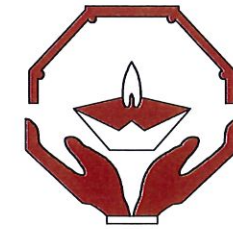


DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

STATE MINISTRY OF NATIONAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT



NATIONAL BUILDING RESEARCH ORGANISATION



REDUCTION OF LANDSLIDE VULNERABILITY

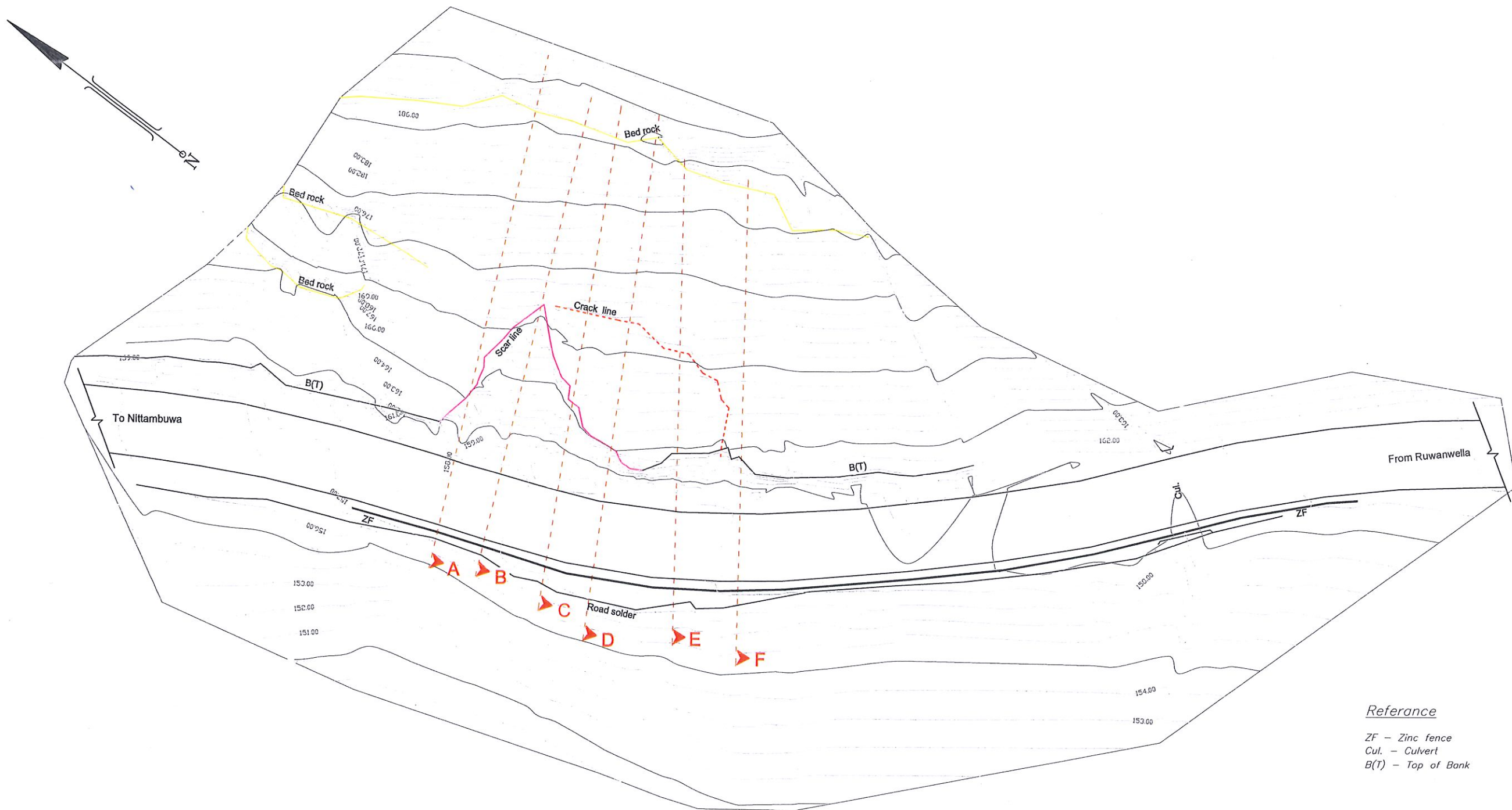
BY MITIGATION MEASURES

LAND SLIDE MITIGATION WORKS IN LANDSLIDE MITIGATION WORKS
IN COLOMBO, GAMPAHA, KEGALLE & KURUNEGALA DISTRICTS

PACKAGE NO: RLVMMMP/WORKS/04A

DETAILED DESIGN DRAWINGS

2021



Reference
 ZF - Zinc fence
 Cul. - Culvert
 B(T) - Top of Bank

EMPLOYER
 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANIZATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER
 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANIZATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

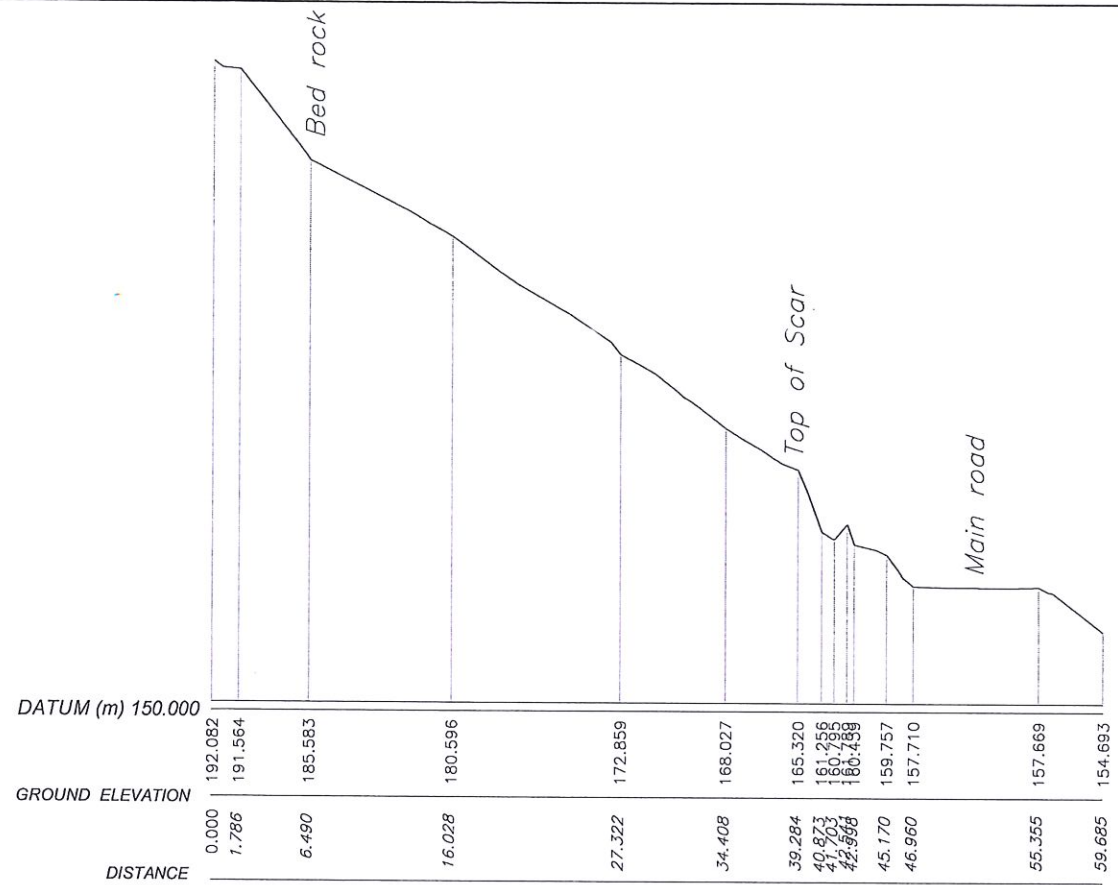
REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 BETWEEN Ch 15+740 - Ch 15+790
 VEYANGODA - RUWANWELLA ROAD

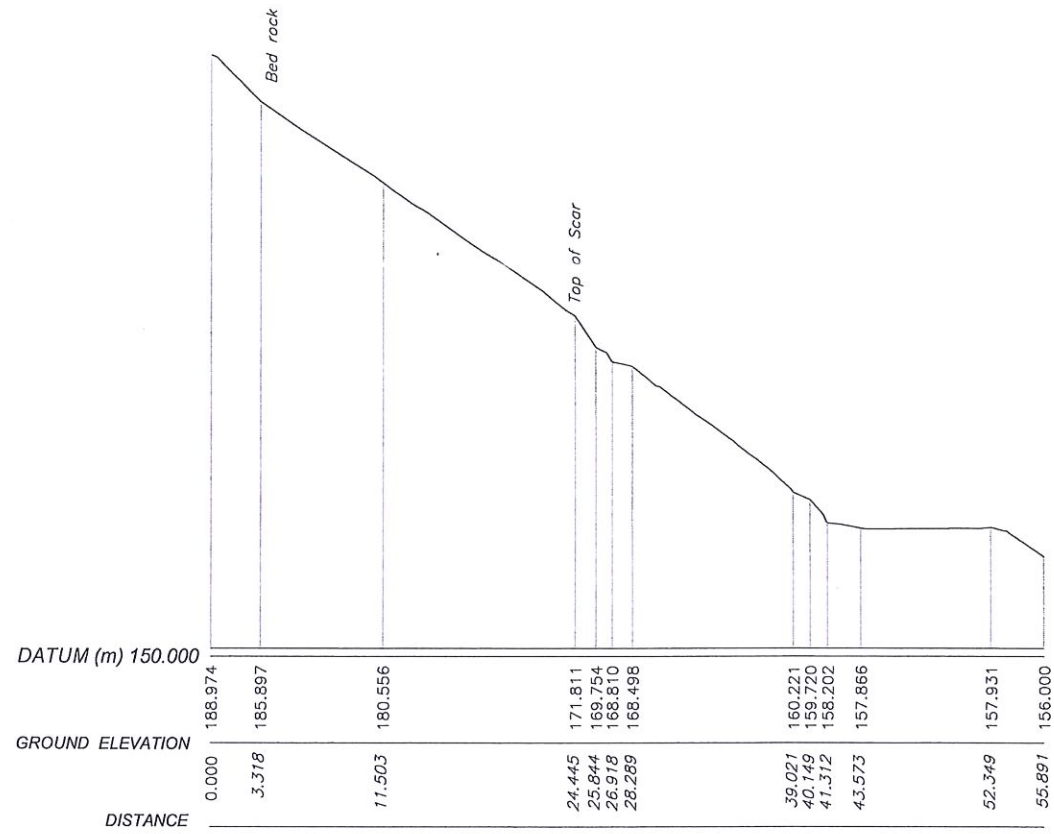
TITLE
 CONTOUR SURVEY PLAN

SCALE: 1:500 DATE: 03.10.2018
 PROJECT / DRAWING No. REVISION
 RLVMP/WORKS/NCB/04A/05-VR/DR-01 00

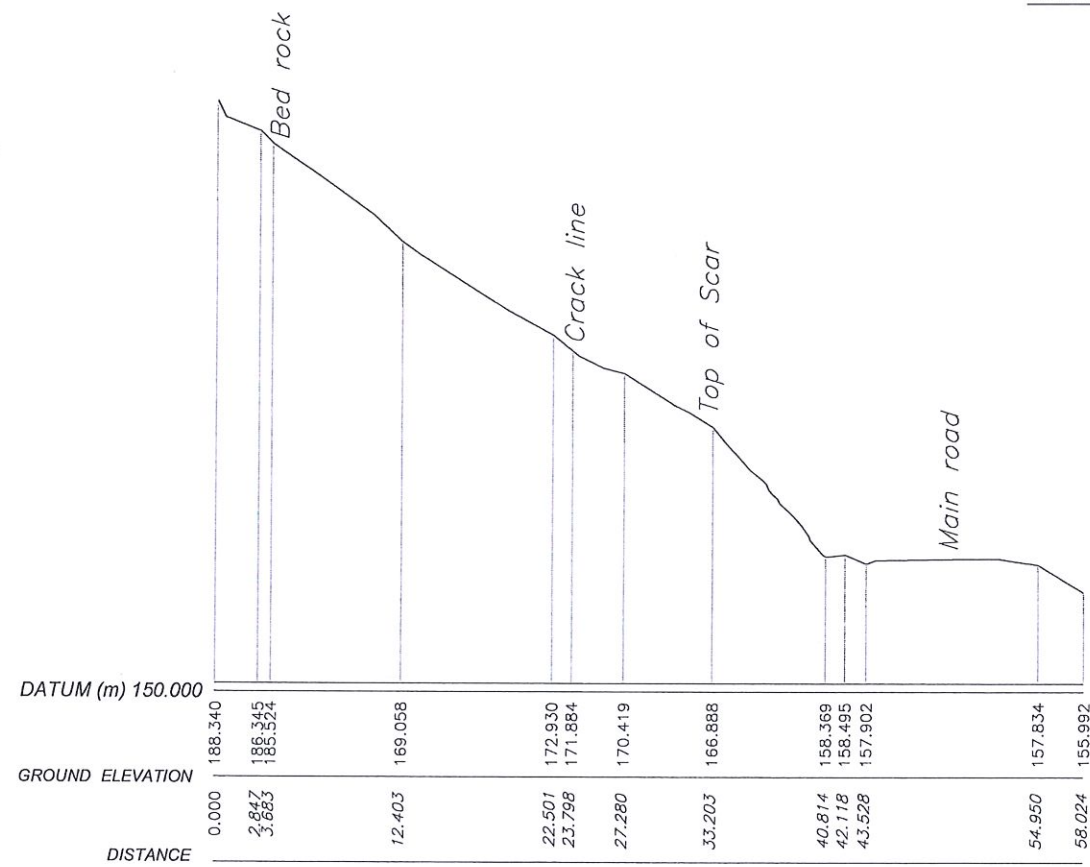
DESCRIPTION	NAME	SIGNATURE
SURVEYED	KAMAL DESHAPRIYA	
CHECKED	V.G.D. GANGANI	



SECTION-A

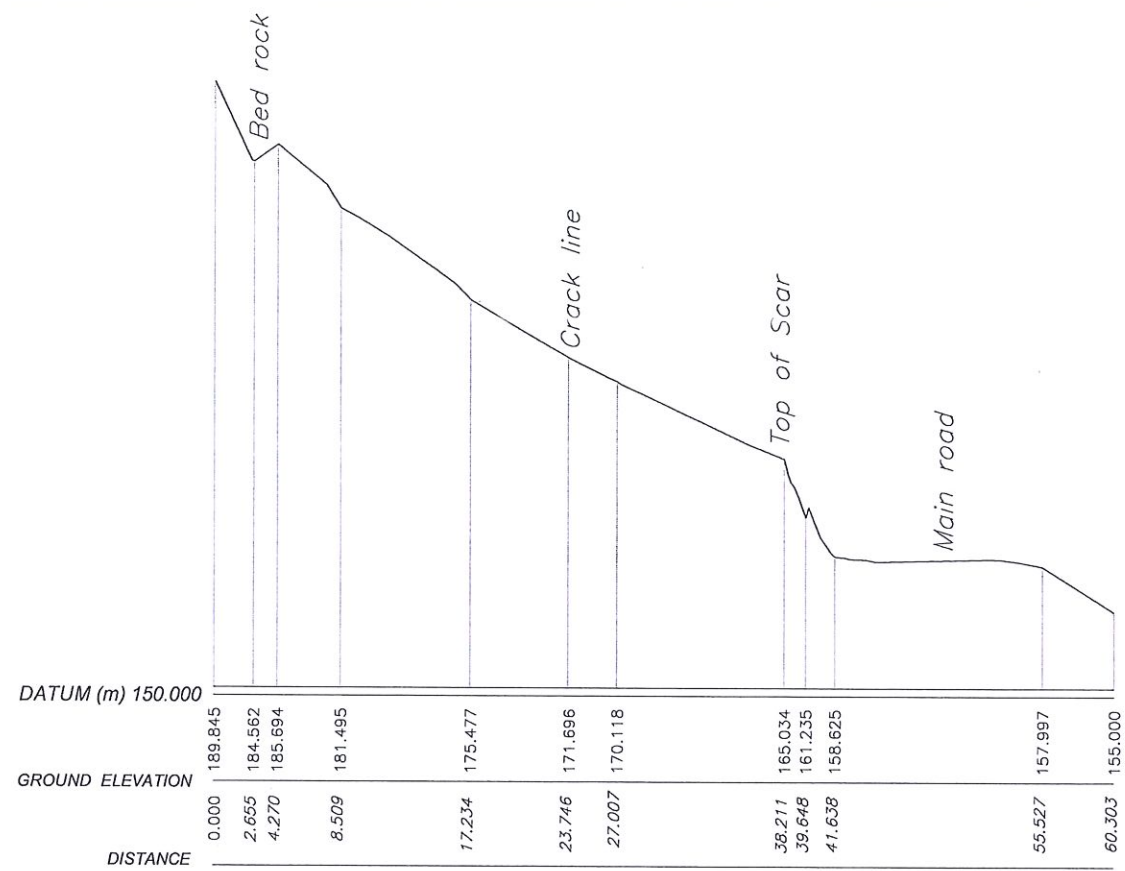


SECTION-B

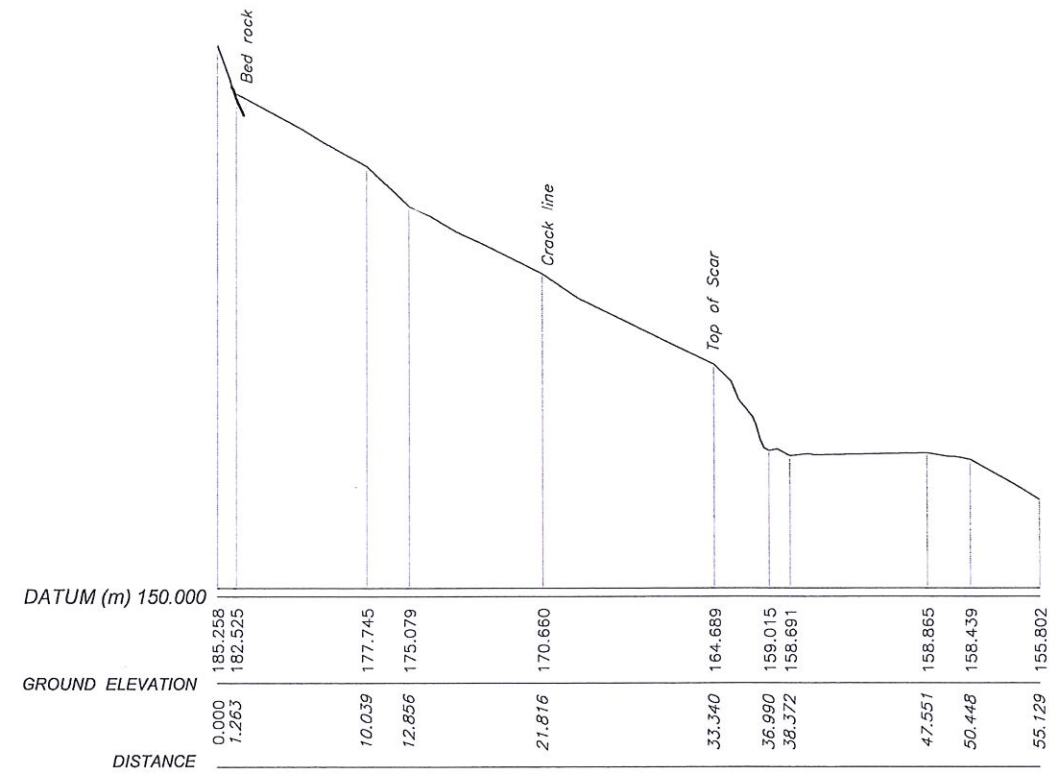


SECTION-C

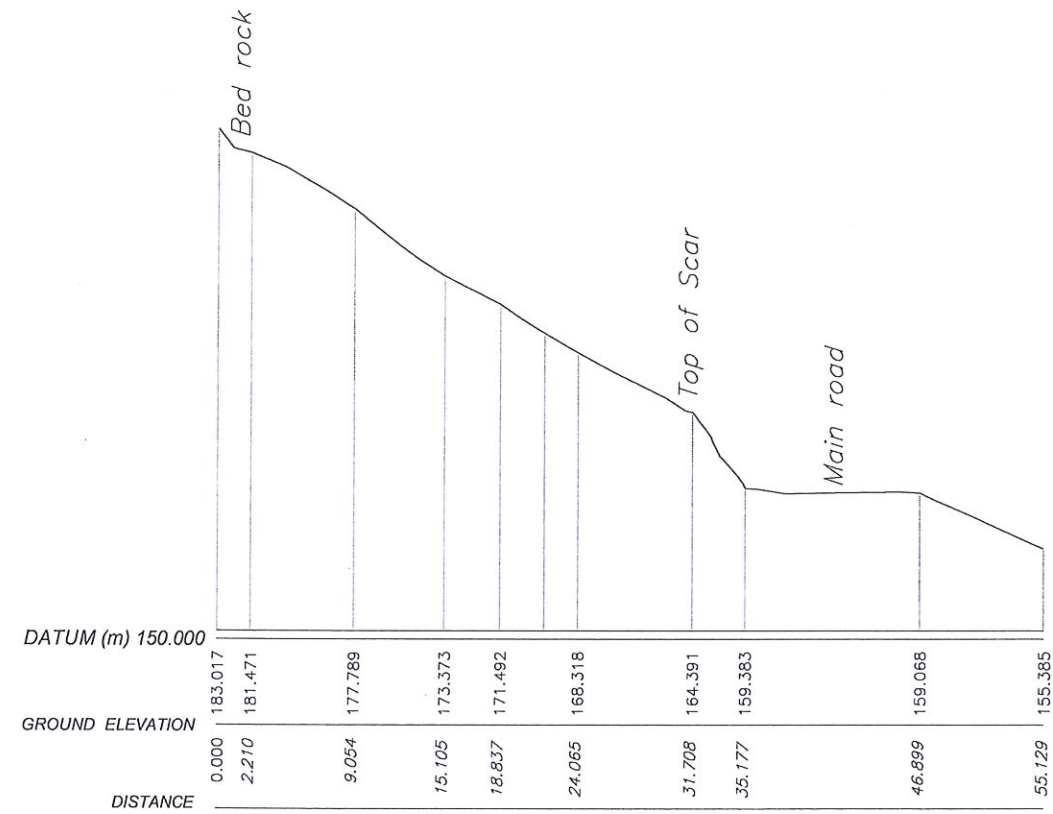
<p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	REV	DATE	REVISION DESCRIPTION	APPROVAL	<p>PROJECT TITLE</p> <p>REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BETWEEN Ch 15+740 - Ch 15+790 VEYANGODA - RUWANWELLA ROAD</p>	TITLE		DESCRIPTION	NAME	SIGNATURE
							EXISTING CROSS SECTIONS		SURVEYED	KAMAL DESHAPRIYA	
									CHECKED	V.G.D. GANGANI	
									SCALE	1:500	DATE
						PROJECT / DRAWING No.	RLVMMP/WORKS/NCB/04A/05-VR/DR-02a	REVISION	00		




SECTION-D



SECTION-E



SECTION-F

EMPLOYER

 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANIZATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER

 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANIZATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 BETWEEN Ch 15+740 - Ch 15+790
 VEYANGODA - RUWANWELLA ROAD

TITLE
 EXISTING CROSS SECTIONS

SCALE	1:500	DATE	03.10.2018
PROJECT / DRAWING No.		REVISION	00
RLVMMP/WORKS/NCB/04A/05-VR/DR-02b			

DESCRIPTION	NAME	SIGNATURE
SURVEYED	KAMAL DESHAPRIYA	
CHECKED	V.G.D. GANGANI	



DESIGN NOTATION

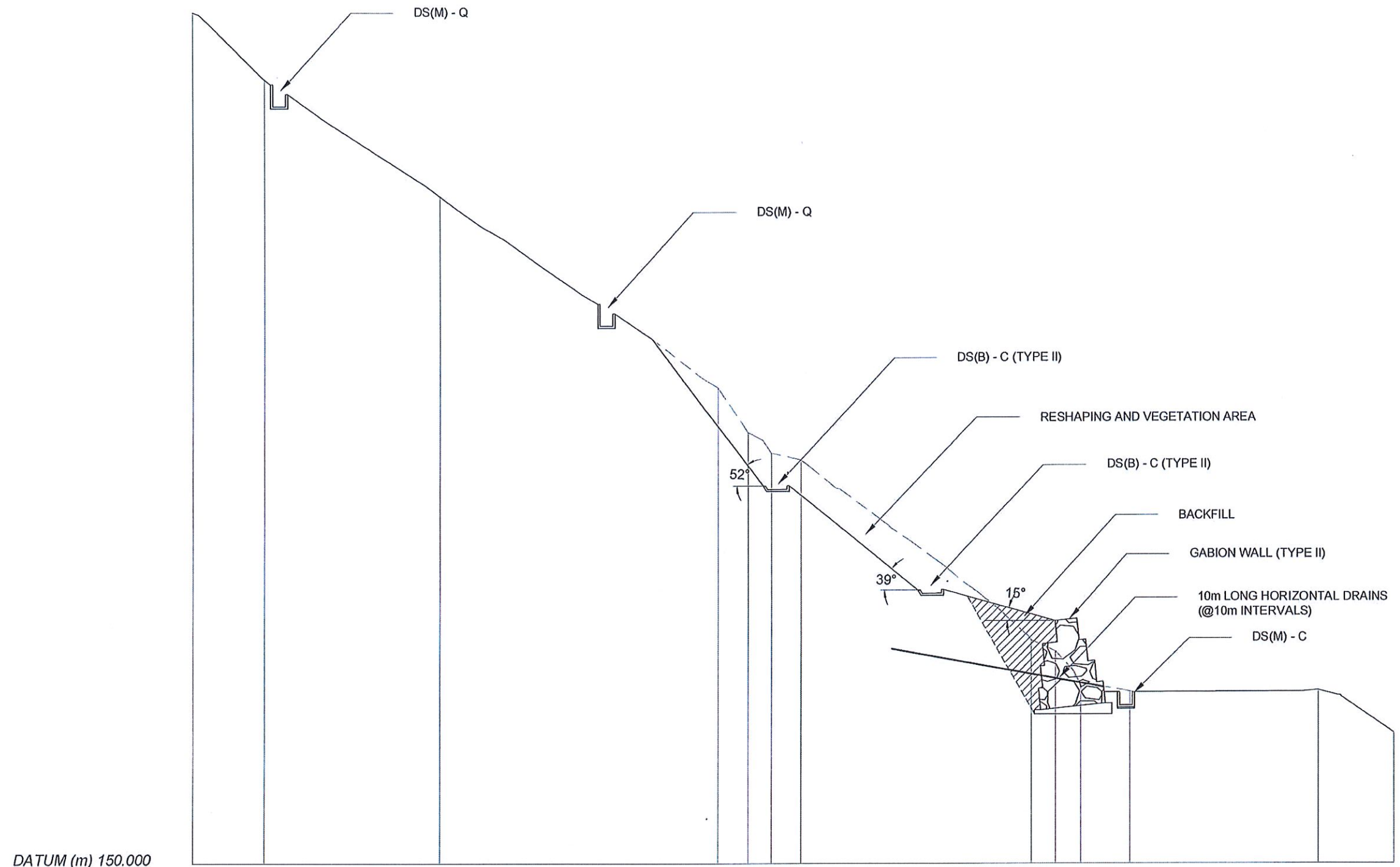
	RESHAPING AND VEGETATION AREA
	BERM AREA
	GABION WALL (TYPE II)
	DS(M) - Q
	DS(M) - C
	DS(B) - C (TYPE II)
	DS(C) - E (TYPE II)
	HORIZONTAL LONG DRAIN (DIA. 75mm)
	CATCH-PIT

REFERENCE

ZF - ZINC FENCE
 Cul. - CULVERT
 B(T) - TOP OF BANK

- NOTE:**
1. SURFACE/ CASCADE DRAINS LOCATIONS (PATH OF THE DRAINS) & LENGTH MIGHT BE VARIED ACCORDING TO ACTUAL SITE CONDITION.
 2. HORIZONTAL DRAIN LOCATIONS AND DIRECTIONS MIGHT BE VARIED ACCORDING TO THE ACTUAL SITE CONDITION.
 3. LOCATION OF THE CATCHPITS MIGHT BE VARIED ACCORDING TO THE ACTUAL SITE CONDITION.
 4. UNSTABLE ROCK BOULDERS TO BE REMOVED (LOCATIONS/ SIZE ARE INDICATIVE ONLY).

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BETWEEN Ch 15+740 - Ch 15+790 VEYANGODA - RUWANWELLA ROAD	TITLE		DESCRIPTION	NAME	SIGNATURE
								PLAN VIEW OF PROPOSED MITIGATION MEASURES	SCALE 1:300 PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/05-VR/DR-03	DATE 06.11.2020 REVISION 00	DRAWN B.V.S. PATTRISHIYA DESIGNER V.G.D. GANGANI CHECKED J.P. SAMARANAYAKA RECOMMENDED PROF. S.A.S. KULATHILAKA APPROVED K.N. BANDARA

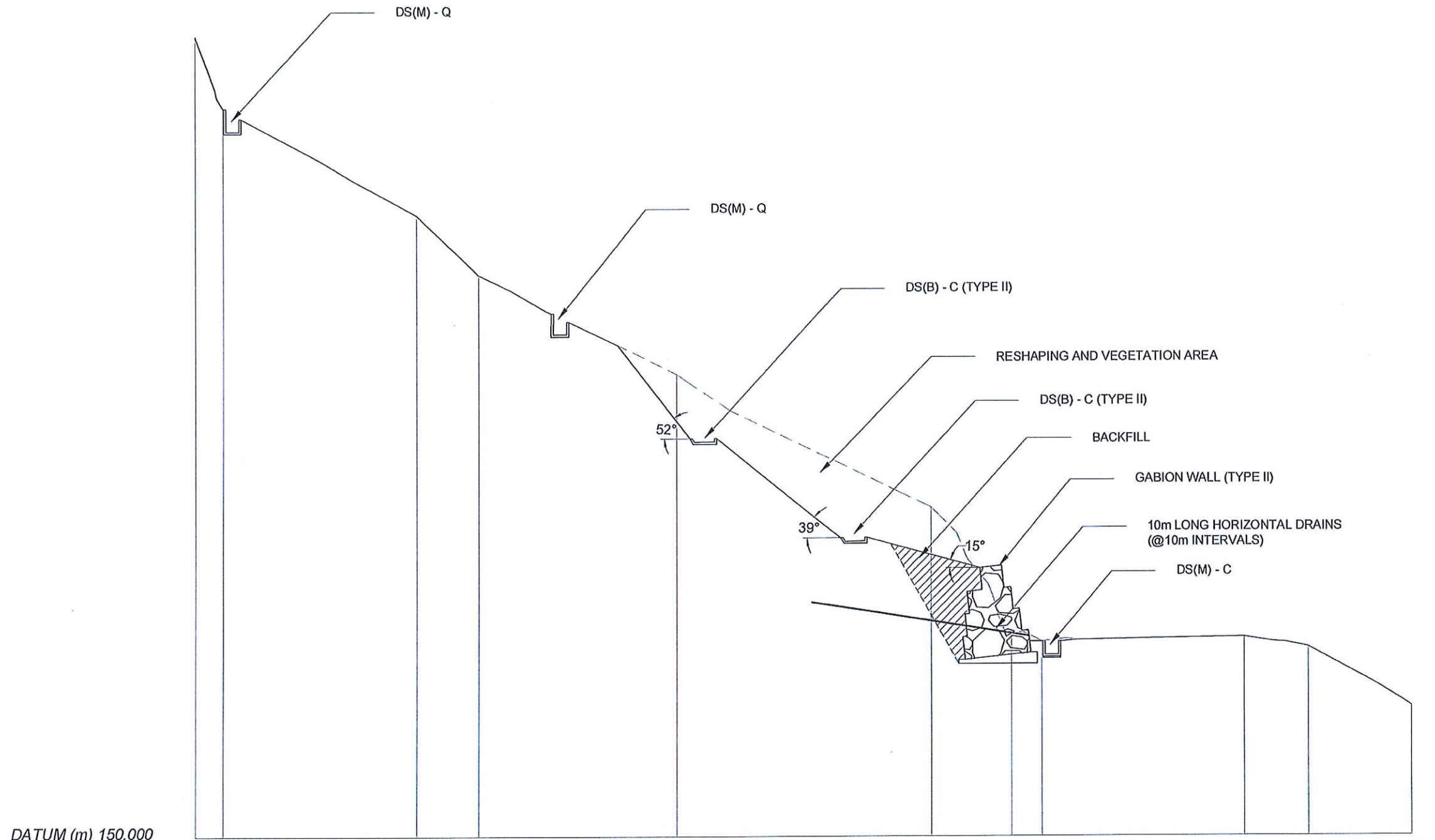


DATUM (m) 150.000

GROUND ELEVATION(m)	188.974	185.897	180.556	171.811	169.754	168.810	168.498	160.221	159.720	158.202	157.866	157.931	156.000
DISTANCE (m)	0.000	3.318	11.503	24.445	25.844	26.918	28.289	39.021	40.149	41.312	43.573	52.349	55.891


SECTION-1

<p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1 ,JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1 ,JAWATTA ROAD COLOMBO - 05</p>	REV	DATE	REVISION DESCRIPTION	APPROVAL	<p>PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BETWEEN Ch 15+740 - Ch 15+790 VEYANGODA - RUWANWELLA ROAD</p>	<p>TITLE CROSS SECTIONS OF PROPOSED MITIGATION MEASURES</p>	DESCRIPTION	NAME	SIGNATURE
		SCALE 1:200		DATE 06.11.2020			RECOMMENDED	PROF. S.A.S. KULATHILAKA		
		PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/05-VR/DR-04a		REVISION 00			APPROVED	K.N. BANDARA		



	0.000	1.263	10.039	12.856	21.816	33.340	36.990	38.372	47.551	50.448	55.129
GROUND ELEVATION(m)	185.258	182.525	177.745	175.079	170.660	164.689	159.015	158.691	158.865	158.439	155.802
DISTANCE (m)	0.000	1.263	10.039	12.856	21.816	33.340	36.990	38.372	47.551	50.448	55.129

SECTION-2


 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANIZATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05






DESIGNER

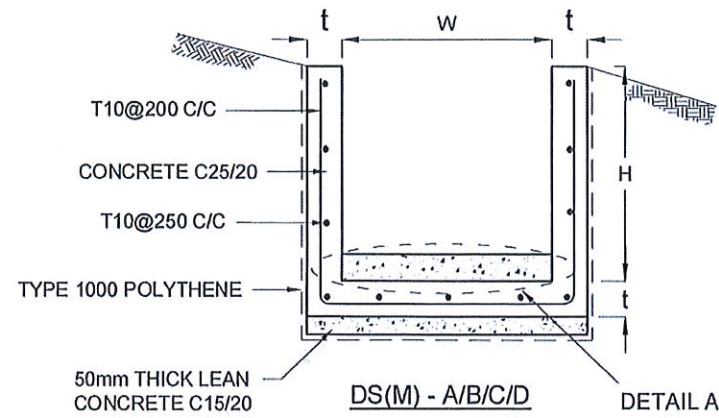
 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANIZATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 BETWEEN Ch 15+740 - Ch 15+790
 VEYANGODA - RUWANWELLA ROAD

TITLE
 CROSS SECTIONS OF
 PROPOSED MITIGATION MEASURES
 SCALE 1:200
 DATE 06.11.2020
 PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/05-VR/DR-04b
 REVISION 00

DESCRIPTION	NAME	SIGNATURE
DRAWN	B.V.S. PATRISHIYA	
DESIGNER	V.G.D. GANGANI	
CHECKED	J.P. SAMARANAYAKA	
RECOMMENDED	PROF. S.A.S. KULATHILAKA	
APPROVED	K.N. BANDARA	



DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (M) - A/P	300	300	100
DS (M) - B/R	450	450	100
DS (M) - C/Q	600	600	100
DS (M) - D	750	750	125
DS (M) - E	900	900	150
DS (M) - F	1000	1000	150

NOTES

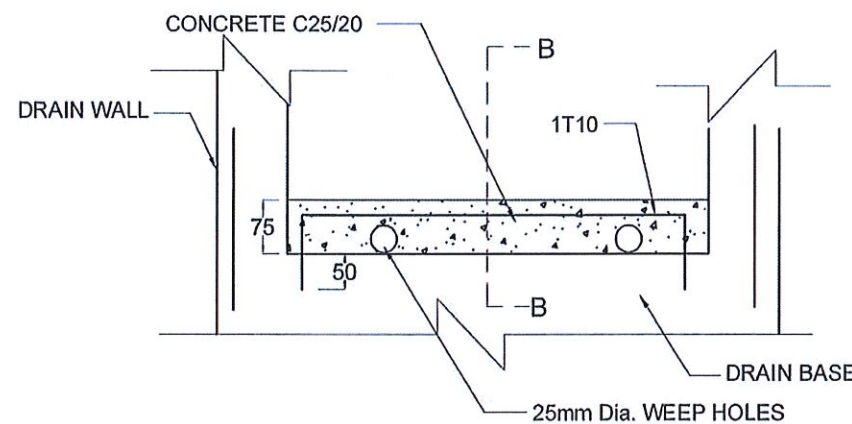
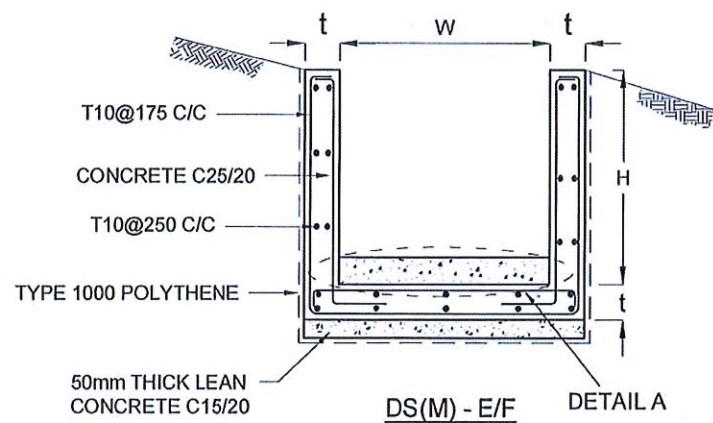
1. DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS
2. STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
3. ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
6. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.

CONCRETE

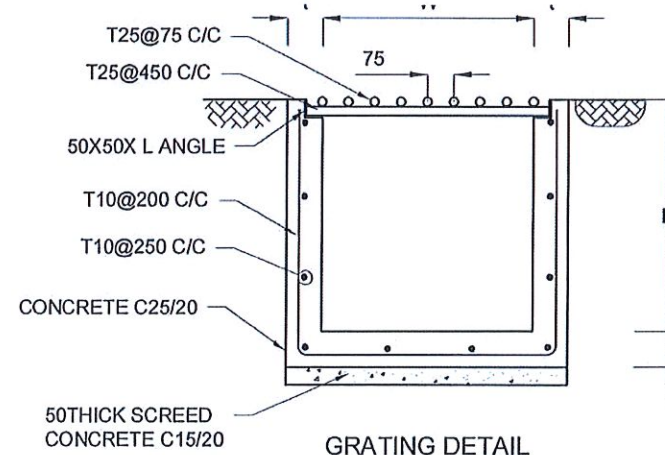
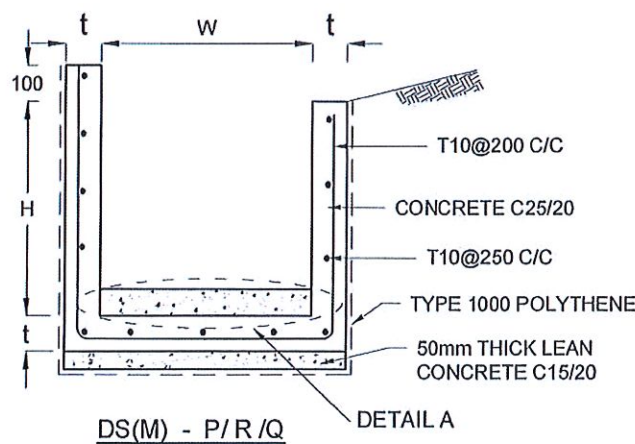
7. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

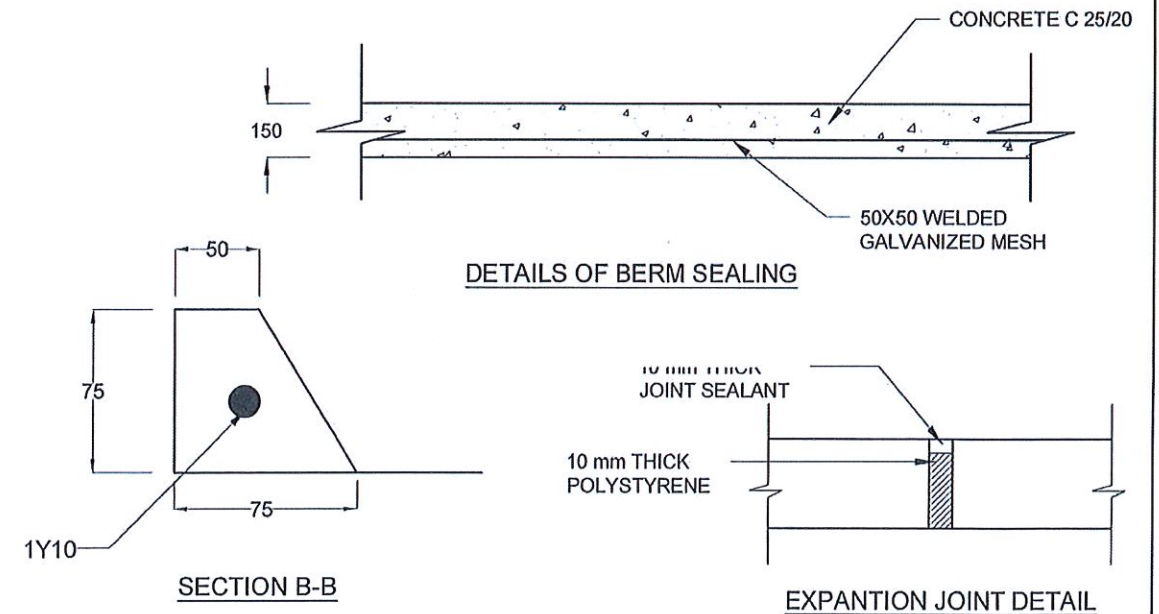
8. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
9. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
10. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
11. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
12. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



DETAIL A - (ENERGY BREAKER AT 3M)



GRATING DETAIL



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 NATIONAL BUILDING RESEARCH ORGANIZATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER
 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

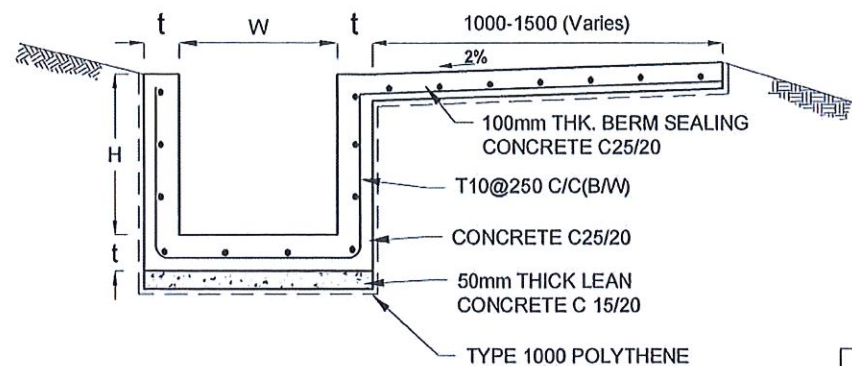
REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 BETWEEN Ch 15+740 - Ch 15+790
 VEYANGODA - RUWANWELLA ROAD

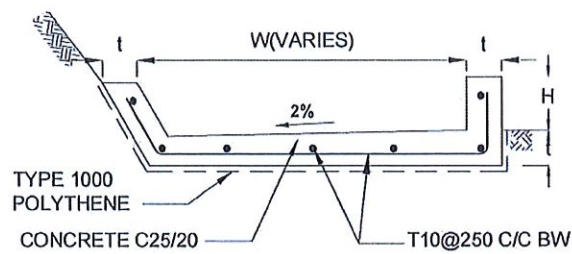
TITLE
 DETAILS OF DRAINS
 (SURFACE DRAIN -1 OF 2)

SCALE	N.T.S.	DATE	06.11.2020
PROJECT / DRAWING No.	RLVMM/WORKS/NCB/04A/05-VR/DR-05a	REVISION	00

DESCRIPTION	NAME	SIGNATURE
DRAWN	B.V.S. PATRISHIYA	<i>[Signature]</i>
DESIGNER	V.G.D. GANGANI	<i>[Signature]</i>
CHECKED	J.P. SAMARANAYAKA	<i>[Signature]</i>
RECOMMENDED	PROF. S.A.S. KULATHILAKA	<i>[Signature]</i>
APPROVED	K.N. BANDARA	<i>[Signature]</i>

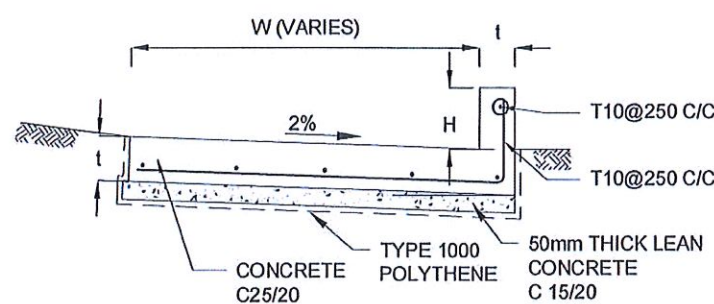


DS (B) - (TYPE I)



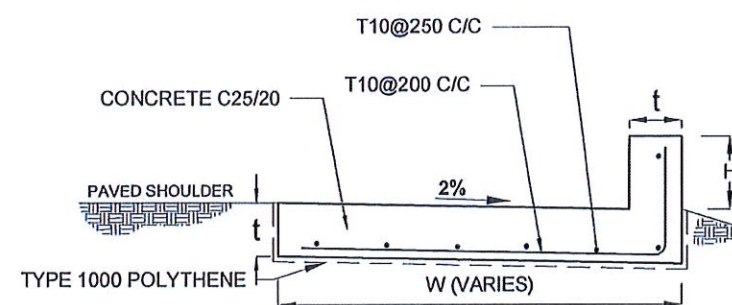
DS (B) - (TYPE II)

DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (B) - A	300	300	100
DS (B) - B	450	450	100
DS (B) - C	1000	150	100

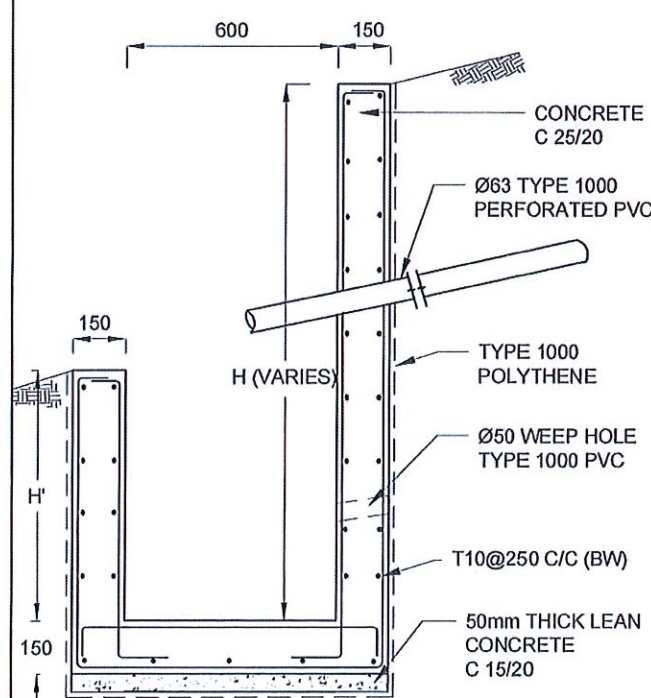


DS (K) - TYPE I

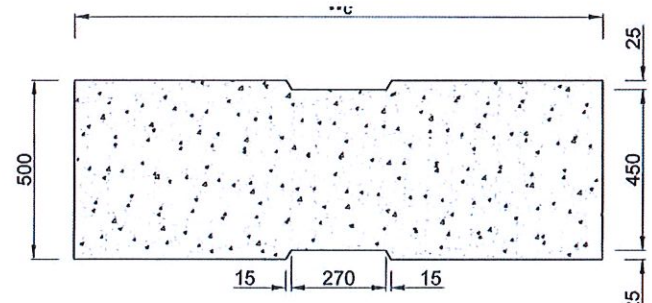
DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (K) - A	1000	200	100
DS (K) - B	1000	300	100
DS (K) - C	1150	200	200



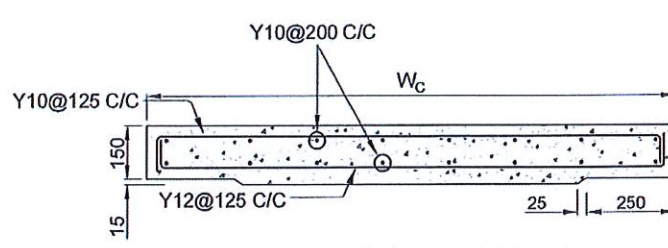
DS (K) - TYPE II



DS (M) - L



PLAN VIEW OF COVER SLAB



ACCESS & HEAVY DUTY COVER SLAB
SECTION OF (W_c x 500 x 150mm)

DS(M) - L	W (mm)	H' (mm)	t (mm)
TYPE I	600	600	150
TYPE II	800	800	150

NOTES

- DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
- STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
- DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- COVER SLABS NEED TO BE PROVIDED ONLY FOR THE REGIONS AS INSTRUCTED BY THE ENGINEER.
- COVER SLAB WIDTH (W_c) SHOULD BE TAKEN AS THE SUM OF DRAIN WIDTH AND 2x DRAIN WALL THICKNESS. [W_c = W+2xt]
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
- 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.

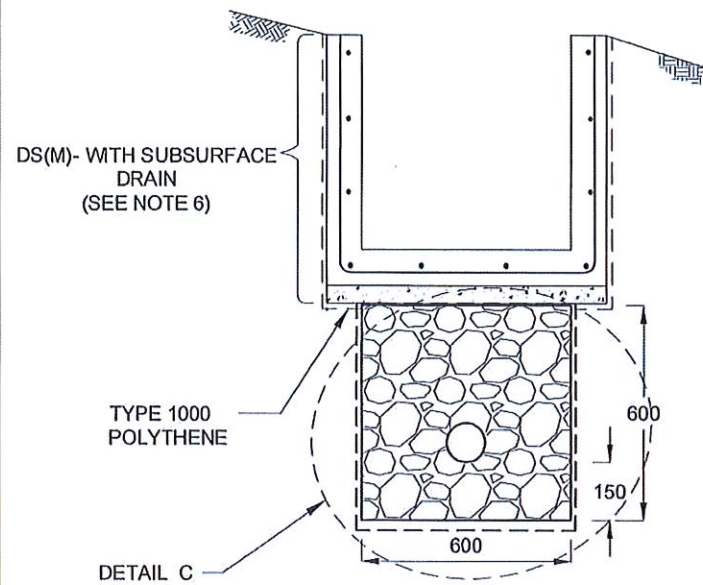
CONCRETE

- USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

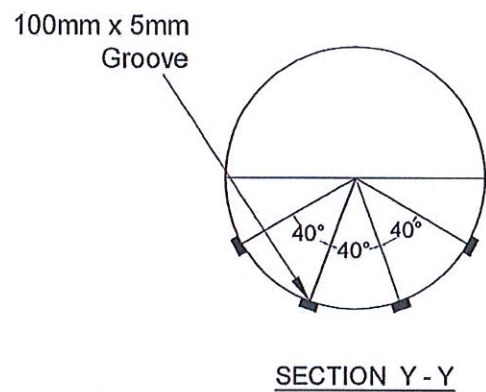
REINFORCEMENT

- ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
- BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
- ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
- REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
- COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm

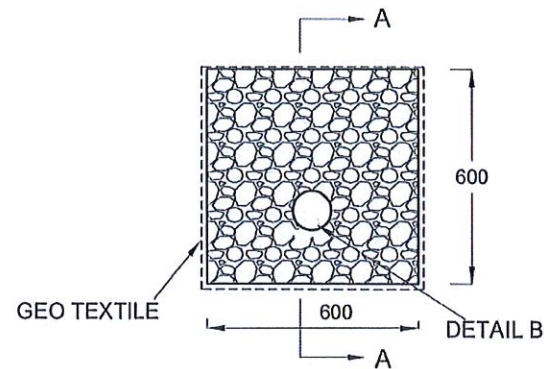
EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV. DATE REVISION DESCRIPTION APPROVAL PROJECT TITLE	TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BETWEEN Ch 15+740 - Ch 15+790 VEYANGODA - RUWANWELLA ROAD	DESCRIPTION NAME SIGNATURE DRAWN B.V.S. PATTRISHIYA <i>f. Papp</i> DESIGNER V.G.D. GANGANI <i>V.G.D. Gangani</i> CHECKED J.P. SAMARANAYAKA <i>J.P. Samaranayaka</i> RECOMMENDED PROF. S.A.S. KULATHILAKA <i>S.A.S. Kulathilaka</i> APPROVED K.N. BANDARA <i>K.N. Bandara</i>
		SCALE N.T.S. DATE 06.11.2020 PROJECT / DRAWING No. RLVMP/WORKS/NCB/04/A/05-VR/DR-05b REVISION 00		



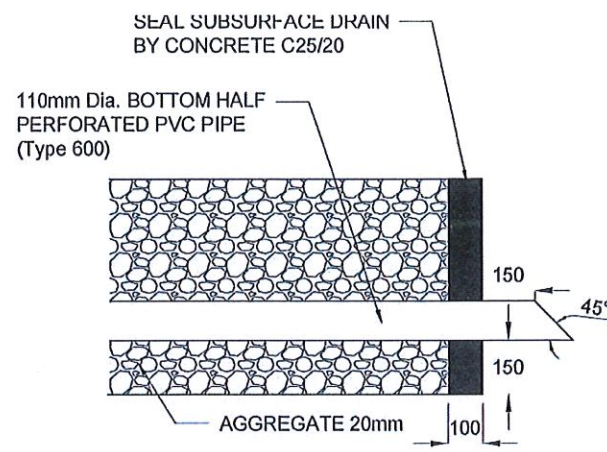
**SUBSURFACE DRAIN
[DS (S) -A]**



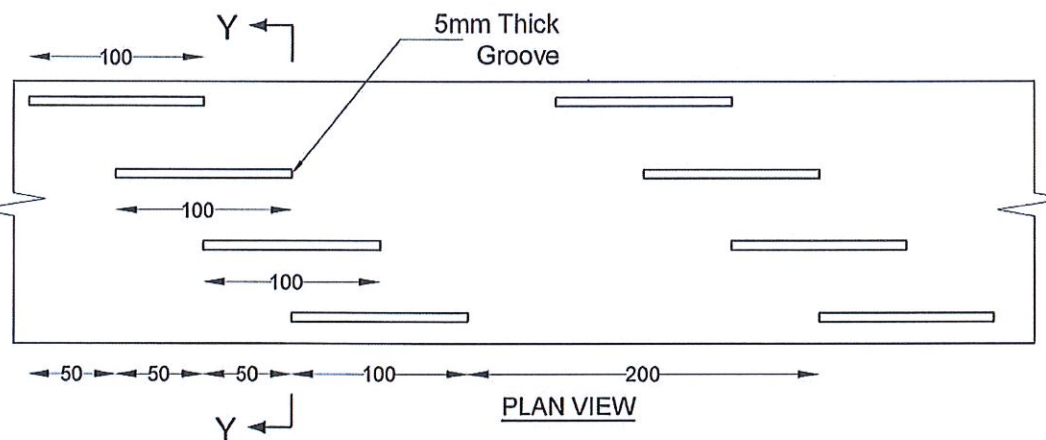
SECTION Y - Y



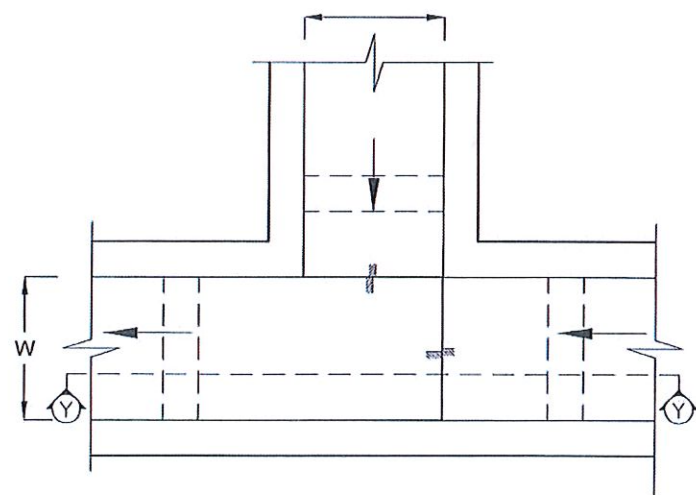
DETAIL C / DS (S) -A



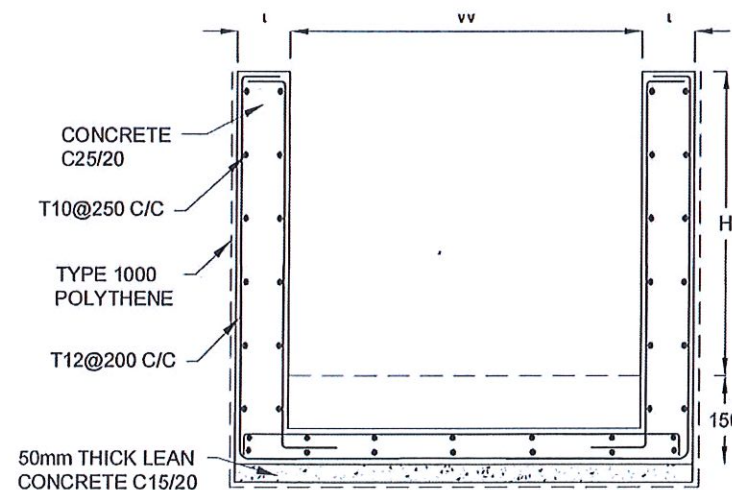
**SECTION A-A
(OUTLET DETAIL SUBSURFACE DRAIN)**



DETAIL - B (PERFORATED PIPE FOR SUB-SURFACE DRAINS)



PLAN VIEW OF CATCH PIT (CP)



SECTION Y-Y (CP - R)

NOTES

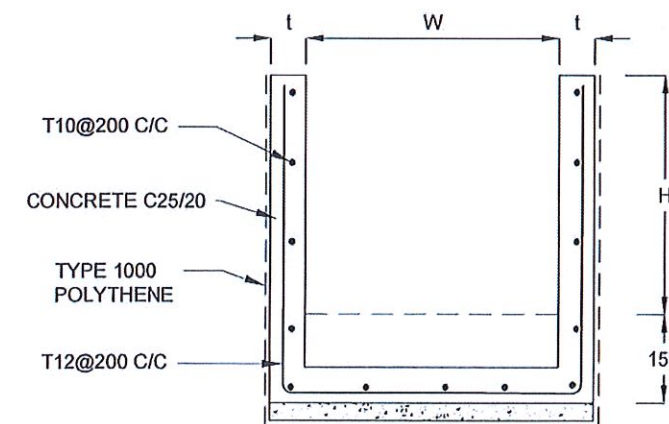
1. W,H,t ; SHALL BE THE SAME AS RESPECTIVE DRAIN SECTION.
2. CP - R SHALL BE USED WHERE $H \geq 900$ mm
3. DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. DETAILS OF SURFACE DRAIN PORTION OF THE SUBSURFACE DRAINS SHALL BE AS PER DS(M), DS(B), DS(K) OR DS(C) SECTIONS ACCORDINGLY.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

CONCRETE

8. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

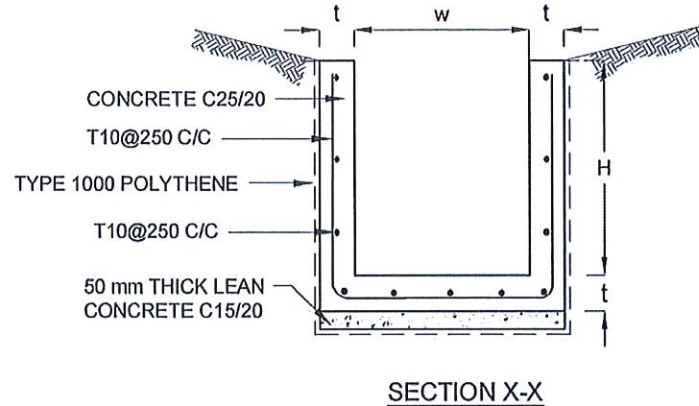
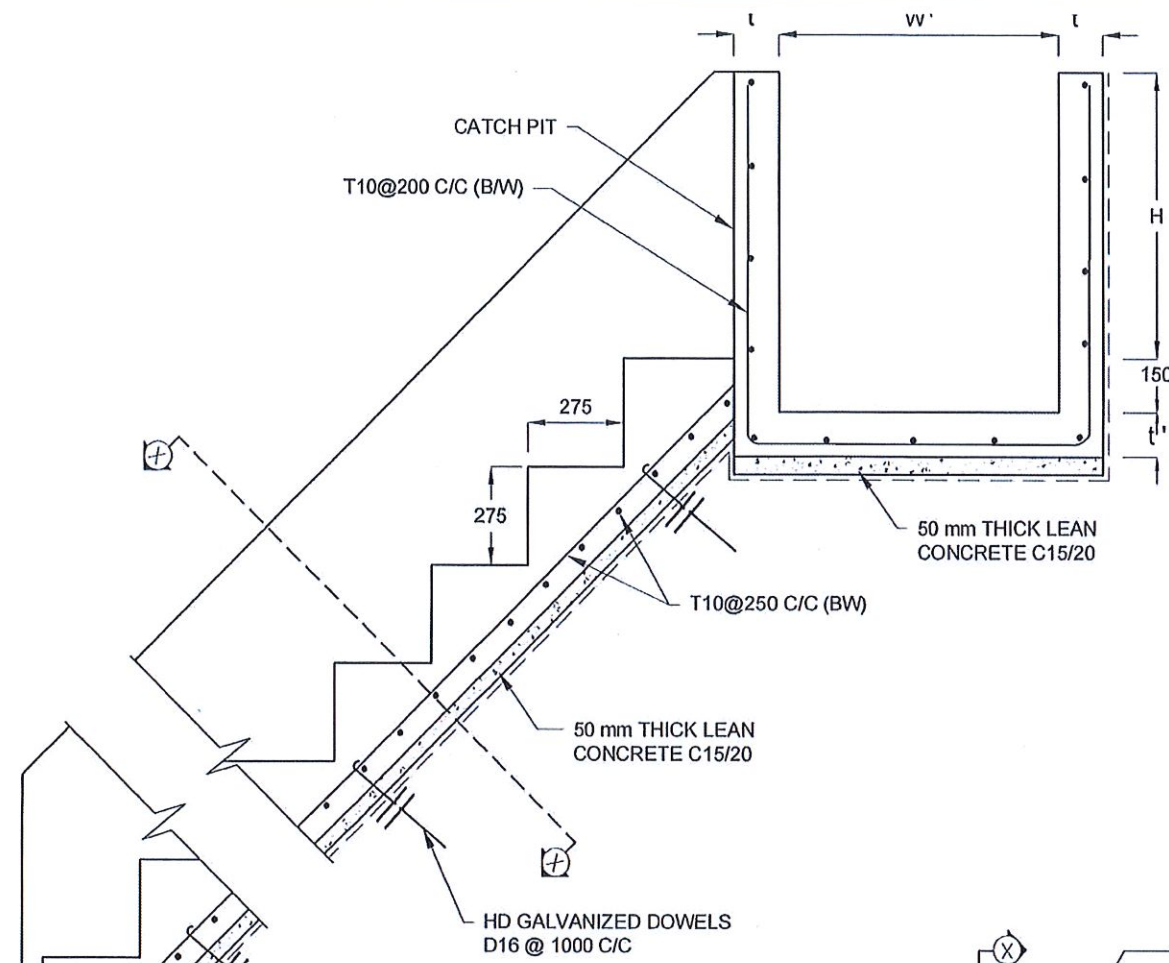
REINFORCEMENT

9. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
10. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPEL FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
11. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
12. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
13. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



SECTION Y - Y

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BETWEEN Ch 15+740 - Ch 15+790 VEYANGODA - RUWANWELLA ROAD	TITLE DETAILS OF DRAINS (SUBSURFACE DRAIN AND CATCHPIT)	DESCRIPTION NAME SIGNATURE																			
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APPROVED	K.N. BANDARA																							



