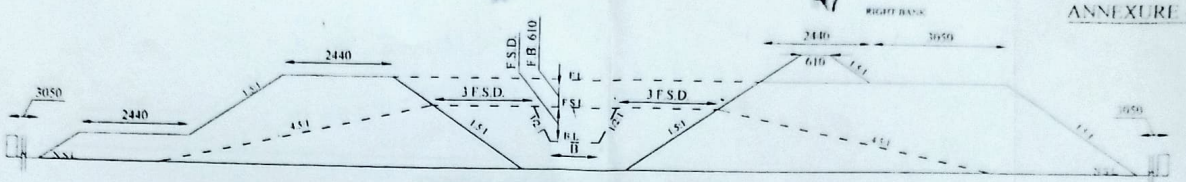
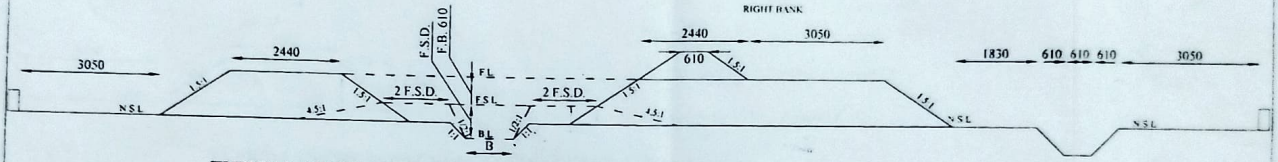
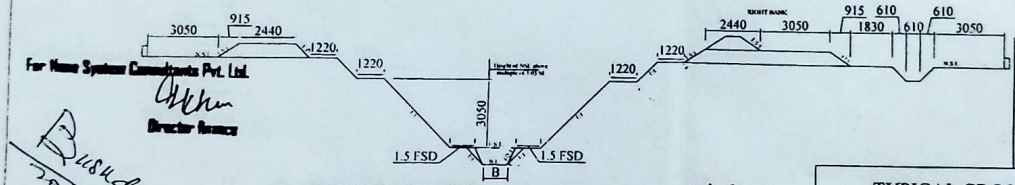
ANNEXURE - 4



TYPICAL CROSS SECTION IN FILLING
(MINIMUM VERTICAL COVER OVER H.G. LINE SHOULD BE 0.61 M)
SCALE 1:100



TYPICAL CROSS SECTION IN PARTIAL FILLING & CUTTING
(MINIMUM VERTICAL COVER OVER H.G. LINE SHOULD BE 0.61 M)
SCALE 1:100



TYPICAL CROSS SECTION IN CUTTING
SCALE 1:200

For Nano System Consultants Pvt. Ltd.
Director Finance

Legend

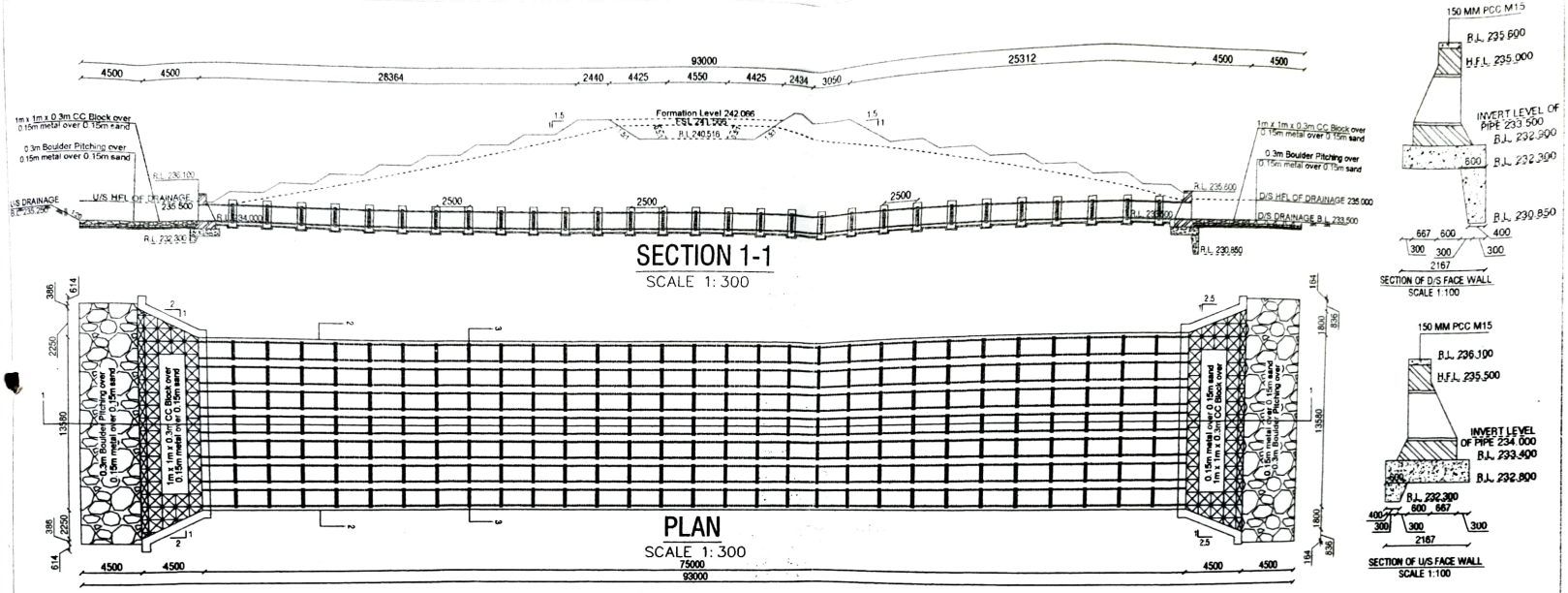
S.No	Particulars	
1.	BED WIDTH	B
2.	F.S.D.	F.S.D
3.	F.B.	F.B

TYPICAL CROSS SECTION OF CANAL

PREPARED BY NANO SYSTEM CONSULTANTS PVT. LTD. RANCHI

J.E. A.E. E.E. अधीक्षण अभियंता, सिंचाई प्रमंडल, देवघर

18/03/2026 J.E
18/03/2026 J.E
18/03/2026 J.E
18/03/26 EE
24/03/26 SE
24/03/26 J.E
24/03/26 J.E
29/03/26
24/03/26 E.E
26/03/26 A.E
26.3.2026
26/3/26



NOTES: -

1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METER.
2. ALL PCC WORK WILL BE DONE IN M-15 OR AS MENSIONED IN THE DRAWING.
3. FOUNDATION WILL NOT BE DONE ON FILLED UP EARTH.
4. THE JOINTS OF PIPES WILL BE DONE AS PER SPECIFICATION AND AS PER DRAWING.
5. BACK FILLING BEHIND WING WALL/RETURN WALL WILL BE DONE WITH COURSE PERVIOUS SOIL FOR AVOIDING ANY BUILT UP WATER PRESSURE.
6. WEEP HOLES OF 75mm Ø WILL BE PROVIDED BELOW 1.0M FROM TOP OF EARTH FILLING TO 1.0M ABOVE BED LEVEL @ 1.5M CC STAGGERED WITH 600 x 600 x 600mm INVERTED FILTER AT BACK OF WEEP HOLE.
7. RRM WILL BE DONE IN CM (1:4). THE BOULDER SHOULD BE AS PER SPECIFICATION REGARDING SIZE AND QUALITY OF BOULDER.
8. RUBBER SEAL WILL BE PROVIDED AT JOINTS OF WING WALL AND FACE WALL.

NOTES :-

1. BEARING PRESSURE OF SOIL HAS TO BE TESTED BEFORE EXECUTION
2. THE DESIGN IS BASED ON SAFE BEARING PRESSURE OF 15 T/SQM
3. R.R.M IN FACE WALL SHOULD BE DONE IN (1:4) UPTO H.F.L AND (1:6) ABOVE H.F.L
4. ONLY FIGURED DIMENSION SHOULD FOLLOWED
5. ALL DIMENSION ARE IN M.K.S UNIT

PREPARED BY WAPCOS SYSTEM
CONSULTANCY DIVISION-III

SHEET NO 1/1

DESIGN DATA

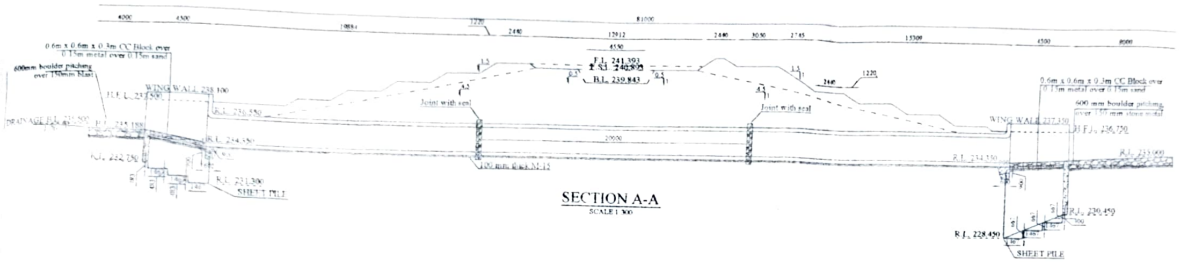
	CANAL	
1.	FULL SUPPLY DISCHARGE	3.153 Cumecs
2.	BED WIDTH	4.550 M
3.	FULL SUPPLY DEPTH	1.050 M
4.	BED LEVEL	240.516 M
5.	BED SLOPE	1:4000
6.	F.S.L.	241.566 M
7.	TOP OF BANK LEVEL	242.066 M
8.	RUGOSITY COEFFICIENT	0.025
	DRAINAGE	
1.	CATCHMENT AREA	97.95 Ha
2.	SILT FACTOR	1.00
3.	WEIGHT OF P.C.C.	2.20 T/Cum
4.	DIA OF HUME PIPE	1.20 M
5.	TOE TO TOE DISTANCE BETWEEN OUTER SLOPE OF BANKS	84.044 M

GOVERNMENT OF JHARKHAND

PUNASI RESERVOIR SCHEME

CROSS DRAINAGE WORK AT 935.00 M OF GURUKUL BRANCH CANAL

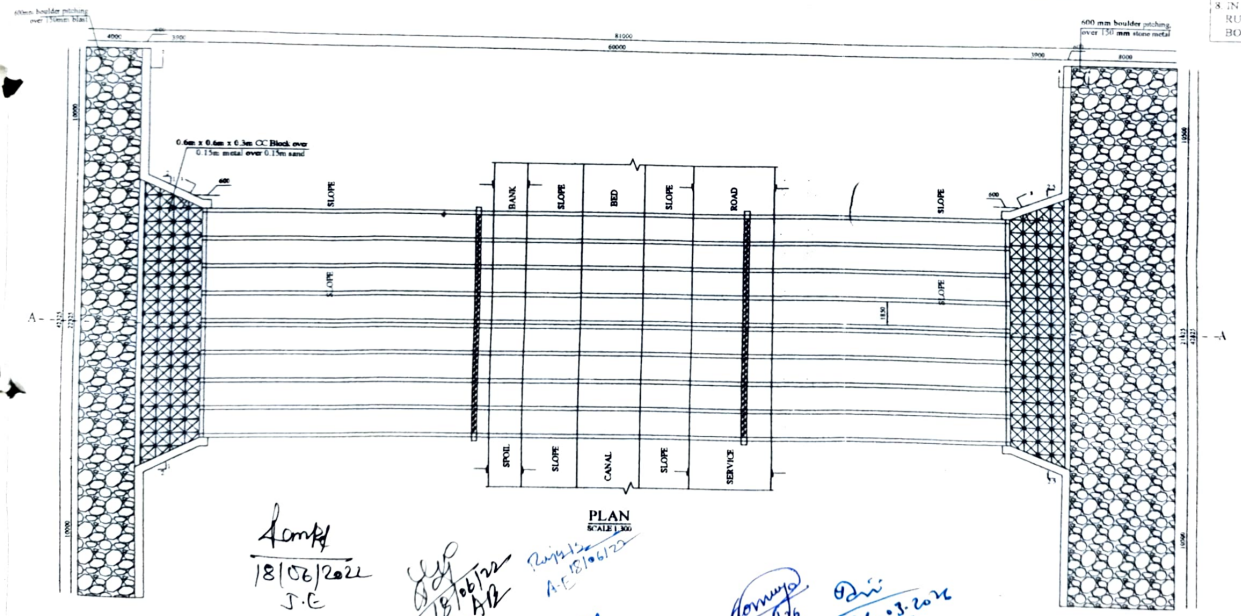
Designed by



SECTION A-A
SCALE 1:100

NOTES :-

1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METER
2. REINFORCEMENT SHOULD BE OF HIGH YIELD STRENGTH DEFORMED BARS CONFORMING TO IS : 1786 - 1985 (Fe-415)
3. WHEREVER JOINTS IS PROVIDED IN THE REINFORCEMENT, PROPER LAP LENGTH SHOULD BE 50 TIMES THE DIA OF THE LARGER BAR. THE JOINTS IN THE REINFORCEMENT SHOULD BE SUITABLY STAGGERED
4. CLEAR COVER OF NOT BELOW 50mm WILL BE PROVIDED IN BARREL AND 50mm FOR ABUTMENT AND PIERS
5. CONCRETE OF GRADE M-20 WILL BE PROVIDED IN ALL R.C.C. WORK. THE ROAD SLAB WILL BE OF M-25 GRADE
6. BACK FILLING WILL BE DONE WITH COARSE PERVIOUS SOIL FOR PROPER DRAINAGE
7. WEEP HOLES OF 75mm Ø WILL BE PROVIDED BELOW 1M FROM JOB OF EARTH FILLING TO 1M ABOVE BED LEVEL IN WING WALL, CENTER FOR ABUTMENT AND WING WALL @ 1.5M C/C STAGGERED WITH 600 x 600 x 600mm INVERTED FILTER AT BACK OF WEEP HOLE
8. IN EXPANSION/CONTRACTION JOINTS APPROVED SEALS OF RUBBER WILL BE PROVIDED WITH PROPER EMBEDMENT BOTH SIDE IN CONCRETE



PLAN
SCALE 1:100

DESIGN DATA (CANAL)		
1	Bed Width	4.550 M
2	Full Supply Depth	1.050 M
3	Free Board	0.500 M
4	Bed Level	239.843 M
5	Side slope of canal	1:1.5
6	N.S.L	235.188 M
7	Service Road Width	3.05 M
8	Spoil Bank Width	2.44 M
9	F.S.Q in Cumecs	3.153
10	Bed Slope	1 in 4000
11	F.S.L	240.893 M
12	Service Road Level	241.393 M

DESIGN DATA (DRAIN)		
1	Discharge in Cumecs	79.064
2	Barrel Size	2x1.90x1.85m
3	Catchment Area	841.67 Hac

GOVERNMENT OF JHARKHAND
PUNASI RESERVOIR SCHEME
C.D. WORK (BARREL) AT 3630.00 M OF GURUKUL BRANCH CANAL

Designed By
R.R. Sinha

18/06/2022
J.E

18/06/22
A.E

24/03/26
J.E

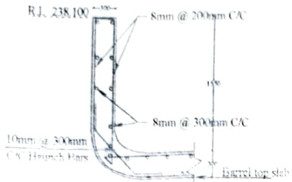
24/3/22
कार्यपालक अभियंता
सचल प्रमंडल सं-4, देवघर

AE 26/3/26

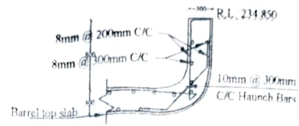
22.03.2022
JE

24/3/22

SHEET NO 12



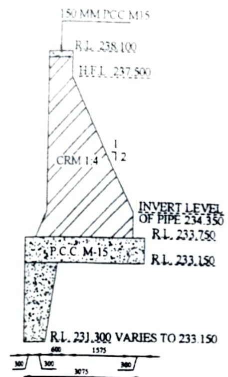
DETAILS OF REIN. IN VERTICAL WALL OVER BARREL IN U/S
SCALE 1:50



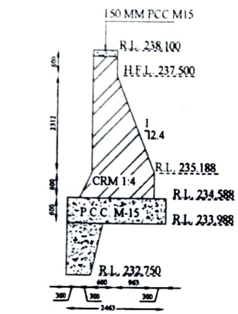
DETAILS OF REIN. IN VERTICAL WALL OVER BARREL IN D/S
SCALE 1:50

NOTES :-

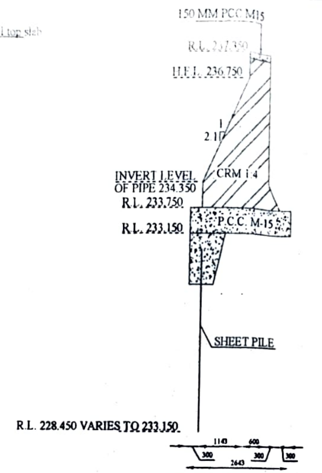
1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METER
2. REINFORCEMENT SHOULD BE OF HIGH YIELD STRENGTH DEFORMED BARS CONFORMING TO IS : 1786 - 1985 (Fe-415)
3. WHEREVER JOINTS IS PROVIDED IN THE REINFORCEMENT, PROPER LAP LENGTH SHOULD BE 50 TIMES THE DIA OF THE LARGER BAR. THE JOINTS IN THE REINFORCEMENT SHOULD BE SUITABLY STAGGERED
4. CLEAR COVER OF NOT BELOW 30mm WILL BE PROVIDED ... BARREL AND 50mm FOR ABUTMENT AND PIERS
5. CONCRETE OF GRADE M-20 WILL BE PROVIDED ... WORK. THE ROAD SLAB WILL BE OF M-25 GRADE
6. THE BACK FILLING WILL BE DONE WITH ... SOIL FOR PROPER DRAINAGE
7. WEEP HOLES OF 75mm Ø WILL BE PROVIDED ... JOB OF EARTH FILLING TO 1M ABOVE BED LEVEL IN WING WALL/ENTER FOR ABUTMENT AND WING WALL @ 1.5M C/C STAGGERED WITH 600 x 600 x 600mm INVERTED FILTER AT BACK OF WEEP HOLE.
8. IN EXPANSION/CONTRACTION JOINTS APPROVED SEALS OF RUBBER WILL BE PROVIDED WITH PROPER EMBEDMENT BOTH SIDE IN CONCRETE.



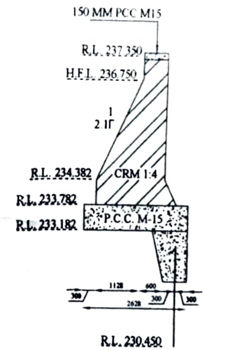
SECTION 1-1 OF U/S WING WALL
SCALE 1:100



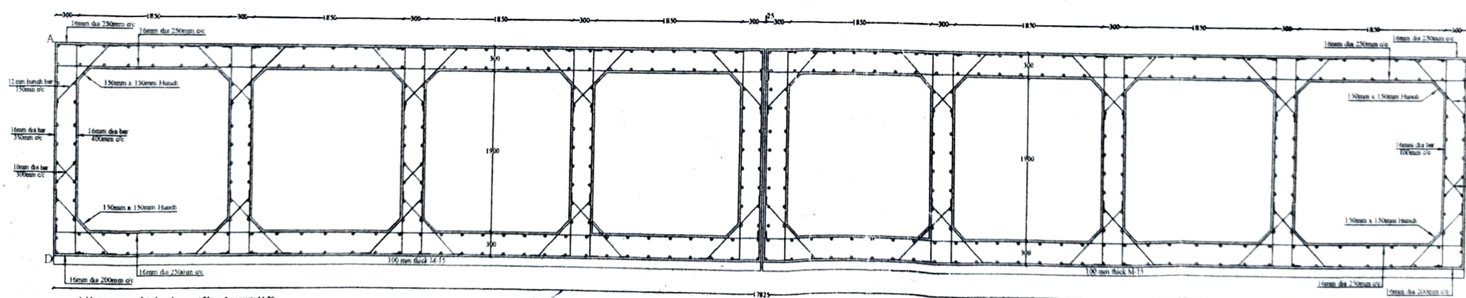
SECTION 2-2 OF U/S RETURN WALL
SCALE 1:100



SECTION 3-3 OF D/S WING WALL
SCALE 1:100



SECTION 4-4 OF D/S RETURN WALL
SCALE 1:100

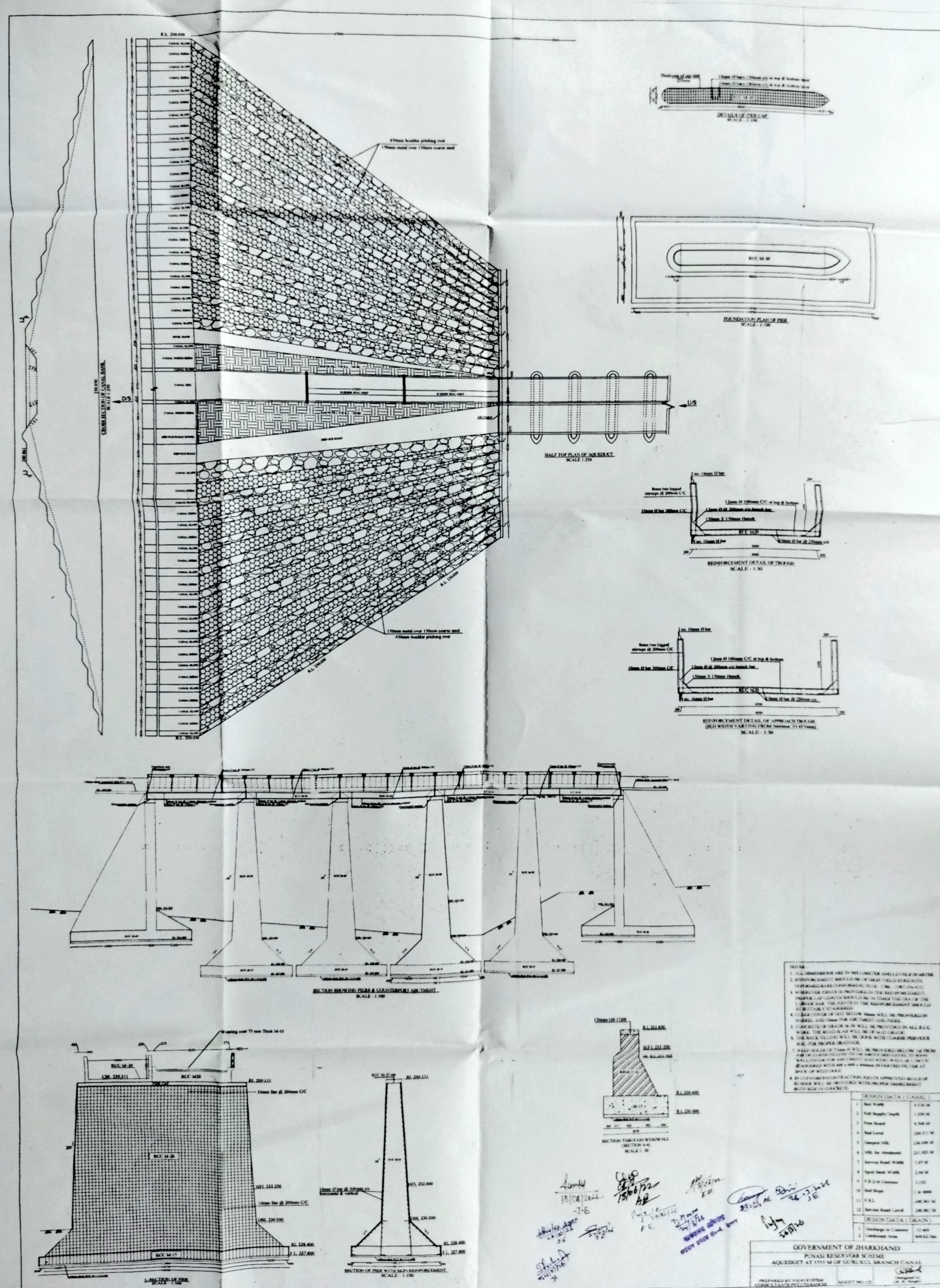


REINFORCEMENT DETAILS OF BARREL
SCALE 1:50

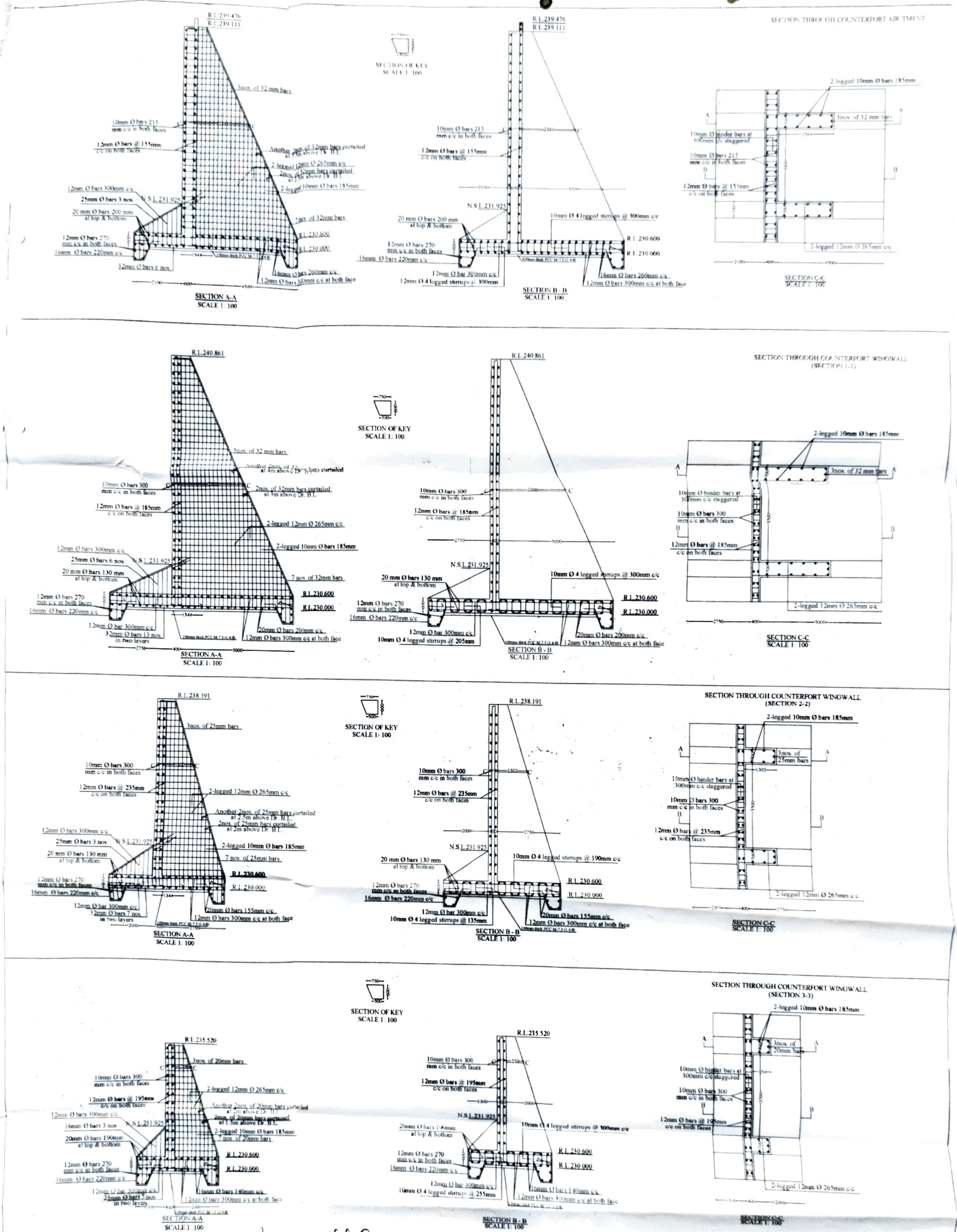
GOVERNMENT OF JHARKHAND
PUNASI RESERVOIR SCHEME
C.D. WORK (BARREL) AT 3630.00 M OF GURUKUL BRANCH CANAL

