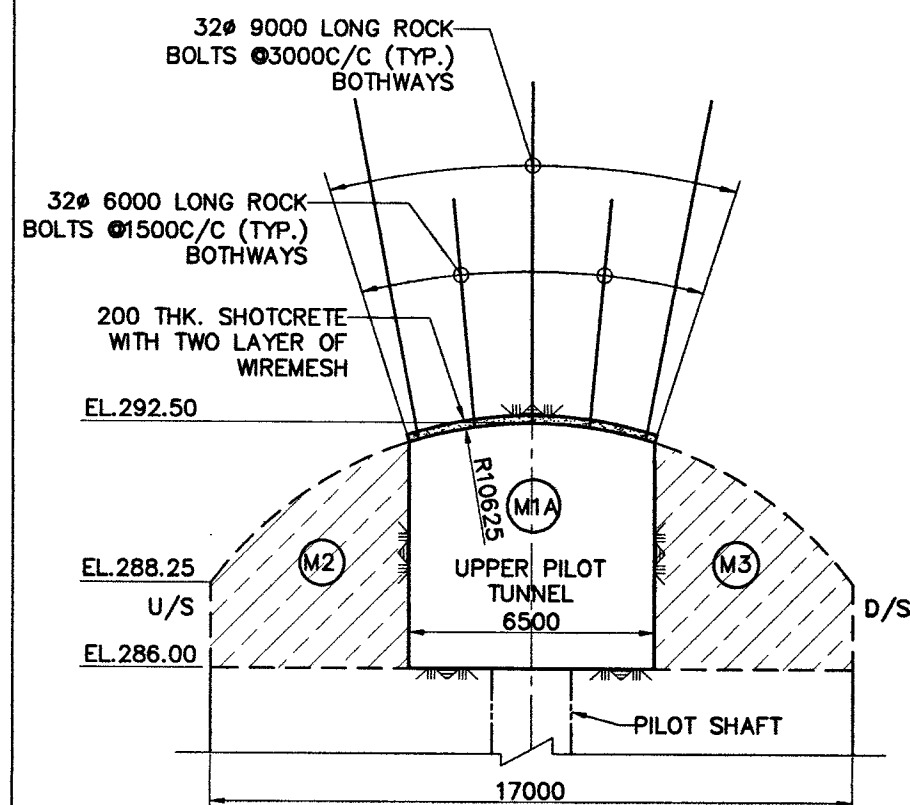
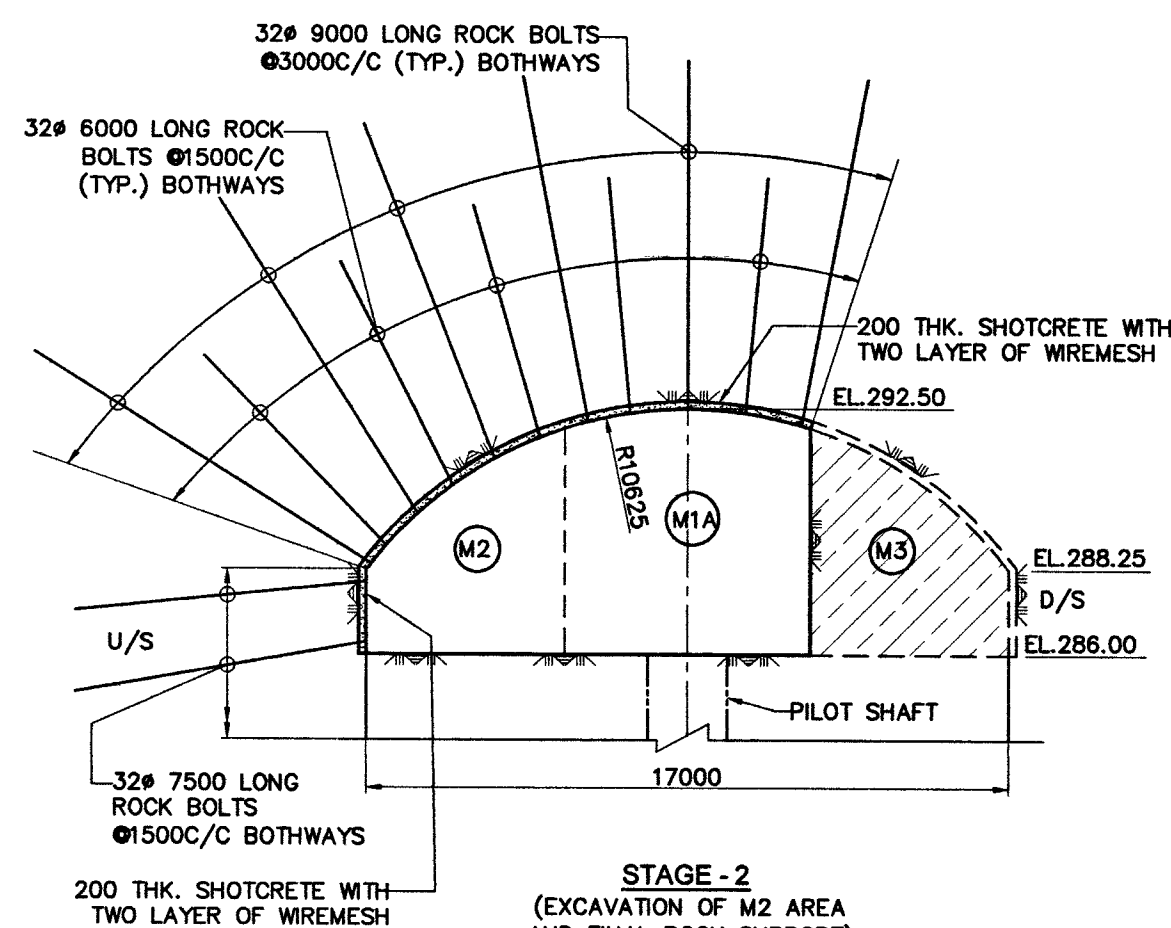
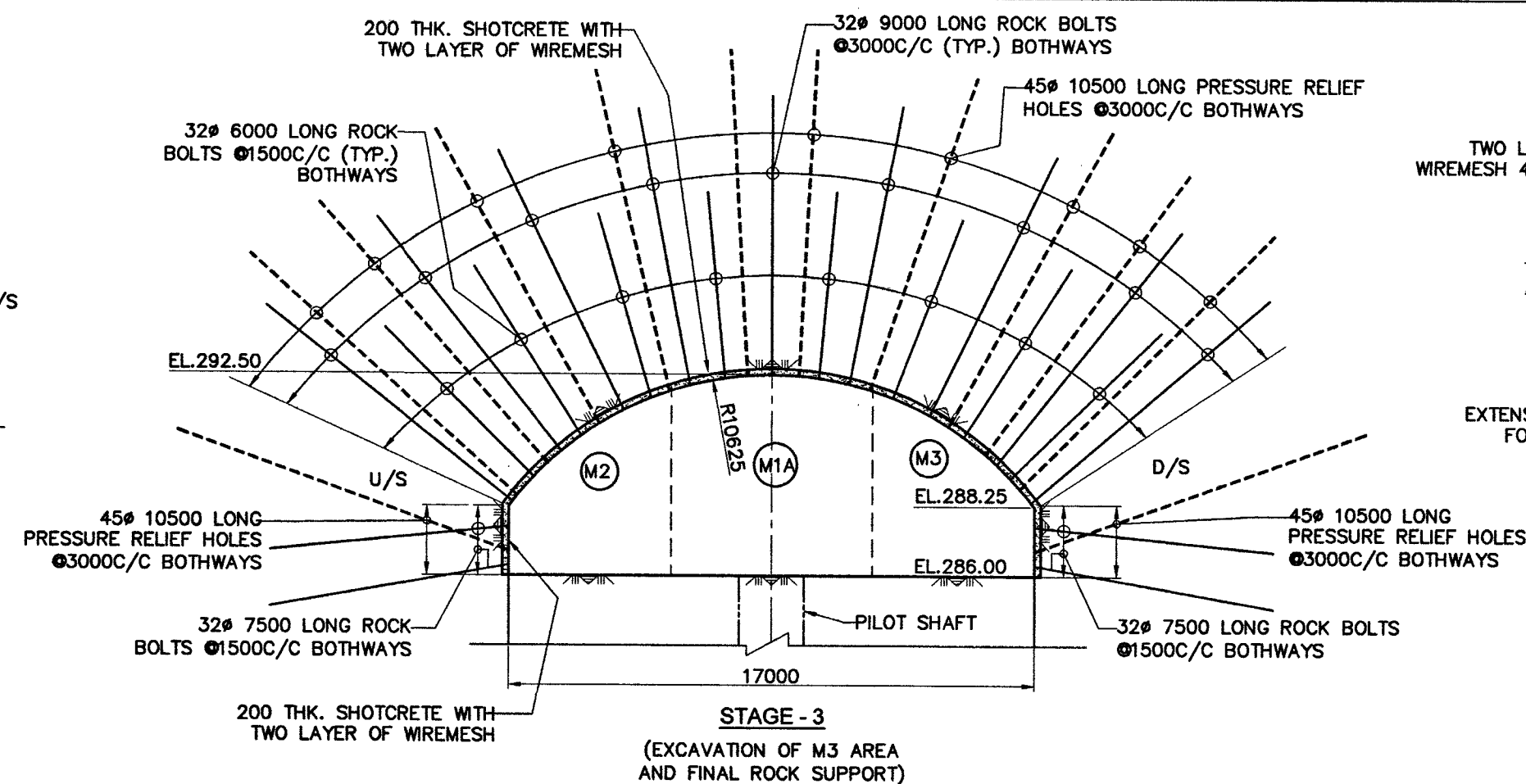
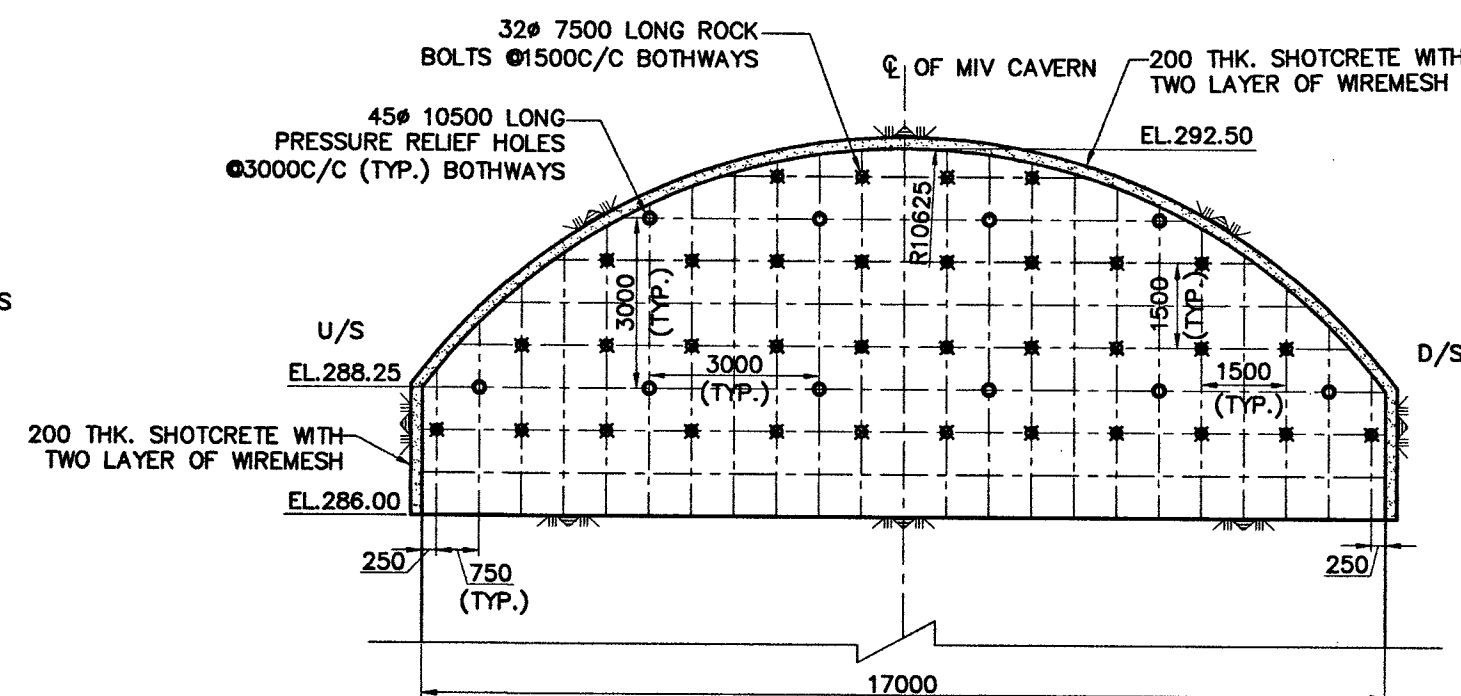
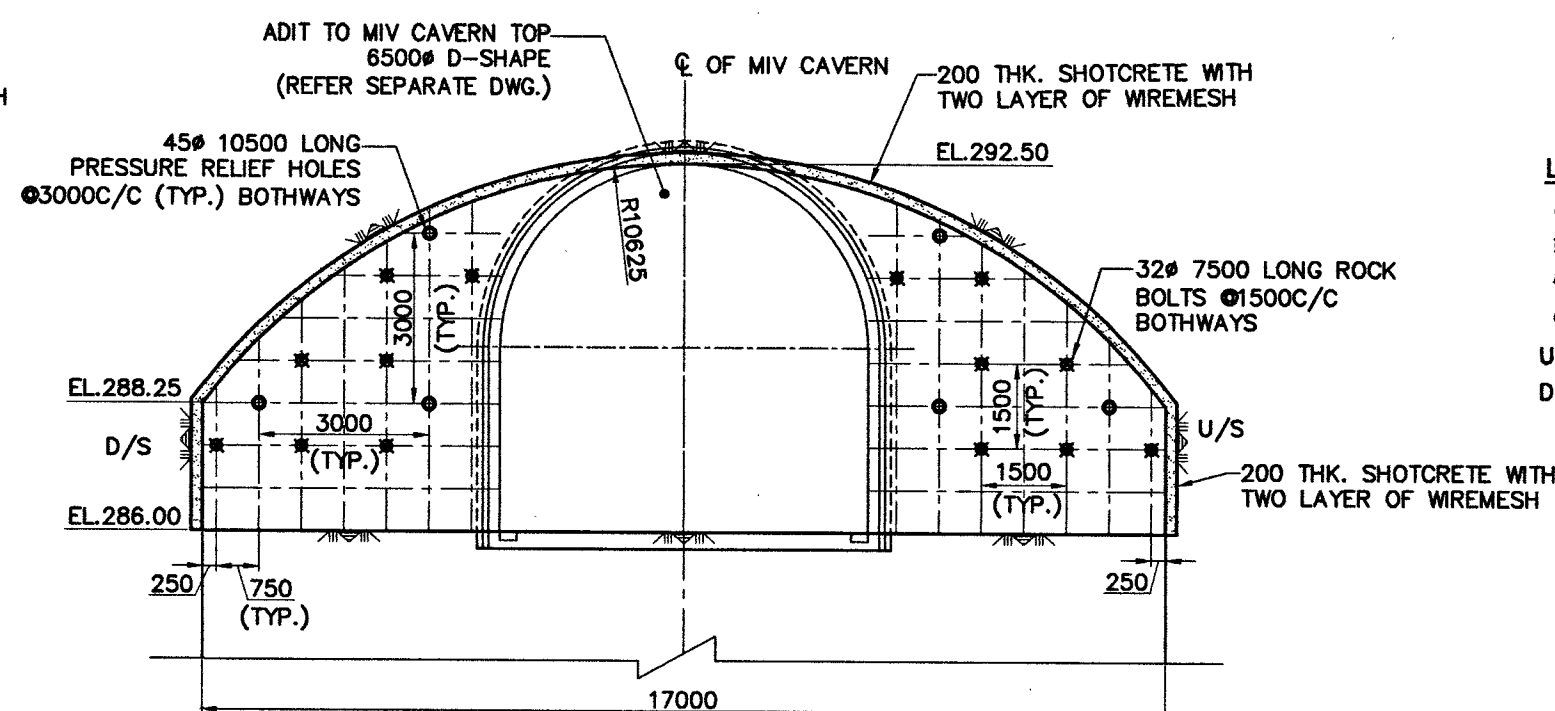
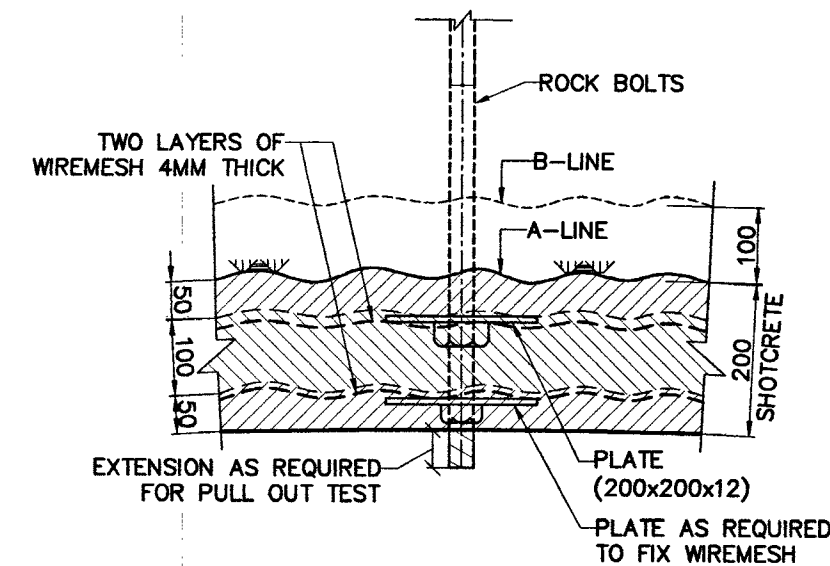
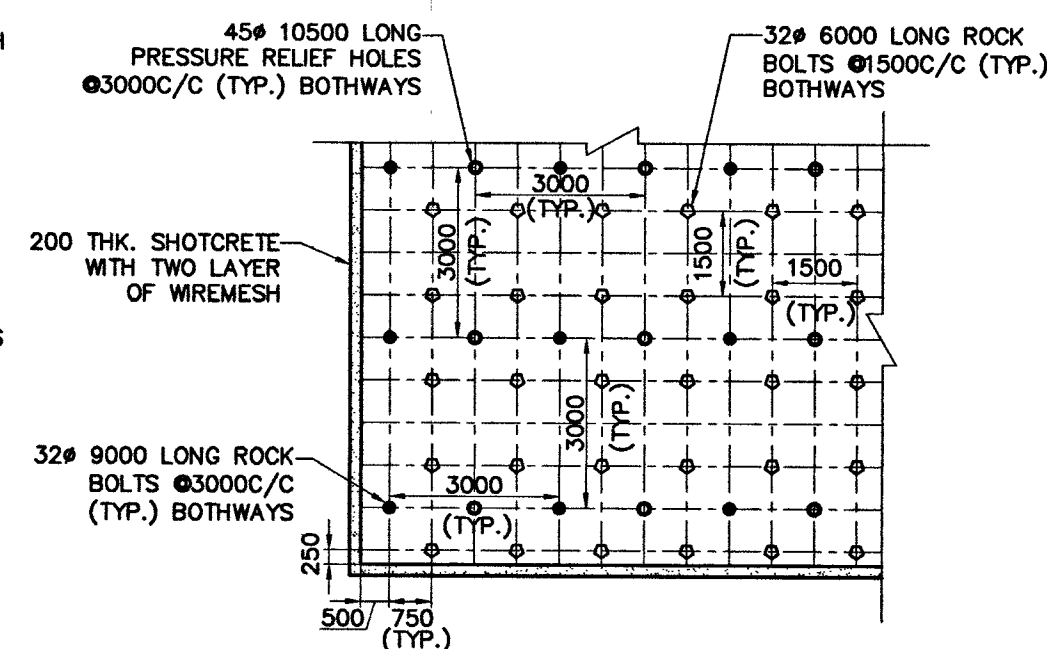


DEFINITION OF EXCAVATION

STAGE-1
[EXCAVATION OF UPPER PILOT TUNNEL (M1A) AND FINAL ROCK SUPPORT]STAGE - 2
(EXCAVATION OF M2 AREA AND FINAL ROCK SUPPORT)STAGE - 3
