

AREA : 0.368 Hac.
SCALE 1:1000

LEGEND	
1. CONTOUR	
2. ROAD	
3. TREE	
4. DAMAGE ROAD	
5. OVERBURDEN	
6. WALL	
7. NALIDRAIN	
8. BOULDER	
9. SIGN-BOARD	
10. GABION	
11. CRASH-BARRIER	

NOTE:

BASED ON FIELD SURVEY WORK CARRIED OUT IN THE MONTH OF SEPTEMBER 2024, TAKING CO-ORDINATES OF REFERENCE POINTS AS DETAILED BELOW. (THE SAME HAS BEEN MARKED WHITE PAINT AT SITE)

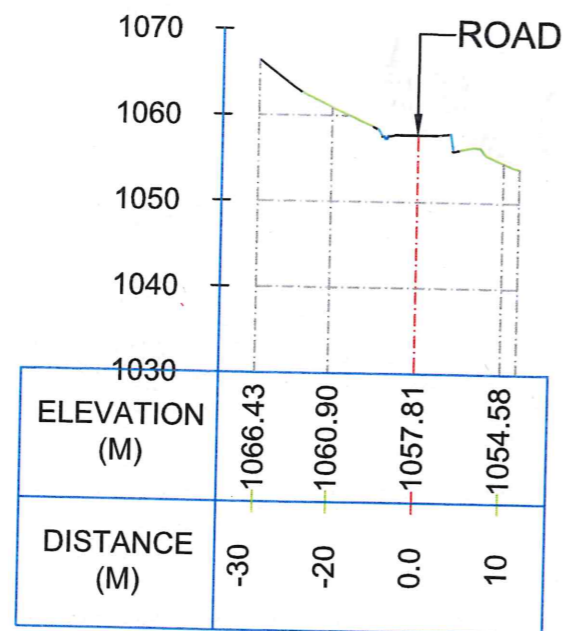
CO-ORDINATES OF REFERENCE POINTS (IN METERS)

POINT ID	EASTING	NORTHING	ELEVATION
B3	414688.854	3299899.688	1057.913
B5	414684.958	3299966.021	1054.481

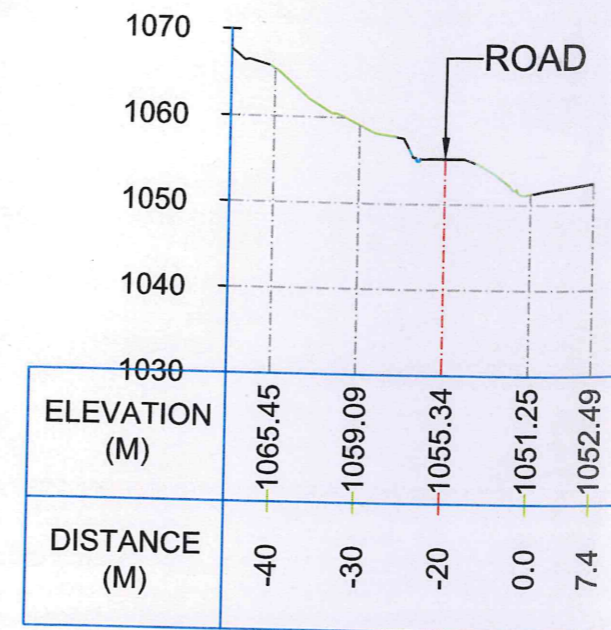
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Uttarakhand Landslide Mitigation
& Management Center

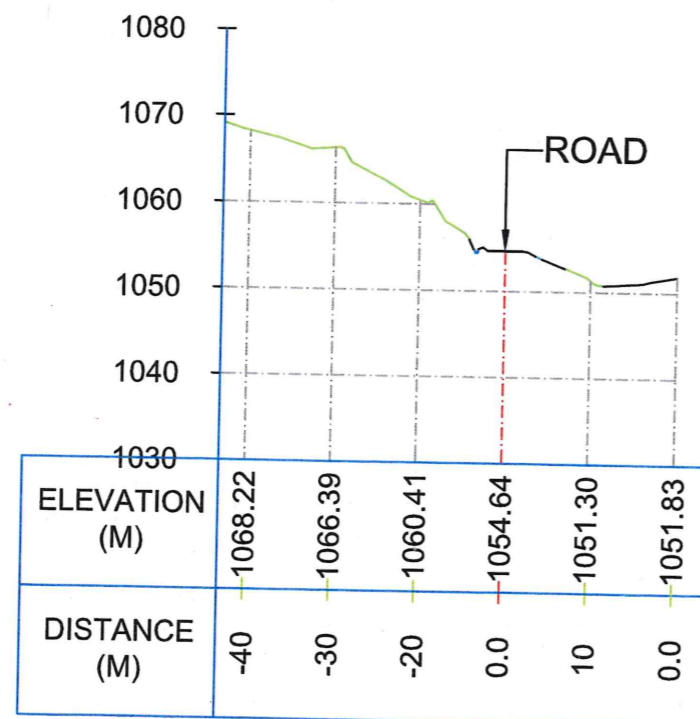
टीएचडीसी इण्डिया लिमिटेड THDC INDIA LIMITED		
CONSULTANCY TO U.K PWD UTTARAKHAND		
TOPOGRAPHICAL & CROSS-SECTIONAL MAP BETWEEN CH-122.000 KM TO CH-122.060 KM, BERINAG-ASKOT ROAD ON SH-03 UTTARAKHAND		
सर्वेक्षक SURVEYED BY: KOMAL KUMAR रेखांकित DRAWN BY: POOJA रेखाचित्र सं. 1072/THDCIL/S&I/UKPWD-52	संपरीक्षित CHECKED BY S.C PANDEY (Sr. Mgr.) प्रस्तुत SUBMITTED BY T.K KOTIYAL (DGM)	स्वीकृत APPROVED NIRAJ AGARWAL (AGM-I)
DATE: -15.10.2024		



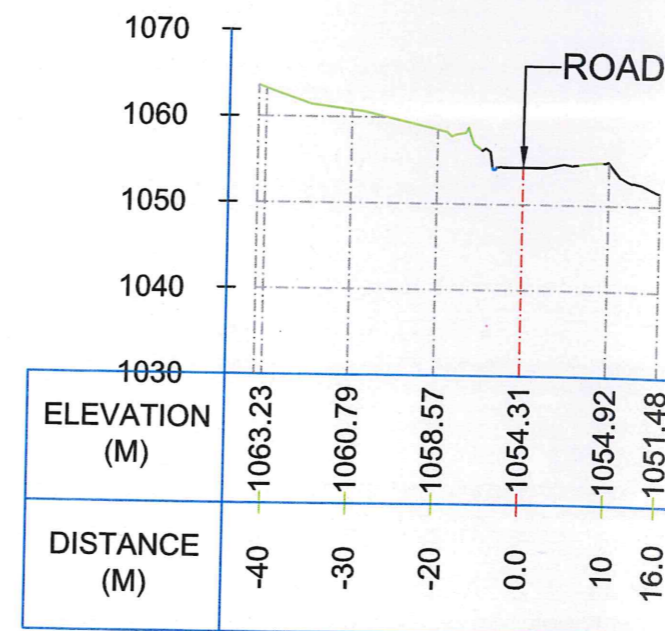
SECTION AT CH.122.000 KM.



SECTION AT CH.122.020 KM.

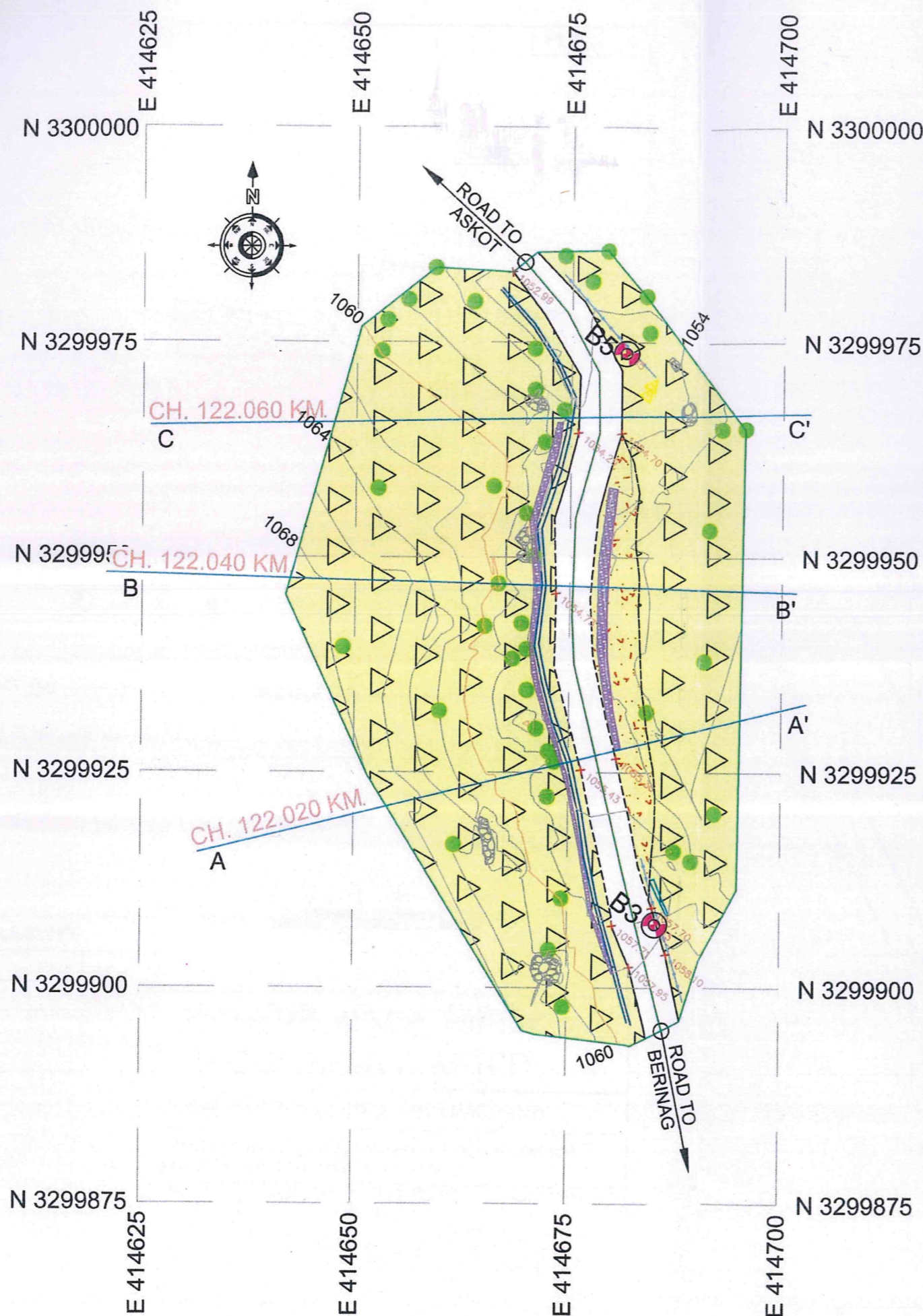


SECTION AT CH.122.040 KM.