SHEET NO 2/2

कार्यपालक अभियंता
रुपांकण प्रमंडल सं०-4, देवघर



DETAILS OF PIER CAP
FOUNDATION PLAN OF PIER
HALF TOP PLAN OF AQUEDUCT
SCALE 1:250
CROSS SECTION OF CANAL BANK
D/S
U/S
REINFORCEMENT DETAIL OF TROUGH
SCALE - 1:50
REINFORCEMENT DETAIL OF APPROACH TROUGH
SCALE - 1:50
SECTION SHOWING PIERS & COUNTERFORT ABUTMENT
SCALE - 1:100
SECTION THROUGH WINGWALL
SCALE 1:30
L-SECTION OF PIER
SECTION OF PIER WITH SKIN REINFORCEMENT
SCALE - 1:100
BCC M-20
RCC M-20
DESIGN DATA (CANAL)
DESIGN DATA (DRAIN)
GOVERNMENT OF JHARKHAND
PUNASI RESERVOIR SCHEME
AQUEDUCT AT 5755 M OF GURUKUL BRANCH CANAL


SECTION THROUGH COUNTERFORT ABUTMENT
SECTION OF KEY
SCALE 1: 100
R.L.239.476
R.L.239.111
3nos. of 32 mm bars
10mm Ø bars 215 mm c/c in both faces
12mm Ø bars @ 155mm c/c on both faces
2-legged 10mm Ø bars 185mm
N.S.L.231.925
R.L.230.600
R.L.230.000
SECTION A-A
SCALE 1: 100
SECTION B - B
SCALE 1: 100
SECTION C-C
SCALE 1: 100
SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 1-1)
R.L.240.861
3nos. of 32 mm bars
2-legged 12mm Ø 265mm c/c
2-legged 10mm Ø bars 185mm
7 nos. of 32mm bars
10mm Ø 4 legged stirrups @ 300mm c/c
SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 2-2)
R.L.238.191
3nos. of 25mm bars
2-legged 12mm Ø 265mm c/c
10mm Ø 4 legged stirrups @ 190mm c/c
SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 3-3)
R.L.235.520
3nos. of 20mm bars
2-legged 10mm Ø bars 185mm
10mm Ø 4 legged stirrups @ 300mm c/c

GOVERNMENT OF JHARKHAND

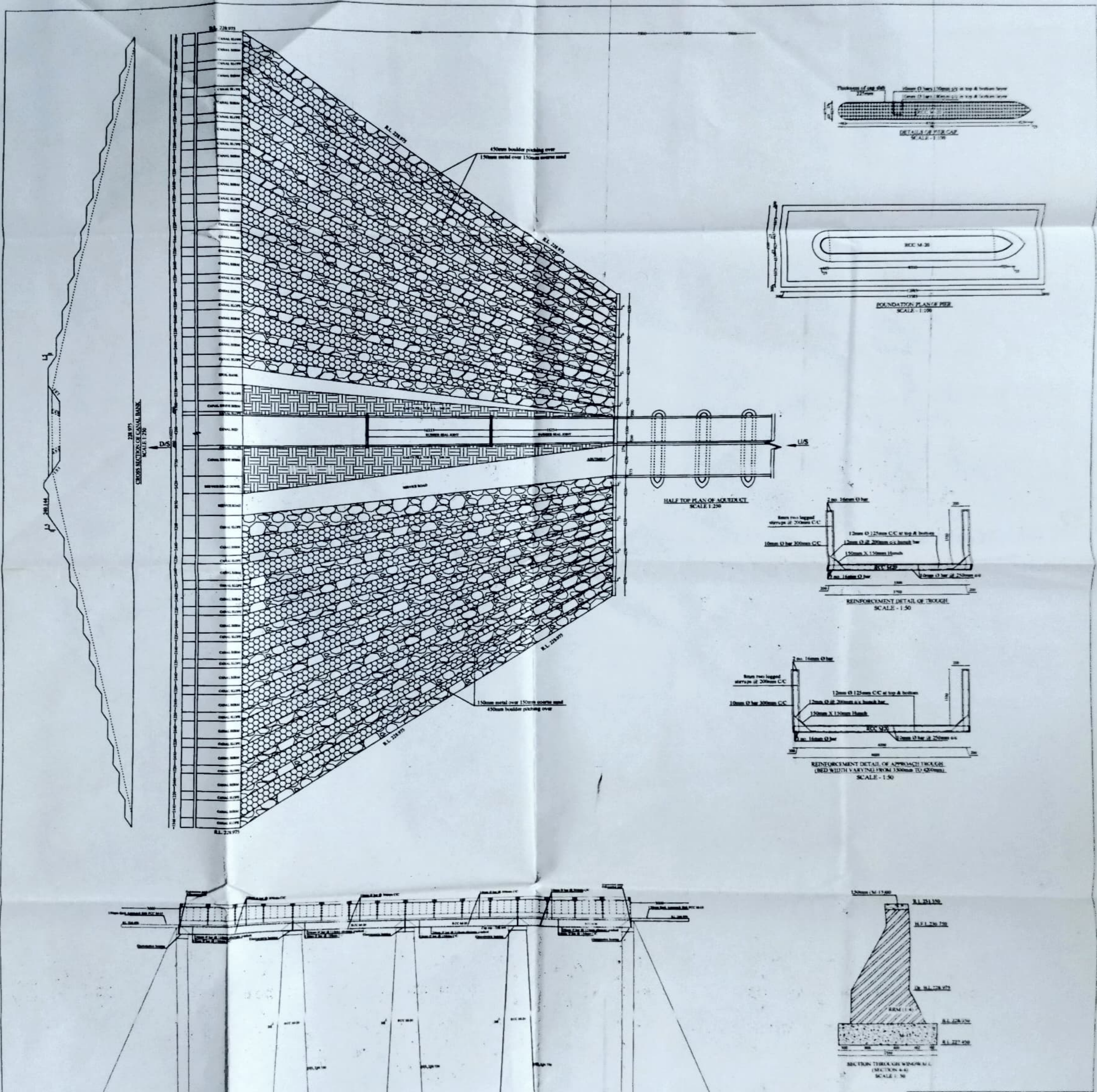
PUNASI RESERVOIR SCHEME

AQUEDUCT AT 5755 M OF GURUKUL BRANCH CANAL

PREPARED BY NANO SYSTEM CONSULTANTS PVT LTD RANCHI

SHEET NO 2/2

Designed by (R. R. Singh)


CROSS SECTION OF CANAL BANK
SCALE 1:250
HALF TOP PLAN OF AQUEDUCT
SCALE 1:250
D/S
U/S
450mm boulder pitching over 150mm metal over 150mm coarse sand
150mm metal over 150mm coarse sand 450mm boulder pitching over
R.L. 228.975
DETAILS OF PIER CAP
SCALE - 1:100
FOUNDATION PLAN OF PIER
SCALE - 1:100
RCC M-20
REINFORCEMENT DETAIL OF TROUGH
SCALE - 1:50
REINFORCEMENT DETAIL OF APPROACH TROUGH (BED WIDTH VARYING FROM 1300mm TO 4200mm)
SCALE - 1:50
12mm Ø 125mm C/C at top & bottom
150mm X 150mm Haunch
SECTION SHOWING PIERS & COUNTERFORT ABUTMENT
SCALE - 1:100
SECTION THROUGH WING WALL (SECTION 4-4)
SCALE 1:50
RRM (1:4)
SECTION OF PIER
SCALE - 1:100
SECTION OF PIER WITH SKIN REINFORCEMENT
SCALE - 1:100
RCC M-20
10mm bar @ 200mm C/C
R.L. 228.444

NOTES :-

1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METER.
2. REINFORCEMENT SHOULD BE OF HIGH YIELD STRENGTH DEFORMED BARS CONFORMING TO IS : 1786 - 1985 (Fe-415).
3. WHEREVER JOINTS IS PROVIDED IN THE REINFORCEMENT, PROPER LAP LENGTH SHOULD BE 50 TIMES THE DIA OF THE LARGER BAR. THE JOINTS IN THE REINFORCEMENT SHOULD BE SUITABLY STAGGERED.
4. CLEAR COVER OF NOT BELOW 30mm WILL BE PROVIDED IN BARREL AND 50mm FOR ABUTMENT AND PIERS.
5. CONCRETE OF GRADE M-20 WILL BE PROVIDED IN ALL R.C.C. WORK. THE ROAD SLAB WILL BE OF M-25 GRADE.
6. THE BACK FILLING WILL BE DONE WITH COARSE PERVIOUS SOIL FOR PROPER DRAINAGE.
7. WEEP HOLES OF 75mm Ø WILL BE PROVIDED BELOW 1M FROM TOP OF EARTH FILLING TO 1M ABOVE BED LEVEL IN WING WALL, RETURN FOR ABUTMENT AND WING WALL ... BACK OF WEEP HOLE.
8. IN EXPANSION/CONTRACTION JOINTS APPROVED SEALS OF RUBBER WILL BE PROVIDED WITH PROPER EMBEDMENT WITH SIDE IN CONCRETE.

DESIGN DATA (CANAL)		
1	Bed Width	4.200 M
2	Full Supply Depth	1.000 M
3	Free Board	0.300 M
4	Bed Level	228.444 M
5	Designed NSL	228.975 M
6	NSL for Abutment	228.975 M
7	Service Road Width	3.05 M
8	Spoil Bank Width	2.44 M
9	F.S.Q in Cumecs	2.678
10	Bed Slope	1 in 4000
11	F.S.L.	229.444 M
12	Service Road Level	230.144 M

DESIGN DATA (DRAIN)		
1	Discharge in Cumecs	28.70
2	Catchment Area	217.95 Ha.

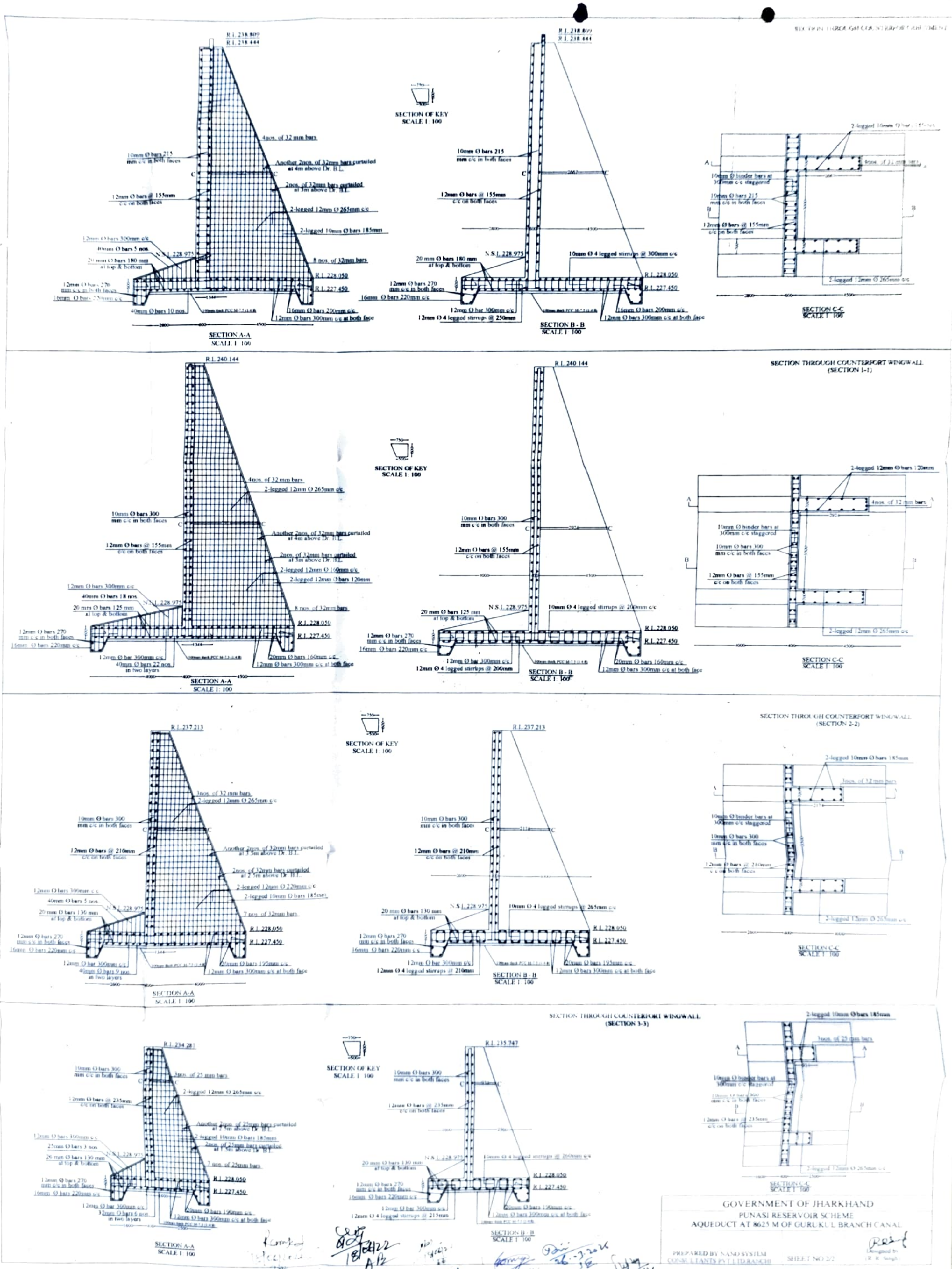
GOVERNMENT OF JHARKHAND

PUNASI RESERVOIR SCHEME

AQUEDUCT AT 8625 M OF GURUKUL BRANCH CANAL

PREPARED BY NAND SYSTEM CONSULTANTS PVT.LTD.RANCHI	SHEET NO.1/2	Designed by (R. K. Singh)

205


R.L. 238.809
R.L. 238.444
SECTION OF KEY
SCALE 1 : 100
4nos. of 32 mm bars
10mm Ø bars 215 mm c/c in both faces
Another 2nos. of 32mm bars curtailed at 4m above Dr. B.L.
2nos. of 32mm bars curtailed at 3m above Dr. B.L.
12mm Ø bars @ 155mm c/c on both faces
2-legged 12mm Ø 265mm c/c
2-legged 10mm Ø bars 185mm
12mm Ø bars 300mm c/c
40mm Ø bars 5 nos.
N.S.L 228.975
20 mm Ø bars 180 mm at top & bottom
8 nos. of 32mm bars
R.L 228.050
R.L 227.450
12mm Ø bars 270 mm c/c in both faces
16mm Ø bars 220mm c/c
40mm Ø bars 10 nos.
16mm Ø bars 200mm c/c
12mm Ø bars 300mm c/c at both face
SECTION A-A
SCALE 1 : 100
10mm Ø 4 legged stirrups @ 300mm c/c
12mm Ø bar 300mm c/c
12mm Ø 4 legged stirrups @ 250mm
SECTION B - B
SCALE 1 : 100
SECTION C-C
SCALE 1 : 100
10mm Ø binder bars at 300mm c/c staggered
R.L. 240.144
SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 1-1)
10mm Ø bars 300 mm c/c in both faces
2-legged 12mm Ø 265mm c/c
2-legged 12mm Ø 160mm c/c
2-legged 12mm Ø bars 120mm
40mm Ø bars 18 nos
20 mm Ø bars 125 mm at top & bottom
20mm Ø bars 160mm c/c
40mm Ø bars 22 nos in two layers
10mm Ø 4 legged stirrups @ 200mm c/c
12mm Ø 4 legged stirrups @ 200mm
R.L. 237.213
SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 2-2)
3nos. of 32 mm bars
12mm Ø bars @ 210mm c/c on both faces
Another 2nos. of 32mm bars curtailed at 3.5m above Dr. B.L.
2nos. of 32mm bars curtailed at 2.5m above Dr. B.L.
2-legged 12mm Ø 220mm c/c
7 nos. of 32mm bars
20 mm Ø bars 130 mm at top & bottom
20mm Ø bars 195mm c/c
40mm Ø bars 9 nos. in two layers
10mm Ø 4 legged stirrups @ 265mm c/c
12mm Ø 4 legged stirrups @ 210mm
SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 3-3)
R.L. 234.281
R.L. 235.747
3nos. of 25 mm bars
12mm Ø bars @ 235mm c/c on both faces
Another 2nos. of 25mm bars curtailed at 2.5m above Dr. B.L.
2nos. of 25mm bars curtailed at 1.5m above Dr. B.L.
25mm Ø bars 3 nos.
7 nos. of 25mm bars
32mm Ø bars 6 nos. in two layers
10mm Ø 4 legged stirrups @ 260mm c/c
12mm Ø 4 legged stirrups @ 215mm

GOVERNMENT OF JHARKHAND

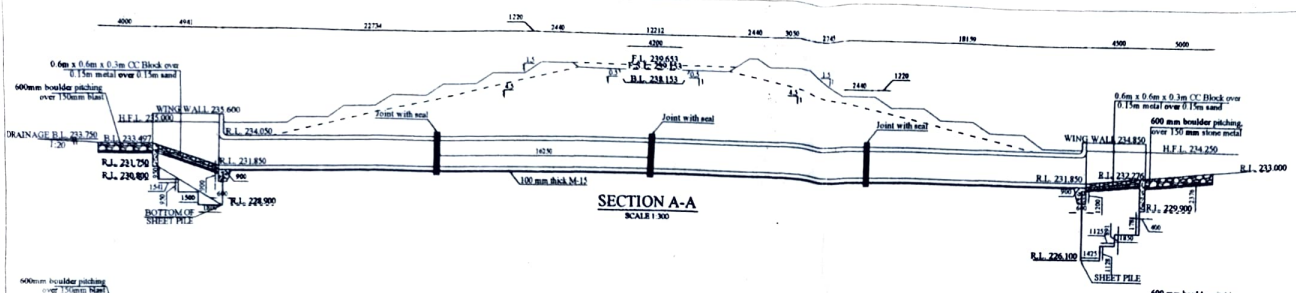
PUNASI RESERVOIR SCHEME

AQUEDUCT AT 8625 M OF GURUKUL BRANCH CANAL

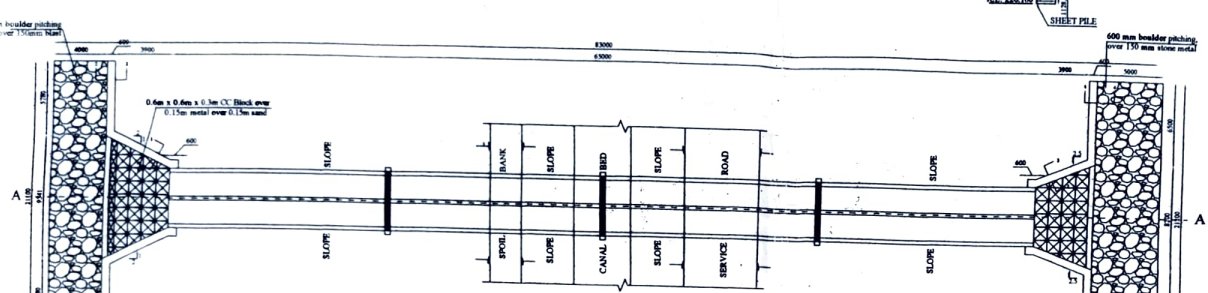
PREPARED BY NANO SYSTEM CONSULTANTS PVT LTD RANCHI

SHEET NO 2/2

Designed by R. K. Singh



SECTION A-A
SCALE 1:300

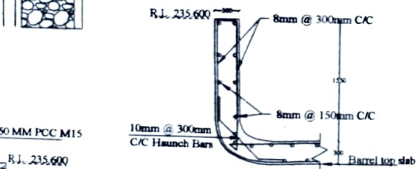


PLAN
SCALE 1:300

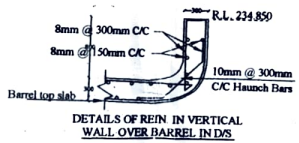
DESIGN DATA (CANAL)		
1	Bed Width	4.200 M
2	Full Supply Depth	1.000 M
3	Free Board	0.500 M
4	Bed Level	238.153 M
5	Side slope of canal	1:1.5
6	N.S.L	233.497 M
7	Service Road Width	3.05 M
8	Spoil Bank Width	2.44 M
9	F.S.Q in Cumecs	2.678
10	Bed Slope	1 in 4000
11	F.S.L	239.153 M
12	Service Road Level	239.653 M

DESIGN DATA (DRAIN)		
1	Discharge in Cumecs	19.313
2	Barrel Size	2x1.90x1.85m
3	Catchment Area	115.78 Hac

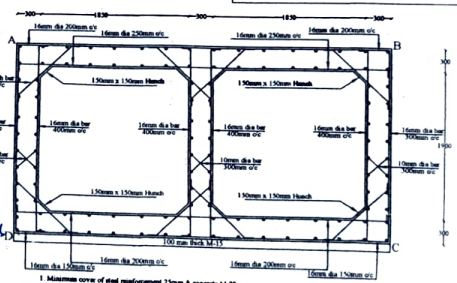
NOTES :-
1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METER.
2. REINFORCEMENT SHOULD BE OF HIGH YIELD STRENGTH DEFORMED BARS CONFORMING TO IS : 1786 - 1985 (Fe-415).
3. WHEREVER JOINTS IS PROVIDED IN THE REINFORCEMENT, PROPER LAP LENGTH SHOULD BE 50 TIMES THE DIA OF THE LARGER BAR. THE JOINTS IN THE REINFORCEMENT SHOULD BE SUITABLY STAGGERED.
4. CLEAR COVER OF NOT BELOW 30mm WILL BE PROVIDED IN BARREL AND 50mm FOR ABUTMENT AND PIERS.
5. CONCRETE OF GRADE M-20 WILL BE PROVIDED IN ALL R.C.C. WORK. THE ROAD SLAB WILL BE OF M-25 GRADE.
6. THE BACK FILLING WILL BE DONE WITH COARSE PERVIOUS SOIL FOR PROPER DRAINAGE.
7. WEEP HOLES OF 75mm Ø WILL BE PROVIDED BELOW 1M FROM JOB OF EARTH FILLING TO 1M ABOVE BED LEVEL IN WING WALL/ENTER FOR ABUTMENT AND WING WALL @ 1.5M C/C STAGGERED WITH 600 x 600 x 600mm INVERTED FILTER AT BACK OF WEEP HOLE.
8. IN EXPANSION/CONTRACTION JOINTS APPROVED SEALS OF RUBBER WILL BE PROVIDED WITH PROPER EMBEDMENT BOTH SIDE IN CONCRETE.



