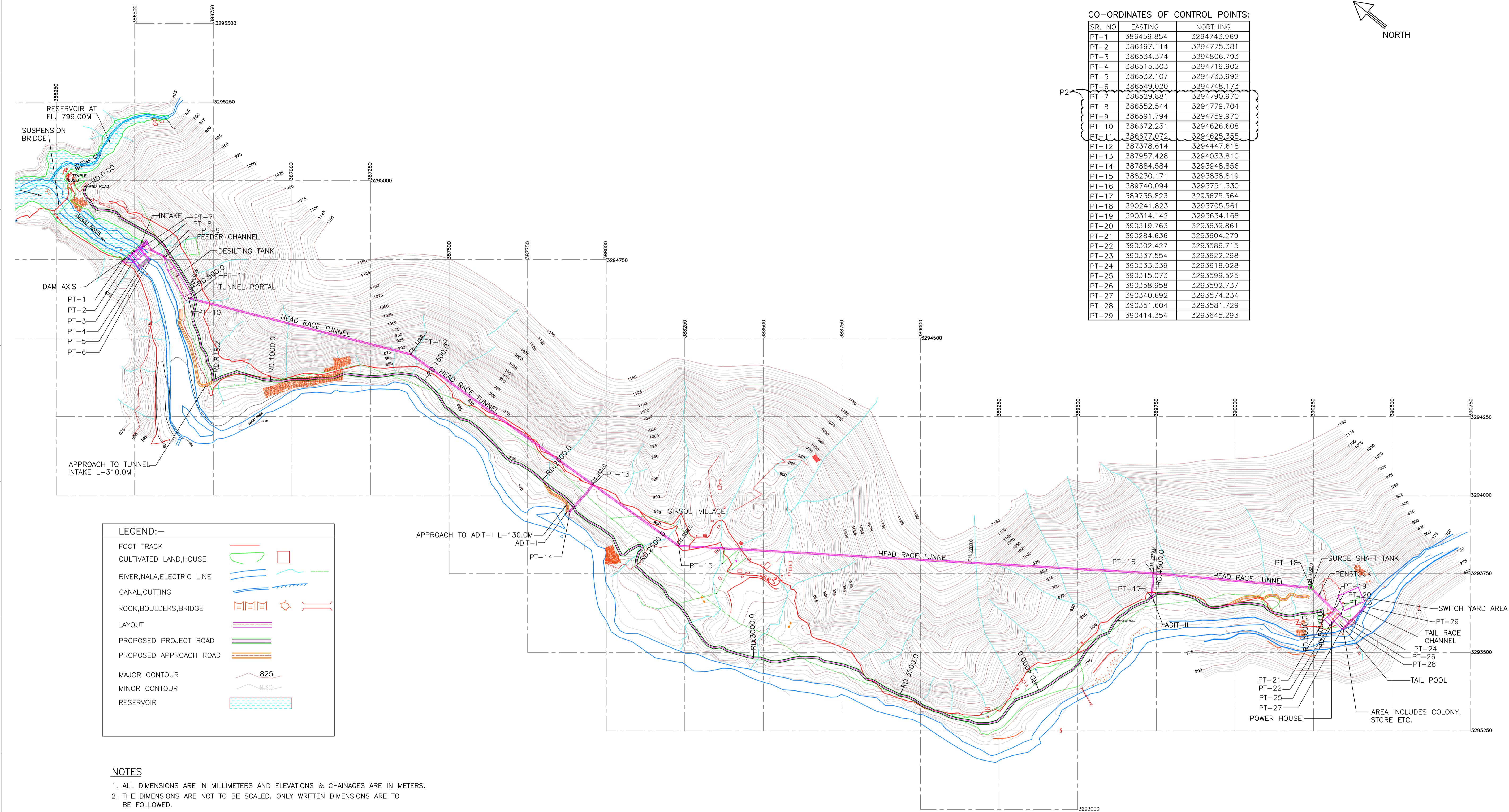


LIST OF DRAWINGS

SR.NO.	DRAWING NO.	DRAWING TITLE
GENERAL ARRANGEMENT DRAWINGS		
1.	TCE7784A-200-GA-6500	PROJECT INFRASTRUCTURE PLAN
2.	TCE-7784A-200-GA-6502	PROPOSED LAYOUT PLAN OF HEAD RACE TUNNEL INTAKE PORTAL (FOR PACKAGE-II)
3.	TCE-7784A-200-GA-6503	PROPOSED LAYOUT PLAN OF ADIT-I (FOR PACKAGE-II)
4.	TCE-7784A-200-RC-6504	HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-I (FOR PACKAGE-II)
5.	TCE-7784A-200-RC-6505	HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-II (FOR PACKAGE-II)
6.	TCE-7784A-200-RC-6506	HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-III (FOR PACKAGE-II)
7.	TCE-7784A-200-RC-6507	HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-IV (FOR PACKAGE-II)
8.	TCE-7784A-200-RC-6508	PROPOSED ADIT-I PRIMARY ROCK SUPPORT DETAILS CLASS-III & IV (FOR PACKAGE-II)
9.	TCE-7784A-200-RC-6509	PROPOSED LAYOUT OF ADIT-I & HRT JUNCTION (FOR PACKAGE-II)



LEGEND:-	
FOOT TRACK	
CULTIVATED LAND,HOUSE	
RIVER,NALA,ELECTRIC LINE	
CANAL,CUTTING	
ROCK,BOULDERS,BRIDGE	
LAYOUT	
PROPOSED PROJECT ROAD	
PROPOSED APPROACH ROAD	
MAJOR CONTOUR	
MINOR CONTOUR	
RESERVOIR	

- NOTES**
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS & CHAINAGES ARE IN METERS.
 2. THE DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
 3. ALL CONTOURS ARE IN METER.
 4. ENTIRE RESERVOIR IS NOT SHOWN IN THIS LAYOUT.
 5. CONTRACTOR TO EXPLORE & DEVELOP HAUL ROADS.
 6. THE GRADIENT OF THE ROAD
MAXIMUM- 1:250
MINIMUM- 1:15
 7. THE TURNING RADIUS SHOULD NOT BE LESS THAN 9.0 M.

CO-ORDINATES OF CONTROL POINTS:

SR. NO	EASTING	NORTHING
PT-1	386459.854	3294743.969
PT-2	386497.114	3294775.381
PT-3	386534.374	3294806.793
PT-4	386515.303	3294719.902
PT-5	386532.107	3294733.992
PT-6	386549.020	3294748.173
PT-7	386529.881	3294790.970
PT-8	386552.544	3294779.704
PT-9	386591.794	3294759.970
PT-10	386672.231	3294626.608
PT-11	386677.072	3294625.355
PT-12	387378.614	3294447.618
PT-13	387957.428	3294033.810
PT-14	387884.584	3293948.856
PT-15	388230.171	3293838.819
PT-16	389740.094	3293751.330
PT-17	389735.823	3293675.364
PT-18	390241.823	3293705.561
PT-19	390314.142	3293634.168
PT-20	390319.763	3293639.861
PT-21	390284.636	3293604.279
PT-22	390302.427	3293586.715
PT-23	390337.554	3293622.298
PT-24	390333.339	3293618.028
PT-25	390315.073	3293599.525
PT-26	390358.958	3293592.737
PT-27	390340.692	3293574.234
PT-28	390351.604	3293581.729
PT-29	390414.354	3293645.293

DO NOT SCALE FOR TENDER PURPOSE

KHUTANI POWER COMPANY PVT. LTD
KHUTANI SMALL HYDRO ELECTRIC PROJECT UTTARAKHAND

PROJECT INFRASTRUCTURE PLAN

TATA CONSULTING ENGINEERS LIMITED
MUMBAI

SCALE: 1:7500 APPROVED DATE (RO ISSUE)
DEL.CENTRE-DISC: DD-CV SKD DATE (CURRENT ISSUE)
DRN: NK SP SKD 08-08-2018

CHD: MKM DWG No TCE7784A-200-GA-6500 ISSUE P3

FOR RO ISSUE ONLY			ISSUE	REVISIONS	DRN	CLEARED				APPD	DATE	ISSUE	REVISIONS	DRN	CLEARED				APPD	DATE	ISSUE
DISC.	SIGNATURE	DATE				CIVIL	ELEC	I&C	MECH						CIVIL	ELEC	I&C	MECH			
CIVIL			P1	MUCK DUMPING AREA III RELOCATED.																	
ELEC			P2	PT POINT P7 TO P11 REVISED.																	
I&C			P3	LEGEND FOR ACCESS ROAD ADDED																	
MECH																					