(EXCAVATION OF M3 AREA AND FINAL ROCK SUPPORT)TYPICAL PATTERN (END WALL - ADIT TO MIV FLOOR SIDE)
(ROCK BOLTS & PRESSURE RELIEF HOLES)
(NTS)TYPICAL PATTERN (END WALL - ADIT TO MIV CAVERN TOP SIDE)
(ROCK BOLTS & PRESSURE RELIEF HOLES)
(NTS)TYP. DETAIL OF ROCK BOLT AND ANCHORAGE
(NTS)
(ARRANGEMENT MAY BE MODIFIED AS PER SITE REQUIREMENT)TYPICAL PATTERN (CROWN)
(ROCK BOLTS & PRESSURE RELIEF HOLES)
(NTS)

LEGENDS:

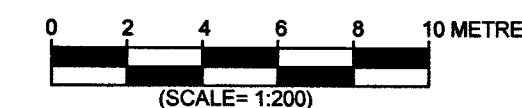
- 32# 9000 LONG ROCK BOLT @3000C/C
 - 32# 7500 LONG ROCK BOLTS @1500C/C
 - 32# 6000 LONG ROCK BOLT @1500C/C
 - 45# 10500 LONG PRESSURE RELIEF HOLES @3000C/C
- U/S UPSTREAM SIDE
D/S DOWNSTREAM SIDE

NOTES:

1. सभी माप मिलीमीटर में तथा ऊंचाई मीटर में दिए गए हैं।
2. ALL DIMENSIONS ARE IN MILLIMETRE AND ELEVATIONS ARE IN METRE.
3. THIS DRAWING IS ISSUED FOR EXCAVATION & ROCK SUPPORT OF MIV CAVERN EXCAVATION FROM EL. 292.50M TO EL. 286.00M.
4. EXCAVATION SHALL BE DONE IN STAGES CONFORMING TO SECTION B.3.8.7 OF TECHNICAL SPECIFICATIONS. BEFORE