NOTES

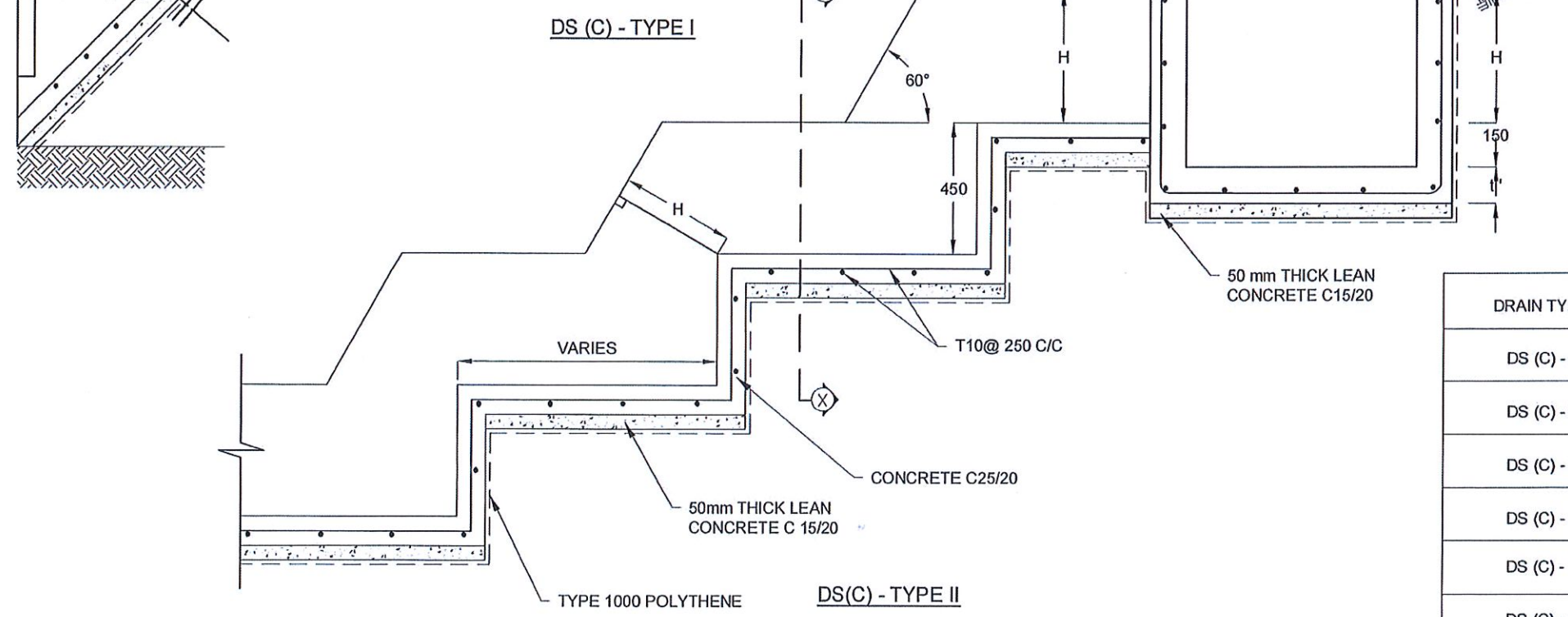
1. USE EITHER TYPE I OR TYPE II CASCADE DRAIN ACCORDING TO THE ACTUAL GROUND CONDITION AS INSTRUCTED BY THE ENGINEER.
2. LENGTH OF THE STEPS OF CASCADE WILL BE VARIED ACCORDING TO THE SITE CONDITIONS.
3. DEPTH OF EXCAVATION SHALL BE VARIED ACCORDING TO SITE CONDITIONS.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

CONCRETE

7. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

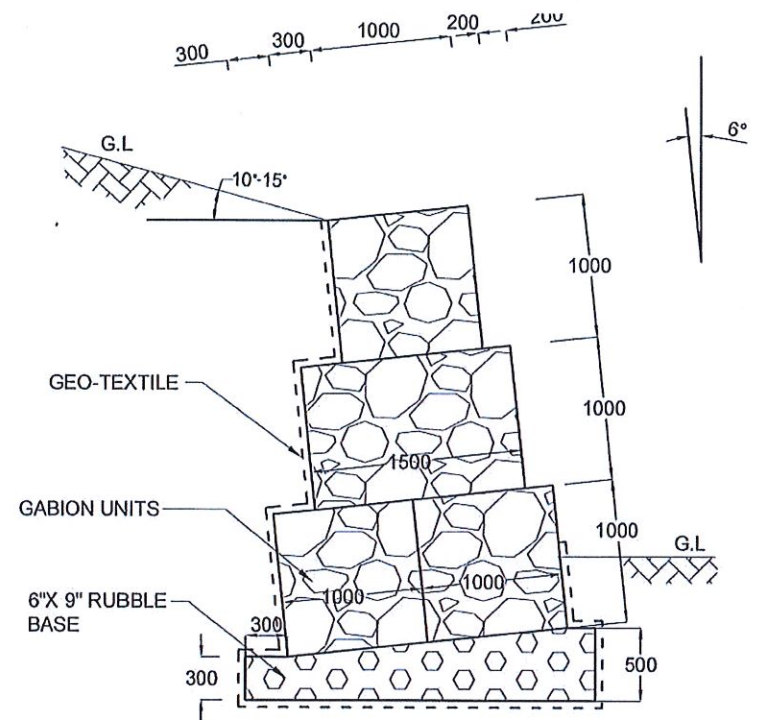
REINFORCEMENT

8. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
9. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
10. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
11. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
12. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm

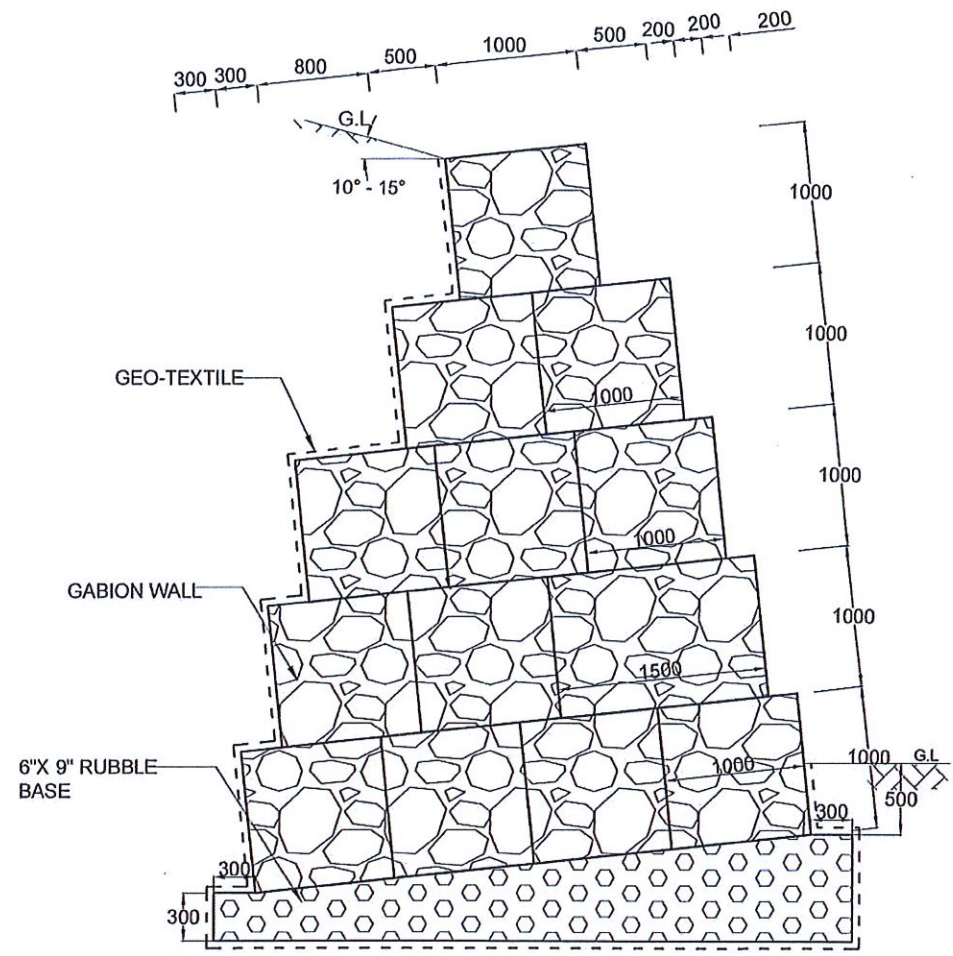


DRAIN TYPE	W (mm)	H (mm)	t (mm)	W' (mm)	t' (mm)
DS (C) - A	450	450	100	600	100
DS (C) - B	450	600	100	750	100
DS (C) - C	600	600	100	800	100
DS (C) - D	750	750	100	800	100
DS (C) - E	800	800	125	1000	125
DS (C) - F	1000	750	125	1200	125

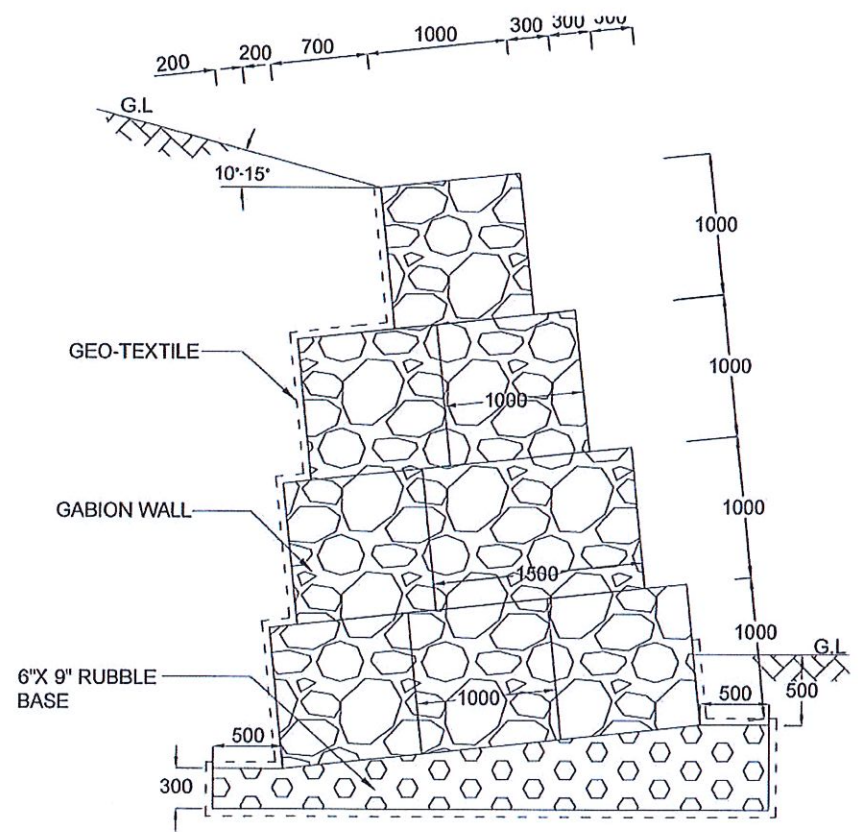
<p>EMPLOYER</p> <p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGNER</p> <p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>REVISION DESCRIPTION</th> <th>APPROVAL</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	DATE	REVISION DESCRIPTION	APPROVAL																					<p>PROJECT TITLE</p> <p>REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BETWEEN Ch 15+740 - Ch 15+790 VEYANGODA - RUWANWELLA ROAD</p>	<p>TITLE</p> <p>DETAILS OF DRAINS (CASCADE DRAIN)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DESCRIPTION</th> <th>NAME</th> <th>SIGNATURE</th> </tr> </thead> <tbody> <tr> <td>DRAWN</td> <td>B.V.S. PATTRISHIYA</td> <td></td> </tr> <tr> <td>DESIGNER</td> <td>V.G.D. GANGANI</td> <td></td> </tr> <tr> <td>CHECKED</td> <td>J.P. SAMARANAYAKA</td> <td></td> </tr> <tr> <td>RECOMMENDED</td> <td>PROF. S.A.S. KULATHILAKA</td> <td></td> </tr> <tr> <td>APPROVED</td> <td>K.N. BANDARA</td> <td></td> </tr> </tbody> </table>	DESCRIPTION	NAME	SIGNATURE	DRAWN	B.V.S. PATTRISHIYA		DESIGNER	V.G.D. GANGANI		CHECKED	J.P. SAMARANAYAKA		RECOMMENDED	PROF. S.A.S. KULATHILAKA		APPROVED	K.N. BANDARA	
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			<p>SCALE N.T.S.</p> <p>PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/05-V/R/DR-05d</p>	<p>DATE 06.11.2020</p> <p>REVISION 00</p>																																											



GABION WALL
TYPE I







GABION WALL
TYPE III

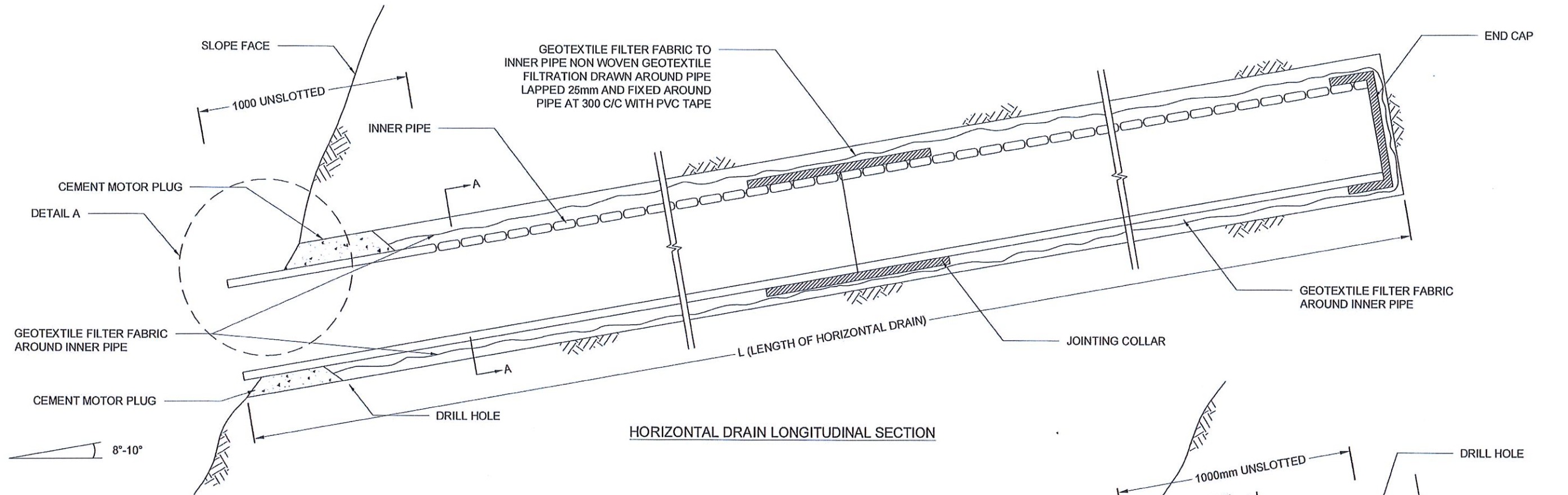


GABION WALL
TYPE II

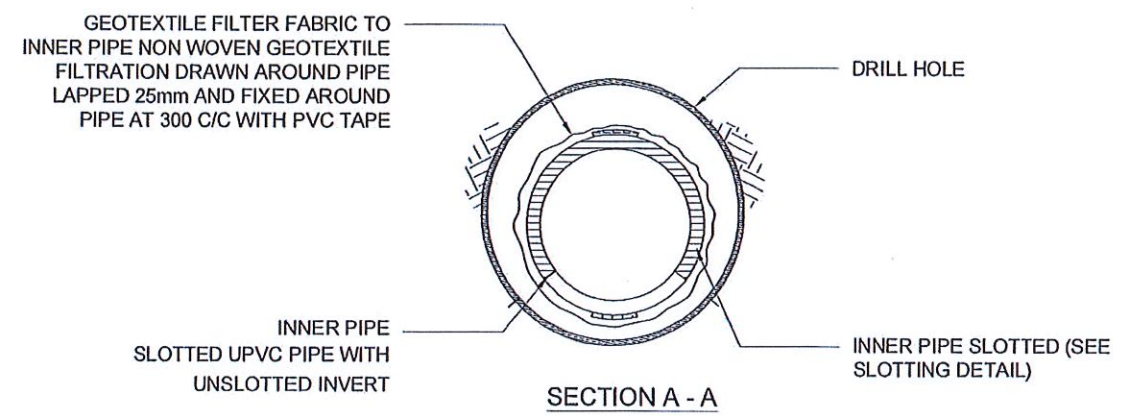
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS.

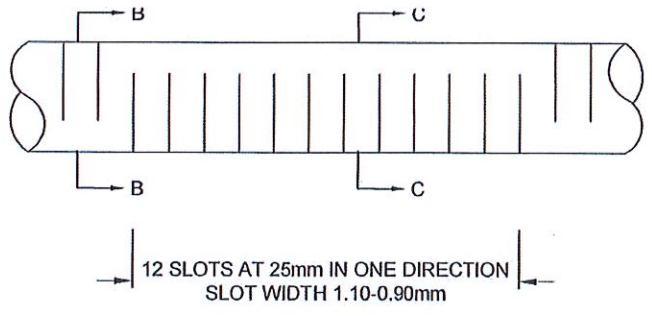
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								RECOMMENDED	PROF. S.A.S. KULATHILAKA		
								APPROVED	K.N. BANDARA		



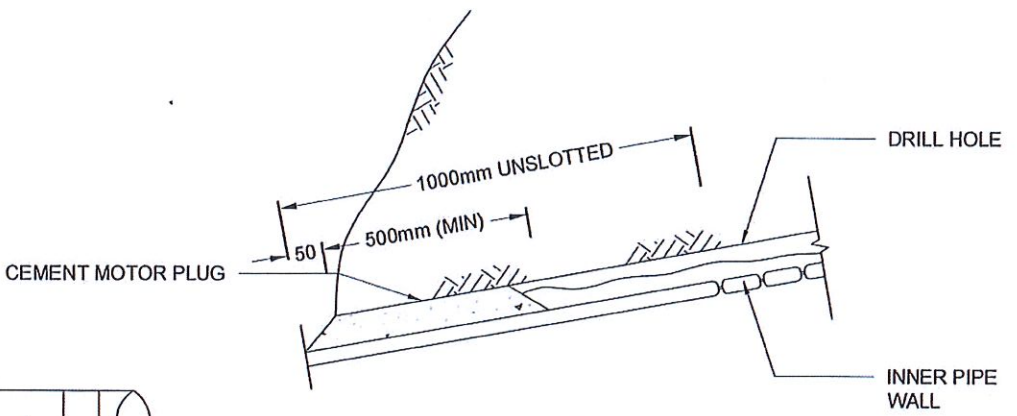
HORIZONTAL DRAIN LONGITUDINAL SECTION



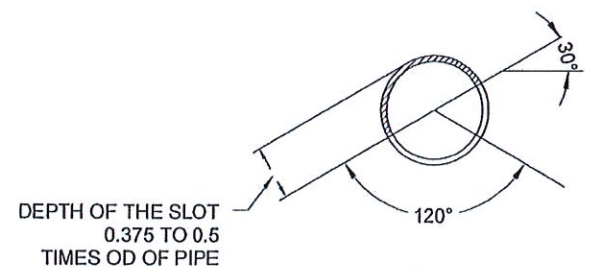
SECTION A - A



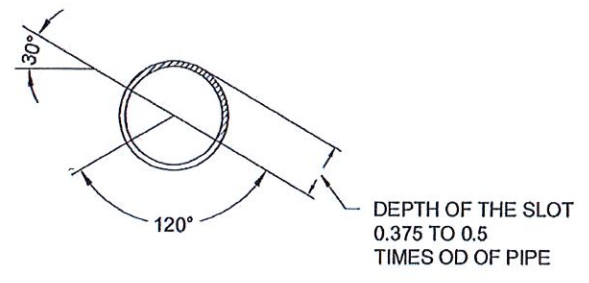
INNER AND OUTER PIPE SLOTTING DETAIL (TOP VIEW)



DETAIL A



SECTION B - B



SECTION C - C

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. PIPE DIAMETERS, ANGLE & LENGTHS AS SPECIFIED IN DRAWINGS.
3. ALL MATERIALS SHALL CONFORM TO PROJECT SPECIFICATION

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV [Empty table for revision details]	DATE [Empty table for revision dates]	REVISION DESCRIPTION [Empty table for revision descriptions]	APPROVAL [Empty table for approvals]	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BETWEEN Ch 15+740 - Ch 15+790 VEYANGODA - RUWANWELLA ROAD	TITLE DETAILS OF HORIZONTAL DRAIN SECTIONS	DESCRIPTION DRAWN DESIGNER CHECKED RECOMMENDED APPROVED	NAME B.V.S. PATTRISHIYA V.G.D. GANGANI J.P. SAMARANAYAKA PROF. S.A.S. KULATHILAKA K.N. BANDARA	SIGNATURE
		SCALE N.T.S. DATE 06.11.2020 PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/05-VR/DR-07 REVISION 00								



LEVEL PLAN NO:
2017/L/Colombo/LRRMD-34

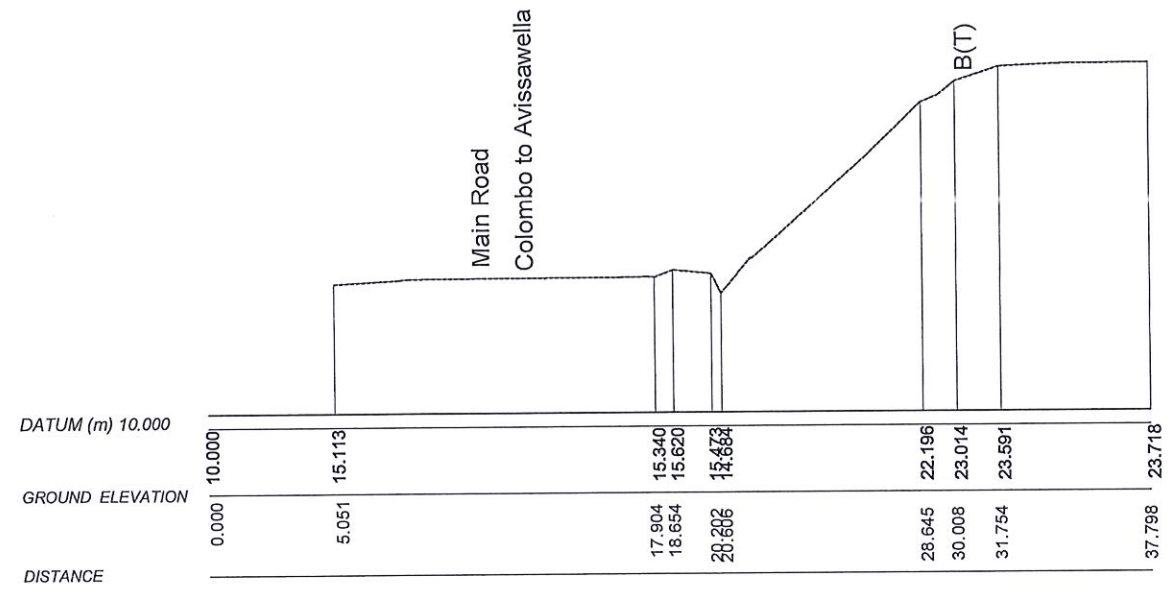


NOTE: Heights are based on an arbitrary datum.
Contour Interval - 1.0m
Area surveyed 0.86 Hectares

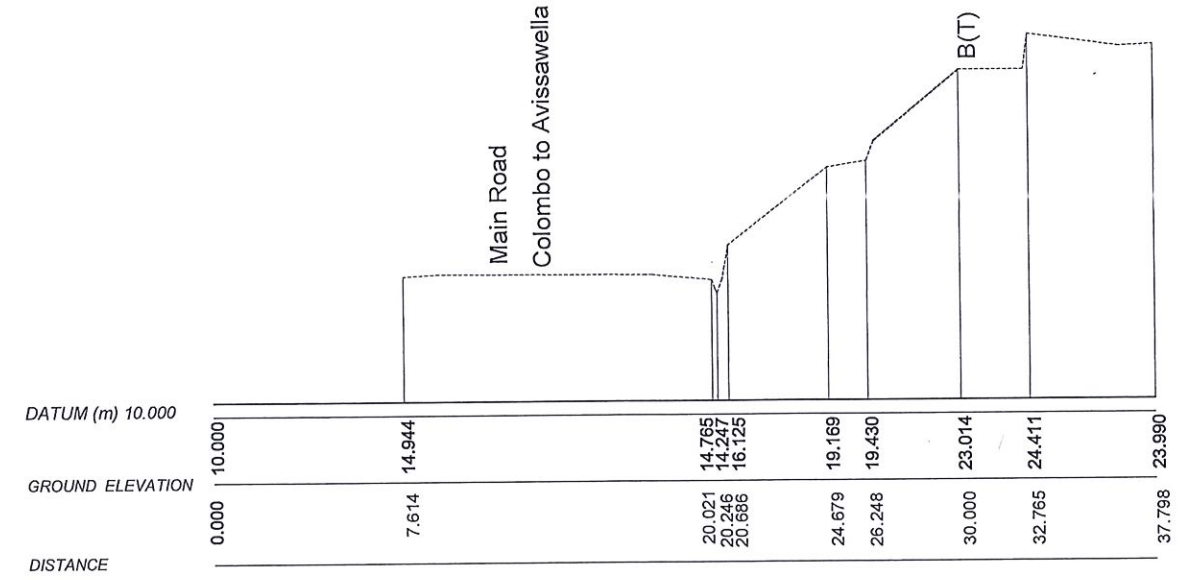
REFERENCE

- B(T) - Top of Bank
- B(B) - Bottom of Bank
- P - Permanent building
- Cdn - Concrete Drain
- EP - Electricity Pole
- Edn - Earth Drain
- MW - Masonry Well
- RW - Retaining Wall
- BW - Boundary Wall
- G - Gate
- CUL - Culvert

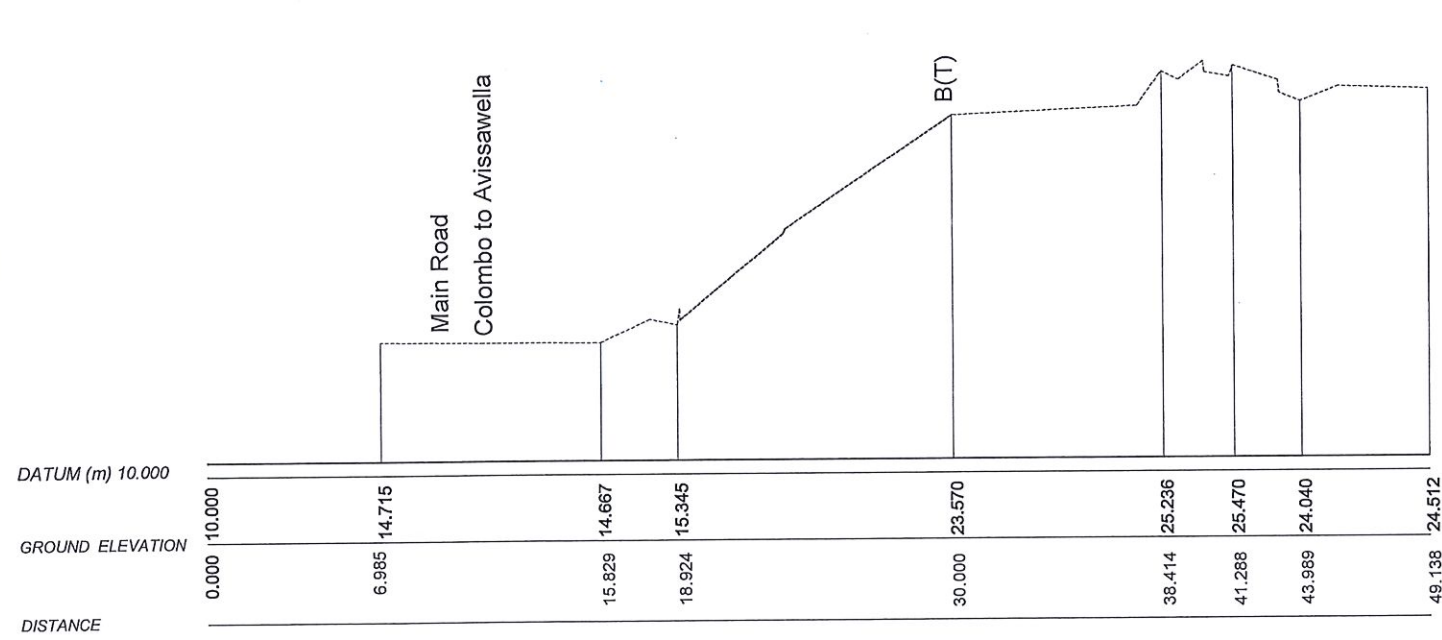
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		SCALE: N.T.S. PROJECT / DRAWING No. RLVMMP/WORKS/NCB/04A/12-KA/DR-1		DATE 12.11.2020 REVISION 00	DESCRIPTION SURVEYED CHECKED	NAME KAMAL DESHAPRIYA S.O.A.D.M. LAKRUWAN



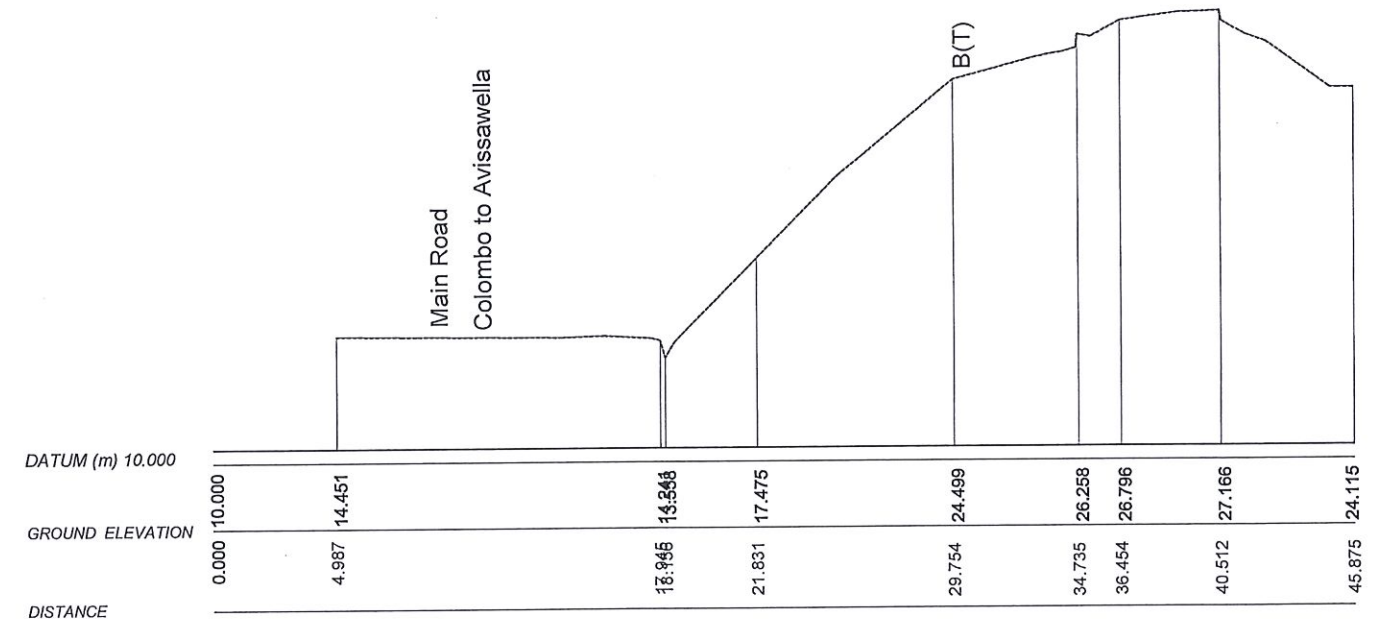
SECTION-E





SECTION-F

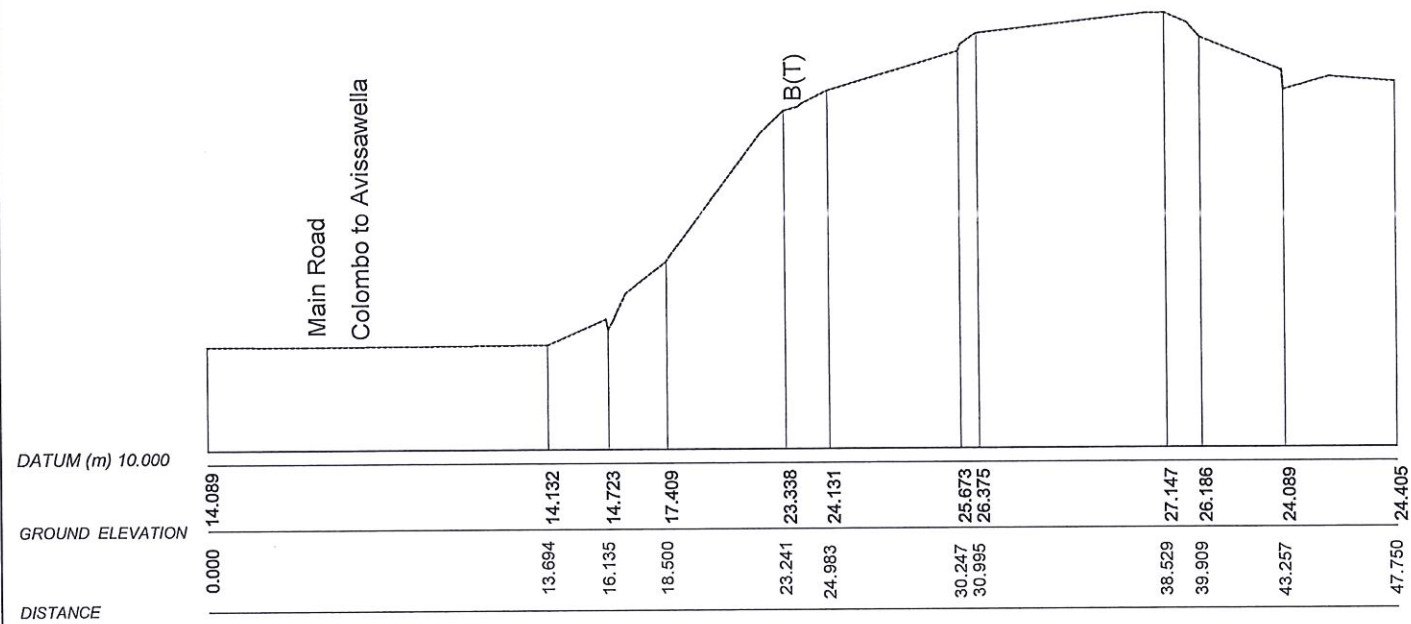


SECTION-G

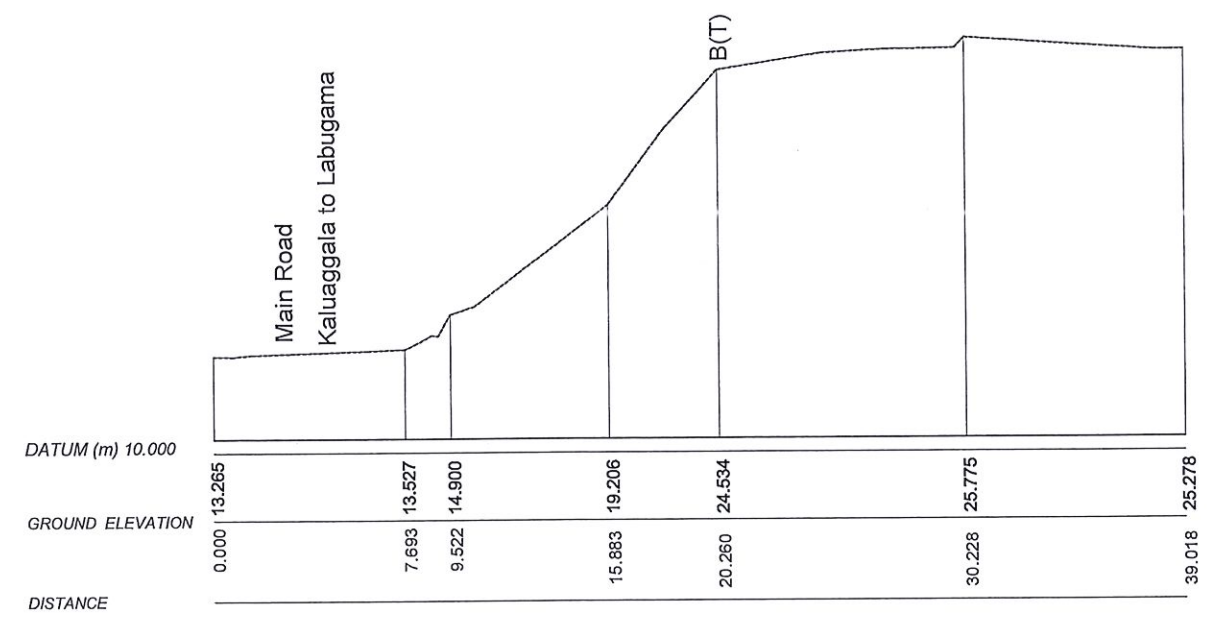


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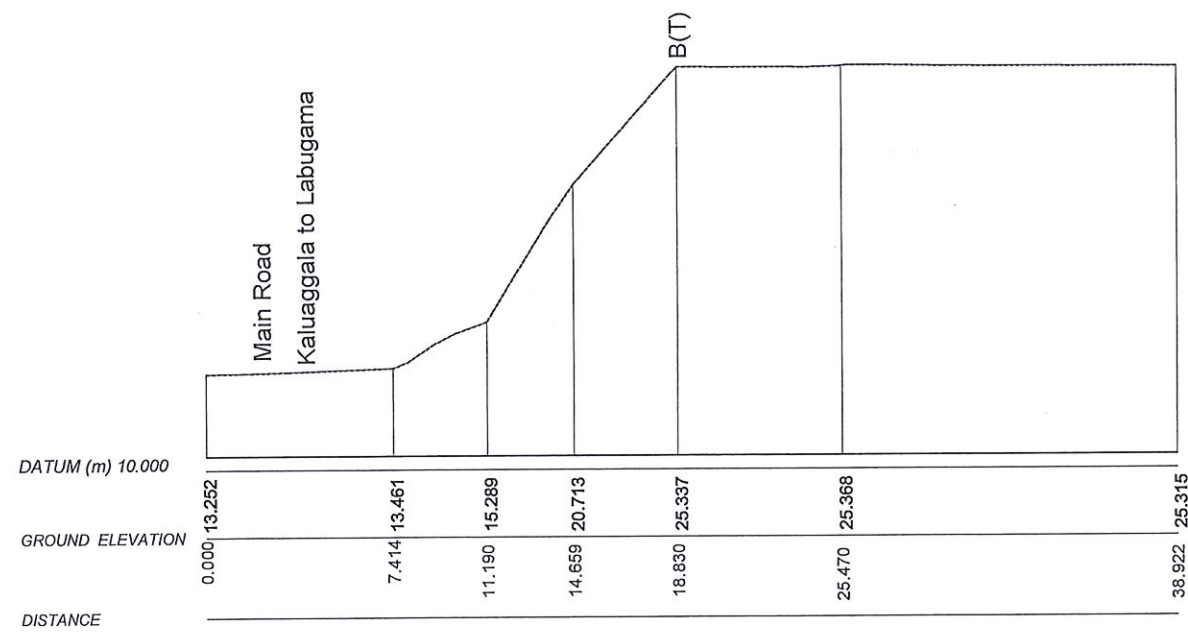
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								REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION	CONTOUR CROSS SECTIONS	SURVEYED	KAMAL DESHAPRIYA
							SCALE 1:300	DATE 12.11.2020	CHECKED	S.O.A.D.M. LAKRUWAN	
							PROJECT / DRAWING No. RLVMMF/WORKS/NCB/04A/12-KA/DR-2b	REVISION 00			



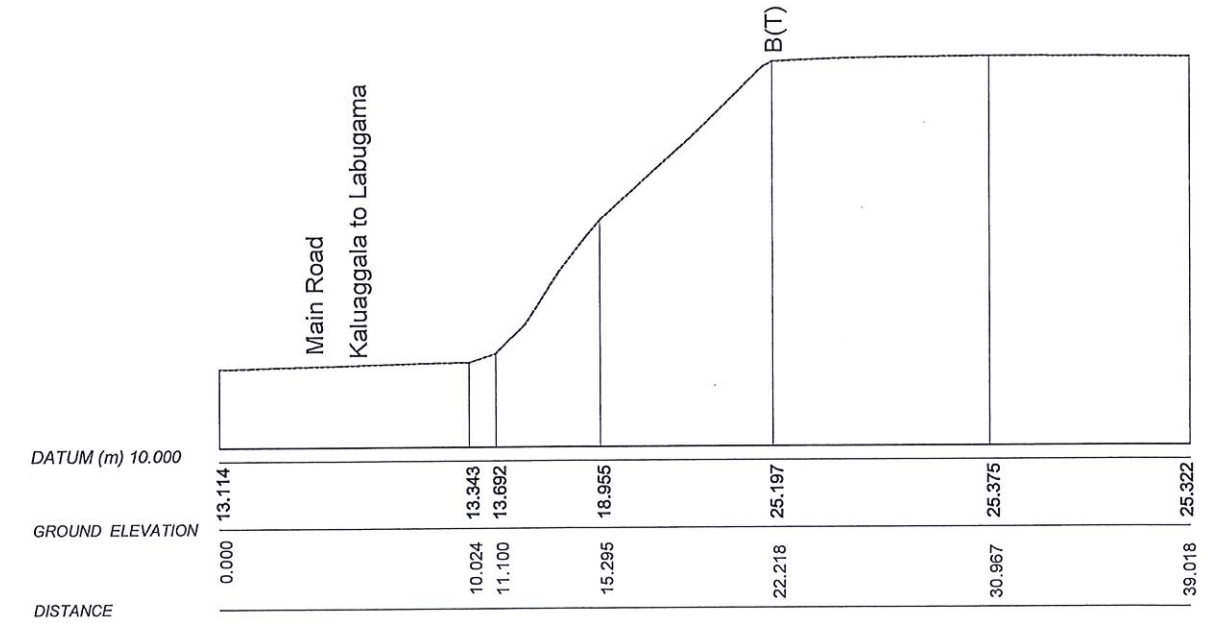
SECTION-I




SECTION-M



SECTION-N



SECTION-O

EMPLOYER

 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER

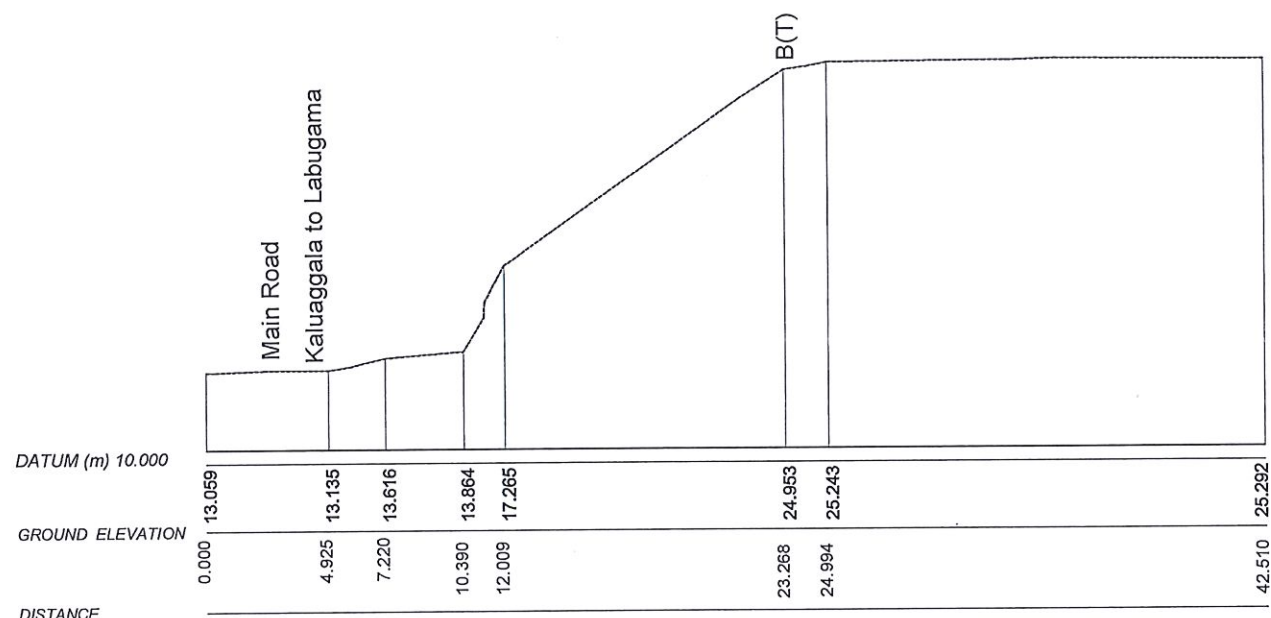
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 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

REV	DATE	REVISION DESCRIPTION	APPROVAL

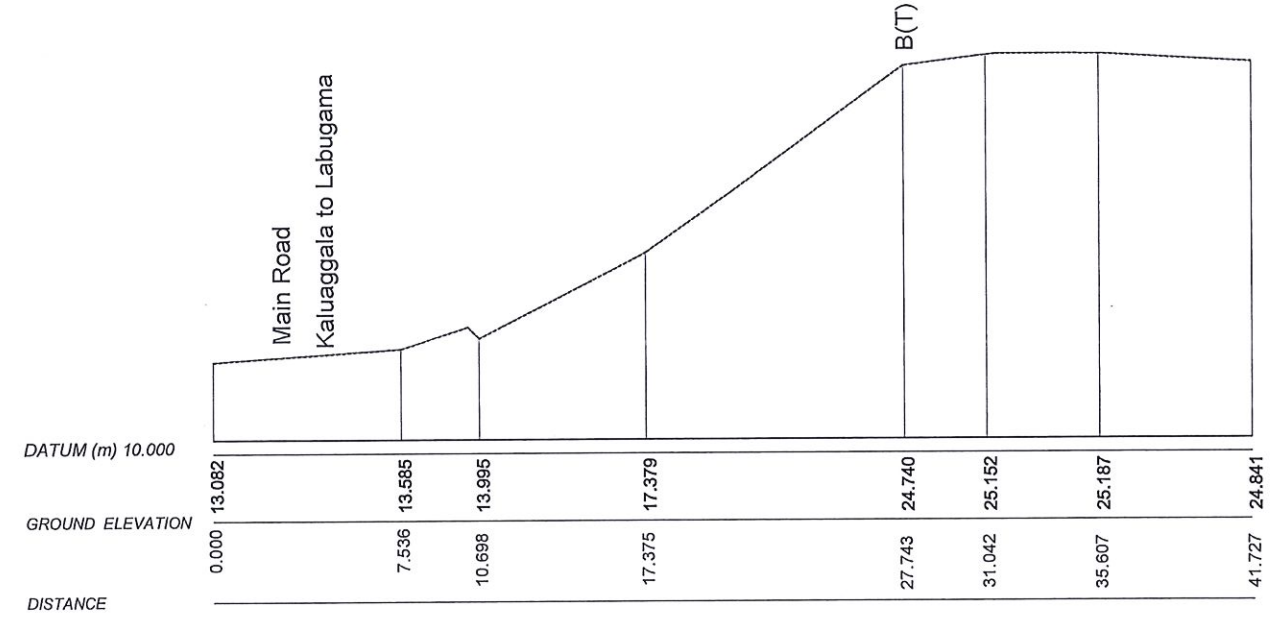
PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 KALUAGGALA JUNCTION

TITLE
 CONTOUR CROSS SECTIONS
 SCALE 1:300 DATE 12.11.2020
 PROJECT / DRAWING No. RLVMMMP/WORKS/NCB/04A/12-KA/DR-2c REVISION 00



DESCRIPTION	NAME	SIGNATURE
SURVEYED	KAMAL DESHAPRIYA	
CHECKED	S.O.A.D.M. LAKRUWAN	



SECTION-P



SECTION-Q

EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION	TITLE CONTOUR CROSS SECTIONS	DESCRIPTION NAME SIGNATURE																																																															
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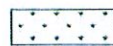




LEVEL PLAN NO:
2017/L/Colombo/LRRMD-34



REFERENCE

















- B(T) - TOP OF BANK
- B(B) - BOTTOM OF BANK
- P - PERMANENT BUILDING
- Cdn - CONCRETE DRAIN
- EP - ELECTRICITY POLE
- Edn - EARTH DRAIN
- MW - MASONRY WELL
- RW - RETAINING WALL
- BW - BOUNDARY WALL
- G - GATE
- Cul. - CULVERT

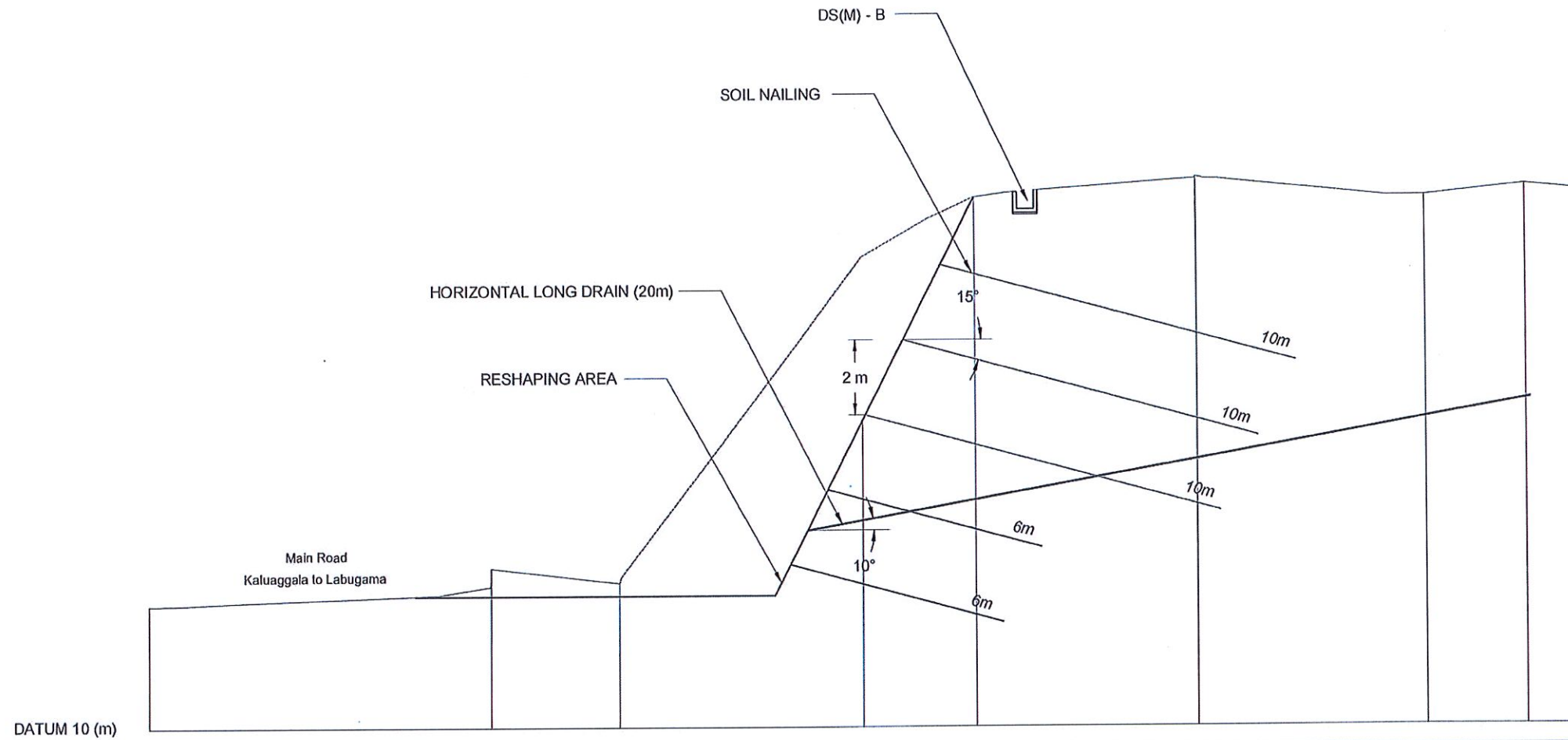
DESIGN NOTATION

-  TURFING AREA
-  NAILING AREA
-  DS (M) - B
-  DS (C) - F
-  CATCHPIT

NOTE

1. LOCATION, LENGTH AND NUMBER OF SOIL NAILS MIGHT BE VARIED ACCORDING TO ACTUAL SITE CONDITION.
2. ANGLE, LOCATION, LENGTH AND NUMBER OF HORIZONTAL DRAIN MIGHT BE VARIED ACCORDING TO THE ACTUAL SITE CONDITION.
3. SURFACE / SUBSURFACE DRAIN LOCATIONS (PATHS) CASCADE DRAINS LOCATIONS (PATH) & LENGTH MIGHT BE VARIED ACCORDING TO THE ACTUAL SITE CONDITION.
4. LOCATION OF THE CATCHPITS MIGHT BE VARIED ACCORDING TO THE ACTUAL SITE CONDITION.

EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL PROJECT TITLE	TITLE PAL VIEW OF PROPOSED MITIGATION MEASURES REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION	DESCRIPTION NAME SIGNATURE																																																													
		<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																																										<table border="1"> <tr> <td>SCALE</td> <td>1:400</td> <td>DATE</td> <td>12.11.2020</td> </tr> <tr> <td>PROJECT / DRAWING No.</td> <td>RLVMMP/WORKS/INCB/04A/12-KA/DR-3</td> <td>REVISION</td> <td>00</td> </tr> </table>	SCALE	1:400	DATE	12.11.2020	PROJECT / DRAWING No.	RLVMMP/WORKS/INCB/04A/12-KA/DR-3	REVISION	00	<table border="1"> <tr> <td>DRAWN</td> <td>B.V.S. PATTRISHIYA</td> <td></td> </tr> <tr> <td>DESIGNER</td> <td>S.O.A.D.M. LAKRUWAN</td> <td></td> </tr> <tr> <td>CHECKED</td> <td>J.P. SAMARANAYAKA</td> <td></td> </tr> <tr> <td>RECOMMENDED</td> <td>PROF. S.A.S. KULATHILAKA</td> <td></td> </tr> <tr> <td>APPROVED</td> <td>K.N. BANDARA</td> <td></td> </tr> </table>	DRAWN	B.V.S. PATTRISHIYA		DESIGNER	S.O.A.D.M. LAKRUWAN		CHECKED	J.P. SAMARANAYAKA		RECOMMENDED	PROF. S.A.S. KULATHILAKA	
SCALE	1:400	DATE	12.11.2020																																																														
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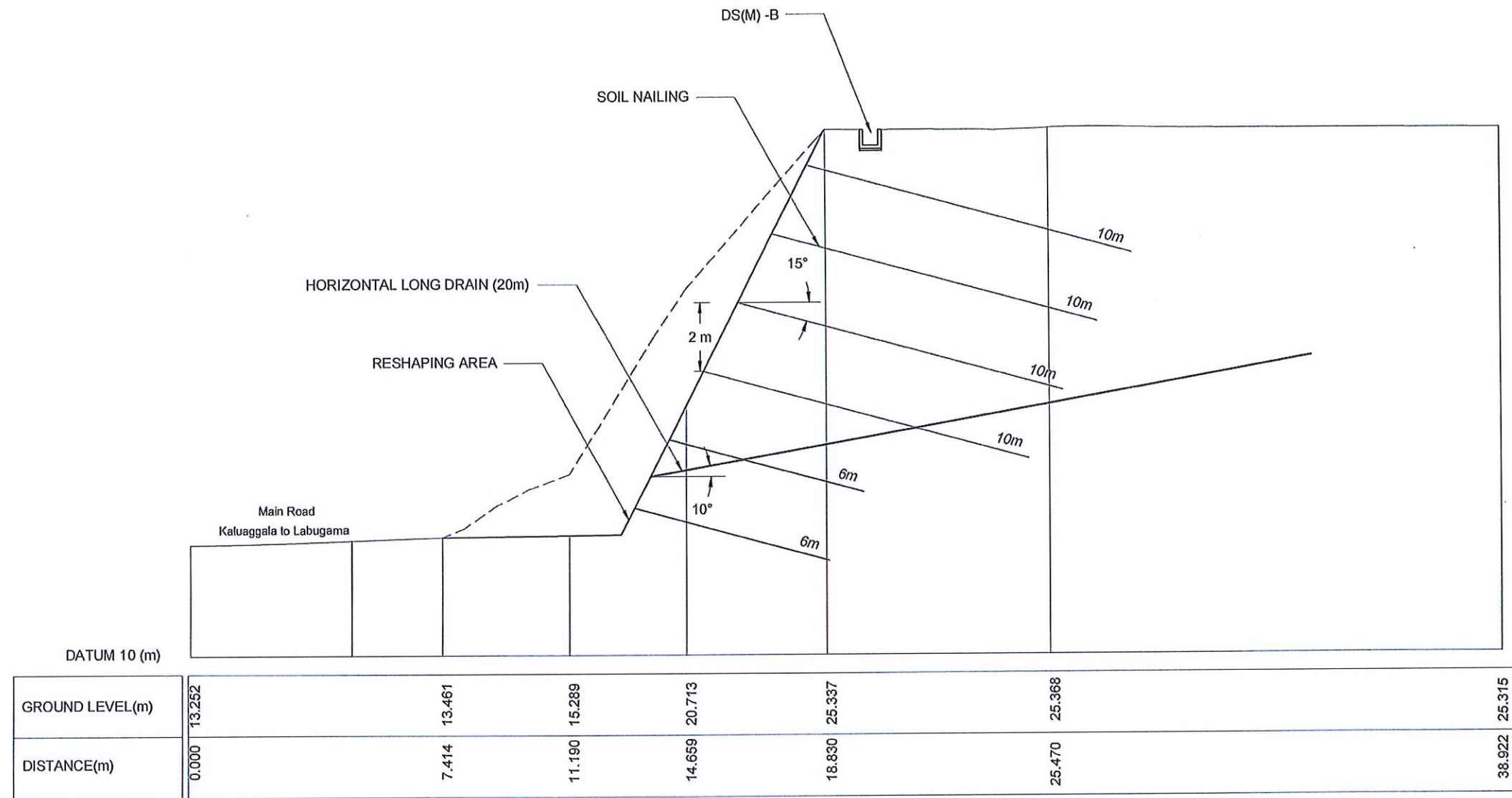
GROUND LEVEL(m)	13.273	14.270	13.864	22.569	24.149	24.666	24.143	24.409	24.281
DISTANCE(m)	0.000	9.266	12.758	19.383	22.466	28.503	34.739	37.456	39.018

SECTION - K

NOTE:

1. LOCATION, LENGTH AND NUMBER OF SOIL NAILS MIGHT BE VARIED ACCORDING TO THE SITE CONDITION ENCOUNTERED DURING CONSTRUCTION.
2. ANGLE, LOCATION, LENGTH AND NUMBER OF HORIZONTAL DRAINS MIGHT BE VARIED ACCORDING TO THE SITE CONDITION ENCOUNTERED DURING CONSTRUCTION.



EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION	TITLE CROSS SECTION OF PROPOSED MITIGATION MEASURES			DESCRIPTION	NAME	SIGNATURE
								SCALE 1:150 PROJECT / DRAWING No. RLVMP/WORKS/INCB/04A/12-KA/DR-4a	DATE 12.11.2020 REVISION 00	DRAWN B.V.S. PATTRISHIYA DESIGNER S.O.A.D.M. LAKRUWAN CHECKED J.P. SAMARANAYAKA RECOMMENDED PROF. S.A.S. KULATHILAKA APPROVED K.N. BANDARA		

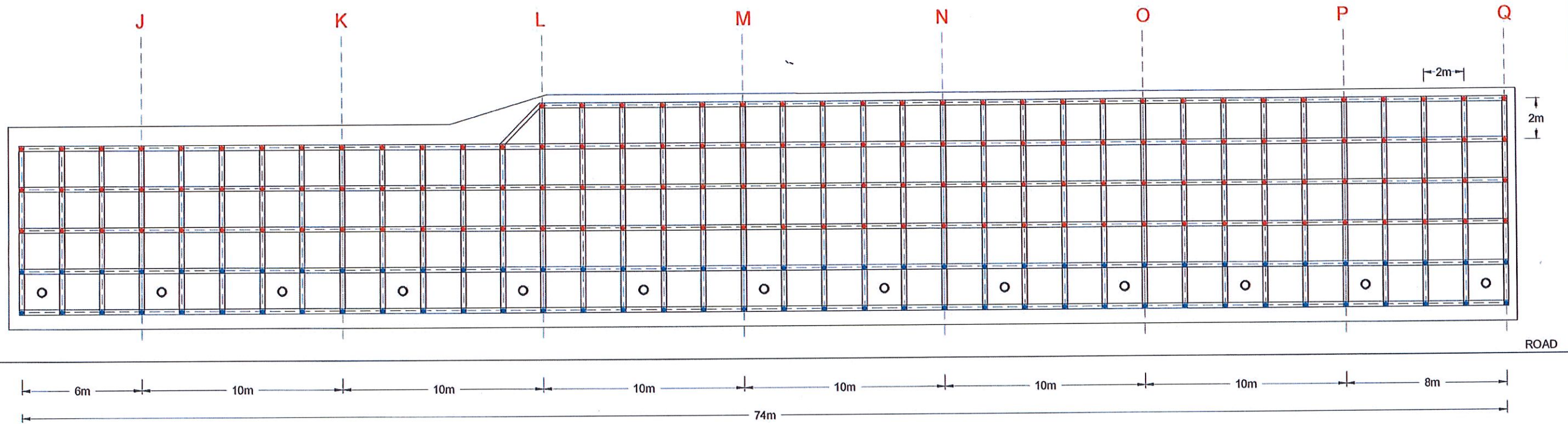


SECTION - O

NOTE:

1. LOCATION, LENGTH AND NUMBER OF SOIL NAILS MIGHT BE VARIED ACCORDING TO THE SITE CONDITION ENCOUNTERED DURING CONSTRUCTION.
2. ANGLE, LOCATION, LENGTH AND NUMBER OF HORIZONTAL DRAINS MIGHT BE VARIED ACCORDING TO THE SITE CONDITION ENCOUNTERED DURING CONSTRUCTION.

EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1 JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1 JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION	TITLE CROSS SECTION OF PROPOSED MITIGATION MEASURES		DESCRIPTION	NAME	SIGNATURE
								SCALE 1:150	DATE 12.11.2020	DRAWN B.V.S. PATRISHIYA	
						PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/12-KA/DR-4b	REVISION 00	DESIGNER S.O.A.D.M. LAKRUWAN			
								CHECKED J.P. SAMARANAYAKA			
								RECOMMENDED PROF. S.A.S. KULATHILAKA			
								APPROVED K.N. BANDARA			



FRONT ELEVATION OF PROPOSED SOIL NAILING PATTERN

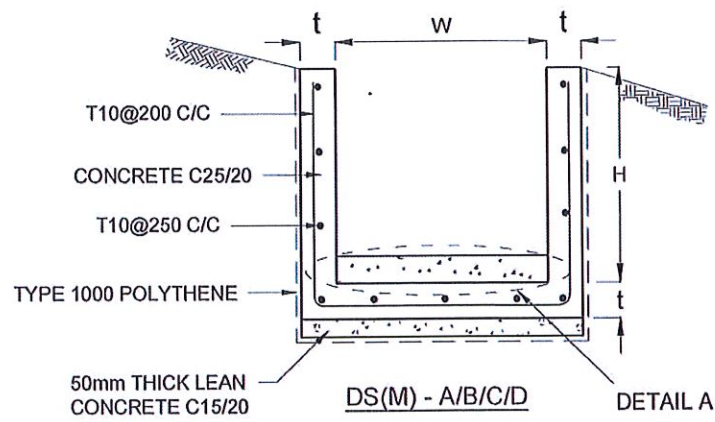
- SOIL NAILING - DESIGN NAIL LENGTH = 6m
 NO'S OF NAILS = 76
 REINFORCEMENT DIAMETER = 32mm
 DIAMETER OF THE BOREHOLE = 125mm
- SOIL NAILING - DESIGN NAIL LENGTH = 10m
 NO'S OF NAILS = 139
 REINFORCEMENT DIAMETER = 32mm
 DIAMETER OF THE BOREHOLE = 125mm

- HORIZONTAL LONG DRAINS - DRAIN LENGTH= 20m
 NO'S OF DRAINS = 13
 DIAMETER = 75mm

NOTE

1. LOCATION, LENGTH AND NUMBER OF SOIL NAILS MIGHT BE VARIED ACCORDING TO THE SITE CONDITION ENCOUNTERED DURING CONSTRUCTION.
2. ANGLE, LOCATION, LENGTH AND NUMBER OF HORIZONTAL DRAINS MIGHT BE VARIED ACCORDING TO THE SITE CONDITION ENCOUNTERED DURING CONSTRUCTION.

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION	TITLE FRONT ELEVATION OF PROPOSED MITIGATION MEASURES		DESCRIPTION DRAWN	NAME B.V.S. PATTRISHIYA	SIGNATURE
		SCALE 1:200 DATE 12.11.2020 PROJECT / DRAWING No. RLVMP/WORKS/INCB/04A/12-KA/DR-5 REVISION 00		CHECKED J.P. SAMARANAYAKA	RECOMMENDED Prof. S.A.S. KULATHILAKA	APPROVED K.N.BANDARA		



DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (M) - A /P	300	300	100
DS (M) - B/R	450	450	100
DS (M) - C/Q	600	600	100
DS (M) - D	750	750	125
DS (M) - E	900	900	150
DS (M) - F	1000	1000	150

NOTES

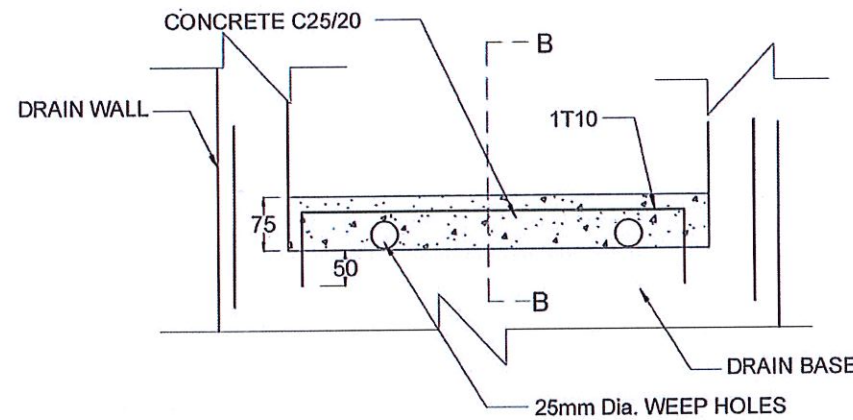
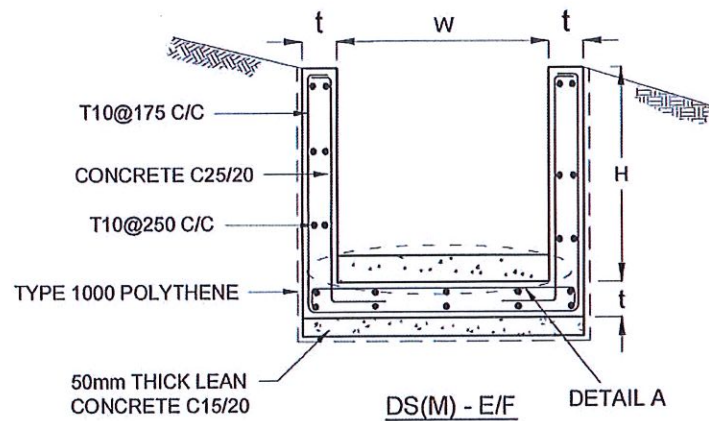
1. DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
2. STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
3. ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
6. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.

