PROPOSED CENTRAL EXPRESSWAY PROJECT

from Pothuhera to Galagedara (Section 03)

Updated Environment Management Plan (EMP)

March 2017

Submitted to: Central Environmental Authority, Ministry of Mahaweli Development and Environment

Submitted by: Road Development Authority, Ministry of Higher Education and Highways

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1. Environmental Management Plan (EMP) for Pothuhera to Galagedera Section (Section 3) of the Central Expressway Project

This Environmental Management Plan (EMP) is the summarized matrix of all likely impacts that may occur during preconstruction, construction and operational activities of section 3 of Central Expressway Project (CEP). EMP is prepared based on all anticipated impacts that are identified in the main report of the Environmental Impact Assessment (EIA) conducted for Section 3 of CEP during each phases of the project, their locations where they shall possibly be occurred and mitigation measures to minimise the particular impacts at particular locations and responsible agencies for implementation.

Primary responsibility of implementing the mitigation measures specified in the EMP is admitted by Road Development Authority (RDA). However as the EMP forms part of the Contract, the prescriptions detailed in the EMP are mandatory in nature and also contractually binding with the parties stated in the EMP. With the assistance of the Engineer of Construction Supervision Consultant (CSC) appointed by the Employer the [Road Development Authority (RDA)] shall monitor the compliance of EMP by the Contractor.

The Contractor is advised to carefully consider the relevant EMP requirements stated under item “Pre-construction and design phase” and “Construction phase” when preparing the proposal. In case the Contractor fails to implement the EMP recommendations after informing in writing, the Engineer shall take whatever actions it is deemed necessary to ensure that the EMP is properly implemented. If the Contractor still fails to comply with EMP requirements, the Engineer shall impose a penalty and take actions to arrange appropriate remedial measures to rectify the impact through a third party and cost shall be recovered from the Contractor.

The Contractor through an appointed dedicated Environmental Manager shall assist the Engineer to discharge his duties as required in the EMP implementation by (a) maintaining up to date records on actions taken by the Contractor with regard to implementation of EMP recommendations (b) timely submission of reports, information and data to the Employer through CSC, (c) participating in the meetings convened by the Engineer and (d) any other assistance requested by the Engineer.

List of Abbreviations

ABOP	Air Blast Over Pressure
AIA	Archaeological Impact Assessment
BOQ	Bills of Quantities
CBO	Community Based Organizations
CD	Construction and Demolition
CEA	Central Environmental Authority
CEB	Ceylon Electricity Board
CV	Chief Valuer
DA	Department of Archeology
DAD	Department of Agrarian Development
DMC	Disaster Management Center
DOA	Department of Archeology
DOF	Department of Forest
DS	Divisional Secretary
DWLC	Department of Wildlife Conservation
EMOP	Environmental Monitoring Plan
EMP	Environmental Management Plan
EMU	Expressway Management Unit
EPL	Environmental Protection License
ESDD	Environmental and Social Development Division
GRC	Grievance Redress Committee
GSMB	Geological Survey and Mines Bureau
ID	Irrigation Department
IML	Industrial Mining License
LA	Local Authority
LAA	Land Acquisition Act
LD	Land Division
LHS	Left Hand Side
MOH	Medical Officer of Health
NBRO	National Building Research Organisation
NIRP	National Involuntary Resettlement Policy
NWP-EA	North Western Province Environmental Authority
NWS&DB	National Water Supply and Drainage Board
PIE	Provincial Irrigation Engineer

PPE	Personal Protective Equipment
PPV	Peak Particle Velocity
PS	Pradesheya Sabha
RDA	Road Development Authority
RHS	Right Hand Side
SLLRDC	Sri Lanka Land Reclamation and Development Corporation
SLT	Sri Lanka Telecom
SSEMAP	Site Specific Environmental Management Action Plan
WRB	Water Resources Board

List of Annexes

Annex 1.1	Hydrology Study
Annex 1.2	Streams and Waterways Crossed
Annex 1.3	Places of Worship and Archeological Important Locations
Annex 1.4	Locations of Landslide Prone Areas
Annex 1.5	Location Map of Tunnels
Annex 1.6	Erosion Protection Walls

Environmental Issues		Protection and preventive measures	Locations/ Project phase	Mitigation Cost	Institutional Responsibility	
					Implementation	Supervision
1.0 Advance Works (Pre-construction and design phase)						
1.1	**Land Acquisition**					
	1.1.1	**Removal of buildings/structures within the proposed project area**				
	(a)	For the title holders, compensation for lost housing structures shall be paid based on the Land Acquisition Act (LAA) and its 2013 regulations. Entitlements of affected persons shall be based on the project specific entitlement matrix prepared based on the National Involuntary Resettlement Policy (NIRP).	Locations of affected buildings in the project area	Based on the Land Acquisition Act and its regulations.	Employer	RDA (Land Division (LD) and Environmental and Social Development Division (ESDD)), Chief Valuer (CV), Divisional Secretariat (DS).
	1.1.2	**Acquisition of private/ state land for the proposed project area**				
	(a)	Compensation for private lands shall be paid based on the Land Acquisition Act (LAA) and its 2013 regulations guided by the project specific entitlement matrix based on the NIRP.	Throughout the project area where private lands are to be acquired	Based on the Land Acquisition Act and its regulations	PMU of RDA, DS	Employer (LD and ESDD), CV, DS
1.2	**Design for cross drainage**					
	(a)	Design of cross drainage structures including via-ducts, bridges, culverts and road side drains shall be in compliance with the recommendations given in the Draft Final Drainage Study Report prepared by Sri Lanka Land Reclamation and Development Corporation (SLLRDC). Drainage Study Report prepared for section 3 of CEP which is still at the draft final stage is attached in annex 1.1.	At all stream intersections of the expressway trace and along flood plains. A list of streams intersected by the trace is given in annex 1.2 while flood plains which are crossed by the trace are as follows; • Rambukkan Oya (15+600 – 16+000km)	Design Cost under the Bills of Quantities (BOQ)	Contractor under supervision and coordination of the Employer	Engineer appointed by the Employer, SLLRDC, DI, PIE, DAD

		In addition designs of cross drainage structures shall be carried out as per the specifications. Recommendations given by Department of Irrigation (DI), Department of Agrarian Development (DAD), Provincial Irrigation Engineer (PIE) and any feasible suggestions made by Community Based Organizations (CBO) shall also be incorporated to the final designs before construction starts.	• Kuda Oya (16+000 – 21+000km) • Kospothu Oya (25+800 – 26+550km, 27+800 – 31+000km)			
1.3	**Identification of utility supply lines that may need to be shifted**					
	(a)	Prior consultation and consent shall be taken from relevant service providers (CEB, NWS&DB, SLT and Community Based Organizations (CBO) in case of community water supply schemes prior to commencement of construction activities if utility lines located within the proposed Right of Way (ROW) need to be shifted due to acquiring of the ROW.	At all utilities need to be shifted.	Cost of utility shifting under the BOQ	Contractor under supervision and coordination of the Employer	Engineer appointed by the Employer, Service Providers (CEB, NWS&DB, SLT and CBOs in case of community water supply schemes) (as applicable)
1.4	**Road sections near cultural, historical and archaeological sites**					
	(a)	Recommendations given in Archaeological Impact Assessment (AIA) carried out by Department of Archaeology and conditions laid down in archaeological clearance for the section 3 of CEP shall be strictly followed.	Throughout the expressway trace with special attention to places of worship locations as given in annex 1.3.	Additional Design Cost through BOQ/variation	Contractor under supervision and coordination of the Employer	Engineer appointed by the Employer, Department of Archaeology, CEA/NW- PEA (as applicable)

1.5	**Designs at expressway along landslide prone areas**					
	(a)	Designing for cuts, fills and tunnelling shall be followed by a detailed investigation (Bore holes, seismic tests, geological mapping etc…) on slope stability along the trace. Special slope protection measures such as soil nailing, rock bolting rock, netting and earth reinforcement system (using geogrids/geotextiles) shall be considered if required according to detail investigations and site condition. Close coordination shall be maintained with National Building Research Organisation (NBRO), Geological Survey and Mines Bureau (GSMB) and other responsible organisations and final designs for such locations shall be approved by the Engineer on the recommendation of NBRO prior to the construction activities.	Special attention shall be given to landslide prone areas shown in the annex 1.4 (Approx. 15+150km, 18+500 – 19+200km, 19+850km, 20+500km and 25+300km are the locations where landslides are to be expected and around 29+900km where landslides most likely to occur) and locations given below. Mitigation measures shall be taken based on the NBRO/GSMB recommendations. Tunnel locations; • Tunnel 1: 15+120 – 15+410km (Both RHS and LHS alignments) • Tunnel 2: 23+430 – 23+630km (Both RHS and LHS alignments) • Tunnel 3: LHS alignment: 27+490 – 27+725km, RHS alignment: 27+495- 27+665km. • Detail studies shall be conducted in consultation with NBRO/GSMB and approximately 100m additional tunnel shall be constructed at 32+400km if recommended by NBRO/GSMB. (Please refer to location map of tunnels attached in annex 1.5) Major cut locations (Cut height > 20m); • 7+640 – 7+780 (RHS)	Design Cost under the BOQ	Contractor under supervision and coordination of the Employer	Engineer appointed by the Employer , NBRO, GSMB

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9+500 – 10+140 (LHS)
13+120 – 13+230 (Double cut)
14+930 – 15+010 (RHS)
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Major filling locations (>10m height);
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<tr><td></td><td>(b)</td><td>Additional lands shall be acquired during the design phase if space for establishment of necessary slope protection measures or clear zones are required as recommended by NBRO/GSMB.</td><td>At locations where cut height is more than 12m.</td><td>Land acquisition cost</td><td>Employer</td><td>Employer, DS, NBRO</td></tr>
<tr><td>1.6</td><td colspan="5">Securing material for construction activities</td></tr>
<tr><td></td><td>(a)</td><td>Material requirement especially earth and aggregates shall be secured from the ROW itself to the extent possible. For example, soil and</td><td>At all cut areas along the trace and Rock outcrops located within the ROW (E.g: Rock outcrop at the</td><td>Design Cost within Contract Price</td><td>The contractor shall take the necessary</td><td>Employer</td></tr>
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		aggregates generated from cut areas and blasting within the ROW shall be utilized for the project. New sites shall be secured for the balance requirement and necessary approvals for such sites shall be obtained with the assistance of the Employer.	Pothuhera Interchange area from 0+000 to 0+200km). And at all new borrow pits and quarry sites.		approvals with the assistance of the Employer. How ever, RDA will hold the entire responsibility to ensure compliance of CEA and GSMB requirements	
2.0 Construction Phase						
2.1	**Earthwork, Water and Soil Conservation**					
	2.1.1	**Disposal of debris and spoil**				
	(a)	All disposal sites and their capacities shall be identified well in advance for disposal of all spoil/Unsuitable material and construction wastes. Tunnel muck shall be reused to the extent possible and the balance shall be disposed in identified sites. Regular monitoring sessions shall be conducted to ensure that all spoil/Unsuitable material and construction wastes shall be disposed only at pre-identified disposal sites.	All active sites of the project including all disposal sites. E.g: Following potential locations; • Pubbiliya of R.G. Abeykeerthi, Gangodapitiya, Kahapathwala of Galagedara DS Division • Mahakumburawatta of S. Madhavi, Wattegedara, Watareka, Inguru Watta of Mawathagama DS Division • Halmillagollawatta of C. Gunasena, A301/1, Kanugolla, Rambukkana.	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer & CEA/NW-PEA/LA
	(b)	All disposal sites shall be approved by Central Environmental Authority (CEA) and/or relevant Local Authority (LA) before starting dumping. A proper method statement for each disposal site shall be prepared in order to address and minimize site specific impacts such as soil erosion and slope failures etc… with a rehabilitation plan	-do-	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW- PEA/LA

		and other documents as requested by CEA/LA for their approval.				
	(c)	All disposal sites shall be selected avoiding environmentally sensitive areas such as flood prone areas, adjacent to water bodies and landslide prone areas. If not, strict site specific mitigation measures as recommended by the Engineer, and relevant authorities such as CEA, NW- PEA, LA, SLLRDC and NBRO/GSMB (As applicable) shall be adopted before start dumping. Abandoned quarry or borrow sites may be used if permitted by CEA/LA.	At all disposal sites to be used for the project (Example locations of potential disposal sites are given below) and special consideration shall be paid to flood prone areas and landslide prone areas as given below (location map of landslide prone areas along the trace is given in annex 1.4). Following potential disposal locations; • Pubbiliya of R.G. Abeykeerthi, Gangodapitiya, Kahapathwala of Galagedara DS Division • Mahakumburawatta of S. Madhavi, Wattegedara, Watareka, Inguru Watta of Mawathagama DS Division • Halmillagollawatta of C. Gunasena, A301/1, Kanugolla, Rambukkana. Approx. landslide prone areas; Approx. 15+150km, 18+500 – 19+200km, 19+850km, 20+500km and 25+300km are the locations where landslides are to be expected and around 29+900km where landslides most likely to occur Flood prone areas: • Rambukkan Oya (15+600 – 16+000km) • Kuda Oya (16+000 – 21+000km)	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW- PEA/LA, SLLRDC and NBRO

			• Kopothu Oya (25+800 – 26+550km, 27+800 – 31+000km)			
	(d)	Construction and Demolition waste (CD wastes)/Solid wastes/Hazardous wastes and other debries shall not be disposed or leave within the ROW.	Applicable to entire site area	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW- PEA/LA
	(e)	Drilling fluid (Bentonite slurry) used for piling activities shall be disposed only in locations which are specifically approved for such activity by CEA, LA and under the supervision of Engineer. Any preconditions listed by CEA and/ or LA shall be strictly followed. Bentonite shall not be allowed to drain off when temporarily stored within the site. Bentonite slurry shall always be mixed with soil prior to being disposed. If abandoned quarries are used as disposal sites, any stagnated water within such site shall be removed prior to disposal of bentonite. Adequate silt traps shall be constructed at such sites to avoid Bentonite mixed soil runoff into surrounding areas. All vehicles should be sufficiently covered when transporting Bentonite mixed soil from the construction site to disposal area. No leakages should occur when transporting of Bentonite mixed soil.	Within sites where piling work for via-ducts shall be carried out (along via duct sections as given below) and at locations where Bentonite slurry shall be disposed and roads along the Bentonite slurry shall be transported. Via ducts from 3+540 – 3+810km, 7+550 – 7+640km, 14+235 – 14+775, 15+720 – 16+140, 16+920 – 17+190, 17+400 – 18+550, 19+050 – 19+260, 19+720 – 19+870, 25+720 – 25+930km, 26+548 – 26+818, 27+233 – 27+503 (LHS), 27+246 – 27+516 (RHS), 27+733 – 27+883 (LHS), 27+691 – 27+781 (RHS), 30+228 - 30+378km, 31+068 - 31+248km, 31+618 - 31+798km. Bridges and overpasses at; 0+610, 0+767, 2+000, 3+540, 4+965, 6+340, 7+950, 8+910, 11+280, 12+040, 13+090, 13+880, 16+610, 20+150, 21+518, 21+980, 23+400, 25+025, 26+372, 28+030, 28+678, 28+843, 29+308, 30+000	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW- PEA/LA
	(f)	Dump trucks shall not be overfilled with debris/ excavated material or any other material.	Throughout the trace of transportation.	Within Contract Price	Contractor (As per the contract under	Engineer appointed by the Employer, LA

		Contractor shall make sure that no material is hanging over the tipper bed before releasing the truck to the disposal site.			the supervision and coordination of Employer)	
	2.1.2	**Conservation and reuse of top soil**				
	(a)	Removed vegetative top soil shall be used when replanting/establishing road side vegetation. Residual topsoil could be distributed on adjoining/proximate barren areas with the approval from Divisional Secretary (DS) and/or LA under the supervision of the Engineer.	Within the project area where topsoil from productive land to be removed E.g.: Agricultural lands and home gardens	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, DS
	2.1.3	**Borrowing of earth & quarrying**				
	(a)	Only material extraction sites with a valid Industrial Mining License (IML) and Environmental Protection License (EPL) shall be used for construction. Necessary approvals shall be obtained from the licensing agencies for new borrow sites and quarries with assistance of the Employer.	All potential quarries and borrow sites identified and any other new sites approved by the Engineer.	Within Contract Price	The contractor shall take the necessary approvals with the assistance of the Employer. Howe ver, RDA will hold the entire responsibility to ensure compliance of CEA and GSMB requirements	Engineer appointed by the Employer, GSMB, CEA, NW- PEA
	(b)	Borrow areas and quarry sites selected should be far away from the water bodies & from residential areas to the extent possible. Recommendations of NBRO shall also be complied in selecting borrow areas for the project.	All potential quarries and borrow sites identified and any other new sites approved by the Engineer.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB, NBRO, CEA, NW-PEA,

	(c)	Vegetation clearing shall be limited to the exact extent required in order to avoid erosion and unnecessary loss of vegetation; the removed vegetative top shall be handled as given in clause 2.1.2.	All potential quarries and borrow sites identified and any other new sites approved by the Engineer.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB, NBRO, CEA, NW-PEA,
	(d)	During material exploitation, the removal of land cover in natural slopes shall be restricted to maintain the slope stability. Any excavated slopes should be maintained at stable angles (as recommended by NBRO and GSMB). After completion of excavation slope shall be maintained to ensure stability and berm and drains be provided to avoid erosion and slope failure. Similarly, areas that are liable for slides (example, steep slopes > 30° and having thick overburden soil or highly weathered rocks with exposed roots of trees, gullies, etc..) shall be avoided during wet weather	All borrow and quarry areas identified and any other sites approved by the Engineer and special consideration shall be paid to landslide prone areas as given below; (location map of landslide prone areas (Approx. 15+150km, 18+500 – 19+200km, 19+850km, 20+500km and 25+300km are the locations where landslides are to be expected and around 29+900km where landslides most likely to occur) along the trace is given in annex 1.4).	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB, NBRO, CEA, NW-PEA,
	(e)	Land exploited for fill material shall be cut into profiles of flat surfaces leaving no over burden. After borrowing the slope/gradient of the area shall be graded to match or blend with existing contours; Re-slope the edges of pits so that any fallen animals can escape. Install some form of high visibility fence around the pits to discourage animals wondering into the area. The slopes shall be either hard or soft landscaped.	-do-	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB, CEA, NW- PEA
	(f)	The area shall be rehabilitated by replanting with native tree species and maintained properly. Native species which are identified as threatened or endangered shall be selected to the extent possible with the help of Department	All borrow and quarry areas identified and any other sites approved by the Engineer.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB, CEA, NW- PEA, DOF

		of Forest (DOF) for replanting. Thatching of exposed soil areas with dead or live vegetation and even replantation of such areas where possible with any stripped native vegetation is recommended to reduce the generation of surface run-off during rainy periods, intercept material coming down and also to reduce dust emission scenarios.				
	(g)	A rehabilitation plans shall be provided to the CEA, NWP- EA, GSMB (External Monitoring Committee) for each site and progress to be documented according to the plans periodically with dated photographs, etc…	-do-	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB, CEA, NW- PEA
	2.1.4	**Prevention of soil erosion /Slope failures**				
	(a)	Application of managed drainage systems connected to the main side drains, natural waterways, lead ways of culverts/bridges and compaction of slopes to specified degree of compaction shall be carried out to avoid soil erosion. Open soil mounds shall not be left exposed to direct rainfall and periodic de-siltation of the drainage system shall be conducted to minimize soil erosion. Embankment slopes, fills, slopes of cuts, etc shall not be unduly exposed to erosive forces. These exposed slopes shall be graded and covered by grass as per the specifications. All fills, back fills and slopes should be compacted immediately to reach the specified degree of compaction and establishment of proper mulch.	At all active areas of the project with special attention to material stock piles, near water bodies (annex 1.2) and agricultural lands.	Within Contract Price/As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB, NBRO, CEA, NW-PEA,

		Work that lead to heavy erosion shall be avoided during the rainy season. If such activities need to be continued during rainy season, prior approval must be obtained from the Engineer by submitting a proposal on actions that shall be undertaken by the Contractor to prevent erosion. Erosion protection walls shall be provided for embankments adjacent to water bodies subject to flooding.	Erosion protection walls at locations as given in annex 1.6.			
	(b)	In case of slope failure, construction activities near to the particular location shall be stopped immediately and informed to NBRO and Disaster Management Center (DMC). For such locations, recommendations from NBRO shall be obtained and necessary actions such as soil nailing/rock bolting/rock netting and earth reinforcement systems using geogrids or geotextiles as recommended by NBRO shall be applied as early as possible in order to protect the location and to avoid further impacts. In addition, necessary restoration measures as directed by NBRO shall be taken.	Along the trace with special attention to landslide prone areas as given below (location map of landslide prone areas along the trace is given in annex 1.4) and locations where cuts, fills and tunneling shall be in place. Approx. landslide prone areas; Approx. 15+150km, 18+500 – 19+200km, 19+850km, 20+500km and 25+300km are the locations where landslides are to be expected and around 29+900km where landslides most likely to occur Tunnel locations; • Tunnel 1: 15+120 – 15+410km (Both RHS and LHS alignments) • Tunnel 2: 23+430 – 23+630km (Both RHS and LHS alignments) • Tunnel 3: LHS alignment: 27+490	Within the Contract Price (Such as insurance) and BOQ as applicable	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, NBRO, GSMB, DMC

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– 27+725km, RHS alignment: 27+495- 27+665km.
• Detail studies shall be conducted in consultation with NBRO/GSMB and approximately 100m additional tunnel shall be constructed at 32+400km if recommended by NBRO/GSMB.
(Please refer to location map of tunnels attached in annex 1.5)

Major cut locations (Cut height > 20m);
• 7+640 – 7+780 (RHS)
• 9+500 – 10+140 (LHS)
• 13+120 – 13+230 (Double cut)
• 14+930 – 15+010 (RHS)
• 27+060 – 27+160 (LHS)
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			20+630 - 20+690 7+330 - 7+510 29+610 - 29+710 10+590 - 11+010 24+490 - 24+800			
	(c)	In general where cut height is more than 12m, a clear zone shall be provided for safety, and where cut slope is almost same with the ground, cut angle shall be increased and proper slope protection shall be introduced in compliance with the NBRO recommendations. As per the detailed designs, tunnels shall be placed at locations where double cut height is more than 20m. And if the fill height is more than 12m a viaduct shall be introduced. These criteria shall be further confirmed based on detailed designs and detailed investigations done for slope stability.	Along the expressway trace with special attention to following locations; - Cuts exceeding 12m height - Tunnel locations as given in 2.1.4 (b) - Via ducts to compensate fills exceeding 12m (E.g.: via ducts at; 3+540 - 3+810km and 26+548 – 26+818km) Above locations shall be further specified with the outcome of the detailed design and detailed investigations on slope stability.	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, NBRO, GSMB
	2.1.5	**Contamination of soil (fuel, lubricants)**				
	(a)	Fuel, lubricants and all other hazardous goods (including Pd containing material) shall be transported in enclosed and sealed containers and stored at predefined enclosed storage locations (example, elevated containers with provisions to collect spills). Storage tanks and containers (including empty items) should be well stacked (not piled on each other) in enclosed sheds which have impervious floor. Storage locations should have good ventilation, but not directly exposed to sunlight, devoid of	Along the entire trace and yards, camps, plants, quarries, vehicle maintenance and repairing locations. E.g; Quarry sites, borrow areas and special attention shall be paid to waterways identified along the trace (annex 1.2).	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA

		ignition sources and should not be subjected to runoff, floods or close to waterways.				
	(b)	Used empty oil contaminated drums, cans and containers should be reused to the extent possible or handed over to the local collectors. If these containers are to be stored temporary until giving away to collectors, mitigation measures as given above shall be practiced. The service of agencies having a valid EPL for incineration can be obtained in this regard. To avoid soil contamination at fuel dispensers, "Oil interceptors" shall be provided.	-do-	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(c)	Vehicles, machinery and equipment servicing and maintenance work shall be carried out only in designated locations / service stations which are operated with a valid EPL and in situ repairing shall be done only on paved locations where eluent is collected into settlement/treatment ponds before released to the environment (No direct washing in waterways or close to waterways shall be allowed). Also regular servicing and maintenance of all machinery, etc. is crucial.	All relevant areas. This includes parking areas of machineries and construction vehicles, service areas, repairing areas, fuel dispensers, quarry sites, borrow areas, access routes and batching plants. These activities shall be controlled near waterways as given in annex 1.2.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	2.1.6	**Disposal of harmful construction wastes (Scheduled Wastes)**				
	(a)	Prior to commencement of work, a list of hazardous chemicals and material (including Pd containing), to be used in the project work shall be submitted to the Engineer and to CEA/NW-PEA for approval (Along with details pertaining to proposed disposal and any other document). Material Safety Data Sheets (MSDS) or technical data sheets of the different material to be used shall also be furnished for approval. Scheduled	Locations stated in the method statement submitted by the Contractor	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA

		wastes shall be stored separately from other construction material. All of these hazardous wastes shall be disposed according to the National Environmental Regulations.				
	(b)	Method of disposal of all scheduled wastes shall be properly identified and necessary approvals shall be taken prior to the disposal.	Locations of disposal sites for scheduled wastes. Following are potential locations for disposal which can be used with approval; • Pubbiliya of R.G. Abeykeerthi, Gangodapitiya, Kahapathwala of Galagedara DS Division • Mahakumburawatta of S. Madhavi, Wattegedara, Watareka, Inguru Watta of Mawathagama DS Division • Halmillagollawatta of C. Gunasena, A301/1, Kanugolla, Rambukkana.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	2.1.7	**Quarry operations & blasting works elsewhere**				
	(a)	A blasting plan with necessary safeguards requirements shall be prepared for all quarry operations and approval shall be obtained from GSMB and Ministry of Defense. This plan shall include method of storage & transport of explosives, use of explosives for blasting (loading of explosives, post-blast requirements, misfires), safety aspects (pre-blast measures and prevention of high noise, dust and projectiles), monitoring of PPVs (Peak Particle Velocities) and ABOPs (Air Blast Overpressures) during blasting or test-blasting works.	At all quarry locations, blasting within the ROW and any other blasting locations approved by the Engineer and locations where explosives and detonators are stored, routes and vehicle used for transportation of explosives and detonators and any other blasting materials.	Within Contract Price and as per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA, GSMB, Ministry of Defense
	(b)	Test blasts shall be carried out according to GSMB guidelines. Public shall be made aware of the	At all quarry and blasting locations or any other blasting locations	Within Contract Price	Contractor	Engineer appointed by the

		places, dates and times of blasting. Property damages by blasting shall be compensated. Pre-condition survey, monitoring of nearby building structures, regular monitoring of vibration frequencies and PPVs shall help to minimize development of cracks.	approved by the Engineer.		(As per the contract under the supervision and coordination of Employer)	Employer, CEA/NW-PEA, GSMB, Ministry of Defense
	(c)	A baseline survey of vibration levels shall be conducted at locations where blasting is planned.	At all blasting locations including tunnel locations, cuts with special attention to sensitive areas such as residential areas, schools, temples and hospitals etc…	Employer's fund	Employer	Employer, CEA
	(d)	A property condition survey (including a crack survey) and property construction monitoring of vibration frequencies (Hz) and PPV shall be carried out for buildings and other structures located within a radius as decided by the Engineer or GSMB before blasting activities. Any crack damages (new cracks or expansion of existing cracks) due to construction activities shall be compensated based in comparison with baseline conditions.	-do-	As per the BOQ (Provisional Sum of Rs. 10,000,000.00) Actual amount to be paid by the Contractor	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA, GSMB
	(e)	Controlled blasting using chemical or low explosive material etc… shall be carried out at sensitive locations if directed by the Engineer in compliance with the guidelines of GSMB.	Blasting if required at sensitive locations such as places of worship, schools, hospitals, court (As given below), residential areas and any other critical location found close to the trace. Kotawella Kanishta Vidyalaya (14+350km), Parape Maha Vidyalaya (17+050km), Wataraka Maha Vidyalaya (21+200km), Galagedara Central College (31+560km) & Galabawa Maha Vidyalaya (26+200km)	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA, GSMB

			Kaamawa Dombemada Kanishta Vidyalaya (8+500km) Hospitals; Bhikshu Wattauwa, Ministry of Health and District Hospital at Galagedara Interchange (32+500km) Galagedera Magistrates Court (32+500km)			
2.2	**Storage and handling of construction material**					
	2.2.1	**Emission of dust**				
	(a)	All vehicles delivering construction material that could generate dust (example, fill material, cement and aggregates) and taking away Construction and Demolition wastes shall be well covered with tarpaulin sheets to avoid dusts blow and spills. Construction vehicles and machineries shall be periodically maintained & serviced to minimize emission of air pollutants. Adequate number of water trucks/ bowsers (at all times) shall be deployed to sprinkle water to suppress dust along haulage roads of material. The frequency of spraying water shall depend on the weather condition and as instructed by the Engineer.	All active areas of the project with special attention to areas where there are sensitive recipients; Places of worship as given in annex 1.3, schools, hospitals, court (as given in 2.1.7 (e)) and residential areas and any other sensitive recipient which are located adjacent to the trace and material transportation roads.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA,
	(b)	All stockpiles shall be located sufficiently away from sensitive receptors. Material storage areas and any equipment that could generate dust shall also be located downwind of any habitation areas or away from inhabited areas and other sensitive recipients such	At all material storage locations with special attention to places of worship as given in annex 1.3, schools, hospitals, court (as mentioned in 2.1.7 (e)) and residential areas which are located adjacent to the trace and material storage locations.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA,

		as schools and temples. Also the assembly, operation and dismantling of plants, machinery and equipment shall be handled so as to minimize the generation of dust. Construction material stockpiles, spoil and any land clearing debris shall be well covered at all times				
	(c)	It shall be ensured that project activities shall avoid, where possible and take suitable action such as placing tire baths, tire washing mechanisms etc… to prevent dirt and mud being carried to nearby roads (particularly following wet weather).	All active areas of the project with special attention to yards, batching plants, material storage sites, asphalt plants, crusher plants and material extraction sites which are located adjacent to public roads.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA
	2.2.2	**Avoiding fumes and offensive odour**				
	(a)	Fuel, lubricants and hazardous goods (including chemicals that have VOCs) shall be stored in predefined enclosed storage /transported in cans and drums or any other approved containers that have well sealed lids and made of appropriate material in order to prevent odour and offensive smells emanating from them. In cases wherein odour or offensive smell does occur, immediate actions shall be taken to rectify the situation. Any health issue that may result from severe odour or offensive smells shall be compensated. Workers involved in handling chemicals having volatile organic compounds (VOCs), acids, etc… shall be provided appropriate PPE such as gloves and respirators. Those involved in spray painting shall be given facemasks too.	All active areas of the project site including storage yards approved by LA and any other relevant authorities, quarry sites, borrow areas, access routes, batching plants and relevant storage locations.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA

	(b)	MSDS (Material Storage Data Sheets) and technical data sheets of toxic material shall be maintained and used according to manufacturer's instructions. MSDS should include an inventory of all hazardous material / chemicals received at site and this needs to include the trade name, physical and chemical properties, ingredient and their % or levels, eco-toxicological data, safe handling and storage procedures and emergency & first aid procedures, etc.	All active areas of the project. construction material storage yards approved by LA and other relevant authorities/ locations (their offices) to be considered	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA
	2.2.3	**Transportation of material**				
	(a)	A method statement on transportation of material shall be prepared and approved by the Engineer based on the recommendations/approval of the relevant authorities. The Contractor shall use the mode of transportation so approved by the Engineer for the transportation of goods and materials for the construction works.	All relevant routes	Within Contract Price and BOQ item.	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, GSMB
2.3.	**Water – Protection of water sources and quality**					
	2.3.1.	**Protection of water sources and disruption to water users**				
	(a)	The project staff shall be made aware on water conservation and minimization of water wastage in the construction process. Sources of water used by the community shall be protected so that continued use of these water sources shall not be disrupted by the work. If these water sources shall be affected temporary alternative arrangements shall be arranged for supply water to affected parties. Water shall be extracted from public sources only	Throughout the project area and at worker camps	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, DAD

		if the relevant responsible agency permits.				
	(b)	Waterways including canals and streams shall not be diverted, closed or blocked (even for a short period of time) by the construction activities in a manner that adversely affect downstream users. If diversion or closure or blocking of canals and water paths is required for the execution of work, the water flow shall be continued by providing alternative paths with the Engineer's approval in writing. Construction works shall be managed in the way that it shall not disturb periods of activities in downstream such as cultivation periods of agricultural lands. Prior approval for construction shall be obtained from the relevant agency (such as DI, DAD, LA or Divisional Secretary) that is responsible for the relevant water way. The waterway shall be restored back to its original status once the need for such diversion or closure or blockage is over.	At all waterways crossed by the expressway trace E.g.: Streams given in annex 1.2 including major waterways such as (Ch 15+860 Rambukkan Oya, 19+080 - 19+750 Kuda Oya, 25+730 & 31+010 Kospothu Oya) that have major beneficial uses	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, DAD, DI, LA
	2.3.2	**Siltation into water bodies**				
	(a)	Land clearing, cut and fill operations and excavations etc… and bridge construction works should be arranged to avoid siltation in to the water bodies by providing silt traps and interceptor drains, etc.	All locations where waterways are crossed by or located adjacent to the trace as given in annex 1.2 including following major streams; Rambukkana Oya (Ch 15+830 to 16+060 km, 16+900 km, 25 + 740	Within Contract Price	Contractor (As per the contract under the supervision and	Engineer appointed by the Employer, DI, DAD, DS, LA

		Maintaining suitable surface covers in the vicinity of any identified water bodies and paddy lands to reduce the effects of rainfall impact; For example, placement of silt fences (until construction is completed) along the ROW and along paddy lands. The trapped sediments shall be regularly removed and disposed as a fill material (or used as backfill material) and the silt fences, traps/drains, etc. shall be regularly checked and maintained/cleaned	km, 30 +200km) Kuda Oya (Ch 17+200 km, Ch 18 + 000 km, Ch 18+700 to Ch 18+800 km & Ch 18+750 to 19 +150 km), Ch 2+400 km, Ch 12+100 km, Ch 14+600 km, Ch 21+860 km, Ch 31+275 km from Ch 17+000 to Ch 17+200 km & Ch 18+650 to 18+950 km of the Kuda Oya Wataraka Moratuwa at Ch 21+200 At all stream intersections (annex 1.2) and where paddy lands and marshy areas are located close or adjacent to the trace including, (Ch 17+000 to Ch 17+200 km, Ch 18+650 to 18+950 km & Ch 18+750 to Ch 19+150 km of the Kuda Oya		coordination of Employer)	
	(b)	Cofferdams and silt curtains shall be placed where bridges to be constructed. During site clearing and excavations of any banks for the construction of bridge abutments, it shall ensure that the containment bunds/coffer dams are incorporated into the excavation areas and these are regularly checked and well maintained to prevent downstream migration of contained sediments. No direct dewatering shall be done for sediment-laden water collected within the coffer dams to the stream water.	At all bridge construction locations E.g.: Rambukkana Oya (Ch 15+830 to Ch 16+060 km, Ch 16 + 900 km, Ch 25 + 740 km and Ch 30+200 km), Kuda Oya (Ch 18 + 000 km, Ch 18+700 to Ch 18+800 km & Ch 18+750 to 19 +150 km), Ch 37 + 970 km, Ch 2+400 km, Ch 12+100 km, Ch 14+600 km, Ch 21+860 km and Ch 31+275 km.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer , DI, DAD
	(c)	Vehicle including tanks of trucks carrying concrete / construction materials shall not be washed at	All active areas of the project including streams (annex 1.2),and	Within Contract Price	Contractor (As per the	Engineer appointed by

		streams and at any other waterbody. These vehicles and tanks shall be washed only at locations which have paved surface with drainage facilities to collect water into settlement/treatment ponds before released to the environment.	paddy fields, and, quarry sites, borrow areas, access routes, concrete batching plants, etc.		contract under the supervision and coordination of Employer)	the Employer, DI, DAD, CEA/NW- PEA
	2.3.3	**Alteration of drainage paths, impacts to retention capacities, damage to flood protection structures**				
	(a)	Proper approval shall be obtained from SLLRDC, DI, and other relevant stakeholders for the pilot road drainage management plan prepared by the Contractor. Temporary cross drainage openings shall be provided along the pilot road in line with all locations where permanent cross drainage structures shall be located and wherever identified locations along the trace. 900mm or above pipes and temporary bridges shall be provided. The Contractor shall responsible to cut open the pilot road and dissipate any water logging condition in upstream during high intensity rainfall as per contingency management plan.	Along the pilot road with special attention to flood plains (as given below) and stream crossings (annex 1.2) • Rambukkan Oya (15+600 – 16+000km) • Kuda Oya (16+000 – 21+000km) • Kospothu Oya (25+800 – 26+550km, 27+800 – 31+000km)	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer , DI, DAD, SLLRDC
	(b)	The lead in lead away canals shall be improved during the construction stage as per the DI and SLLRDC and any other stakeholder recommendations.	At all drainage structures	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer , DI, DAD, SLLRDC
	(c)	There shall be close communication with the regional office of the Irrigation Department/Provincial Irrigation Engineer or	Location of irrigation structures near to the trace.	Within Contract Price	Contractor (As per the contract under the supervision	Engineer appointed by the Employer ,

		Department of Agrarian Development on methods of carrying out construction works close to bunds and irrigation/agricultural structures. Any accidental damages caused to the structures shall be rectified without any delay. Rectification of such damage shall be under the supervision of the relevant authority.			and coordination of Employer)	DI, DAD, SLLRDC
	2.3.4.	**Contamination of water from construction wastes**				
	(a)	Refer to the measures mentioned in items 2.1.1, 2.1.5, 2.1.6, 2.2 and 2.3.2	All stream intersections as given in annex 1.2.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW- PEA
	(b)	Construction works shall be managed/minimized near/ at such drainage locations during heavy rain seasons such as South West Monsoonal rains from May to September.	-Do-	-Do-	-Do-	-Do-
	(c)	The discharge standards promulgated under the National Environmental Act shall be strictly adhered to. All waste arising from the project is to be disposed in a manner that is acceptable to the Engineer and according to the guidelines/instructions issued by CEA/NW-PEA.	-Do-	-Do-	-Do-	-Do-
	2.3.5.	**Contamination from fuel and lubricants**				
	(a)	Refer to the measures mentioned in items 2.1.5, 2.1.6 and 2.2.2	All locations indicated under the said items.	Within Contract Price	Contractor (As per the contract under the supervision	Engineer appointed by the Employer, CEA/NW- PEA

					and coordination of Employer)	
	2.3.6.	**Locating labour camps, sanitation and waste disposal in construction camps**				
	(a)	Labor camps, offices, storage areas and any other accommodation shall be located away from waterways and other sensitive area as approved by the Engineer. All locations of accommodations shall be approved by relevant LA and/or CEA.	At all locations selected for labor camps and special attention to be paid at all stream intersections as given in annex 1.2.	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, CEA/NW-PEA
	(b)	Adequate water supply, sanitation and all requisite infrastructure facilities shall be provided for all labor camps conforming to WHO or SLS 614 Parts 1 and 2 (1983) Drinking Water Standards.	At all labor camps including temporary huts (used as resting places) and office spaces and surrounding environments	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer
	(c)	Adequate water sealed toilet facilities shall be provided and upgraded whenever needed & be dismantled and filled completely at the time of decommissioning. Septic tank/soakage pit shall be constructed as per the approval given by the relevant authority. Septic effluents shall not be directed to waterways. The Contractor shall ensure proper disposal of sludge from septic tanks through a suitable arrangement with the relevant LA. Sludge disposal shall not be done in a haphazard manner and shall be done only at septic locations approved by LA.	At all locations selected for labor camps and special attention to be paid at all stream intersections as given in annex 1.2.	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA
	(d)	Solid waste from the camp shall be properly	-do-	Within Contract	Contractor	Engineer

		managed by separating the biodegradable component from the non - biodegradable component such as polythene, glass and metal as directed by relevant LA. A suitable arrangement shall be made with the relevant LA to periodically remove the accumulated waste for recycling or final disposal. Solid waste shall not be allowed to accumulate for long periods of time within the labor camp under any circumstances.		Price	(As per the contract under the supervision and coordination of Employer)	appointed by the Employer, LA
	(e)	After completion of construction work all labor camps, temporary resting, office and storage areas shall be restored to its original condition.	As given in above section (b)	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA
	2.3.7.	**Extraction of water**				
	(a)	Adequate supply of water shall be arranged for the project purpose throughout the construction period. Water shall not be obtained/extracted from groundwater, community water supplies, irrigation tanks or canals or surface water-bodies for any purposes including for labour camps from public or community water supplies without approval from the relevant authority. Such extraction (if approved) should be under direct supervision of the Engineer complying with the guidelines and instructions issued by relevant authority. The Contractor shall be fully responsible for settlement of any claims arising out of conflicts with other users of water from natural water sources.	At all labor camps including temporary huts (used as resting places) and office spaces and surrounding environments and locations where water shall be extracted for construction works	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, DI, DAD
	(b)	Construction over the irrigation canals shall be undertaken under necessary permission from the Department of Agrarian Services or Department	Existing streams within and close to the project area (annex 1.2)	Within Contract Price	Contractor (As per the contract under	Engineer appointed by the Employer,

		of Irrigation as applicable.			the supervision and coordination of Employer)	LA, DI, DAD
	2.3.8	**Impacts to ground water table due to cuts and tunneling**				
	(a)	Pre-condition survey on baseline ground water levels shall be carried out before construction starts. If complaints shall be received on depletion of water table due to construction activity, a detail study shall be carried out through Water Resources Board (WRB) and recommendations shall be applied. If instructed by the Water Resources Board; • Temporary water supply shall be provided to well users (in case of temporary drying out of water wells or loss of access to the water wells) as directed by the Engineer. • Cost of construction of new water wells shall be provided or an alternative water supply (pipe born water or tube wells) shall be provided with the approval of the Engineer if the water table is not restored as a result of the project activities.	At all cuts and tunneling locations as mentioned in 2.1.4 (b) and on complain basis.	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, WRB, DS
2.4.	**Flood Prevention**					
	2.4.1.	**Blockage of drainage paths and drains**				
	(a)	Construction activities shall not lead to flooding conditions as a result of blocked drainage paths and drains. All measures necessary as directed by the Engineer shall be taken to keep all drainage paths and drains clear of blockage at all times. If flooding or stagnation of storm water is caused by construction activities, the Contractor	Existing streams and canals within and close to the project area (annex 1.2) and flood plains; • Rambukkan Oya (15+600 – 16+000km) • Kuda Oya (16+000 – 21+000km)	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, DI, DAD, SLLRDC

		shall prevent loss of access to any land or property and prevent any damage to land or property as directed by the Engineer. Any loss of income or damage as a result of such flooding shall be compensated.	• Kopothu Oya (25+800 – 26+550km, 27+800 – 31+000km)			
	2.4.2	**Work in flood prone areas**				
	(a)	Contractor's activities shall not lead to aggravate floods in nearby areas when working in flood prone areas. When working in flood prone areas during rainy season actions shall be taken to avoid storing of materials, chemicals and other items of work which could be washed away by the floods.	Flood prone areas along the trace; • Rambukkan Oya (15+600 – 16+000km) • Kuda Oya (16+000 – 21+000km) • Kopothu Oya (25+800 – 26+550km, 27+800 – 31+000km)	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, DI, DAD, SLLRDC
	2.4.3	**Construction of pilot road**				
	(a)	The land over which the pilot/ service road is constructed shall be properly restored after completion of project to the satisfaction of Engineer and LA. Soil removed from the pilot road shall be disposed only at approved disposal sites.	Along the pilot road	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, DI, DAD, SLLRDC
2.5	**Air Pollution**					
	2.5.1	**Air Pollution**				
	(a)	A baseline monitoring survey of air quality shall be carried out at selected locations which are	Throughout the trace where residential areas, hospitals, schools	Employer's fund	Employer	Employer, CEA

		sensitive to degradation of air quality.	and any other critical sites are located			
	(b)	Air quality at all areas related to construction activities shall be periodically monitored as specified in the Environmental Monitoring Plan (EMOP) and as directed the Engineer and all construction activities shall be undertaken in compliance with the regulations and standards given in National Environmental Act. If emission levels are found or reported to be exceeded the stipulated standards, appropriate measures shall be adopted in order to manage the impact to an acceptable level. A compensation package shall be adopted to compensate the affected parties with the approval of the Engineer.	At locations given in EMOP and any other locations as recommended by the Engineer	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(c)	Refer section 2.2.3 transportation of material.	All active areas including, pilot road and roads used for material transportation.	Within Contract Price and BOQ item.	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, GSMB
	(d)	Speed limits shall be maintained at 5-10 km/hr within the project area in order to minimize dust blow, worker & community safety. Speed limit signboards shall be erected at regular intervals of the sub roads and make drivers aware.		Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(e)	Frequent sprinkling of exposed earth surfaces and unpaved haulage roads when dust plumes are likely or when surfaces are dried (with cracks or fissures). Adequate reliable water supply shall be provided at site for sprinkling / wetting and the workforce shall be provided with appropriate PPE such as dust masks & eye goggles.	All active areas of the project and sensitive locations as given in (as mentioned in 2.1.7 (e))	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA

	(f)	Please refer section 2.2.1 (a) emission of Dust also.	All active areas of the Project Site. This includes (but not limited to) quarry sites, borrow areas, access routes, batching plants and crusher plants with special attention to sensitive receptors as given in (as mentioned in 2.1.7 (e)).	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA,
	(g)	Construction vehicles and machineries shall be periodically maintained & serviced to minimize air pollutants.	-do-	-do-	-do-	-do-
	(h)	Construction material stockpiles, spoil and any land clearing debris should be well covered at all times.	-do-	-do-	-do-	-do-
	(i)	Air quality (parameters such as O_2, SO_2, NO_2, CO, Methane etc…) within the tunnels shall be frequently monitored against the relevant standards and necessary mitigation measures as directed by the Engineer shall be adopted.	At tunnel locations as given in 2.1.4 (b).	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA, GSMB
	2.5.2	**Emissions from Asphalt Concrete (AC) Plants and Concrete Batch Mixing Plants**				
	(a)	All Asphalt Concrete and concrete batching plants are required to obtain a site clearance and EPL from CEA/NW-PEA prior to commencing operations and shall be operated strictly in accordance with the conditions stipulated in the site clearance and the EPL.	At all asphalt and concrete batch mixing plants	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(b)	Aggregate piles from concrete batching plants shall be frequently kept damp (through water spraying; Fixed water sprays should be installed for long term stocking areas if appropriate) and well covered with tarpaulin sheets.	At Asphalt and concrete batching plants and access routes associated with them (storage areas included)	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA

		Appropriate PPE (dust masks and eye goggles) shall be provided to the workers.				
	(c)	Storage areas where there is vehicular movement shall either have a consolidated surface, which shall be kept clean and in good repair, or be kept wet. Sweeping, wetting or sealing are all techniques that may be used to reduce dust emissions from roads. The technique that shall be used depends upon the type of the road under consideration.	At all material storage areas within and outside the ROW.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(d)	Water shall be sprayed during material loading to tippers, etc. and during unloading	Asphalt and concrete batching plants and access routes associated with them (storage areas included)	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(e)	Locating asphalt and batching plants away from prevailing high winds (Consider the prevailing wind direction to ensure that bunkers and conveyors are sited in the leeward direction to minimize the effects of the wind). Natural or artificial barriers shall be established to control the spreading of dust from the plant.	At all asphalt and concrete batching plants & storage areas	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(f)	Emissions from asphalt and batching plants shall be controlled by emissions passing through either a cyclone dust collector, a scrubber or a baghouse filter. To control dust from batching plant and other work sites; - The cement weigh hopper shall be enclosed, to ensure that dust cannot escape to the atmosphere. - Sand and aggregates shall be kept dampen.	At batching plants and material storage areas	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA

		- Conveyor belts and hoppers shall be enclosed or covered. Pavements and surfaces shall be kept clean. - Enclosing the loading bay				
	2.5.3.	**Air Pollution from crusher**				
	(a)	All crusher plants are required to obtain a site clearance and EPL from CEA/NW-PEA prior to commencing operations and shall be operated strictly in accordance with the conditions stipulated in the site clearance and the EPL. Crushed metal stockpiles shall be frequently kept damp (through water spraying; Fixed water sprays shall be installed for long term stocking areas if appropriate) and well covered with tarpaulin sheets. Crushers shall be totally contained or fitted with a water suppression system over the crusher aperture. The discharge from crushers and screens onto conveyors or into other equipment shall be enclosed as far as is practicable; gunny bags or geotextiles that are frequently wetted would be applicable to be used as covering material for crushers. Appropriate PPE (dust masks and eye goggles) shall be provided to the workers	At all metal crushers plants of the project (E.g: 29+900km), access roads and material storage yards.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(b)	Storage areas where there is vehicular movement shall either have a consolidated surface, which shall be kept clean and in good repair, or shall be kept wet. Sweeping, wetting or sealing are all techniques that may be used to reduce dust	Material storage areas of crusher plants	Within Contract Price	Contractor (As per the contract under the supervision	Engineer appointed by the Employer, CEA/NW-PEA

		emissions from roads.			and coordination of Employer)	
	(c)	Water shall be sprayed during material loading to tippers, etc. and during unloading	At all metal crusher plants (E.g.: 29+900 km), access roads and material storage yards.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(d)	Locating crushers out of prevailing high winds (Considering the prevailing wind direction to ensure that bunkers and conveyors are sited in the leeward direction to minimize the effects of the wind). Providing natural or artificial barriers (high tapeline screens to prevent wind blowing them away) to control the emission of dust from the plant. Establishing and maintain a buffer zone if directed by relevant authorities.	At all metal crusher plants (E.g.: 29+900 km), and material storage yards.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
2.6. Noise Pollution and Vibration						
	2.6.1	**Noise from vehicles, plants and equipment.**				
	(a)	Noise at all areas related to construction activities shall be periodically monitored as specified in the EMOP and as directed by the Engineer and all construction activities shall be undertaken in compliance with the regulations and standards given in National Environmental Act (Noise Control Regulations - Extra Ordinary Gazette No. 924/12 May 1996 amended by Extra Ordinary Gazette 937/7 April 1997). If noise levels are found or reported to be exceeded the stipulated standards, appropriate measures shall be adopted in order to manage the impact to an acceptable level.	At locations given in EMOP and any other locations as recommended by the Engineer. Noise levels shall be monitored at tunnel locations (as give in 2.1.4 (b)) in compliance with the GSMB requirement.	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA

	(b)	All construction works shall be limited to working hours stipulated by CEA to minimize noise induced disturbances during night and considering worker safety aspects. However, if construction work shall have to be extended beyond stipulated time, a special approval from Engineer and CEA shall be obtained for night work and high noise generation activities shall be restricted during night shift in order to comply with the given maximum permissible noise levels.	All active areas of the Project Site And sensitive locations. Special attention shall be given near to settlement areas if night work shall be carried out.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(c)	All heavy equipment and machinery shall be fitted in full compliance with the national regulation, Noise Control Regulations - Extra Ordinary Gazette No. 924/12 May 1996 amended by Extra Ordinary Gazette 937/7 April 1997 and manufacturers specifications. All precautions shall be in place not to exceed the maximum permissible levels for construction noise during day time. If the noise monitoring levels exceeds the levels stipulated by the CEA, the Contractor shall adopt appropriate measures in order to reduce noise levels.	All active areas of the project and special attention shall be paid to the Expressway Sections close by schools, places of worship, courts, hospitals and any other sensitive locations. E.g.: Schools; Kotawella Kanishta Vidyalaya (14+350km), Parape Maha Vidyalaya (17+050km), Wataraka Maha Vidyalaya (21+200km), Galagedara Central College (31+560km) & Galabawa Maha Vidyalaya (26+200km) Kaamawa Dombemada Kanishta Vidyalaya (8+500km) Hospitals; Bhikshu Wattauwa, Ministry of Health and District Hospital at Galagedara Interchange (32+500km) Galagedera Magistrates Court (32+500km)	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA

			Places of worship: as given in annex 1.3			
	(d)	All machinery and equipment shall be regularly serviced and well maintained and have noise reduction devices (vehicles and equipment should have exhaust silencers). Plants such as asphalt, crusher and batching shall be operated with a valid EPL and given conditions shall be strictly adhered in order to minimize noise impacts.	All active areas of the Project Site including quarry sites, borrow areas, access routes, batching plants, crusher plants and asphalt plats. Special attention to locations where there are sensitive recipients such as schools, places of worship and hospitals, interchanges, material storage yards, etc…	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(e)	Study the current traffic scenarios in busy areas (with the support of the RDA and Police) and implement proper traffic management practices with reference to material transport (including quarry material) in order to reduce traffic congestions and traffic noise too	Highly applicable to 3 interchanges	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(f)	Necessary PPE (ear plugs or muffs with hard hats/helmets) should be given to the workforce involved in noise handling works including rock blasting works	All active areas of the Project Site with special attention to areas where there are sensitive recipients (as mentioned in 2.6.1. (c)). The Locations to be considered including (but not limited to) quarry sites, borrow areas, access routes, batching plants, 4 interchanges, material storage yards, etc.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(g)	Locating asphalt, metal crushing and concrete batching plants, together with noise abatement measures to reduce air-borne noise transmission. Such facilities should be upwind of sensitive receptors a minimum of 500 m and downwind of sensitive receptors minimum 100 m.	Asphalt plants, crushers and concrete batching plant locations and special attention to be paid to sensitive receptors as given in 2.6.1 (c).	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEA/NW-PEA
	(h)	Rock blasting works (including blasting done for tunnels) shall be confined to the	At all quarry sites and blasting sites (including Ch 7+940 km), tunnels (as given in 2.1.4 (b)) and other blasting	Within Contract Price	Contractor (As per the contract under	Engineer appointed by the

		working hours stipulated by CEA and proper communication mechanisms shall be established to inform the community within 500m and as directed by the Engineer and GSMB. A special approval shall be obtained from CEA If construction activities are to be extended beyond the stipulated time. Powerful sirens have to be used prior to blasting with deployment of flagmen and preventing public access to the blasting areas with barricades, etc… Also measures as given in clause 2.10.5 shall also be applicable.	sites.		the supervision and coordination of Employer)	Employer, GSMB, CEA, Police and LA
	(i)	A background noise monitoring survey shall be carried out along the trace at selected locations which are sensitive to high noise levels in order to setup the baseline. A detailed study (validated mathematical modelling) shall be done for at least 50 years traffic data to find out scenarios where noise barriers are imperative during the operational period. Actions shall be taken to establishment of noise barriers as per the schedule prepared under the above study. The outcome of the study shall be submitted to CEA for approval.	Study to be carried out for the entire trace and mitigation measures shall be in place as per the recommendations of the study.	1. As per the BOQ (supply and installation of noise barriers which is Rs. 226,000,000.00) for the present requirement 2. Employer funds for the future requirements	**Present requirement -** Contractor (As per the contract under the supervision and coordination of Employer) **Future requirement –** Employer	Engineer appointed by the Employer, Employer, CEA/NW-PEA
	2.6.2	**Vibration**				
	(a)	A background vibration survey shall be carried out at locations which are susceptible to vibration impact along the trace in order to set up the baseline.	At selected locations which are susceptible to vibration.	Employer's funds	Employer	Employer
	(b)	Vibration at all areas related to construction activities shall be periodically monitored as specified in the Environmental Monitoring Plan	At locations given in EMOP and any other locations as recommended by the Engineer and GSMB (for tunneling).	As per the BOQ	Contractor (As per the contract under the supervision	Engineer appointed by the Employer, GSMB

		(EMOP) and as directed by the Engineer and all construction activities shall be undertaken in compliance with the regulations and standards given in National Environmental Act. If vibration levels are found or reported to be exceeded the stipulated levels, appropriate measures shall be adopted in order to manage the impact to an acceptable level. Property condition surveys (Crack survey) shall be carried out covering structures within 500m from the respective centerline or as directed by the Engineer/GSMB/CEA/NW-PEA prior to construction and shall monitor the pre-construction PPVs and vibration frequencies as recommended by the Engineer. Reasonable compensation should be given to parties affected by vibration. A mechanism shall be establish to address public complaints and grievances due to vibration as mentioned in 2.14. Construction works such as compaction shall be controlled at sensitive locations such as places of worship, schools, hospitals etc...			and coordination of Employer)	
	(c)	No blasting activity including road side blasting and blasting for tunnels shall be carried out without an approval from GSMB and conditions laid down under such approval shall be strictly adhered.	All active areas of the Project Site quarry sites, tunnels (as given in 2.1.4 (b)), borrow areas, access routes, batching plants, material storage yards, etc... Special attention should be paid to places of worship as given in annex 1.3 and other sensitive receptors as mentioned in 2.6.1 (c), settlement	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB

			areas which are located nearby and along tunnels.			
	(d)	All construction works shall be limited to working hours stipulated by CEA to minimize vibration induced disturbances during night and considering worker safety aspects. A special approval shall be obtained from CEA If construction activities are to be extended beyond the stipulated time. However, if construction work shall have to be extended beyond stipulated time, a special approval from Engineer and CEA shall be obtained for night work and high noise generation activities shall be restricted during night shift in order to comply with the given maximum permissible vibration levels.	All active areas of the Project Site specially along settlement areas	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB, CEA
	(e)	Vibration less techniques shall be used (if practically possible) such as approved chemicals rather than using detonators, ANFO/ and dynamite/Gelignite cartridges in areas where there are sensitive recipients to reduce vibration and projectiles.	All active areas of the Project Site including quarry sites. Special attention should be paid if blasting shall be required near to archeological places/places of worship as given in annex 1.3 and other sensitive receptors as mentioned in 2.6.1 (c) and also settlement areas which are located nearby.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, GSMB, CEA, Police, LA
2.7.	**Impacts to Flora**					
	2.7.1.	**Loss, damage or disruption to flora**				
	(a)	All works shall be carried out in a manner that the destruction to the flora and their habitats is minimized. Trees and vegetation shall be felled / removed only if that impinges directly on the permanent works or necessary temporary works. In all such cases Contractor shall be instructed to take prior approval from the Engineer.	Throughout the expressway trace with special attention to forest area around Siyambalagamuwa (around 8+200)	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, DS, Timber Corporation

		Felled trees shall be handed over to the Timber Corporation through DS.				
	(b)	The ground vegetation cover within the ROW shall not be unnecessarily destroyed and all staff of the Contractor including machinery operators and laborers shall be educated in this regard. Movement and parking of construction vehicle, machinery and equipment shall be done only in the areas of work and areas designated/approved by the Engineer in order to minimize damage to vegetation.	-do-	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer
	(c)	A compensatory tree planting program shall be developed in consultation with DOF/ local authorities/ communities in order to replenish the loss of trees. Native tree species shall be selected for this purpose and efforts shall be made to select native species which are threatened or endangered with the help of DOF in order to facilitate their survival in the environment.	Throughout the expressway trace. Locations of public places where replanting can be carried out, degraded lands owned by DOF which can be reforested and the edge of the ROW of the expressway (after completion of construction works)	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, DOF
	(d)	In order to prevent further invasion of existing invasive species, the waste plant materials generated during the site clearing and dredging activities (if any) shall be securely disposed.	At locations where invasive species shall be removed from the ROW.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, DOF
	2.7.2	**Chance found important flora**				
	(a)	During construction, if a rare/threatened/endangered flora species is found, the Contractor is instructed to inform immediately to the DOF through Employer. All activities that could destroy such flora and/or its habitat shall be stopped with immediate effect. Such activities shall be restarted only after obtaining the Engineer's approval. Conditions stipulated in the Engineers	Throughout the expressway trace with special attention to forest area around Siyambalagamuwa (around 8+200)	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, DOF

		approval to conserve such flora species/habitat will be strictly adhered.				
2.8.	**Impact on Fauna**					
	2.8.1.	**Loss, damage or disruption to fauna**				
	(a)	All works shall be carried out in such a manner that the destruction or disruption to the fauna and their habitats is minimum.	Throughout the expressway trace with special attention to forest area around Siyambalagamuwa (around 8+200)	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, DWLC
	(b)	Construction workers shall be instructed to protect fauna including wild animals and aquatic life as well as their habitats. Hunting, pouching and unauthorized fishing by project workers is not allowed.	-do-	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, DWLC
	(c)	A detail study on animal movements across the trace shall be carried out through a reputed service provider which shall be approved by Department of Wildlife Conservation (DWLC) and site specific measures to facilitate animal movements across the expressway shall be decided based on the findings and recommendations of the study.	-do-	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, DWLC
	2.8.2	**Chance found important fauna**				
	(a)	During construction, if a rare/threatened/endangered fauna species is found, it shall be immediately informed to the DWLC through the Employer. All activities that could	Throughout the expressway trace with special attention to forest area around Siyambalagamuwa (around 8+200)	Within Contract Price	Contractor (As per the contract under the supervision	Engineer appointed by the Employer, DWLC

		destroy such fauna and/or its habitat shall be stopped with immediate effect. Such activities shall be restarted only after obtaining the Engineer's approval. Conditions stipulated in the Engineers approval to conserve such fauna species/habitat will be strictly adhered.			and coordination of Employer)	
2.9.	**Disruption to Users**					
	2.9.1	**Loss of access**				
	(a)	Action shall be taken to ensure continuity of existing movements/facilities of vehicles, pedestrians and livestock etc… affected by construction activities. Prior approval shall be taken from the Engineer for such action before executing the same.	Throughout the expressway trace specially where existing minor roads, pathways, footpaths etc… are crossed	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA
	(b)	On completion of the works, all temporary obstructions to access shall be cleared away, all rubbish and piles of debris that obstruct access be cleared to the satisfaction of the Engineer.	-do-	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA
	(c)	Providing advance information to the public about the planned construction works and activities causing disruption to access roads, and the temporary arrangements made to give relief to public in order to avoid any inconveniences due to the construction activities.	-do-	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA
	(d)	Use of flagmen and/or temporary traffic lights to control traffic flows at constricted sites, including safe crossing for pedestrians especially at town areas and near schools under supervision of Police.	-do-	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA, Police

2.10	**Accidents and Risks**					
	2.10.1	**Public and worker safety**				
	(a)	All relevant provisions of the International Labor Organization Convention No. 62 and Safety and Health Regulations of the Factory Ordinance of Sri Lanka and any other relevant regulations related to safety and health shall be adhered. Action shall be taken to ensure safety of the public.	Applicable to all active areas of the Project Site, quarries, bathing plants, asphalting plants, quarries from pre-construction to construction / de-commissioning phase	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer
	(b)	Contractor shall be instructed to arrange all personal protective equipment (PPEs) such as helmet, boots etc… and first-aid facilities and firefighting equipment at construction sites and other related locations. An emergency plan shall be prepared to meet any emergency case like fire, accidents. According to the construction schedule, daily Tool Box sessions shall be conducted by qualified and experienced Safety Officers under the guidance of the Environmental, Health and Safety Manager of the Contractor on a daily basis emphasizing the importance of worker safety and precautions to be taken at different working conditions, the use of appropriate PPE. Emergency vehicles with reliable drivers and with first aid boxes shall be readily available at site to reach the nearest hospitals.	Applicable to all active areas of the Project Site from pre- construction to construction / de- commissioning phase	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer

		If night time works are unavoidable, sufficient illumination has to be provided to the satisfaction of the Engineer and other relevant authorities to ensure the safety.				
	2.10.2.	**Prevention of risks of electrocution**				
	(a)	All electrical wiring and supply related shall confirm to standards acceptable to the Engineer. Adequate precautions shall be taken to prevent danger of electrocution from electrical equipment and power supply lines including distribution boards, transformers, etc. Measures such as danger signboards, danger/red lights, fencing and lights shall be provided to protect the public and workers. All electric power driven machines to be used shall be free from defects, be properly maintained and kept in good working condition, be regularly inspected and according to manufacturer's recommendations and to the satisfaction of the Engineer	All active areas of the Project Site from site mobilization to construction Consider the 4 interchanges and all sensitive recipient areas indicated at the end of this table.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer
	2.10.3	**Risk at hazardous activity**				
	(a)	Mitigation measures described under items 2.1.7, 2.2.2, 2.5.1, 2.5.2., 2.6.1 and also 2.10.1, 2.10.4 with reference to Occupational, health & safety management aspects are applied here as well.	All active areas of the Project Site including the construction material and construction waste (including hazardous waste) storage locations.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer
	(b)	The use of any toxic chemical shall be strictly in accordance with the manufacturer's instructions. The Engineer shall be notified of toxic chemicals that are planned to be used in all contract related activities. A register of all toxic	All active areas of the project including locations where toxic material are handled and stored for the project.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer

		chemicals delivered to the site shall be kept and maintained up to date by the Contractor. The register shall include the trade name, physical properties and characteristics, chemical ingredients, health and safety hazard information, safe handling and storage procedures, and emergency and first aid procedures for the product.				
	2.10.4	**Handling of explosives**				
	(a)	Explosives shall be transported, stored in a secured manner as directed by the relevant authorities and as approved by the Engineer. Permits have to be obtained from the Ministry of Defense (MOD) under the Explosives Act No. 12 of 1956 (as amended) and approvals from the GSMB.	At all locations where explosives are used and magazines, quarry sites and route taken to transport the explosives and detonators.	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, Police, Ministry of Defense
2.11	**Health and safety**					
	2.11.1	**Prevention of vector borne diseases**				

	(a)	Measures under item 2.3.6 are applied. Contractor shall be instructed to report any outbreak of infectious disease or water-borne disease in a labor camp to the Project Engineer of the RDA and then to the Medical Officer of Health (MOH) or the PHI of the area immediately. Contractor shall carry out all instructions issued by the Medical Officer of Health (MOH) or the local PHI All areas connected to construction activities shall be maintained in a sanitary manner in order to prevent breeding of mosquitoes and other disease carrying vectors.	Applicable to all active areas of the Project including labor camps and temporary resting huts etc…	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, LA
2.12	**Protection of cultural and religious places and properties**					
	2.12.1	**Prevention of damages to cultural and religious places and properties**				
	(a)	The construction activities adjacent to archeologically important places already identified under the Archeological Impact Assessment (AIA) given in location column shall be carried out under continuous supervision of DOA and any other recommendations given by them are strictly adhered during construction phase. The construction activities at other archeologically important locations found during implementation shall be carried out in compliance with the recommendations of Department of Archeology	Nearby Awariyagala Dagaba (an ancient temple) at Pothuhera Interchange (0+000km) and Walpola Temple (12+500km).	Additional construction/shifting Cost through BOQ/variation	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, DOA

		(DOA). During construction activities the Contractor shall instructed to take all necessary and adequate care as directed by the Engineer to minimize impacts on places of worship. Workers should not be allowed to trespass in to such areas.				
2.13	**Environmental enhancement**					
	2.13.1	**Roadside landscape**				
	(a)	Road landscape plantation, re-vegetation of road embankments and other slopes, edge treatment of water bodies shall be taken up according to contract. Tree species which are under threatened or endangered shall be selected (with the approval of the Engineer and DOF) for environmental enhancement.	Within and close to the project area, and all locations used for quarry sites, burrow pits, asphalt plant, concrete batching plants, workshops and labour camps	As per the BOQ	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer
	2.13.2	**Protection of Utilities**				
	(a)	Actions shall be taken to protect the existing utility services such as water, electricity, telephone etc… within the construction related areas. For this purpose appropriate methodology shall be developed in consultation with relevant agencies. Such methodology shall be submitted to the Engineer for approval. Any damage caused due to construction activity shall be rectified immediately as directed by the relevant authority.	At all locations where electricity, water and telecommunication supply lines located close to the project area	Within the Contract Price/BOQ as stated in the Specifications	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer, CEB, SLT, NWSDB, CBOs (For community water supplies)
	2.13.3	**Road furniture**				
	(a)	Road furniture including footpaths, guard rails, cable barriers, storm water drains, crash barrier, traffic signs, speed zone signs, pavement markers, intersections, rotaries, traffic islands, safety	Throughout the project area	As per the BOQ	Contractor (As per the contract under the supervision	Engineer appointed by the Employer

		fences, roadside protection and any other such items shall be provided according to the approved design. Displaying of public awareness messages on either side of the expressway e.g., biodiversity conservation, protection of environment etc…			and coordination of Employer)	
2.14	**Handling environmental issues/grievances during construction**					
	(a)	The Contractor shall appoint a qualified Environmental Manager and Social and Resettlement Officer for community liaison to handle public complaints and grievances. The Contractor shall develop a suitable mechanism to receive and address the complaints and grievances. The person who is responsible for receiving complaints shall be easily accessible by the public. The Environmental Manager should promptly investigate and review environmental complaints and implement the appropriate corrective actions. A register consisting of all the complaints made is to be passed to the Engineer within a reasonable time after reception. Action taken by the Environmental Manager/ Social and Resettlement Officer on complains must be included with chainages and other details. It is recommended to have a Register at the RDA /Regional RDA offices/sub-offices too for the affected community to have easy access. Complaints that could not be resolved shall be referred to Grievance Redress Committee (GRC) level 1 at the Grama Niladari level and level 2 at the DS level.	Throughout the expressway trace and in all active areas of the project	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer

	(b)	Contractor shall prepare a detailed Site Specific Environmental Management Action Plan (SSEMAP) clearly stating the approach, actions and manner in which the EMP is implemented. The SSEMAP shall be updated regularly and submitted for Engineers review and approval.	Throughout the expressway trace and in all active areas of the project	Within Contract Price	Contractor (As per the contract under the supervision and coordination of Employer)	Engineer appointed by the Employer
3.0 Operational stage						
	3.1	**Stagnation of water at hydraulic structures during heavy rains due to siltation and blocking of openings with debris.**				
	(a)	Periodic maintenance through de-siltation of hydraulic structures and lead away canals, monitoring of upstream water levels	All hydraulic structures constructed.	Part of routine maintenance costs	Expressway Management Unit (EMU)	Employer
	(b)	In case of slope failure (local failure), necessary actions such as soil nailing and rock bolting should be carried out in consultation with NBRO.	Along the entire trace	Part of routine maintenance costs	EMU	Employer, NBRO
	3.2.	**Road safety**				
	(a)	Maintenance of road furniture including footpaths, guard rails, cable barriers, storm water drains, crash barrier, traffic signs, speed zone signs, pavement markers, intersections, rotaries, traffic islands, safety fences, roadside protection and any	Along the entire trace	Part of routine maintenance costs	EMU	Employer

		other such items. Ensure proper illumination is there during night time (example, lights and luminous signs) and legible sign boards & regular maintenance				
	(b)	Fencing to prevent animal access and regular maintenance.	Along the entire trace	Part of routine maintenance costs	EMU	Employer
	(c)	Ensure pedestrian crossovers have well maintained fences to prevent accidental costs	Where pedestrian crossovers are located	Part of routine maintenance costs	EMU	Employer
	3.3	**Encroachment on to ROW**				
	(a)	RDA should not allow any encroachments to ROW.	Throughout the trace	Part of routine maintenance costs	EMU	Employer
	3.4	**Damage to flora and fauna**				
	(a)	Maintenance of roadside landscaping. Maintenance of planted trees and gap filling Monitoring of invasion of invasive floral/faunal species Displaying of public awareness messages on either side of the expressway e.g., biodiversity conservation, protection of environment….etc	Throughout the trace	Part of routine maintenance costs	EMU	Employer, DOF, DWLC
	(b)	Daily recording of the status of animal collision throughout the trace and maintaining a database. Identification of locations need to be rectified and application of possible mitigations measures during operational stage with the help of DWLC/DOF/Relevant expertise	Throughout the trace and special attention to black spots of animal collisions identified (if any).	Part of routine maintenance costs	EMU	Employer, DOF, DWLC

	3.5	**Impacts due to traffic noise**				
	(a)	Establishment of balance noise barriers	At locations where noise barriers are recommended.	Part of routine maintenance Costs (Rs. 113,000,000.00)	EMU	Employer, CEA
	(b)	Maintenance of noise barriers	At locations where noise barriers are established.	Part of routine maintenance Costs (Rs. 500,000.00/year or as estimated)	EMU	Employer, CEA
	3.6	**Traffic Impact Management**				
	(a)	Existing connectivity roads relevant to interchanges shall be improved. Widening of the existing road shall be considered where necessary. Special consideration shall be given to the existing Galagedara to Katugastota section of Katugasthota – Kurunegala – Puttalam road (A10) to upgrade to facilitate the traffic coming from the expressway.	All national roads connected to interchanges of the expressway	Engineering cost	RDA	Employer

2. Environmental Monitoring Plan (EMOP) for Pothuhera to Galagedera Section (Section 3) of the Central Expressway Project

Environmental component	Project stage	Parameters to be monitored	Locations	Frequency	Standards	Rate (Rs.)	Implementation and Supervision
Air quality	Pre-Construction	SPM, PM10, NO_2,CO,SO2, CO_2	At locations which are sensitive to degradation of air quality found within 200m corridor from the edge of the ROW to the both sides on approval of the Engineer. The selected locations shall be confirmed with the CEA.	Twice covering dry and wet weather conditions	NAAQS of Sri Lanka	40,000 per sample	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Construction	SPM, PM10, NO_2,CO,SO2, CO_2	At above locations and on complain basis	Once in three months for three years and on complain basis	NAAQS of Sri Lanka	40,000 per sample	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Operational	SPM, PM10, NO_2,CO,SO2, CO_2	At above locations	Annually or as required	NAAQS of Sri Lanka	-	Employer
Noise	Pre-Construction	Leq10 and Leq 50 values	At locations which are sensitive to high noise levels found within 200m corridor from the edge of the ROW to the both sides on approval of the Engineer. The selected locations shall be confirmed with the CEA.	Twice covering dry and wet weather conditions	CEA Regulations on ambient noise levels	10,000 per sample	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Construction	Leq or L10 and L90 values	At above mentioned locations and on complain basis.	Once in three months for three years and on complain basis	CEA Regulations on ambient noise levels	10,000 per sample	Implemented by the Contractor under supervision of the Engineer appointed by the Employer

Environmental component	Project stage	Parameters to be monitored	Locations	Frequency	Standards	Rate (Rs.)	Implementation and Supervision
	Operational	Leq10 and Leq 50 values	At above mentioned locations	Annually or as required	CEA Regulations on ambient noise levels	-	Employer
Vibration	Pre-Construction	GV and ABOP	At locations which are sensitive to vibration impact found within 200m corridor from the edge of the ROW to the both sides on approval of the Engineer. The selected locations shall be confirmed with the CEA.	Twice covering dry and wet weather conditions	CEA Regulations on permissible ground vibration levels	10,000 per sample	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Construction	Peak Particle Velocity (PPV) and ABOP	At above mentioned locations and on complain basis.	Once in three months for three years and on complain basis	CEA Regulations on permissible ground vibration levels	10,000 per sample	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Operational	PPV and ABOP	At locations mentioned above.	Annually or as required	CEA Regulations on permissible ground vibration levels	-	Employer
Water quality	Pre-Construction	Temperature, pH, Electrical	At locations which are sensitive to water quality degradation found within 50m corridor from the edge of	Twice covering dry and wet	CEA Water Quality	10,000 per sample	Implemented by the Contractor under supervision

Environmental component	Project stage	Parameters to be monitored	Locations	Frequency	Standards	Rate (Rs.)	Implementation and Supervision
		Conductivity, DO, BOD_5, TSS, Turbidity, Salinity, Total Coliform count	the ROW to the both sides on approval of the Engineer. The selected locations shall be confirmed with the CEA.	weather conditions	Regulation		of the Engineer appointed by the Employer
	Construction	Temperature, pH, Electrical Conductivity, DO, BOD_5, TSS, Turbidity, Salinity, Total Coliform count	At locations mentioned above and on complain basis	Once in three months for three years and on complain basis	CEA Water Quality Regulation	10,000 per sample	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Operational	Temperature, pH, Electrical Conductivity, DO, BOD_5, TSS, Turbidity, Salinity, Total Coliform count, Oil and Grease	At locations mentioned above.	Annually or as required	CEA Water Quality Regulation	-	Employer

Environmental component	Project stage	Parameters to be monitored	Locations	Frequency	Standards	Rate (Rs.)	Implementation and Supervision
Ground water level	Pre-Construction	Depth to the ground water table	At locations which are susceptible to ground water depletion due to project activities as recommended by the Engineer including tunnel locations and cuts. Selected locations shall be confirmed with CEA.	Twice covering dry and wet weather conditions	-	50,000 per Piezometers (Construction cost)	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Construction	Depth to the ground water table	-Do-	Monthly for three years	-	15,000 per month for all locations (Cost of monitoring)	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Operational	Depth to the ground water table	-Do-	Once in six months for three years	-	-	Employer
Survey of terrestrial and aquatic flora and fauna	Pre-Construction	Survey of presence of flora and fauna species (terrestrial and aquatic)	Land available within the proposed ROW and adjacent lands	Once	-	2,000,000	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Construction	Survey to assess any changes against the baseline	Land adjacent to the ROW	Annually for three years	-	2,000,000	Implemented by the Contractor under supervision of the Engineer appointed by the Employer
	Operational	Survey to assess any changes against the	Land adjacent to the ROW	Annually for three years	-	-	Employer

Environmental component	Project stage	Parameters to be monitored	Locations	Frequency	Standards	Rate (Rs.)	Implementation and Supervision
		previous studies					

3. Contingency Plan

Category	Mitigation and compensation	Method / Responsibility
Affected Drinking water wells	Provide temporary water supply to well users (in case of drying out of water wells or no access to the water wells) , Provide cost for construction of new water well. Provide new wells at alternative locations if there is no water table recovery. Investigation cost for Water Board. Cost for getting pipe born water connection from the water board. Cost for establishment of tube wells	LARC and SUPER LARC /RDA / Contractor
Upstream flooding	Contractor/RDA shall take immediate action to overcome the flood due to heavy rains wherever necessary. Contractor shall compensate for any loss of income or damage as a result of flooding due to construction activities.	RDA / Contractor
Loss of Access	Preparation of road network/access plan and Provide new access by the project	RDA
Loss of day today income during the construction period	Preparation of income restoration plan, Provide compensation, introduce alterative incomes during the construction period.	Project GRM/ RDA / Contractor
Blockage of Access during construction period	Immediate Rectification and Provide temporary access.	Contractor
Disturbances to Agricultural areas during construction period.	Rectification and pay income loss.	Contractor
Damages to the Properties (building and structures)	Property condition survey before the construction. Pay compensation/ repairing of damaged properties. Temporary evacuation	Contractor
Safety Issues	Preparation of Safety management Plan and Provide proper safety arrangements accordingly	Contractor

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1 INTRODUCTION AND PROJECT BACKGROUND

1.1 Project Background

The Government of Democratic Socialist Republic of Sri Lanka has decided to construct the Central Expressway starting from Kadawatha up to Dambulla with link roads to Ambepussa and Galagedara from Pothuhera respectively. The newly proposed expressway is a combination of previously proposed two expressway traces. i.e. Segment from Kadawatha to Gampaha remains unchanged as in the (Colombo Kandy Alternate Highway) CKAH trace and the trace will follow the former Northern Expressway trace beyond Gampaha. New trace is named as the Central Expressway(CE) and consists of following segments as per ToR.