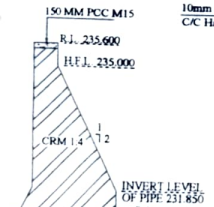
DETAILS OF REIN IN VERTICAL WALL OVER BARREL IN U/S
SCALE 1:50



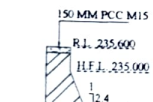
DETAILS OF REIN IN VERTICAL WALL OVER BARREL IN D/S
SCALE 1:50



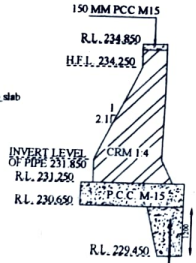
REINFORCEMENT DETAILS OF BARREL
SCALE 1:50



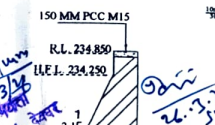
SECTION 1-1 OF U/S WING WALL
SCALE 1:100



SECTION 2-2 OF U/S RETURN WALL
SCALE 1:100



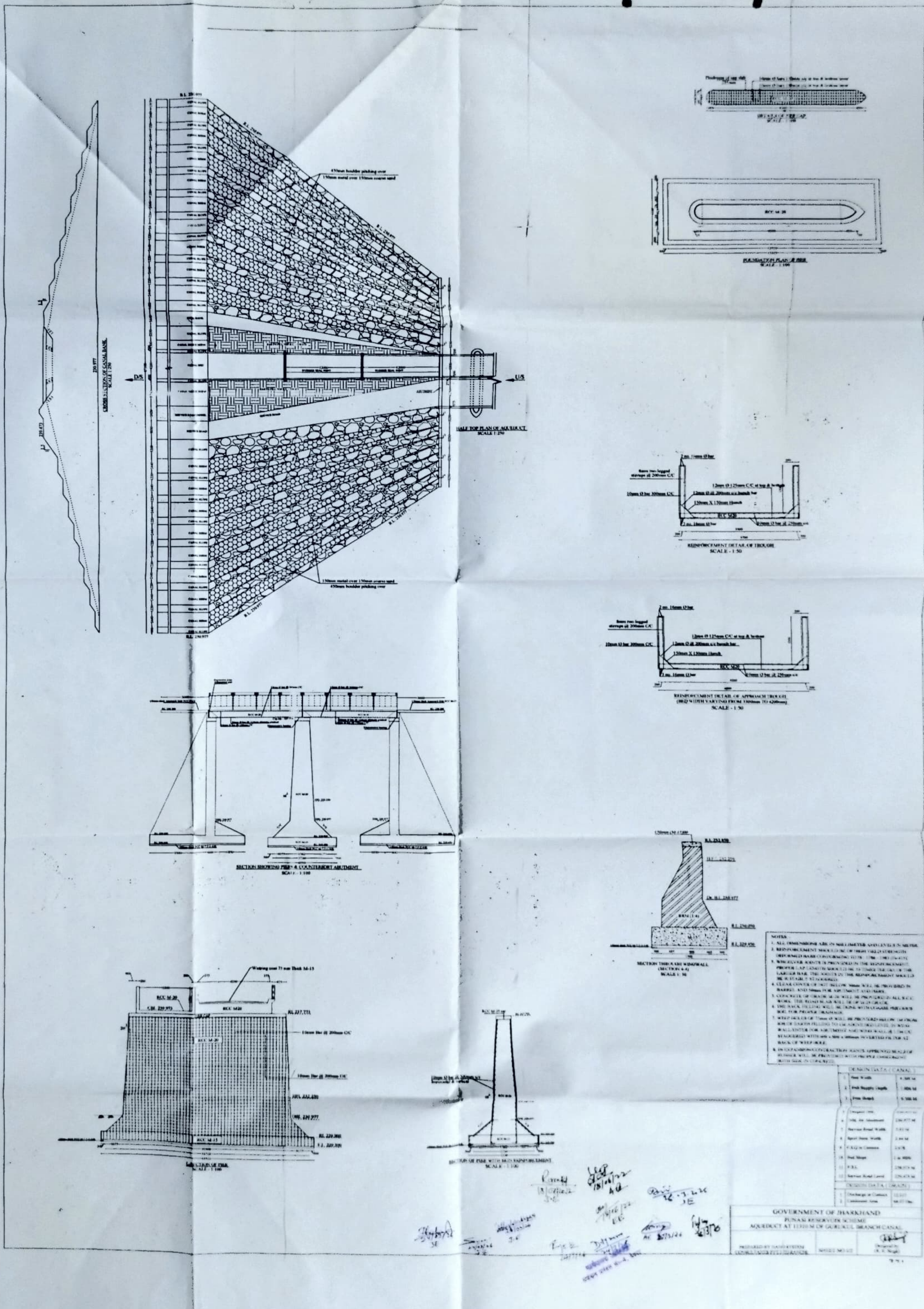
SECTION 3-3 OF D/S WING WALL
SCALE 1:100



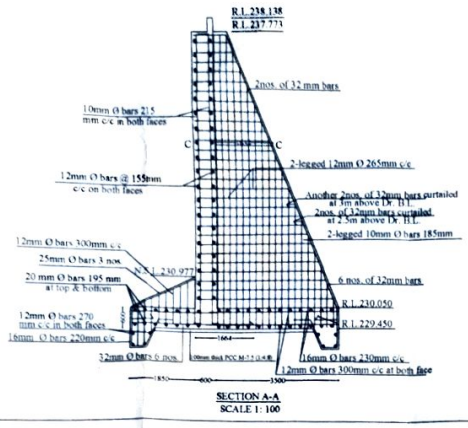
SECTION 4-4 OF D/S RETURN WALL
SCALE 1:100

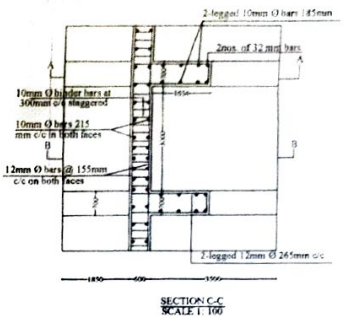
GOVERNMENT OF JHARKHAND
PUNASI RESERVOIR SCHEME
C.D. WORK (BARREL) AT 10590.00 M OF GURUKUL BRANCH CANAL

PREPARED BY: NANO SYSTEM CONSULTANTS (P) LTD., RANCHI
SHEET NO. 1.1

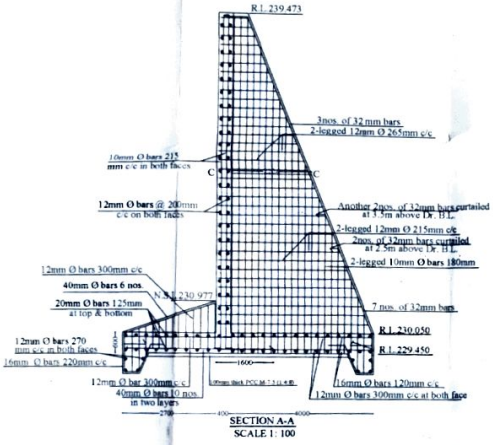

CROSS SECTION OF CANAL BANK
D/S
U/S
HALF TOP PLAN OF AQUEDUCT
SCALE 1:250
FOUNDATION PLAN OF PIER
SCALE : 1:100
REINFORCEMENT DETAIL OF TROUGH
SCALE - 1:50
REINFORCEMENT DETAIL OF APPROACH TROUGH
SCALE - 1:50
SECTION SHOWING PIERS & COUNTERFORT ABUTMENT
SECTION THROUGH WINGWALL
RCC M-20
NOTES
DESIGN DATA (CANAL)
DESIGN DATA (DRAIN)
GOVERNMENT OF JHARKHAND

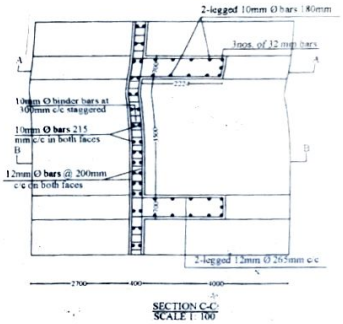
SECTION THROUGH COUNTERFORT ABUTMENT



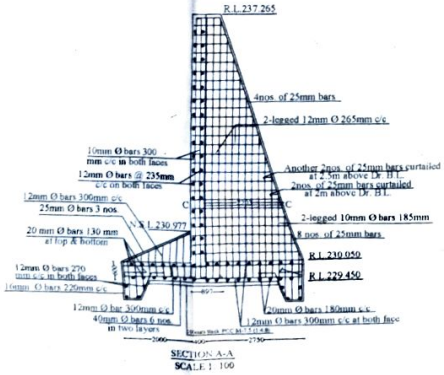


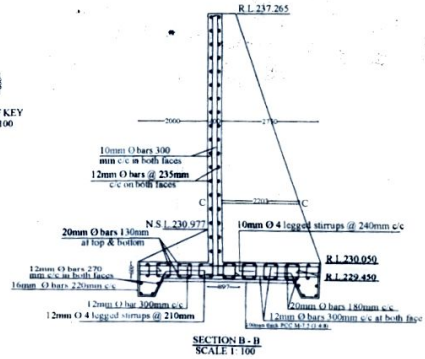
SECTION THROUGH COUNTERFORT WINGWALL (SECTION 1-1)

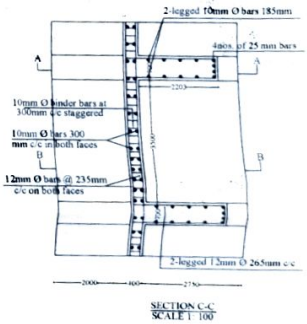




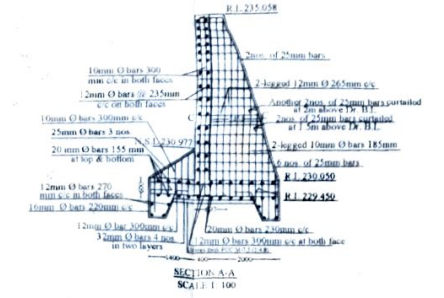
SECTION THROUGH COUNTERFORT WINGWALL (SECTION 2-2)

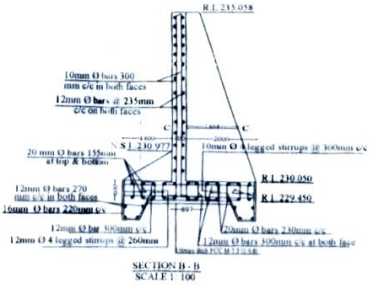


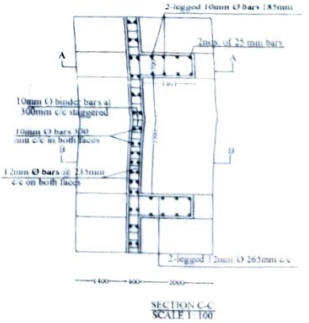




SECTION THROUGH COUNTERFORT WINGWALL (SECTION 3-3)



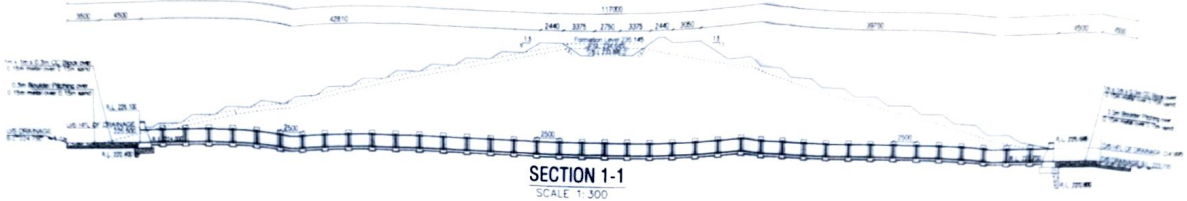




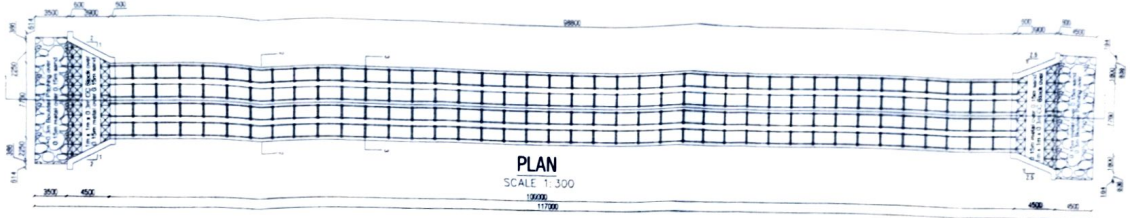
GOVERNMENT OF JHARKHAND
PUNASI RESERVOIR SCHEME
AQUEDUCT AT 11310 M OF GURUKUL BRANCH CANAL

PREPARED BY NANO SYSTEM CONSULTANTS PVT LTD RANCHI | SHEET NO 2/2 | Designed by (R. R. Singh)

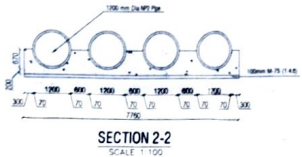
कार्यपालक अभियंता
कार्यपालक प्रमंडल सं०-4, देवघर



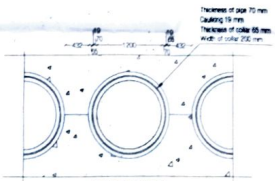
SECTION 1-1
SCALE 1:300



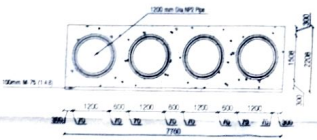
PLAN
SCALE 1:300



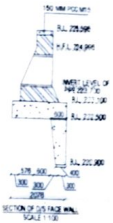
SECTION 2-2
SCALE 1:100

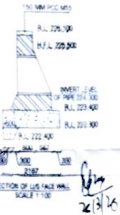


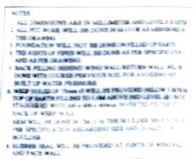
SECTION 3-3
SCALE 1:50



SECTION THROUGH JOINT
SECTION 3-3
SCALE 1:100







DESIGN DATA

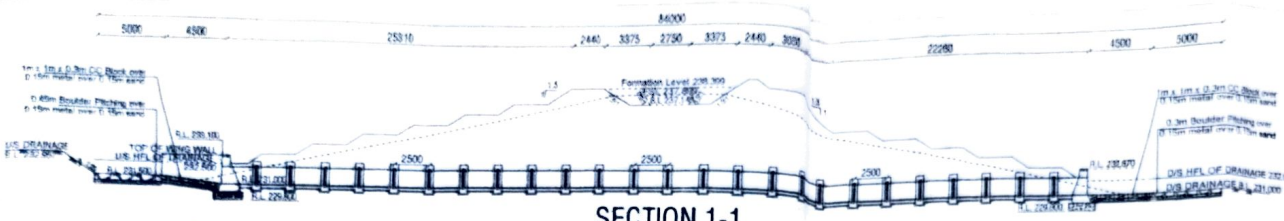
1	CANAL	
2	FULL SUPPLY DISCHARGE	
3	BED WIDTH	
4	FULL SUPPLY DEPTH	
5	BED LEVEL	
6	BED SLOPE	
7	F.S.L.	
8	TOP OF BANK LEVEL	
9	RUGOSITY COEFFICIENT	
	DRAINAGE	
1	CATCHMENT AREA	
2	SILT FACTOR	
3	WEIGHT OF P.C.C.	
4	DIA OF HUME PIPE	
5	SIDE TO TOE DISTANCE OF TAPERED OUTER SLOPE OF BARREL	

NOTES :
1. BEARING PRESSURE OF SOIL MUST BE TESTED BEFORE EXECUTION
2. THE DESIGN IS BASED ON SAFE BEARING PRESSURE OF
3. R.B.M IN FACE WALL SHOULD BE ONLY IN
AND IT IS ABOVE H.F.L.
4. ONLY FIGURED DIMENSION SHOULD FOLLOWED
5. ALL DIMENSION ARE IN MILS UNLESS

GOVERNMENT OF JHARKHAND
PUNASI RESERVOIR SCHEME
CROSS DRAINAGE WORK AT 19620.00 M OF GURUKUL BRANCH CANAL

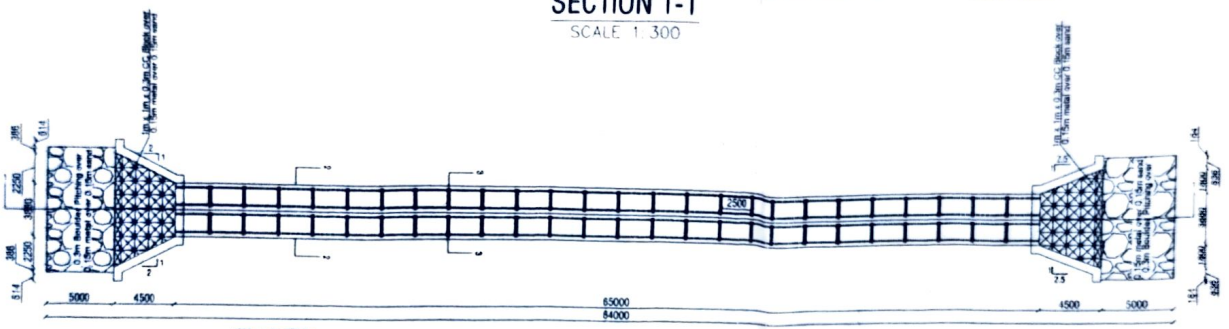
PREPARED BY MANO SYSTEM
CONSULTANTS PVT. LTD. RANCHI

SHEET NO. 1.1



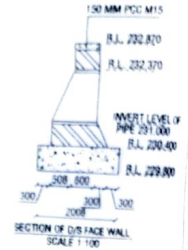
SECTION 1-1

SCALE 1:300



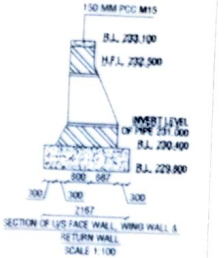
PLAN

SCALE 1:300



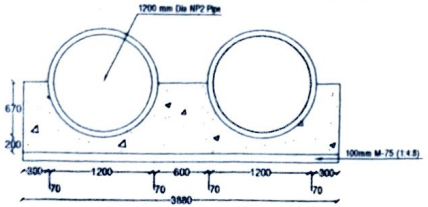
SECTION OF D/S FACE WALL

SCALE 1:100



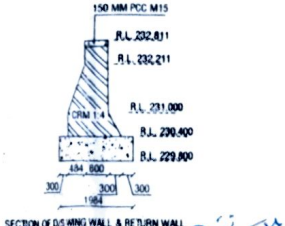
SECTION OF U/S FACE WALL, WING WALL & RETURN WALL

SCALE 1:100



SECTION 2-2

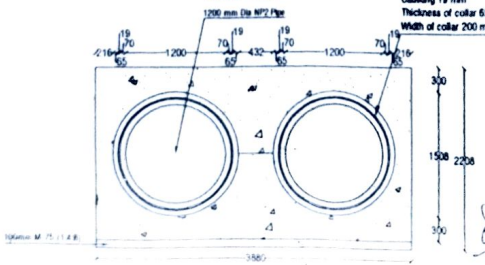
SCALE 1:50



SECTION OF D/S WING WALL & RETURN WALL

SCALE 1:100

Thickness of pipe 70 mm
Caulking 19 mm
Thickness of collar 65 mm
Width of collar 200 mm



SECTION THROUGH JOINT

SECTION 3-3

DESIGN DATA		
	CANAL	
1.	FULL SUPPLY DISCHARGE	1.078 Cumecs
2.	BED WIDTH	2.750 M
3.	FULL SUPPLY DEPTH	0.750 M
4.	BED LEVEL	237.149 M
5.	BED SLOPE	1:4000
6.	F.S.L.	237.899 M
7.	TOP OF BANK LEVEL	238.399 M
8.	RUGOSITY COEFFICIENT	0.025
	DRAINAGE	
1.	CATCHMENT AREA	13.61 Ha
2.	SILT FACTER	1.00
3.	WEIGHT OF P.C.C.	2.20 T/Cum
4.	DIA OF HUME PIPE	1.20 M
5.	TOE TO TOE DISTANCE BETWEEN OUTER SLOPE OF BANKS	14.141 M

NOTES :-

1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METER.
2. ALL PCC WORK WILL BE DONE IN M-15 OR AS MENSIONED IN THE DRAWING.
3. FOUNDATION WILL NOT BE DONE ON FILLED UP EARTH.
4. THE JOINTS OF PIPES WILL BE DONE AS PER SPECIFICATION AND AS PER DRAWING.
5. BACK FILLING BEHIND WING WALL, RETURN WALL WILL BE DONE WITH COURSE PERVIOUS SOIL FOR AVOIDING ANY BUILT UP WATER PRESSURE.
6. WEEP HOLES OF 75mm Ø WILL BE PROVIDED BELOW 1.0M FROM TOP OF EARTH FILLING TO 1.0M ABOVE BED LEVEL @ 1.5M C/C STAGGERED WITH 600 x 600 x 600mm INVERTED FILTER AT BACK OF WEEP HOLE.
7. RRM WILL BE DONE IN CM (1:4). THE BOULDER SHOULD BE AS PER SPECIFICATION REGARDING SIZE AND QUALITY OF BOULDER.
8. RUBBER SEAL WILL BE PROVIDED AT JOINTS OF WING WALL AND FACE WALL.

NOTES :-

1. BEARING PRESSURE OF SOIL MUST BE TESTED BEFORE EXECUTION. THE DESIGN IS BASED ON SAFE BEARING PRESSURE OF 15 T/SQM.
2. [illegible] FACE WALL SHOULD BE DONE IN [illegible] ABOVE H.F.L.
3. ONLY FIGURED DIMENSION SHOULD BE FOLLOWED.
4. ALL DIMENSION ARE IN M.K.S UNIT.

GOVERNMENT OF JHARKHAND

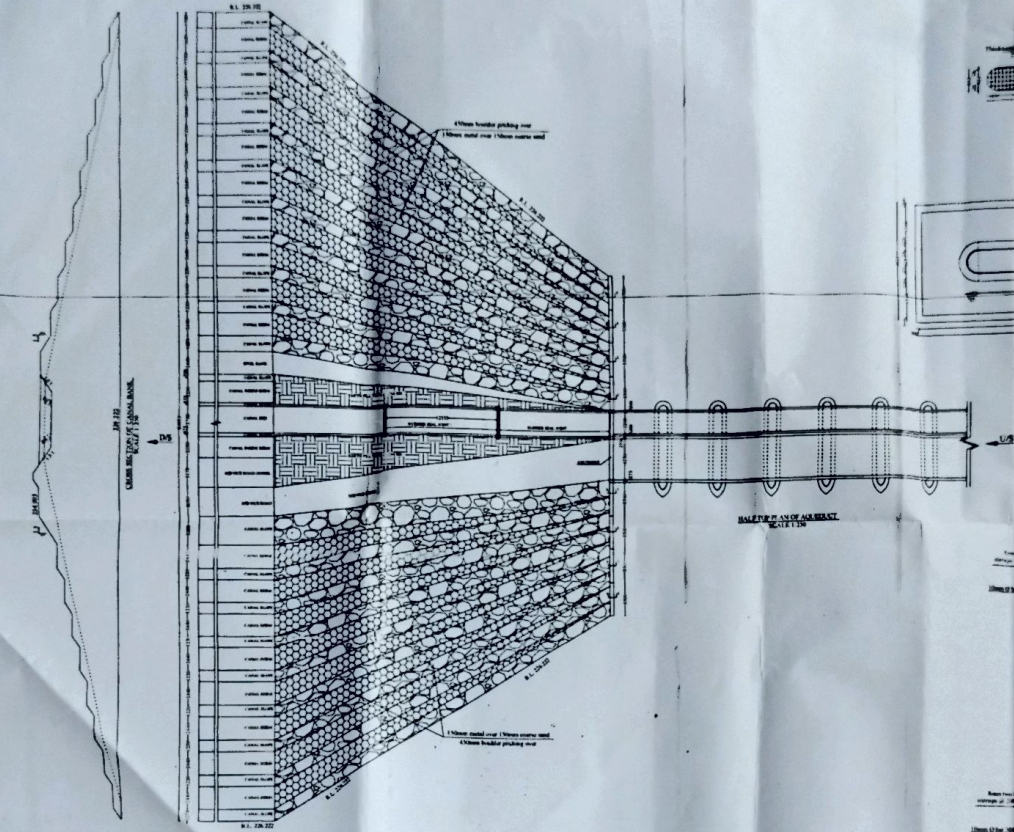
PUNASI RESERVOIR SCHEME

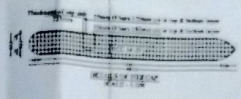
CROSS DRAINAGE WORK AT 15605.00 M OF GURUKUL BRANCH CANAL

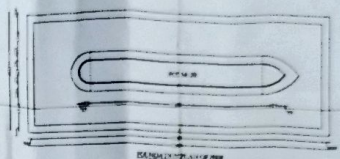
PREPARED BY NANO SYSTEM CONSULTANTS PVT. LTD. RANCHI

