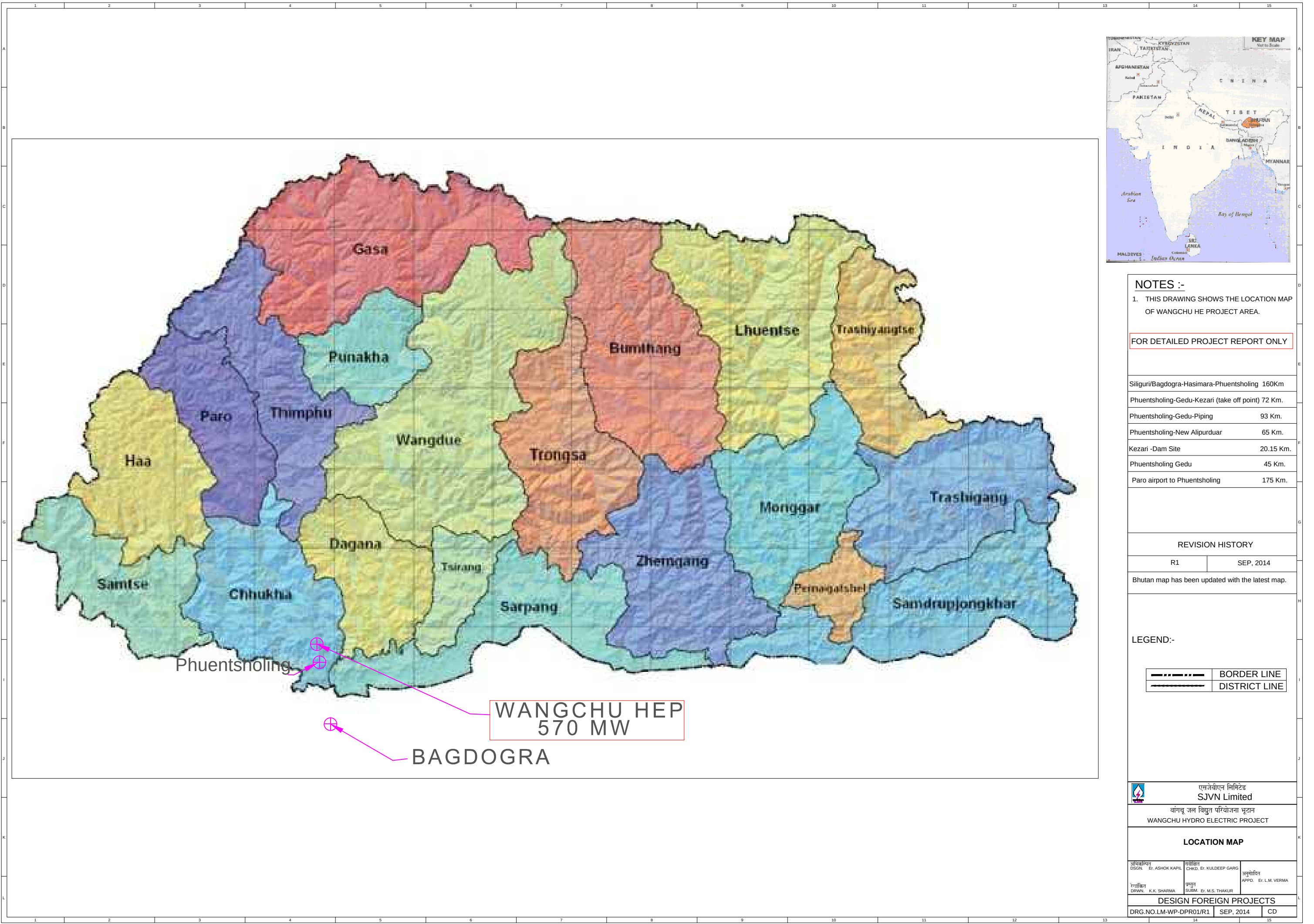




NOTES :-
1. THIS DRAWING SHOWS THE LOCATION MAP OF WANGCHU HE PROJECT AREA.

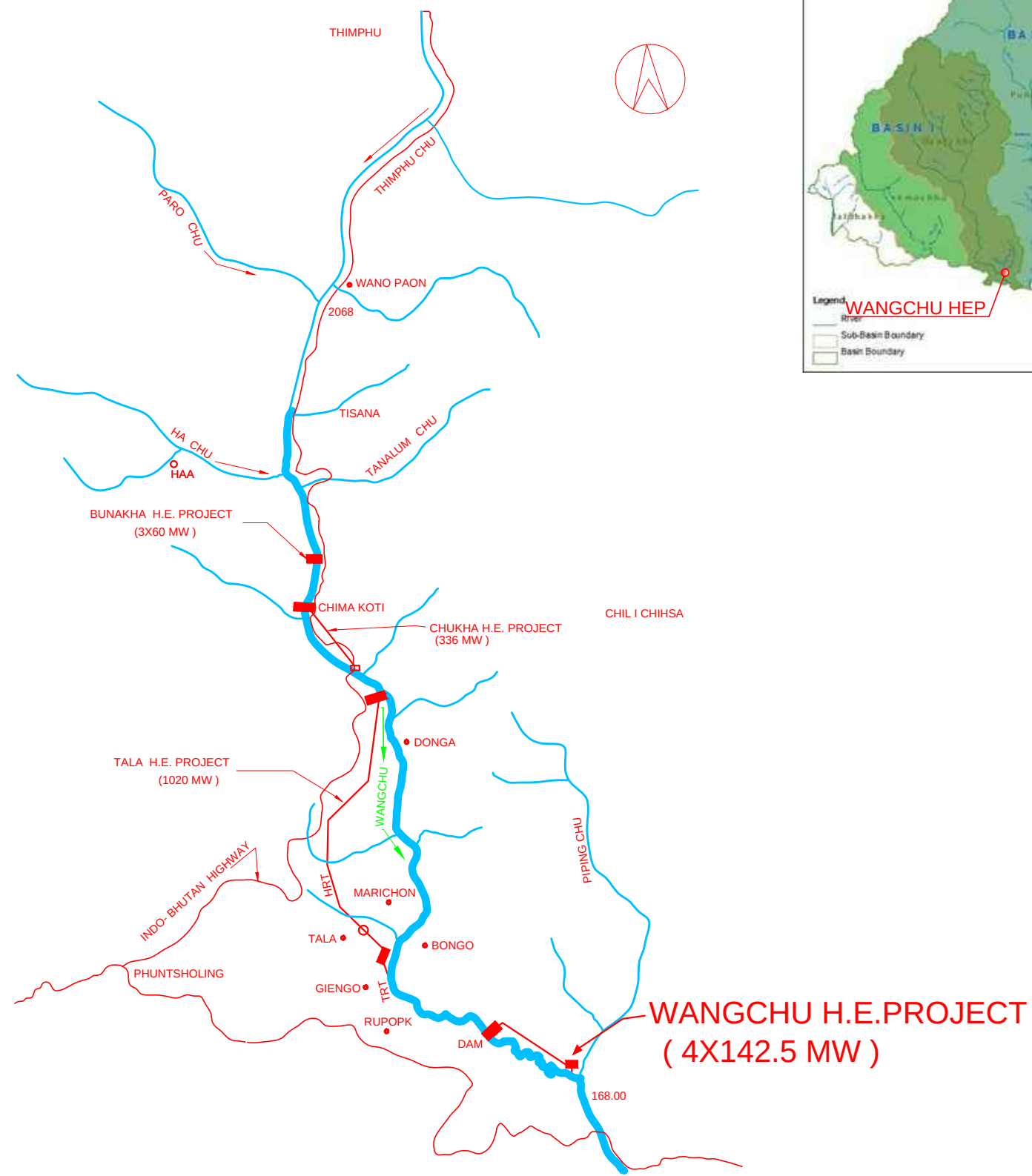
FOR DETAILED PROJECT REPORT ONLY

Siliguri/Bagdogra-Hasimara-Phuentsholing	160Km
Phuentsholing-Gedu-Kezari (take off point)	72 Km.
Phuentsholing-Gedu-Piping	93 Km.
Phuentsholing-New Alipurduar	65 Km.
Kezari -Dam Site	20.15 Km.
Phuentsholing Gedu	45 Km.
Paro airport to Phuentsholing	175 Km.

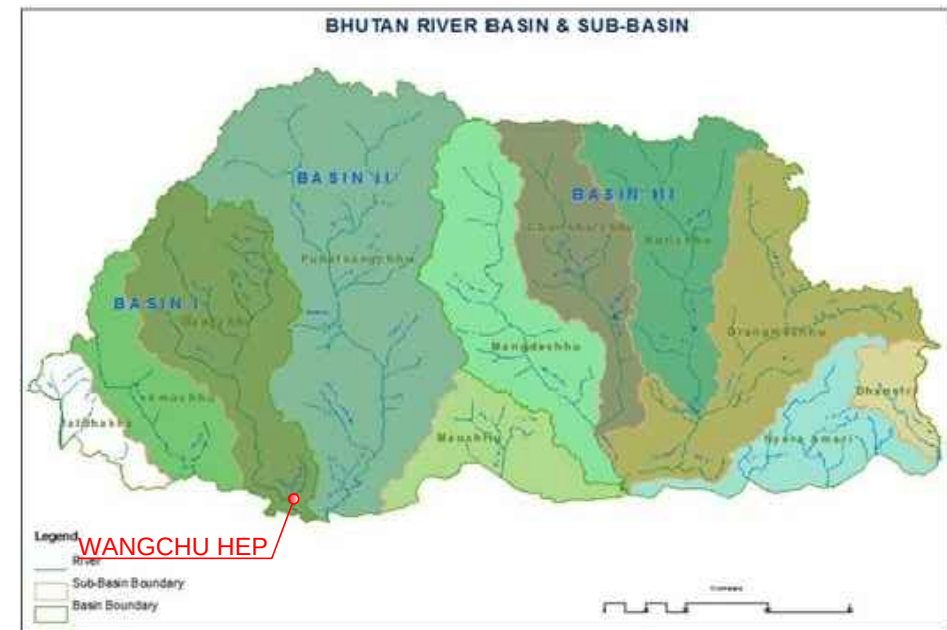
REVISION HISTORY	
R1	SEP, 2014
Bhutan map has been updated with the latest map.	