CONCRETE

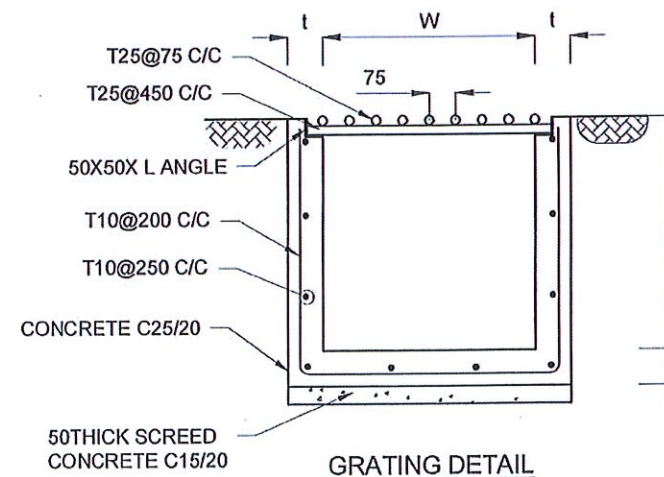
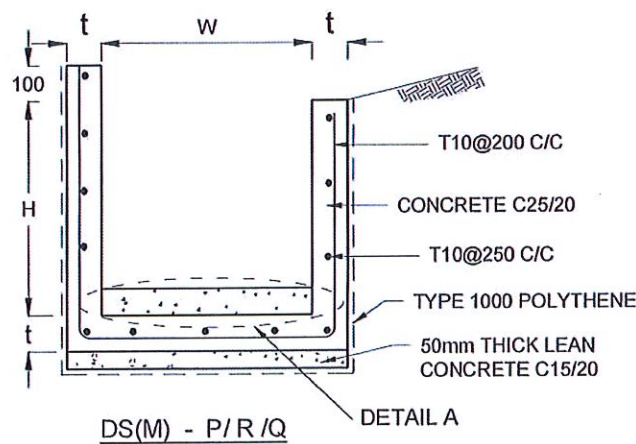
7. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

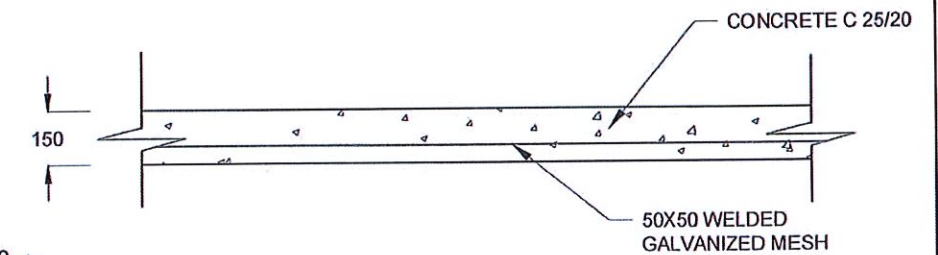
8. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
9. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
10. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
11. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
12. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



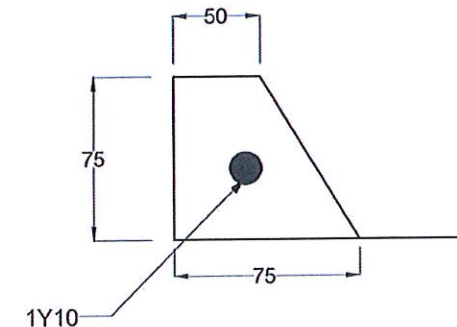
DETAIL A - (ENERGY BREAKER AT 3M)



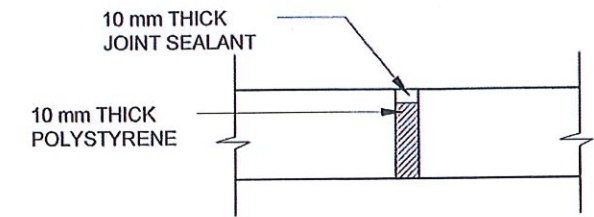
GRATING DETAIL



DETAILS OF BERM SEALING

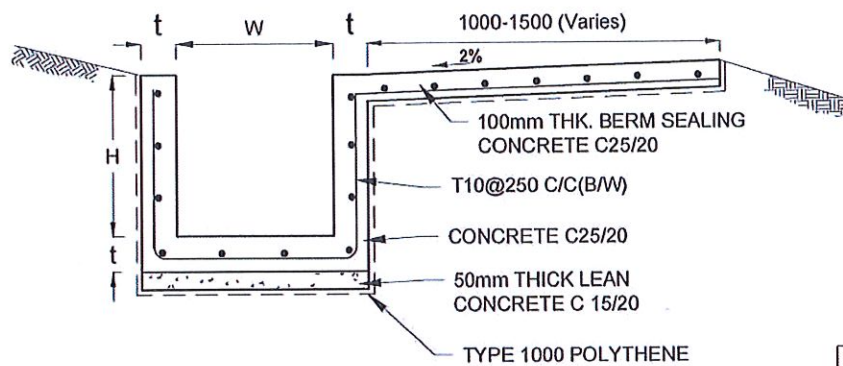


SECTION B-B

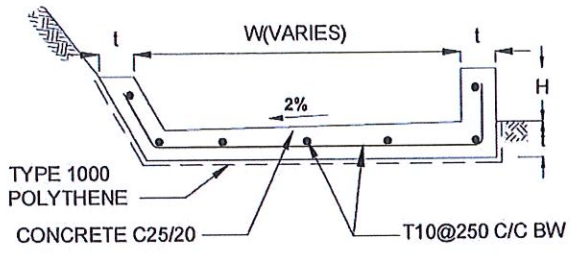


EXPANSION JOINT DETAIL

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL PROJECT TITLE	TITLE DETAILS OF DRAINS (SURFACE DRAIN -1 OF 2)	DESCRIPTION NAME SIGNATURE
		[Empty Revision Table]		SCALE: N.T.S. DATE: 12.11.2020 PROJECT / DRAWING No. RLVMM/WORKS/NCB/04A/12-KA/DR-06a REVISION: 00

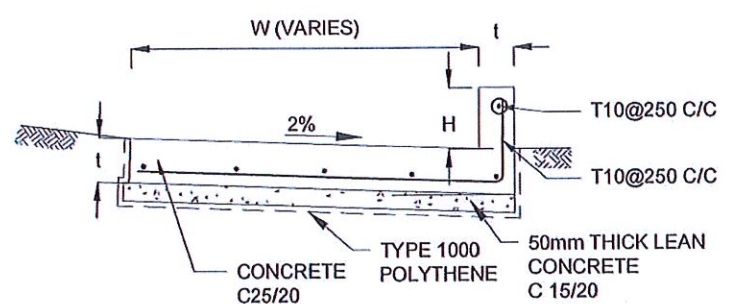


DS (B) - (TYPE I)



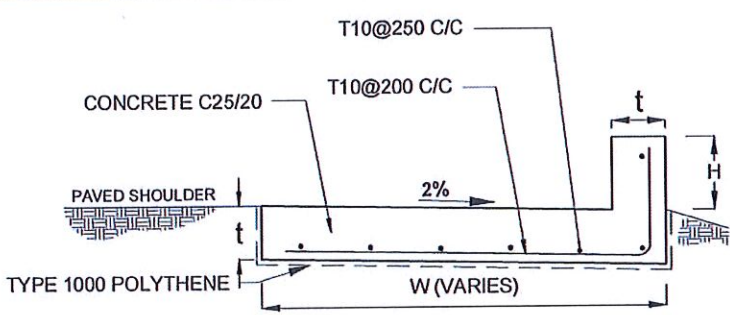
DS (B) - (TYPE II)

DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (B) - A	300	300	100
DS (B) - B	450	450	100
DS (B) - C	1000	150	100



DS (K) - TYPE I

DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (K) - A	1000	200	100
DS (K) - B	1000	300	100
DS (K) - C	1150	200	200



DS (K) - TYPE II

NOTES

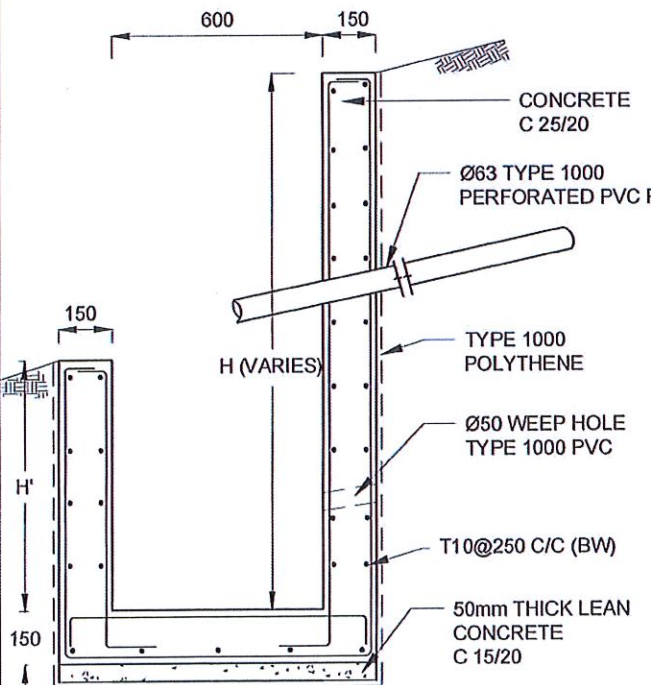
- DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
- STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
- DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- COVER SLABS NEED TO BE PROVIDED ONLY FOR THE REGIONS AS INSTRUCTED BY THE ENGINEER.
- COVER SLAB WIDTH (W_c) SHOULD BE TAKEN AS THE SUM OF DRAIN WIDTH AND $2x$ DRAIN WALL THICKNESS. [$W_c = W + 2t$]
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
- 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.

CONCRETE

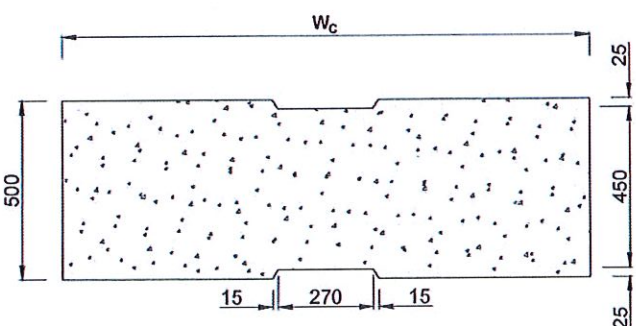
- USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

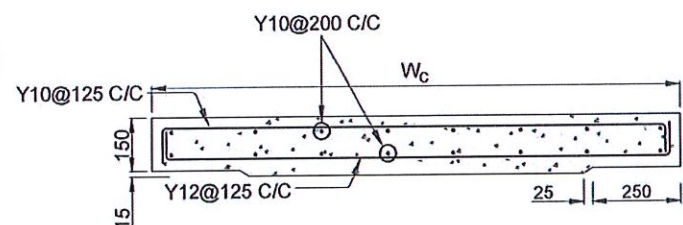
- ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN $460N/mm^2$.
- BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF $50 \times$ BAR DIA. AND LAPPING SHOULD BE STAGGERED.
- ANCHORAGE LENGTH SHOULD BE $40x$ BAR DIA.
- REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
- COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



DS (M) - L



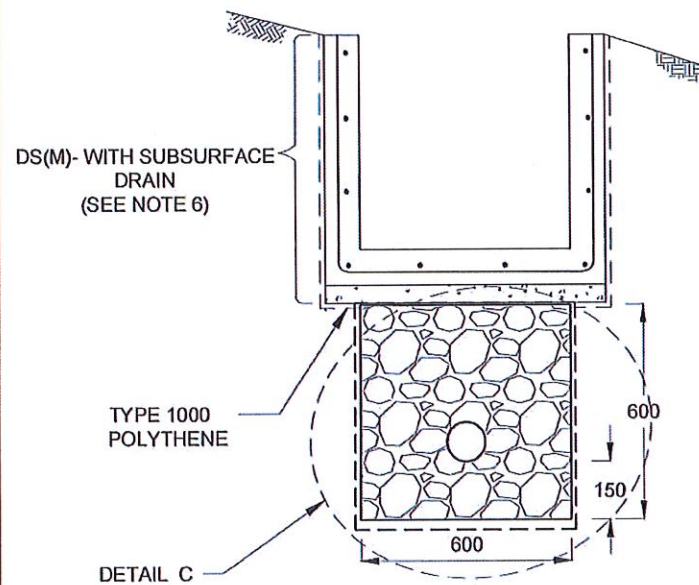
PLAN VIEW OF COVER SLAB



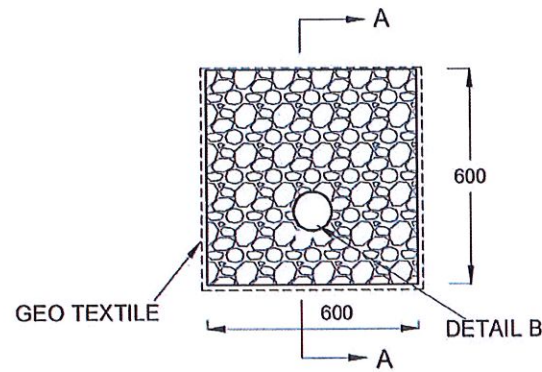
ACCESS & HEAVY DUTY COVER SLAB
SECTION OF ($W_c \times 500 \times 150mm$)

DS(M) - L	W (mm)	H' (mm)	t (mm)
TYPE I	600	600	150
TYPE II	800	800	150

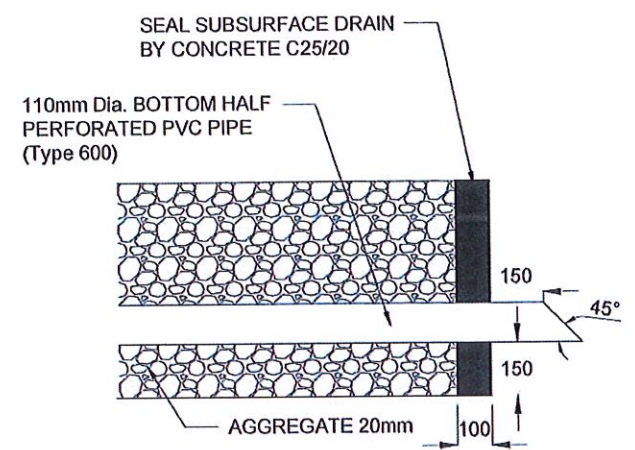
EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION	TITLE DETAILS OF DRAINS (SURFACE DRAIN -2 OF 2)	DESCRIPTION NAME SIGNATURE
		SCALE: N.T.S. DATE: 12.11.2020 PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/12-KA/DR-06b REVISION: 00			DRAWN: B.V.S. PATTRISHIYA DESIGNER: S.O.A.D.M. LAKRUWAN CHECKED: J.P. SAMARANAYAKA RECOMMENDED: PROF. S.A.S. KULATHILAKA APPROVED: K.N. BANDARA



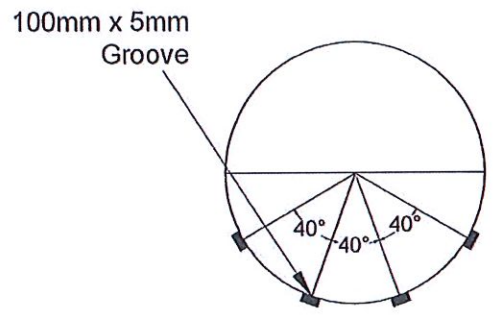
**SUBSURFACE DRAIN
[DS (S) -A]**



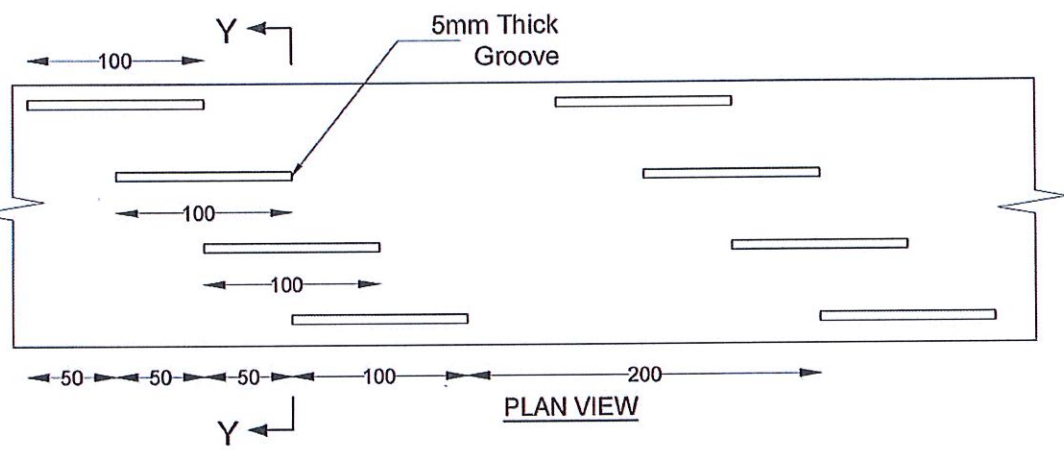
DETAIL C / DS (S) -A



**SECTION A-A
(OUTLET DETAIL SUBSURFACE DRAIN)**

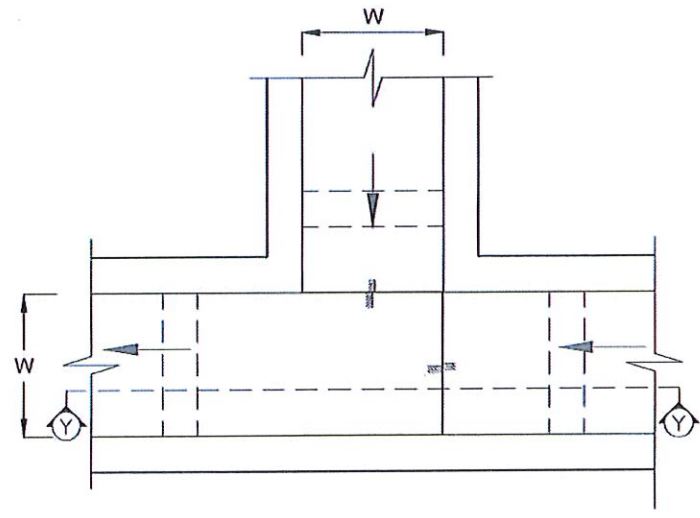


SECTION Y - Y

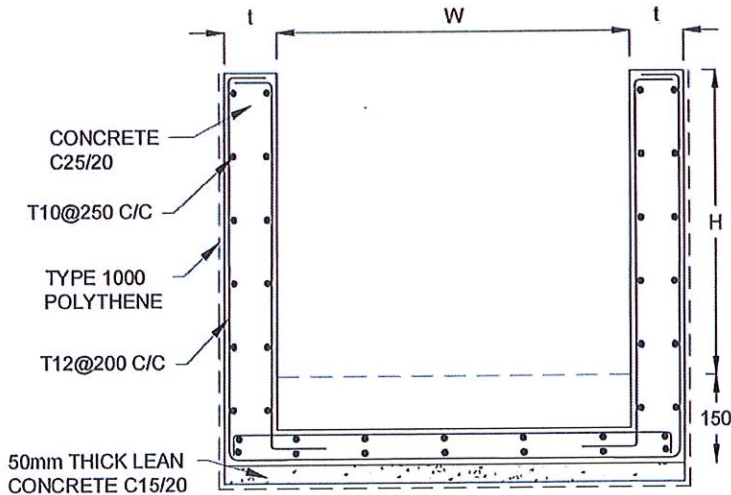


PLAN VIEW

DETAIL - B (PERFORATED PIPE FOR SUB-SURFACE DRAINS)



PLAN VIEW OF CATCH PIT (CP)



SECTION Y-Y (CP- R)

NOTES

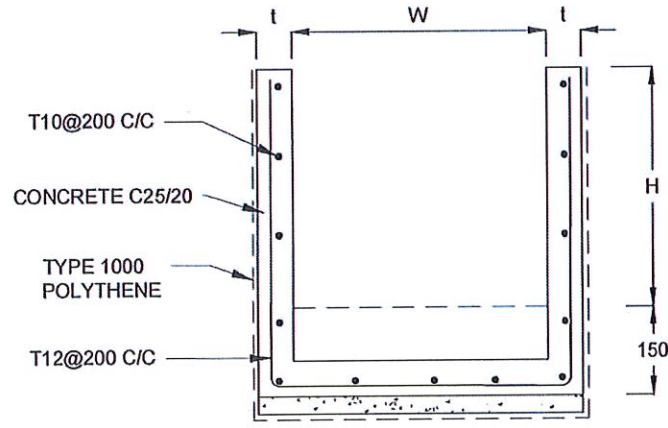
1. W,H,t; SHALL BE THE SAME AS RESPECTIVE DRAIN SECTION.
2. CP - R SHALL BE USED WHERE $H \geq 900\text{mm}$
3. DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. DETAILS OF SURFACE DRAIN PORTION OF THE SUBSURFACE DRAINS SHALL BE AS PER DS(M), DS(B), DS(K) OR DS(C) SECTIONS ACCORDINGLY.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

CONCRETE

8. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

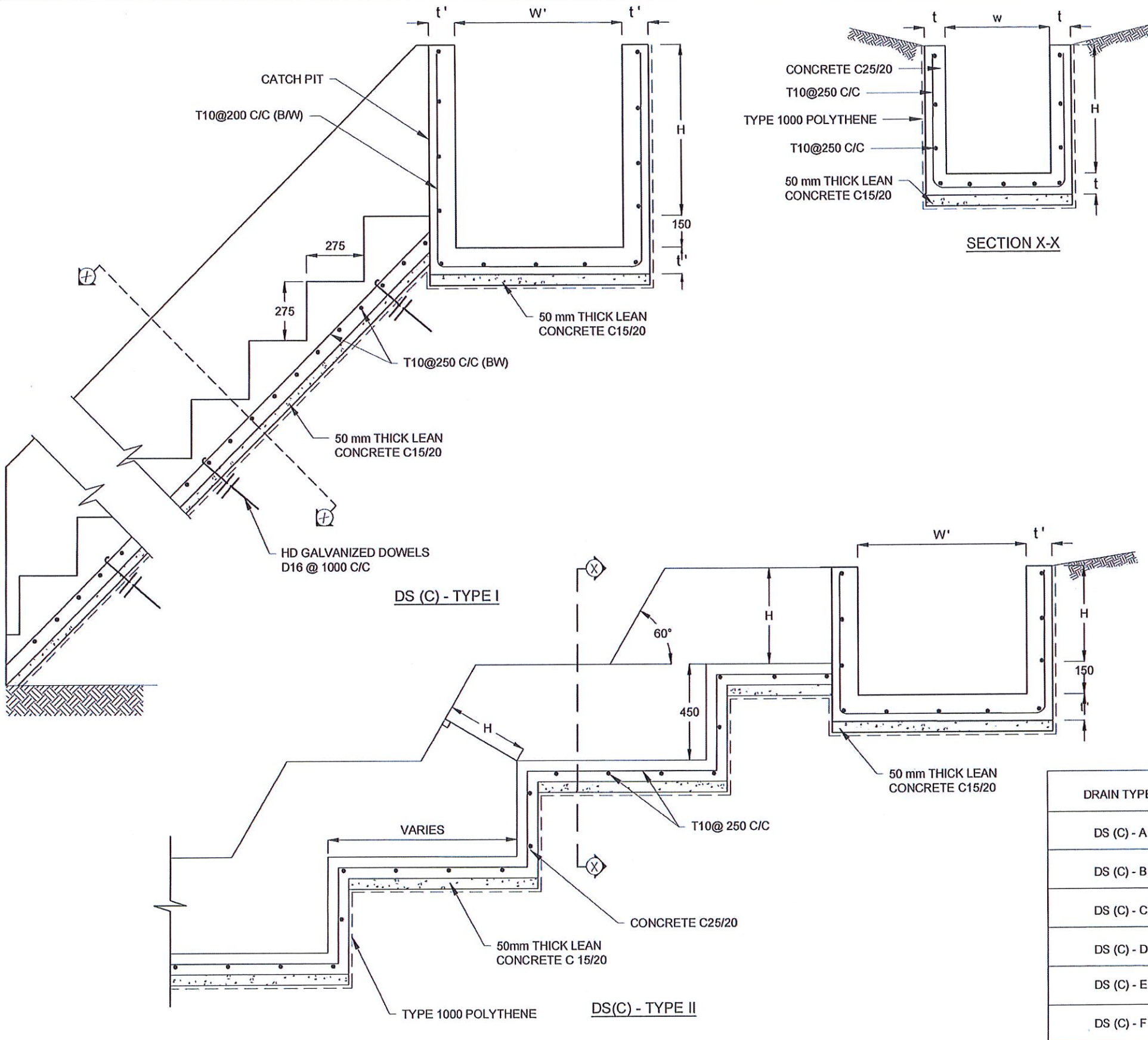
REINFORCEMENT

9. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm^2 .
10. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF $50 \times \text{BAR DIA.}$ AND LAPPING SHOULD BE STAGGERED.
11. ANCHORAGE LENGTH SHOULD BE $40 \times \text{BAR DIA.}$
12. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
13. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



SECTION Y - Y

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION	TITLE DETAILS OF DRAINS (SUBSURFACE DRAIN AND CATCHPIT)	DESCRIPTION NAME SIGNATURE																																																												
		<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>																																															<table border="1"> <tr><td>SCALE</td><td>N.T.S.</td><td>DATE</td><td>12.11.2020</td></tr> <tr><td>PROJECT / DRAWING No.</td><td>RLVMP/WORKS/INCB/04A/12-KVDR-06c</td><td>REVISION</td><td>00</td></tr> <tr><td>DRAWN</td><td>B.V.S. PATRISHIYA</td><td>CHECKED</td><td>J.P. SAMARANAYAKA</td></tr> <tr><td>DESIGNER</td><td>S.O.A.D.M. LAKRUWAN</td><td>RECOMMENDED</td><td>PROF. S.A.S. KULATHILAKA</td></tr> <tr><td>CHECKED</td><td>J.P. SAMARANAYAKA</td><td>APPROVED</td><td>K.N. BANDARA</td></tr> </table>	SCALE	N.T.S.	DATE	12.11.2020	PROJECT / DRAWING No.	RLVMP/WORKS/INCB/04A/12-KVDR-06c	REVISION	00	DRAWN	B.V.S. PATRISHIYA	CHECKED	J.P. SAMARANAYAKA	DESIGNER	S.O.A.D.M. LAKRUWAN	RECOMMENDED	PROF. S.A.S. KULATHILAKA
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NOTES

1. USE EITHER TYPE I OR TYPE II CASCADE DRAIN ACCORDING TO THE ACTUAL GROUND CONDITION AS INSTRUCTED BY THE ENGINEER.
2. LENGTH OF THE STEPS OF CASCADE WILL BE VARIED ACCORDING TO THE SITE CONDITIONS.
3. DEPTH OF EXCAVATION SHALL BE VARIED ACCORDING TO SITE CONDITIONS.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

CONCRETE

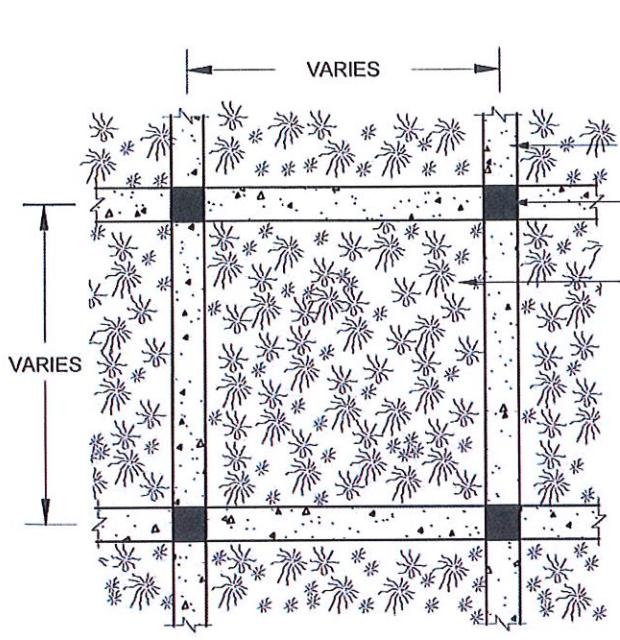
7. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

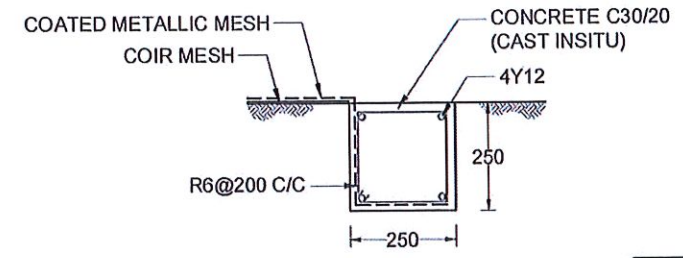
8. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
9. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
10. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
11. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
12. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm

DRAIN TYPE	W (mm)	H (mm)	t (mm)	W' (mm)	t' (mm)
DS (C) - A	450	450	100	600	100
DS (C) - B	450	600	100	750	100
DS (C) - C	600	600	100	800	100
DS (C) - D	750	750	100	800	100
DS (C) - E	800	800	125	1000	125
DS (C) - F	1000	750	125	1200	125

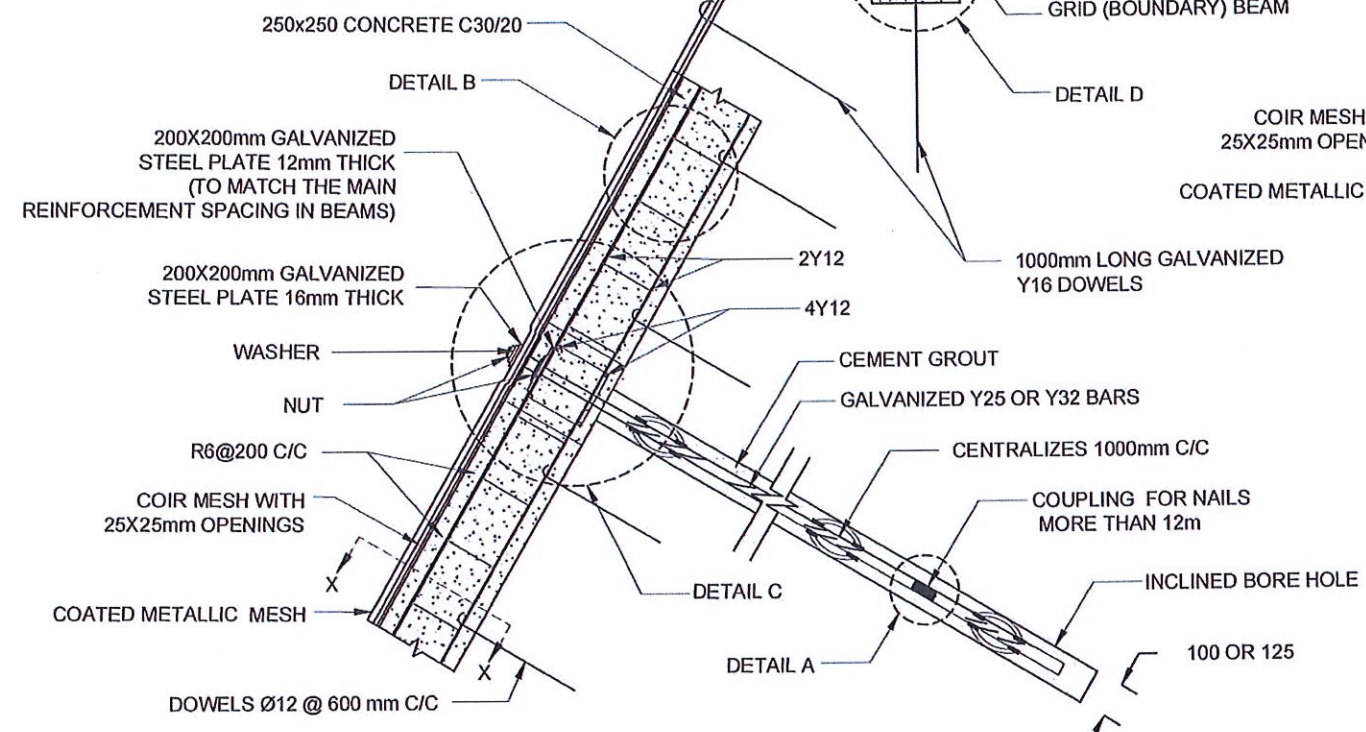
<p>EMPLOYER</p> <p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGNER</p> <p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>REVISION DESCRIPTION</th> <th>APPROVAL</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	DATE	REVISION DESCRIPTION	APPROVAL																	<p>PROJECT TITLE</p> <p>REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION</p>	<p>TITLE</p> <p>DETAILS OF DRAINS (CASCADE DRAIN)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>SCALE</td> <td>N.T.S.</td> <td>DATE</td> <td>12.11.2020</td> </tr> <tr> <td>PROJECT / DRAWING No.</td> <td>RLVMP/WORKS/NCB/04A/12-KA/DR-06d</td> <td>REVISION</td> <td>00</td> </tr> </table>	SCALE	N.T.S.	DATE	12.11.2020	PROJECT / DRAWING No.	RLVMP/WORKS/NCB/04A/12-KA/DR-06d	REVISION	00	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DESCRIPTION</th> <th>NAME</th> <th>SIGNATURE</th> </tr> </thead> <tbody> <tr> <td>DRAWN</td> <td>B.V.S. PATRISHIYA</td> <td></td> </tr> <tr> <td>DESIGNER</td> <td>S.O.A.D.M. LAKRUWAN</td> <td></td> </tr> <tr> <td>CHECKED</td> <td>J.P. SAMARANAYAKA</td> <td></td> </tr> <tr> <td>RECOMMENDED</td> <td>PROF. S.A.S. KULATHILAKA</td> <td></td> </tr> <tr> <td>APPROVED</td> <td>K.N. BANDARA</td> <td></td> </tr> </tbody> </table>	DESCRIPTION	NAME	SIGNATURE	DRAWN	B.V.S. PATRISHIYA		DESIGNER	S.O.A.D.M. LAKRUWAN		CHECKED	J.P. SAMARANAYAKA		RECOMMENDED	PROF. S.A.S. KULATHILAKA		APPROVED	K.N. BANDARA	
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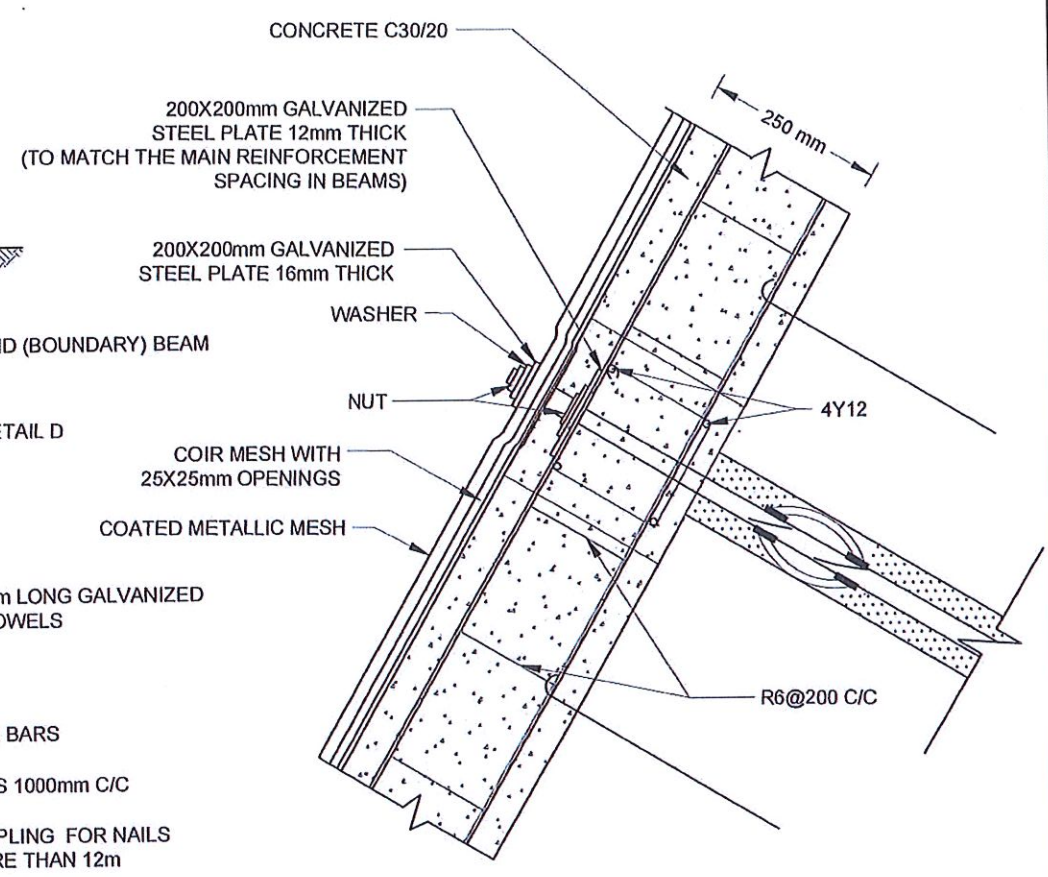
DETAIL - B



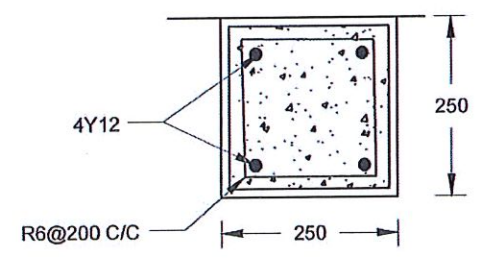
DETAIL D



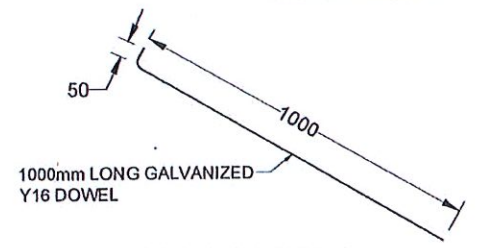
DETAIL OF SOIL NAIL



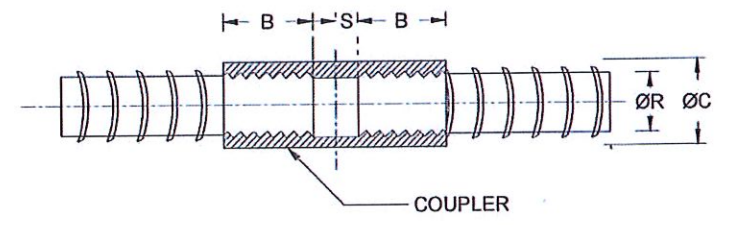
DETAIL C



SECTION X-X



DETAILS OF DOWELS



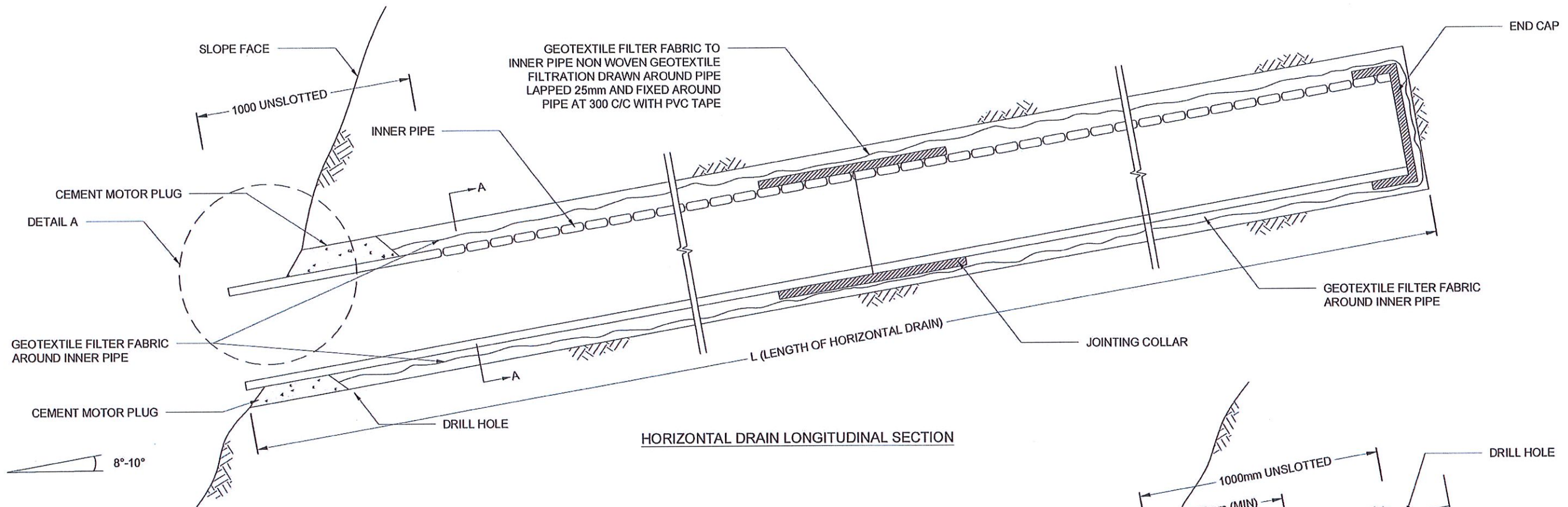
COUPLER DETAILS - A (NAIL LENGTH >12m)

NOTES

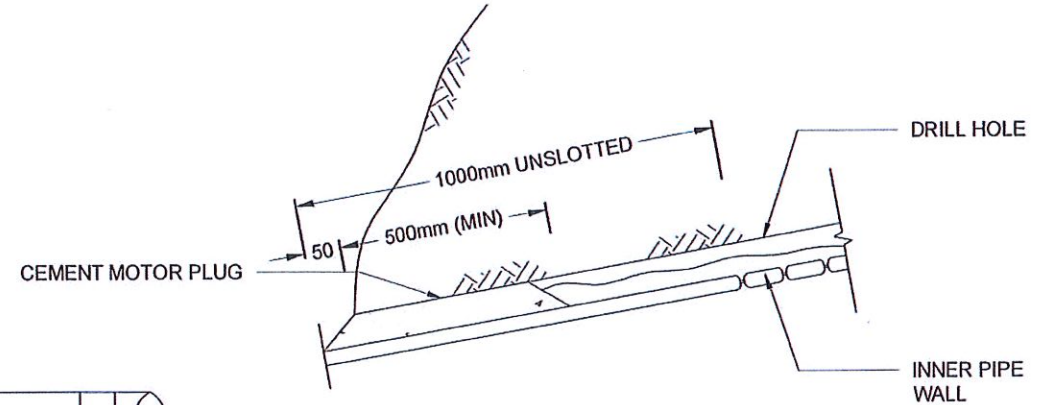
1. ALL DIMENSIONS ARE IN mm.
2. STRUCTURAL CONC. AS PER SPECIFICATION
3. MINIMUM CLEAR COVER TO R/F - 20mm TO 30mm
4. STRUCTURAL MEMBERS AS PER SPECIFICATION
5. LAP LENGTH FOR R/F BARS 40 x BAR DIA.
6. SOIL NAIL/ BOREHOLE DETAILS AS PER THE DRAWINGS.
7. TURFING / SODDING / SEEDING / PLANTING USED FOR VEGETATION COVER
8. THE BAR COUPLER SHALL ONLY BE USE FOR SOIL NAILING OF MORE THAN 12m LONG
9. THE TENSILE STRENGTH OF THE BAR COUPLER SHALL BE CAPABLE TO DEVELOP AT LEAST 95% OF TENSILE STRENGTH OF THE REBAR AS TESTED AND CERTIFIED BY THE MANUFACTURE
10. SPACING BETWEEN NAIL HEAD ARE VARIED ACCORDING TO THE GROUND CONDITION
11. DOWEL SPACING FOR BOUNDARY BEAM SHALL BE 2m
12. BOUNDARY BEAM SHALL BE STRUCTURALLY CONNECTED TO ALREADY CONSTRUCTED GRID BEAMS AT EACH JUNCTION
13. MINIMUM OF 2 DOWELS SHALL BE TYPICALLY USED TO FIX THE HIGH TENSILE WIRE MESH AGAINST THE SLOPE AT EACH SLOPE SPACE IN BETWEEN THE GRID BEAMS, AS SHOWN IN THE DRAWING
14. SPACING AND LOCATIONS OF DOWELS INSTALLED TO FIX THE HIGH TENSILE WIRE MESH AGAINST THE SLOPE SHALL BE VARIED ACCORDING TO THE SITE CONDITION

REINFORCEMENT BAR DIAMETER (ØR)	COUPLER OUTER BAR DIAMETER (ØC)	MIN - THREADED LENGTH OF COUPLER (B)	NON - THREADED LENGTH OF COUPLER (S)
25 mm	36 mm	50 mm	2.5 mm
32 mm	46 mm	64 mm	2.5 mm

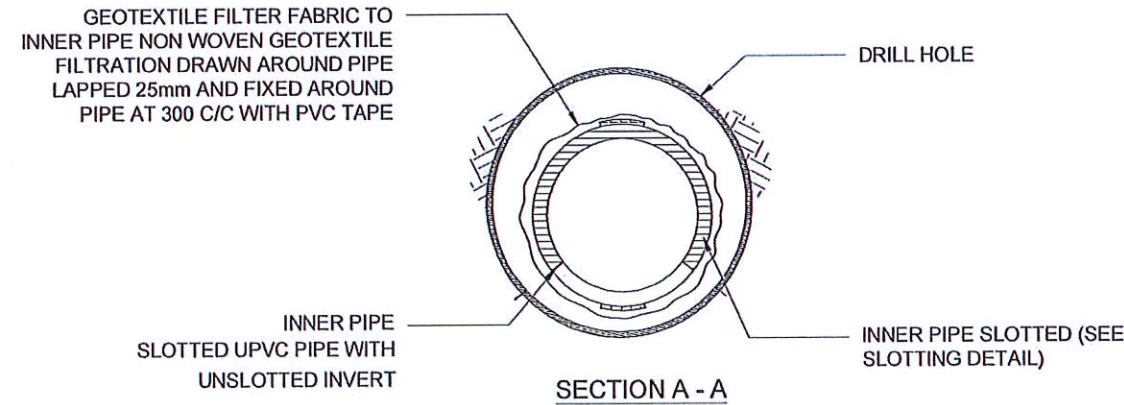
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		SCALE N.T.S. DATE 12.11.2020 PROJECT / DRAWING No. RLVMMF/WORKS/NCB/04A/12-KA/DR-07 REVISION 00					



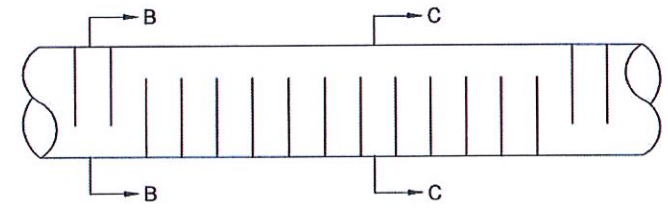
HORIZONTAL DRAIN LONGITUDINAL SECTION



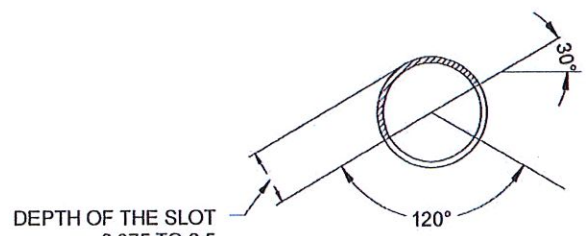
DETAIL A



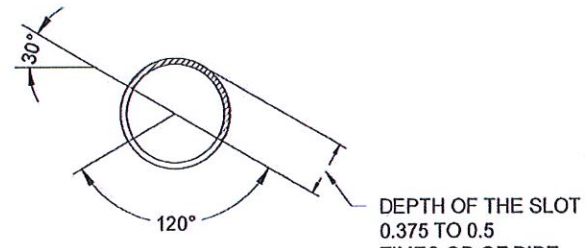
SECTION A - A



INNER AND OUTER PIPE SLOTTING DETAIL (TOP VIEW)



SECTION B - B

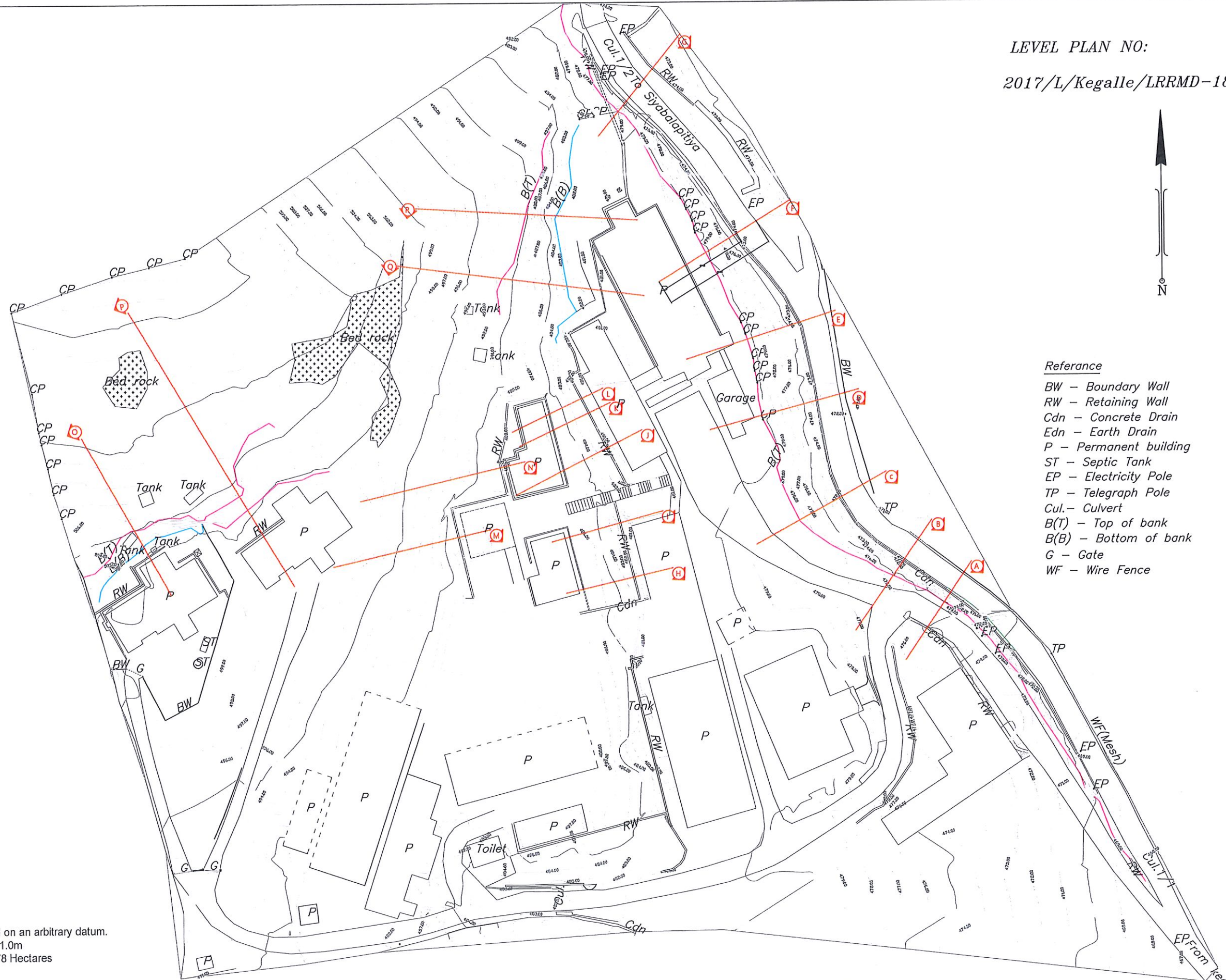


SECTION C - C

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. PIPE DIAMETERS, ANGLE & LENGTHS AS SPECIFIED IN DRAWINGS.
3. ALL MATERIALS SHALL CONFORM TO PROJECT SPECIFICATION

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES KALUAGGALA JUNCTION	TITLE		DESCRIPTION	NAME	SIGNATURE
								DETAILS OF HORIZONTAL DRAIN SECTIONS	DRAWN DESIGNER CHECKED RECOMMENDED APPROVED	B.V.S. PATTRISHIYA S.O.A.D.M. LAKRUWAN J.P. SAMARANAYAKA PROF. S.A.S. KULATHILAKA K.N. BANDARA	
						SCALE	N.T.S.	DATE	12.11.2020	REVISION	00
						PROJECT / DRAWING No.		RLVMM/WORKS/NCB/04A/12-KA/DR-08			




Reference

- BW - Boundary Wall
- RW - Retaining Wall
- Cdn - Concrete Drain
- Edn - Earth Drain
- P - Permanent building
- ST - Septic Tank
- EP - Electricity Pole
- TP - Telegraph Pole
- Cul. - Culvert
- B(T) - Top of bank
- B(B) - Bottom of bank
- G - Gate
- WF - Wire Fence

NOTE:
Heights are based on an arbitrary datum.
Contour Interval - 1.0m
Area surveyed 1.78 Hectares

EMPLOYER



DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
AND DISASTER MANAGEMENT
NATIONAL BUILDING RESEARCH ORGANISATION
No. 99/1, JAWATTA ROAD
COLOMBO - 05

DESIGNER



DESIGN UNIT
NATIONAL BUILDING RESEARCH ORGANISATION
No. 99/1, JAWATTA ROAD,
COLOMBO - 05

REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE

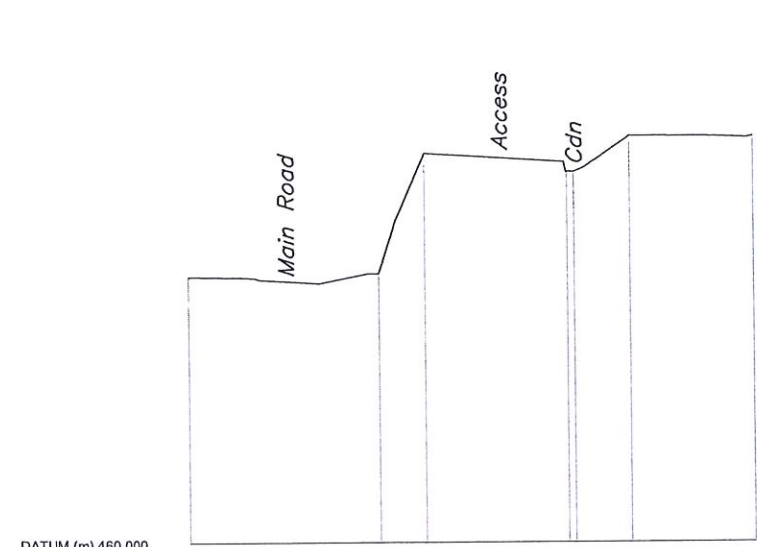
REDUCTION OF LANDSLIDE
VULNERABILITY BY MITIGATION MEASURES
DISTRICT COURT COMPLEX, KEGALLE

TITLE

CONTOUR SURVEY PLAN

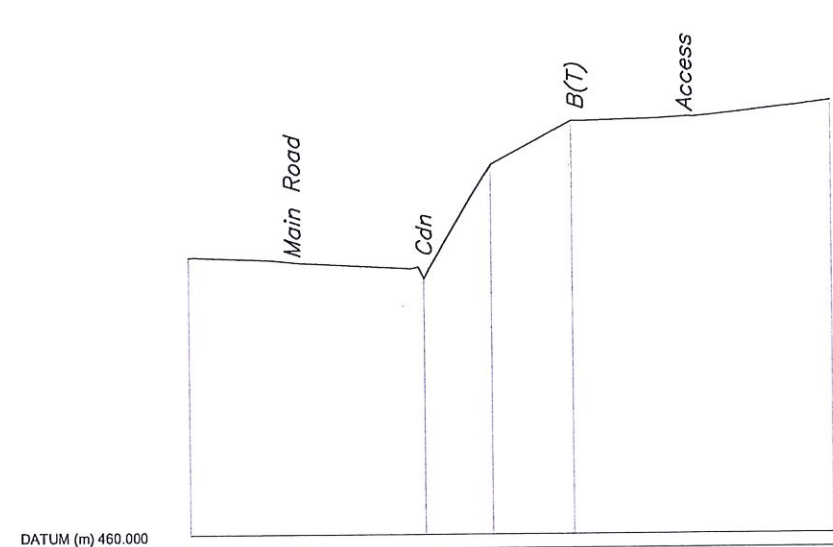
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PROJECT / DRAWING No. REVISION: 00
RLVMP/WORKS/NCB/04A/20-Dc/DR-01

DESCRIPTION	NAME	SIGNATURE
SURVEYED	KAMAL DESHAPRIYA	
DRAWN	M. H. M. HARSHANI	



DATUM (m) 460.000	
GROUND ELEVATION	470.473
	470.600
	475.351
	474.633
	474.618
	476.004
DISTANCE	0.000
	7.655
	9.500
	15.255
	15.535
	17.746
	22.733

SECTION-A



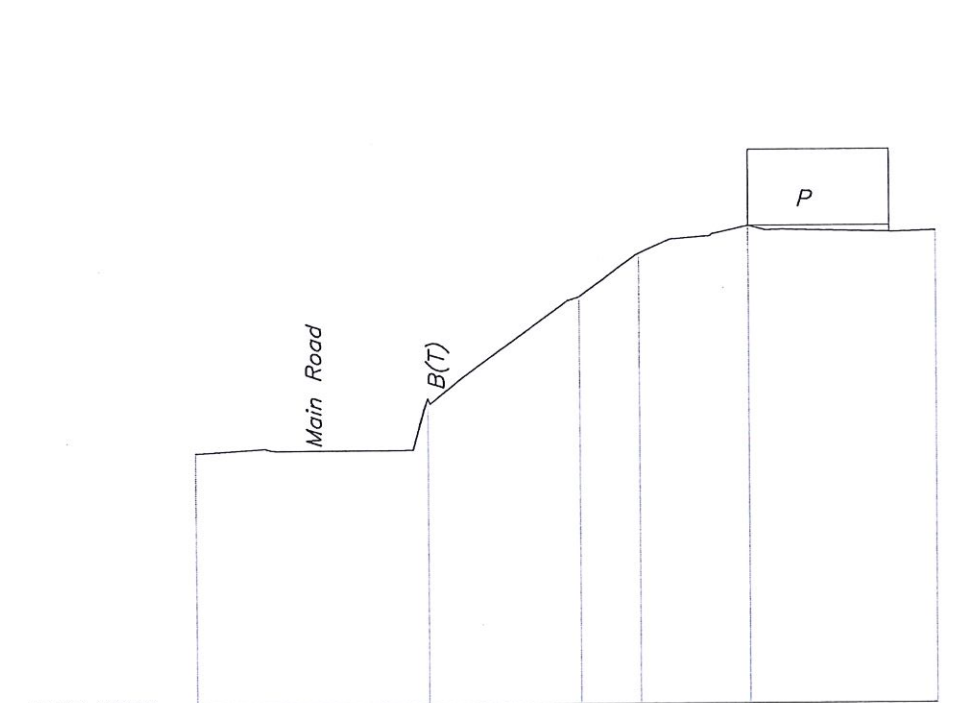
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GROUND ELEVATION	470.950
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DISTANCE	0.000
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	12.143
	15.418
	25.807

SECTION-B



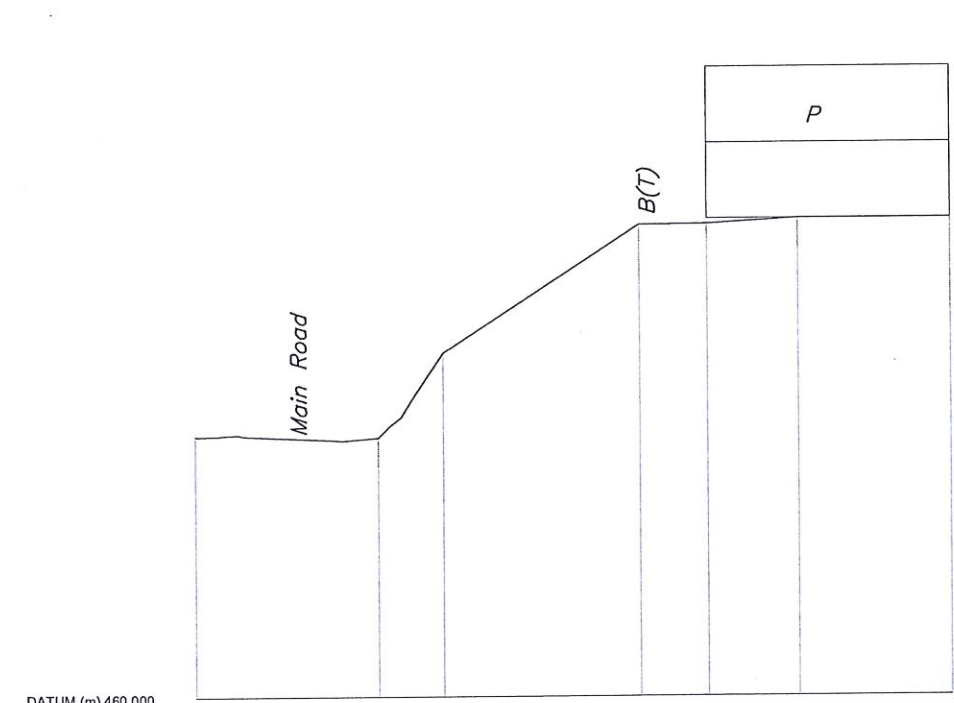
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GROUND ELEVATION	471.453
	471.077
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DISTANCE	0.000
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	14.881
	18.306
	24.782
	28.597

SECTION-C



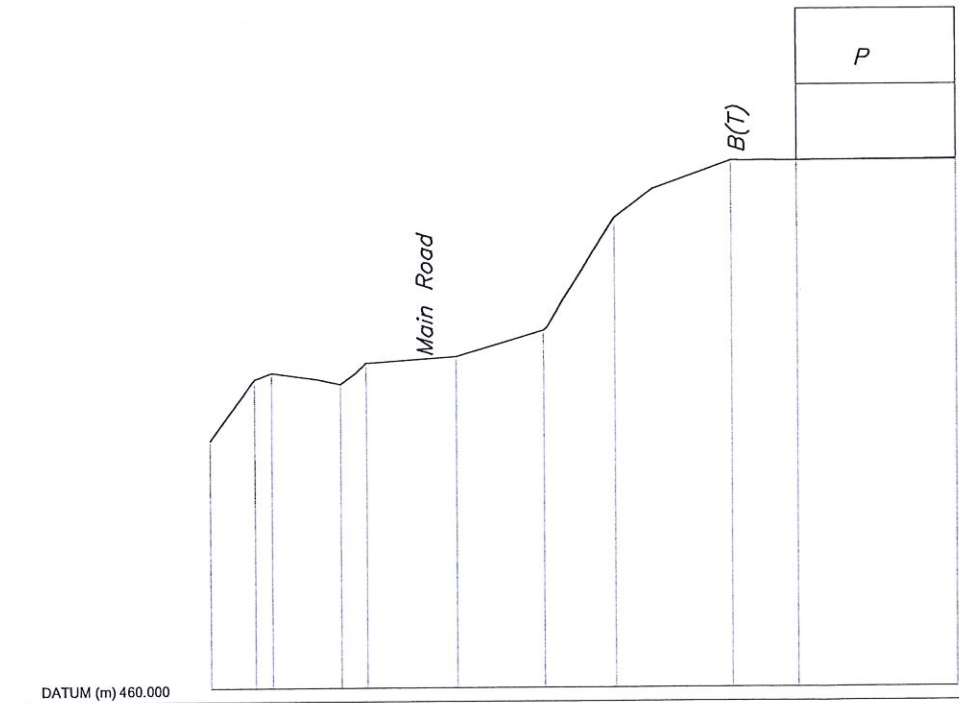
DATUM (m) 460.000	
GROUND ELEVATION	470.008
	472.114
	476.106
	477.826
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DISTANCE	0.000
	9.384
	15.504
	17.869
	22.305
	29.771

SECTION-D



DATUM (m) 460.000	
GROUND ELEVATION	470.315
	470.250
	473.610
	478.650
DISTANCE	0.000
	7.337
	9.947
	17.881
	24.220
	30.355

SECTION-E



DATUM (m) 460.000	
GROUND ELEVATION	469.811
	472.223
	472.470
	472.023
	472.861
	473.097
	474.122
	478.555
	480.800
DISTANCE	0.000
	1.805
	2.490
	5.264
	6.288
	9.875
	13.407
	16.298
	21.029
	30.028

SECTION-F

EMPLOYER

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
AND DISASTER MANAGEMENT
NATIONAL BUILDING RESEARCH ORGANISATION
No. 99/1, JAWATTA ROAD
COLOMBO - 05

DESIGNER

DESIGN UNIT
NATIONAL BUILDING RESEARCH ORGANISATION
No. 99/1, JAWATTA ROAD,
COLOMBO - 05

REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE

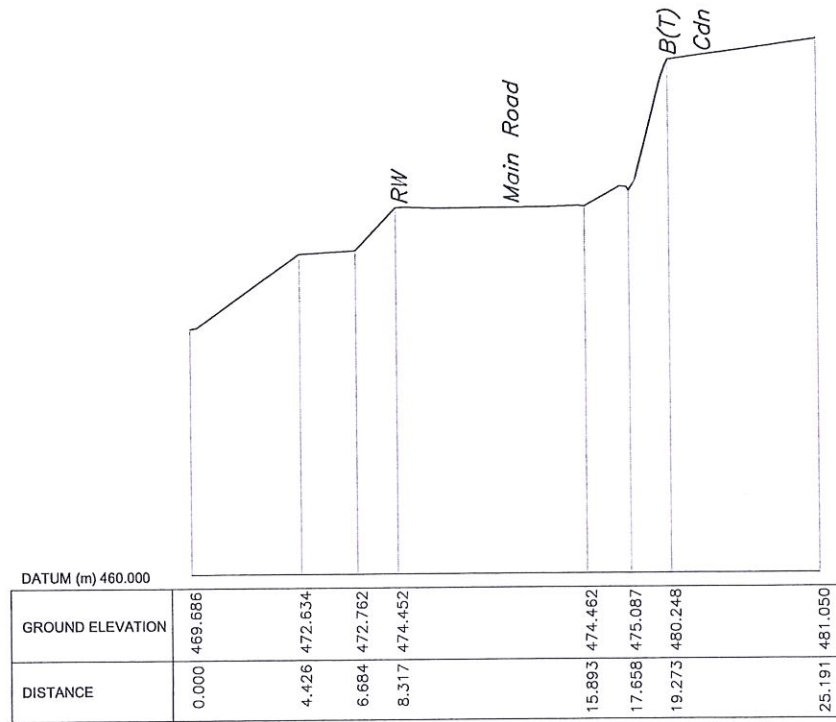
REDUCTION OF LANDSLIDE
VULNERABILITY BY MITIGATION MEASURES
DISTRICT COURT COMPLEX, KEGALLE