SECTION AT CH.122.060 KM.

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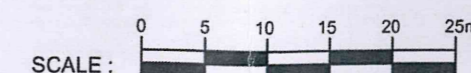
LEGEND	
1. CONTOUR	
2. ROAD	
3. TREE	
4. DAMAGE ROAD	
5. OVERBURDEN	
6. SLIDE MATERIAL	
7. NALI/DRAIN	
8. BOULDER / SIGN-BOARD	
9. GABION	
10. CRASH-BARRIER / WALL	

NOTE:

1. TOPOGRAPHICAL MAP OF SLOPE BETWEEN CH. 122.000 KM TO CH. 122.060 KM HAS BEEN PROVIDED BY DESIGN DEPARTMENT VIDE E - MAIL DATED 18/11/2024.
2. REFERENCE CHAINAGE OF THE SLIDE LOCATION MAY BE VERIFIED WITH THE CONCERNED AUTHORITY / DEPARTMENT.
3. GEOLOGICAL ASSESSMENT REPORT / DRAWING OF THE SLIDE LOCATED BETWEEN N 3299895, E 414686 AND N 3299884, E 414669 (SURVEY REFERENCE CHAINAGE FROM CH. 122.000 KM TO CH. 122.060 KM) HAS BEEN PREPARED BASED ON THE CONTOUR PLAN & SECTION FORWARDED BY DESIGN DEPARTMENT WIDE E-MAIL DATED 18/11/2024.

CO-ORDINATES OF REFERENCE POINTS (IN METERS)

POINT ID	EASTING	NORTHING	ELEVATION
B3	414688.854	3299899.688	1057.913
B5	414684.958	3299966.021	1054.481



CONSULTANCY TO U.K PWD UTTARAKHAND

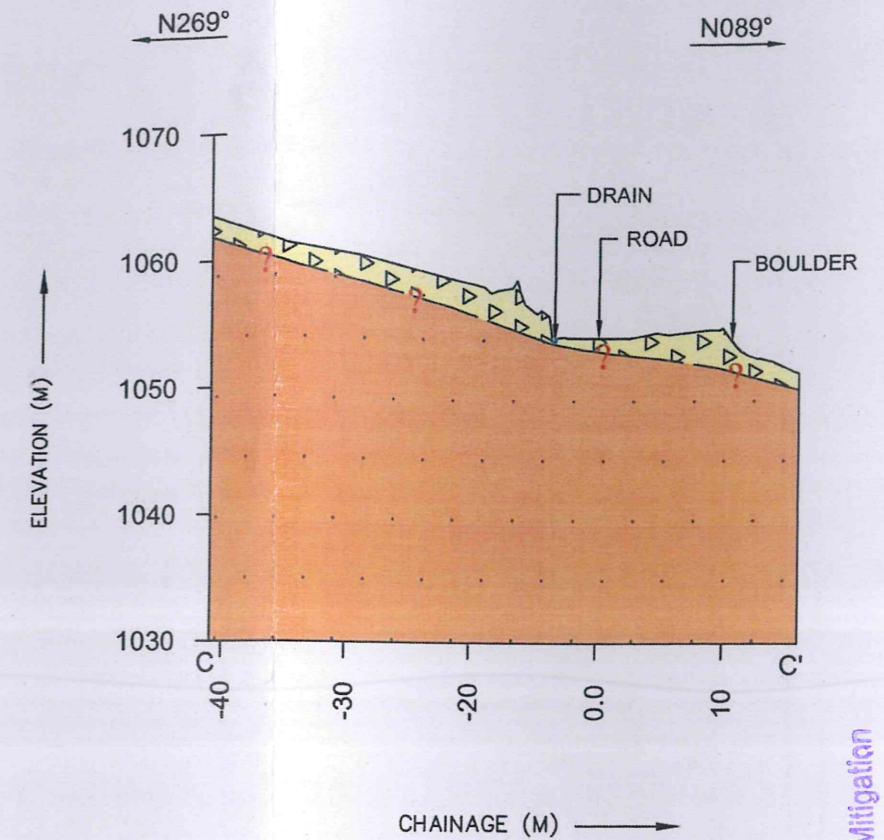
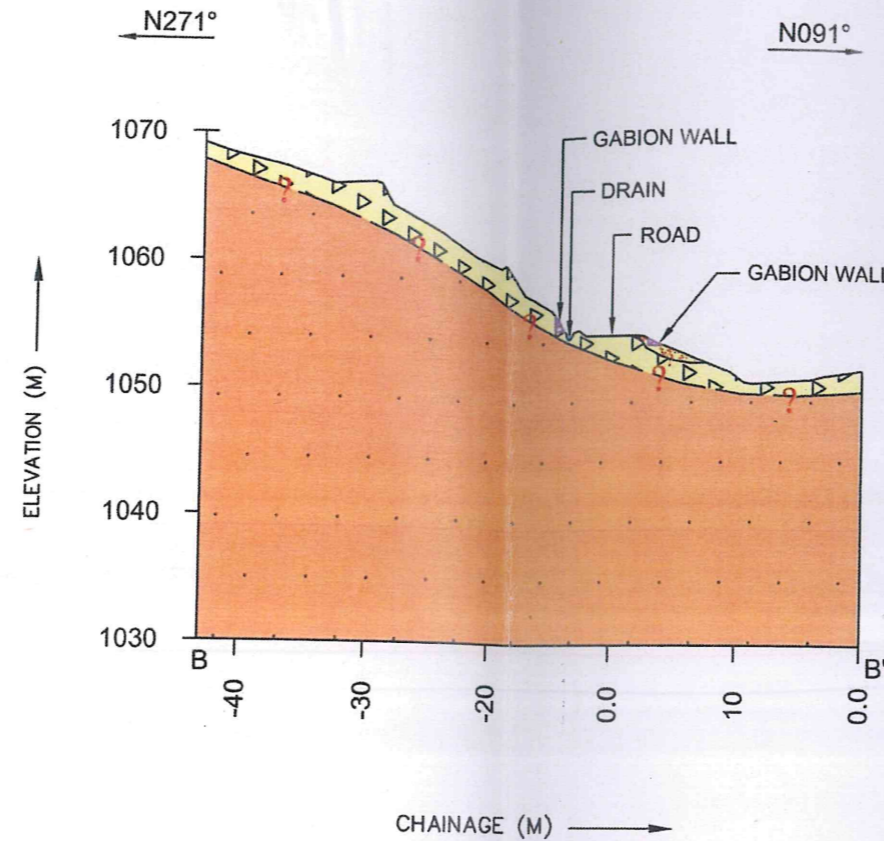
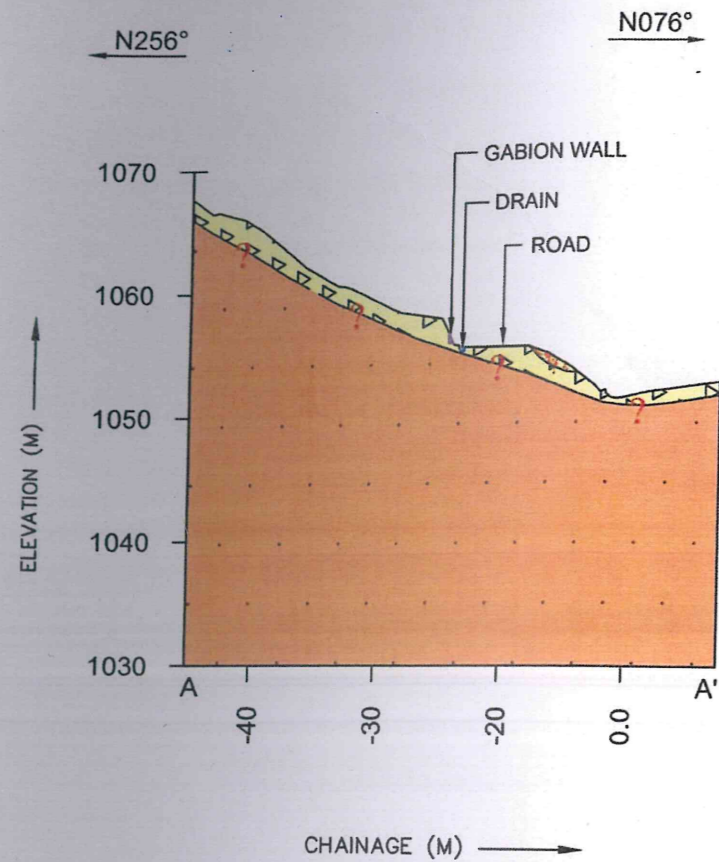
GEOLOGICAL MAP BETWEEN CH. 122.000 KM TO CH. 122.060 KM,
BERINAG - ASKOT ROAD ON SH-03 UTTARAKHAND.

DRAWN BY :	PREPARED BY :	CHECKED BY :	REVIEWED BY :	APPROVED BY :
सुरेश रावत (प्रारूपकार)	नीलेश रावत (भू-वैज्ञानिक)	आशीष कु. यादव (वरि. प्रबंधक)	हरीश चन्द्र उपाध्याय (उप महाप्रबंधक)	ए.के. बहानी (अपर महाप्रबंधक) (I/C)

DRG.NO : THDC/RKSH/GG/F-1898-01(A)/11

DATE : 27/01/2025

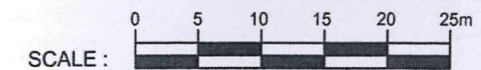
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& Management Center



LEGEND	
1. OVERBURDEN	
2. QUARTZITE	
3. SLIDE MATERIAL	

NOTE

- CROSS SECTIONS OF SLOPE BETWEEN CH. 122.000 KM TO CH. 122.060 KM PROVIDED BY DESIGN DEPARTMENT VIDE E-MAIL, Dt. 18/11/2024.
- DEPTH OF OVERBURDEN MAY VARY AS NO SUB-SURFACE EXPLORATION HAS BEEN DONE TO INFER ROCK - OVERBURDEN CONTACT.
- GEOLOGICAL ASSESSMENT REPORT / DRAWING OF THE SLIDE LOCATED BETWEEN N 3299895, E 414686 AND N 3299984, E 414669 (SURVEY REFERENCE CHAINAGE FROM CH. 122.000 KM TO CH. 122.060 KM) HAS BEEN PREPARED BASED ON THE CONTOUR PLAN & SECTION FORWARDED BY DESIGN DEPARTMENT WIDE E-MAIL DATED 18/11/2024.