LEGEND:-	
	BORDER LINE
	DISTRICT LINE

एसजेवीएन लिमिटेड SJVN Limited		
वांगचू जल विद्युत परियोजना भूटान WANGCHU HYDRO ELECTRIC PROJECT		
LOCATION MAP		
अभिस्वीकृत DSGN. Er. ASHOK KAPIL	मंजूरित CHKD. Er. KULDEEP GARG	अनुमोदित APPD. Er. L.M. VERMA
रचयिता DRWN. K.K. SHARMA	परामर्श SUBM. Er. M.S. THAKUR	
DESIGN FOREIGN PROJECTS		
DRG.NO.LM-WP-DPR01/R1	SEP, 2014	CD



VICINITY MAP



NOTES:--

1. ALL DIMENSIONS ARE IN MILLIMETRES & ELEVATIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
- 2.NO DIMENSIONS SHALL BE SCALED OUT ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

REVISION HISTORY

R1

SEP, 2014

Bhutan map has been updated with the latest map.

legends:



Wangchu river.



Other projects.



Indo- Bhutan Highway



एसजेवीएन लिमिटेड
SJVN Limited

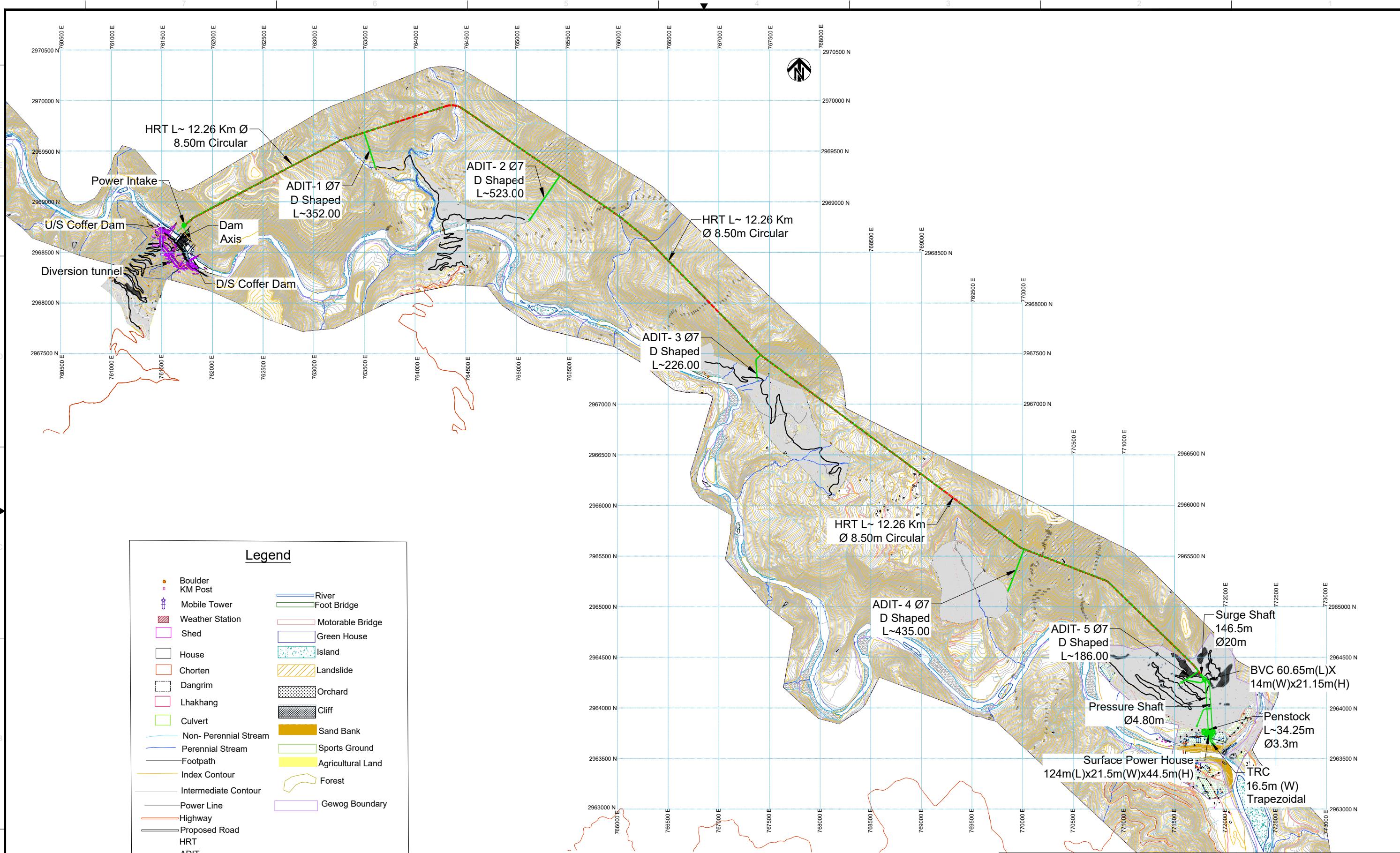
वांग्चू जलविद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

VICINITY MAP

आपिकल्पित DSGN. Er. PRIYANKA	समीक्षित CHKD.Er. ASHOK KAPIL	अनुमोदित APPD. Er. L.M. VERMA
रेखांकित DRWN. B.S.BANYAL	प्रस्तुत SUBM.Er. M.S. THAKUR	

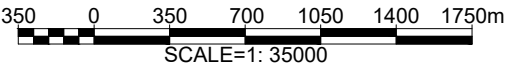
DESIGN FOREIGN PROJECTS

DRG.NO.VM-WP-DPR02/R1 SEP.:2014 CD

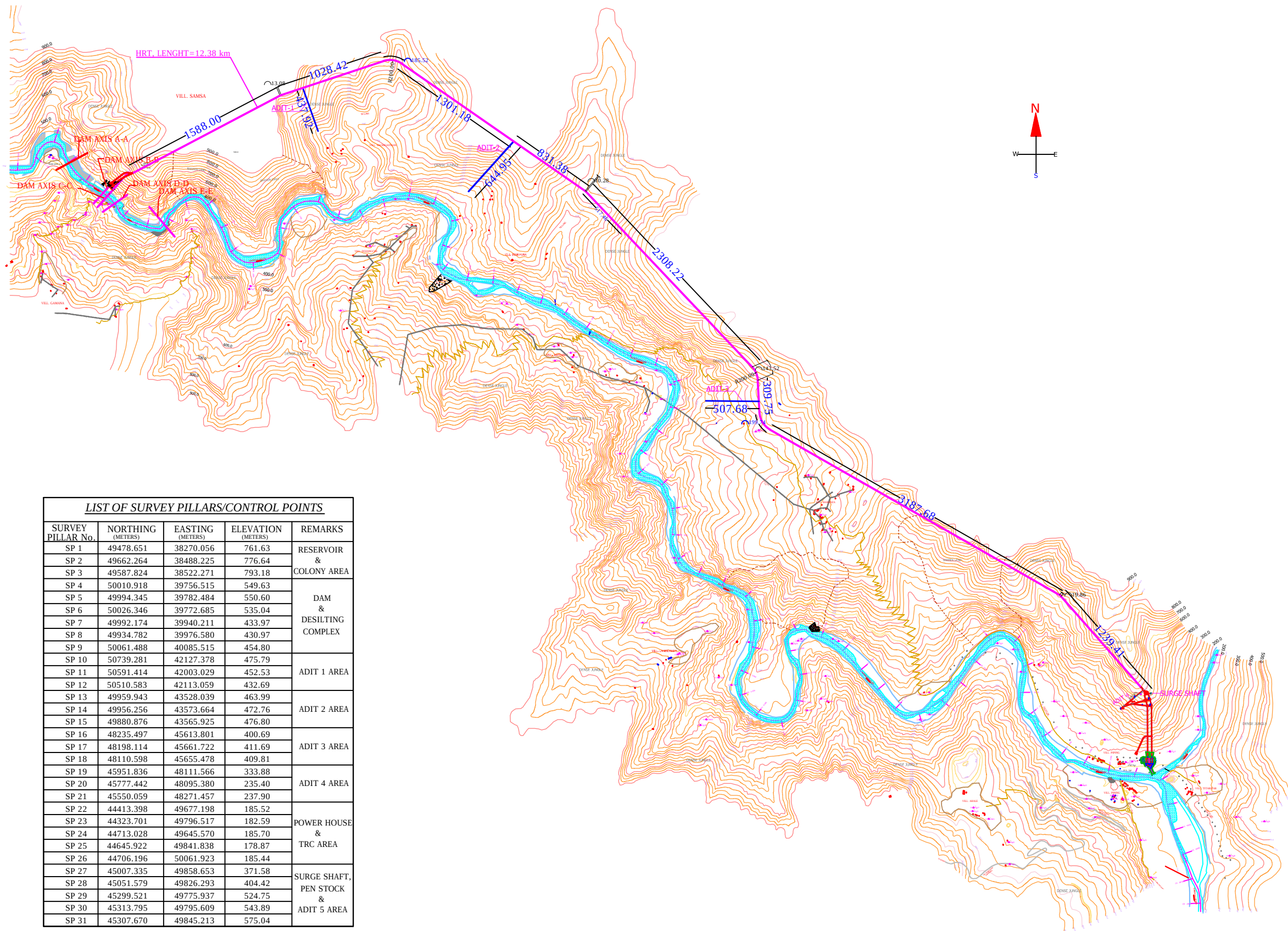


Legend

Boulder	River
KM Post	Foot Bridge
Mobile Tower	Motorable Bridge
Weather Station	Green House
Shed	Island
House	Landslide
Chorten	Orchard
Dangrim	Cliff
Lhakhang	Sand Bank
Culvert	Sports Ground
Non-Perennial Stream	Agricultural Land
Perennial Stream	Forest
Footpath	Gewog Boundary
Index Contour	
Intermediate Contour	
Power Line	
Highway	
Proposed Road	
HRT	
ADIT	



Owner:		WANGCHHU HYDROELECTRIC POWER LTD.		
Date	August, 2026	Revised date		Project: 570 MW WANGCHHU HYDROELECTRIC POWER LIMITED CHHUKHA, BHUTAN
Designed		Verified		Title: GENERAL PROJECT LAYOUT
Reviewed		Approved		
Drawn		Scale	AS SHOWN	Drawing No.
THIS DRAWING IS MEANT FOR REFERENCE ONLY.				DRG.No.PL.WP - DPR03/R1
				Rev. 1 A3