FILE NAME: F-041-Rev-R5.dwg

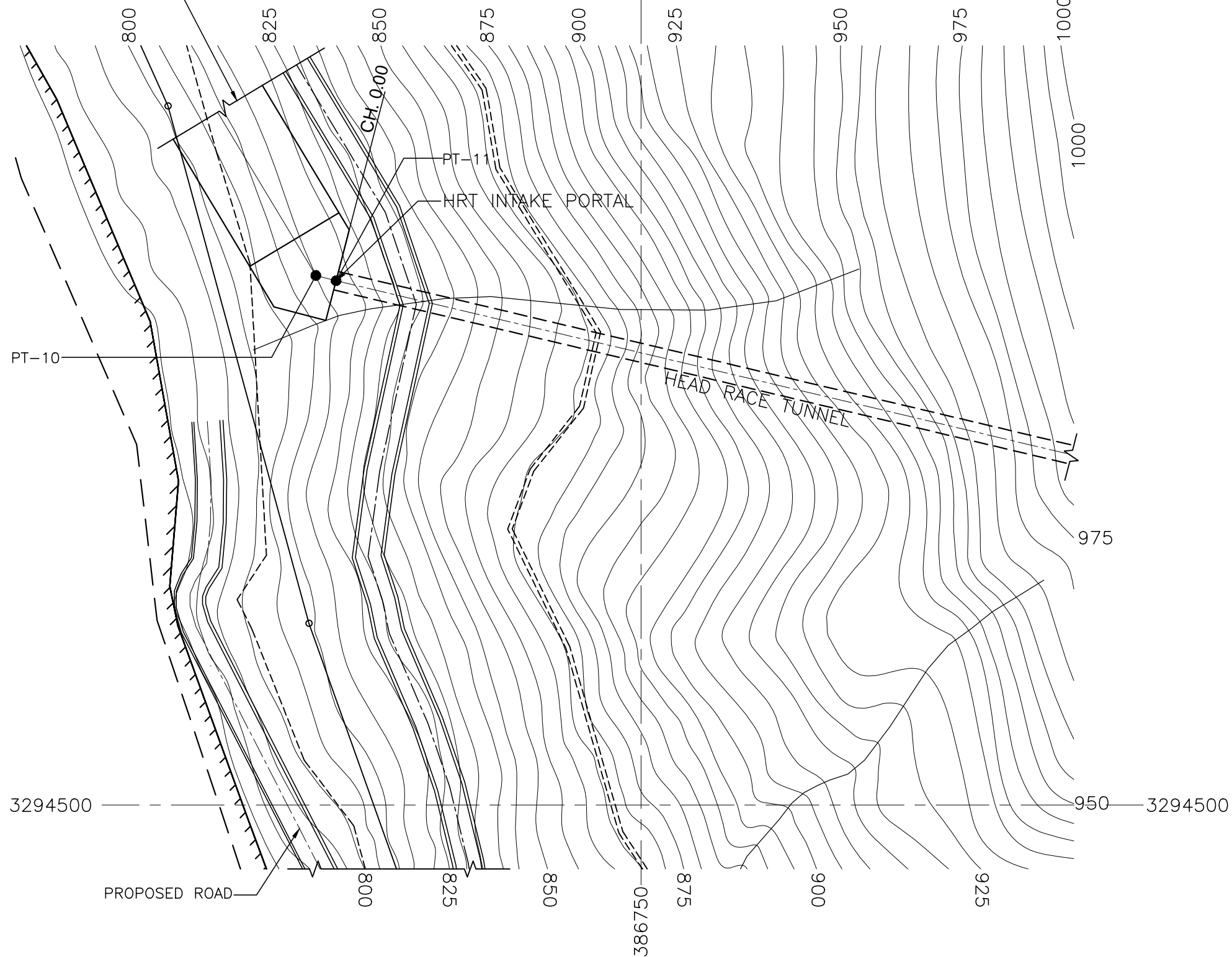
FILE NAME : 7784A6500.DWG

"P" (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY. AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.
CONSTRUCTION / FABRICATION WORK IS PERMITTED ON "R" (RELEASED) ISSUES ONLY.
INFORMATION CONTAINED WITHIN "HOLD" IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST SET DESIGN OFFICE TO CLEAR "HOLD" IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO "HOLD".

37-E-AT

TCE FORM NO. 041 R5

DESILTING TANK




LEGEND:-

FOOT TRACK	---
RIVER,NALA,ELECTRIC LINE	==
CANAL,CUTTING	==
LAYOUT	==
PROPOSED APPROACH ROAD	==
MAJOR CONTOUR	825
MINOR CONTOUR	830

NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS.
- NO DIMENSION SHOULD BE MEASURED FROM THE DRAWING.

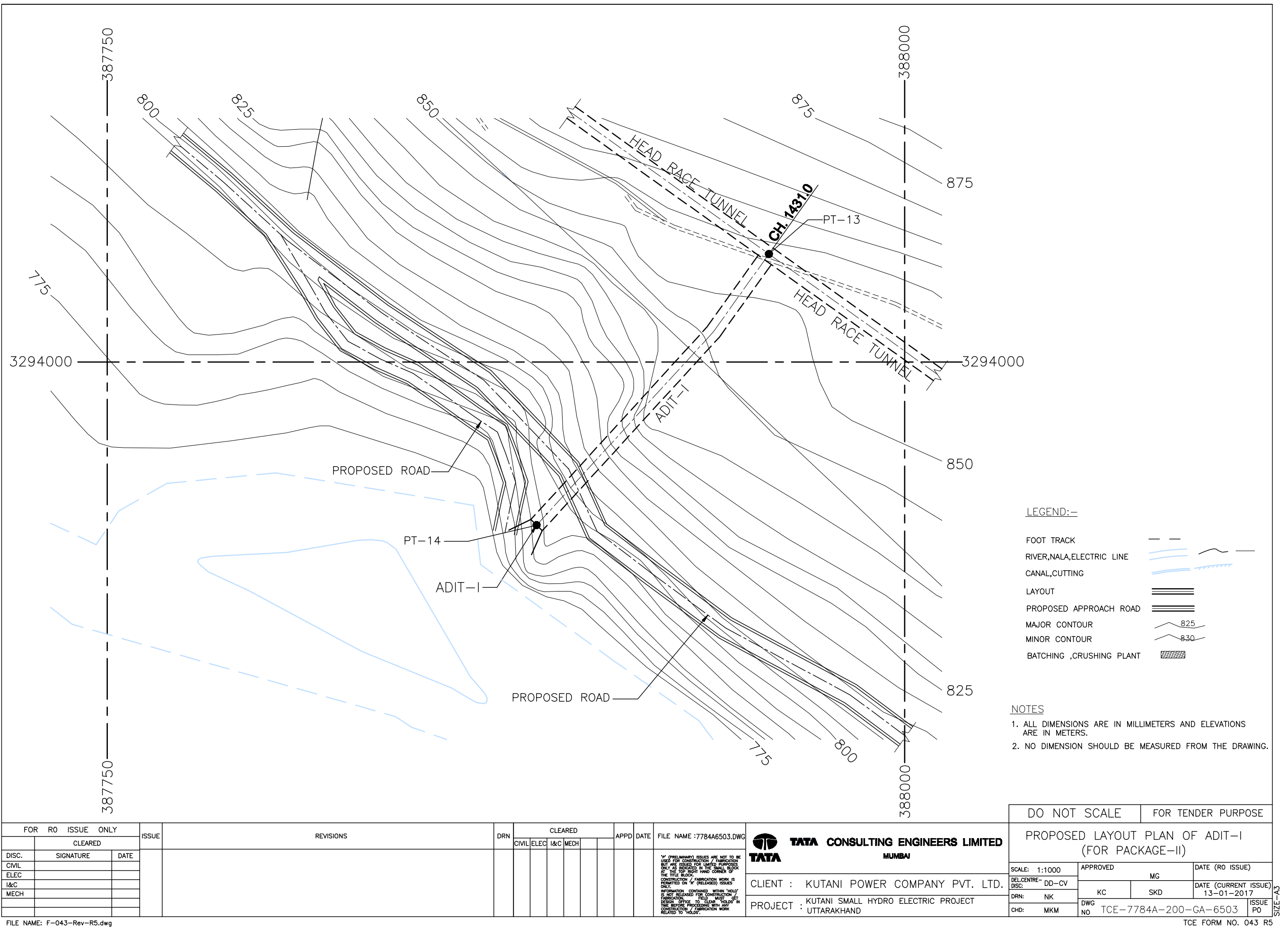
FOR RO ISSUE ONLY			ISSUE	REVISIONS	DRN	CLEARED				APPD	DATE	FILE NAME : 7784A6502.DWG	 TATA CONSULTING ENGINEERS LIMITED MUMBAI
DISC.	SIGNATURE	DATE				CIVIL	ELEC	I&C	MECH				
CIVIL													
ELEC													
I&C													
MECH													

CLIENT : KUTANI POWER COMPANY PVT. LTD.
PROJECT : KUTANI SMALL HYDRO ELECTRIC PROJECT
UTTARAKHAND

DO NOT SCALE		FOR TENDER PURPOSE	
SCALE: 1:1000		APPROVED	
DEL.CENTRE- DISC: DD-CV		MG	
DRN: NK		KC	SKD
CHD: MKM		DATE (RO ISSUE) 13-01-2017	
DWG NO TCE-7784A-200-GA-6502		ISSUE P0	