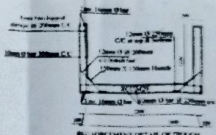
SHEET NO. :-

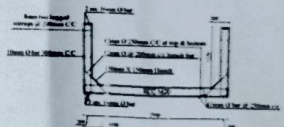
Designed by

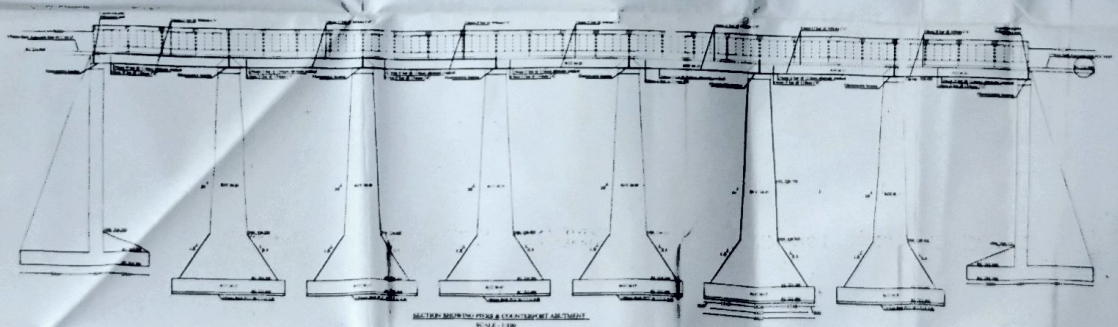


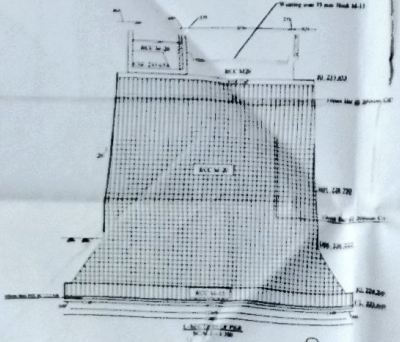


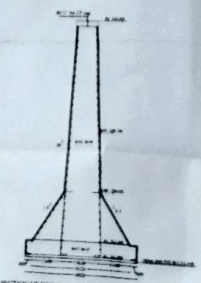


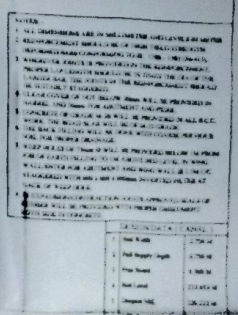




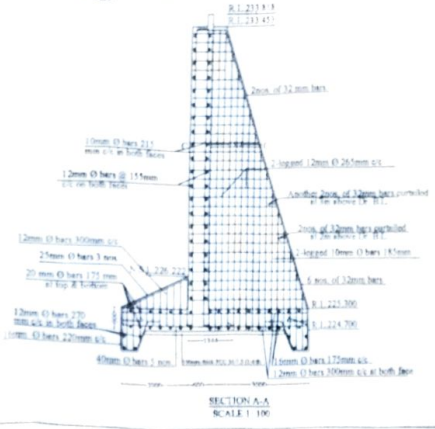




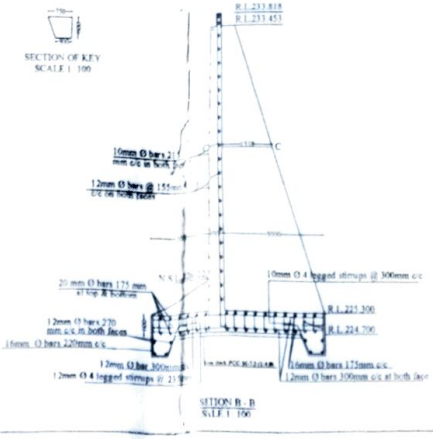




GOVERNMENT OF JHARKHAND
PUBLIC HEALTH ENGINEERING
AQUEDUCT AT 27500 M OF GUMLA RTL BRANCH CANAL

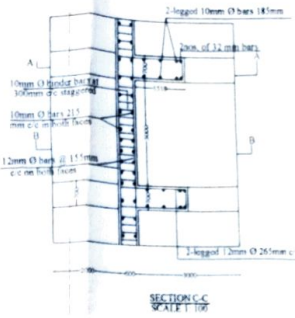


SECTION A-A
SCALE 1 : 100



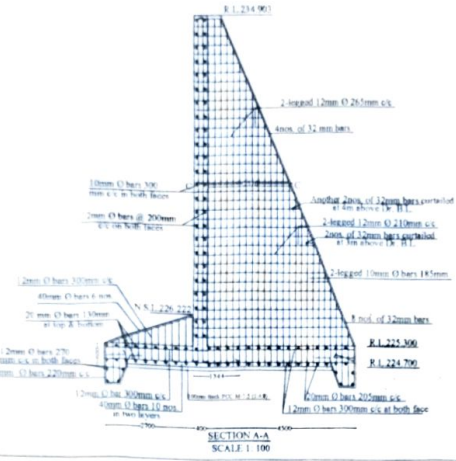
SETTION B - B
SCALE 1 : 100

SECTION THROUGH COUNTERFORT ABUTMENT

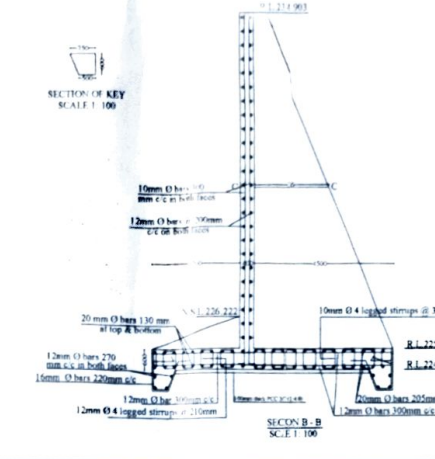


SECTION C-C
SCALE 1 : 100

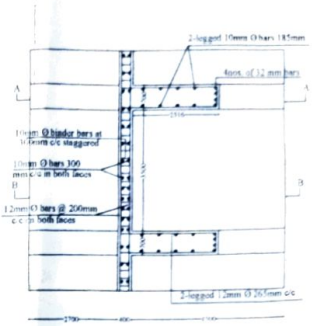
SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 1-1)



SECTION A-A
SCALE 1 : 100

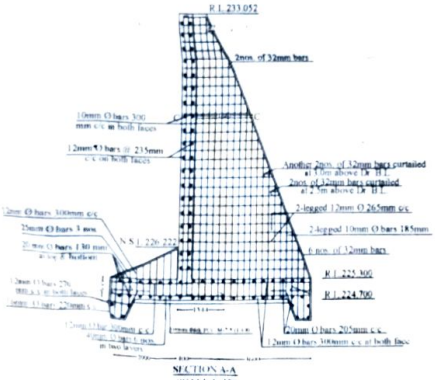


SECON B - B
SCALE 1 : 100

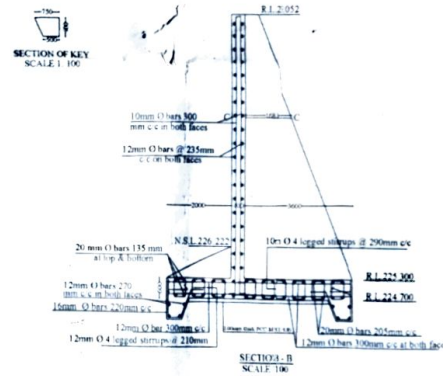


SECTION C-C
SCALE 1 : 100

SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 2-2)

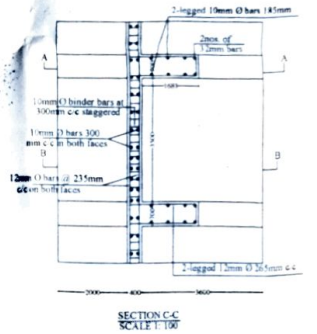


SECTION A-A
SCALE 1 : 100



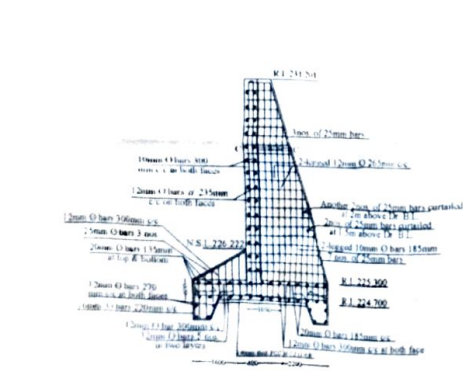
SECTION B - B
SCALE 100

SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 2-2)

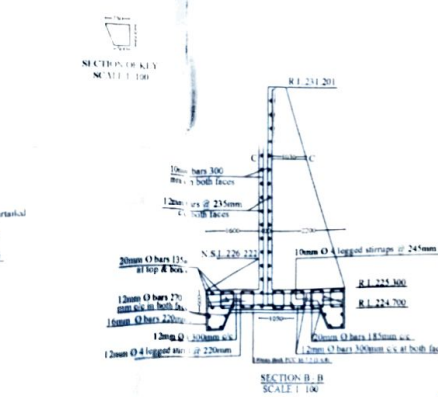


SECTION C-C
SCALE 1 : 100

SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 3-3)

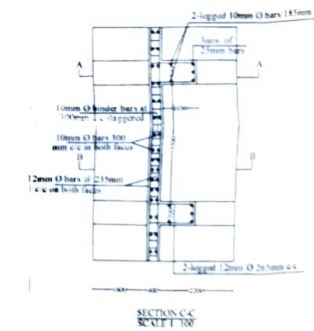


SECTION A-A
SCALE 1 : 100



SECTION B - B
SCALE 100

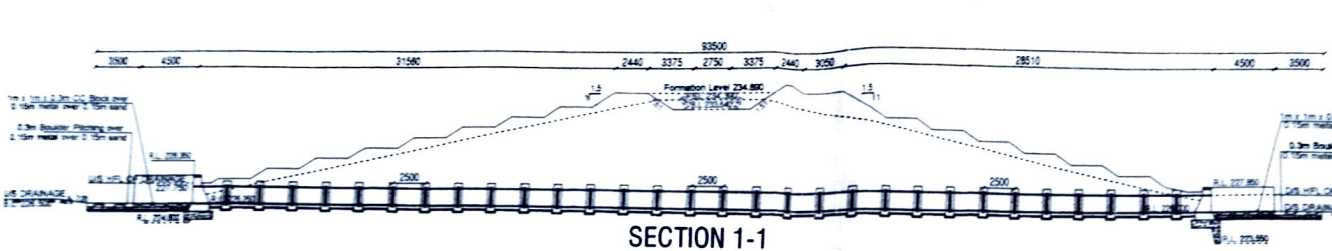
SECTION THROUGH COUNTERFORT WINGWALL
(SECTION 3-3)



SECTION C-C
SCALE 1 : 100

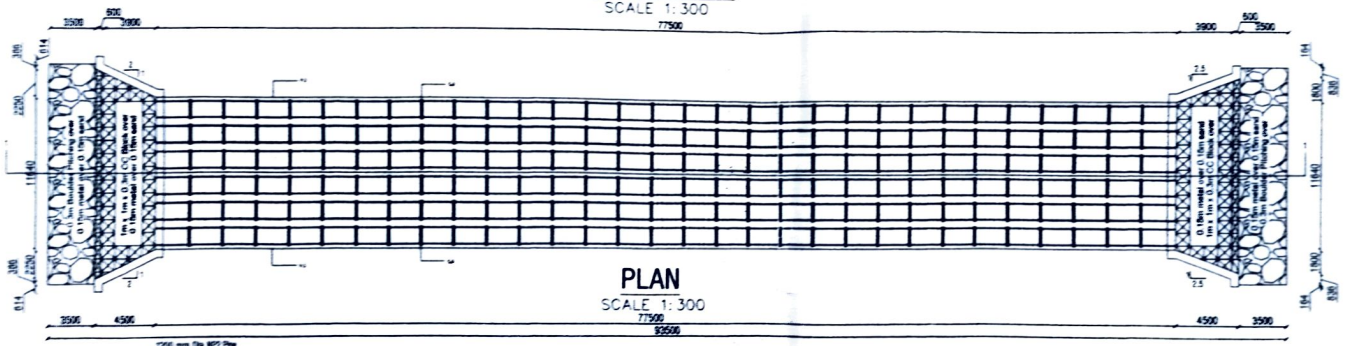
GOVERNMENT OF JHARKHAND
PUNASI RESERVOIR SCHEME
AQUEDUCT AT 17590 M OF GURUKUL BRANCH CANAL

PREPARED BY NANO SYSTEM CONSULTANTS PVT LTD RANCHI	SHEET NO 2/2	Designed by (R. K. Singh)



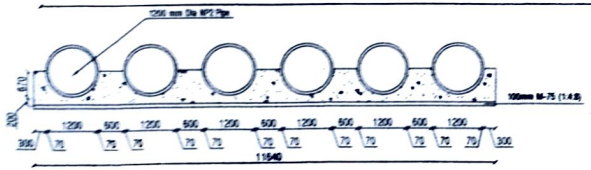
SECTION 1-1

SCALE 1: 300



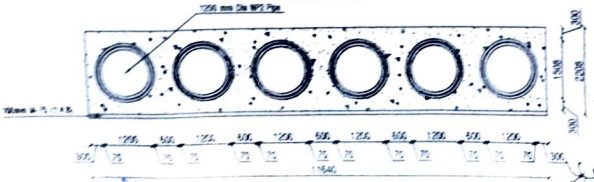
PLAN

SCALE 1: 300



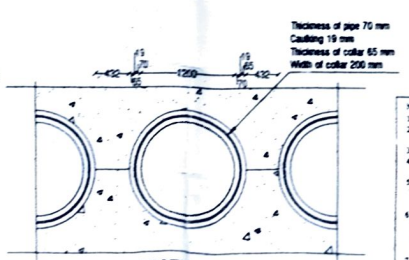
SECTION 2-2

SCALE 1:100



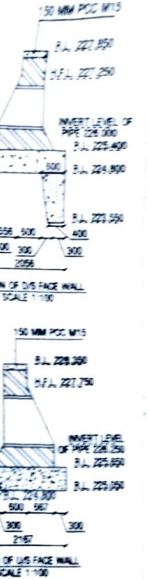
SECTION THROUGH JOINT

SECTION 3-3



SECTION 3-3

SCALE 1:50



NOTES :-

1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METER.
2. ALL PCC WORK WILL BE DONE IN M-15 OR AS MENSIONED IN THE DRAWING.
3. FOUNDATION WILL NOT BE DONE ON FILLED UP EARTH.
4. THE JOINTS OF PIPES WILL BE DONE AS PER SPECIFICATION AND AS PER DRAWING.
5. BACK FILLING BEHIND WING WALL/RETURN WALL WILL BE DONE WITH COARSE PERVIOUS SOIL FOR AVOIDING ANY BUILT UP WATER PRESSURE.
6. WEEP HOLES OF 75mm Ø WILL BE PROVIDED BELOW 1.0M FROM TOP OF EARTH FILLING TO 1.0M ABOVE BED LEVEL @ 1.5M C/C STAGGERED WITH 600 x 600 x 600mm INVERTED FILTER AT BACK OF WEEP HOLE.
7. FERM WILL BE DONE IN CM (1:4). THE BOULDER SHOULD BE AS PER SPECIFICATION REGARDING SIZE AND QUALITY OF BOULDER.
8. RUBBER SEAL WILL BE PROVIDED AT JOINTS OF WING WALL AND FACE WALL.

DESIGN DATA

	CANAL	
1.	FULL SUPPLY DISCHARGE	1.578 Cumecs
2.	BED WIDTH	2.750 M
3.	FULL SUPPLY DEPTH	0.750 M
4.	BED LEVEL	233.840 M
5.	BED SLOPE	1:4000
6.	F.S.L.	234.390 M
7.	TOP OF BANK LEVEL	234.890 M
8.	RUGGOSITY COEFFICIENT	0.025
	DRAINAGE	
1.	CATCHMENT AREA	64.45 Ha
2.	SILT FACTOR	1.00
3.	WEIGHT OF P.C.C	2.20 T/Cum
4.	DIA OF HUME PIPE	1.25 M
5.	TOE TO TOE DISTANCE BETWEEN OUTER SLOPE OF BANKS	87.560 M

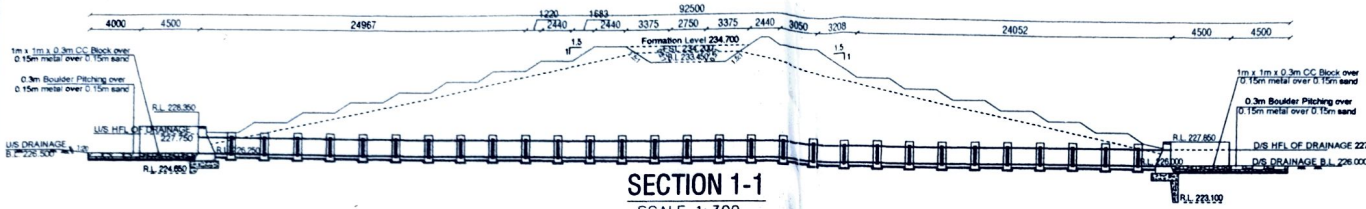
NOTES:

1. BEARING PRESSURE OF SOIL MUST BE TESTED BEFORE EXECUTION.
2. THE DESIGN IS BASED ON SAFE BEARING PRESSURE OF [illegible] T/SQM
3. REINFORCEMENT IN FACE WALL SHOULD BE DONE IN [illegible] LIFT ONLY.
4. [illegible] ABOVE H.F.L.
5. [illegible] DIMENSION SHOULD BE FOLLOWED.
6. ALL DIMENSION ARE IN M.M.'S UNIT.

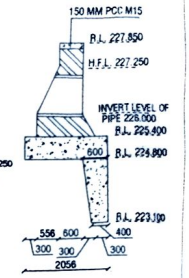
GOVERNMENT OF JHARKHAND

PUNAS RESERVOIR SCHEME

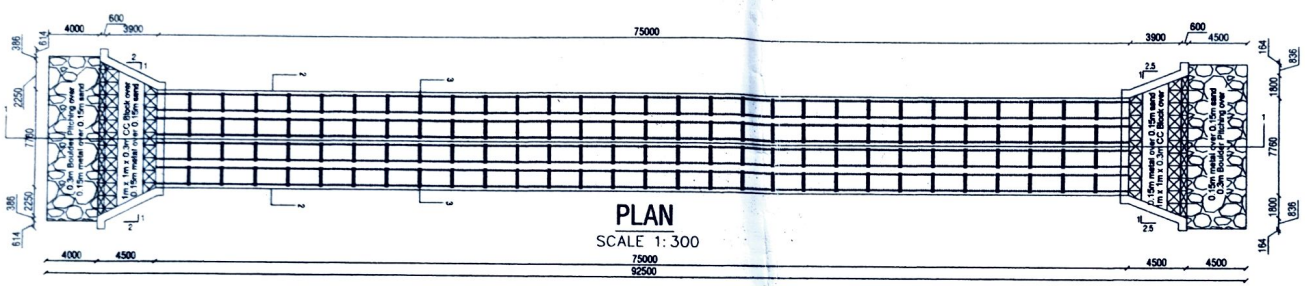
CROSS DRAINAGE WORK AT 17640.00 M OF GURUKUL BRANCH CANAL



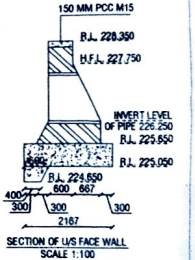
SECTION 1-1
SCALE 1:300



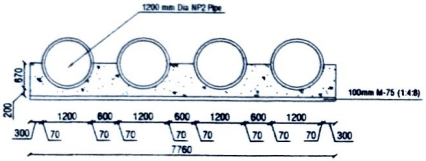
SECTION OF D/S FACE WALL
SCALE 1:100



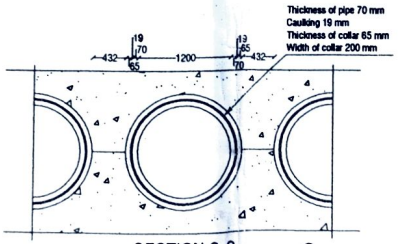
PLAN
SCALE 1:300



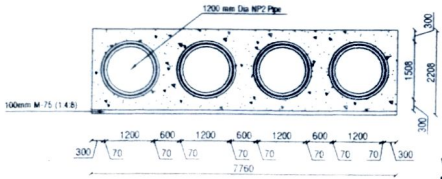
SECTION OF U/S FACE WALL
SCALE 1:100



SECTION 2-2
SCALE 1:100



SECTION 3-3
SCALE 1:50



SECTION THROUGH JOINT

SECTION 3-3

Ramp. 18/06/2022 J.E

DESIGN DATA		
	CANAL	
1.	FULL SUPPLY DISCHARGE	1.078 Cumecs
2.	BED WIDTH	2.750 M
3.	FULL SUPPLY DEPTH	0.750 M
4.	BED LEVEL	233.450 M
5.	BED SLOPE	1:4000
6.	F.S.L.	234.200 M
7.	TOP OF BANK LEVEL	234.700 M
8.	RUGOSITY COEFFICIENT	0.025
	DRAINAGE	
1.	CATCHMENT AREA	46.65 Ha
2.	SILT FACTOR	1.00
3.	WEIGHT OF P.C.C.	2.20 T/Cum
4.	DIA OF HUME PIPE	1.20 M
5.	TOE TO TOE DISTANCE BETWEEN OUTER SLOPE OF BANKS	85.850 M

NOTES :-
1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METER.
2. ALL PCC WORK WILL BE DONE IN M-15 OR AS MENSIONED IN THE DRAWING.
3. FOUNDATION WILL NOT BE DONE ON FILLED UP EARTH.
4. THE JOINTS OF PIPES WILL BE DONE AS PER SPECIFICATION AND AS PER DRAWING.
5. BACK FILLING BEHIND WING WALL/RETURN WALL WILL BE DONE WITH COURSE PERVIOUS SOIL FOR AVOIDING ANY BUILT UP WATER PRESSURE.
6. WEEP HOLES OF 75mm Ø WILL BE PROVIDED BELOW 1.0M FROM TOP OF EARTH FILLING TO 1.0M ABOVE BED LEVEL @ 1.5M C/C STAGGERED WITH 600 x 600 x 600mm INVERTED FILTER AT BACK OF WEEP HOLE.
7. RRM WILL BE DONE IN CM (1:4). THE BOULDER SHOULD BE AS PER SPECIFICATION REGARDING SIZE AND QUALITY OF BOULDER.
8. RUBBER SEAL WILL BE PROVIDED AT JOINTS OF WING WALL AND FACE WALL.