टीएचडीसी इण्डिया लिमिटेड THDC INDIA LIMITED		CONSULTANCY TO U.K PWD UTTARAKHAND		
		GEOLOGICAL SECTIONS BETWEEN CH. 122.000 KM TO CH. 122.060 KM, BERINAG - ASKOT ROAD ON SH-03 UTTARAKHAND.		
DRAWN BY :	PREPARED BY :	CHECKED BY :	REVIEWED BY :	APPROVED BY :
सुरज रावत (प्रारूपकार)	डॉ. नीरज रावत (भू-वैज्ञानिक)	आशीष कु. यादव (वरि. प्रबंधक)	हरीश चन्द्र उपाध्याय (उप महाप्रबंधक)	ए.के. बडोनी (अपर महाप्रबंधक) (I/C)
DRG.NO : THDC/RKSH/GG/F-1898-01(A)/12				DATE : 27/01/2025

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 & Management Center

PROVISION OF 90M LONG, 4.0M HIGH CC GRAVITY WALL FROM CH. 121.990 TO CH. 122.080 KM AT EL ±1050M
REFER DETAIL-B ON SHEET 6 OF 9

2.0M WIDE HILL CUTTING FOR ROAD WIDENING FROM CH. 121.990 TO CH. 122.080 KM QTY=1650CUM

PROVISION OF 90M LONG, 4.0M HIGH CC GRAVITY WALL WITH CC DRAIN OVER RCC RAFT & CLUSTER OF BUNDLED SDRA AND ONE ROW OF 75MM DIA SEMI PERFORATED SUB SURFACE PVC DRAIN PIPE 10M DEEP @ 4.0M C/C STAGGERED FROM CH. 121.990 TO CH. 122.080 KM AT EL ±1054M
REFER DETAIL-A ON SHEET 5 OF 9

PROVISION OF 100M LONG 6.0M HIGH RCC STEPPED WALL OVER RCC RAFT & CLUSTER OF BUNDLED SDRA FROM CH. 121.990 TO CH. 122.090 KM AT EL ±1035M
REFER DETAIL-D ON SHEET 7 OF 9

PROVISION OF 2.5M (W) X2.5M (D) SIZE, CC CATCHPIT CONNECTING RCC BOX CULVERT AT EL ±980M
REFER DETAIL-F ON SHEET 8 OF 9

PROVISION OF 2 M WIDE, 2.5M DEEP AND 8M LENGTH SPAN RCC BOX CULVERT SINGLE BAY AND PROVISION OF 2NOS, 3M LENGTH RETURN WALL AT THE EXIT END IN PLACE OF EXISTING CAUSEWAY AT EL ±980M
REFER DETAIL-G ON SHEET 8 OF 9

PROVISION OF 2 M WIDE, 10M LONG GABION CHANNEL CONNECTING RCC BOX CULVERT
REFER DETAIL-H ON SHEET 9 OF 9

PROVISION OF 40M LONG, 6.0M HIGH RCC STEPPED WALL WITH CC DRAIN OVER RCC RAFT & CLUSTER OF BUNDLED SDRA AND ONE ROW OF 75MM DIA SEMI PERFORATED SUB SURFACE PVC DRAIN PIPE 10M DEEP @ 4.0M C/C STAGGERED FROM CH. 122.020 TO CH. 122.060 KM AFTER DISMANTLING OF EXISTING GABION WALL AT EL ±980M
REFER DETAIL-E ON SHEET 7 OF 9

PROVISION OF 95M LONG, 4.0M HIGH CC GRAVITY WALL OVER RCC RAFT & CLUSTER OF BUNDLED SDRA FROM CH. 121.990 TO CH. 122.085 KM AT EL ±1045M
REFER DETAIL-C ON SHEET 6 OF 9

NOTE
1. ALL DIMENSIONS ARE IN M UNLESS OTHERWISE SPECIFIED.

LEGEND	
1	CONTOUR
2	ROAD
3	TREE
4	DAMAGE ROAD
5	OVERBURDEN
6	SLIDE MATERIAL
7	WALUDRAIN
8	BOULDER / SIGN BOARD
9	GABION
10	CRASH-BARRIER / WALL
11	4.0M HIGH CC GRAVITY WALL WITH CC DRAIN OVER RCC RAFT & BUNDLED SDRA
12	4.0M HIGH CC GRAVITY WALL
13	4.0M HIGH CC GRAVITY WALL OVER RCC RAFT & BUNDLED SDRA
14	6.0M HIGH RCC STEPPED WALL OVER RCC RAFT & BUNDLED SDRA
15	6.0M HIGH RCC STEPPED WALL WITH CC DRAIN OVER RCC RAFT & BUNDLED SDRA
16	OPEN CC CATCHPIT
17	RCC BOX CULVERT
18	HILL CUTTING FOR ROAD WIDENING
19	GABION CHANNEL
20	RETURN WALL

SCALE: 0 5 10 15 20 25m

FOR TENDER PURPOSE ONLY



PUBLIC WORKS DEPARTMENT
GOVERNMENT OF UTTARAKHAND

PROTECTION / TREATMENT WORKS OF LANDSLIDE ZONE
FROM BERINAG - ASKOT ROAD SH - 03 (UTTARAKHAND)

CONSULTANT: टीएचडीसी इंडिया लिमिटेड
THDC INDIA LIMITED

(KEY PLAN)
STABILITY MEASURES
FOR LOCATION BETWEEN CH. 121.990 KM TO CH. 122.090 KM
ON BERINAG-ASKOT ROAD SH-03 (UTTARAKHAND)

SHEET 1 OF 9

DESIGNED BY	CHECKED BY	SUBMITTED BY	APPROVED BY
GUTAM YADAV (ENGINEER CIVIL)	KRISHNENDU P J (ASST. MGR.)	ANISH KUMAR (SR. MGR.)	NIRAJ AGRAWAL (GM)

DRG NO THDC/RKSH/D&E/UKPWD/(L-CH 121.990-122.090KM)/TD-01

FEB 2025

D&E RISHIKESH

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Uttarakhand Landslide Mitigation
& Management Center

N256°

N076°

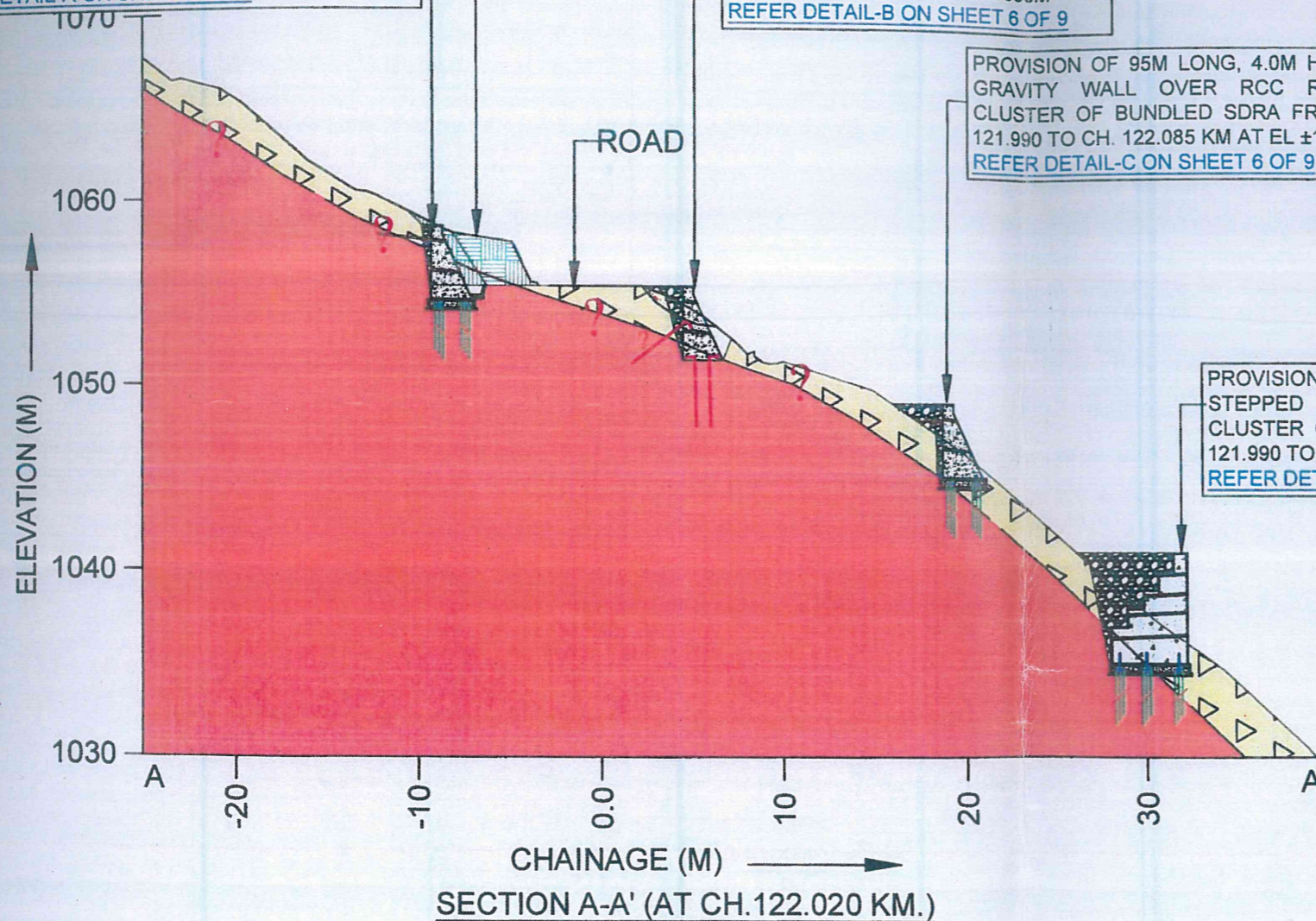
PROVISION OF 90M LONG, 4.0M HIGH CC GRAVITY WALL WITH CC DRAIN OVER RCC RAFT & CLUSTER OF BUNDLED SDRA AND ONE ROW OF 75MM DIA SEMI PERFORATED SUB SURFACE PVC DRAIN PIPE 10M DEEP @ 4.0M C/C STAGGERED FROM CH. 121.990 TO CH. 122.080 KM AT EL ±1054M
REFER DETAIL-A ON SHEET 5 OF 9

2.0M WIDE HILL CUTTING FOR ROAD WIDENING FROM CH. 121.990 TO CH. 122.080 KM QTY=1650CUM

PROVISION OF 90M LONG, 4.0M HIGH CC GRAVITY WALL FROM CH. 121.990 TO CH. 122.080 KM AT EL ±1050M
REFER DETAIL-B ON SHEET 6 OF 9

PROVISION OF 95M LONG, 4.0M HIGH CC GRAVITY WALL OVER RCC RAFT & CLUSTER OF BUNDLED SDRA FROM CH. 121.990 TO CH. 122.085 KM AT EL ±1045M
REFER DETAIL-C ON SHEET 6 OF 9

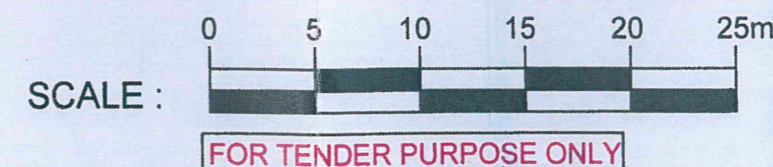
PROVISION OF 100M LONG 6.0M HIGH RCC STEPPED WALL OVER RCC RAFT & CLUSTER OF BUNDLED SDRA FROM CH. 121.990 TO CH. 122.090 KM AT EL ±1035M
REFER DETAIL-D ON SHEET 7 OF 9