TITLE

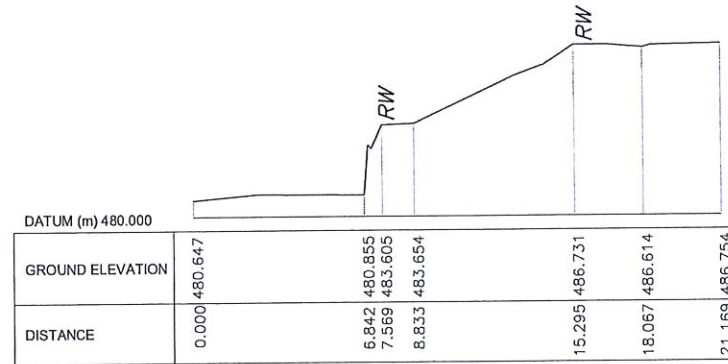
SURVEY CROSS SECTIONS

SCALE | 1: 300 | DATE | 02.11.2020
PROJECT / DRAWING No. | REVISION
RLVMMMP/WORKS/NCB/04A/20-Dc/DR-02a | 00

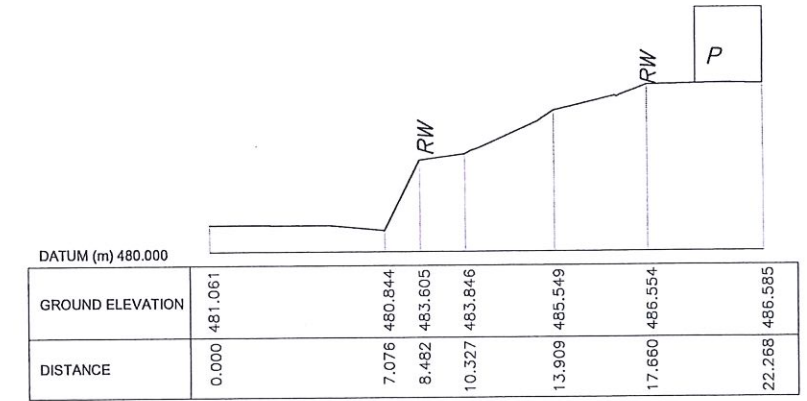
DESCRIPTION	NAME	SIGNATURE
SURVEYED	KAMAL DESHAPRIYA	
DRAWN	M. H. M. HARSHANI	



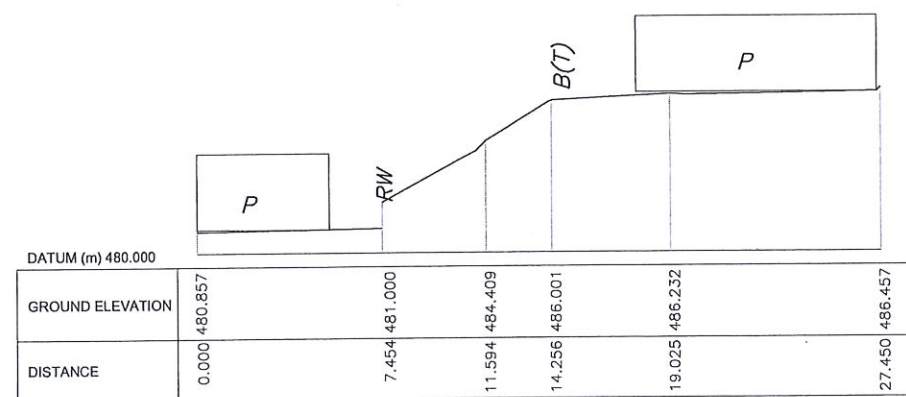
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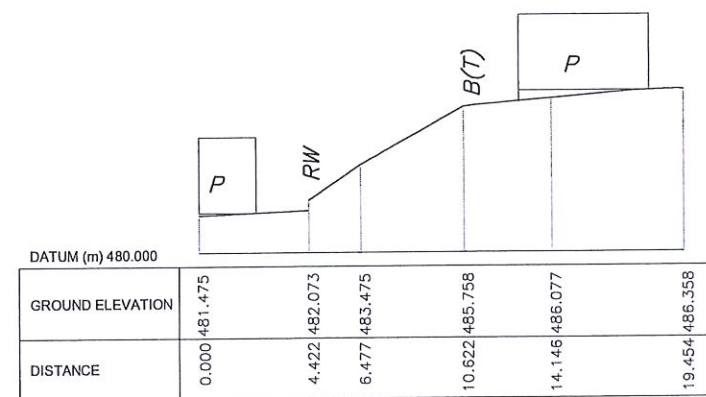
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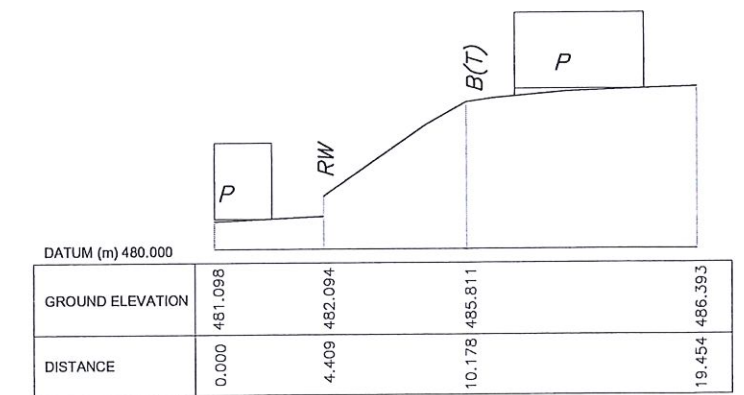
SECTION-I




SECTION-J



SECTION-K



SECTION-L

EMPLOYER

 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
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 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER

 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD,
 COLOMBO - 05

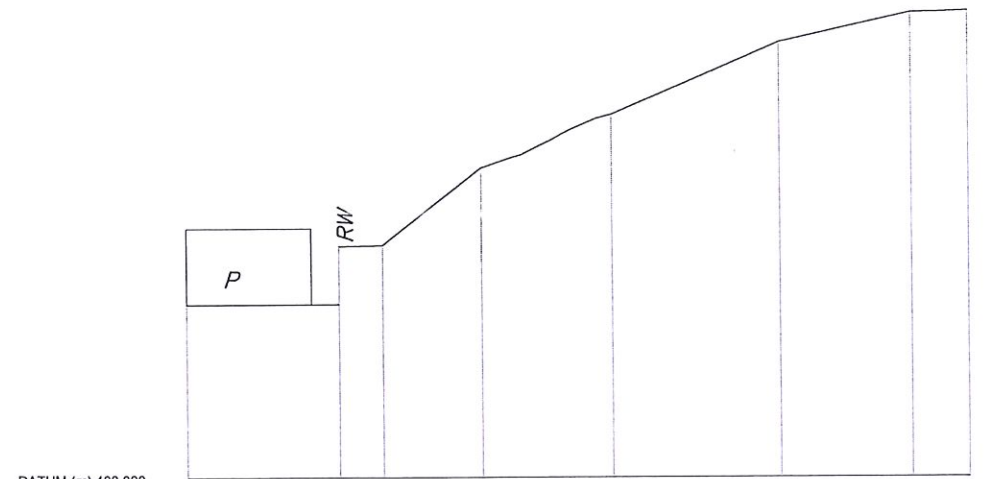
REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 DISTRICT COURT COMPLEX, KEGALLE

TITLE
 SURVEY CROSS SECTIONS

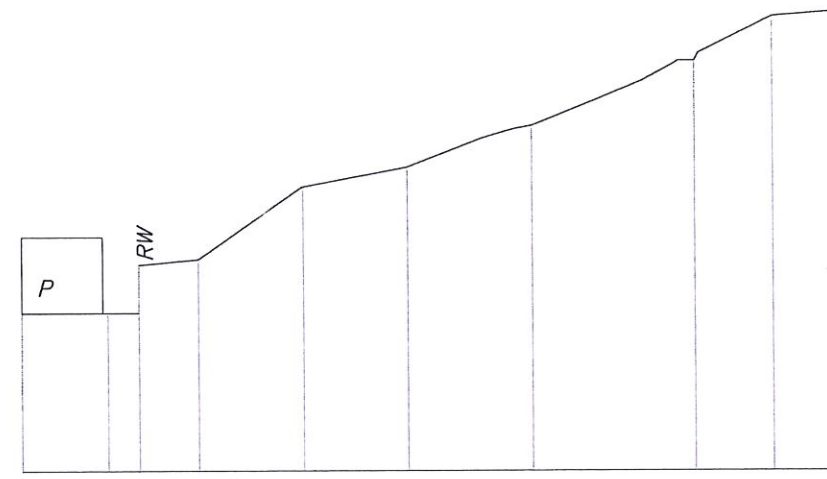
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PROJECT / DRAWING No.	RLVMM/WORKS/NCB/04A/20-Dc/DR-02b	REVISION	00

DESCRIPTION	NAME	SIGNATURE
SURVEYED	KAMAL DESHAPRIYA	
DRAWN	M. H. M. HARSHANI	



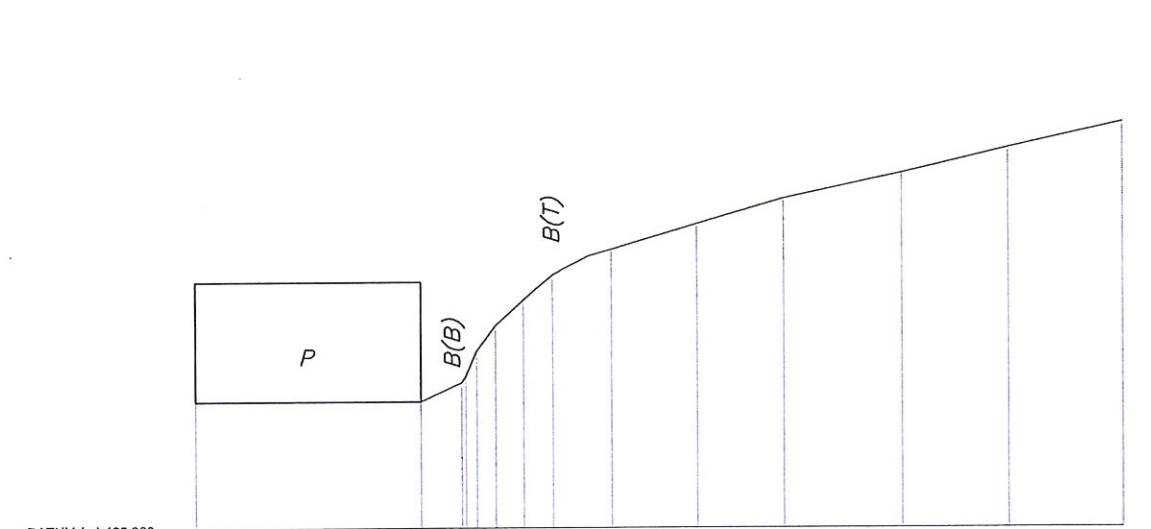
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GROUND ELEVATION	0.000 486.826 6.119 489.112 7.871 489.159 11.849 492.206 17.063 494.304 23.841 497.155 29.061 498.322 31.347 498.382
DISTANCE	

SECTION-M



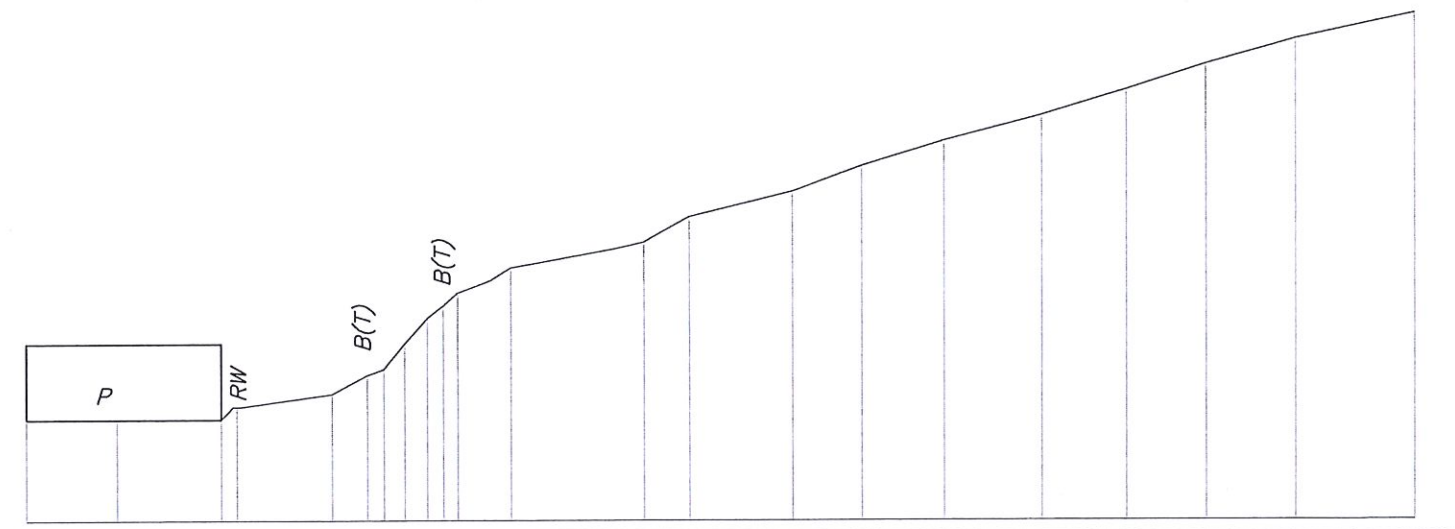
DATUM (m) 480.000	
GROUND ELEVATION	0.000 486.237 3.478 486.236 4.728 488.127 7.108 488.344 11.327 491.199 15.513 491.978 20.492 493.606 27.055 496.175 30.200 497.927 32.811 498.129
DISTANCE	

SECTION-N




DATUM (m) 495.000	
GROUND ELEVATION	0.000 500.000 1.647 500.750 1.814 501.000 2.259 502.000 3.015 503.000 4.116 504.000 5.245 505.000 6.746 505.750 7.628 506.000 11.101 507.000 14.601 508.000 19.296 509.000 23.597 510.000 28.211 511.000
DISTANCE	

SECTION-O



DATUM (m) 495.000	
GROUND ELEVATION	0.000 499.000 4.805 499.500 8.655 500.000 10.067 500.750 10.738 501.000 11.579 502.000 12.482 503.000 13.118 503.500 13.707 504.000 15.043 504.500 15.833 505.000 20.086 505.750 21.187 506.000 23.030 507.000 27.192 508.000 29.949 509.000 33.238 510.000 37.179 511.000 40.599 512.000 43.819 513.000 47.391 514.000 52.185 515.000
DISTANCE	

SECTION-P

EMPLOYER

 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER

 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD,
 COLOMBO - 05

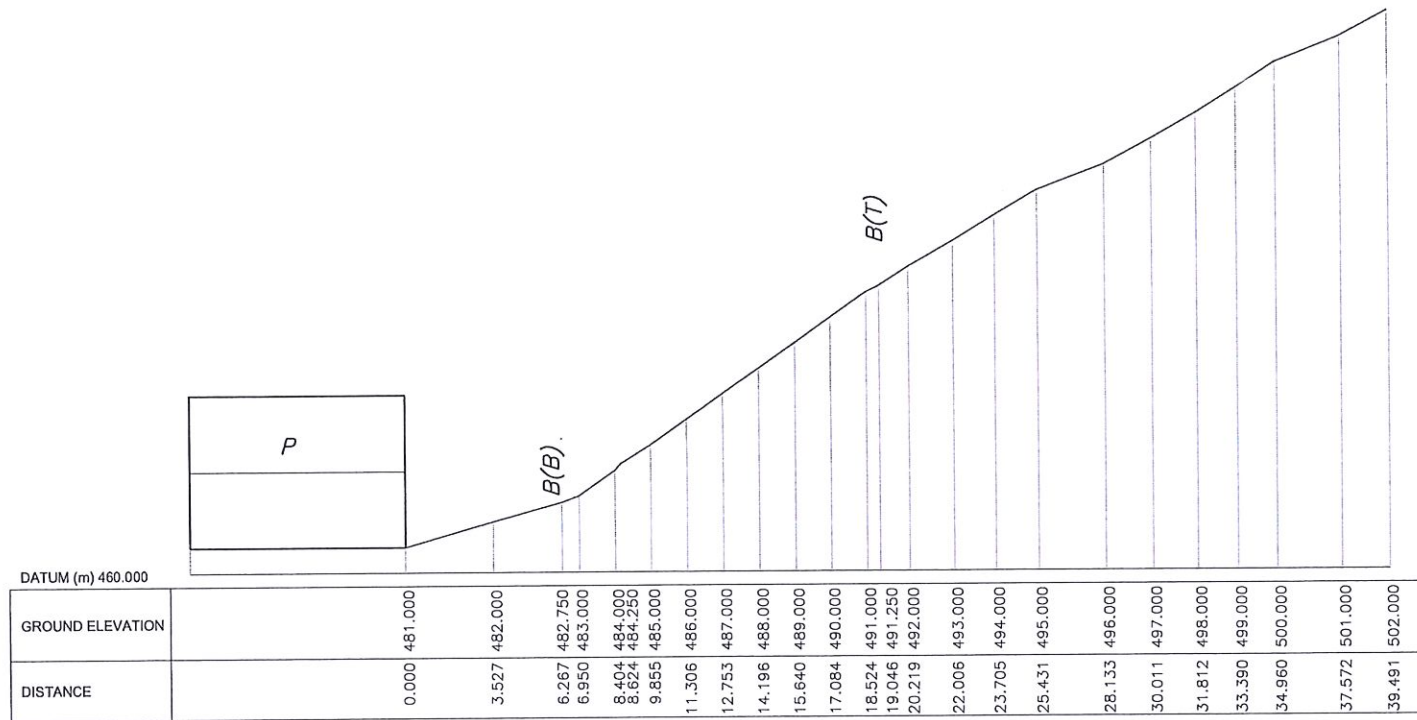
REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 DISTRICT COURT COMPLEX, KEGALLE

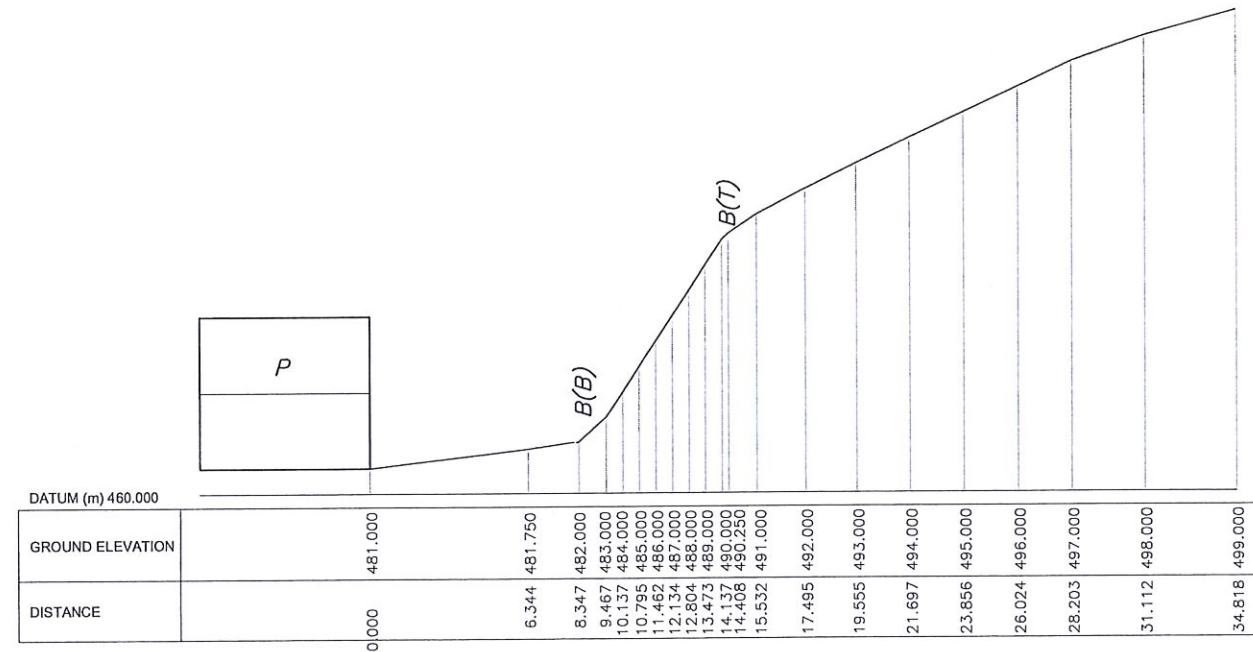
TITLE
 SURVEY CROSS SECTIONS

SCALE	1:300	DATE	02.11.2020
PROJECT / DRAWING No.	RLVMMP/WORKS/NCB/04A/20-Dc/DR-02c	REVISION	00

DESCRIPTION	NAME	SIGNATURE
SURVEYED	KAMAL DESHAPRIYA	
DRAWN	M. H. M. HARSHANI	

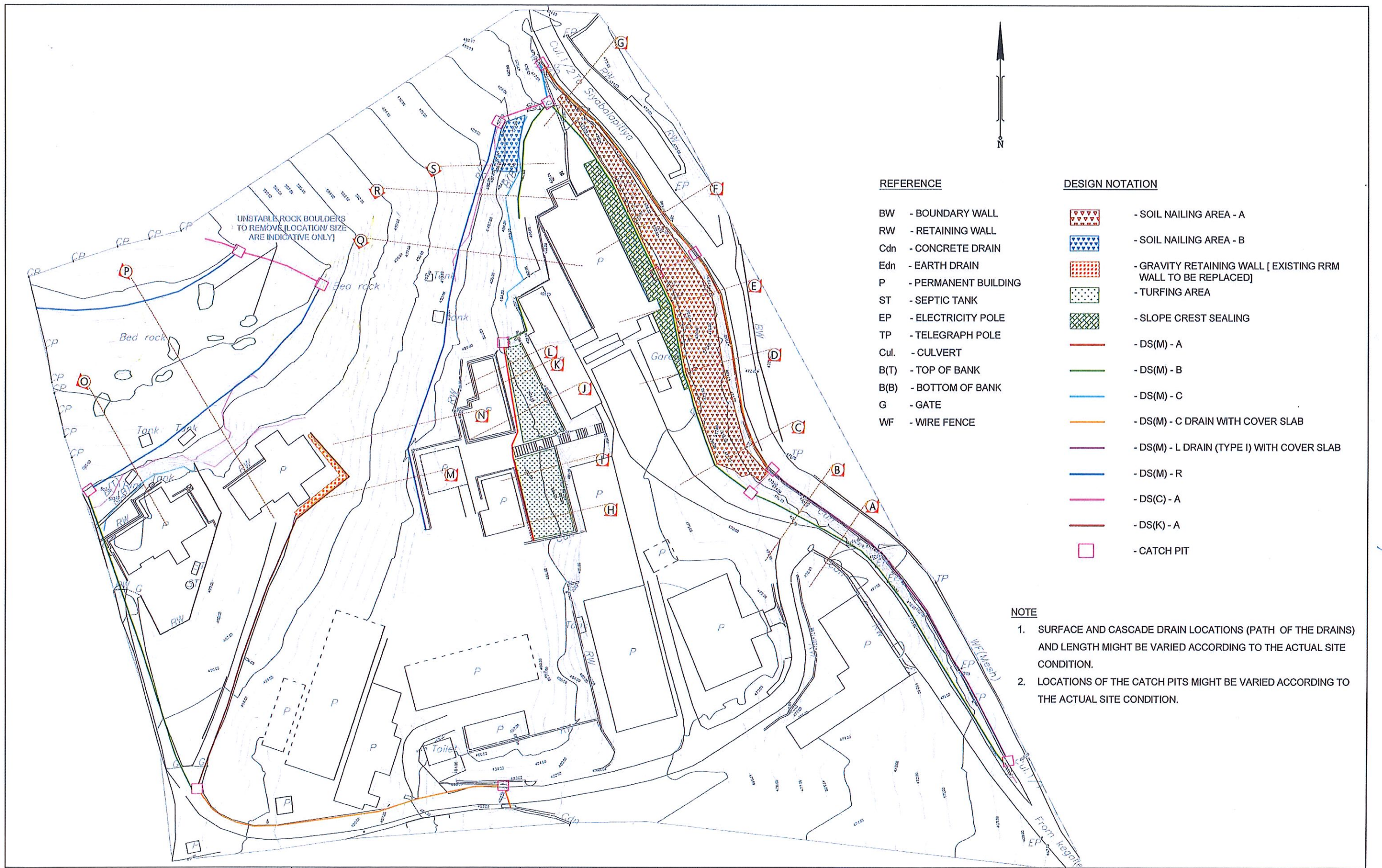


SECTION-Q



SECTION-R

<p>EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD, COLOMBO - 05</p>	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES DISTRICT COURT COMPLEX, KEGALLE	TITLE SURVEY CROSS SECTIONS		DESCRIPTION	NAME	SIGNATURE		
								SCALE	1:300	DATE	02.11.2020	SURVEYED	KAMAL DESHAPRIYA
							PROJECT / DRAWING No.	RLVMM/WORKS/NCB/04A/20-Dc/DR-02d	REVISION	00	DRAWN	M. H. M. HARSHANI	



REFERENCE

- BW - BOUNDARY WALL
- RW - RETAINING WALL
- Cdn - CONCRETE DRAIN
- Edn - EARTH DRAIN
- P - PERMANENT BUILDING
- ST - SEPTIC TANK
- EP - ELECTRICITY POLE
- TP - TELEGRAPH POLE
- Cul. - CULVERT
- B(T) - TOP OF BANK
- B(B) - BOTTOM OF BANK
- G - GATE
- WF - WIRE FENCE

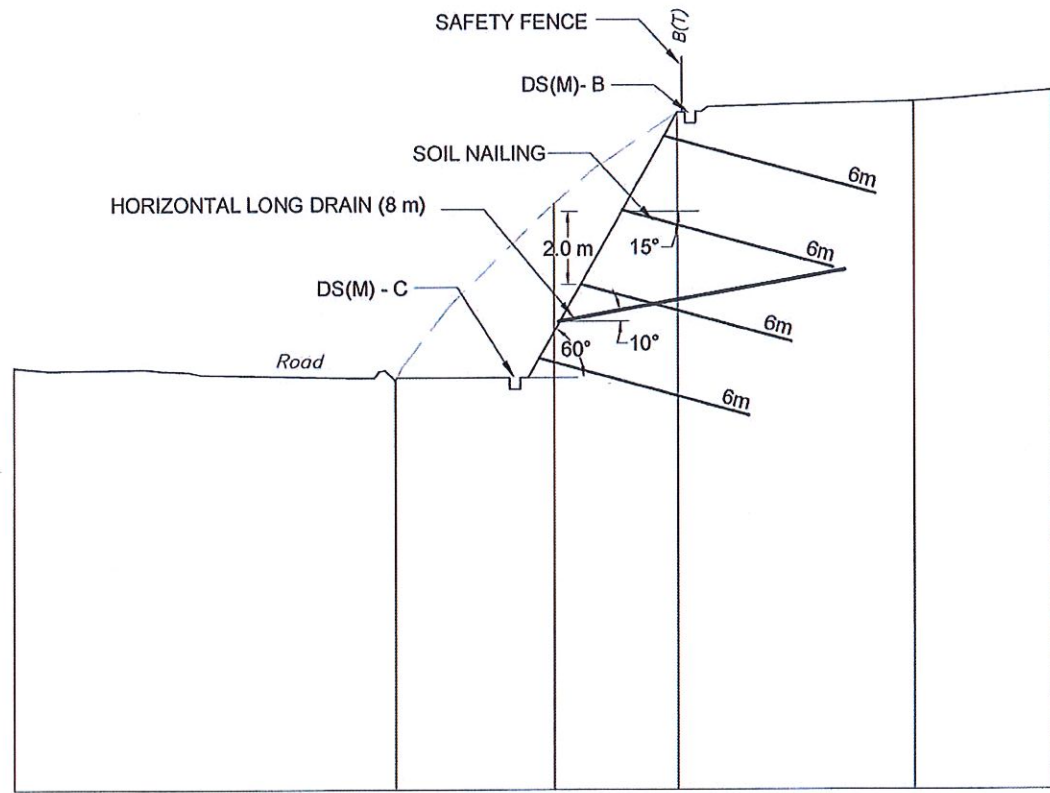
DESIGN NOTATION

- SOIL NAILING AREA - A
- SOIL NAILING AREA - B
- GRAVITY RETAINING WALL [EXISTING RRM WALL TO BE REPLACED]
- TURFING AREA
- SLOPE CREST SEALING
- DS(M) - A
- DS(M) - B
- DS(M) - C
- DS(M) - C DRAIN WITH COVER SLAB
- DS(M) - L DRAIN (TYPE I) WITH COVER SLAB
- DS(M) - R
- DS(C) - A
- DS(K) - A
- CATCH PIT

NOTE

1. SURFACE AND CASCADE DRAIN LOCATIONS (PATH OF THE DRAINS) AND LENGTH MIGHT BE VARIED ACCORDING TO THE ACTUAL SITE CONDITION.
2. LOCATIONS OF THE CATCH PITS MIGHT BE VARIED ACCORDING TO THE ACTUAL SITE CONDITION.

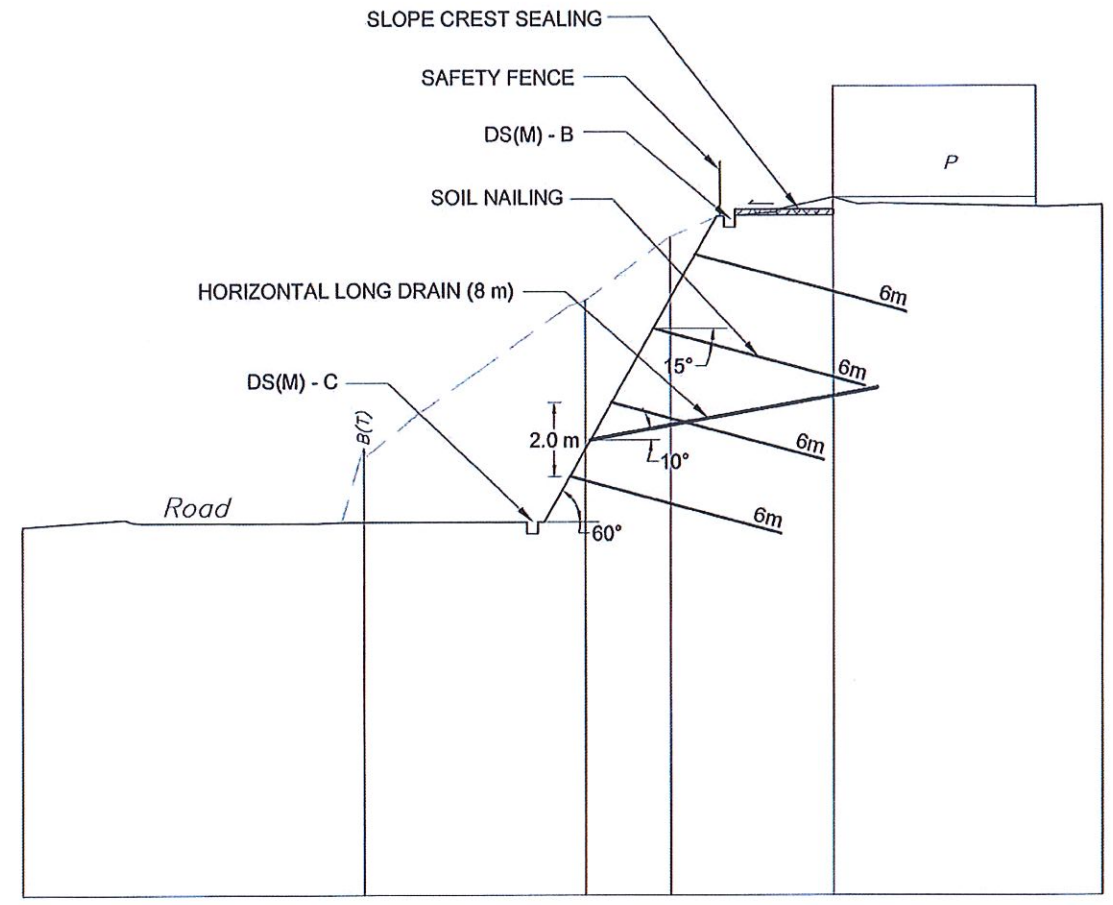
EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES DISTRICT COURT COMPLEX, KEGALLE	TITLE PLAN VIEW OF PROPOSED MITIGATION MEASURES	DESCRIPTION NAME SIGNATURE
		SCALE 1:750 PROJECT / DRAWING No. RLVMMP/WORKS/INCB/04A/20-Dd/DR-03	DATE 02.11.2020 REVISION 00	DRAWN B.V.S. PATTRISHIYA DESIGNER M. H. M. HARSHANI CHECKED J.P. SAMARANAYAKA RECOMMENDED PROF. S.A.S. KULATHILAKA APPROVED K.N. BANDARA	



DATUM (m) 460.000

GROUND ELEVATION	0.000	471.453	471.077	475.875	478.346	478.631	478.924
DISTANCE			10.528	14.881	18.306	24.782	28.597

SECTION-C




DATUM (m) 460.000

GROUND ELEVATION	0.000	470.008	472.114	476.106	477.826	478.894	478.676
DISTANCE			9.384	15.504	17.869	22.305	29.771

SECTION-D

NOTE

1. LENGTH OF THE SOIL NAILS, LENGTH & LOCATION OF HORIZONTAL DRAINS MIGHT BE VARIED ACCORDING TO THE ACTUAL SOIL PROFILE OR SITE CONDITION.

EMPLOYER

 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER



 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD,
 COLOMBO - 05

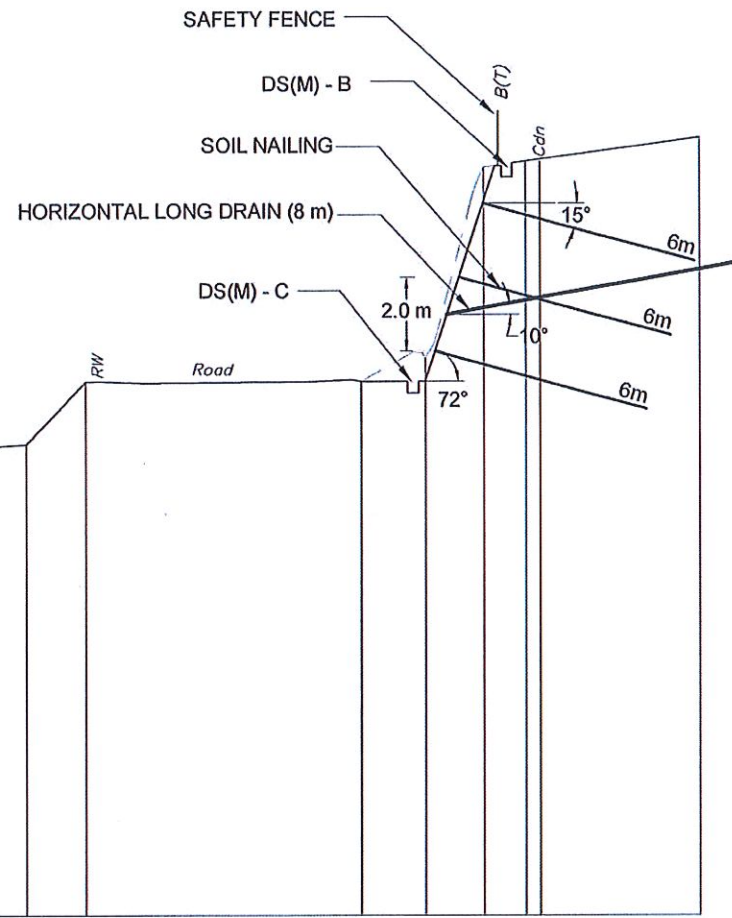
REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 DISTRICT COURT COMPLEX, KEGALLE

TITLE
 CROSS SECTIONS OF PROPOSED
 MITIGATION MEASURES

SCALE	1: 200	DATE	02.11.2020
PROJECT / DRAWING No.	RLVMMP/WORKS/NCB/04A/20-Dc/DR-04a	REVISION	00

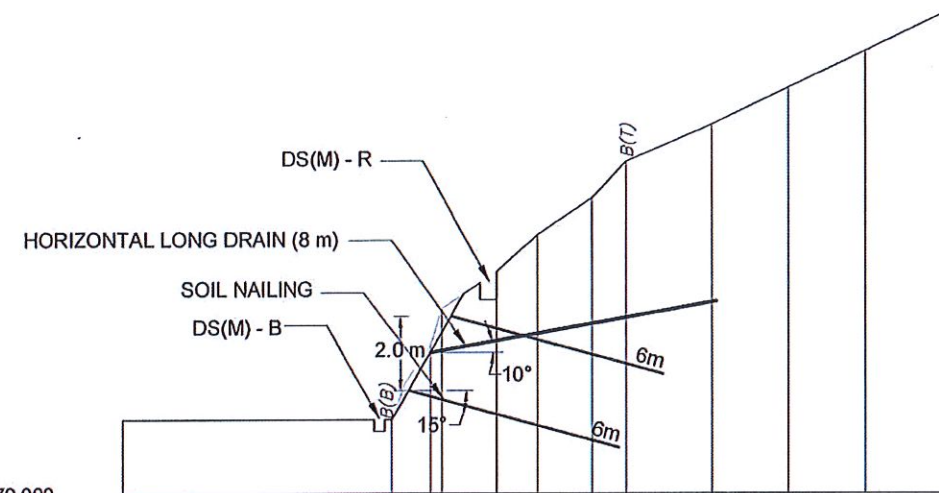
DESCRIPTION	NAME	SIGNATURE
DRAWN	B.V.S. PATTRISHIYA	
DESIGNER	M. H. M. HARSHANI	
CHECKED	J.P. SAMARANAYAKA	
RECOMMENDED	PROF. S.A.S. KULATHILAKA	
APPROVED	K.N. BANDARA	



DATUM (m) 460.000

GROUND ELEVATION	469.686	472.634	472.762	474.452	474.462	475.087	480.248	481.050
DISTANCE	0.000	4.426	6.684	8.317	15.893	17.658	19.273	25.191

SECTION-G




DATUM (m) 479.000

GROUND ELEVATION	481.000	481.000	483.000	484.000	485.000	486.000	487.000	488.000	489.000	490.000	491.000	492.000
DISTANCE	0.000	7.390	8.460	8.780	10.290	11.420	12.910	13.860	16.230	18.340	20.430	22.600

SECTION-S

NOTE

1. LENGTH OF THE SOIL NAILS, LENGTH & LOCATION OF HORIZONTAL DRAINS MIGHT BE VARIED ACCORDING TO THE ACTUAL SOIL PROFILE OR SITE CONDITION.

EMPLOYER

 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

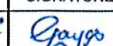




DESIGNER

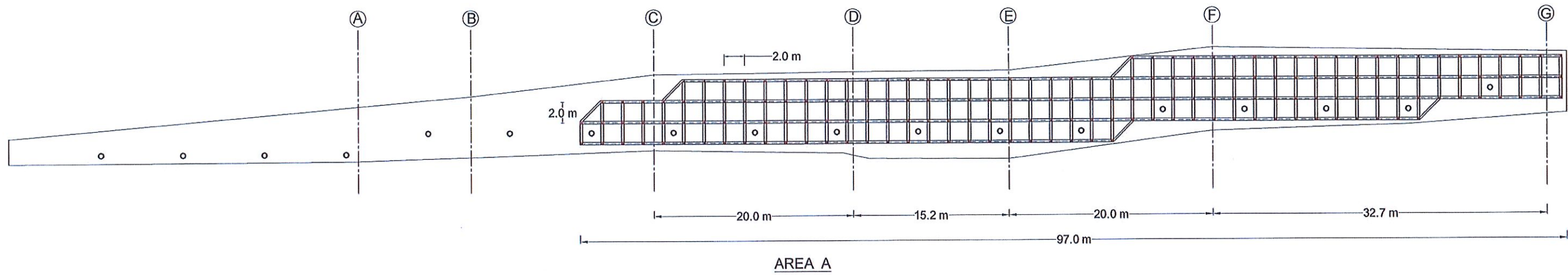
 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD,
 COLOMBO - 05

REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 DISTRICT COURT COMPLEX, KEGALLE

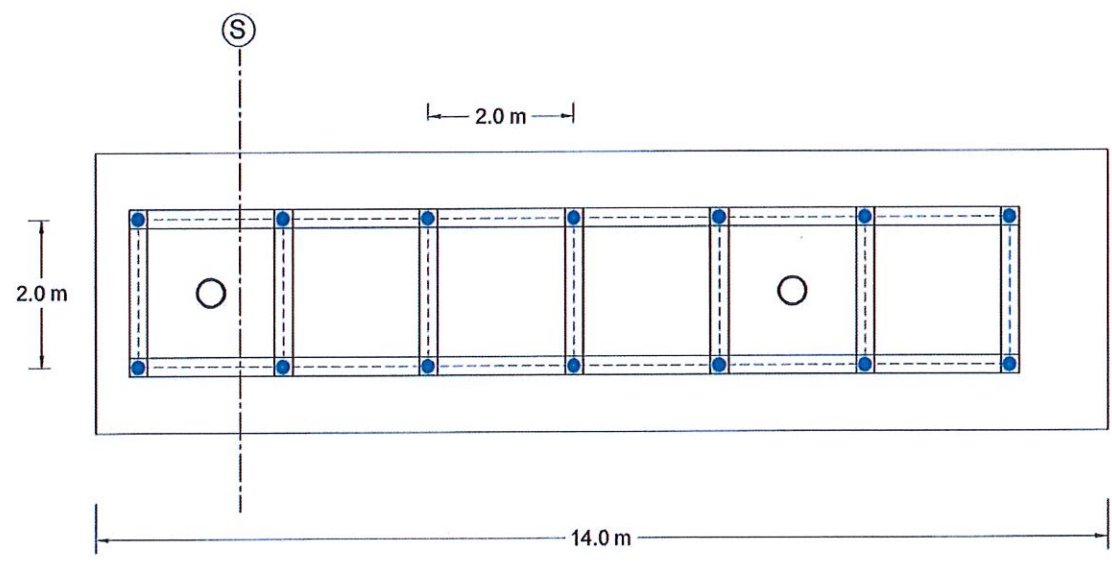
TITLE
 CROSS SECTIONS OF PROPOSED
 MITIGATION MEASURES
 SCALE 1: 200
 PROJECT / DRAWING No. RLVMMPP/WORKS/NCB/04A/20-Dd/DR-04c
 DATE 02.11.2020
 REVISION 00

DESCRIPTION	NAME	SIGNATURE
DRAWN	B.V.S. PATTRISHIYA	
DESIGNER	M. H. M. HARSHANI	
CHECKED	J.P. SAMARANAYAKA	
RECOMMENDED	PROF. S.A.S. KULATHILAKA	
APPROVED	K.N. BANDARA	



LEGEND

- SOIL NAILING -** TOTAL NAIL LENGTH= 6 m
 NO'S OF NAIL = 183
 SOIL NAIL DIAMETER = 32 mm
 DIAMETER OF THE DRILLED HOLE = 125 mm
 NAIL SPACING = 2.0 m
- HORIZONTAL LONG DRAIN -** HORIZONTAL LONG DRAIN LENGTH = 8 m
 NO' S OF LONG DRAIN = 18
 DIAMETER = 90 mm



AREA B

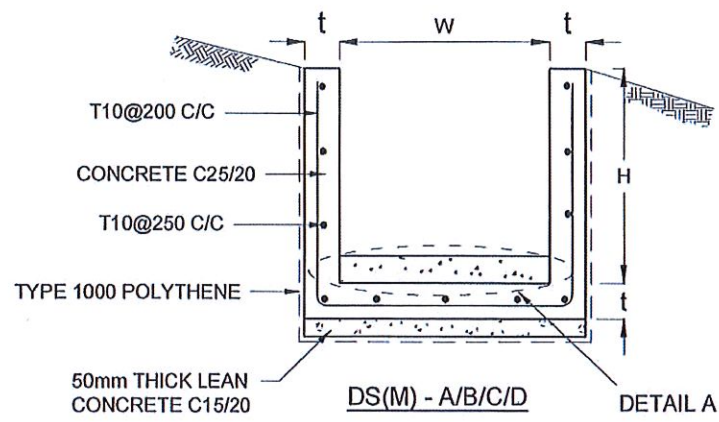
LEGEND

- SOIL NAILING -** TOTAL NAIL LENGTH= 6 m
 NO'S OF NAIL = 14
 SOIL NAIL DIAMETER = 32 mm
 DIAMETER OF THE DRILLED HOLE = 125 mm
 NAIL SPACING = 2.0 m
- HORIZONTAL LONG DRAIN -** HORIZONTAL LONG DRAIN LENGTH = 8 m
 NO' S OF LONG DRAIN = 02
 DIAMETER = 90 mm

NOTE

1. INSTALLED LENGTHS OF THE SOIL NAILS MIGHT BE VARIED ACCORDING TO THE ACTUAL SOIL PROFILE OR SITE CONDITION.
2. LOCATION AND LENGTH OF THE HORIZONTAL LONG DRAINS WILL BE DECIDED ACCORDING TO THE ACTUAL SITE CONDITION.
3. SOIL NAIL SLOPE NEAR SECTION C SHALL END WITH SMOOTH TRANSITION TO MATCH WITH EXISTING SLOPE.

<p>EMPLOYER</p> <p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGNER</p> <p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD, COLOMBO - 05</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>REVISION DESCRIPTION</th> <th>APPROVAL</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	DATE	REVISION DESCRIPTION	APPROVAL																																									<p>PROJECT TITLE</p> <p style="text-align: center;">REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES DISTRICT COURT COMPLEX, KEGALLE</p>	<p>TITLE</p> <p style="text-align: center;">FRONT ELEVATION OF PROPOSED MITIGATION MEASURES</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>SCALE</td> <td>1:400 / 1: 100</td> <td>DATE</td> <td>02.11.2020</td> </tr> <tr> <td>PROJECT / DRAWING No.</td> <td>RLVMMP/WORKS/NCB/04A/20-DG/DR-05</td> <td>REVISION</td> <td>00</td> </tr> </table>	SCALE	1:400 / 1: 100	DATE	02.11.2020	PROJECT / DRAWING No.	RLVMMP/WORKS/NCB/04A/20-DG/DR-05	REVISION	00	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DESCRIPTION</th> <th>NAME</th> <th>SIGNATURE</th> </tr> </thead> <tbody> <tr> <td>DRAWN</td> <td>B.V.S. PATTRISHIYA</td> <td></td> </tr> <tr> <td>DESIGNER</td> <td>M. H. M. HARSHANI</td> <td></td> </tr> <tr> <td>CHECKED</td> <td>J.P. SAMARANAYAKA</td> <td></td> </tr> <tr> <td>RECOMMENDED</td> <td>PROF. S.A.S. KULATHILAKA</td> <td></td> </tr> <tr> <td>APPROVED</td> <td>K.N. BANDARA</td> <td></td> </tr> </tbody> </table>	DESCRIPTION	NAME	SIGNATURE	DRAWN	B.V.S. PATTRISHIYA		DESIGNER	M. H. M. HARSHANI		CHECKED	J.P. SAMARANAYAKA		RECOMMENDED	PROF. S.A.S. KULATHILAKA		APPROVED	K.N. BANDARA	
REV	DATE	REVISION DESCRIPTION	APPROVAL																																																																									
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APPROVED	K.N. BANDARA																																																																											



DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (M) - A/P	300	300	100
DS (M) - B/R	450	450	100
DS (M) - C/Q	600	600	100
DS (M) - D	750	750	125
DS (M) - E	900	900	150
DS (M) - F	1000	1000	150

NOTES

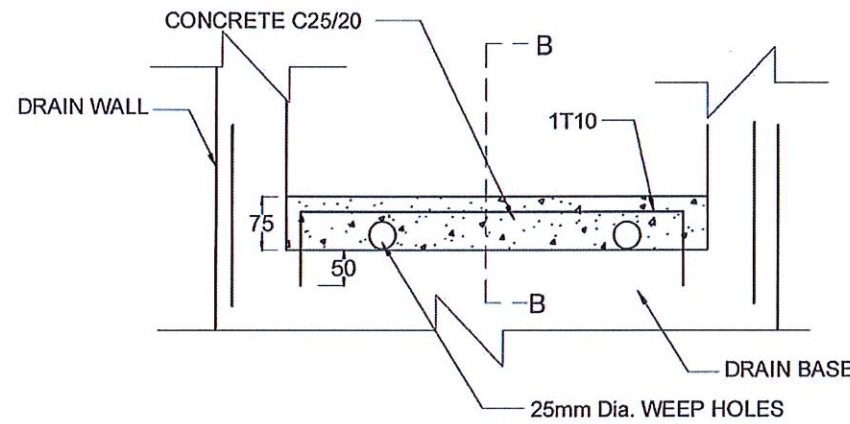
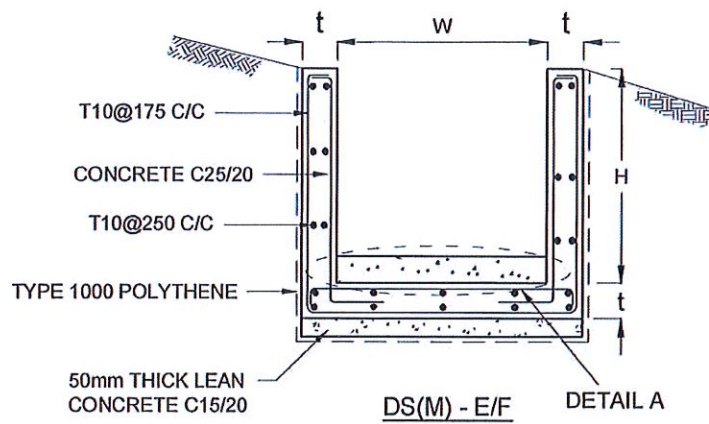
- DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
- STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
- DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
- 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.

CONCRETE

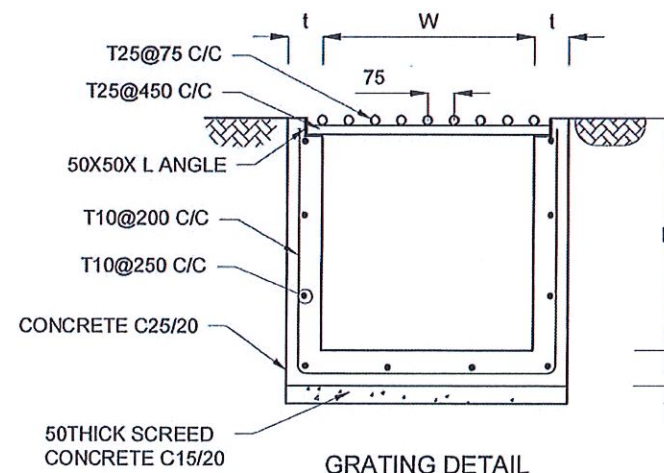
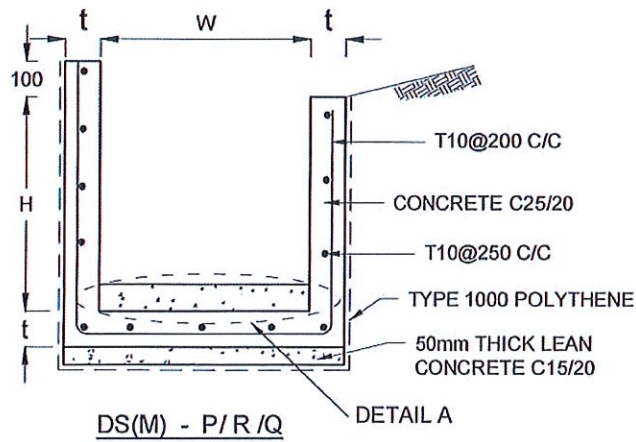
- USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

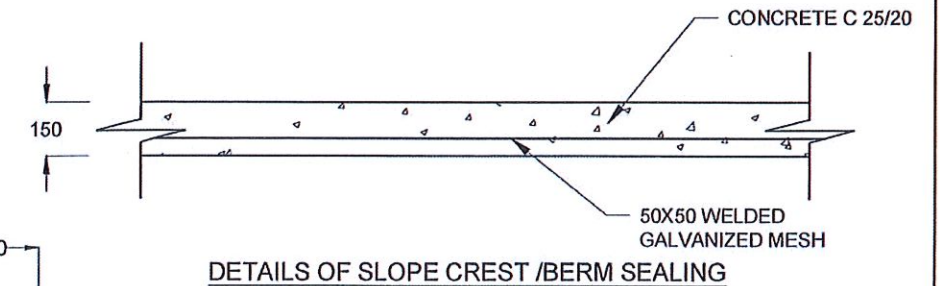
- ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
- BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
- ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
- REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
- COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



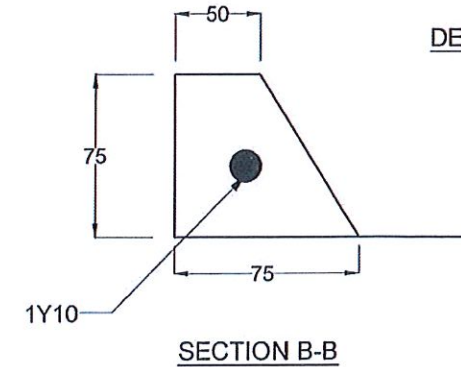
DETAIL A - (ENERGY BREAKER AT 3M)



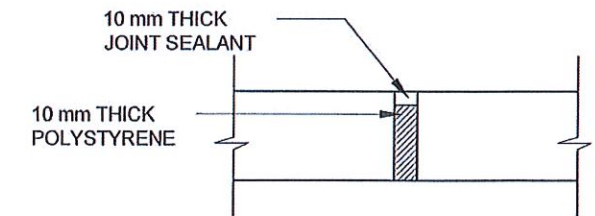
GRATING DETAIL


















DETAILS OF SLOPE CREST /BERM SEALING

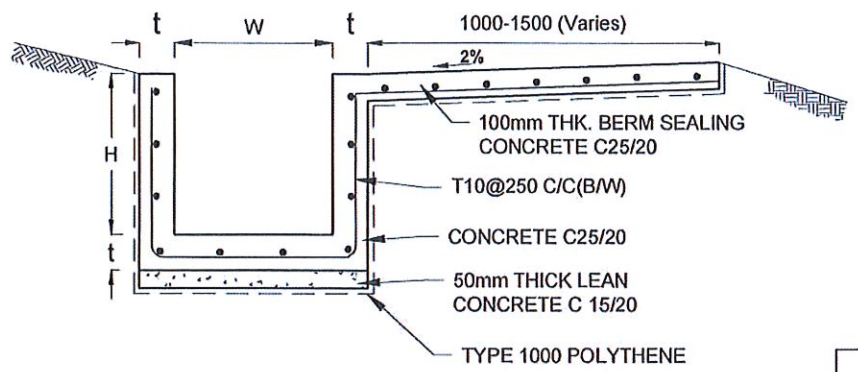


SECTION B-B

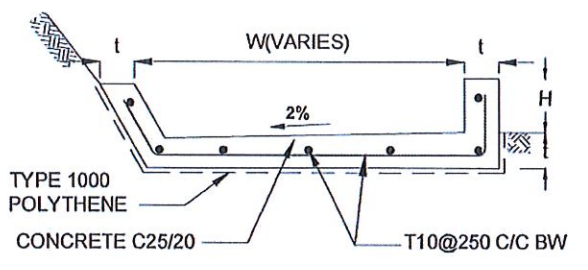


EXPANSION JOINT DETAIL

EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES DISTRICT COURT COMPLEX, KEGALLE	TITLE DETAILS OF DRAINS (SURFACE DRAIN -1 OF 2)	DESCRIPTION NAME SIGNATURE																																																																
		<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>																																															<table border="1"> <tr> <td>SCALE</td> <td>N.T.S.</td> <td>DATE</td> <td>02.11.2020</td> </tr> <tr> <td>PROJECT / DRAWING No.</td> <td>RLVMMP/WORKS/NCB/04A/20-Dc/DR-06a</td> <td>REVISION</td> <td>00</td> </tr> </table>	SCALE	N.T.S.	DATE	02.11.2020	PROJECT / DRAWING No.	RLVMMP/WORKS/NCB/04A/20-Dc/DR-06a	REVISION	00	<table border="1"> <tr> <td>DRAWN</td> <td>B.V.S. PATTRISHIYA</td> <td></td> </tr> <tr> <td>DESIGNER</td> <td>M. H. M. HARSHANI</td> <td></td> </tr> <tr> <td>CHECKED</td> <td>J.P. SAMARANAYAKA</td> <td></td> </tr> <tr> <td>RECOMMENDED</td> <td>PROF. S.A.S. KULATHILAKA</td> <td></td> </tr> <tr> <td>APPROVED</td> <td>K.N. BANDARA</td> <td></td> </tr> </table>	DRAWN	B.V.S. PATTRISHIYA		DESIGNER	M. H. M. HARSHANI		CHECKED	J.P. SAMARANAYAKA		RECOMMENDED	PROF. S.A.S. KULATHILAKA
SCALE	N.T.S.	DATE	02.11.2020																																																																		
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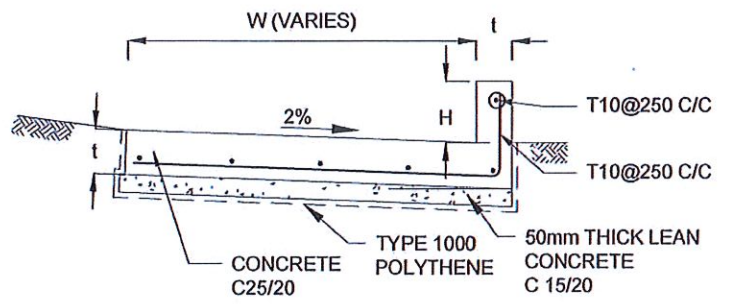


DS (B) - (TYPE I)



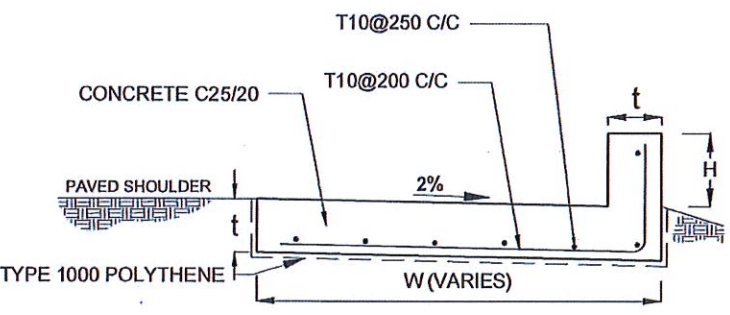
DS (B) - (TYPE II)

DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (B) - A	300	300	100
DS (B) - B	450	450	100
DS (B) - C	1000	150	100

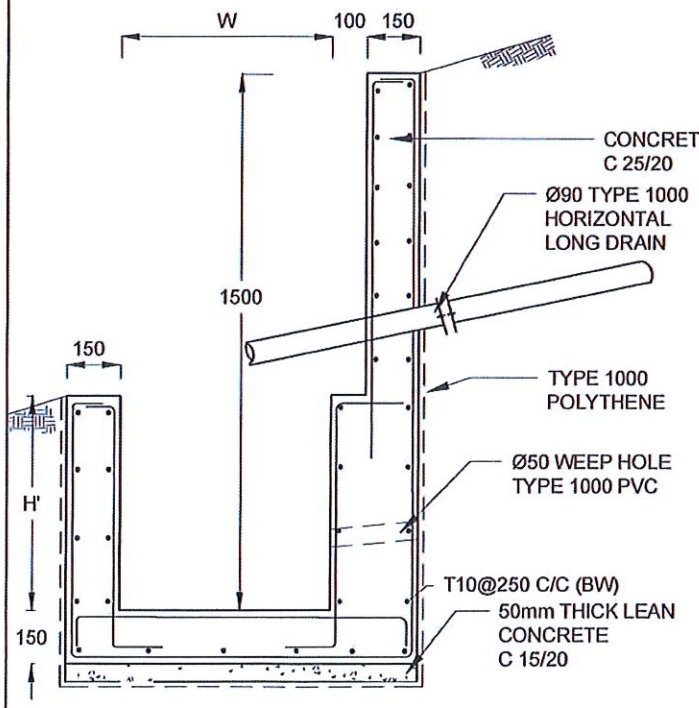


DS (K) - TYPE I

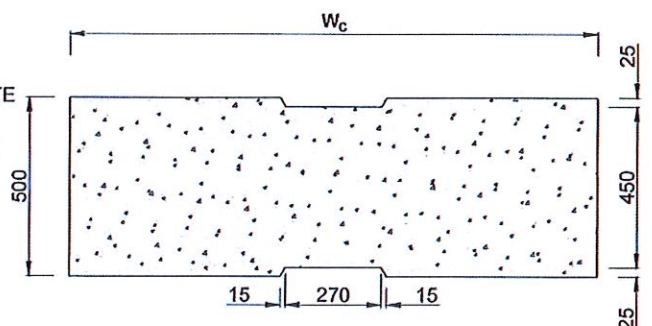
DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (K) - A	1000	200	100
DS (K) - B	1000	300	100
DS (K) - C	1150	200	200



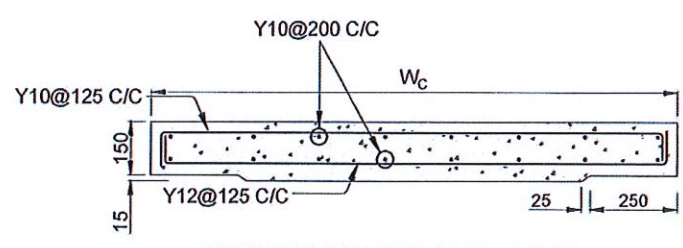
DS (K) - TYPE II



DS (M) - L



PLAN VIEW OF COVER SLAB



ACCESS & HEAVY DUTY COVER SLAB
SECTION OF (Wc x 500 x 150mm)

DS(M) - L	W (mm)	H' (mm)	t (mm)
TYPE I	600	600	150
TYPE II	800	800	150

NOTES

- DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
- STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
- DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- COVER SLABS NEED TO BE PROVIDED ONLY FOR THE REGIONS AS INSTRUCTED BY THE ENGINEER.
- COVER SLAB WIDTH (Wc) SHOULD BE TAKEN AS THE SUM OF DRAIN WIDTH AND 2x DRAIN WALL THICKNESS. [Wc = W+2x t]
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
- 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.