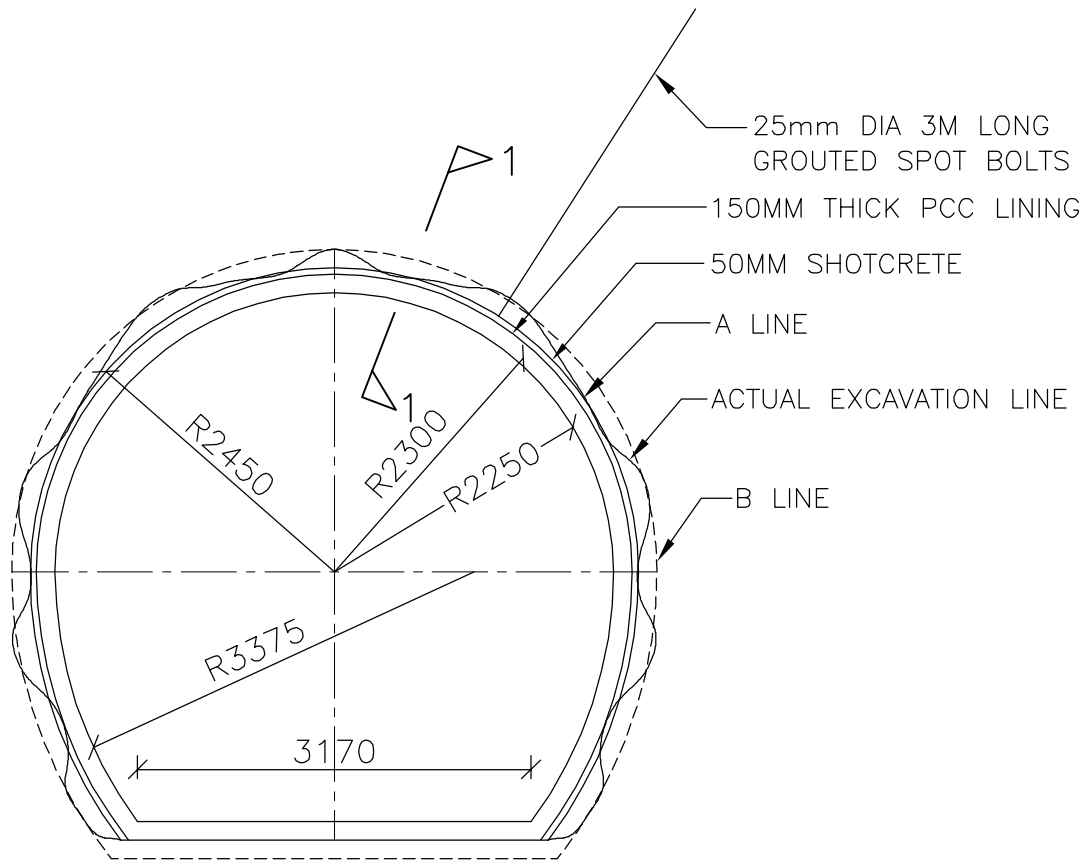
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TCE FORM NO. 043 R5

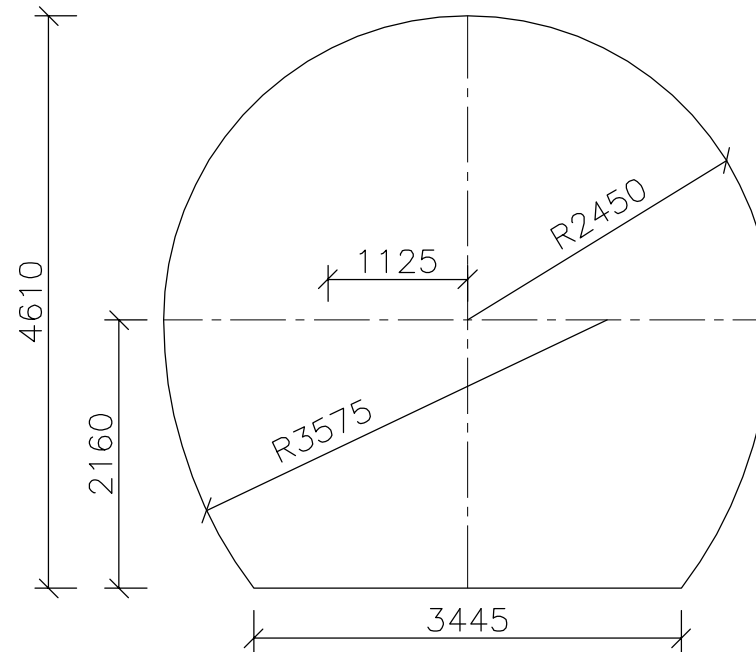


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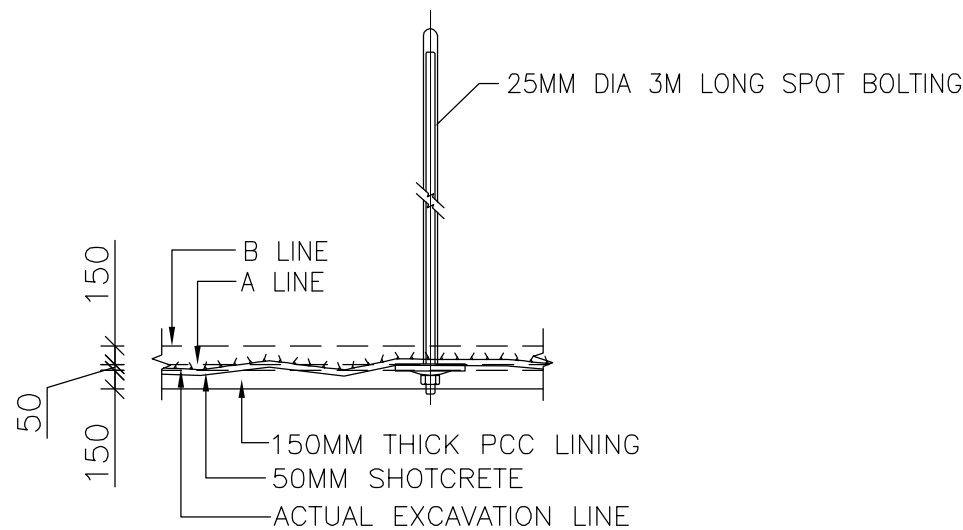
TCE FORM NO. 043 R5



CLASS-I



A LINE SET OUT



SECTION 1-1

ROCK SUPPORT -CLASS I		
Q VALUE	>10	
RMR	>81	
INVESTIGATION	SYSTEMATIC PROBE DRILLING, L=15/25M WITH 5M OVERLAP	
DRAINAGE	EVENTUALLY DEPENDING ON PROBE HOLE RESULTS	
SHOTCRETE	SHOTCRETING 50MM THICK	
ROCK BOLTS	SPOT BOLTING, 25MM DIA. 3M LONG	
AREA(SQM)	FINISHED SECTION	16.148
	UPTO A-LINE	19.016
	UPTO B-LINE	21.455

LEGEND:-

 EXCAVATION LINE

NOTES

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- A LINE = MINIMUM EXCAVATION LINE
B LINE = PAY LINE
- SUPPORT SYSTEM MAY VARY DEPENDING UPON THE SITE CONDITIONS ENCOUNTERED AND DESIGN MODIFICATIONS.

