

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-6512	PROPOSED LAYOUT PLAN OF ADIT-II (FOR PACKAGE-III)
3.	TCE-7784A-200-RC-6513	HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-I (FOR PACKAGE-III)
4.	TCE-7784A-200-RC-6514	HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-II (FOR PACKAGE-III)
5.	TCE-7784A-200-RC-6515	HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-III (FOR PACKAGE-III)
6.	TCE-7784A-200-RC-6516	HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-IV (FOR PACKAGE-III)
7.	TCE-7784A-200-RC-6517	PROPOSED ADIT-II PRIMARY ROCK SUPPORT DETAILS CLASS-III & IV (FOR PACKAGE-III)
8.	TCE-7784A-200-RC-6518	PROPOSED LAYOUT OF ADIT-II & HRT JUNCTION (FOR PACKAGE-III)
9.	TCE.7784A-200-RC-6519	SURGE SHAFT CONCRETE OUTLINE,EXCAVATION & SUPPORT SYSTEM (FOR PACKAGE-III)



CO-ORDINATES OF CONTROL POINTS:

SR. NO	EASTING	NORTHING
PT-1	386433.491	3294567.387
PT-2	386484.076	3294559.957
PT-3	386534.652	3294552.464
PT-4	386452.219	3294509.915
PT-5	386473.907	3294506.670
PT-6	386495.734	3294503.404
PT-7	386515.097	3294546.100
PT-8	386521.682	3294521.663
PT-9	386532.918	3294479.192
PT-10	386486.364	3294330.571
PT-11	386488.633	3294326.116
PT-12	386820.496	3293682.983
PT-13	386894.241	3292975.294
PT-14	386782.347	3292973.537
PT-15	386928.991	3292641.824
PT-16	387864.199	3291453.166
PT-17	387804.484	3291406.017
PT-18	388162.455	3291047.123
PT-19	388156.924	3290945.651
PT-20	388164.912	3290945.216
PT-21	388114.986	3290947.937
PT-22	388113.626	3290922.974
PT-23	388163.552	3290920.253
PT-24	388157.561	3290920.580
PT-25	388131.599	3290921.995
PT-26	388155.601	3290884.633
PT-27	388129.640	3290886.048
PT-28	388142.485	3290882.844
PT-29	388231.672	3290877.983

LEGEND:-

FOOT TRACK	
CULTIVATED LAND,HOUSE	
RIVER,NALA,ELECTRIC LINE	
CANAL,CUTTING	
ROCK,BOULDERS,BRIDGE	
LAYOUT	
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.

DO NOT SCALE FOR TENDER PURPOSE

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

PROJECT INFRASTRUCTURE PLAN



SCALE: 1:6000 APPROVED DATE (R/O ISSUE)

DEL.CENTRE-DISC: DD-CV MG DATE (CURRENT ISSUE) 13-01-2017

DRN: NK KC SKD

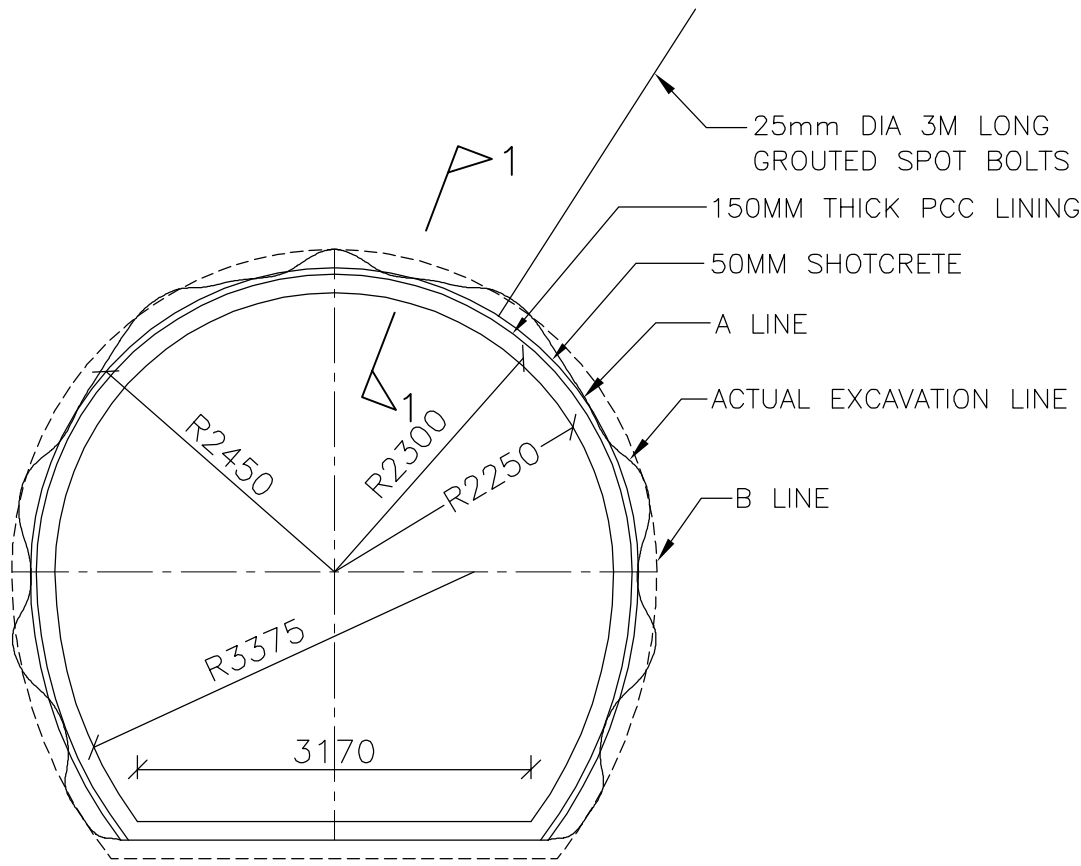
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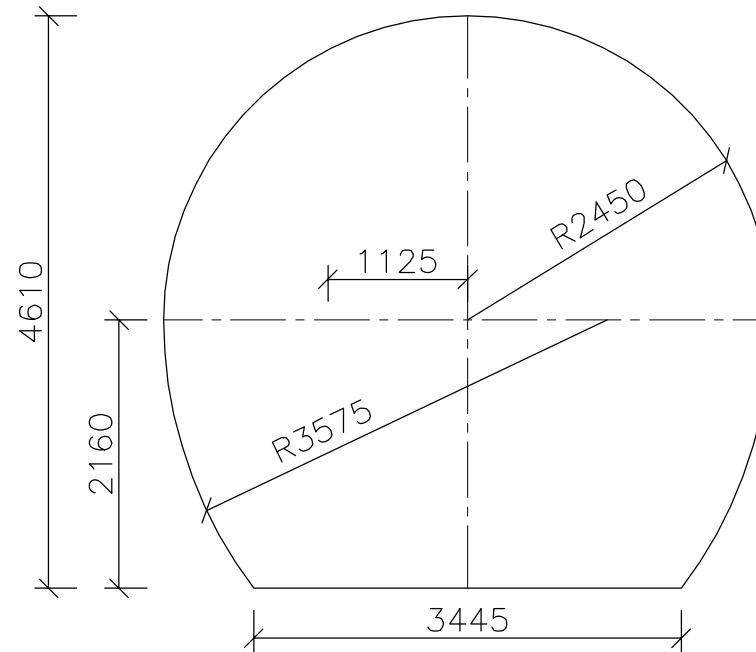
"P" (PRELIMINARY) ISSUES ARE NOT TO BE USED FOR CONSTRUCTION / FABRICATION BUT ARE ISSUED FOR LIMITED PURPOSES ONLY AS NOTED IN THE SMALL BLOCK AT THE TOP RIGHT HAND CORNER OF THE TITLE BLOCK.
CONSTRUCTION / FABRICATION WORK IS PERMITTED ON "R" (RELEASED) ISSUES ONLY.
INFORMATION CONTAINED WITHIN "HOLD" 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".

