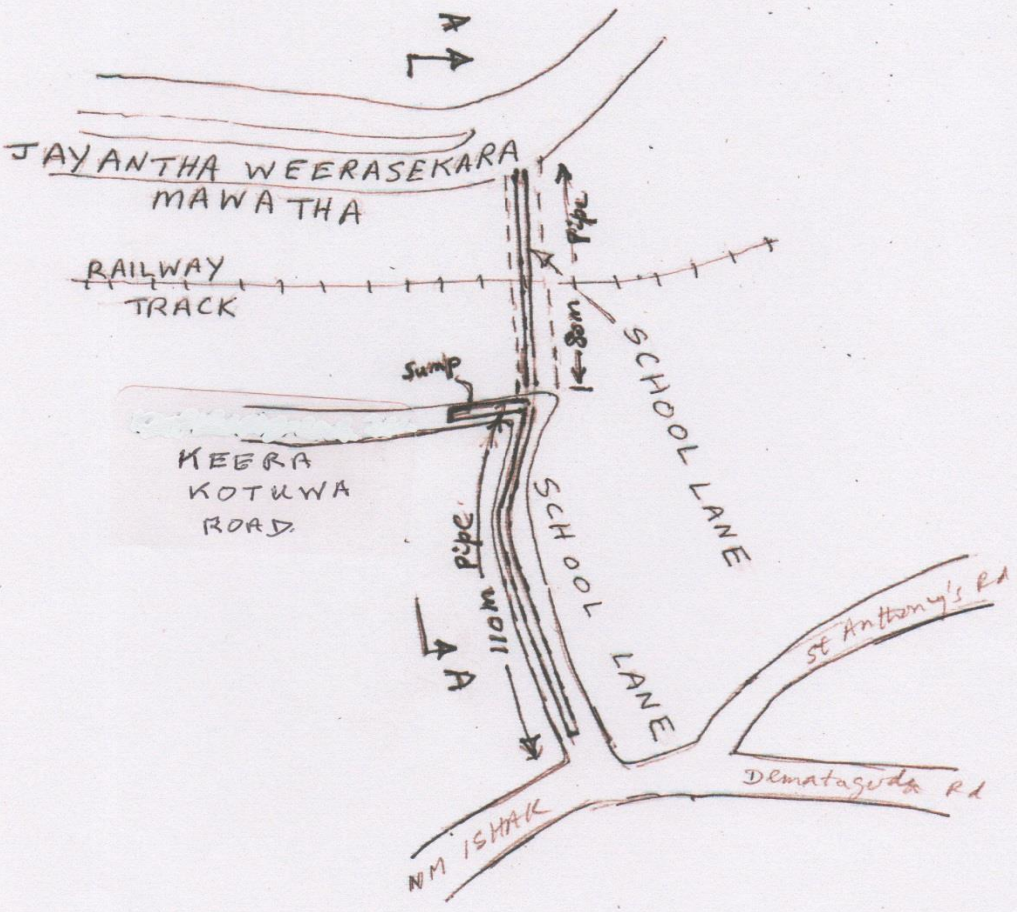
SSLES CONTRIBUTION

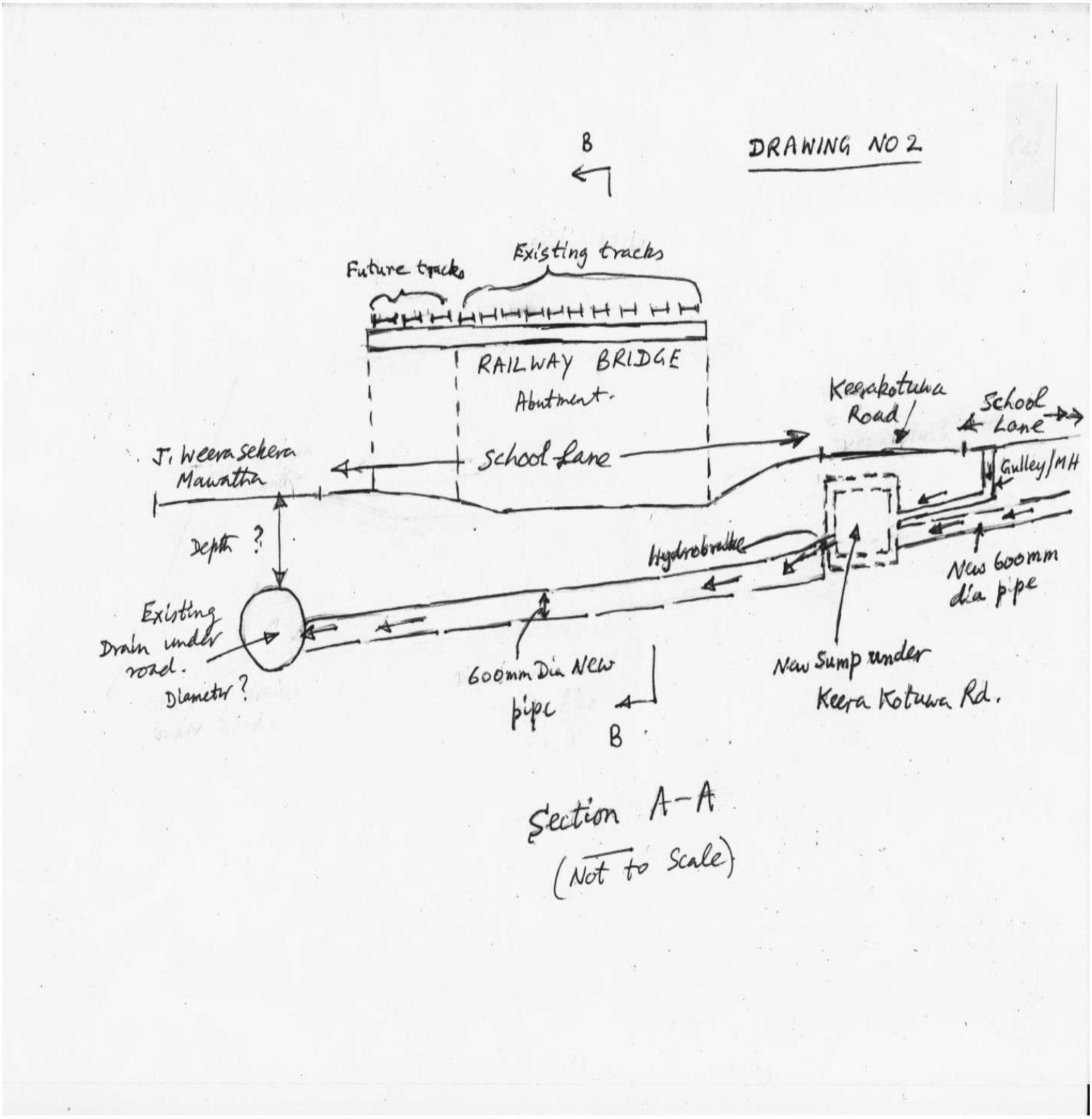
SSLES (UK) will be pleased to assist in designing the drainage works in collaboration with the appropriate authorities. This expertise is available because the engineer who originally did this work is now a member of the SSLES.