FOR RO ISSUE ONLY		
CLEARED		
DISC.	SIGNATURE	DATE
CIVIL		
ELEC		
I&C		
MECH		

ISSUE

REVISIONS	

DRN	CLEARED				APPD	DATE
	CIVIL	ELEC	I&C	MECH		

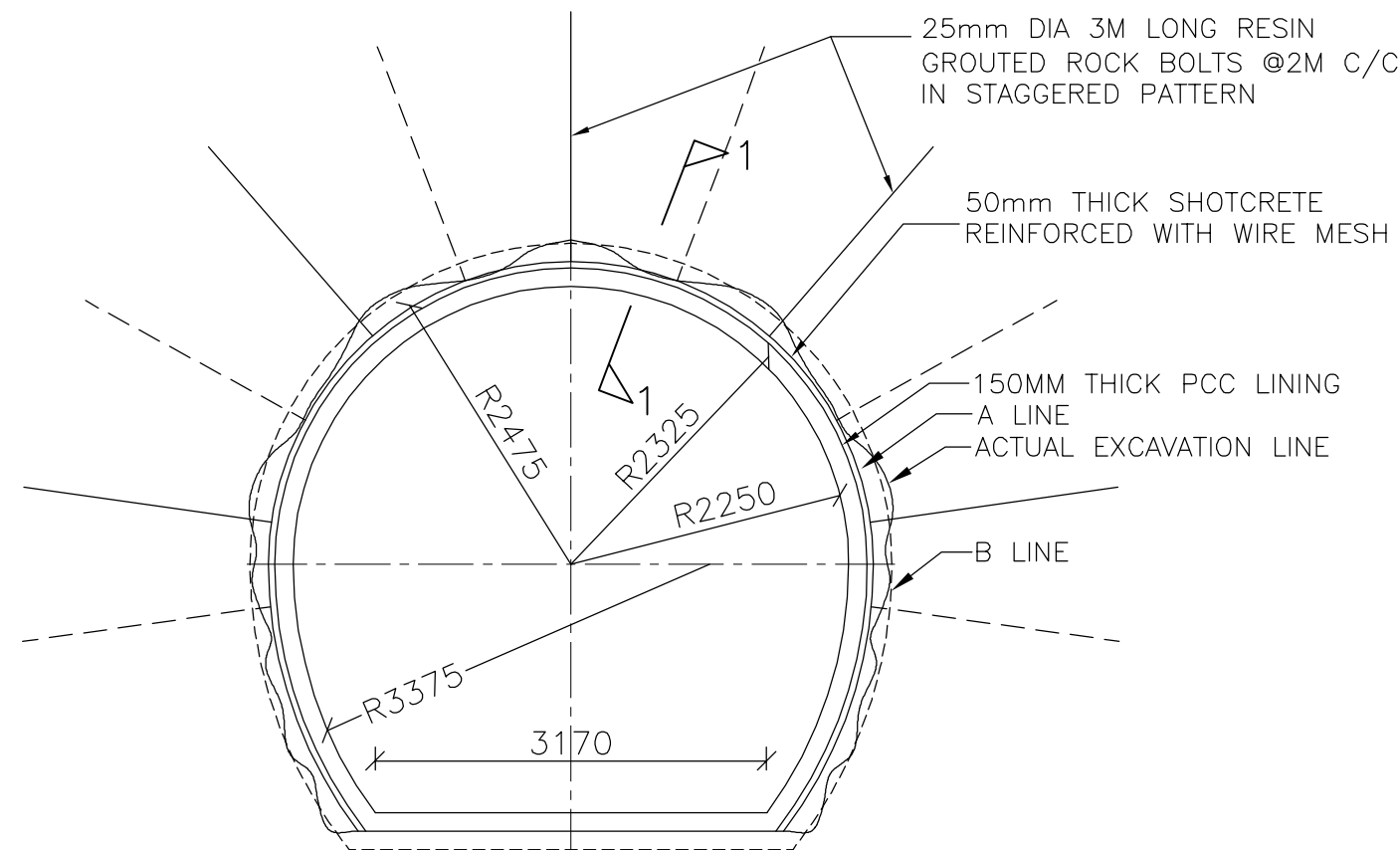
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"P" (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS INDICATED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK. CONSTRUCTION / FABRICATION WORK IS PERMITTED ON "R" (RELEASED) ISSUES ONLY.
INFORMATION CONTAINED WITHIN "HOLD" IS NOT RELEASED FOR CONSTRUCTION / FABRICATION. FIELD MUST SET DESIGN OFFICE TO CLEAR "HOLD" IN TIME BEFORE PROCEEDING WITH ANY CONSTRUCTION / FABRICATION WORK RELATED TO "HOLD".

**TATA CONSULTING ENGINEERS LIMITED**
MUMBAI

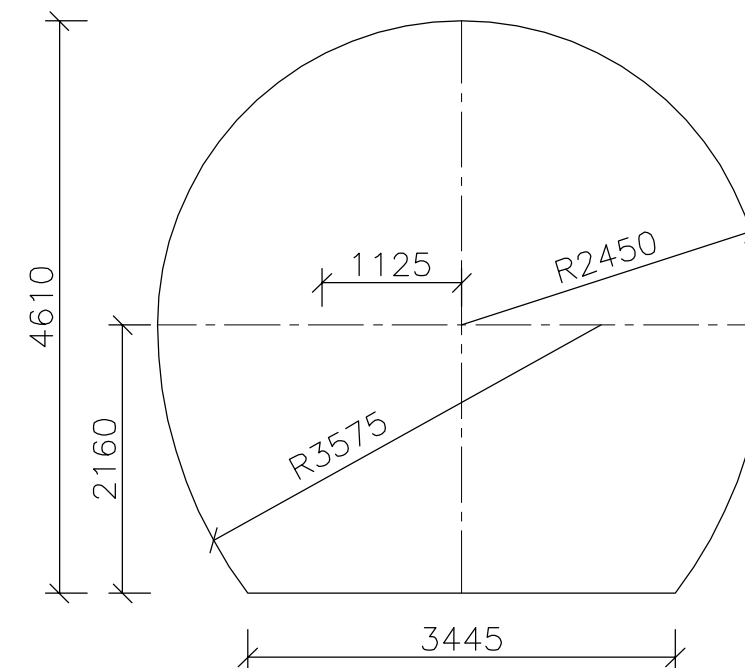
CLIENT : KUTANI POWER COMPANY PVT. LTD.

PROJECT : KUTANI SMALL HYDRO ELECTRIC PROJECT (21 MW) UTTARAKHAND

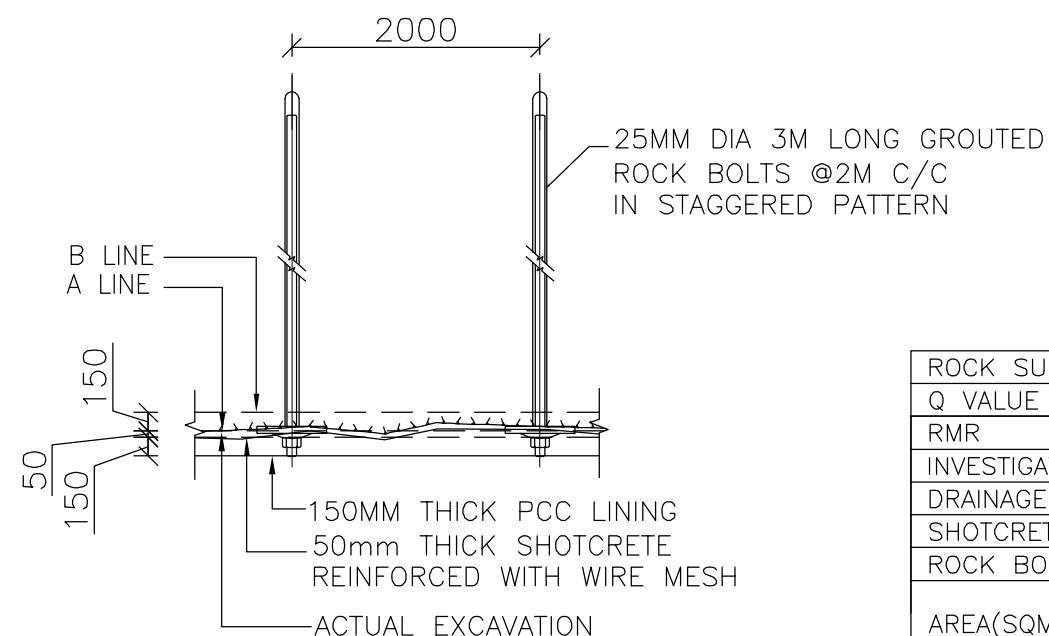
DO NOT SCALE		FOR TENDER PURPOSE	
HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-I (FOR PACKAGE-II)			
SCALE: 1:60	APPROVED SKD		DATE (RO ISSUE)
DEL.CENTRE-DISC: DD-CV	DATE (CURRENT ISSUE) 08-08-2018		P1
DRN: NK	SP	SKD	
CHD: RR	DWG NO TCE-7784A-200-RC-6504		



CLASS-II



A LINE SET OUT



SECTION 1-1

ROCK SUPPORT -CLASS II		
Q VALUE	1<Q<10	
RMR	61-81	
INVESTIGATION	SYSTEMATIC PROBE DRILLING, L=15/25M WITH 5M OVERLAP	
DRAINAGE	EVENTUALLY DEPENDING ON PROBE HOLE RESULTS	
SHOTCRETE	75MM THICK SHOTCRETE WITH WIRE MESH	
ROCK BOLTS	25MM DIA. 3M LONG GROUTED ROCK BOLTS @2M C/C IN STAGGERED PATTERN	
AREA(SQM)	FINISHED SECTION	16.148
	UPTO A-LINE	19.016
	UPTO B-LINE	21.456

LEGEND:-

 EXCAVATION LINE

NOTES


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- NO DIMENSION SHOULD BE MEASURED FROM THE DRAWING.
- A LINE = MINIMUM EXCAVATION LINE
B LINE = PAY LINE
- SUPPORT SYSTEM MAY VARY DEPENDING UPON THE SITE CONDITIONS ENCOUNTERED AND DESIGN MODIFICATIONS.