TAKING UP THE EXCAVATION OF CAVERN, EXCAVATION METHODOLOGY SHALL BE SUBMITTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER-IN-CHARGE.
5. EXCAVATION SEQUENCE MAY MODIFY TO SUIT THE SITE CONDITIONS.
6. THE DEFINITION OF 'A' AND 'B' LINE SHALL BE AS PER SECTION B.3 OF TECHNICAL SPECIFICATIONS.
7. NEXT STAGE EXCAVATION SHALL START ONLY AFTER INSTALLATION OF ROCK SUPPORT & INSTRUMENTS IN THE PREVIOUS STAGE INCLUDING GROUTING OF THE ROCK BOLTS.
8. THIS DRAWING SHOWS FINAL ROCK SUPPORT SYSTEM ONLY. IN ADDITION SOME TEMPORARY SUPPORTS MAY BE REQUIRED DURING EXCAVATION BEFORE INSTALLATION OF THE FINAL SUPPORTS. THE SAME MAY BE INSTALLED DEPENDING UPON SITE CONDITIONS WITH THE APPROVAL OF ENGINEER-IN-CHARGE.
9. THE BENCHING EXCAVATION SHALL IN NO CASE BE MORE THAN 3000 HEIGHT UNLESS IT IS SUPPORTED BY THE PERMANENT SUPPORT SHOWN IN THE DRAWINGS.
10. THE ROCK BOLTS SHOWN IN THE DRAWING SHALL BE CONFORMING TO SECTION B.4 OF TECHNICAL SPECIFICATIONS. THE ROCK BOLTS IN THE CROWN SHALL BE TENSIONED AS PER CLAUSE 4.5.8 OF SECTION B.4 OF TECHNICAL SPECIFICATIONS. MINOR MODIFICATION IN THE LENGTH, ORIENTATION, PATTERN AND LOCATION OF ROCK BOLTS MAY BE DONE TO SUIT THE SITE CONDITIONS WITH THE APPROVAL OF ENGINEER-IN-CHARGE. ADDITIONALLY, IN CASE OF PROMINENT SHEAR ZONES, IF ANY, PRE GROUTING SHALL BE PERFORMED AS PER SITE CONDITION IN CONSULTATION WITH SITE GEOLOGIST AS PER B.4 OF TECHNICAL SPECIFICATION AND AS APPROVED BY ENGINEER-IN-CHARGE.