LIST OF SURVEY PILLARS/CONTROL POINTS				
SURVEY PILLAR No.	NORTHING (METERS)	EASTING (METERS)	ELEVATION (METERS)	REMARKS
SP 1	49478.651	38270.056	761.63	RESERVOIR & COLONY AREA
SP 2	49662.264	38488.225	776.64	
SP 3	49587.824	38522.271	793.18	
SP 4	50010.918	39756.515	549.63	
SP 5	49994.345	39782.484	550.60	DAM & DESILTING COMPLEX
SP 6	50026.346	39772.685	535.04	
SP 7	49992.174	39940.211	433.97	
SP 8	49934.782	39976.580	430.97	
SP 9	50061.488	40085.515	454.80	ADIT 1 AREA
SP 10	50739.281	42127.378	475.79	
SP 11	50591.414	42003.029	452.53	
SP 12	50510.583	42113.059	432.69	
SP 13	49959.943	43528.039	463.99	ADIT 2 AREA
SP 14	49956.256	43573.664	472.76	
SP 15	49880.876	43565.925	476.80	
SP 16	48235.497	45613.801	400.69	
SP 17	48198.114	45661.722	411.69	ADIT 3 AREA
SP 18	48110.598	45655.478	409.81	
SP 19	45951.836	48111.566	333.88	
SP 20	45777.442	48095.380	235.40	
SP 21	45550.059	48271.457	237.90	ADIT 4 AREA
SP 22	44413.398	49677.198	185.52	
SP 23	44323.701	49796.517	182.59	
SP 24	44713.028	49645.570	185.70	
SP 25	44645.922	49841.838	178.87	POWER HOUSE & TRC AREA
SP 26	44706.196	50061.923	185.44	
SP 27	45007.335	49858.653	371.58	
SP 28	45051.579	49826.293	404.42	
SP 29	45299.521	49775.937	524.75	SURGE SHAFT, PEN STOCK & ADIT 5 AREA
SP 30	45313.795	49795.609	543.89	
SP 31	45307.670	49845.213	575.04	

NOTES:-

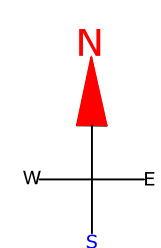
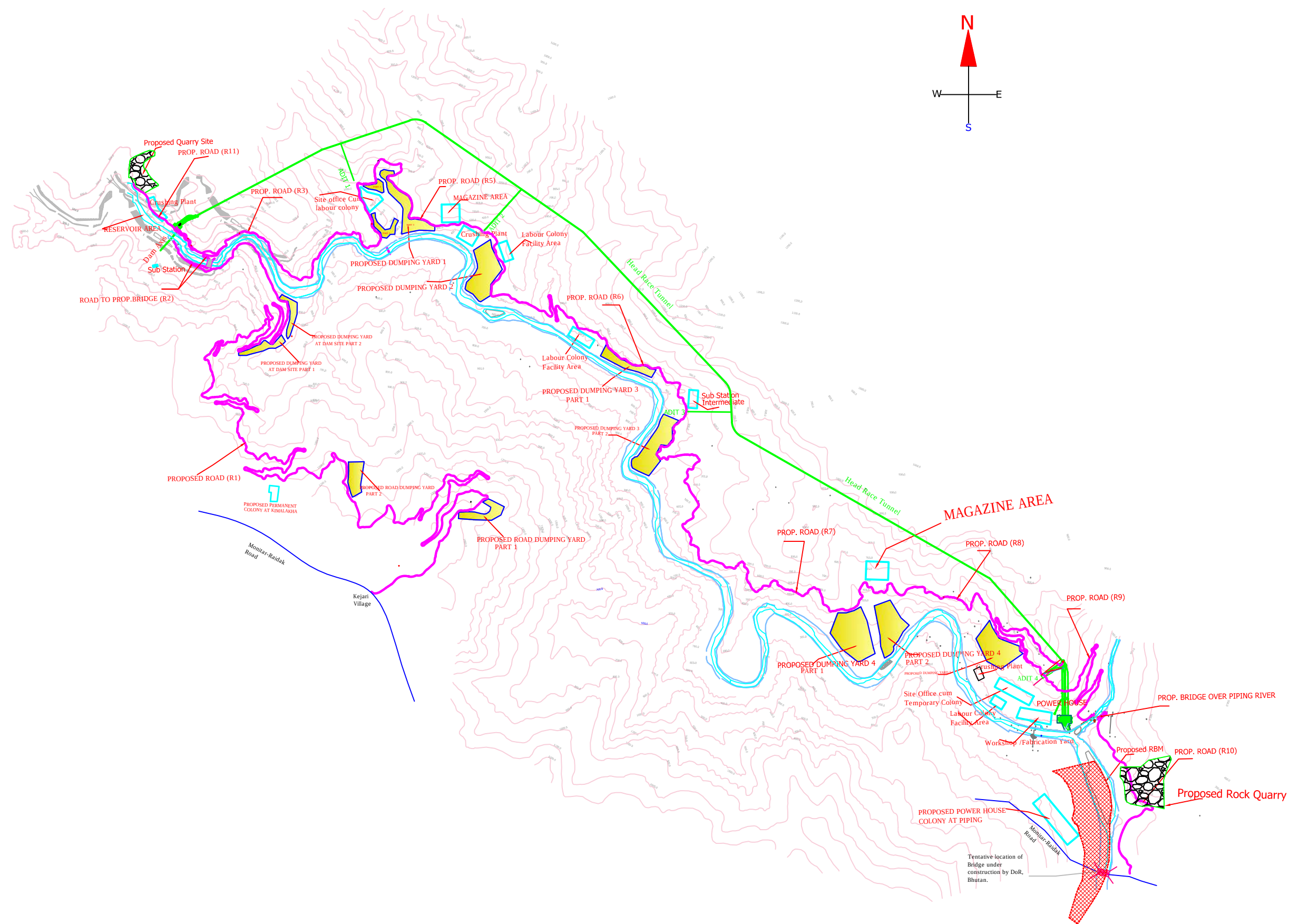
1. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES. UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

LEGEND	
1	RIVER
2	RIVER BORNE MATERIAL
3	NALLAH
4	FOOT PATH
5	ELECTRIC LINE
6	CULTIVATION LIMIT
7	BOULDER
8	ROCK
9	CONTOUR LINE
10	CONTROL POINT
CONTOUR INTERVAL 25.0m	

REVISION AS PER LATEST DATA AVAILABLE

 एस्‌जेन लिमिटेड SJVN LIMITED		
वांगचु, जस वल्लिग परियोजना भुटान WANGCHU H.E. PROJECT BHUTAN		
WANGCHU H.E. PROJECT (570MW) PROJECT LAYOUT VARIOUS ALTERNATIVES		
अभिप्रेत DSGN. ER. Bharu Sharma	अभिप्रेत CHKD. ER. Kulddeep Gang	अभिप्रेत APPD. ER. L.M. VERMA
तयार DRWN. ER. Mohit Shukla	सुपर SUBM. ER. M S Thakur	
DESIGN FOREIGN PROJECTS		
DRG.NO.PA-WP-DPR-04/R1	SEP, 2014	CD



NOTES:-

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS OTHERWISE SPECIFIED

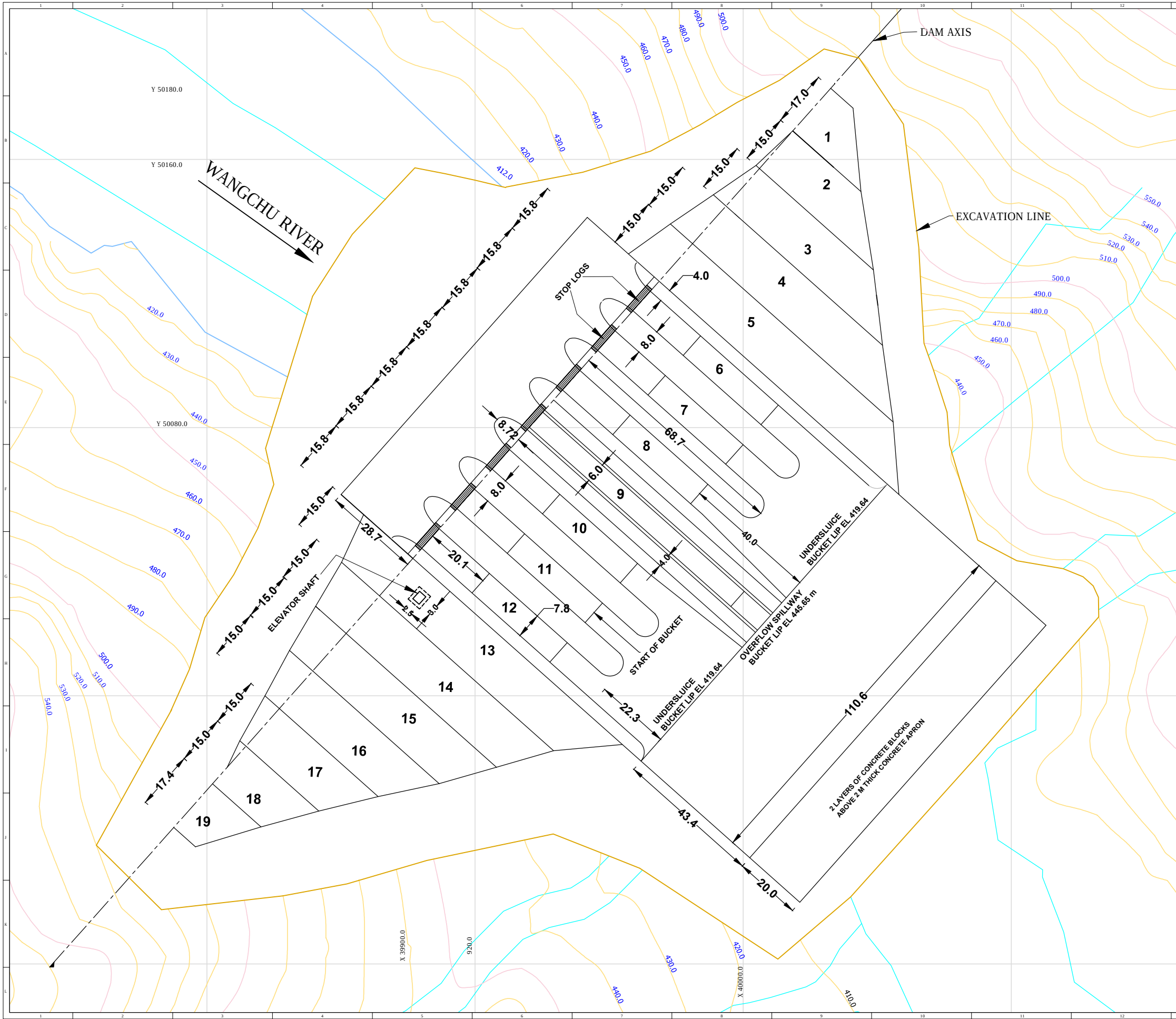
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

LEGEND	
1 RIVER	
2 ROAD	
3 BRIDGE	
4 DUMPING YARD	
5 TEMPORARY STRUCTURE	
6 PERMANENT STRUCTURE	
7 ROCK QUARRY	
8 RBM	
CONTOUR INTERVAL 100.0m	

REVISION AS PER LATEST DATA AVAILABLE.