FOR R/O ISSUE ONLY			ISSUE	REVISIONS	DRN	CLEARED						APPD	DATE	ISSUE	REVISIONS	DRN	CLEARED						APPD	DATE		
DISC.	CLEARED					CIVIL	ELEC	I&C	MECH								CIVIL	ELEC	I&C	MECH						
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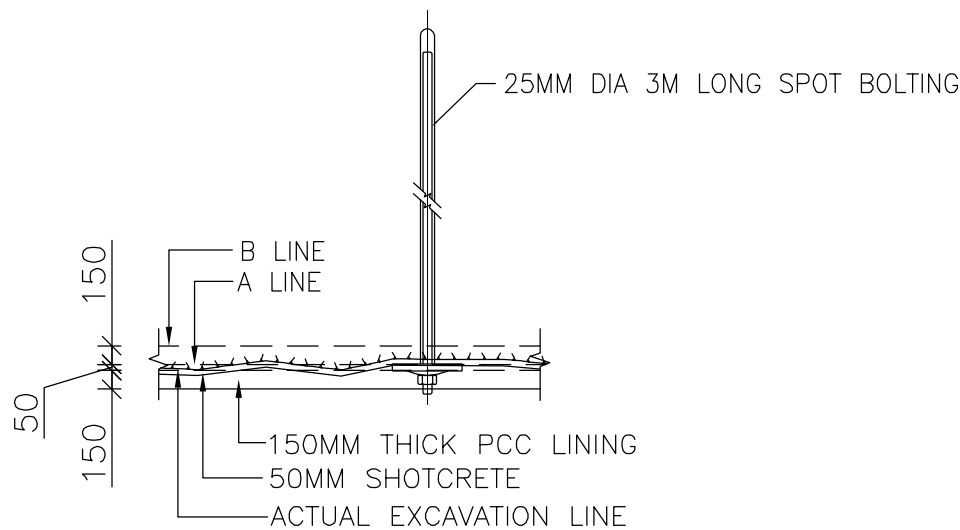
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CLASS-I



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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- 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		
CLEARED		
DISC.	SIGNATURE	DATE
CIVIL		
ELEC		
I&C		
MECH		

ISSUE

REVISIONS	

DRN	CLEARED				APPD	DATE
	CIVIL	ELEC	I&C	MECH		

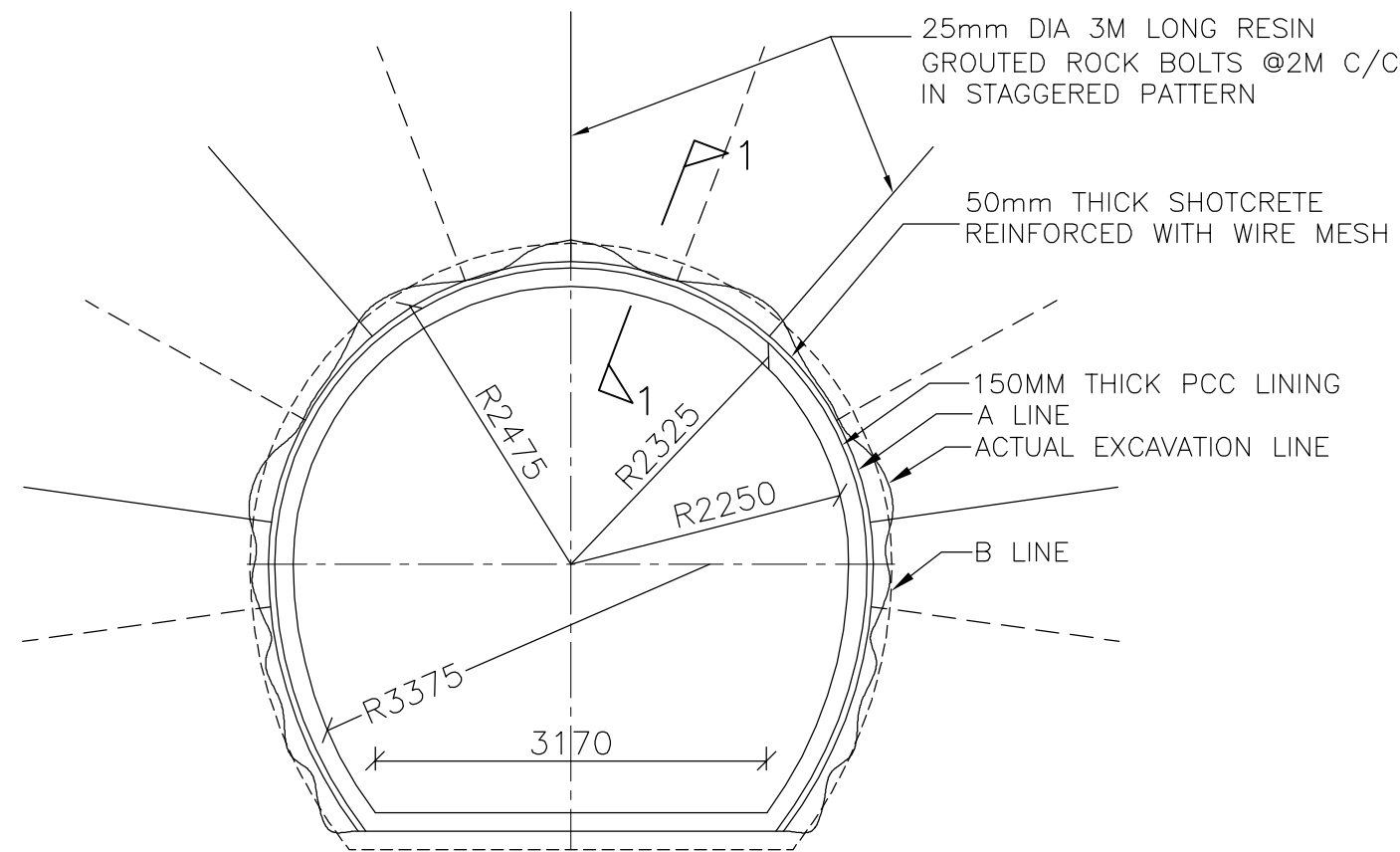
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**TATA** CONSULTING ENGINEERS LIMITED
MUMBAI

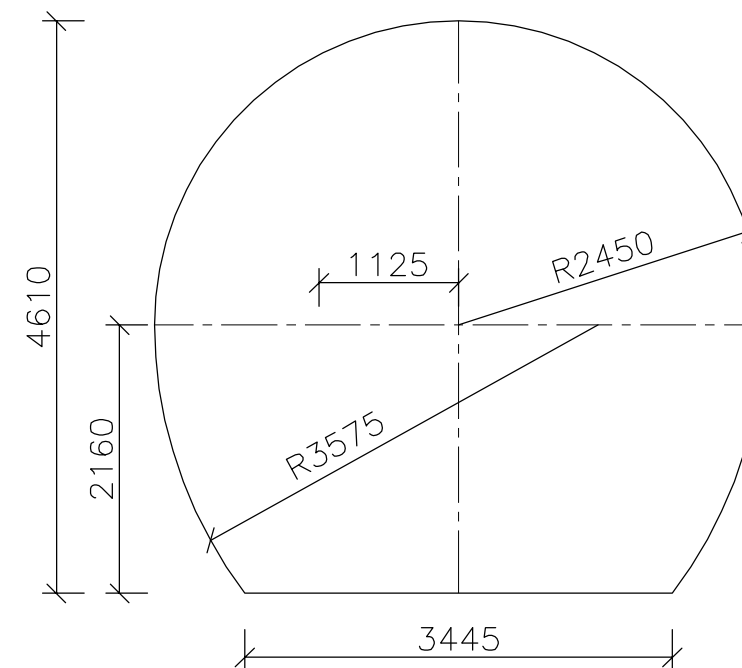
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PROJECT : KUTANI SMALL HYDRO ELECTRIC PROJECT (21 MW) UTTARAKHAND