11. IN CASE OF WEAK ROCK MASS WHERE END ANCHORAGE WITH EXPANSION SHELL ROCK BOLT IS NOT POSSIBLE, RESIN GROUTED ROCK BOLTS SHALL BE PROVIDED IN CONSULTATION WITH SITE GEOLOGIST AS PER DIRECTION OF ENGINEER-IN-CHARGE.
12. THE ROCK BOLTS SHALL BE INSTALLED ONLY ON FINISHED EXCAVATION SURFACES UNLESS AS GOVERNED BY GEOLOGICAL CONDITION AS APPROVED BY ENGINEER-IN-CHARGE.
13. THE CONTRACTOR SHALL EXERCISE ALL PRECAUTIONS TO PREVENT DAMAGE TO ALREADY PLACED SHOTCRETE DURING THE BLASTING FOR THE NEXT PHASE OF EXCAVATION.
14. ATLEAST 50% BOLTS SHALL FORM THE PART OF CYCLE. BALANCE BOLTS CAN BE INSTALLED OUT OF CYCLE BUT BEFORE COMPLETING A PARTICULAR STAGE OF EXCAVATION. THE SPACING BETWEEN THE TWO BOLTS SHALL IN NO CASE EXCEED 3000.
15. INSTALLATION METHODS OF ROCK BOLTS AND SHOTCRETE SHALL BE FULLY OPTIMIZED THROUGH TEST BOLTS IN THE REPRESENTATIVE ROCK, PRIOR TO ACTUAL START OF WORK.
16. PLAIN SHOTCRETE WITH WIREMESH SHOWN IN THE DRAWING SHALL BE APPLIED AS SPECIFIED IN SECTION B.4 & B.5 OF TECHNICAL SPECIFICATIONS. IF REQUIRED, SFR SHOTCRETE CAN BE USED WITH THE APPROVAL OF ENGINEER-IN-CHARGE.
17. 45# 5000 LONG (INTO ROCK) CONSOLIDATION GROUTING @3000 C/C STAGGERED BOTHWAYS SHALL BE PROVIDED IN WEAK ROCK MASS AS DIRECTED BY ENGINEER-IN-CHARGE, AS PER SECTION B.7 OF TECHNICAL SPECIFICATIONS.
18. THE PRESSURE RELIEF HOLES SHOWN IN THE DRAWING SHALL CONFORM TO B.7 OF TECHNICAL SPECIFICATIONS. 36# SLOTTED PVC LINERS IN PRESSURE RELIEF HOLES SHALL BE INSTALLED AS PER THE DIRECTION OF ENGINEER-IN-CHARGE.
19. FOR INSTRUMENTATION REFER SEPARATE DRAWING.
20. FOR DETAILS OF PRESSURE RELIEF HOLES ARRANGEMENTS REFER SEPARATE DRAWING.
21. FOR ROCK SUPPORT OF SUSPENDED CEILING, REFER SEPARATE DRAWING.

REFERENCE DRAWINGS:

1. NHDB-4AC4-41-DD-0001
2. NHDB-4FC4-41-DD-1001



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दिवांग बहुउद्देशीय परियोजना DIBANG MULTIPURPOSE PROJECT	
MIV CAVERN EXCAVATION AND ROCK SUPPORTS FROM EL. 292.50 M TO EL. 286.00 M	
30.06.2025	TYP. DETAIL OF ROCK BOLT AND ANCHORAGE UPDATED.
07.03.2025	ISSUED FOR CONSTRUCTION
DATE	NO.
REVISION OR ISSUES	BY. CH. APP.
DESIGN MEMO NO.	DRG. NO.
डिजाइन मेमो नंबर	ड्राइंग नंबर
DRAWN	Sd./
SUBMITTED	Sd./
RECOMMENDED	Sd./
DESIGN	Sd./
APPROVED	Sd./
DATE	DRG. NO.
MAR 2025	NHDB 4FC4 41 DD 1002 01