NOTES :-
1. BEARING PRESSURE OF SOIL MUST BE TESTED BEFORE EXECUTION
2. THE DESIGN IS BASED ON SAFE BEARING PRESSURE OF 15 T/SQM
3. R.R.M IN FACE WALL SHOULD BE DONE IN (1:4) UPTO H.F.L AND (1:6) ABOVE H.F.L
4. ONLY FIGURED DIMENSION SHOULD FOLLOWED
5. ALL DIMENSION ARE IN M.K.S UNIT

GOVERNMENT OF JHARKHAND

PUNASI RESERVOIR SCHEME

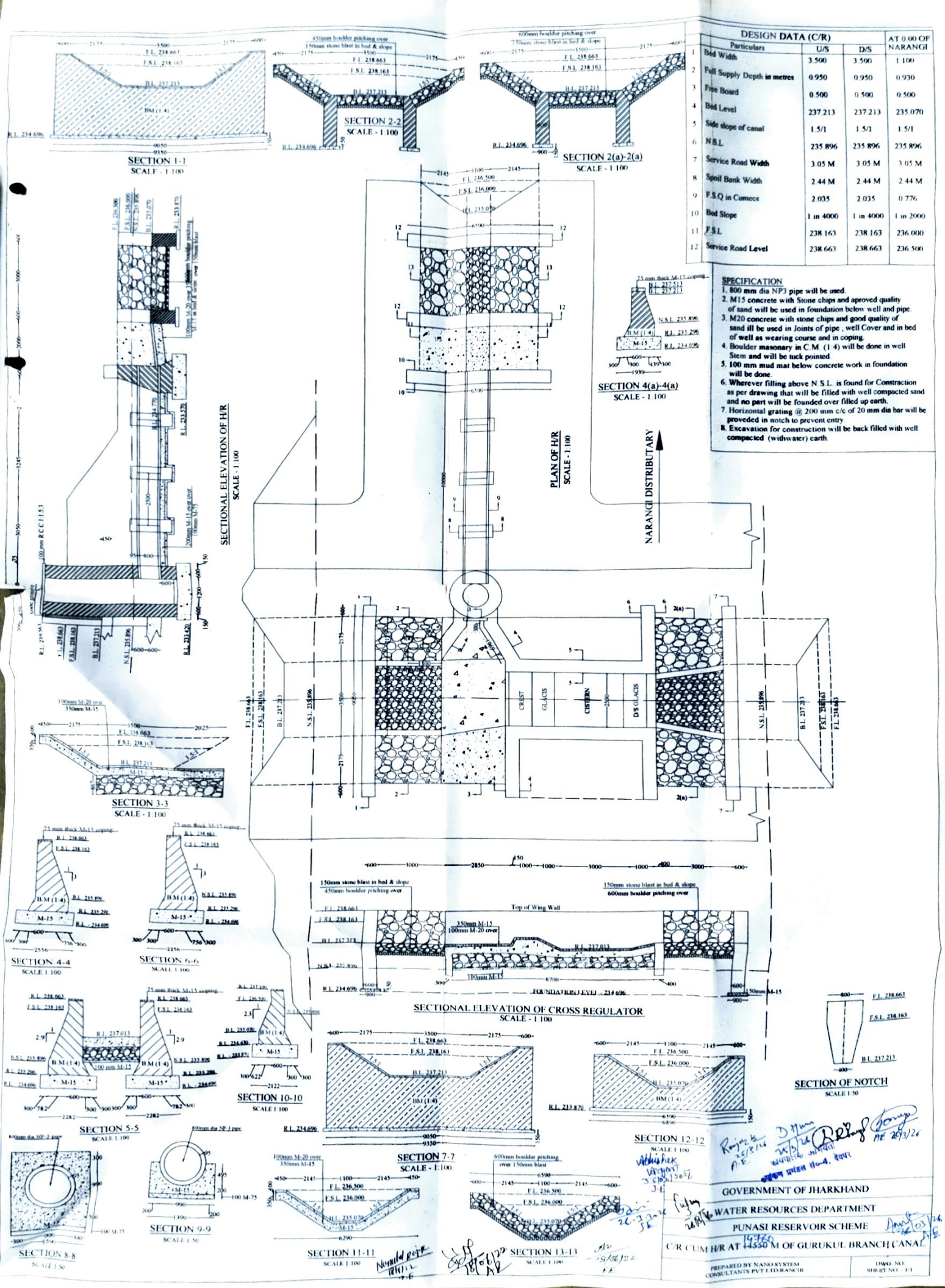
CROSS DRAINAGE WORK AT 18400.00 M OF GURUKUL BRANCH CANAL

PREPARED BY NANO SYSTEM CONSULTANTS PVT LTD RANCHI

SHEET NO. 101

Designed by (S. S. Singh)

कार्यपालक अभियंता
प्रखंड प्रमंडल सं०-II, देवघर



DESIGN DATA (C/R)

	Particulars	U/S	D/S	AT 0.00 OF NARANGI
1	Bed Width	3.500	3.500	1.100
2	Full Supply Depth in metres	0.950	0.950	0.930
3	Free Board	0.500	0.500	0.500
4	Bed Level	237.213	237.213	235.070
5	Side slope of canal	1.5/1	1.5/1	1.5/1
6	N.S.L	235.896	235.896	235.896
7	Service Road Width	3.05 M	3.05 M	3.05 M
8	Spoil Bank Width	2.44 M	2.44 M	2.44 M
9	F.S.Q in Cumecs	2.035	2.035	0.776
10	Bed Slope	1 in 4000	1 in 4000	1 in 2000
11	F.S.L	238.163	238.163	236.000
12	Service Road Level	238.663	238.663	236.500

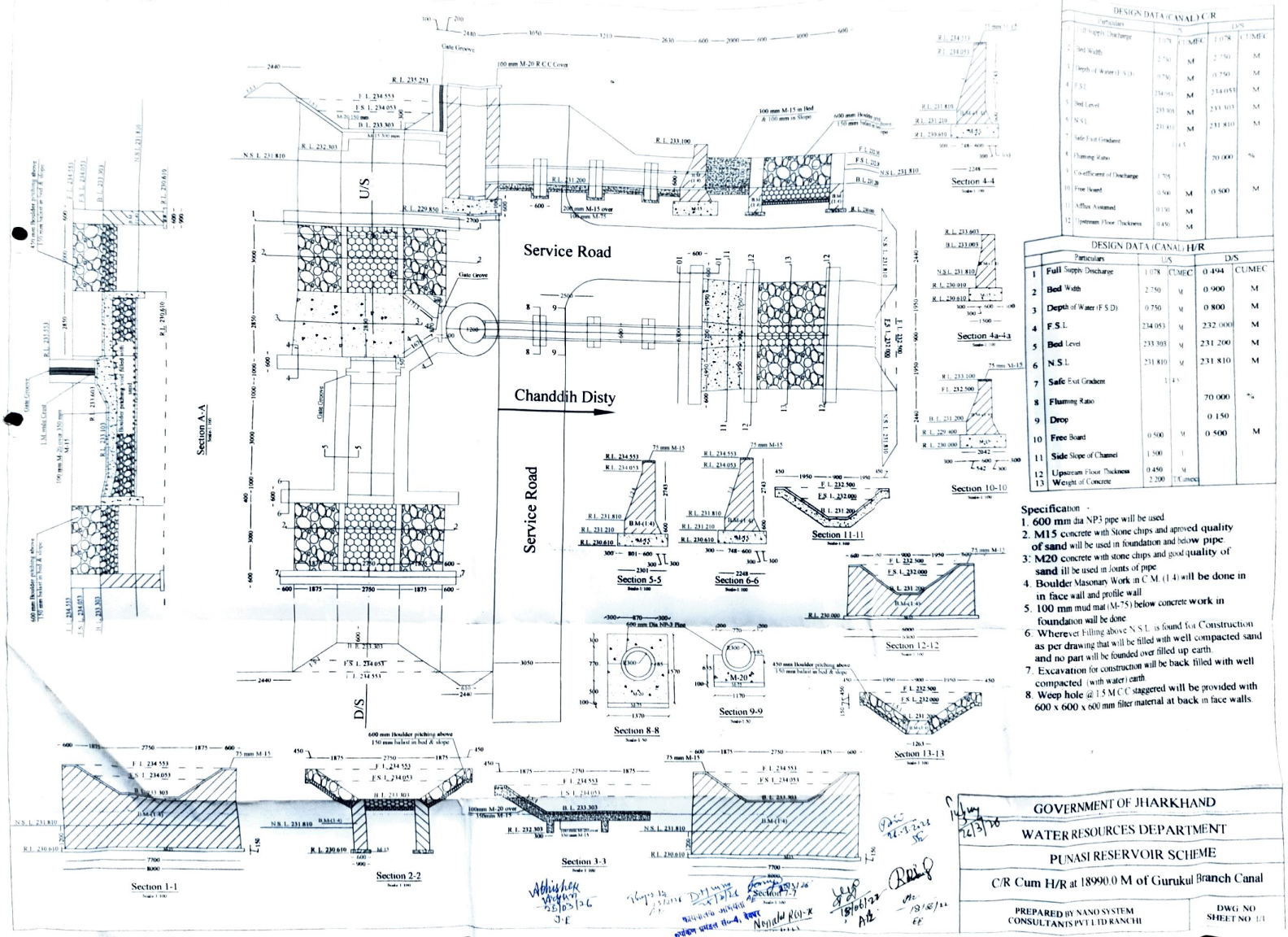
SPECIFICATION

1. 800 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation below well and pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe , well Cover and in bed of well as wearing course and in coping.
4. Boulder masonary in C.M. (1:4) will be done in well Stem and will be tuck pointed.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever filling above N.S.L. is found for Constraction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Horizontal grating @ 200 mm c/c of 20 mm dia bar will be proveded in notch to prevent entry.
8. Excavation for construction will be back filled with well compacted (withwater) earth.

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
C/R CUM H/R AT 14550 M OF GURUKUL BRANCH CANAL

PREPARED BY NANO SYSTEM CONSULTANTS PVT LTD RANCHI

DWG. NO.
SHEET NO. - 1/1



DESIGN DATA (CANAL) C/R

	Particulars	U/S		D/S	
1	Full Supply Discharge	1.078	CUMEC	1.078	CUMEC
2	Bed Width	2.750	M	2.750	M
3	Depth of Water (F.S.D)	0.750	M	0.750	M
4	F.S.L	234.053	M	234.053	M
5	Bed Level	233.303	M	233.303	M
6	N.S.L	231.810	M	231.810	M
7	Safe Exit Gradient		1.5		
8	Flaming Ratio			70.000	%
9	Co-efficient of Discharge	1.705			
10	Free Board	0.500	M	0.500	M
11	Afflux Assumed	0.150	M		
12	Upstream Floor Thickness	0.450	M		

DESIGN DATA (CANAL) H/R

	Particulars	U/S		D/S	
1	Full Supply Discharge	1.078	CUMEC	0.494	CUMEC
2	Bed Width	2.750	M	0.900	M
3	Depth of Water (F.S.D)	0.750	M	0.800	M
4	F.S.L	234.053	M	232.000	M
5	Bed Level	233.303	M	231.200	M
6	N.S.L	231.810	M	231.810	M
7	Safe Exit Gradient		1.5		
8	Flaming Ratio			70.000	%
9	Drop			0.150	
10	Free Board	0.500	M	0.500	M
11	Side Slope of Channel	1.500	1		
12	Upstream Floor Thickness	0.450	M		
13	Weight of Concrete	2.200	T/Cumec		

Specification -

1. 600 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in face wall and profile wall.
5. 100 mm mud mat (M-7.5) below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Construction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.

GOVERNMENT OF JHARKHAND

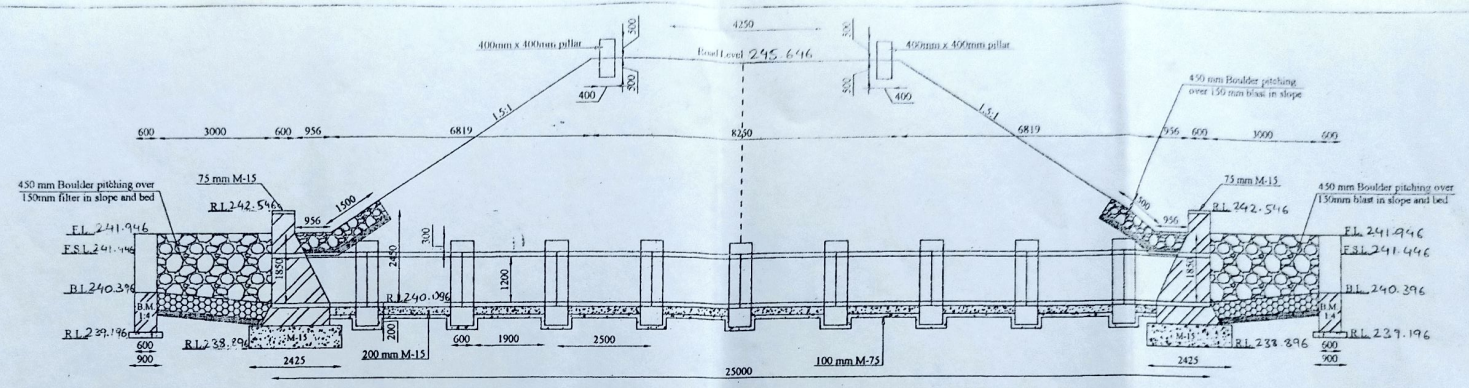
WATER RESOURCES DEPARTMENT

PUNASI RESERVOIR SCHEME

C/R Cum H/R at 18990.0 M of Gurukul Branch Canal

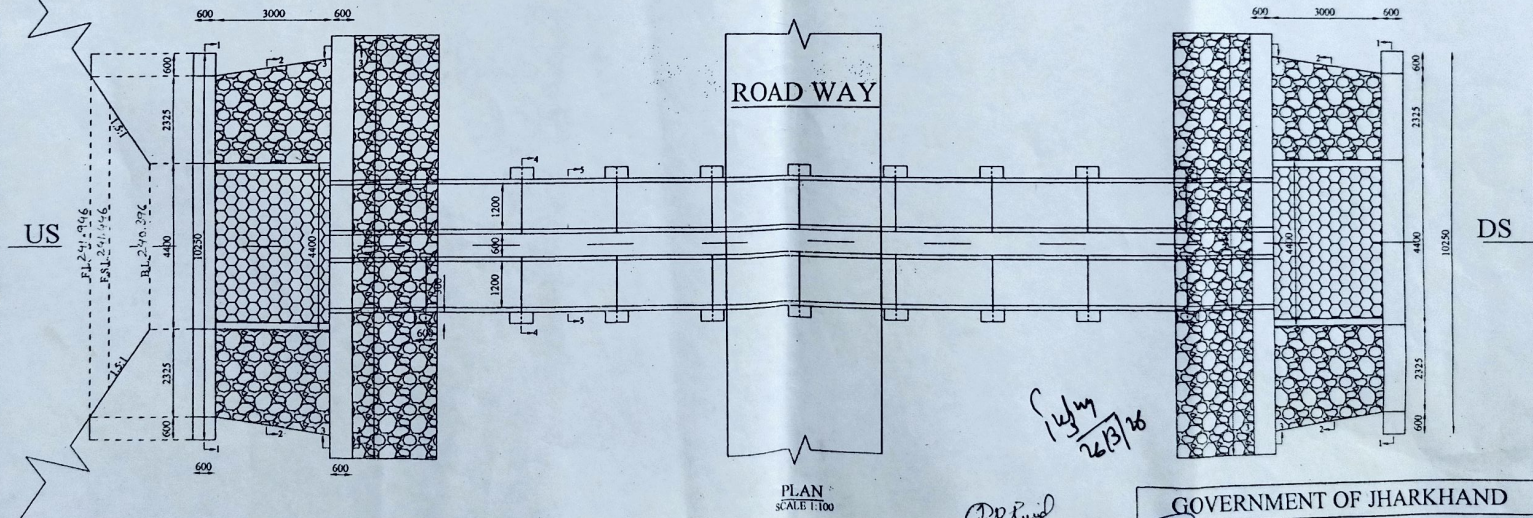
PREPARED BY NANO SYSTEM CONSULTANTS PVT LTD RANCHI

DWG. NO
SHEET NO. 1/1



SECTIONAL ELEVATION

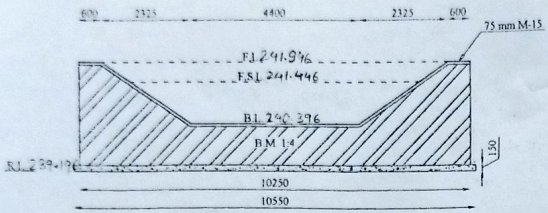
SCALE 1:100



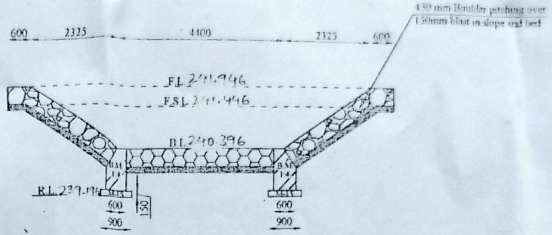
PLAN

SCALE 1:100

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR BRIDGE AT 2415.0 M OF GURUKUL BRANCH CANAL
PREPARED BY NANO SYSTEM

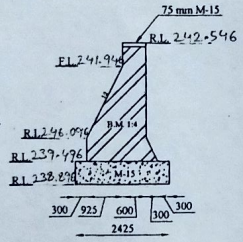


SECTION 1-1
SCALE 1:100

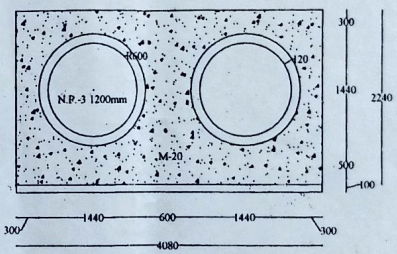


SECTION 2-2
SCALE 1:100

DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.400 M
2	Full Supply Depth	1.050 M
3	Free Board	0.500 M
4	Bed Level	240.396 M
5	Side slope of canal	1.5:1
6	N.S.L (Road Level)	245.896 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	3.043
10	Bed Slope	1 in 4000
11	F.S.L	241.446 M
12	Service Road Level	241.946 M



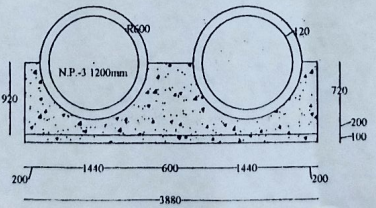
SECTION 3-3
SCALE 1:100



SECTION 4-4
SCALE 1:50

Specification : -

1. 1200 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.



SECTION 5-5
SCALE 1:50

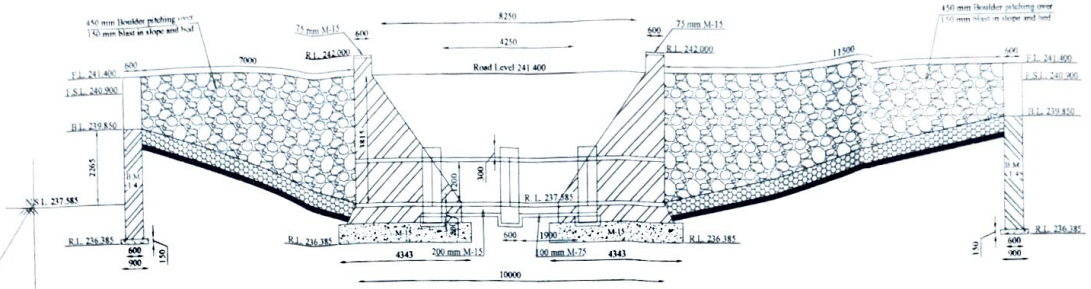
18/06/2022 J.E

24/3/26

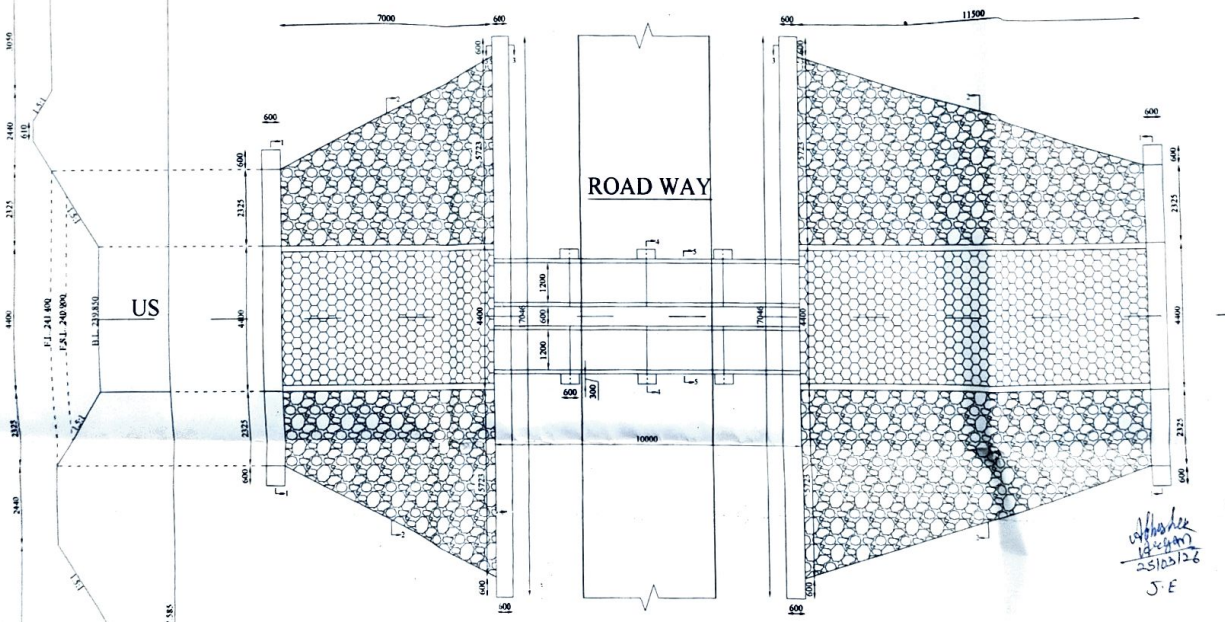
25/03/26 A.E

25/03/26 J.E

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR BRIDGE AT 1415.0 M OF GURUKUL BRANCH CANAL
PREPARED BY NANO SYSTEM



SECTIONAL ELEVATION
SCALE 1:100

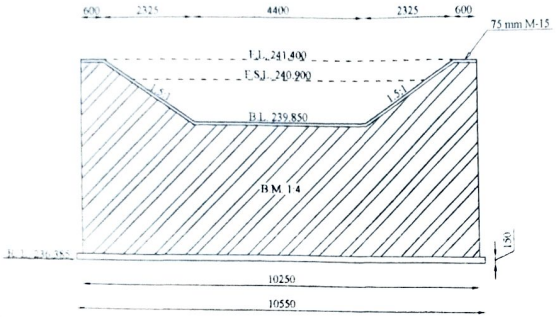


PLAN
SCALE 1:100

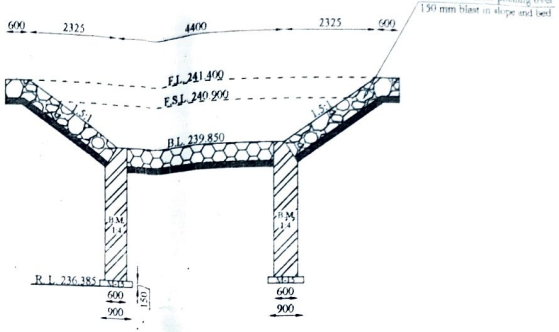
Specification
1. 1200 mm
2. M15 conc
of sand wi
3. M20 conc
sand till b
4. Boulder
m face w
5. 100 mm
will be do
6. Wherever
as per dra
and no pa
7. Excavati
compacte
8. Weep hol
600 x 600

GOVERNM
WATER RES
PUNASI
DESIGN OF S
OF GURU
PREPARED B
CONSULTANTS

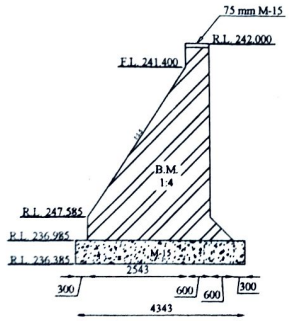
DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.400 M
2	Full Supply Depth	1.050 M
3	Free Board	0.500 M
4	Bed Level	239.850 M
5	Side slope of canal	1.5 1
6	N.S.L.	237.585 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	3.043
10	Bed Slope	1 in 4000
11	F.S.L.	240.900 M
12	Service Road Level	241.400 M



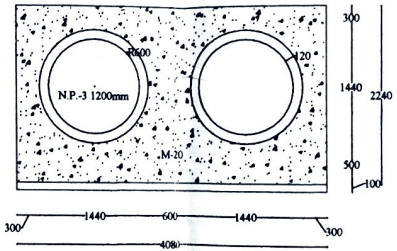
SECTION 1-1
SCALE 1:100



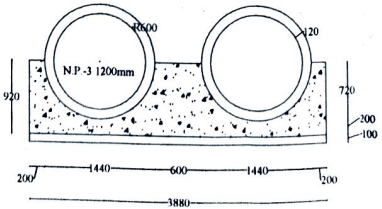
SECTION 2-2
SCALE 1:100



SECTION 3-3
SCALE 1:100



SECTION 4-4
SCALE 1:50

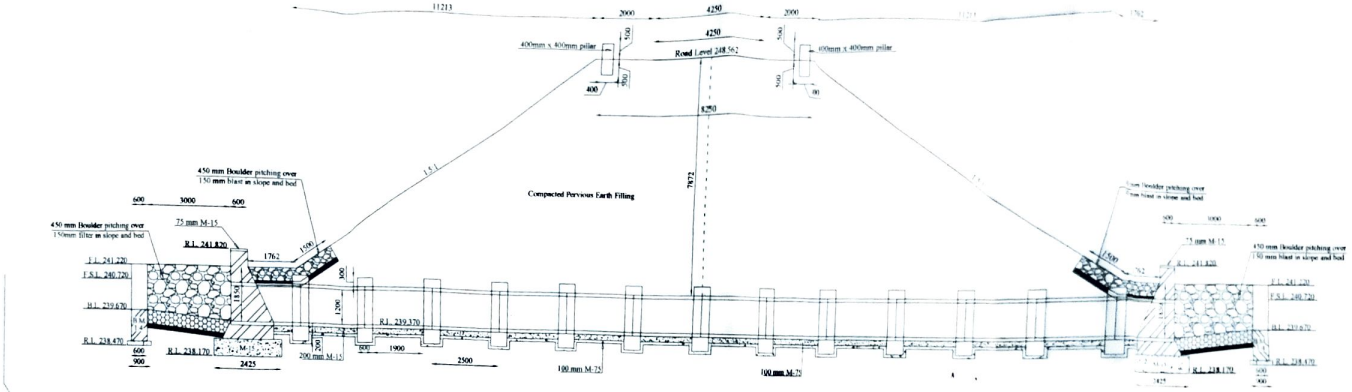


SECTION 5-5
SCALE 1:50

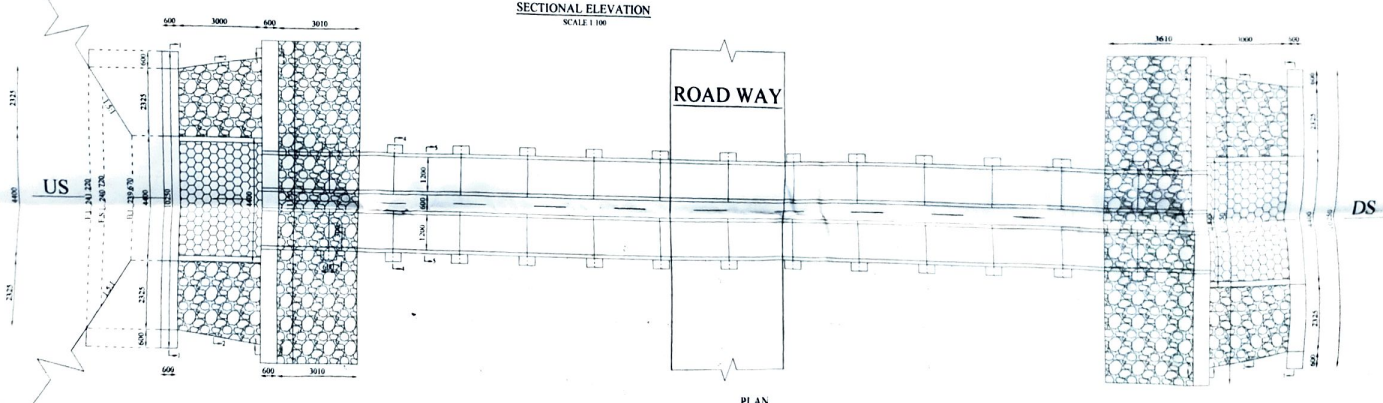
Specification :-

1. 1200 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat (1:4:8) below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR, A BRIDGE AT 3600.0 M OF GURUKUL BRANCH CANAL