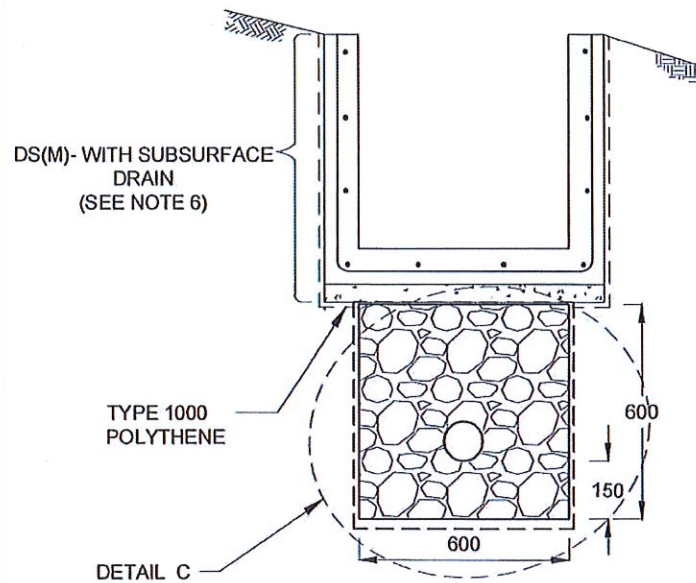
CONCRETE

- USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

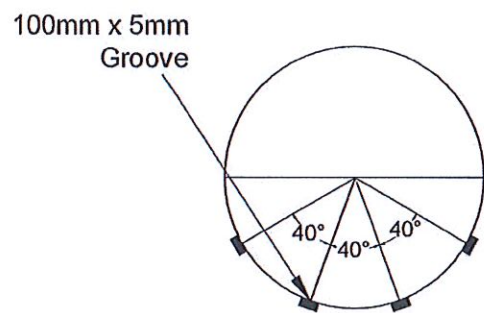
REINFORCEMENT

- ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
- BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
- ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
- REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
- COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm

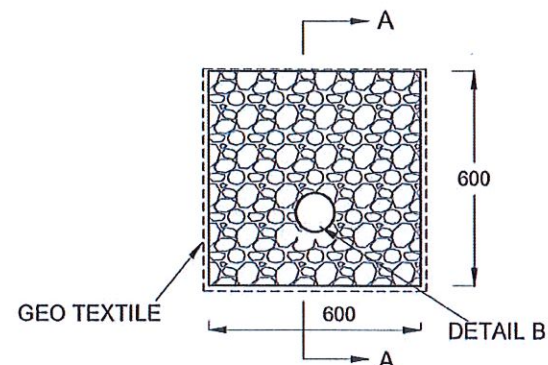
<p>EMPLOYER</p> <p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGNER</p> <p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>REVISION DESCRIPTION</th> <th>APPROVAL</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	DATE	REVISION DESCRIPTION	APPROVAL																					<p>PROJECT TITLE</p> <p style="text-align: center;">REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES DISTRICT COURT COMPLEX, KEGALLE</p>	<p>TITLE</p> <p style="text-align: center;">DETAILS OF DRAINS (SURFACE DRAIN - 2 OF 2)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DESCRIPTION</th> <th>NAME</th> <th>SIGNATURE</th> </tr> </thead> <tbody> <tr> <td>DRAWN</td> <td>B.V.S. PATTRISHIYA</td> <td></td> </tr> <tr> <td>DESIGNER</td> <td>M. H. M. HARSHANI</td> <td></td> </tr> <tr> <td>CHECKED</td> <td>J.P. SAMARANAYAKA</td> <td></td> </tr> <tr> <td>RECOMMENDED</td> <td>PROF. S.A.S. KULATHILAKA</td> <td></td> </tr> <tr> <td>APPROVED</td> <td>K.N. BANDARA</td> <td></td> </tr> </tbody> </table>	DESCRIPTION	NAME	SIGNATURE	DRAWN	B.V.S. PATTRISHIYA		DESIGNER	M. H. M. HARSHANI		CHECKED	J.P. SAMARANAYAKA		RECOMMENDED	PROF. S.A.S. KULATHILAKA		APPROVED	K.N. BANDARA	
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<p>SCALE N.T.S. DATE 02.11.2020</p> <p>PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/20-Dc/DR-06b REVISION 00</p>																																															



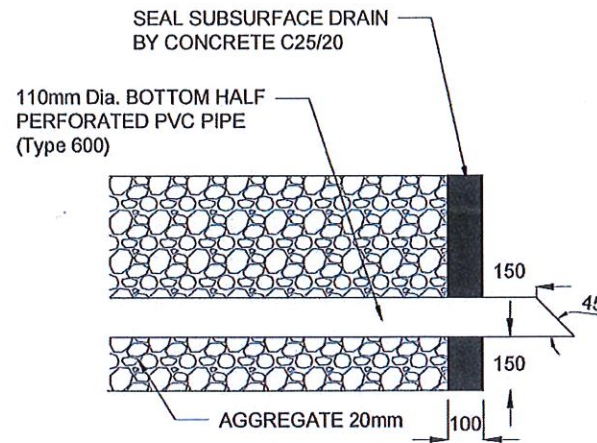
SUBSURFACE DRAIN [DS (S) -A]



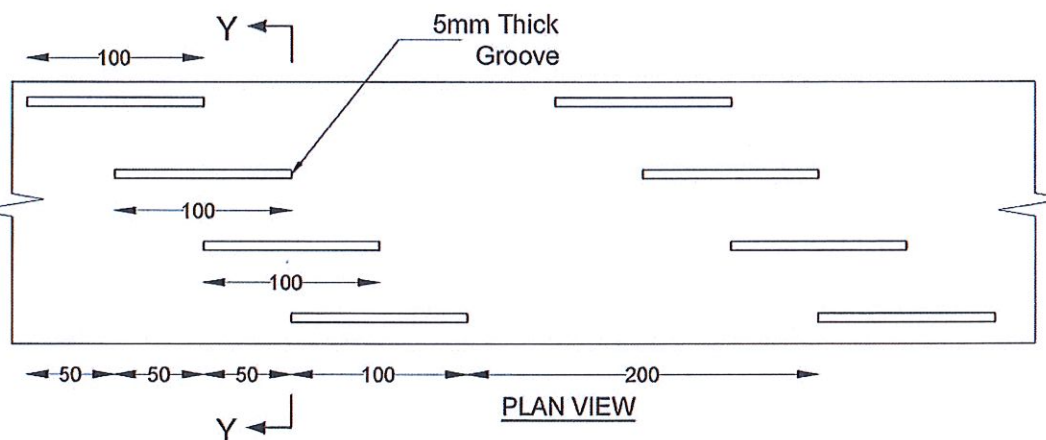
SECTION Y - Y



DETAIL C / DS (S) -A

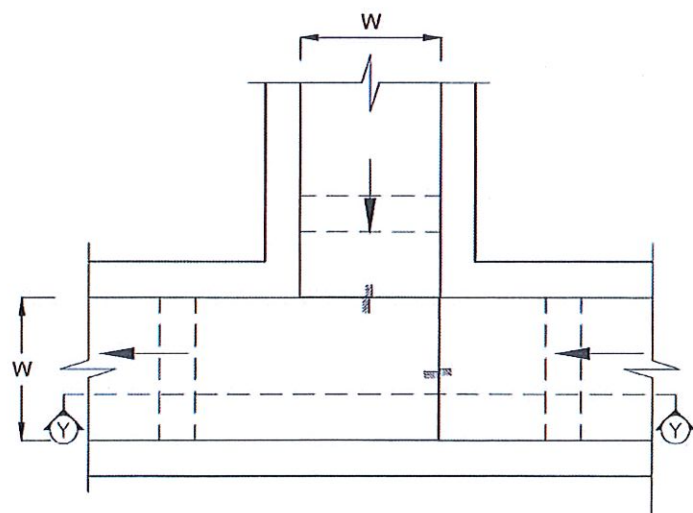


SECTION A-A (OUTLET DETAIL SUBSURFACE DRAIN)

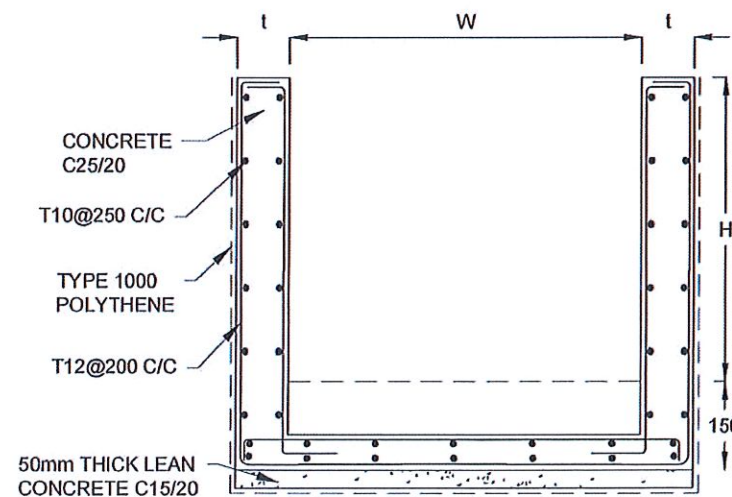


PLAN VIEW

DETAIL - B (PERFORATED PIPE FOR SUB-SURFACE DRAINS)



PLAN VIEW OF CATCH PIT (CP)



SECTION Y-Y (CP-R)

NOTES

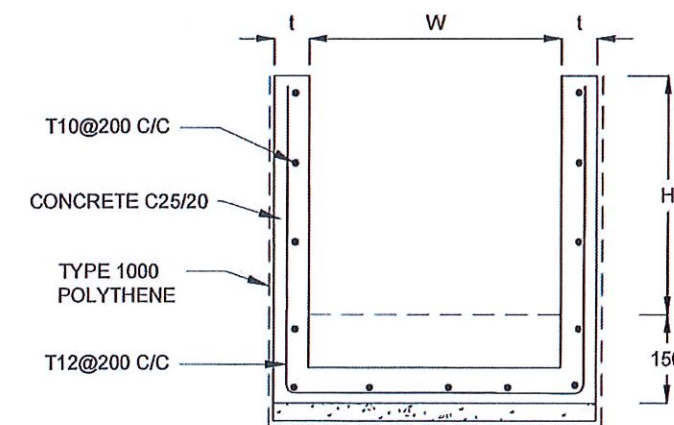
1. W,H,t ; SHALL BE THE SAME AS RESPECTIVE DRAIN SECTION.
2. CP - R SHALL BE USED WHERE $H \geq 900\text{mm}$
3. DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. DETAILS OF SURFACE DRAIN PORTION OF THE SUBSURFACE DRAINS SHALL BE AS PER DS(M), DS(B), DS(K) OR DS(C) SECTIONS ACCORDINGLY.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

CONCRETE

8. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

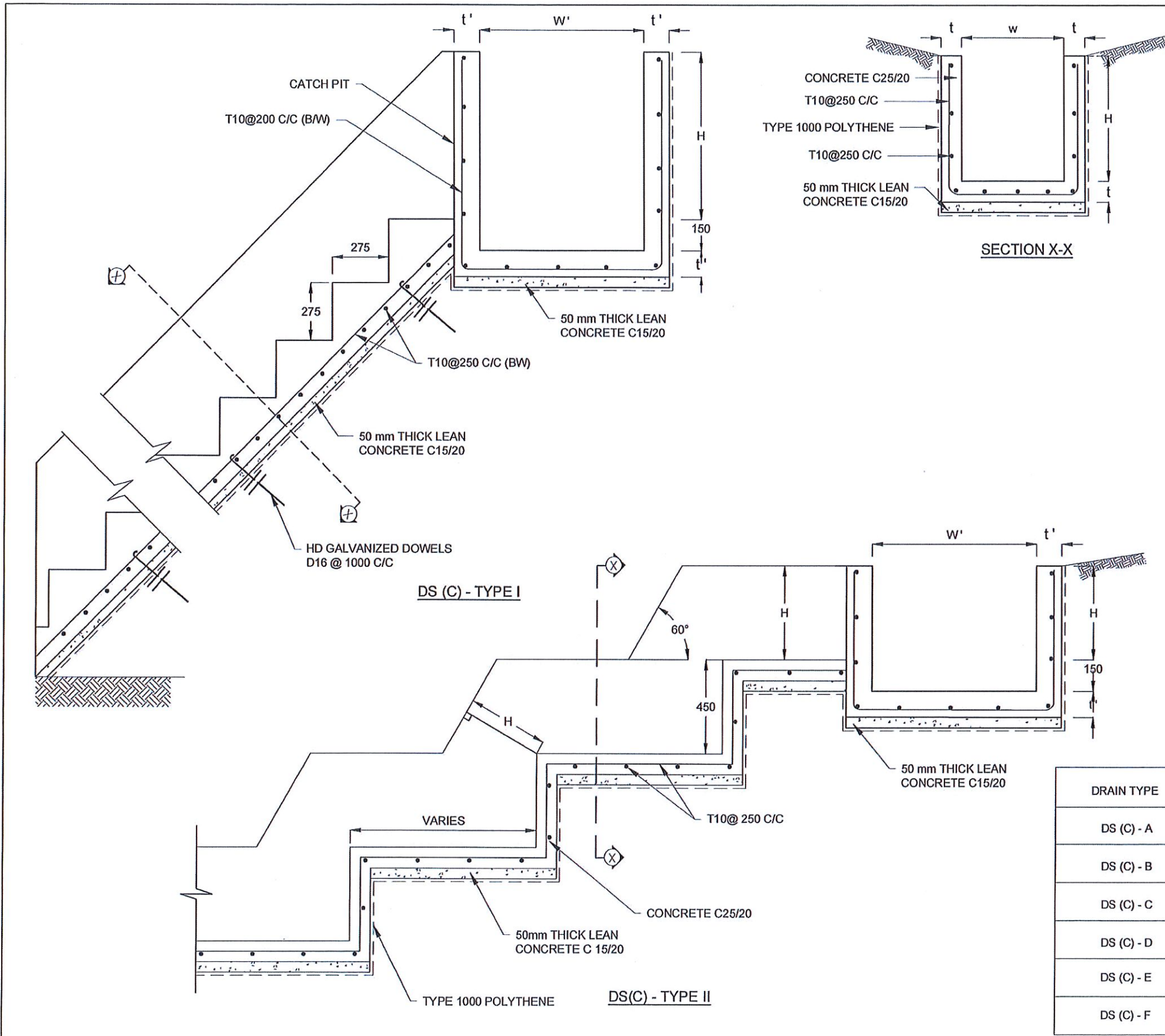
REINFORCEMENT

9. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm^2 .
10. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF $50 \times \text{BAR DIA.}$ AND LAPPING SHOULD BE STAGGERED.
11. ANCHORAGE LENGTH SHOULD BE $40 \times \text{BAR DIA.}$
12. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
13. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



SECTION Y - Y

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES DISTRICT COURT COMPLEX, KEGALLE	TITLE DETAILS OF DRAINS (SUBSURFACE DRAIN AND CATCHPIT)	DESCRIPTION	NAME	SIGNATURE			
									SCALE	N.T.S.	DATE	02.11.2020	RECOMMENDED
							PROJECT / DRAWING No.			REVISION	00	APPROVED	K.N. BANDARA
							RLVMMP/WORKS/NCB/04A/20-Dc/DR-06c						



NOTES

1. USE EITHER TYPE I OR TYPE II CASCADE DRAIN ACCORDING TO THE ACTUAL GROUND CONDITION AS INSTRUCTED BY THE ENGINEER.
2. LENGTH OF THE STEPS OF CASCADE WILL BE VARIED ACCORDING TO THE SITE CONDITIONS.
3. DEPTH OF EXCAVATION SHALL BE VARIED ACCORDING TO SITE CONDITIONS.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

CONCRETE

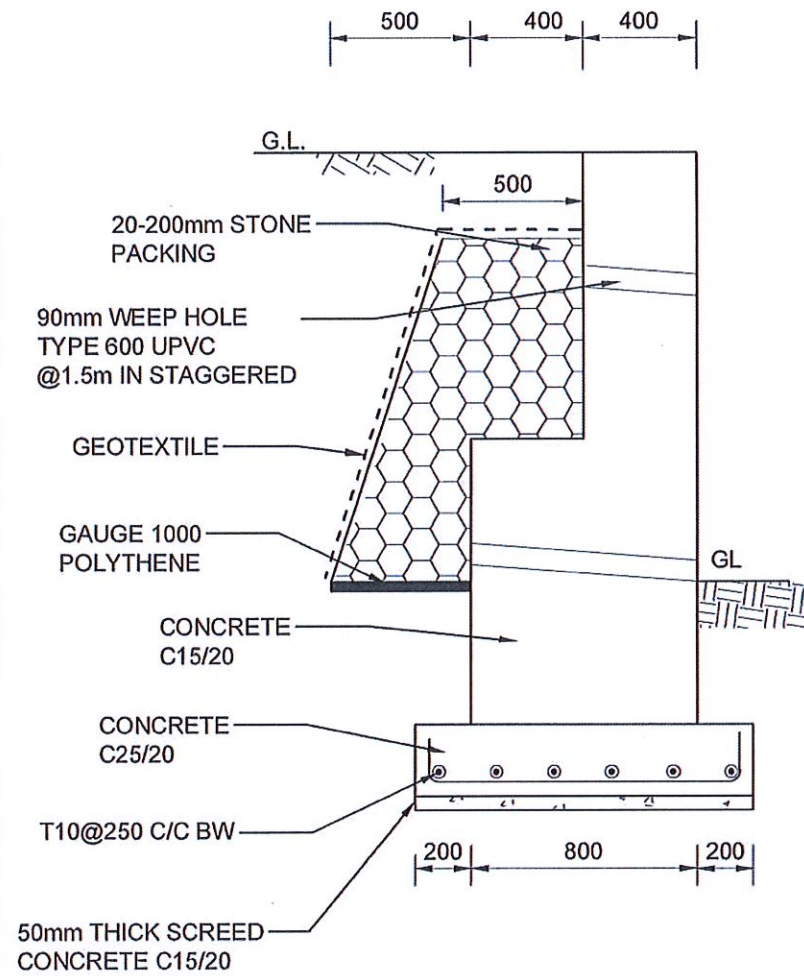
7. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

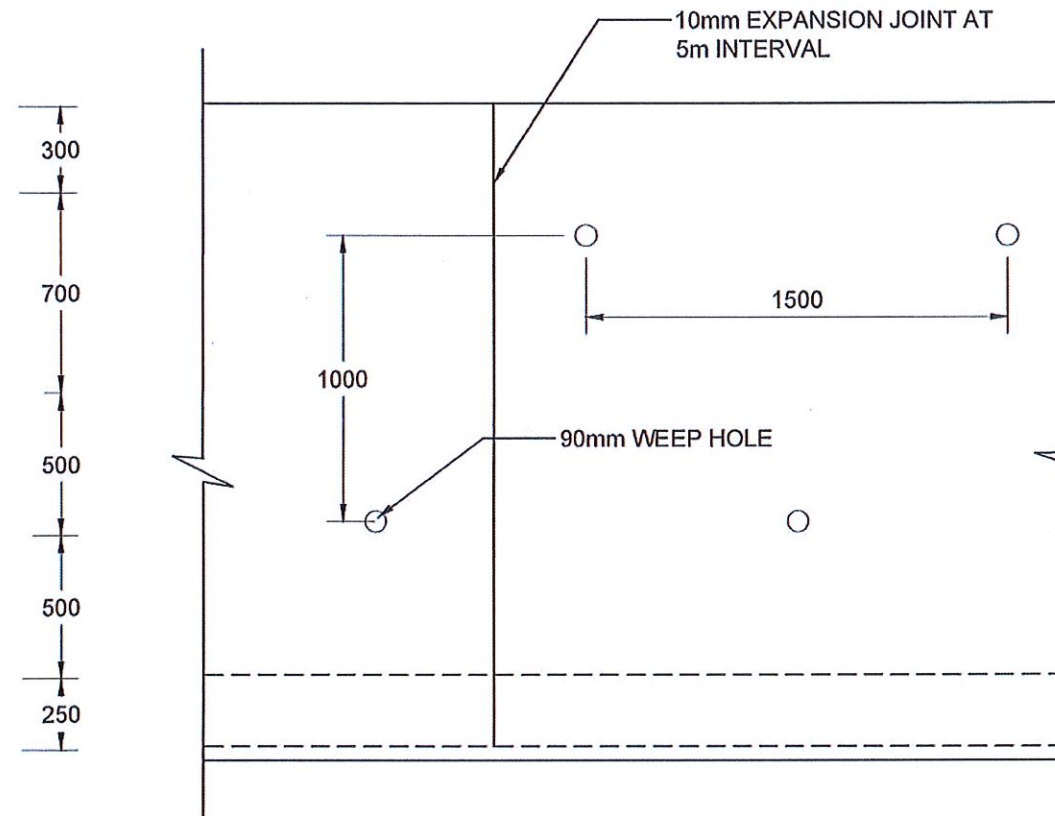
8. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
9. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
10. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
11. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
12. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm

DRAIN TYPE	W (mm)	H (mm)	t (mm)	W' (mm)	t' (mm)
DS (C) - A	450	450	100	600	100
DS (C) - B	450	600	100	750	100
DS (C) - C	600	600	100	800	100
DS (C) - D	750	750	100	800	100
DS (C) - E	800	800	125	1000	125
DS (C) - F	1000	750	125	1200	125

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									SCALE	N.T.S.	DATE	02.11.2020	RECOMMENDED	PROF. S.A.S. KULATHILAKA
							PROJECT / DRAWING No.			REVISION	00	APPROVED	K.N. BANDARA	
							RLVMMP/WORKS/NCBI04A/20-Dc/DR-06d							



SECTION



FRONT ELEVATION

NOTES

- [a] ALL DIMENSION ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
- [b] POROUS BACKFILL ALONG THE ENTIRE LENGTH OF THE WALL AS INDICATED.
- [c] WEEP HOLES TO BE PROVIDED AT 1.5m C/C STAGGERED USING 90mm DIA UPVC PIPES.(TYPE 600)

CONCRETE

- [d] USE FOLLOWING CONCRETE GRADES FOR STRUCTURES
 - [a] SCREED / WALL - C 15/20
 - [b] FOUNDATION BASE - C 25/20

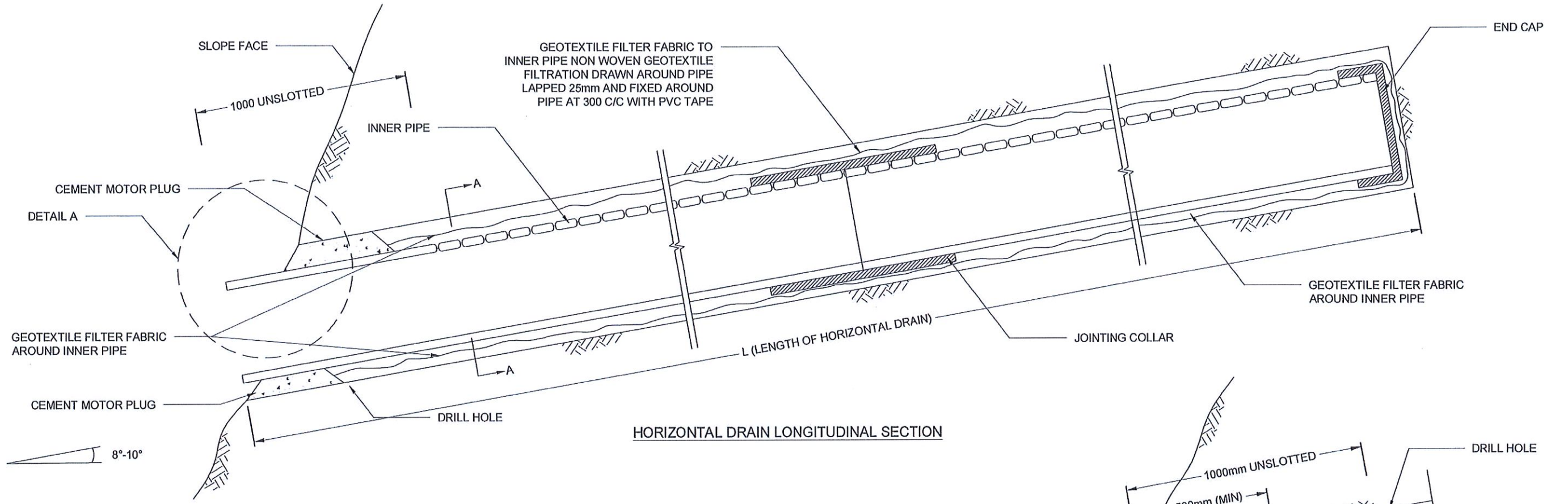
REINFORCEMENTS

- [e] ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
- [f] BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED WITH LENGTH OF 50Ø, WHERE Ø IS THE DIAMETER. LAPPINGS SHOULD BE STAGGERED
- [g] REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
- [h] CLEAR CONCRETE COVER FOR THE REINFORCEMENT BELLOW GROUND LEVEL SHALL BE 50mm.

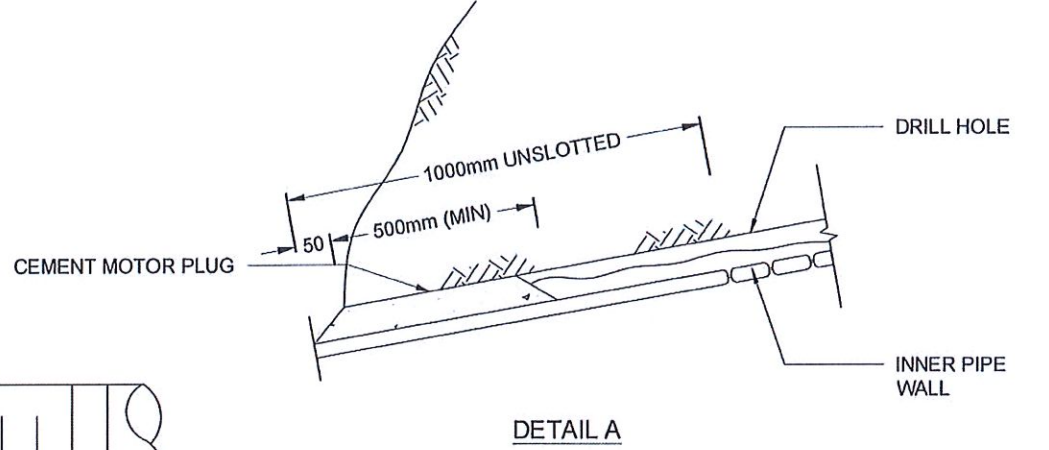
SPECIAL NOTE

- [i] ALLOWABLE BEARING CAPACITY OF THE GROUND IS 150kPa.
- [j] EXPANSION JOINTS SHALL BE PROVIDED AT 5m SPACES WITH APPROVED MATERIAL

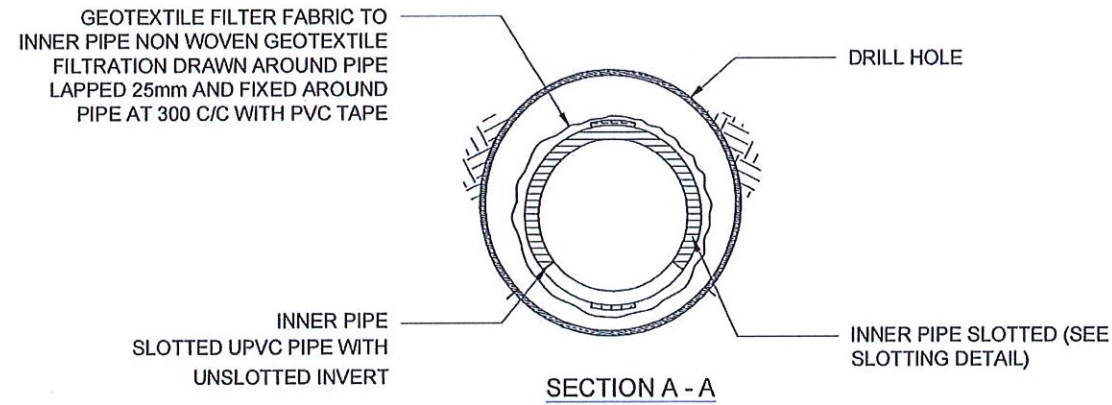
EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES DISTRICT COURT COMPLEX, KEGALLE	TITLE DETAILS OF CONCRETE GRAVITY RETAINING WALL	DESCRIPTION NAME SIGNATURE																																																								
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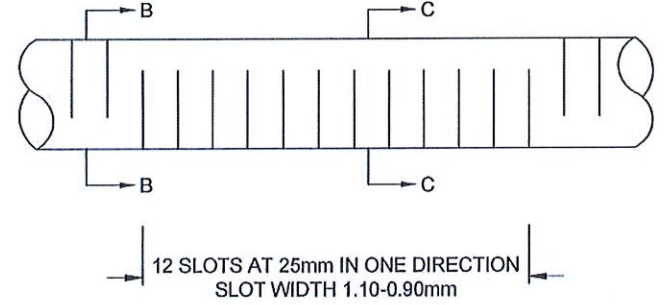
HORIZONTAL DRAIN LONGITUDINAL SECTION



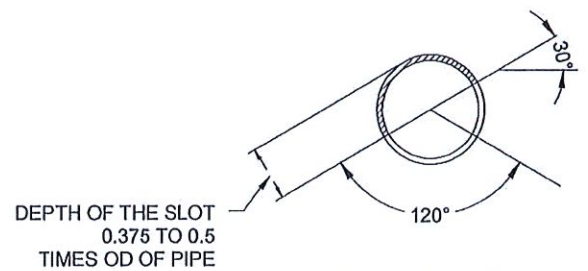
DETAIL A



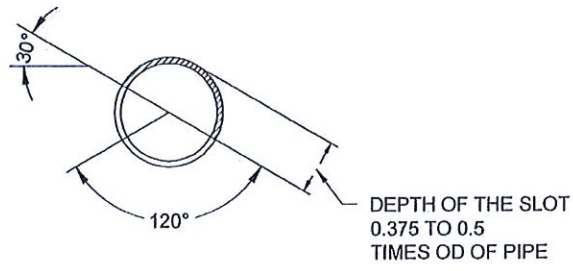
SECTION A - A



INNER AND OUTER PIPE SLOTTING DETAIL (TOP VIEW)


















SECTION B - B

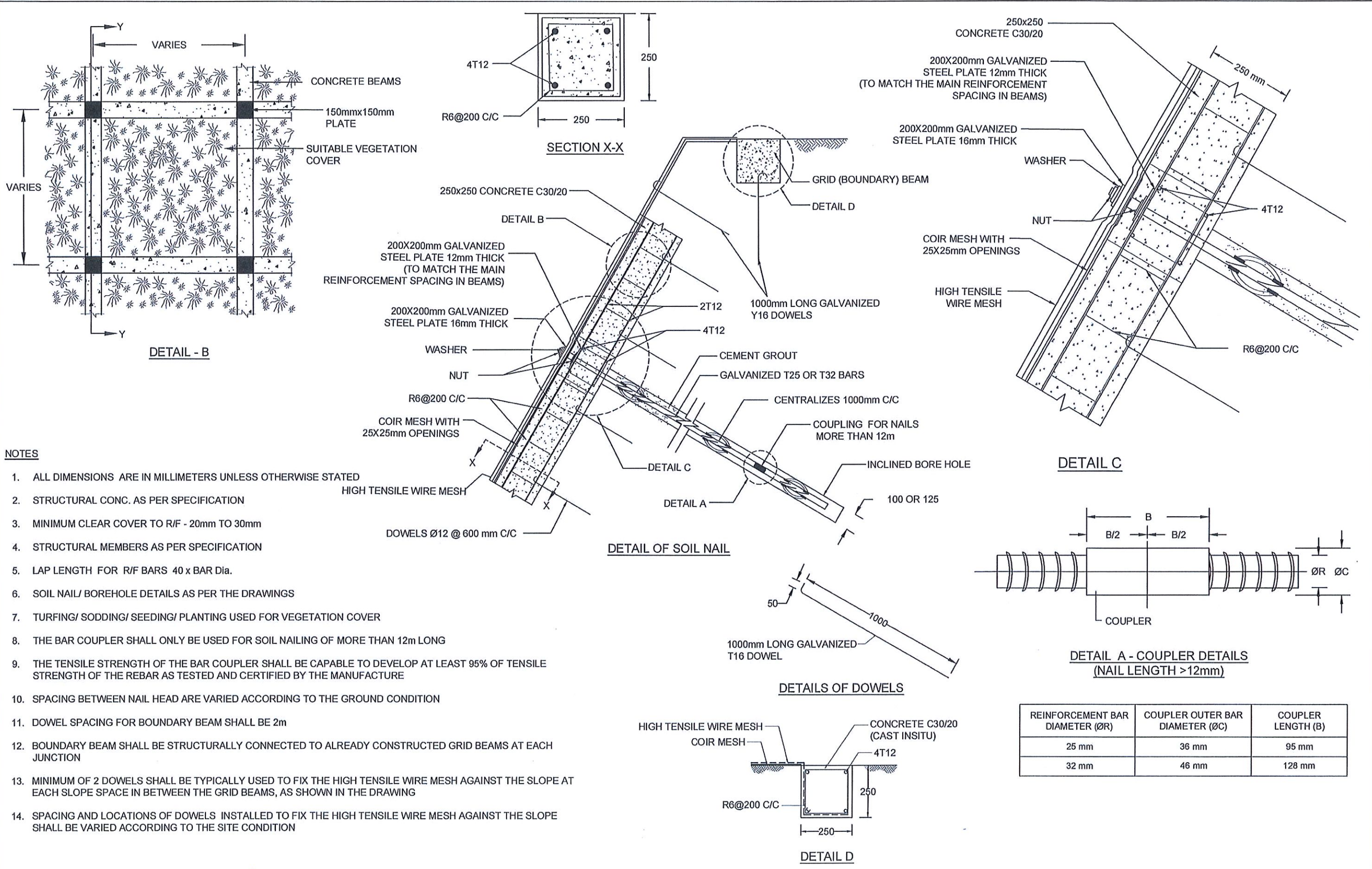


SECTION C - C

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. PIPE DIAMETERS, ANGLE & LENGTHS AS SPECIFIED IN DRAWINGS.
3. ALL MATERIALS SHALL CONFORM TO PROJECT SPECIFICATION

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NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED
2. STRUCTURAL CONC. AS PER SPECIFICATION
3. MINIMUM CLEAR COVER TO R/F - 20mm TO 30mm
4. STRUCTURAL MEMBERS AS PER SPECIFICATION
5. LAP LENGTH FOR R/F BARS 40 x BAR Dia.
6. SOIL NAIL/ BOREHOLE DETAILS AS PER THE DRAWINGS
7. TURFING/ SODDING/ SEEDING/ PLANTING USED FOR VEGETATION COVER
8. THE BAR COUPLER SHALL ONLY BE USED FOR SOIL NAILING OF MORE THAN 12m LONG
9. THE TENSILE STRENGTH OF THE BAR COUPLER SHALL BE CAPABLE TO DEVELOP AT LEAST 95% OF TENSILE STRENGTH OF THE REBAR AS TESTED AND CERTIFIED BY THE MANUFACTURE
10. SPACING BETWEEN NAIL HEAD ARE VARIED ACCORDING TO THE GROUND CONDITION
11. DOWEL SPACING FOR BOUNDARY BEAM SHALL BE 2m
12. BOUNDARY BEAM SHALL BE STRUCTURALLY CONNECTED TO ALREADY CONSTRUCTED GRID BEAMS AT EACH JUNCTION
13. MINIMUM OF 2 DOWELS SHALL BE TYPICALLY USED TO FIX THE HIGH TENSILE WIRE MESH AGAINST THE SLOPE AT EACH SLOPE SPACE IN BETWEEN THE GRID BEAMS, AS SHOWN IN THE DRAWING
14. SPACING AND LOCATIONS OF DOWELS INSTALLED TO FIX THE HIGH TENSILE WIRE MESH AGAINST THE SLOPE SHALL BE VARIED ACCORDING TO THE SITE CONDITION

EMPLOYER

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER

DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE

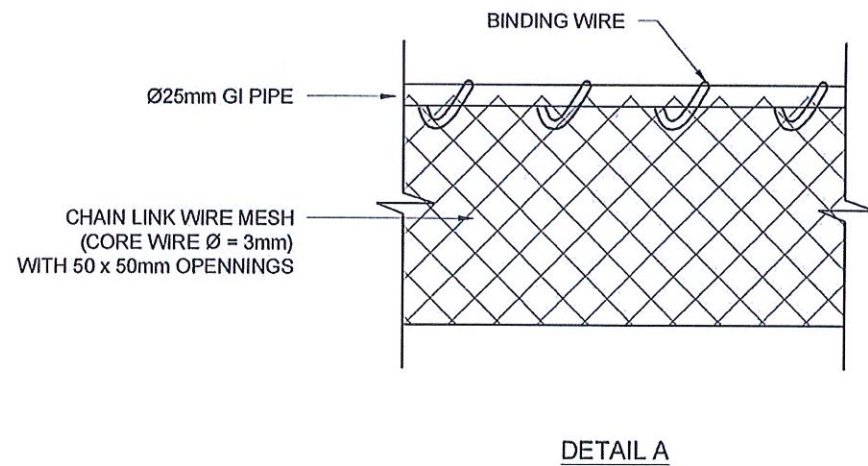
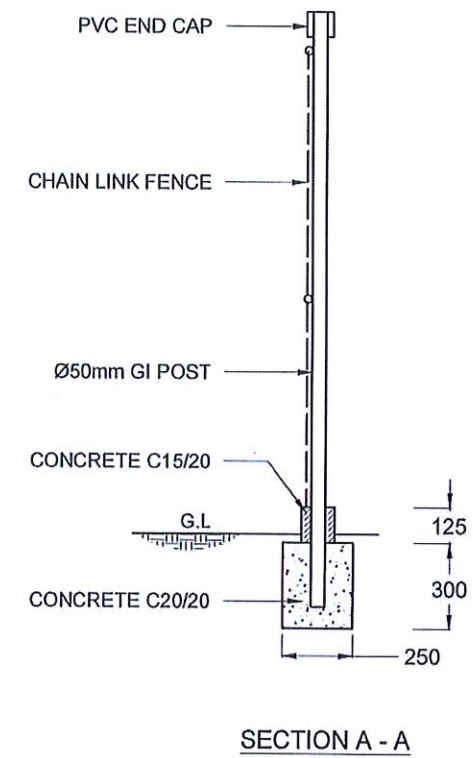
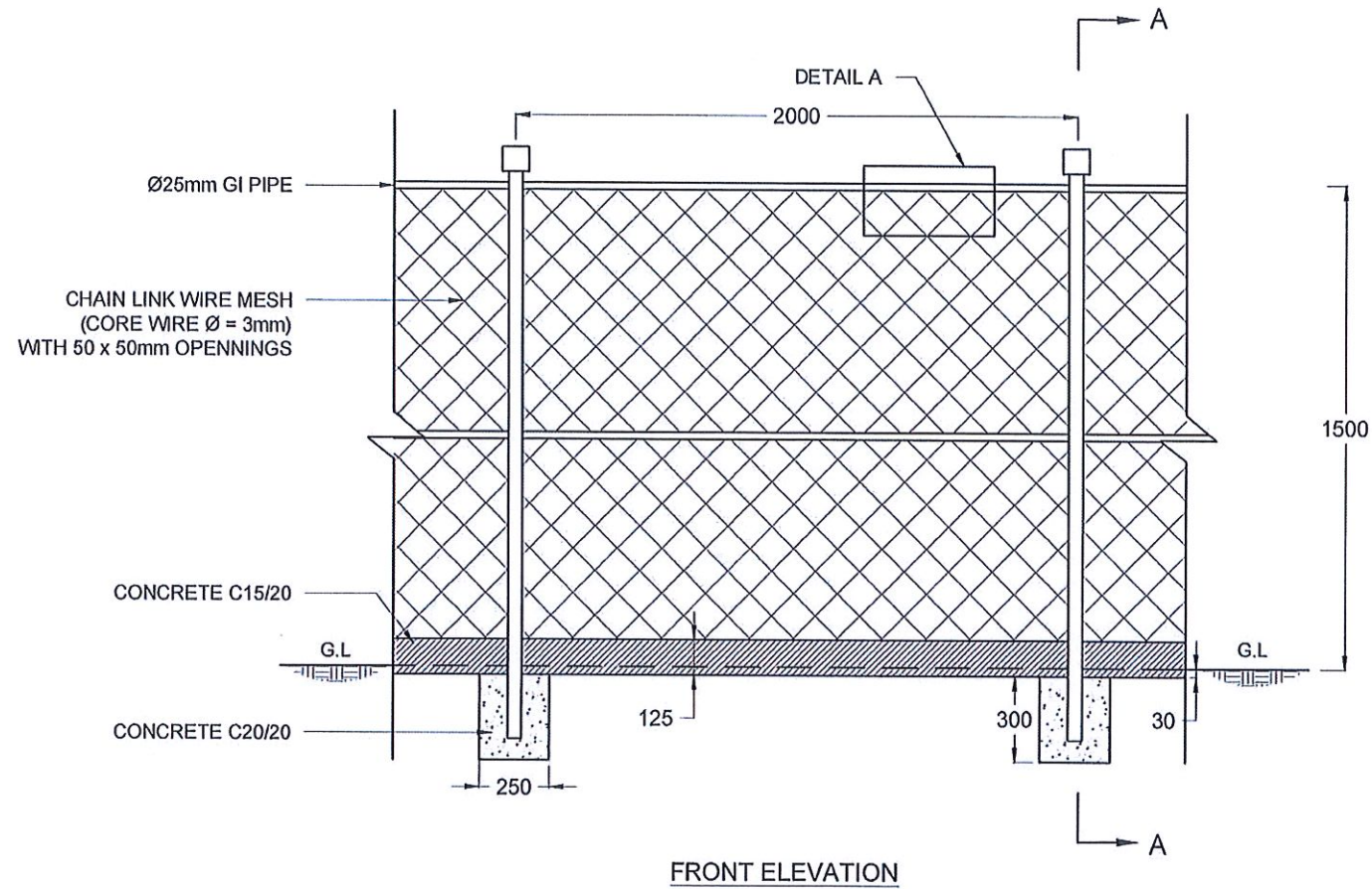
REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 DISTRICT COURT COMPLEX, KEGALLE

TITLE

DETAILS OF SOIL NAILING WITH
 GRID BEAM & HYDROSEEDING



SCALE: N.T.S. DATE: 02.11.2020
 PROJECT / DRAWING No. REVISION: 00
 RLVMP/WORKS/NCB/04A/20-Dc/DR-09

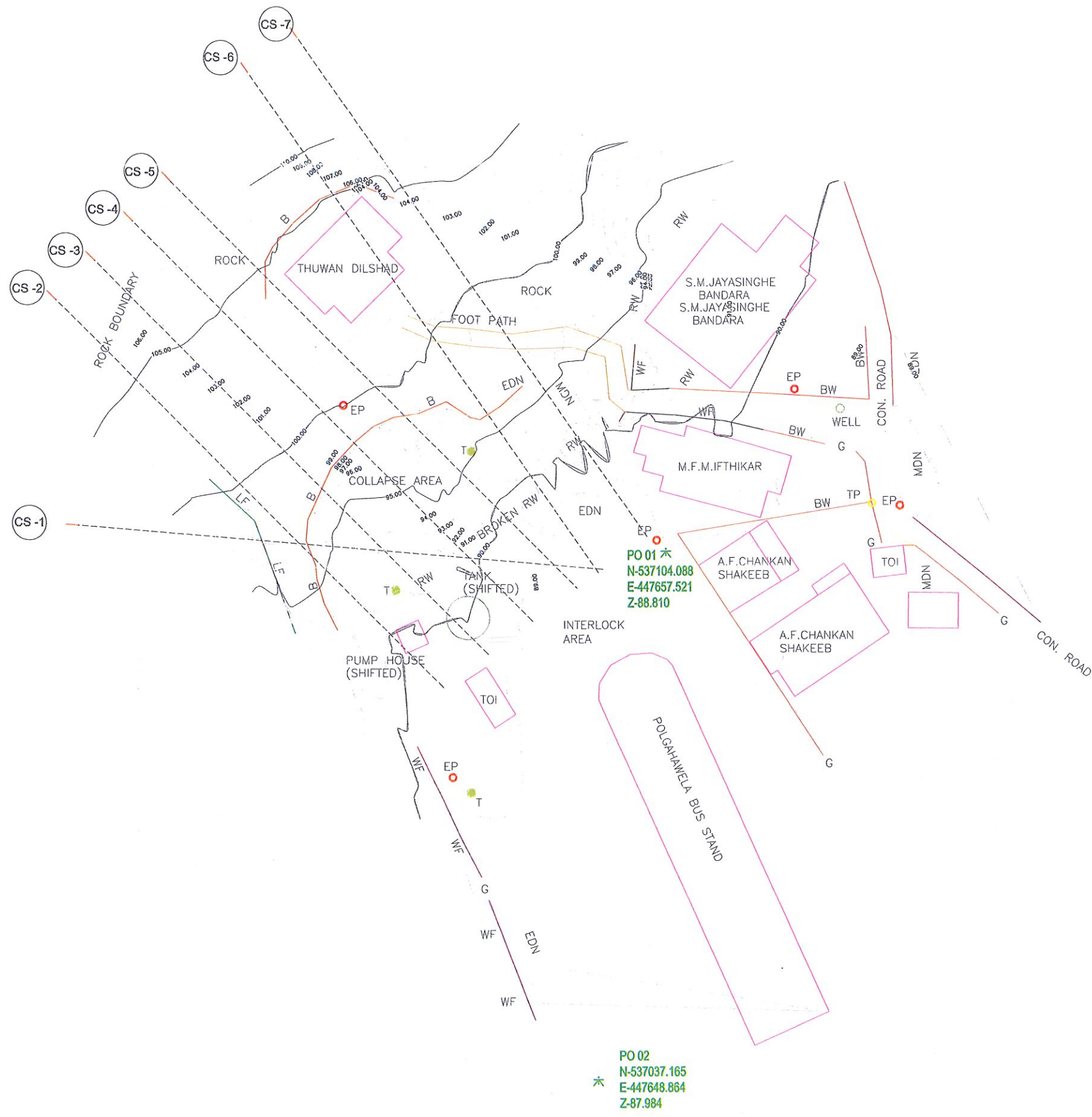
DESCRIPTION	NAME	SIGNATURE
DRAWN	B.V.S. PATTRISHIYA	<i>[Signature]</i>
DESIGNER	M. H. M. HARSHANI	<i>[Signature]</i>
CHECKED	J.P. SAMARANAYAKA	<i>[Signature]</i>
RECOMMENDED	PROF. S.A.S. KULATHILAKA	<i>[Signature]</i>
APPROVED	K.N. BANDARA	<i>[Signature]</i>



NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED
2. GI POST SHOULD BE COVERED WITH GREEN COLOUR ANTI-CORROSIVE PAINT
3. PRIOR APPROVAL IS REQUIRED FOR CHAIN LINK WIRE MESH, GI POST AND PVC CAP



EMPLOYER	DESIGNER	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE	TITLE	DESCRIPTION	NAME	SIGNATURE		
 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	 DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05					REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES DISTRICT COURT COMPLEX, KEGALLE	DETAILS OF CHAIN LINK FENCE					
								SCALE	N.T.S.	DATE	02.11.2020	RECOMMENDED
							PROJECT / DRAWING No.	RLVMP/WORKS/NCB/04A/20-Dc/DR-10	REVISION	00	APPROVED	K.N. BANDARA

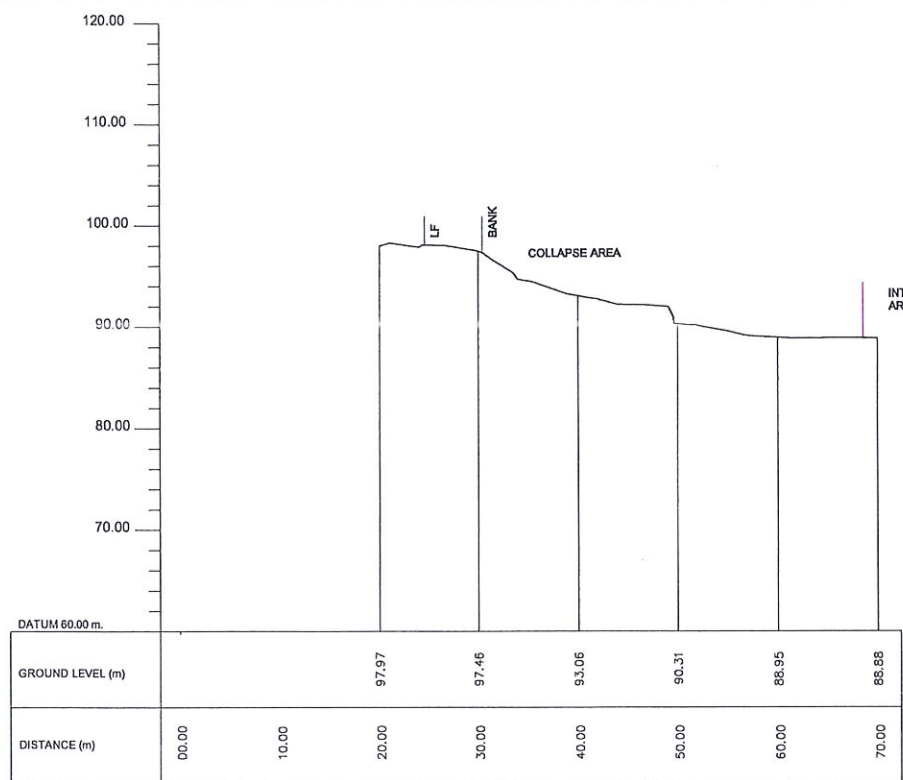


- REFERENCE**
- B - BANK
 - BD - BUILDING
 - BW - BOUNDARY WALL
 - CUL - CULVERT
 - G - GATE
 - LF - LIVE FENCE
 - MDN - MASONRY DRAIN
 - EDN - EARTH DRAIN
 - RW - RETAINING WALL
 - TOI - TOILET
 - WF - WIRE FENCE

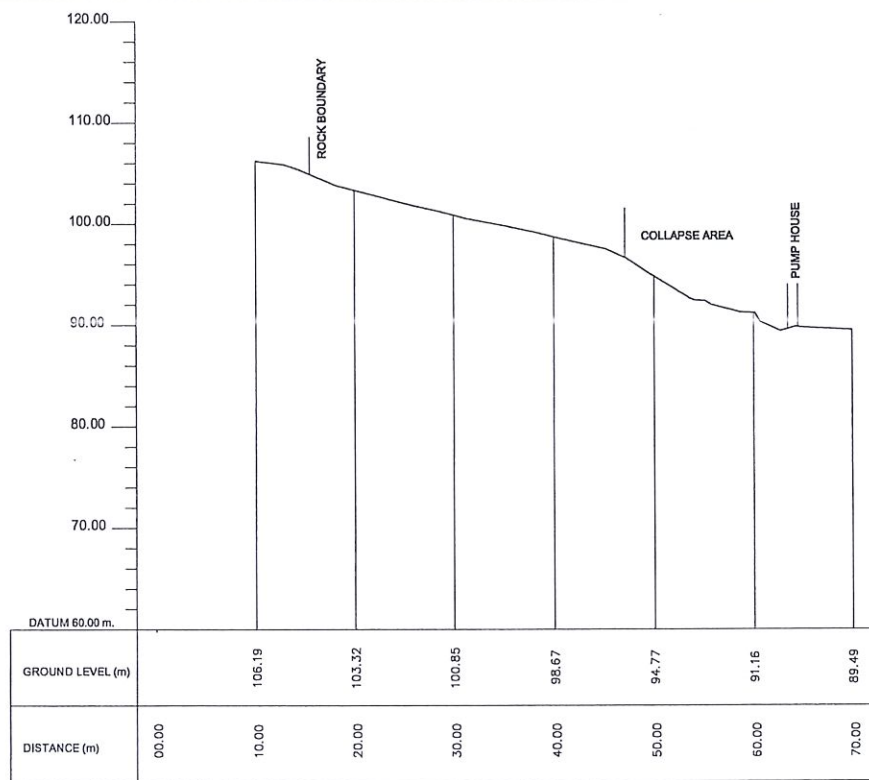
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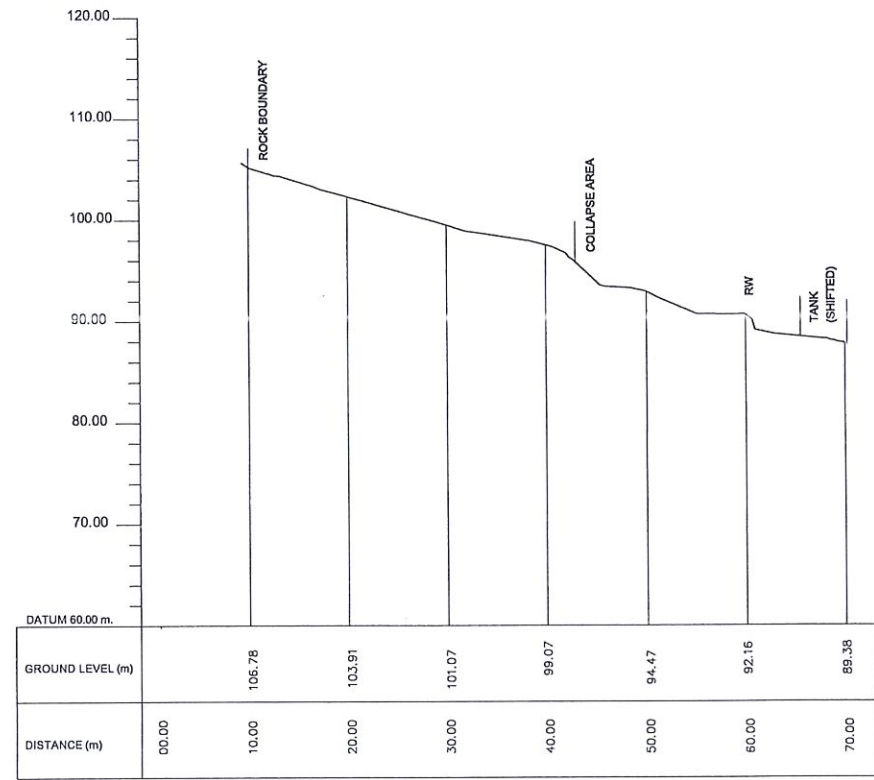
EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES POLGAHAWELA BUS STAND	TITLE CONTOUR SURVEY PLAN	DESCRIPTION	NAME	SIGNATURE	
								SURVEYED	LANKA G.P.S. (PVT) LTD		
								CHECKED	B.I. KUMARAGE		
							SCALE	1 : 500	DATE	12.11.2020	
							PROJECT / DRAWING No.	RLVMP/WORKS/NCB/04A/07-PL/DR-01	REVISION	00	



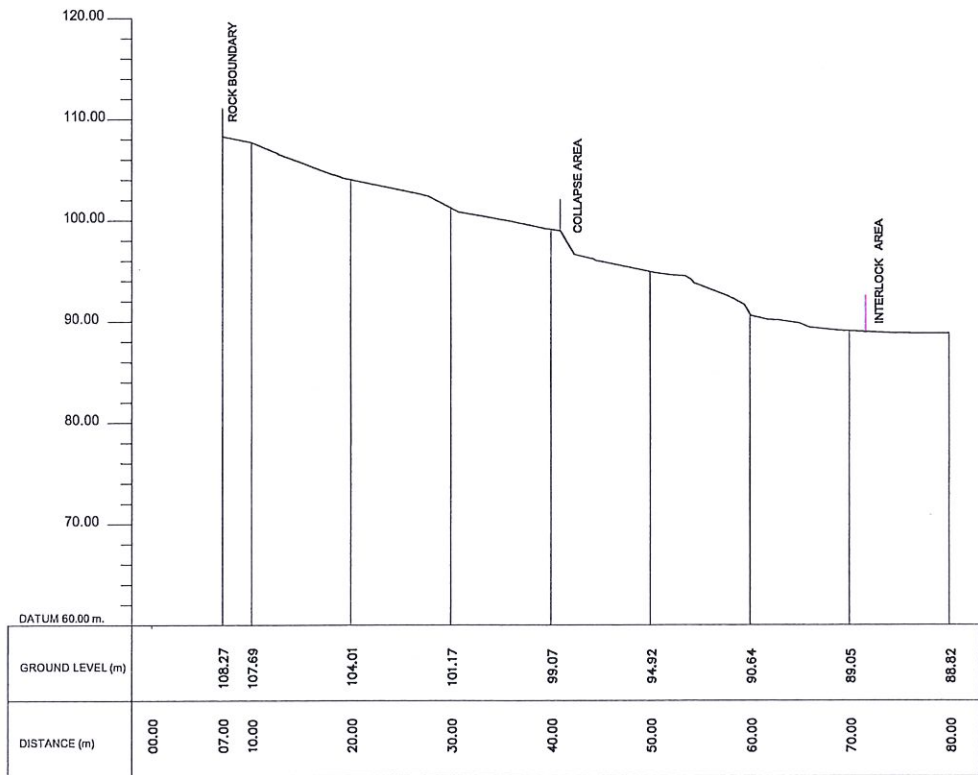
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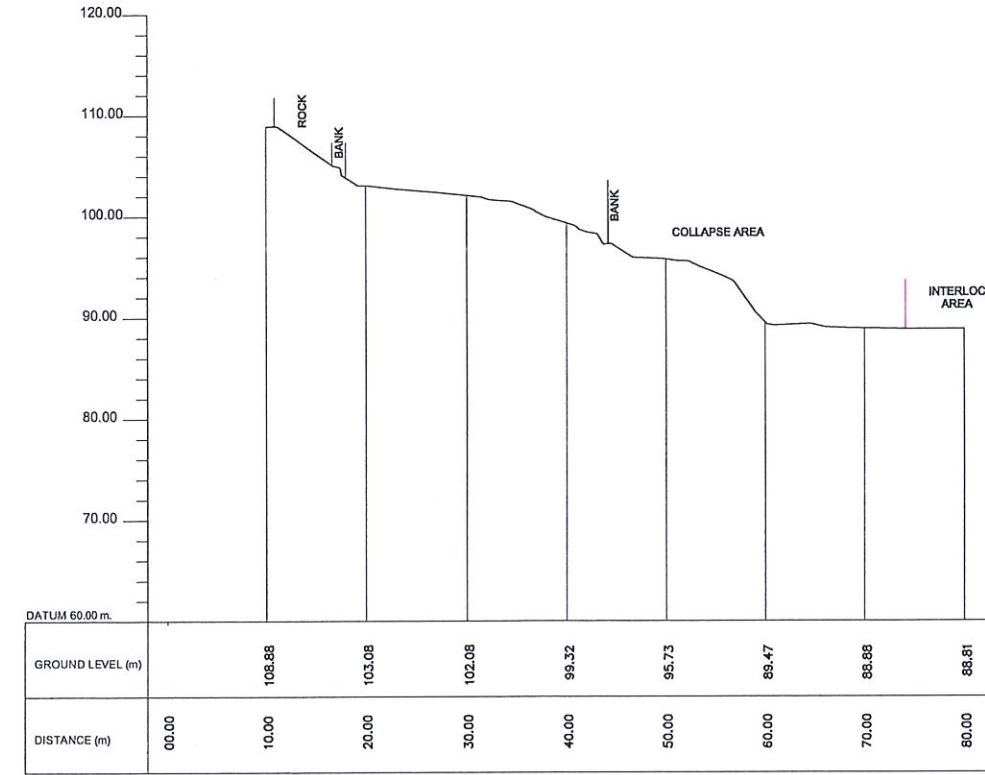
SECTION 02



SECTION 03

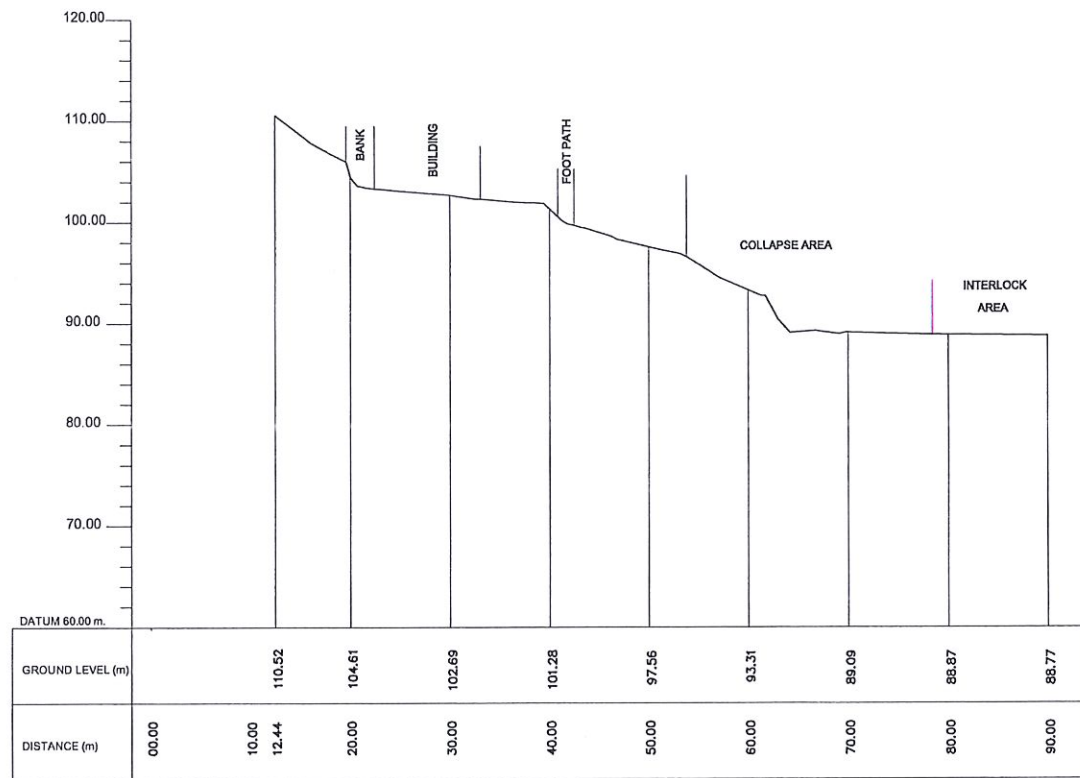


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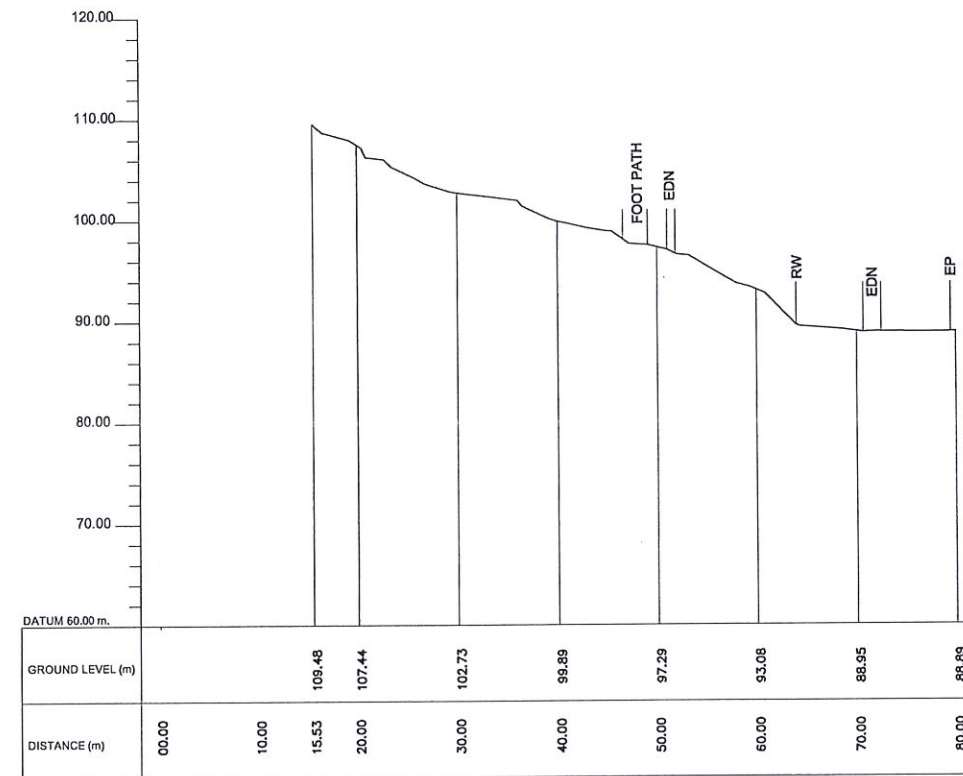


SECTION 05


<p>EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES POLGAHAWELA BUS STAND	TITLE SURVEY CROSS SECTIONS	DESCRIPTION	NAME	SIGNATURE	
									SCALE: 1:750	DATE: 12.11.2020	
							PROJECT / DRAWING No. RLVMMP/WORKS/NCB/04A/07-PL/DR- 02a	REVISION 00			



SECTION 06



SECTION 07

EMPLOYER

 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05



DESIGNER

 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 POLGAHAWELA BUS STAND

TITLE
 SURVEY CROSS SECTIONS

SCALE	1 : 750	DATE	12.11.2020
PROJECT / DRAWING No.	RLVMMP/WORKS/NCB/04A/07-PL/DR- 02b	REVISION	00

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CHECKED	B.I. KUMARAGE	

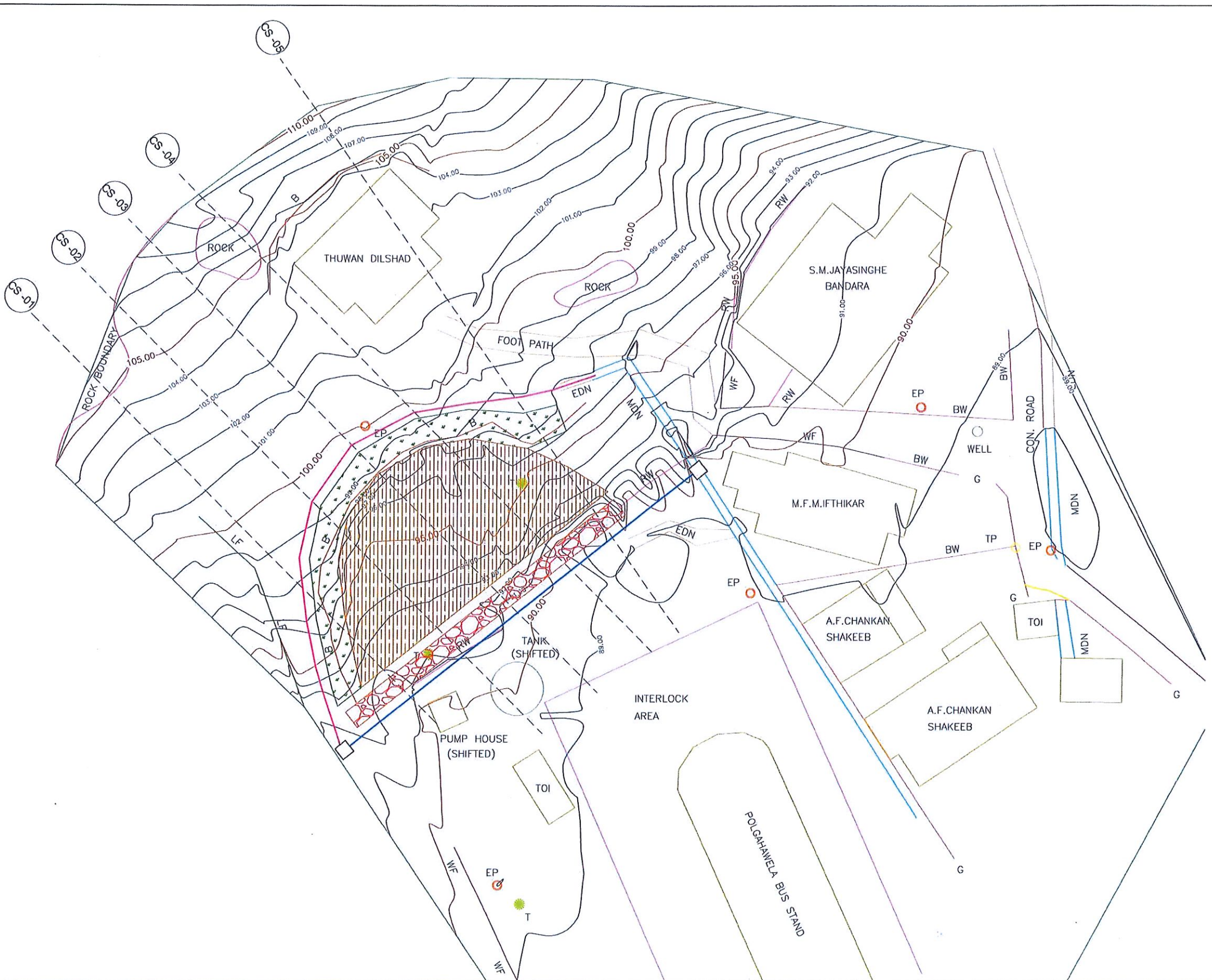


EXISTING FEATURES

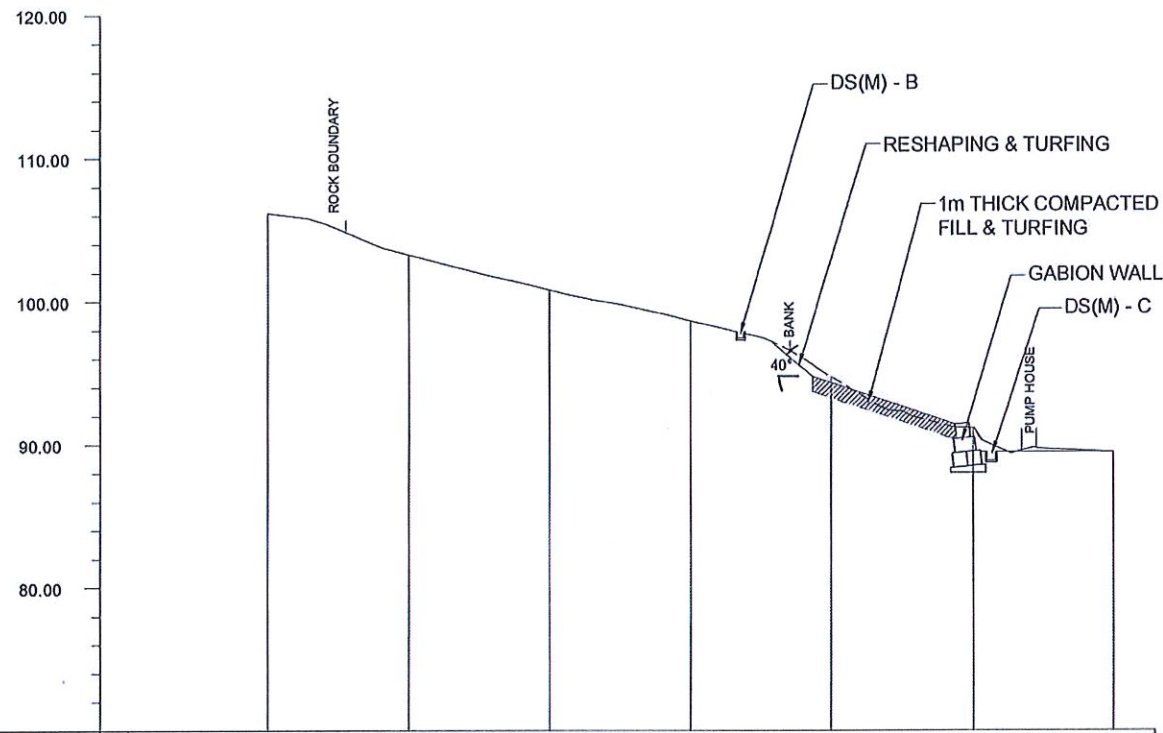
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- BD BUILDING
- BW BOUNDARY WALL
- CUL CULVERT
- G GATE
- LF LIVE FENCE
- MDN MASONRY DRAIN
- EDN EARTH DRAIN
- RW RETAINING WALL
- TOI TOILET
- WF WIRE FENCE

DESIGN NOTATION

- COMPACTED FILL & TURFING
- GABION WALL - TYPE I
- RESHAPING & TURFING
- DS (M) - B
- DS (M) - C
- CATCH-PIT



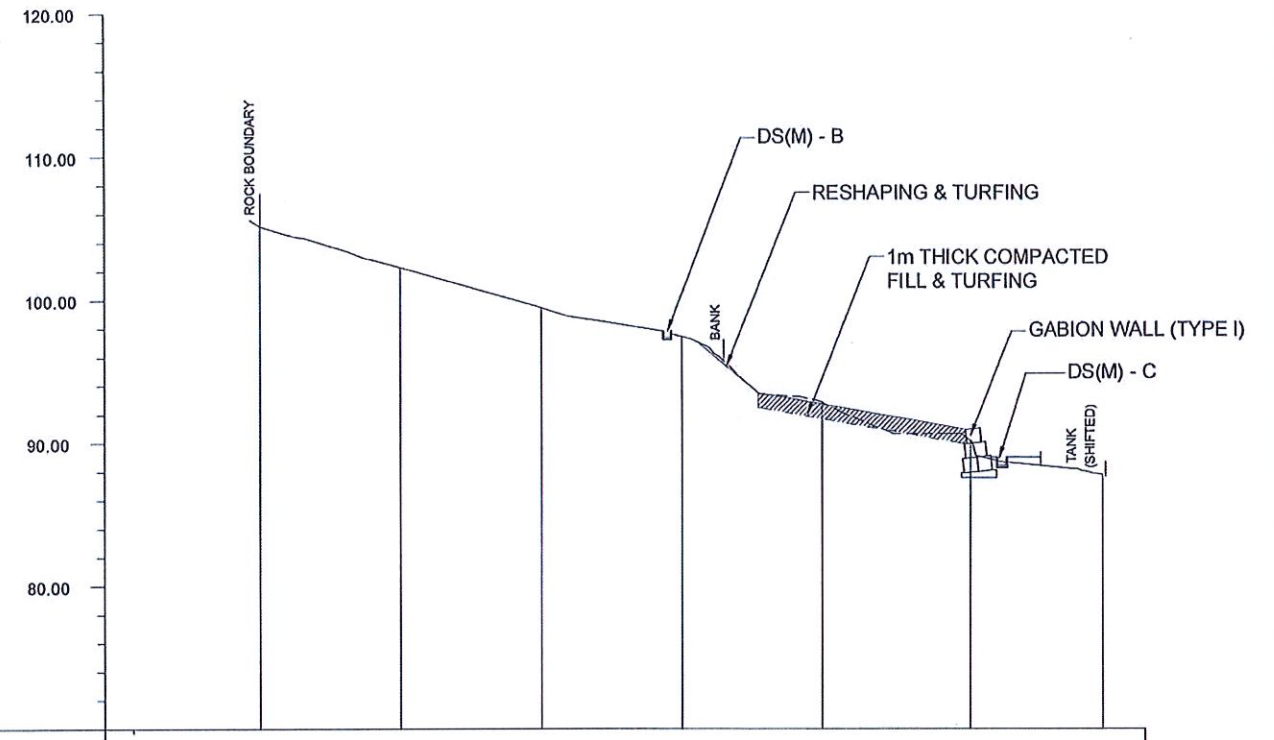
<p>EMPLOYER</p> <p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGNER</p> <p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>REVISION DESCRIPTION</th> <th>APPROVAL</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	DATE	REVISION DESCRIPTION	APPROVAL																	<p>PROJECT TITLE</p> <p style="text-align: center;">REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES POLGAHAWELA BUS STAND</p>	<p>TITLE</p> <p style="text-align: center;">PROPOSED RECTIFICATION PLAN</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>SCALE</td> <td>1 : 400</td> <td>DATE</td> <td>12.11.2020</td> </tr> <tr> <td>PROJECT / DRAWING No.</td> <td>RLVMM/WORKS/NCB/04A/07-PL/DR- 028</td> <td>REVISION</td> <td>00</td> </tr> </table>	SCALE	1 : 400	DATE	12.11.2020	PROJECT / DRAWING No.	RLVMM/WORKS/NCB/04A/07-PL/DR- 028	REVISION	00	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DESCRIPTION</th> <th>NAME</th> <th>SIGNATURE</th> </tr> </thead> <tbody> <tr> <td>DRAWN</td> <td>B.V.S. PATTRISHIYA</td> <td></td> </tr> <tr> <td>DESIGNER</td> <td>S.O.A.D.M. LAKRUWAN</td> <td></td> </tr> <tr> <td>CHECKED</td> <td>J.P. SAMARANAYAKA</td> <td></td> </tr> <tr> <td>RECOMMENDED</td> <td>PROF. S.A.S. KULATHILAKA</td> <td></td> </tr> <tr> <td>APPROVED</td> <td>K.N. BANDARA</td> <td></td> </tr> </tbody> </table>	DESCRIPTION	NAME	SIGNATURE	DRAWN	B.V.S. PATTRISHIYA		DESIGNER	S.O.A.D.M. LAKRUWAN		CHECKED	J.P. SAMARANAYAKA		RECOMMENDED	PROF. S.A.S. KULATHILAKA		APPROVED	K.N. BANDARA	
			REV	DATE	REVISION DESCRIPTION	APPROVAL																																														
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APPROVED	K.N. BANDARA																																																			



DATUM 70.00 m.