FOR RO ISSUE ONLY		
DISC.	SIGNATURE	DATE
CIVIL		
ELEC		
I&C		
MECH		

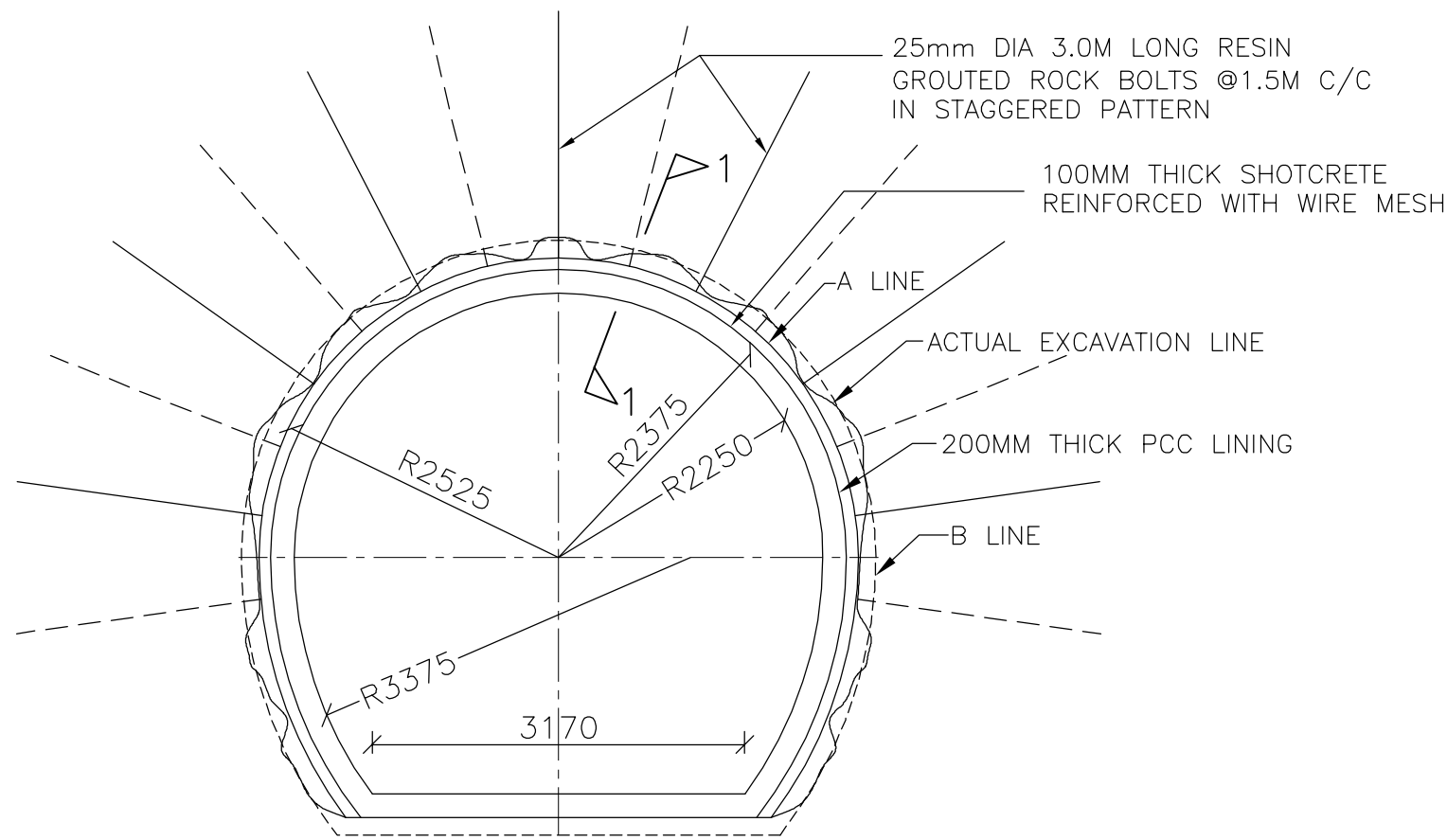
ISSUE

REVISIONS	

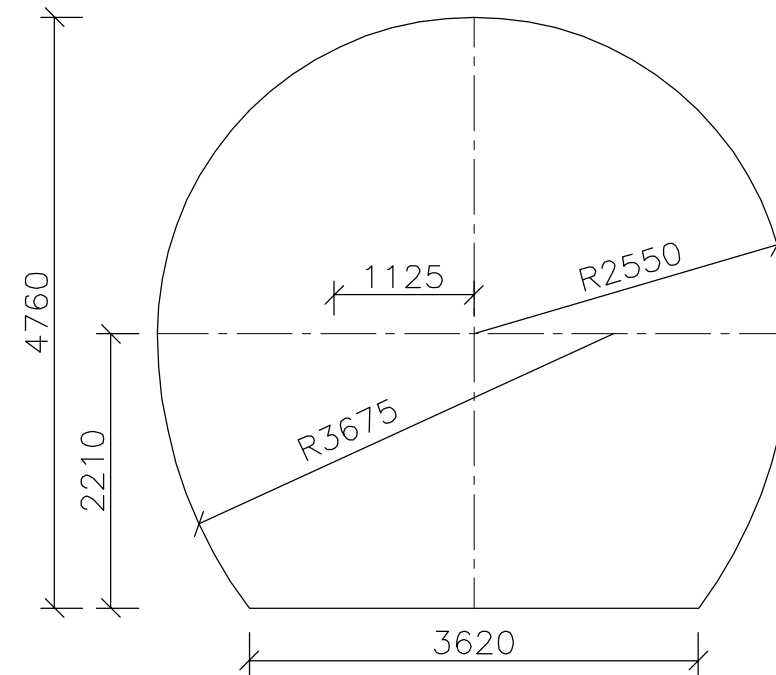
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	CIVIL	ELEC	I&C	MECH			

 TATA CONSULTING ENGINEERS LIMITED MUMBAI	
CLIENT : KUTANI POWER COMPANY PVT. LTD. PROJECT : KUTANI SMALL HYDRO ELECTRIC PROJECT (21 MW) UTTARAKHAND	

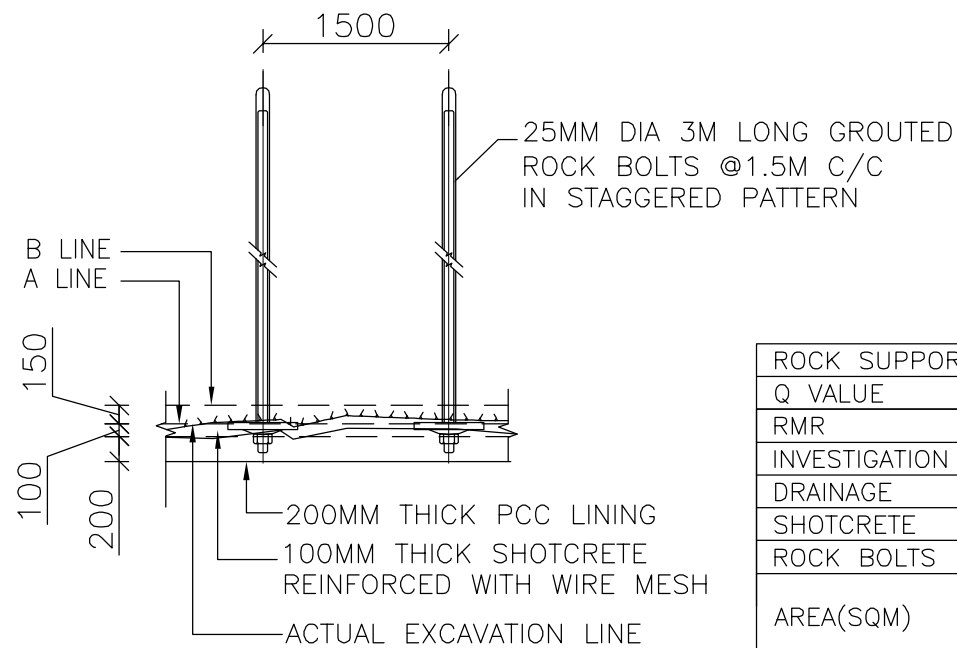
DO NOT SCALE		FOR TENDER PURPOSE	
HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-II (FOR PACKAGE-II)			
SCALE: 1:60	APPROVED		DATE (RO ISSUE)
DEL.CENTRE-DISC: DD-CV	SKD		DATE (CURRENT ISSUE)
DRN: NK	SP	SKD	08-08-2018
CHD: RR	DWG NO	TCF-7784A-200-RC-6505	ISSUE P1



CLASS-III



A LINE SET OUT



SECTION 1-1

ROCK SUPPORT -CLASS III		
Q VALUE	0.1<Q<1	
RMR	41-60	
INVESTIGATION	SYSTEMATIC PROBE DRILLING, L=15/25M WITH 5M OVERLAP	
DRAINAGE	EVENTUALLY DEPENDING ON PROBE HOLE RESULTS	
SHOTCRETE	125MM THICK SHOTCRETE REINFORCED WITH WIRE MESH	
ROCK BOLTS	25MM DIA. RESIN GROUTED ROCK BOLTS, 3M LONG@1.5M C/C IN STAGGERED PATTERN	
AREA(SQM)	FINISHED SECTION	16.148
	UPTO A-LINE	20.447
	UPTO B-LINE	22.976

LEGEND:-

EXCAVATION LINE

NOTES

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- A LINE = MINIMUM EXCAVATION LINE
B LINE = PAY LINE
- SUPPORT SYSTEM MAY VARY DEPENDING UPON THE SITE CONDITIONS ENCOUNTERED AND DESIGN MODIFICATIONS.