1. Kadawatha- Kossinna (4.4 km)
2. Kossinna-Mirigama (32.5km)
3. Mirigama-Kurunegala (39.72 km) & Ambepussa Link Road (9.3 km)
4. Pothuhera-Galagedara (32.5 km)
5. Kurunegala-Ridigama (12.5 km)
6. Ridigama-Melsiripura (18.9 km)
7. Melsiripura-Galewela (16.2 km)
8. Galewela-Dambulla (12.7 km)

Sri Lanka Land Reclamation and Development Corporation (SLLRDC) has done a hydrological study for section from Kadawatha to Gampaha under Colombo-Kandy Alternative (CKAH) Project in 2001.

RDA has entrusted SLLRDC with the task of carrying out the hydrological study for the entire Central Expressway trace from Kadawatha to Dambulla (Sections 1, 2 and 4) , Ambepussa Link road and from Pothuhera to Galagedera(Section 3). For the hydrological studies RDA has issued a Terms of Reference(TOR) of which the scope of work has been defined.

1.2 Objectives of the Hydrological Study

The following study objectives have been developed in the TOR

- Study the Topography and identify the locations where the expressway pass through natural rivers/streams, water paths, marshes, storage pools etc. by studying the Rainfall/ Geography/Runoff characteristics and the effect of constructing an embankment as the first update of expressway platform with bridges/culverts provided for river/stream crossings while identifying the openings required for each with respect to flood heights for relevant storm of defined return periods as specified for different structures depending on their importance.

- The soffit of the structure shall have sufficient freeboard as defined depending on the discharge through the structure or structure dimensions.

- Consider other implications of providing the embankment with above openings such as upstream flooding due to the prevention of over ground flow (sheet flow) and

allowing higher discharge through natural channels hither to not imposed on them which could lead to bottom and bank erosion and high speeds effecting society at large.

- Modify their original considerations based on above analysis if necessary and finally provide the openings required for cross drainage with existing/new openings required to prevent runoff/flood related social problems, due solely to construction of the expressway, at its finished condition and while during construction.

1.3 Expressway Sections

To facilitate the work and award contracts RDA has divided the Central Expressway to four major Sections.

a) **Section 1**- Kadawatha-Meerigama (37km)

b) **Section 2**-Meerigama-Kurunegala (41km) and Ambepussa Link (9km)

c) **Section 3**-Pothuhera-Galagedara (33 km)

d) **Section 4**-Kurunegala-Dambulla (60km)

1.4 Introduction for Report

This is the hydrological study report on the feasibility of the Central Expressway Section 3 from Kurunegala (0+000km) to Kandy (32+500km). It contains, standard methods adopted in the study, data collected, data analysis, hydrological model simulations, results of the analysis, and the recommended sizes and levels of the culverts, irrigation openings bridges and viaducts.

1.5 Location Map for Section 1 of Central Expressway

The project area lies mainly in Maha Oya and Deduru Oya River Basins Figure 1-1 below shows the Section 3 along with the trace consisting of Sections 1,2 and 4 of the proposed Central Expressway. See figure 1-2 below for and enhanced layout view of Section 3.

1.6 Scope of Work

The scope of work related to hydrological studies and relevant specifications have been defined in Section 3 of the TOR. The said TOR is given in **Annex 1**.

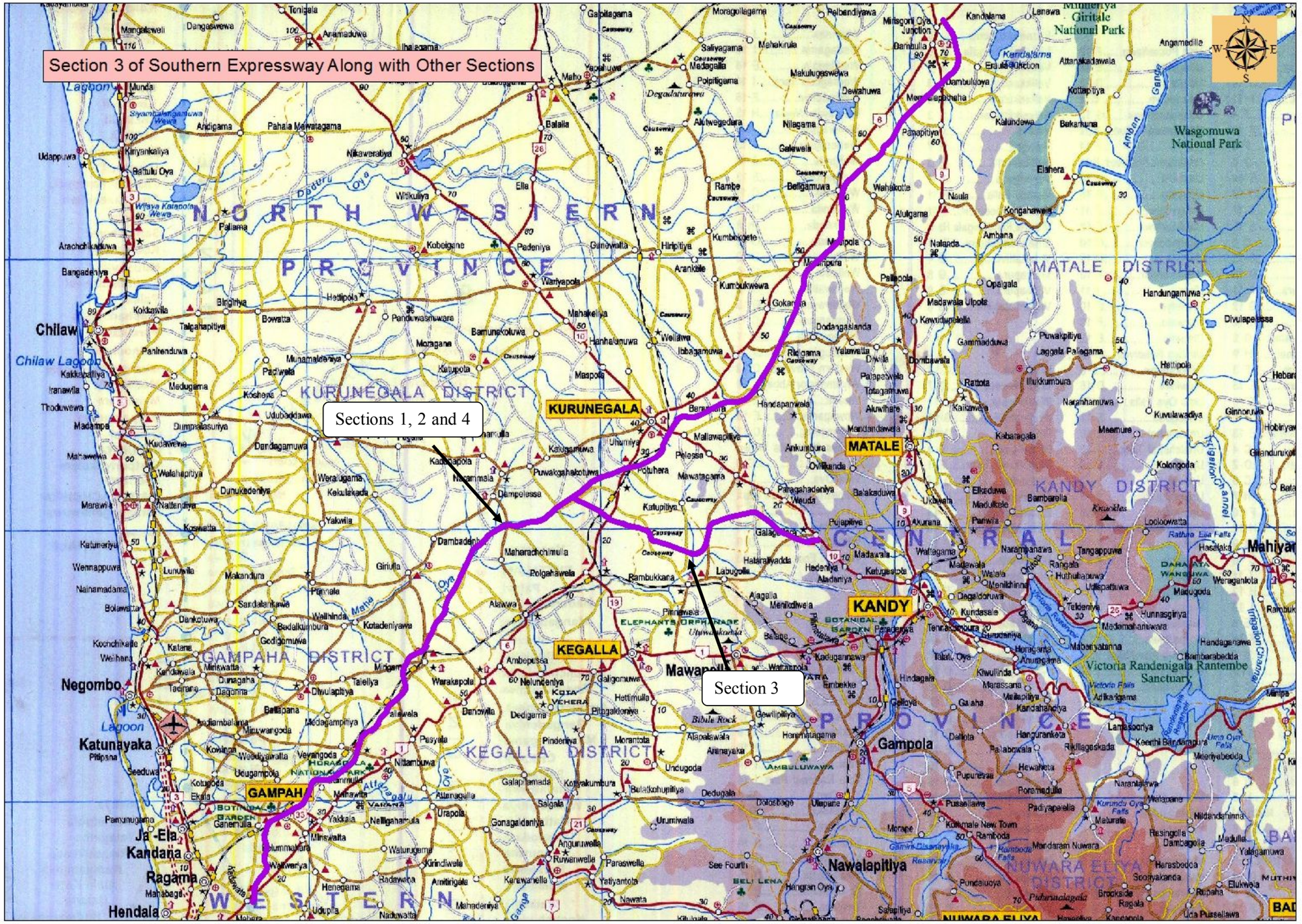

Figure 1-1– Section 3 of the Central Expressway along with Other Sections

Figure 1-2– Location Map

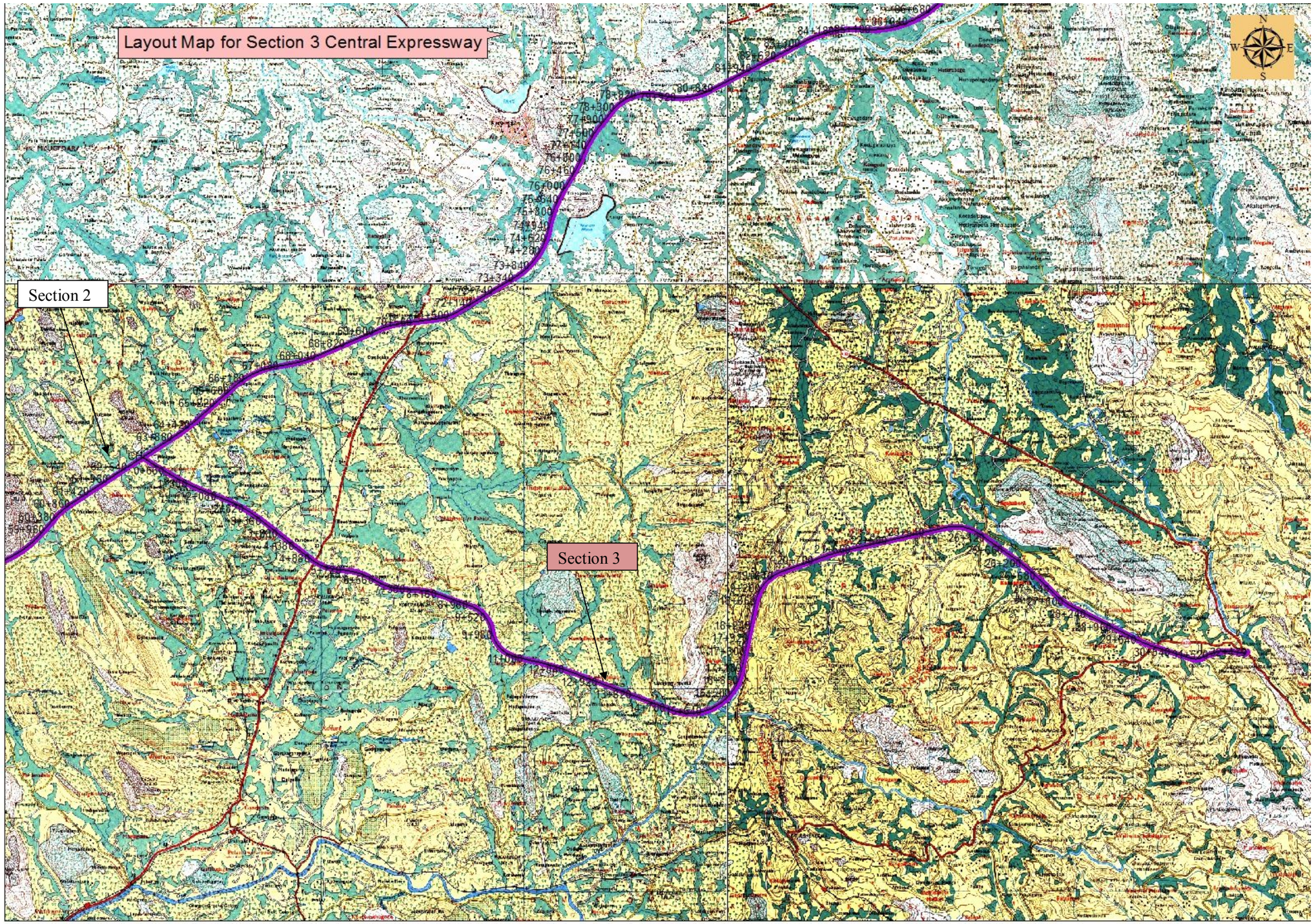

Figure 1-3-Project area and the expressway trace

2 SOURCES OF INFORMATION

2.1 Literature

Recent hydrological report of the Central Expressway by SMEC Consultants Australia was referred to get an initial idea of the hydrology of the Section 3 of the Central Expressway.

2.2 Topographic Maps

Topographic maps of scales 1:50000 and 1:10000 published by the Survey Department of Sri Lanka were used. These maps were used in an image form in a GIS database after applying georeferencing.

2.3 Satellite Imagery

High resolution satellite images provided by the RDA are used for this study. These satellite imageries adequately covered the road trace area. However, these images did not cover some larger catchment areas needed for the study. These catchment areas were obtained using the topographic maps, Digital Elevation Models (DEM) and Google satellite imagery as supplementary information.

2.4 IDF Information

IDF curves for all the principal meteorological stations in the country are given in Ranatunge,D.G.L. (2001). However, these IDF curves are developed based on the data prior to the year 2000 and the rainfall intensities are known to have increased in the recent past especially for short duration rains. Therefore, those IDF curves had to be updated by using the most recent rainfall intensities. Latest rainfall intensities for these stations were obtained from the pluviographs compiled by the Department of Meteorology. The needed IDF curves were determined using the Theissen Polygon method. After applying the Theissen Polygon it was found that the following IDF curves are effective for Section 3 of the expressway.

1. Kurunegala (From 0+000km to 27+520km)
2. Katugastota (From 27+520km to 32+479km)

Theissen polygon used for the selection of the IDF curves are given in the figure below.

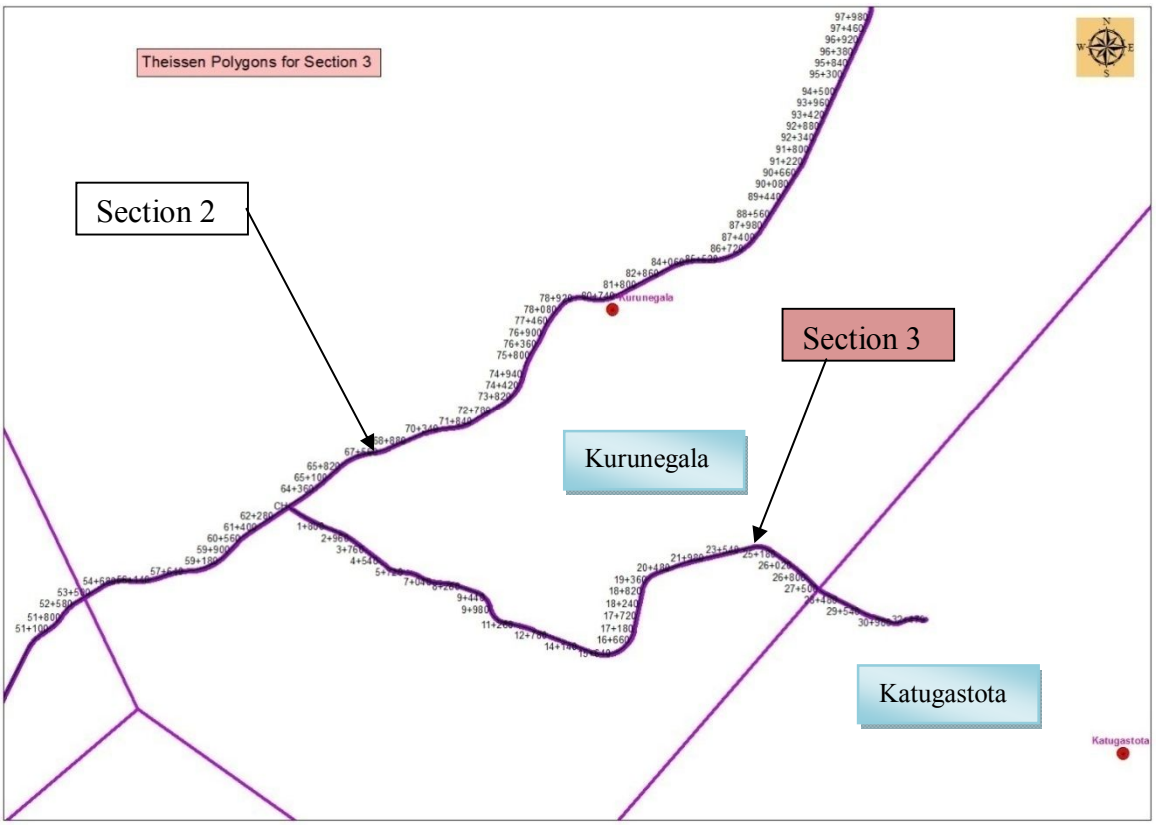

Figure 2-1-Theissen Polygons

2.5 Stream Cross Sections

Stream cross sections of Rambukkan Oya and Kospothu Oya with major tributaries in the close proximity were surveyed form upstream to downstream taking into account the river crossings created by the expressway. These river cross sections were used to develop HEC RAS model for these two streams.

2.6 Water levels for extreme floods

Water levels for extreme floods for the area was collected from two methods. They are;

1. Data collected during the recent cross section surveys. Surveyors were instructed to obtain the flood levels from nearby residents.
2. Through site visits – having discussions with residents

These flood levels were used to calibrate the HEC - RAS models for Rambukkan Oya (15+960) and Kospothu Oya (25+840km)

2.7 Data Pertaining to Previous Models

The HEC RAS model developed by SMEC Consultants Australia for the work of the Section 3 of the Central Expressway were taken as the prevailing models and various modifications were made to update the model to accurately represent the sub catchments of Rambukkan Oya (15+960) and Kospothu Oya (25+840km).

2.8 Road trace drawings

AutoCAD drawings related to the road trace on the satellite images were provided by RDA. Some of these AutoCad drawing information were converted into ArcGIS shape files, geo-databases and raster files, TIN layers etc. to delineate catchments and to identify major, medium and minor stream crossings of the expressway.

3 HYDROLOGICAL PARAMETERS

3.1 Rainfall Intensity Duration Frequency (IDF) Curves

Nearest meteorological stations where rainfall Intensity Duration Frequency (IDF) Curves available are Kurunegala and Katugastota. The updated IDF curves for Katugastota was obtained from the Hydrological Study Kandy - Katugastota Road Project and the updated IDF curve for Kurunegala was obtained from the Hydrological Report for A006 Road Kurunegala Town Area. IDF curve for Kandy Katugastota and Kurunegala are given in Figures 3.1 to 3.2.

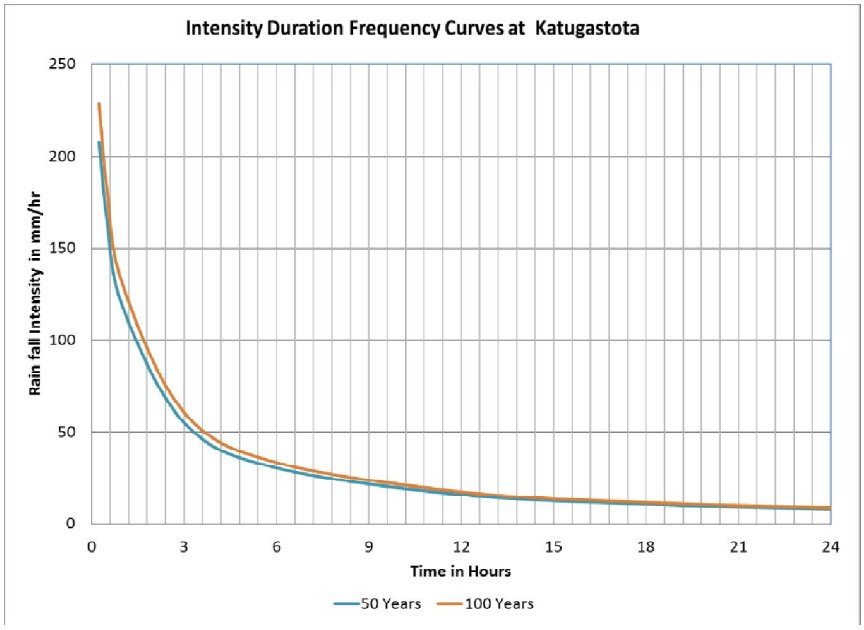

Figure 3-1– Updated IDF Curve for Kandy Katugastota

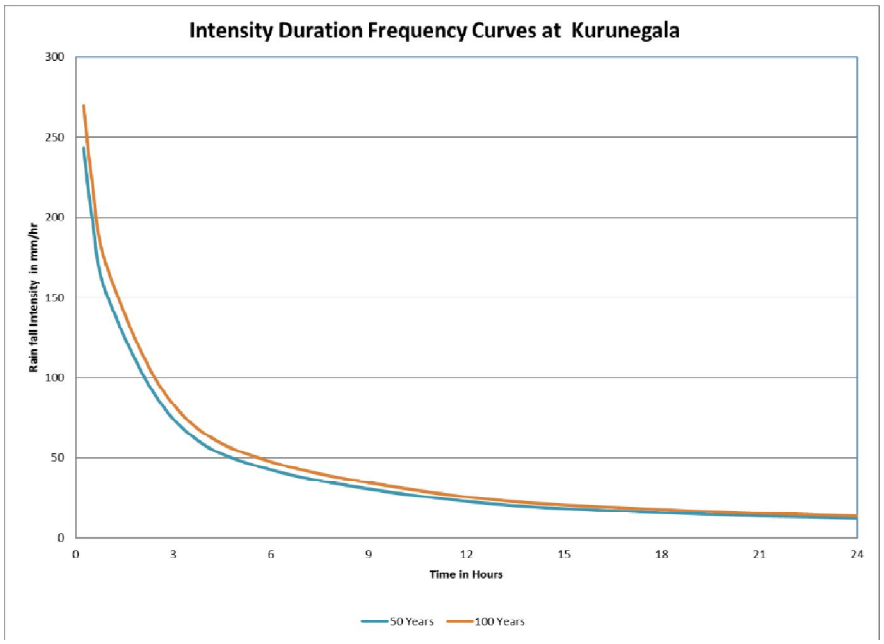

Figure 3-2– Updated IDF Curve for Kurunegala

3.2 Selected Recurrence Interval

The selected recurrence interval for the embankment, culverts, bridges and Viaducts is 100 years. A similar approach had been taken during the hydrological studies of Central Expressway project.

3.3 Design Rain Events for HEC RAS Models

Rainfall event that generates the design discharge at culverts and minor bridges is based on the 100-year rainfall intensity read from the relevant IDF curve at the time of concentration at that location. This event was applied during modelling. 100-year rainfall depth read from the relevant IDF curve was used to run the HEC HMS models for Rambukkan Oya and Kospothu Oya.

3.4 Run off Coefficients for Rational Method

Application of runoff coefficient was needed in computation of the peak discharge calculation for culverts outside the model area where one culvert or a group of consecutive culverts was taken as the outlet to a single isolated catchment to which the Rational Formula was applied.

Percentage of rainwater that comes into the streams and thus into the culverts and bridges depends on the characteristics and the condition of the soil. In areas with non-steep terrain, compacted subsoil, high water table, developed land, surface runoff is high as the infiltration is low. Rational method which is used to estimate the surface runoff, lumps the ground slope, land use, soil character and conditions into a single parameter;

Runoff Coefficient. Widely used typical values of runoff coefficients are given in
Table 3-1- Details of Runoff Coefficients. This table was used as a guidance and when the characteristics of the catchment are not evenly distributed over the whole area, it was divided into several sub catchments for which individual runoff coefficients given in the table below were applied.

Table 3-1- Details of Runoff Coefficients

Character of surface	Return Period (years) 2	5	10	25	50	100	500
Developed							
Asphaltic	0.73	0.77	0.81	0.86	0.90	0.95	1.00
Concrete/roof	0.75	0.80	0.83	0.88	0.92	0.97	1.00
Grass areas (lawns, parks, etc.)							
Poor condition (grass cover less than 50% of the area)							
Flat, 0–2%	0.32	0.34	0.37	0.40	0.44	0.47	0.58
Average, 2–7%	0.37	0.40	0.43	0.46	0.49	0.53	0.61
Steep, over 7%	0.40	0.43	0.45	0.49	0.52	0.55	0.62
Fair condition (grass cover on 50% to 75% of the area)							
Flat, 0–2%	0.25	0.28	0.30	0.34	0.37	0.41	0.53
Average, 2–7%	0.33	0.36	0.38	0.42	0.45	0.49	0.58
Steep, over 7%	0.37	0.40	0.42	0.46	0.49	0.53	0.60
Good condition (grass cover larger than 75% of the area)							
Flat, 0–2%	0.21	0.23	0.25	0.29	0.32	0.36	0.49
Average, 2–7%	0.29	0.32	0.35	0.39	0.42	0.46	0.56
Steep, over 7%	0.34	0.37	0.40	0.44	0.47	0.51	0.58
Undeveloped							
Cultivated Land							
Flat, 0–2%	0.31	0.34	0.36	0.40	0.43	0.47	0.57
Average, 2–7%	0.35	0.38	0.41	0.44	0.48	0.51	0.60
Steep, over 7%	0.39	0.42	0.44	0.48	0.51	0.54	0.61
Pasture/Range							
Flat, 0–2%	0.25	0.28	0.30	0.34	0.37	0.41	0.53
Average, 2–7%	0.33	0.36	0.38	0.42	0.45	0.49	0.58
Steep, over 7%	0.37	0.40	0.42	0.46	0.49	0.53	0.60
Forest/Woodlands							
Flat, 0–2%	0.22	0.25	0.28	0.31	0.35	0.39	0.48
Average, 2–7%	0.31	0.34	0.36	0.40	0.43	0.47	0.56
Steep, over 7%	0.35	0.39	0.41	0.45	0.48	0.52	0.58

(Source: Chow, Maidment and Mays., Applied Hydrology, Mc-Graw-Hill International Editions, 1988)

4 METHODOLOGY OF THE HYDROLOGICAL STUDY

4.1 General

Estimation of flood levels and discharges were carried out using the most appropriate method for the particular locations. Selection of the most appropriate method was based on the site reconnaissance, flood area categorisation, identification of major and minor streams and availability of data. HEC RAS and HEC HMS modelling and Rational methods were used as follows.

(a) Flood Modelling using HEC RAS for Rambukkan Oya (15+960) and Kospothu Oya (25+840km).

(b) Flood peak computation using Rational Formula and adequacy checking of structure dimensions using Manning Formula for all small catchments

4.2 Site Reconnaissance and consultations with relevant agencies

Site visits were conducted to decide the method used for flood level and flow estimations, to assess the drainage issues at site, to record anecdotal flood evidences, to check the validity of simulated flood levels and to verify the adequacy and suitability of the proposed structures. Many site visits exclusively for the above purposes were conducted during the period January 2016 to February 2016. Flood marks of highest flood depth locations were recorded with their observed flood height from the existing ground level and GPS coordinates. Flood heights in the middle of flood plains obtained through hearsay evidence were sometimes unreliable. Flood boundary points (e.g. on a road or a high ground) which occur sometimes outside the ROW of the proposed expressway was also recorded and used to reasonably identify the high flood contour as such flood boundaries are reliably indelible in the minds of inhabitants.

4.3 Flood Area Classification

4.3.1 General

Proposed road trace in Section 3 entirely runs through highland and relatively low-lying areas mainly paddy fields, abandoned paddy fields, marshes and wetlands which are vulnerable to floods. Flood plains of Kospothu Oya and its tributaries dominate the relatively low-lying areas in this stretch. Categorisation of streams are done according to their discharge capacities. Streams and creeks where the discharge is few cubic meters requiring only a culvert are classified as minor streams and the streams and rivers with higher discharges are categorised as major streams where bridges or via ducts are proposed.

4.3.2 Major Streams

There are some streams and streamlets which cross the proposed expressway and most of the low lying areas are paddy areas which serve as flood plains. Major streams that drain across the expressway trace are given in Table 4.1.

Table 4-1- Major streams that drain across the expressway trace

Chainage km+m (Approximate)	Stream Name	Remarks
15+960,17+920	Rambukkan Oya	There are multiple crossings
25+820,27+840,31+320	Kospothu Oya	

4.3.3 Minor Streams

There are many streams, creeks and irrigation canals identified using 1: 50,000 /1: 10,000, topographic maps, topographic surveys satellite images and GPS information collected during site reconnaissance. Culverts are proposed at all those locations so that the storm water will cross the expressway with no disruption. However, there can be few additional locations where additional culverts may be necessary which can be identified only when a detailed topographic survey is done. Refer the culvert location maps given in the Executive Summary for details.

4.4 Hydrological and Hydraulic Design of Structures in Critical Areas

4.4.1 Flood Modelling Using HEC RAS/HEC HMS

For Rambukkan Oya (15+960) and Kospothu Oya (25+840km) HE RAS/HEC HMS flood modeling was carried out to test the adequacy (height, width and available Free Board) of the provided via ducts.

For these segments flood models were run using HEC RAS Model using 100-year rain event as the input in the respective HEC HMS models. The model generated water levels were calibrated with the flood levels obtained during site visits and cross section surveys, information collected during the surveys and information collected during site visits.

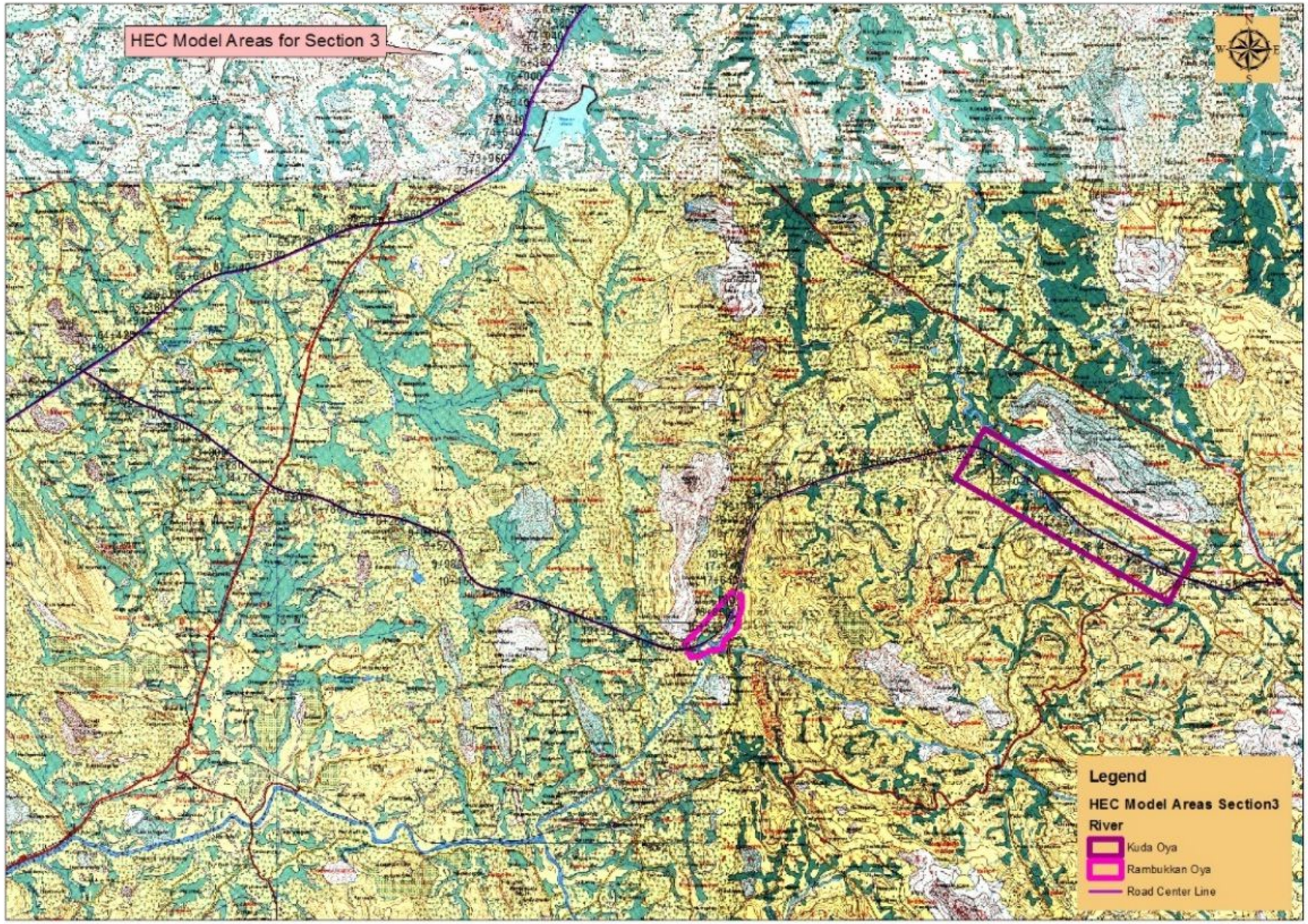

Figure 4-1- Expressway Stretches of Section1 Subjected to Different Types of Modelling

4.5 Hydrological and Hydraulic Design of Cross Drainage Structures for Minor Catchments

4.5.1 General

The hydrological design consists of several steps which lead to final adequacy checking of the particular hydraulic structure. Rainfall intensity with 100-year return period were extracted from the Intensity Duration Frequency (IDF) curves. Most critical duration for the rainfall intensity is taken as the Time of Concentration at the particular location. Rational method was then used to estimate the peak flow for known catchment area and runoff coefficient. Opening sizes were determined using the Manning's equation in open channel flow (That is a flow with a free surface).

4.5.2 Selection of Runoff Coefficients

The runoff coefficients were selected from the standard table given in Chow, Maidment and Mays, Applied Hydrology, Mc-Graw-Hill International Editions (1988). That table is reproduced as Table 3-1. Run off coefficient varies with the land use and ground slope. Land-use and ground slope information were obtained from 1:50,000 and 1: 10,000 maps. Refer the Annex 3 for details of run-off coefficients and relevant details.

4.5.3 Computation of Time of concentration (T_c) for Bridges and Cross Culverts

Estimation of time of concentration (T_c) for bridges and cross culverts was done using the method proposed in Ponrajah A.J.P. (1984); Design of Irrigation Headworks for Small Catchments, Irrigation Department, Sri Lanka. This is a very well established local standard.

$$T_c = \frac{L}{60V} + t_0$$

Where
L = Length of the longest watercourse (m)
V = Velocity of flow (m/sec)
t_o= Overland flow time (up to about 15 minutes depending on the terrain)

Velocity of flow is estimated using the Table 4-2 adapted by Ponrajah A.J.P. (1984).

Table 4-2- Velocity of flow vs. slope (Source; Ponrajah A.J.P., 1984)

Average Gradient %	Average Velocity m/s
0-1	0.45
1-2	0.60
2-4	0.90
4-6	1.2
> 6	1.5

4.5.4 Establishing a Suitable Recurrence Interval (Return Period)

For all major and minor drainage structure 100-year recurrence interval was used.

4.5.5 Computation of Peak flow

Once all the parameters have been realistically established, the peak flow Q could be estimated by using the Rational Formula.

$Q = CIA/360$

Where Q = Peak flow (m^3/s)
C = Runoff coefficient (dimensionless)
I = Rainfall intensity corresponding to a storm duration equal to time of concentration (mm/hr)
A = Total catchment area (Ha)

This peak flow was taken as the design discharge.

4.5.6 Hydraulic Design of Cross Drainage Structures

General
Once the peak flows were estimated, the culvert conveyance capacities were determined through a hydraulic design. Manning's formula and continuity equation was used for various trial sections to obtain the optimum slope and the section of the culvert. The dimensions were practically fixed to suit the site conditions.
The formulas are given as follows:

Continuity equation: $Q' = AV$

Where A = Cross sectional area of flow m^2
Q' = Actual Discharge (m^3/s)
V = Velocity of Flow (m/s)

Manning's Equation: $V = \frac{1}{n} R^{2/3} S^{1/2}$

Where R = Hydraulic Mean Depth (m)
V = Flow velocity (m/s)
S = Channel slope
n = Manning's Coefficient (n = 0.02)
$R = \frac{A}{P}$ Where A = Cross sectional area of flow (m^2)
P = Wetted perimeter (m)

Culvert opening designs were performed by selecting trial sections assuming a free board of 10% of the water depth and calculating the actual discharge Q' and comparing it with the peak flow Q obtained in the hydrologic design. For a satisfactory performance of the culvert $Q' > Q$. That is the culvert should have a capacity to carry a flow equal or more than the peak flow. Also the velocity of the flow should preferably be less than 2.0 m/s to avoid scouring at approach and lead-away channels. For Manning's n, 0.02 was used throughout

all the calculations, which represents a condition where the culvert bottom is covered with sediments and the two side walls are made of rough concrete.

5 RESULTS

5.1 General

Minimum required sizes of hydraulic structures were computed using Rational and Manning formulas for minor bridges and culverts. Adequacy of the via duct width and height was determined by HEC HMS and HEC RAS models for Rambukkan Oya (15+960km) and Kospothu Oya (25+840km) as detailed in the following sections.

5.2 Sizes of Hydraulic Structures

Sizes and other details of the hydraulic structures are given in Table A of the report.

5.3 Results for Rambukkan Oya (15+960 km)

5.3.1 Flood Levels in Chainage Ranges

Summarized hundred-year (100Yr) flood levels for major flooding sections of Rambukkan Oya are given in Table 5.1 below.

Table 5-1 : Rambukkan Oya 100 Year Flood Levels and Soffit Levels of Via Ducts

HEC RAS Station No.	Historical Highest Flood Level (Obtained from Survey)(m MSL)	Details of Via ducts	HEC Flood Level (m MSL)	Design Soffit Level (m MSL)	100 Year Peak Discharge from Flood Frequency Analysis (m3/s)	Peak Discharge from Model (m3/s)
10.0	82.8	**	86.0	**	920	654.3
20.0	83.5	**	86.8	**	**	**
30.0	84.3	**	88.3	**	**	**
40.0	86.2	**	88.6	**	**	**
46.8	**	Via duct 1 - Start 15+710	89.0	95.4	**	**
50.0	86.2	**	89.1	**	**	**
60.0	86.2	**	89.4	**	**	**
61.6	**	Via duct 1 - End 15+980	89.4	90.5	**	**
70.0	86.4	**	89.6	**	**	**
130.0	86.7	**	82.0	**	370	131.2
139.4	**	Via duct 2 - Start 16+580	89.6	95.3	**	**
140.0	87.6	**	89.6	**	**	**
142.1	**	Via duct 2 - End 16+640	89.6	95.7	**	**
146.0	**	Via duct 3 - Start 16+920	89.6	97.1	**	**
150.0	90.8	**	90.6	**	**	**
152.6	**	Via duct 3 - End 17+190	92.0	97.3	**	**
157.3	**	Via duct 4 - Start 17+400	92.8	95.5	**	**
160.0	92.0	**	93.1	**	**	**
164.0	**	Via duct 4 - End 17+980	93.5	100.272	**	**
170.0	95.4	**	94.7		**	**
176.0	**	Via duct 5 - End 18+550	96.5	103.6	**	**
180.0	96.8	**	97.5	**	**	**
200.0	98.3	**	98.7	**	**	**
210.0	99.5	Via duct 6 - Start 19+050	99.7	106.7	**	**
220.0	101.3	**	103.3	**	**	**
222.0	**	Via duct 6 - End 19+260	103.5	111.2	**	**
235.0	**	Via duct 7 - Start 19+720	106.2	116.35	**	**
240.0	106.7		107.8	**	**	**
241.4	**	Via duct 7 - End 19+870	108.0	115.886	**	**
248.0	**	via duct 8 - Start 20+125	109.1	117.2	**	**
249.5	**	Via duct 8 - End 20+175	109.3	118.3	**	**
250.0	109.8	**	110.2	**	**	**
260.0	110.7	**	113.0	**	**	**

5.3.2 Results of HEC HMS/HE RAS Models

The details of HEC RAS and HEC HMS models are given in the following sub sections. The model sub areas of Section 3 is given in Figure 5-1 below.

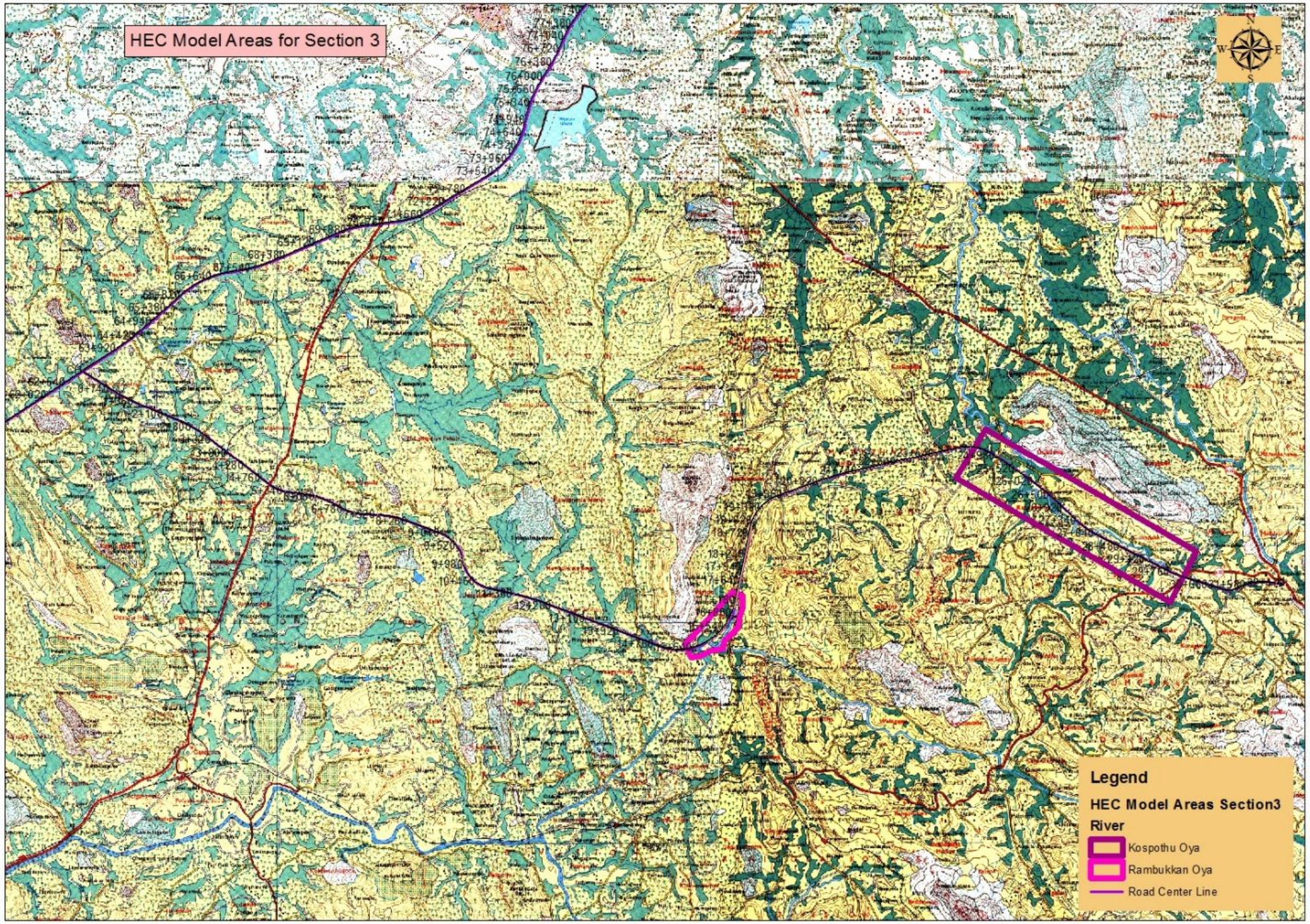

Figure 5-1Model Areas for Section 3

5.3.3 Model Results for Rambukkan Oya (15+960km)

5.3.3.1 Layout of Rambukkan Oya Used for Modeling

The layout map showing the area of Rambukkan Oya river system which was used in the HEC RAS model is given in Figure 5-2. below.

Figure 5-2 Layout Map for Rambukkan Oya with the Expressway Via Ducts

5.3.4 Calculation of Time of Concentration

To derive a design rainfall event for Rambukkan Oya catchment system Time of Concentration T_c was computed using three independent formulas and the average of the T_c obtained from the three formulas were used as the Time of Concentration. The method adopted and the calculation is given below and the results are given in Table 5-2.

Table 5-2 Details of time of Concentration Calculation

Sream	L				S=H/L	Tc(hrs)			
	L(miles)	L(ft)	L(m)	H(m)		Case - 1	Case - 2	Case - 3	Average
Rambukkan Oya	38.34	202451	61707	700	0.01134	10.193	8.88639	8.89662	9.33
						Tc(min)			
						611.58	533.183	533.797	559.52

5.3.5 Formulas Used to Compute Time of Concentration

Case-1 :- Kirpich Formula

$$T_c = 0.00025 \left(\frac{L}{\sqrt{S}} \right)^{0.8}$$

where,

T_c = Time of concentration in hrs

L = Length of the catchment along the longest river channel in m

S = Overall catchment slope

Case-2 :- Kirkpatric Formula

$$T_c = \frac{0.00013\, L^{0.77}}{S^{0.385}}$$

where,

T_c = Time of concentration in hrs

L = Length of the catchment along the longest river channel in ft

S = Overall catchment slope

Case-3 :- Formula from 'Design of Small Dams'

$$T_c = \left(\frac{11.9 L^3}{H} \right)^{0.385}$$

where,

T_c = Time of concentration in hrs

L = Length of the catchment along the longest river channel in miles

H = Elevation difference in ft

Using the duration of the design rain was set is such a manner that it exceeds the time of concentration. Standard “Balanced Storm Method “using the Rainfall Intensity Duration Frequency curve. The Design Storm is given in Figure 5-3 below.

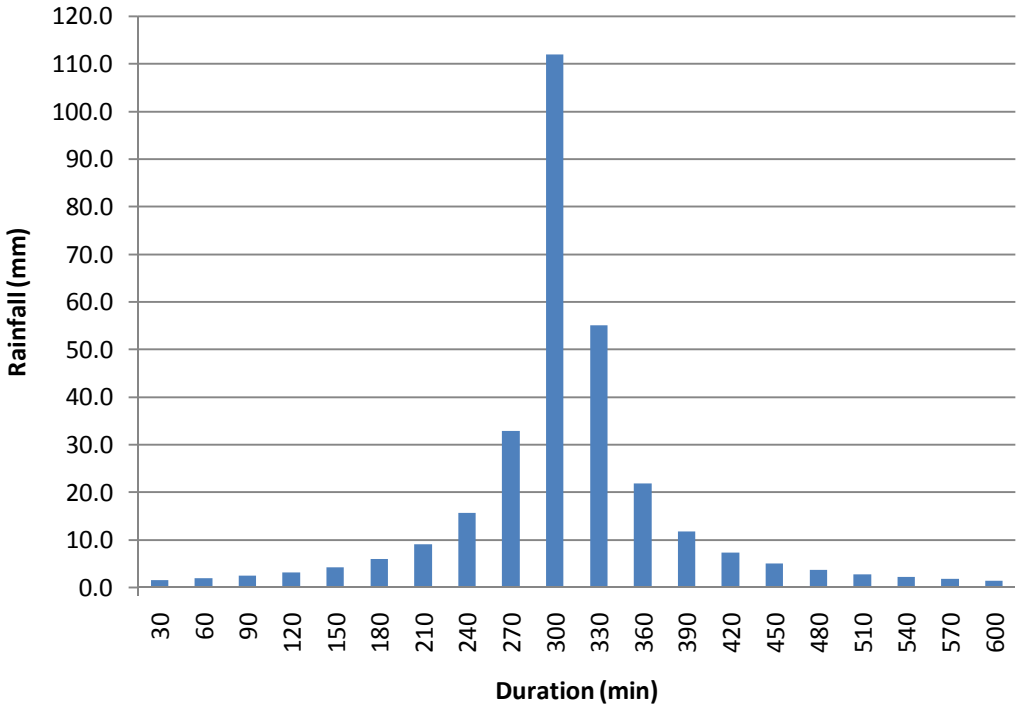

Figure 5-3 Design Storm for Rambukkan Oya Catchment

The design storm obtained above was used in HEC HMS model to determine the outflow hydrographs of sub catchments of Rambukkan Oya sub catchment system. The outflow hydrographs from various sub catchments were used as hydrologic boundaries to the HEC RAS model through the DSS file input. Approximate model calibration was carried out using the flood frequency analysis for Deduru Oya at Ridibendi Elle using historical data. This analysis is given in the Hydrological Study Report by SMEC Consultants [Ref 1].

100 year flood dischage computed for Kospothu Oya at Alawala Anicut = 488m^3/s
Catchment area for Alawala Anicut = 103km^2
Hence the specific yield at Alawala Anicut = 4.74m^3/s /km^2

The runoff curve number for HEC HMS model was adjusted until this specific yied is gained in the sub catchments of the HEC HMS Model taking into the fact that the basin for Kospothu Oya lies closer to that of Rambukkan Oya.

HEC HMS Model setups with the relevant sub catchments are given in Figure 5-4 below. A sample outflow hydrograph for a sub catchment in HEC HMS Model is given in Figure 5-5 below.

HEC RAS Model set up with cross section locations and the Central Expressway Section 3 trace is given in Figure 5-6 below.

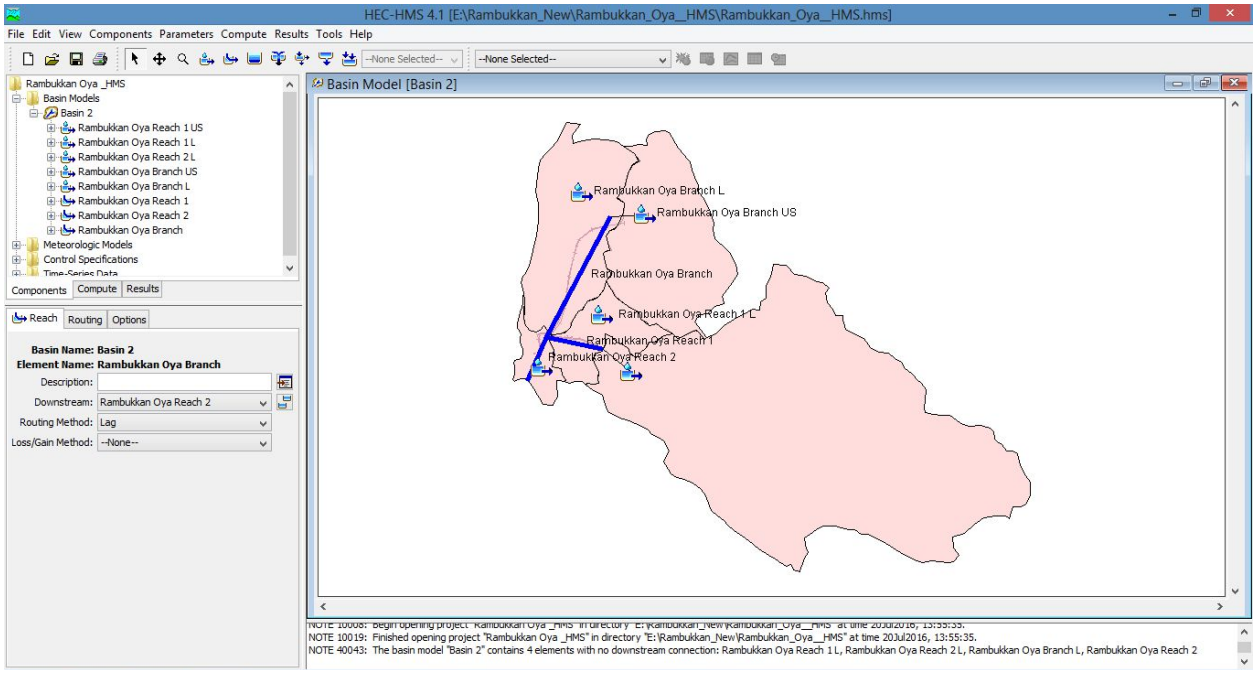

Figure 5-4 HEC HMS Model Setup with Catchments

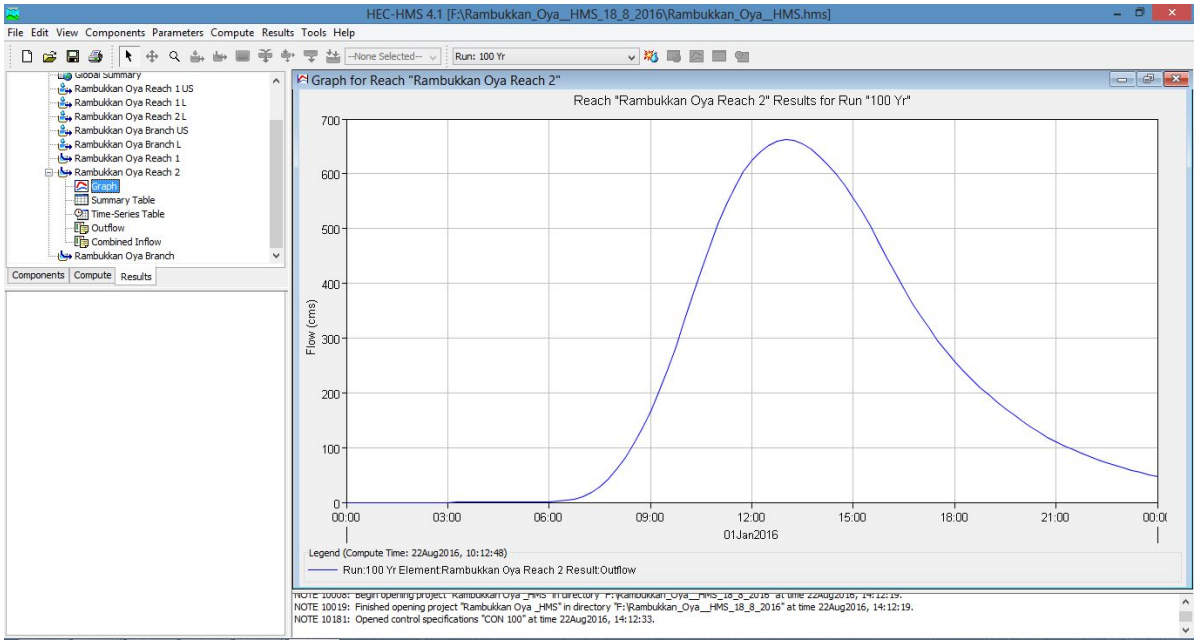

Figure 5-5 Outflow Hydrograph for a typical sub catchment

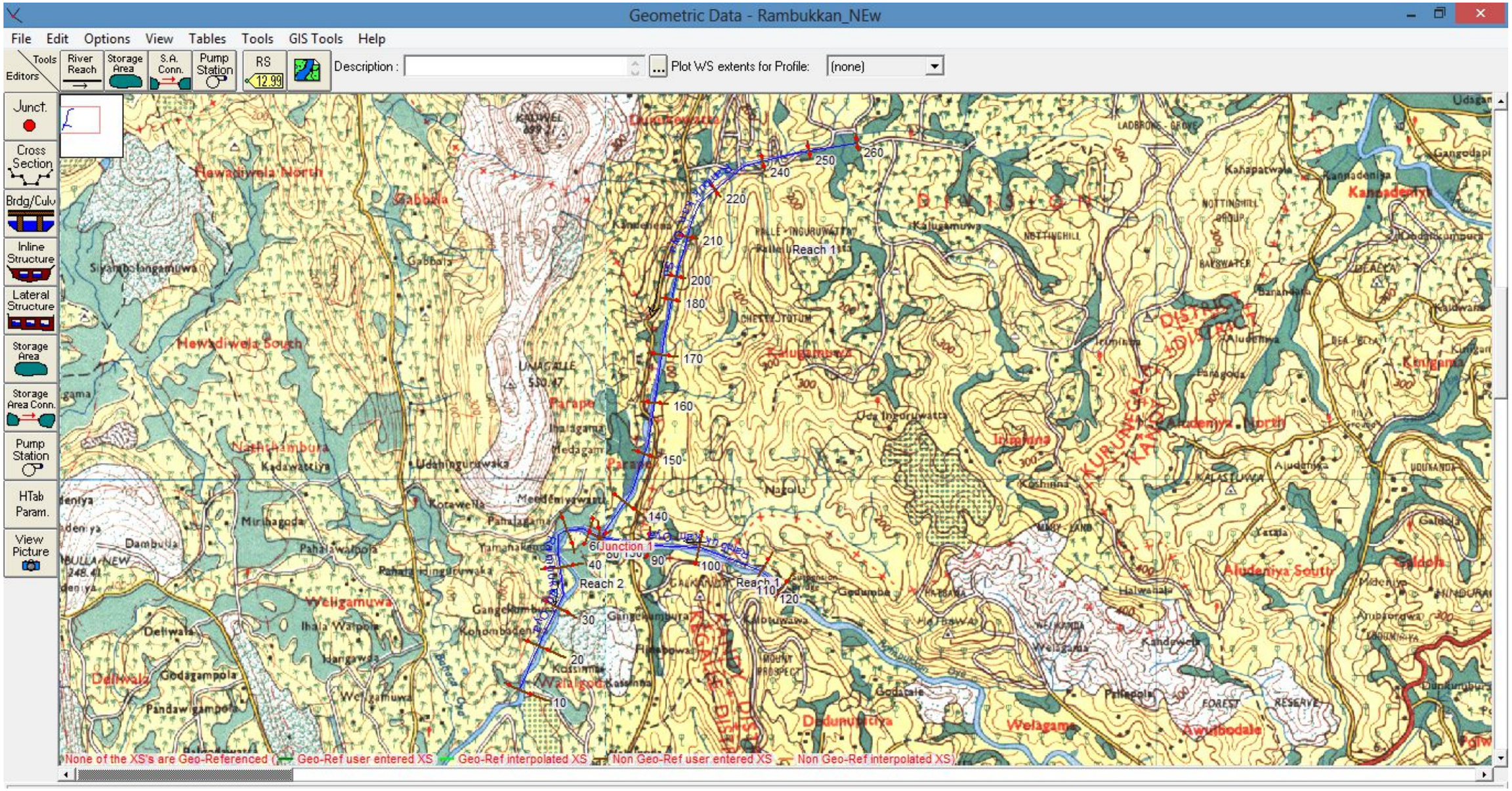

Figure 5-6 HEC RAS Model Set up with Cross Sections and Background Features

5.4 Water Level Profile for Rambukkan Oya for 100 Year Flood

After running the HEC RAS model using the calibrated HEC HMS model based on the specific yield of Kospothu Oya water level profiles pertaining to 100-year flood was obtained and the results are presented in Figure 5-7 below. The design soffit levels of the proposed via ducts are also presented in the same figure.

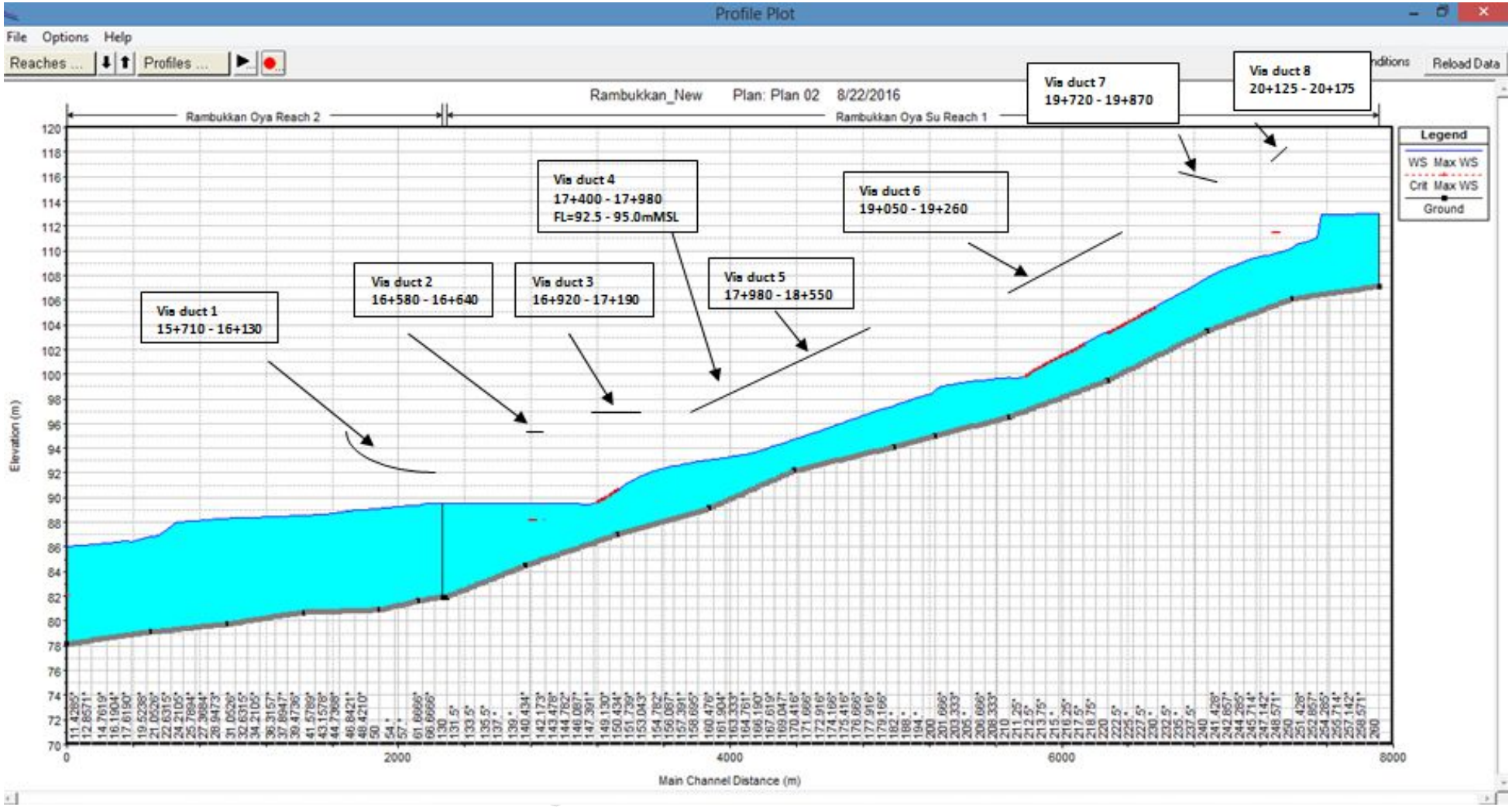

Figure 5-7 Water Level Profiles and Via Duct Soffit Levels

5.5 Results for Kospothu Oya (25+840km)

5.5.1 Layout of Kospothu Oya Used for Modelling

The layout map showing the area of Kospothu Oya river system which was used in the HEC RAS model is given in Figure 5-8 below.

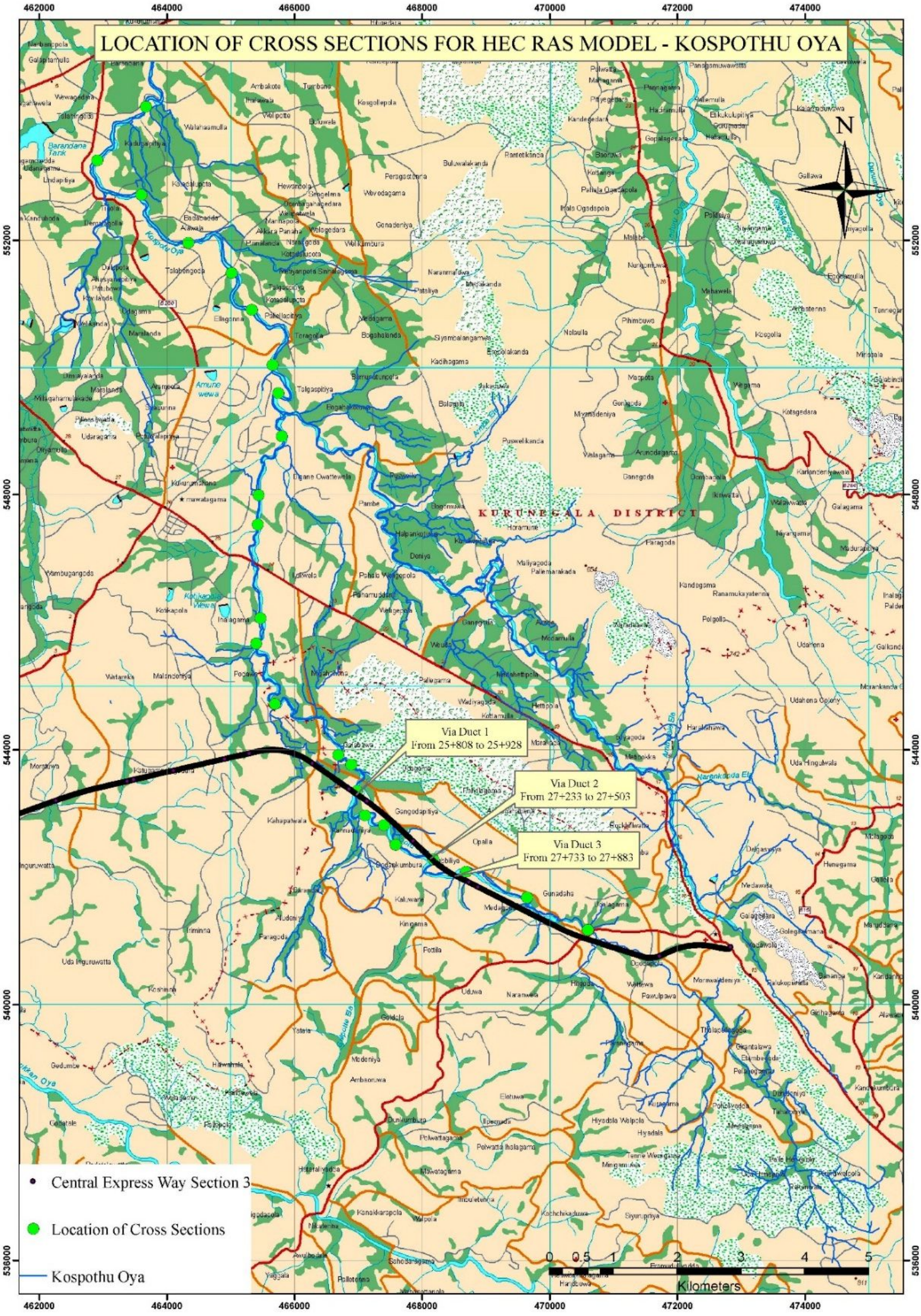

Figure 5-8 Kospothu Oya River System Used in HEC RAS Model

5.5.2 Calculation of Time of Concentration

The method applied under Rambukkan Oya catchment system was adopted for Kospothu Oya and the results of the calculation are given in Table 5-3 below.

Table 5-3 Calculation of Time of Concentration

Stream	L			H		S=H/L	T_c (hrs)			
	in mile	in m	in ft	in m	in ft		Case-1	Case-2	Case-3	Average
Kospothu Oya	20.460	32921	108009	670	2198.16	0.03000000	4.179	3.767	4.380	4.1
							T_c (min)			
							150.4	135.6	157.7	147.9

5.5.3 Model Schematization for HEC HMS Model

The model schematization for the HEC HMS model is given in Figure 5-9 below.