 एसजेवीएन लिमिटेड SJVN LIMITED		
वांगचु जल विद्युत परियोजना भूटान WANGCHU H.E. PROJECT 570 MW (BHUTAN)		
PROJECT INFRASTRUCTURE FACILITIES		
आयोजनाकर्ता DSGN. ER.Mohit Shukla	अधीक्षक CHKD.ER.Ashok Kumar	अनुमोदित APPD. ER. L.M. VERMA
रचयिता DRWN.ER.Bhanu Sharma	समीक्षक SUBM. ER. MS THAKUR	
DESIGN FOREIGN PROJECTS		
DRG.NO.IF-WP-DPR05/R2	SEP, 2014	CD-1



NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS.
2. NO DIMENSIONS SHALL BE SCALED OUT. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS :

DRG. NO.	TITLE
DM-WP-DPR02/00	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS
DM-WP-DPR-07R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- OVERFLOW SECTION 7,8 & 10
DM-WP-DPR08R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- OVERFLOW SECTION I/C SPILLWAY -BLOCK 9

SCALE



एसजेवीएन लिमिटेड
SJVN Limited

वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

DAM COMPLEX
CONCRETE GRAVITY DAM
EXCAVATION PLAN

अभिष्क्रियत
DSGN. Er. ASHOK KAPIL

समीक्षित
CHKD. Er. KULDIP GARG

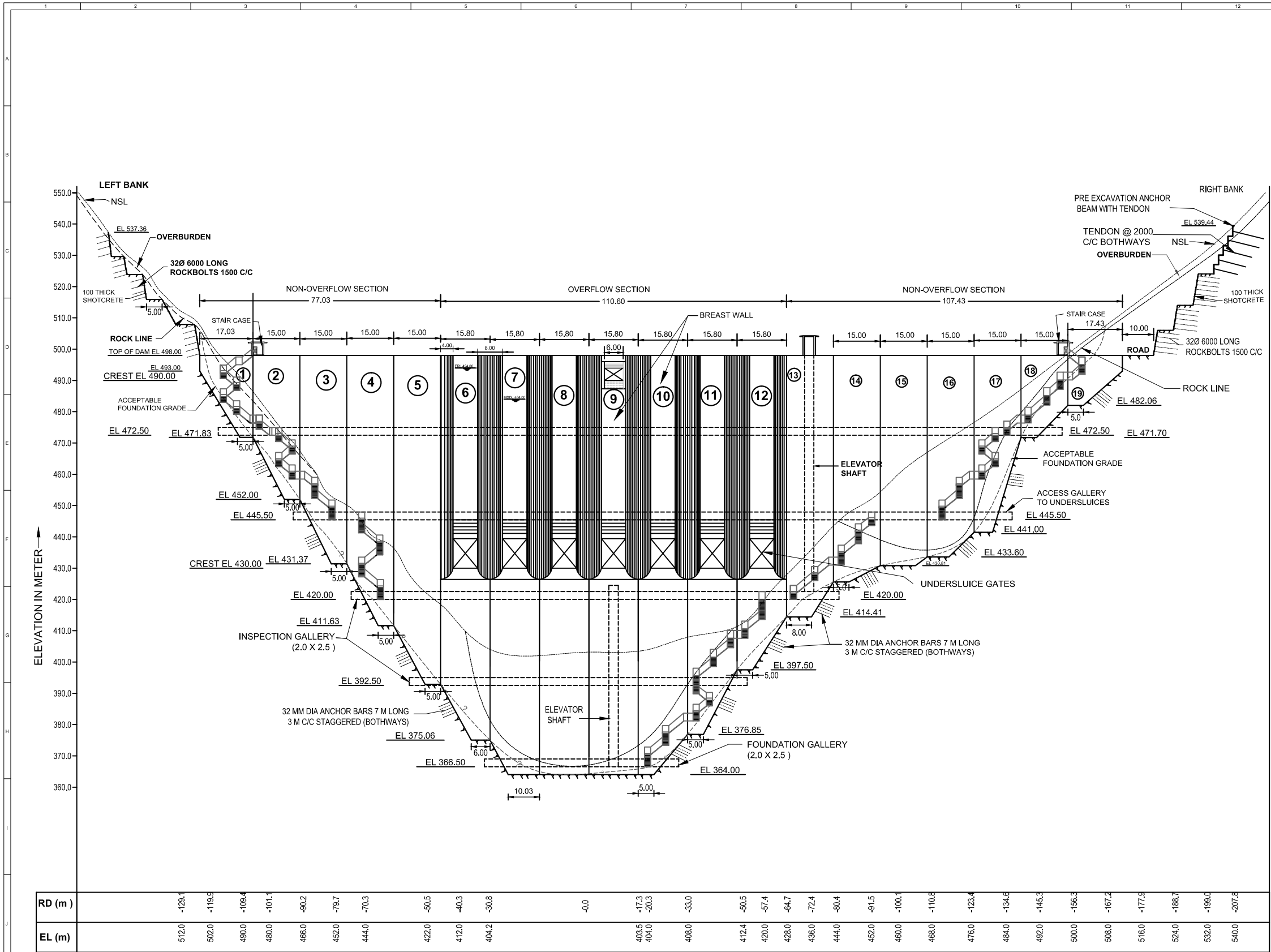
अनुमोदित
APPD. Er. L.M. VERMA

रचयिता
DRWN. DEVI CHAND

प्रस्तुत
SUBM. Er. M.K.SHARMA

DESIGN FOREIGN PROJECTS

DRG. No. DM-WP-DPR01/R1 | FEB, 2014 | CD



NOTES

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WP-DPR01/00	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR05/00	DAM COMPLEX - CONCRETE GRAVITY DAM- MAX NOF SECTION -BLOCK 5
DM-WP-DPR07/00	DAM COMPLEX - CONCRETE GRAVITY DAM- OVERFLOW SECTION 7,8 & 10
DM-WP-DPR08/00	DAM COMPLEX - CONCRETE GRAVITY DAM- OVERFLOW SECTION I/C SPILLWAY -BLOCK 9

SCALE



एसजेवीएन लिमिटेड
SJVN Limited

वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

DAM COMPLEX
CONCRETE GRAVITY DAM
SECTION ALONG DAM AXIS

अभिफलित
DSGN. Er. ASHOK KAPIL

संयोजित
CHKD. Er. KULDIP GARG

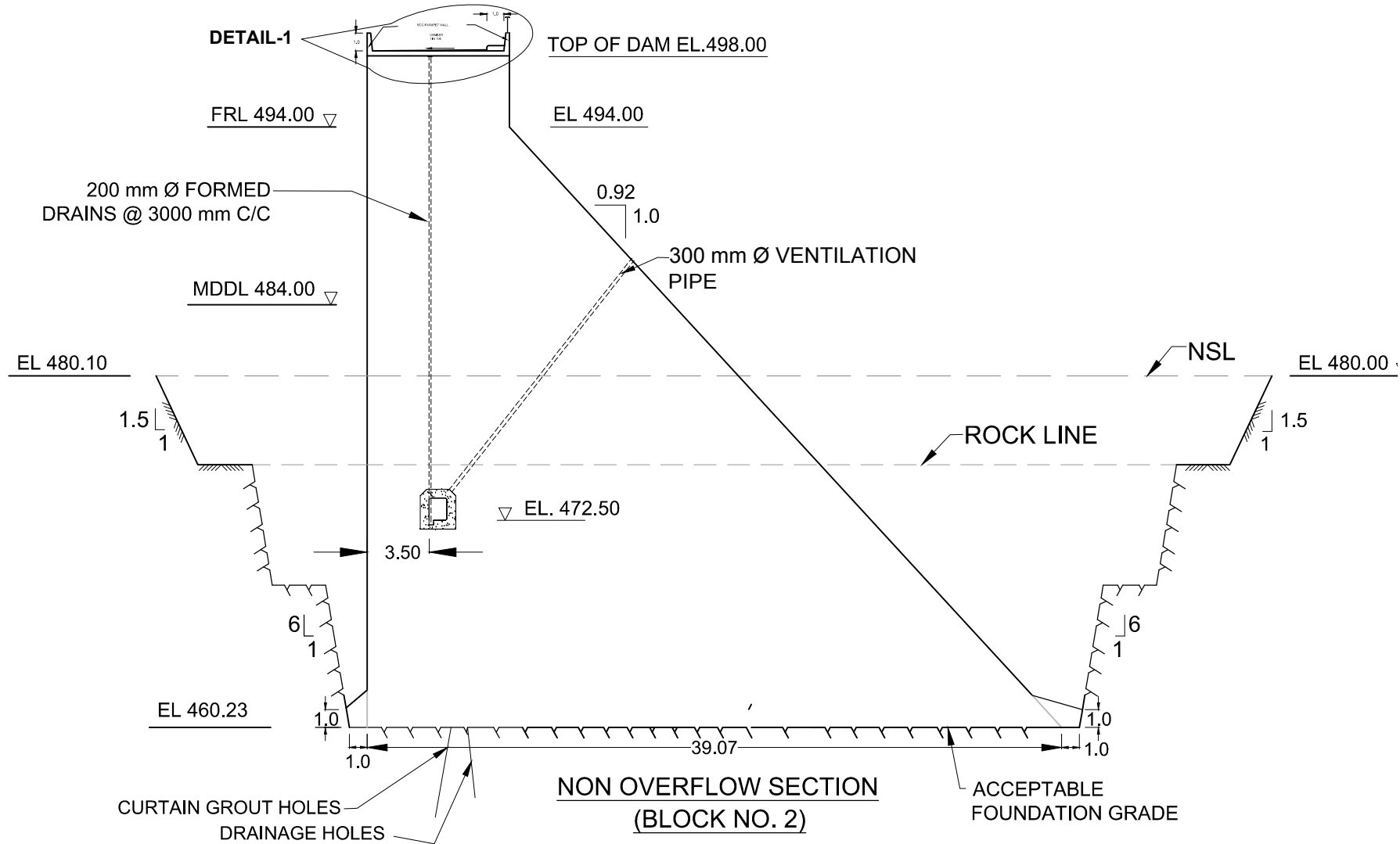
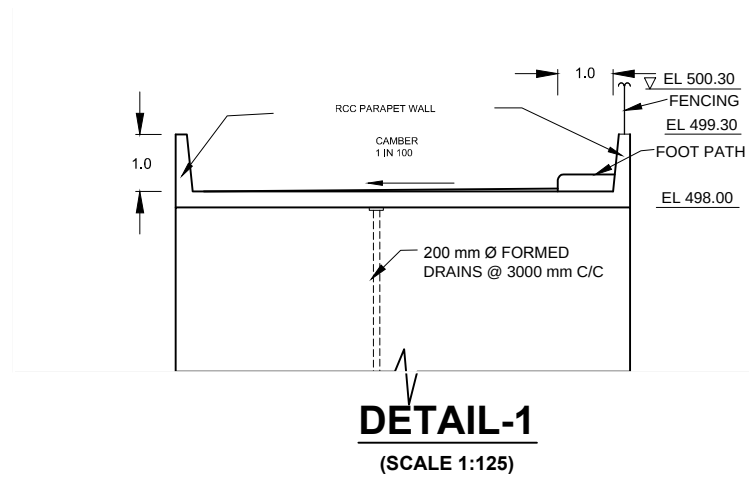
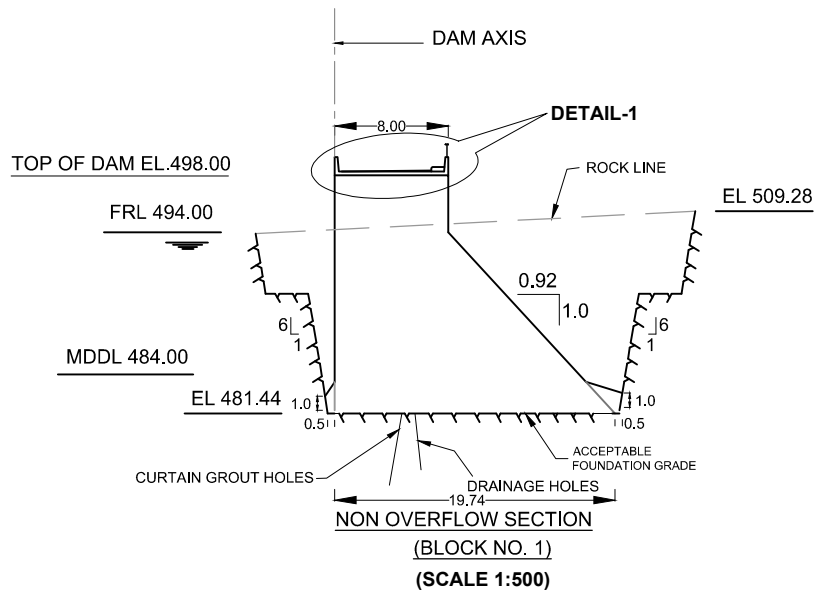
अनुमोदित
APPD. Er. L.M. VERMA