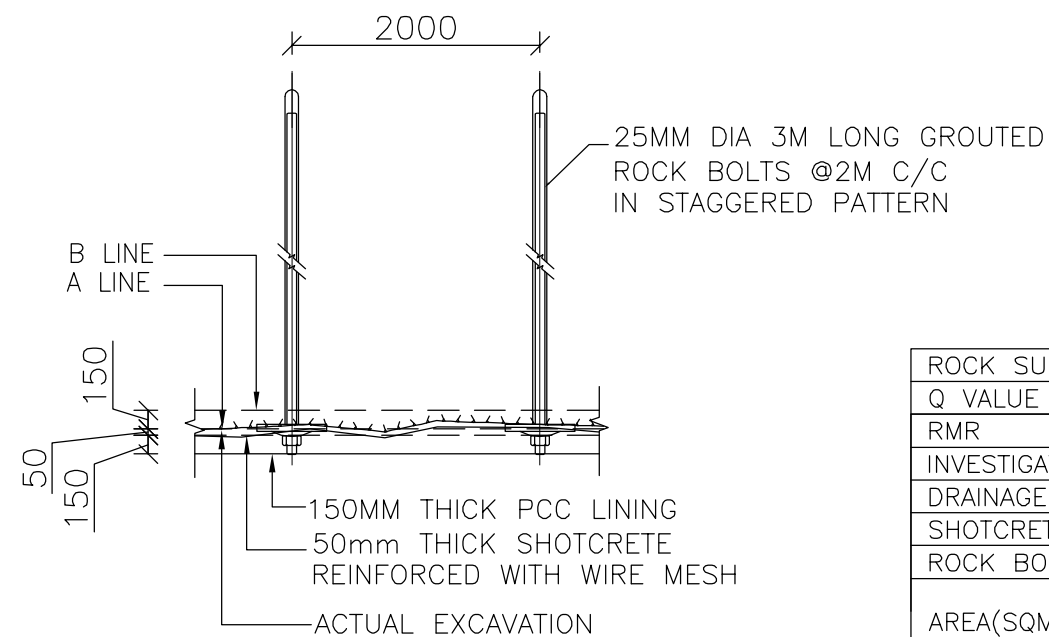
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HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-I (FOR PACKAGE-III)			
SCALE: 1:60	APPROVED		DATE (RO ISSUE)
DEL.CENTRE- DISC: DD-CV	SKD		DATE (CURRENT ISSUE) 10-08-2018
	SP	SKD	
DRN: NK	DWG NO	TCE-7784A-200-RC-6513	ISSUE P1
CHD: RR			



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		

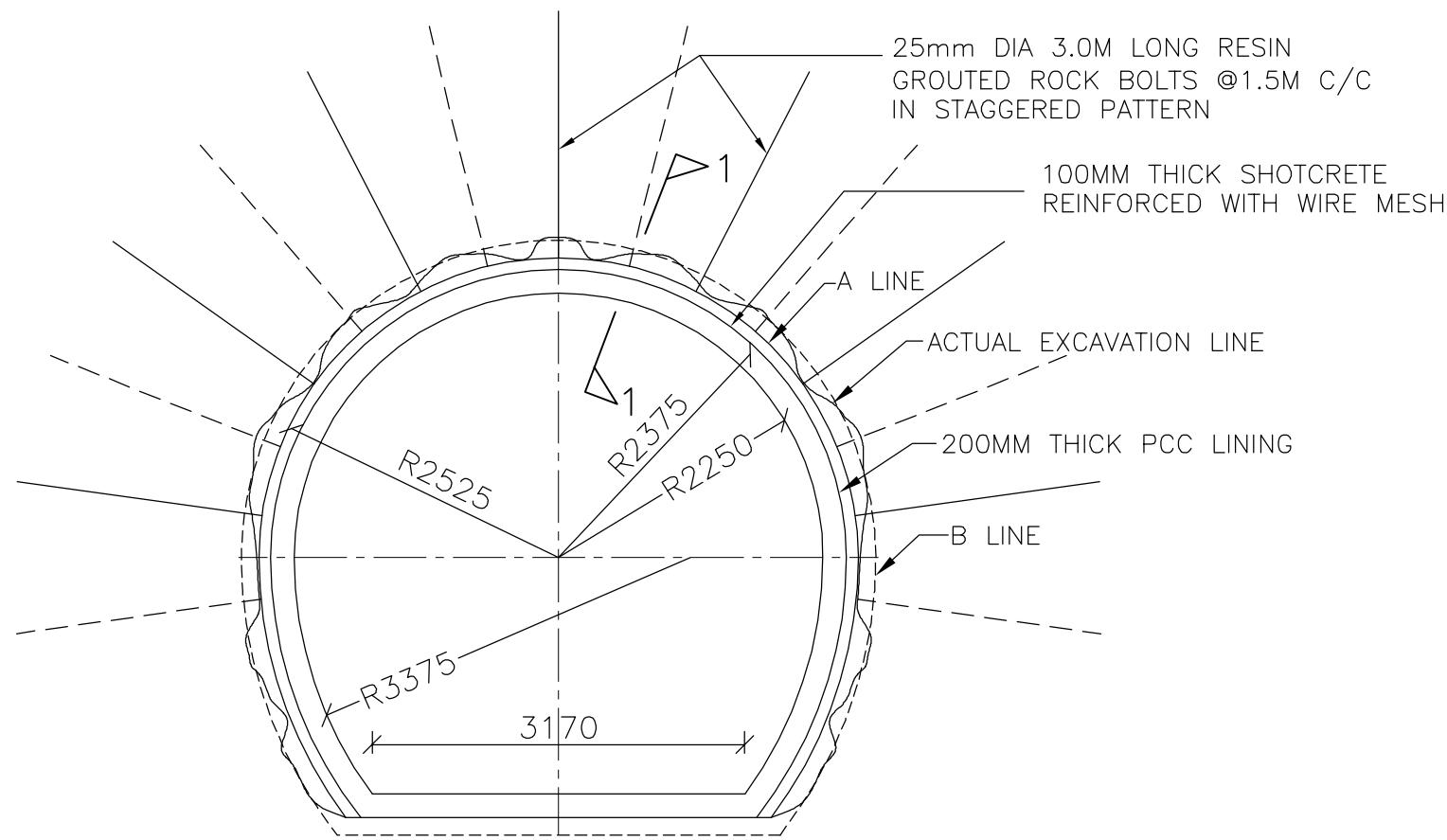
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REVISIONS			
NO.	DESCRIPTION	DATE	BY