NOTE

1. ALL DEPTH OF OVERBURDEN MAY VARY AS NO SUB-SURFACE EXPLORATION HAS BEEN DONE TO INFER ROCK - OVERBURDEN CONTACT.

LEGEND	
1	OVERBURDEN
2	QUARTZITE
3	SLIDE MATERIAL
4	HILL CUTTING FOR ROAD WIDENING
5	4.0M HIGH CC GRAVITY WALL WITH CC DRAIN OVER RCC RAFT & BUNDLED SDRA
6	4.0M HIGH CC GRAVITY WALL
7	4.0M HIGH CC GRAVITY WALL OVER RCC RAFT & BUNDLED SDRA
8	6.0M HIGH RCC STEPPED WALL OVER RCC RAFT & BUNDLED SDRA



PUBLIC WORKS DEPARTMENT
GOVERNMENT OF UTTARAKHAND

PROTECTION / TREATMENT WORKS OF LANDSLIDE ZONE
FROM BERINAG - ASKOT ROAD SH - 03 (UTTARAKHAND)

CONSULTANT: टीएचडीसी इंडिया लिमिटेड
THDC INDIA LIMITED

(SECTION A-A')
STABILITY MEASURES
FOR LOCATION BETWEEN CH. 121.990 KM TO CH. 122.090 KM
ON BERINAG-ASKOT ROAD SH-03 (UTTARAKHAND)

SHEET 2 OF 9

DESIGNED BY HAUTAM YADAV (ENGINEER CIVIL)	CHECKED BY KRISHNENDU P J (ASST. MGR.)	SUBMITTED BY AYKESH KUMAR (SR. MGR.)	APPROVED BY NIRAJ AGRAWAL (GM)
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DRG NO THDC/RKSH/D&E/UKPWD (L-CH 121.990-122.090KM)/TD-01

FEB 2025

D&E RISHIKESH

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Uttarakhand Landslide Mitigation
& Management Center

N271°

N091°

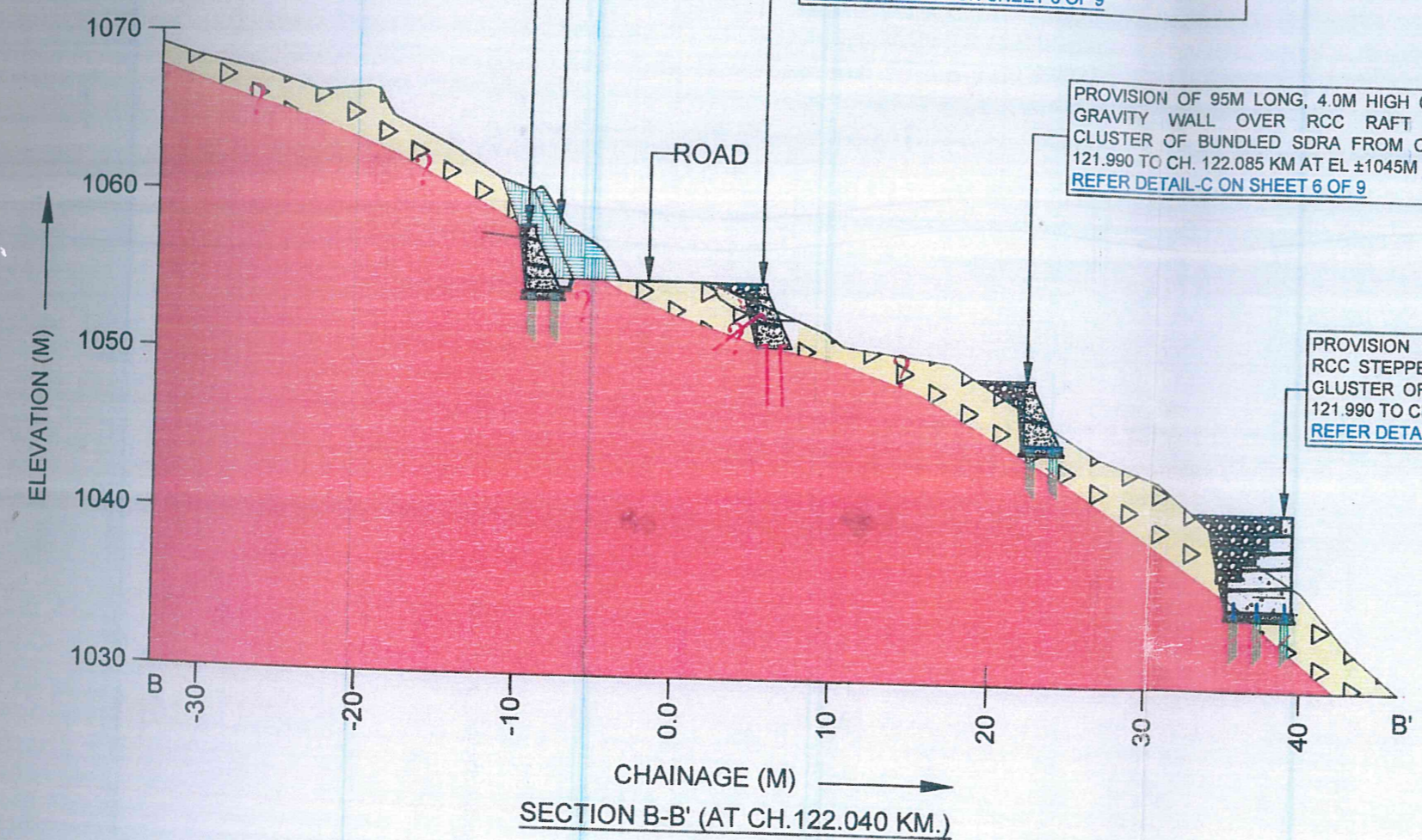
PROVISION OF 90M LONG, 4.0M HIGH CC GRAVITY WALL WITH CC DRAIN OVER RCC RAFT & CLUSTER OF BUNDLED SDRA AND ONE ROW OF 75MM DIA SEMI PERFORATED SUB SURFACE PVC DRAIN PIPE /10M DEEP @ 4.0M C/C STAGGERED FROM CH. 121.990 TO CH. 122.080 KM AT EL ±1054M
REFER DETAIL-A ON SHEET 5 OF 9

2.0M WIDE HILL CUTTING FOR ROAD WIDENING FROM CH. 121.990 TO CH. 122.080 KM QTY=1650CUM

PROVISION OF 90M LONG, 4.0M HIGH CC GRAVITY WALL FROM CH. 121.990 TO CH. 122.080 KM AT EL ±1050M
REFER DETAIL-B ON SHEET 6 OF 9

PROVISION OF 95M LONG, 4.0M HIGH CC GRAVITY WALL OVER RCC RAFT & CLUSTER OF BUNDLED SDRA FROM CH. 121.990 TO CH. 122.085 KM AT EL ±1045M
REFER DETAIL-C ON SHEET 6 OF 9

PROVISION OF 100M LONG 6.0M HIGH RCC STEPPED WALL OVER RCC RAFT & CLUSTER OF BUNDLED SDRA FROM CH. 121.990 TO CH. 122.090 KM AT EL ±1035M
REFER DETAIL-D ON SHEET 7 OF 9



NOTE
1. ALL DEPTH OF OVERBURDEN MAY VARY AS NO SUB-SURFACE EXPLORATION HAS BEEN DONE TO INFER ROCK - OVERBURDEN CONTACT.

LEGEND	
1	OVERBURDEN
2	QUARTZITE
3	SLIDE MATERIAL
4	HILL CUTTING FOR ROAD WIDENING
5	4.0M HIGH CC GRAVITY WALL WITH CC DRAIN OVER RCC RAFT & BUNDLED SDRA
6	4.0M HIGH CC GRAVITY WALL
7	4.0M HIGH CC GRAVITY WALL OVER RCC RAFT & BUNDLED SDRA
8	6.0M HIGH RCC STEPPED WALL OVER RCC RAFT & BUNDLED SDRA



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<p>PUBLIC WORKS DEPARTMENT GOVERNMENT OF UTTARAKHAND</p>			
<p>PROTECTION / TREATMENT WORKS OF LANDSLIDE ZONE FROM BERINAG - ASKOT ROAD SH - 03 (UTTARAKHAND)</p>			
<p>CONSULTANT:</p>		<p>टीएचडीसी इंडिया लिमिटेड THDC INDIA LIMITED</p>	
<p>(SECTION B-B') STABILITY MEASURES FOR LOCATION BETWEEN CH. 121.990 KM TO CH. 122.090 KM ON BERINAG-ASKOT ROAD SH-03 (UTTARAKHAND)</p>			
DESIGNED BY	CHECKED BY	SUBMITTED BY	APPROVED BY
GAUTAM YADAV (ENGINEER CIVIL)	KRISHNENDU P J (ASST. MGR.)	VIKASH KUMAR (SR. MGR.)	NIRAJ AGRAWAL (GM)
<p>DRG NO THDC/RKSH/D&E/UKPWD/(L-CH 121.990-122.090KM)/TD-01</p>			<p>FEB 2025</p>
<p>D&E RISHIKESH</p>			

N269°

N089°

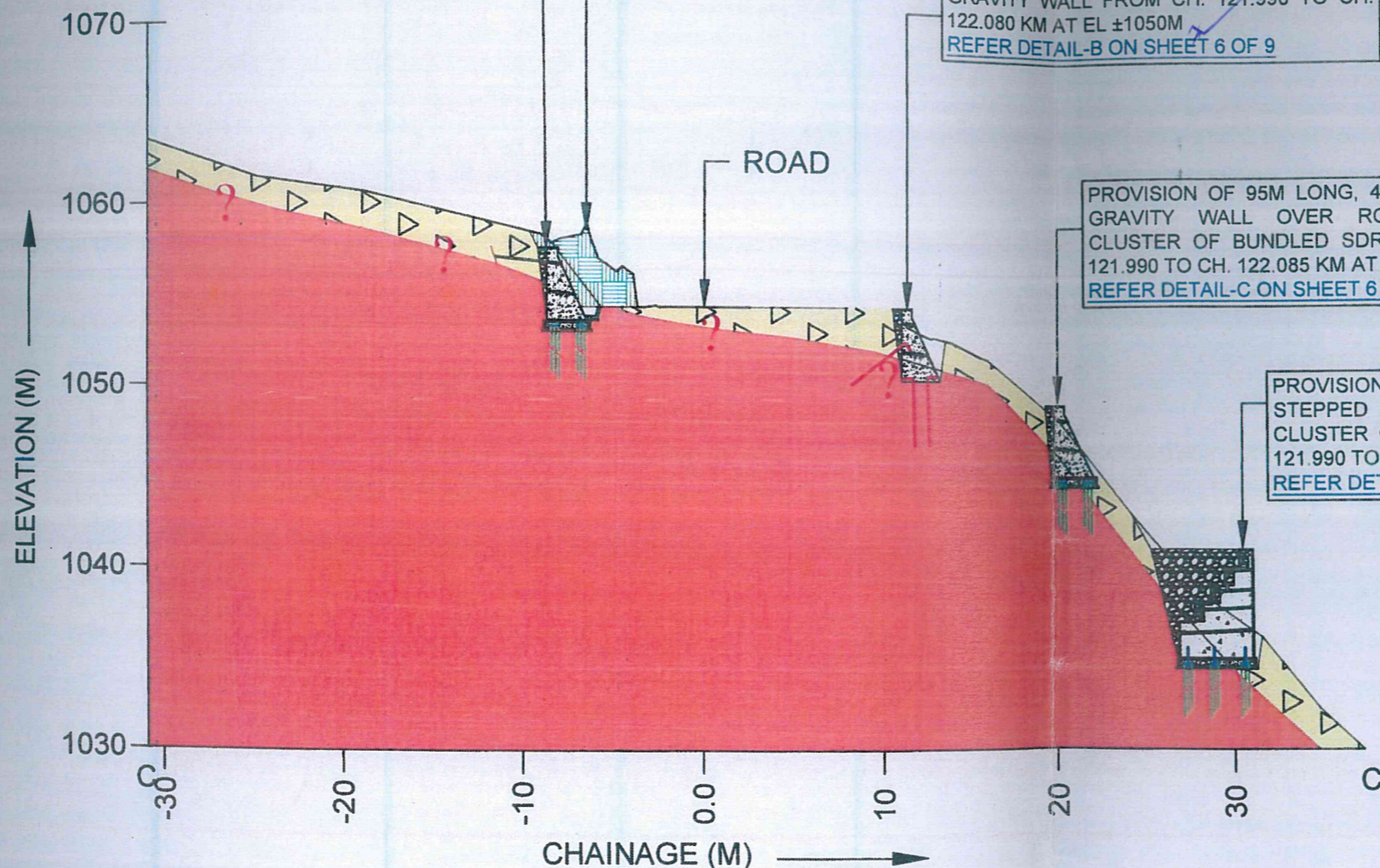
PROVISION OF 90M LONG, 4.0M HIGH CC GRAVITY WALL WITH CC DRAIN OVER RCC RAFT & CLUSTER OF BUNDLED SDRA AND ONE ROW OF 75MM DIA SEMI PERFORATED SUB SURFACE PVC DRAIN PIPE 10M DEEP @ 4.0M C/C STAGGERED FROM CH. 121.990 TO CH. 122.080 KM AT EL ±1054M
REFER DETAIL-A ON SHEET 5 OF 9