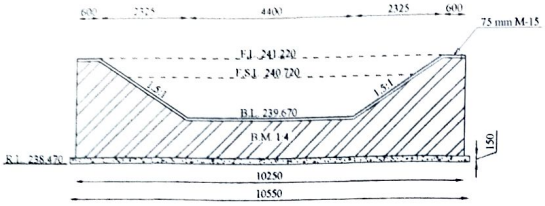
SECTIONAL ELEVATION
SCALE 1:100



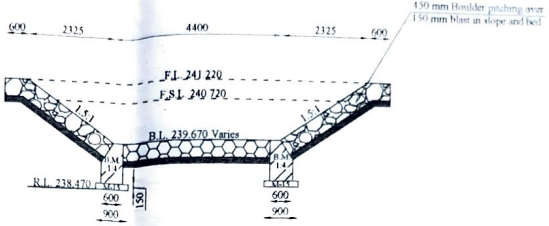
PLAN
SCALE 1:100

GOVERNMENT OF JHARKHAND	
WATER RESOURCES DEPARTMENT	
PUNASI RESERVOIR SCHEME	
DESIGN OF SLR BRIDGE AT 4320.0 M OF GURUKUL BRANCH CANAL	
PREPARED BY NANO SYSTEM CONSULTANTS PVT. LTD. RANCHI	SHEET NO 1/2

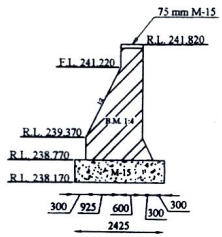
DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.400 M
2	Full Supply Depth	1.050 M
3	Free Board	0.500 M
4	Bed Level	239.670 M
5	Side slope of canal	1.5:1
6	N.S.L (Road Level)	248.562 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	3.043
10	Bed Slope	1 in 4000
11	F.S.L	240.720 M
12	Service Road Level	241.220 M



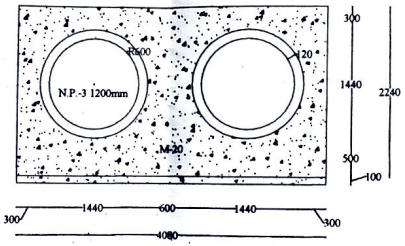
SECTION 1-1
SCALE 1:100



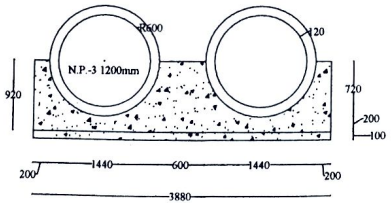
SECTION 2-2
SCALE 1:100



SECTION 3-3
SCALE 1:100



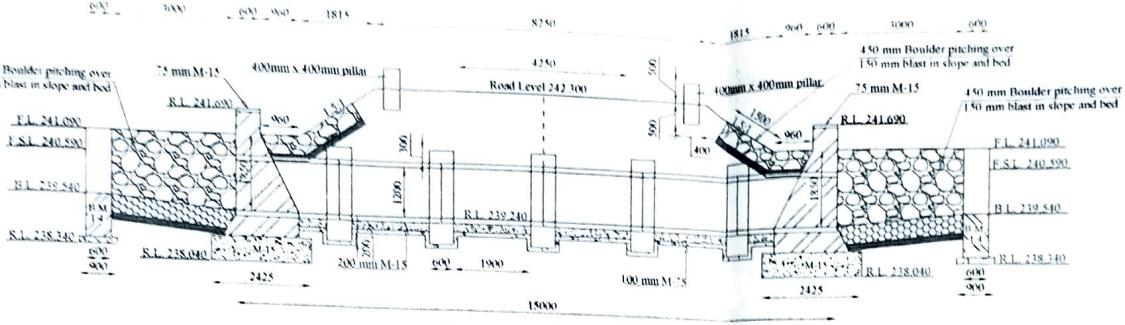
SECTION 4-4
SCALE 1:50



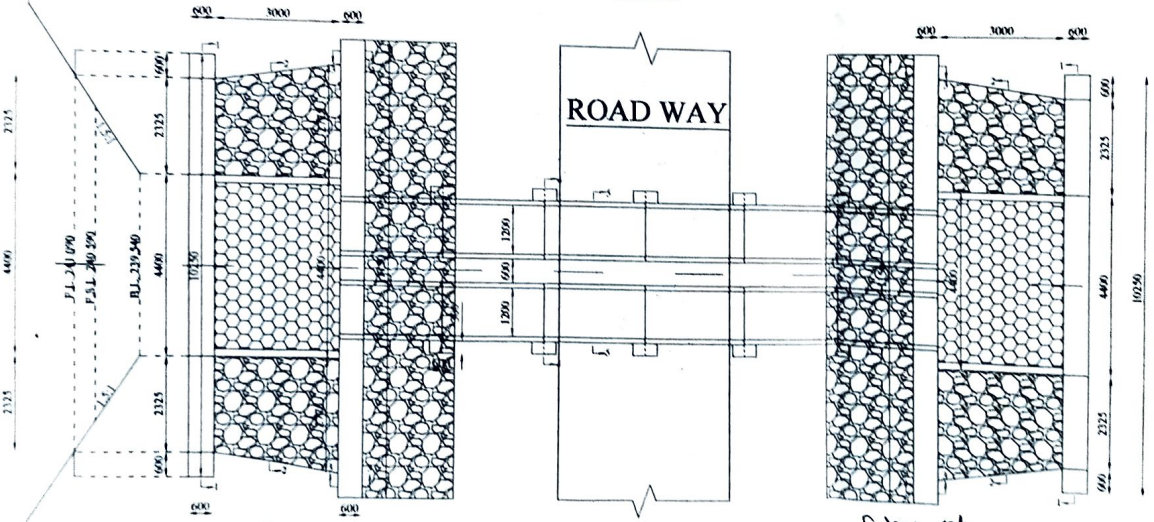
SECTION 5-5
SCALE 1:50

Specification -
1. 1200 mm dia NP3 pipe will be used
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR BRIDGE AT 4320.0 M OF GURUKUL BRANCH CANAL



SECTIONAL ELEVATION
SCALE 1:100



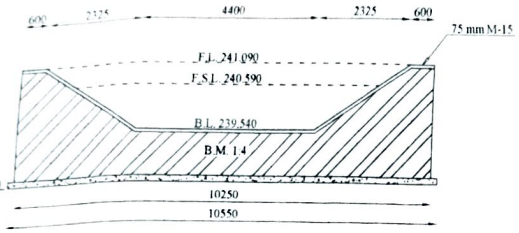
PLAN
SCALE 1:100

DESIGN DATA (CANAL)		
	Particulars	
1	Bed Width	4.400 M
2	Full Supply Depth	1.050 M
3	Free Board	0.500 M
4	Bed Level	239.540 M
5	Side slope of canal	1 : 1
6	N.S.L (Road Level)	242.221 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	3.043
10	Bed Slope	1 in 4000
11	F.S.L	240.590 M
12	Service Road Level	241.090 M

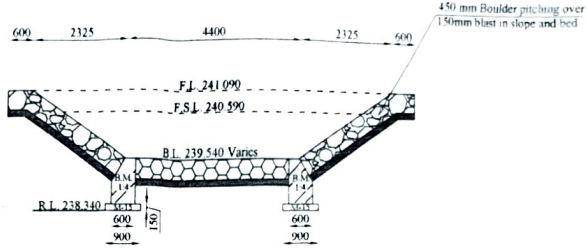
Specification :-
1. 1200 mm dia NP3 pipe will be used
2. M-15 concrete with Stone chips and approved quality of sand will be used in foundation and below pipe
3. M-20 concrete with stone chips and good quality of sand ill be used in Joints of pipe
4. Boulder Masonry Work in C.M. (1:4) will be done in in face wall and profile wall
5. 100 mm mud mat below concrete work in foundation will be done
6. Wherever Filling above N.S.L. is found for Construction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth
7. Excavation for construction will be back filled with well compacted (with water) earth
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SER A BRIDGE AT 4840.0 M
OF SURFACE BRANCH CANAL

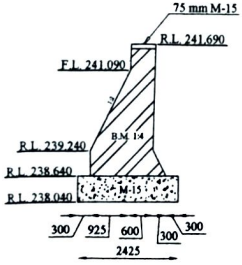
DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.400 M
2	Full Supply Depth	1.050 M
3	Free Board	0.500 M
4	Bed Level	239.540 M
5	Side slope of canal	1.5:1
6	N.S.L (Road Level)	242.221 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	3.043
10	Bed Slope	1 in 4000
11	F.S.L	240.590 M
12	**Service Road Level**	241.090 M



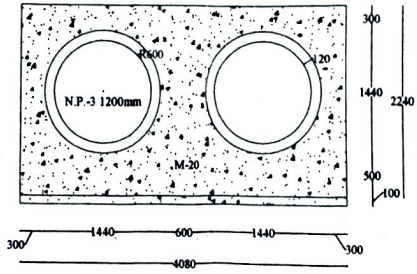
SECTION 1-1
SCALE 1:100



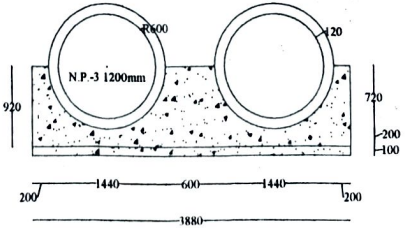
SECTION 2-2
SCALE 1:100



SECTION 3-3
SCALE 1:100



SECTION 4-4
SCALE 1:50

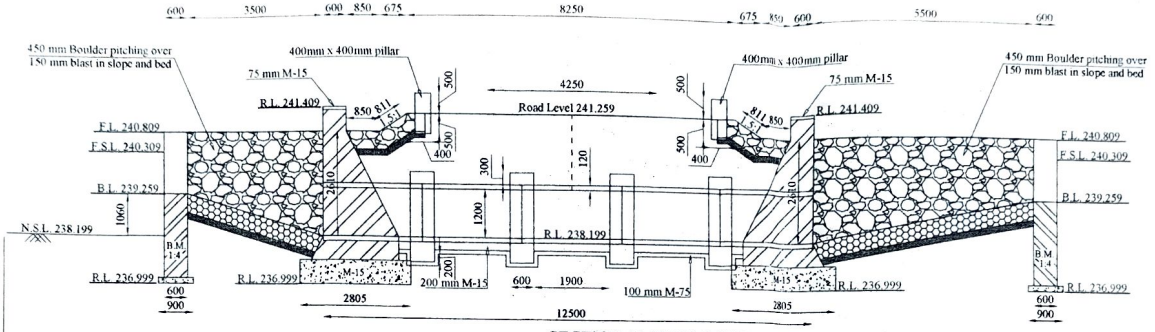


SECTION 5-5
SCALE 1:50

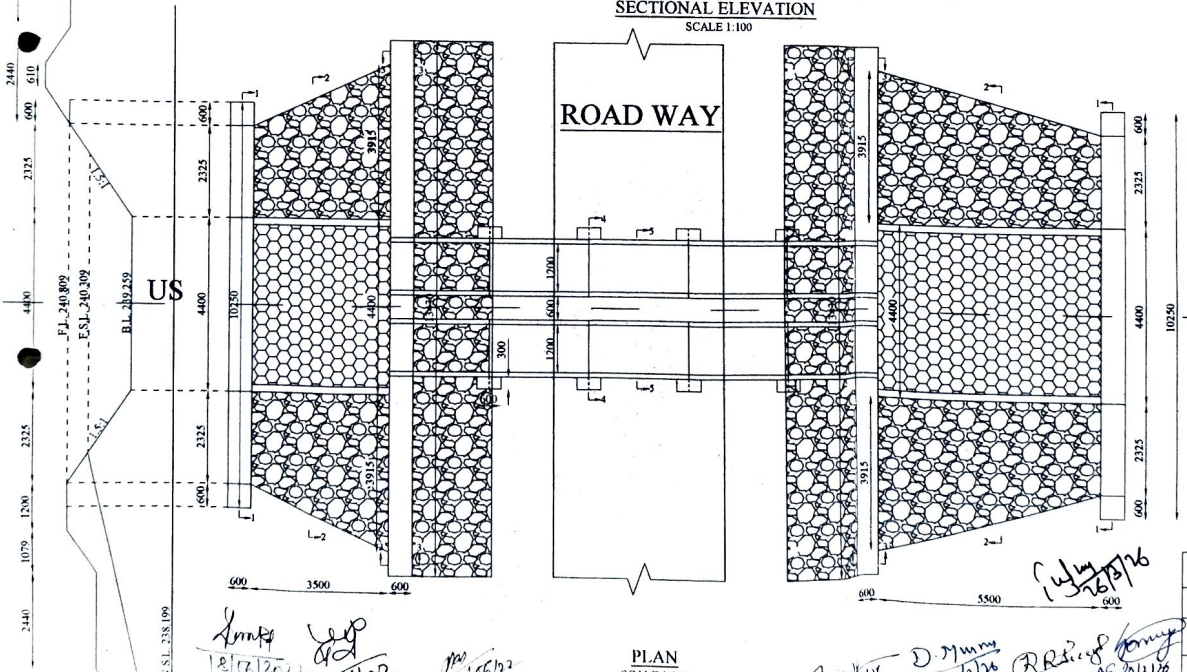
Specification :-

1. 1200 mm dia NP3 pipe will be used.
2. M-15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe
3. M-20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction. as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR A BRIDGE AT 4840.0 M OF GURUKUL BRANCH CANAL



SECTIONAL ELEVATION
SCALE 1:100

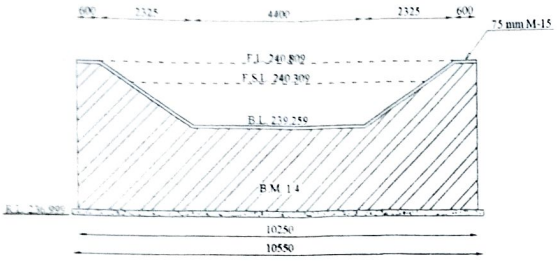


PLAN
SCALE 1:100

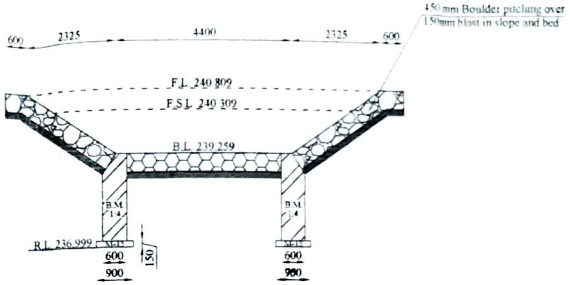
DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.400 M
2	Full Supply Depth	1.050 M
3	Free Board	0.500 M
4	Bed Level	239.259 M
5	Side slope of canal	1.5:1
6	N.S.L.	238.199 M
7	Service Road Width	3.650 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	3.043
10	Bed Slope	1 in 4000
11	F.S.L	240.309 M
12	Service Road Level	240.809 M

Specification : -
1. 1200 mm dia NP3 pipe will be used.
2. M-15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe
3. M-20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction. as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.

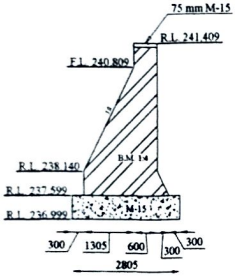
GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR A BRIDGE AT 5965.0 M OF GURUKUL BRANCH CANAL
PREPARED BY NANO SYSTEM



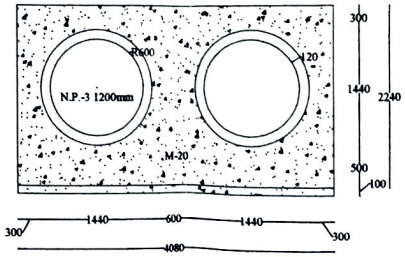
SECTION 1-1
SCALE 1:100



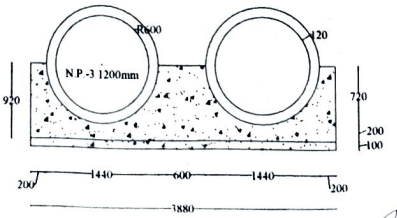
SECTION 2-2
SCALE 1:100



SECTION 3-3
SCALE 1:100



SECTION 4-4
SCALE 1:50

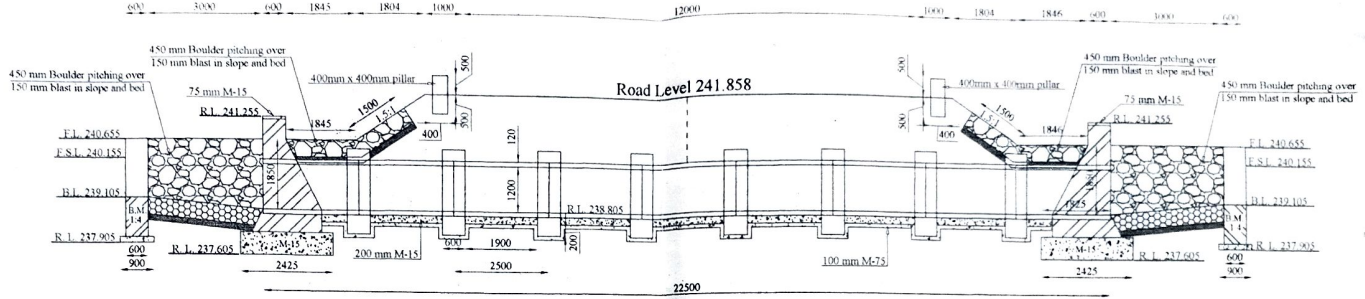


SECTION 5-5
SCALE 1:50

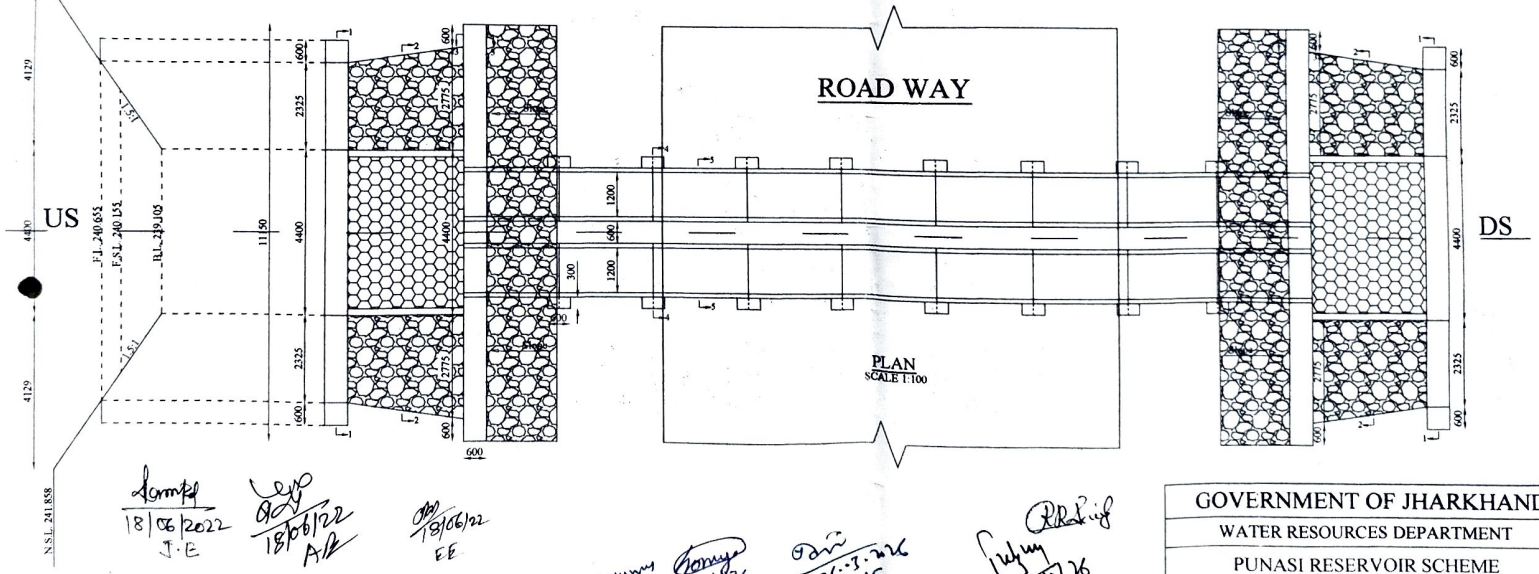
Specification -

1. 1200 mm dia NP3 pipe will be used.
2. M-15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe
3. M-20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1.4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction. as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR A BRIDGE AT 5965.0 M OF GURUKUL BRANCH CANAL
[illegible]



SECTIONAL ELEVATION
SCALE 1:100

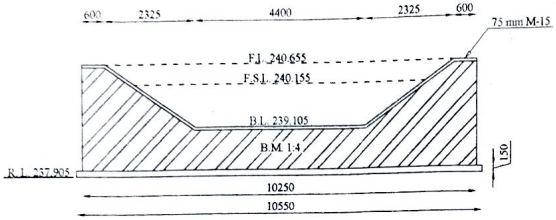


PLAN
SCALE 1:100

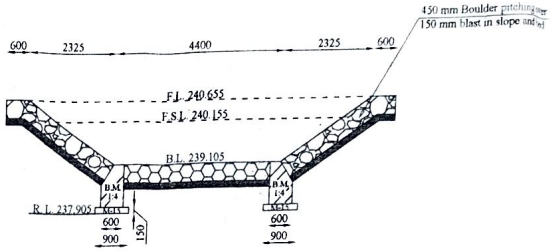
18/06/2022 J.E
18/06/22 A/E
18/06/22 E.E
25/03/26 J.E
25/3/26
25/3/26
26.3.2026 J.E
26/3/26

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF DLR BRIDGE AT 6580.0 M OF GURUKUL BRANCH CANAL
PREPARED BY NANO SYSTEM

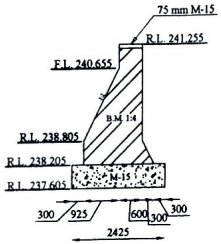
DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.400 M
2	Full Supply Depth	1.050 M
3	Free Board	0.500 M
4	Bed Level	239.105 M
5	Side slope of canal	1.5:1
6	N.S.L (Road Level)	241.858 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	3.043
10	Bed Slope	1 in 4000
11	F.S.L	240.155 M
12	**Service Road Level**	240.655 M