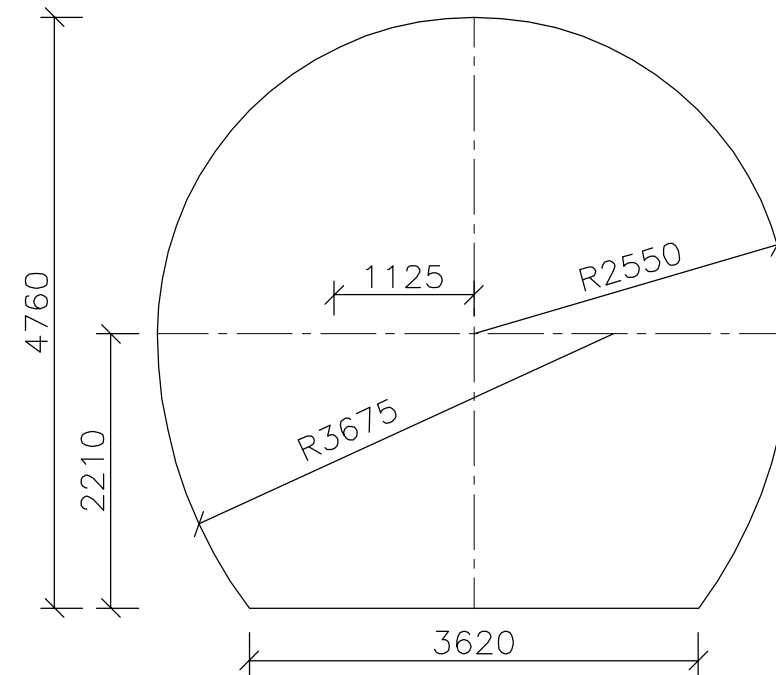
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TATA CONSULTING ENGINEERS LIMITED	
MUMBAI	
CLIENT : KUTANI POWER COMPANY PVT. LTD.	
PROJECT : KUTANI SMALL HYDRO ELECTRIC PROJECT (21 MW)	
UTTARAKHAND	

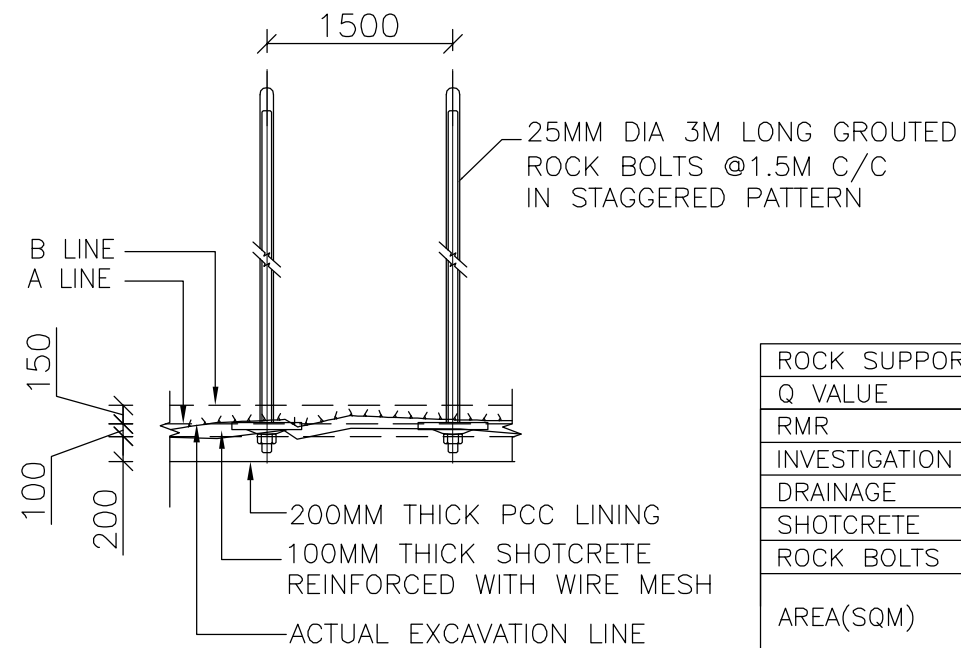
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HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-II (FOR PACKAGE-III)			
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DEL.CENTRE-DISC: DD-CV	SKD		DATE (CURRENT ISSUE)
DRN: NK	SP	SKD	10-08-2018
CHD: RR	DWG NO. TCE-7784A-200-RC-6514		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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- 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	

DRN

CLEARED			
CIVIL	ELEC	I&C	MECH

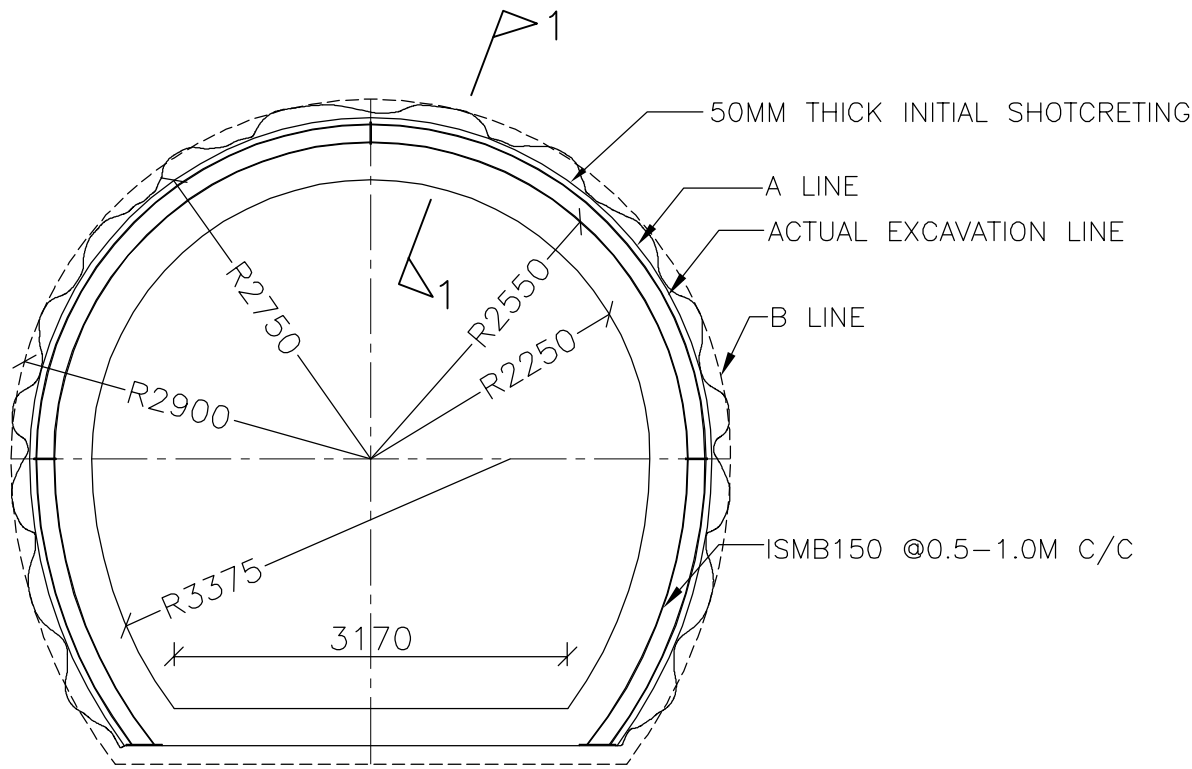
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DATE

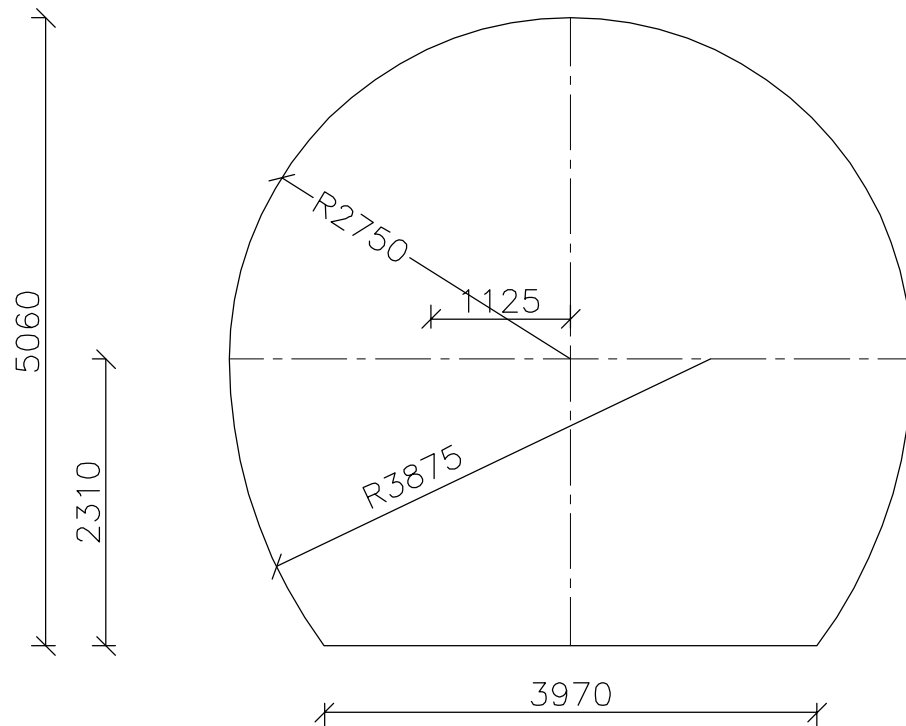
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MUMBAI	
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PROJECT : KUTANI SMALL HYDRO ELECTRIC PROJECT (21 MW)	
UTTARAKHAND	