FOR RO ISSUE ONLY		
DISC.	SIGNATURE	DATE
CIVIL		
ELEC		
I&C		
MECH		

ISSUE

REVISIONS	

DRN

CLEARED			
CIVIL	ELEC	I&C	MECH

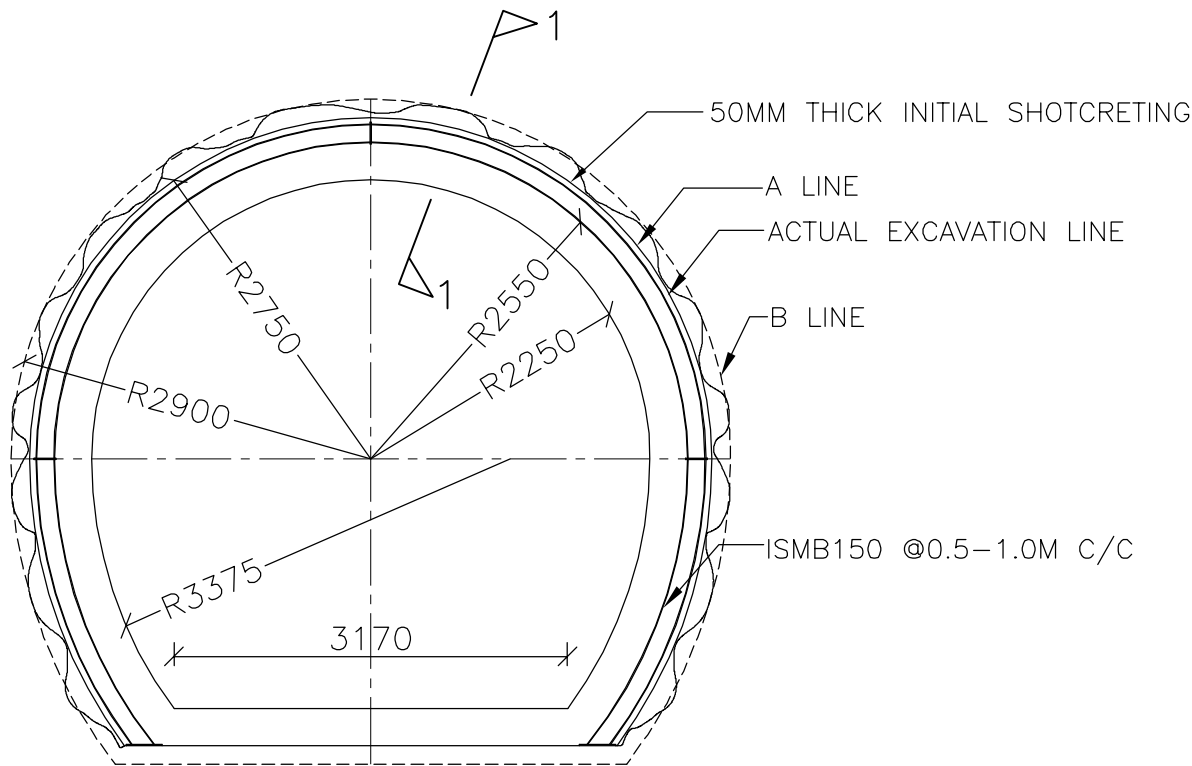
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DATE

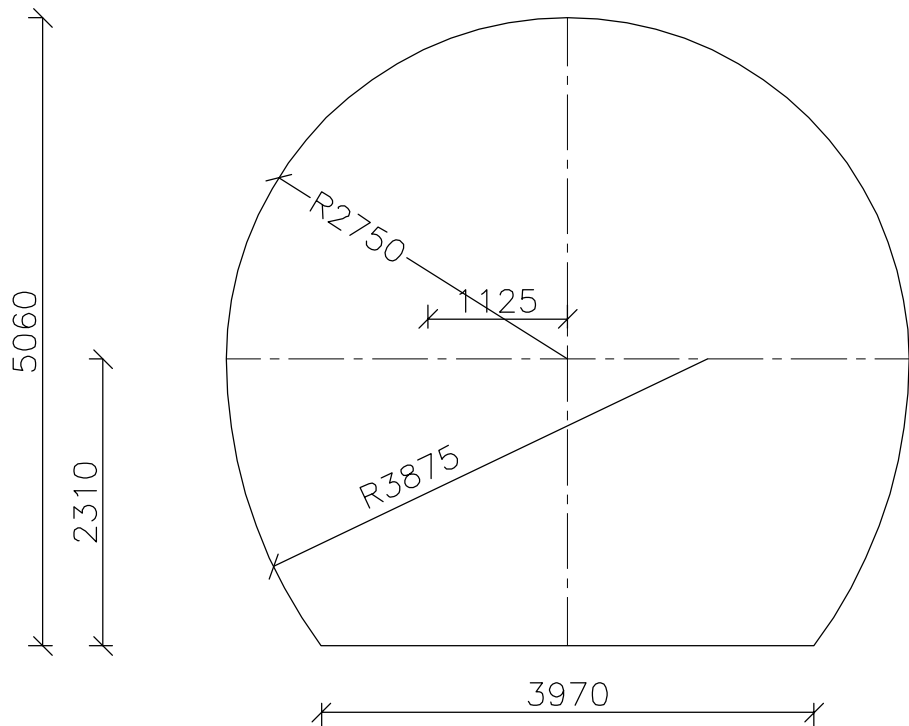
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	TATA CONSULTING ENGINEERS LIMITED
MUMBAI	
CLIENT : KUTANI POWER COMPANY PVT. LTD.	
PROJECT : KUTANI SMALL HYDRO ELECTRIC PROJECT (21 MW)	
UTTARAKHAND	

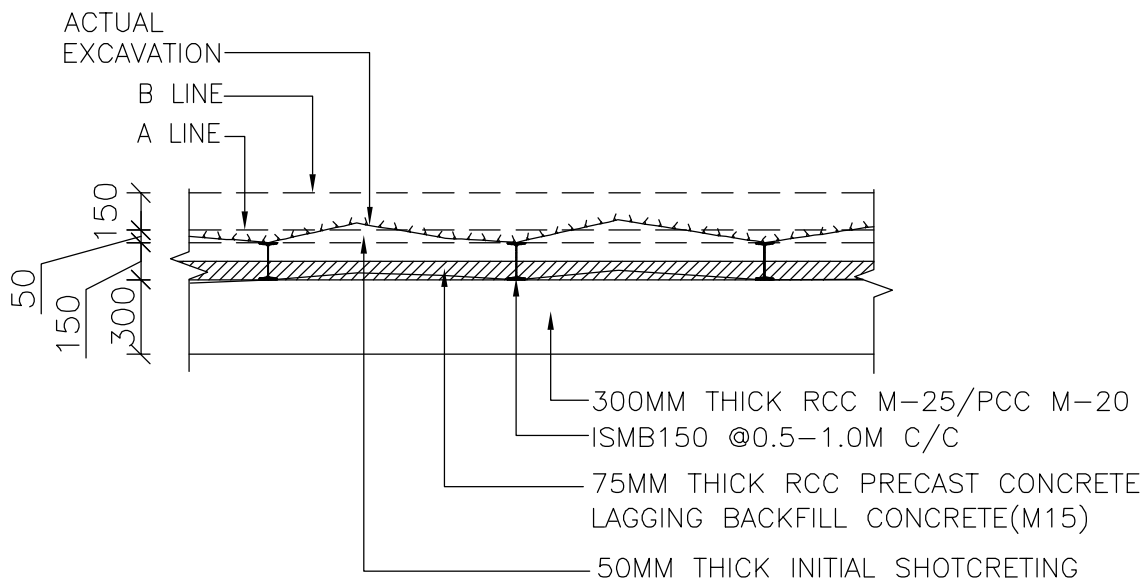
DO NOT SCALE		FOR TENDER PURPOSE	
HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-III (FOR PACKAGE-II)			
SCALE: 1:60	APPROVED		DATE (RO ISSUE)
DEL.CENTRE-DISC: DD-CV	SKD		DATE (CURRENT ISSUE) 08-08-2018
DRN: NK	SP	SKD	
CHD: RR	DWG NO	TCE-7784A-200-RC-6506	ISSUE P1