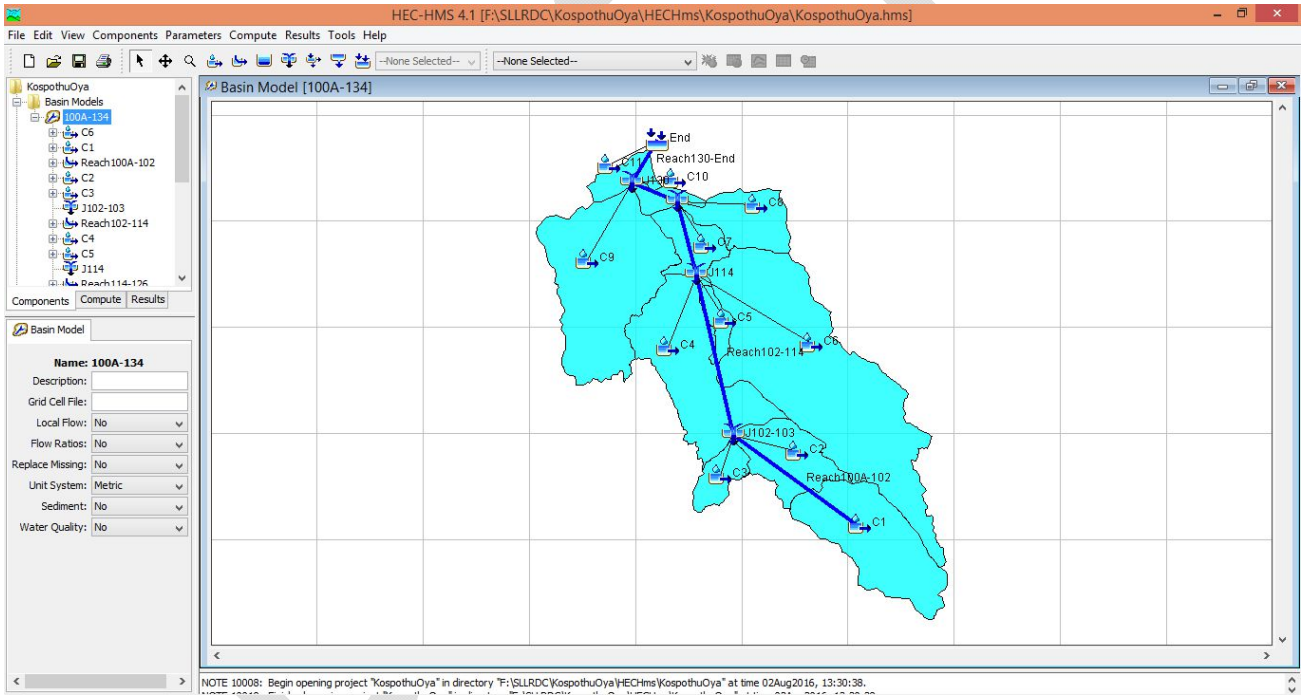

Figure 5-9 HEC HMS Model Schematization

5.5.4 Peak Flows for Typical Catchments

Peak flows for sub catchments were obtained using HEC HMS Model and results are given in Figure 5-10 below.

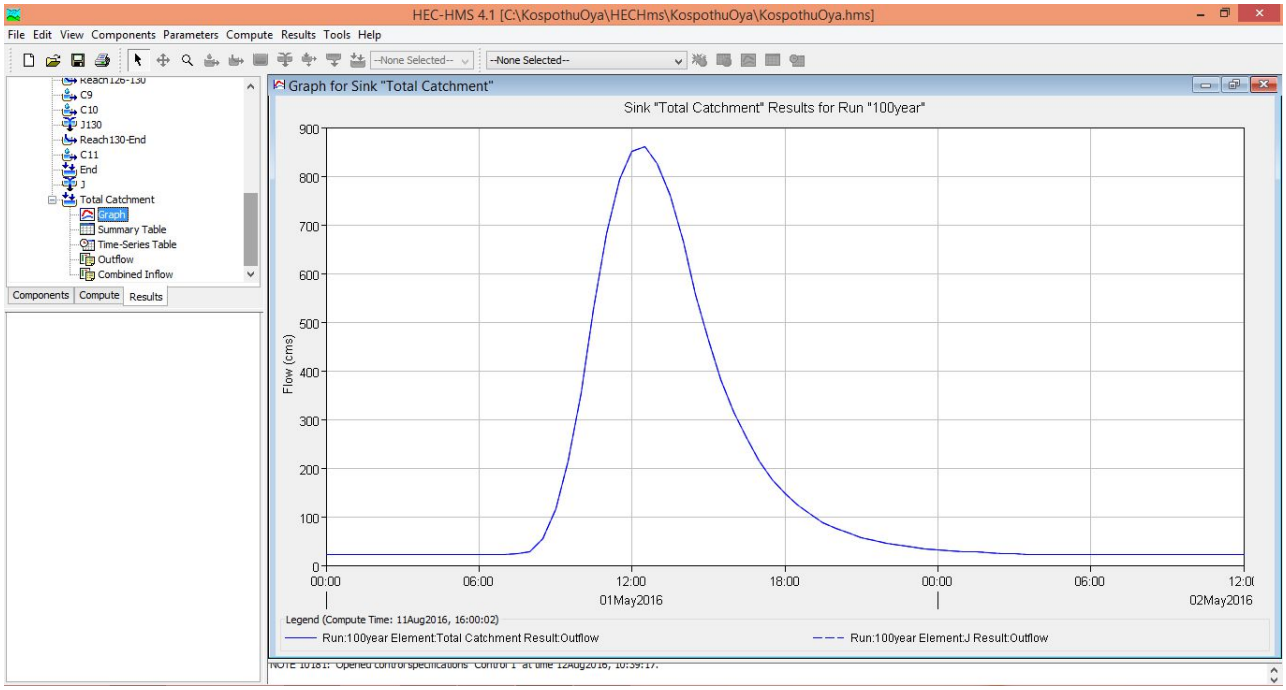

Figure 5-10 Peak Flows for a Typical Catchment

5.5.5 Model Schematization for HEC RAS Model

Model schematization for the HEC RAS model is presented in Figure 5-11 below.

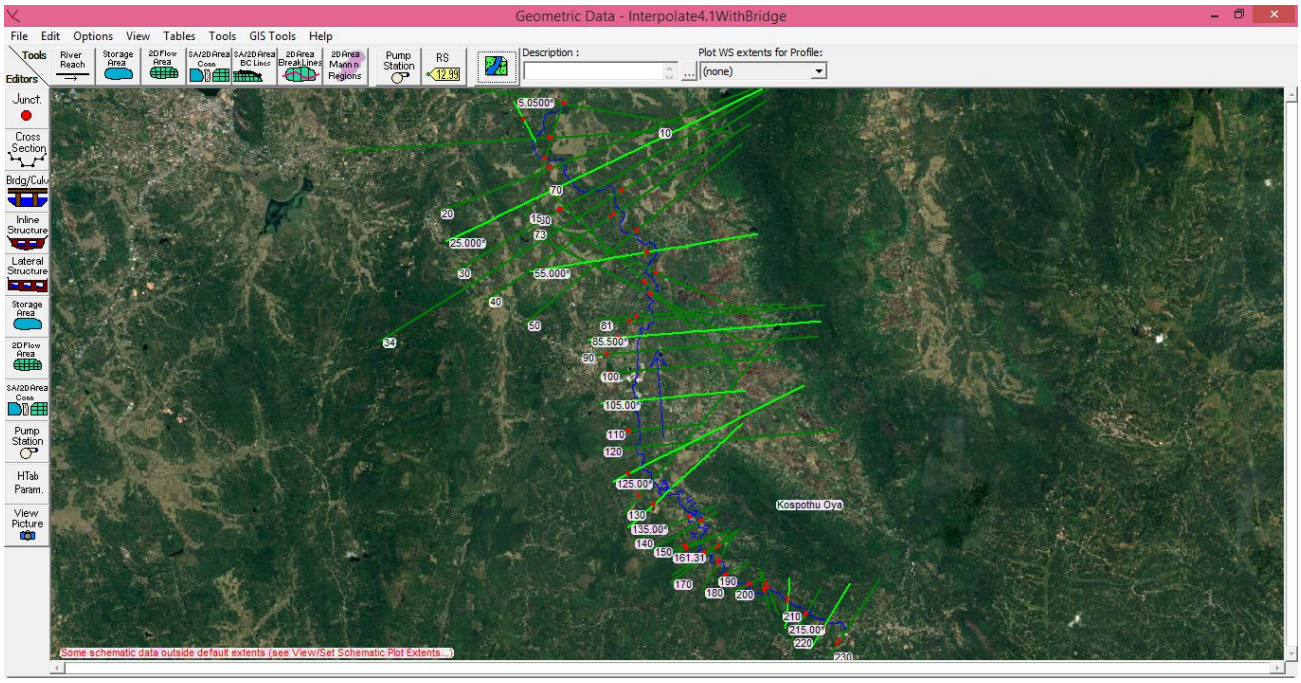

Figure 5-11-HEC RAS Model Schematization

5.5.6 Water Level Profile and Design Soffit Levels of Proposed Via Ducts

The resulting water level profile for 100-year flood is given in Figure 5-12 below along with the designed soffit level of via ducts. Details of via duct soffit levels along with other information are also shown in Table 5-4 below.

Table 5-4 Kospothu Oya 100 Year Flood Levels and Soffit Levels of Via Ducts

HEC RAS Station No.	Historical Highest Flood Level (Obtained from Survey)(m MSL)	Details of Via Ducts	HEC Flood Level	Design Soffit Level	100 Year Peak Discharge from Flood Frequency Analysis (m3/s)	Peak Discharge from Model (m3/s)
230	236.7	**	**	**	**	**
220	229.2	**	**	**	**	**
210	222.88	**	**	**	**	**
**	**	Via Duct 3 - End 27+883	219.35	231.5	**	**
208	**	Via Duct 3 - Start 27+733	219.35	225.8	**	**
**	**	Via Duct2- end 27+516	206	219.4	**	**
200	206.5	**	**	**	**	**
198	**	Via Duct2-Start 27+246	202.88	213.8	**	**
190	186.3	**	**	**	**	**
180	185.46	**	**	**	**	**
170	182.38	Bridge 370 D/S	**	**	**	**
**	**	Via Duct1 End	183.46	189.5	**	**
161.13	**	Via Duct 1 Start	183.46	188.7	**	**
160	180.63	Bridge 50m U/S	**	**	**	**
150	179.56	**	**	**	**	**
140	177.94	**	**	**	**	**
130	160.92	**	**	**	**	**
120	157.2	**	**	**	**	**
110	153.21	**	**	**	**	**
100	145.56	**	**	**	**	**
90	142.9	**	**	**	**	**
80	139.21	**	**	**	**	**
70	137.71	**	**	**	**	**
60	135.06	**	**	**	**	**
50	134.11	**	**	**	**	**
40	132.65	**	**	**	**	**
30	128.95	Alawala Anicut	**	**	488	549.7
20	126.44	**	**	**	**	**
10	123.88	**	**	**	**	**
0	121.75	**	**	**	**	**

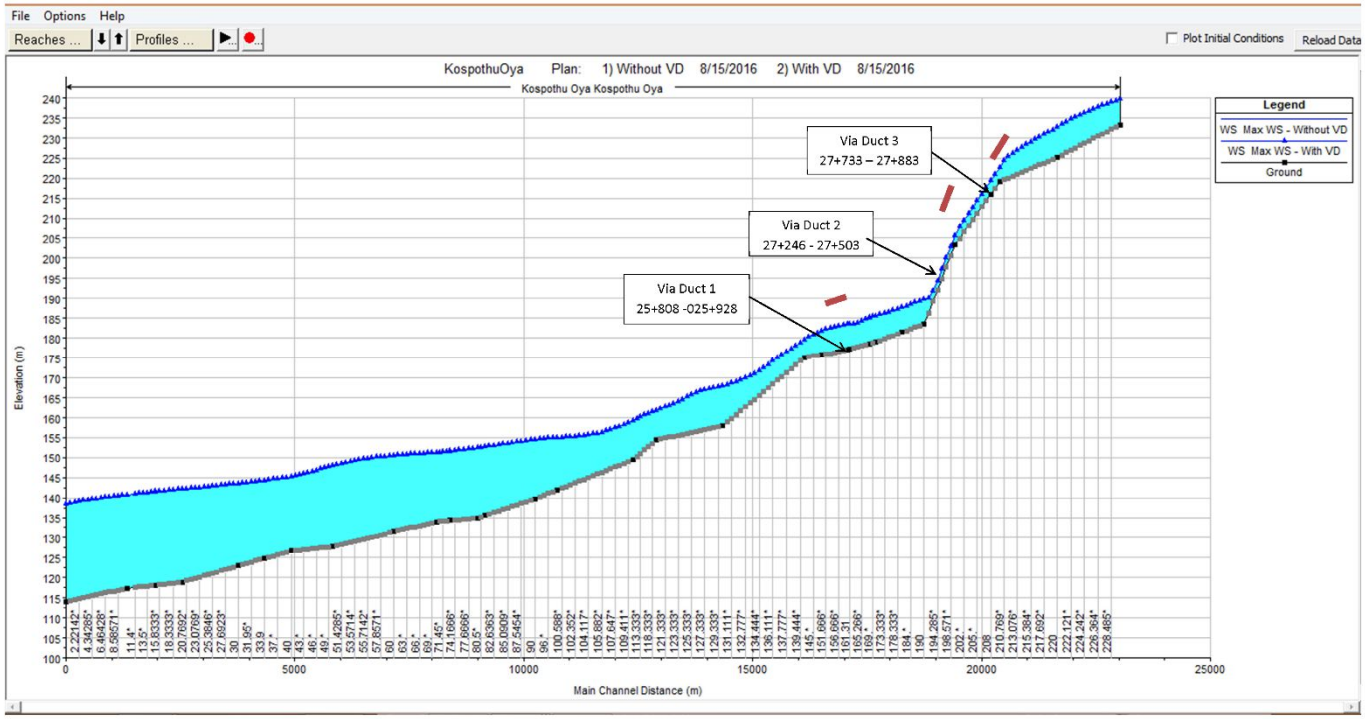

Figure 5-12-Water Level Profile of HEC RAS Model for Kospothu Oya

6 CONCLUSIONS & RECOMMENDATIONS

6.1 Conclusions

(1) It was possible to minimize the impact of backwater inducement by floods by readjusting the positions and widths of culverts. The status qua about floods will mostly remain unchanged.

(2) The via ducts provided by RDA to Rambukkan Oya and Kospothu Oya are adequate in height and width. These via duct will not cause any significant backwater during 100-year flood events.

(3) Approximately 4.8 km long via ducts and 11 number of bridges and 110 number of box culverts should be provided to minimize the backwater created by the expressway. Some of the openings will serve triple purposes i.e. drainage, irrigation and access.

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6.2 Recommendations

(1) Adjustment of structure invert levels to suit actual existing stream bed levels should be done during the construction stage.

(2) Fine adjustments to structure locations shall be done during the construction stage.

(3) Determination of the culvert invert levels is very important after correct determination of the stream bed level. Stream LS should be surveyed to -200m to +200m along the stream including silt and scour condition

(4) The RDA and Contractor should liaise with SLLRDC, Irrigation Department, Department of Agrarian Development (Farmer organizations), Provincial Irrigation Engineer before implementation of the hydraulic structure construction. Joint site visits will be very useful, time saving so that future issues be avoided.

(5) If there are A or B class roads which underpasses the expressway and if these roads are earmarked for rehabilitation (i.e. for finished level raising because of flooding etc.) those details should be considered before fixing the road finished level in order to avoid Free Board or Head Clearance related issues.

7 REFERENCES

(1) SMEC Australia-Colombo Kandy Expressway Feasibility Study- Preliminary Design Report -Stage 3. Volume 3- Hydrology and Drainage- April 2014
(2) Hydrology Report A006 Road 31+900km-36+300km (Kurunegala Town) - MAGA Pvt. Ltd.- July 2015
(3) Hydrology Report – Kandy Jaffna (A009) Road – 1+650km to 3+900km (Kandy Town) - MAGA Pvt. Ltd.- July 2015
(4) Road Development Authority, Sri Lanka, Environmental Impact Assessment Report Southern Highway, (2006)
(5) Road Development Authority, Sri Lanka, Bridge Design Manual
(6) Ponrajah A.J.P. (1984); Design of Irrigation Headworks for Small Catchments, Irrigation Department, Sri Lanka
(7) Chow, Maidment and Mays., Applied Hydrology, Mc-Graw-Hill International Editions (1988)
(8) Ranatunge, D.G.L. (2001); Towards More Efficient Hydraulic and Hydrological Design of Cross Drainage Structures Using New Developed Intensity Duration Frequency Equations, Journal of the Institution of Engineers, Sri Lanka - 2001.

Annex 1. Terms of Reference

Terms of Reference for Detailed Hydrology Study of Central Expressway

1. Background

The Government of Democratic Socialist Republic of Sri Lanka has decided to construct the Central Expressway form Kadawatha on the Outer Circular Highway (OCH) as in the previously proposed Colombo-Kandy Alternate Highway (CKAH). The newly proposed expressway is a combination of previously proposed two expressway traces. i.e. Segment from Kadawatha to Gampaha remains unchanged as in the CKAH trace and the trace will follow the former Northern Expressway trace beyond Gampaha. New trace is named as the Central Expressway and consists of following segments.

1. Kadawatha- Kossinna (4.4 km)
2. Kossinna-Mirigama (32.5km)
3. Mirigama-Kurunegala (39.72 km) & Ambepussa Link Road (9.3 km)
4. Pothuhera-Galagedara (32.5 km)
5. Kurunegala-Ridigama (12.5 km)
6. Ridigama-Melsiripura (18.9 km)
7. Melsiripura-Galewela (16.2 km)
8. Galewela-Dambulla (12.7 km)

Sri Lanka Land Reclamation and Development Corporation (SLLRDC) has done a hydraulically study for section from Kadawatha to Gampaha under Colombo-Kandy Alternative (CKAH) Project in 2001. Preliminary hydrological studies for the Central Expressway beyond Gampaha have been undertaken by SLLRDC and reports are available in the Road Development Authority (RDA).

2. Objectives of Consultancy

The Consultant shall study the topography and identify the locations where the expressway pass through natural rivers/streams, water paths, marshes, storage pools etc. by studying the rainfall/ geography/runoff characteristics and the effect of constructing an embankment as the first update of expressway platform with bridges/culverts provided for river/stream crossings while identifying the openings required for each with respect to flood heights for relevant storm of defined return periods as specified for different structures depending on their importance.

It is to be noted that the underside of the structure shall have sufficient freeboard as defined below depending on the discharge through the structure. After this the Consultant shall consider other implications of providing the embankment with above openings such as upstream flooding due to the prevention of over ground flow (sheet flow) and allowing

higher discharge through natural channels hitherto not imposed on them which could lead to bottom and bank erosion and high speeds effecting society at large.
The Consultant shall modify their original considerations based on above analysis if necessary and finally provide the openings required for cross drainage with existing/new openings required to prevent runoff/flood related social problems, due solely to construction of the expressway, at its finished condition and while during construction.
The consultant shall undertake the hydrological study of Central Expressway for following Sections.

a) Kadawatha-Mirigama (37km)

b) Mirigama-Kurunegala (41km) and Ambepussa Link (9km)

c) Pothuhera-Galagedara (33 km)

d) Kurunegala-Dambulla (60km)

3. Scope of the Consultancy Services

i. Conduct and complete the consultancy as per the agreed TOR and scope of the consultancy.
ii. Collect data as needed for the study from concerned institutions. The consultants shall acquire real time data.
iii. Conduct field visits for required data collection or to verify model results.
iv. Carry out detailed hydrological studies and study the hydraulics of watercourses at the proposed bridge and culvert sites. The requirements for cross drainage of the central expressway and local roads (including bridges) shall be determined as follows or using any other approved method:

a) Major catchments (greater than 30 sq.km.),
   - Soil conservation Service (SCS) Unit Hydrograph Method developed by the US Corps of Engineers and, where applicable , frequency analysis of flood flows;

b) Minor catchments (greater than 15 sq. km and less than 30 sq. km.),
   - The modified Rational Method;

c) Minor catchments (less than 15 sq. km)
   - The Rational Method.

The cross drainage structures shall be designed to withstand floods or return periods and freeboard as follows:

Description	Return Period (Years)	Freeboard (m)	
		Discharge>300 cu. m/s	Discharge<300 cu. m/s
Major Roads			
a) Bridges	100	0.9	0.6
b) Major culverts (>2 m diameter or equivalent)	50	0.3	0
c) culverts (<2 m diameter or equivalent)	25	0.3	0
d) Side Drains	5	0	0
Minor (Local) Roads			
a) Bridges	25	0.9	0.6
b) Culverts	10	0.3	0
c) Side Drains	5	0	0

v. Hydrological analysis shall be carried out using the appropriate computer software. The work to be undertaken shall include, but not to be confined to;

a) Collect, review and analyze relevant data

Primarily, intensity –duration analysis shall be carried out using data from the relevant rain gauge stations of the Department of Meteorology. When such data are not available following approach may be adopted for the absence of better method, the annual maximum daily rainfall data for ten stations in close proximity to the Project Area shall be converted to maximum 24-hourly rainfalls, and these data shall be subjected to extreme value analysis to derive the annual maximum 24-hourly peak hydrograph for the required return periods. The peak hydrograph for shorter periods may be computed by empirical methods applicable. The results derived shall be compared to forecast obtained from actual data in similar regions.

b) Collect, review and analyze stream flow data

Stream flow data available for gauging stations operated by the Irrigation Department shall be collected. These data shall be reviewed and shall be subjected to value analysis to produce flows and levels for 10- and 100- year flood hydrographs. The synthetic 10- year flood hydrograph for this catchment shall be developed using the peak rainfall obtained as above and the relevant catchment characteristics. The two estimates of the 10-year flood shall be compared and adjustments shall be made to the parameters of the synthetically generated flood hydrograph. The adjusted method shall then be applied to

the major catchments for which no hydrological data are available and respective flood hydrographs shall be derived.

c) Estimate design flood discharges for smaller catchments

The Modified Rational Formula and Rational Formula shall be used to estimate the design flood flows for minor catchments. These computations shall be based on the rainfall intensities obtained above with an assessment of catchment characteristics. Provide inundation zones and flood levels.

d) Hydraulic design of structures

The requirement of waterway opening sizes for the proposed bridges and sizes of cross drainage culverts shall be determined using the Manning Formula or any other applicable formulae. The roughness of the upstream and downstream channels shall be estimated and compared with the derived values from known locations. The slopes and channel cross sections may be obtained from topographic surveys. The backwater effects (if any) for upstream of proposed river structures shall be determined.

vi) Provide comprehensive review of flood forecasting undertaken by SLLRDC for section from Kadawatha to Gampaha under Colombo-Kandy Alternative (CKAH) Project in 2001 and update using recent hydrological data.

vii) Review and update the preliminary hydrological studies completed for the Central Expressway beyond Gampaha by SLLRDC.

viii) Study and assess sediment load and scouring depths of major rivers.

4. Data, Services and facilities for the Services

The following amenities will be provided by the Client:

a. Office space, for the consultant, to access data and reports, Topo sheets, reports and preliminary design, maps, historic and current data on hydrometeorology, hydrology and hydraulics; rainfall and flood forecast reports will be provided only if available in the RDA.

b. Assistance by other Government agencies for data collection.

The Department of Meteorology of Sri Lanka provides historical daily rainfall Data at various stations Island wide.

Department of Irrigation operates island wide hydro-meteorological observation network for:

i) Management of hydro-meteorological database and information system to meet the present and future requirements of the country.
ii) Flood mapping including collection of required data and information related to major floods.
iii) River gauging.

Hydrometric Network of Sri Lanka

There are 103 major river basins in Sri Lanka which cover the 90 % of total land extent of the country. The remaining 10% which is situated along the coast and Jaffna peninsula is covered by small watersheds which are not much important in hydrological aspect.

About 24 major rivers (out of 103) convey the 80% of total flows generated within the Island and hose are considered highly important in hydrological point of view. The present hydrometric network of Hydrology Division of the Department of Irrigation comprises of 33 permanent stations and 40 peripheral stations covering 19 river basins. Department uses manually operated instruments in all those stations except for few rain rainfall recorders and data loggers installed. Thirty-three permanent stations, record hourly water levels by the Department and most of those stations are equipped with manual rain gauges which record rainfalls at 3 hr. intervals.

Processed hydrological data (Daily average discharges (m3 / sec), Monthly stream flow in MCM , Single Flood Event (WL & Q), Annual maximum / minimum values and River water levels) may be obtained from the Department of Irrigation.

River Cross-sectional Survey

River cross-section data will be provided if available in the RDA.

5. Reporting Requirement

a) Inception Report

The consultant shall submit an inception report within one month assessing accuracy and quality of data, methods to be adopted in analyzing data, review of experience and methodology for the development of suitable models for the analysis. Identification of data inputs for the model, outputs expected, methodology for calibration and validation of model.

b) Interim design report in sections –after3 months and 5 months from start.

c) Draft final report, including all models, tools and acceptance testing.

d) Final report and models and tools after acceptance in hard copy and electronic form.

6. Schedule for Completion of Services

The activities described earlier and the outputs described below shall be completed within a period of seven months.

7. Qualification Requirement of the Consultant

a) Advanced academic degree in Hydrology, Hydraulic and / or Water Resources engineering.

b) At least 10 years working experience in flood modeling tools used for flood forecasting; shall have very good experience in rainfall- run-off modeling.

8. Payments

a) Advance Payment on award of consultancy services-10% of Total Contract Sum.

b) At the submission of Inception Report-10% of Total Contract Sum (end of 1st Month).

c) Interim Design Report 1-10% of Total Contract Sum (end of 3rd Month).

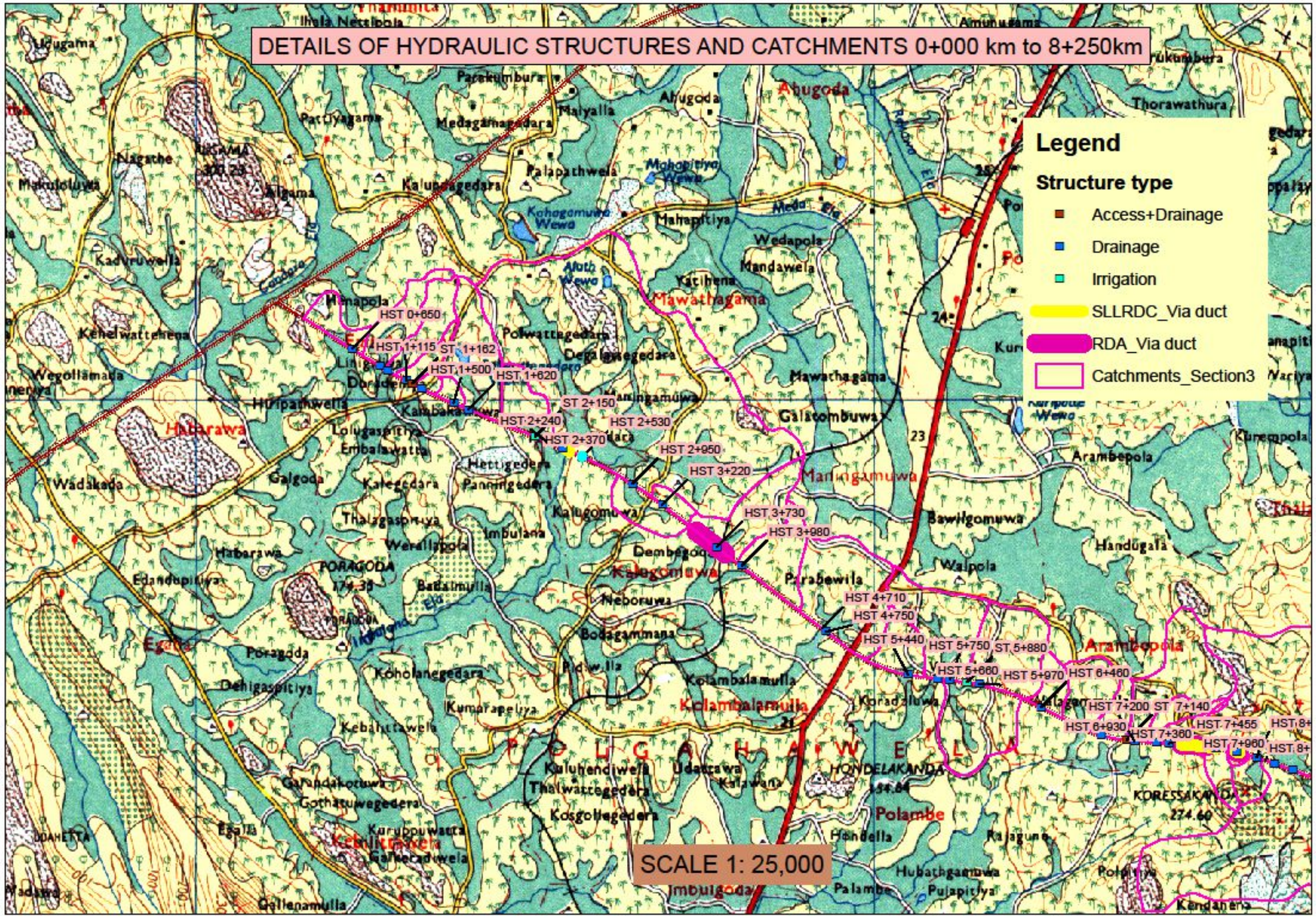
d) Interim Design Report 2-20% of Total Contract Sum (end of 5th Month).

e) Draft Final Report-25 % of Total Contract Sum (end of 6th Month).

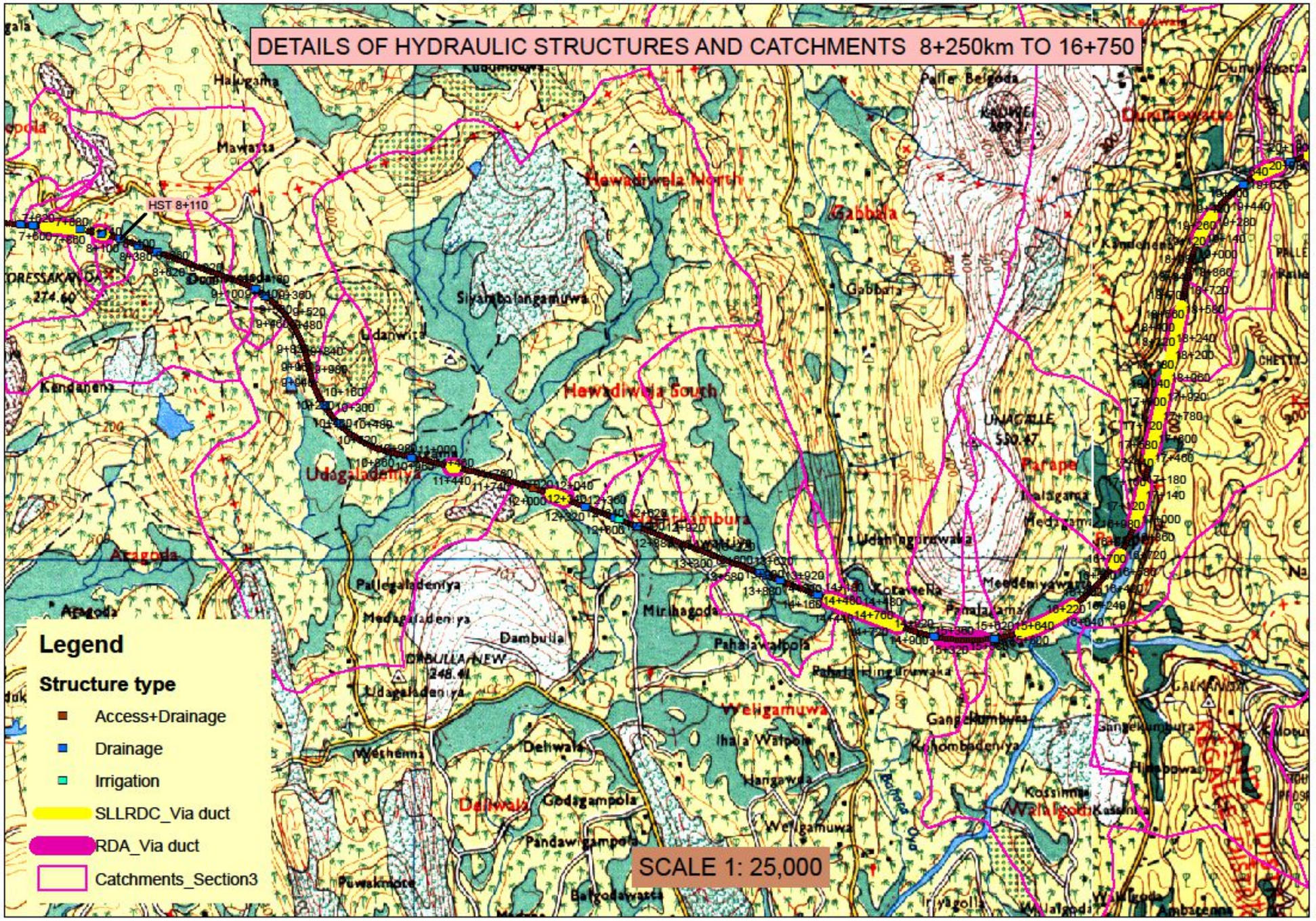
f) Final Report-25% of Total Contract Sum (end of 7th Month).

Advance Payment shall be paid against an unconditional on demand bank guarantee or any other security acceptable to the RDA.

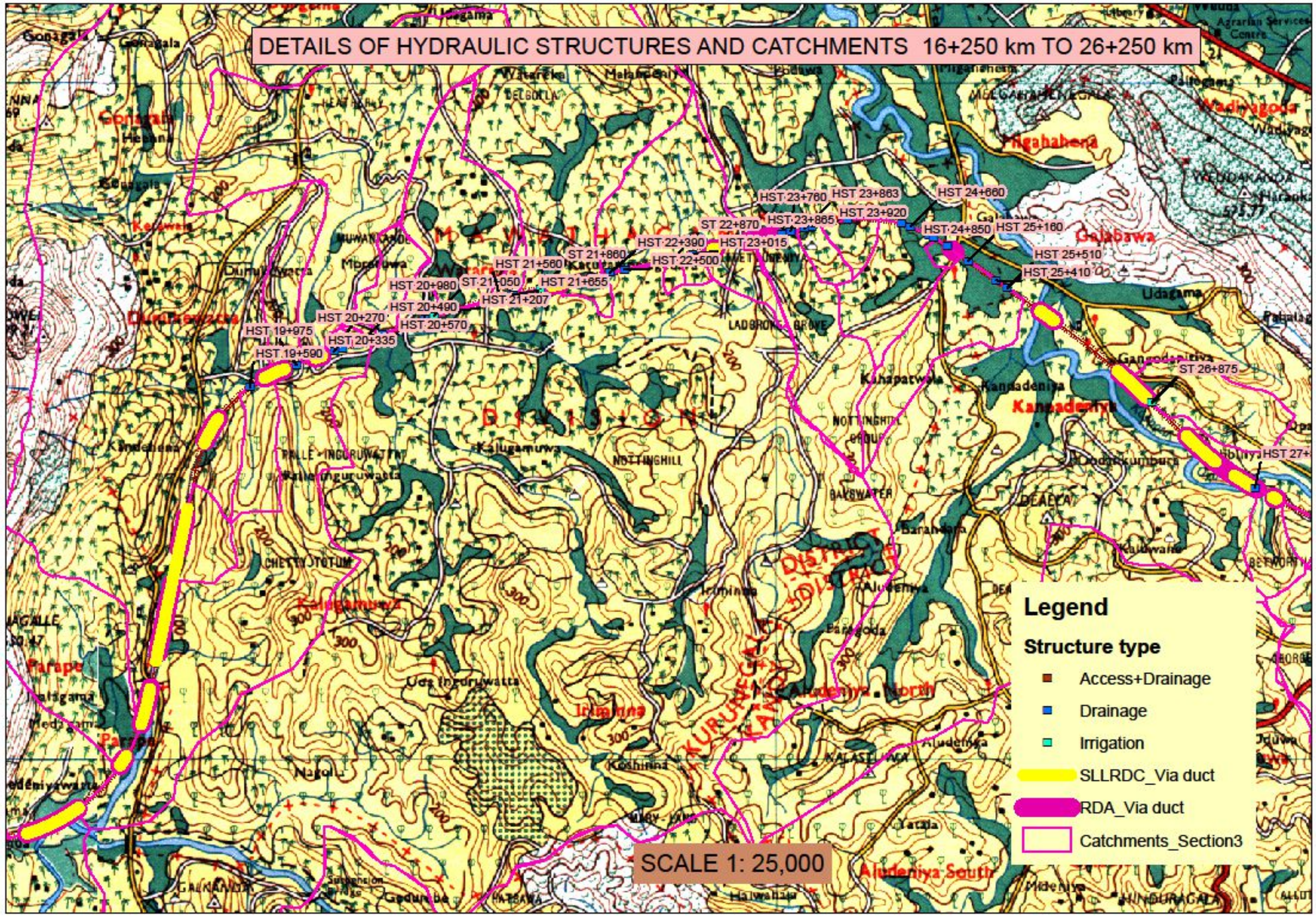
Annex 2- Layout Maps Showing Catchment Areas for Hydraulic Structures


DETAILS OF HYDRAULIC STRUCTURES AND CATCHMENTS 0+000 km to 8+250km
Legend
Structure type
Access+Drainage
Drainage
Irrigation
SLLRDC_Via duct
RDA_Via duct
Catchments_Section3
HST 0+650
HST 1+115
ST 1+162
HST 1+500
HST 1+620
ST 2+150
HST 2+240
HST 2+530
HST 2+370
HST 2+950
HST 3+220
HST 3+730
HST 3+980
HST 4+710
HST 4+750
HST 5+440
HST 5+750
ST 5+880
HST 5+660
HST 5+970
HST 6+460
HST 6+930
HST 7+200
ST 7+140
HST 7+360
HST 7+455
HST 7+960
SCALE 1: 25,000

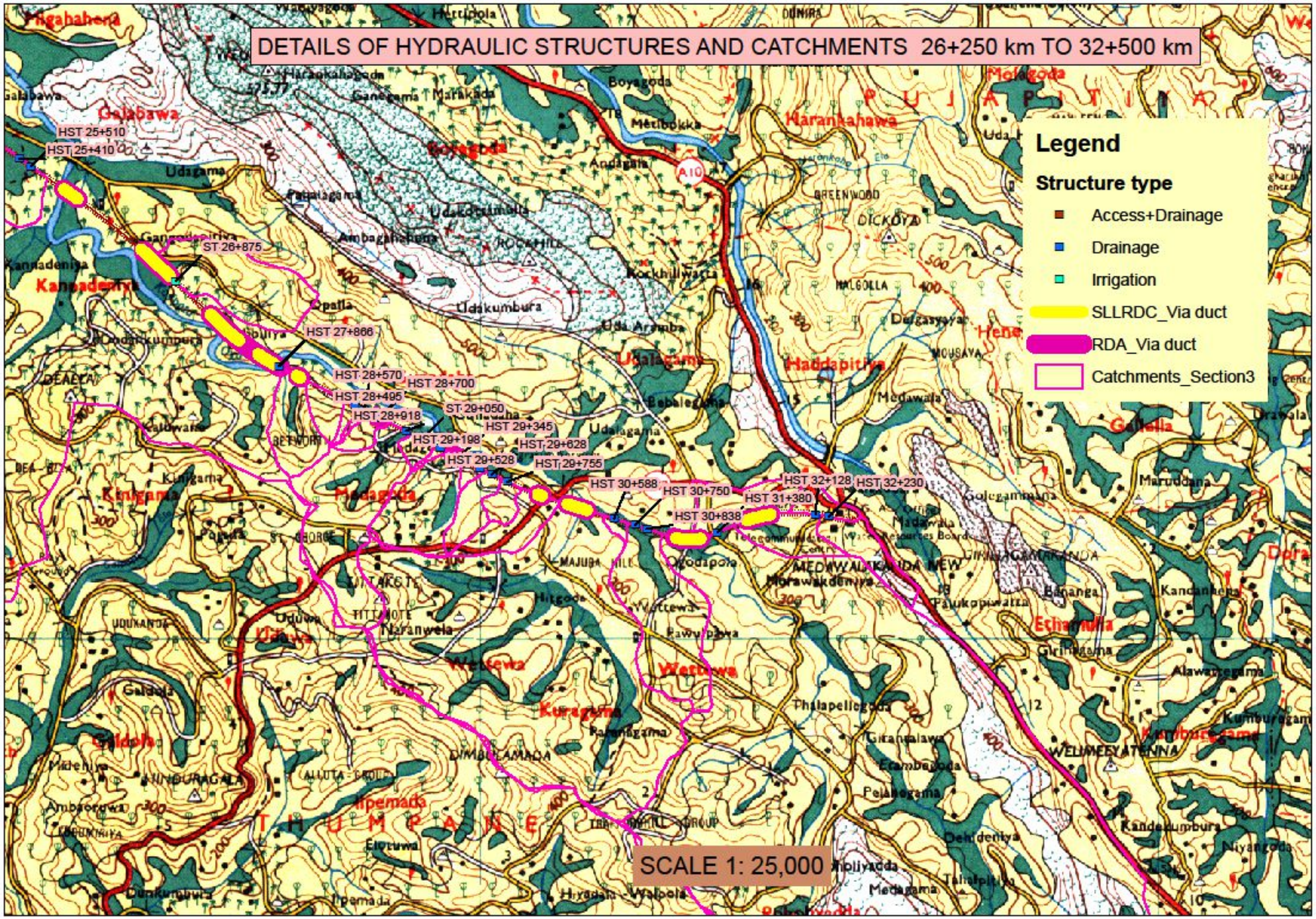
I


DETAILS OF HYDRAULIC STRUCTURES AND CATCHMENTS 8+250km TO 16+750
HST 8+110
Legend
Structure type
Access+Drainage
Drainage
Irrigation
SLLRDC_Via duct
RDA_Via duct
Catchments_Section3
SCALE 1: 25,000

J


DETAILS OF HYDRAULIC STRUCTURES AND CATCHMENTS 16+250 km TO 26+250 km
HST 23+760
HST 23+863
HST 24+660
HST 23+865
HST 23+920
ST 22+870
HST 24+850
HST 25+160
HST 22+390
HST 23+015
ST 21+860
HST 25+510
HST 22+500
HST 21+560
HST 25+410
HST 20+980
ST 21+050
HST 21+655
HST 20+490
HST 21+207
HST 20+270
HST 20+570
HST 19+975
HST 20+335
HST 19+590
ST 26+875
Legend
Structure type
Access+Drainage
Drainage
Irrigation
SLLRDC_Via duct
RDA_Via duct
Catchments_Section3
SCALE 1: 25,000

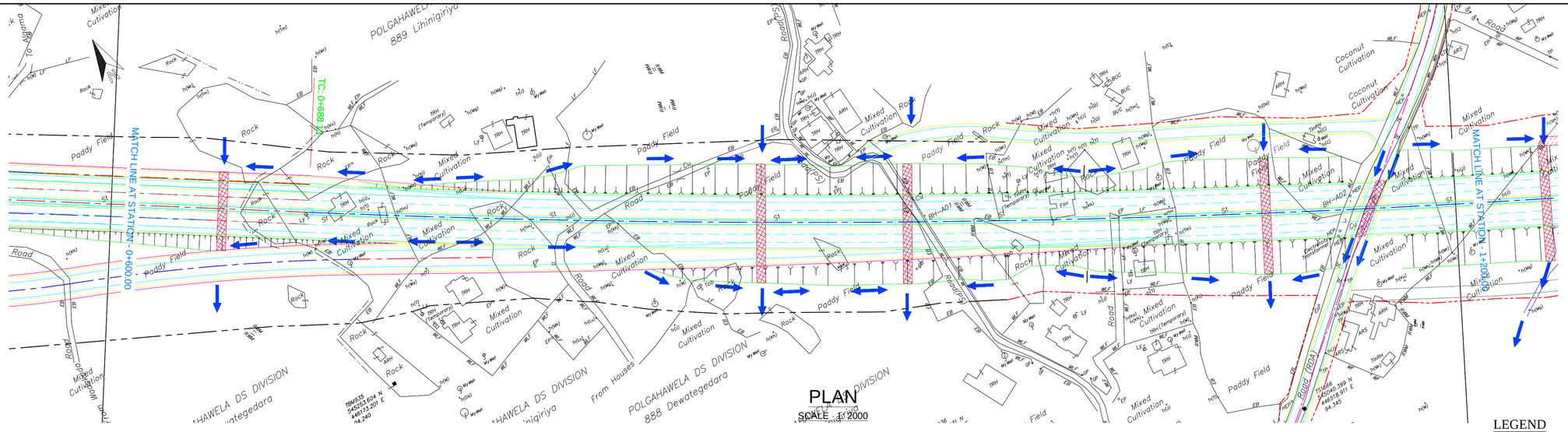
K


DETAILS OF HYDRAULIC STRUCTURES AND CATCHMENTS 26+250 km TO 32+500 km
Legend
Structure type
Access+Drainage
Drainage
Irrigation
SLLRDC_Via duct
RDA_Via duct
Catchments_Section3
HST 25+510
HST 25+410
ST 26+875
HST 27+866
HST 28+570
HST 28+700
HST 28+495
ST 29+050
HST 28+918
HST 29+345
HST 29+198
HST 29+628
HST 29+528
HST 29+755
HST 30+588
HST 30+750
HST 30+838
HST 31+380
HST 32+128
HST 32+230
SCALE 1: 25,000

L

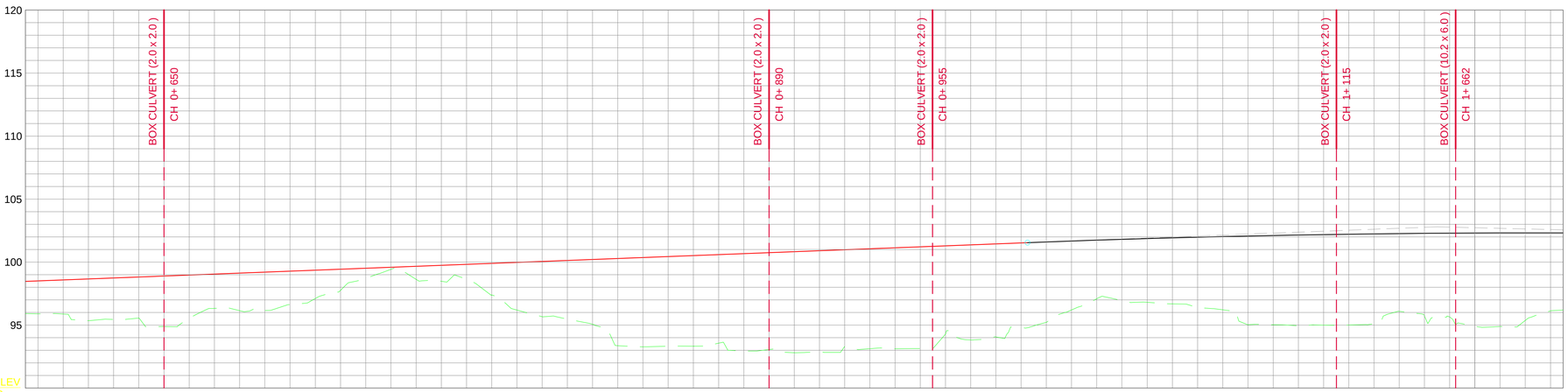
Annex 3- Summary of Calculations for opening sizes of Hydraulic Structure List

Annex 4- Table A - Hydraulic structure list with High Flood Levels



PLAN

SCALE - 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch0+600	98.504	95.991
Ch0+610	98.581	95.878
Ch0+620	98.659	95.348
Ch0+630	98.736	95.453
Ch0+640	98.813	95.560
Ch0+650	98.891	94.888
Ch0+660	98.968	95.543
Ch0+670	99.046	96.326
Ch0+680	99.123	96.140
Ch0+690	99.200	96.151
Ch0+700	99.278	96.624
Ch0+710	99.355	97.106
Ch0+720	99.433	97.752
Ch0+730	99.510	98.704
Ch0+740	99.587	99.421
Ch0+750	99.665	98.634
Ch0+760	99.742	98.476
Ch0+770	99.820	98.646
Ch0+780	99.897	97.388
Ch0+790	99.975	96.192
Ch0+800	100.052	95.669
Ch0+810	100.129	95.476
Ch0+820	100.207	95.064
Ch0+830	100.284	93.362
Ch0+840	100.362	93.271
Ch0+850	100.439	93.318
Ch0+860	100.516	93.327
Ch0+870	100.594	93.562
Ch0+880	100.671	92.941
Ch0+890	100.749	93.061
Ch0+900	100.826	92.803
Ch0+910	100.903	92.846
Ch0+920	100.981	93.293
Ch0+930	101.058	93.125
Ch0+940	101.136	93.123
Ch0+950	101.213	93.139
Ch0+960	101.290	94.280
Ch0+970	101.368	93.825
Ch0+980	101.445	94.061
Ch0+990	101.523	94.816
Ch1+000	101.599	95.218
Ch1+010	101.672	96.202
Ch1+020	101.740	97.089
Ch1+030	101.805	96.946
Ch1+040	101.866	96.810
Ch1+050	101.923	96.684
Ch1+060	101.976	96.394
Ch1+070	102.025	96.210
Ch1+080	102.071	95.026
Ch1+090	102.112	95.024
Ch1+100	102.150	94.943
Ch1+110	102.184	94.996
Ch1+120	102.214	95.007
Ch1+130	102.240	95.101
Ch1+140	102.262	96.095
Ch1+150	102.280	95.734
Ch1+160	102.294	95.650
Ch1+170	102.305	94.916
Ch1+180	102.311	94.891
Ch1+190	102.314	95.370
Ch1+200	102.313	96.125

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

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Consultant (Hydrology)

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SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

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Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH0+600.00 - CH1+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
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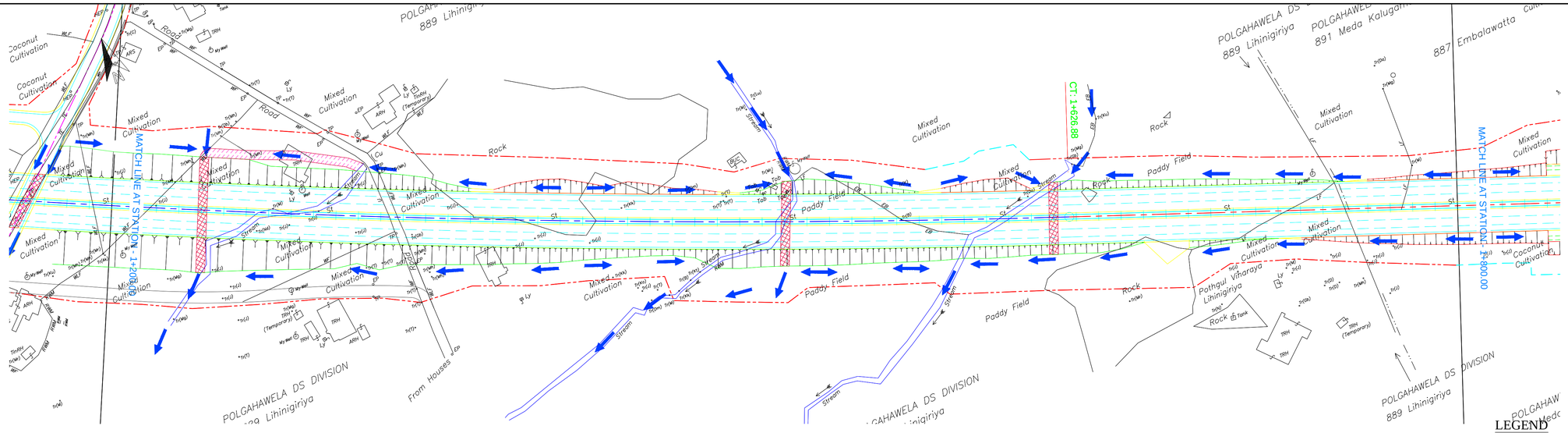
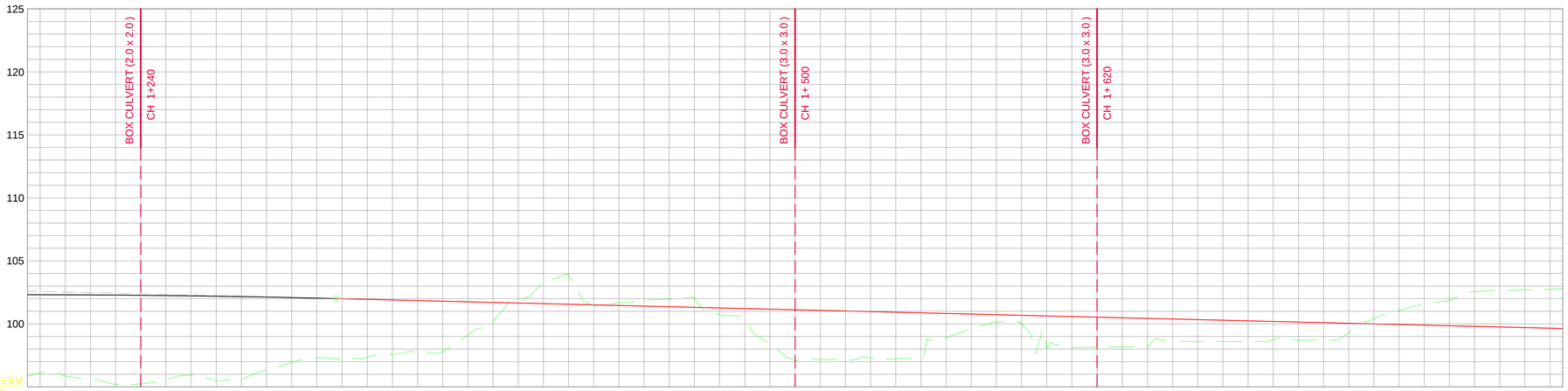


PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch1+200	102.313	96.125
Ch1+210	102.308	95.870
Ch1+220	102.299	95.561
Ch1+230	102.286	95.207
Ch1+240	102.269	95.243
Ch1+250	102.248	95.579
Ch1+260	102.224	95.937
Ch1+270	102.196	95.511
Ch1+280	102.163	95.642
Ch1+290	102.127	96.329
Ch1+300	102.087	96.931
Ch1+310	102.043	97.316
Ch1+320	101.996	97.210
Ch1+330	101.947	97.342
Ch1+340	101.898	97.539
Ch1+350	101.849	97.771
Ch1+360	101.801	97.798
Ch1+370	101.752	99.136
Ch1+380	101.703	100.179
Ch1+390	101.654	101.867
Ch1+400	101.606	103.315
Ch1+410	101.557	103.857
Ch1+420	101.508	101.472
Ch1+430	101.459	101.654
Ch1+440	101.411	101.870
Ch1+450	101.362	101.970
Ch1+460	101.313	102.028
Ch1+470	101.265	100.743
Ch1+480	101.216	100.132
Ch1+490	101.167	98.429
Ch1+500	101.118	97.094
Ch1+510	101.070	97.176
Ch1+520	101.021	97.129
Ch1+530	100.972	97.288
Ch1+540	100.923	97.232
Ch1+550	100.875	97.214
Ch1+560	100.826	98.914
Ch1+570	100.777	99.611
Ch1+580	100.728	100.142
Ch1+590	100.680	99.981
Ch1+600	100.631	98.077
Ch1+610	100.582	98.115
Ch1+620	100.533	98.157
Ch1+630	100.485	98.152
Ch1+640	100.436	98.151
Ch1+650	100.387	98.576
Ch1+660	100.338	98.577
Ch1+670	100.290	98.591
Ch1+680	100.241	98.607
Ch1+690	100.192	98.744
Ch1+700	100.143	98.703
Ch1+710	100.095	98.694
Ch1+720	100.046	99.265
Ch1+730	99.997	100.421
Ch1+740	99.948	101.054
Ch1+750	99.900	101.629
Ch1+760	99.851	101.829
Ch1+770	99.802	102.548
Ch1+780	99.753	102.604
Ch1+790	99.705	102.697
Ch1+800	99.656	102.744

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

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Reference Drawing No :	Scale :	Date :	Sheet No:
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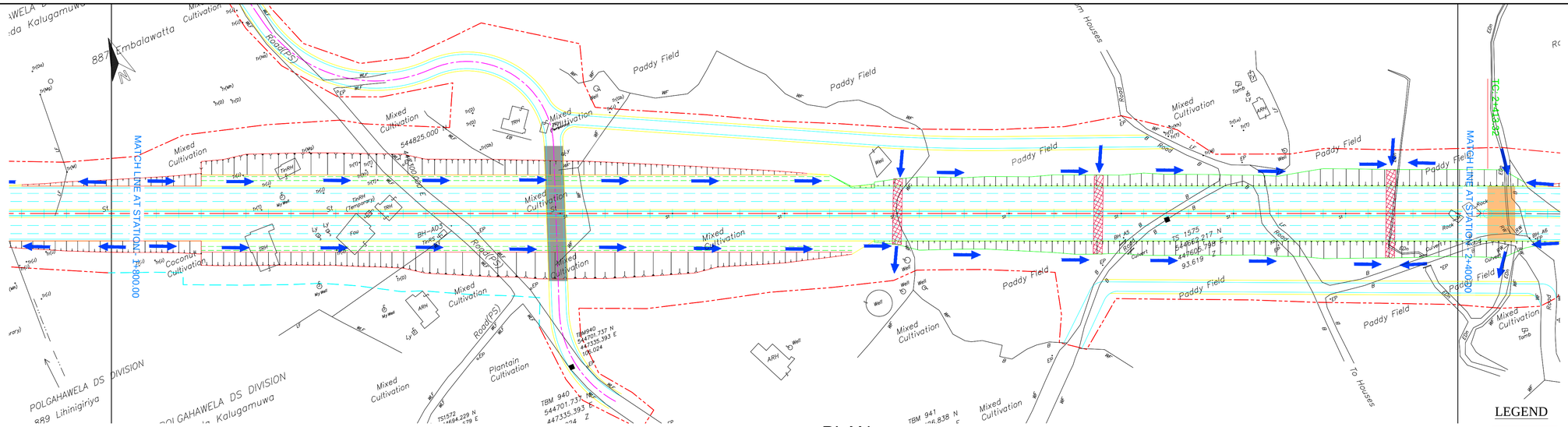
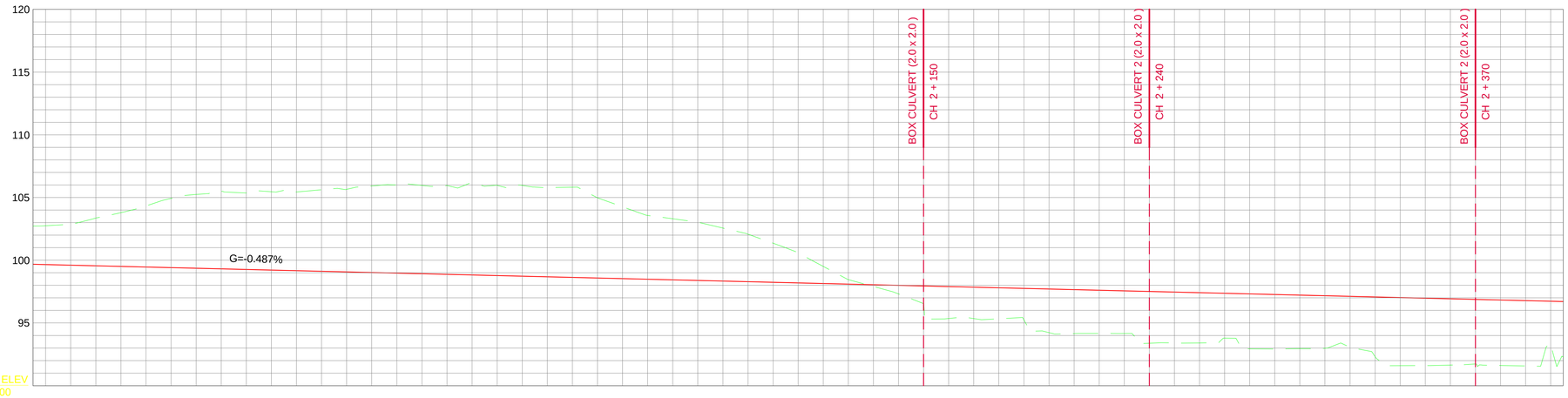


PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch1+800	99.656	102.744
Ch1+810	99.607	102.875
Ch1+820	99.558	103.359
Ch1+830	99.510	103.791
Ch1+840	99.461	104.324
Ch1+850	99.412	104.931
Ch1+860	99.363	105.245
Ch1+870	99.315	105.489
Ch1+880	99.266	105.365
Ch1+890	99.217	105.460
Ch1+900	99.168	105.439
Ch1+910	99.120	105.619
Ch1+920	99.071	105.656
Ch1+930	99.022	105.915
Ch1+940	98.973	106.017
Ch1+950	98.925	105.963
Ch1+960	98.876	105.951
Ch1+970	98.827	106.161
Ch1+980	98.778	105.972
Ch1+990	98.730	105.966
Ch2+000	98.681	105.780
Ch2+010	98.632	105.822
Ch2+020	98.584	104.977
Ch2+030	98.535	104.257
Ch2+040	98.486	103.570
Ch2+050	98.437	103.308
Ch2+060	98.389	103.033
Ch2+070	98.340	102.563
Ch2+080	98.291	102.078
Ch2+090	98.242	101.358
Ch2+100	98.194	100.606
Ch2+110	98.145	99.507
Ch2+120	98.096	98.450
Ch2+130	98.047	97.906
Ch2+140	97.999	97.313
Ch2+150	97.950	96.542
Ch2+160	97.901	95.355
Ch2+170	97.852	95.351
Ch2+180	97.804	95.328
Ch2+190	97.755	95.239
Ch2+200	97.706	94.231
Ch2+210	97.657	94.146
Ch2+220	97.609	94.153
Ch2+230	97.560	94.155
Ch2+240	97.511	93.385
Ch2+250	97.462	93.398
Ch2+260	97.414	93.403
Ch2+270	97.365	93.790
Ch2+280	97.316	92.929
Ch2+290	97.267	92.928
Ch2+300	97.219	92.950
Ch2+310	97.170	92.983
Ch2+320	97.121	93.056
Ch2+330	97.072	92.312
Ch2+340	97.024	91.594
Ch2+350	96.975	91.600
Ch2+360	96.926	91.641
Ch2+370	96.877	91.731
Ch2+380	96.829	91.607
Ch2+390	96.780	91.572
Ch2+400	96.731	93.245

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

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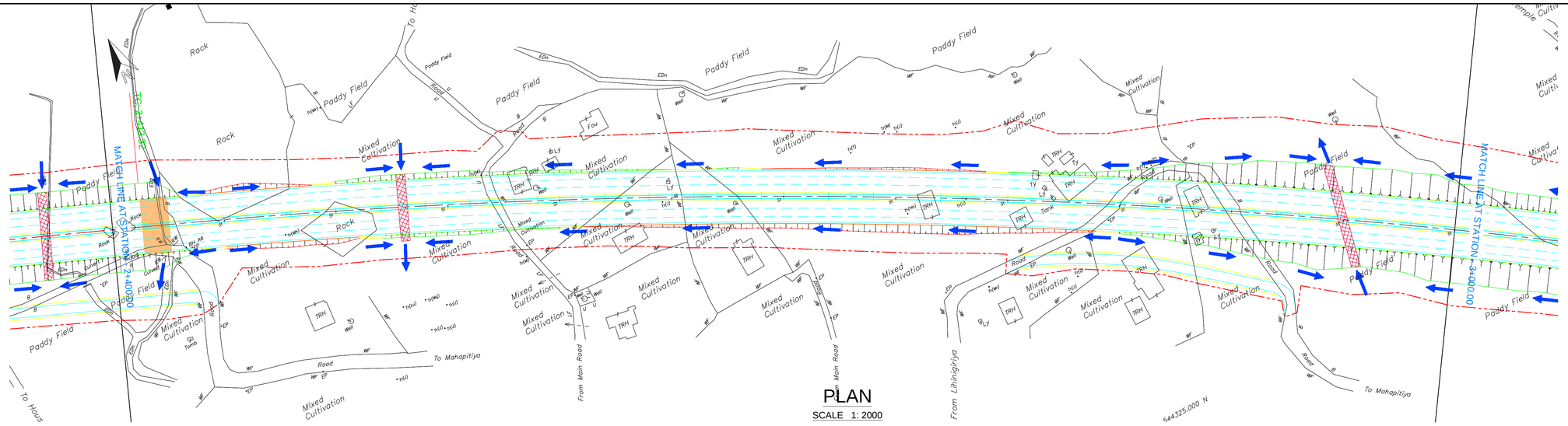
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH1+800.00 - CH2+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-03	1:2000	16-05-2016	03 of 68

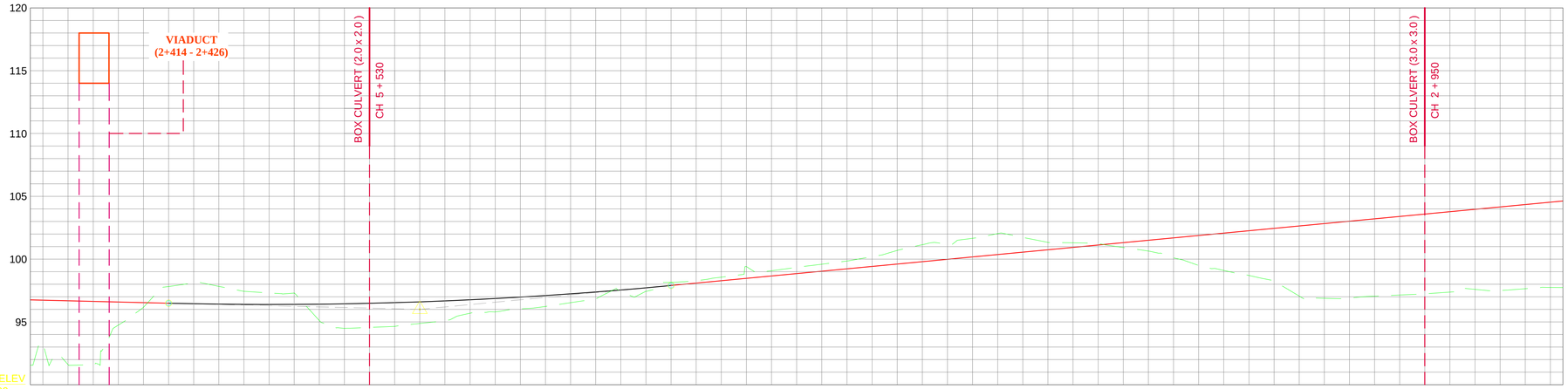


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch2+400	96.731	93.245
Ch2+410	96.682	91.596
Ch2+420	96.634	91.587
Ch2+430	96.585	94.745
Ch2+440	96.536	96.159
Ch2+450	96.487	97.820
Ch2+460	96.445	98.107
Ch2+470	96.414	97.830
Ch2+480	96.395	97.436
Ch2+490	96.388	97.309
Ch2+500	96.393	97.295
Ch2+510	96.410	95.106
Ch2+520	96.438	94.491
Ch2+530	96.479	94.562
Ch2+540	96.531	94.645
Ch2+550	96.596	94.877
Ch2+560	96.672	95.085
Ch2+570	96.761	95.691
Ch2+580	96.861	95.797
Ch2+590	96.973	96.040
Ch2+600	97.097	96.231
Ch2+610	97.233	96.528
Ch2+620	97.381	96.826
Ch2+630	97.541	97.411
Ch2+640	97.712	97.426
Ch2+650	97.896	98.154
Ch2+660	98.086	98.270
Ch2+670	98.275	98.562
Ch2+680	98.465	99.400
Ch2+690	98.655	99.073
Ch2+700	98.844	99.345
Ch2+710	99.034	99.594
Ch2+720	99.223	99.846
Ch2+730	99.413	100.196
Ch2+740	99.603	100.693
Ch2+750	99.792	101.147
Ch2+760	99.982	101.172
Ch2+770	100.171	101.659
Ch2+780	100.361	102.028
Ch2+790	100.551	101.733
Ch2+800	100.740	101.329
Ch2+810	100.930	101.297
Ch2+820	101.119	101.239
Ch2+830	101.309	100.923
Ch2+840	101.499	100.640
Ch2+850	101.688	100.100
Ch2+860	101.878	99.494
Ch2+870	102.068	99.102
Ch2+880	102.257	98.697
Ch2+890	102.447	98.254
Ch2+900	102.636	97.062
Ch2+910	102.826	96.878
Ch2+920	103.016	96.910
Ch2+930	103.205	97.049
Ch2+940	103.395	97.140
Ch2+950	103.584	97.238
Ch2+960	103.774	97.370
Ch2+970	103.964	97.591
Ch2+980	104.153	97.501
Ch2+990	104.343	97.643
Ch3+000	104.532	97.746

NOTE

01. Structures and structure locations are given for indication only.

02. Storm water drainage management plan at cut sections to be suitably designed depending on the site conditions at detailed design stage.
Only a tentative plan is given at some locations based on currently proposed vertical profile by RDA which shall be changed to suit the site conditions.

03. Storm water drainage management plan at interchange areas to be designed based on finalized geometric designs. Tentative partial plans given considering the main traces in these locations.

04. Existing width of the canal to be maintained wherever canal route is block and diverted. For such major streams, drainage network should be suitably designed and get approval from SLLRDC.
Only an indicative plan is given for flow directions.