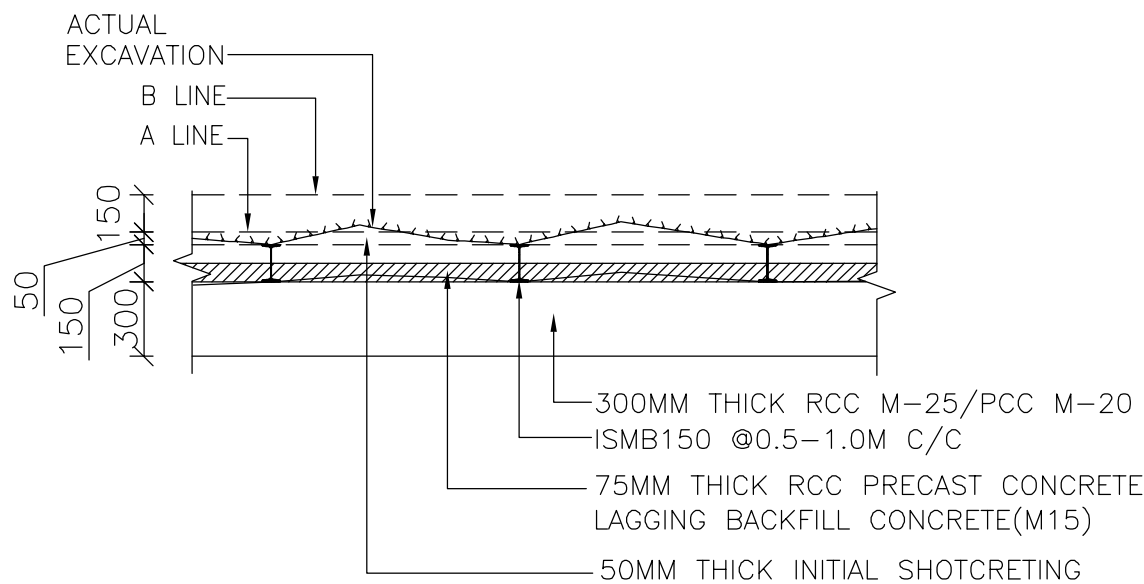
DO NOT SCALE		FOR TENDER PURPOSE	
HEAD RACE TUNNEL PROPOSED PRIMARY ROCK SUPPORT DETAILS CLASS-III (FOR PACKAGE-III)			
SCALE: 1:60	APPROVED		DATE (RO ISSUE)
DEL.CENTRE-DISC: DD-CV	SKD		DATE (CURRENT ISSUE) 10-08-2018
DRN: NK	SP	SKD	
CHD: RR	DWG NO	TCE-7784A-200-RC-6515	ISSUE P1