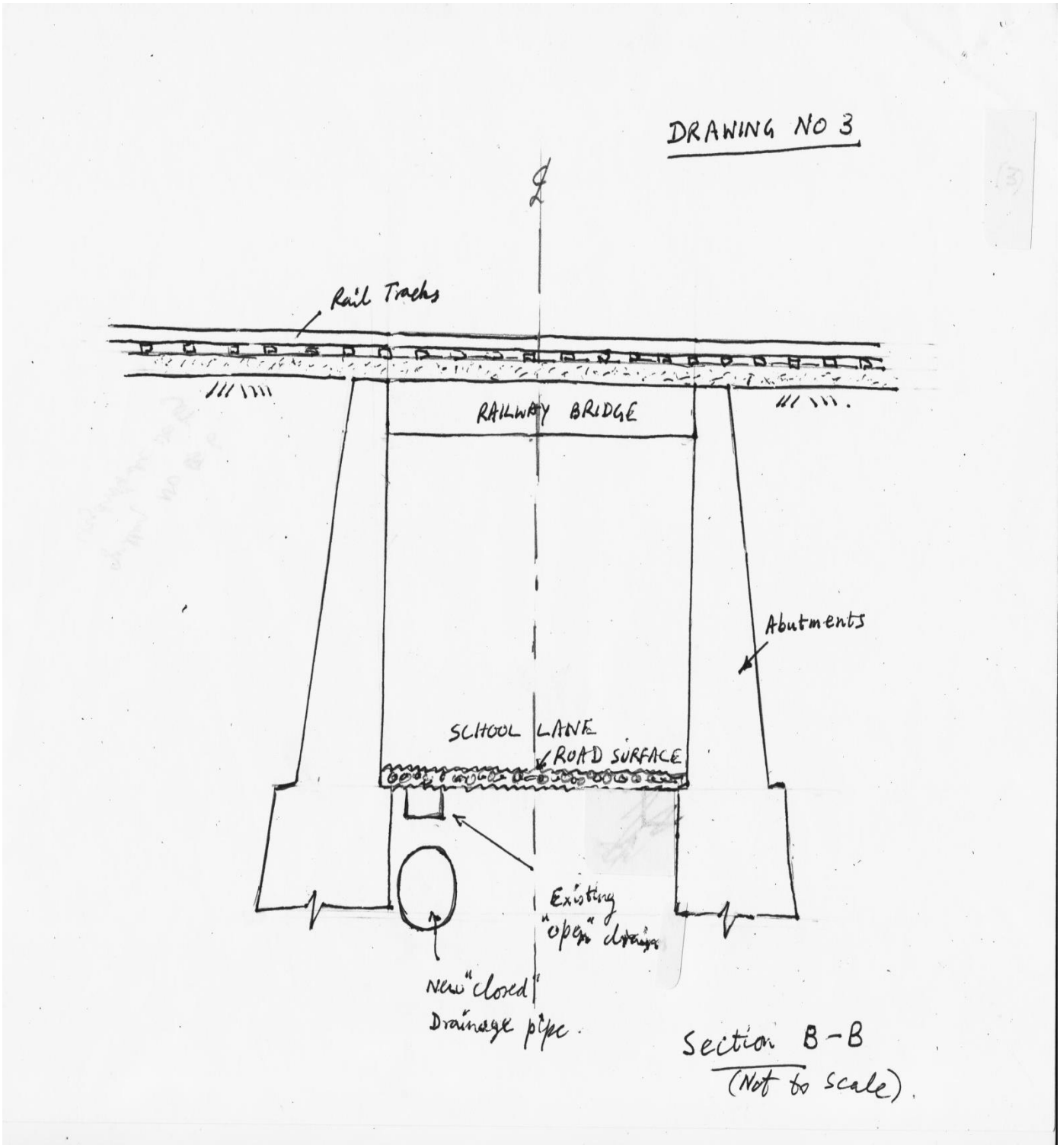
ANNEXURES

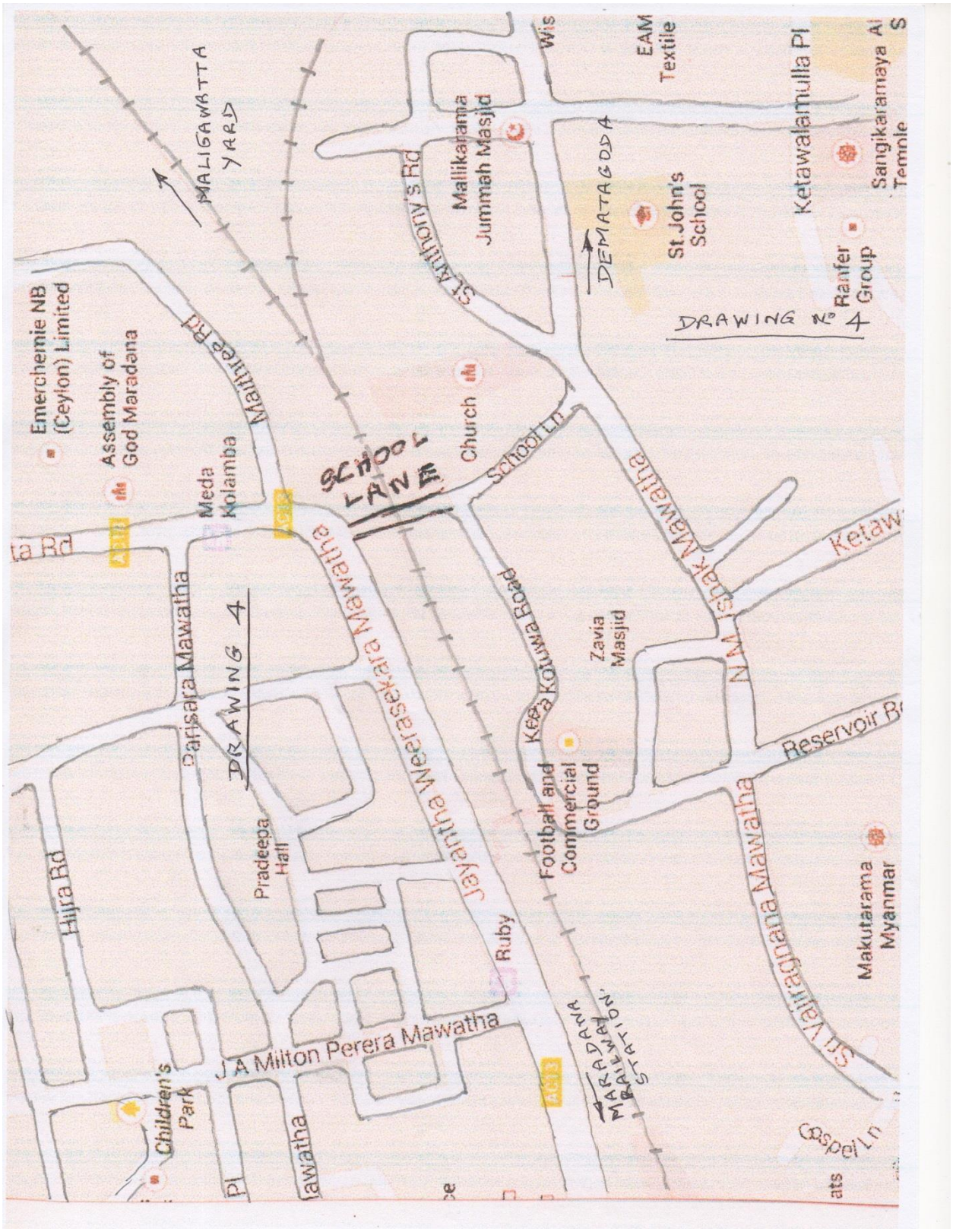
1. Drawing No 1 : Plan of Proposed Drainage works
2. Drawing No 2 : Cross section A-A showing proposed drainage at School Lane
3. Drawing No 3 : Cross Section B-B showing existing drainage at School Lane
4 Drawing No 4 : Location map of Maligawatte and School Lane
5. Drawing No 5 : *Hydrobrake Optimum*
6. Drawing No 6 : Non-return Gulley
7. Table : Estimated cost of the drainage proposal

DRAWING NO 1


A
JAYANTHA WEERASEKARA MAWATHA
RAILWAY TRACK
Pipe
80m
SCHOOL LANE
Sump
KEERA KOTUWA ROAD
Pipe
100m
SCHOOL LANE
A
St Anthony's Rd
Dematagoda Rd
NM ISHAK


B
DRAWING NO 2.
Future tracks
Existing tracks
RAILWAY BRIDGE
Abutment.
School Lane
Keerakotuwa Road
School Lane
J. Weerasekera Mawatha
Gulley/MH
Depth ?
Hydrobrake
New 600mm dia pipe
Existing Drain under road.
Diameter ?
600mm Dia New pipe
New Sump under Keera Kotuwa Rd.
B
Section A-A
(Not to Scale)


DRAWING NO 3