रेखांकित
DRWN. DEVI CHAND

प्रस्तुत
SUBM. Er. M.K.SHARMA

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR02/R1 FEB, 2014 CD



NOTES :-

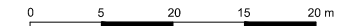
1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS SPECIFIED OTHERWISE.
2. NO DIMENSIONS SHALL BE SCALED OUT. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WP-DPR01/00	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02/00	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS

SCALE



एसजेवीएन लिमिटेड
SJVN Limited

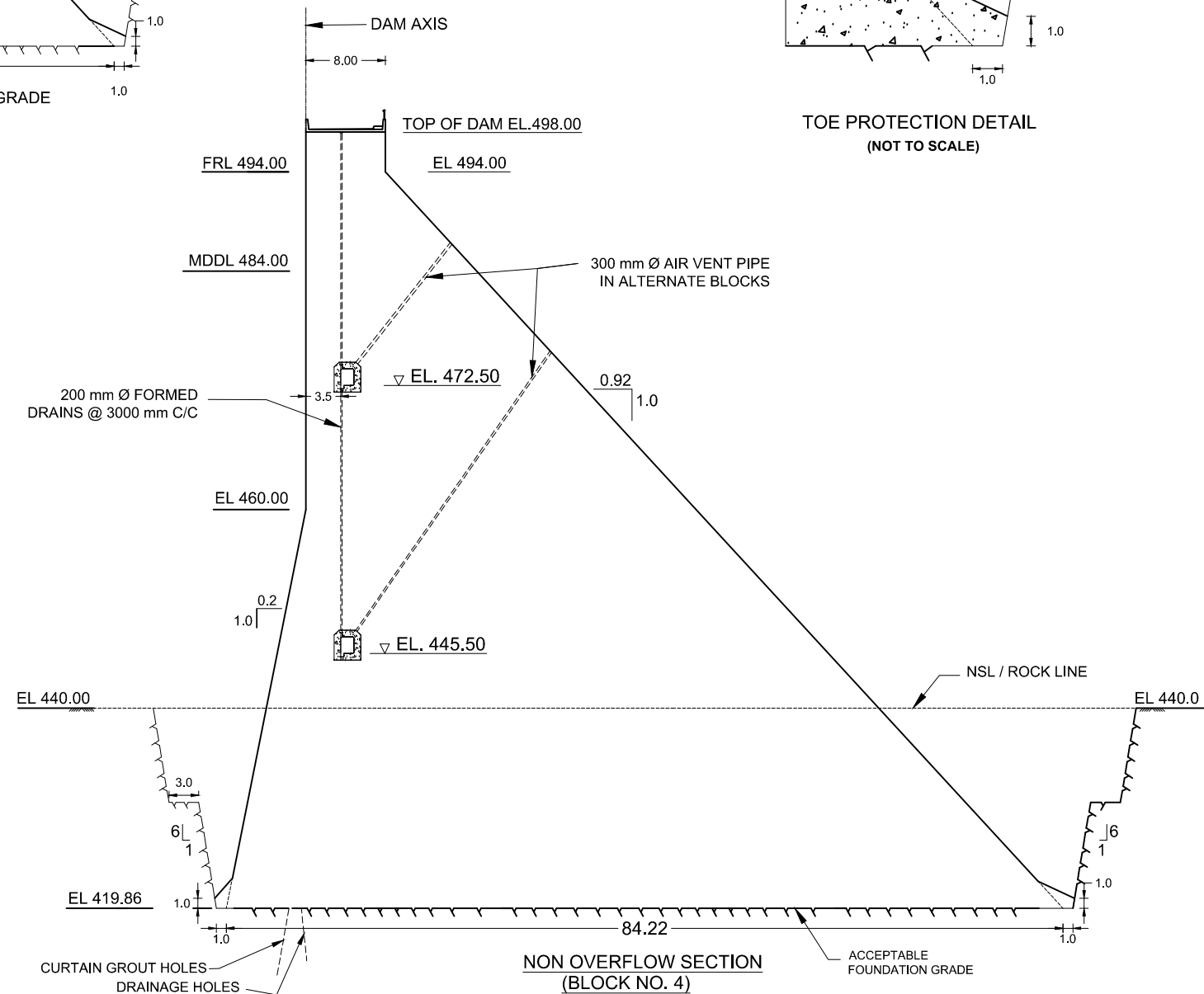
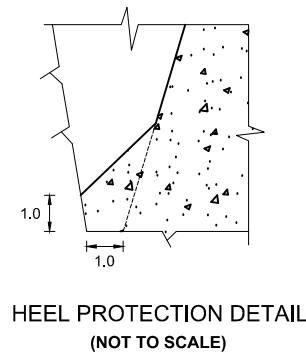
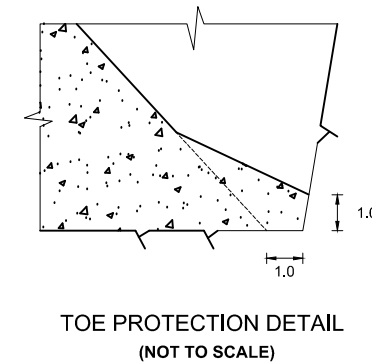
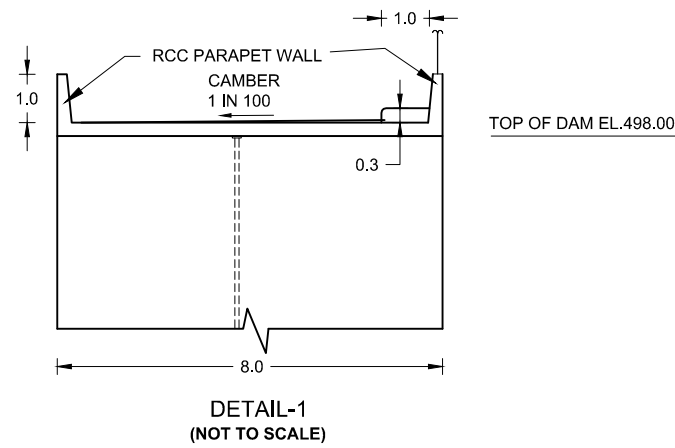
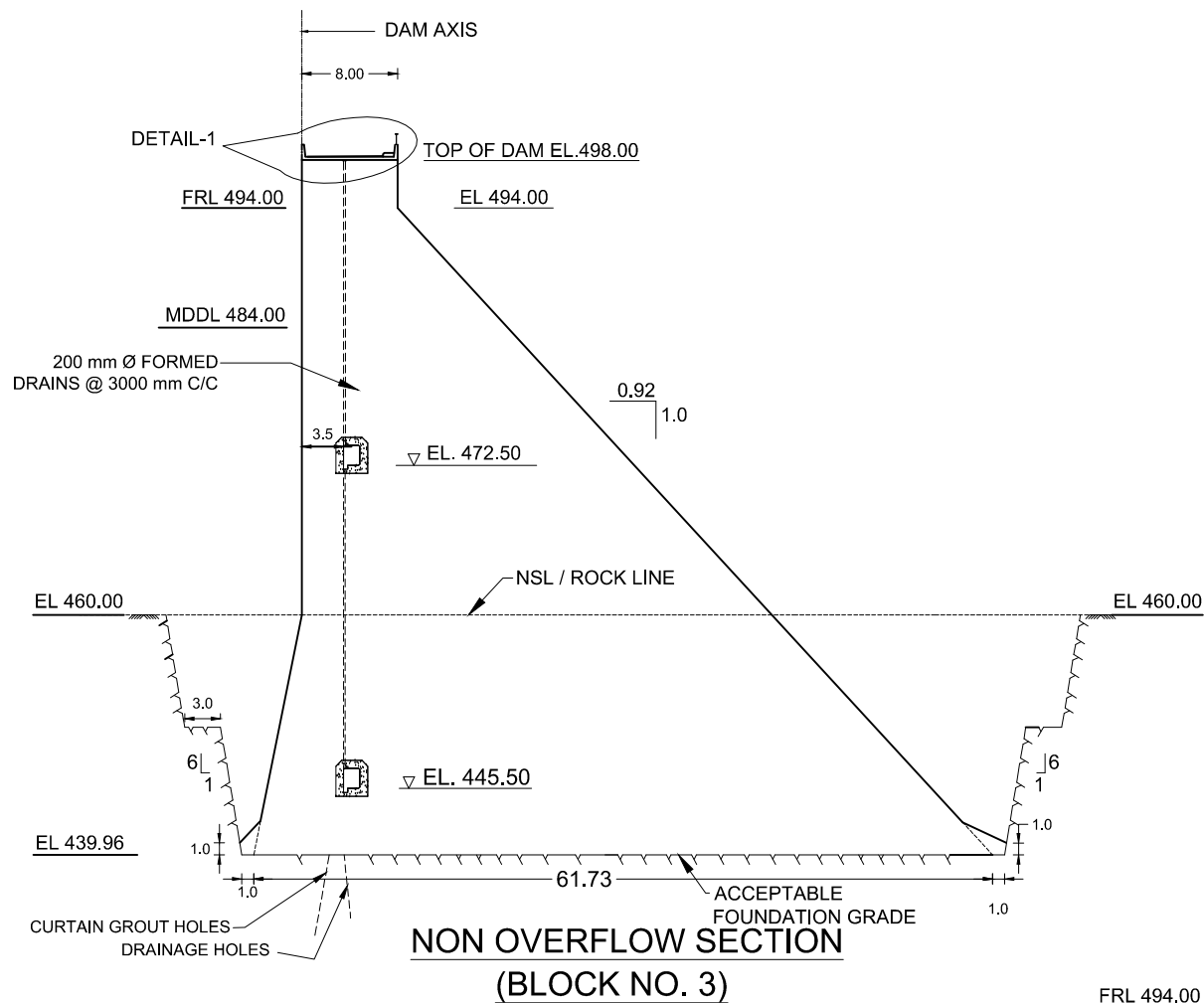
वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
NON-OVERFLOW SECTION
(BLOCK NO. 1&2)**