CLASS-IV



A LINE SET OUT



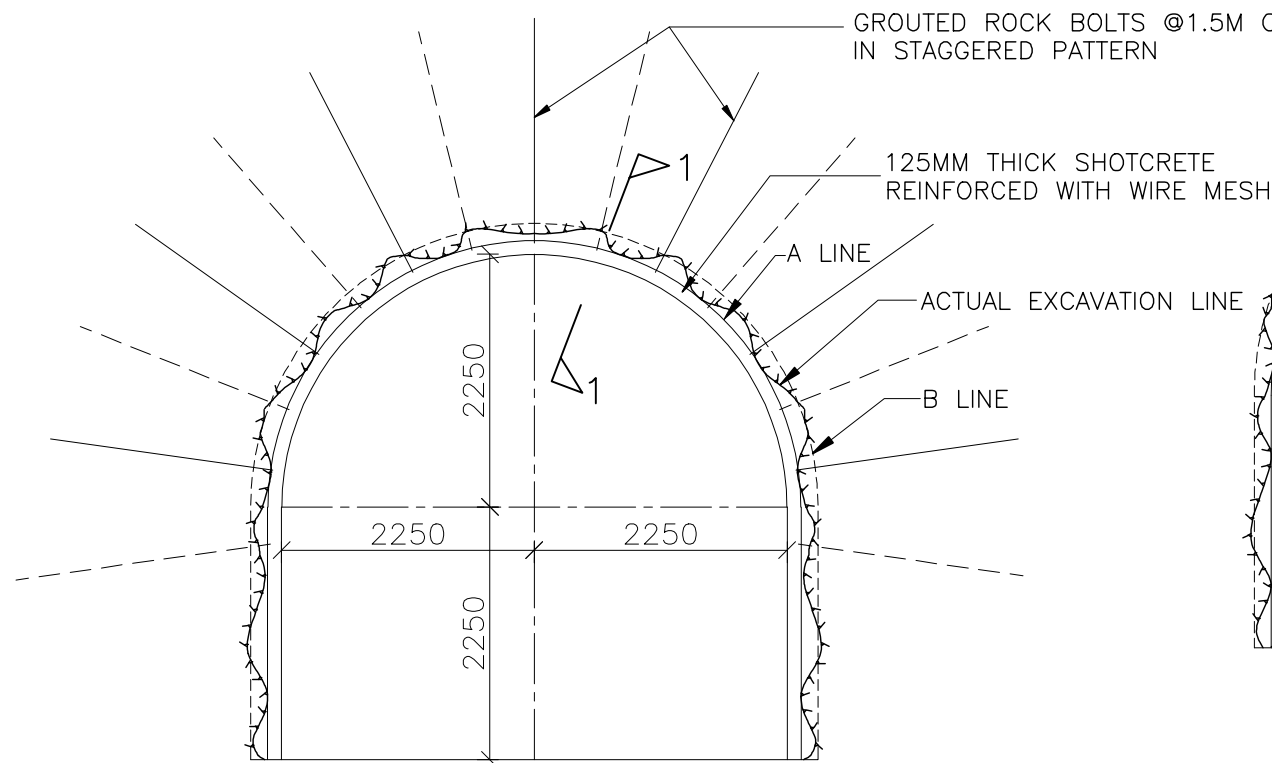
SECTION 1-1

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

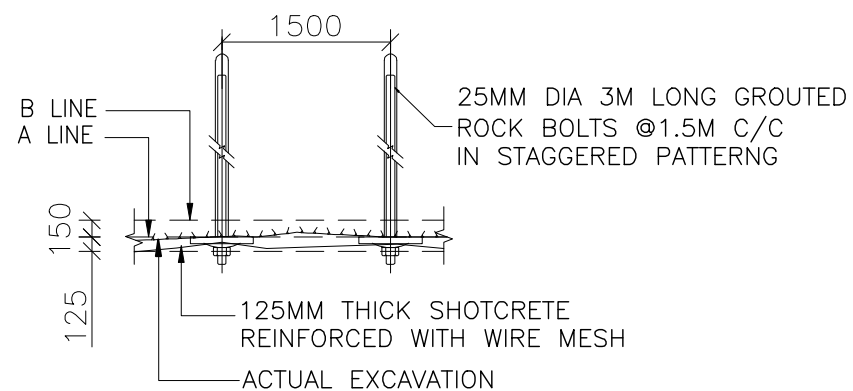
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS.
2. NO DIMENSION SHOULD BE MEASURED FROM THE DRAWING.
3. A LINE = MINIMUM EXCAVATION LINE
B LINE = PAY LINE
4. 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 :7784A6516.DWG	<div> TATA CONSULTING ENGINEERS LIMITED MUMBAI </div>	DO NOT SCALE FOR TENDER PURPOSE		
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ELEC														DEL.CENTRE- DD-CV	SKD	DATE (CURRENT ISSUE)
I&C														DRN: NK	SP	10-08-2018
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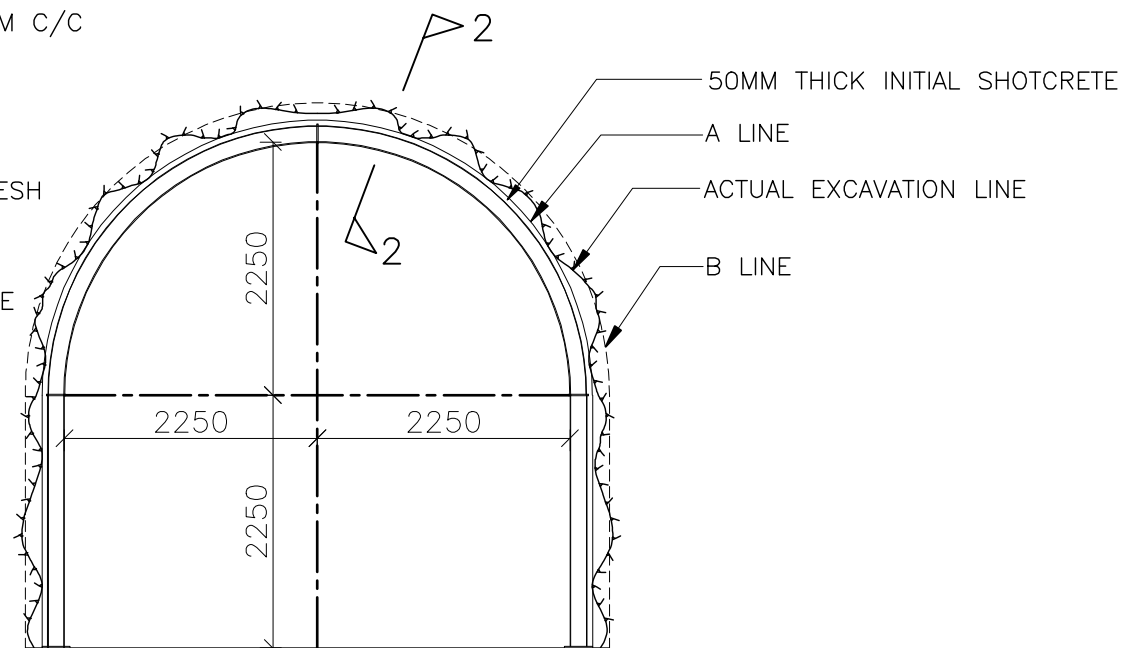


CLASS-III

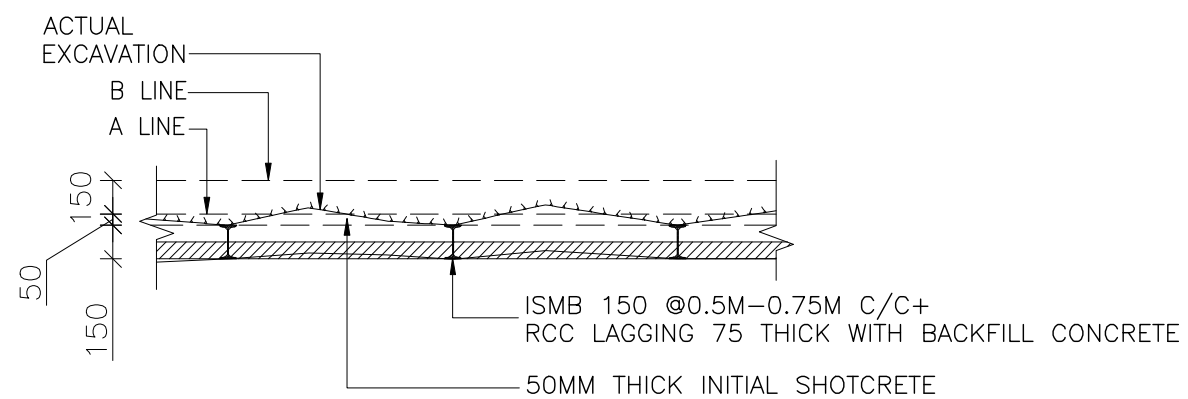


SECTION 1-1

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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- SUPPORT SYSTEM MAY VARY DEPENDING UPON THE SITE CONDITIONS ENCOUNTERED AND DESIGN MODIFICATIONS.

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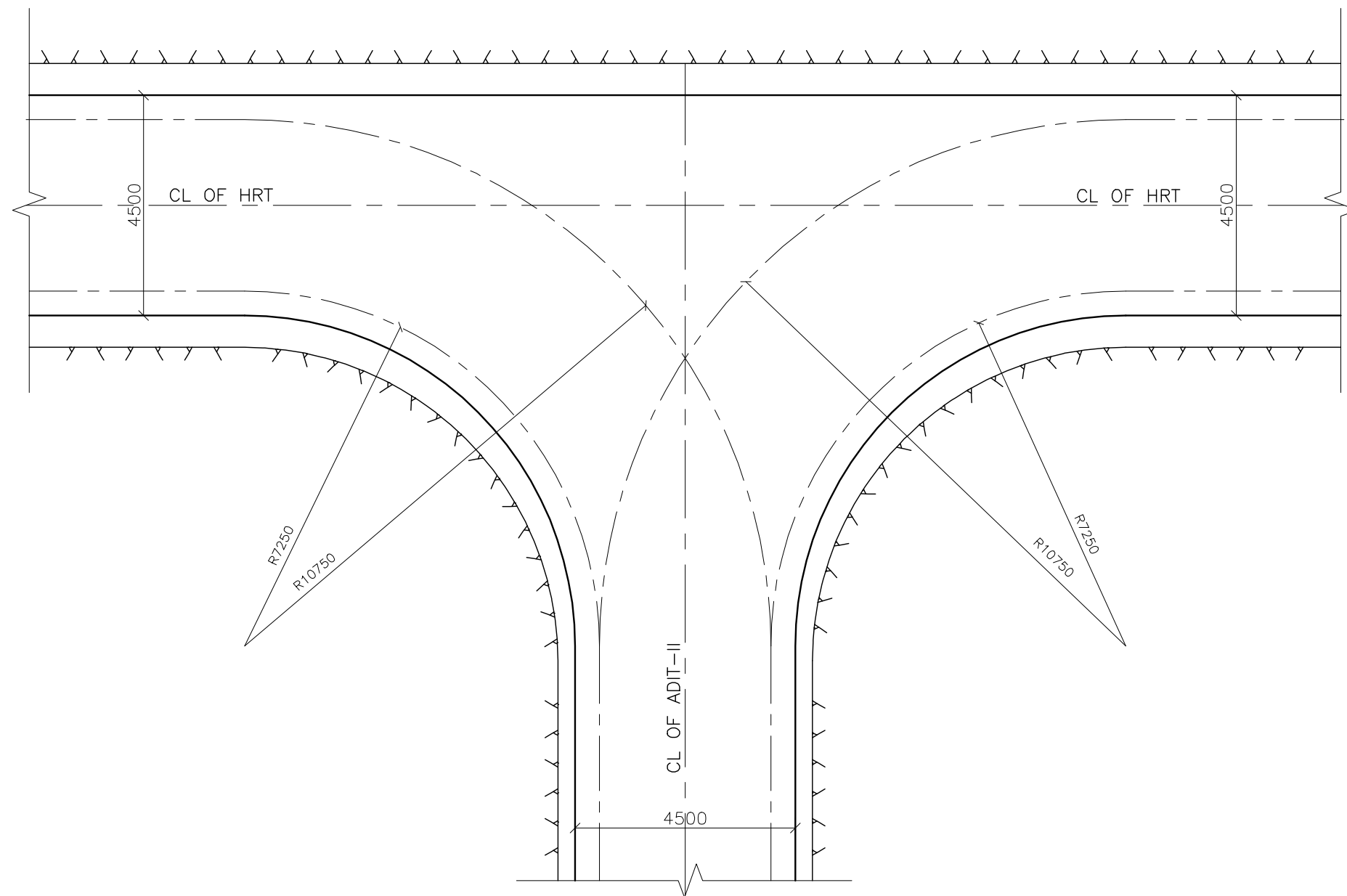
TATA CONSULTING ENGINEERS LIMITED
MUMBAI