2.0M WIDE HILL CUTTING FOR ROAD WIDENING FROM CH. 121.990 TO CH. 122.080 KM QTY=1650CUM

PROVISION OF 90M LONG, 4.0M HIGH CC GRAVITY WALL FROM CH. 121.990 TO CH. 122.080 KM AT EL ±1050M
REFER DETAIL-B ON SHEET 6 OF 9

PROVISION OF 95M LONG, 4.0M HIGH CC GRAVITY WALL OVER RCC RAFT & CLUSTER OF BUNDLED SDRA FROM CH. 121.990 TO CH. 122.085 KM AT EL ±1045M
REFER DETAIL-C ON SHEET 6 OF 9

PROVISION OF 100M LONG 6.0M HIGH RCC STEPPED WALL OVER RCC RAFT & CLUSTER OF BUNDLED SDRA FROM CH. 121.990 TO CH. 122.090 KM AT EL ±1035M
REFER DETAIL-D ON SHEET 7 OF 9



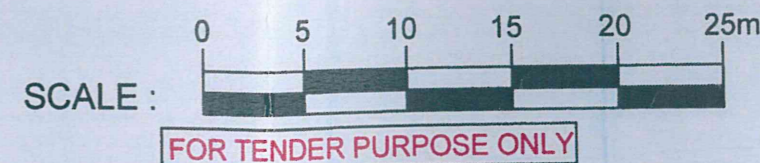
SECTION C-C' (AT CH.122.060 KM.)

NOTE

1. ALL DEPTH OF OVERBURDEN MAY VARY AS NO SUB-SURFACE EXPLORATION HAS BEEN DONE TO INFER ROCK - OVERBURDEN CONTACT.

LEGEND	
1. OVERBURDEN	
2. QUARTZITE	
3. SLIDE MATERIAL	
4. HILL CUTTING FOR ROAD WIDENING	
5. 4.0M HIGH CC GRAVITY WALL WITH CC DRAIN OVER RCC RAFT & BUNDLED SDRA	
6. 4.0M HIGH CC GRAVITY WALL	
7. 4.0M HIGH CC GRAVITY WALL OVER RCC RAFT & BUNDLED SDRA	
8. 6.0M HIGH RCC STEPPED WALL OVER RCC RAFT & BUNDLED SDRA	

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PUBLIC WORKS DEPARTMENT
GOVERNMENT OF UTTARAKHAND

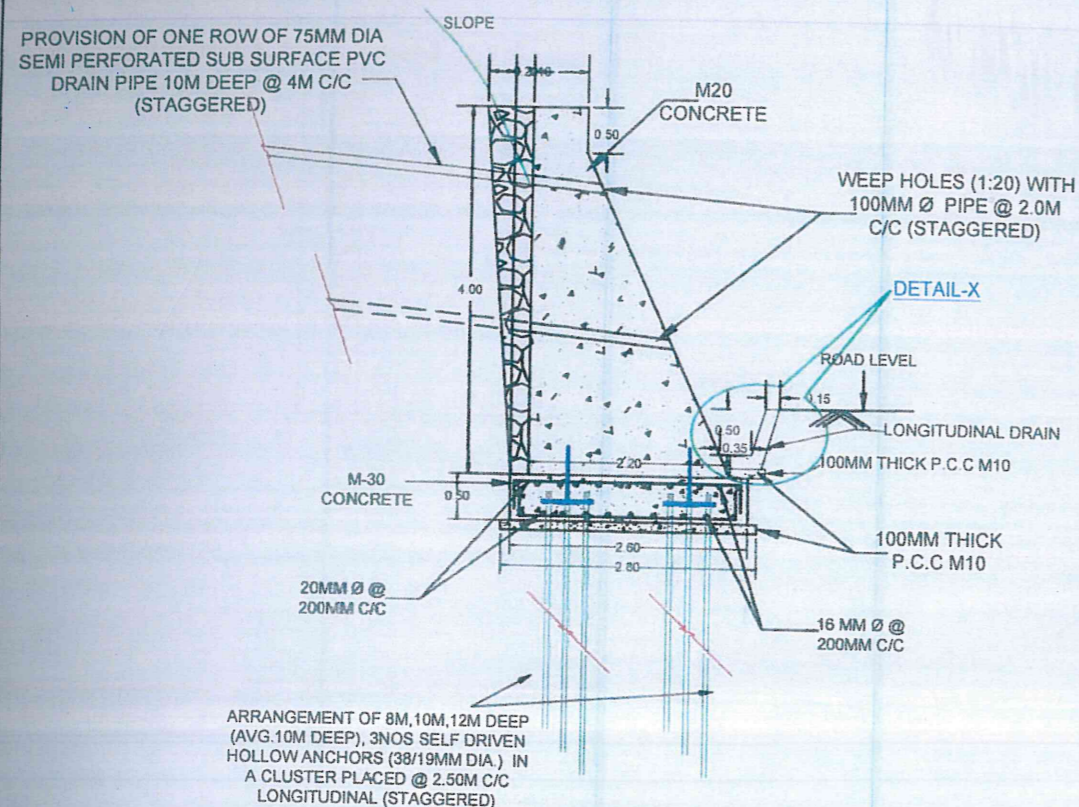
PROTECTION / TREATMENT WORKS OF LANDSLIDE ZONE
FROM BERINAG - ASKOT ROAD SH - 03 (UTTARAKHAND)

CONSULTANT: टीएचडीसी इंडिया लिमिटेड
THDC INDIA LIMITED

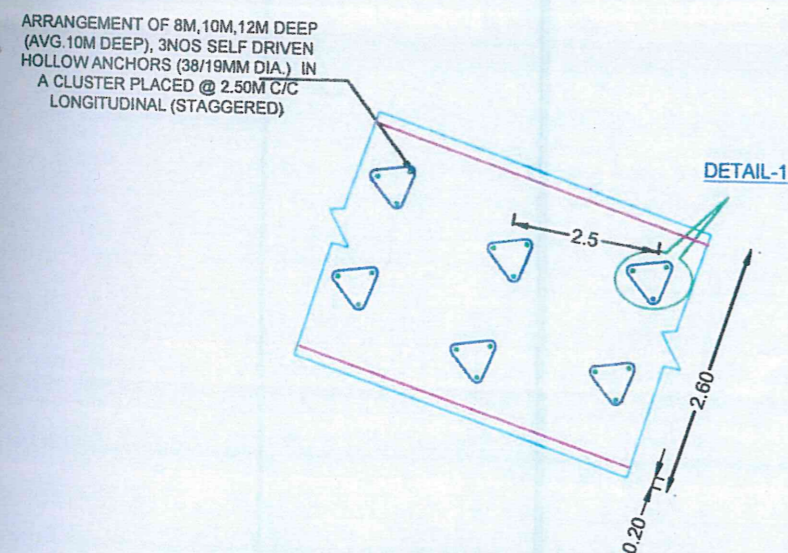
(SECTION C-C')
STABILITY MEASURES
FOR LOCATION BETWEEN CH 121.990 KM TO CH 122.090 KM
ON BERINAG-ASKOT ROAD, SH-03 (UTTARAKHAND)

SHEET 4 OF 9

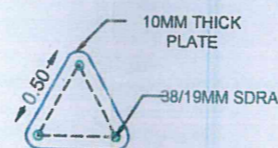
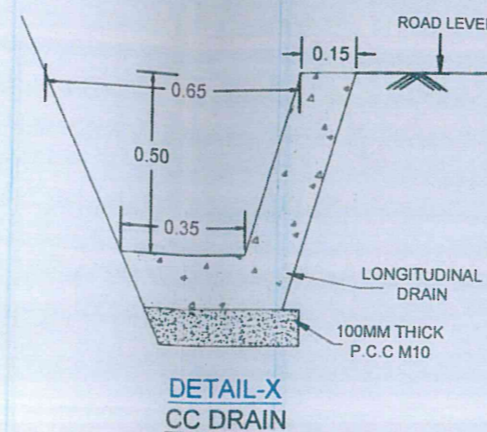
DESIGNED BY GAUTAM YADAV (ENGINEER CIVIL)	CHECKED BY KRISHNENDU P. J (ASST. MGR.)	SUBMITTED BY AVKESH KUMAR (SR. MGR.)	APPROVED BY NIRAJ KUMAR WAI (GM)
DRG NO:THDC/RKSH/D&E/UKPWD/(L-CH 121.990-122.090KM)/TD-01			FEB 2025
			D&E RISHIKESH



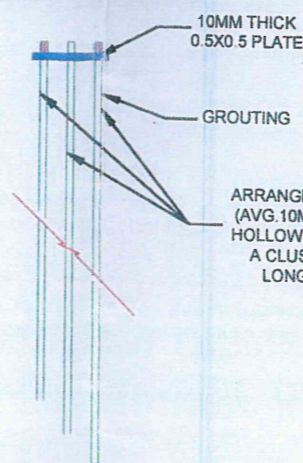
DETAIL-A
TYPICAL DETAILS OF 4M HIGH CC GRAVITY WALL
WITH DRAIN OVER RCC RAFT & BUNDLED SDRA
(ALONG HILL ROAD)