05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

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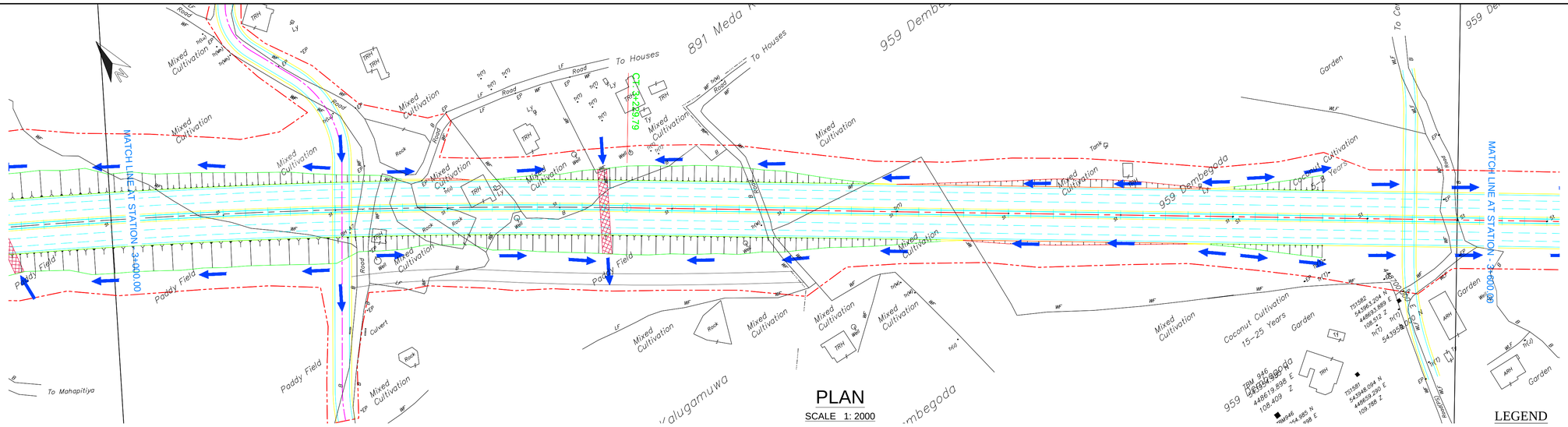
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

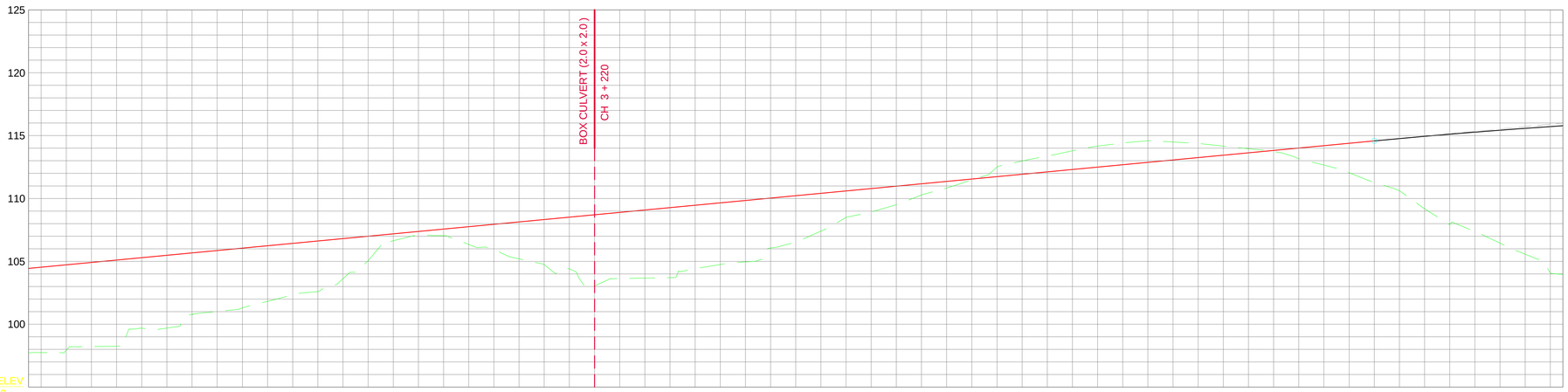
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH2+400.00 - CH3+000.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-04	1:2000	16-05-2016	04 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch3+000	104.532	97.746
Ch3+010	104.722	97.939
Ch3+020	104.912	98.224
Ch3+030	105.101	98.254
Ch3+040	105.291	99.684
Ch3+050	105.481	99.693
Ch3+060	105.670	100.815
Ch3+070	105.860	101.013
Ch3+080	106.049	101.303
Ch3+090	106.239	101.817
Ch3+100	106.429	102.351
Ch3+110	106.618	102.593
Ch3+120	106.808	103.623
Ch3+130	106.997	105.047
Ch3+140	107.187	106.638
Ch3+150	107.377	107.103
Ch3+160	107.566	107.044
Ch3+170	107.756	106.338
Ch3+180	107.945	105.949
Ch3+190	108.135	105.201
Ch3+200	108.325	104.735
Ch3+210	108.514	104.393
Ch3+220	108.704	103.033
Ch3+230	108.894	103.630
Ch3+240	109.083	103.668
Ch3+250	109.273	103.707
Ch3+260	109.462	104.424
Ch3+270	109.652	104.753
Ch3+280	109.842	104.953
Ch3+290	110.031	106.063
Ch3+300	110.221	106.513
Ch3+310	110.410	107.404
Ch3+320	110.600	108.499
Ch3+330	110.790	108.919
Ch3+340	110.979	109.508
Ch3+350	111.169	110.278
Ch3+360	111.358	110.832
Ch3+370	111.548	111.475
Ch3+380	111.738	112.496
Ch3+390	111.927	112.980
Ch3+400	112.117	113.364
Ch3+410	112.306	113.788
Ch3+420	112.496	114.162
Ch3+430	112.686	114.411
Ch3+440	112.875	114.593
Ch3+450	113.065	114.494
Ch3+460	113.255	114.378
Ch3+470	113.444	114.165
Ch3+480	113.634	113.950
Ch3+490	113.823	113.720
Ch3+500	114.013	113.164
Ch3+510	114.203	112.654
Ch3+520	114.392	112.056
Ch3+530	114.582	111.274
Ch3+540	114.768	110.618
Ch3+550	114.946	109.181
Ch3+560	115.116	107.920
Ch3+570	115.279	107.372
Ch3+580	115.434	106.450
Ch3+590	115.582	105.569
Ch3+600	115.722	104.082

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

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SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

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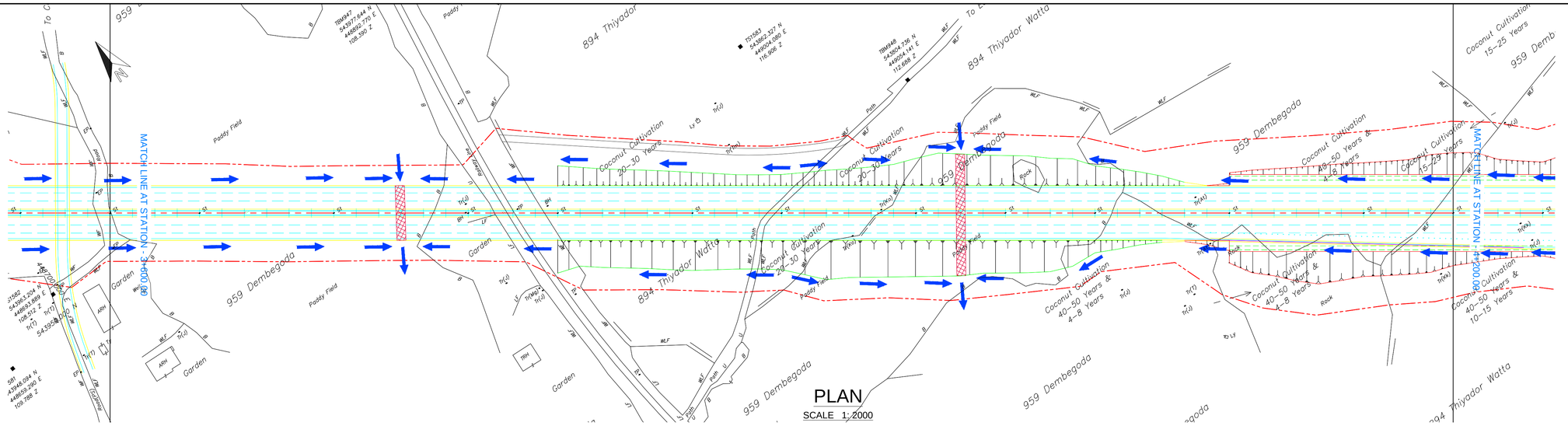
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

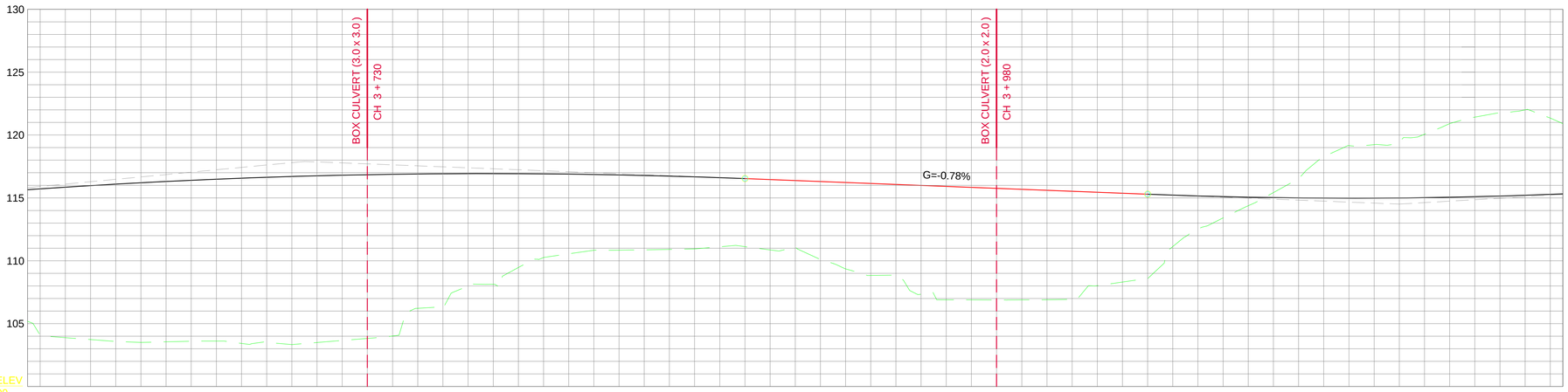
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH3+000.00 - CH3+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-05	1:2000	16-05-2016	05 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch3+600	115.722	104.082
Ch3+610	115.854	103.886
Ch3+620	115.979	103.733
Ch3+630	116.096	103.582
Ch3+640	116.205	103.505
Ch3+650	116.307	103.550
Ch3+660	116.401	103.596
Ch3+670	116.487	103.611
Ch3+680	116.566	103.429
Ch3+690	116.637	103.574
Ch3+700	116.701	103.335
Ch3+710	116.756	103.497
Ch3+720	116.805	103.660
Ch3+730	116.845	103.822
Ch3+740	116.878	104.016
Ch3+750	116.903	106.219
Ch3+760	116.921	106.223
Ch3+770	116.931	107.997
Ch3+780	116.933	108.132
Ch3+790	116.928	109.462
Ch3+800	116.915	110.262
Ch3+810	116.894	110.551
Ch3+820	116.866	110.837
Ch3+830	116.830	110.840
Ch3+840	116.787	110.870
Ch3+850	116.736	110.907
Ch3+860	116.677	110.943
Ch3+870	116.610	111.111
Ch3+880	116.536	111.121
Ch3+890	116.458	110.863
Ch3+900	116.380	111.103
Ch3+910	116.302	110.102
Ch3+920	116.224	109.352
Ch3+930	116.147	108.834
Ch3+940	116.069	108.854
Ch3+950	115.991	107.333
Ch3+960	115.913	106.887
Ch3+970	115.835	106.886
Ch3+980	115.757	106.885
Ch3+990	115.679	106.885
Ch4+000	115.601	106.897
Ch4+010	115.523	106.930
Ch4+020	115.445	108.017
Ch4+030	115.367	108.306
Ch4+040	115.289	108.594
Ch4+050	115.216	111.131
Ch4+060	115.153	112.503
Ch4+070	115.099	113.403
Ch4+080	115.055	114.378
Ch4+090	115.020	115.423
Ch4+100	114.995	116.532
Ch4+110	114.980	118.271
Ch4+120	114.975	119.156
Ch4+130	114.979	119.234
Ch4+140	114.992	119.428
Ch4+150	115.016	120.064
Ch4+160	115.049	120.906
Ch4+170	115.091	121.423
Ch4+180	115.144	121.706
Ch4+190	115.206	122.005
Ch4+200	115.277	121.347

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000

VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

01. Structures and structure locations are given for indication only.
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05. Drainage should be specially designed tunnelling area during detailed design stage.

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

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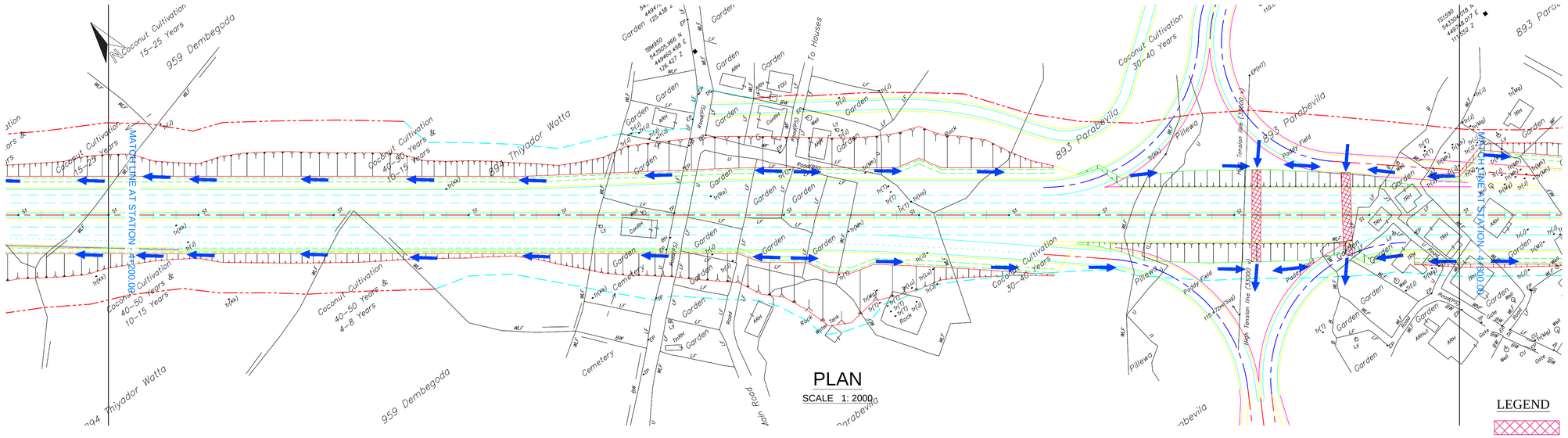
Project Title

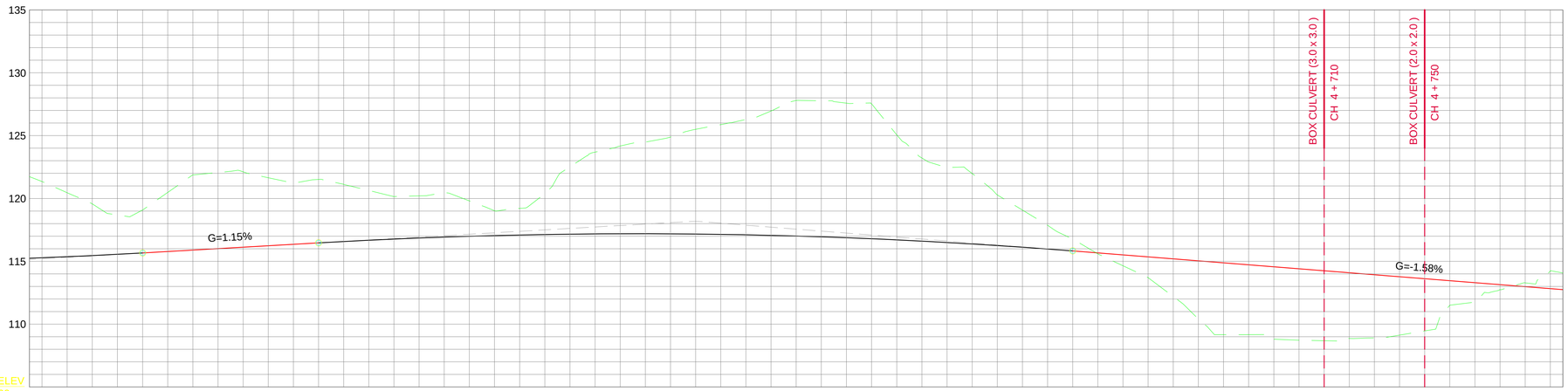
CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :

SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH3+600.00 - CH4+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-06	1:2000	16-05-2016	06 of 68





CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch4+200	115.277	121.347
Ch4+210	115.358	120.454
Ch4+220	115.449	119.560
Ch4+230	115.550	118.685
Ch4+240	115.660	119.084
Ch4+250	115.775	120.478
Ch4+260	115.890	121.868
Ch4+270	116.005	122.063
Ch4+280	116.120	122.119
Ch4+290	116.235	121.648
Ch4+300	116.350	121.218
Ch4+310	116.465	121.512
Ch4+320	116.575	121.120
Ch4+330	116.677	120.633
Ch4+340	116.769	120.148
Ch4+350	116.852	120.204
Ch4+360	116.926	120.471
Ch4+370	116.991	119.806
Ch4+380	117.047	119.023
Ch4+390	117.094	119.208
Ch4+400	117.132	120.375
Ch4+410	117.161	122.518
Ch4+420	117.180	123.686
Ch4+430	117.191	124.169
Ch4+440	117.192	124.486
Ch4+450	117.184	124.882
Ch4+460	117.167	125.500
Ch4+470	117.141	125.877
Ch4+480	117.107	126.284
Ch4+490	117.062	126.957
Ch4+500	117.009	127.798
Ch4+510	116.947	127.767
Ch4+520	116.876	127.581
Ch4+530	116.795	127.524
Ch4+540	116.706	125.061
Ch4+550	116.607	123.217
Ch4+560	116.499	122.454
Ch4+570	116.383	121.986
Ch4+580	116.257	120.285
Ch4+590	116.122	119.074
Ch4+600	115.978	117.864
Ch4+610	115.825	116.765
Ch4+620	115.667	115.591
Ch4+630	115.509	114.644
Ch4+640	115.351	113.702
Ch4+650	115.194	112.197
Ch4+660	115.036	110.401
Ch4+670	114.878	109.165
Ch4+680	114.721	109.169
Ch4+690	114.563	108.798
Ch4+700	114.405	108.721
Ch4+710	114.248	108.681
Ch4+720	114.090	108.860
Ch4+730	113.932	108.901
Ch4+740	113.774	109.122
Ch4+750	113.617	109.461
Ch4+760	113.459	111.503
Ch4+770	113.301	111.737
Ch4+780	113.144	112.744
Ch4+790	112.986	113.286
Ch4+800	112.828	114.236

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

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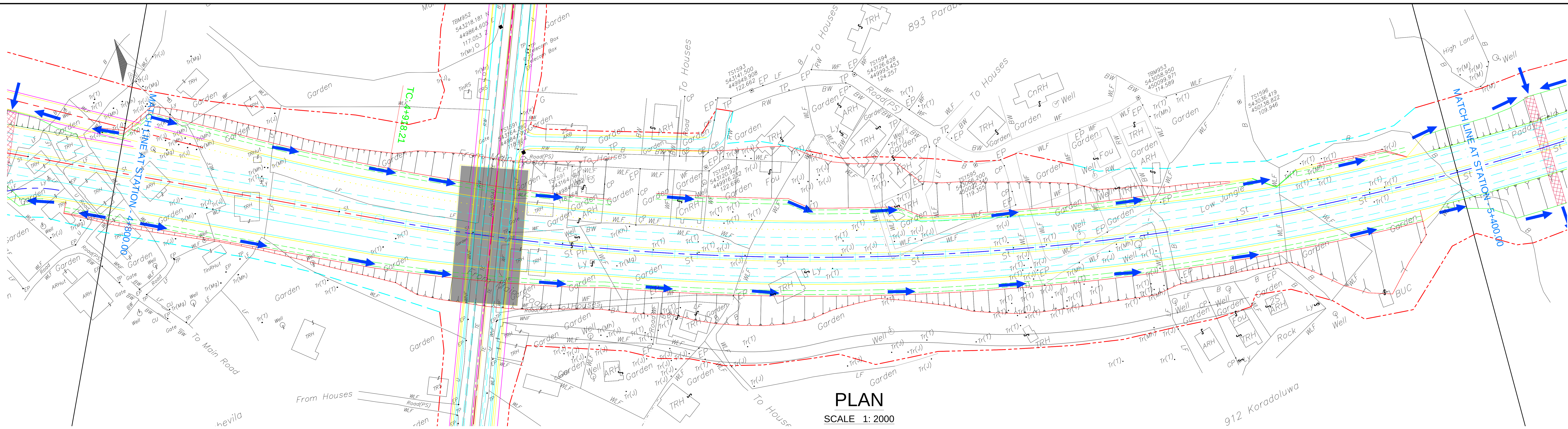
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH4+200.00 - CH4+800.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-07	1:2000	16-05-2016	07 of 68



PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
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NOTE

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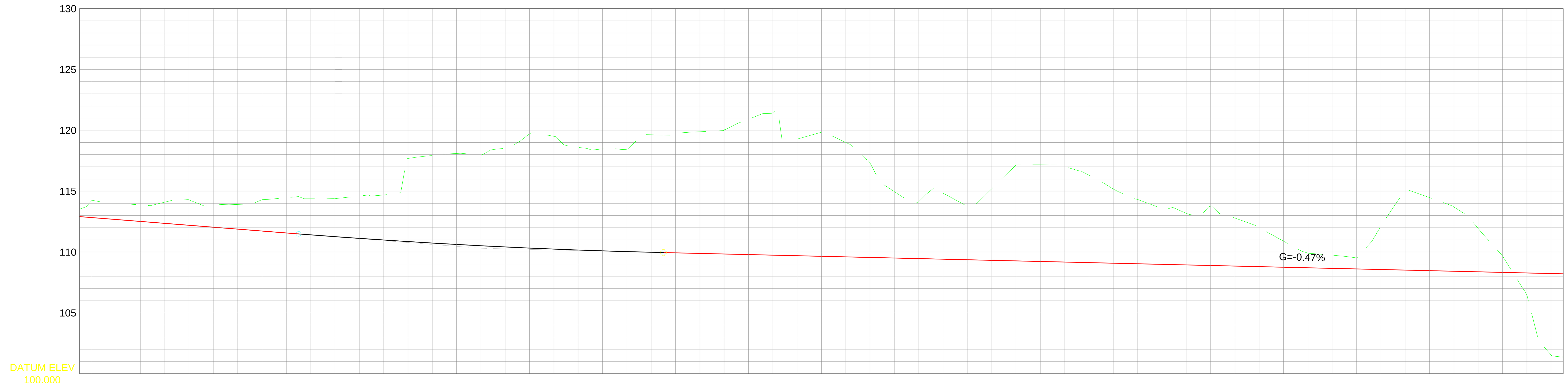


CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch4+800	112.828	114.236
Ch4+810	112.671	113.948
Ch4+820	112.513	113.867
Ch4+830	112.355	114.098
Ch4+840	112.197	114.280
Ch4+850	112.040	113.853
Ch4+860	111.882	113.896
Ch4+870	111.724	114.295
Ch4+880	111.567	114.462
Ch4+890	111.410	114.374
Ch4+900	111.260	114.380
Ch4+910	111.117	114.601
Ch4+920	110.981	114.685
Ch4+930	110.853	117.684
Ch4+940	110.732	117.938
Ch4+950	110.618	118.099
Ch4+960	110.512	117.965
Ch4+970	110.414	118.529
Ch4+980	110.322	119.702
Ch4+990	110.238	119.502
Ch5+000	110.162	118.597
Ch5+010	110.092	118.475
Ch5+020	110.030	118.445
Ch5+030	109.976	119.633
Ch5+040	109.928	119.715
Ch5+050	109.881	119.881
Ch5+060	109.833	120.019
Ch5+070	109.786	120.915
Ch5+080	109.739	121.447
Ch5+090	109.692	119.280
Ch5+100	109.645	119.846
Ch5+110	109.598	119.000
Ch5+120	109.551	117.302
Ch5+130	109.503	114.962
Ch5+140	109.456	114.135
Ch5+150	109.409	114.831
Ch5+160	109.362	113.749
Ch5+170	109.315	115.199
Ch5+180	109.268	117.143
Ch5+190	109.220	117.164
Ch5+200	109.173	117.036
Ch5+210	109.126	116.312
Ch5+220	109.079	115.166
Ch5+230	109.032	114.316
Ch5+240	108.985	113.566
Ch5+250	108.937	113.178
Ch5+260	108.890	113.765
Ch5+270	108.843	112.790
Ch5+280	108.796	111.988
Ch5+290	108.749	110.887
Ch5+300	108.702	109.913
Ch5+310	108.654	109.735
Ch5+320	108.607	109.516
Ch5+330	108.560	112.116
Ch5+340	108.513	114.955
Ch5+350	108.466	114.476
Ch5+360	108.419	113.691
Ch5+370	108.371	111.940
Ch5+380	108.324	109.674
Ch5+390	108.277	106.435
Ch5+400	108.230	101.534

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY
PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

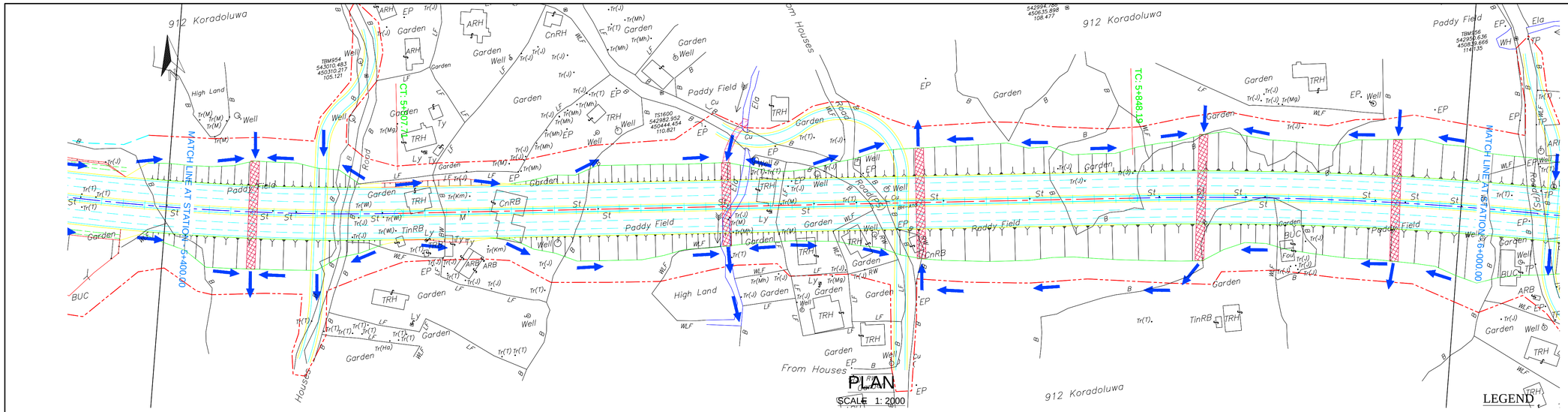
MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT
SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

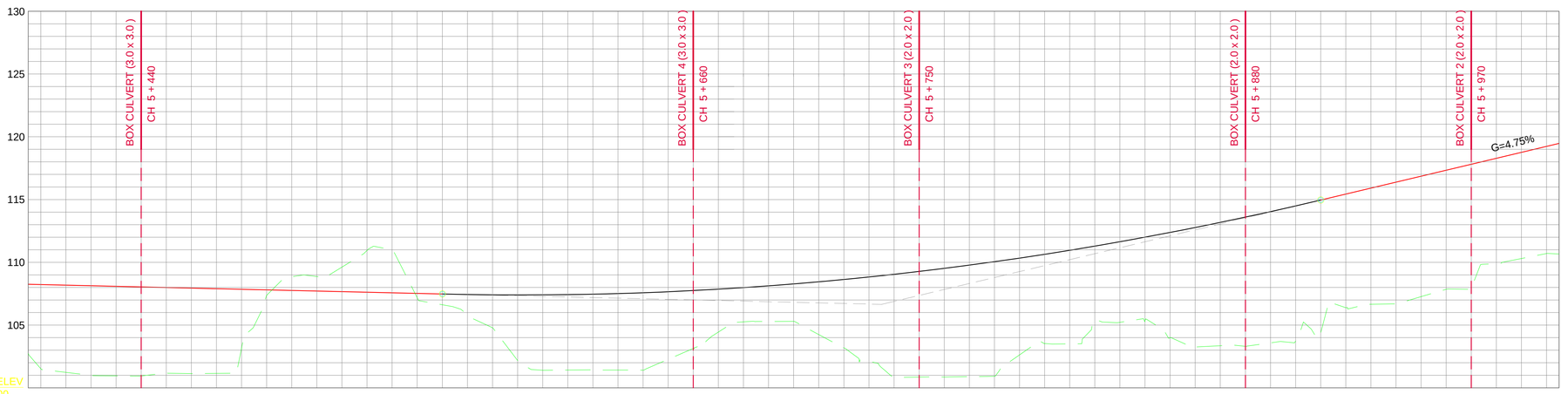
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
PLAN & PROFILE
(CH4+800.00 - CH5+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-08	1:2000	16-05-2016	08 of 68





CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch5+400	108.230	101.534
Ch5+410	108.183	101.233
Ch5+420	108.136	100.978
Ch5+430	108.088	100.953
Ch5+440	108.041	100.948
Ch5+450	107.994	101.164
Ch5+460	107.947	101.136
Ch5+470	107.900	101.151
Ch5+480	107.853	103.157
Ch5+490	107.805	107.364
Ch5+500	107.758	108.841
Ch5+510	107.711	108.870
Ch5+520	107.664	109.615
Ch5+530	107.617	110.944
Ch5+540	107.570	110.998
Ch5+550	107.523	107.180
Ch5+560	107.475	106.618
Ch5+570	107.436	105.817
Ch5+580	107.411	104.795
Ch5+590	107.401	102.179
Ch5+600	107.406	101.396
Ch5+610	107.426	101.415
Ch5+620	107.461	101.434
Ch5+630	107.511	101.412
Ch5+640	107.575	101.409
Ch5+650	107.655	102.272
Ch5+660	107.749	103.136
Ch5+670	107.859	104.447
Ch5+680	107.983	105.260
Ch5+690	108.122	105.285
Ch5+700	108.276	105.294
Ch5+710	108.446	104.242
Ch5+720	108.630	103.181
Ch5+730	108.828	102.132
Ch5+740	109.042	100.827
Ch5+750	109.271	100.852
Ch5+760	109.515	100.860
Ch5+770	109.773	100.893
Ch5+780	110.047	100.915
Ch5+790	110.335	102.626
Ch5+800	110.638	103.503
Ch5+810	110.956	103.501
Ch5+820	111.290	105.431
Ch5+830	111.638	105.218
Ch5+840	112.000	105.340
Ch5+850	112.378	103.992
Ch5+860	112.771	103.236
Ch5+870	113.179	103.354
Ch5+880	113.601	103.305
Ch5+890	114.039	103.585
Ch5+900	114.491	103.721
Ch5+910	114.959	104.391
Ch5+920	115.433	106.386
Ch5+930	115.908	106.657
Ch5+940	116.383	106.676
Ch5+950	116.858	107.262
Ch5+960	117.332	107.853
Ch5+970	117.807	107.919
Ch5+980	118.282	109.891
Ch5+990	118.757	110.299
Ch6+000	119.232	110.699

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

01. Structures and structure locations are given for indication only.
02. Storm water drainage management plan at cut sections to be suitably designed depending on the site conditions at detailed design stage.
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    Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

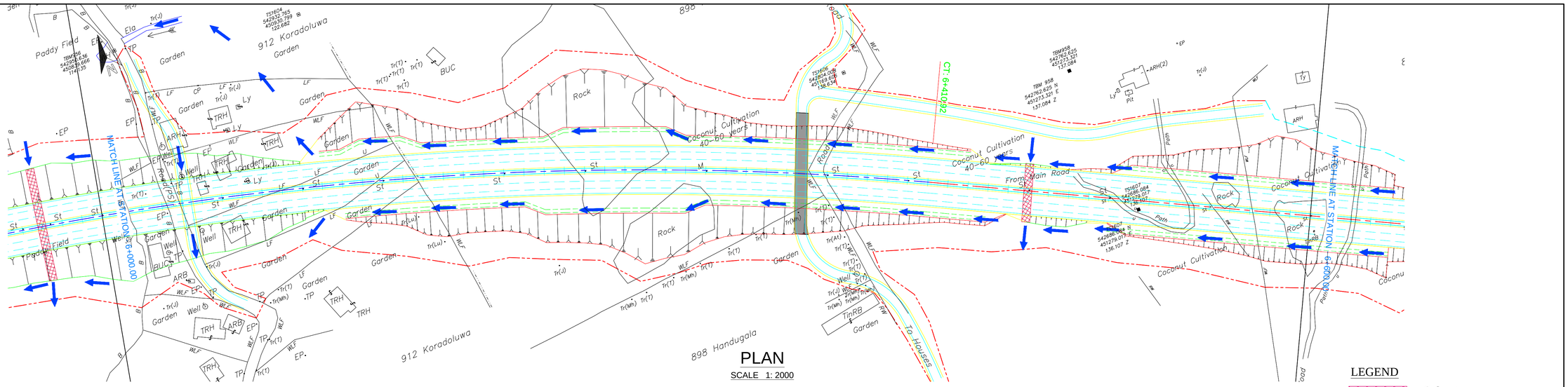
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

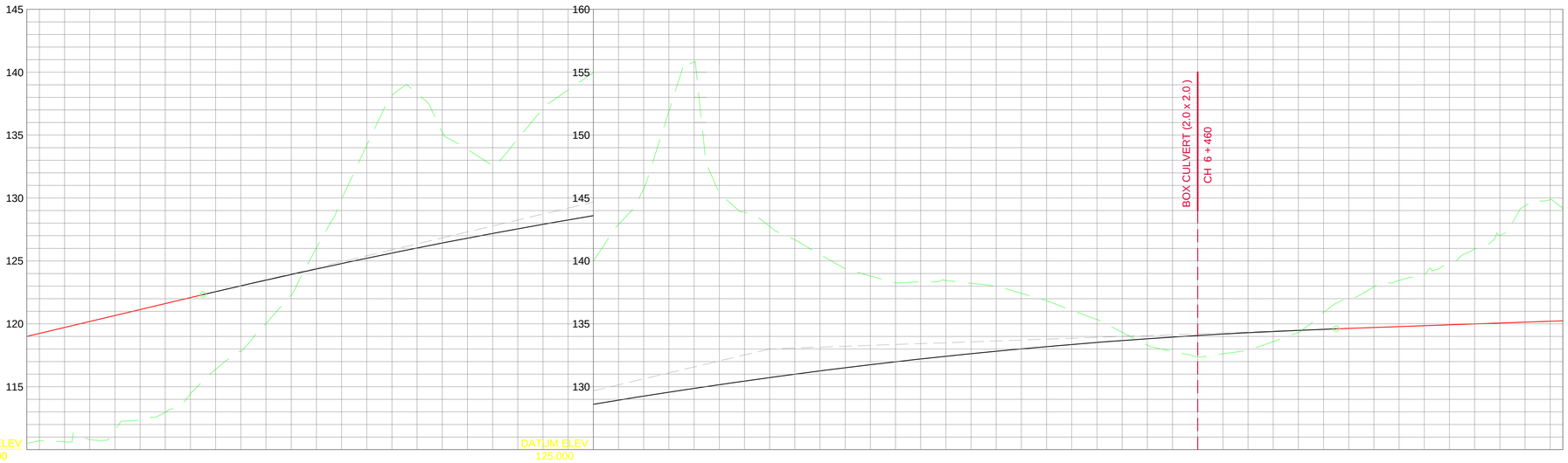
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH5+400.00 - CH6+000.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-09	1:2000	16-05-2016	09 of 68



PLAN

SCALE 1: 2000



CHAINAGE	Ch6+000	Ch6+010	Ch6+020	Ch6+030	Ch6+040	Ch6+050	Ch6+060	Ch6+070	Ch6+080	Ch6+090	Ch6+100	Ch6+110	Ch6+120	Ch6+130	Ch6+140	Ch6+150	Ch6+160	Ch6+170	Ch6+180	Ch6+190	Ch6+200	Ch6+210	Ch6+220	Ch6+230	Ch6+240	Ch6+250	Ch6+260	Ch6+270	Ch6+280	Ch6+290	Ch6+300	Ch6+310	Ch6+320	Ch6+330	Ch6+340	Ch6+350	Ch6+360	Ch6+370	Ch6+380	Ch6+390	Ch6+400	Ch6+410	Ch6+420	Ch6+430	Ch6+440	Ch6+450	Ch6+460	Ch6+470	Ch6+480	Ch6+490	Ch6+500	Ch6+510	Ch6+520	Ch6+530	Ch6+540	Ch6+550	Ch6+560	Ch6+570	Ch6+580	Ch6+590	Ch6+600
FINISHED GROUND LEVEL	119.232	119.706	120.181	120.656	121.131	121.605	122.080	122.554	123.020	123.476	123.924	124.363	124.793	125.214	125.626	126.029	126.423	126.808	127.184	127.551	127.909	128.259	128.599	128.930	129.252	129.566	129.870	130.165	130.452	130.729	130.998	131.257	131.507	131.749	131.982	132.205	132.420	132.625	132.822	133.010	133.188	133.358	133.519	133.671	133.814	133.947	134.072	134.188	134.295	134.393	134.482	134.562	134.634	134.705	134.776	134.848	134.919	134.990	135.061	135.132	135.203
EXSISTING GROUND LEVEL	110.699	110.618	110.796	111.559	112.472	112.977	114.430	116.380	117.784	120.030	122.289	126.024	129.886	134.190	138.144	138.318	135.228	133.871	132.564	134.696	137.135	138.593	139.985	142.893	145.724	151.883	155.819	145.419	143.876	142.744	141.695	140.513	139.378	138.803	138.252	138.335	138.425	138.221	138.007	137.427	136.832	136.085	135.333	134.329	133.304	132.810	132.383	132.608	132.897	133.583	134.313	135.910	136.872	137.954	138.457	138.914	139.780	140.940	142.013	144.378	144.867

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000

VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

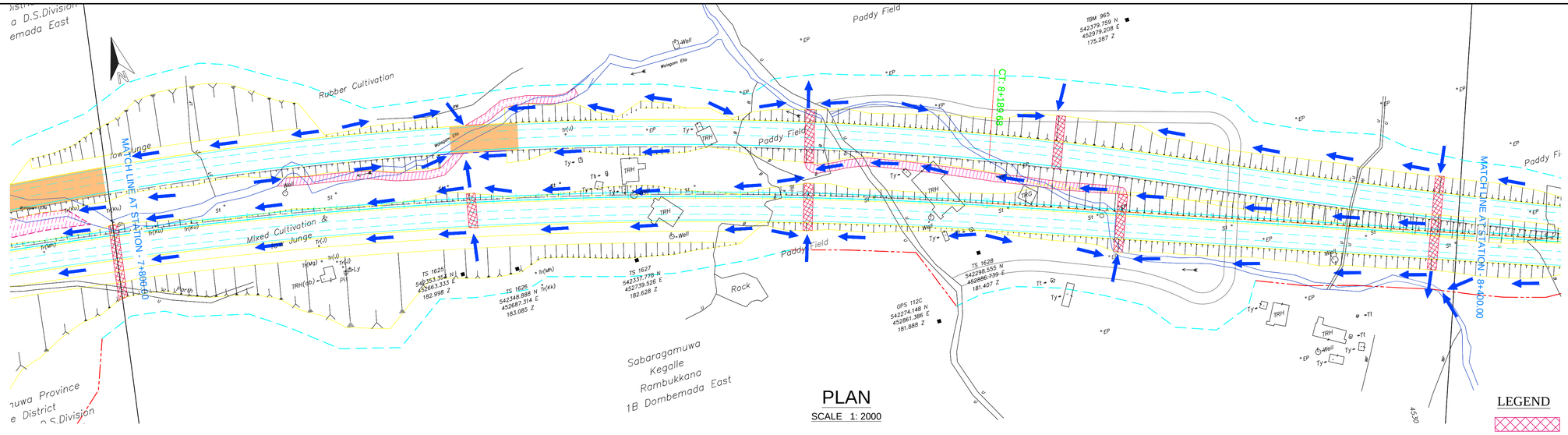
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH6+000.00 - CH6+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-10	1:2000	16-05-2016	10 of 68

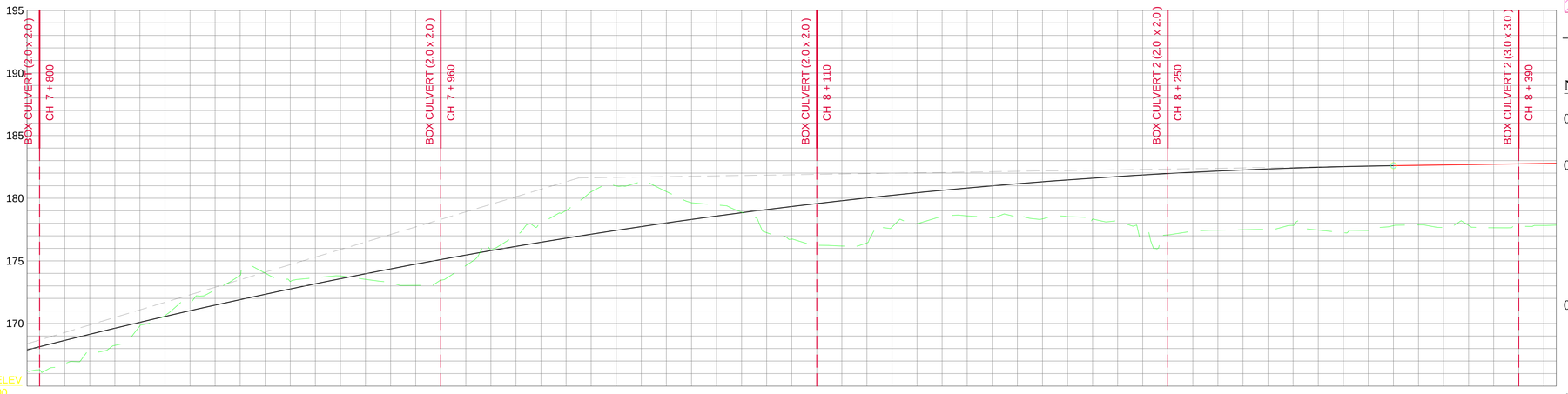


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch7+800	168.147	166.317
Ch7+810	168.648	166.792
Ch7+820	169.140	167.752
Ch7+830	169.623	168.249
Ch7+840	170.097	169.817
Ch7+850	170.562	170.616
Ch7+860	171.019	171.681
Ch7+870	171.467	172.682
Ch7+880	171.906	173.844
Ch7+890	172.337	174.019
Ch7+900	172.758	173.345
Ch7+910	173.171	173.648
Ch7+920	173.575	173.796
Ch7+930	173.970	173.522
Ch7+940	174.356	173.234
Ch7+950	174.734	173.042
Ch7+960	175.103	173.451
Ch7+970	175.462	174.619
Ch7+980	175.814	175.861
Ch7+990	176.156	177.029
Ch8+000	176.490	178.033
Ch8+010	176.814	179.012
Ch8+020	177.130	180.508
Ch8+030	177.437	180.979
Ch8+040	177.736	181.326
Ch8+050	178.025	180.529
Ch8+060	178.306	179.643
Ch8+070	178.578	179.462
Ch8+080	178.841	178.876
Ch8+090	179.095	177.252
Ch8+100	179.341	176.732
Ch8+110	179.578	176.263
Ch8+120	179.806	176.182
Ch8+130	180.025	176.434
Ch8+140	180.235	177.697
Ch8+150	180.437	177.963
Ch8+160	180.630	178.561
Ch8+170	180.814	178.587
Ch8+180	180.989	178.429
Ch8+190	181.155	178.694
Ch8+200	181.313	178.344
Ch8+210	181.462	178.520
Ch8+220	181.602	178.338
Ch8+230	181.733	178.165
Ch8+240	181.855	176.898
Ch8+250	181.969	177.071
Ch8+260	182.073	177.373
Ch8+270	182.169	177.448
Ch8+280	182.257	177.485
Ch8+290	182.335	177.522
Ch8+300	182.405	177.831
Ch8+310	182.465	177.455
Ch8+320	182.517	177.249
Ch8+330	182.561	177.418
Ch8+340	182.595	177.809
Ch8+350	182.625	177.869
Ch8+360	182.655	177.667
Ch8+370	182.685	177.826
Ch8+380	182.715	177.646
Ch8+390	182.745	177.761
Ch8+400	182.775	177.829

NOTE

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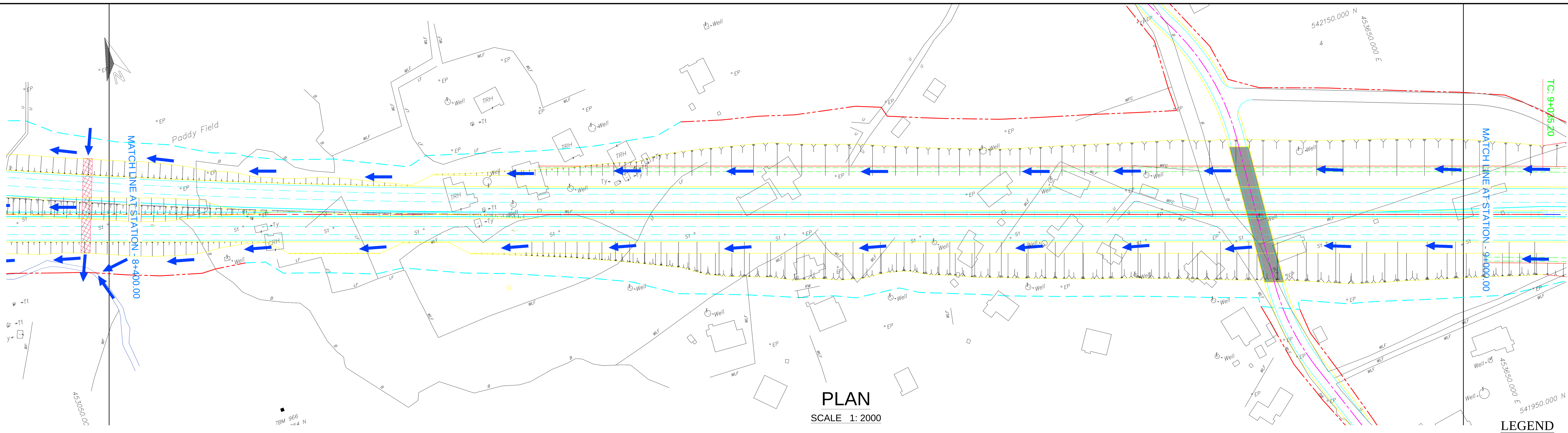
    Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer	Consultant (Hydrology)	Project Title	Drawing Title :
DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA MINISTRY OF HIGHER EDUCATION & HIGHWAYS **ROAD DEVELOPMENT AUTHORITY** PROJECT DIRECTOR - CENTRAL EXPRESSWAY 3rd Floor, Sethsiripaya, Battaramulla. Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com	MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT **SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION** NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA. Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com	CENTRAL EXPRESSWAY PROJECT (CEP) SECTION - 3 FROM POTUHERA TO GALAGEDARA (CH. 0+000 - CH. 32+500)	SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH7+800.00 - CH8+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-14	1:2000	16-05-2016	14 of 68

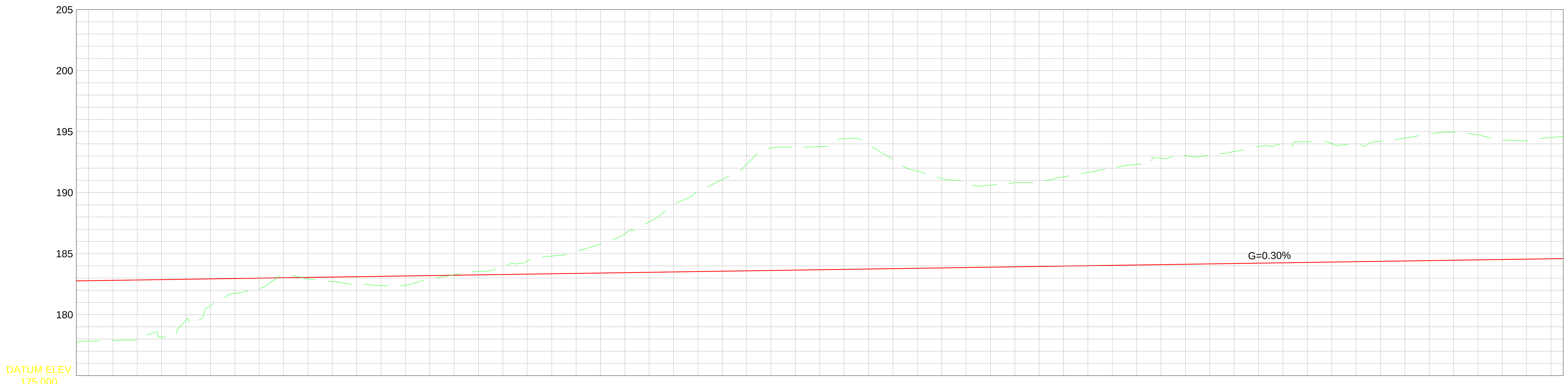


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	Ch8+400	Ch8+410	Ch8+420	Ch8+430	Ch8+440	Ch8+450	Ch8+460	Ch8+470	Ch8+480	Ch8+490	Ch8+500	Ch8+510	Ch8+520	Ch8+530	Ch8+540	Ch8+550	Ch8+560	Ch8+570	Ch8+580	Ch8+590	Ch8+600	Ch8+610	Ch8+620	Ch8+630	Ch8+640	Ch8+650	Ch8+660	Ch8+670	Ch8+680	Ch8+690
FINISHED GROUND LEVEL	182.775	182.805	182.835	182.865	182.895	182.925	182.955	182.985	183.015	183.045	183.075	183.105	183.135	183.165	183.195	183.225	183.255	183.285	183.315	183.345	183.375	183.405	183.435	183.465	183.495	183.525	183.555	183.585	183.615	183.645
EXSISTING GROUND LEVEL	177.829	177.876	177.915	178.168	179.546	180.734	181.752	182.151	183.350	182.926	182.710	182.470	182.382	182.402	182.935	183.265	183.529	183.877	184.395	184.798	185.173	185.786	186.608	187.603	189.014	190.111	191.079	192.316	193.665	193.728

CHAINAGE	Ch8+700	Ch8+710	Ch8+720	Ch8+730	Ch8+740	Ch8+750	Ch8+760	Ch8+770	Ch8+780	Ch8+790	Ch8+800	Ch8+810	Ch8+820	Ch8+830	Ch8+840	Ch8+850	Ch8+860	Ch8+870	Ch8+880	Ch8+890	Ch8+900	Ch8+910	Ch8+920	Ch8+930	Ch8+940	Ch8+950	Ch8+960	Ch8+970	Ch8+980	Ch8+990	Ch9+000
FINISHED GROUND LEVEL	183.675	183.705	183.735	183.765	183.795	183.825	183.855	183.885	183.915	183.945	183.975	184.005	184.035	184.065	184.095	184.125	184.155	184.185	184.215	184.245	184.275	184.305	184.335	184.365	184.395	184.425	184.455	184.485	184.515	184.545	184.575
EXSISTING GROUND LEVEL	193.787	194.417	193.949	192.750	191.753	191.171	190.805	190.609	190.808	190.865	191.292	191.655	192.022	192.317	192.818	193.047	193.072	193.369	193.788	194.024	194.170	194.023	193.972	194.201	194.475	194.833	194.949	194.744	194.267	194.254	194.522

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

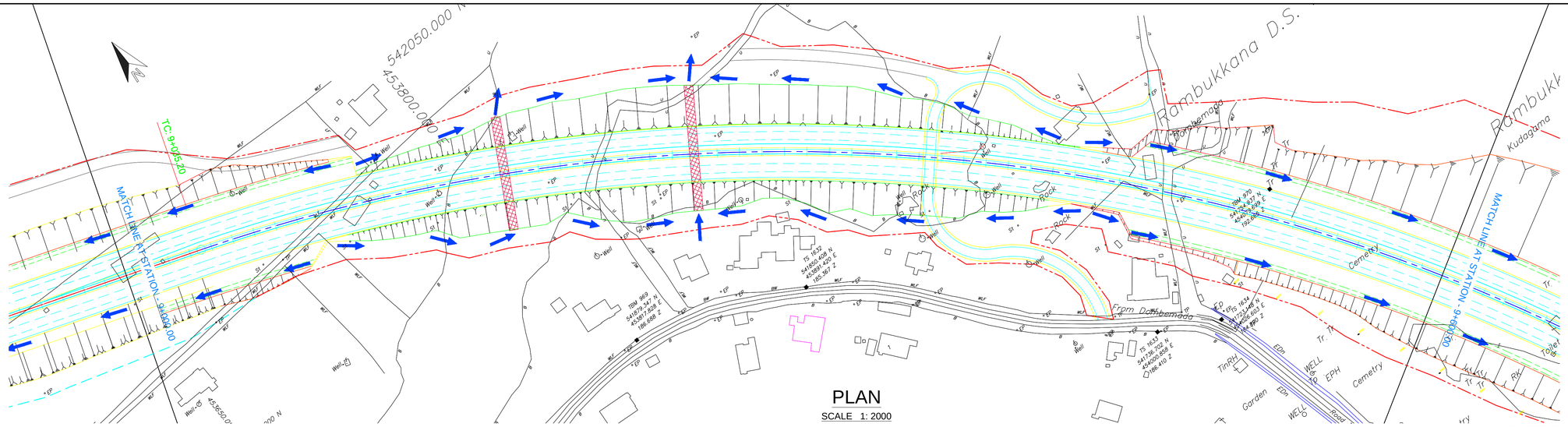
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

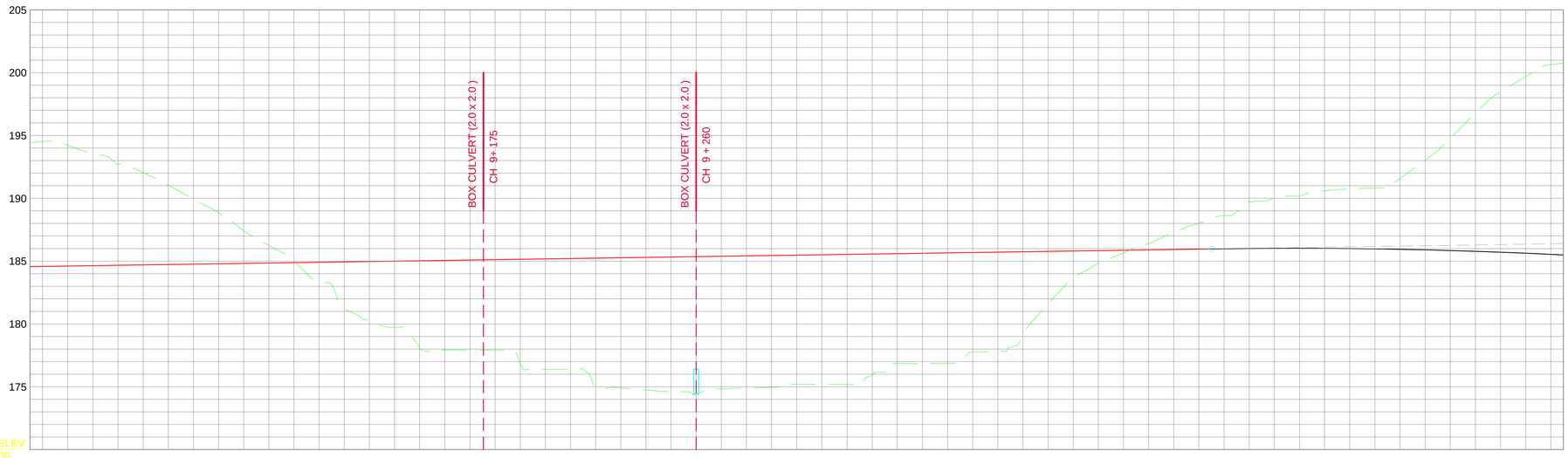
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH8+400.00 - CH9+000.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-16	1:2000	16-05-2016	16 of 68





CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch9+000	184.575	194.522
Ch9+010	184.605	194.217
Ch9+020	184.635	193.523
Ch9+030	184.665	192.706
Ch9+040	184.695	192.050
Ch9+050	184.725	191.050
Ch9+060	184.755	189.943
Ch9+070	184.785	188.855
Ch9+080	184.815	187.429
Ch9+090	184.845	186.251
Ch9+100	184.875	185.050
Ch9+110	184.905	183.275
Ch9+120	184.935	181.184
Ch9+130	184.965	180.226
Ch9+140	184.995	179.740
Ch9+150	185.025	178.101
Ch9+160	185.055	177.929
Ch9+170	185.085	177.916
Ch9+180	185.115	177.904
Ch9+190	185.145	176.915
Ch9+200	185.175	176.382
Ch9+210	185.205	176.373
Ch9+220	185.235	174.991
Ch9+230	185.265	174.912
Ch9+240	185.295	174.742
Ch9+250	185.325	174.611
Ch9+260	185.355	174.460
Ch9+270	185.385	174.823
Ch9+280	185.415	174.913
Ch9+290	185.445	174.943
Ch9+300	185.475	175.206
Ch9+310	185.505	175.194
Ch9+320	185.535	175.177
Ch9+330	185.565	175.907
Ch9+340	185.595	176.873
Ch9+350	185.625	176.855
Ch9+360	185.655	176.870
Ch9+370	185.685	177.769
Ch9+380	185.715	177.810
Ch9+390	185.745	179.126
Ch9+400	185.775	181.616
Ch9+410	185.805	183.722
Ch9+420	185.835	184.891
Ch9+430	185.865	185.662
Ch9+440	185.895	186.379
Ch9+450	185.925	187.351
Ch9+460	185.955	188.014
Ch9+470	185.984	188.619
Ch9+480	186.005	189.716
Ch9+490	186.016	190.018
Ch9+500	186.019	190.190
Ch9+510	186.013	190.602
Ch9+520	185.997	190.750
Ch9+530	185.972	190.815
Ch9+540	185.938	191.574
Ch9+550	185.895	193.037
Ch9+560	185.843	194.788
Ch9+570	185.782	196.771
Ch9+580	185.712	198.479
Ch9+590	185.632	199.686
Ch9+600	185.543	200.635

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

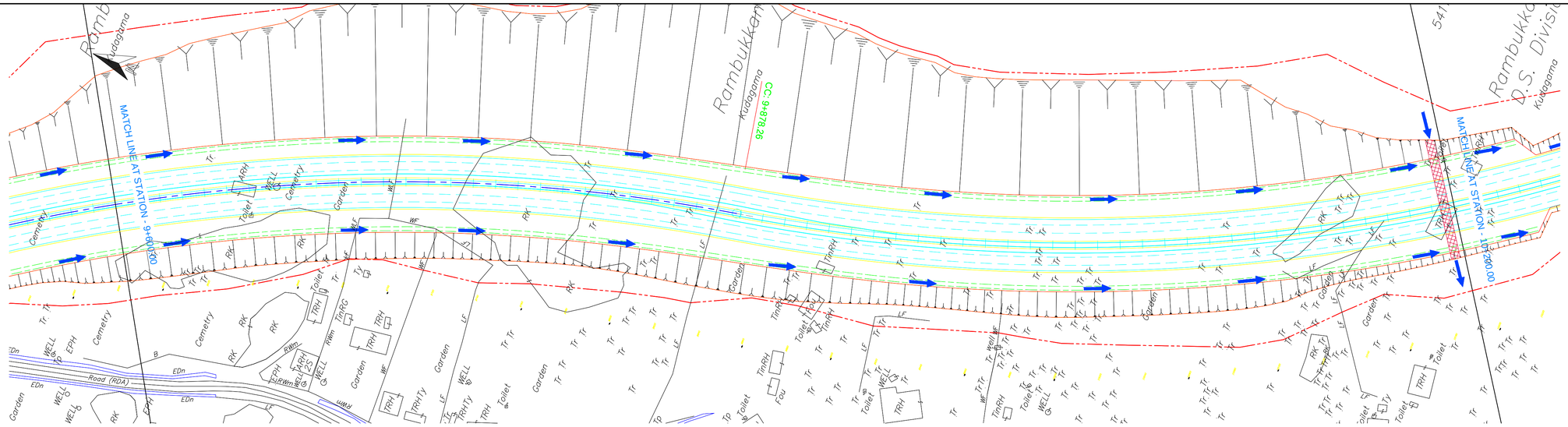
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
PLAN & PROFILE
(CH9+000.00 - CH9+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-18	1:2000	16-05-2016	18 of 68



PLAN

SCALE 1: 2000

CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch9+600	185.543	200.635
Ch9+610	185.446	200.914
Ch9+620	185.339	200.900
Ch9+630	185.223	200.503
Ch9+640	185.098	200.093
Ch9+650	184.963	199.274
Ch9+660	184.820	198.748
Ch9+670	184.668	196.532
Ch9+680	184.506	196.259
Ch9+690	184.335	196.527
Ch9+700	184.155	196.505
Ch9+710	183.966	196.129
Ch9+720	183.768	195.785
Ch9+730	183.561	196.294
Ch9+740	183.345	195.402
Ch9+750	183.119	196.770
Ch9+760	182.884	199.144
Ch9+770	182.641	201.560
Ch9+780	182.388	202.777
Ch9+790	182.126	203.482
Ch9+800	181.855	201.151
Ch9+810	181.574	199.106
Ch9+820	181.285	197.561
Ch9+830	180.987	198.315
Ch9+840	180.679	199.268
Ch9+850	180.362	199.011
Ch9+860	180.036	197.604
Ch9+870	179.701	195.377
Ch9+880	179.357	192.876
Ch9+890	179.004	190.342
Ch9+900	178.642	189.441
Ch9+910	178.270	189.342
Ch9+920	177.889	189.405
Ch9+930	177.500	189.883
Ch9+940	177.101	190.643
Ch9+950	176.693	192.051
Ch9+960	176.276	191.066
Ch9+970	175.849	190.025
Ch9+980	175.414	189.279
Ch9+990	174.970	189.103
Ch10+000	174.516	189.001
Ch10+010	174.053	189.279
Ch10+020	173.581	190.090
Ch10+030	173.100	190.530
Ch10+040	172.610	190.595
Ch10+050	172.111	189.828
Ch10+060	171.603	189.203
Ch10+070	171.085	188.609
Ch10+080	170.558	187.591
Ch10+090	170.023	186.571
Ch10+100	169.478	185.425
Ch10+110	168.924	184.119
Ch10+120	168.361	181.976
Ch10+130	167.788	179.711
Ch10+140	167.207	176.162
Ch10+150	166.617	172.855
Ch10+160	166.017	169.131
Ch10+170	165.408	165.853
Ch10+180	164.790	162.811
Ch10+190	164.163	159.530
Ch10+200	163.527	157.931

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

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SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

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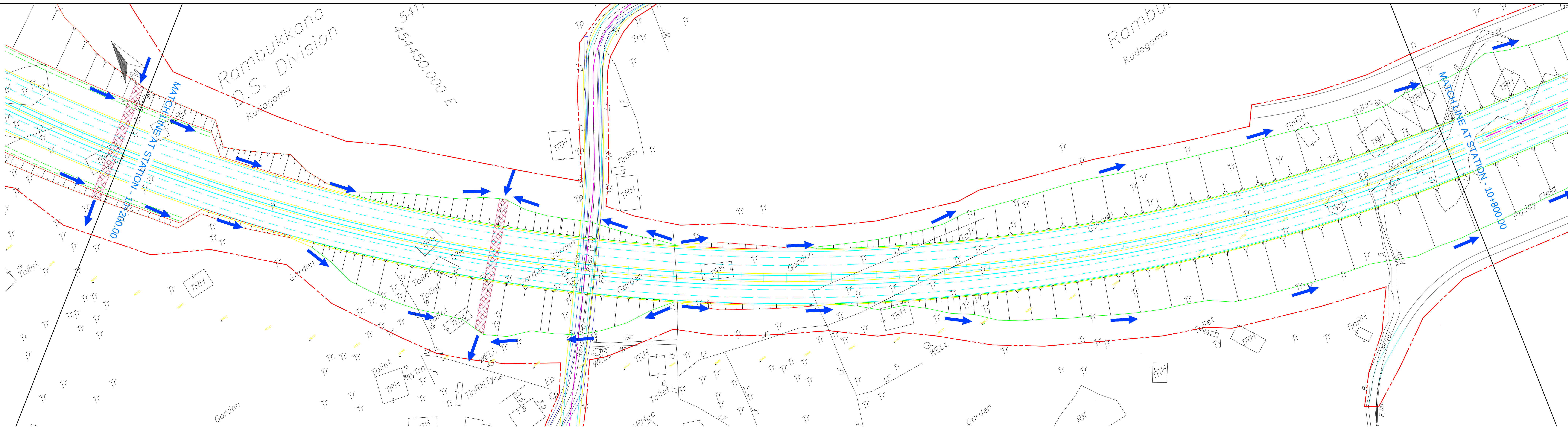
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH9+600.00 - CH10+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-19	1:2000	16-05-2016	19 of 68



PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch10+200	163.527	157.931
Ch10+210	162.882	158.843
Ch10+220	162.228	161.896
Ch10+230	161.564	163.361
Ch10+240	160.891	164.087
Ch10+250	160.210	164.253
Ch10+260	159.519	163.875
Ch10+270	158.820	162.671
Ch10+280	158.120	160.359
Ch10+290	157.420	157.392
Ch10+300	156.720	154.436
Ch10+310	156.020	151.697
Ch10+320	155.320	149.543
Ch10+330	154.620	147.494
Ch10+340	153.920	145.807
Ch10+350	153.220	144.941
Ch10+360	152.520	143.243
Ch10+370	151.820	141.348
Ch10+380	151.120	141.881
Ch10+390	150.420	142.726
Ch10+400	149.720	142.122
Ch10+410	149.020	141.379
Ch10+420	148.320	141.625
Ch10+430	147.620	142.899
Ch10+440	146.920	144.411
Ch10+450	146.220	145.759
Ch10+460	145.520	147.145
Ch10+470	144.820	147.264
Ch10+480	144.120	146.651
Ch10+490	143.420	145.338
Ch10+500	142.720	144.042
Ch10+510	142.020	142.603
Ch10+520	141.320	141.029
Ch10+530	140.620	139.903
Ch10+540	139.920	138.643
Ch10+550	139.221	137.320
Ch10+560	138.530	135.742
Ch10+570	137.848	133.697
Ch10+580	137.174	132.024
Ch10+590	136.510	130.503
Ch10+600	135.855	128.966
Ch10+610	135.208	127.586
Ch10+620	134.570	126.240
Ch10+630	133.941	124.903
Ch10+640	133.321	123.648
Ch10+650	132.710	122.515
Ch10+660	132.108	121.363
Ch10+670	131.515	120.381
Ch10+680	130.931	119.405
Ch10+690	130.355	118.496
Ch10+700	129.789	117.851
Ch10+710	129.231	117.063
Ch10+720	128.682	116.477
Ch10+730	128.142	115.806
Ch10+740	127.611	114.861
Ch10+750	127.089	114.372
Ch10+760	126.576	114.036
Ch10+770	126.072	113.230
Ch10+780	125.576	112.232
Ch10+790	125.090	111.467
Ch10+800	124.612	111.485

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
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Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

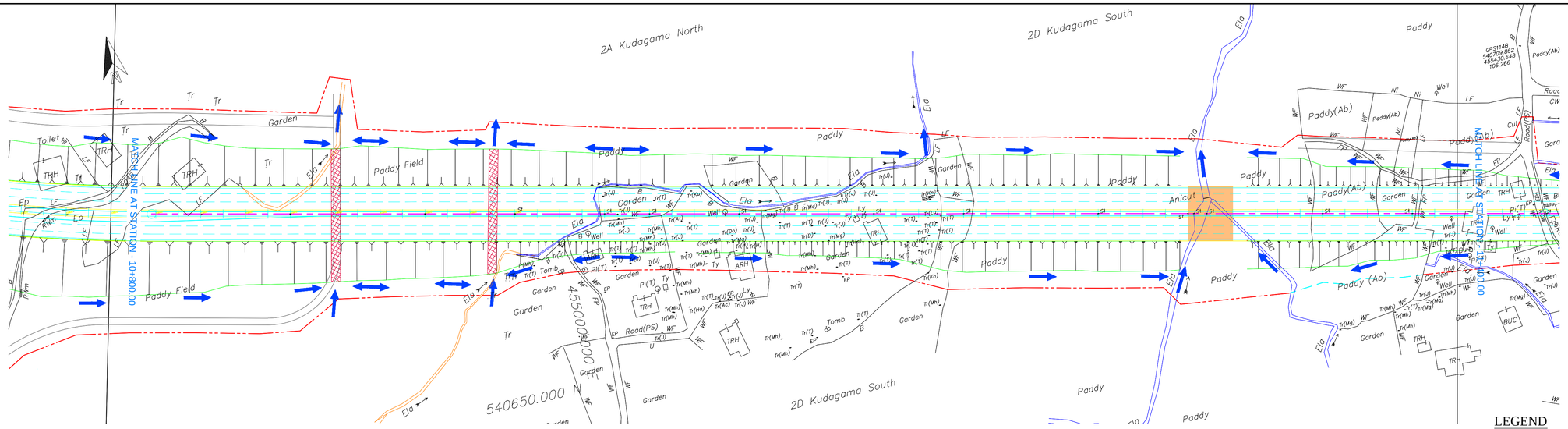
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

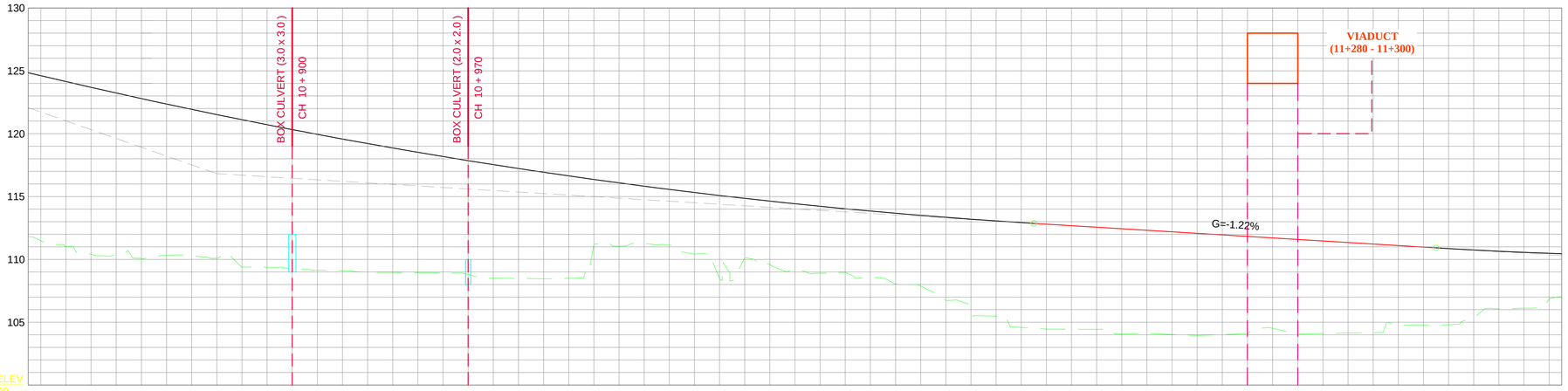
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH10+200.00 - CH10+800.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-20	1:2000	16-05-2016	20 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch10+800	124.612	111.485
Ch10+810	124.143	111.033
Ch10+820	123.684	110.413
Ch10+830	123.233	110.379
Ch10+840	122.791	110.077
Ch10+850	122.358	110.315
Ch10+860	121.933	110.296
Ch10+870	121.518	110.097
Ch10+880	121.112	109.377
Ch10+890	120.714	109.370
Ch10+900	120.325	109.271
Ch10+910	119.946	109.129
Ch10+920	119.575	109.107
Ch10+930	119.213	108.980
Ch10+940	118.860	108.967
Ch10+950	118.516	108.941
Ch10+960	118.180	108.930
Ch10+970	117.854	108.795
Ch10+980	117.536	108.507
Ch10+990	117.228	108.481
Ch11+000	116.928	108.455
Ch11+010	116.637	108.493
Ch11+020	116.355	111.189
Ch11+030	116.082	111.049
Ch11+040	115.818	111.276
Ch11+050	115.563	111.130
Ch11+060	115.317	110.420
Ch11+070	115.079	108.474
Ch11+080	114.851	110.106
Ch11+090	114.631	109.585
Ch11+100	114.420	109.298
Ch11+110	114.218	108.896
Ch11+120	114.026	108.974
Ch11+130	113.841	108.511
Ch11+140	113.666	108.025
Ch11+150	113.500	107.881
Ch11+160	113.343	106.733
Ch11+170	113.194	106.085
Ch11+180	113.055	105.486
Ch11+190	112.924	104.582
Ch11+200	112.801	104.454
Ch11+210	112.679	104.443
Ch11+220	112.558	104.434
Ch11+230	112.436	104.069
Ch11+240	112.314	104.103
Ch11+250	112.192	104.025
Ch11+260	112.070	103.944
Ch11+270	111.949	104.018
Ch11+280	111.827	104.094
Ch11+290	111.705	104.510
Ch11+300	111.583	104.062
Ch11+310	111.461	104.105
Ch11+320	111.340	104.150
Ch11+330	111.218	104.174
Ch11+340	111.096	104.775
Ch11+350	110.974	104.781
Ch11+360	110.854	104.788
Ch11+370	110.744	105.433
Ch11+380	110.645	106.067
Ch11+390	110.557	106.113
Ch11+400	110.481	106.847

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

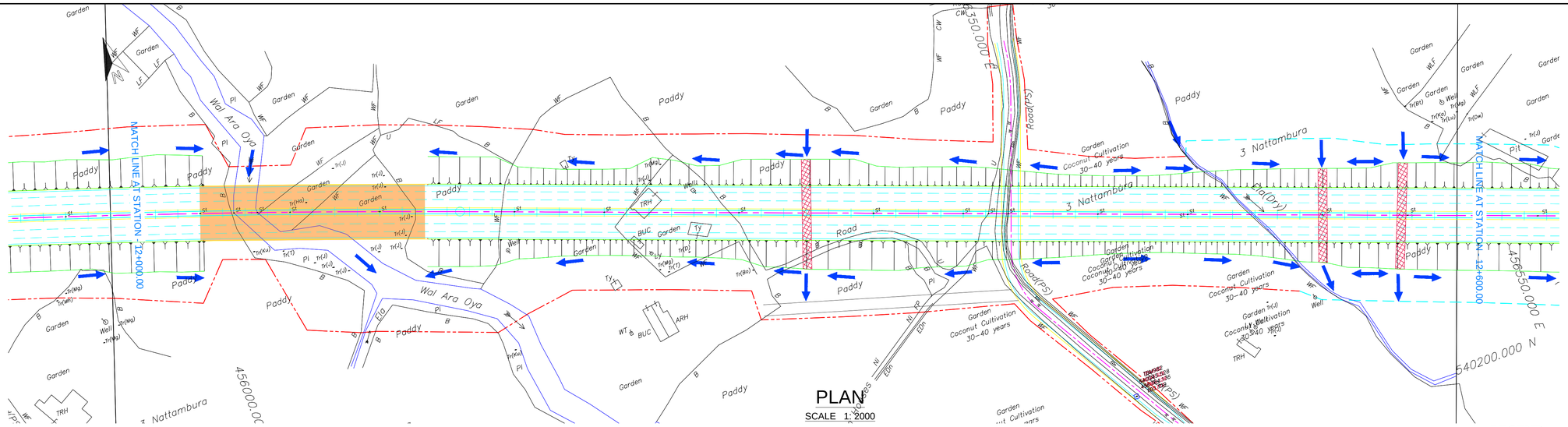
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