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

DO NOT SCALE		FOR TENDER PURPOSE	
SCALE: 1:60	APPROVED	DATE (RO ISSUE)	
DEL.CENTRE- DISC: DD-CV	MG	DATE (CURRENT ISSUE)	
DRN: NK	KC	SKD	16-02-2017
CHD: RR	DWG NO	TCE-7784A-200-RC-6517	ISSUE PO

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

TCE FORM NO. 043 R5



ADIT-II & HRT JUNCTION PLAN

LEGEND:-

EXCAVATION LINE

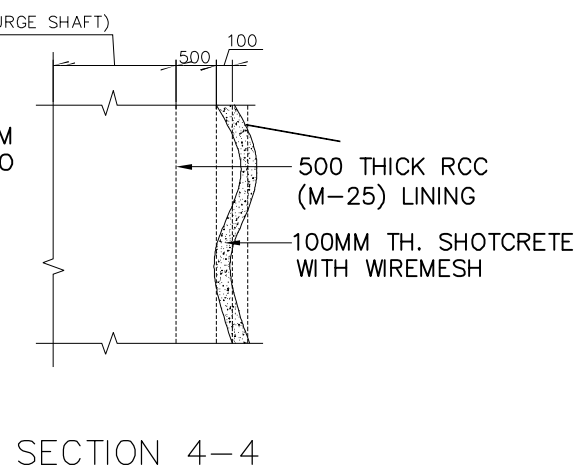
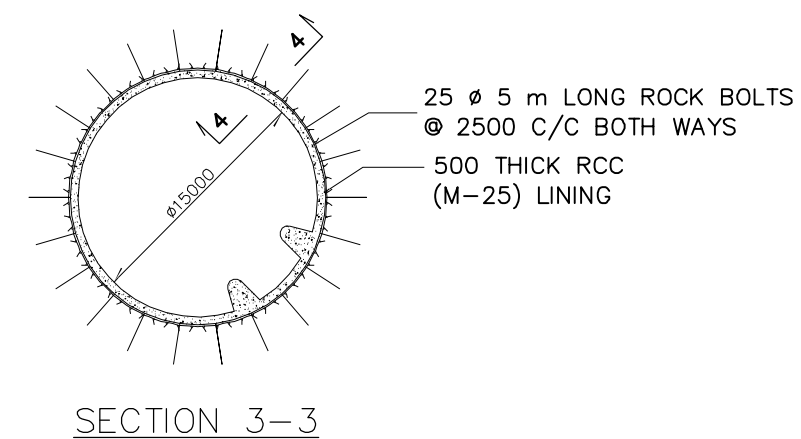
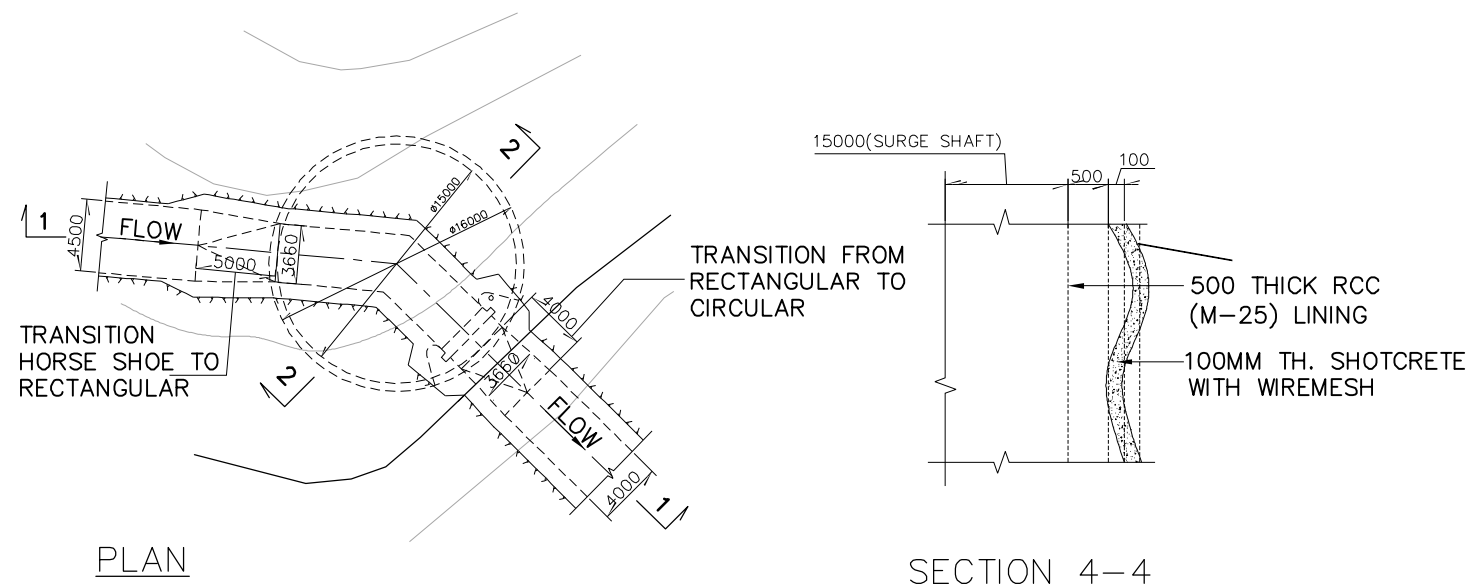
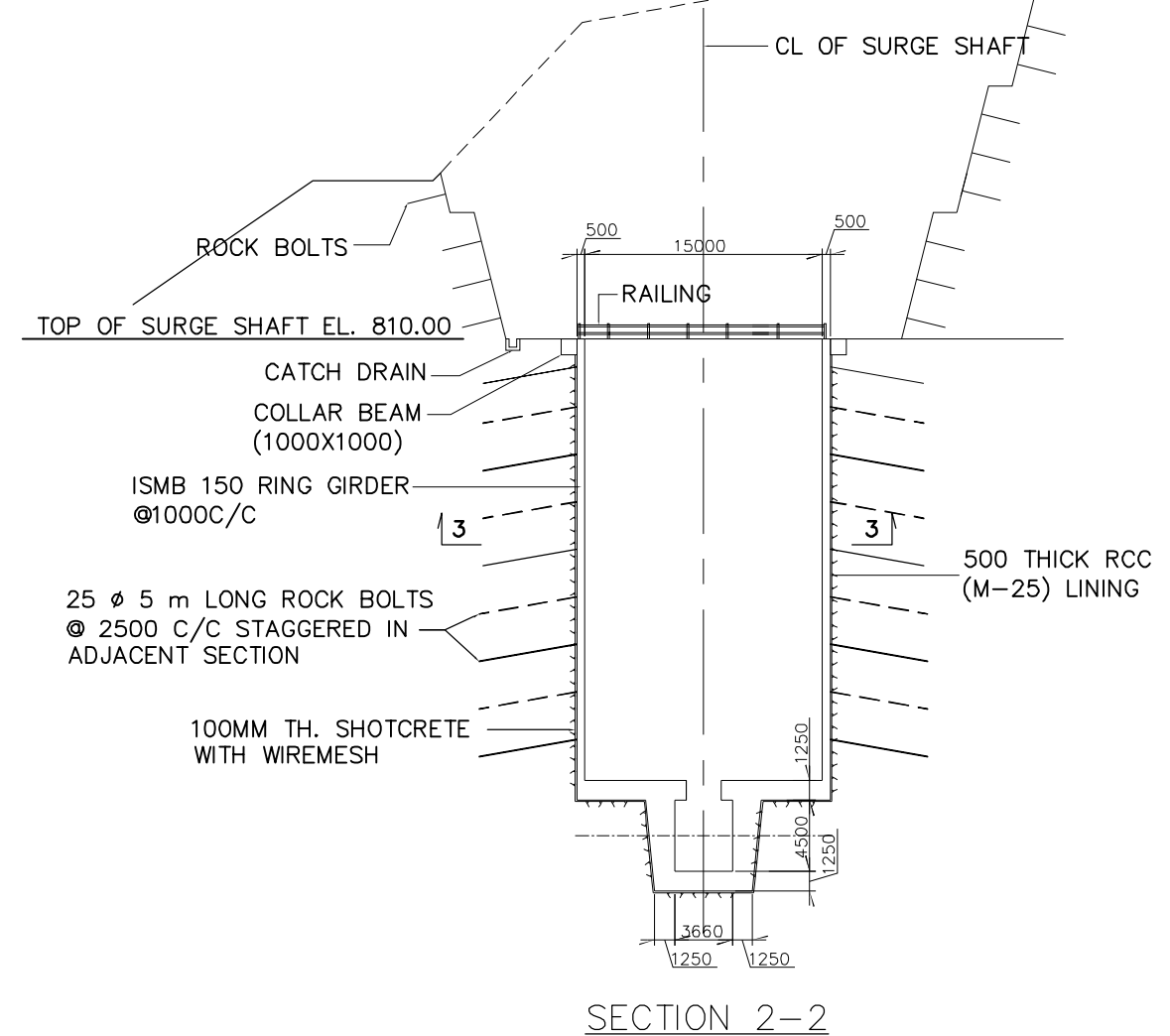
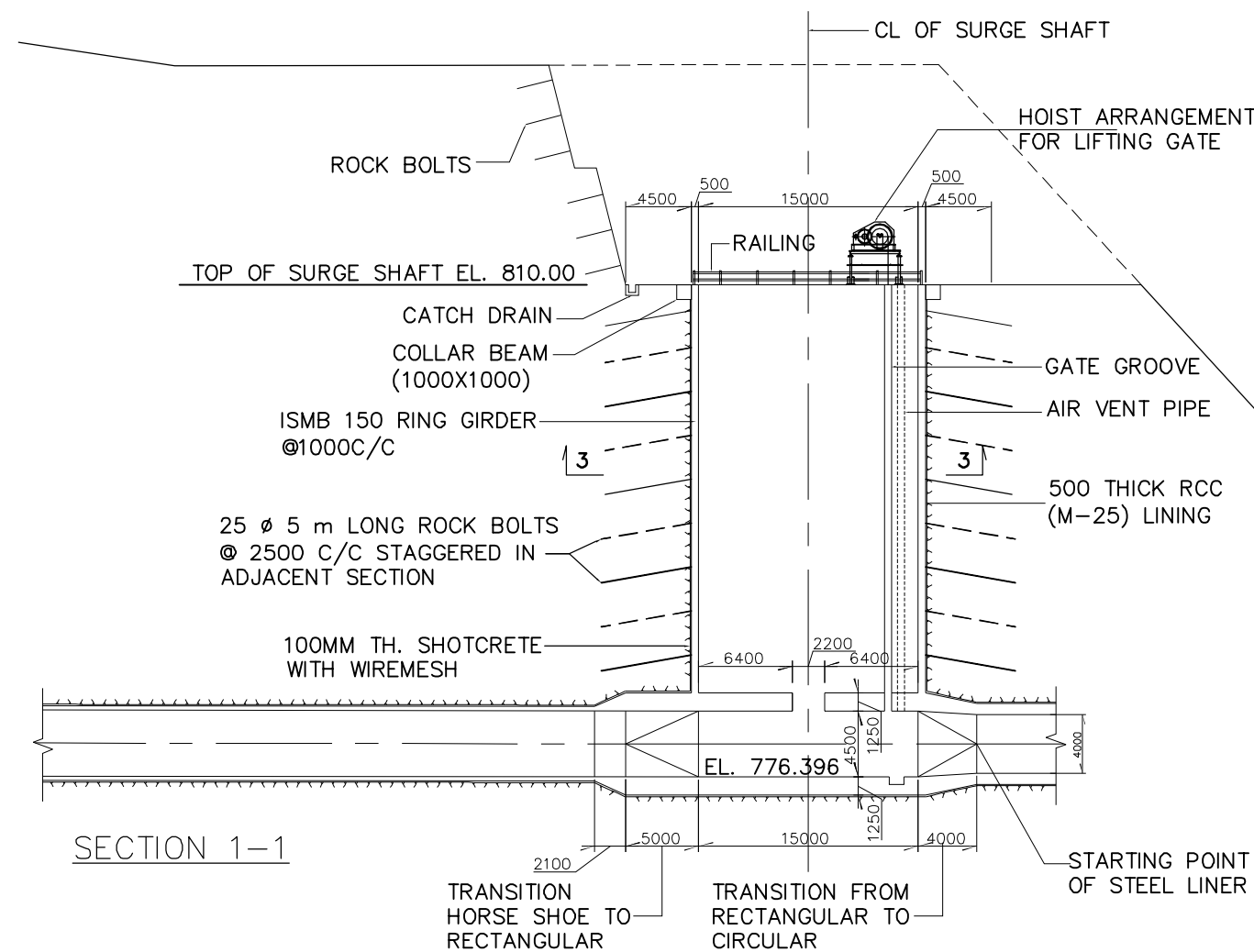
NOTES

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CLIENT : KUTANI POWER COMPANY PVT. LTD. PROJECT : KUTANI SMALL HYDRO ELECTRIC PROJECT UTTARAKHAND												TCE FORM NO. 043 R5					

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

SIZE-A3



LEGEND: –

EXCAVATION LINE

NOTES

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3. SUPPORT SYSTEM MAY VARY DEPENDING UPON THE SITE CONDITIONS ENCOUNTERED AND DESIGN MODIFICATIONS.

DO NOT SCALE	FOR TENDER PURPOSE
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SURGE SHAFT CONCRETE OUTLINE,
EXCAVATION & SUPPORT SYSTEM
(FOR PACKAGE-III)

SCALE:	1: 500	APPROVED		DATE (R0 ISSUE)
DEL.CENTRE- DISC:	DD - CV	SKD		DATE (CURRENT ISSUE) 10-08-2018
DRN:	NK	SP	SKD	
CHD:	SP	DWG NO	TCE-7784A-200-RC-6519	ISSUE P0

FOR RO ISSUE ONLY			ISSUE	REVISIONS	DRN	CLEARED						APPD	DATE	FILE NAME :7784A6519.DWG	
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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
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FILE NAME: F-043-Rev-R5.dwg

TCE FORM NO. 043 R5

SIZE-A3