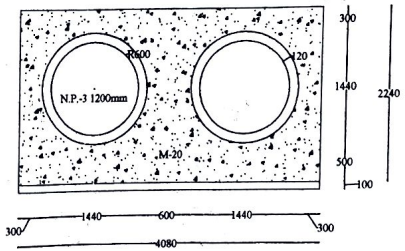
SECTION 1-1
SCALE 1:100



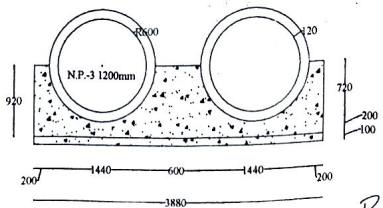
SECTION 2-2
SCALE 1:100



SECTION 3-3
SCALE 1:100



SECTION 4-4
SCALE 1:50

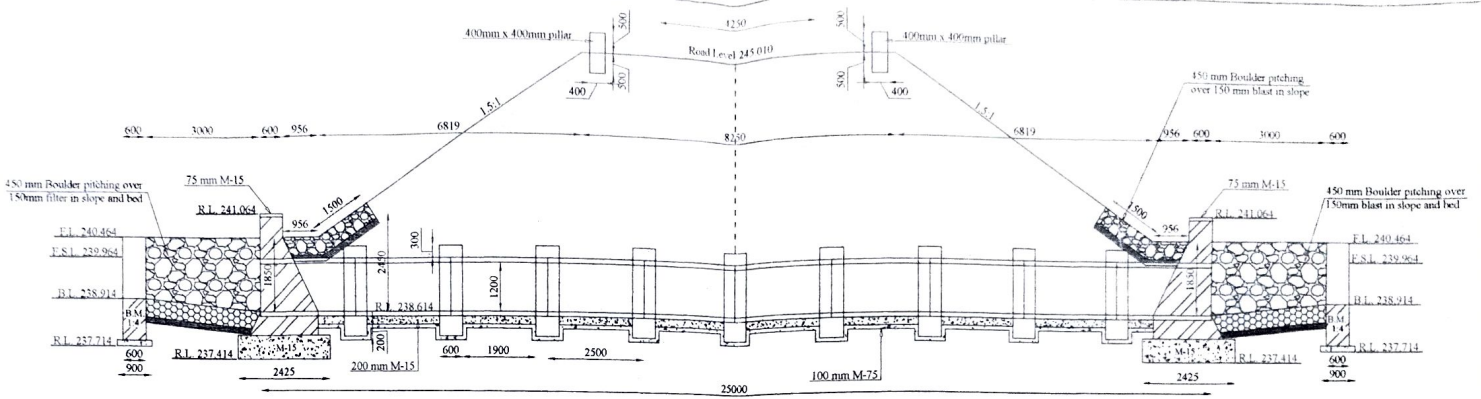


SECTION 5-5
SCALE 1:50

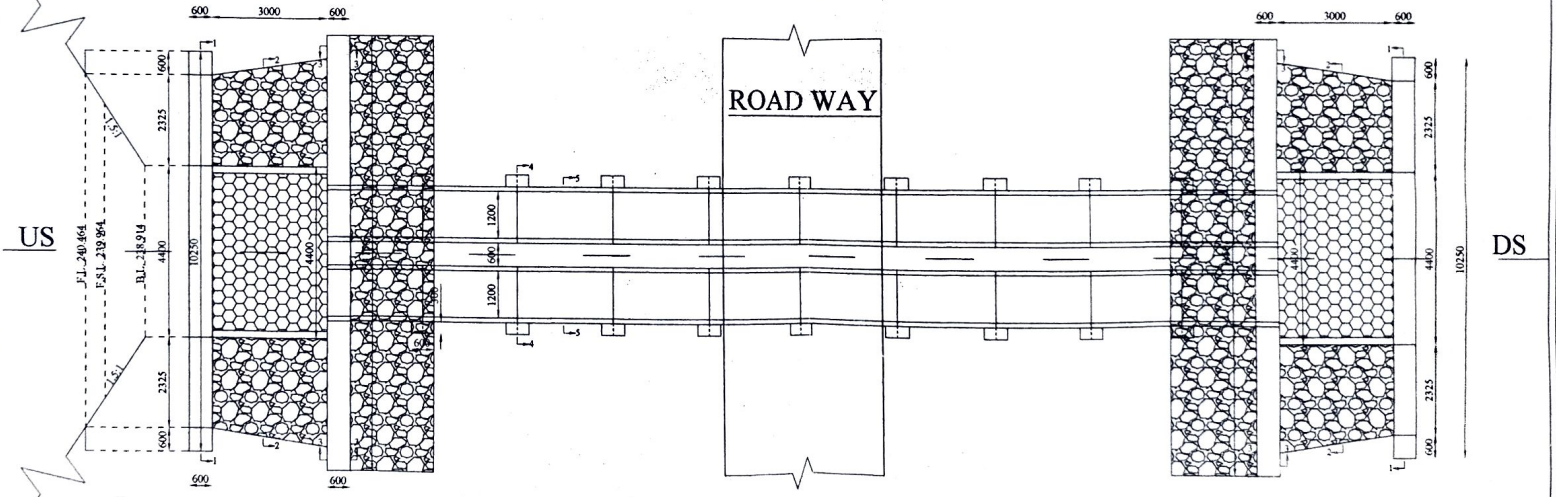
Specification :-

1. 1200 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF DLR BRIDGE AT 6580.0 M OF GURUKUL BRANCH CANAL



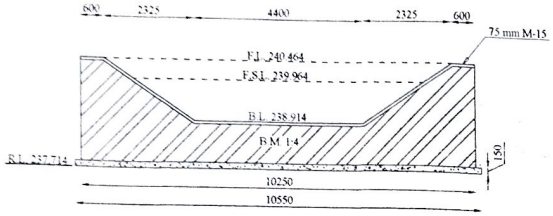
SECTIONAL ELEVATION
SCALE 1:100



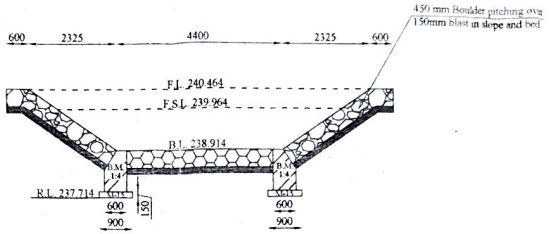
PLAN
SCALE 1:100

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR BRIDGE AT 7345.0 M OF GURUKUL BRANCH CANAL
PREPARED BY CAD SYSTEM

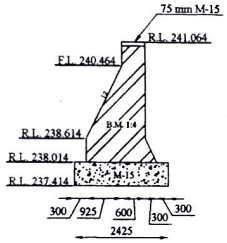
DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.400 M
2	Full Supply Depth	1.050 M
3	Free Board	0.500 M
4	Bed Level	238.914 M
5	Side slope of canal	1.5:1
6	N.S.L (Road Level)	245.010 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	3.043
10	Bed Slope	1 in 4000
11	F.S.L	240.464 M
12	Service Road Level	240.964 M



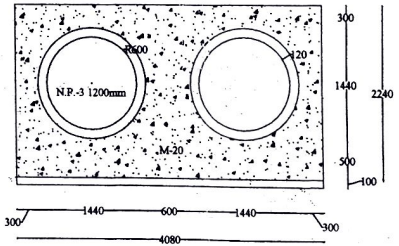
SECTION 1-1
SCALE 1:100



SECTION 2-2
SCALE 1:100

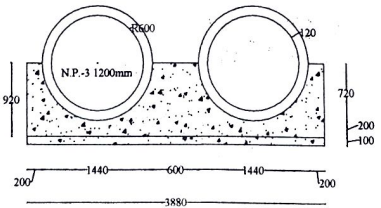


SECTION 3-3
SCALE 1:100



SECTION 4-4
SCALE 1:50

Specification :-
1. 1200 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.



SECTION 5-5
SCALE 1:50

18/08/2022 J.E

18/08/22 AE

26/3/26

26/3/26 AE

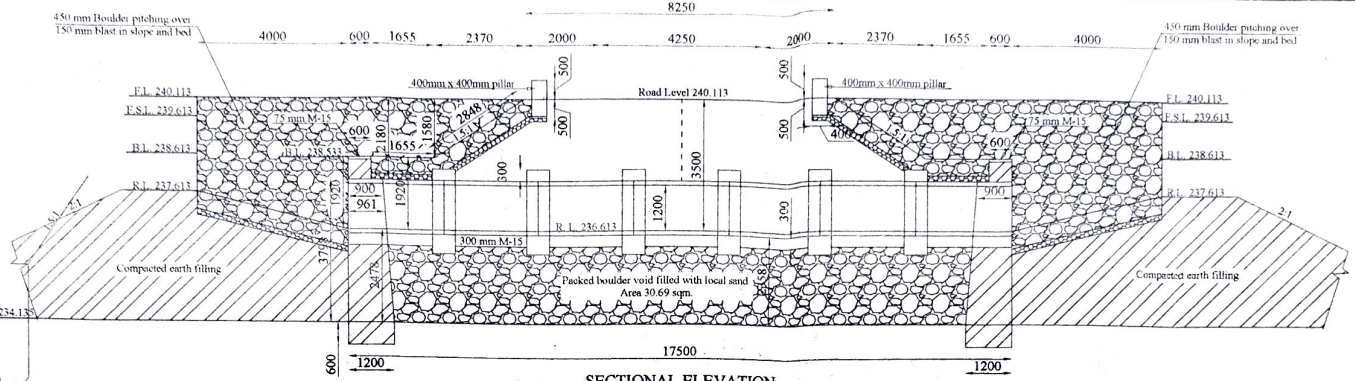
25/08/26 J.E

26/3/26 AE

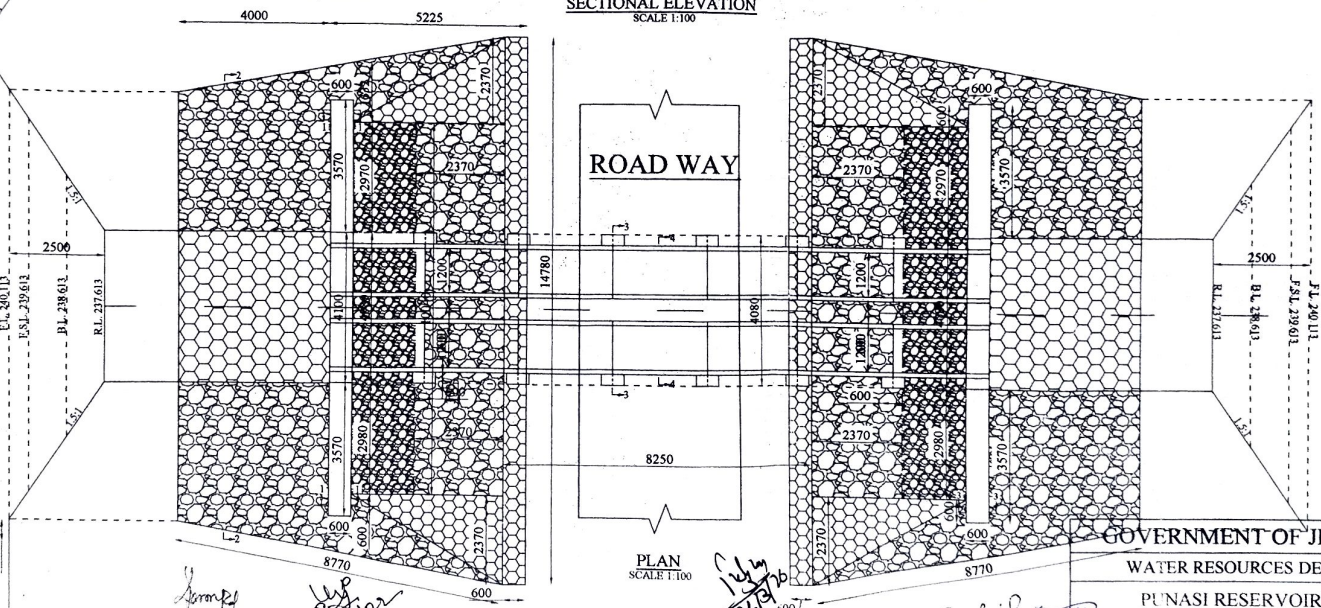
26/3/26 AE

02.03.2026 JE

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR BRIDGE AT 7345.0 M OF GURUKUL BRANCH CANAL
PREPARED BY NANO SYSTEM

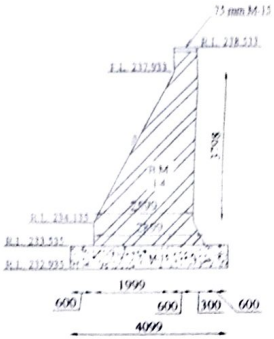


SECTIONAL ELEVATION
SCALE 1:100

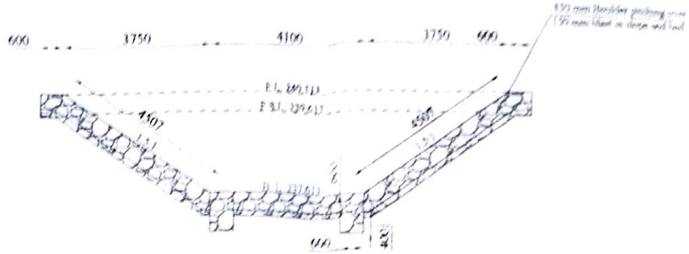


PLAN
SCALE 1:100

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF S.L.R.-A BRIDGE AT 8750.0 M OF GURUKUL BRANCH CANAL

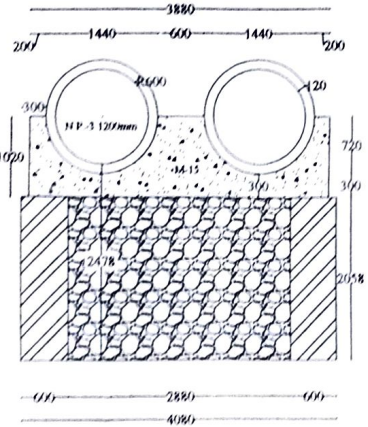


SECTION 1-1
SCALE 1:100

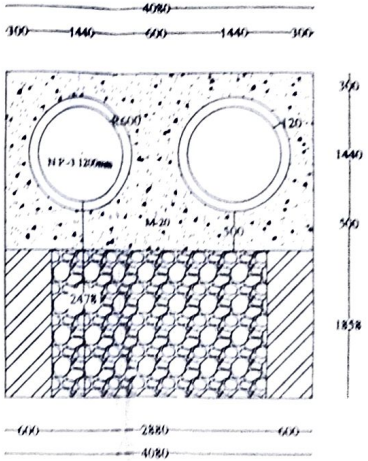


SECTION 2-2
SCALE 1:100

DESIGN DATA OF CANAL		
	Particulars	U/S
1	Bed Width	4.100 M
2	Full Supply Depth	1.500 M
3	Free Board	0.500 M
4	Bed Level	238.633 M
5	Side slope of canal	1:1
6	W.S.L.	239.133 M
7	Service Road Width	3.000 M
8	Spoil Bank Width	2.440 M
9	F.S.D. in Culvert	2.611
10	Bed Slope	1 in 4000
11	F.S.L.	239.633 M
12	Service Road Level	240.133 M



SECTION 5-5
SCALE 1:50

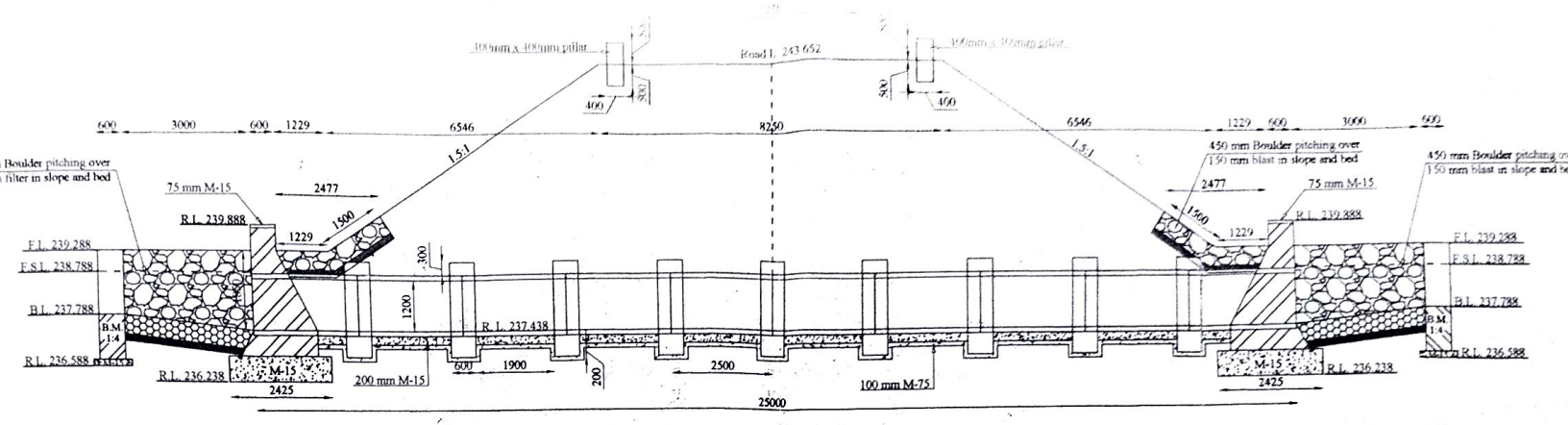


SECTION 4-4
SCALE 1:50

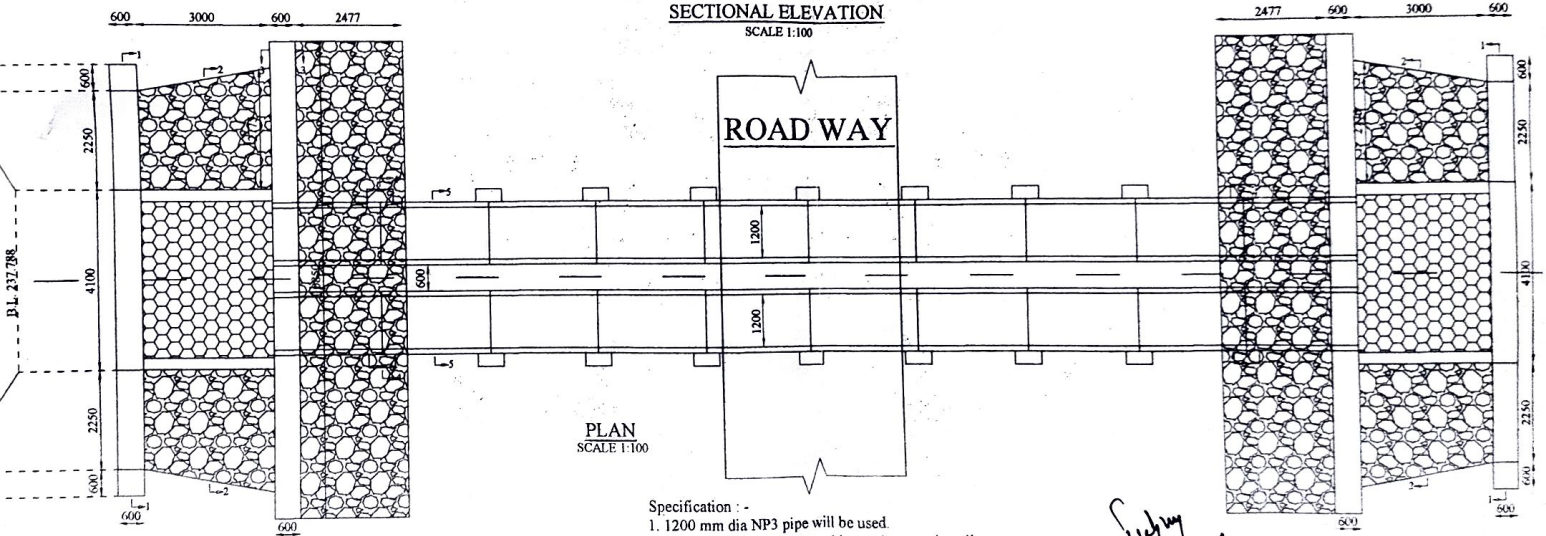
Specification :-

1 1200 mm dia NP3 pipe will be used
2 M-15 concrete with Stone chips and approved quality of sand will be used in foundation and below pipe
3 M-20 concrete with stone chips and good quality of sand ill be used in Joints of pipe
4 Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall
5 100 mm mud mat (1:4:8) belerw concrete work in foundation will be done
6 Wherever Filling above N.S.L. is found for Construction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth
7 Excavation for construction will be back filled with well compacted (with water) earth
8 Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF S.E.R. A BRIDGE AT RD 0.00 M
OF RIGHT BRANCH CANAL



SECTIONAL ELEVATION
SCALE 1:100



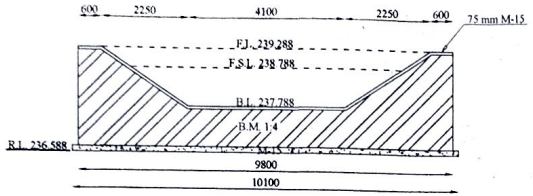
PLAN
SCALE 1:100

Specification : -

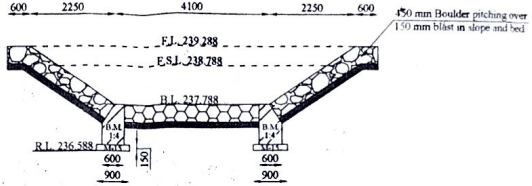
1. 1200 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT

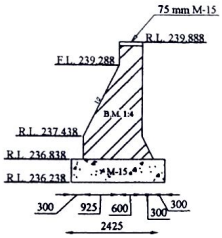
DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.100 M
2	Full Supply Depth	1.000 M
3	Free Board	0.500 M
4	Bed Level	237.788 M
5	Side slope of canal	1.5:1
6	N.S.L. (Road Level)	243.652 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	2.611
10	Bed Slope	1 in 4000
11	F.S.L.	238.788 M
12	Service Road Level	239.288 M



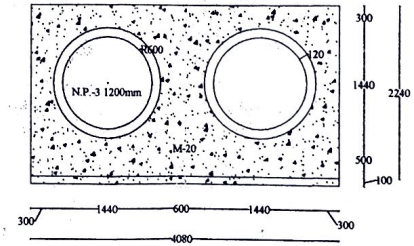
SECTION 1-1
SCALE 1:100



SECTION 2-2
SCALE 1:100



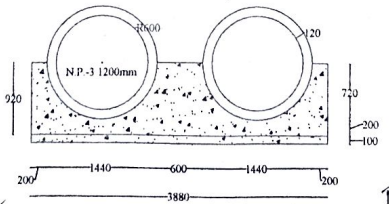
SECTION 3-3
SCALE 1:100



SECTION 4-4
SCALE 1:50

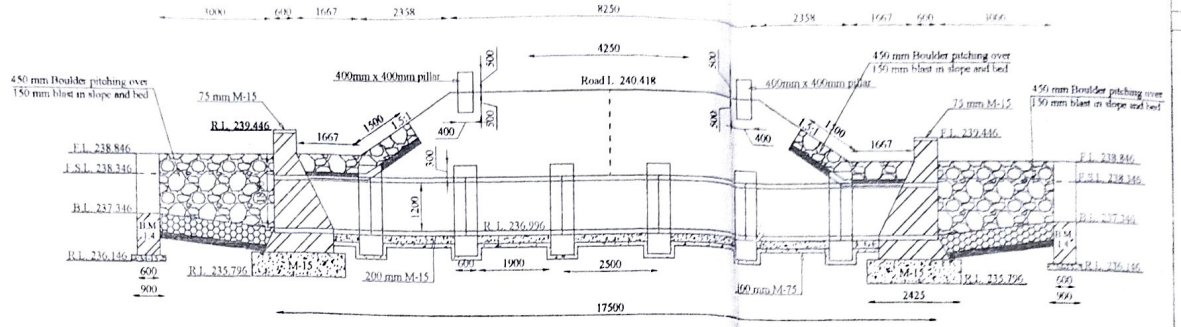
Specification : -

1. 1200 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.