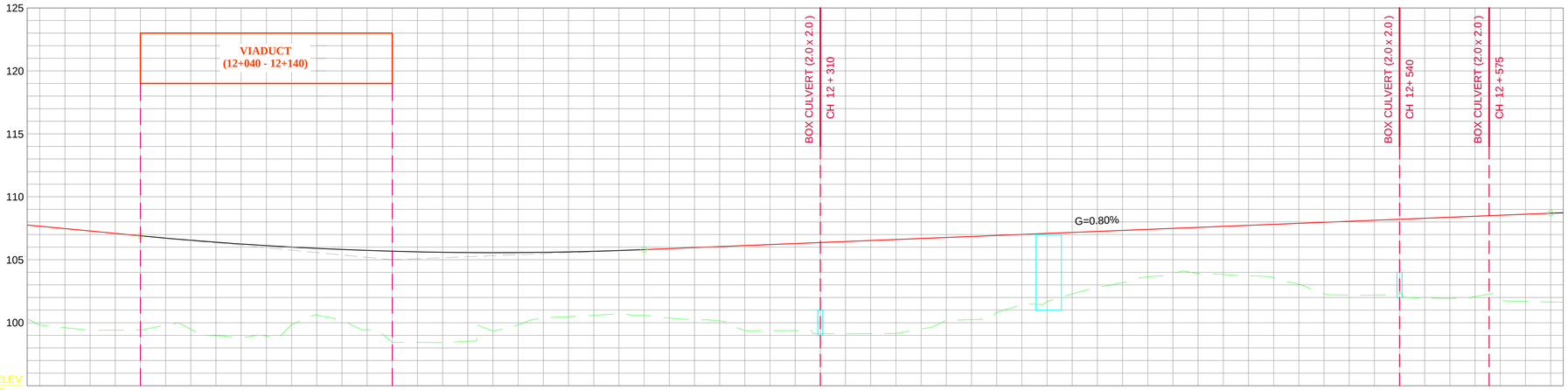
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH10+800.00 - CH11+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-21	1:2000	16-05-2016	21 of 68





CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch12+000	107.660	99.819
Ch12+010	107.470	99.606
Ch12+020	107.280	99.397
Ch12+030	107.090	99.413
Ch12+040	106.900	99.424
Ch12+050	106.717	99.804
Ch12+060	106.547	99.480
Ch12+070	106.391	98.967
Ch12+080	106.248	98.779
Ch12+090	106.119	98.949
Ch12+100	106.003	99.841
Ch12+110	105.901	100.617
Ch12+120	105.813	100.216
Ch12+130	105.737	99.439
Ch12+140	105.676	98.447
Ch12+150	105.628	98.433
Ch12+160	105.593	98.419
Ch12+170	105.572	98.527
Ch12+180	105.565	99.335
Ch12+190	105.571	99.838
Ch12+200	105.590	100.380
Ch12+210	105.623	100.477
Ch12+220	105.670	100.572
Ch12+230	105.730	100.715
Ch12+240	105.804	100.585
Ch12+250	105.884	100.372
Ch12+260	105.964	100.265
Ch12+270	106.045	100.134
Ch12+280	106.125	99.376
Ch12+290	106.205	99.375
Ch12+300	106.286	99.371
Ch12+310	106.366	99.137
Ch12+320	106.446	99.114
Ch12+330	106.527	99.133
Ch12+340	106.607	99.152
Ch12+350	106.688	99.496
Ch12+360	106.768	100.181
Ch12+370	106.848	100.243
Ch12+380	106.929	100.832
Ch12+390	107.009	101.413
Ch12+400	107.089	101.678
Ch12+410	107.170	102.282
Ch12+420	107.250	102.812
Ch12+430	107.330	103.191
Ch12+440	107.411	103.656
Ch12+450	107.491	103.920
Ch12+460	107.571	103.908
Ch12+470	107.652	103.832
Ch12+480	107.732	103.699
Ch12+490	107.812	103.574
Ch12+500	107.893	103.046
Ch12+510	107.973	102.302
Ch12+520	108.054	102.199
Ch12+530	108.134	102.197
Ch12+540	108.214	102.433
Ch12+550	108.295	101.963
Ch12+560	108.375	101.927
Ch12+570	108.455	102.079
Ch12+580	108.536	101.990
Ch12+590	108.616	101.692
Ch12+600	108.696	101.648

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

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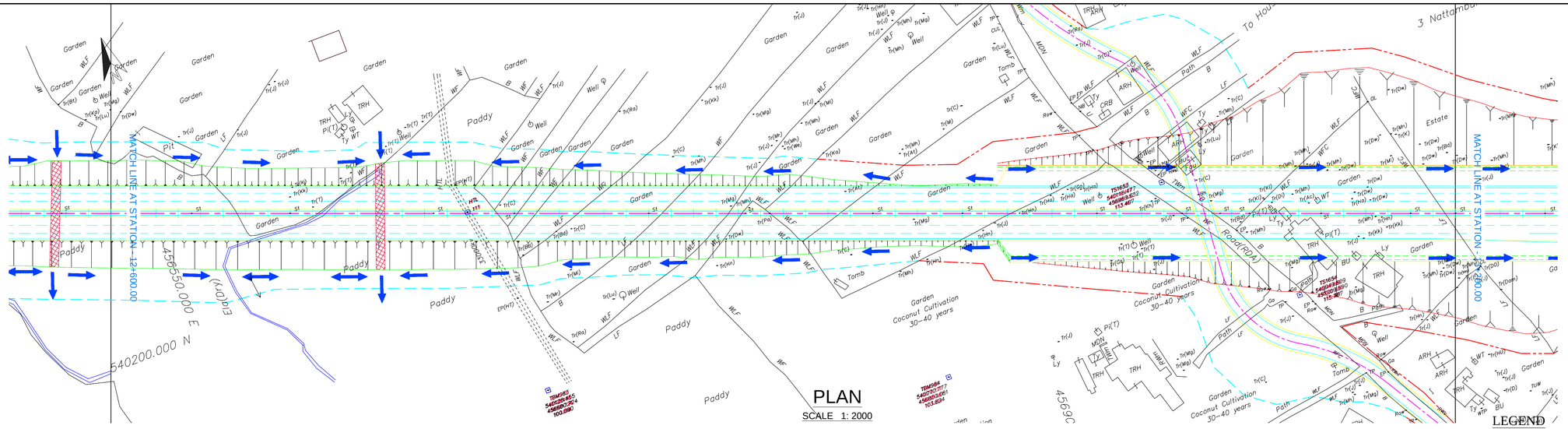
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

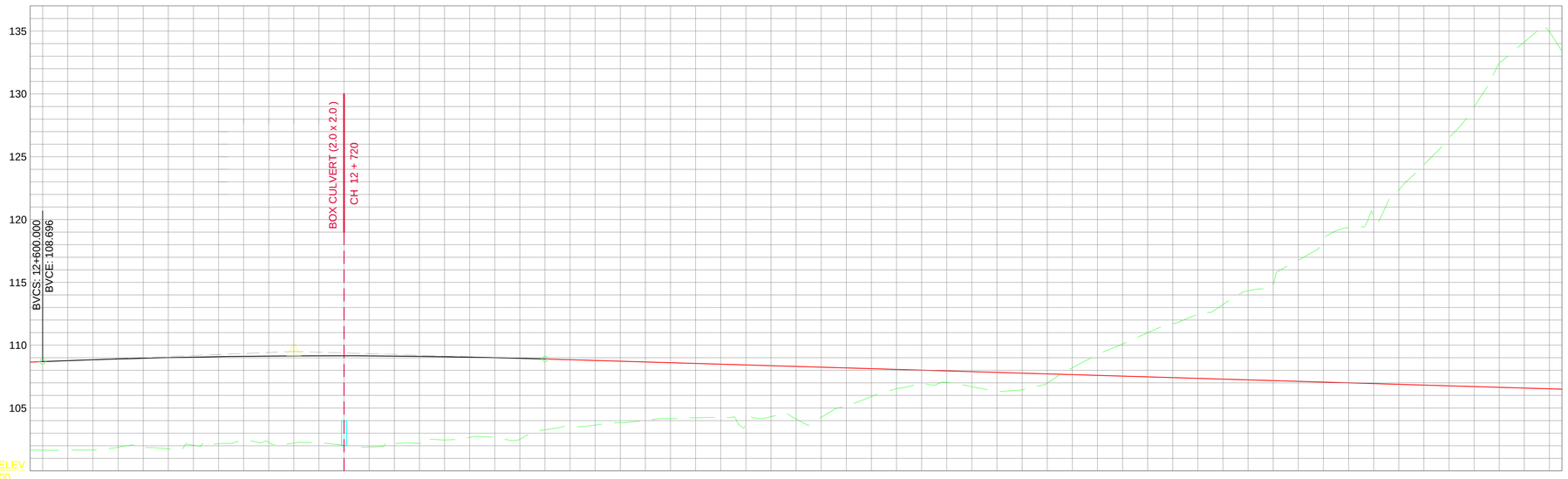
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH12+000.00 - CH12+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-23	1:2000	16-05-2016	23 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch12+600	108.696	101.648
Ch12+610	108.773	101.645
Ch12+620	108.843	101.660
Ch12+630	108.906	101.881
Ch12+640	108.962	101.863
Ch12+650	109.011	101.754
Ch12+660	109.053	102.038
Ch12+670	109.088	102.160
Ch12+680	109.116	102.484
Ch12+690	109.137	102.271
Ch12+700	109.151	102.210
Ch12+710	109.157	102.249
Ch12+720	109.157	102.027
Ch12+730	109.150	101.883
Ch12+740	109.136	102.197
Ch12+750	109.115	102.187
Ch12+760	109.087	102.455
Ch12+770	109.052	102.665
Ch12+780	109.010	102.685
Ch12+790	108.962	102.514
Ch12+800	108.906	103.270
Ch12+810	108.846	103.547
Ch12+820	108.787	103.647
Ch12+830	108.727	103.836
Ch12+840	108.668	103.963
Ch12+850	108.608	104.156
Ch12+860	108.549	104.220
Ch12+870	108.490	104.243
Ch12+880	108.430	103.729
Ch12+890	108.371	104.313
Ch12+900	108.311	104.130
Ch12+910	108.252	104.259
Ch12+920	108.192	105.158
Ch12+930	108.133	105.907
Ch12+940	108.073	106.548
Ch12+950	108.014	106.938
Ch12+960	107.955	107.039
Ch12+970	107.895	106.693
Ch12+980	107.836	106.301
Ch12+990	107.776	106.437
Ch13+000	107.717	106.972
Ch13+010	107.657	108.202
Ch13+020	107.598	109.291
Ch13+030	107.538	110.097
Ch13+040	107.479	110.997
Ch13+050	107.420	111.702
Ch13+060	107.360	112.488
Ch13+070	107.301	113.244
Ch13+080	107.241	114.330
Ch13+090	107.182	114.807
Ch13+100	107.122	116.767
Ch13+110	107.063	118.580
Ch13+120	107.003	119.353
Ch13+130	106.944	120.223
Ch13+140	106.885	122.346
Ch13+150	106.825	124.369
Ch13+160	106.766	126.521
Ch13+170	106.706	128.972
Ch13+180	106.647	132.466
Ch13+190	106.587	134.131
Ch13+200	106.528	134.968

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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    Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

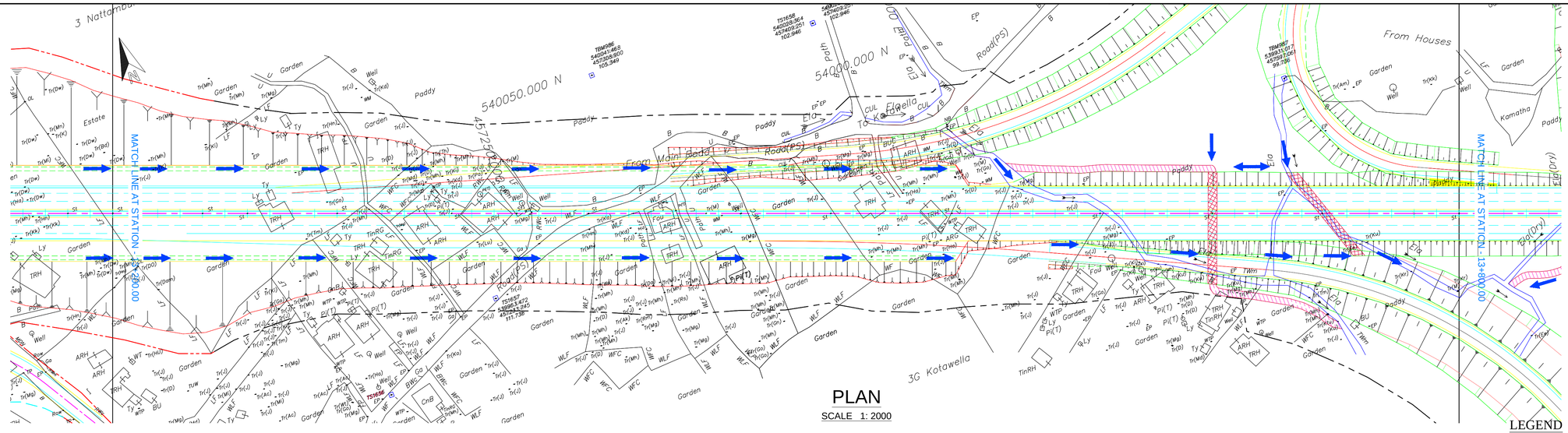
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH12+600.00 - CH13+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-24	1:2000	16-05-2016	24 of 68

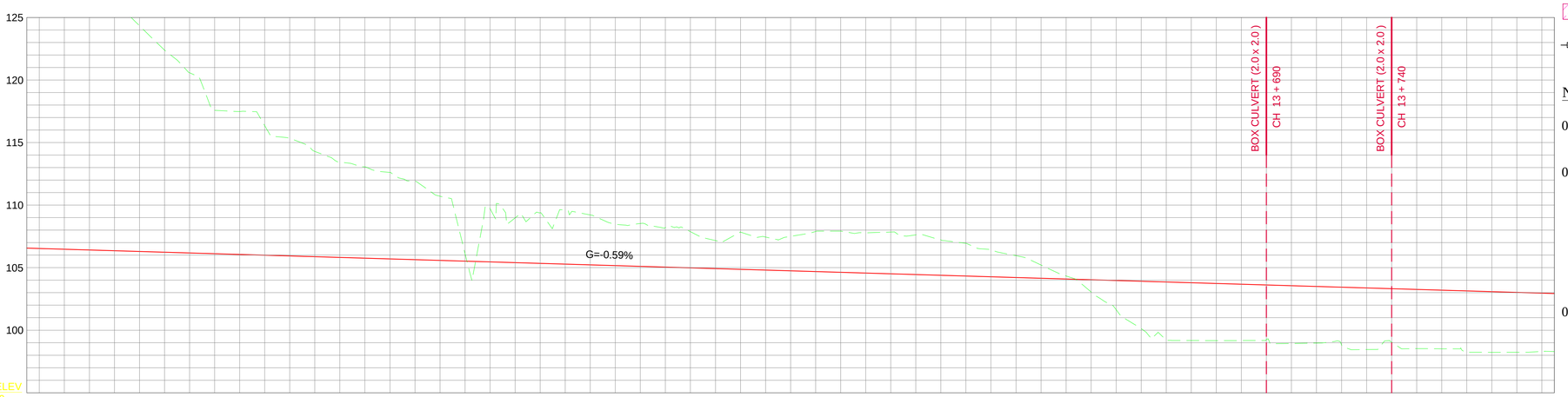


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch13+200	106.528	134.968
Ch13+210	106.469	131.825
Ch13+220	106.409	128.889
Ch13+230	106.350	126.315
Ch13+240	106.290	124.337
Ch13+250	106.231	122.394
Ch13+260	106.171	120.579
Ch13+270	106.112	117.575
Ch13+280	106.052	117.483
Ch13+290	105.993	116.351
Ch13+300	105.934	115.336
Ch13+310	105.874	114.292
Ch13+320	105.815	113.430
Ch13+330	105.755	113.056
Ch13+340	105.696	112.612
Ch13+350	105.636	111.900
Ch13+360	105.577	110.710
Ch13+370	105.517	106.135
Ch13+380	105.458	109.714
Ch13+390	105.399	108.971
Ch13+400	105.339	109.384
Ch13+410	105.280	109.597
Ch13+420	105.220	109.211
Ch13+430	105.161	108.463
Ch13+440	105.101	108.529
Ch13+450	105.042	108.213
Ch13+460	104.983	107.874
Ch13+470	104.923	107.163
Ch13+480	104.864	107.843
Ch13+490	104.804	107.446
Ch13+500	104.745	107.497
Ch13+510	104.685	107.892
Ch13+520	104.626	107.916
Ch13+530	104.566	107.789
Ch13+540	104.507	107.848
Ch13+550	104.448	107.614
Ch13+560	104.388	107.225
Ch13+570	104.329	106.946
Ch13+580	104.269	106.454
Ch13+590	104.210	105.956
Ch13+600	104.150	105.208
Ch13+610	104.091	104.339
Ch13+620	104.031	103.058
Ch13+630	103.972	101.638
Ch13+640	103.913	100.136
Ch13+650	103.853	99.181
Ch13+660	103.794	99.174
Ch13+670	103.734	99.168
Ch13+680	103.675	99.172
Ch13+690	103.615	99.279
Ch13+700	103.556	98.940
Ch13+710	103.497	98.970
Ch13+720	103.437	98.827
Ch13+730	103.378	98.453
Ch13+740	103.318	99.049
Ch13+750	103.259	98.529
Ch13+760	103.199	98.510
Ch13+770	103.140	98.242
Ch13+780	103.080	98.234
Ch13+790	103.021	98.236
Ch13+800	102.962	98.302

NOTE

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

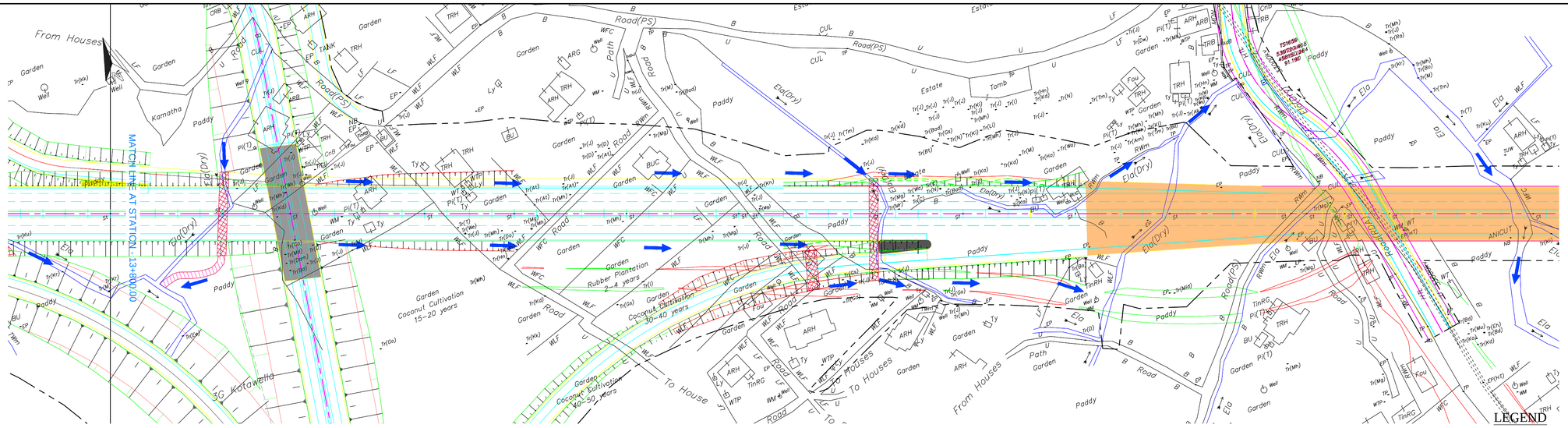
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH13+200.00 - CH13+800.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-25	1:2000	16-05-2016	25 of 68

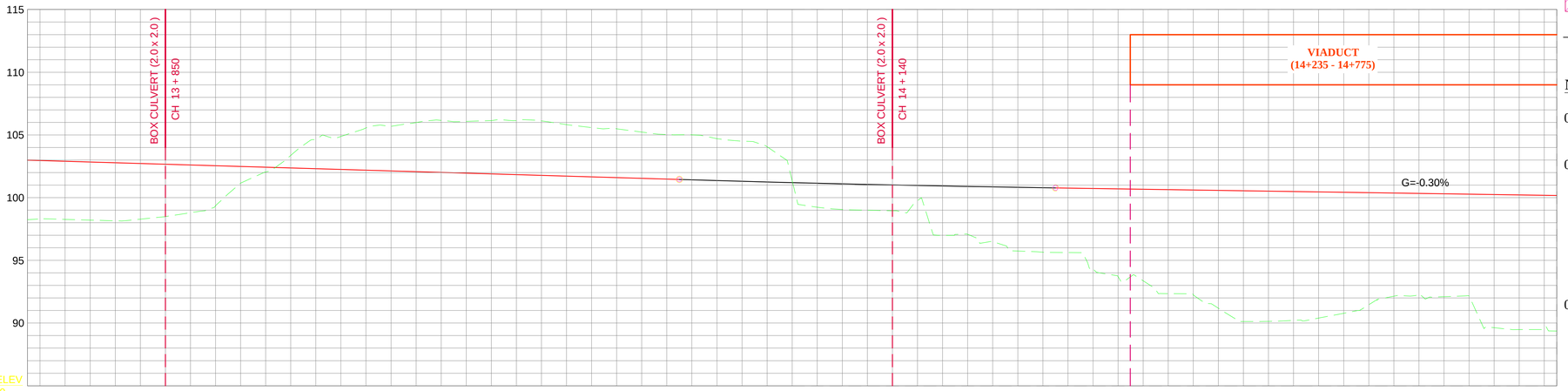


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch13+800	102.962	98.302
Ch13+810	102.902	98.266
Ch13+820	102.843	98.209
Ch13+830	102.783	98.152
Ch13+840	102.724	98.285
Ch13+850	102.664	98.489
Ch13+860	102.605	98.799
Ch13+870	102.545	99.345
Ch13+880	102.486	101.151
Ch13+890	102.427	102.044
Ch13+900	102.367	103.366
Ch13+910	102.308	104.618
Ch13+920	102.248	104.877
Ch13+930	102.189	105.561
Ch13+940	102.129	105.691
Ch13+950	102.070	105.990
Ch13+960	102.010	106.158
Ch13+970	101.951	106.080
Ch13+980	101.892	106.142
Ch13+990	101.832	106.139
Ch14+000	101.773	106.121
Ch14+010	101.713	105.818
Ch14+020	101.654	105.585
Ch14+030	101.594	105.491
Ch14+040	101.535	105.228
Ch14+050	101.476	105.031
Ch14+060	101.416	105.007
Ch14+070	101.359	104.702
Ch14+080	101.303	104.503
Ch14+090	101.250	104.066
Ch14+100	101.198	101.348
Ch14+110	101.148	99.236
Ch14+120	101.101	99.056
Ch14+130	101.055	98.997
Ch14+140	101.011	98.954
Ch14+150	100.969	99.758
Ch14+160	100.929	96.992
Ch14+170	100.892	97.076
Ch14+180	100.856	96.485
Ch14+190	100.822	95.741
Ch14+200	100.790	95.649
Ch14+210	100.759	95.622
Ch14+220	100.729	94.279
Ch14+230	100.699	93.700
Ch14+240	100.669	93.374
Ch14+250	100.639	92.348
Ch14+260	100.609	92.256
Ch14+270	100.579	91.189
Ch14+280	100.548	90.117
Ch14+290	100.518	90.134
Ch14+300	100.488	90.212
Ch14+310	100.458	90.396
Ch14+320	100.428	90.780
Ch14+330	100.398	91.458
Ch14+340	100.368	92.139
Ch14+350	100.338	92.352
Ch14+360	100.308	92.100
Ch14+370	100.278	92.140
Ch14+380	100.247	89.631
Ch14+390	100.217	89.478
Ch14+400	100.187	89.544

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

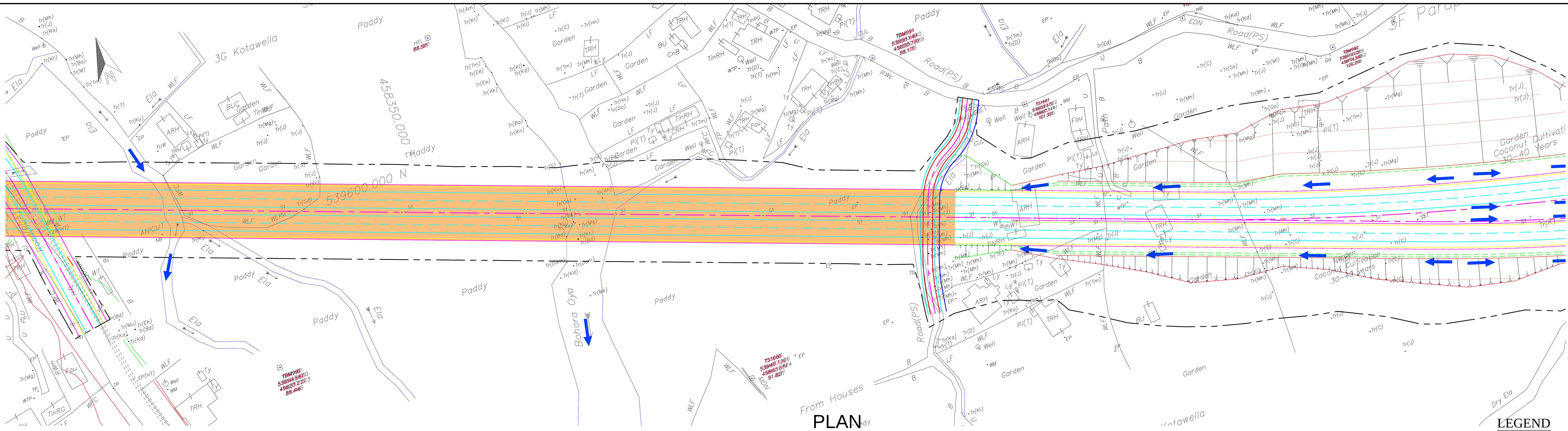
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH13+800.00 - CH14+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-26	1:2000	16-05-2016	26 of 68

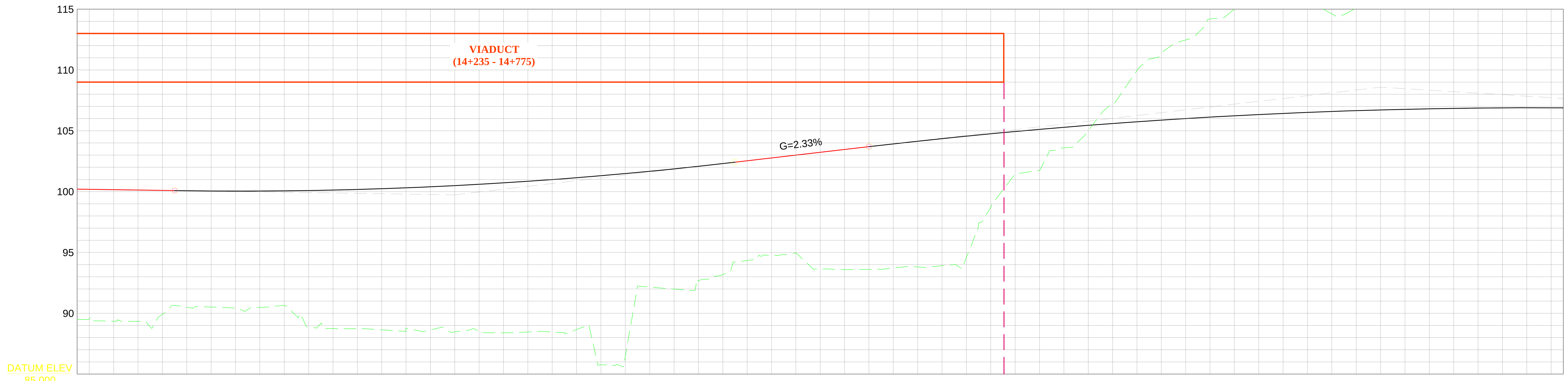


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch14+400	100.187	89.544
Ch14+410	100.157	89.346
Ch14+420	100.127	89.332
Ch14+430	100.097	89.914
Ch14+440	100.068	90.496
Ch14+450	100.050	90.508
Ch14+460	100.042	90.433
Ch14+470	100.047	90.485
Ch14+480	100.062	90.652
Ch14+490	100.089	88.879
Ch14+500	100.128	88.732
Ch14+510	100.178	88.733
Ch14+520	100.239	88.639
Ch14+530	100.312	88.763
Ch14+540	100.396	88.630
Ch14+550	100.492	88.467
Ch14+560	100.599	88.417
Ch14+570	100.718	88.396
Ch14+580	100.848	88.458
Ch14+590	100.989	88.453
Ch14+600	101.142	88.669
Ch14+610	101.306	85.769
Ch14+620	101.482	86.474
Ch14+630	101.669	92.150
Ch14+640	101.868	91.987
Ch14+650	102.078	92.672
Ch14+660	102.300	93.179
Ch14+670	102.531	94.338
Ch14+680	102.764	94.751
Ch14+690	102.997	94.946
Ch14+700	103.230	93.636
Ch14+710	103.463	93.584
Ch14+720	103.696	93.611
Ch14+730	103.925	93.713
Ch14+740	104.145	93.802
Ch14+750	104.357	93.907
Ch14+760	104.560	94.575
Ch14+770	104.755	98.726
Ch14+780	104.941	101.448
Ch14+790	105.119	101.749
Ch14+800	105.288	103.597
Ch14+810	105.449	105.003
Ch14+820	105.601	107.170
Ch14+830	105.745	109.956
Ch14+840	105.880	111.332
Ch14+850	106.007	112.468
Ch14+860	106.126	114.195
Ch14+870	106.236	115.000
Ch14+880	106.337	116.775
Ch14+890	106.430	116.661
Ch14+900	106.514	115.532
Ch14+910	106.590	114.610
Ch14+920	106.658	115.090
Ch14+930	106.717	115.487
Ch14+940	106.767	115.988
Ch14+950	106.809	117.187
Ch14+960	106.843	119.538
Ch14+970	106.868	120.816
Ch14+980	106.884	122.414
Ch14+990	106.892	123.708
Ch15+000	106.892	123.552

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

NOTE

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MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
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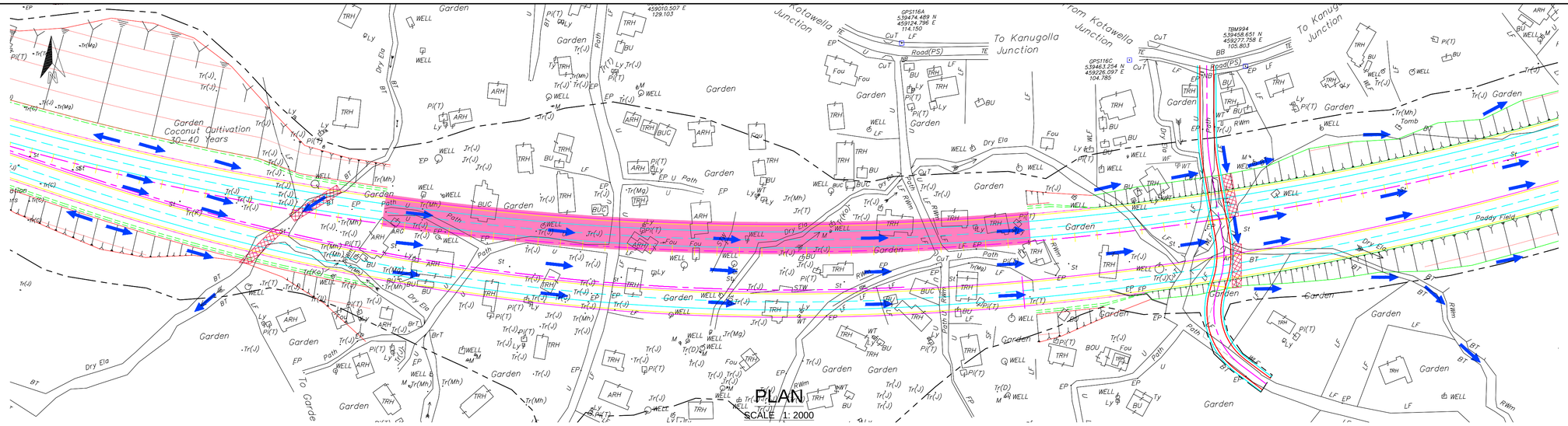
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

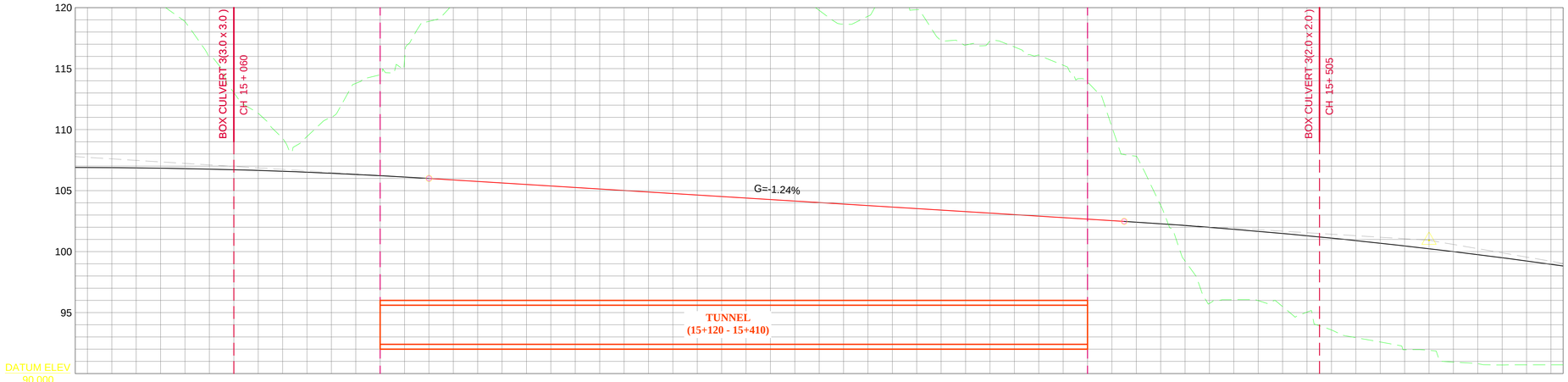
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH14+400.00 - CH15+000.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-27	1:2000	16-05-2016	27 of 68



PLAN

SCALE : 1: 2000



CHAINAGE	Ch15+000	Ch15+010	Ch15+020	Ch15+030	Ch15+040	Ch15+050	Ch15+060	Ch15+070	Ch15+080	Ch15+090	Ch15+100	Ch15+110	Ch15+120	Ch15+130	Ch15+140	Ch15+150	Ch15+160	Ch15+170	Ch15+180	Ch15+190	Ch15+200	Ch15+210	Ch15+220	Ch15+230	Ch15+240	Ch15+250	Ch15+260	Ch15+270	Ch15+280	Ch15+290	Ch15+300	Ch15+310	Ch15+320	Ch15+330	Ch15+340	Ch15+350	Ch15+360	Ch15+370	Ch15+380	Ch15+390	Ch15+400	Ch15+410	Ch15+420	Ch15+430	Ch15+440	Ch15+450	Ch15+460	Ch15+470	Ch15+480	Ch15+490	Ch15+500	Ch15+510	Ch15+520	Ch15+530	Ch15+540	Ch15+550	Ch15+560	Ch15+570	Ch15+580	Ch15+590	Ch15+600
FINISHED GROUND LEVEL	106.892	106.883	106.865	106.840	106.805	106.762	106.711	106.651	106.583	106.506	106.421	106.327	106.224	106.114	105.994	105.871	105.747	105.624	105.500	105.377	105.253	105.130	105.006	104.883	104.759	104.636	104.512	104.389	104.265	104.142	104.018	103.895	103.771	103.648	103.524	103.401	103.277	103.153	103.030	102.906	102.783	102.659	102.536	102.411	102.279	102.138	101.988	101.829	101.661	101.484	101.299	101.104	100.901	100.689	100.468	100.238	100.000	99.752	99.496	99.231	98.957
EXSISTING GROUND LEVEL	123.552	122.572	121.169	120.298	118.860	116.028	113.030	111.346	109.315	109.425	111.046	113.792	114.494	115.743	118.872	120.215	122.794	123.408	125.980	128.027	130.360	132.246	134.696	136.697	136.409	133.985	130.274	128.432	123.917	120.804	119.777	118.645	119.290	120.833	119.831	117.293	116.930	117.245	116.774	116.116	115.285	113.907	110.221	107.821	103.783	99.224	95.754	96.056	95.983	95.490	95.035	93.577	92.945	92.591	91.955	91.904	90.941	90.806	90.707	90.711	90.715

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

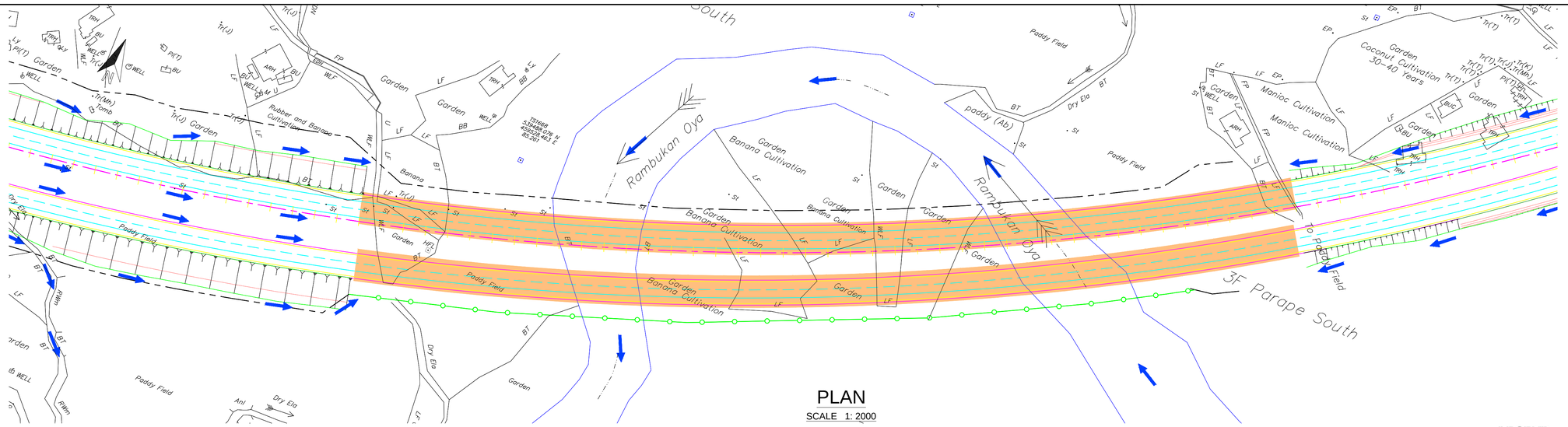
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

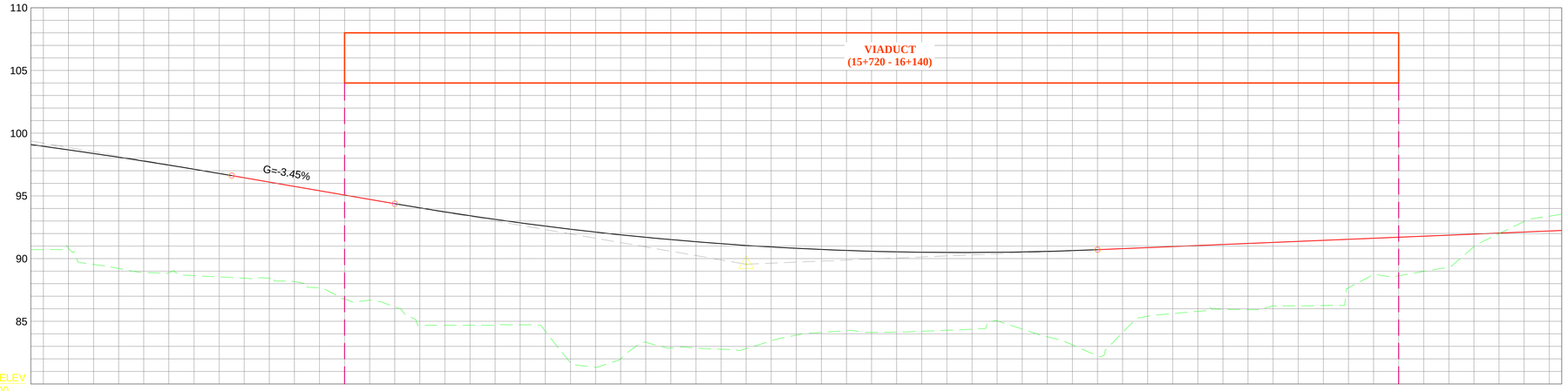
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH15+000.00 - CH15+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-29	1:2000	16-05-2016	29 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch15+600	98.957	90.715
Ch15+610	98.674	90.833
Ch15+620	98.382	89.532
Ch15+630	98.082	89.209
Ch15+640	97.772	88.903
Ch15+650	97.454	88.881
Ch15+660	97.127	88.634
Ch15+670	96.791	88.540
Ch15+680	96.447	88.432
Ch15+690	96.102	88.433
Ch15+700	95.757	88.155
Ch15+710	95.412	87.667
Ch15+720	95.068	86.760
Ch15+730	94.723	86.681
Ch15+740	94.378	86.146
Ch15+750	94.041	84.688
Ch15+760	93.719	84.687
Ch15+770	93.412	84.686
Ch15+780	93.121	84.713
Ch15+790	92.845	84.718
Ch15+800	92.584	84.211
Ch15+810	92.338	81.704
Ch15+820	92.108	81.333
Ch15+830	91.893	82.005
Ch15+840	91.693	83.345
Ch15+850	91.508	82.868
Ch15+860	91.339	82.870
Ch15+870	91.185	82.771
Ch15+880	91.046	82.818
Ch15+890	90.923	83.445
Ch15+900	90.815	83.899
Ch15+910	90.722	84.105
Ch15+920	90.644	84.256
Ch15+930	90.582	84.118
Ch15+940	90.535	84.141
Ch15+950	90.503	84.202
Ch15+960	90.486	84.281
Ch15+970	90.485	84.373
Ch15+980	90.499	85.034
Ch15+990	90.528	84.377
Ch16+000	90.573	83.764
Ch16+010	90.633	83.118
Ch16+020	90.708	82.246
Ch16+030	90.790	84.100
Ch16+040	90.873	85.398
Ch16+050	90.956	85.614
Ch16+060	91.038	85.791
Ch16+070	91.121	85.956
Ch16+080	91.204	85.925
Ch16+090	91.287	86.237
Ch16+100	91.369	86.234
Ch16+110	91.452	86.256
Ch16+120	91.535	87.677
Ch16+130	91.617	88.644
Ch16+140	91.700	88.632
Ch16+150	91.783	88.974
Ch16+160	91.865	89.261
Ch16+170	91.948	90.945
Ch16+180	92.031	91.988
Ch16+190	92.113	92.957
Ch16+200	92.196	93.380

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

01. Structures and structure locations are given for indication only.

02. Storm water drainage management plan at cut sections to be suitably designed depending on the site conditions at detailed design stage.
Only a tentative plan is given at some locations based on currently proposed vertical profile by RDA which shall be changed to suit the site conditions.

03. Storm water drainage management plan at interchange areas to be designed based on finalized geometric designs. Tentative partial plans given considering the main traces in these locations.

04. Existing width of the canal to be maintained wherever canal route is block and diverted. For such major streams, drainage network should be suitably designed and get approval from SLLRDC.
Only an indicative plan is given for flow directions.

05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
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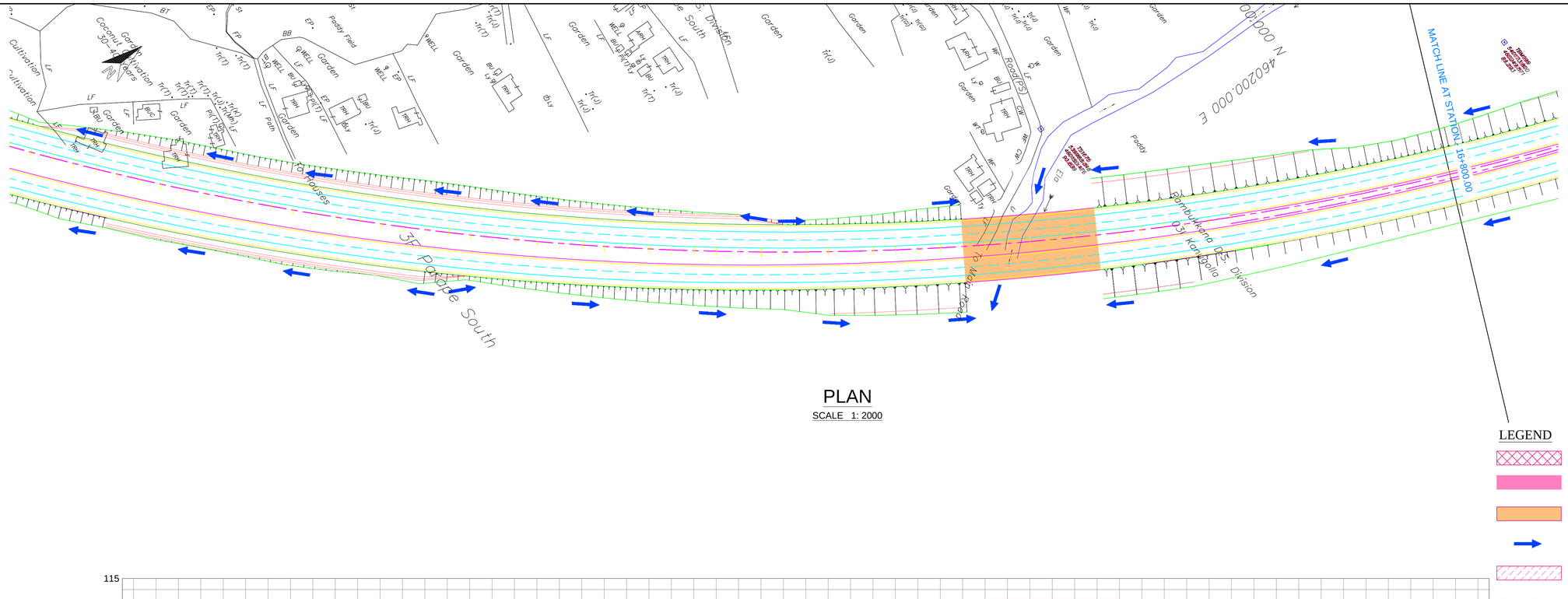
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

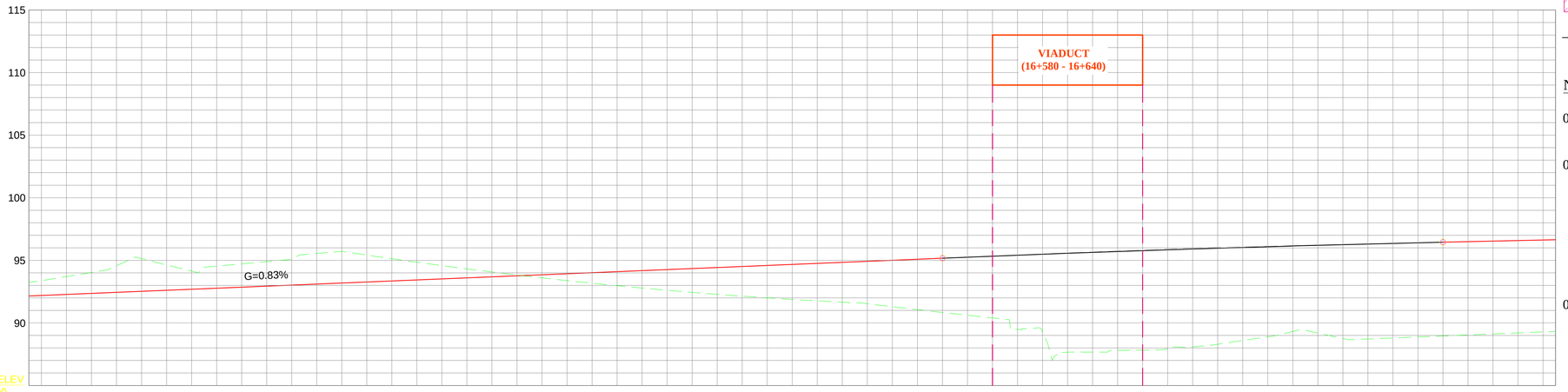
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH15+600.00 - CH16+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-31	1:2000	16-05-2016	31 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch16+200	92.196	93.380
Ch16+210	92.279	93.702
Ch16+220	92.362	94.029
Ch16+230	92.444	94.567
Ch16+240	92.527	95.140
Ch16+250	92.610	94.633
Ch16+260	92.692	94.136
Ch16+270	92.775	94.535
Ch16+280	92.858	94.714
Ch16+290	92.940	94.898
Ch16+300	93.023	95.110
Ch16+310	93.106	95.547
Ch16+320	93.188	95.712
Ch16+330	93.271	95.418
Ch16+340	93.354	95.128
Ch16+350	93.437	94.848
Ch16+360	93.519	94.578
Ch16+370	93.602	94.318
Ch16+380	93.685	94.069
Ch16+390	93.767	93.829
Ch16+400	93.850	93.600
Ch16+410	93.933	93.381
Ch16+420	94.015	93.173
Ch16+430	94.098	92.974
Ch16+440	94.181	92.786
Ch16+450	94.263	92.609
Ch16+460	94.346	92.441
Ch16+470	94.429	92.284
Ch16+480	94.512	92.137
Ch16+490	94.594	92.001
Ch16+500	94.677	91.875
Ch16+510	94.760	91.759
Ch16+520	94.842	91.654
Ch16+530	94.925	91.532
Ch16+540	95.008	91.294
Ch16+550	95.090	91.062
Ch16+560	95.173	90.836
Ch16+570	95.255	90.616
Ch16+580	95.335	90.402
Ch16+590	95.413	89.487
Ch16+600	95.489	89.293
Ch16+610	95.563	87.659
Ch16+620	95.635	87.664
Ch16+630	95.705	87.802
Ch16+640	95.773	87.821
Ch16+650	95.840	87.993
Ch16+660	95.904	88.077
Ch16+670	95.967	88.295
Ch16+680	96.028	88.593
Ch16+690	96.086	88.889
Ch16+700	96.143	89.319
Ch16+710	96.198	89.190
Ch16+720	96.251	88.758
Ch16+730	96.303	88.716
Ch16+740	96.352	88.797
Ch16+750	96.399	88.877
Ch16+760	96.444	88.958
Ch16+770	96.489	89.038
Ch16+780	96.533	89.119
Ch16+790	96.578	89.200
Ch16+800	96.622	89.281

NOTE

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    Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

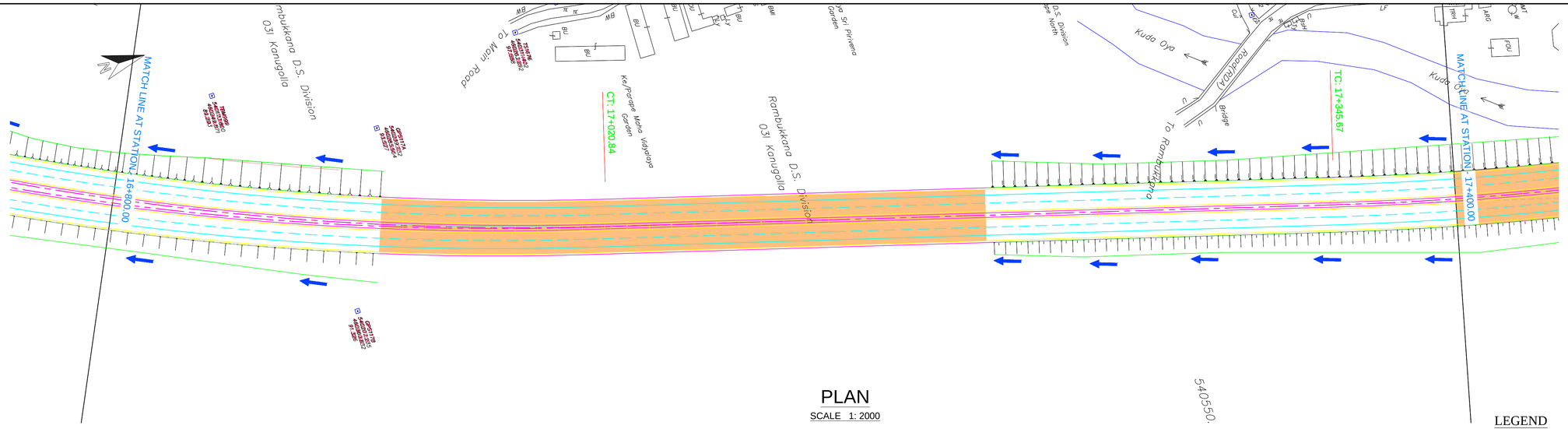
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

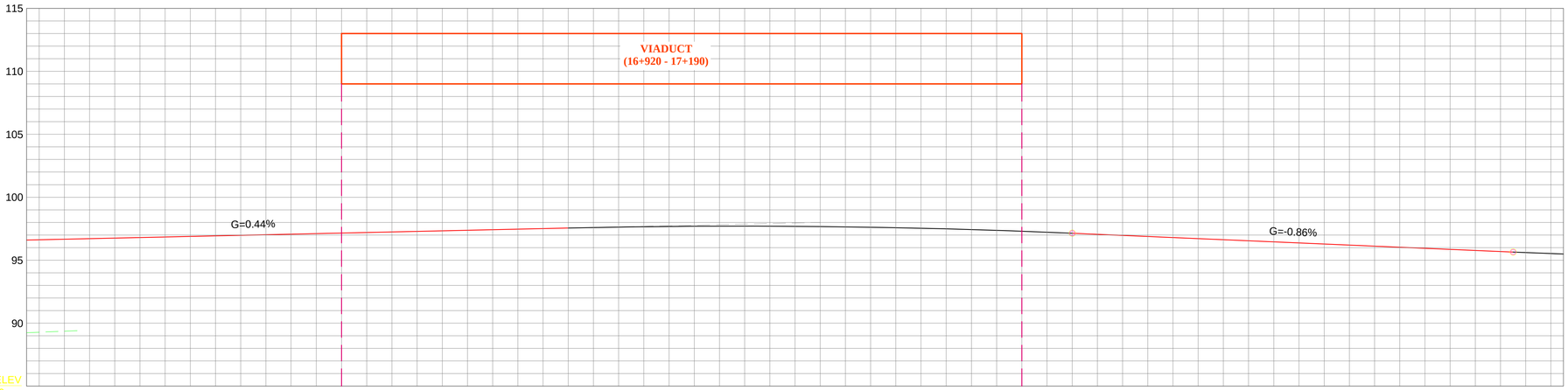
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH16+200.00 - CH16+800.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-33	1:2000	16-05-2016	33 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch16+800	96.622	89.281
Ch16+810	96.667	89.362
Ch16+820	96.711	
Ch16+830	96.756	
Ch16+840	96.800	
Ch16+850	96.844	
Ch16+860	96.889	
Ch16+870	96.933	
Ch16+880	96.978	
Ch16+890	97.022	
Ch16+900	97.067	
Ch16+910	97.111	
Ch16+920	97.156	
Ch16+930	97.200	
Ch16+940	97.244	
Ch16+950	97.289	
Ch16+960	97.333	
Ch16+970	97.378	
Ch16+980	97.422	
Ch16+990	97.467	
Ch17+000	97.511	
Ch17+010	97.556	
Ch17+020	97.597	
Ch17+030	97.631	
Ch17+040	97.660	
Ch17+050	97.681	
Ch17+060	97.696	
Ch17+070	97.705	
Ch17+080	97.707	
Ch17+090	97.703	
Ch17+100	97.692	
Ch17+110	97.675	
Ch17+120	97.651	
Ch17+130	97.620	
Ch17+140	97.583	
Ch17+150	97.540	
Ch17+160	97.490	
Ch17+170	97.434	
Ch17+180	97.371	
Ch17+190	97.301	
Ch17+200	97.225	
Ch17+210	97.143	
Ch17+220	97.057	
Ch17+230	96.971	
Ch17+240	96.886	
Ch17+250	96.800	
Ch17+260	96.714	
Ch17+270	96.629	
Ch17+280	96.543	
Ch17+290	96.457	
Ch17+300	96.371	
Ch17+310	96.286	
Ch17+320	96.200	
Ch17+330	96.114	
Ch17+340	96.029	
Ch17+350	95.943	
Ch17+360	95.857	
Ch17+370	95.771	
Ch17+380	95.686	
Ch17+390	95.602	
Ch17+400	95.528	

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

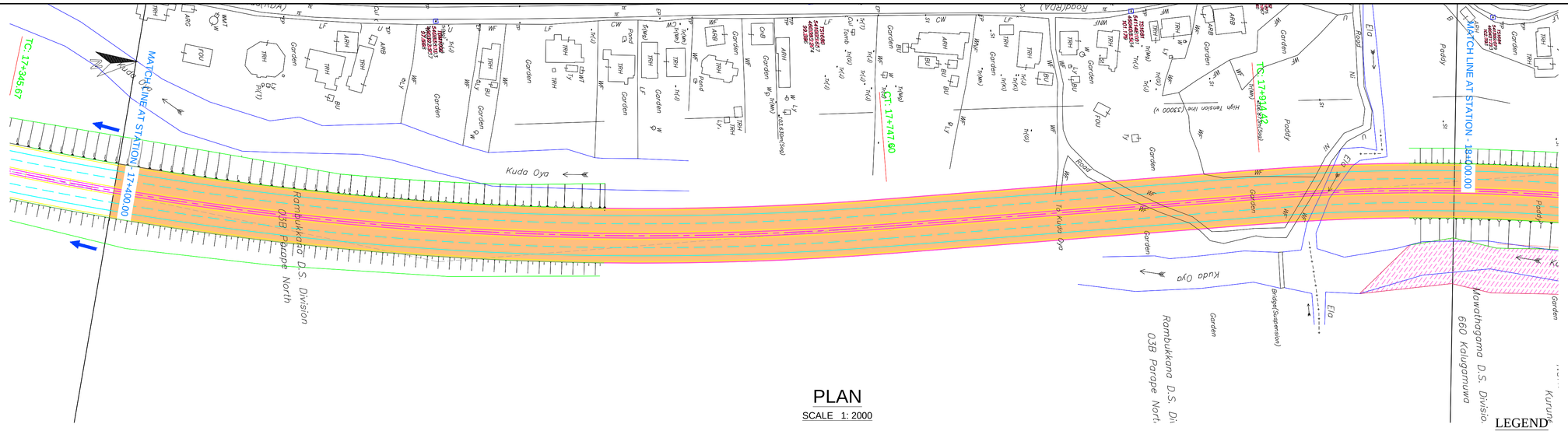
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

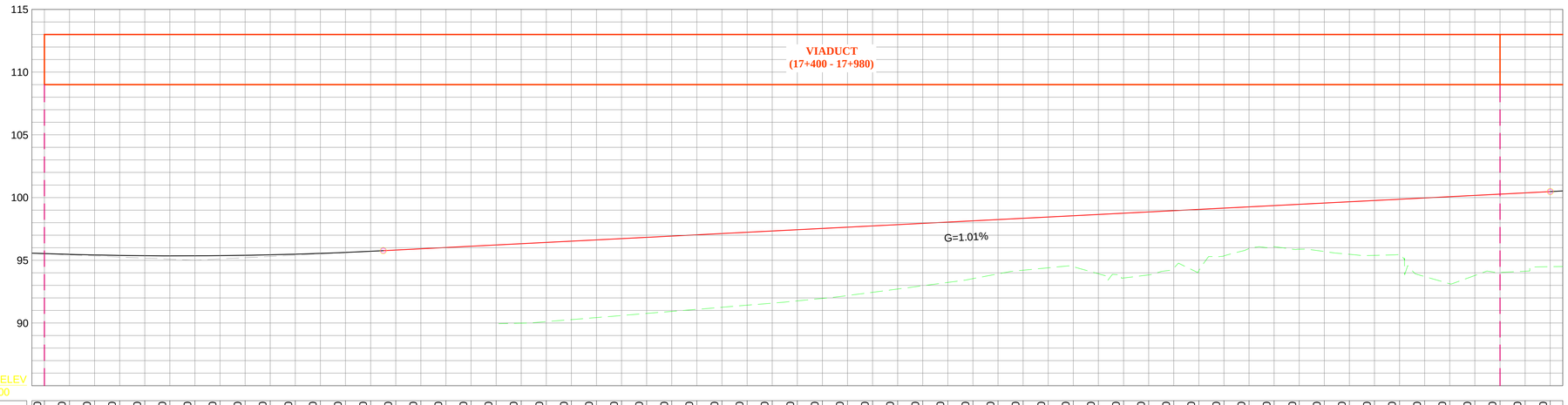
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH16+800.00 - CH17+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-35	1:2000	16-05-2016	35 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch17+400	95.528	
Ch17+410	95.468	
Ch17+420	95.419	
Ch17+430	95.383	
Ch17+440	95.360	
Ch17+450	95.349	
Ch17+460	95.351	
Ch17+470	95.365	
Ch17+480	95.391	
Ch17+490	95.430	
Ch17+500	95.482	
Ch17+510	95.546	
Ch17+520	95.622	
Ch17+530	95.711	
Ch17+540	95.811	
Ch17+550	95.913	
Ch17+560	96.014	
Ch17+570	96.115	
Ch17+580	96.217	
Ch17+590	96.318	89.982
Ch17+600	96.419	90.106
Ch17+610	96.521	90.269
Ch17+620	96.622	90.432
Ch17+630	96.724	90.596
Ch17+640	96.825	90.759
Ch17+650	96.926	90.923
Ch17+660	97.028	91.088
Ch17+670	97.129	91.252
Ch17+680	97.231	91.417
Ch17+690	97.332	91.581
Ch17+700	97.433	91.762
Ch17+710	97.535	91.959
Ch17+720	97.636	92.186
Ch17+730	97.738	92.444
Ch17+740	97.839	92.705
Ch17+750	97.940	92.968
Ch17+760	98.042	93.233
Ch17+770	98.143	93.534
Ch17+780	98.245	93.916
Ch17+790	98.346	94.206
Ch17+800	98.447	94.399
Ch17+810	98.549	94.484
Ch17+820	98.650	93.921
Ch17+830	98.751	93.590
Ch17+840	98.853	93.829
Ch17+850	98.954	94.363
Ch17+860	99.056	94.167
Ch17+870	99.157	95.348
Ch17+880	99.258	95.938
Ch17+890	99.360	96.079
Ch17+900	99.461	95.880
Ch17+910	99.563	95.696
Ch17+920	99.664	95.473
Ch17+930	99.765	95.390
Ch17+940	99.867	95.450
Ch17+950	99.968	93.701
Ch17+960	100.070	93.123
Ch17+970	100.171	93.787
Ch17+980	100.272	94.028
Ch17+990	100.374	94.125
Ch18+000	100.475	94.489

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH17+400.00 - CH18+000.00)

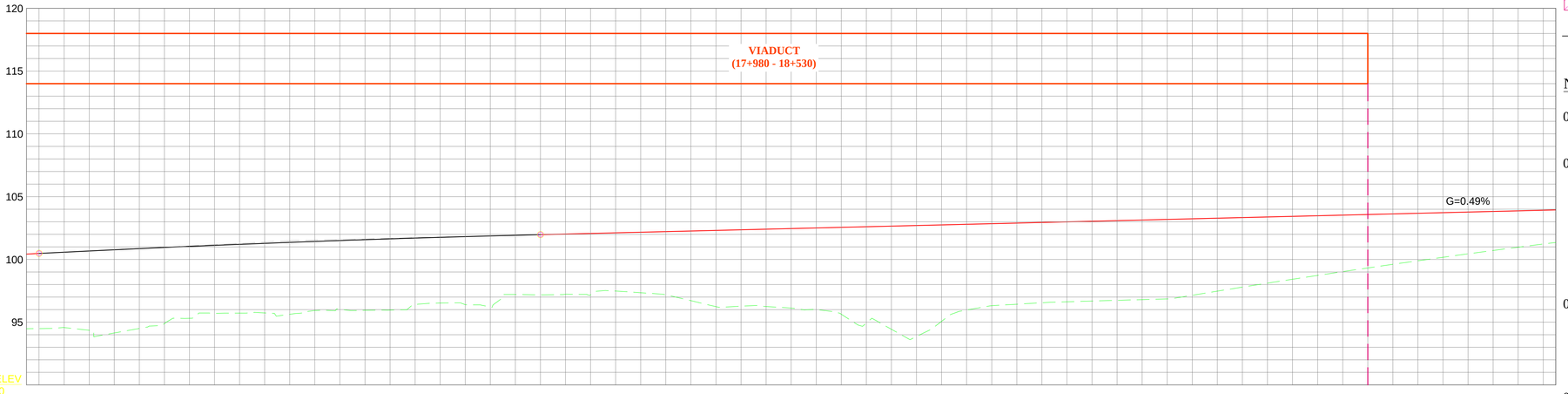
Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-37	1:2000	16-05-2016	37 of 68

PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch18+000	100.475	94.489
Ch18+010	100.575	94.570
Ch18+020	100.673	94.350
Ch18+030	100.767	94.139
Ch18+040	100.860	94.496
Ch18+050	100.949	94.885
Ch18+060	101.036	95.306
Ch18+070	101.120	95.705
Ch18+080	101.202	95.721
Ch18+090	101.281	95.737
Ch18+100	101.357	95.628
Ch18+110	101.430	95.927
Ch18+120	101.501	96.023
Ch18+130	101.570	95.943
Ch18+140	101.635	95.962
Ch18+150	101.698	96.422
Ch18+160	101.759	96.519
Ch18+170	101.817	96.394
Ch18+180	101.872	96.205
Ch18+190	101.924	97.210
Ch18+200	101.974	97.176
Ch18+210	102.023	97.224
Ch18+220	102.071	97.172
Ch18+230	102.120	97.478
Ch18+240	102.168	97.347
Ch18+250	102.217	97.178
Ch18+260	102.265	96.717
Ch18+270	102.314	96.239
Ch18+280	102.362	96.270
Ch18+290	102.411	96.243
Ch18+300	102.459	96.123
Ch18+310	102.508	96.007
Ch18+320	102.556	95.632
Ch18+330	102.605	94.937
Ch18+340	102.653	94.434
Ch18+350	102.702	93.862
Ch18+360	102.750	95.066
Ch18+370	102.799	95.970
Ch18+380	102.847	96.312
Ch18+390	102.896	96.429
Ch18+400	102.944	96.546
Ch18+410	102.993	96.623
Ch18+420	103.041	96.681
Ch18+430	103.090	96.738
Ch18+440	103.138	96.796
Ch18+450	103.187	96.854
Ch18+460	103.235	97.142
Ch18+470	103.284	97.469
Ch18+480	103.332	97.791
Ch18+490	103.381	98.107
Ch18+500	103.429	98.418
Ch18+510	103.478	98.723
Ch18+520	103.526	99.023
Ch18+530	103.575	99.317
Ch18+540	103.623	99.606
Ch18+550	103.672	99.890
Ch18+560	103.720	100.169
Ch18+570	103.769	100.442
Ch18+580	103.817	100.709
Ch18+590	103.866	100.971
Ch18+600	103.914	101.227

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

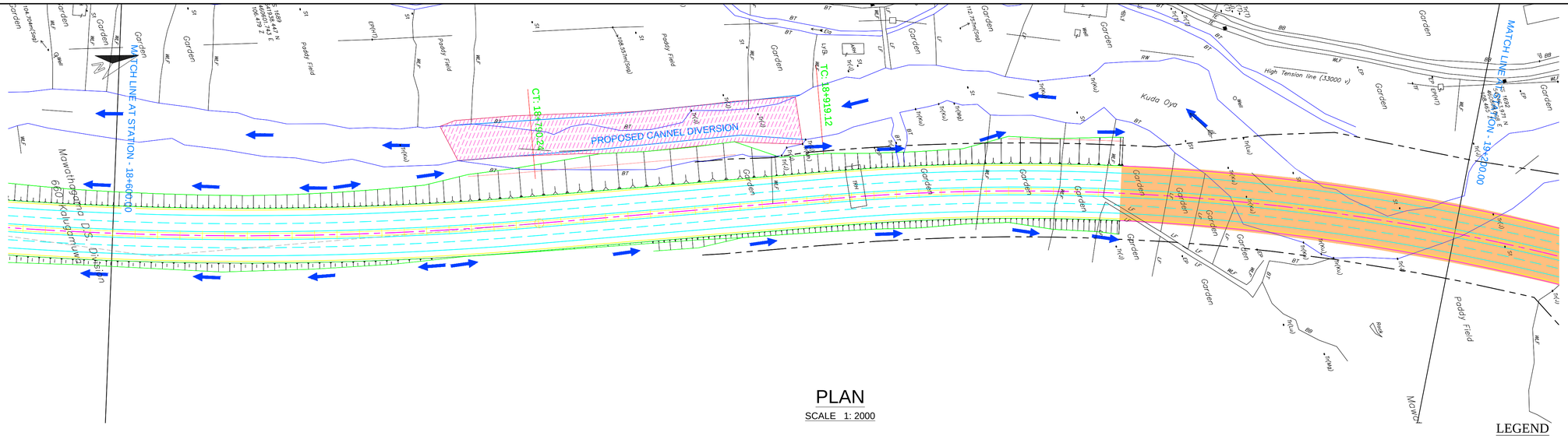
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

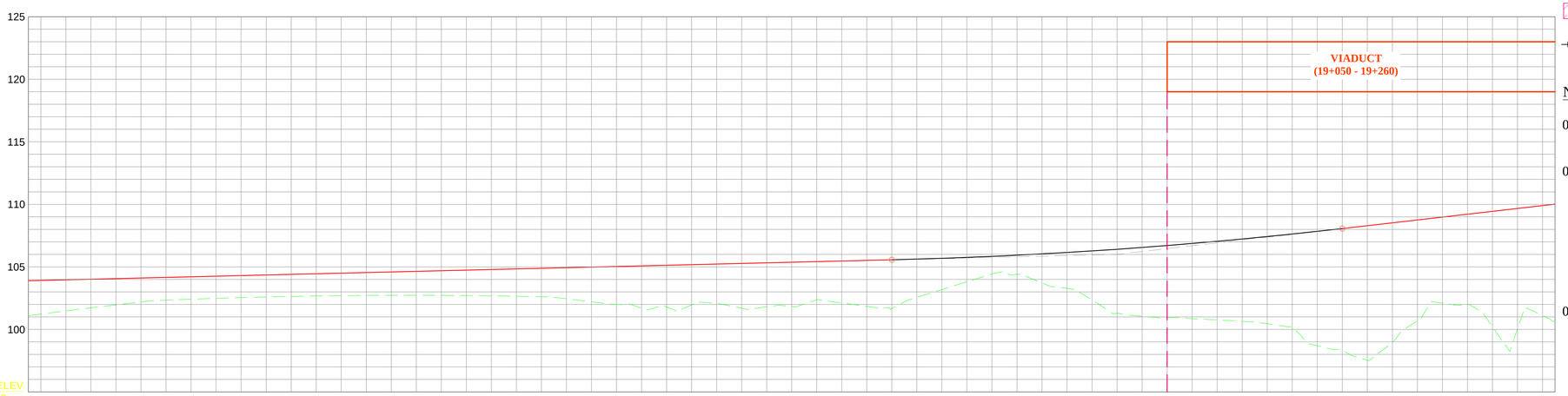
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH18+000.00 - CH18+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-38	1:2000	16-05-2016	38 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch18+600	103.914	101.227
Ch18+610	103.963	101.478
Ch18+620	104.011	101.723
Ch18+630	104.060	101.963
Ch18+640	104.108	102.197
Ch18+650	104.157	102.334
Ch18+660	104.205	102.412
Ch18+670	104.254	102.481
Ch18+680	104.302	102.541
Ch18+690	104.351	102.593
Ch18+700	104.399	102.636
Ch18+710	104.448	102.671
Ch18+720	104.496	102.697
Ch18+730	104.545	102.715
Ch18+740	104.593	102.725
Ch18+750	104.642	102.726
Ch18+760	104.690	102.719
Ch18+770	104.739	102.703
Ch18+780	104.787	102.680
Ch18+790	104.836	102.647
Ch18+800	104.884	102.610
Ch18+810	104.933	102.450
Ch18+820	104.981	102.209
Ch18+830	105.030	101.991
Ch18+840	105.078	101.691
Ch18+850	105.127	101.793
Ch18+860	105.175	101.953
Ch18+870	105.224	102.082
Ch18+880	105.272	101.694
Ch18+890	105.321	101.804
Ch18+900	105.369	101.834
Ch18+910	105.418	102.370
Ch18+920	105.466	102.114
Ch18+930	105.515	101.841
Ch18+940	105.563	101.674
Ch18+950	105.617	102.566
Ch18+960	105.681	103.187
Ch18+970	105.754	103.808
Ch18+980	105.838	104.429
Ch18+990	105.931	104.404
Ch19+000	106.035	103.714
Ch19+010	106.149	103.282
Ch19+020	106.273	102.358
Ch19+030	106.406	101.282
Ch19+040	106.550	101.051
Ch19+050	106.704	100.937
Ch19+060	106.868	100.854
Ch19+070	107.042	100.763
Ch19+080	107.226	100.637
Ch19+090	107.420	100.454
Ch19+100	107.624	100.190
Ch19+110	107.838	98.690
Ch19+120	108.062	98.311
Ch19+130	108.292	97.532
Ch19+140	108.521	98.972
Ch19+150	108.750	100.654
Ch19+160	108.979	102.108
Ch19+170	109.208	102.004
Ch19+180	109.438	100.217
Ch19+190	109.667	100.051
Ch19+200	109.896	101.103