Rail Tracks
RAILWAY BRIDGE
Abutments
SCHOOL LANE
ROAD SURFACE
Existing "open" drain
New "closed" Drainage pipe.
Section B-B
(Not to scale)


MALIGAWATTA YARD
Emerchemie NB (Ceylon) Limited
Assembly of God Maradana
Meda Kolamba
Matthiwela Rd
SCHOOL LANE
Church
St.Anthony's Rd
Mallikarama Jummah Masjid
DEMATAGODA
St.John's School
EAM Textile
Ketawalamulla Pl
Sangikaramaya
Ranfer Group
DRAWING No 4
DRAWING 4
Barisara Mawatha
Hijra Rd
Pradeepa Hall
Jayantha Weerasekara Mawatha
Kew
Kotuwa Road
Zavia Masjid
N.M. Ishak Mawatha
Ketaw
Football and Commercial Ground
Reservoir
Ruby
J A Milton Perera Mawatha
Children's Park
MARADANA RAILWAY STATION
Sri Vajiragnana Mawatha
Makutarama Myanmar

DRAWING NO 5.

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Hydro-Brake Optimum

Hydro-Brake Optimum® is an independently accredited, self-activating vortex flow control with no moving parts and no power requirement. Hydro-Brake Optimum® is used to control the forward flow of water.