TYPICAL ARRANGEMENT OF CLUSTER OF SELF
DRIVEN HOLLOW ROCK ANCHORS



DETAIL-1
TYPICAL ARRANGEMENT
OF SDRA CLUSTER



SECTIONAL ELEVATION OF SDRA CLUSTER
WITH 500X500X10MM PLATE

NOTES:-

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. EXCAVATION FOR FOUNDATION SHALL BE DONE IN 6-8M LONG STRECHES ONLY & TREATMENT SHALL BE COMPLETED BEFORE START OF NEW PATCH.
3. CONCRETE SURFACE SHOULD BE ROUGHED AND CLEAN BEFORE POURING THE CONCRETE/FRESH CONCRETE.
4. FOUNDATION SURFACE UPON WHICH CC WALL IS TO BE PLACED SHALL BE APPROVED BY GEOLOGIST/ENGINEER-IN - CHARGE PRIOR TO START OF WORK.
5. HIGH STRENGTH ORDINARY PORTLAND CEMENT CONFORMING TO IS : 8112 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
6. THE MINIMUM CEMENT CONTENT AND WATER CEMENT RATIO IN THE CONCRETE DESIGN MIX SHALL BE 310 KG PER CUM AND 0.45 RESPECTIVELY.
7. CONCRETE USED SHALL BE OF GRADES AS SPECIFIED BELOW CONFORMING TO IS 456 (LATEST):
RCC RAFT - M30
CC GRAVITY WALL - M20
CC DRAIN - M20
LEVELING COURSE - M10.
8. PROPERLY BRACED STEEL PLATES SHALL BE USED AS SHUTTERING.
9. THE GROUTING SHALL BE DONE AT A PRESSURE RANGING FROM 1 TO 3 KG/SQCM.
10. LAPS AND ANCHORAGE LENGTH SHALL BE AS PER IS 456(LATEST).
11. LAPS SHALL BE STAGGERED.

FOR TENDER PURPOSE ONLY



PUBLIC WORKS DEPARTMENT
GOVERNMENT OF UTTARAKHAND

PROTECTION / TREATMENT WORKS OF LANDSLIDE ZONE
FROM BERINAG - ASKOT ROAD SH - 03 (UTTARAKHAND)

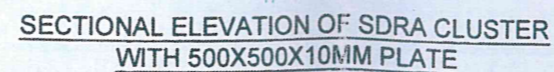
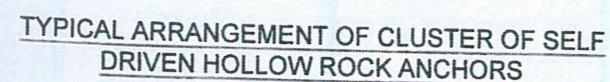
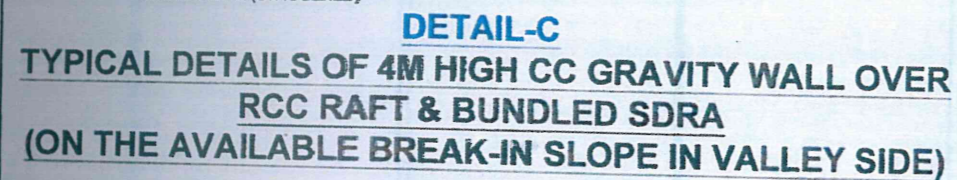
CONSULTANT:



टीएचडीसी इंडिया लिमिटेड
THDC INDIA LIMITED

(DETAIL-A)
STABILITY MEASURES
FOR LOCATION BETWEEN CH. 121.990 KM TO CH. 122.090 KM
ON BERINAG-ASKOT ROAD, SH-03 (UTTARAKHAND)

DESIGNED BY	CHECKED BY	SUBMITTED BY	SHEET 5 OF 9
GAUTAM YADAV (ENGINEER CIVIL)	KRISHNENDU P J (ASST. MGR.)	AVKESH KUMAR (SR. MGR.)	NIRAJ AGRAWAL (GM)
DRG NO THDC/RKSH/D&E/UKPWD/(L-CH 121.990-122.090KM)/TD-01	FEB 2025	D&E RISHIKESH	



1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. EXCAVATION FOR FOUNDATION SHALL BE DONE IN 6-8M LONG STRECHES ONLY & TREATMENT SHALL BE COMPLETED BEFORE START OF NEW PATCH.
3. CONCRETE SURFACE SHOULD BE ROUGHED AND CLEAN BEFORE POURING THE CONCRETE/FRESH CONCRETE.
4. FOUNDATION SURFACE UPON WHICH CC WALL IS TO BE PLACED SHALL BE APPROVED BY GEOLOGIST/ENGINEER-IN - CHARGE PRIOR TO START OF WORK.
5. HIGH STRENGTH ORDINARY PORTLAND CEMENT CONFORMING TO IS : 8112 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
6. THE MINIMUM CEMENT CONTENT AND WATER CEMENT RATIO IN THE CONCRETE DESIGN MIX SHALL BE 310 KG PER CUM AND 0.45 RESPECTIVELY.
7. CONCRETE USED SHALL BE OF GRADES AS SPECIFIED BELOW CONFORMING TO IS 456 (LATEST):
 - RCC RAFT - M30
 - CC GRAVITY WALL - M20
 - LEVELING COURSE - M10.
8. PROPERLY BRACED STEEL PLATES SHALL BE USED AS SHUTTERING.
9. THE GROUTING SHALL BE DONE AT A PRESSURE RANGING FROM 1 TO 3 KG/SQCM.
10. LAPS AND ANCHORAGE LENGTH SHALL BE AS PER IS 456(LATEST).
11. LAPS SHALL BE STAGGERED.

PUBLIC WORKS DEPARTMENT
GOVERNMENT OF UTTARAKHAND

**PROTECTION / TREATMENT WORKS OF LANDSLIDE ZONE
FROM BERINAG - ASKOT ROAD SH - 03 (UTTARAKHAND)**

CONSULTANT:


टीएचडीसी इंडिया लिमिटेड
THDC INDIA LIMITED

(DETAIL-B&C)
STABILITY MEASU

FOR LOCATION BETWEEN CH. 121.990 KM TO CH. 122.090 KM
ON BERINAG-ASKOT ROAD, SH-03 (UTTARAKHAND)

SHEET 6 OF 9

GAUTAM YADAV
(ENGINEER CIVIL)

CHECKED BY

 KRISHNENDU P
 ASST. MOD.

SUBMITTED BY
24.0
AYKESH KUMAR
(SP, MGR)

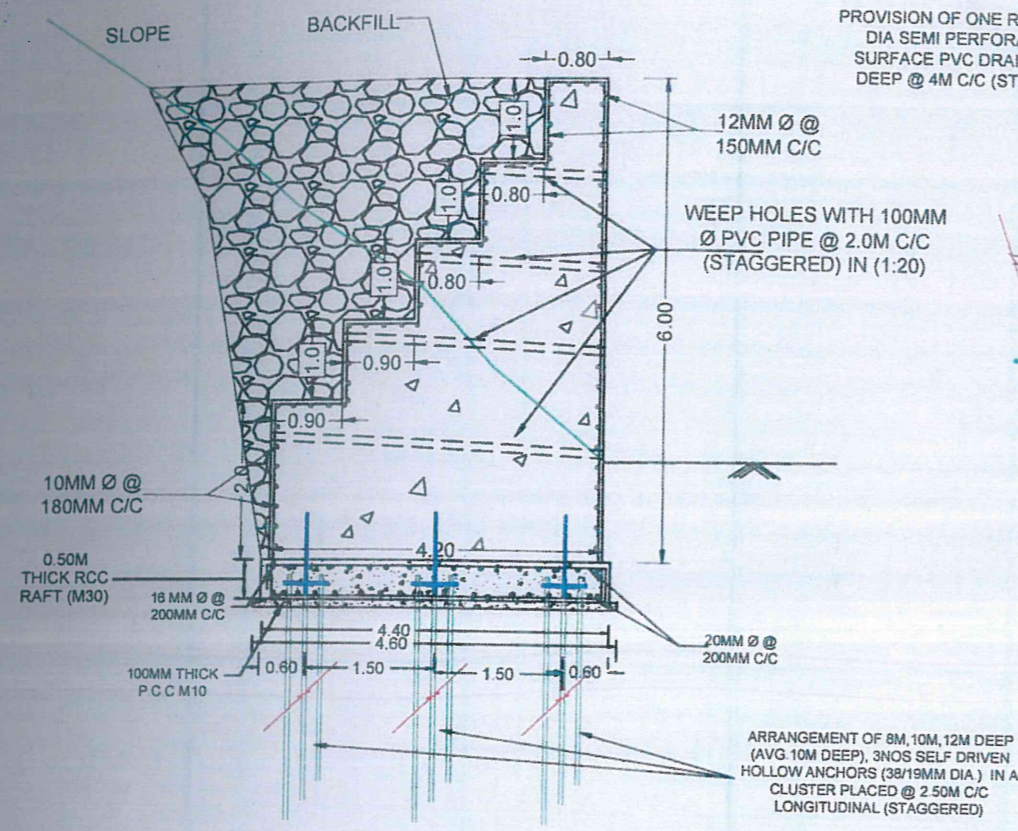
APPROVED BY

NIRAJ AGRAWAL
(GM)

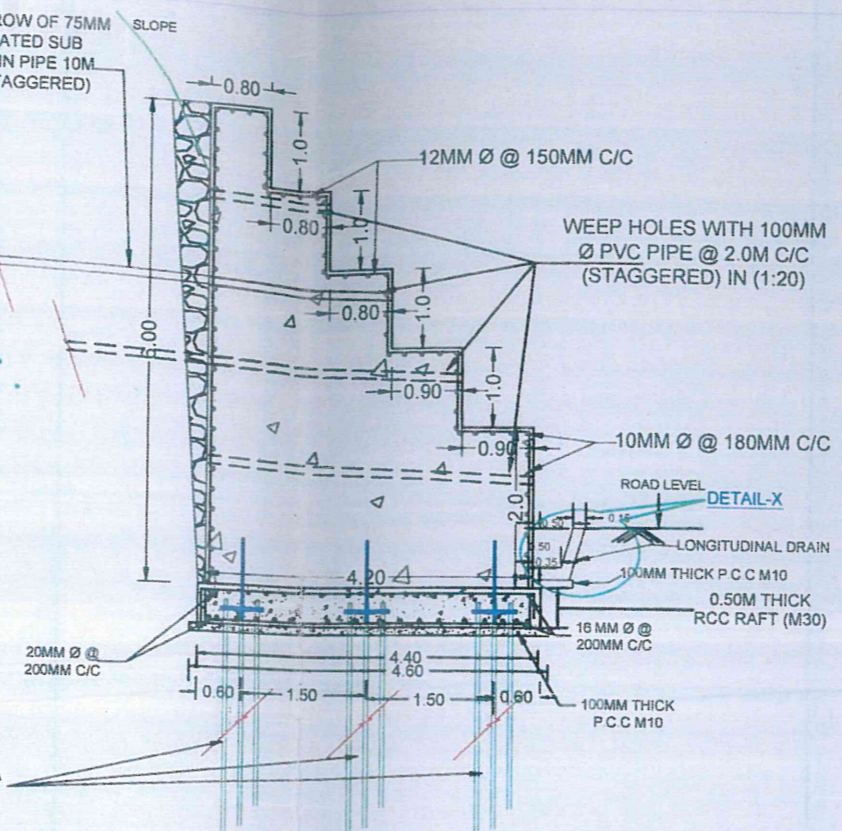
DRG NO THDC/RKSH/D&E/UKPWD/(L-CH 121 990-122 090KM)/TD-01