GROUND LEVEL (m)		106.19	103.32	100.85	98.67	94.77	91.16	89.49
HORIZONTAL DISTANCE (m)	00.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00


CS - 01



DATUM 70.00 m.

GROUND LEVEL (m)		106.78	103.91	101.07	99.07	94.47	92.16	89.38
HORIZONTAL DISTANCE (m)	00.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00

CS - 02

EMPLOYER

 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER

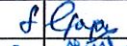

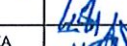

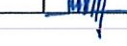
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 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

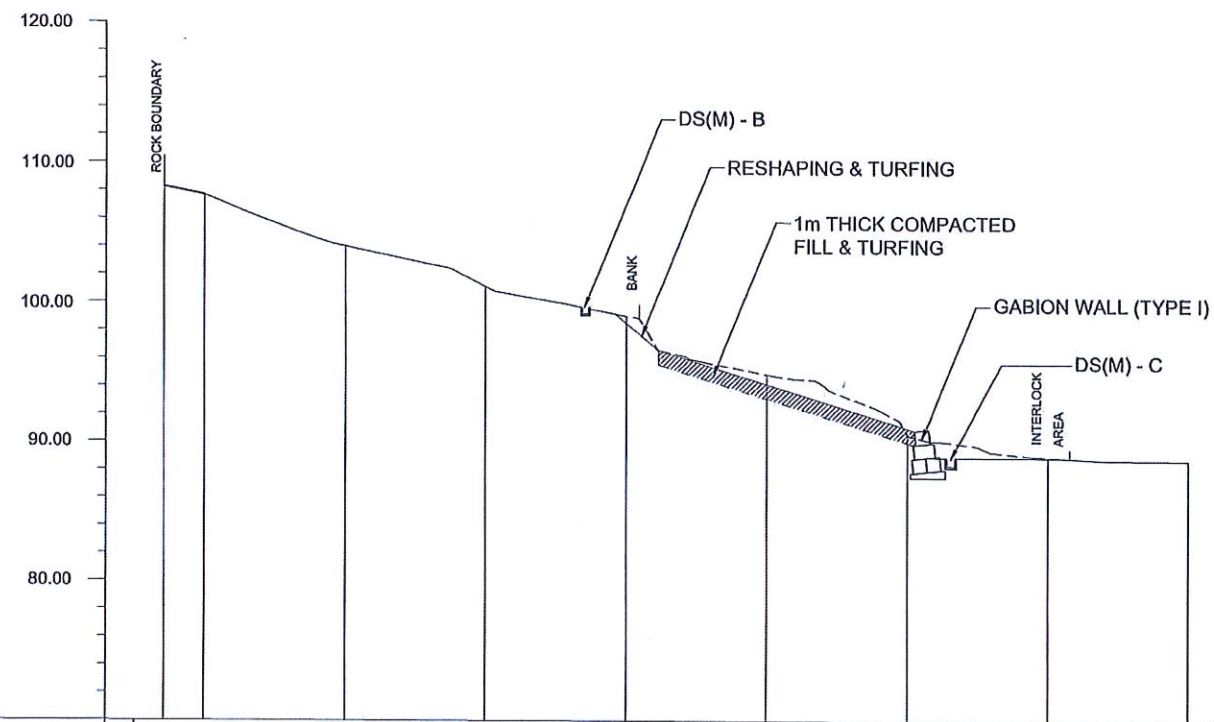
REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 POLGAHAWELA BUS STAND

TITLE
 DESIGN CROSS SECTIONS

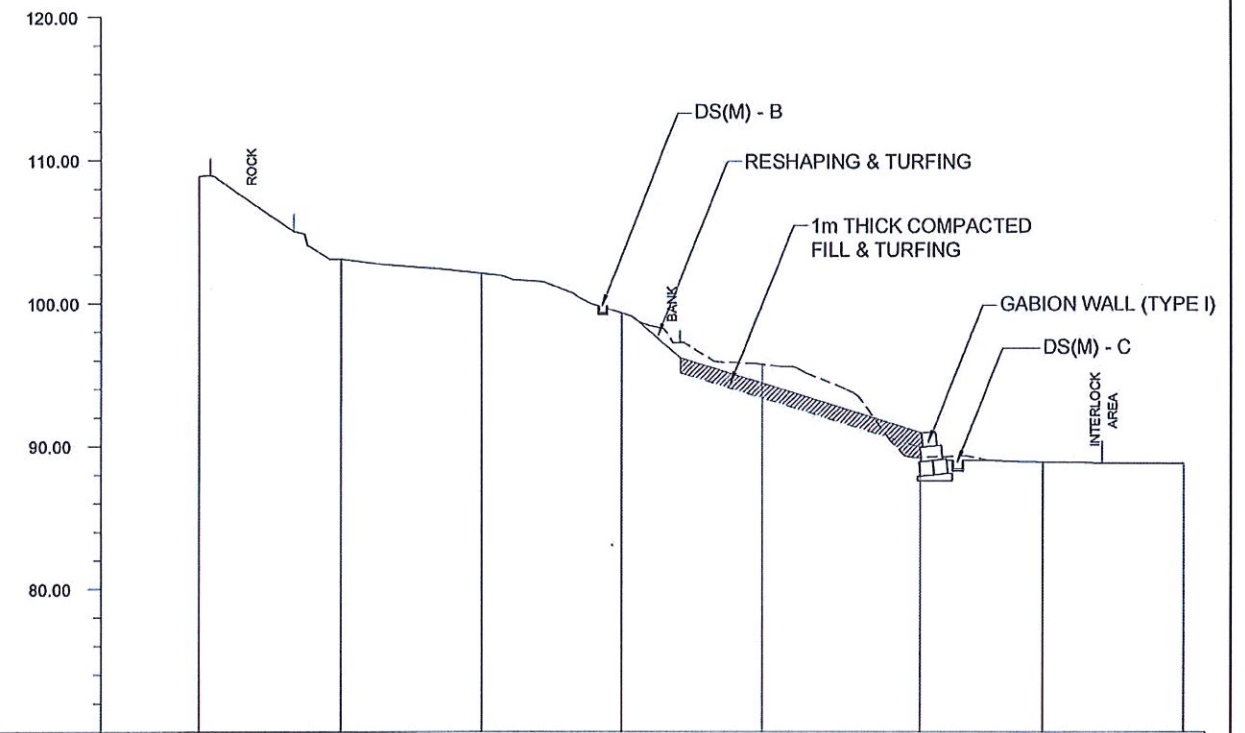
SCALE	1 : 500	DATE	12.11.2020
PROJECT / DRAWING No.	RLVMMP/WORKS/NCB/04A/07-PL/DR-026	REVISION	00

DESCRIPTION	NAME	SIGNATURE
DRAWN	B.V.S. PATTRISHIYA	
DESIGNER	S.O.A.D.M. LAKRUWAN	
CHECKED	J.P. SAMARANAYAKA	
RECOMMENDED	PROF. S.A.S. KULATHILAKA	
APPROVED	K.N. BANDARA	








DATUM 70.00 m.	
GROUND LEVEL (m)	108.27 107.69 104.01 101.17 99.07 94.92 90.64 89.05 88.82
HORIZONTAL DISTANCE (m)	07.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00

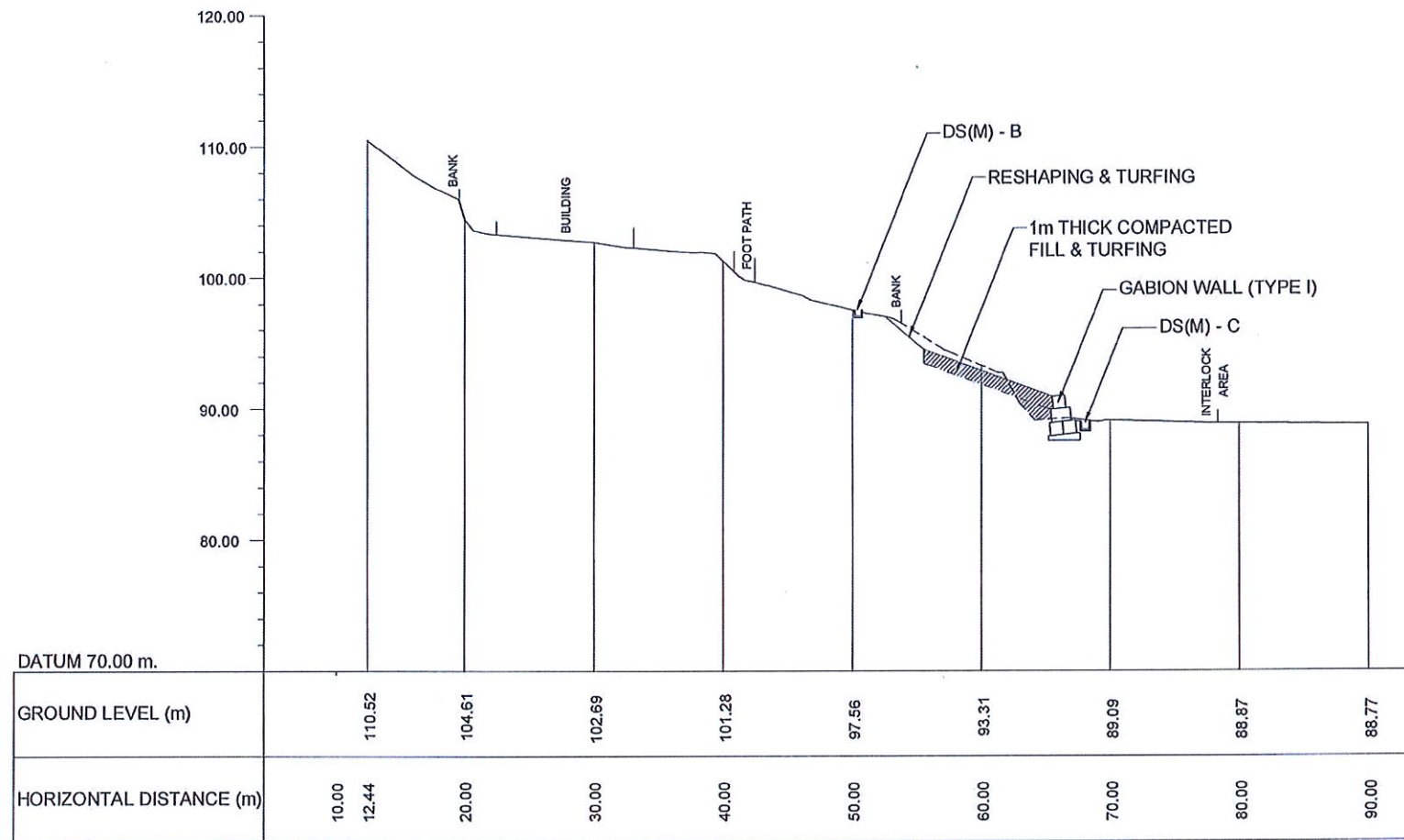
CS - 03






DATUM 70.00 m.	
GROUND LEVEL (m)	108.88 103.08 102.08 99.32 95.73 89.47 88.88 88.81
HORIZONTAL DISTANCE (m)	05.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00

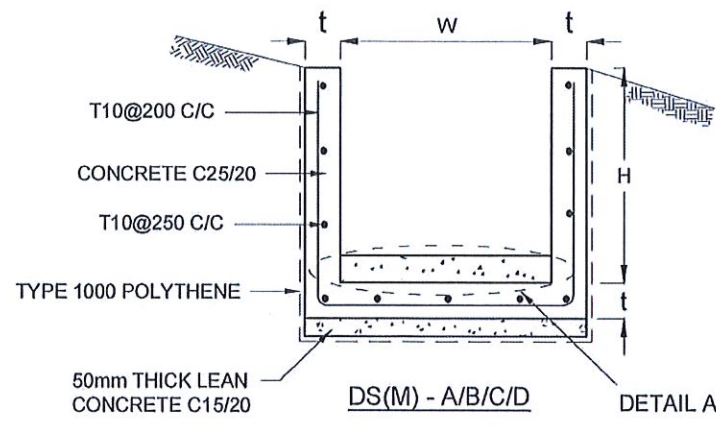
CS - 04

EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV []	DATE []	REVISION DESCRIPTION []	APPROVAL []	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES POLGAHAWELA BUS STAND	TITLE DESIGN CROSS SECTIONS	DESCRIPTION DRAWN	NAME B.V.S. PATTRISHIYA	SIGNATURE 
		SCALE 1 : 500	DATE 12.11.2020	REVISION 00	RECOMMENDED			PROF. S.A.S. KULATHILAKA		
PROJECT / DRAWING No. RLVMP/WORKS/NCB/04/AJ07-PL/DR-02c							APPROVED	K.N. BANDARA		



CS - 05

EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES POLGAHAWELA BUS STAND	TITLE DESIGN CROSS SECTIONS	DESCRIPTION	NAME	SIGNATURE
		SCALE	1 : 500	DATE	12.11.2020			REVISION	00	RECOMMENDED
PROJECT / DRAWING No. RLVMMPP/WORKS/NCB/04A/07-PLDR- 02d							APPROVED	K.N. BANDARA		



DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (M) - A /P	300	300	100
DS (M) - B/R	450	450	100
DS (M) - C/Q	600	600	100
DS (M) - D	750	750	125
DS (M) - E	900	900	150
DS (M) - F	1000	1000	150

NOTES

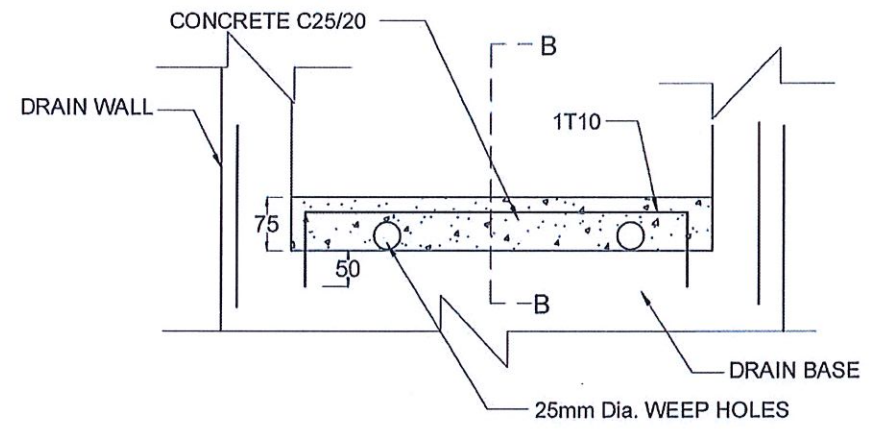
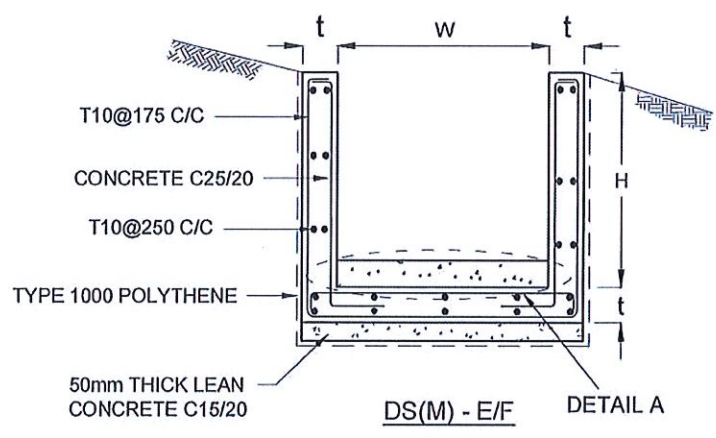
- DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
- STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
- DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
- 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.

CONCRETE

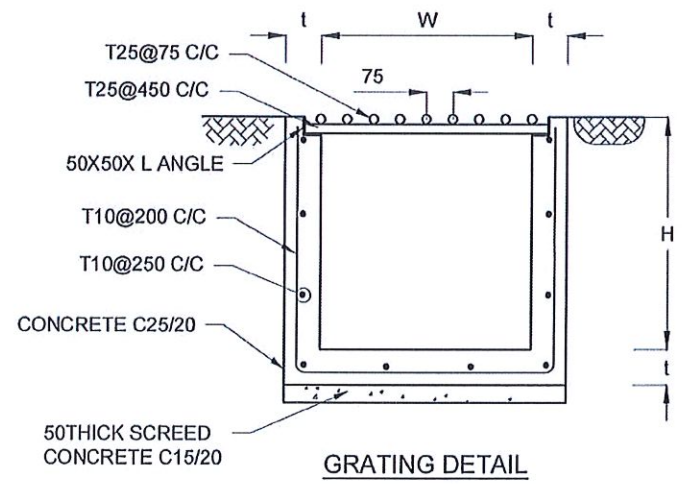
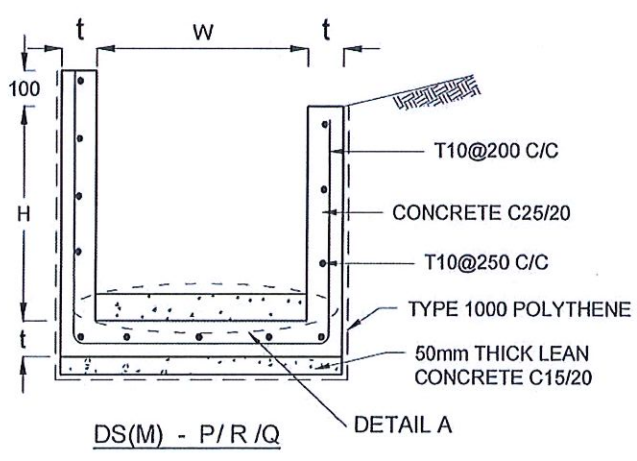
- USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

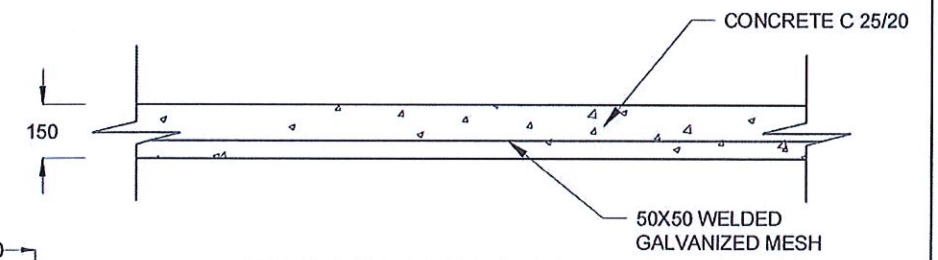
- ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
- BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
- ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
- REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
- COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



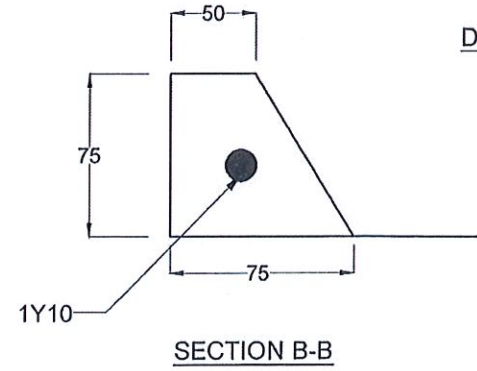
DETAIL A - (ENERGY BREAKER AT 3M)



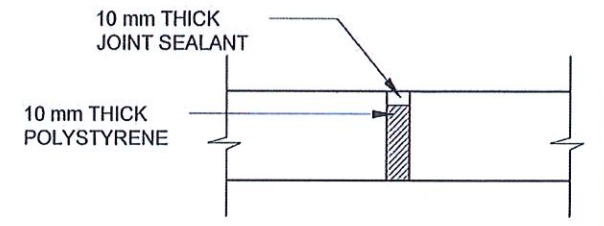
GRATING DETAIL





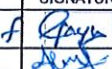




DETAILS OF BERM SEALING

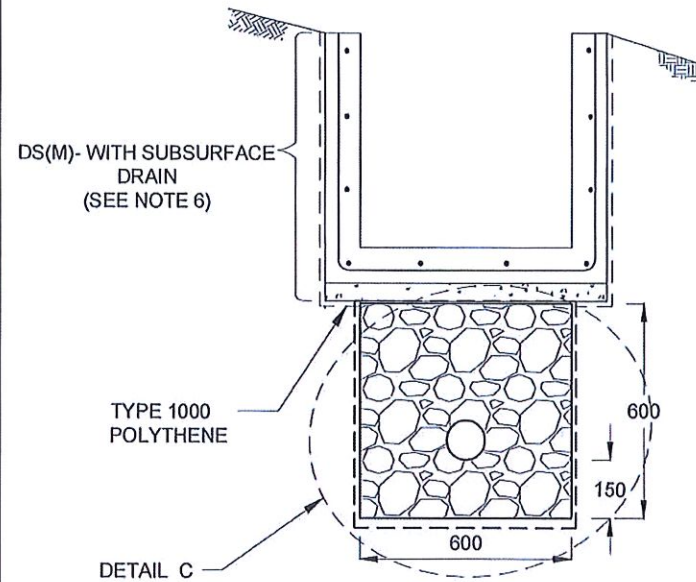


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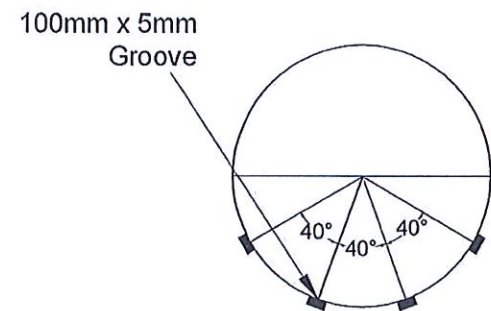


EXPANSION JOINT DETAIL

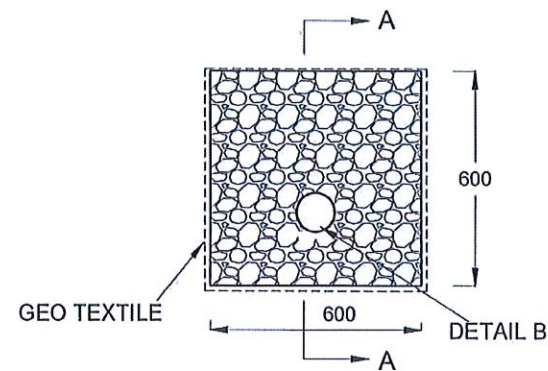
EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV 1 2 3 4 5 6 7 8 9 10	DATE 	REVISION DESCRIPTION 	APPROVAL 	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES POLGAHAWELA BUS STAND	TITLE DETAILS OF DRAINS (SURFACE DRAIN -1 OF 2)	DESCRIPTION DRAWN DESIGNER CHECKED RECOMMENDED APPROVED	NAME B.V.S. PATTRISHIYA S.O.A.D.M. LAKRUWAN J.P. SAMARANAYAKA PROF. S.A.S. KULATHILAKA K.N. BANDARA	SIGNATURE     
		SCALE N.T.S. PROJECT / DRAWING No. RLVMP/WORKS/INCB/04A/07-PL/DR- 03a DATE 12.11.2020 REVISION 00	REVISION 00	APPROVED	APPROVED					



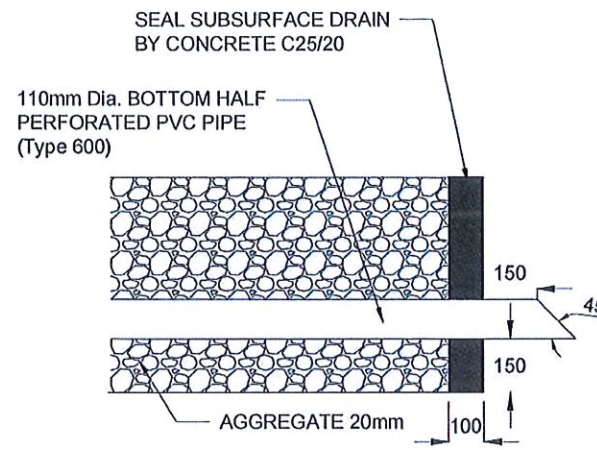
SUBSURFACE DRAIN [DS (S) -A]



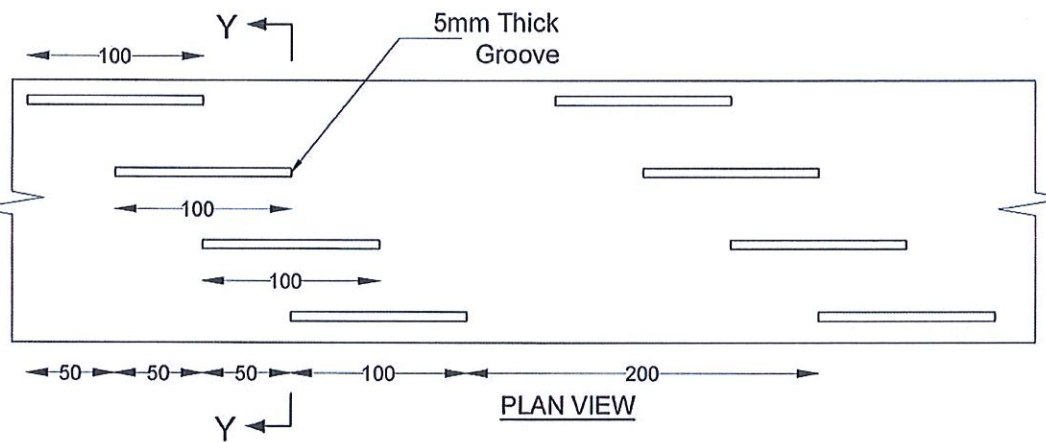
SECTION Y - Y



DETAIL C / DS (S) -A

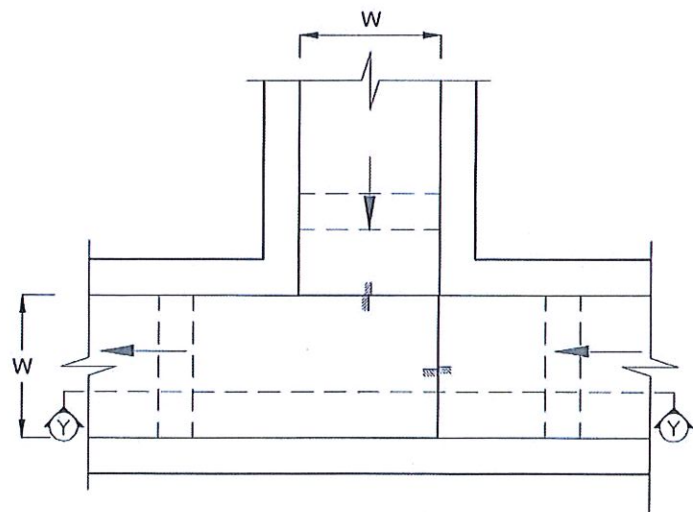


SECTION A-A (OUTLET DETAIL SUBSURFACE DRAIN)

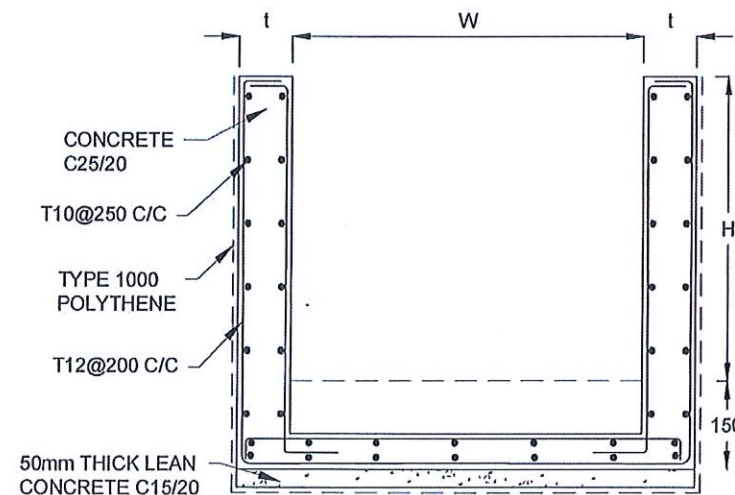


PLAN VIEW

DETAIL - B (PERFORATED PIPE FOR SUB-SURFACE DRAINS)



PLAN VIEW OF CATCH PIT (CP)



SECTION Y-Y (CP-R)

NOTES

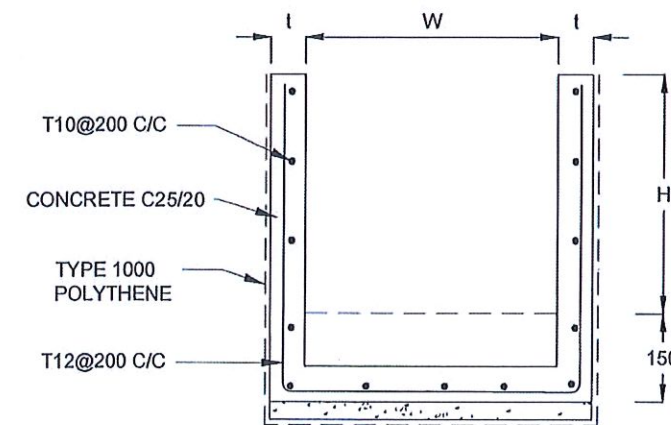
1. W,H,t ; SHALL BE THE SAME AS RESPECTIVE DRAIN SECTION.
2. CP - R SHALL BE USED WHERE H > = 900mm
3. DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. DETAILS OF SURFACE DRAIN PORTION OF THE SUBSURFACE DRAINS SHALL BE AS PER DS(M), DS(B), DS(K) OR DS(C) SECTIONS ACCORDINGLY.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

CONCRETE

8. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

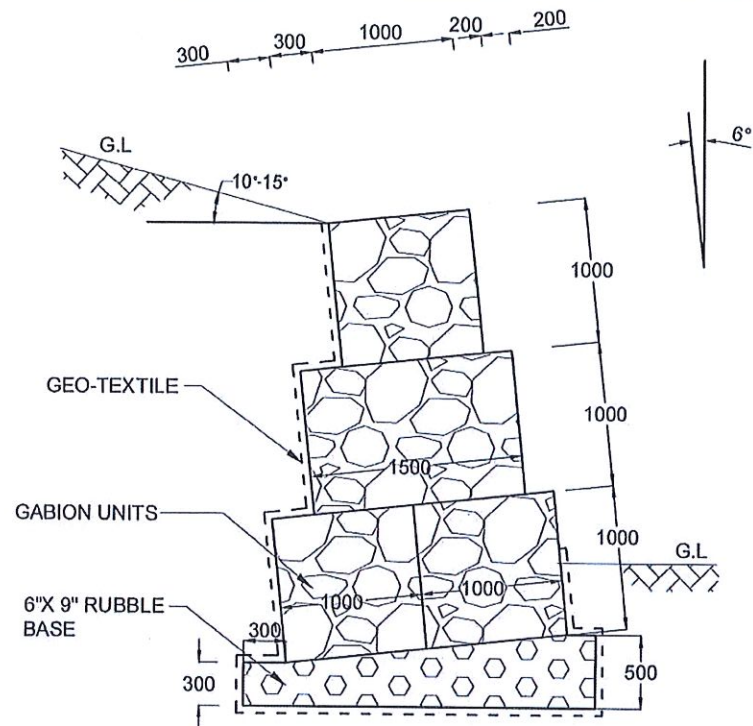
REINFORCEMENT

9. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
10. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
11. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
12. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
13. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm

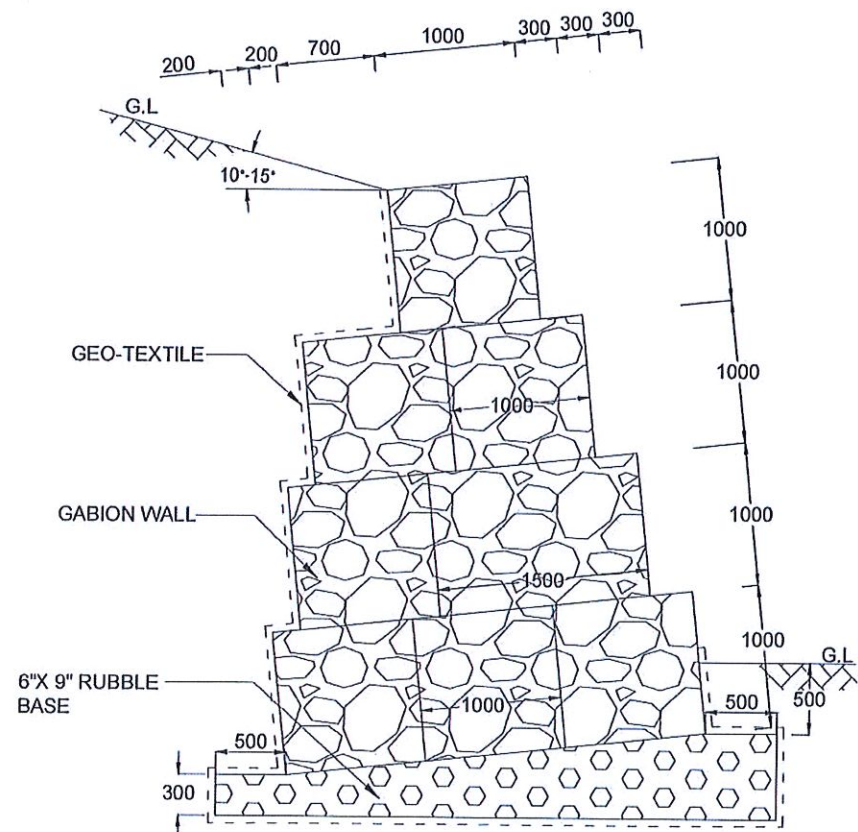


SECTION Y - Y

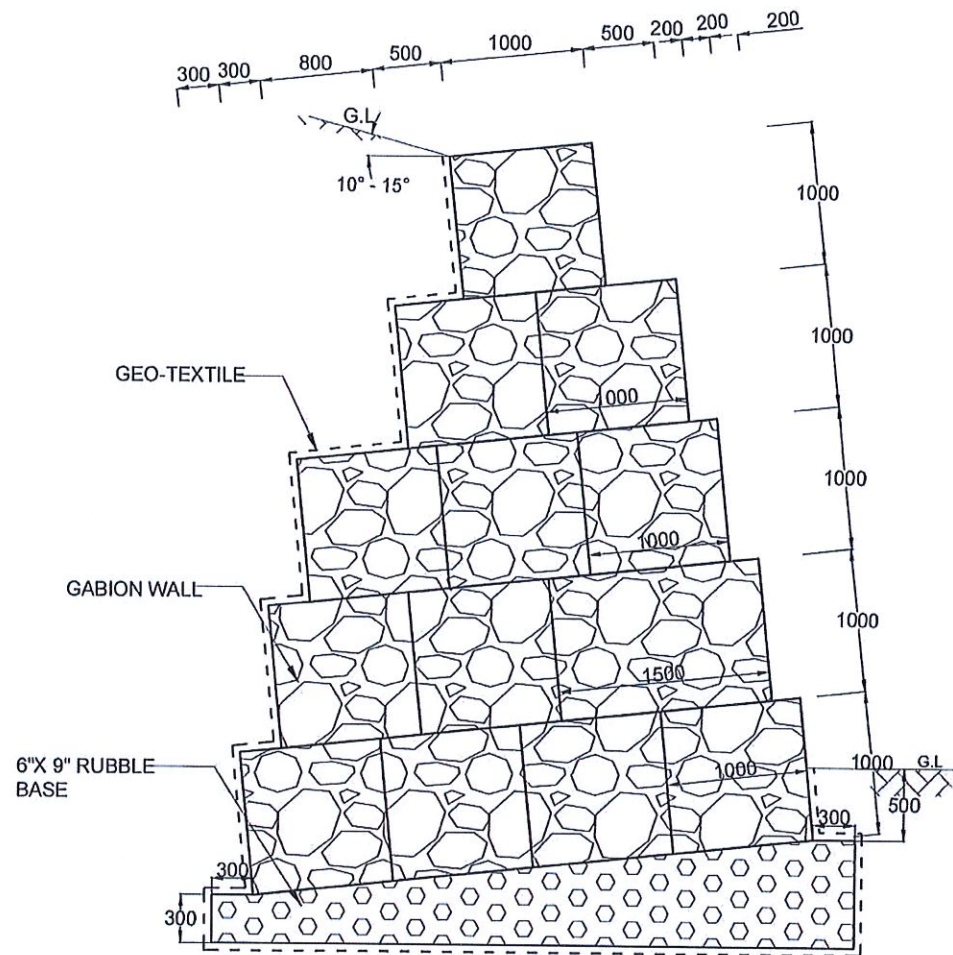
EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1 ,JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1 ,JAWATTA ROAD COLOMBO - 05	REV. DATE REVISION DESCRIPTION APPROVAL PROJECT TITLE	REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES POLGAHAWELA BUS STAND	TITLE DETAILS OF DRAINS (SUBSURFACE DRAIN AND CATCHPIT)	DESCRIPTION NAME SIGNATURE
		PROJECT / DRAWING No. RLVMP/WORKS/NCB/04/A/07-PL/DR- 03b			DATE 12.11.2020 REVISION 00



GABION WALL
TYPE I





GABION WALL
TYPE II

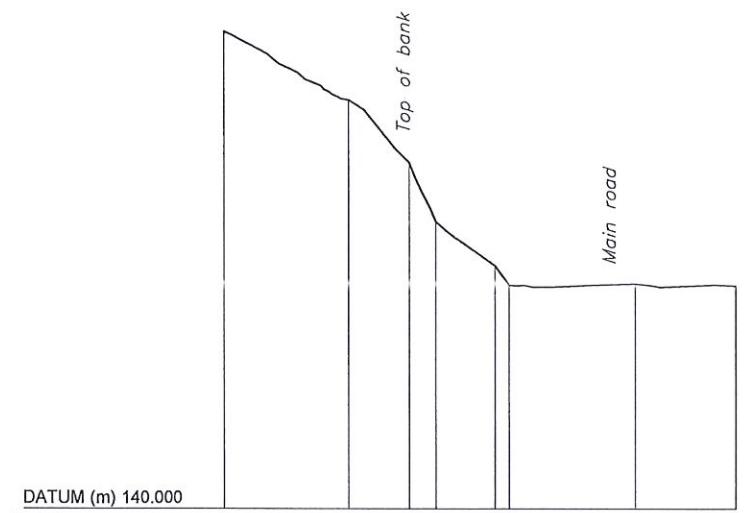


GABION WALL
TYPE III

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS.

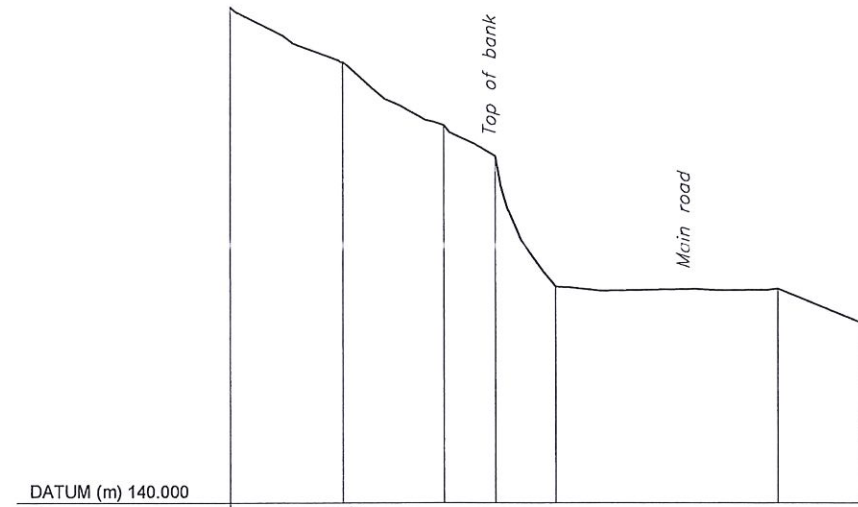
EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES POLGAHAWELA BUS STAND	TITLE DETAILS OF GABION WALL	DESCRIPTION NAME SIGNATURE
		SCALE N.T.S. PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/07-PL/DR-04	DATE 12.11.2020 REVISION 00	DRAWN B.V.S. PATTRISHIYA DESIGNER S.O.A.D.M. LAKRUWAN CHECKED J.P. SAMARANAYAKA RECOMMENDED PROF. S.A.S. KULATHILAKA APPROVED K.N. BANDARA	



DATUM (m) 140.000

GROUND ELEVATION	177.667	172.271	167.300	166.624	159.143	157.750	157.598	
DISTANCE	0.000	10.037	14.911	17.022	21.761	22.869	33.014	41.114

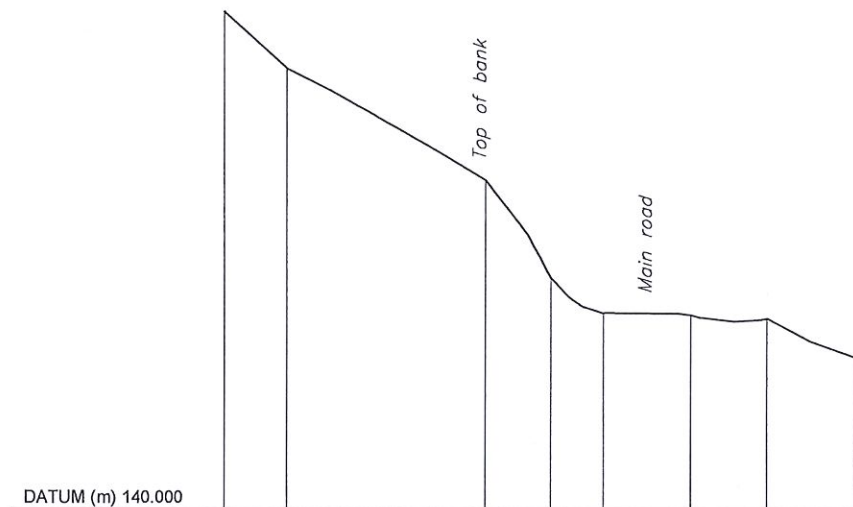
SECTION-1



DATUM (m) 140.000

GROUND ELEVATION	179.134	174.780	169.799	167.351	157.048	156.896	154.208
DISTANCE	0.000	9.060	17.192	21.351	26.216	44.008	50.702

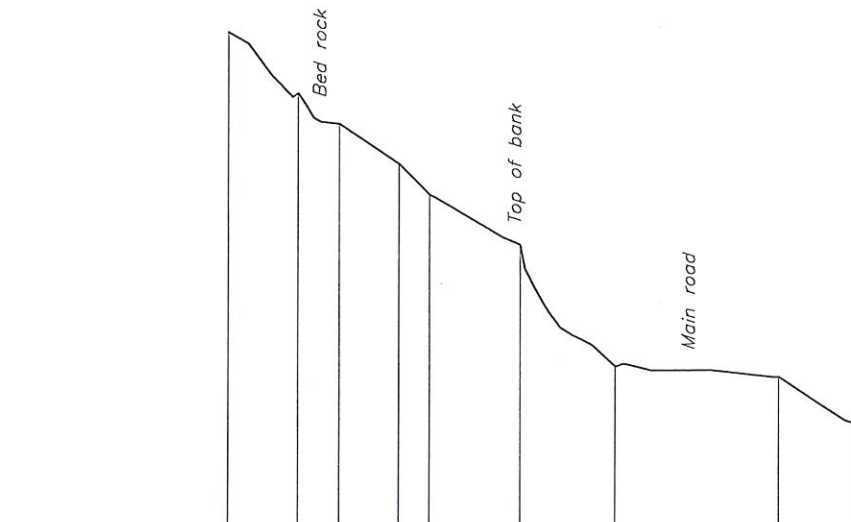
SECTION-2



DATUM (m) 140.000

GROUND ELEVATION	179.261	174.795	165.956	158.228	155.473	155.308	155.046	152.007
DISTANCE	0.000	5.041	20.936	26.191	30.479	37.483	43.614	50.702



SECTION-3

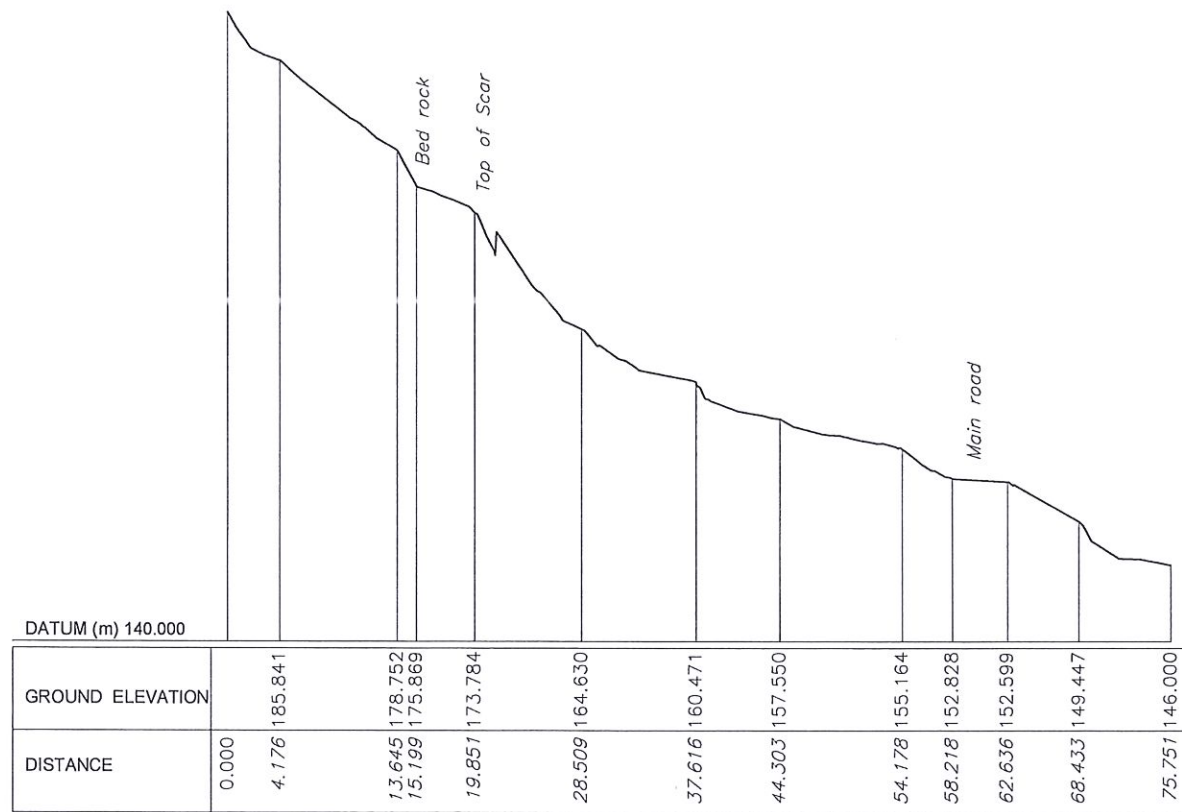


DATUM (m) 140.000

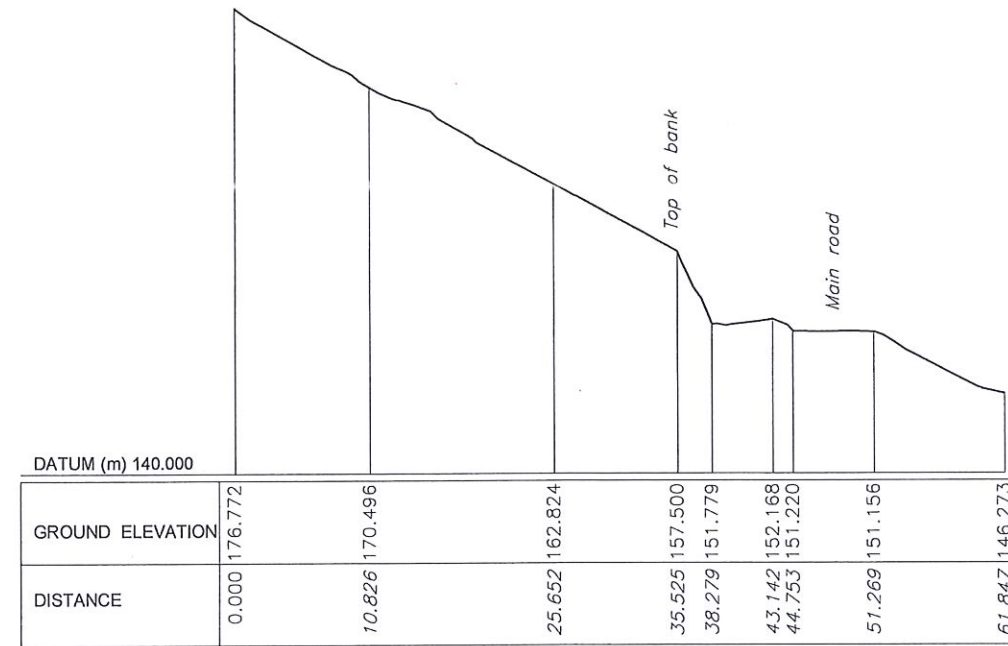
GROUND ELEVATION	180.996	176.170	173.755	170.588	168.157	164.186	154.520	153.675	150.000
DISTANCE	0.000	5.543	8.883	13.740	16.197	23.485	31.070	44.249	50.417

SECTION-4

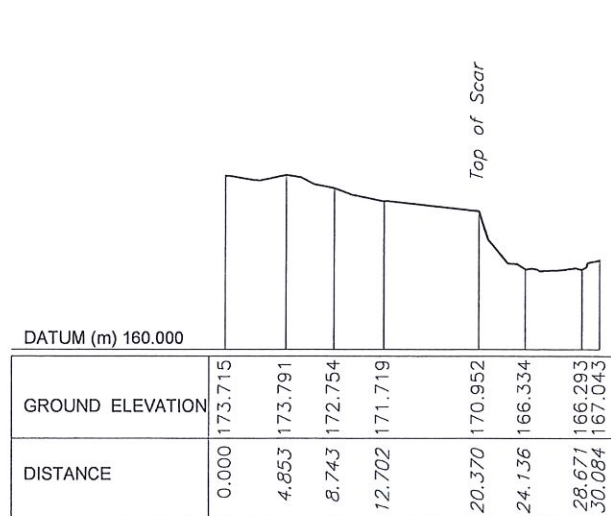
 <p>EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	 <p>DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	REV	DATE	REVISION DESCRIPTION	APPROVAL	<p>PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)</p>	<p>TITLE SURVEY CROSS SECTIONS</p>	DESCRIPTION	NAME	SIGNATURE	
								SURVEYED	KAMAL DESHAPRIYA		
								CHECKED	M. H. M. HARSHANI		
							SCALE	1:750	DATE	05.11.2020	
							PROJECT / DRAWING No.	RLVMP/WORKS/NCB/04A/25-Ru/DR - 02a	REVISION	00	



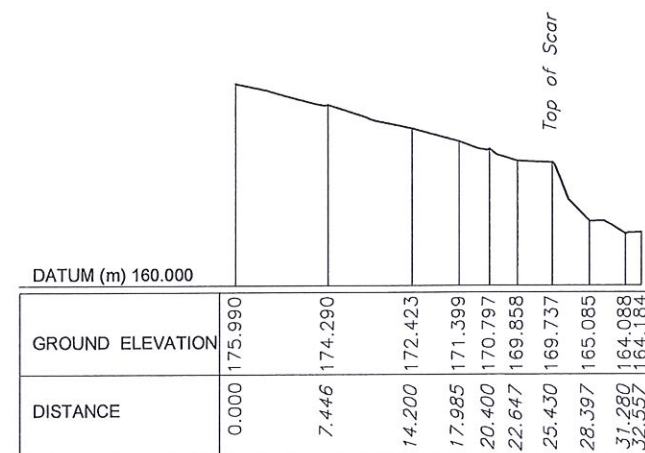
SECTION-5



SECTION-6

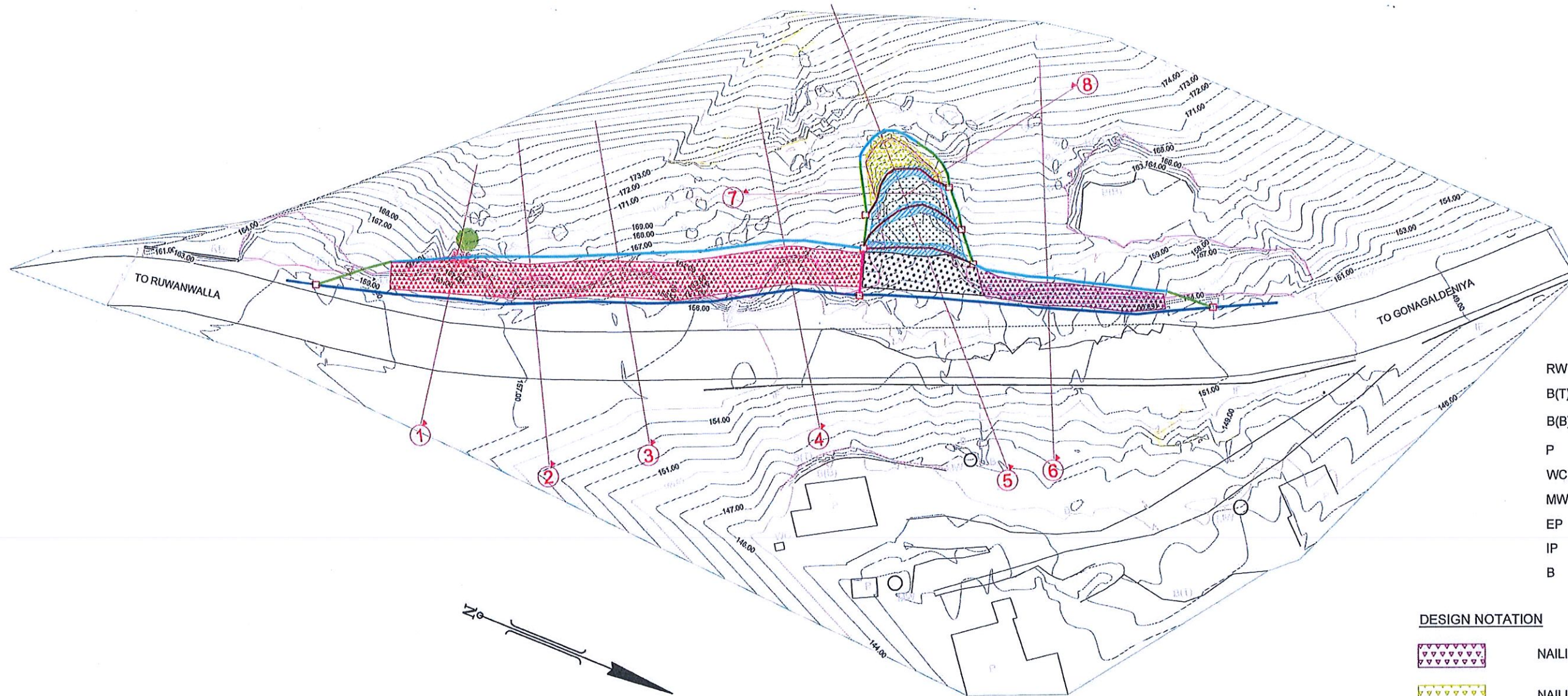


SECTION-7



SECTION-8

<p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	REV	DATE	REVISION DESCRIPTION	APPROVAL	<p>PROJECT TITLE</p> <p>REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)</p>	<p>TITLE</p> <p>SURVEY CROSS SECTIONS</p>	DESCRIPTION	NAME	SIGNATURE
							SCALE	1:750	DATE	05.11.2020
							PROJECT / DRAWING No.	RLVMP/WORKS/NCB/04A/25-Ru/DR - 02b	REVISION	00



REFERENCE

- RW - RETAINING WALL
- B(T) - TOP OF BANK
- B(B) - BOTTOM OF BANK
- P - PERMANENT BUILDING
- WC - WATER CLOSET
- MW - MASONARY WALL
- EP - ELECTRICITY POST
- IP - IRON FENCE
- B - BOULDER

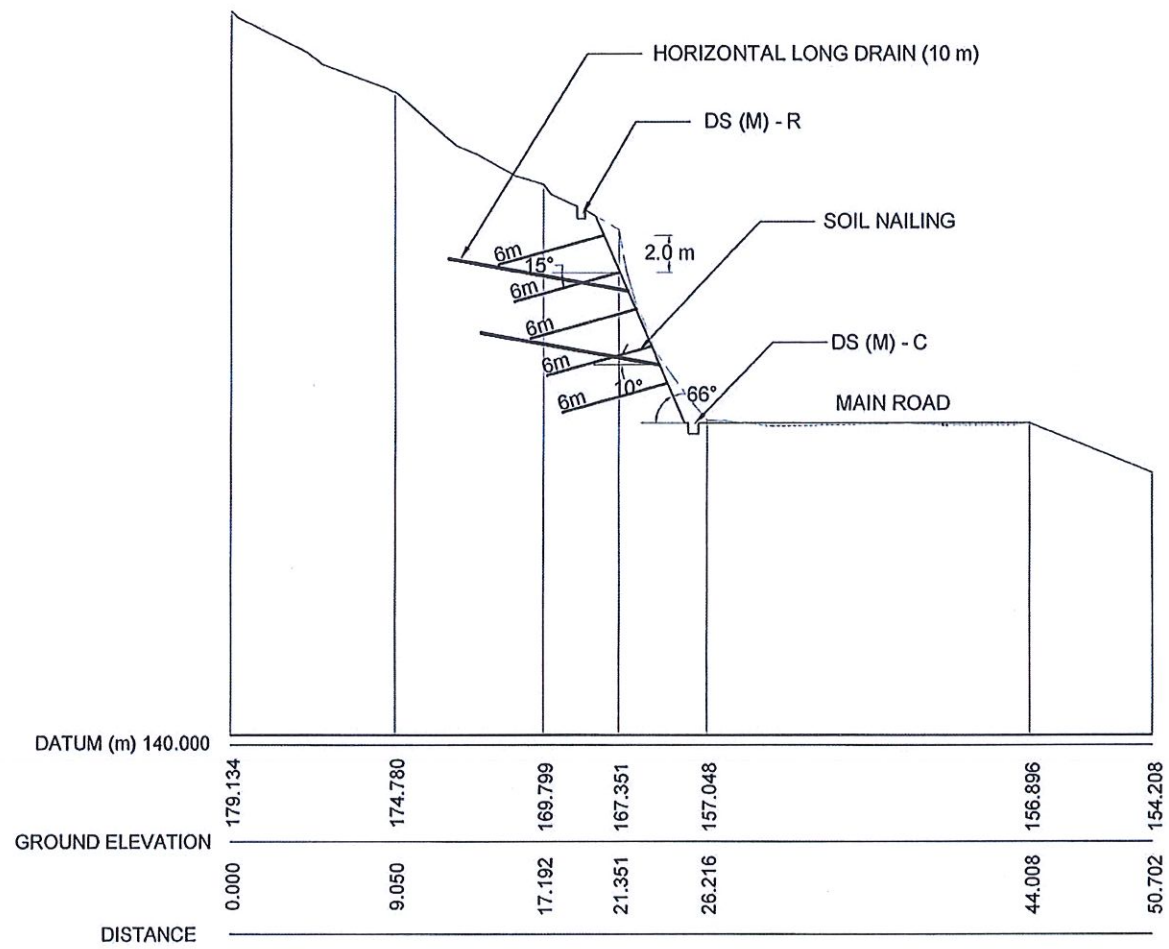
DESIGN NOTATION

- NAILING AREA A
- NAILING AREA B
- NAILING AREA C
- RESHAPING AND TURFING AREA
- DEBRIS REMOVAL
- BERM AREA
- DS(B) - A TYPE I
- DS(M) - B
- DS(M) - C WITH COVER SLAB
- DS(M) - R
- DS(C) - B
- CATCH PIT

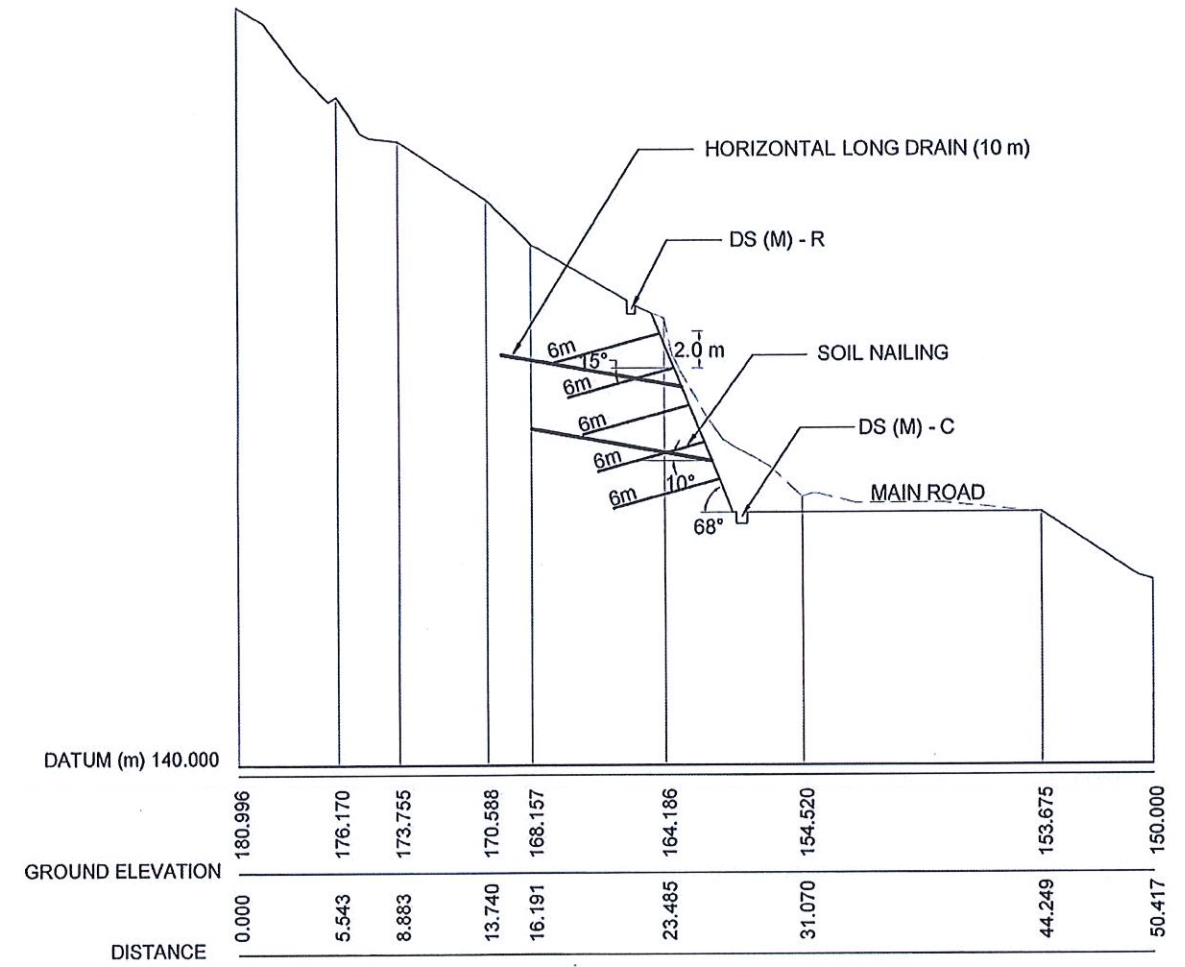
NOTE:

1. SURFACE AND CASCADE DRAIN LOCATIONS (PATH OF THE DRAINS) AND LENGTH MIGHT BE VARIED ACCORDING TO ACTUAL SITE CONDITIONS.
2. LOCATIONS OF THE CATCH PITS MIGHT BE VARIED ACCORDING TO THE ACTUAL SITE CONDITIONS.






EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)	TITLE		DESCRIPTION	NAME	SIGNATURE
								PLAN VIEW OF PROPOSED MITIGATION MEASURES	SCALE 1:750	DATE 05.11.2020	DRAWN
							PROJECT / DRAWING No.	REVISION	DESIGNER	M. H. M. HARSHANI	
							RLVMP/WORKS/NCB/04/25-Ru/DR - 03	00	CHECKED	J.P. SAMARANAYAKA	
									RECOMMENDED	PROF. S.A.S. KULATHILAKA	
									APPROVED	K.N. BANDARA	

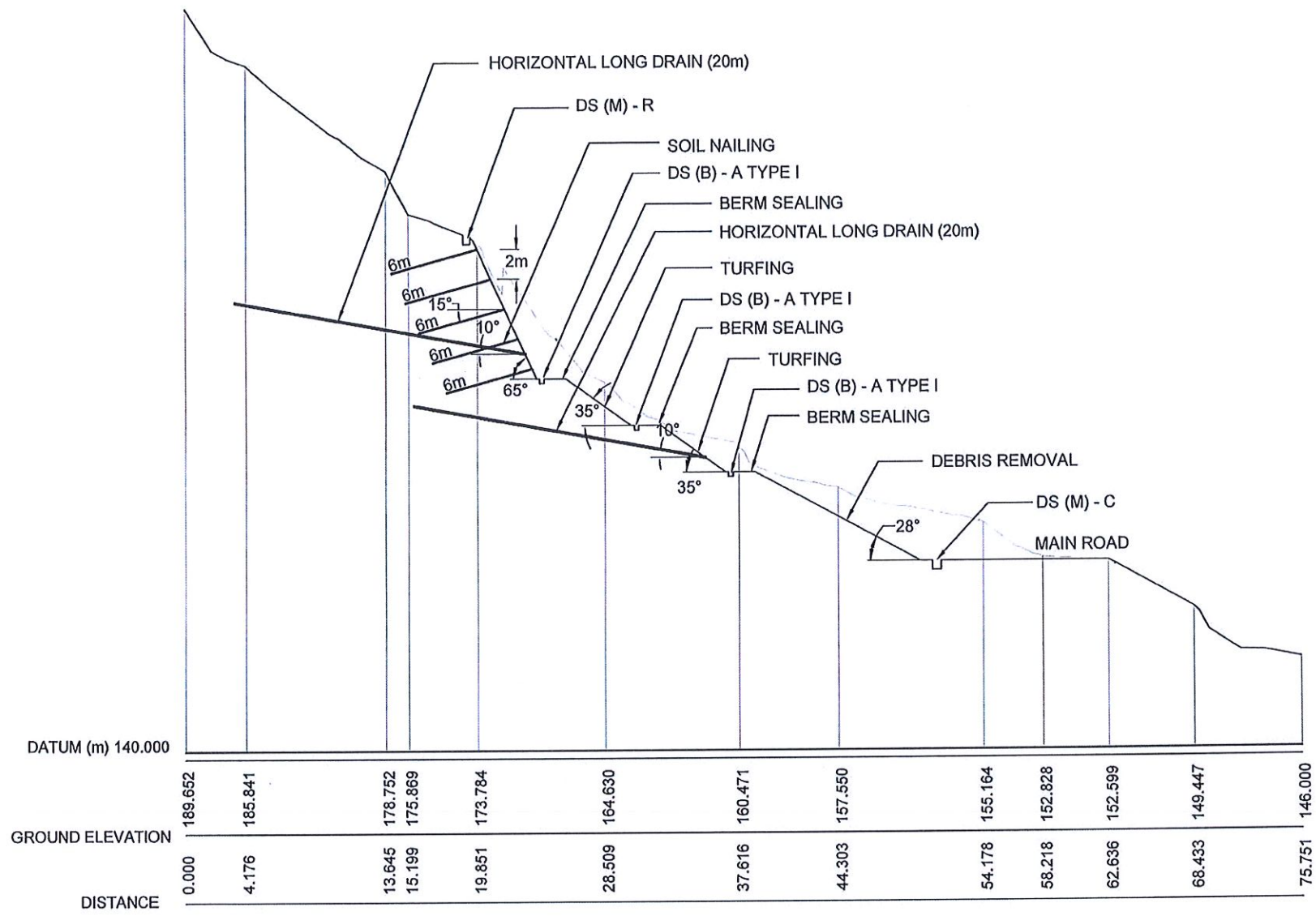


SECTION-2

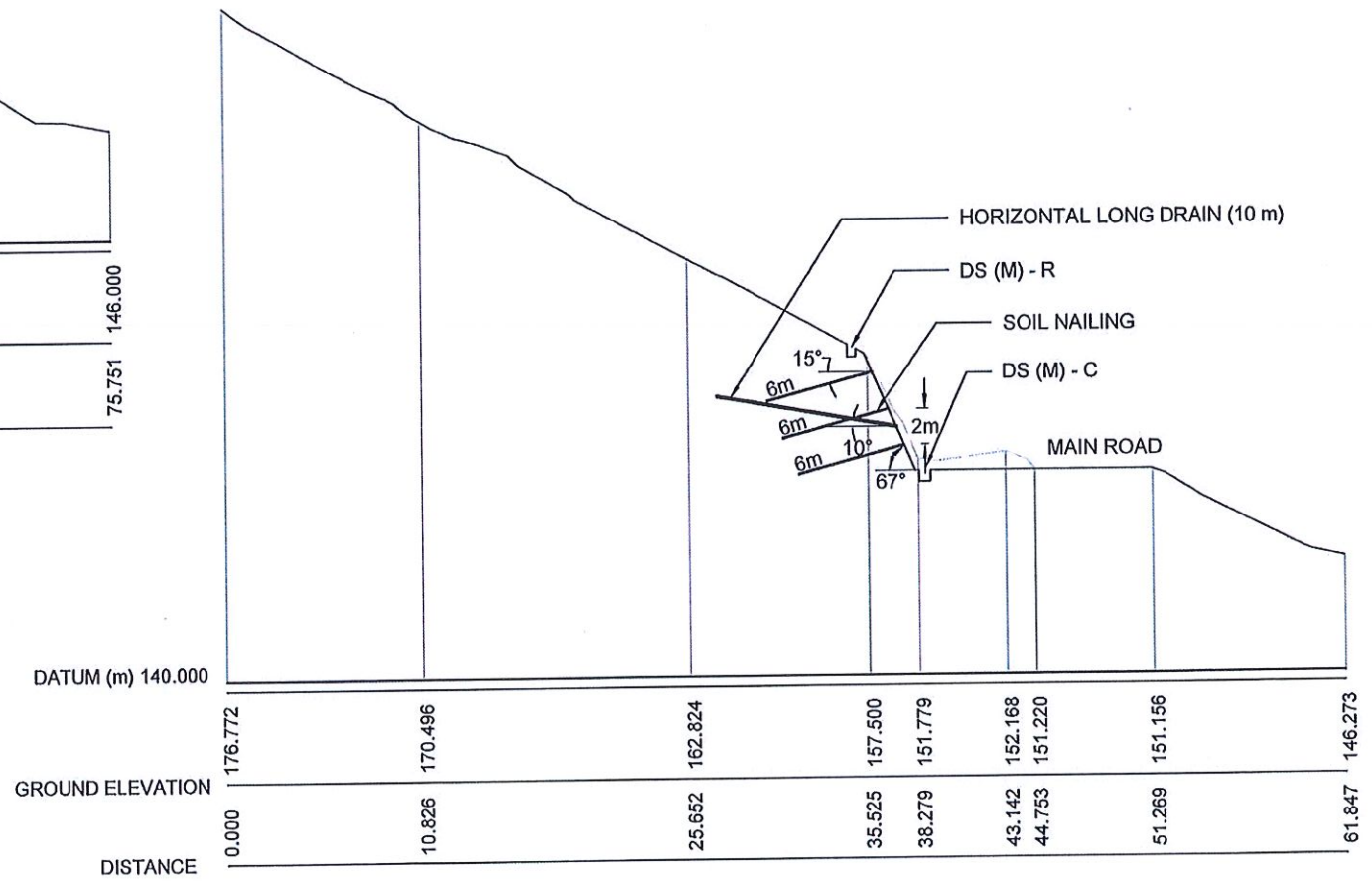


SECTION-4

EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV []	DATE []	REVISION DESCRIPTION []	APPROVAL []	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)	TITLE CROSS SECTIONS OF PROPOSED MITIGATION MEASURES		DESCRIPTION DRAWN	NAME S.A.G.D. SENANAYAKA	SIGNATURE 
		SCALE 1:400	DATE 05.11.2020	REVISION 00	RECOMMENDED		PROF. S.A.S. KULATHILAKA				
PROJECT / DRAWING No. RLVMMMP/WORKS/NCB/04A/25-Ru/DR - 04a							APPROVED		K.N. BANDARA		

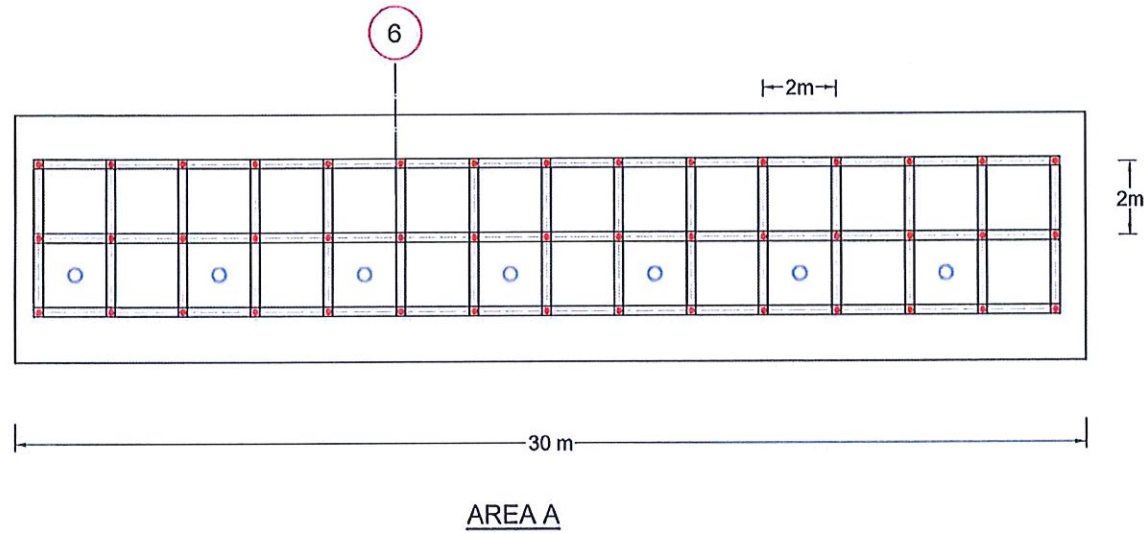


SECTION-5

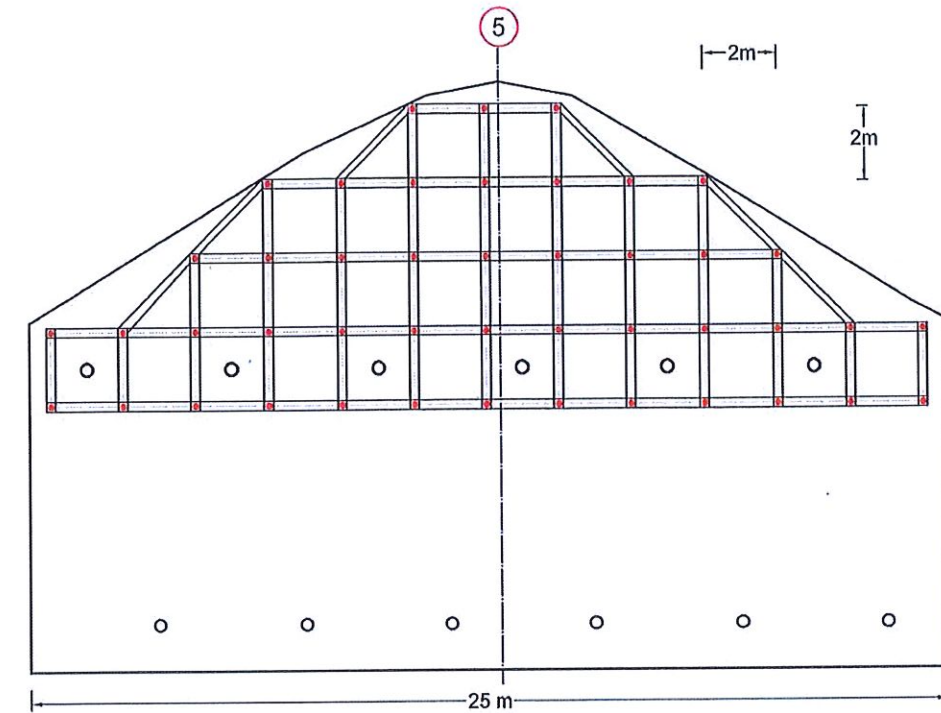


SECTION-6

<p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	REV	DATE	REVISION DESCRIPTION	APPROVAL	<p>PROJECT TITLE</p> <p>REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)</p>	TITLE		<p>DESCRIPTION</p> <p>DRAWN</p> <p>DESIGNER</p> <p>CHECKED</p> <p>RECOMMENDED</p> <p>APPROVED</p>	<p>NAME</p> <p>S.A.G.D. SENANAYAKA</p> <p>M. H. M. HARSHANI</p> <p>J.P. SAMARANAYAKA</p> <p>PROF. S.A.S. KULATHILAKA</p> <p>K.N. BANDARA</p>	<p>SIGNATURE</p>
								SCALE			
							1:400	05.11.2020			
							PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/25-Ru/DR - 04t	REVISION 00			



AREA A



AREA B

LEGEND



- SOIL NAILING -
 - TOTAL NAIL LENGTH= 6 m
 - NO'S OF NAIL = 45
 - REINFORCEMENT DIAMETER =32 mm
 - DIAMETER OF THE DRILLED HOLE =125 mm
 - NAIL SPACING = 2.0 m
- HORIZONTAL LONG DRAINAGE -
 - HORIZONTAL LONG DRAIN LENGTH =10 m
 - NO' S OF LONG DRAIN= 7
 - DIAMETER = 90 mm

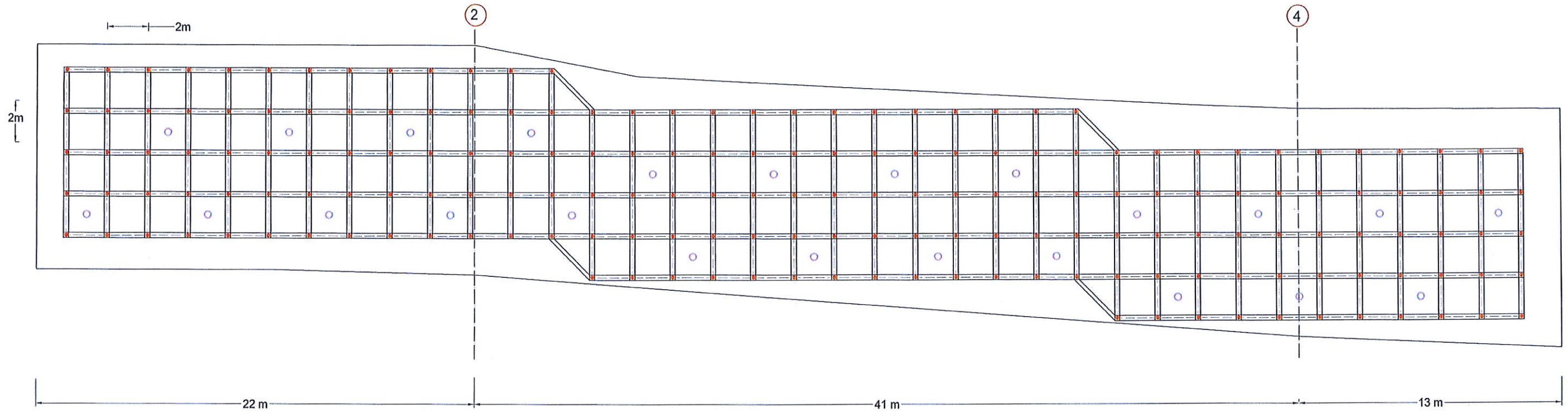
LEGEND

- SOIL NAILING -
 - TOTAL NAIL LENGTH= 6 m
 - NO'S OF NAIL = 45
 - REINFORCEMENT DIAMETER =32 mm
 - DIAMETER OF THE DRILLED HOLE =125 mm
 - NAIL SPACING = 2.0 m
- HORIZONTAL LONG DRAINAGE -
 - HORIZONTAL LONG DRAIN LENGTH =20 m
 - NO' S OF LONG DRAIN= 12
 - DIAMETER = 90 mm

NOTES

1. LENGTH OF THE SOIL NAILS,LENGTH & LOCATION OF HORIZONTAL DRAINS
MIGHT BE VARIED ACCORDING TO THE ACTUAL SOIL PROFILE OR SITE CONDITION.

EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1 ,JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1 ,JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)	TITLE		DESCRIPTION	NAME	SIGNATURE
		SCALE	1:200	DATE	05.11.2020		REVISION	00	FRONT ELEVATION OF PROPOSED MITIGATION MEASURES AREA A & B	DRAWN S.A.G.D. SENANAYAKA	DESIGNER M. H. M. HARSHANI



AREA C

LEGEND

■ SOIL NAILING -



○ HORIZONTAL LONG DRAINAGE -

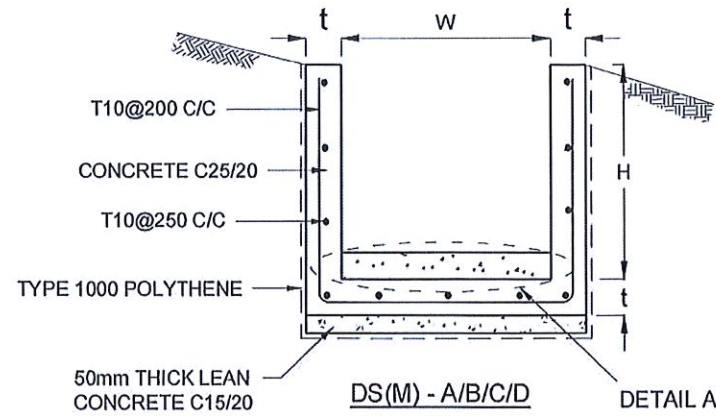
TOTAL NAIL LENGTH= 6 m
 NO'S OF NAIL = 185
 REINFORCEMENT DIAMETER =32 mm
 DIAMETER OF THE DRILLED HOLE =125 mm
 NAIL SPACING = 2.0 m

HORIZONTAL LONG DRAIN LENGTH =10 m
 NO' S OF LONG DRAIN = 24
 DIAMETER = 90 mm

NOTES

1. LENGTH OF THE SOIL NAILS,LENGTH & LOCATION OF HORIZONTAL DRAINS MIGHT BE VARIED ACCORDING TO THE ACTUAL SOIL PROFILE OR SITE CONDITION.

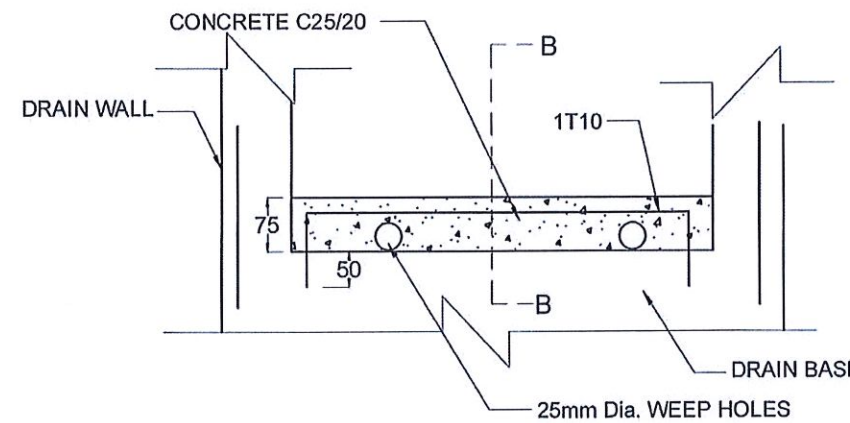
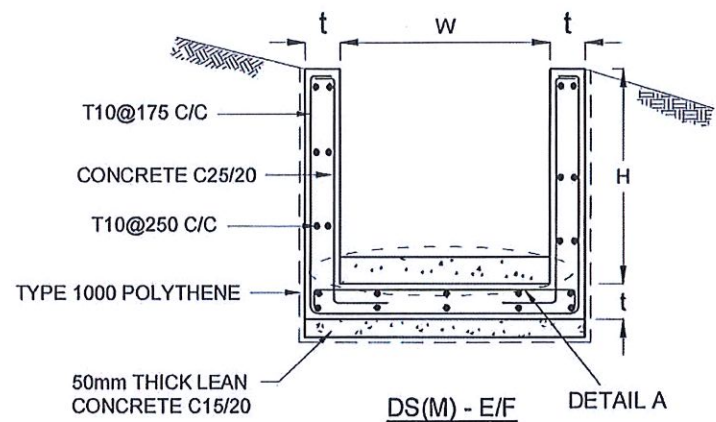
EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1 ,JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1 ,JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)	TITLE FRONT ELEVATION OF PROPOSED MITIGATION MEASURES AREA C	DESCRIPTION	NAME	SIGNATURE	
									SCALE 1:200	DATE 05.11.2020	RECOMMENDED
							PROJECT / DRAWING No.	REVISION	APPROVED	K.N. BANDARA	
							RLVMMMP/WORKS/NCB/04A/25-Ru/DR - 05b	00			



DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (M) - A /P	300	300	100
DS (M) - B/R	450	450	100
DS (M) - C/Q	600	600	100
DS (M) - D	750	750	125
DS (M) - E	900	900	150
DS (M) - F	1000	1000	150

NOTES

- DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
- STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
- DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OR OTHERWISE STATED.
- 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.



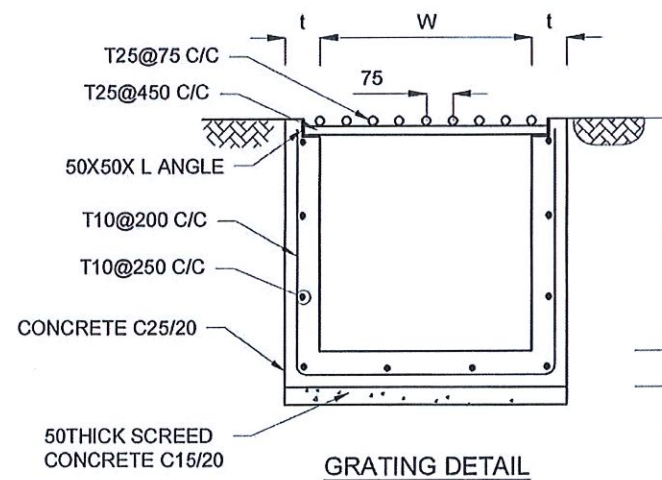
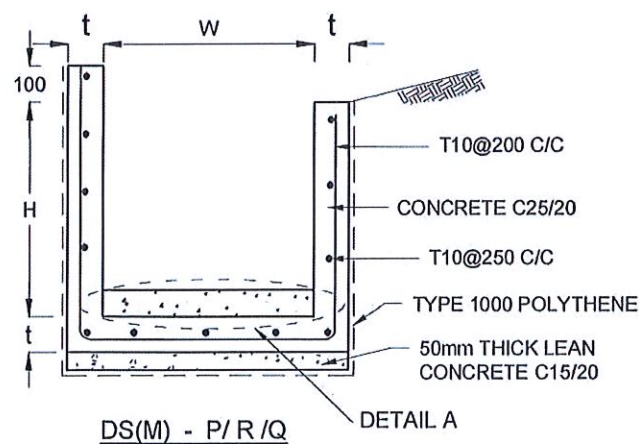
DETAIL A - (ENERGY BREAKER AT 3M)

CONCRETE

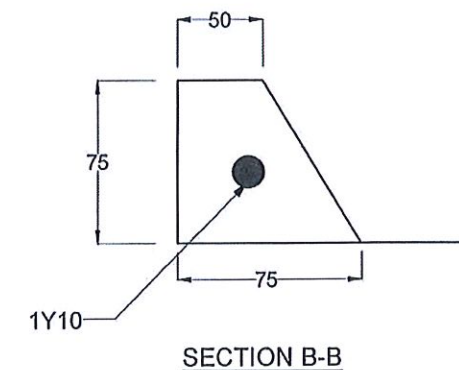
- USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

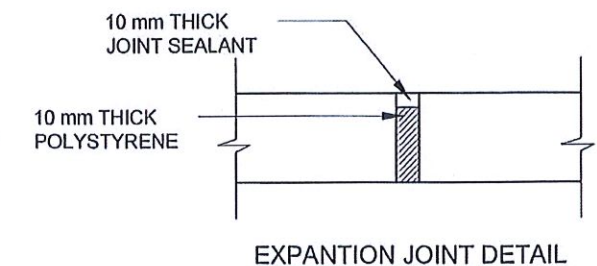
- ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
- BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
- ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
- REINFORCEMENT BARS SHALL BE BENT ACCORDANCE WITH STANDARD SPECIFICATIONS.
- COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40mm
 - [b] ALL OTHER FACES - 25mm.



GRATING DETAIL

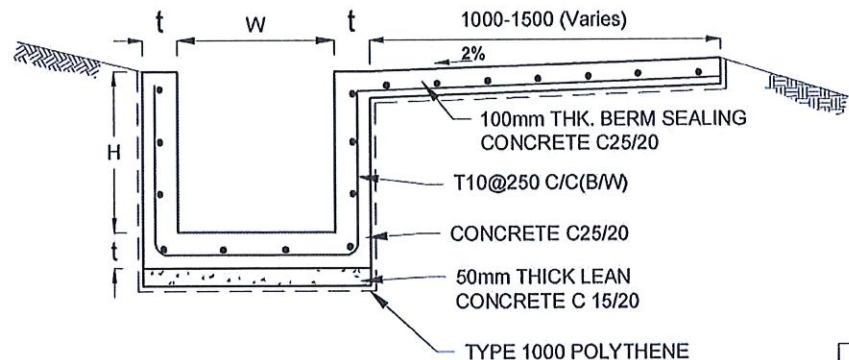


SECTION B-B

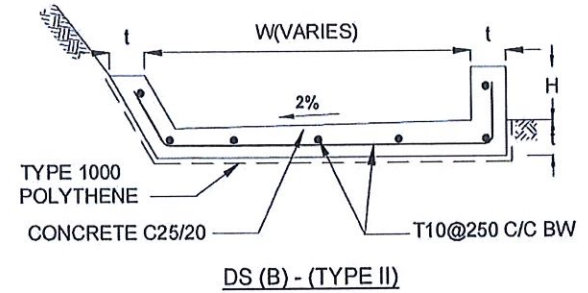


EXPANTION JOINT DETAIL

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)	TITLE		DESCRIPTION	NAME	SIGNATURE
								DETAILS OF DRAINS (SURFACE DRAIN -1 OF 2)		DRAWN DESIGNED CHECKED RECOMMENDED APPROVED	S.A.G.D. SENANAYAKA M. H. M. HARSHANI J.P. SAMARANAYAKA PROF. S.A.S. KULATHILAKA K.N. BANDARA
						SCALE	N.T.S.	DATE	05.11.2020		
						PROJECT / DRAWING No.	RLVMMP/WORKS/NCB/04A/25-Ru/DR - 06a-1	REVISION	00		

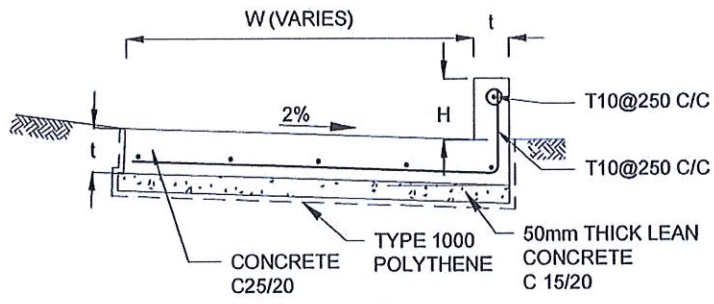


DS (B) - (TYPE I)



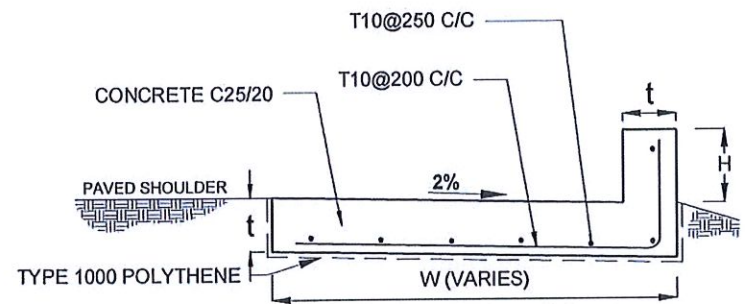
DS (B) - (TYPE II)

DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (B) - A	300	300	100
DS (B) - B	450	450	100
DS (B) - C	1000	150	100

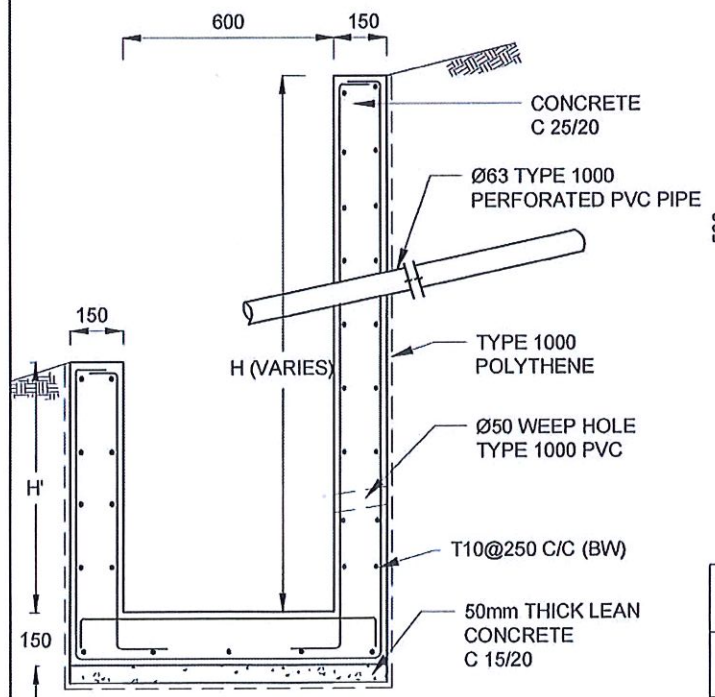


DS (K) - TYPE I

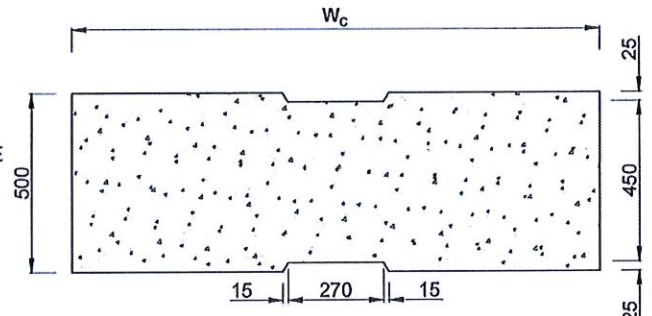
DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (K) - A	1000	200	100
DS (K) - B	1000	300	100
DS (K) - C	1150	200	200



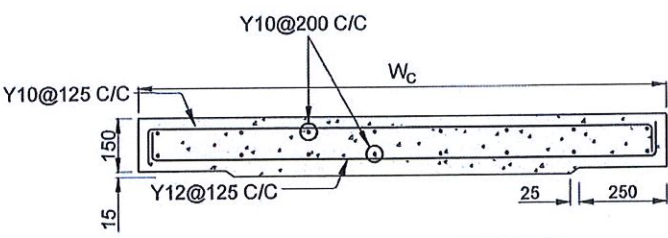
DS (K) - TYPE II



DS (M) - L



PLAN VIEW OF COVER SLAB



ACCESS & HEAVY DUTY COVER SLAB SECTION OF (Wc x 500 x 150mm)

DS(M) - L	W (mm)	H' (mm)	t (mm)
TYPE I	600	600	150
TYPE II	800	800	150

NOTES

- DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
- STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
- DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- COVER SLABS NEED TO BE PROVIDE ONLY FOR THE REGIONS AS INSTRUCTED BY THE ENGINEER.
- COVER SLAB WIDTH (W_c) SHOULD BE TAKEN AS THE SUM OF DRAIN WIDTH AND 2x DRAIN WALL THICKNESS. [W_c = W+2xt]
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OR OTHERWISE STATED.
- 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCE IN EVERY 5m INTERVAL.

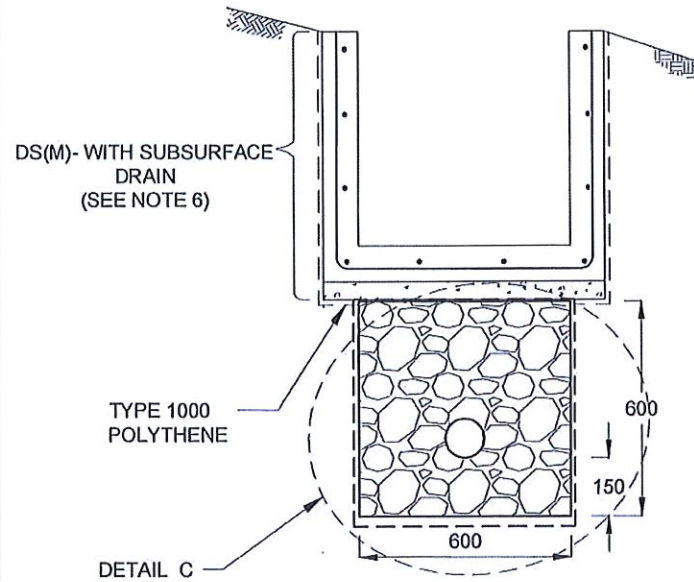
CONCRETE

- USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

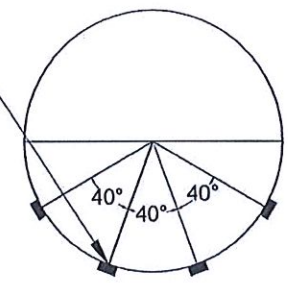
- ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
- BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
- ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
- REINFORCEMENT BARS SHALL BE BENT ACCORDANCE WITH STANDARD SPECIFICATIONS.
- COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40mm
 - [b] ALL OTHER FACES - 25mm.

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)	TITLE DETAILS OF DRAINS (SURFACE DRAIN -2 OF 2)	DESCRIPTION	NAME	SIGNATURE	
		SCALE	N.T.S.	DATE	05.11.2020			RECOMMENDED	PROF. S.A.S. KULATHILAKA		
PROJECT / DRAWING No. RLVMP/WORKS/NCB/04/25-Ru/DR - 06a-II							REVISION	00	APPROVED	K.N. BANDARA	

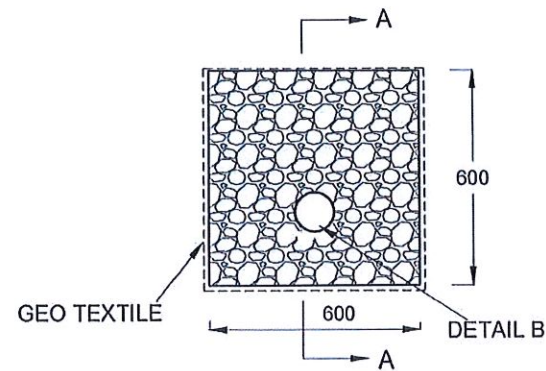


SUBSURFACE DRAIN [DS (S) -A]

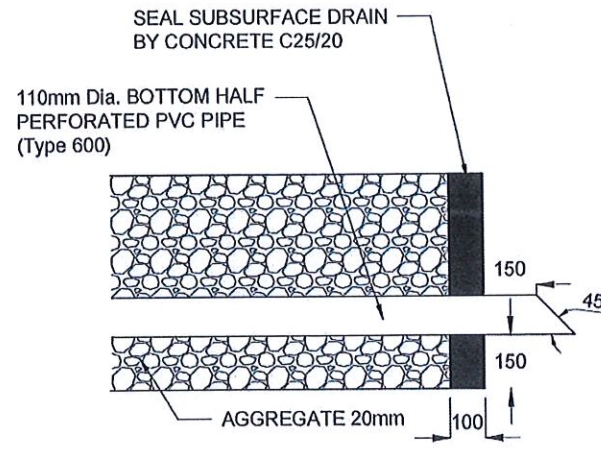
100mm x 5mm Groove



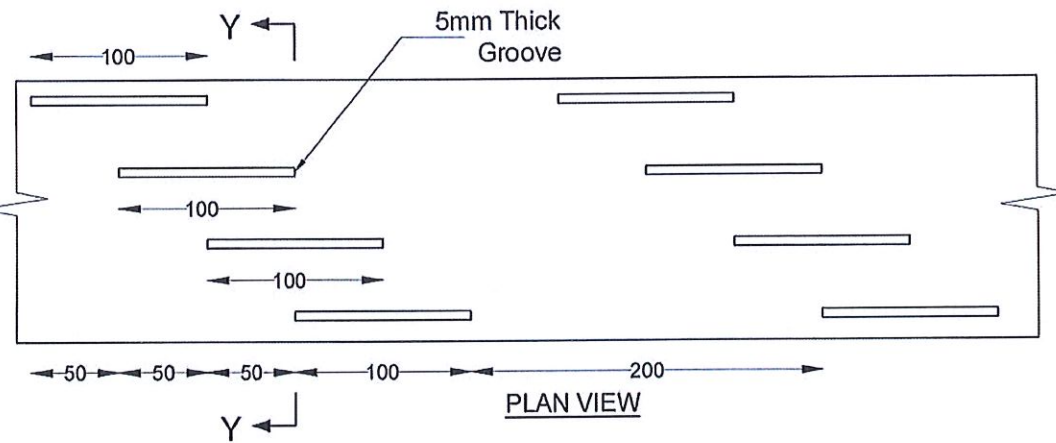
SECTION Y - Y



DETAIL C / DS (S) -A

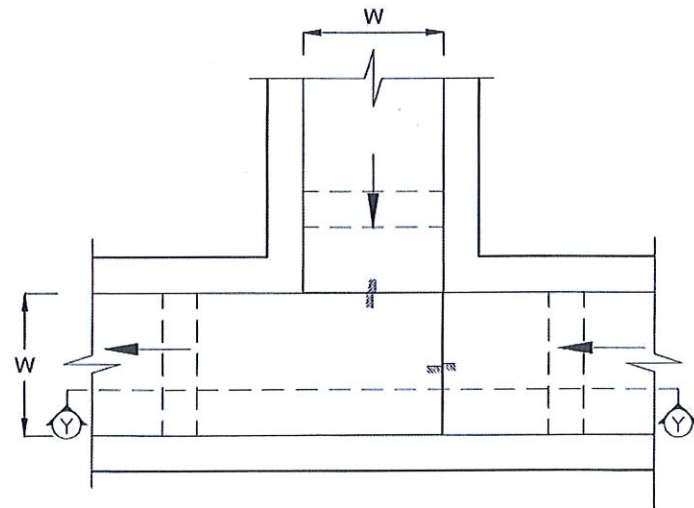


SECTION A-A (OUTLET DETAIL SUBSURFACE DRAIN)

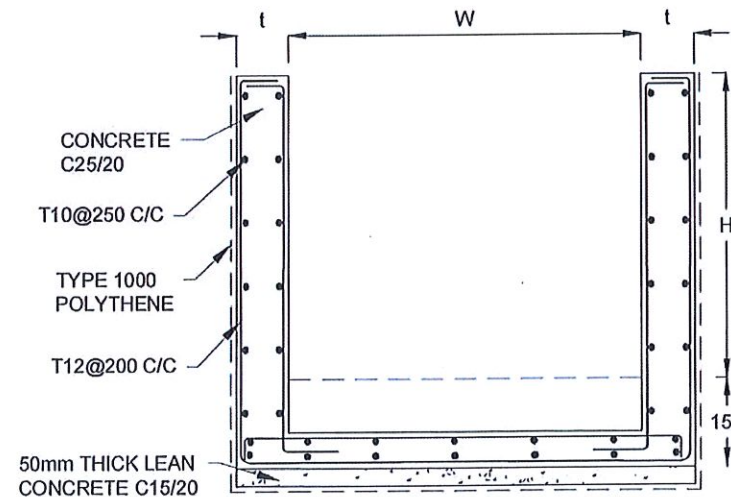


PLAN VIEW

DETAIL - B (PERFORATED PIPE FOR SUB-SURFACE DRAINS)



PLAN VIEW OF CATCH PIT (CP)



SECTION Y-Y (CP - R)

NOTES

1. W,H,t ; SHALL BE THE SAME AS RESPECTIVE DRAIN SECTION.
2. CP - R SHALL BE USED WHERE $H > 900\text{mm}$
3. DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
4. DOWELS WILL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. DETAILS OF SURFACE DRAIN PORTION OF THE SUBSURFACE DRAINS SHALL BE AS PER DS(M), DS(B), DS(K) OR DS(C) SECTIONS ACCORDINGLY.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

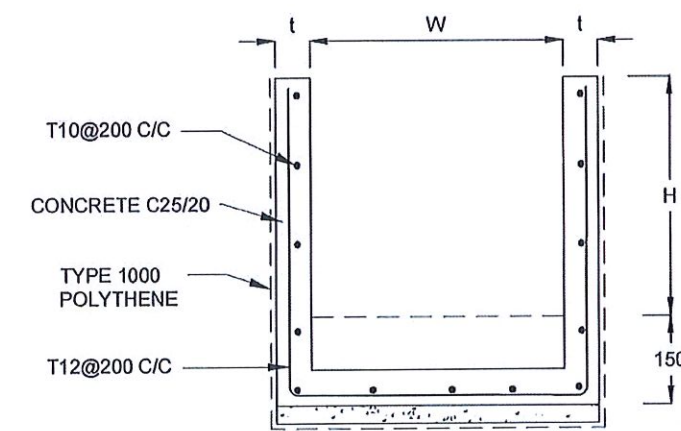
CONCRETE

8. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE

- [a] SCREED - C. 15/20
- [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

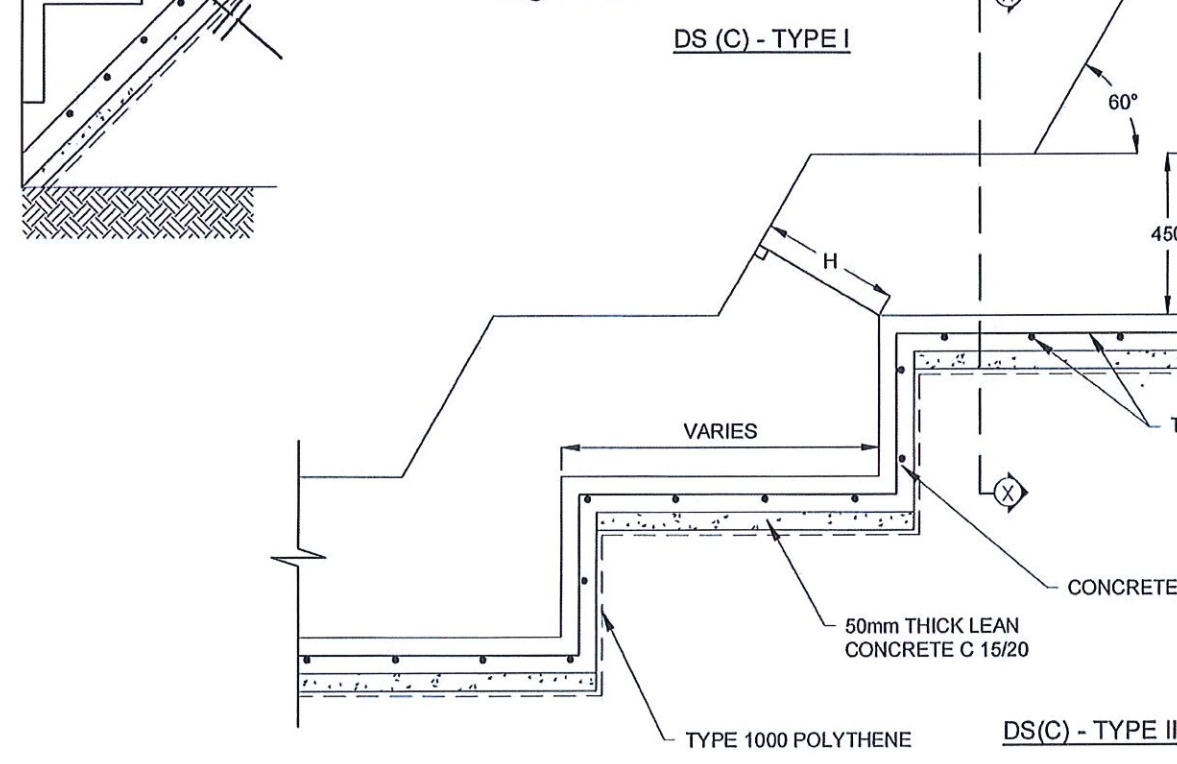
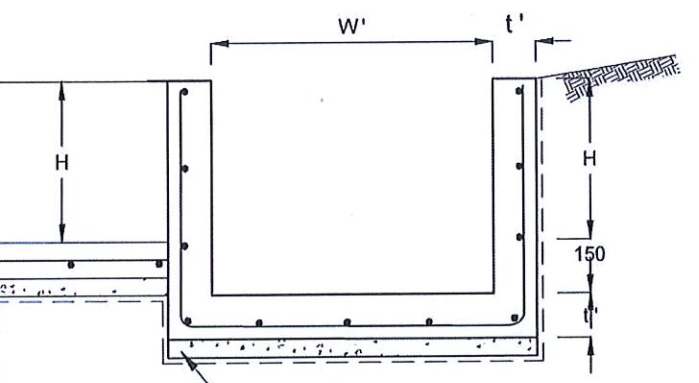
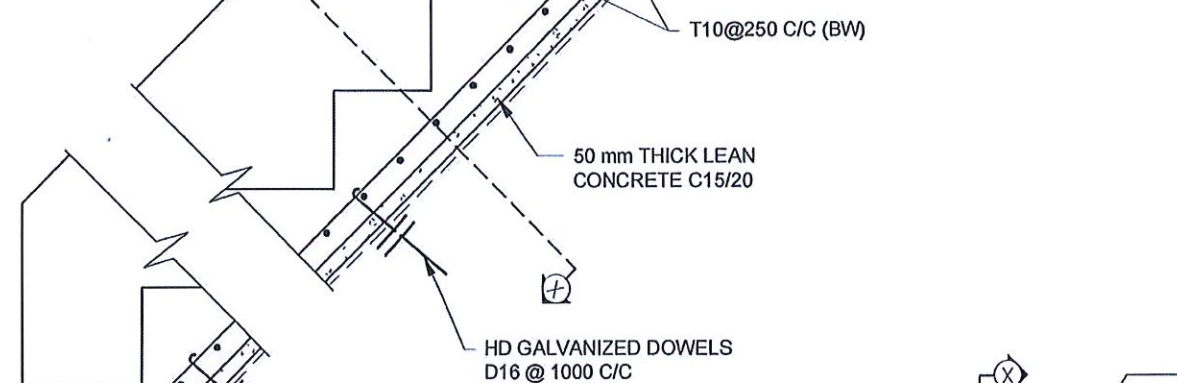
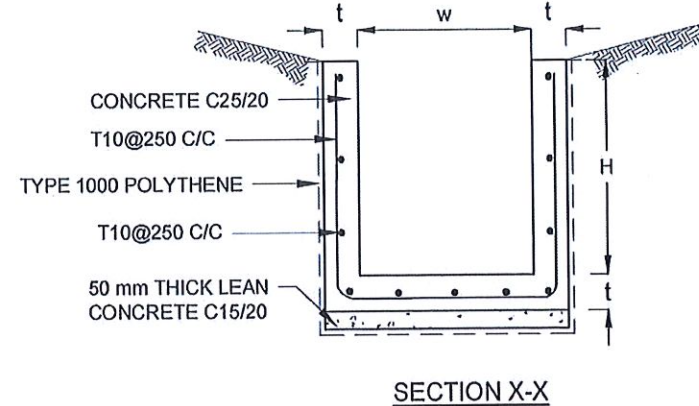
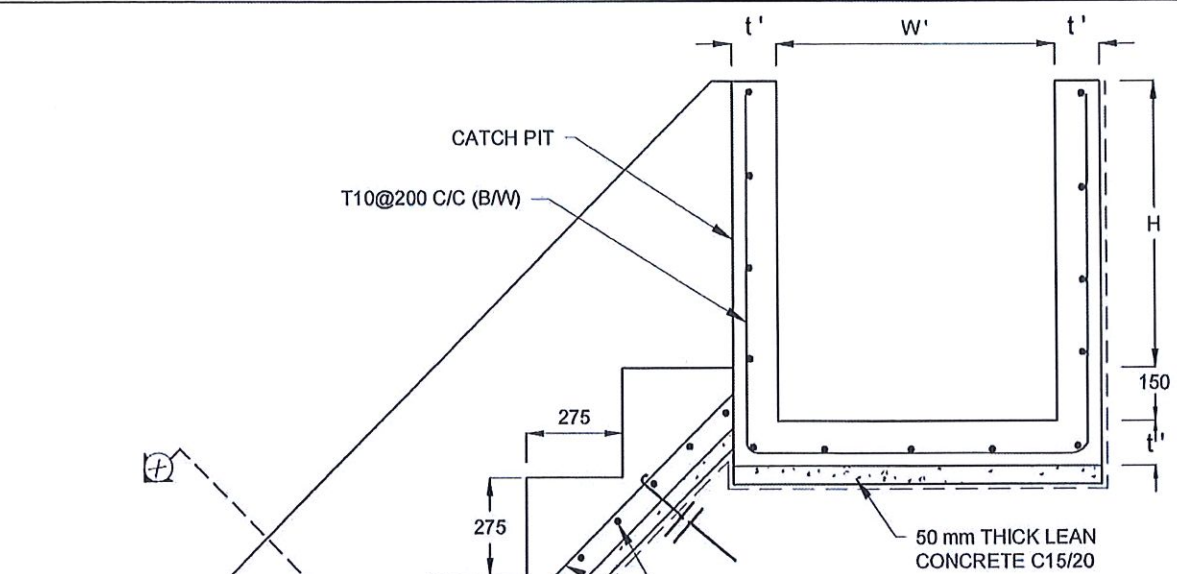
REINFORCEMENT

9. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm^2 .
10. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF $50 \times \text{BAR DIA.}$ AND LAPPING SHOULD BE STAGGERED.
11. ANCHORAGE LENGTH SHOULD BE $40 \times \text{BAR DIA.}$
12. REINFORCEMENT BARS SHALL BE BENT ACCORDANCE WITH STANDARD SPECIFICATIONS.
14. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40mm
 - [b] ALL OTHER FACES - 25mm.



SECTION Y - Y

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)	TITLE		DESCRIPTION	NAME	SIGNATURE
		SCALE N.T.S.		DATE	05.11.2020		DETAILS OF DRAINS (SUBSURFACE DRAIN AND CATCHPIT)		DRAWN	S.A.G.D. SENANAYAKA	
PROJECT / DRAWING No.		RLVMMP/WORKS/NCB/04A/25-Ru/DR - 06b	REVISION	00	APPROVED		K.N. BANDARA				



NOTES

1. USE EITHER TYPE I OR TYPE II CASCADE DRAIN ACCORDING TO THE ACTUAL GROUND CONDITION AS INSTRUCT BY THE ENGINEER.
2. LENGTH OF THE STEPS OF CASCADE WILL BE VARIED ACCORDING TO THE SITE CONDITIONS.
3. DEPTH OF EXCAVATION SHALL BE VARIED ACCORDING TO SITE CONDITIONS.
4. DOWELS WILL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCE IN EVERY 5m INTERVAL.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OR OTHERWISE STATED.

CONCRETE

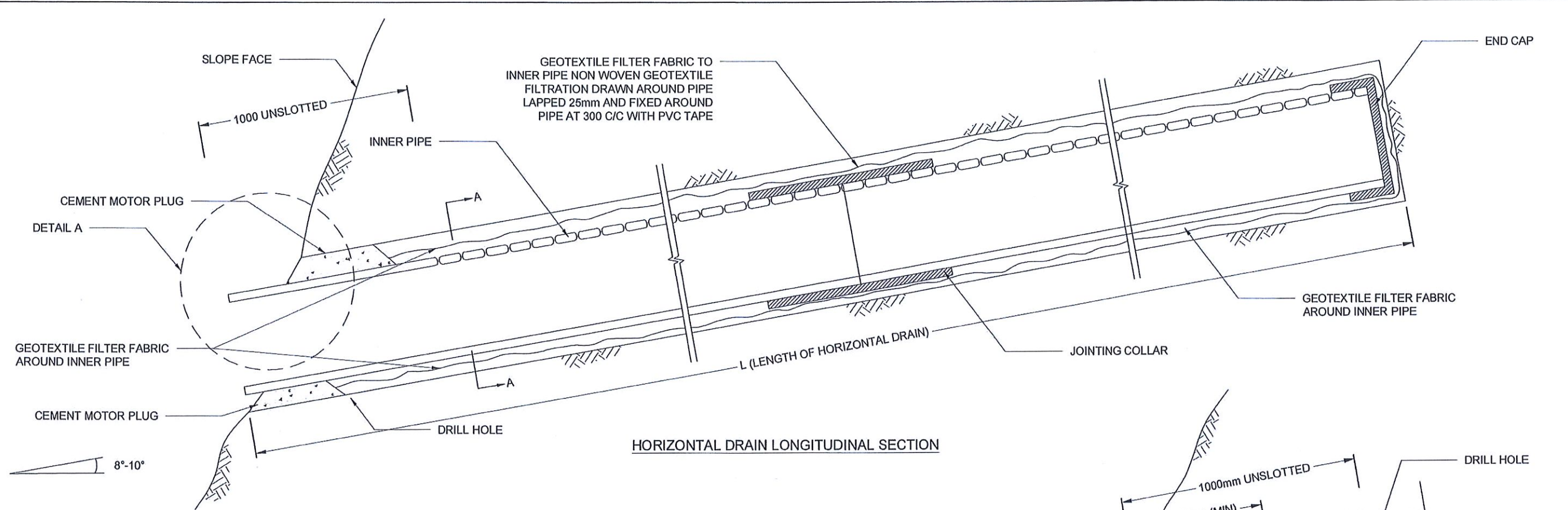
7. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

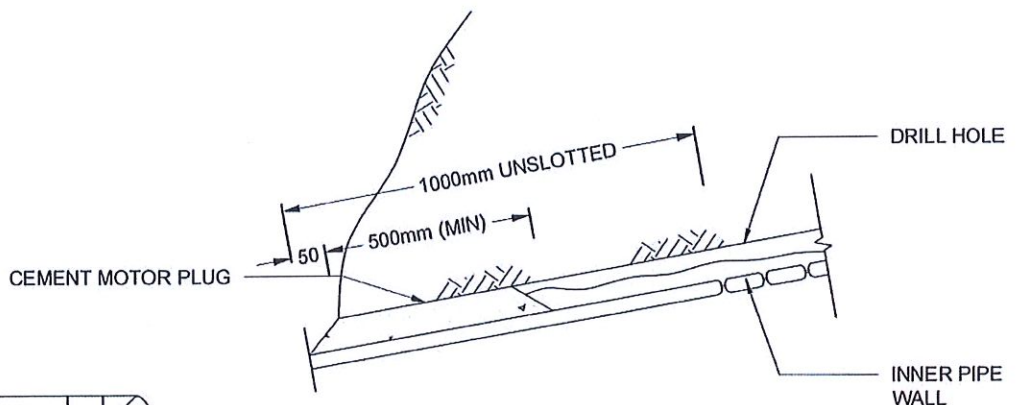
8. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
9. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
10. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
11. REINFORCEMENT BARS SHALL BE BENT ACCORDANCE WITH STANDARD SPECIFICATIONS.
14. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40mm
 - [b] ALL OTHER FACES - 25mm.