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000

VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

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NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

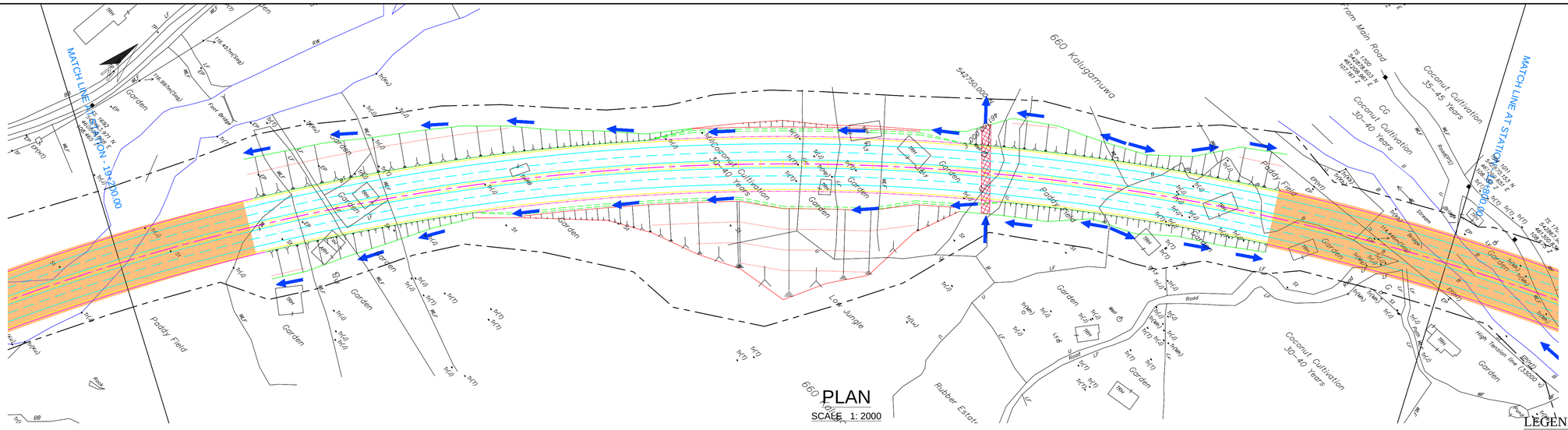
Project Title

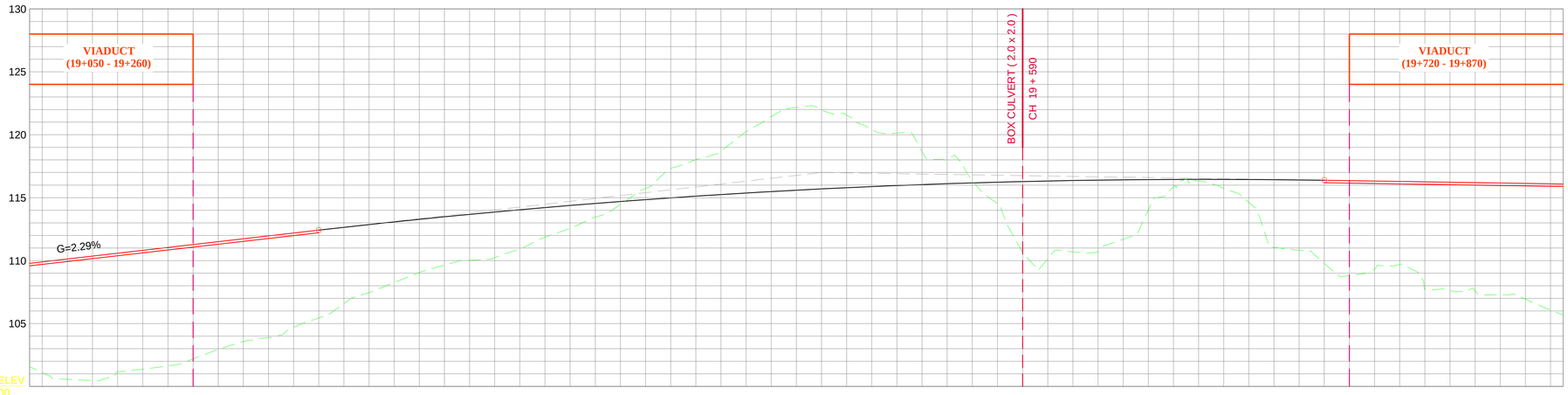
CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :

SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH18+600.00 - CH19+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-39	1:2000	16-05-2016	39 of 68





CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch19+200	109.896	101.103
Ch19+210	110.125	100.570
Ch19+220	110.354	100.461
Ch19+230	110.583	101.162
Ch19+240	110.812	101.371
Ch19+250	111.042	101.636
Ch19+260	111.271	102.188
Ch19+270	111.500	102.929
Ch19+280	111.729	103.565
Ch19+290	111.958	103.883
Ch19+300	112.188	104.690
Ch19+310	112.417	105.441
Ch19+320	112.643	106.579
Ch19+330	112.862	107.463
Ch19+340	113.075	108.253
Ch19+350	113.281	109.059
Ch19+360	113.481	109.634
Ch19+370	113.675	110.027
Ch19+380	113.862	110.229
Ch19+390	114.042	110.912
Ch19+400	114.216	111.857
Ch19+410	114.383	112.551
Ch19+420	114.544	113.447
Ch19+430	114.698	114.455
Ch19+440	114.846	115.733
Ch19+450	114.988	117.336
Ch19+460	115.123	118.023
Ch19+470	115.251	118.703
Ch19+480	115.373	120.247
Ch19+490	115.488	121.448
Ch19+500	115.597	122.167
Ch19+510	115.699	121.985
Ch19+520	115.795	121.572
Ch19+530	115.885	120.421
Ch19+540	115.968	120.135
Ch19+550	116.044	118.670
Ch19+560	116.114	118.087
Ch19+570	116.177	116.383
Ch19+580	116.234	114.544
Ch19+590	116.284	110.667
Ch19+600	116.328	110.140
Ch19+610	116.365	110.698
Ch19+620	116.396	110.705
Ch19+630	116.421	111.696
Ch19+640	116.438	114.014
Ch19+650	116.450	115.856
Ch19+660	116.455	116.336
Ch19+670	116.453	115.732
Ch19+680	116.445	114.626
Ch19+690	116.430	111.049
Ch19+700	116.409	110.819
Ch19+710	116.381	109.775
Ch19+720	116.350	108.805
Ch19+730	116.319	109.294
Ch19+740	116.288	109.693
Ch19+750	116.257	107.708
Ch19+760	116.226	107.621
Ch19+770	116.195	107.594
Ch19+780	116.165	107.289
Ch19+790	116.134	106.937
Ch19+800	116.103	106.068

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Bound

NOTE

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05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

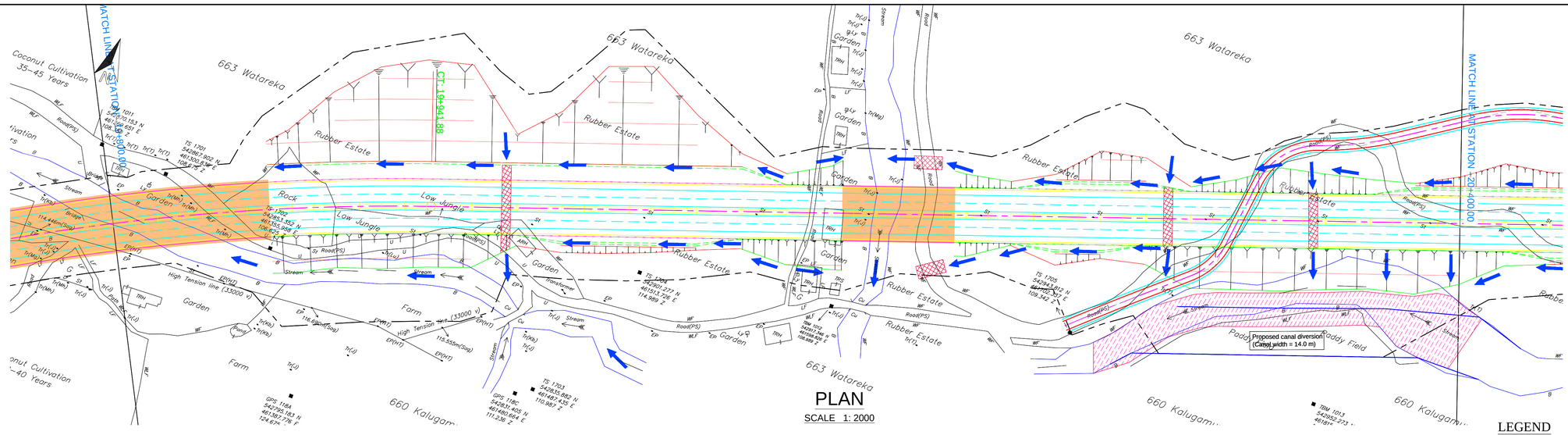
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

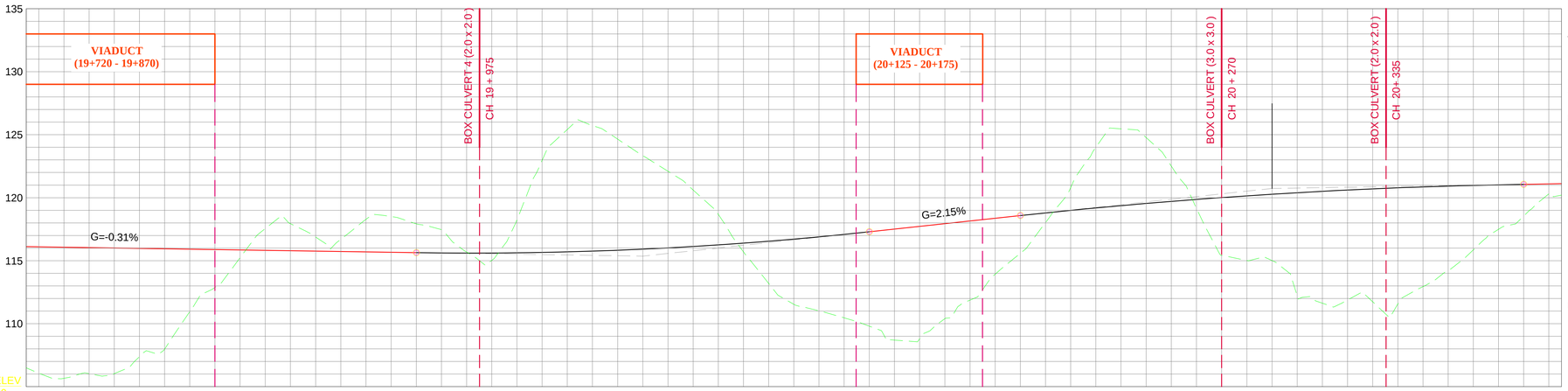
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH19+200.00 - CH19+800.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-40	1:2000	16-05-2016	40 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch19+800	116.103	106.068
Ch19+810	116.072	105.665
Ch19+820	116.041	106.031
Ch19+830	116.010	106.034
Ch19+840	115.979	107.382
Ch19+850	115.948	107.979
Ch19+860	115.917	110.950
Ch19+870	115.886	112.875
Ch19+880	115.855	115.239
Ch19+890	115.824	117.549
Ch19+900	115.793	117.936
Ch19+910	115.762	116.882
Ch19+920	115.731	116.692
Ch19+930	115.700	118.280
Ch19+940	115.669	118.505
Ch19+950	115.639	117.927
Ch19+960	115.614	117.463
Ch19+970	115.604	115.681
Ch19+980	115.607	115.025
Ch19+990	115.624	118.239
Ch20+000	115.655	122.965
Ch20+010	115.699	125.414
Ch20+020	115.757	125.731
Ch20+030	115.828	124.653
Ch20+040	115.913	123.330
Ch20+050	116.012	122.100
Ch20+060	116.125	120.607
Ch20+070	116.251	118.685
Ch20+080	116.391	115.701
Ch20+090	116.544	113.196
Ch20+100	116.711	111.540
Ch20+110	116.892	111.018
Ch20+120	117.087	110.459
Ch20+130	117.295	109.805
Ch20+140	117.510	108.694
Ch20+150	117.725	108.796
Ch20+160	117.940	110.395
Ch20+170	118.155	111.866
Ch20+180	118.370	113.925
Ch20+190	118.585	115.585
Ch20+200	118.795	118.024
Ch20+210	118.997	120.802
Ch20+220	119.189	123.994
Ch20+230	119.372	125.469
Ch20+240	119.546	124.773
Ch20+250	119.711	122.505
Ch20+260	119.867	119.147
Ch20+270	120.013	115.420
Ch20+280	120.151	115.020
Ch20+290	120.279	115.012
Ch20+300	120.399	112.195
Ch20+310	120.509	111.626
Ch20+320	120.610	111.881
Ch20+330	120.702	111.740
Ch20+340	120.785	111.560
Ch20+350	120.858	112.941
Ch20+360	120.923	114.229
Ch20+370	120.979	115.867
Ch20+380	121.025	117.487
Ch20+390	121.062	118.548
Ch20+400	121.095	120.304

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

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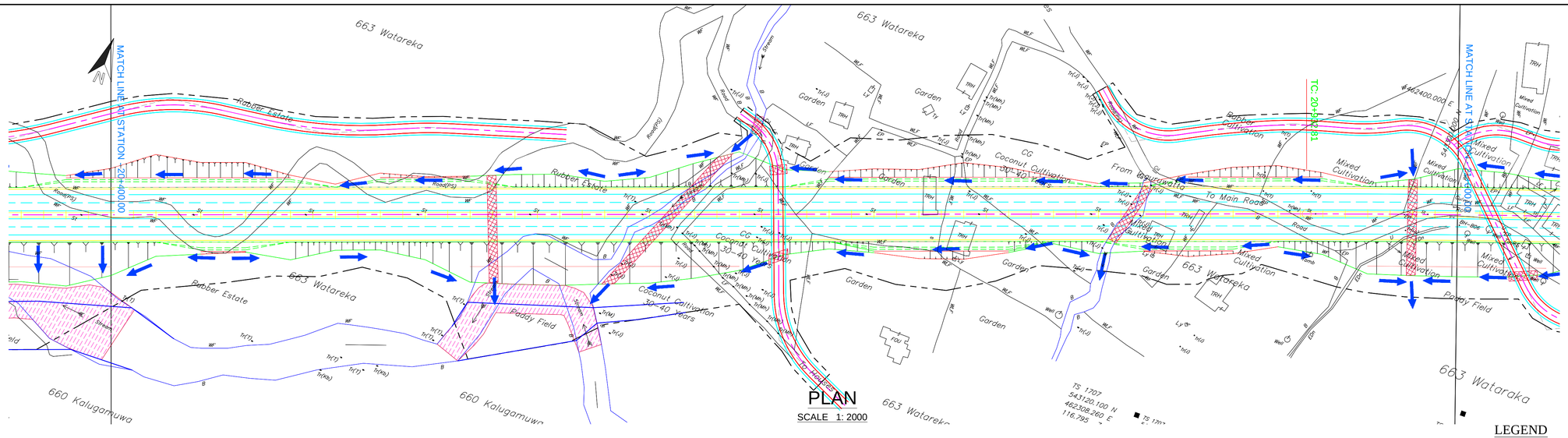
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH19+800.00 - CH20+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-41	1:2000	16-05-2016	41 of 68

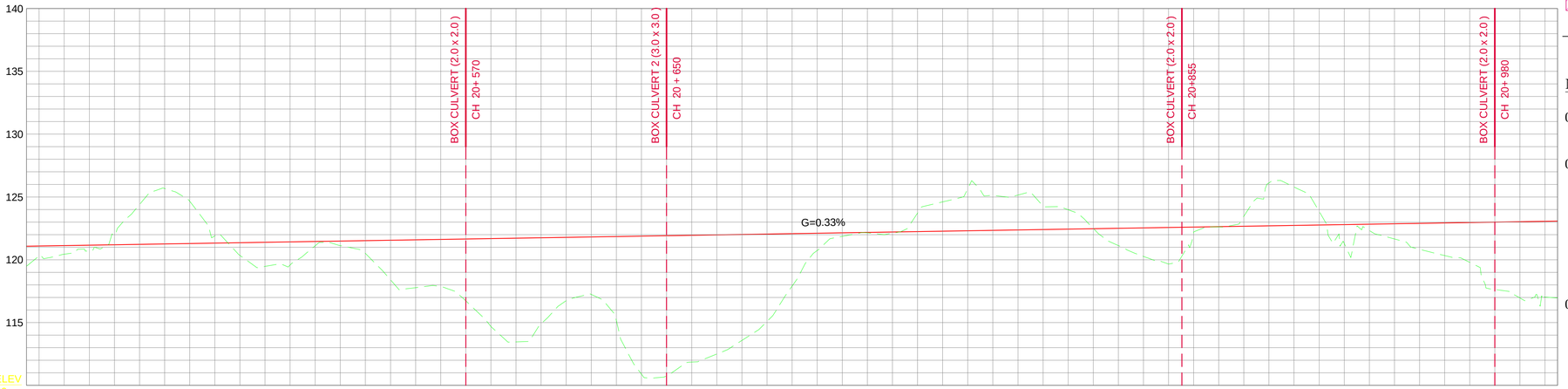


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch20+400	121.095	120.304
Ch20+410	121.128	120.439
Ch20+420	121.161	120.687
Ch20+430	121.193	121.972
Ch20+440	121.226	124.398
Ch20+450	121.259	125.672
Ch20+460	121.292	124.660
Ch20+470	121.324	121.892
Ch20+480	121.357	120.345
Ch20+490	121.390	119.472
Ch20+500	121.423	119.580
Ch20+510	121.455	121.118
Ch20+520	121.488	121.126
Ch20+530	121.521	120.506
Ch20+540	121.554	118.404
Ch20+550	121.586	117.778
Ch20+560	121.619	117.864
Ch20+570	121.652	116.732
Ch20+580	121.685	114.689
Ch20+590	121.717	113.460
Ch20+600	121.750	114.909
Ch20+610	121.783	116.742
Ch20+620	121.816	117.240
Ch20+630	121.848	115.171
Ch20+640	121.881	110.885
Ch20+650	121.914	110.750
Ch20+660	121.946	111.856
Ch20+670	121.979	112.493
Ch20+680	122.012	113.576
Ch20+690	122.045	115.087
Ch20+700	122.077	117.897
Ch20+710	122.110	120.735
Ch20+720	122.143	121.864
Ch20+730	122.176	122.138
Ch20+740	122.208	122.117
Ch20+750	122.241	123.717
Ch20+760	122.274	124.607
Ch20+770	122.307	125.657
Ch20+780	122.339	125.112
Ch20+790	122.372	125.147
Ch20+800	122.405	124.282
Ch20+810	122.438	123.985
Ch20+820	122.470	122.502
Ch20+830	122.503	121.133
Ch20+840	122.536	120.267
Ch20+850	122.569	119.659
Ch20+860	122.601	122.180
Ch20+870	122.634	122.617
Ch20+880	122.667	123.456
Ch20+890	122.700	126.117
Ch20+900	122.732	125.789
Ch20+910	122.765	123.844
Ch20+920	122.798	121.293
Ch20+930	122.831	122.325
Ch20+940	122.863	121.660
Ch20+950	122.896	120.832
Ch20+960	122.929	120.336
Ch20+970	122.962	119.793
Ch20+980	122.994	117.629
Ch20+990	123.027	116.953
Ch21+000	123.060	117.024

NOTE

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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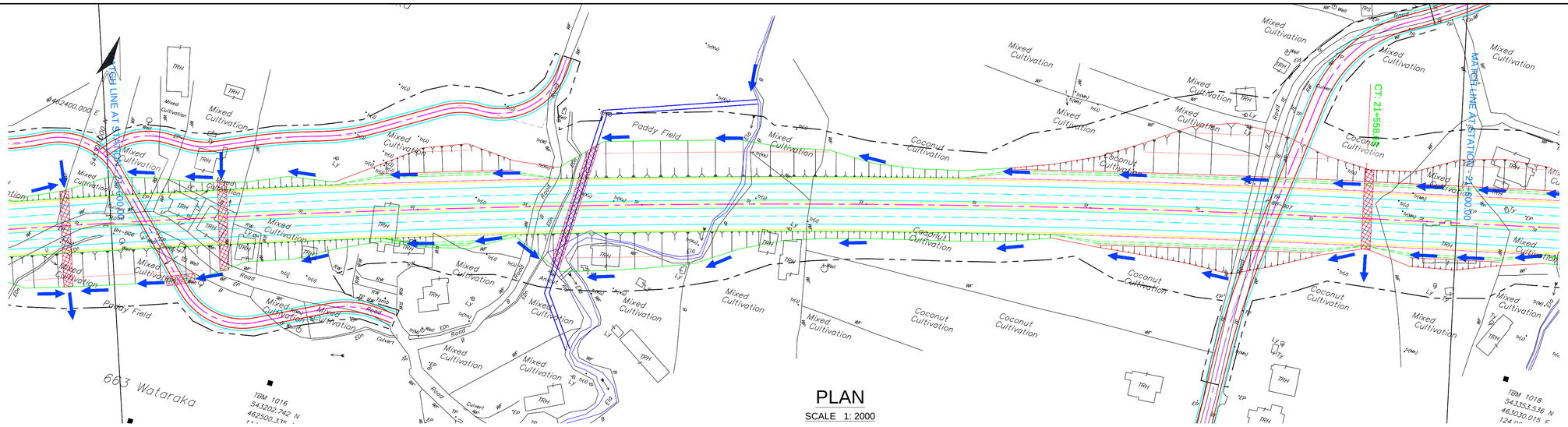
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

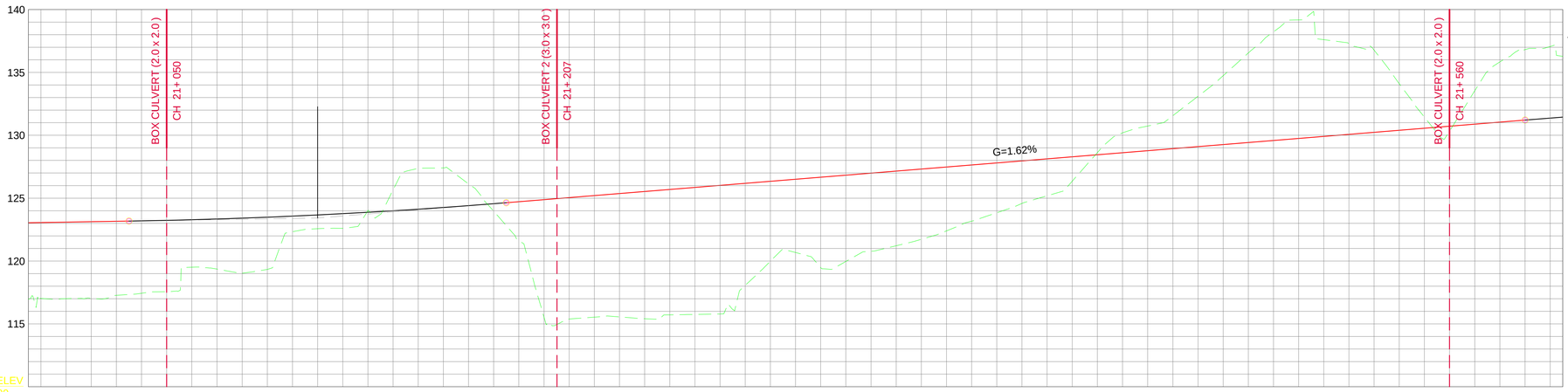
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH20+400.00 - CH21+000.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-42	1:2000	16-05-2016	42 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch21+000	123.060	117.024
Ch21+010	123.093	117.007
Ch21+020	123.125	117.037
Ch21+030	123.158	117.270
Ch21+040	123.192	117.439
Ch21+050	123.233	117.554
Ch21+060	123.283	119.506
Ch21+070	123.342	119.357
Ch21+080	123.409	119.028
Ch21+090	123.485	119.327
Ch21+100	123.570	122.333
Ch21+110	123.663	122.572
Ch21+120	123.765	122.604
Ch21+130	123.875	124.011
Ch21+140	123.995	125.656
Ch21+150	124.122	127.370
Ch21+160	124.259	127.405
Ch21+170	124.404	126.136
Ch21+180	124.558	123.961
Ch21+190	124.719	121.586
Ch21+200	124.881	115.543
Ch21+210	125.044	115.383
Ch21+220	125.206	115.537
Ch21+230	125.368	115.556
Ch21+240	125.531	115.413
Ch21+250	125.693	115.719
Ch21+260	125.856	115.753
Ch21+270	126.018	115.788
Ch21+280	126.180	118.066
Ch21+290	126.343	119.984
Ch21+300	126.505	120.673
Ch21+310	126.667	119.483
Ch21+320	126.830	119.965
Ch21+330	126.992	120.777
Ch21+340	127.155	121.214
Ch21+350	127.317	121.727
Ch21+360	127.479	122.400
Ch21+370	127.642	123.170
Ch21+380	127.804	123.836
Ch21+390	127.966	124.579
Ch21+400	128.129	125.185
Ch21+410	128.291	126.354
Ch21+420	128.454	128.625
Ch21+430	128.616	130.193
Ch21+440	128.778	130.740
Ch21+450	128.941	131.561
Ch21+460	129.103	133.102
Ch21+470	129.265	134.737
Ch21+480	129.428	136.550
Ch21+490	129.590	138.228
Ch21+500	129.753	139.175
Ch21+510	129.915	137.606
Ch21+520	130.077	137.285
Ch21+530	130.240	136.770
Ch21+540	130.402	134.103
Ch21+550	130.564	131.446
Ch21+560	130.727	130.336
Ch21+570	130.889	133.533
Ch21+580	131.052	135.837
Ch21+590	131.214	136.817
Ch21+600	131.372	137.063

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

01. Structures and structure locations are given for indication only.
02. Storm water drainage management plan at cut sections to be suitably designed depending on the site conditions at detailed design stage.
Only a tentative plan is given at some locations based on currently proposed vertical profile by RDA which shall be changed to suit the site conditions.
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Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
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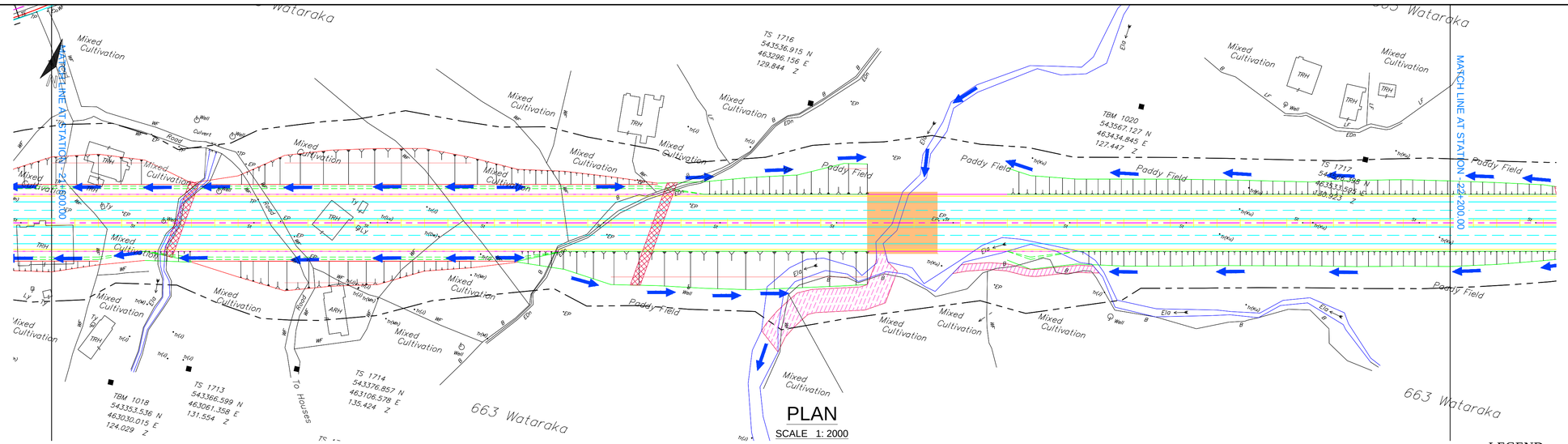
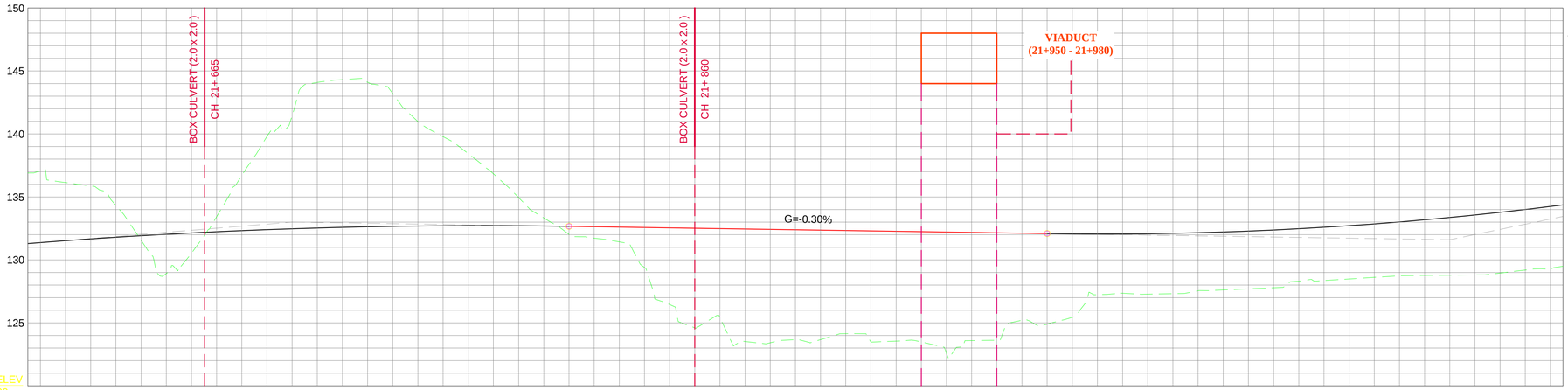
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH21+000.00 - CH21+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-43	1:2000	16-05-2016	43 of 68





CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch21+600	131.372	137.063
Ch21+610	131.521	136.138
Ch21+620	131.662	135.867
Ch21+630	131.793	134.325
Ch21+640	131.916	131.563
Ch21+650	132.030	128.915
Ch21+660	132.136	130.524
Ch21+670	132.232	133.421
Ch21+680	132.320	136.706
Ch21+690	132.399	139.816
Ch21+700	132.470	141.461
Ch21+710	132.531	144.089
Ch21+720	132.584	144.314
Ch21+730	132.628	144.108
Ch21+740	132.664	143.203
Ch21+750	132.690	140.983
Ch21+760	132.708	139.787
Ch21+770	132.717	138.436
Ch21+780	132.717	136.833
Ch21+790	132.709	134.946
Ch21+800	132.691	133.330
Ch21+810	132.665	132.027
Ch21+820	132.635	131.720
Ch21+830	132.604	131.431
Ch21+840	132.574	129.400
Ch21+850	132.543	126.453
Ch21+860	132.513	124.608
Ch21+870	132.483	125.415
Ch21+880	132.452	123.518
Ch21+890	132.422	123.419
Ch21+900	132.391	123.662
Ch21+910	132.361	123.666
Ch21+920	132.330	124.137
Ch21+930	132.300	123.474
Ch21+940	132.270	123.550
Ch21+950	132.239	123.483
Ch21+960	132.209	122.599
Ch21+970	132.178	123.592
Ch21+980	132.148	123.610
Ch21+990	132.117	125.205
Ch22+000	132.087	124.902
Ch22+010	132.063	125.439
Ch22+020	132.054	127.239
Ch22+030	132.058	127.351
Ch22+040	132.076	127.278
Ch22+050	132.107	127.316
Ch22+060	132.153	127.545
Ch22+070	132.212	127.611
Ch22+080	132.285	127.699
Ch22+090	132.372	127.787
Ch22+100	132.472	128.302
Ch22+110	132.587	128.356
Ch22+120	132.715	128.482
Ch22+130	132.857	128.608
Ch22+140	133.013	128.734
Ch22+150	133.182	128.765
Ch22+160	133.366	128.784
Ch22+170	133.563	128.803
Ch22+180	133.774	128.956
Ch22+190	133.999	129.195
Ch22+200	134.237	129.265

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

01. Structures and structure locations are given for indication only.
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05. Drainage should be specially designed tunnelling area during detailed design stage.

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

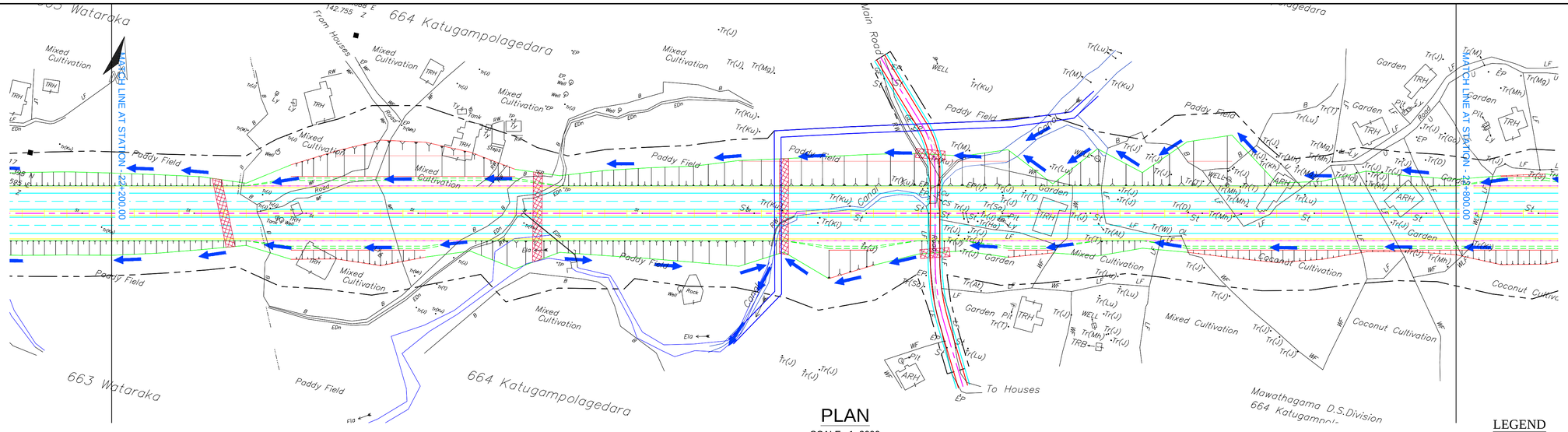
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

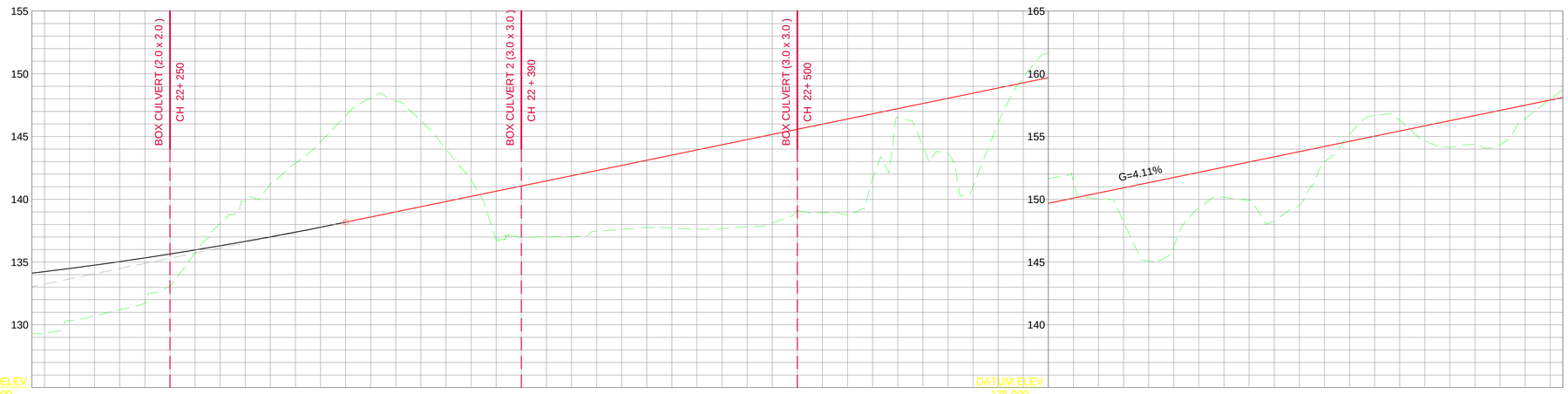
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH21+600.00 - CH22+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-44	1:2000	16-05-2016	44 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch22+200	134.237	129.265
Ch22+210	134.490	130.326
Ch22+220	134.756	130.718
Ch22+230	135.036	131.201
Ch22+240	135.329	131.805
Ch22+250	135.637	133.078
Ch22+260	135.958	135.722
Ch22+270	136.293	138.080
Ch22+280	136.642	139.825
Ch22+290	137.005	141.192
Ch22+300	137.381	142.881
Ch22+310	137.772	144.581
Ch22+320	138.176	146.640
Ch22+330	138.587	148.068
Ch22+340	138.998	147.830
Ch22+350	139.409	146.272
Ch22+360	139.820	144.002
Ch22+370	140.231	141.593
Ch22+380	140.642	136.750
Ch22+390	141.053	136.984
Ch22+400	141.464	137.016
Ch22+410	141.875	137.002
Ch22+420	142.286	137.448
Ch22+430	142.697	137.603
Ch22+440	143.108	137.745
Ch22+450	143.519	137.715
Ch22+460	143.930	137.623
Ch22+470	144.341	137.665
Ch22+480	144.752	137.794
Ch22+490	145.163	138.108
Ch22+500	145.574	139.084
Ch22+510	145.985	138.946
Ch22+520	146.396	138.750
Ch22+530	146.807	141.608
Ch22+540	147.218	146.504
Ch22+550	147.629	144.220
Ch22+560	148.040	143.630
Ch22+570	148.451	141.014
Ch22+580	148.862	146.042
Ch22+590	149.273	149.706
Ch22+600	149.684	151.640
Ch22+610	150.095	151.412
Ch22+620	150.505	150.046
Ch22+630	150.916	148.204
Ch22+640	151.327	145.092
Ch22+650	151.738	146.263
Ch22+660	152.149	149.325
Ch22+670	152.560	150.153
Ch22+680	152.971	149.925
Ch22+690	153.382	148.271
Ch22+700	153.793	149.511
Ch22+710	154.204	153.030
Ch22+720	154.615	155.166
Ch22+730	155.026	156.667
Ch22+740	155.437	156.289
Ch22+750	155.848	154.666
Ch22+760	156.259	154.140
Ch22+770	156.670	154.375
Ch22+780	157.081	154.354
Ch22+790	157.492	156.409
Ch22+800	157.903	157.965

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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    Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

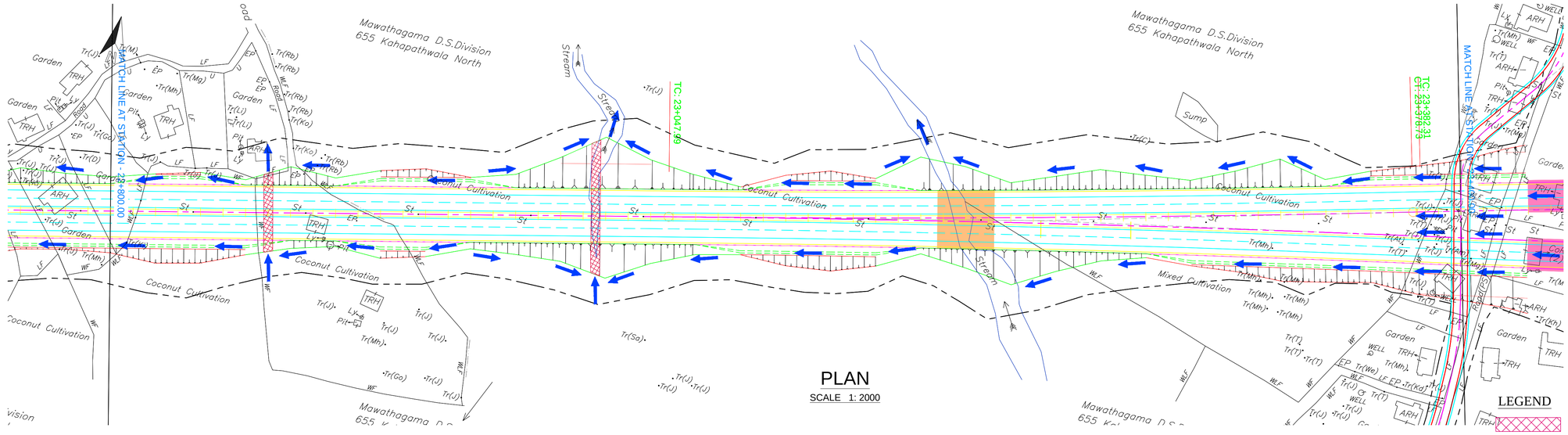
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

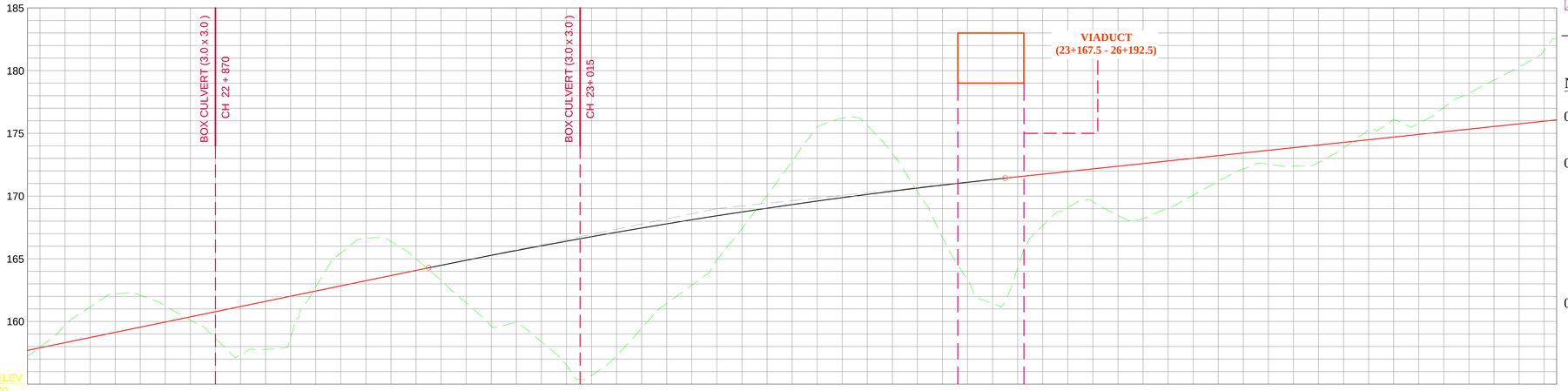
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH22+200.00 - CH22+800.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-45	1:2000	16-05-2016	45 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch22+800	157.903	157.965
Ch22+810	158.314	159.726
Ch22+820	158.725	161.154
Ch22+830	159.136	162.192
Ch22+840	159.547	162.097
Ch22+850	159.958	161.235
Ch22+860	160.369	160.112
Ch22+870	160.780	158.654
Ch22+880	161.191	157.348
Ch22+890	161.602	157.769
Ch22+900	162.013	158.749
Ch22+910	162.424	162.755
Ch22+920	162.835	165.463
Ch22+930	163.246	166.613
Ch22+940	163.657	166.384
Ch22+950	164.068	164.988
Ch22+960	164.478	163.287
Ch22+970	164.880	161.488
Ch22+980	165.274	159.628
Ch22+990	165.659	159.926
Ch23+000	166.035	158.387
Ch23+010	166.403	156.532
Ch23+020	166.762	155.707
Ch23+030	167.112	157.289
Ch23+040	167.453	159.468
Ch23+050	167.786	161.444
Ch23+060	168.110	162.882
Ch23+070	168.426	164.901
Ch23+080	168.732	167.408
Ch23+090	169.030	170.037
Ch23+100	169.320	172.787
Ch23+110	169.600	175.506
Ch23+120	169.872	176.192
Ch23+130	170.136	175.622
Ch23+140	170.390	173.387
Ch23+150	170.636	170.352
Ch23+160	170.874	166.694
Ch23+170	171.102	163.308
Ch23+180	171.322	161.430
Ch23+190	171.534	164.260
Ch23+200	171.745	167.647
Ch23+210	171.957	169.103
Ch23+220	172.168	169.540
Ch23+230	172.379	168.453
Ch23+240	172.590	168.185
Ch23+250	172.801	169.030
Ch23+260	173.013	170.075
Ch23+270	173.224	171.177
Ch23+280	173.435	172.168
Ch23+290	173.646	172.540
Ch23+300	173.857	172.380
Ch23+310	174.069	172.675
Ch23+320	174.280	173.847
Ch23+330	174.491	175.252
Ch23+340	174.702	176.099
Ch23+350	174.913	175.799
Ch23+360	175.125	177.065
Ch23+370	175.336	178.195
Ch23+380	175.547	179.231
Ch23+390	175.758	180.296
Ch23+400	175.969	181.606

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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    Only an indicative plan is given for flow directions.
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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

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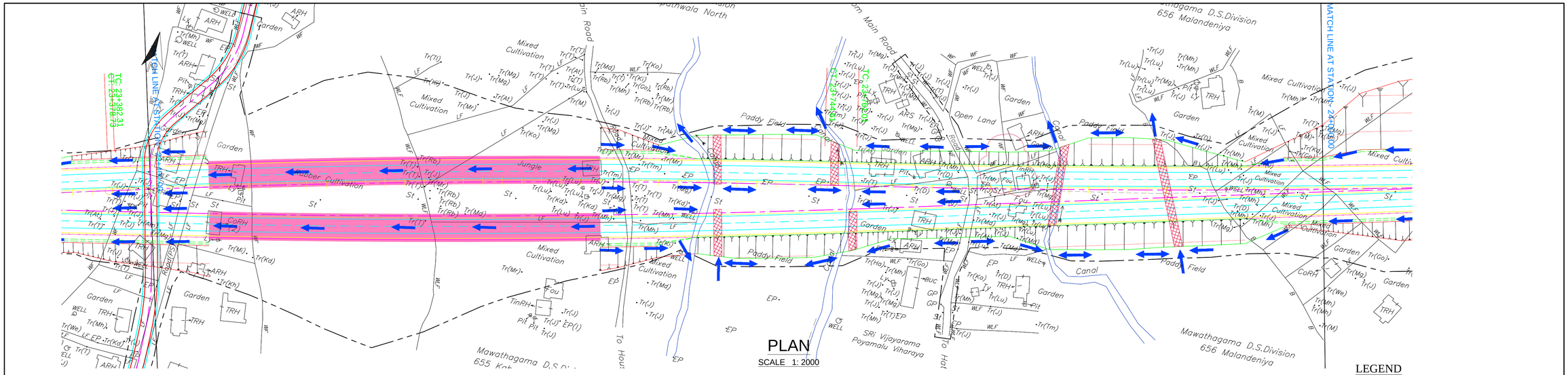
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

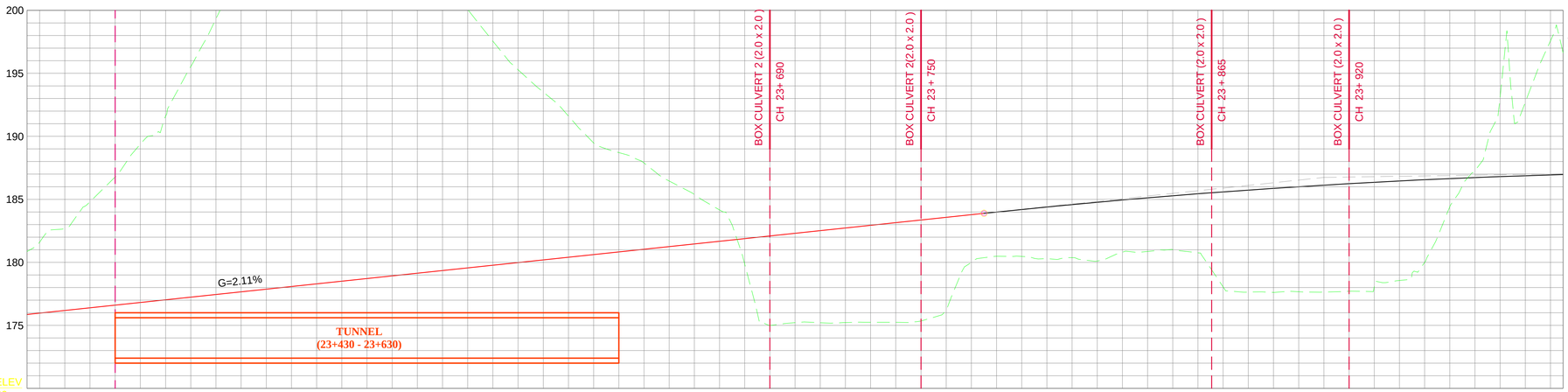
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH22+800.00 - CH23+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-46	1:2000	16-05-2016	46 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch23+400	175.969	181.606
Ch23+410	176.180	182.688
Ch23+420	176.392	184.810
Ch23+430	176.603	186.768
Ch23+440	176.814	189.377
Ch23+450	177.025	191.579
Ch23+460	177.236	195.532
Ch23+470	177.448	199.316
Ch23+480	177.659	204.322
Ch23+490	177.870	209.120
Ch23+500	178.081	212.872
Ch23+510	178.292	214.582
Ch23+520	178.504	215.393
Ch23+530	178.715	213.357
Ch23+540	178.926	211.048
Ch23+550	179.137	207.462
Ch23+560	179.348	203.696
Ch23+570	179.560	200.066
Ch23+580	179.771	197.554
Ch23+590	179.982	195.283
Ch23+600	180.193	193.513
Ch23+610	180.404	191.615
Ch23+620	180.615	189.473
Ch23+630	180.827	188.709
Ch23+640	181.038	187.886
Ch23+650	181.249	186.458
Ch23+660	181.460	185.389
Ch23+670	181.671	184.158
Ch23+680	181.883	179.855
Ch23+690	182.094	174.981
Ch23+700	182.305	175.215
Ch23+710	182.516	175.210
Ch23+720	182.727	175.219
Ch23+730	182.939	175.244
Ch23+740	183.150	175.242
Ch23+750	183.361	175.341
Ch23+760	183.572	176.214
Ch23+770	183.783	180.004
Ch23+780	183.994	180.486
Ch23+790	184.198	180.468
Ch23+800	184.396	180.293
Ch23+810	184.587	180.368
Ch23+820	184.771	180.106
Ch23+830	184.949	180.808
Ch23+840	185.120	180.864
Ch23+850	185.284	181.012
Ch23+860	185.442	180.757
Ch23+870	185.592	178.047
Ch23+880	185.736	177.636
Ch23+890	185.874	177.609
Ch23+900	186.005	177.663
Ch23+910	186.128	177.639
Ch23+920	186.246	177.703
Ch23+930	186.356	178.070
Ch23+940	186.460	178.563
Ch23+950	186.557	179.993
Ch23+960	186.648	184.410
Ch23+970	186.731	187.266
Ch23+980	186.808	193.132
Ch23+990	186.878	192.709
Ch24+000	186.942	197.581

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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3rd Floor, Sethsiripaya, Battaramulla.
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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

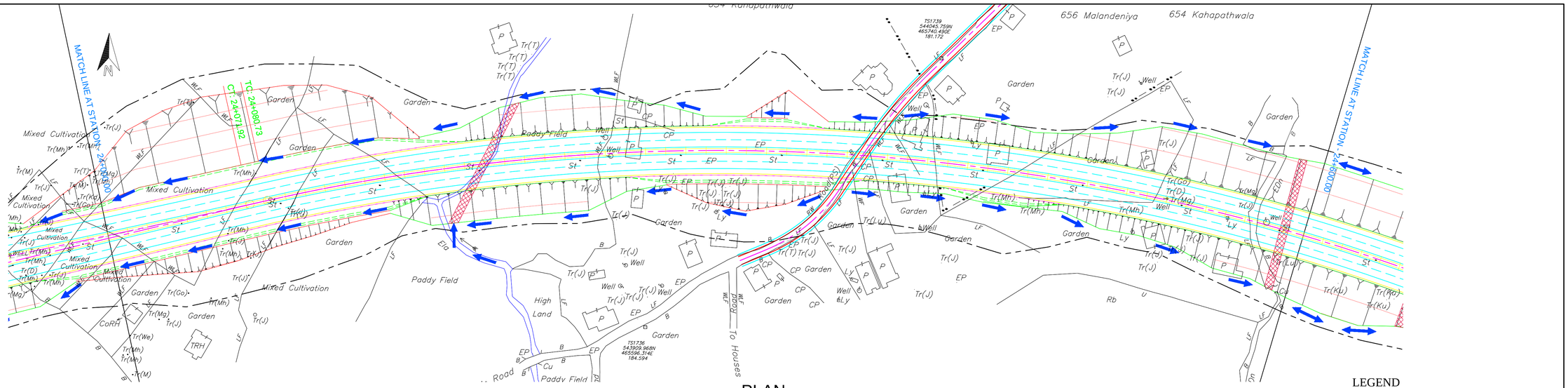
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

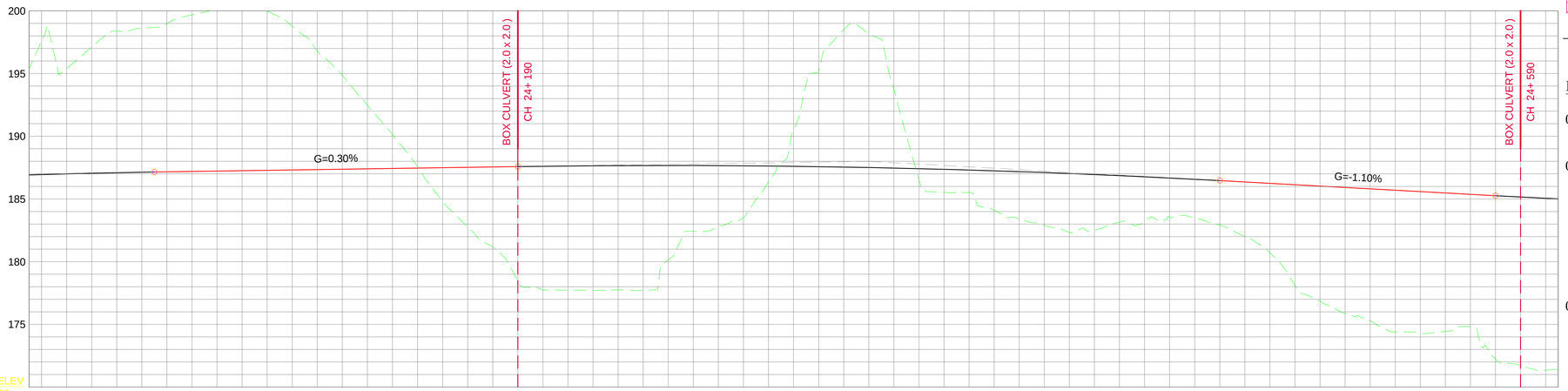
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH23+400.00 - CH24+000.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-48	1:2000	16-05-2016	48 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch24+000	186.942	197.581
Ch24+010	186.999	195.398
Ch24+020	187.049	197.108
Ch24+030	187.092	198.387
Ch24+040	187.129	198.609
Ch24+050	187.160	198.984
Ch24+060	187.190	199.676
Ch24+070	187.220	200.143
Ch24+080	187.250	200.501
Ch24+090	187.280	199.976
Ch24+100	187.310	198.786
Ch24+110	187.340	196.797
Ch24+120	187.370	194.857
Ch24+130	187.400	192.479
Ch24+140	187.430	190.129
Ch24+150	187.460	187.591
Ch24+160	187.490	184.775
Ch24+170	187.520	182.765
Ch24+180	187.550	181.176
Ch24+190	187.580	178.467
Ch24+200	187.608	177.741
Ch24+210	187.630	177.726
Ch24+220	187.648	177.714
Ch24+230	187.660	177.753
Ch24+240	187.668	177.708
Ch24+250	187.670	180.137
Ch24+260	187.668	182.426
Ch24+270	187.660	182.751
Ch24+280	187.648	183.512
Ch24+290	187.631	186.351
Ch24+300	187.608	190.478
Ch24+310	187.581	195.119
Ch24+320	187.548	198.483
Ch24+330	187.511	198.166
Ch24+340	187.469	193.763
Ch24+350	187.421	186.523
Ch24+360	187.369	185.530
Ch24+370	187.312	185.523
Ch24+380	187.250	184.106
Ch24+390	187.182	183.423
Ch24+400	187.110	182.888
Ch24+410	187.033	182.340
Ch24+420	186.951	182.486
Ch24+430	186.863	183.151
Ch24+440	186.771	183.216
Ch24+450	186.674	183.545
Ch24+460	186.572	183.493
Ch24+470	186.465	182.918
Ch24+480	186.355	182.018
Ch24+490	186.245	180.706
Ch24+500	186.136	178.095
Ch24+510	186.026	176.846
Ch24+520	185.916	175.857
Ch24+530	185.806	175.273
Ch24+540	185.697	174.392
Ch24+550	185.587	174.310
Ch24+560	185.477	174.435
Ch24+570	185.368	174.815
Ch24+580	185.258	172.256
Ch24+590	185.152	171.703
Ch24+600	185.052	171.348

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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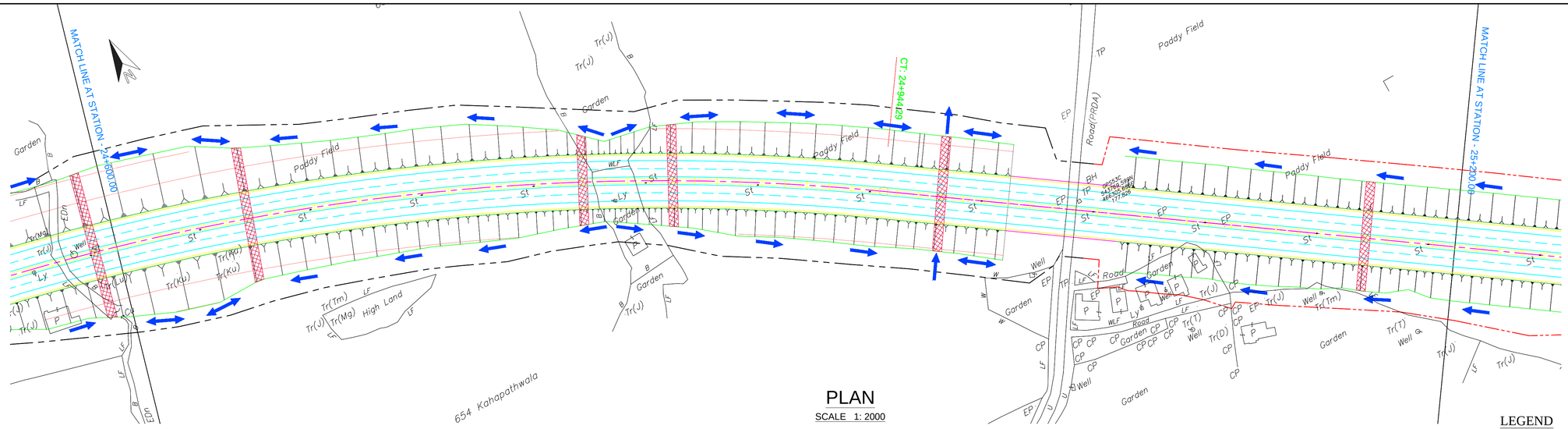
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

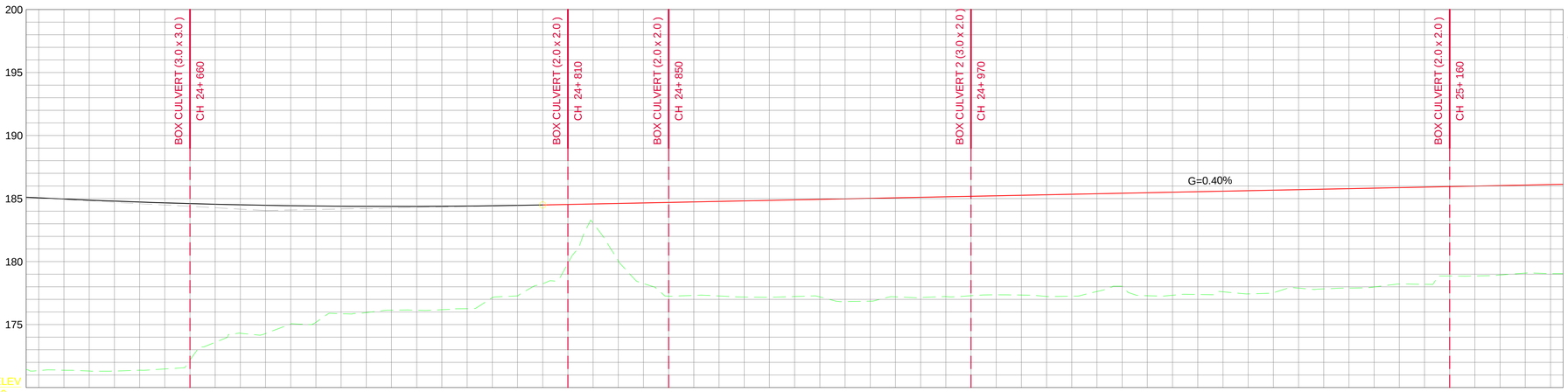
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH24+000.00 - CH24+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-50	1:2000	16-05-2016	50 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch24+600	185.052	171.348
Ch24+610	184.960	171.376
Ch24+620	184.874	171.308
Ch24+630	184.795	171.309
Ch24+640	184.723	171.374
Ch24+650	184.657	171.473
Ch24+660	184.599	172.191
Ch24+670	184.547	173.590
Ch24+680	184.502	174.311
Ch24+690	184.464	174.288
Ch24+700	184.433	175.048
Ch24+710	184.408	175.178
Ch24+720	184.391	175.864
Ch24+730	184.380	175.947
Ch24+740	184.376	176.144
Ch24+750	184.379	176.136
Ch24+760	184.388	176.179
Ch24+770	184.405	176.263
Ch24+780	184.428	177.138
Ch24+790	184.458	177.276
Ch24+800	184.495	178.230
Ch24+810	184.535	179.855
Ch24+820	184.576	183.051
Ch24+830	184.616	180.057
Ch24+840	184.656	178.259
Ch24+850	184.697	177.255
Ch24+860	184.737	177.314
Ch24+870	184.777	177.273
Ch24+880	184.817	177.186
Ch24+890	184.858	177.165
Ch24+900	184.898	177.226
Ch24+910	184.938	177.195
Ch24+920	184.979	176.818
Ch24+930	185.019	176.862
Ch24+940	185.059	177.201
Ch24+950	185.100	177.148
Ch24+960	185.140	177.224
Ch24+970	185.180	177.289
Ch24+980	185.220	177.356
Ch24+990	185.261	177.341
Ch25+000	185.301	177.234
Ch25+010	185.341	177.256
Ch25+020	185.382	177.624
Ch25+030	185.422	178.039
Ch25+040	185.462	177.292
Ch25+050	185.503	177.331
Ch25+060	185.543	177.388
Ch25+070	185.583	177.601
Ch25+080	185.623	177.434
Ch25+090	185.664	177.520
Ch25+100	185.704	177.892
Ch25+110	185.744	177.833
Ch25+120	185.785	177.894
Ch25+130	185.825	177.982
Ch25+140	185.865	178.216
Ch25+150	185.906	178.195
Ch25+160	185.946	178.853
Ch25+170	185.986	178.858
Ch25+180	186.026	178.935
Ch25+190	186.067	179.083
Ch25+200	186.107	179.045

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

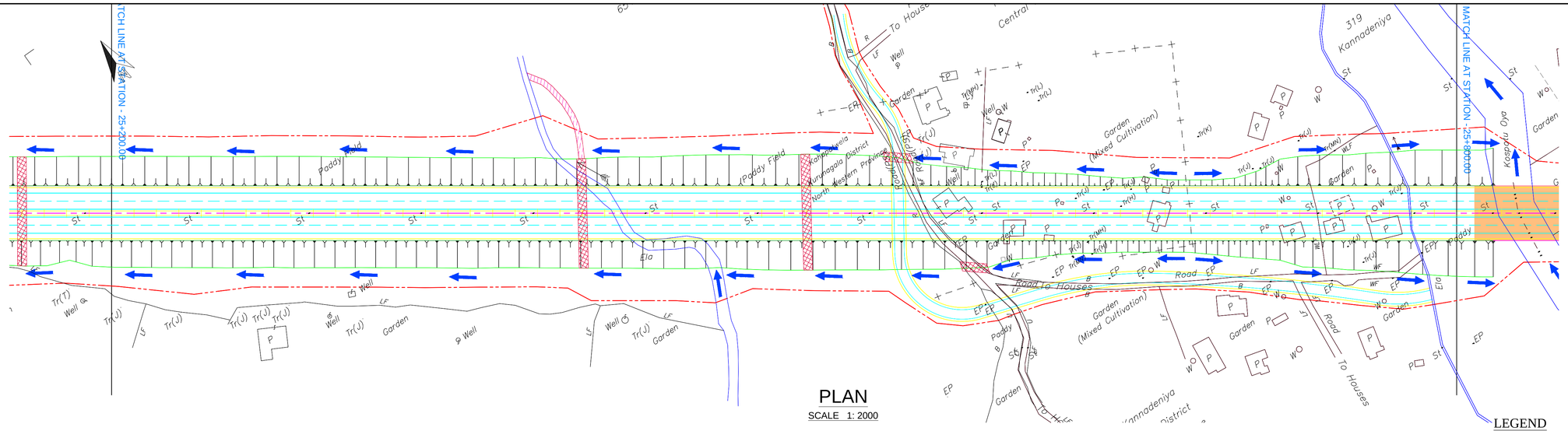
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH24+600.00 - CH25+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-52	1:2000	16-05-2016	52 of 68

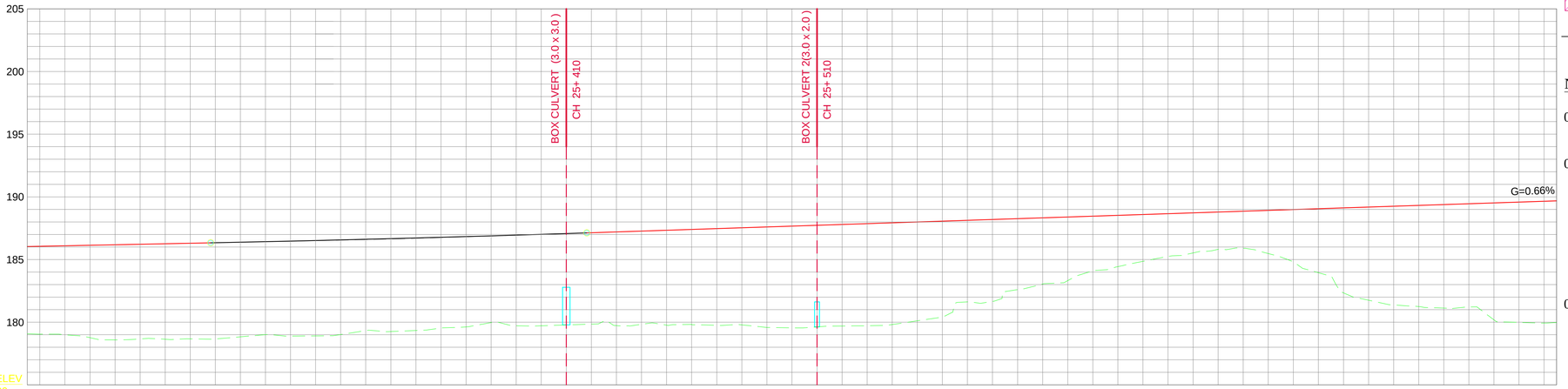


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch25+200	186.054	179.045
Ch25+210	186.094	178.985
Ch25+220	186.134	178.767
Ch25+230	186.175	178.588
Ch25+240	186.215	178.663
Ch25+250	186.255	178.637
Ch25+260	186.295	178.669
Ch25+270	186.336	178.658
Ch25+280	186.377	178.830
Ch25+290	186.420	179.002
Ch25+300	186.465	178.888
Ch25+310	186.512	178.905
Ch25+320	186.560	179.013
Ch25+330	186.610	179.325
Ch25+340	186.662	179.254
Ch25+350	186.715	179.336
Ch25+360	186.771	179.527
Ch25+370	186.827	179.618
Ch25+380	186.886	179.966
Ch25+390	186.947	179.714
Ch25+400	187.009	179.712
Ch25+410	187.072	179.780
Ch25+420	187.138	179.845
Ch25+430	187.204	179.723
Ch25+440	187.270	179.830
Ch25+450	187.336	179.761
Ch25+460	187.402	179.816
Ch25+470	187.468	179.747
Ch25+480	187.534	179.786
Ch25+490	187.600	179.580
Ch25+500	187.666	179.548
Ch25+510	187.733	179.625
Ch25+520	187.799	179.694
Ch25+530	187.865	179.719
Ch25+540	187.931	179.812
Ch25+550	187.997	180.108
Ch25+560	188.063	180.403
Ch25+570	188.129	181.623
Ch25+580	188.195	181.656
Ch25+590	188.261	182.595
Ch25+600	188.327	183.048
Ch25+610	188.393	183.312
Ch25+620	188.459	184.105
Ch25+630	188.525	184.428
Ch25+640	188.591	184.856
Ch25+650	188.658	185.239
Ch25+660	188.724	185.522
Ch25+670	188.790	185.810
Ch25+680	188.856	185.893
Ch25+690	188.922	185.476
Ch25+700	188.988	184.814
Ch25+710	189.054	183.947
Ch25+720	189.120	182.337
Ch25+730	189.186	181.752
Ch25+740	189.252	181.372
Ch25+750	189.318	181.245
Ch25+760	189.384	181.126
Ch25+770	189.450	181.213
Ch25+780	189.516	180.191
Ch25+790	189.583	179.984
Ch25+800	189.649	179.928

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

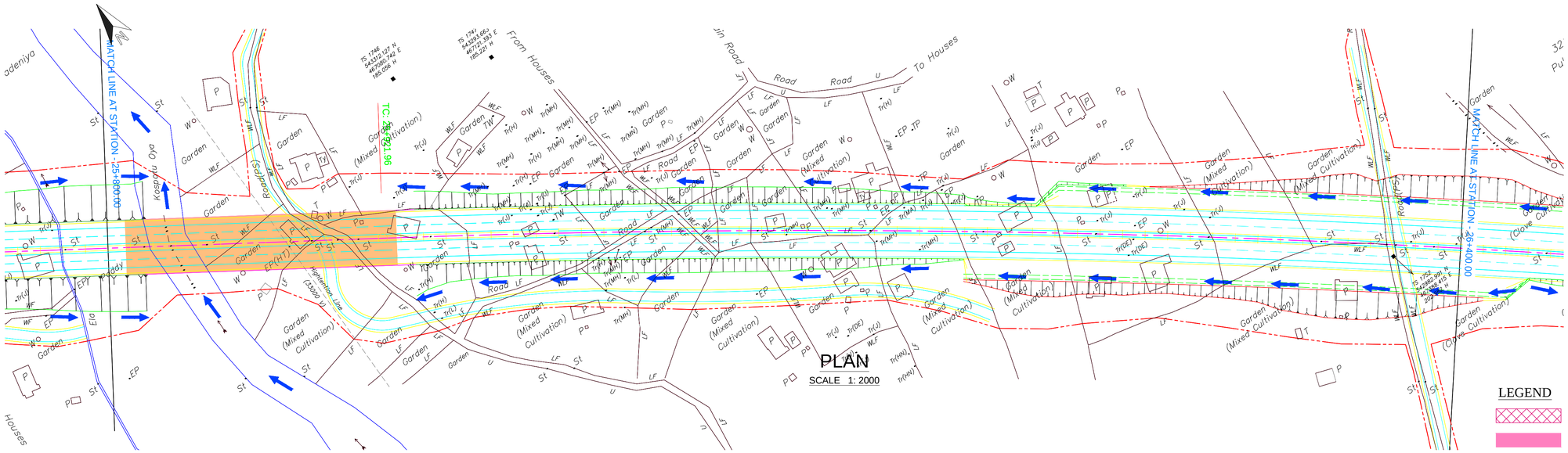
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