CLASS-IV



A LINE SET OUT



SECTION 1-1


ROCK SUPPORT -CLASS IV		
Q VALUE	0.01<Q<0.1	
RMR	21-40	
INVESTIGATION	SYSTEMATIC PROBE DRILLING, L=15/25M WITH 5M OVERLAP	
DRAINAGE	EVENTUALLY DEPENDING ON PROBE HOLE RESULTS	
SHOTCRETE	50MM THICK INITIAL SHOTCRETE	
STEEL RIB	ISMB150 @0.5-1.0M C/C	
AREA(SQM)	FINISHED SECTION	16.148
	UPTO A-LINE	23.461
	UPTO B-LINE	26.168

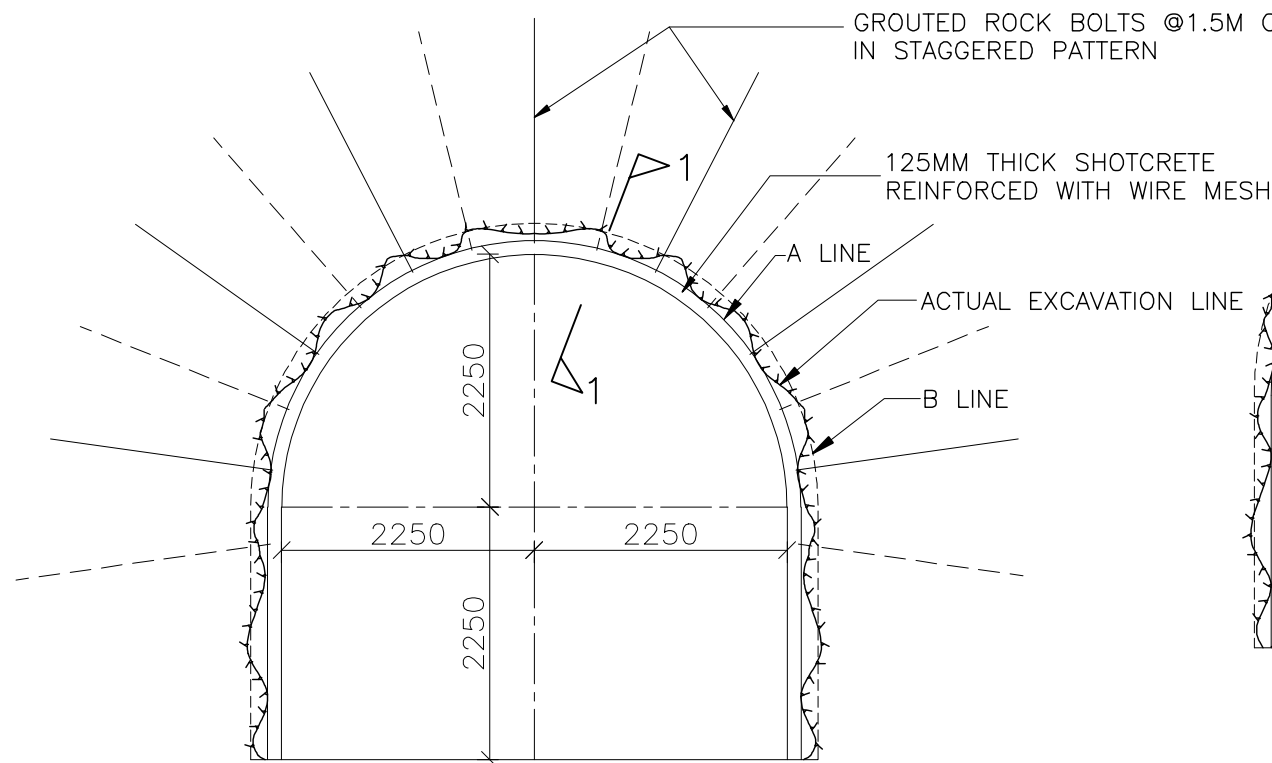
LEGEND:-

EXCAVATION LINE

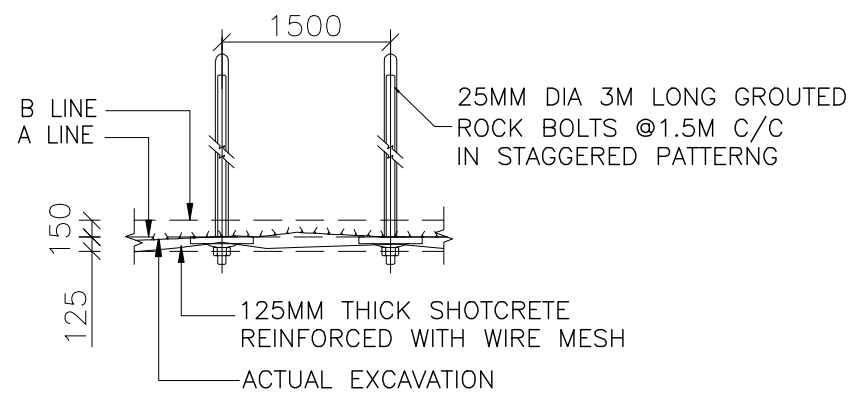
NOTES

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- A LINE = MINIMUM EXCAVATION LINE
B LINE = PAY LINE
- SUPPORT SYSTEM MAY VARY DEPENDING UPON THE SITE CONDITIONS ENCOUNTERED AND DESIGN MODIFICATIONS.

FOR RO ISSUE ONLY			ISSUE	REVISIONS	DRN	CLEARED				APPD	DATE	FILE NAME :7784A6507.DWG	 TATA CONSULTING ENGINEERS LIMITED MUMBAI	DO NOT SCALE FOR TENDER PURPOSE		
DISC.	SIGNATURE	DATE				CIVIL	ELEC	I&C	MECH					HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-IV (FOR PACKAGE-II)		
CIVIL														SCALE: 1:60	APPROVED	DATE (RO ISSUE)
ELEC														DEL.CENTRE- DD-CV	SKD	DATE (CURRENT ISSUE)
I&C														DRN: NK	SP	08-08-2018
MECH														CHD: RR	DWG NO	ISSUE
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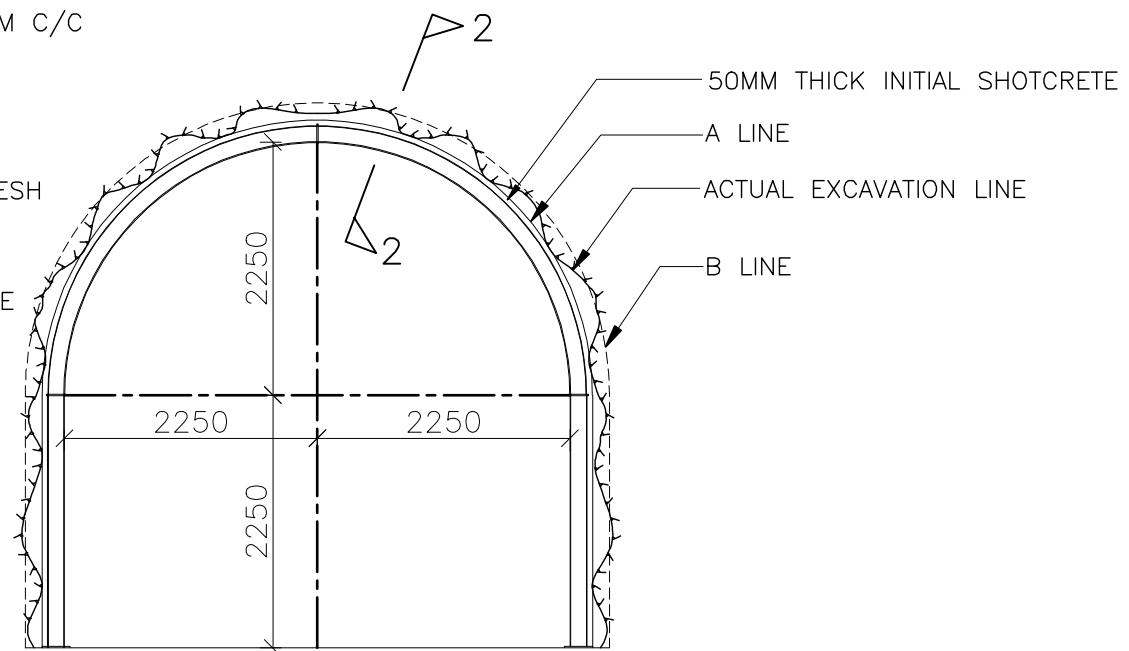