FEB 2025

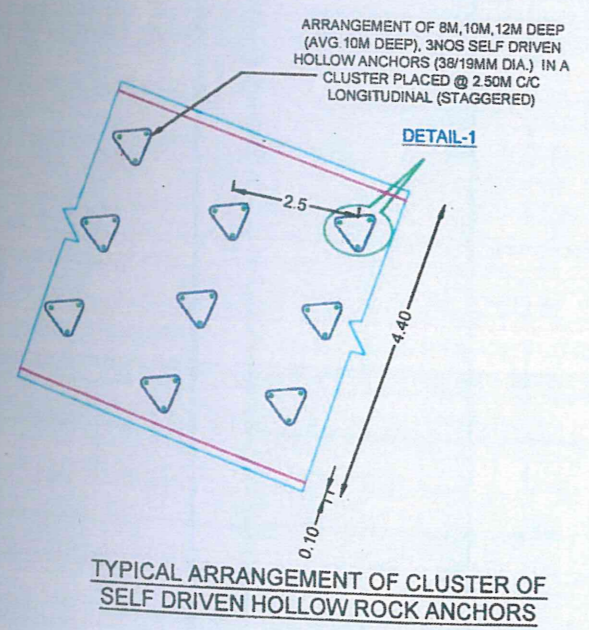
D&E RISHIKESH



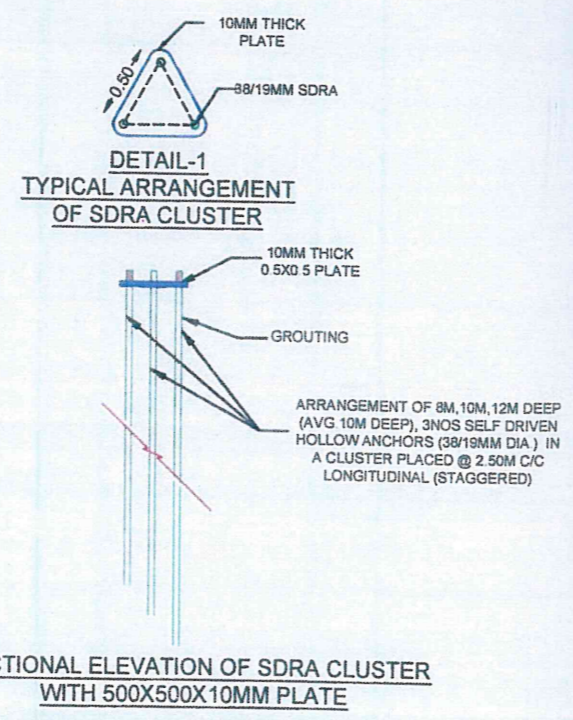
DETAIL-D
TYPICAL DETAILS OF 6M HIGH RCC STEPPED WALL
OVER A RAFT & BUNDLED SDRA



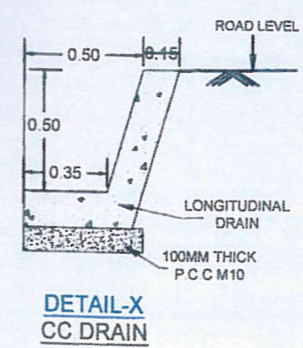
DETAIL-E
TYPICAL DETAILS OF 6M HIGH RCC STEPPED WALL
WITH CC DRAIN OVER A RAFT & BUNDLED SDRA



TYPICAL ARRANGEMENT OF CLUSTER OF
SELF DRIVEN HOLLOW ROCK ANCHORS



SECTIONAL ELEVATION OF SDRA CLUSTER
WITH 500X500X10MM PLATE









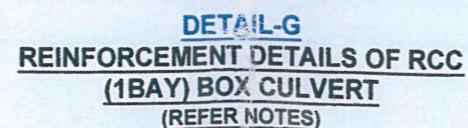
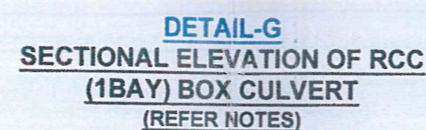
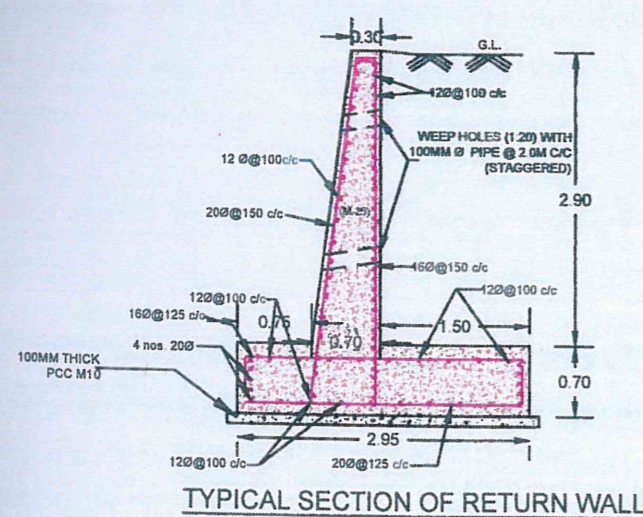
DETAIL-X
CC DRAIN

NOTES:-

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. EXCAVATION FOR FOUNDATION SHALL BE DONE IN 6-8M LONG STRECHES ONLY & TREATMENT SHALL BE COMPLETED BEFORE START OF NEW PATCH.
3. CONCRETE SURFACE SHOULD BE ROUGHED AND CLEAN BEFORE POURING THE CONCRETE/FRESH CONCRETE.
4. FOUNDATION SURFACE UPON WHICH CC WALL IS TO BE PLACED SHALL BE APPROVED BY GEOLOGIST/ENGINEER-IN - CHARGE PRIOR TO START OF WORK.
5. HIGH STRENGTH ORDINARY PORTLAND CEMENT CONFORMING TO IS : 8112 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
6. THE MINIMUM CEMENT CONTENT AND WATER CEMENT RATIO IN THE CONCRETE DESIGN MIX SHALL BE 310 KG PER CUM AND 0.45 RESPECTIVELY.
7. CONCRETE USED SHALL BE OF GRADES AS SPECIFIED BELOW CONFORMING TO IS 456 (LATEST):
RCC RAFT - M30
RCC STEPPED WALL - M25
CC DRAIN - M20
LEVELING COURSE - M10.
8. PROPERLY BRACED STEEL PLATES SHALL BE USED AS SHUTTERING.
9. THE GROUTING SHALL BE DONE AT A PRESSURE RANGING FROM 1 TO 3 KG/SQCM.
10. LAPS AND ANCHORAGE LENGTH SHALL BE AS PER IS 456(LATEST).
11. LAPS SHALL BE STAGGERED.

FOR TENDER PURPOSE ONLY

 <p>PUBLIC WORKS DEPARTMENT GOVERNMENT OF UTTARAKHAND</p>			
PROTECTION / TREATMENT WORKS OF LANDSLIDE ZONE FROM BERINAG - ASKOT ROAD SH - 03 (UTTARAKHAND)			
CONSULTANT:		 टीएचडीसी इंडिया लिमिटेड THDC INDIA LIMITED	
(DETAIL-D&E) STABILITY MEASURES FOR LOCATION BETWEEN CH. 121.990 KM TO CH. 122.090 KM ON BERINAG-ASKOT ROAD SH-03 (UTTARAKHAND)			
DESIGNED BY	CHECKED BY	SUBMITTED BY	SHEET 7 OF 9
 GAUTAM YADAV (ENGINEER CIVIL)	 KRISHNENDU P. J. (ASST. MGR.)	 24.02 AVIKESH KUMAR (SR. MGR.)	APPROVED BY  NIRAJ AGRAWAL (GM)
DRG NO THDC/RKSH/D&E/UKPWD/(L-CH 121.990-122.090KM)/TD-01			FEB 2025
D&E RISHIKESH			



1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. ALL REINFORCEMENT (R/F) SHALL BE OF HIGH YIELD STRENGTH COLD TWISTED DEFORMED BARS Fe 500 CONFIRMING TO IS 1786 (LATEST).
3. HIGH STRENGTH ORDINARY PORTLAND CEMENT CONFORMING TO IS : 8112 CAPABLE OF ACHIEVING THE REQUIRED DESIGN CONCRETE STRENGTH SHALL ONLY BE USED.
4. THE MINIMUM CEMENT CONTENT AND WATER CEMENT RATIO IN THE CONCRETE DESIGN MIX SHALL BE 310 KG PR CU.M AND 0.45 RESPECTIVELY.
5. CONCRETE USED SHALL BE OF GRADES AS SPECIFIED BELOW CONFORMING TO IS 456 (LATEST):
 - BOX CULVERT - M25
 - CC CATCHPIT - M25
 - RETURN WALL - M25
 - LEVELLING COURSE - M10.
6. MINIMUM CLEAR COVER TO ALL REINFORCEMENT INCLUDING STIRRUPS SHALL BE 50MM UNLESS OTHERWISE SHOWN IN THE DRAWINGS.
7. CONSTRUCTION JOINTS:
 - (i) THE LOCATION AND PROVISION OF CONSTRUCTION JOINTS SHALL BE APPROVED BY ENGINEER-IN-CHARGE. SUGGESTED LOCATION OF CONSTRUCTION JOINTS IN THE DIRECTION PARALLELED TO THE DIRECTION OF WATER FLOW SHOWN IN THE GENERAL ARRANGEMENT DRAWINGS OF BOX CULVERT. THE CONCRETING OPERATION SHALL BE CARRIED OUT CONTINUOUS UPTO THE CONSTRUCTION JOINTS.
 - (ii) THE CONCRETE SURFACE AT THE JOINT SHALL BE BRUSHED WITH A STIFF BRUSH AFTER CASING WHILE THE CONCRETE IS STILL FRESH AND IT HAS ONLY SLIGHTLY HARDENED.
 - (iii) BEFORE NEW CONCRETE IS POURED THE SURFACE OF OLD CONCRETE SHALL BE PREPARED AS UNDER:
 - a. FOR PARTIALLY HARDENED CONCRETE, THE SURFACE SHALL BE TREATED BY WIRE BRUSH FOLLOWED BY AN AIR JET
 - b. THE OLD SURFACE SHALL BE SOAKED WITH WATER WITHOUT LEAVING PUDDLES IMMEDIATELY, BEFORE STARTING CONCRETING TO PREVENT THE ABSORPTION OF WATER FROM THE NEW CONCRETE.
 - c. FOR HARDENED CONCRETE, THE SURFACE SHALL BE THOROUGHLY CLEANED TO REMOVE DEBRIS/LAINTANCE AND MADE ROUGH SO THAT $\frac{1}{4}$ OF THE SIZE OF THE AGGREGATE IS EXPOSED.
 - (iv) NEW CONCRETE SHALL BE THOROUGHLY COMPACTED IN THE REGION OF THE JOINT.
8. LAPS IN REINFORCEMENT :
 - (i) MINIMUM LAP LENGTH OF REINFORCEMENT SHALL BE DECIDED AS PER THE REINFORCEMENT ARRANGEMENT BASED ON THE CLAUSE - 304.8.6 OF IRC -21-1987.
 - (ii) NOT MORE THAN 50% OF REINFORCEMENT SHALL BE LAPPED AT ANY ONE LOCATION.
9. PROPERLY BRACED STEEL PLATES SHALL BE USED AS SHUTTERING.