DRAIN TYPE	W (mm)	H (mm)	t (mm)	W' (mm)	t' (mm)
DS (C) - A	450	450	100	600	100
DS (C) - B	450	600	100	750	100
DS (C) - C	600	600	100	800	100
DS (C) - D	750	750	100	800	100
DS (C) - E	800	800	125	1000	125
DS (C) - F	1000	750	125	1200	125

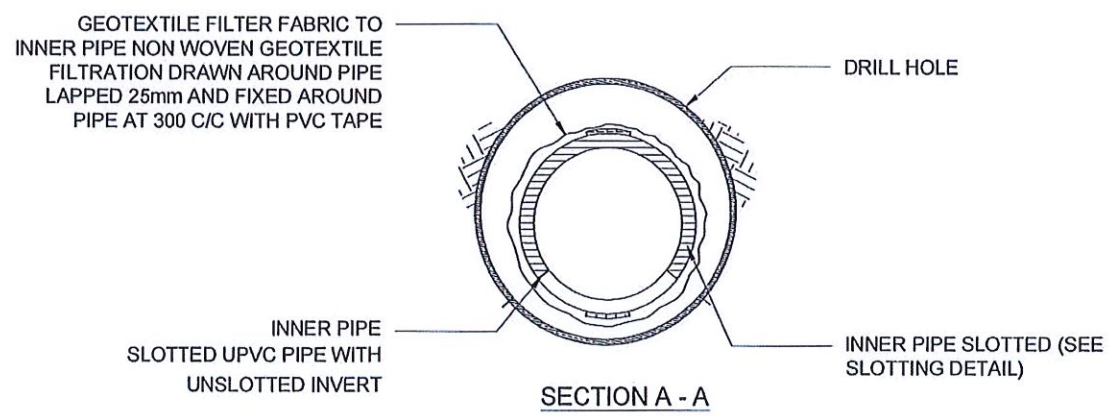
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		N.T.S.	05.11.2020	00	DRAWN			S.A.G.D. SENANAYAKA	DESIGNED	M. H. M. HARSHANI	CHECKED	J.P. SAMARANAYAKA



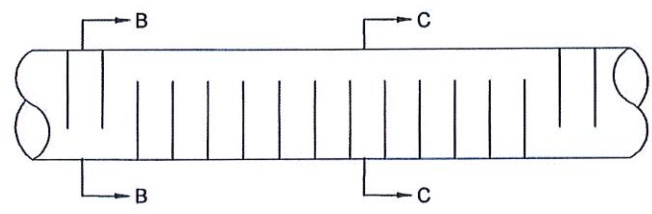
HORIZONTAL DRAIN LONGITUDINAL SECTION



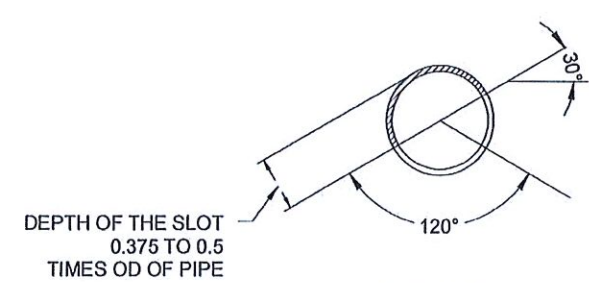
DETAIL A



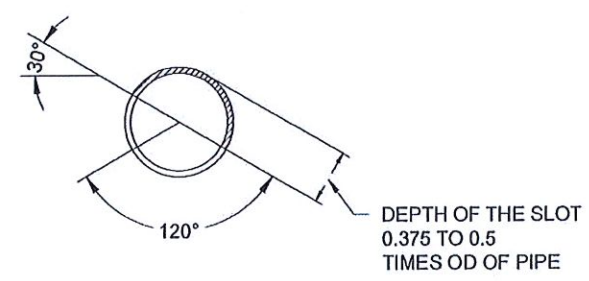
SECTION A - A



INNER AND OUTER PIPE SLOTTING DETAIL (TOP VIEW)






SECTION B - B

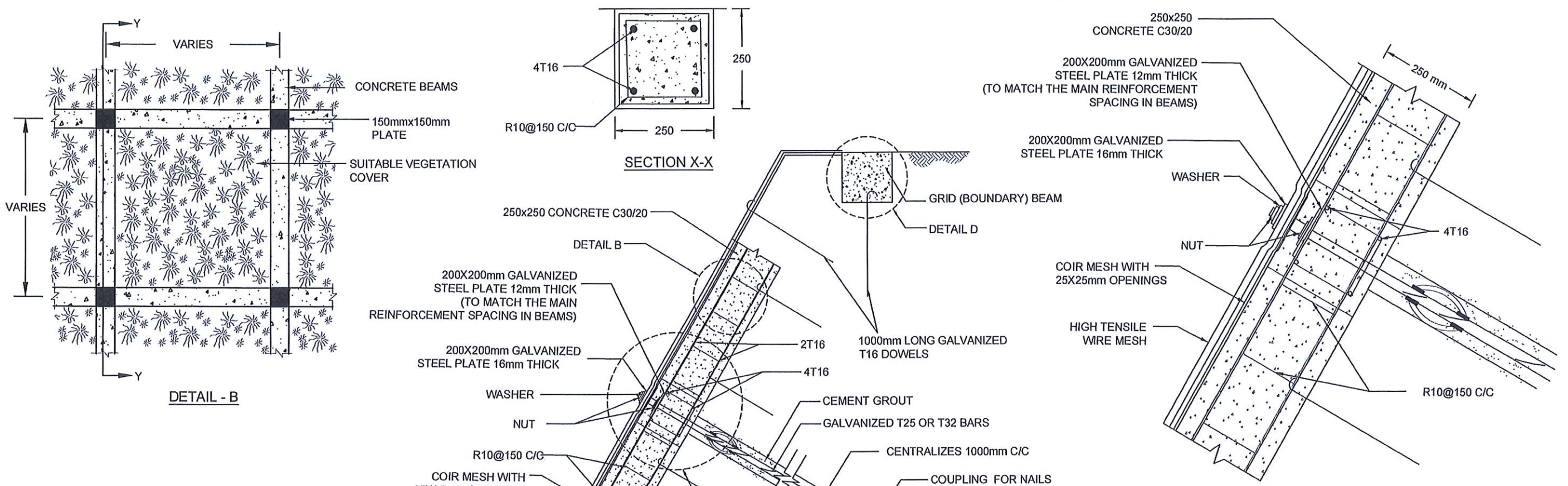


SECTION C - C

NOTES

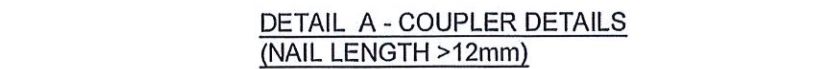
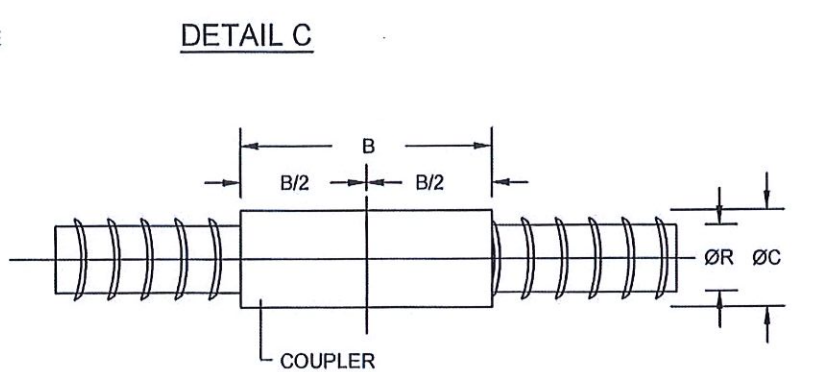
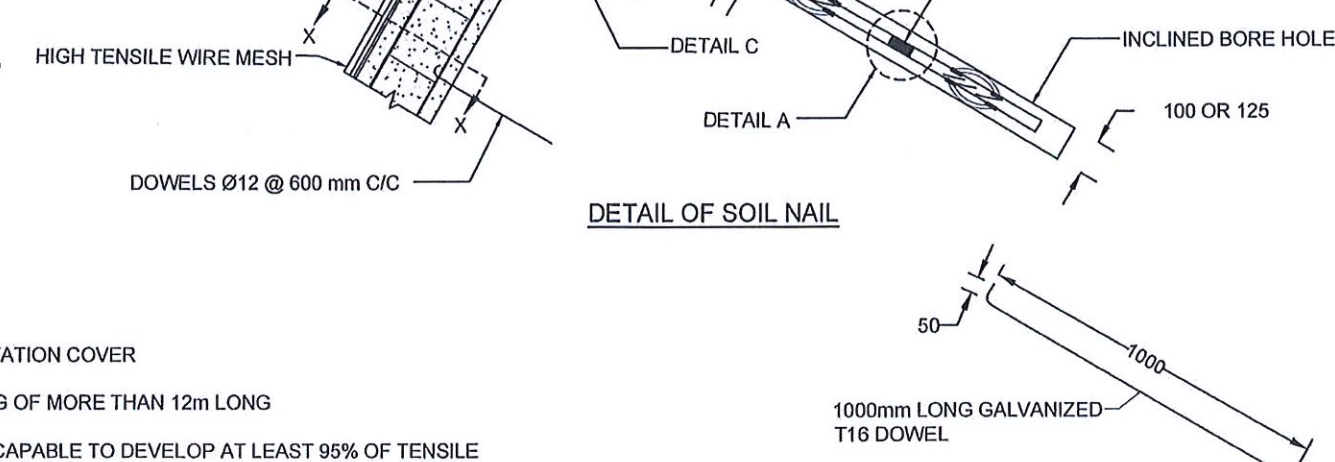
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. PIPE DIAMETERS, ANGLE & LENGTHS AS SPECIFIED IN DRAWINGS.
3. ALL MATERIALS SHALL CONFORM TO PROJECT SPECIFICATION

EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)	TITLE DETAILS OF HORIZONTAL DRAIN SECTIONS	DESCRIPTION	NAME	SIGNATURE			
									SCALE	N.T.S.	DATE	05.11.2020	REVISION
								PROJECT / DRAWING No.	RLVMMP/WORKS/NCB/04A/25-Ru/DR - 07	APPROVED	K.N. BANDARA		

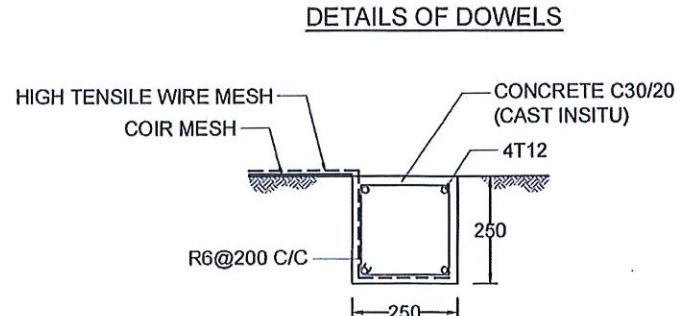


NOTES

1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE STATED
2. STRUCTURAL CONC. AS PER SPECIFICATION
3. MINIMUM CLEAR COVER TO R/F - 20mm TO 30mm
4. STRUCTURAL MEMBERS AS PER SPECIFICATION
5. LAP LENGTH FOR R/F BARS 40 x BAR Dia.
6. SOIL NAIL/ BOREHOLE DETAILS AS PER THE DRAWINGS
7. TURFING/ SODDING/ SEEDING/ PLANTING USED FOR VEGETATION COVER
8. THE BAR COUPLER SHALL ONLY BE USED FOR SOIL NAILING OF MORE THAN 12m LONG
9. THE TENSILE STRENGTH OF THE BAR COUPLER SHALL BE CAPABLE TO DEVELOP AT LEAST 95% OF TENSILE STRENGTH OF THE REBAR AS TESTED AND CERTIFIED BY THE MANUFACTURE
10. SPACING BETWEEN NAIL HEAD ARE VARIED ACCORDING TO THE GROUND CONDITION
11. DOWEL SPACING FOR BOUNDARY BEAM SHALL BE 2m
12. BOUNDARY BEAM SHALL BE STRUCTURALLY CONNECTED TO ALREADY CONSTRUCTED GRID BEAMS AT EACH JUNCTION
13. MINIMUM OF 2 DOWELS SHALL BE TYPICALLY USED TO FIX THE HIGH TENSILE WIRE MESH AGAINST THE SLOPE AT EACH SLOPE SPACE IN BETWEEN THE GRID BEAMS, AS SHOWN IN THE DRAWING
14. SPACING AND LOCATIONS OF DOWELS INSTALLED TO FIX THE HIGH TENSILE WIRE MESH AGAINST THE SLOPE SHALL BE VARIED ACCORDING TO THE SITE CONDITION



REINFORCEMENT BAR DIAMETER (ØR)	COUPLER OUTER BAR DIAMETER (ØC)	COUPLER LENGTH (B)
25 mm	36 mm	95 mm
32 mm	46 mm	128 mm

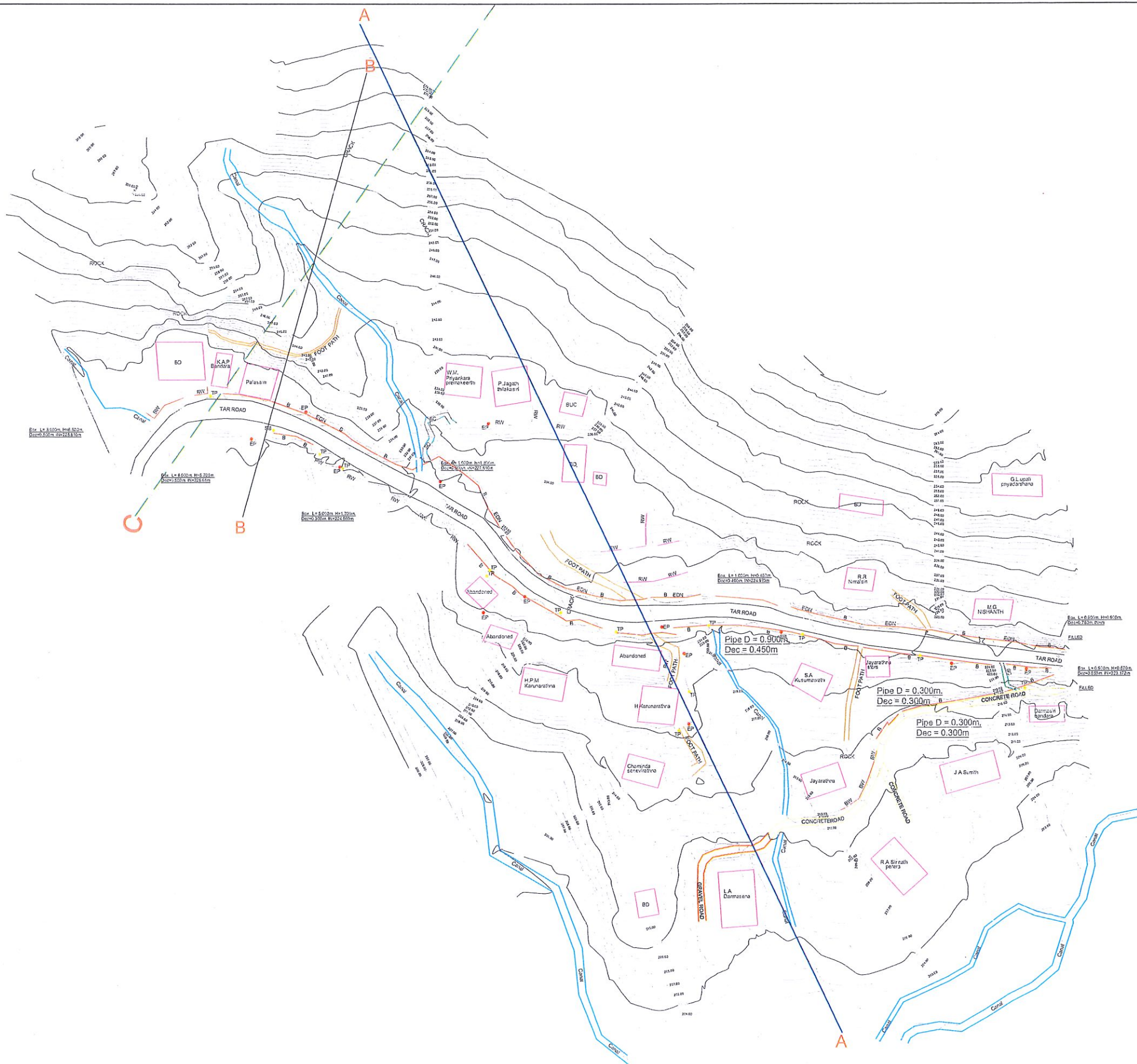




EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD, COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES VEYANGODA-RUWANWELLA ROAD (B445) - LOCATION 01 (CH. 23+100 - CH 23+210 RHS)	TITLE DETAILS OF SOIL NAILING WITH GRID BEAM & HYDROSEEDING			DESCRIPTION	NAME	SIGNATURE
								SCALE	N.T.S.	DATE	05.11.2020	DRAWN
							PROJECT / DRAWING No.		REVISION	DESIGNED	M. H. M. HARSHANI	
							RLVMP/WORKS/NCB/04A/25-Ru/DR - 8	00		CHECKED	J.P. SAMARANAYAKA	
										RECOMMENDED	PROF. S.A.S. KULATHILAKA	
										APPROVED	K.N. BANDARA	

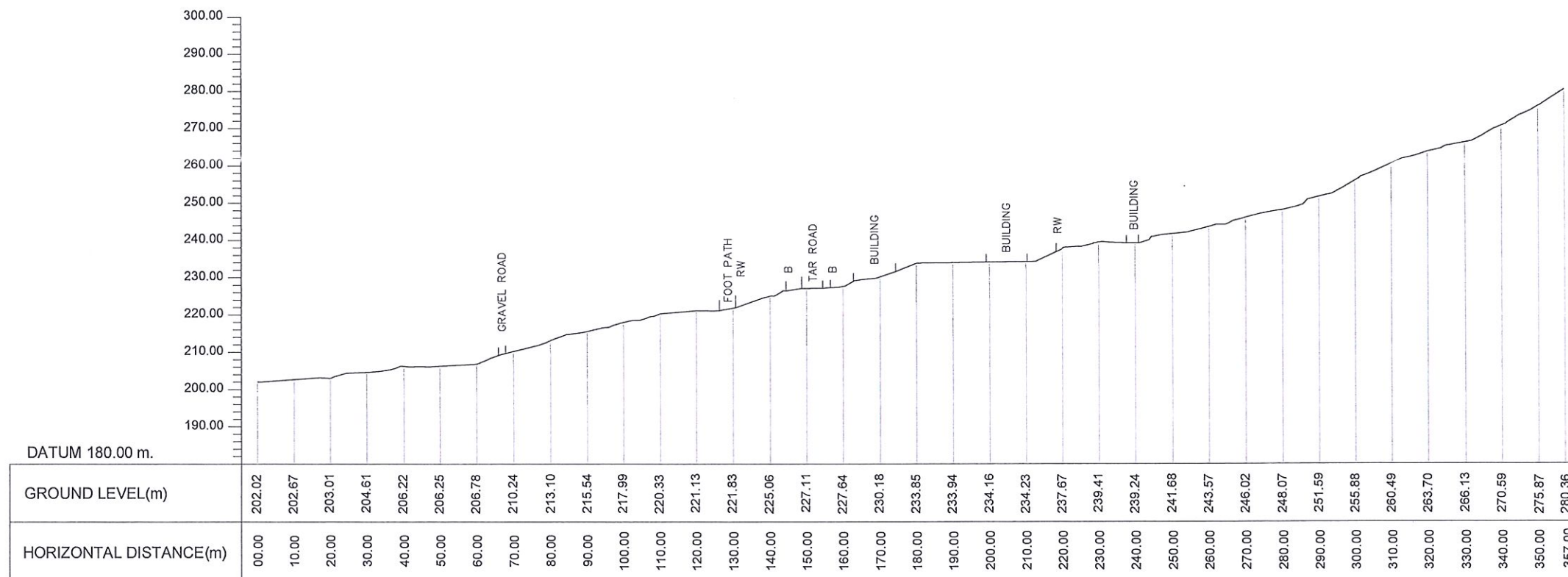


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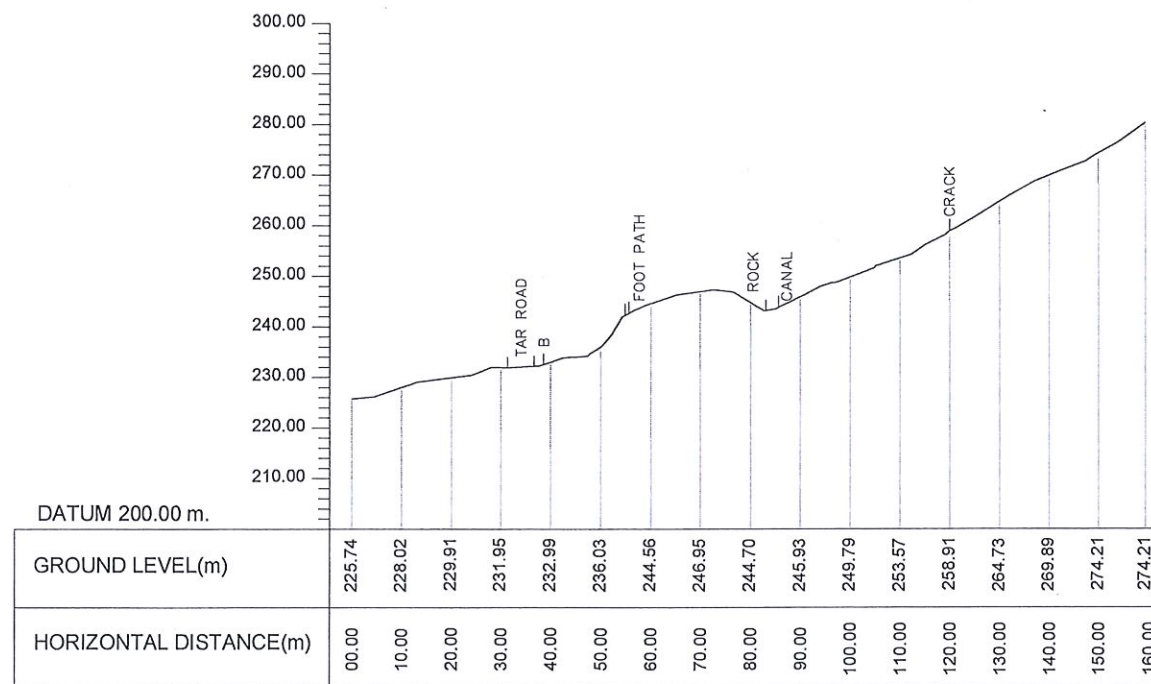
- B - BANK
- BD - BUILDING
- BW - BOUNDARY WALL
- CUL - CULVERT
- EDN - EARTH DRAIN
- GR - GRAVEL ROAD
- LF - LIVE FENCE
- MDN - MASONRY DRAIN
- RW - RETAINING WALL
- TOI - TOILET
- WF - WIRE FENCE
- TP - TELEPHONE POST
- EP - ELECTRIC POST
- BUC - BUILDING UNDER CONSTRUCTION
- SB - SIGN BOARD
- SC - STAIR CASE
- Rock - ROCK
- Can - CANAL
- FP - FOOT PATH
- TR - TRANSFORMER
- Con. R - CONCRETE ROAD



 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	 DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BULATHKOHUPITIYA	TITLE SURVEY CONTOUR PLAN			DESCRIPTION	NAME	SIGNATURE
							SCALE N.T.S.	DATE	06.11.2020			
							PROJECT / DRAWING No.	REVISION	00			
							RLVMMP/WORKS/NCB/04A/09-BUL/DR-01					

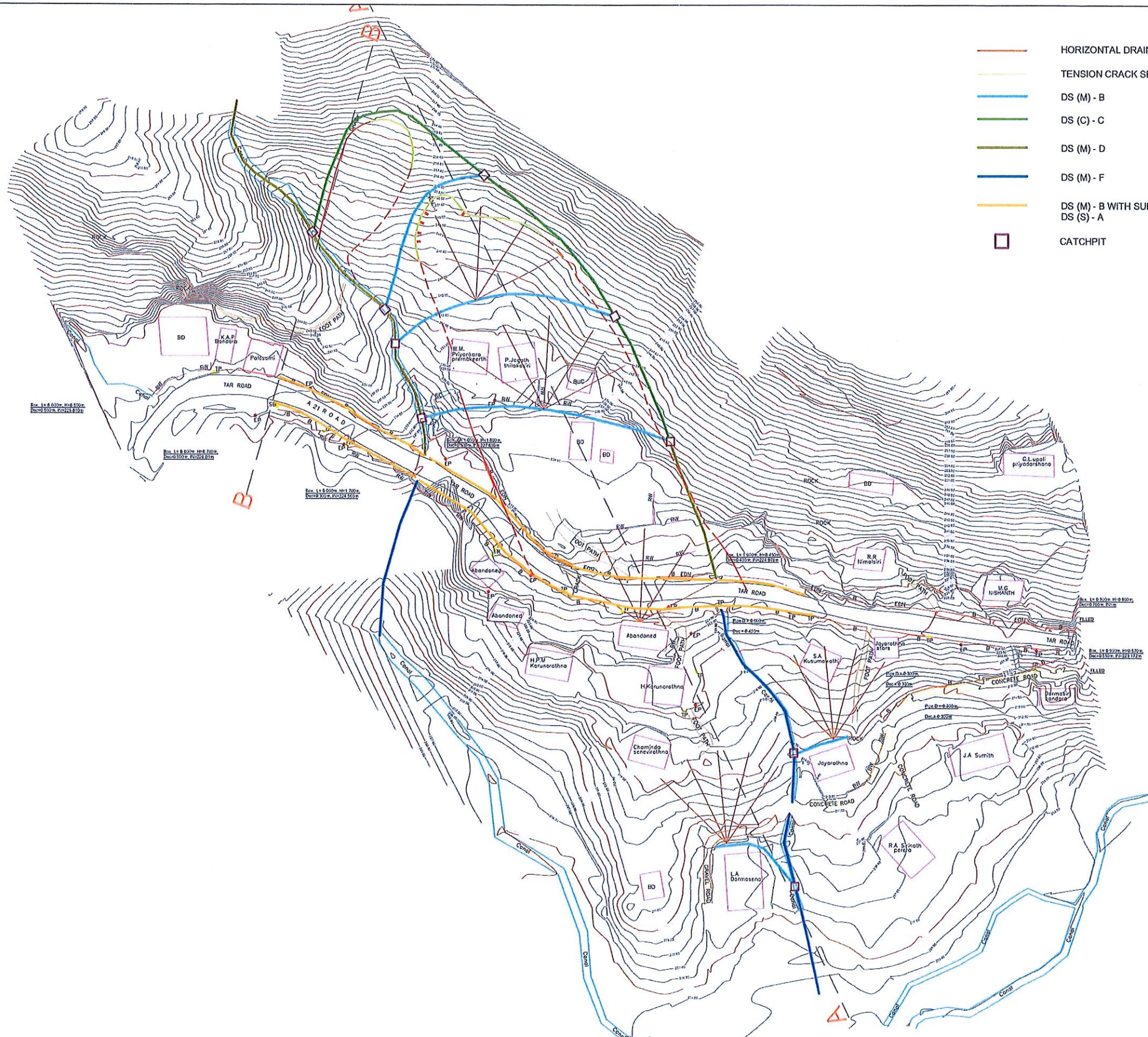


SECTION A - A






SECTION B - B

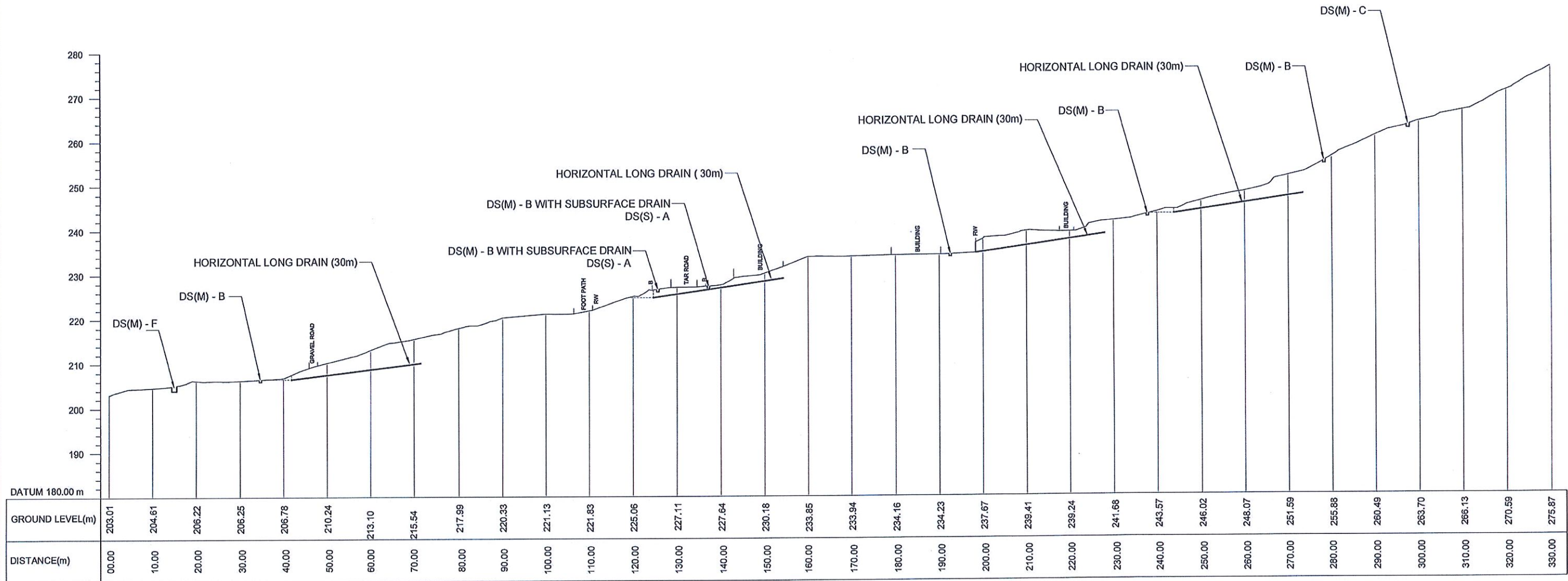
<p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	<p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANIZATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BULATHKOHUPITIYA	TITLE SURVEY CROSS SECTIONS		DESCRIPTION	NAME	SIGNATURE	
								SCALE	N.T.S.	DATE	06.11.2020	
							PROJECT / DRAWING No.	RLVMP/WORKS/NCB/04A/09-BUL/DR-02	REVISION	00		



REFERENCE

- B - BANK
- BD - BUILDING
- BW - BOUNDARY WALL
- CUL - CULVERT
- EDN - EARTH DRAIN
- GR - GRAVEL ROAD
- LF - LIVE FENCE
- MDN - MASONRY DRAIN
- RW - RETAINING WALL
- TOI - TOILET
- WF - WIRE FENCE
- TP - TELEPHONE POST
- EP - ELECTRIC POST
- BUC - BUILDING UNDER CONSTRUCTION
- SB - SIGN BOARD
- SC - STAIR CASE
- Rock - ROCK
- Can - CANAL
- FP - FOOT PATH
- TR - TRANSFORMER
- Con. R - CONCRETE ROAD

 <p>EMPLOYER</p> <p>DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	 <p>DESIGNER</p> <p>DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05</p>	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE	TITLE	DESCRIPTION	NAME	SIGNATURE	
						<p>REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BULATHKOHUPITIYA</p>	<p>PLAN VIEW OF PROPOSED MITIGATION MEASURES</p>	SCALE	N.T.S.	DATE	12.11.2020
								PROJECT / DRAWING No.	RLVMP/WORKS/NCB/04/A/09-BUL/DR-03	REVISION	00
								APPROVED	K.N. BANDARA		

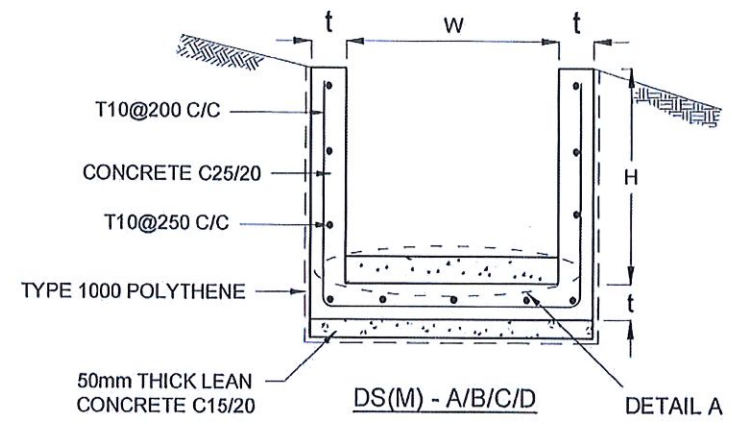


SECTION A - A

NOTE:

1. LOCATION AND LENGTH OF HORIZONTAL LONG DRAINS MIGHT BE VARIED ACCORDING TO THE ACTUAL SOIL PROFILE AND SITE CONDITION.

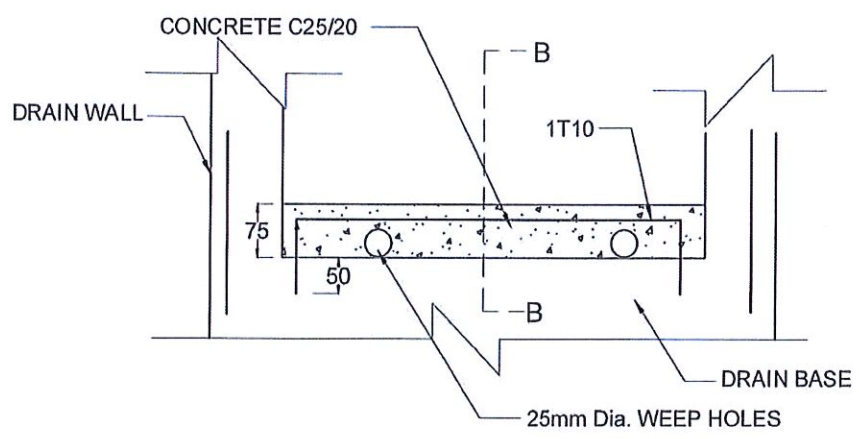
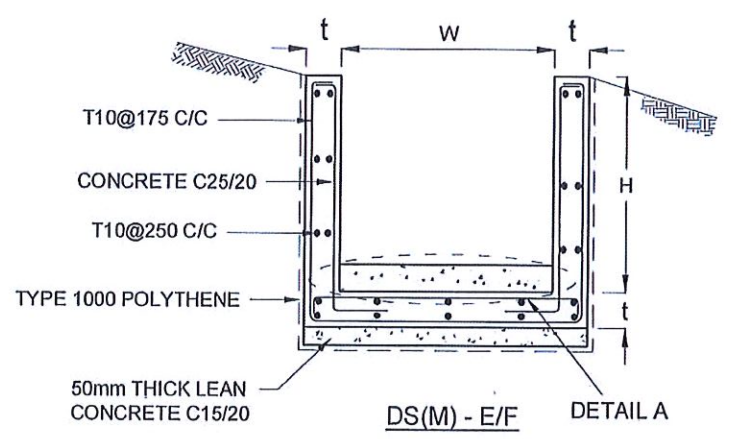
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									SCALE	N.T.S.	DATE	06.11.2020
							PROJECT / DRAWING No.	RLVMP/WORKS/NCB/04A/09-BUL/DR-04	REVISION	00	APPROVED	K.N. BANDARA



DRAIN TYPE	W (mm)	H (mm)	t (mm)
DS (M) - A /P	300	300	100
DS (M) - B/R	450	450	100
DS (M) - C/Q	600	600	100
DS (M) - D	750	750	125
DS (M) - E	900	900	150
DS (M) - F	1000	1000	150

NOTES

- DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
- STEPS SHALL BE CONSTRUCTED AT SURFACE DRAIN ON SLOPING GROUND ACCORDING TO THE SITE CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ENERGY BREAKERS SHALL BE CONSTRUCTED AT THE STEEP DRAIN SEGMENTS AS PER THE INSTRUCTIONS OF THE ENGINEER.
- DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
- 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.



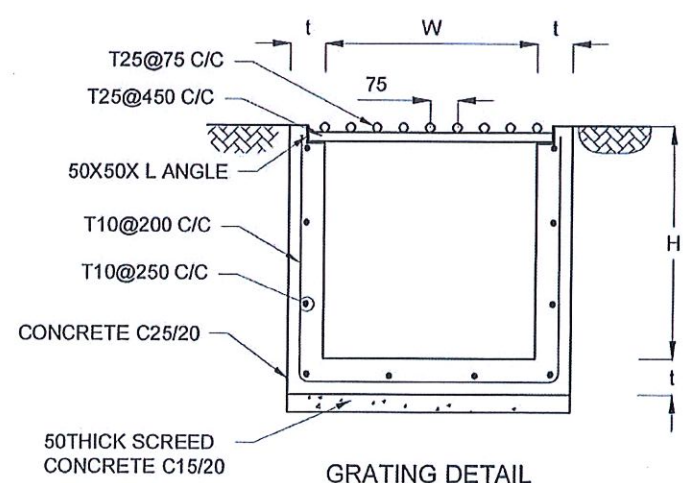
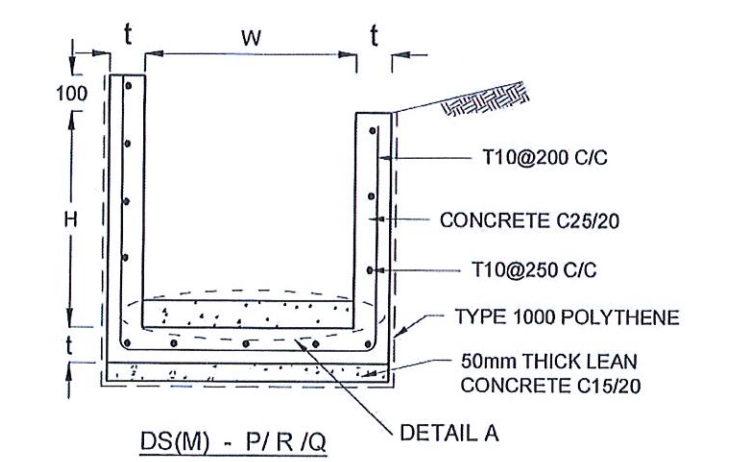
DETAIL A - (ENERGY BREAKER AT 3M)

CONCRETE

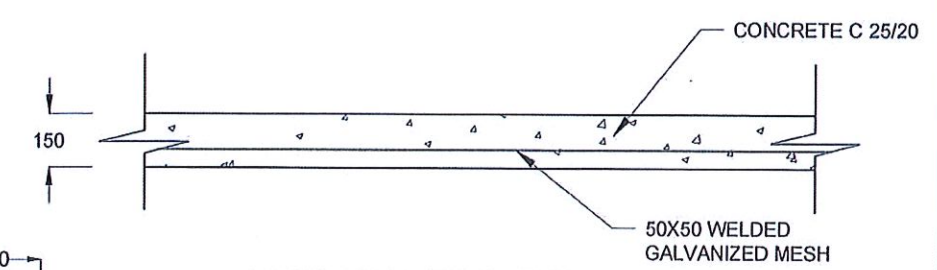
- USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

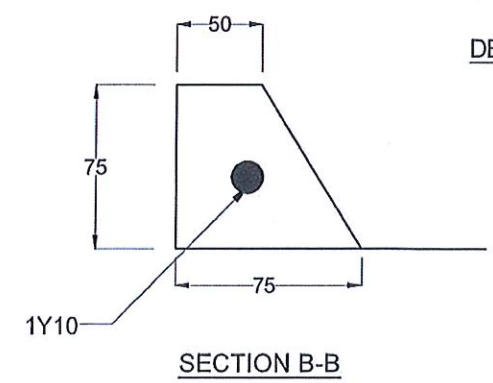
- ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
- BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
- ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
- REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
- COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



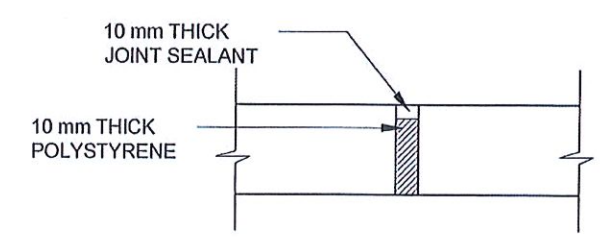
GRATING DETAIL





DETAILS OF BERM SEALING

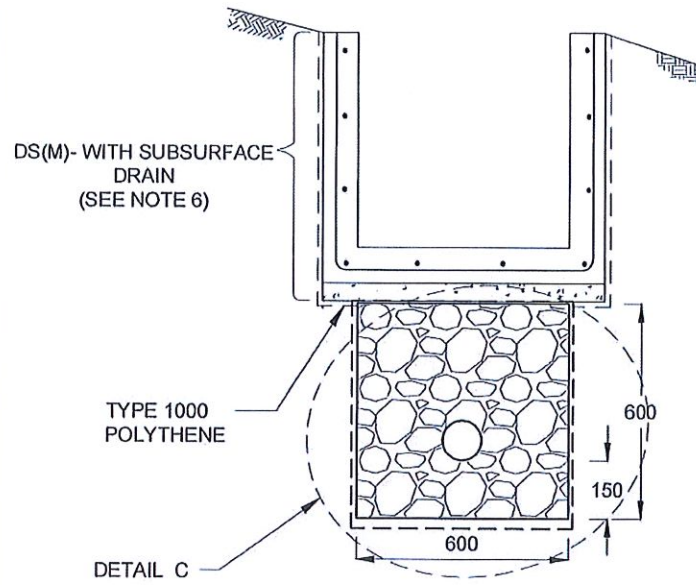


SECTION B-B

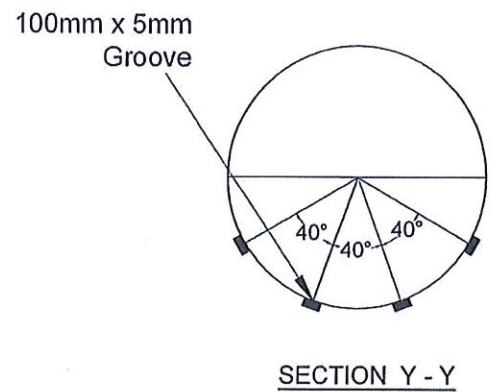


EXPANTION JOINT DETAIL

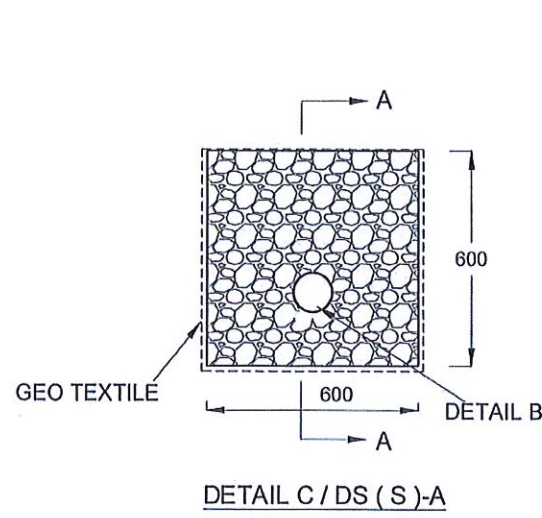
EMPLOYER  DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER  DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV DATE REVISION DESCRIPTION APPROVAL PROJECT TITLE	TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BULATHKOHUPITIYA	DESCRIPTION NAME SIGNATURE
		SCALE N.T.S. DATE 12.11.2020 PROJECT / DRAWING No. RLVMMP/WORKS/NCB/04A/09-BUL/DR-05a REVISION 00	DRAWN B.V.S. PATTRISHIYA DESIGNER S.O.A.D.M. LAKRUWAN CHECKED J.P. SAMARANAYAKA RECOMMENDED PROF. S.A.S. KULATHILAKA APPROVED K.N. BANDARA	



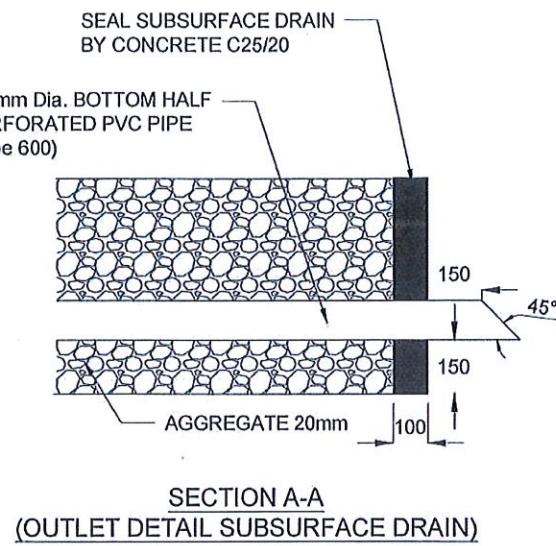
SUBSURFACE DRAIN [DS (S) -A]



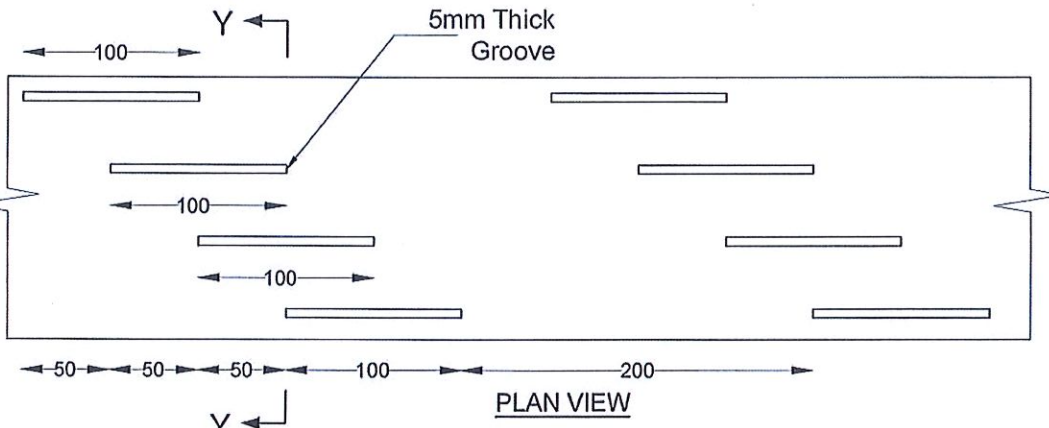
SECTION Y - Y



DETAIL C / DS (S) -A

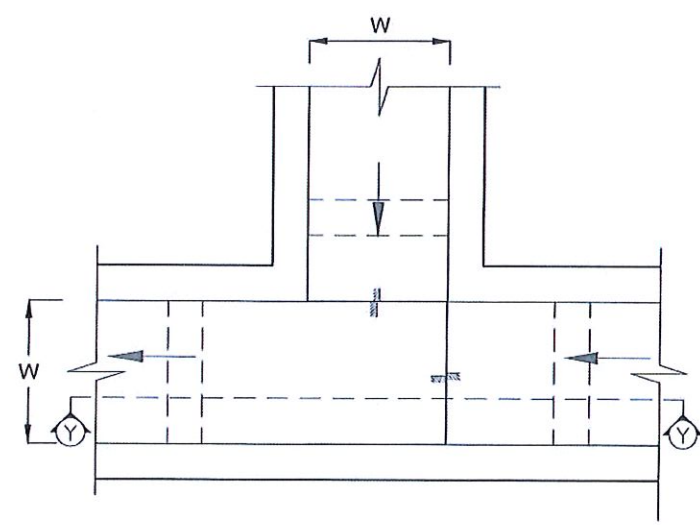


SECTION A-A (OUTLET DETAIL SUBSURFACE DRAIN)

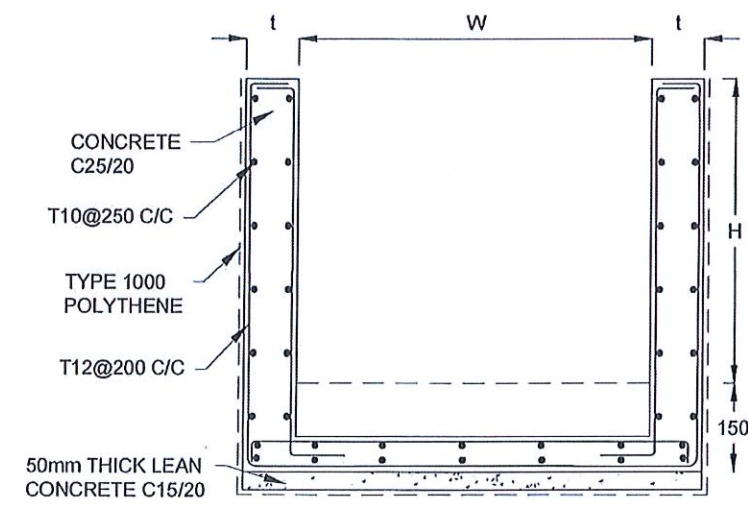


PLAN VIEW

DETAIL - B (PERFORATED PIPE FOR SUB-SURFACE DRAINS)



PLAN VIEW OF CATCH PIT (CP)



SECTION Y-Y (CP - R)

NOTES

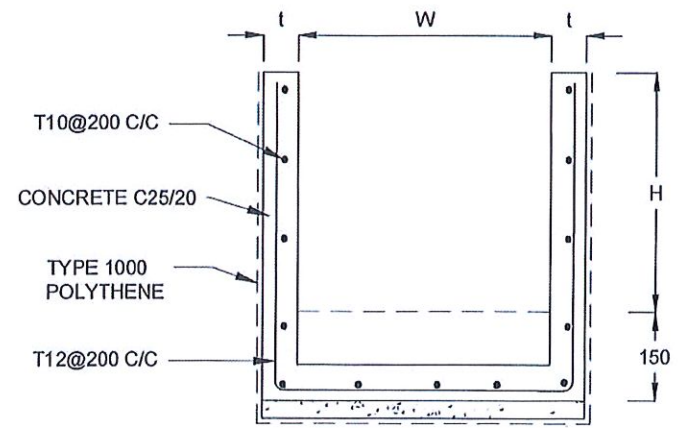
1. W,H,t ; SHALL BE THE SAME AS RESPECTIVE DRAIN SECTION.
2. CP - R SHALL BE USED WHERE $H \geq 900$ mm
3. DEPTH OF EXCAVATION MAY VARY ACCORDING TO SITE CONDITIONS.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. DETAILS OF SURFACE DRAIN PORTION OF THE SUBSURFACE DRAINS SHALL BE AS PER DS(M), DS(B), DS(K) OR DS(C) SECTIONS ACCORDINGLY.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

CONCRETE

8. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

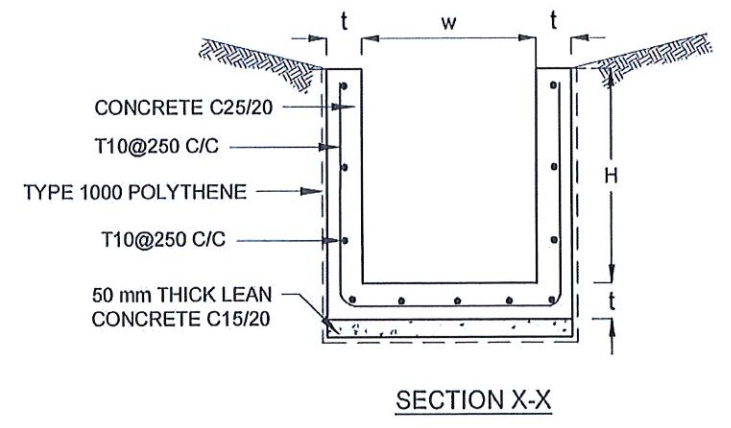
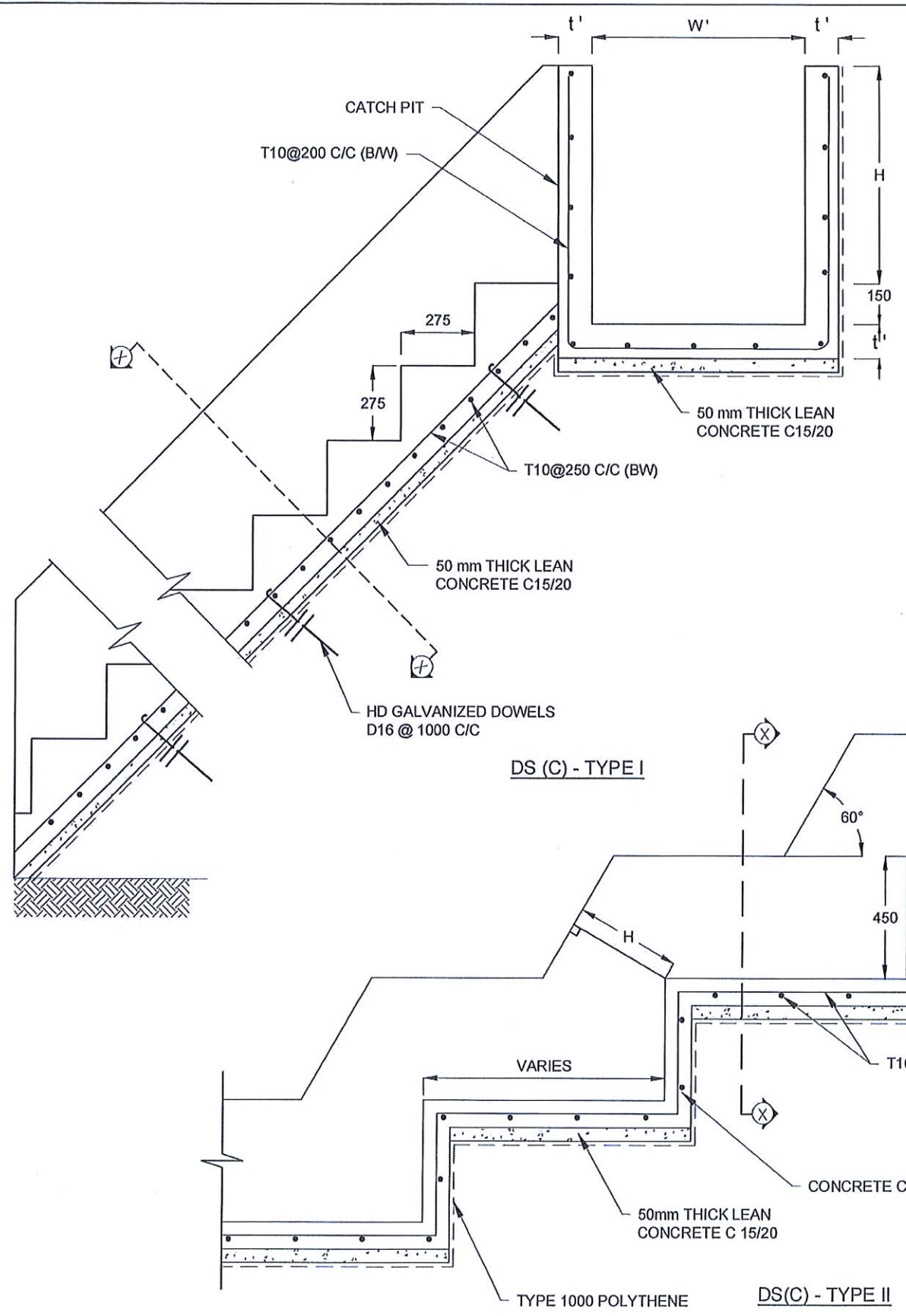
REINFORCEMENT

9. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
10. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
11. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
12. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
13. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



SECTION Y - Y

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BULATHKOHUPITIYA	TITLE DETAILS OF DRAINS (SUBSURFACE DRAIN AND CATCHPIT)	DESCRIPTION	NAME	SIGNATURE			
								SCALE	N.T.S.	DATE	12.11.2020	RECOMMENDED	PROF. S.A.S. KULATHILAKA
							PROJECT / DRAWING No.	RLVMP/WORKS/NCB/04A/09-BUL-05E	REVISION	00	APPROVED	K.N. BANDARA	



NOTES

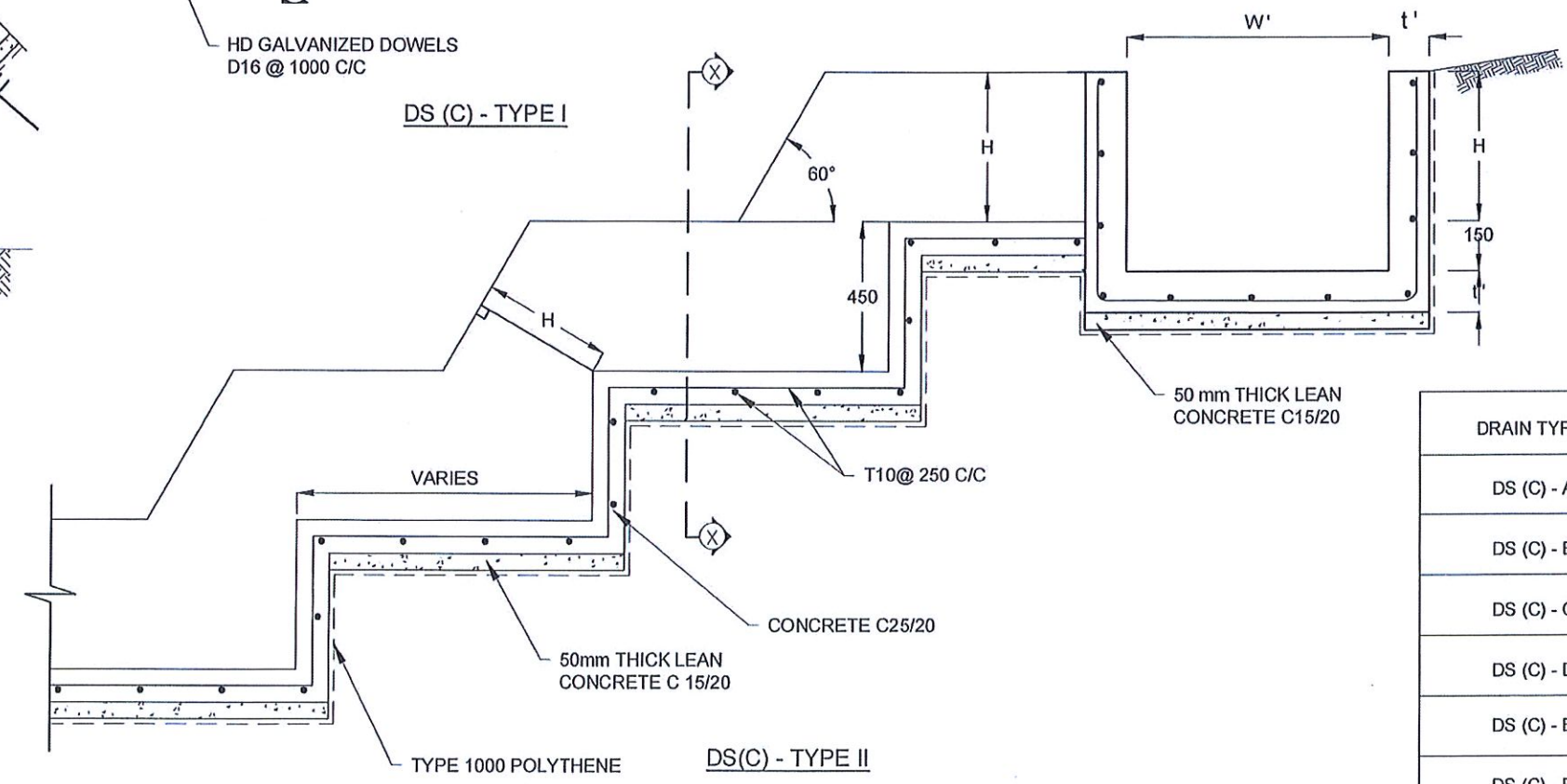
1. USE EITHER TYPE I OR TYPE II CASCADE DRAIN ACCORDING TO THE ACTUAL GROUND CONDITION AS INSTRUCTED BY THE ENGINEER.
2. LENGTH OF THE STEPS OF CASCADE WILL BE VARIED ACCORDING TO THE SITE CONDITIONS.
3. DEPTH OF EXCAVATION SHALL BE VARIED ACCORDING TO SITE CONDITIONS.
4. DOWELS SHALL BE INSTALLED ACCORDING TO THE GROUND CONDITIONS AS INSTRUCTED BY THE ENGINEER.
5. 10 mm THICK EXPANSION JOINT SHALL BE INTRODUCED IN EVERY 5m INTERVAL.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

CONCRETE

7. USE FOLLOWING CONCRETE GRADES FOR STRUCTURE
 - [a] SCREED - C. 15/20
 - [b] WALLS / BASE / ENERGY BREAKERS - C. 25/20

REINFORCEMENT

8. ALL BARS MARKED "T" SHALL BE HIGH YIELD DEFORMED BARS OF YIELD STRENGTH NOT LESS THAN 460N/mm².
9. BARS OF CUT LENGTH LARGER THAN THE SUPPLIED LENGTH TO BE LAPPED FOR A LENGTH OF 50 x BAR DIA. AND LAPPING SHOULD BE STAGGERED.
10. ANCHORAGE LENGTH SHOULD BE 40X BAR DIA.
11. REINFORCEMENT BARS SHALL BE BENT IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
12. COVER TO REINFORCEMENT
 - [a] BURIED FACES AND DRAIN INVERTS - 40 mm
 - [b] ALL OTHER FACES - 25 mm



DRAIN TYPE	W (mm)	H (mm)	t (mm)	W' (mm)	t' (mm)
DS (C) - A	450	450	100	600	100
DS (C) - B	450	600	100	750	100
DS (C) - C	600	600	100	800	100
DS (C) - D	750	750	100	800	100
DS (C) - E	800	800	125	1000	125
DS (C) - F	1000	750	125	1200	125

EMPLOYER
 DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
 STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS
 AND DISASTER MANAGEMENT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

DESIGNER
 DESIGN UNIT
 NATIONAL BUILDING RESEARCH ORGANISATION
 No. 99/1, JAWATTA ROAD
 COLOMBO - 05

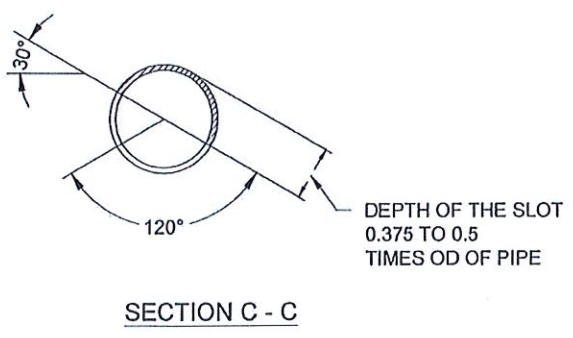
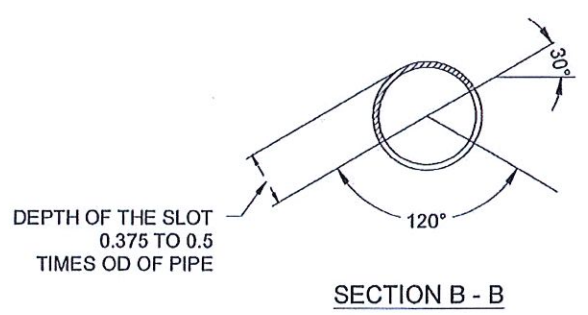
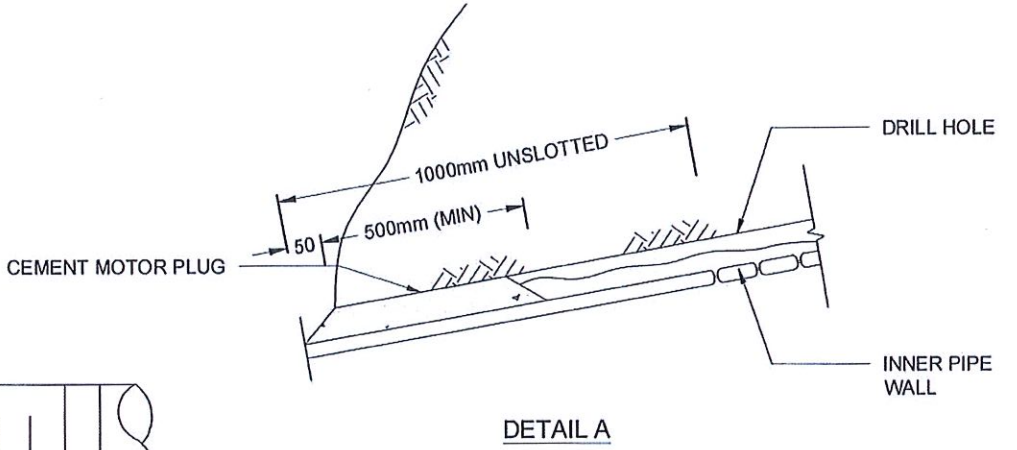
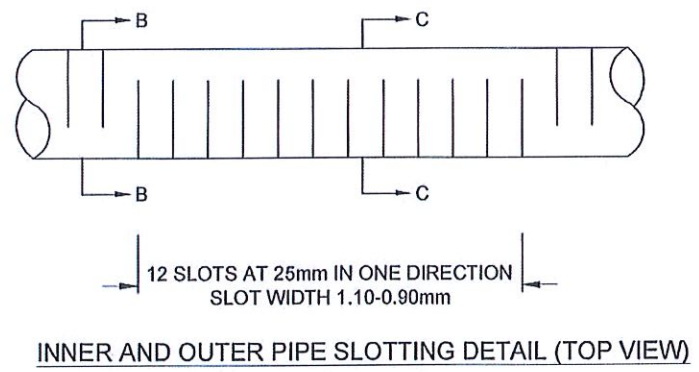
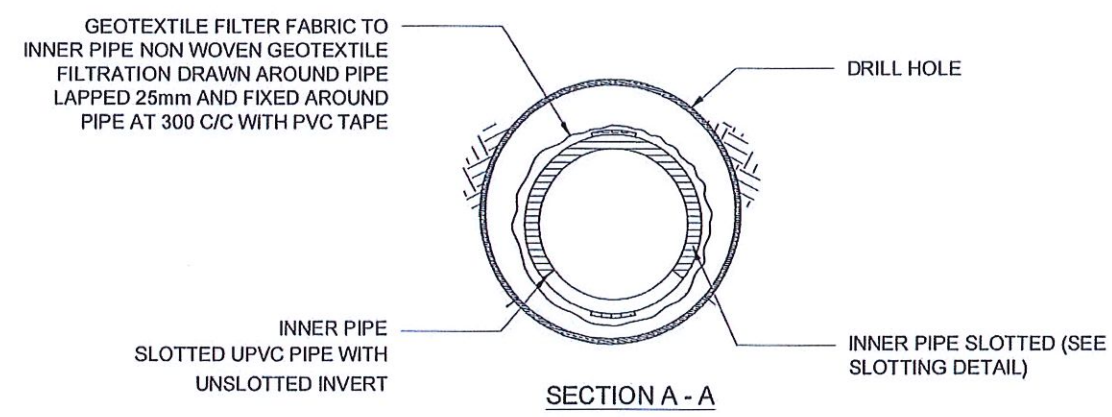
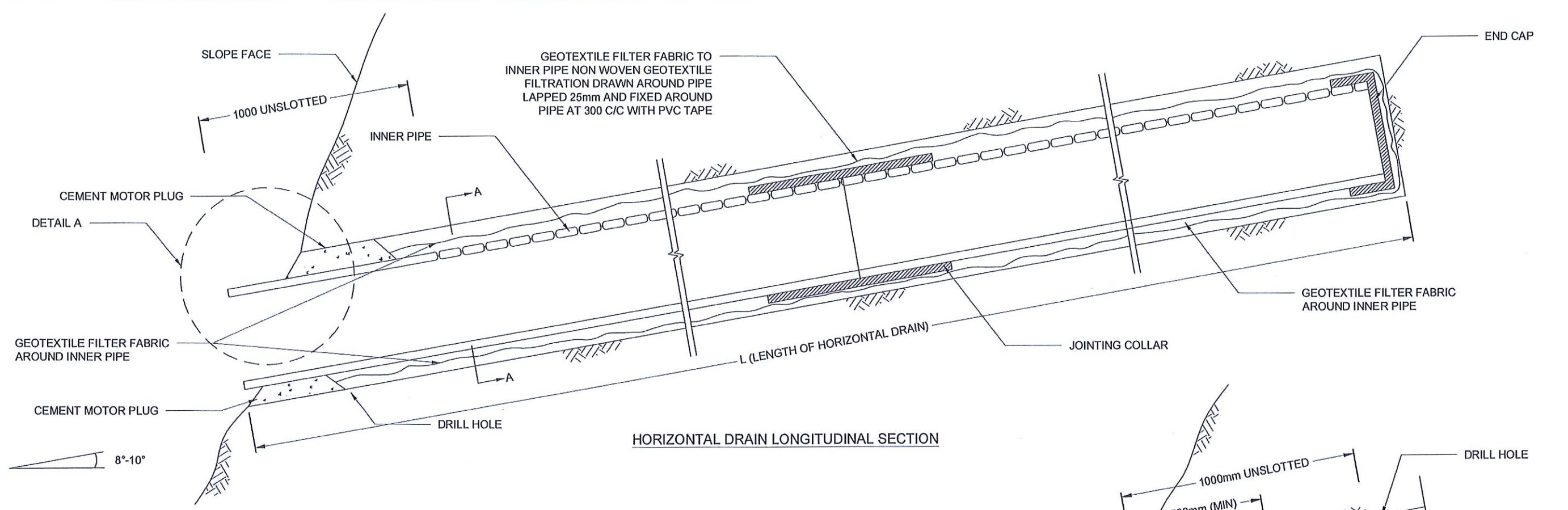
REV	DATE	REVISION DESCRIPTION	APPROVAL

PROJECT TITLE
 REDUCTION OF LANDSLIDE
 VULNERABILITY BY MITIGATION MEASURES
 BULATHKOHUPITIYA

TITLE
 DETAILS OF DRAINS
 (CASCADE DRAIN)

SCALE: N.T.S. DATE: 12.11.2020
 PROJECT / DRAWING No. RLVMP/WORKS/NCB/04/A/09-BUL/DR-05 REVISION: 00

DESCRIPTION	NAME	SIGNATURE
DRAWN	B.V.S. PATRISHIYA	<i>[Signature]</i>
DESIGNER	S.O.A.D.M. LAKRUWAN	<i>[Signature]</i>
CHECKED	J.P. SAMARANAYAKA	<i>[Signature]</i>
RECOMMENDED	PROF. S.A.S. KULATHILAKA	<i>[Signature]</i>
APPROVED	K.N. BANDARA	<i>[Signature]</i>



- NOTES**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 2. PIPE DIAMETERS, ANGLE & LENGTHS AS SPECIFIED IN DRAWINGS.
 3. ALL MATERIALS SHALL CONFORM TO PROJECT SPECIFICATION

EMPLOYER DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA STATE MINISTRY OF INTERNAL SECURITY, HOME AFFAIRS AND DISASTER MANAGEMENT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	DESIGNER DESIGN UNIT NATIONAL BUILDING RESEARCH ORGANISATION No. 99/1, JAWATTA ROAD COLOMBO - 05	REV	DATE	REVISION DESCRIPTION	APPROVAL	PROJECT TITLE REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES BULATHKOHUPITIYA	TITLE		DESCRIPTION	NAME	SIGNATURE
								DETAILS OF HORIZONTAL DRAIN SECTIONS	SCALE: N.T.S. PROJECT / DRAWING No. RLVMP/WORKS/NCB/04A/09-BUL/DR-05	DATE: 12.11.2020 REVISION: 00	DRAWN: B.V.S. PATTRISHIYA DESIGNER: S.O.A.D.M. LAKRUWAN CHECKED: J.P. SAMARANAYAKA RECOMMENDED: PROF. S.A.S. KULATHILAKA APPROVED: K.N. BANDARA