CLASS-III

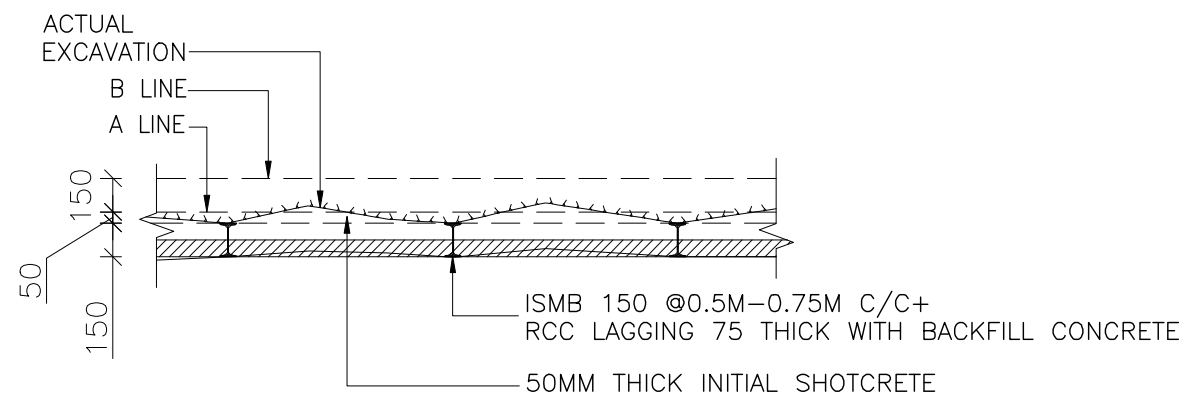


SECTION 1-1

ROCK SUPPORT -CLASS III		
Q VALUE	0.1<Q<1	
RMR	41-60	
INVESTIGATION	SYSTEMATIC PROBE DRILLING, L=15/25M WITH 5M OVERLAP	
DRAINAGE	EVENTUALLY DEPENDING ON PROBE HOLE RESULTS	
SHOTCRETE	125MM THICK SHOTCRETING, REINFORCED WITH WIRE MESH	
ROCK BOLTS	25MM DIA. RESIN GROUTED ROCK BOLTS, 3M LONG@1.5M C/C IN STAGGERED PATTERN	
AREA(SQM)	FINISHED SECTION	18.077
	UPTO A-LINE	19.548
	UPTO B-LINE	22.135



CLASS-IV



SECTION 2-2

ROCK SUPPORT -CLASS IV		
Q VALUE	0.01<Q<0.1	
RMR	21-40	
INVESTIGATION	SYSTEMATIC PROBE DRILLING, L=15/25M WITH 5M OVERLAP	
DRAINAGE	EVENTUALLY DEPENDING ON PROBE HOLE RESULTS	
SHOTCRETE	50MM INITIAL LAYER SHOTCRETE+ ISMB 150 @0.5M-0.75M C/C+ RCC LAGGING 75 THICK WITH BACKFILL CONCRETE	
STEEL RIB	ISMB 150 @0.5M-0.75M C/C	
AREA(SQM)	FINISHED SECTION	18.077
	UPTO A-LINE	20.454
	UPTO B-LINE	23.099

LEGEND:-

EXCAVATION LINE

NOTES

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B LINE = PAY LINE
- SUPPORT SYSTEM MAY VARY DEPENDING UPON THE SITE CONDITIONS ENCOUNTERED AND DESIGN MODIFICATIONS.

FOR RO ISSUE ONLY			ISSUE	REVISIONS	DRN	CLEARED				APPD	DATE	FILE NAME :7784A6508.DWG
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I&C												
MECH												

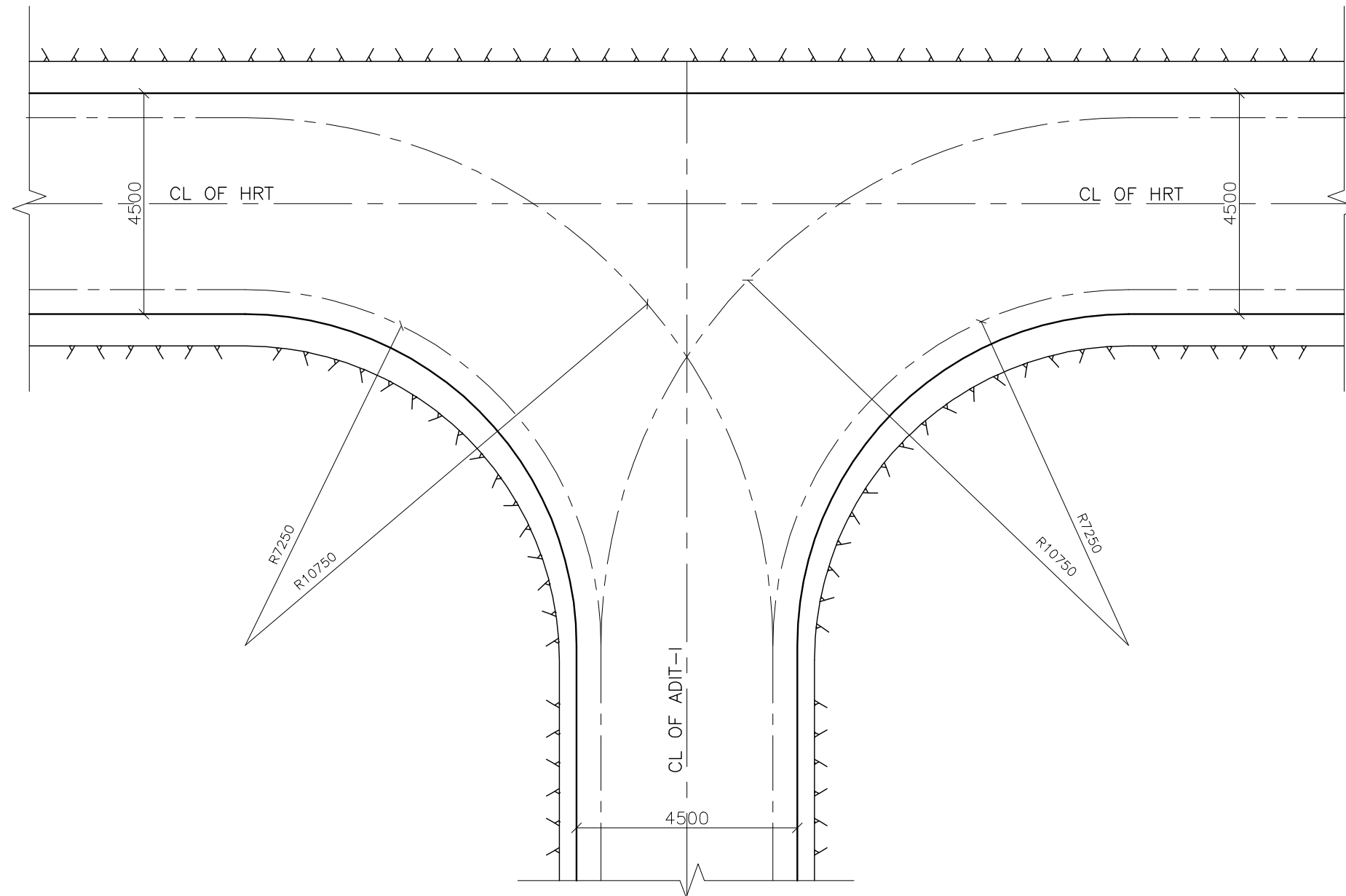
TATA CONSULTING ENGINEERS LIMITED
MUMBAI

CLIENT : KUTANI POWER COMPANY PVT. LTD.
PROJECT : KUTANI SMALL HYDRO ELECTRIC PROJECT
UTTARAKHAND

DO NOT SCALE		FOR TENDER PURPOSE	
SCALE: 1:60	APPROVED	MG	
DEL.CENTRE- DISC: DD-CV	KC	SKD	DATE (CURRENT ISSUE) 13-01-2017
DRN: NK	DWG NO	TCE-7784A-200-RC-6508	
CHD: RR	NO	ISSUE PO	

FILE NAME: F-043-Rev-R5.dwg

TCE FORM NO. 043 R5




ADIT-I & HRT JUNCTION PLAN

LEGEND:-

--- EXCAVATION LINE

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS.
2. NO DIMENSION SHOULD BE MEASURED FROM THE DRAWING.

FOR RO ISSUE ONLY												ISSUE	REVISIONS	DRN	CLEARED						APPD	DATE	FILE NAME :7784A6509.DWG	<div><div></div><div>TATA CONSULTING ENGINEERS LIMITED MUMBAI</div></div>	DO NOT SCALE		FOR TENDER PURPOSE																	
CLEARED															PROPOSED LAYOUT OF ADIT-I & HRT JUNCTION (FOR PACKAGE-II)												SCALE: 1:100	APPROVED		MG		DATE (RO ISSUE)												
DISC.	SIGNATURE											DATE																									DEL.CENTRE- DD-CV		KC		SKD		DATE (CURRENT ISSUE)	
CIVIL																																											13-01-2017	
ELEC																																					DRN: NK		DWG NO		TCE-7784A-200-RC-6509		ISSUE PO	
I&C																																					CHD: MKM							
MECH																																												

FILE NAME: F-043-Rev-R5.dwg

TCE FORM NO. 043 R5

SIZE-A3