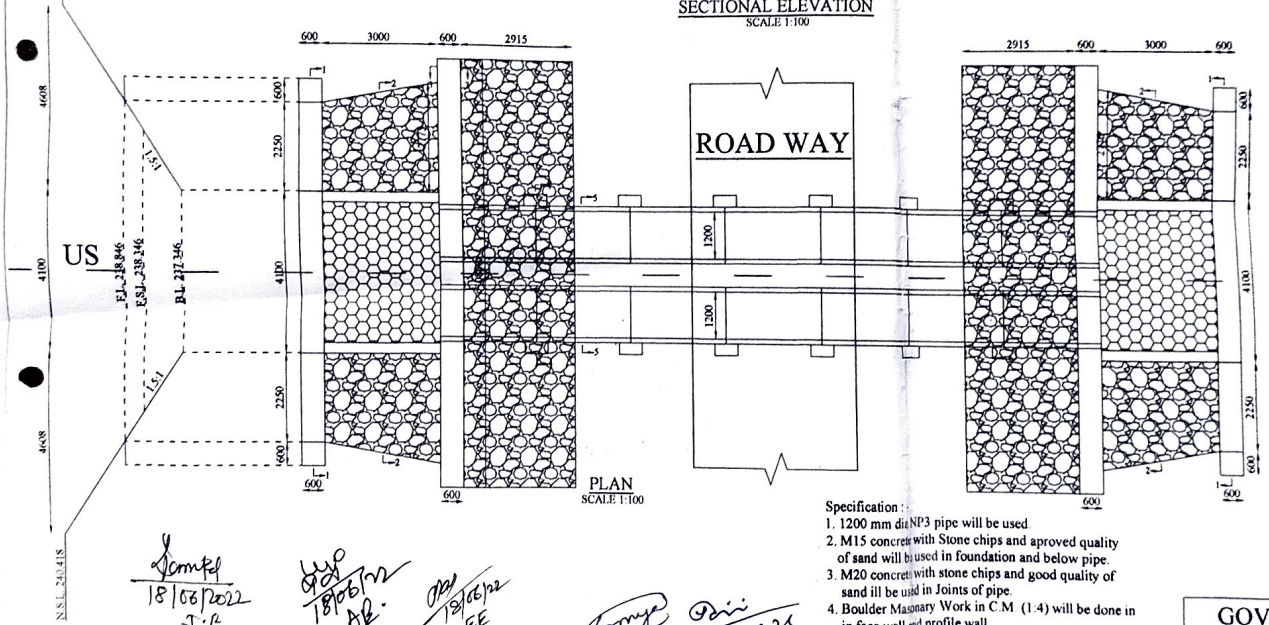
SECTION 5-5
SCALE 1:50

GOVERNMENT OF JHARKHAND	
WATER RESOURCES DEPARTMENT	
PUNASI RESERVOIR SCHEME	
DESIGN OF SLR BRIDGE AT 12050.0 M OF GURUKUL BRANCH CANAL	
PREPARED BY NANO SYSTEM CONSULTANTS PVT. LTD. RANCHI	SHEET NO. 2/2



SECTIONAL ELEVATION
SCALE 1:100

DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.100 M
2	Full Supply Depth	1.000 M
3	Free Board	0.500 M
4	Bed Level	237.346 M
5	Side slope of canal	1.5:1
6	N.S.L. Road Level	240.418 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	2.611
10	Bed Slope	1 in 4000
11	F.S.L	238.346 M
12	**Service Road Level**	**238.846 M**

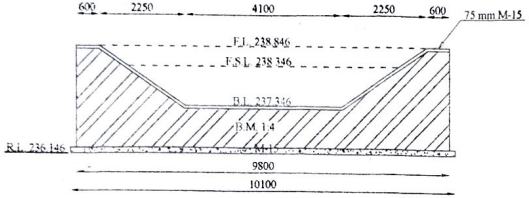


Specification :

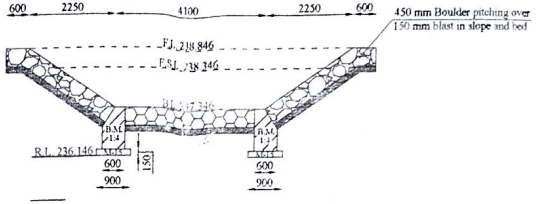
1. 1200 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction as per drawing that will be filled with well compacted sand and no patt will be founded over filled up earth
7. Excavation for construction will be back filled with well compacted earth around the

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR BRIDGE AT 13815.0 M OF GURUKUL BRANCH CANAL

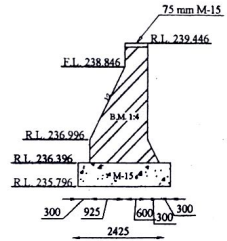
DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	4.100 M
2	Full Supply Depth	1.000 M
3	Free Board	0.500 M
4	Bed Level	237.346 M
5	Side slope of canal	1.5:1
6	N.S.L. Road Level	240.418 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	2.611
10	Bed Slope	1 in 4000
11	F.S.L.	238.346 M
12	Service Road Level	238.846 M



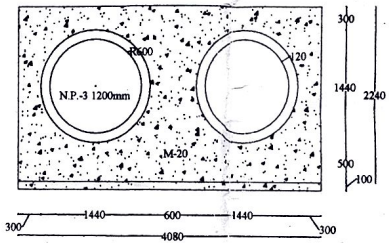
SECTION 1-1
SCALE 1:100



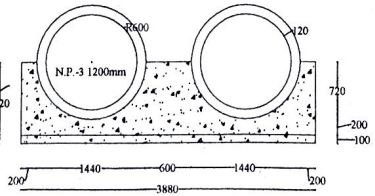
SECTION 2-2
SCALE 1:100



SECTION 3-3
SCALE 1:100



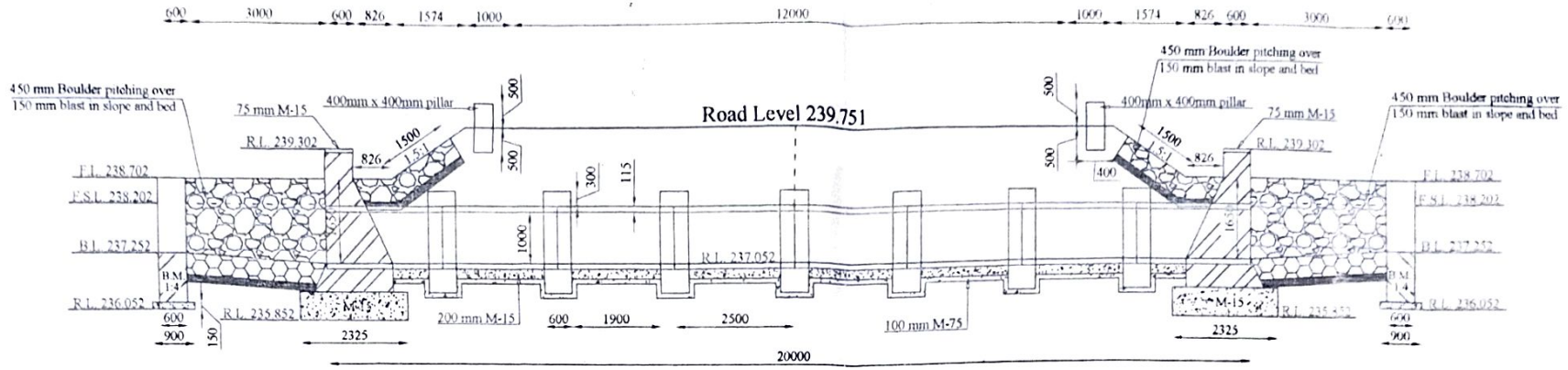
SECTION 4-4
SCALE 1:50



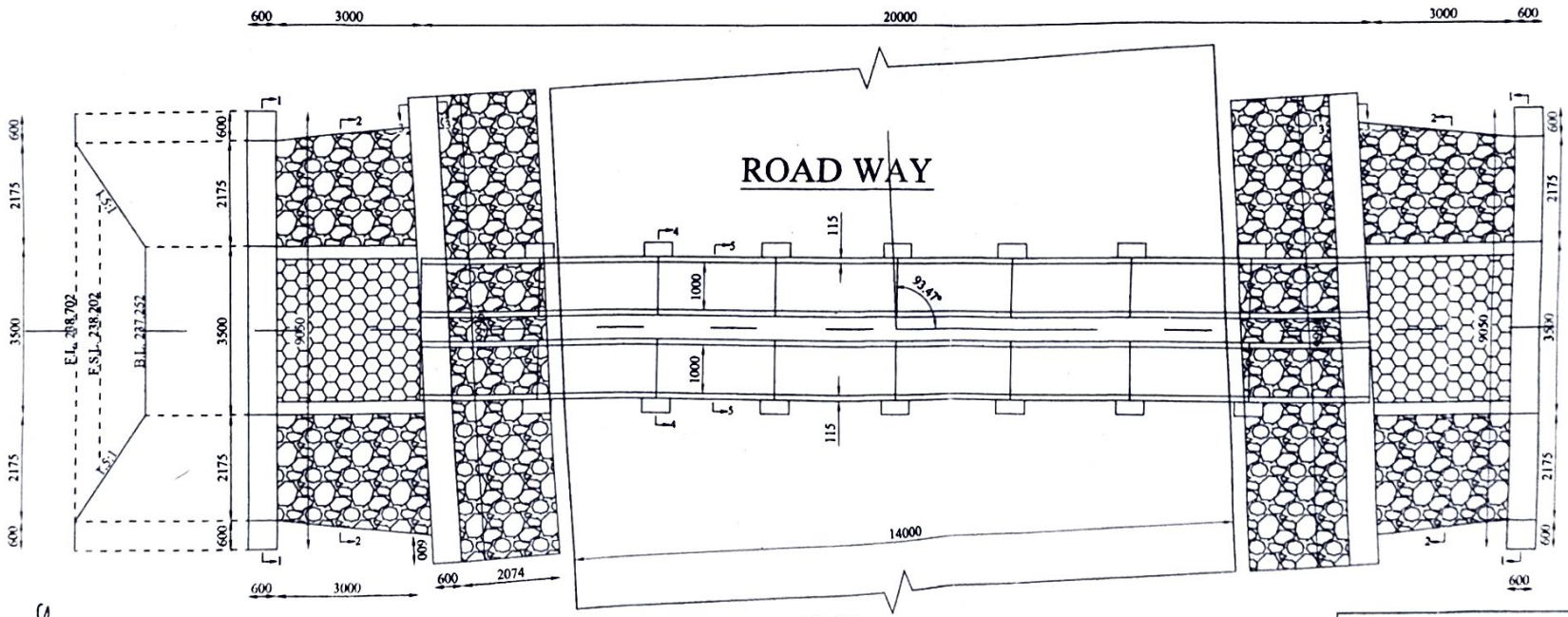
SECTION 5-5
SCALE 1:50

Specification :-
1. 1200 mm dia NP3 pipe will be used.
2. M15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Constraction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF SLR BRIDGE AT 13815.0 M OF GURUKUL BRANCH CANAL



SECTIONAL ELEVATION
SCALE 1:100



PLAN
SCALE 1:100

18/03/2022 J.E

18/03/22 AE

18/03/22 EE

25/03/26 J.E

25/3/26 A.E

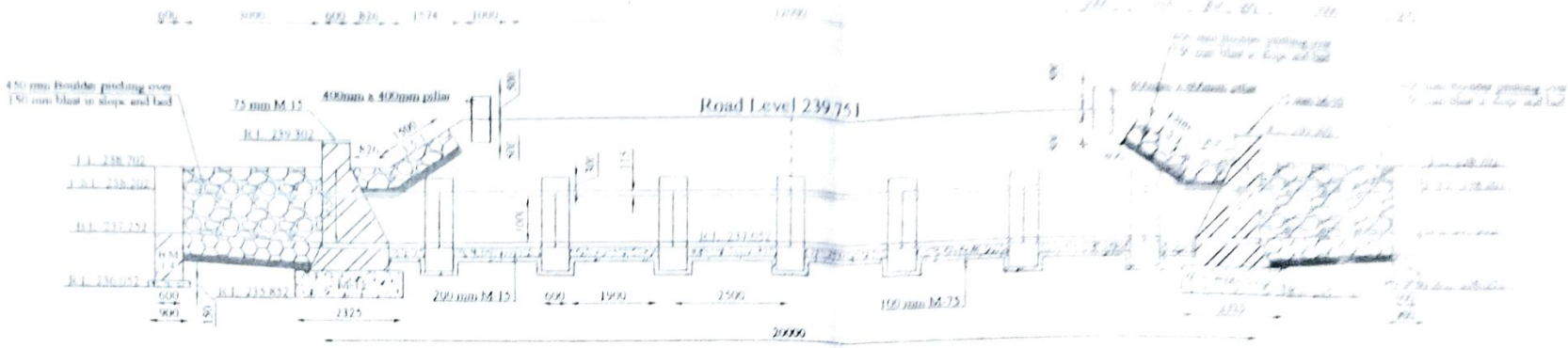
25/3/26

26/3/26 AE

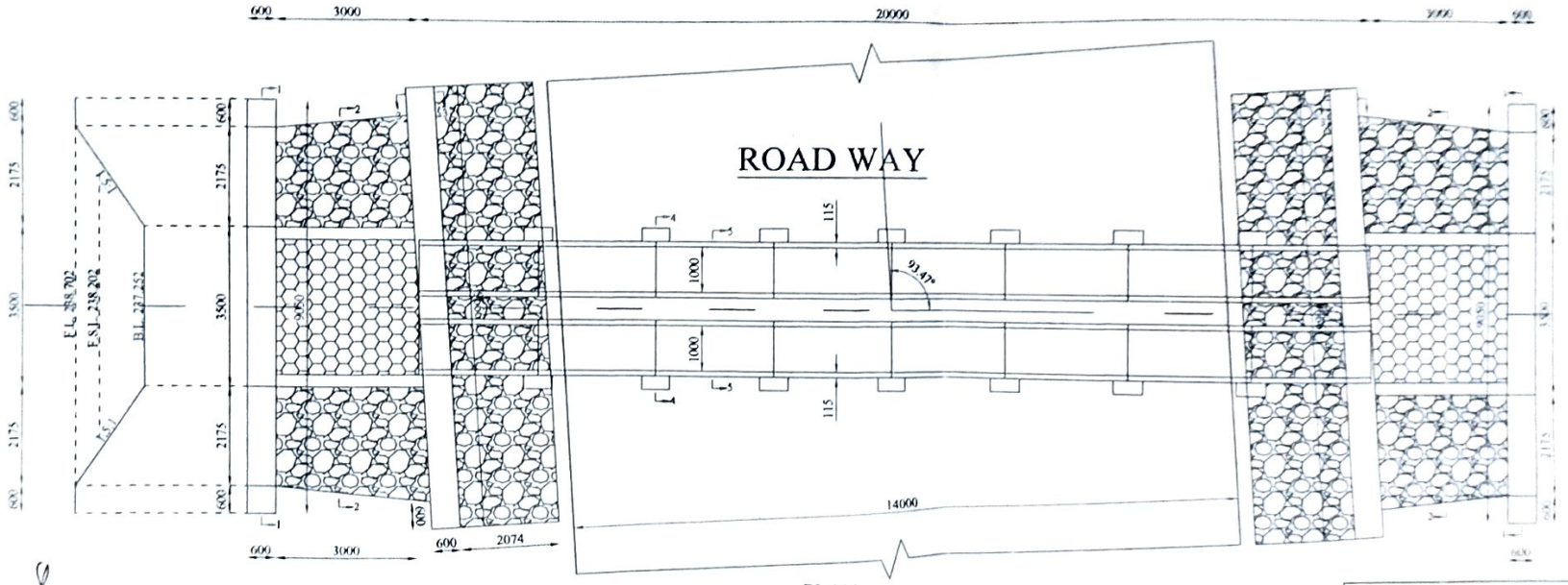
26.3.26 JE

26/3/26

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF DLR BRIDGE AT 14394.0 M OF GURUKUL BRANCH CANAL



SECTIONAL ELEVATION
SCALE 1:100



US

DS

PLAN
SCALE 1:100

18/03/2022 J.E

18/03/22 AE

18/03/22 EE

Abhishek Argal 25/03/26 J.E

Rajesh 25/3/26 A.E

25/3/26

26/3/26 AE

26.3.26 JE

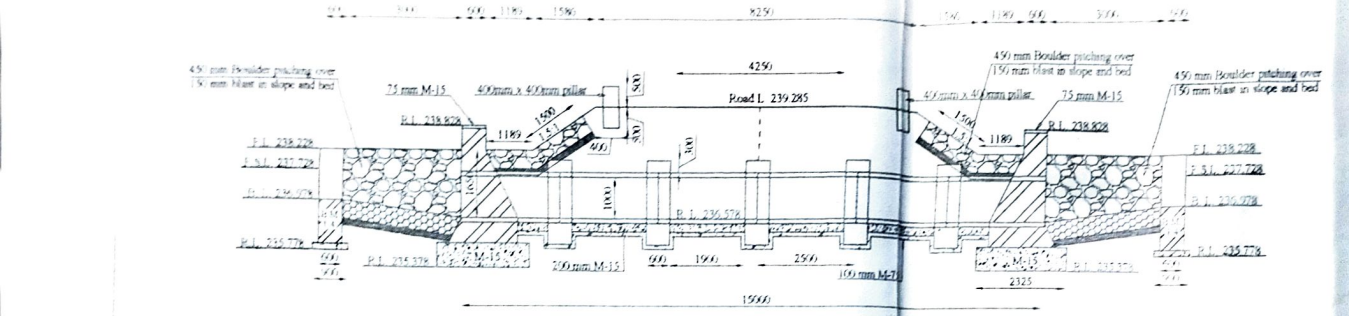
26/3/26

GOVERNMENT OF JHARKHAND

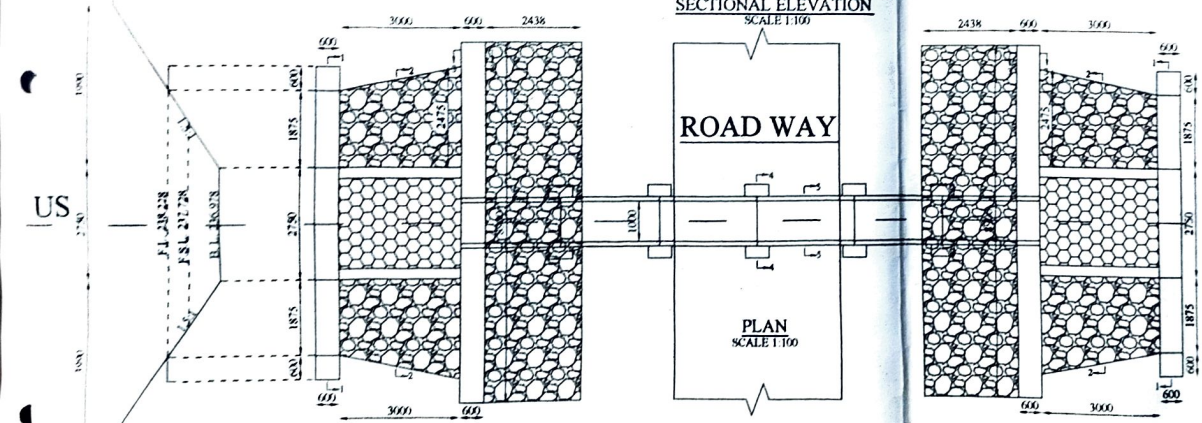
WATER RESOURCES DEPARTMENT

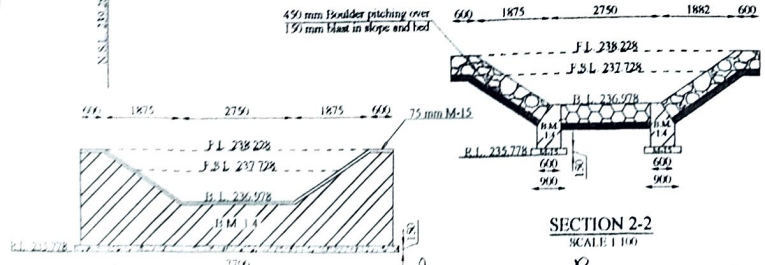
PUNASI RESERVOIR SCHEME

DESIGN OF PIER BRIDGE AT CH 394.0 M

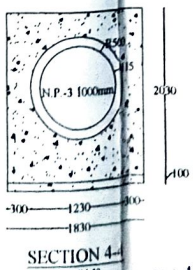


SECTIONAL ELEVATION
SCALE 1:100

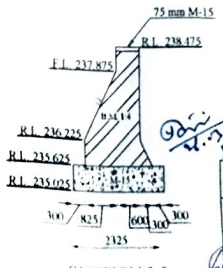




SECTION 2-2
SCALE 1:100



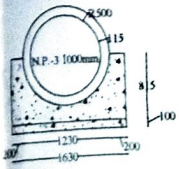
SECTION 4-4
SCALE 1:50



SECTION 3-3
SCALE 1:100

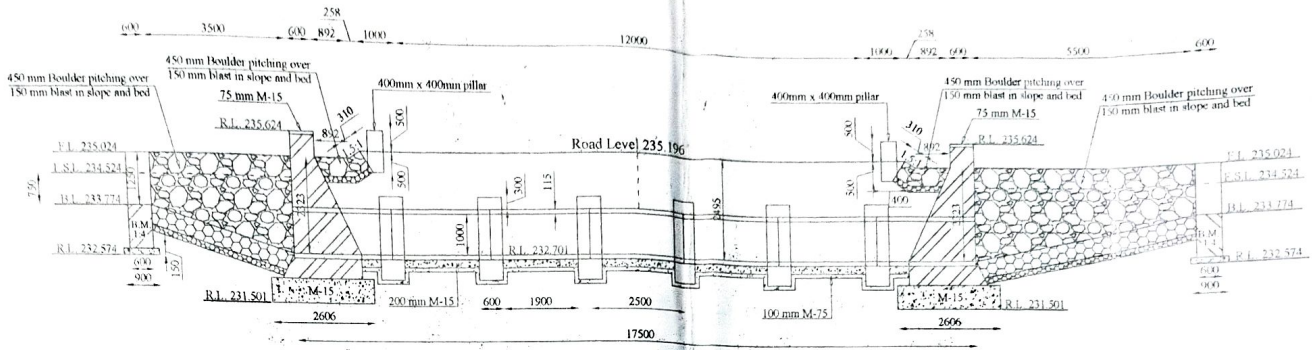
1	Bed Width	2.750 M
2	Full Supply Depth	0.750 M
3	Free Board	0.500 M
4	Bed Level	236.978 M
5	Side slope of canal	1:1
6	N.S.L. (Road Level)	239.285 M
7	Service Road Width	3.750 M
8	Spoil Bank Width	2.500 M
9	F.S.Q in Cumecs	1.078
10	Bed Slope	1 in 4000
11	F.S.L.	237.728 M
12	Service Road Level	238.228 M

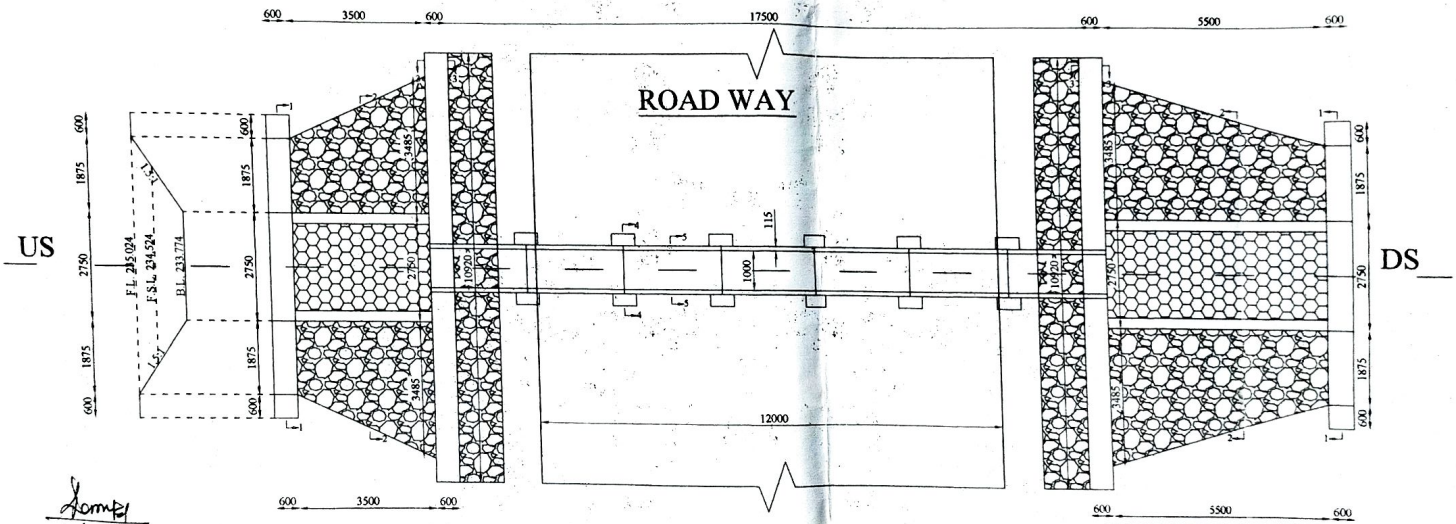
Specification :-
1. 1000 mm dia NP-3 pipe will be used.
2. M-15 concrete with Stone chips and aproved quality of sand will be used in foundation and below pipe.
3. M-20 concrete with stone chips and good quality of sand will be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Construction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.



SECTION 5-5
SCALE 1:50

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF S.L.R. BRIDGE AT 16290.0 M OF GURUKUL BRANCH CANAL





18/06/2022 J.E

18/06/22 A.E

18/06/22 E.E

25/06/26 J.E

25/6/26 A.E

26/6/26 A.E

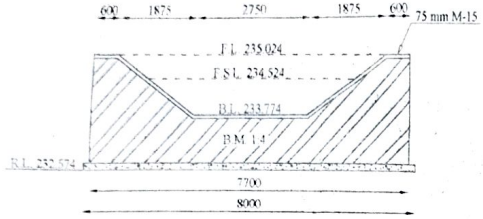
27/6/26 J.E

GOVERNMENT OF JHARKHAND

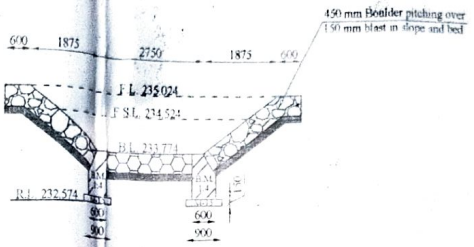
WATER RESOURCES DEPARTMENT

PUNASI RESERVOIR SCHEME

DESIGN OF DLR BRIDGE AT 17105.0 M OF GURUKUL BRANCH CANAL

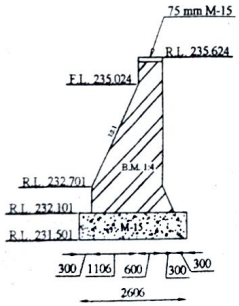


SECTION 1-1
SCALE 1:100

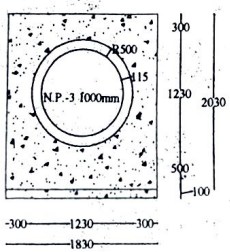


SECTION 2-2
SCALE 1:100

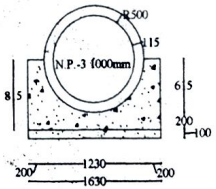
DESIGN DATA (CANAL)		
	Particulars	U/S
1	Bed Width	2.750 M
2	Full Supply Depth	0.750 M
3	Free Board	0.500 M
4	Bed Level	233.774 M
5	Side slope of canal	1:5:1
6	N.S.L.	235.196 M
7	Service Road Width	3.050 M
8	Spoil Bank Width	2.440 M
9	F.S.Q in Cumecs	1.078
10	Bed Slope	1 in 4000
11	F.S.L.	234.524 M
12	Service Road Level	235.024 M



SECTION 3-3
SCALE 1:100



SECTION 4-4
SCALE 1:50



SECTION 5-5
SCALE 1:50

Specification :-

1. 1000 mm dia NP3 pipe will be used.
2. M-15 concrete with Stone chips and aproved quality of sand will be used in foundation below well and pipe.
3. M-20 concrete with stone chips and good quality of sand ill be used in Joints of pipe.
4. Boulder Masonary Work in C.M. (1:4) will be done in in face wall and profile wall.
5. 100 mm mud mat below concrete work in foundation will be done.
6. Wherever Filling above N.S.L. is found for Construction as per drawing that will be filled with well compacted sand and no part will be founded over filled up earth.
7. Excavation for construction will be back filled with well compacted (with water) earth.
8. Weep hole @ 1.5 M C/C staggered will be provided with 600 x 600 x 600 mm filter material at back in face walls.

GOVERNMENT OF JHARKHAND
WATER RESOURCES DEPARTMENT
PUNASI RESERVOIR SCHEME
DESIGN OF DLR BRIDGE AT 17105.0 M OF GURUKUL BRANCH CANAL