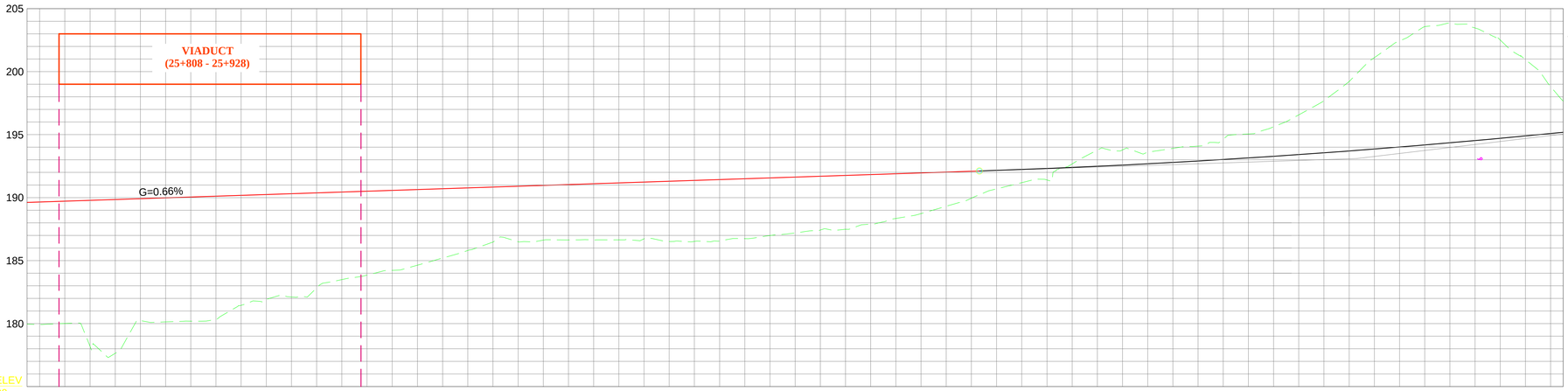
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH25+200.00 - CH25+800.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-53	1:2000	16-05-2016	53 of 68





CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch25+800	189.649	179.928
Ch25+810	189.715	180.005
Ch25+820	189.781	178.186
Ch25+830	189.847	177.635
Ch25+840	189.913	180.234
Ch25+850	189.979	180.130
Ch25+860	190.045	180.193
Ch25+870	190.111	180.318
Ch25+880	190.177	181.447
Ch25+890	190.243	181.854
Ch25+900	190.309	182.113
Ch25+910	190.375	182.834
Ch25+920	190.441	183.491
Ch25+930	190.508	183.846
Ch25+940	190.574	184.224
Ch25+950	190.640	184.635
Ch25+960	190.706	185.200
Ch25+970	190.772	185.797
Ch25+980	190.838	186.471
Ch25+990	190.904	186.497
Ch26+000	190.970	186.623
Ch26+010	191.036	186.641
Ch26+020	191.102	186.639
Ch26+030	191.168	186.645
Ch26+040	191.234	186.732
Ch26+050	191.300	186.512
Ch26+060	191.366	186.522
Ch26+070	191.433	186.555
Ch26+080	191.499	186.740
Ch26+090	191.565	186.988
Ch26+100	191.631	187.191
Ch26+110	191.697	187.426
Ch26+120	191.763	187.479
Ch26+130	191.829	187.888
Ch26+140	191.895	188.344
Ch26+150	191.961	188.730
Ch26+160	192.027	189.313
Ch26+170	192.093	189.955
Ch26+180	192.161	190.694
Ch26+190	192.234	191.183
Ch26+200	192.312	191.400
Ch26+210	192.396	192.677
Ch26+220	192.486	193.774
Ch26+230	192.582	193.789
Ch26+240	192.683	193.613
Ch26+250	192.791	193.909
Ch26+260	192.903	194.084
Ch26+270	193.022	194.638
Ch26+280	193.146	195.053
Ch26+290	193.276	195.620
Ch26+300	193.412	196.571
Ch26+310	193.553	197.694
Ch26+320	193.700	199.217
Ch26+330	193.853	201.112
Ch26+340	194.012	202.437
Ch26+350	194.176	203.580
Ch26+360	194.346	203.884
Ch26+370	194.521	203.465
Ch26+380	194.703	202.509
Ch26+390	194.890	200.962
Ch26+400	195.082	198.817

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
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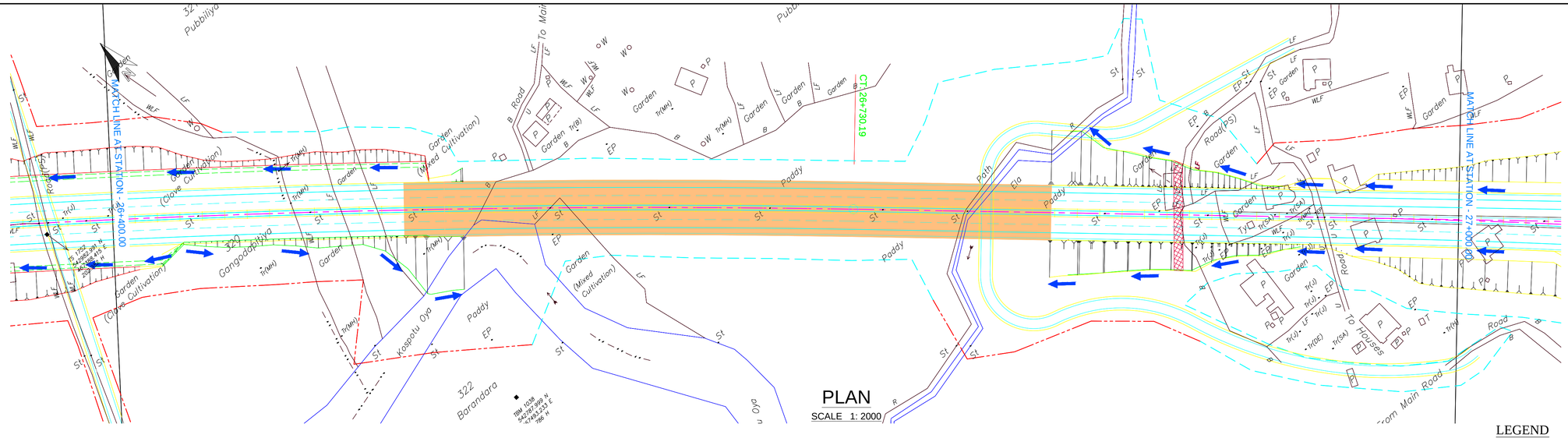
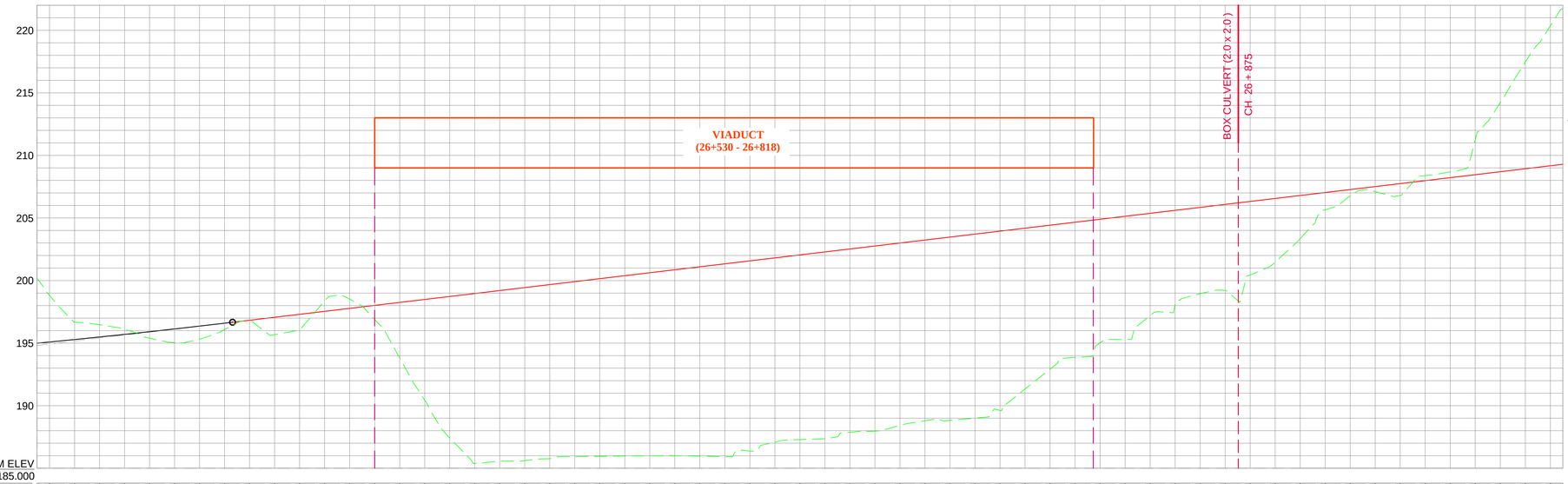
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH25+800.00 - CH26+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-54	1:2000	16-05-2016	54 of 68





CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch26+400	195.082	198.817
Ch26+410	195.281	196.665
Ch26+420	195.485	196.467
Ch26+430	195.695	196.097
Ch26+440	195.911	195.391
Ch26+450	196.132	195.044
Ch26+460	196.359	195.323
Ch26+470	196.592	196.086
Ch26+480	196.829	196.729
Ch26+490	197.066	195.671
Ch26+500	197.304	196.042
Ch26+510	197.541	198.372
Ch26+520	197.778	198.511
Ch26+530	198.016	196.888
Ch26+540	198.253	193.804
Ch26+550	198.491	190.444
Ch26+560	198.728	187.426
Ch26+570	198.965	185.378
Ch26+580	199.203	185.567
Ch26+590	199.440	185.611
Ch26+600	199.677	185.763
Ch26+610	199.915	185.928
Ch26+620	200.152	185.950
Ch26+630	200.390	185.973
Ch26+640	200.627	185.995
Ch26+650	200.864	186.005
Ch26+660	201.102	185.965
Ch26+670	201.339	185.924
Ch26+680	201.576	186.381
Ch26+690	201.814	187.088
Ch26+700	202.051	187.289
Ch26+710	202.289	187.354
Ch26+720	202.526	187.869
Ch26+730	202.763	187.964
Ch26+740	203.001	188.428
Ch26+750	203.238	188.796
Ch26+760	203.476	188.825
Ch26+770	203.713	189.004
Ch26+780	203.950	189.622
Ch26+790	204.188	191.327
Ch26+800	204.425	192.920
Ch26+810	204.662	193.852
Ch26+820	204.900	195.024
Ch26+830	205.137	195.292
Ch26+840	205.375	197.203
Ch26+850	205.612	198.103
Ch26+860	205.849	198.950
Ch26+870	206.087	199.206
Ch26+880	206.324	200.438
Ch26+890	206.561	201.474
Ch26+900	206.799	203.341
Ch26+910	207.036	205.648
Ch26+920	207.274	206.754
Ch26+930	207.511	207.102
Ch26+940	207.748	206.784
Ch26+950	207.986	208.383
Ch26+960	208.223	208.686
Ch26+970	208.461	211.282
Ch26+980	208.698	214.219
Ch26+990	208.935	217.457
Ch27+000	209.173	220.354

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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    Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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3rd Floor, Sethsiripaya, Battaramulla.
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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

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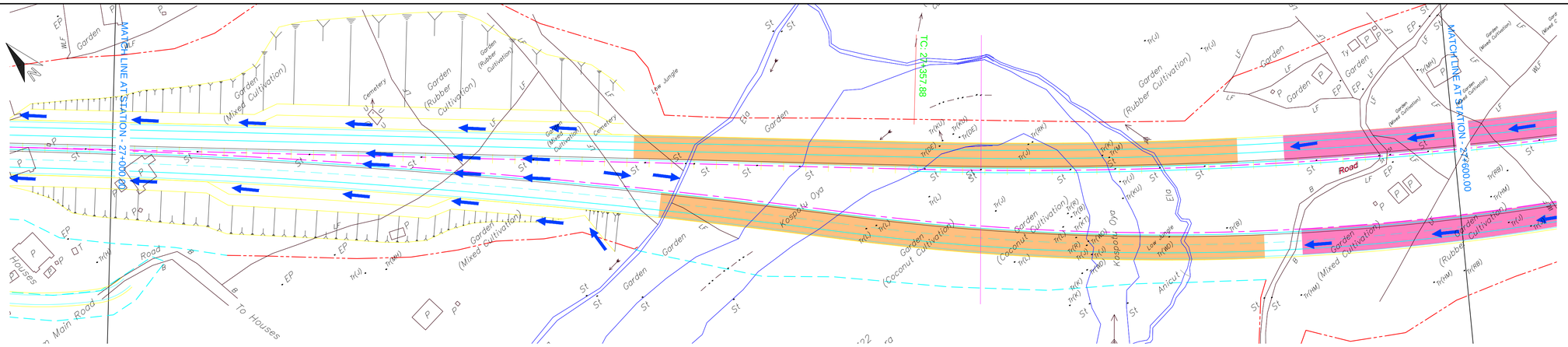
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

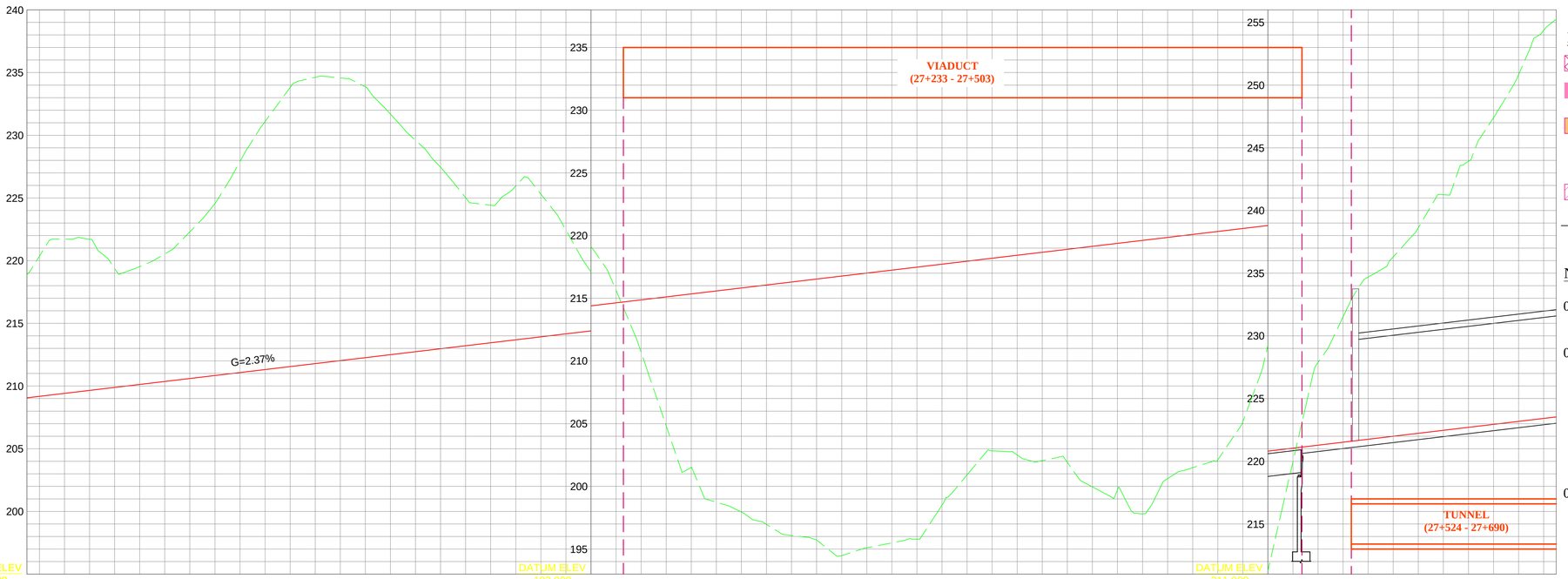
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH26+400.00 - CH27+000.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-55	1:2000	16-05-2016	55 of 68



PLAN

SCALE 1: 2000



LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch27+000	209.173	220.354
Ch27+010	209.410	221.722
Ch27+020	209.647	221.716
Ch27+030	209.885	219.381
Ch27+040	210.122	219.526
Ch27+050	210.360	220.535
Ch27+060	210.597	222.297
Ch27+070	210.834	224.557
Ch27+080	211.072	227.909
Ch27+090	211.309	231.104
Ch27+100	211.546	233.809
Ch27+110	211.784	234.626
Ch27+120	212.021	234.573
Ch27+130	212.259	233.865
Ch27+140	212.496	231.696
Ch27+150	212.733	229.602
Ch27+160	212.971	227.453
Ch27+170	213.208	225.019
Ch27+180	213.446	224.424
Ch27+190	213.683	225.954
Ch27+200	213.920	225.313
Ch27+210	214.158	222.438
Ch27+220	214.395	219.112
Ch27+230	214.632	215.634
Ch27+240	214.870	210.696
Ch27+250	215.107	204.829
Ch27+260	215.345	201.507
Ch27+270	215.582	198.733
Ch27+280	215.819	197.951
Ch27+290	216.057	196.966
Ch27+300	216.294	196.083
Ch27+310	216.531	195.724
Ch27+320	216.769	194.475
Ch27+330	217.006	195.098
Ch27+340	217.244	195.492
Ch27+350	217.481	195.785
Ch27+360	217.718	198.498
Ch27+370	217.956	200.911
Ch27+380	218.193	202.827
Ch27+390	218.431	202.500
Ch27+400	218.668	202.047
Ch27+410	218.905	201.913
Ch27+420	219.143	199.955
Ch27+430	219.380	199.731
Ch27+440	219.617	199.799
Ch27+450	219.855	200.614
Ch27+460	220.092	201.484
Ch27+470	220.330	202.119
Ch27+480	220.567	205.148
Ch27+490	220.804	211.262
Ch27+500	221.042	219.973
Ch27+510	221.279	227.868
Ch27+520	221.516	231.530
Ch27+530	221.754	234.688
Ch27+540	221.991	236.295
Ch27+550	222.229	238.628
Ch27+560	222.466	241.256
Ch27+570	222.703	243.917
Ch27+580	222.941	247.389
Ch27+590	223.178	250.835
Ch27+600	223.416	254.363

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

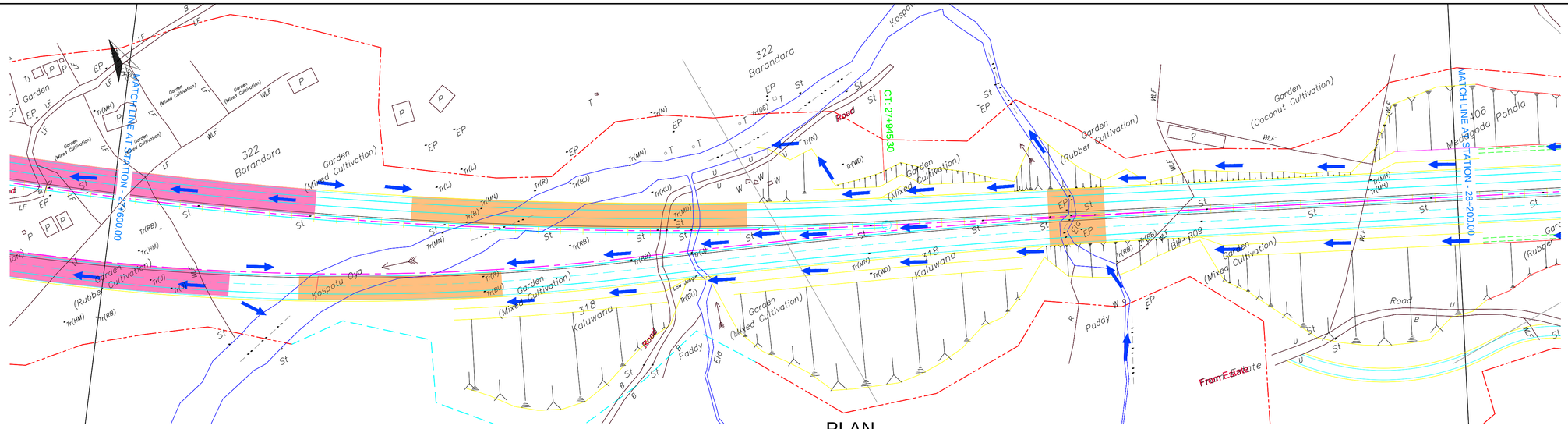
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

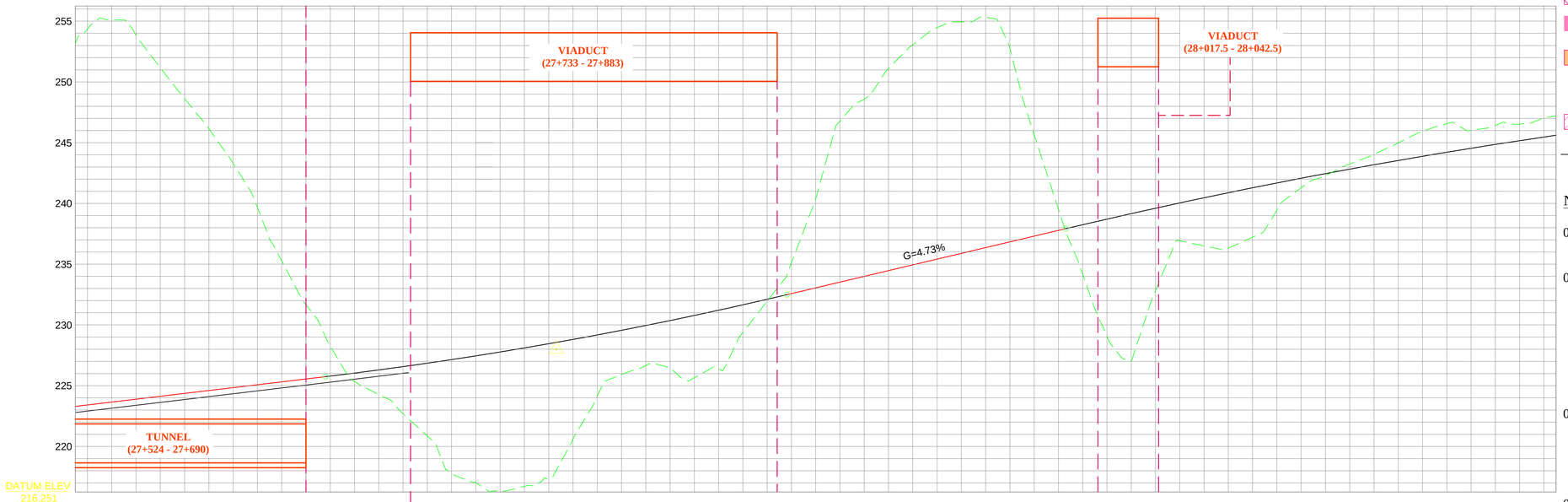
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH27+000.00 - CH27+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-57	1:2000	16-05-2016	57 of 68



PLAN

SCALE 1: 2000



CHAINAGE	Ch27+600	Ch27+610	Ch27+620	Ch27+630	Ch27+640	Ch27+650	Ch27+660	Ch27+670	Ch27+680	Ch27+690	Ch27+700	Ch27+710	Ch27+720	Ch27+730	Ch27+740	Ch27+750	Ch27+760	Ch27+770	Ch27+780	Ch27+790	Ch27+800	Ch27+810	Ch27+820	Ch27+830	Ch27+840	Ch27+850	Ch27+860	Ch27+870	Ch27+880	Ch27+890	Ch27+900	Ch27+910	Ch27+920	Ch27+930	Ch27+940	Ch27+950	Ch27+960	Ch27+970	Ch27+980	Ch27+990	Ch28+000	Ch28+010	Ch28+020	Ch28+030	Ch28+040	Ch28+050	Ch28+060	Ch28+070	Ch28+080	Ch28+090	Ch28+100	Ch28+110	Ch28+120	Ch28+130	Ch28+140	Ch28+150	Ch28+160	Ch28+170	Ch28+180	Ch28+190	Ch28+200
FINISHED GROUND LEVEL	223.416	223.653	223.890	224.128	224.365	224.602	224.840	225.077	225.315	225.552	225.790	226.035	226.294	226.564	226.847	227.143	227.451	227.771	228.103	228.448	228.806	229.175	229.557	229.952	230.359	230.778	231.210	231.654	232.110	232.579	233.051	233.524	233.996	234.469	234.942	235.414	235.887	236.360	236.832	237.305	237.777	238.248	238.710	239.162	239.606	240.040	240.466	240.882	241.289	241.687	242.076	242.456	242.827	243.188	243.541	243.884	244.218	244.543	244.859	245.166	245.464
EXSISTING GROUND LEVEL	254.363	255.113	253.810	251.164	248.614	246.142	243.308	239.665	235.274	231.662	228.254	225.349	224.272	222.688	220.858	217.757	217.013	216.323	216.711	217.369	220.593	224.124	225.917	226.650	226.468	225.658	226.393	229.387	231.943	235.109	240.351	246.774	248.583	251.105	253.046	254.470	254.939	255.337	252.771	245.665	239.530	234.175	229.067	227.033	232.823	236.925	236.506	236.316	237.216	239.454	241.287	242.304	243.240	244.034	244.984	245.933	246.563	246.022	246.423	246.532	247.042

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

01. Structures and structure locations are given for indication only.

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY
PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

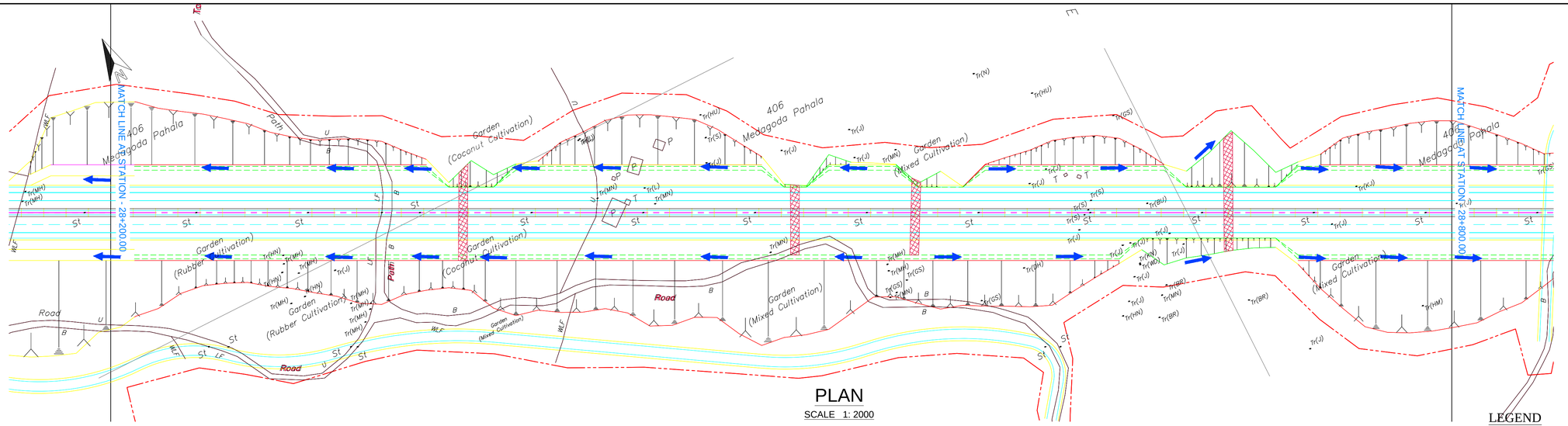
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

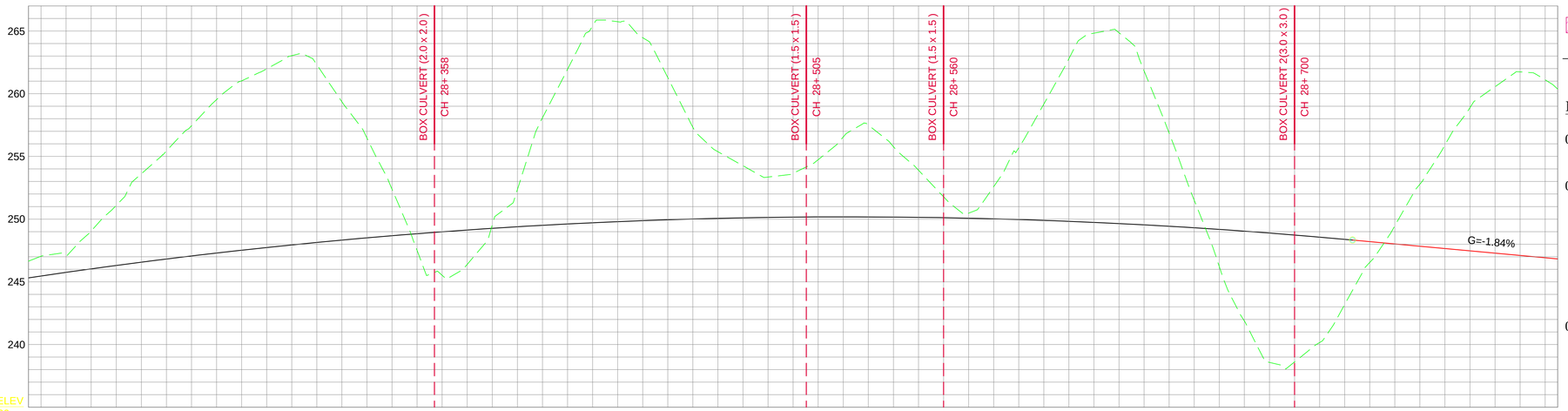
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH27+600.00 - CH28+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-59	1:2000	16-05-2016	59 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch28+200	245.464	247.042
Ch28+210	245.753	247.126
Ch28+220	246.032	249.054
Ch28+230	246.302	251.096
Ch28+240	246.564	253.612
Ch28+250	246.816	255.432
Ch28+260	247.059	257.439
Ch28+270	247.293	259.530
Ch28+280	247.518	261.029
Ch28+290	247.734	261.979
Ch28+300	247.940	263.033
Ch28+310	248.138	262.315
Ch28+320	248.326	259.359
Ch28+330	248.505	256.465
Ch28+340	248.676	252.386
Ch28+350	248.837	247.502
Ch28+360	248.989	245.516
Ch28+370	249.131	246.389
Ch28+380	249.265	249.545
Ch28+390	249.390	252.349
Ch28+400	249.505	258.083
Ch28+410	249.612	261.941
Ch28+420	249.709	265.400
Ch28+430	249.797	265.744
Ch28+440	249.876	264.468
Ch28+450	249.946	261.285
Ch28+460	250.007	257.323
Ch28+470	250.058	255.374
Ch28+480	250.101	254.253
Ch28+490	250.134	253.356
Ch28+500	250.159	253.654
Ch28+510	250.174	254.738
Ch28+520	250.180	256.550
Ch28+530	250.177	257.500
Ch28+540	250.165	255.785
Ch28+550	250.144	253.903
Ch28+560	250.113	251.781
Ch28+570	250.074	250.475
Ch28+580	250.025	252.586
Ch28+590	249.968	255.687
Ch28+600	249.901	259.172
Ch28+610	249.825	262.792
Ch28+620	249.740	264.831
Ch28+630	249.646	264.861
Ch28+640	249.543	261.829
Ch28+650	249.430	256.860
Ch28+660	249.309	251.507
Ch28+670	249.178	246.209
Ch28+680	249.038	241.878
Ch28+690	248.890	238.573
Ch28+700	248.732	238.605
Ch28+710	248.565	240.153
Ch28+720	248.388	243.181
Ch28+730	248.205	246.541
Ch28+740	248.022	249.461
Ch28+750	247.838	252.779
Ch28+760	247.655	255.905
Ch28+770	247.471	258.893
Ch28+780	247.287	260.560
Ch28+790	247.104	261.741
Ch28+800	246.920	261.104

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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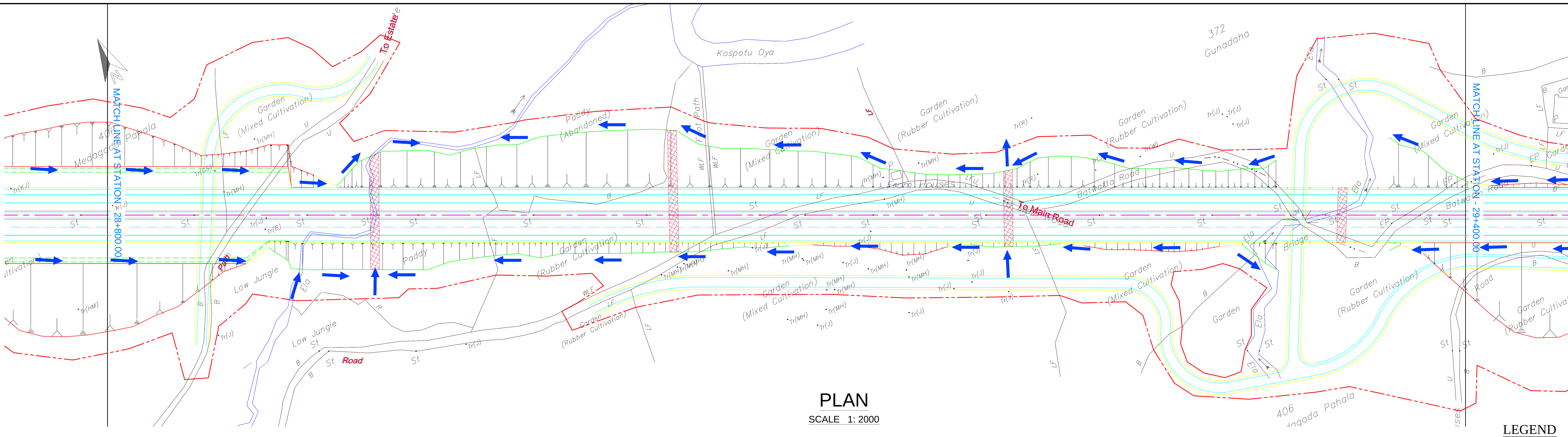
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH28+200.00 - CH28+800.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-61	1:2000	16-05-2016	61 of 68

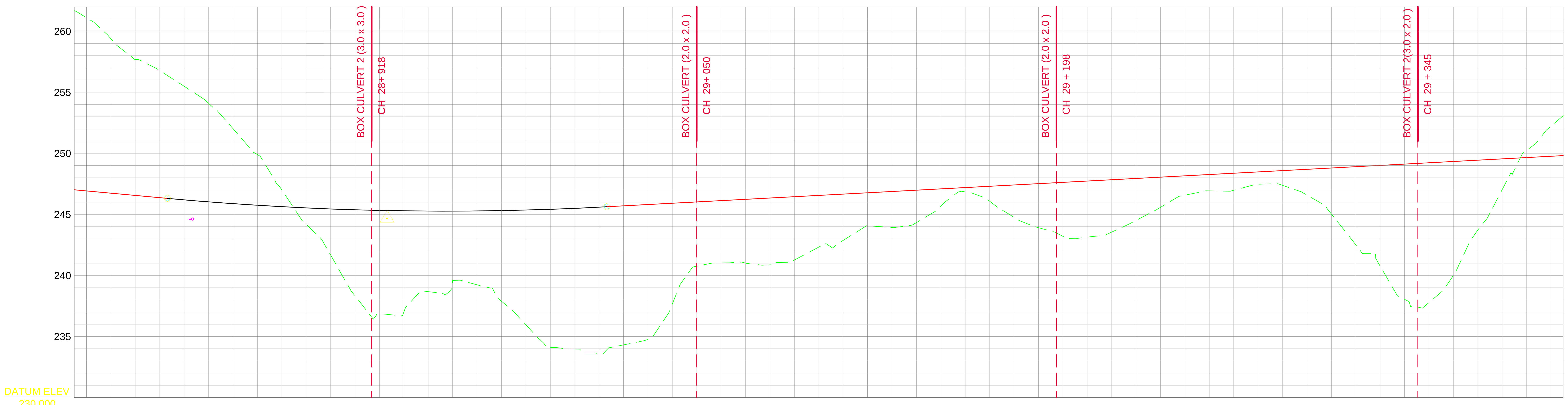


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	Ch28+800	Ch28+810	Ch28+820	Ch28+830	Ch28+840	Ch28+850	Ch28+860	Ch28+870	Ch28+880	Ch28+890
FINISHED GROUND LEVEL	246.920	246.737	246.553	246.370	246.190	246.025	245.877	245.745	245.629	245.529
EXSISTING GROUND LEVEL	261.104	259.389	257.683	256.778	255.495	254.096	252.022	249.902	247.003	244.179

CHAINAGE	Ch28+900	Ch28+910	Ch28+920	Ch28+930	Ch28+940	Ch28+950	Ch28+960	Ch28+970	Ch28+980	Ch28+990
FINISHED GROUND LEVEL	245.445	245.378	245.327	245.291	245.272	245.269	245.282	245.312	245.357	245.419
EXSISTING GROUND LEVEL	241.670	238.329	236.871	236.999	238.670	239.588	239.231	237.890	235.952	234.094

CHAINAGE	Ch29+000	Ch29+010	Ch29+020	Ch29+030	Ch29+040	Ch29+050	Ch29+060	Ch29+070	Ch29+080	Ch29+090
FINISHED GROUND LEVEL	245.496	245.590	245.696	245.803	245.910	246.017	246.124	246.231	246.338	246.445
EXSISTING GROUND LEVEL	233.967	233.584	234.313	234.754	237.664	240.753	241.022	241.014	240.867	241.262

CHAINAGE	Ch29+100	Ch29+110	Ch29+120	Ch29+130	Ch29+140	Ch29+150	Ch29+160	Ch29+170	Ch29+180	Ch29+190
FINISHED GROUND LEVEL	246.552	246.659	246.766	246.873	246.980	247.087	247.194	247.301	247.408	247.515
EXSISTING GROUND LEVEL	242.322	242.874	244.066	243.925	244.328	245.662	246.841	246.081	244.760	243.912

CHAINAGE	Ch29+200	Ch29+210	Ch29+220	Ch29+230	Ch29+240	Ch29+250	Ch29+260	Ch29+270	Ch29+280	Ch29+290
FINISHED GROUND LEVEL	247.622	247.729	247.836	247.943	248.050	248.157	248.264	248.371	248.478	248.585
EXSISTING GROUND LEVEL	243.204	243.138	243.550	244.510	245.580	246.574	246.928	246.976	247.476	247.378

CHAINAGE	Ch29+300	Ch29+310	Ch29+320	Ch29+330	Ch29+340	Ch29+350	Ch29+360	Ch29+370	Ch29+380	Ch29+390	Ch29+400
FINISHED GROUND LEVEL	248.692	248.799	248.906	249.013	249.120	249.227	249.334	249.441	249.548	249.655	249.762
EXSISTING GROUND LEVEL	246.582	245.029	242.522	240.764	238.040	237.783	240.012	243.712	247.033	250.241	252.228

LONGITUDINAL SECTION

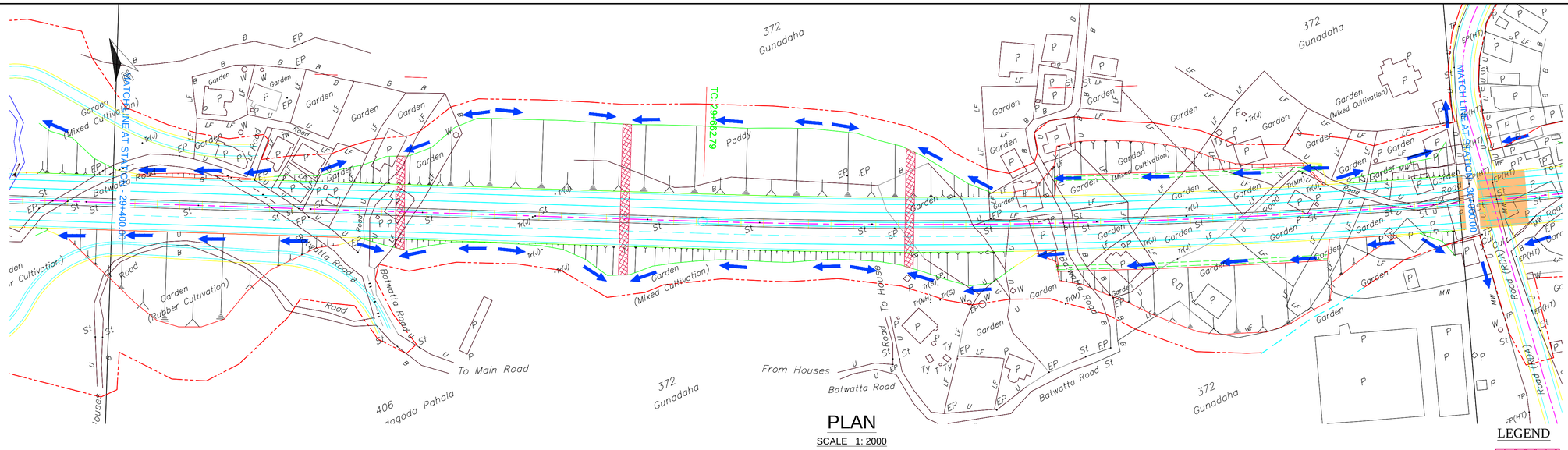
SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

NOTE

01. Structures and structure locations are given for indication only.
02. Storm water drainage management plan at cut sections to be suitably designed depending on the site conditions at detailed design stage.
    Only a tentative plan is given at some locations based on currently proposed vertical profile by RDA which shall be changed to suit the site conditions.
03. Storm water drainage management plan at interchange areas to be designed based on finalized geometric designs. Tentative partial plans given considering the main traces in these locations.
04. Existing width of the canal to be maintained wherever canal route is block and diverted. For such major streams, drainage network should be suitably designed and get approval from SLLRDC.
    Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

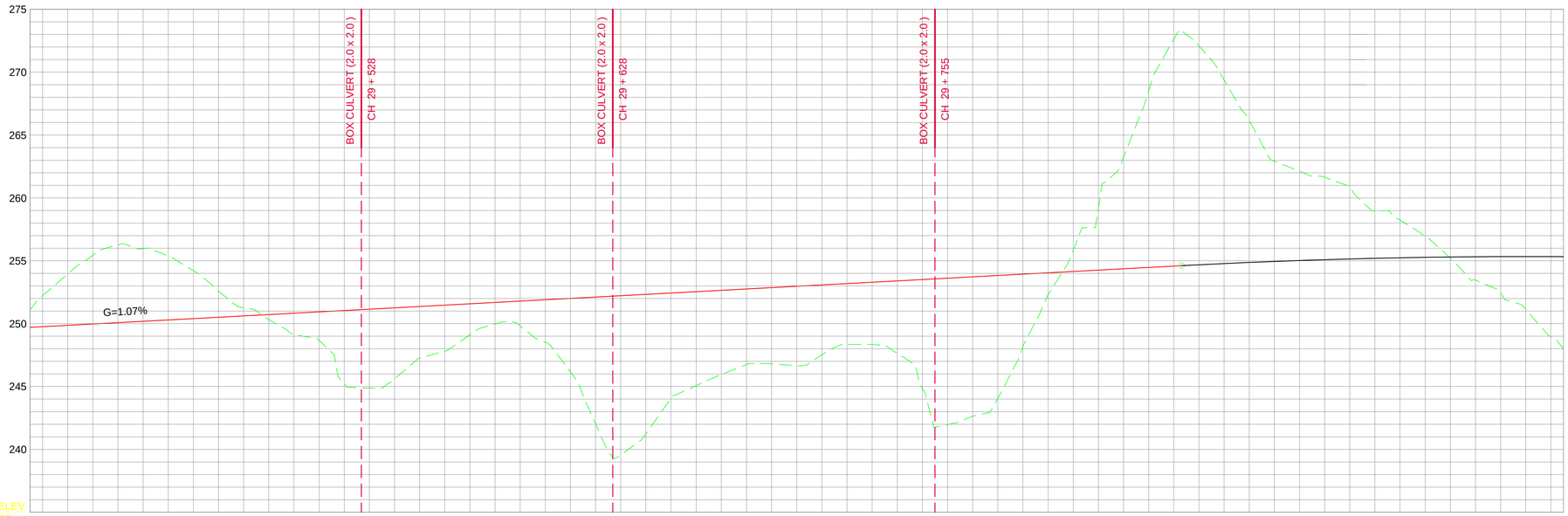
Employer	Consultant (Hydrology)	Project Title	Drawing Title :
DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA MINISTRY OF HIGHER EDUCATION & HIGHWAYS **ROAD DEVELOPMENT AUTHORITY** PROJECT DIRECTOR - CENTRAL EXPRESSWAY 3rd Floor, Sethsiripaya, Battaramulla. Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com	MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT **SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION** NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA. Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com	CENTRAL EXPRESSWAY PROJECT (CEP) SECTION - 3 FROM POTUHERA TO GALAGEDARA (CH. 0+000 - CH. 32+500)	SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH28+800.00 - CH29+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-62	1:2000	16-05-2016	62 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch29+400	249.762	252.228
Ch29+410	249.869	253.953
Ch29+420	249.976	255.436
Ch29+430	250.083	256.269
Ch29+440	250.190	255.968
Ch29+450	250.297	255.389
Ch29+460	250.404	254.214
Ch29+470	250.511	252.574
Ch29+480	250.618	251.269
Ch29+490	250.725	250.316
Ch29+500	250.832	249.121
Ch29+510	250.939	248.674
Ch29+520	251.046	245.236
Ch29+530	251.153	244.875
Ch29+540	251.260	245.604
Ch29+550	251.367	247.257
Ch29+560	251.474	247.803
Ch29+570	251.581	249.113
Ch29+580	251.688	249.980
Ch29+590	251.795	249.816
Ch29+600	251.902	248.523
Ch29+610	252.009	246.165
Ch29+620	252.116	242.017
Ch29+630	252.223	239.561
Ch29+640	252.330	241.247
Ch29+650	252.437	244.068
Ch29+660	252.544	245.072
Ch29+670	252.651	245.956
Ch29+680	252.758	246.742
Ch29+690	252.865	246.800
Ch29+700	252.972	246.649
Ch29+710	253.079	247.521
Ch29+720	253.186	248.340
Ch29+730	253.293	248.340
Ch29+740	253.400	247.648
Ch29+750	253.507	244.832
Ch29+760	253.614	241.973
Ch29+770	253.721	242.644
Ch29+780	253.828	244.072
Ch29+790	253.935	248.171
Ch29+800	254.042	252.310
Ch29+810	254.149	255.849
Ch29+820	254.256	259.206
Ch29+830	254.363	263.232
Ch29+840	254.470	268.531
Ch29+850	254.577	272.624
Ch29+860	254.682	272.080
Ch29+870	254.779	269.395
Ch29+880	254.869	266.167
Ch29+890	254.951	262.918
Ch29+900	255.025	262.122
Ch29+910	255.092	261.646
Ch29+920	255.150	260.850
Ch29+930	255.201	258.983
Ch29+940	255.243	258.233
Ch29+950	255.278	256.971
Ch29+960	255.305	255.201
Ch29+970	255.324	253.459
Ch29+980	255.336	252.488
Ch29+990	255.339	251.131
Ch30+000	255.335	248.960

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

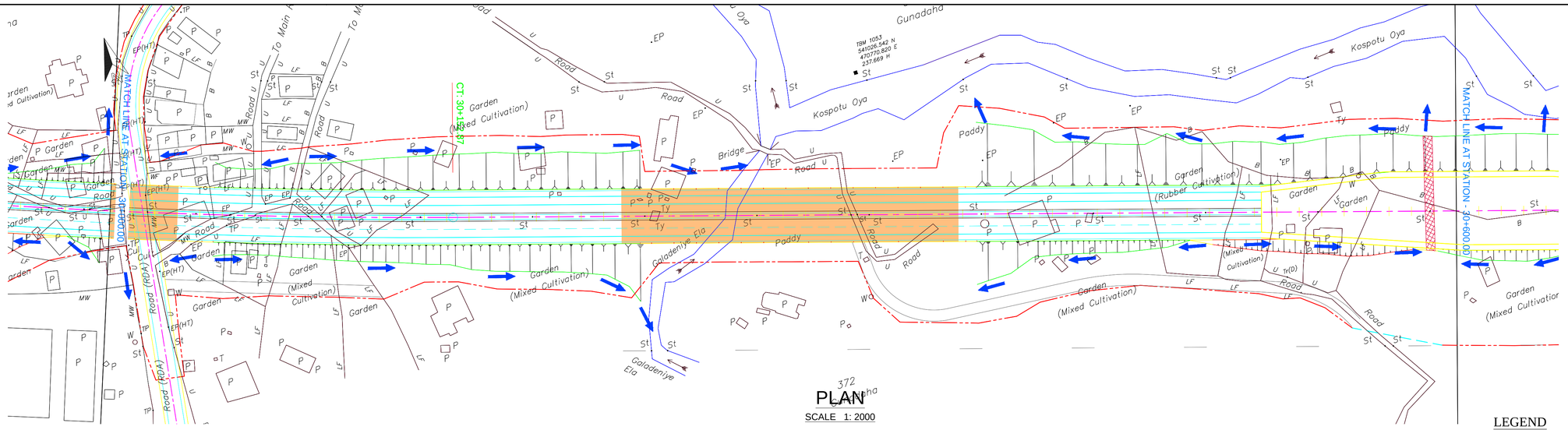
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

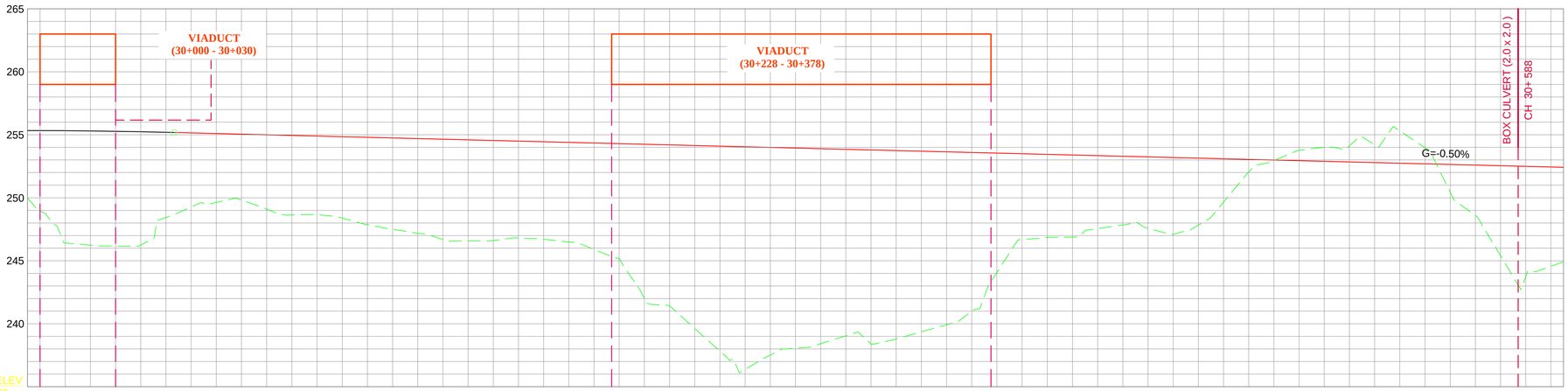
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH29+400.00 - CH30+000.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-63	1:2000	16-05-2016	63 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch30+000	255.335	248.960
Ch30+010	255.323	246.412
Ch30+020	255.303	246.242
Ch30+030	255.275	246.159
Ch30+040	255.239	246.242
Ch30+050	255.195	248.431
Ch30+060	255.146	249.270
Ch30+070	255.096	249.629
Ch30+080	255.046	249.818
Ch30+090	254.996	249.103
Ch30+100	254.946	248.638
Ch30+110	254.896	248.656
Ch30+120	254.846	248.387
Ch30+130	254.796	247.864
Ch30+140	254.746	247.499
Ch30+150	254.696	247.181
Ch30+160	254.646	246.689
Ch30+170	254.596	246.578
Ch30+180	254.546	246.608
Ch30+190	254.496	246.809
Ch30+200	254.446	246.702
Ch30+210	254.396	246.487
Ch30+220	254.346	245.898
Ch30+230	254.296	245.180
Ch30+240	254.246	242.020
Ch30+250	254.196	241.416
Ch30+260	254.146	239.618
Ch30+270	254.096	237.820
Ch30+280	254.046	236.371
Ch30+290	253.996	237.515
Ch30+300	253.946	238.054
Ch30+310	253.896	238.418
Ch30+320	253.846	239.044
Ch30+330	253.796	238.395
Ch30+340	253.746	238.795
Ch30+350	253.696	239.358
Ch30+360	253.646	239.922
Ch30+370	253.596	240.968
Ch30+380	253.546	244.072
Ch30+390	253.496	246.680
Ch30+400	253.446	246.856
Ch30+410	253.396	246.880
Ch30+420	253.346	247.556
Ch30+430	253.296	247.839
Ch30+440	253.246	247.582
Ch30+450	253.196	247.100
Ch30+460	253.146	247.831
Ch30+470	253.096	249.652
Ch30+480	253.046	252.053
Ch30+490	252.996	252.949
Ch30+500	252.946	253.766
Ch30+510	252.896	253.986
Ch30+520	252.846	254.120
Ch30+530	252.796	254.210
Ch30+540	252.746	255.320
Ch30+550	252.696	253.975
Ch30+560	252.646	250.447
Ch30+570	252.596	248.590
Ch30+580	252.546	245.401
Ch30+590	252.496	243.743
Ch30+600	252.446	244.562

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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    Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

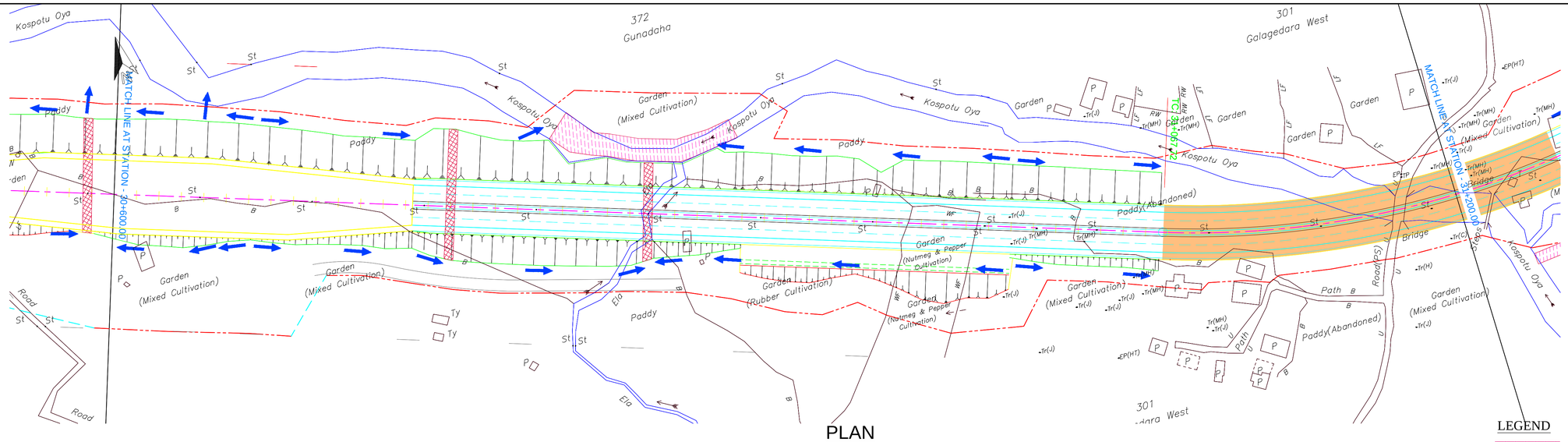
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

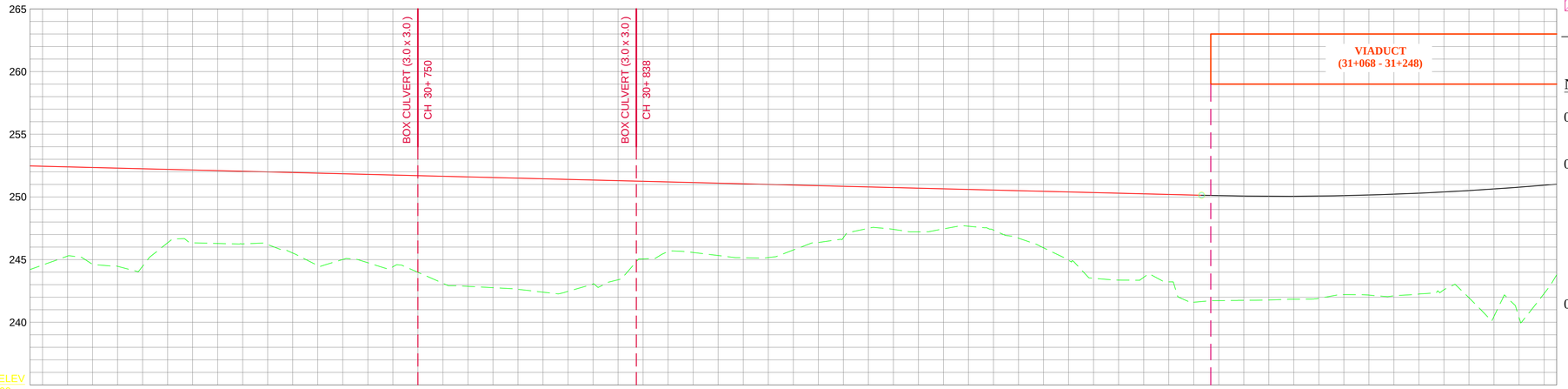
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH30+000.00 - CH30+600.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-64	1:2000	16-05-2016	64 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch30+600	252.446	244.562
Ch30+610	252.396	245.278
Ch30+620	252.346	244.621
Ch30+630	252.296	244.461
Ch30+640	252.246	244.470
Ch30+650	252.196	246.342
Ch30+660	252.146	246.333
Ch30+670	252.096	246.287
Ch30+680	252.046	246.249
Ch30+690	251.996	246.195
Ch30+700	251.946	245.522
Ch30+710	251.896	244.523
Ch30+720	251.846	245.005
Ch30+730	251.796	244.744
Ch30+740	251.746	244.428
Ch30+750	251.696	243.987
Ch30+760	251.646	243.112
Ch30+770	251.596	242.864
Ch30+780	251.546	242.756
Ch30+790	251.496	242.626
Ch30+800	251.446	242.400
Ch30+810	251.396	242.465
Ch30+820	251.346	243.049
Ch30+830	251.296	243.388
Ch30+840	251.246	245.051
Ch30+850	251.196	245.656
Ch30+860	251.146	245.568
Ch30+870	251.096	245.323
Ch30+880	251.046	245.145
Ch30+890	250.996	245.160
Ch30+900	250.946	245.761
Ch30+910	250.896	246.363
Ch30+920	250.846	246.739
Ch30+930	250.796	247.494
Ch30+940	250.746	247.412
Ch30+950	250.696	247.213
Ch30+960	250.646	247.453
Ch30+970	250.596	247.662
Ch30+980	250.546	247.355
Ch30+990	250.496	246.713
Ch31+000	250.446	245.935
Ch31+010	250.396	244.955
Ch31+020	250.346	243.508
Ch31+030	250.296	243.363
Ch31+040	250.246	243.585
Ch31+050	250.196	243.223
Ch31+060	250.146	241.593
Ch31+070	250.099	241.726
Ch31+080	250.068	241.750
Ch31+090	250.053	241.771
Ch31+100	250.054	241.835
Ch31+110	250.070	241.909
Ch31+120	250.102	242.205
Ch31+130	250.151	242.165
Ch31+140	250.215	242.108
Ch31+150	250.295	242.249
Ch31+160	250.390	242.601
Ch31+170	250.502	241.950
Ch31+180	250.630	240.460
Ch31+190	250.773	240.369
Ch31+200	250.932	242.287

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000

VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3rd Floor, Sethsiripaya, Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Consultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

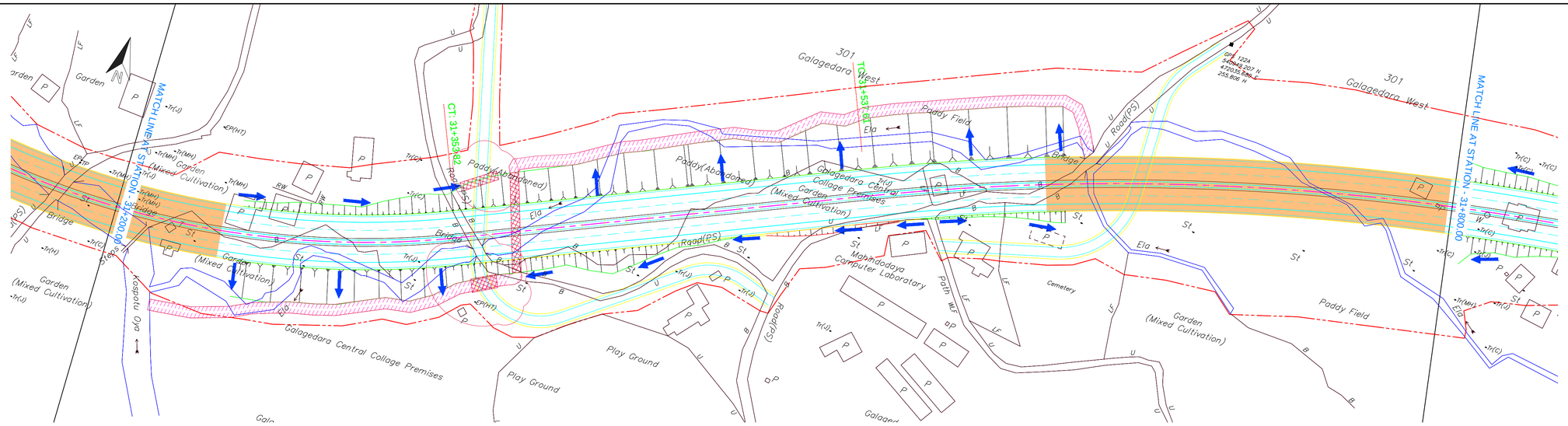
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :

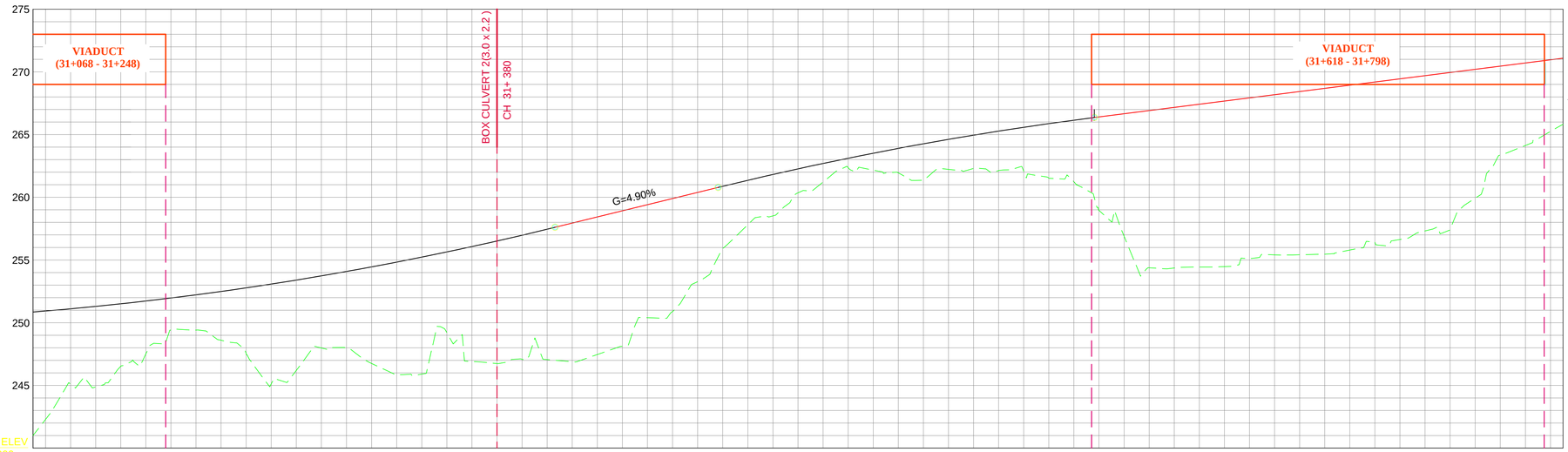
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH30+600.00 - CH31+200.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-65	1:2000	16-05-2016	65 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch31+200	250.932	242.287
Ch31+210	251.108	245.101
Ch31+220	251.299	244.875
Ch31+230	251.506	246.525
Ch31+240	251.728	247.504
Ch31+250	251.967	249.414
Ch31+260	252.222	249.415
Ch31+270	252.492	248.604
Ch31+280	252.778	247.542
Ch31+290	253.081	245.126
Ch31+300	253.399	246.201
Ch31+310	253.733	247.985
Ch31+320	254.082	248.005
Ch31+330	254.448	246.754
Ch31+340	254.830	245.837
Ch31+350	255.227	245.904
Ch31+360	255.640	249.212
Ch31+370	256.070	246.907
Ch31+380	256.515	246.744
Ch31+390	256.975	247.084
Ch31+400	257.452	247.059
Ch31+410	257.941	246.891
Ch31+420	258.431	247.464
Ch31+430	258.921	248.128
Ch31+440	259.410	250.398
Ch31+450	259.900	250.895
Ch31+460	260.390	253.273
Ch31+470	260.879	255.913
Ch31+480	261.358	257.814
Ch31+490	261.821	258.516
Ch31+500	262.268	260.355
Ch31+510	262.700	261.210
Ch31+520	263.115	262.362
Ch31+530	263.516	262.167
Ch31+540	263.900	261.944
Ch31+550	264.268	261.359
Ch31+560	264.621	262.222
Ch31+570	264.958	262.300
Ch31+580	265.279	262.131
Ch31+590	265.584	262.083
Ch31+600	265.874	261.531
Ch31+610	266.148	261.241
Ch31+620	266.406	258.955
Ch31+630	266.659	256.893
Ch31+640	266.913	254.380
Ch31+650	267.166	254.358
Ch31+660	267.419	254.438
Ch31+670	267.672	254.473
Ch31+680	267.925	255.107
Ch31+690	268.178	255.412
Ch31+700	268.431	255.419
Ch31+710	268.685	255.467
Ch31+720	268.938	255.796
Ch31+730	269.191	256.429
Ch31+740	269.444	256.634
Ch31+750	269.697	257.318
Ch31+760	269.950	257.438
Ch31+770	270.204	259.929
Ch31+780	270.457	263.374
Ch31+790	270.710	264.132
Ch31+800	270.963	265.251

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY
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Consultant (Hydrology)

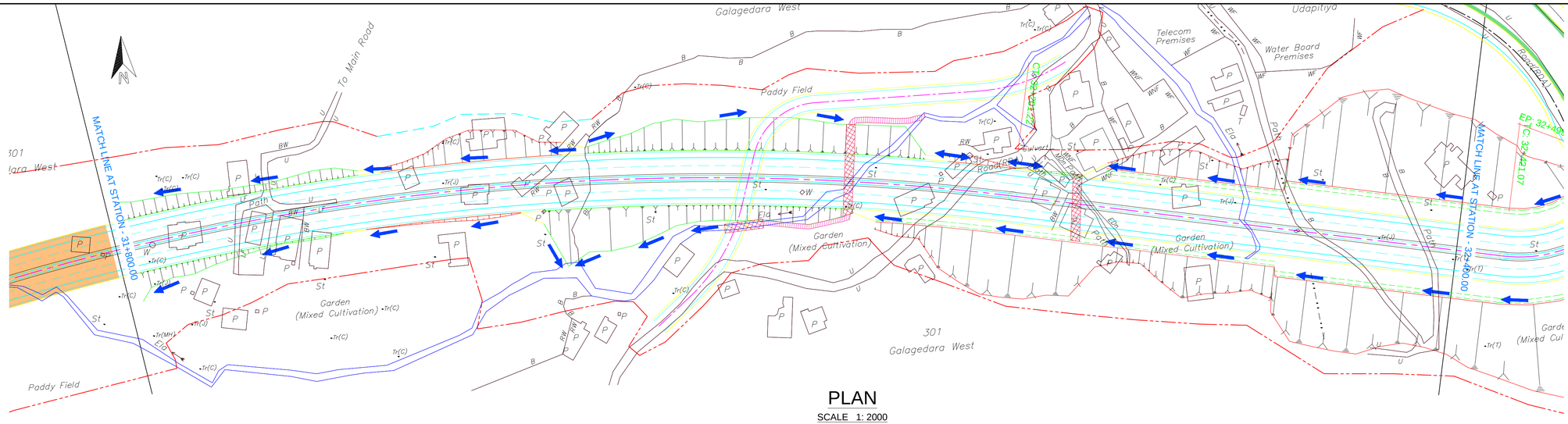
MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT
SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION
NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

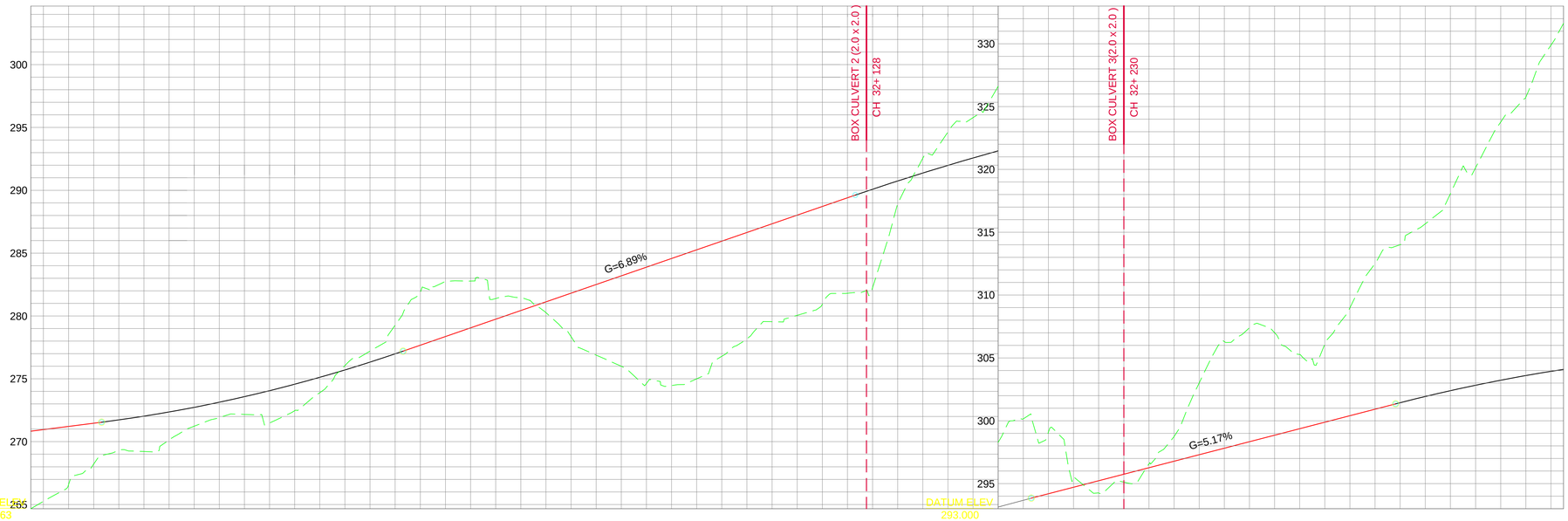
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH31+200.00 - CH31+800.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-66	1:2000	16-05-2016	66 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch31+800	270.963	265.251
Ch31+810	271.216	266.585
Ch31+820	271.469	268.210
Ch31+830	271.731	269.312
Ch31+840	272.027	269.215
Ch31+850	272.360	270.132
Ch31+860	272.729	271.231
Ch31+870	273.135	271.888
Ch31+880	273.576	272.164
Ch31+890	274.054	271.485
Ch31+900	274.569	272.459
Ch31+910	275.120	273.902
Ch31+920	275.707	276.059
Ch31+930	276.330	277.204
Ch31+940	276.990	279.271
Ch31+950	277.678	281.847
Ch31+960	278.368	282.748
Ch31+970	279.057	282.778
Ch31+980	279.746	281.384
Ch31+990	280.436	281.435
Ch32+000	281.125	280.267
Ch32+010	281.815	278.361
Ch32+020	282.504	276.886
Ch32+030	283.194	275.997
Ch32+040	283.883	274.633
Ch32+050	284.573	274.467
Ch32+060	285.262	275.000
Ch32+070	285.952	276.793
Ch32+080	286.641	278.188
Ch32+090	287.331	279.543
Ch32+100	288.020	280.049
Ch32+110	288.710	280.931
Ch32+120	289.399	281.806
Ch32+130	290.083	282.253
Ch32+140	290.743	288.924
Ch32+150	291.379	292.552
Ch32+160	291.990	294.639
Ch32+170	292.576	295.785
Ch32+180	293.138	298.276
Ch32+190	293.676	300.153
Ch32+200	294.194	299.092
Ch32+210	294.711	295.540
Ch32+220	295.229	294.248
Ch32+230	295.746	295.117
Ch32+240	296.264	296.557
Ch32+250	296.781	298.743
Ch32+260	297.298	303.009
Ch32+270	297.816	306.299
Ch32+280	298.333	307.396
Ch32+290	298.850	307.004
Ch32+300	299.368	305.270
Ch32+310	299.885	306.106
Ch32+320	300.402	308.985
Ch32+330	300.920	312.509
Ch32+340	301.437	314.007
Ch32+350	301.932	315.673
Ch32+360	302.396	318.074
Ch32+370	302.828	320.135
Ch32+380	303.229	323.762
Ch32+390	303.597	325.739
Ch32+400	303.934	329.883

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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    Only an indicative plan is given for flow directions.
05. Drainage should be specially designed tunnelling area during detailed design stage.