अभिकल्पित DSGN. Er.ASHOK KAPIL	समीक्षा CHKD. Er.SUMIT KUMAR	अनुमोदित APPD. Er.L.M.VERMA
रचयिता DRWN. K.K. SHARMA	प्रस्तुत SUBM. Er.M.K.SHARMA	

DESIGN FOREIGN PROJECTS

DRG. No. DM-WP-DPR03/R1	FEB, 2014	CD
-------------------------	-----------	----



NOTES :-

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS.
- NO DIMENSIONS SHALL BE SCALED OUT. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WP-DPR01R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS



एसजेवीएन लिमिटेड
SJVN Limited

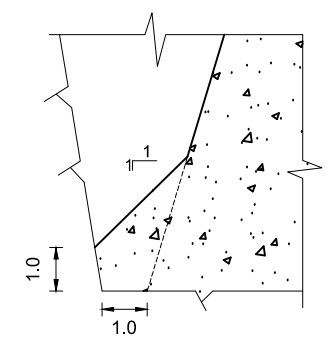
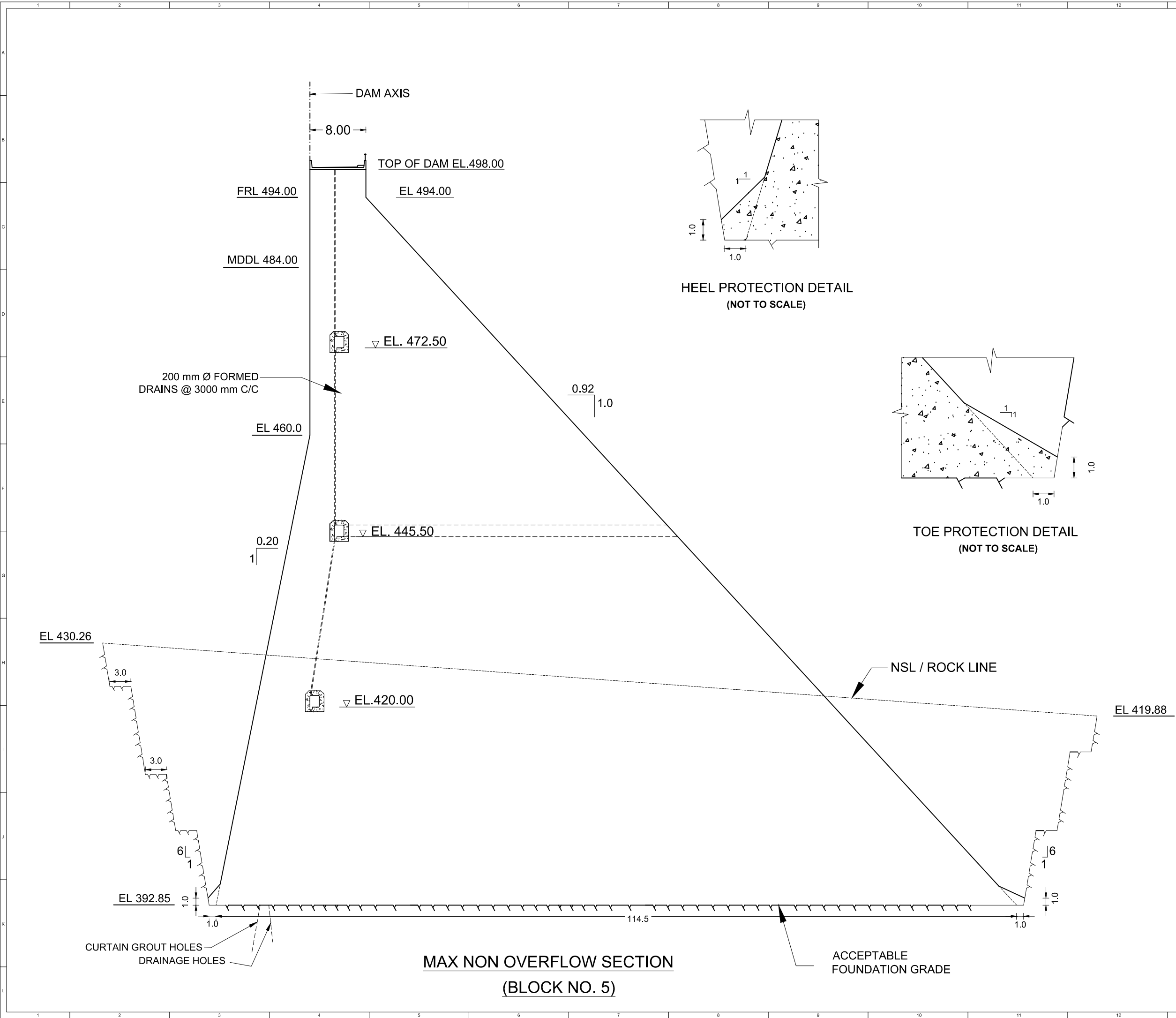
वांगचू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
NON- OVERFLOW SECTION
(BLOCK NO. 3 & 4)**

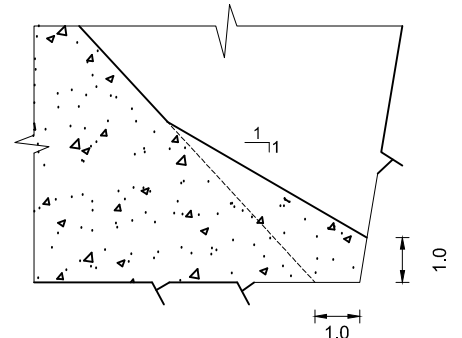
अभिकल्पित DSGN. Er. ASHOK KAPIL	समीक्षित CHKD. Er. KULDIP GARG	अनुमोदित APPD. Er. L.M. VERMA
रेखांकित DRWN. K.K.SHARMA	प्रस्तुत SUBM. Er. M.K.SHARMA	

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR04/R1	FEB, 2014	CD
--------------------------	-----------	----



HEEL PROTECTION DETAIL
(NOT TO SCALE)



TOE PROTECTION DETAIL
(NOT TO SCALE)

NOTES :-

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WP-DPR01R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS

SCALE





एसजेवीएन लिमिटेड
SJVN Limited

वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT.

**DAM COMPLEX
CONCRETE GRAVITY DAM
MAX NON- OVERFLOW SECTION
(BLOCK NO. 5)**

अधिकृत
DSGN. Er. ASHOK KAPIL

रेखांकित
DRWN. B.S. BANYAL

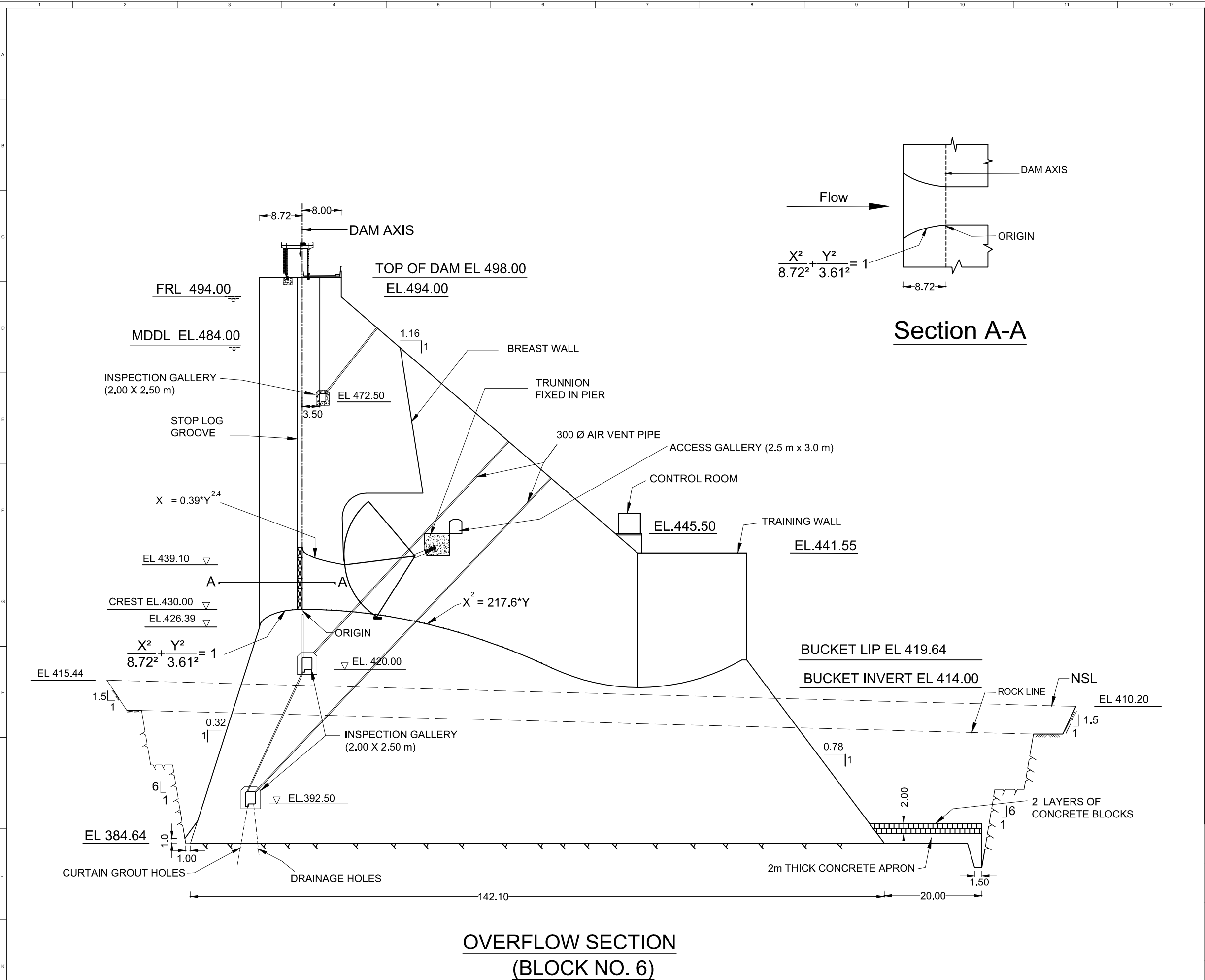
सर्वोक्षित
CHKD. Er. PRIYANKA

प्रस्तुत
SUBM. Er. M.K.SHARMA

अनुमोदित
APPD. Er. L.M. VERMA

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR05/R1	FEB, 2014	CD
--------------------------	-----------	----