Overview **Benefits** **How it works** **FAQs**

Hydro-Brake Optimum® flow controls are self-activating, relying on upstream hydraulic head to generate an air filled vortex within the centre of the casing. This air filled core occupies the majority of the outlet restricting the flow. The vortex generates high peripheral velocities which further restrict the flow and create a back-pressure. This back-pressure restricts the flow to the periphery of the outlet orifice.

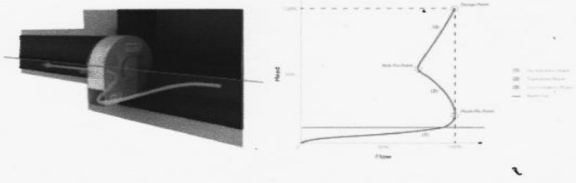
The Hydro-Brake Optimum® moves through three distinct phases of operation:

Low Flow (pre-initiation)

Under low flow conditions (pre-initiation phase), the Hydro-Brake Optimum® behaves like an oversized orifice. The flow is gentle, with minimal turbulence inside the volute of the Hydro-Brake Optimum® or the outlet pipe.

As the water level starts to increase above the soffit of the outlet, air will become trapped in the volute of the Hydro-Brake Optimum®. This will start to exert a back pressure against the water and will begin to restrict the cross sectional area available for water flow.

The peak flow rate at the end of this phase, defined as the Flush-Flo™ point, is the point at which the vortex begins to form.



Uniquely, the Hydro-Brake Optimum® allows this Flush-Flo™ point to be configured to suit the application.

As the water depth continues to increase, a vortex begins to form within the unit and the entrapped air forms the central core. At first there is not enough energy in the water flow to sustain a stable vortex, so the vortex will continually start to build and collapse.

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Region

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The HX Guide to Vortex Flow Controls

The new HX E-guide to Vortex Flow Controls demonstrates the choices available, and the consequences of poorly thought-through selection.

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Hydro-Brake Hotline

For a quotation please call:

01275 337937

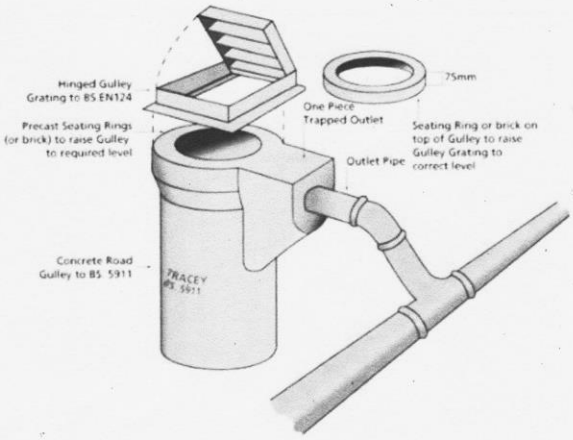
Hydro-Brake Optimum Video

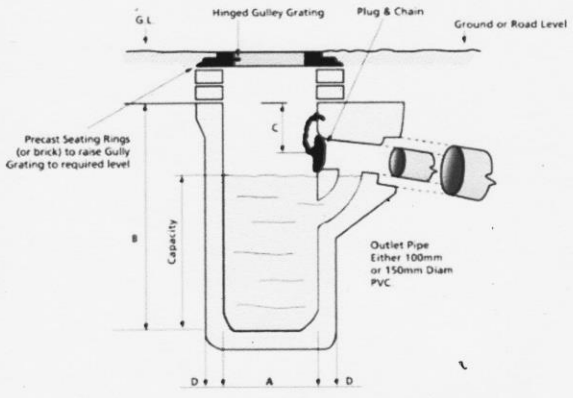
Click the image to watch the video

Related News

DRAWING NO 6.

Because of the trapped outlet, these gullies are used to prevent odours escaping from the drain pipe, which may be the case if the gully is connected to a combined storm and foul water system. They may also be used where there is a risk of oil, which will float on top of water in the gully, preventing it from entering the drain pipe.





Estimated Cost of the Drainage proposal

Item	Estimated cost in SL Rupees
0 Cubic Metre Reinforced concrete Sump	4,800,000
0 diameter pipes (190 m length)	1,180,000
dro brake Optimum Flow control unit	720,000
king good roads & consultation fees	2,300,000
Total	**9,000,000**