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

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SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

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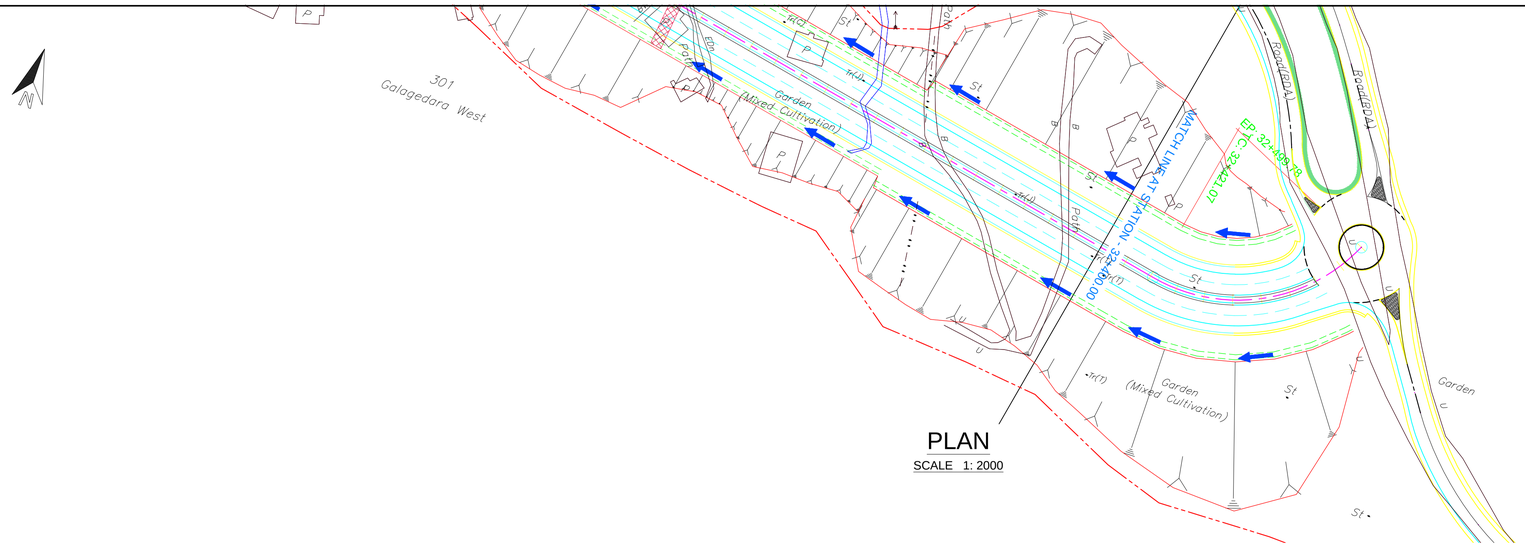
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH31+800.00 - CH32+400.00)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-67	1:2000	16-05-2016	67 of 68



PLAN

SCALE 1: 2000

CHAINAGE	Ch32+400	Ch32+410	Ch32+420	Ch32+430	Ch32+440	Ch32+450	Ch32+460	Ch32+470	Ch32+480	Ch32+490
FINISHED GROUND LEVEL	303.934	304.239	304.513	304.755	304.965	305.143	305.290	305.405	305.488	305.540
EXSISTING GROUND LEVEL	329.883	333.546	337.629	340.899	341.385	336.555	330.053	322.223	312.241	306.074

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000

VERTICAL 1: 400

LEGEND

- Culvert
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Employer

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MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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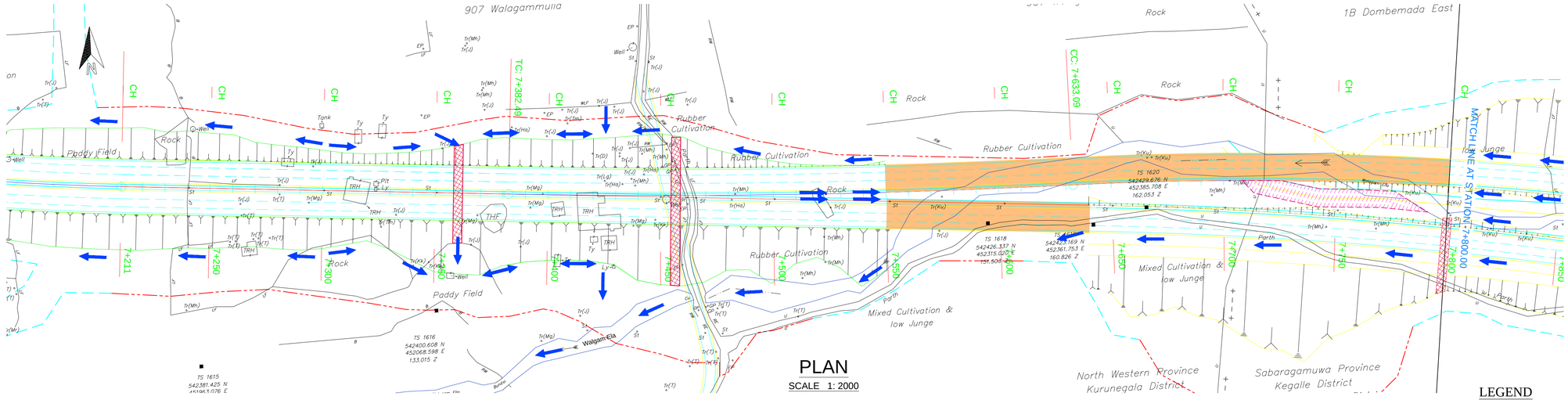
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

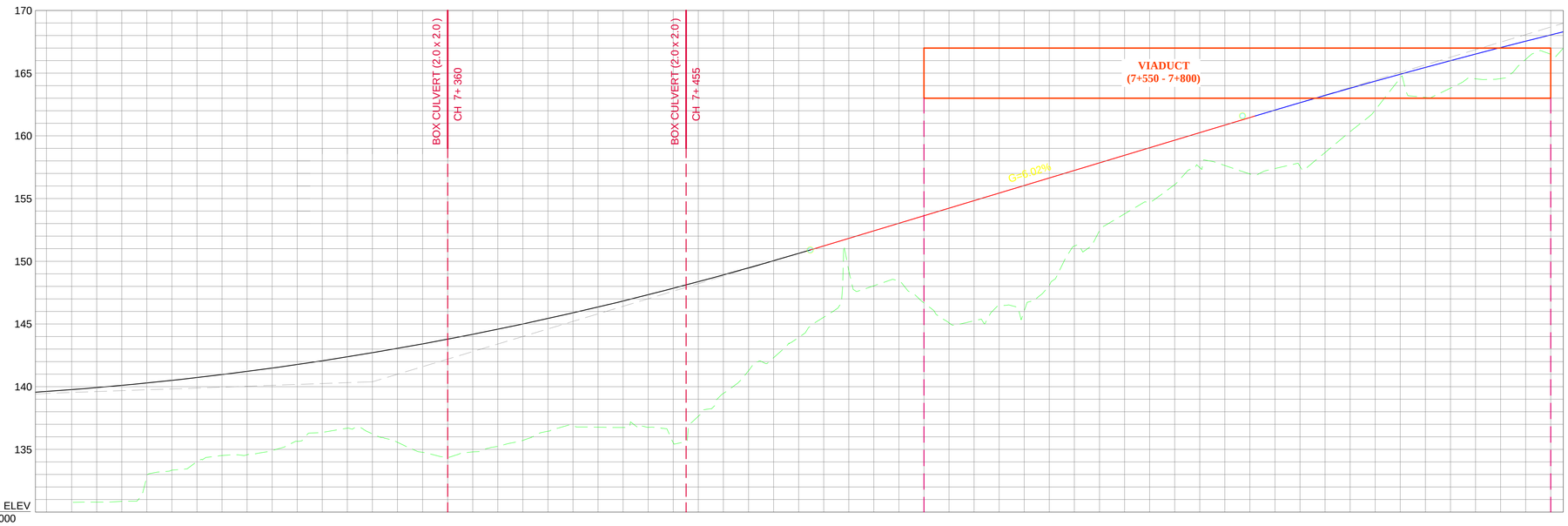
Drawing Title :

SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH32+400.00 - CH32+499.78)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-68	1:2000	16-05-2016	68 of 68



PLAN
SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch7+200	139.617	
Ch7+210	139.764	
Ch7+220	139.925	130.793
Ch7+230	140.102	130.860
Ch7+240	140.294	132.795
Ch7+250	140.502	133.341
Ch7+260	140.724	134.028
Ch7+270	140.962	134.508
Ch7+280	141.215	134.568
Ch7+290	141.483	134.907
Ch7+300	141.766	135.647
Ch7+310	142.065	136.352
Ch7+320	142.378	136.690
Ch7+330	142.707	136.234
Ch7+340	143.051	135.567
Ch7+350	143.411	134.766
Ch7+360	143.785	134.381
Ch7+370	144.175	134.795
Ch7+380	144.580	135.238
Ch7+390	145.000	135.713
Ch7+400	145.435	136.444
Ch7+410	145.886	136.854
Ch7+420	146.351	136.773
Ch7+430	146.832	136.752
Ch7+440	147.328	136.761
Ch7+450	147.840	135.522
Ch7+460	148.366	137.646
Ch7+470	148.908	139.465
Ch7+480	149.465	141.268
Ch7+490	150.037	142.310
Ch7+500	150.624	143.923
Ch7+510	151.224	145.538
Ch7+520	151.826	149.254
Ch7+530	152.428	148.045
Ch7+540	153.030	148.434
Ch7+550	153.632	146.678
Ch7+560	154.234	145.088
Ch7+570	154.836	145.253
Ch7+580	155.438	146.428
Ch7+590	156.039	146.057
Ch7+600	156.641	148.056
Ch7+610	157.243	151.214
Ch7+620	157.845	152.431
Ch7+630	158.447	153.778
Ch7+640	159.049	154.693
Ch7+650	159.651	156.108
Ch7+660	160.253	157.469
Ch7+670	160.855	157.634
Ch7+680	161.456	156.958
Ch7+690	162.056	157.391
Ch7+700	162.646	157.560
Ch7+710	163.227	158.671
Ch7+720	163.799	160.338
Ch7+730	164.362	162.060
Ch7+740	164.916	164.621
Ch7+750	165.460	163.067
Ch7+760	165.996	163.804
Ch7+770	166.523	164.547
Ch7+780	167.040	164.562
Ch7+790	167.548	166.091
Ch7+800	168.048	166.504

LONGITUDINAL SECTION
SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

NOTE

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Employer
DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
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ROAD DEVELOPMENT AUTHORITY
PROJECT DIRECTOR - CENTRAL EXPRESSWAY
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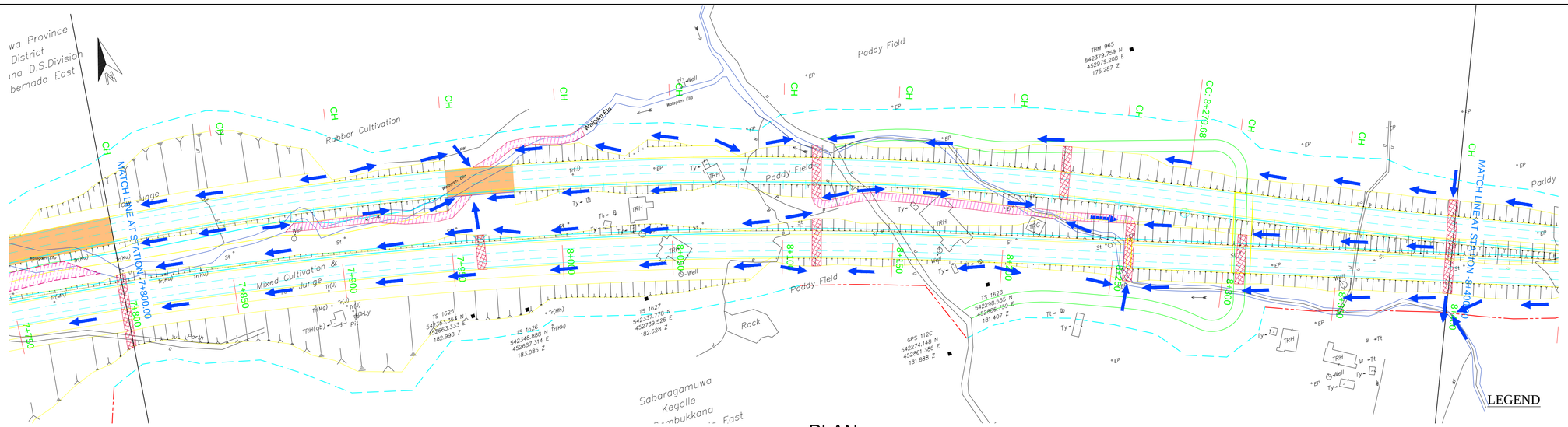
Drswing Title
CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH7+210.85 - CH7+800.00) (LHS)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-13	1:2000	16-05-2016	13 of 68

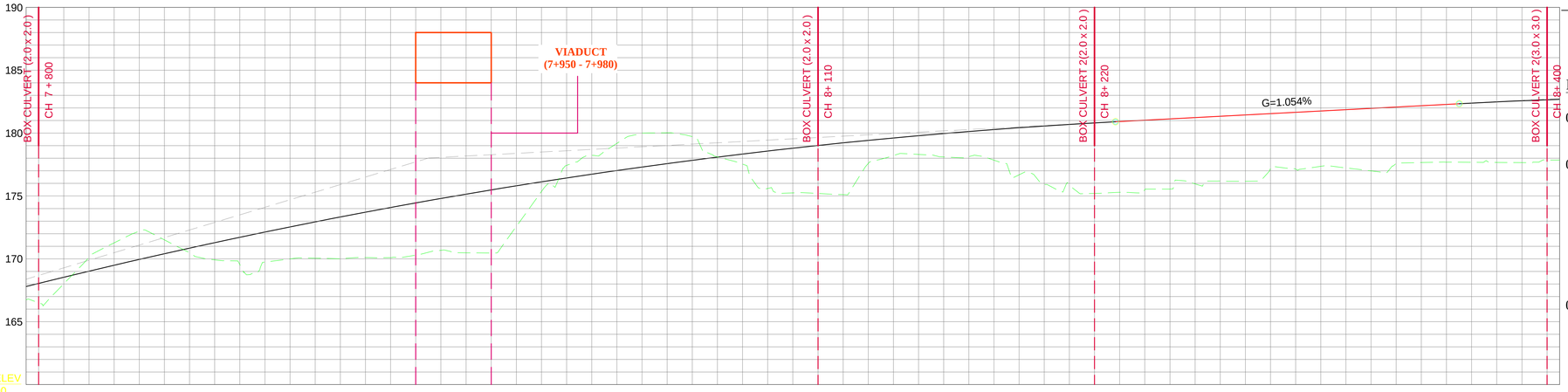


PLAN

SCALE 1: 2000

LEGEND

- Culvert
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch7+800	168.048	166.504
Ch7+810	168.538	168.017
Ch7+820	169.019	170.106
Ch7+830	169.491	171.272
Ch7+840	169.954	172.194
Ch7+850	170.408	171.510
Ch7+860	170.852	170.493
Ch7+870	171.288	169.917
Ch7+880	171.715	169.548
Ch7+890	172.132	169.740
Ch7+900	172.540	169.993
Ch7+910	172.940	170.047
Ch7+920	173.330	170.009
Ch7+930	173.711	170.105
Ch7+940	174.083	170.098
Ch7+950	174.446	170.292
Ch7+960	174.800	170.682
Ch7+970	175.144	170.477
Ch7+980	175.480	170.466
Ch7+990	175.807	172.575
Ch8+000	176.124	175.352
Ch8+010	176.432	177.432
Ch8+020	176.732	178.243
Ch8+030	177.022	179.178
Ch8+040	177.303	180.000
Ch8+050	177.575	180.025
Ch8+060	177.838	179.724
Ch8+070	178.092	178.112
Ch8+080	178.336	177.539
Ch8+090	178.572	175.597
Ch8+100	178.799	175.243
Ch8+110	179.016	175.201
Ch8+120	179.225	175.109
Ch8+130	179.424	177.583
Ch8+140	179.614	178.215
Ch8+150	179.795	178.306
Ch8+160	179.967	178.106
Ch8+170	180.130	178.134
Ch8+180	180.284	177.850
Ch8+190	180.429	176.681
Ch8+200	180.564	175.913
Ch8+210	180.691	175.899
Ch8+220	180.808	175.204
Ch8+230	180.917	175.296
Ch8+240	181.022	175.499
Ch8+250	181.127	175.547
Ch8+260	181.233	175.962
Ch8+270	181.338	176.183
Ch8+280	181.443	176.170
Ch8+290	181.549	177.191
Ch8+300	181.654	177.138
Ch8+310	181.760	177.359
Ch8+320	181.865	177.233
Ch8+330	181.970	176.992
Ch8+340	182.076	177.593
Ch8+350	182.181	177.659
Ch8+360	182.286	177.691
Ch8+370	182.391	177.680
Ch8+380	182.487	177.668
Ch8+390	182.574	177.656
Ch8+400	182.652	177.864

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY

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SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

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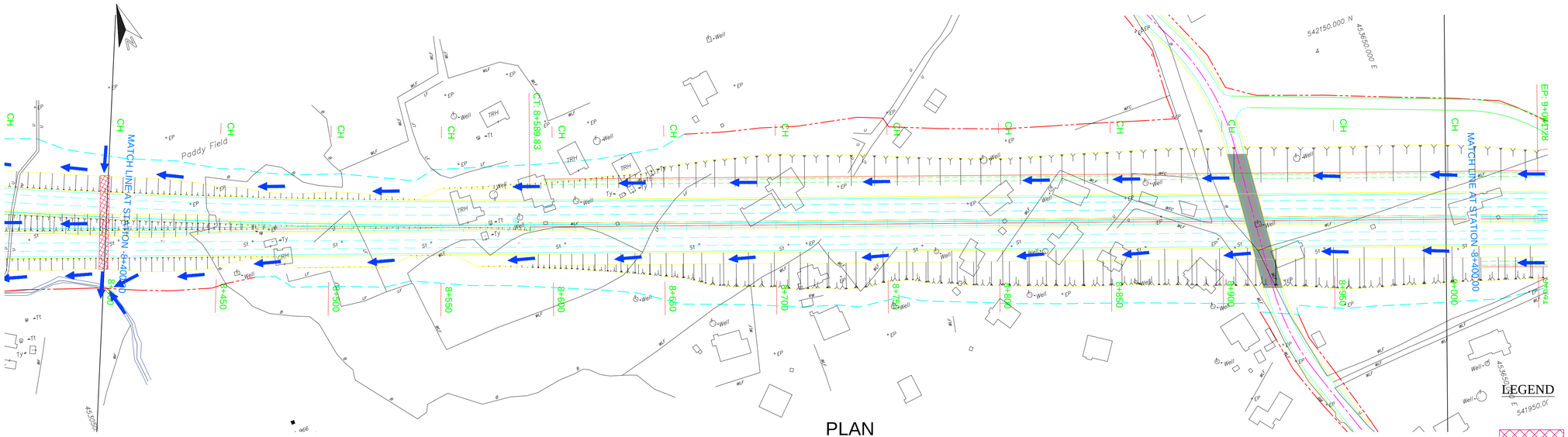
Drswing Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

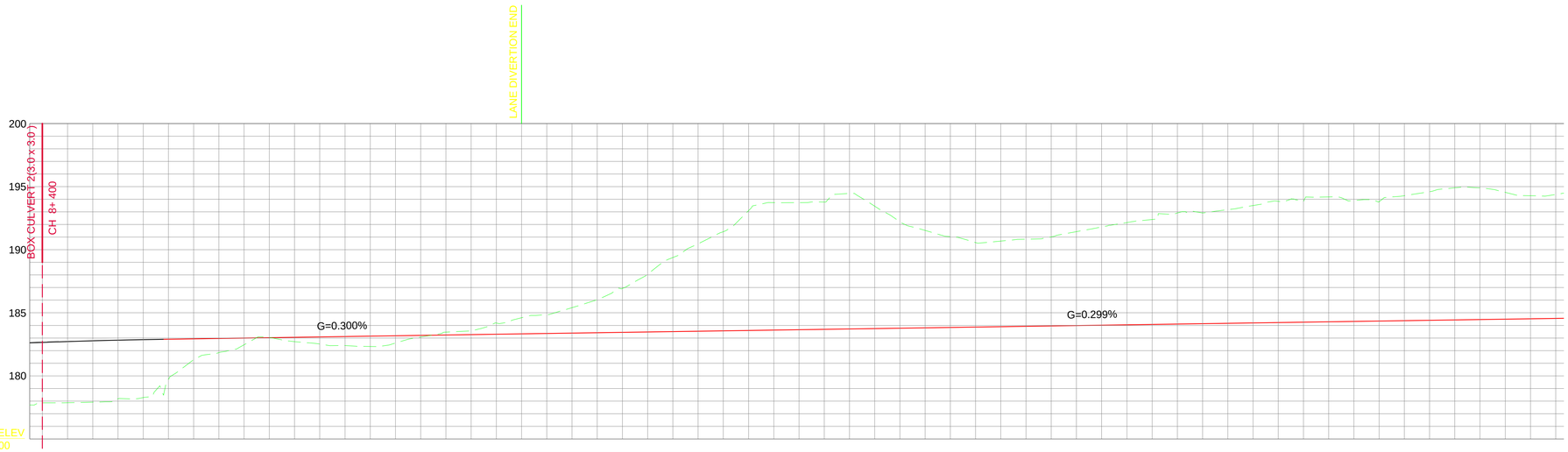
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH7+800.00 - CH8+400.00) (LHS)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-15	1:2000	16-05-2016	15 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch8+400	182.652	177.864
Ch8+410	182.721	177.867
Ch8+420	182.781	177.917
Ch8+430	182.832	178.182
Ch8+440	182.874	178.277
Ch8+450	182.907	179.741
Ch8+460	182.937	181.270
Ch8+470	182.967	181.841
Ch8+480	182.997	182.469
Ch8+490	183.027	183.054
Ch8+500	183.057	182.711
Ch8+510	183.087	182.523
Ch8+520	183.117	182.402
Ch8+530	183.147	182.326
Ch8+540	183.177	182.599
Ch8+550	183.207	183.081
Ch8+560	183.237	183.464
Ch8+570	183.267	183.567
Ch8+580	183.297	184.189
Ch8+590	183.327	184.606
Ch8+600	183.356	184.858
Ch8+610	183.386	185.406
Ch8+620	183.416	186.037
Ch8+630	183.446	186.931
Ch8+640	183.476	188.052
Ch8+650	183.506	189.380
Ch8+660	183.536	190.473
Ch8+670	183.566	191.428
Ch8+680	183.596	193.094
Ch8+690	183.626	193.730
Ch8+700	183.656	193.733
Ch8+710	183.685	193.778
Ch8+720	183.715	194.467
Ch8+730	183.745	193.453
Ch8+740	183.775	192.211
Ch8+750	183.805	191.529
Ch8+760	183.835	191.032
Ch8+770	183.865	190.560
Ch8+780	183.895	190.685
Ch8+790	183.925	190.834
Ch8+800	183.955	191.014
Ch8+810	183.985	191.434
Ch8+820	184.014	191.802
Ch8+830	184.044	192.154
Ch8+840	184.074	192.391
Ch8+850	184.104	192.908
Ch8+860	184.134	192.915
Ch8+870	184.164	193.172
Ch8+880	184.194	193.504
Ch8+890	184.224	193.837
Ch8+900	184.254	193.826
Ch8+910	184.284	194.186
Ch8+920	184.314	193.902
Ch8+930	184.343	193.803
Ch8+940	184.373	194.285
Ch8+950	184.403	194.597
Ch8+960	184.433	194.906
Ch8+970	184.463	194.897
Ch8+980	184.493	194.549
Ch8+990	184.523	194.276
Ch9+000	184.553	194.379

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

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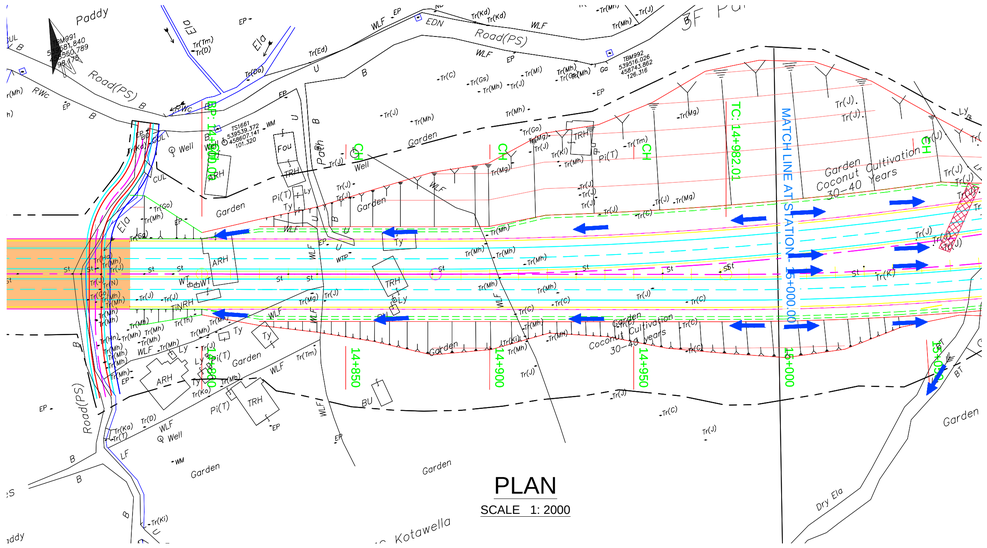
Drswing Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

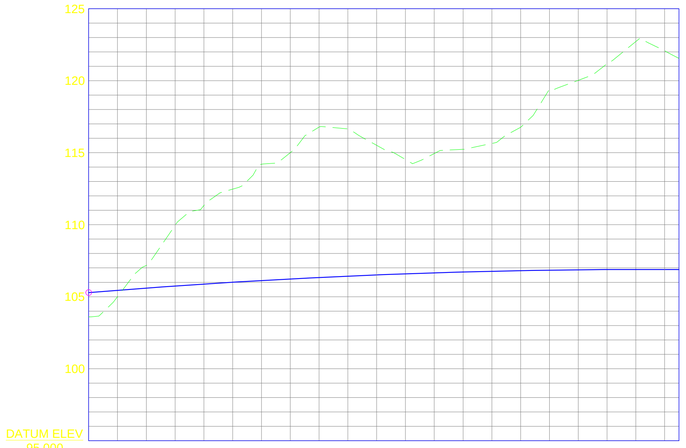
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH8+400.00 - CH9+000.00) (LHS)

Reference Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-17	1:2000	16-05-2016	17 of 68



PLAN

SCALE 1: 2000



CHAINAGE	Ch14+810	Ch14+820	Ch14+830	Ch14+840	Ch14+850	Ch14+860	Ch14+870	Ch14+880	Ch14+890	Ch14+900	Ch14+910	Ch14+920	Ch14+930	Ch14+940	Ch14+950	Ch14+960	Ch14+970	Ch14+980	Ch14+990	Ch15+000
FINISHED GROUND LEVEL	105.449	105.601	105.745	105.880	106.007	106.126	106.235	106.337	106.430	106.514	106.590	106.658	106.716	106.767	106.809	106.842	106.867	106.884	106.892	106.892
EXSISTING GROUND LEVEL	105.003	107.170	109.956	111.332	112.468	114.195	115.000	116.775	116.658	115.512	114.525	114.943	115.235	115.643	116.768	119.369	120.027	121.153	122.721	122.085

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert.
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

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Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY
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Donsultant (Hydrology)

MINISTRY OF MEGAPOLIS & WESTERN DEVELOPMENT

SRI LANKA LAND RECLAMATION AND DEVELOPMENT CORPORATION

NO: 03, SRI JAYAWARDENAPURA MAWATHA, WELIKADA, RAJAGIRIYA.

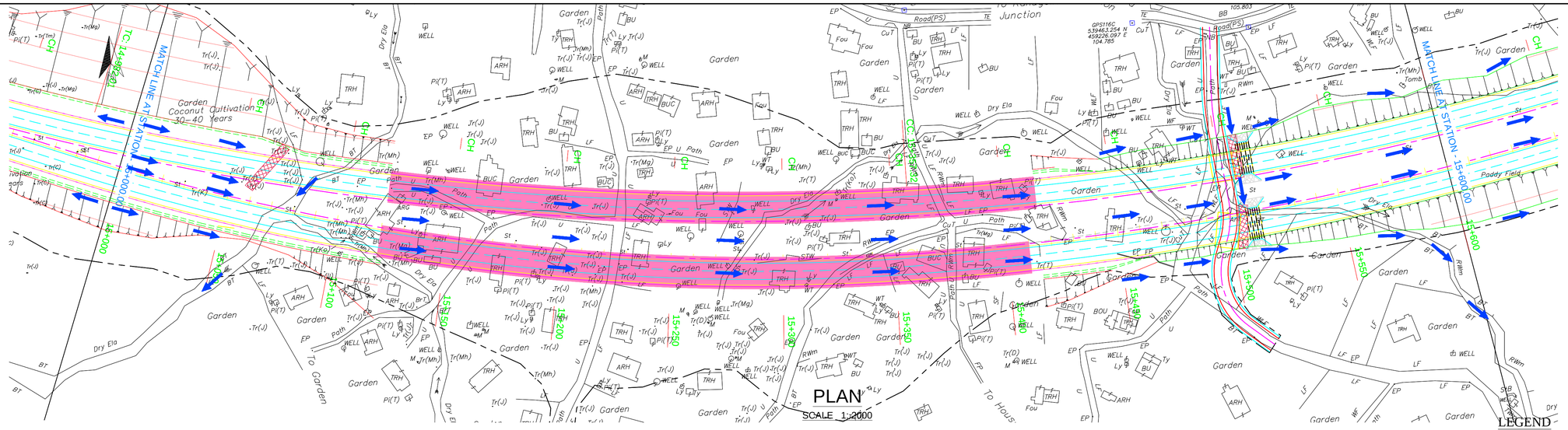
Tel : 0112867532 Fax : 0112872658 Email : sllrdc.consultancy@gmail.com

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

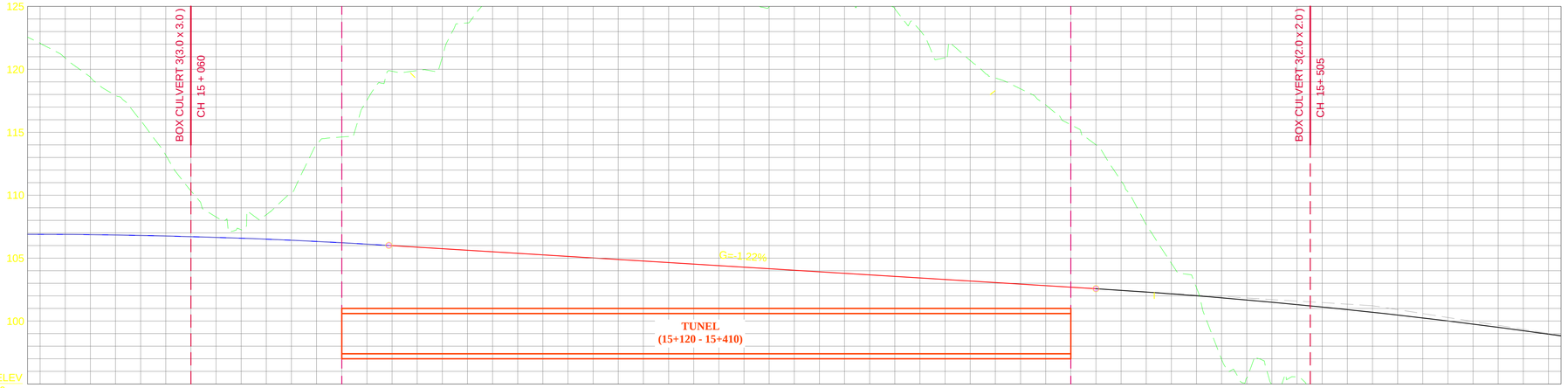
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH14+800.00 - CH15+000.00) (RHS)

Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-28	1:2000	16-05-2016	28 of 68



PLAN

SCALE 1:2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch15+000	106.892	122.085
Ch15+010	106.883	120.893
Ch15+020	106.865	119.983
Ch15+030	106.839	117.929
Ch15+040	106.805	115.934
Ch15+050	106.762	113.186
Ch15+060	106.711	110.946
Ch15+070	106.651	108.271
Ch15+080	106.583	107.258
Ch15+090	106.506	108.451
Ch15+100	106.420	110.197
Ch15+110	106.327	114.052
Ch15+120	106.224	114.626
Ch15+130	106.114	117.543
Ch15+140	105.994	119.655
Ch15+150	105.872	119.902
Ch15+160	105.750	120.955
Ch15+170	105.627	123.880
Ch15+180	105.505	126.282
Ch15+190	105.383	129.255
Ch15+200	105.260	130.023
Ch15+210	105.138	132.167
Ch15+220	105.015	135.107
Ch15+230	104.893	136.197
Ch15+240	104.771	136.035
Ch15+250	104.648	132.910
Ch15+260	104.526	130.156
Ch15+270	104.403	127.098
Ch15+280	104.281	125.036
Ch15+290	104.159	124.962
Ch15+300	104.036	125.691
Ch15+310	103.914	126.083
Ch15+320	103.791	126.356
Ch15+330	103.669	125.462
Ch15+340	103.547	124.817
Ch15+350	103.424	123.104
Ch15+360	103.302	120.918
Ch15+370	103.180	120.704
Ch15+380	103.057	119.909
Ch15+390	102.935	118.452
Ch15+400	102.812	117.180
Ch15+410	102.690	115.597
Ch15+420	102.568	114.007
Ch15+430	102.441	111.146
Ch15+440	102.305	107.651
Ch15+450	102.161	104.589
Ch15+460	102.009	102.665
Ch15+470	101.847	96.962
Ch15+480	101.678	95.474
Ch15+490	101.499	94.924
Ch15+500	101.312	95.668
Ch15+510	101.116	93.382
Ch15+520	100.911	92.831
Ch15+530	100.698	93.045
Ch15+540	100.476	93.458
Ch15+550	100.246	91.969
Ch15+560	100.007	90.739
Ch15+570	99.759	90.914
Ch15+580	99.502	90.805
Ch15+590	99.237	90.735
Ch15+600	98.964	90.715

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LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

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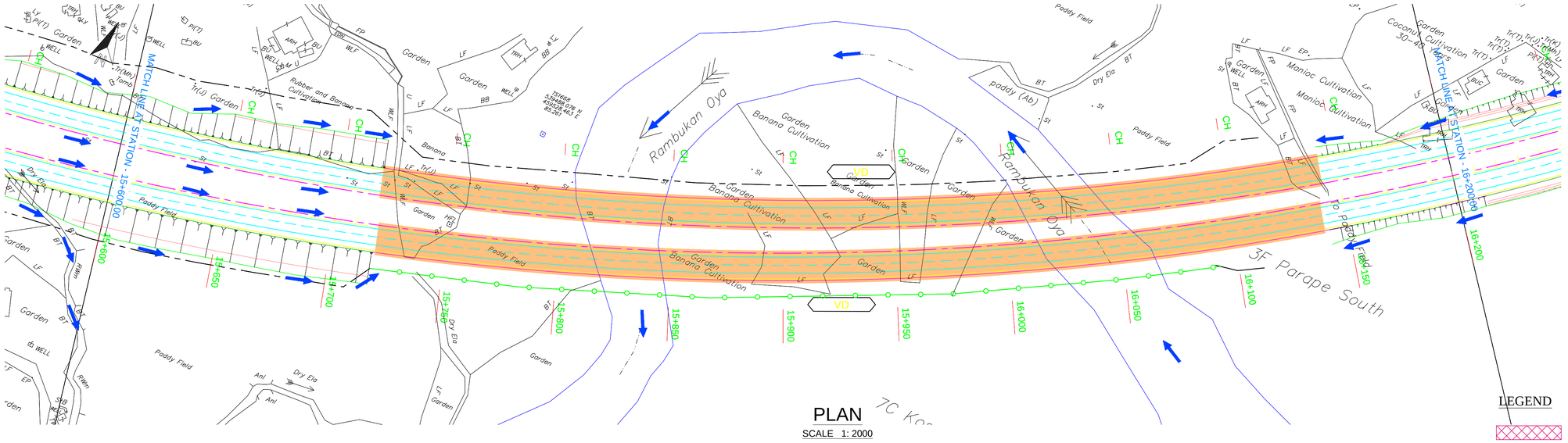
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)

SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

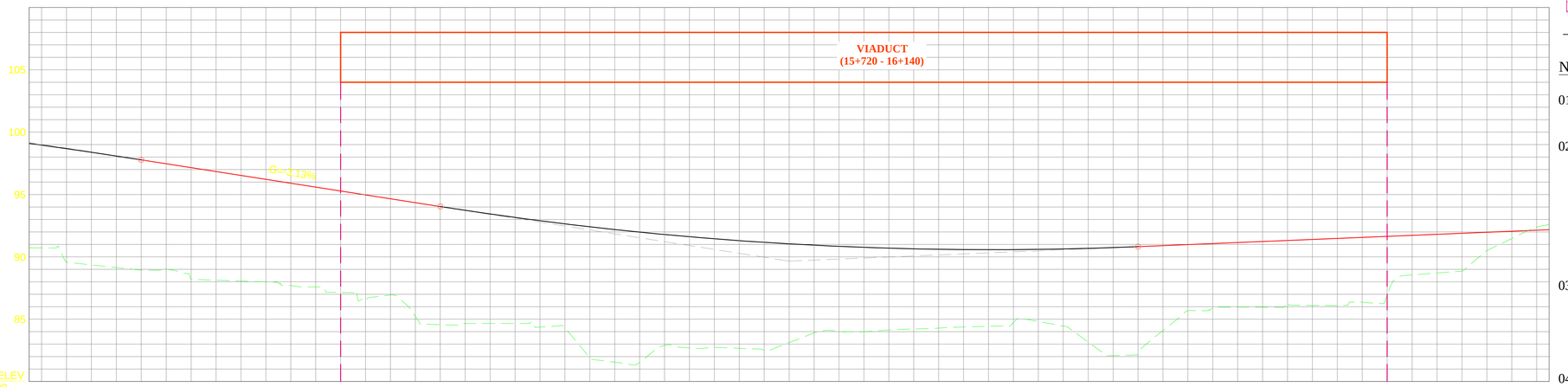
Drawing Title :
SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE
(CH15+000.00- CH15+600.00) (RHS)

Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-30	1:2000	16-05-2016	30 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch15+600	98.964	90.715
Ch15+610	98.681	89.571
Ch15+620	98.390	89.355
Ch15+630	98.091	89.141
Ch15+640	97.782	88.933
Ch15+650	97.470	89.020
Ch15+660	97.157	88.208
Ch15+670	96.845	88.129
Ch15+680	96.532	88.056
Ch15+690	96.219	87.985
Ch15+700	95.907	87.706
Ch15+710	95.594	87.592
Ch15+720	95.282	87.138
Ch15+730	94.969	86.700
Ch15+740	94.656	86.941
Ch15+750	94.344	85.226
Ch15+760	94.031	84.556
Ch15+770	93.726	84.655
Ch15+780	93.434	84.659
Ch15+790	93.157	84.657
Ch15+800	92.894	84.362
Ch15+810	92.645	84.320
Ch15+820	92.410	81.901
Ch15+830	92.189	81.552
Ch15+840	91.982	81.541
Ch15+850	91.790	82.886
Ch15+860	91.611	82.698
Ch15+870	91.447	82.734
Ch15+880	91.297	82.663
Ch15+890	91.161	82.512
Ch15+900	91.039	83.128
Ch15+910	90.931	83.898
Ch15+920	90.837	84.021
Ch15+930	90.757	83.992
Ch15+940	90.692	84.130
Ch15+950	90.640	84.213
Ch15+960	90.603	84.283
Ch15+970	90.580	84.372
Ch15+980	90.571	84.423
Ch15+990	90.576	84.724
Ch16+000	90.595	84.815
Ch16+010	90.628	84.455
Ch16+020	90.676	83.162
Ch16+030	90.737	82.072
Ch16+040	90.813	82.262
Ch16+050	90.896	84.086
Ch16+060	90.978	85.671
Ch16+070	91.061	85.911
Ch16+080	91.144	85.969
Ch16+090	91.226	85.959
Ch16+100	91.309	86.258
Ch16+110	91.392	86.111
Ch16+120	91.475	86.101
Ch16+130	91.557	86.354
Ch16+140	91.640	86.933
Ch16+150	91.723	88.552
Ch16+160	91.805	88.701
Ch16+170	91.888	88.854
Ch16+180	91.971	90.503
Ch16+190	92.053	91.473
Ch16+200	92.136	92.372

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

LEGEND

- Culvert.
- Tunnel
- Viaduct
- Flow Direction
- River Training
- Land Acquisition Boundary

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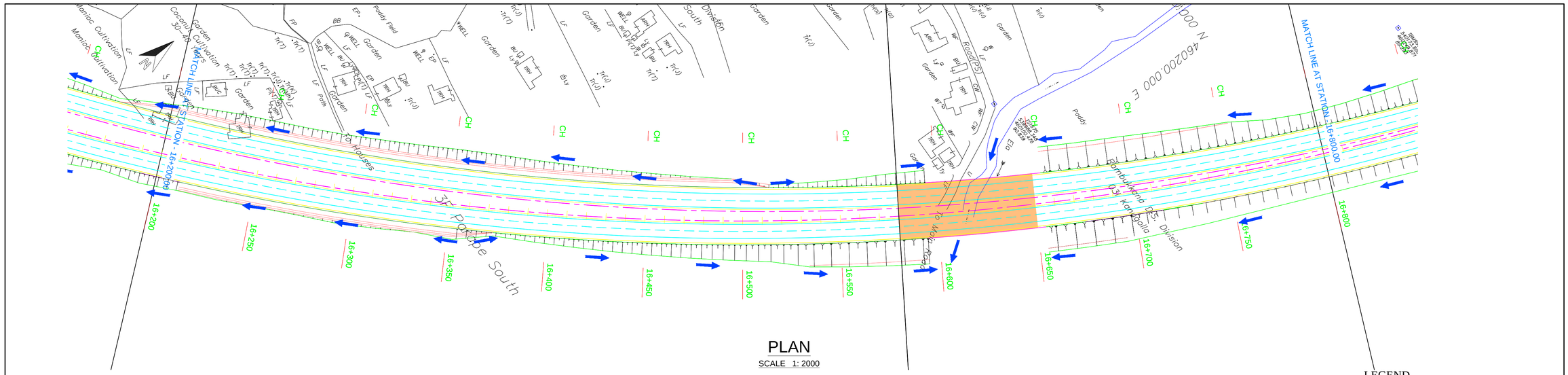
Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)
SECTION - 3 FROM POTUHERA TO GALAGEDARA
(CH. 0+000 - CH. 32+500)

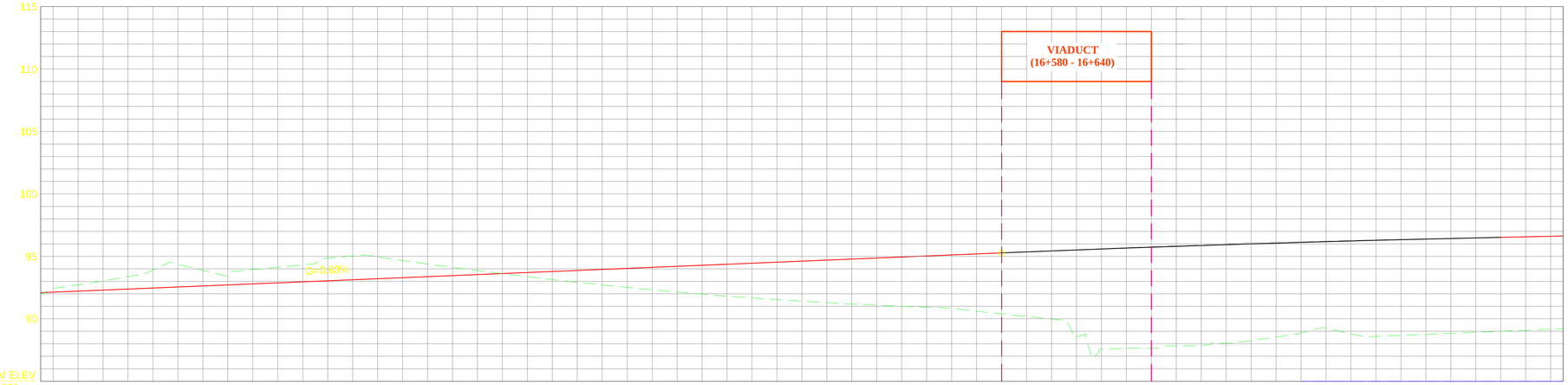
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH15+600.00- CH16+200.00) (RHS)

Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-32	1:2000	16-05-2016	32 of 68



PLAN

SCALE 1: 2000



CHAINAGE	FINISHED GROUND LEVEL	EXSISTING GROUND LEVEL
Ch16+200	92.136	92.372
Ch16+210	92.219	92.712
Ch16+220	92.302	93.040
Ch16+230	92.384	93.374
Ch16+240	92.467	93.915
Ch16+250	92.550	94.381
Ch16+260	92.632	93.884
Ch16+270	92.715	93.397
Ch16+280	92.798	93.946
Ch16+290	92.881	94.131
Ch16+300	92.963	94.322
Ch16+310	93.046	94.866
Ch16+320	93.129	95.032
Ch16+330	93.211	94.957
Ch16+340	93.294	94.667
Ch16+350	93.377	94.388
Ch16+360	93.459	94.118
Ch16+370	93.542	93.858
Ch16+380	93.625	93.609
Ch16+390	93.708	93.370
Ch16+400	93.790	93.140
Ch16+410	93.873	92.921
Ch16+420	93.956	92.713
Ch16+430	94.038	92.514
Ch16+440	94.121	92.326
Ch16+450	94.204	92.147
Ch16+460	94.287	91.979
Ch16+470	94.369	91.822
Ch16+480	94.452	91.674
Ch16+490	94.535	91.537
Ch16+500	94.617	91.410
Ch16+510	94.700	91.293
Ch16+520	94.783	91.187
Ch16+530	94.886	91.091
Ch16+540	94.948	91.005
Ch16+550	95.031	90.929
Ch16+560	95.114	90.826
Ch16+570	95.196	90.605
Ch16+580	95.279	90.391
Ch16+590	95.361	90.182
Ch16+600	95.440	89.979
Ch16+610	95.518	88.547
Ch16+620	95.594	87.564
Ch16+630	95.667	87.645
Ch16+640	95.739	87.645
Ch16+650	95.808	87.822
Ch16+660	95.875	87.863
Ch16+670	95.941	88.037
Ch16+680	96.004	88.246
Ch16+690	96.066	88.542
Ch16+700	96.125	88.878
Ch16+710	96.182	89.234
Ch16+720	96.237	88.797
Ch16+730	96.290	88.595
Ch16+740	96.342	88.675
Ch16+750	96.391	88.756
Ch16+760	96.438	88.836
Ch16+770	96.483	88.917
Ch16+780	96.526	88.998
Ch16+790	96.568	89.079
Ch16+800	96.610	89.160

LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000

VERTICAL 1: 400

LEGEND

- Culvert.
- Tunnel
- Viaduct
- Flow Direction
- River Training
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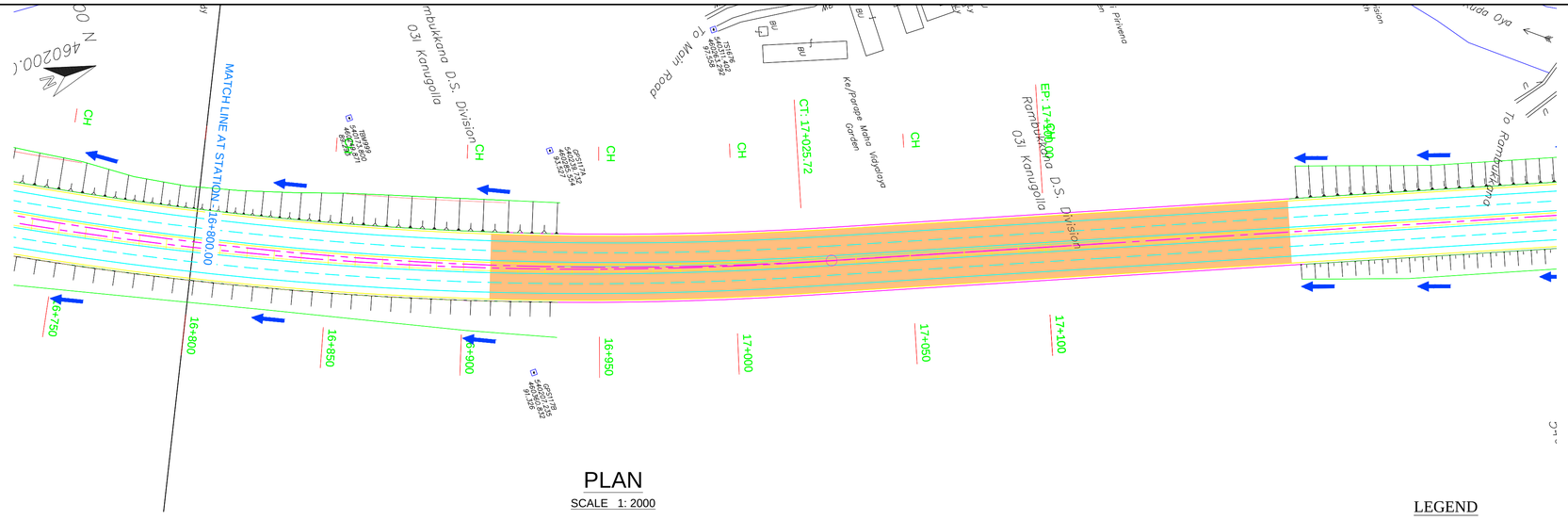
(CH. 0+000 - CH. 32+500)

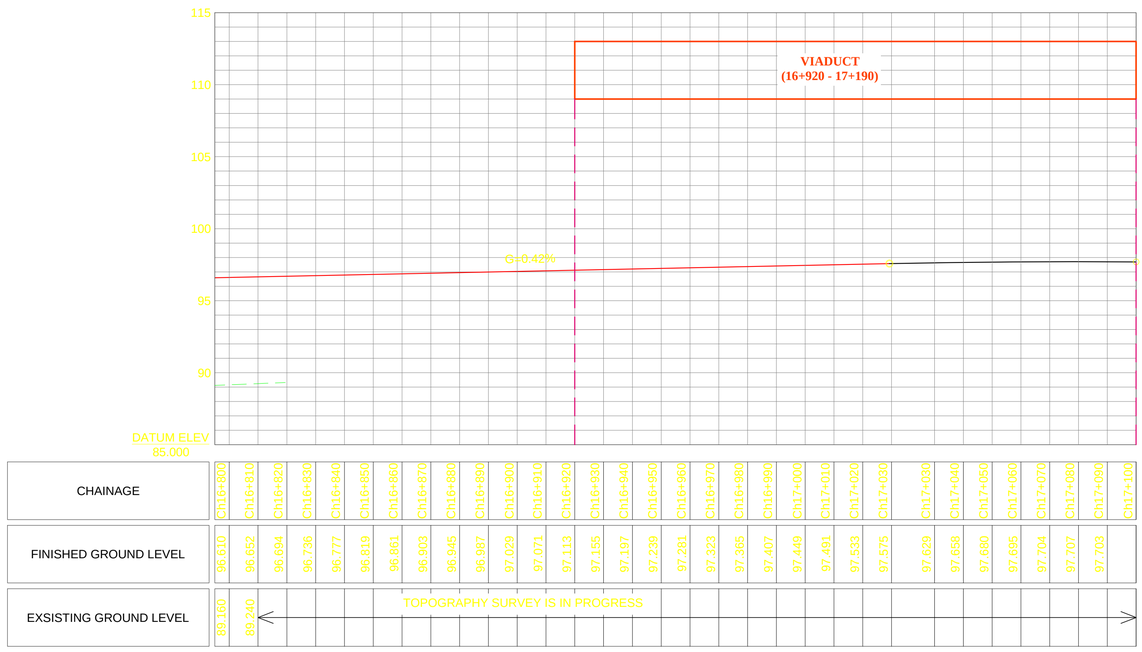
Drawing Title : SCHEMATIC STORM WATER DRAINAGE MANAGEMENT PLAN & PROFILE (CH16+200.00- CH16+800.00) (RHS)

Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-34	1:2000	16-05-2016	34 of 68



PLAN

SCALE 1: 2000



LONGITUDINAL SECTION

SCALE : HORIZONTAL 1: 2000
VERTICAL 1: 400

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Drawing No :	Scale :	Date :	Sheet No:
RDA-CEP-GE-PD-S3-PP-36	1:2000	16-05-2016	36 of 68

Streams and Waterways Crossed By Section III of CEP

Waterbody	Location (km)
Stream	1+240
Stream	1+500
Stream	1+620
Stream	5+660
Stream	5+970
Stream	7+550
Stream	7+550
Stream	7+950
Stream	8+390
Stream	10+970
Waterway	11+280
Waterway	12+040
Stream	12+540
Stream	12+575
waterway	13+690
waterway	13+740
waterway	13+850
waterway	14+140
Road/Waterway	14+235
waterway	15+060
waterway	15+505
waterway	15+510
Road/Waterway	16+580
waterway	16+920
waterway	17+400
waterway	19+050
Road/Waterway	19+720
waterway	19+975
Road/Waterway	20+125
waterway	20+270
waterway	20+335
waterway	20+490
waterway	20+570
waterway	20+650
waterway	20+855
waterway	20+998

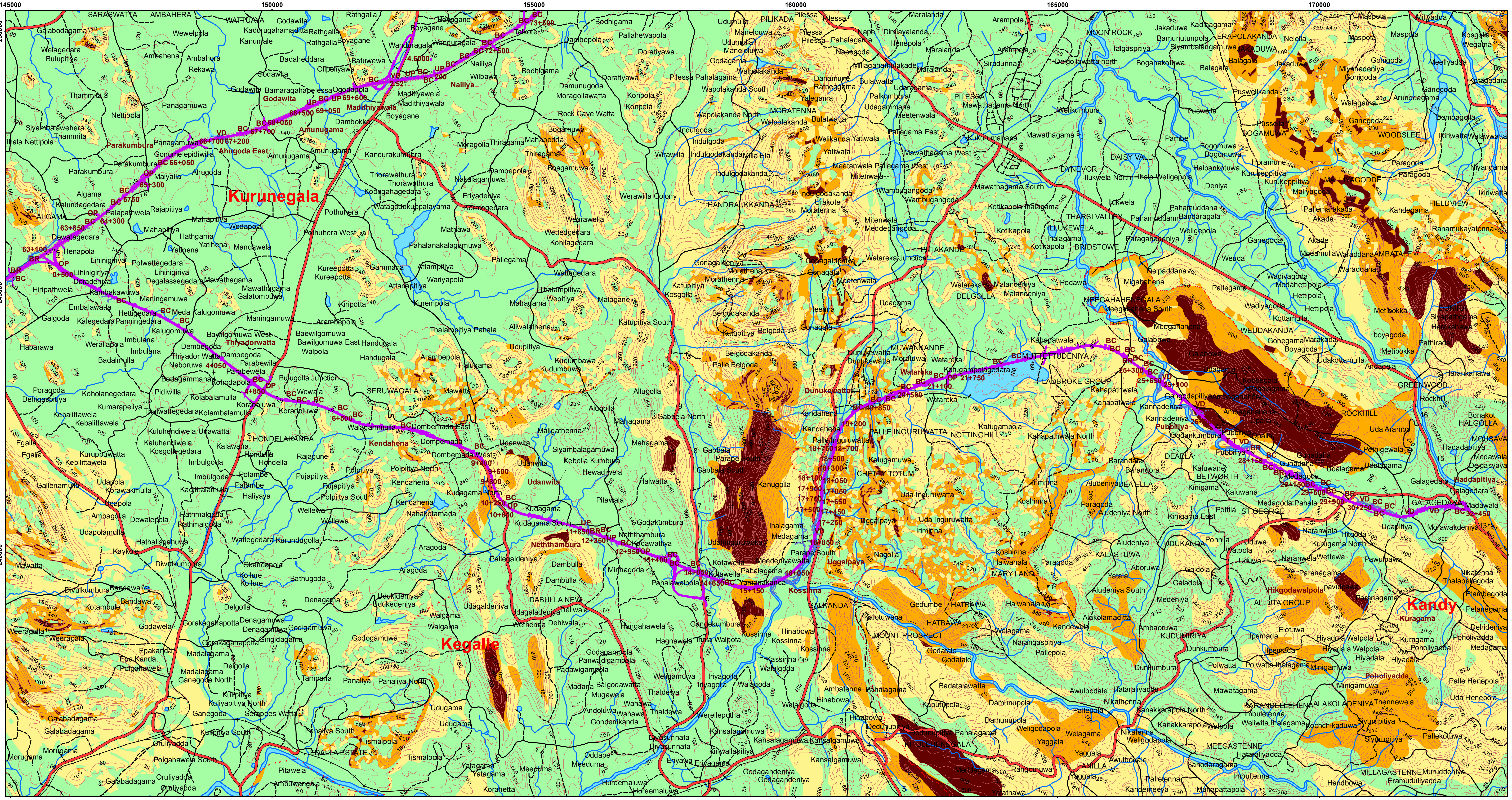
Waterbody	Location (km)
waterway	21+207
waterway	21+560
waterway	21+655
waterway	21+860
waterway	21+980
waterway	22+250
waterway	22+390
waterway	22+500
waterway	22+870
waterway	23+015
waterway	23+173
waterway	23+690
waterway	23+690
waterway	23+750
waterway	23+750
waterway	23+865
waterway	23+865
waterway	23+920
waterway	23+920
waterway	24+190
waterway	24+590
waterway	24+660
waterway	24+810
waterway	24+850
waterway	24+970
Kospothu oya	25+770
Fill/Kospothu oya	26+548
Kospothu oya	27+233
Kospothu oya	27+246
Kospothu oya	27+733
Kospothu oya	27+691
Stream	28+030
Galadeniya Ela	30+228
Kospothu oya	31+068
Stream/Road	31+618

Places of Worship and archeologically important locations located nearby to the trace of Section III of CEP

S.No.	Location	Coordinates	Chainage (km)	Side of the trace	Approx. distance from the trace	Sensitivity range
Archeologically Important Locations						
1)	Awariyagala Dagaba (an ancient temple)		0+000		75m	
2)	Walpola Temple (Daliwala)		12+500	R	10m	
Other places of worship						
3)	Sri Vijeya Sundarama Rajamaha Viharaya	$07^0$24’03.3” $080^0$16’37.2”	00+460	R	1.5 Km	Medium
4)	Mayurawathi Rajamaha Viharaya	$07^0$24’18.3” $080^0$16’58.0”	00+680	R	700 m	High
5)	Pothgul Viharaya, Lihinigiriya	$07^0$24’26.9” $080^0$17’18.6”	01+040	R	75 m	High
6)	Road to Koradoluwa Temple	$07^0$23’28.1” $080^0$19’10.3”		L		
7)	Sri Aswaththarama Viharaya	$07^0$23’40.7” $080^0$19’39.3”	05+840	L	670 m	Medium
8)	Vivekarama Purana Viharaya	$07^0$22’58.1” $080^0$19’43.1”	06+280	R	550 m	Medium
9)	Sri Saranapala Road Viharaya	$07^0$23’31.7” $080^0$20’09.8”	06+620	L	720 m	Low
10)	Sri Negrodarama Senasanaya	$07^0$22’50.8” $080^0$20’11.7”	07+100	R	425 m	Medium
11)	Sambudda Mandiraya and Ella	7°23'27.23" 80°20'27.39"	07+440	L	710 m	Low

	Bodiya					
12)	Keththarama Viharaya (Road to)	$07^{0}23'03.6"$ $080^{0}21'03.6"$	08+560	L	265 m	
13)	Roadside Statue 01 (Christian)	$07^{0}22'36.2"$ $080^{0}21'27.3"$	09+640	R	45 m	High
14)	Roadside Statue 02 (Christian)	$07^{0}22'13.2"$ $080^{0}21'37.9"$	10+400	R	60 m	High
15)	Church	7°22'4.26" 80°21'38.14"	10+540	R	285 m	
16)	Galadenikada Purana Viharaya	$07^{0}21'52.1"$ $080^{0}21'39.1"$	10+640	R	615 m	
17)	Dambulu Rajamaha Viharaya	$07^{0}21'11.3"$ $080^{0}21'43.9"$	11+000	R	1750 m	
18)	Sri Bodiseeha Pirivena	$07^{0}19'44.8"$	16+140	R	4.5 km	Low
19)	Galagedara Mosque	$07^{0}22'23.0"$ $080^{0}30'55.1"$	31+020	L	420 m	Medium
20)	Welivita Sri Saranankara Sangaraja Centre	$07^{0}22'18.7"$ $080^{0}31'30.2"$	32+280	L	115 m	High

Landslide Hazard Zonation Map Along the Central Expressway (Pothuhara - Galagedara)



Legend

- Landslides not likely to occur
- Modest level of landslide hazard exist
- Landslides are to be expected
- Landslides most likely to occur

Topographical Legend

- District Boundary
- Reservoir/Tank/Wewa
- River/Oya/Streams
- Main Road
- Secondary Road
- Foot Path
- Railway Line
- Track
- Contours
- Expressway

N

Kilometers

0 1.25 2.5 5

LANDSLIDE HAZARD MAPPING PROJECT

Landslide Research and Risk Management Division
National Building Research Organisation
99/1
Jawatta Road
Colombo 05

Annex 1.5

Location Map of Tunnels – Section 3 of CEP

KURUNEGALA IC

Section-2

DAMBOKKA IC

POTUHERA IC

POLGAHAWELA IC

KATUGASTHOTA -KURUNEGALA -PUTHTHALAMA ROAD

DALADAGAMWALA ROAD

Tunnel 2
Ch. 23+430 to Ch. 23+630

Section-3

Tunnel 3
Ch. 27+490 to Ch. 27+725

GALAGEDARA IC

AKT ROAD

RAMBUKKANA IC

Tunnel 4 (proposed)
Ch. 32+400

GALAGEDARA - RABUKKANA ROAD

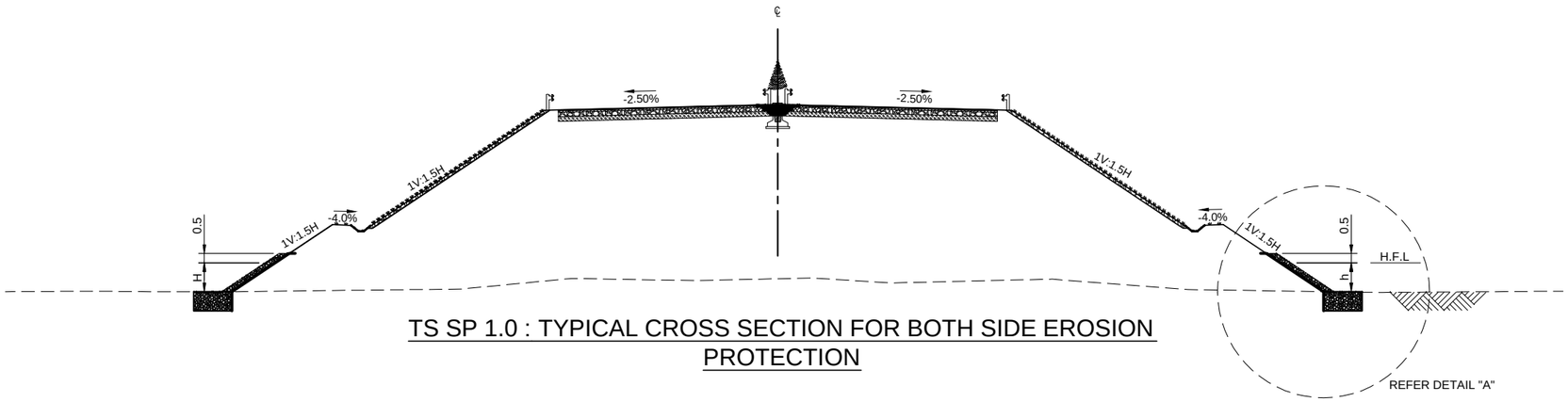
Tunnel 1
Ch. 15+120 to Ch. 15+410

KATUPITIYA ROAD

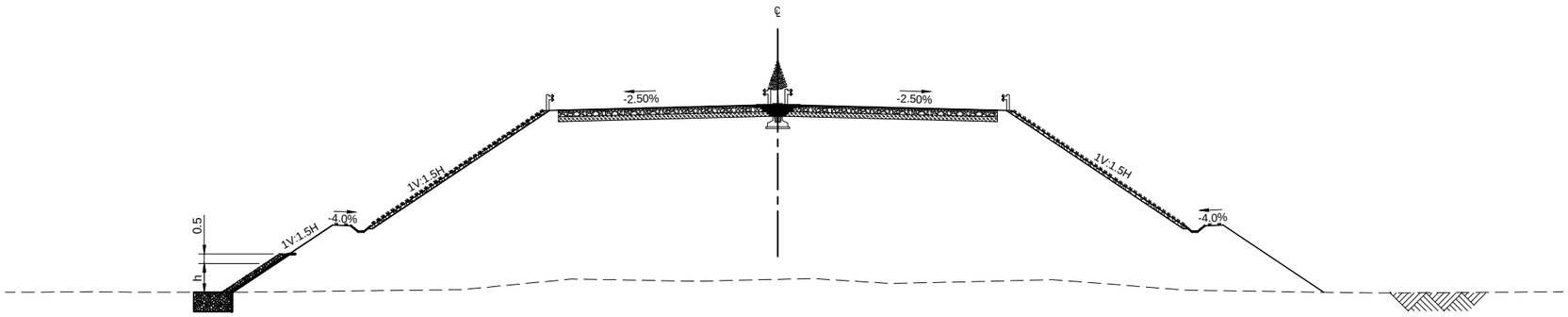
PARAPE MAWATHAGAMA ROAD

Central Expressway Project

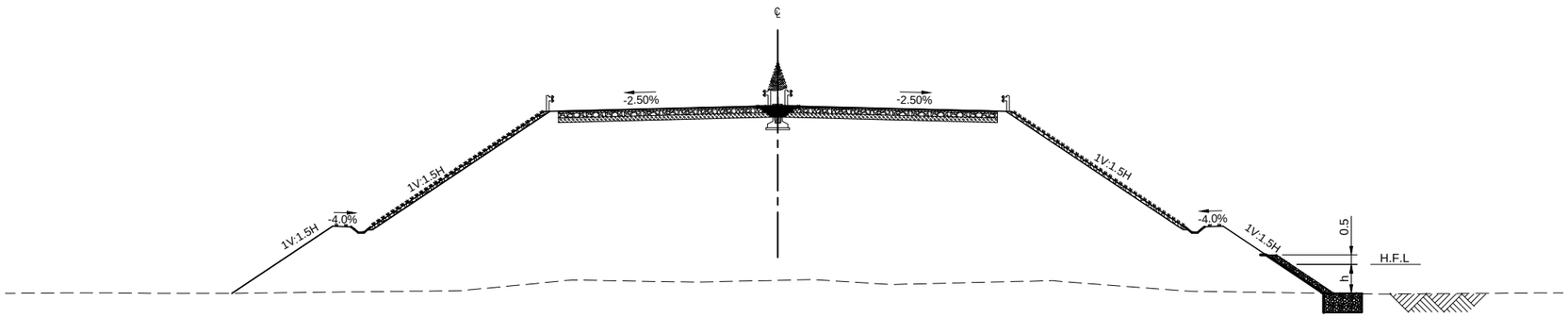
Section 3 (Length - 32.5 km)



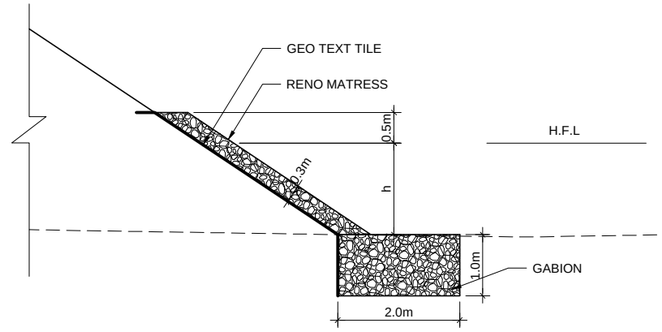
TS SP 1.0 : TYPICAL CROSS SECTION FOR BOTH SIDE EROSION PROTECTION



TS SP 2.0 : TYPICAL CROSS SECTION FOR LHS SIDE EROSION PROTECTION



TS SP 3.0 : TYPICAL CROSS SECTION FOR RHS SIDE EROSION PROTECTION



DETAIL "A"
SCALE 1:100

EROSION PROTECTION WALL				
Start	End	Side	h/m	Length/m
1+230	1+260	RHS	2.0	30
1+300	1+320	LHS	1.0	20
1+460	1+500	RHS	2.5	40
1+490	1+510	LHS	1.5	20
1+570	1+620	RHS	1.2	50
1+610	1+620	LHS	1.2	10
5+660		BOTH SIDE	1.0	10
7+420	4+550	RHS	2.0	130
7+640	7+980	LHS	2.0	340
8+240	8+400	RHS	1.0	160
8+170	8+240	LHS	2.5	70
11+260		RHS	2.0	30
10+980	11+160	LHS	1.0	180
12+140	12+190	RHS	2.5	50
12+040		LHS	2.0	20
15+540	15+700	RHS	2.0	160
16+640	16+920	BOTH SIDE	5.0	280
18+700	19+050	LHS	4.0	350
19+260	19+340	LHS	2.0	80
19+600	19+720	LHS	2.0	120
20+260	20+400	RHS	7.0	140
20+540	20+680	RHS	8.0	140
20+960	21+060	RHS	6.0	100
21+200	21+280	BOTH SIDE	2.0	80
21+820	21+950	RHS	3.0	130
21+920	21+950	LHS	1.0	30
22+460	22+600	LHS	3.0	140
25+400	25+480	RHS	1.5	80
25+400	25+420	LHS	1.5	20
25+780		BOTH SIDE	1.5	30
26+500	26+550	RHS	1.5	50
26+820	26+850	LHS	1.0	30
27+880	27+920	LHS	3.0	40
27+990	28+020	LHS	2.0	30
28+040	28+060	RHS	1.5	20
28+880	28+930	RHS	2.0	50
28+910	28+990	LHS	2.0	80
29+280	29+300	RHS	1.5	20
29+360	29+400	LHS	1.5	40
30+380	31+070	LHS	3.5	690
31+980	32+160	RHS	3.0	180
31+250	31+620	LHS	2.0	370

PRELIMINARY

Employer

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF HIGHER EDUCATION & HIGHWAYS

ROAD DEVELOPMENT AUTHORITY
PROJECT DIRECTOR - CENTRAL EXPRESSWAY
3 rd Floor, Sethsiripaya , Battaramulla.
Tel : 0112877708 Fax : 0112877708 Email : rdapdcep@gmail.com

Designer

ROAD DEVELOPMENT AUTHORITY
DEPUTY DIRECTOR -HIGHWAY DESIGN
Design Office -(Geometrical Design)
S.W.R.D. Bandaranayake Mawatha
Kandy
Tel : 0812054992 Fax : 0812054992
Email : docpkandy@gmail.com

REV.	DESCRIPTION	BY.	DATE

Project Title

CENTRAL EXPRESSWAY PROJECT (CEP)

SECTION - 3 FROM POTHUHERA TO GALAGEDARA

(CH. 0+000 - CH. 32+500)

Drawing Title : TYPICAL CROSS SECTION FOR FILLING WITH EROSION PROTECTION

Designed :	Drawn :	Checked :	
C.E. (Design) : A.G.ARIYAWANSHA		D.D.(Design) : L.V.S.WEERAKOON	
Drawing No : RDA-CEP-GE-PD-S3-TS-32		Scale : 1:300	Date : 15-06-2016	Sheet No: 32