FOR TENDER PURPOSE ONLY



PUBLIC WORKS DEPARTMENT
GOVERNMENT OF UTTARAKHAND

**PROTECTION / TREATMENT WORKS OF LANDSLIDE ZONE
FROM BERINAG - ASKOT ROAD SH - 03 (UTTARAKHAND)**

CONSULTANT:



टीएचडीसी इंडिया लिमिटेड
THDC INDIA LIMITED

(DETAIL-F&G)

STABILITY MEASURES

FOR LOCATION BETWEEN CH. 121.990 KM TO CH. 122.090 KM
ON BERINAG-ASKOT ROAD, SH-03 (UTTARAKHAND)

SHEET 8 OF 9

DESIGNED BY

Gautam
GAUTAM YADAV
(ENGINEER CIVIL)

CHECKED BY


 KRISHNENDU P.
 (ASST. MGR)

SUBMITTED BY

24.
AVKESH KUMAR
(SR. MGR)

SHEET 8
APPROVED BY

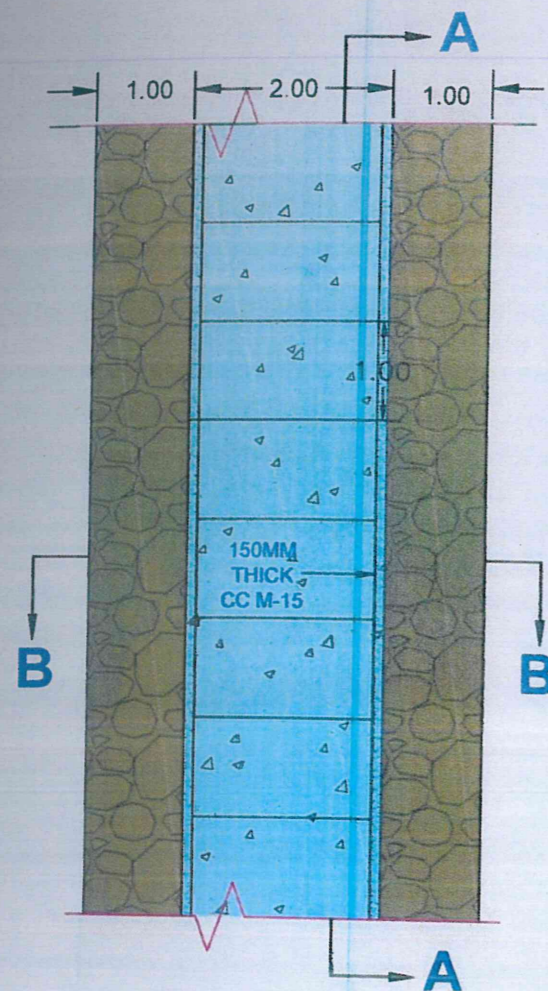
APPROVED BY

NIRAJ AGRAWAL
ICMD

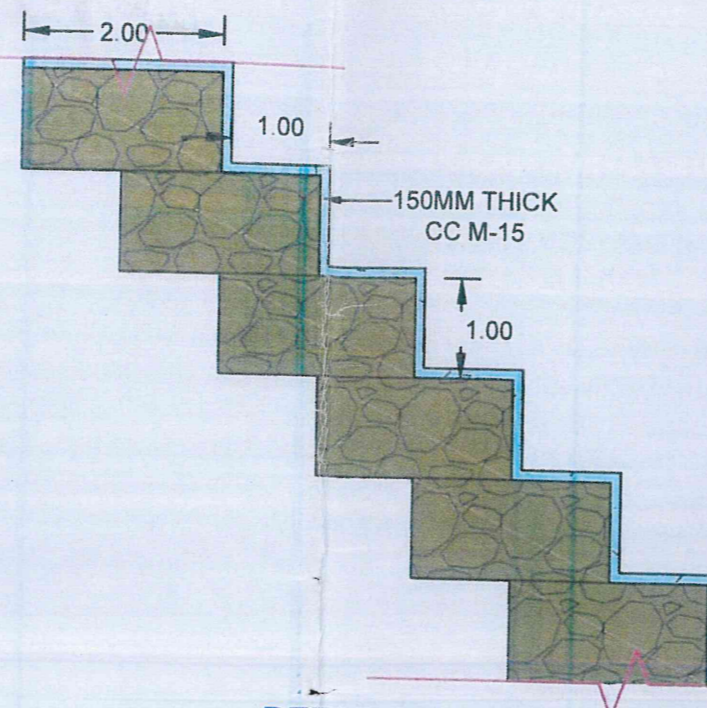
DRG NO THDC/RKSH/D&E/UKPWD/L-CH 121 890-122 090KMYTD-01

FEB 2025

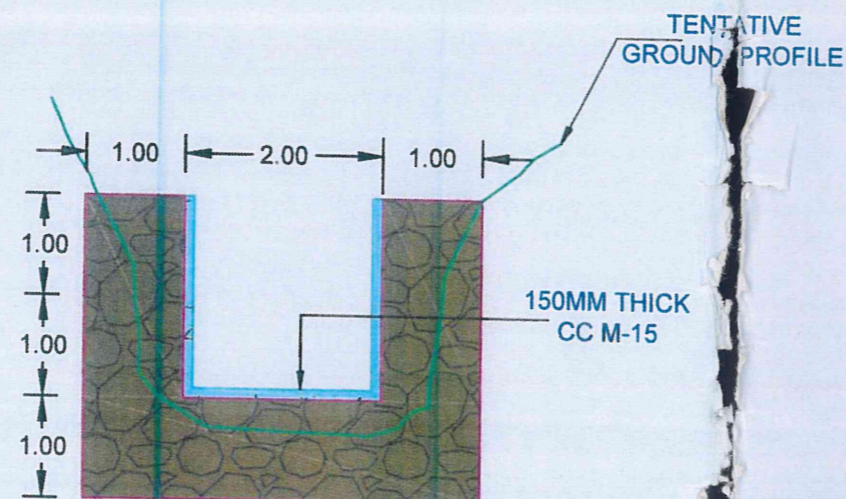
D&F RISHIKESH



DETAIL-H
PLAN OF 2.0M WIDE
GABION CHANNEL



DETAIL-H
SECTION A-A OF 2.0M
WIDE GABION CHANNEL



DETAIL-H
SECTION B-B OF 2.0M WIDE
GABION CHANNEL

NOTES.

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. FOUNDATION SURFACE UPON WHICH GABION STRUCTURE BE PLACED BE TAKEN IN A STRECH OF 8-10M AT ONCE, SHALL BE APPROVED BY ENGINEER-IN-CHARGE PRIOR TO START OF WORK.
3. ALL GABIONS SHALL BE CONFIRMING TO IS 16014 (LATEST) ENGINEER IN CHARGE MAY DECIDE GABION SIZE AS PER BIS CODE.
4. FILL MATERIAL SHALL COMPRISE COBBLES OR ROCK FRAGMENTS THAT ARE DENSE, SOUND, RESISTANT TO ABRASION. COBBLES AND ROCKS SHALL BE FREE OF CRACKS, SEAMS AND OTHER DEFECTS THAT WOULD INCREASE THE SUSCEPTIBILITY TO DESTRUCTION BY EROSION ACTION. INDIVIDUAL COBBLES OR ROCK FRAGMENTS SHALL BE ROUNDED AND WELL GRADED IN SIZE BETWEEN 120MM AND 200MM. FLAT ROCK FRAGMENTS SHALL NOT BE USED.
5. GABIONS:
 - A. GABIONS SHALL BE ASSEMBLED, CONNECTED TOGETHER AND FILLED AS DESCRIBED HEREIN.
 - B. FOUNDATION SURFACES UPON WHICH GABIONS ARE TO BE PLACED SHALL BE REASONABLY SMOOTH AND EVEN, WITH EXCESSIVE HIGH SPOTS REMOVED AND VOIDS FILLED WITH SMALL ROCK FRAGMENTS. GABIONS TO BE PLACED AT TOE OF THE SLOPES SHALL BE LAID IN A TRENCH AT LEAST 250MM DEEP.
 - C. GABIONS SHALL BE SECURED IN POSITION BY TYING TO ADJACENT GABIONS. INTERNAL GALVANIZED WIRE TENSION RODS SHALL BE PROVIDED TO REDUCE DISTORTION OF THE CAGES.
 - D. AFTER SEVERAL GABIONS HAVE BEEN PLACED IN POSITION ADJACENT TO ONE ANOTHER AND CHECKED FOR THE ALIGNMENT, THEY SHALL BE SECURELY TIED TOGETHER CONTINUOUSLY AT THEIR CORNERS OVER THEIR FULL HEIGHT, AND FILLED BY HAND WITH COBBLES AND ROCK FRAGMENTS AS SPECIFIED. PLACE THE COBBLES/STONE FRAGMENTS IN 300MM LIFTS, DISTRIBUTE EVENLY BY AND TO MINIMIZE VOIDS AND ENSURE A PLEASING APPEARANCE ALONG THE EXPOSED FACES. THE FILL IN ADJOINING CELLS SHOULD NOT VARY IN HEIGHT BY MORE THAN 300MM. LEVEL THE FINAL STONE LAYER ALLOWING THE DIAPHRAGM'S TOPS TO BE VISIBLE. ONCE FULL, THE CAGE LID SHALL BE PLACED IN POSITION AND SECURELY TIED ALL ALONG THE PERIMETER OF EDGES OF GABIONS AND DIAPHRAGMS.

FOR TENDER PURPOSE ONLY



PUBLIC WORKS DEPARTMENT
GOVERNMENT OF UTTARAKHAND

PROTECTION / TREATMENT WORKS OF LANDSLIDE ZONE
FROM BERINAG - ASKOT ROAD SH - 03 (UTTARAKHAND)

CONSULTANT:



टीएचडीसी इंडिया लिमिटेड
THDC INDIA LIMITED

(DETAIL-H)
STABILITY MEASURES
FOR LOCATION BETWEEN CH 121.990 KM TO CH 122.090 KM
ON BERINAG-ASKOT ROAD, SH-03 (UTTARAKHAND)

SHEET 9 OF 9

DESIGNED BY	CHECKED BY	SUBMITTED BY	APPROVED BY
GAUTAM YADAV (ENGINEER CIVIL)	KRISHNENDU P. J. (ASST. MGR.)	AYUSH KUMAR (SR. MGR.)	NIRAJ AGARWAL (GM)

DRG NO THDC/RKSH/D&E/UKPWD/(L-CH 121.990-122.090KM)/TD-01

FEB 2025

D&E RISHIKESH