- NOTES :-**
- ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
 - NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS	
DRG. NO.	TITLE
DM-WP-DPR 01R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS





एम्‌जे‌वी‌एन लिमिटेड
SJVN Limited

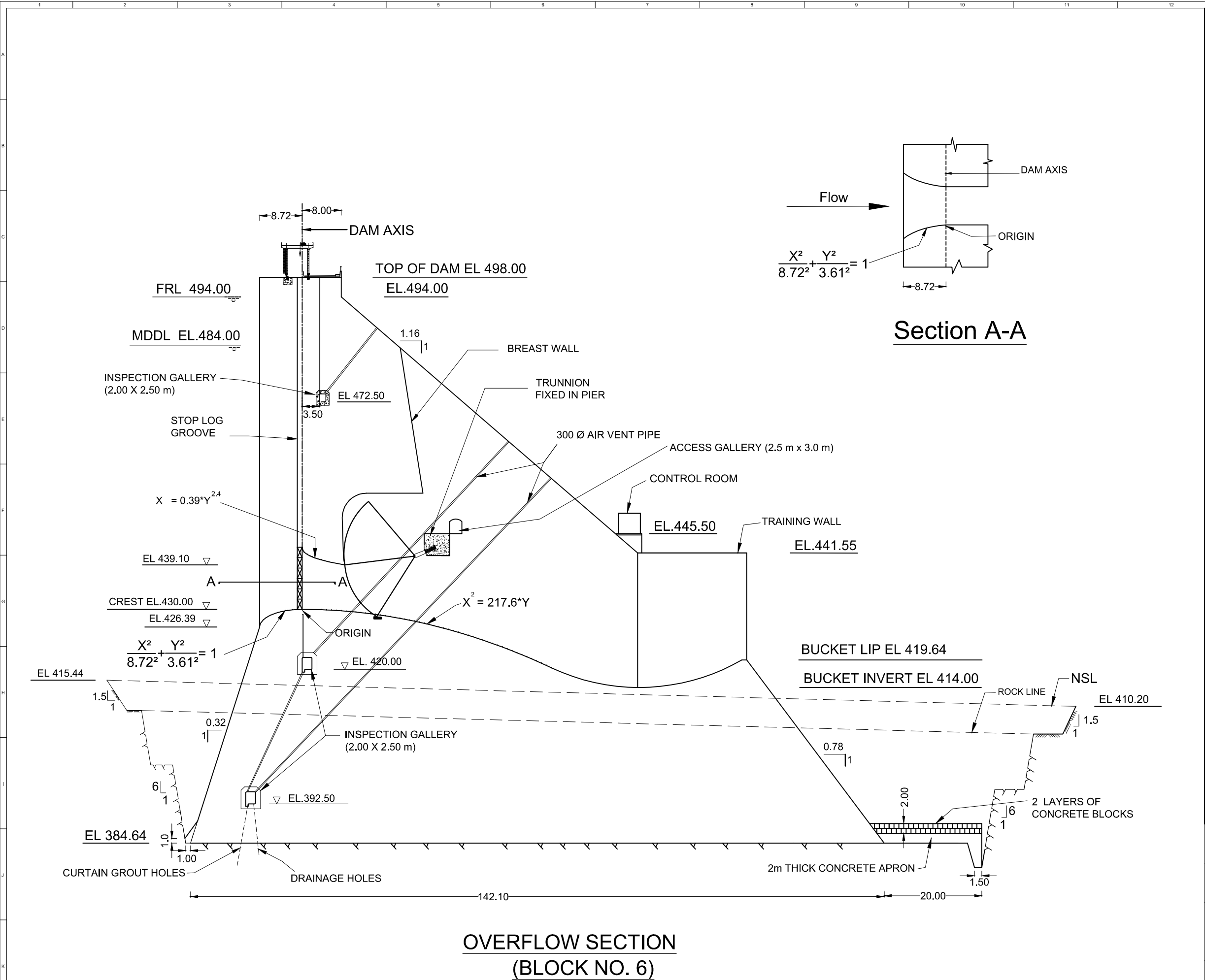
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
OVERFLOW SECTION
(BLOCK NO. 6)**

अभिकल्पित DSGN. Er. ASHOK KAPIL	समीक्षित CHKD. Er. KULDIP GARG	अनुमोदित APPD. Er. L.M. VERMA
संशोधित DRWN. B.S.BANYAL	प्रस्तुत SUBM. Er. M.K.SHRMA	

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR06/R1	FEB, 2014	CD
--------------------------	-----------	----



- NOTES :-**
- ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
 - NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS	
DRG. NO.	TITLE
DM-WP-DPR 01R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS





एम्‌जे‌वी‌एन लिमिटेड
SJVN Limited

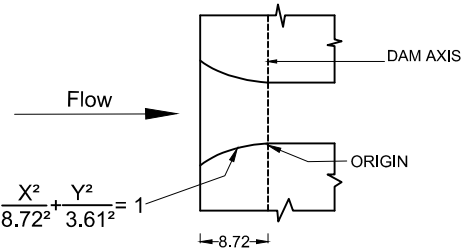
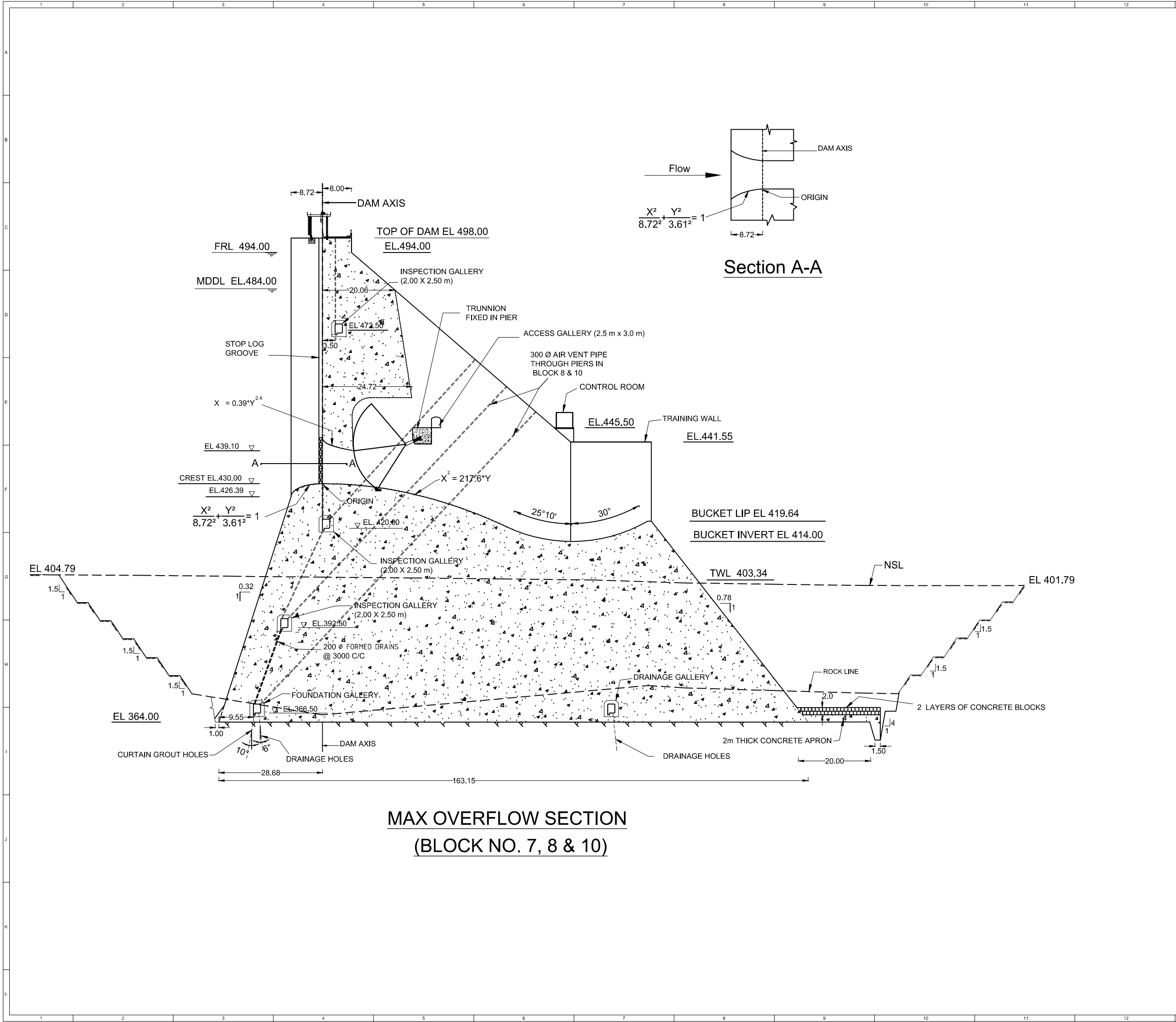
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
OVERFLOW SECTION
(BLOCK NO. 6)**

अभिकल्पित DSGN. Er. ASHOK KAPIL	समीक्षित CHKD. Er. KULDIP GARG	अनुमोदित APPD. Er. L.M. VERMA
संशोधित DRWN. B.S.BANYAL	प्रस्तुत SUBM. Er. M.K.SHRMA	

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR06/R1	FEB, 2014	CD
--------------------------	-----------	----



Section A-A

NOTES :-

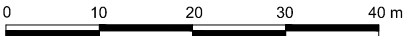
1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WP-DPR 01R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR 02R1/00	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS

SCALE



एसजेवीएन लिमिटेड
SJVN Limited

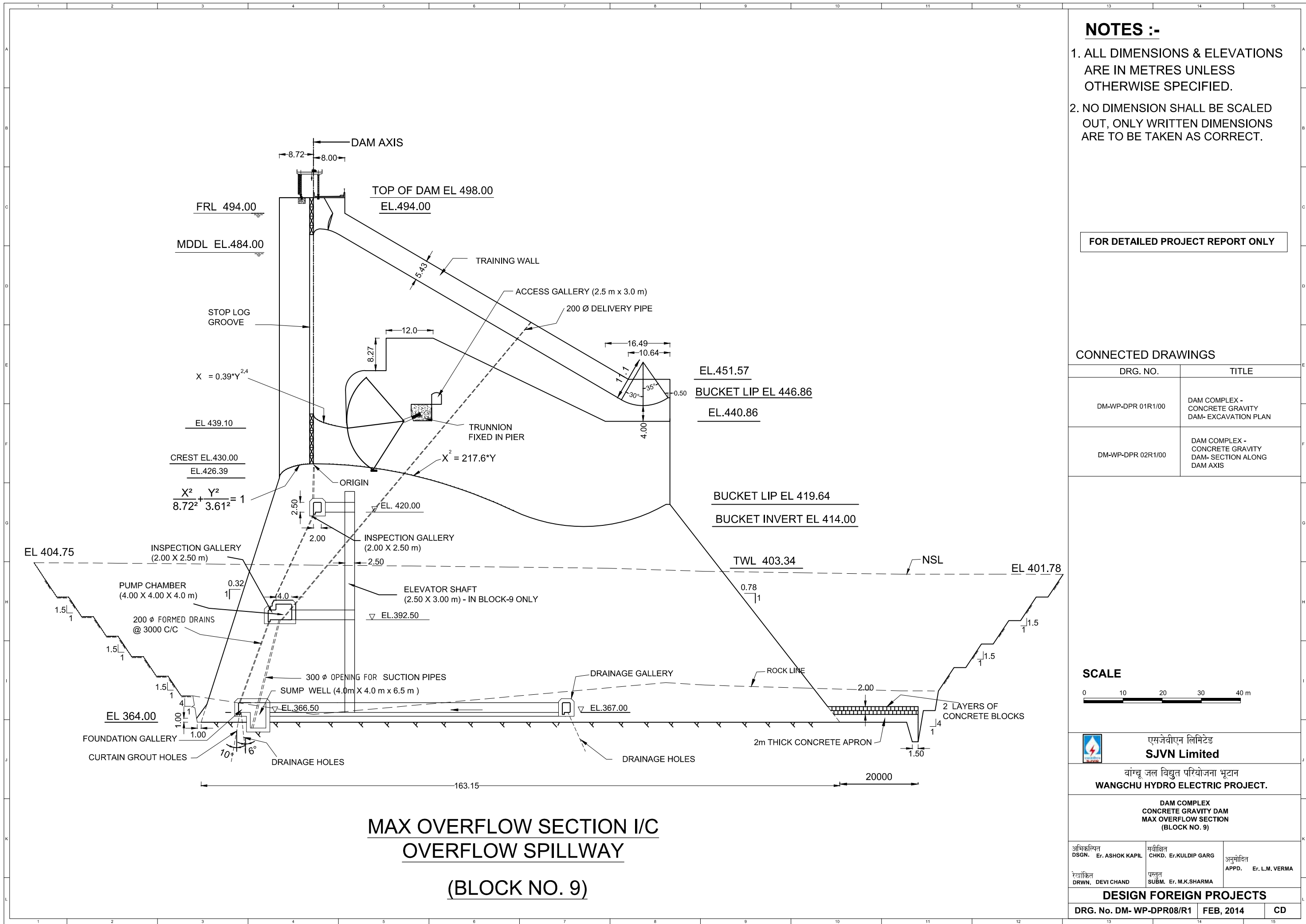
वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT.

DAM COMPLEX
CONCRETE GRAVITY DAM
MAX OVERFLOW SECTION
(BLOCK NO. 7, 8 & 10)

अभिकल्पित DSGN. Er. ASHOK KAPIL	समीक्षित CHKD. Er.KULDIP GARG	अनुमोदित APPD. Er. L.M. VERMA
रेखांकित DRWN. DEVI CHAND	प्रस्तुत SUBM. Er. M.K.SHARMA	

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR07/R1	FEB, 2014	CD
--------------------------	-----------	----



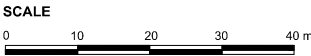
NOTES :-

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WP-DPR01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS



एसजेवीएन लिमिटेड
SJVN Limited

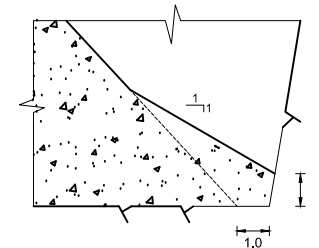
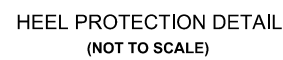
वांचू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

DAM COMPLEX
CONCRETE GRAVITY DAM
OVERFLOW SECTION
(BLOCK NO. 11 & 12)

अधिकृतित DSGN. Er. ASHOK KAPIL	समीक्षित CHKD. Er.KULDIP GARG	अनुमोदित APPD. Er. L.M. VERMA
रेखांकित DRWN. K.K.SHARMA	प्रस्तुत SUBM. Er. M.K.SHARMA	

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR 09/R1	FEB, 2014	CD
---------------------------	-----------	----



TOE PROTECTION DETAIL
(NOT TO SCALE)

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES
UNLESS OTHERWISE SPECIFIED.

2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN
DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

DRG. NO.	TITLE
DM-WP-DPR01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS



एसजेवीएन लिमिटेड
SJVN Limited

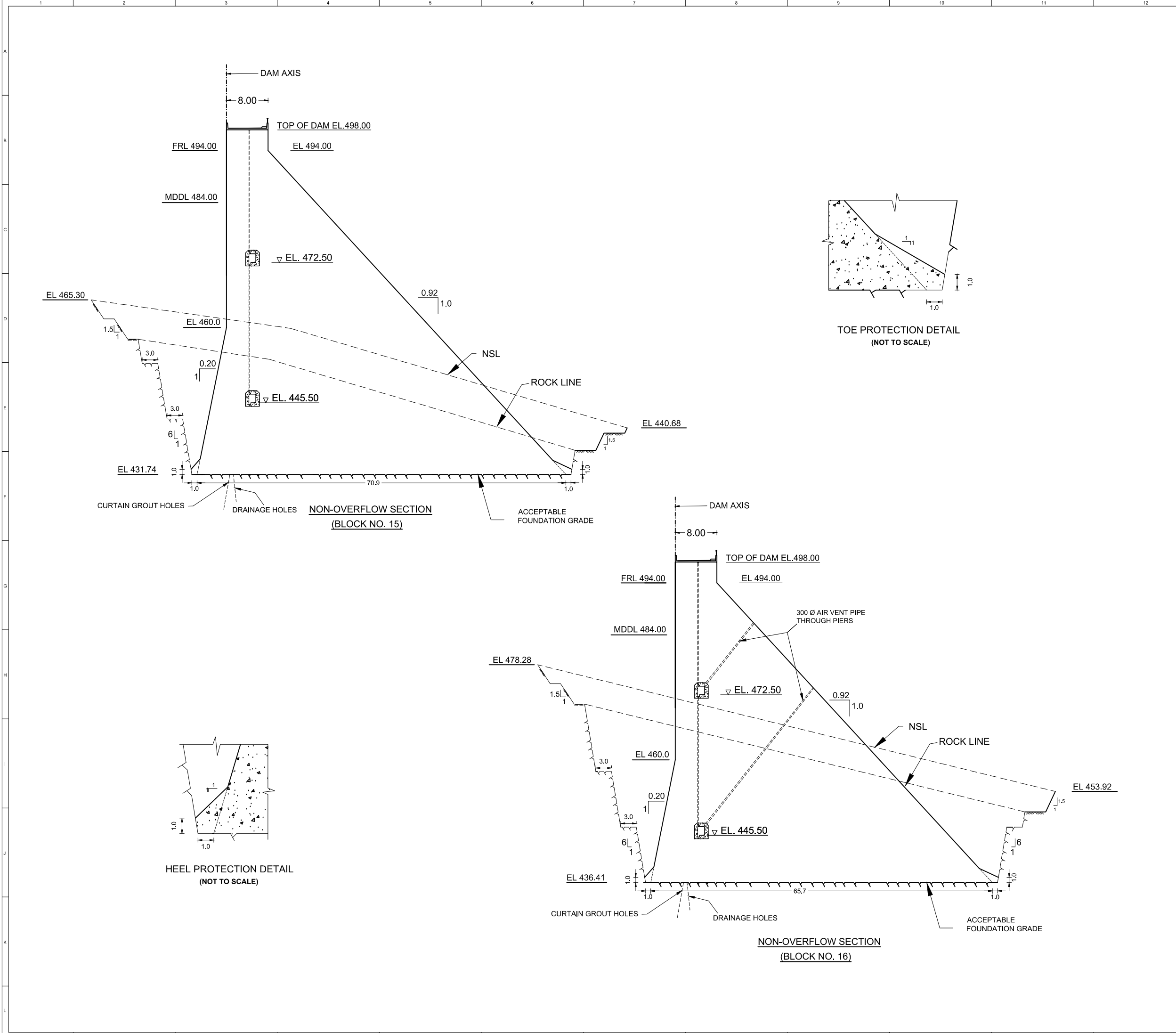
वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
MAX NON- OVERFLOW SECTION
(BLOCK NO. 13 & 14)**

अभिज्ञित DSGN. Er. ASHOK KAPIL	सर्वोच्च CHKD. Er.KULDIP GARG	अनुमोदित APPD. Er. L.M. VERMA
ग्राहक DRWN. K.K.SHARMA	परतु SUBM. Er. M.K.SHARMA	

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR10/R1	FEB, 2014	CD
--------------------------	-----------	----



NOTES :-

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WP-DPR01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS



एसजेवीएन लिमिटेड
SJVN Limited

वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
NON- OVERFLOW SECTION
(BLOCK NO. 15 & 16)**

अभिक्रान्त
DSGN. Er. ASHOK KAPIL

समीक्षित
CHKD. Er PRIYANKA

अनुमोदित
APPD. Er. L.M. VERMA

रचयिता
DRWN. B.S. BANYAL

प्रस्तुत
SUBM. Er. M.K.SHARMA

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR11/R1

FEB, 2014

CD

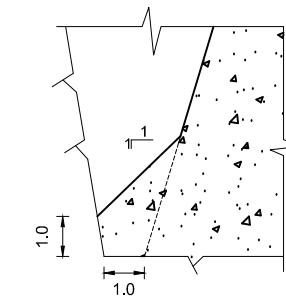
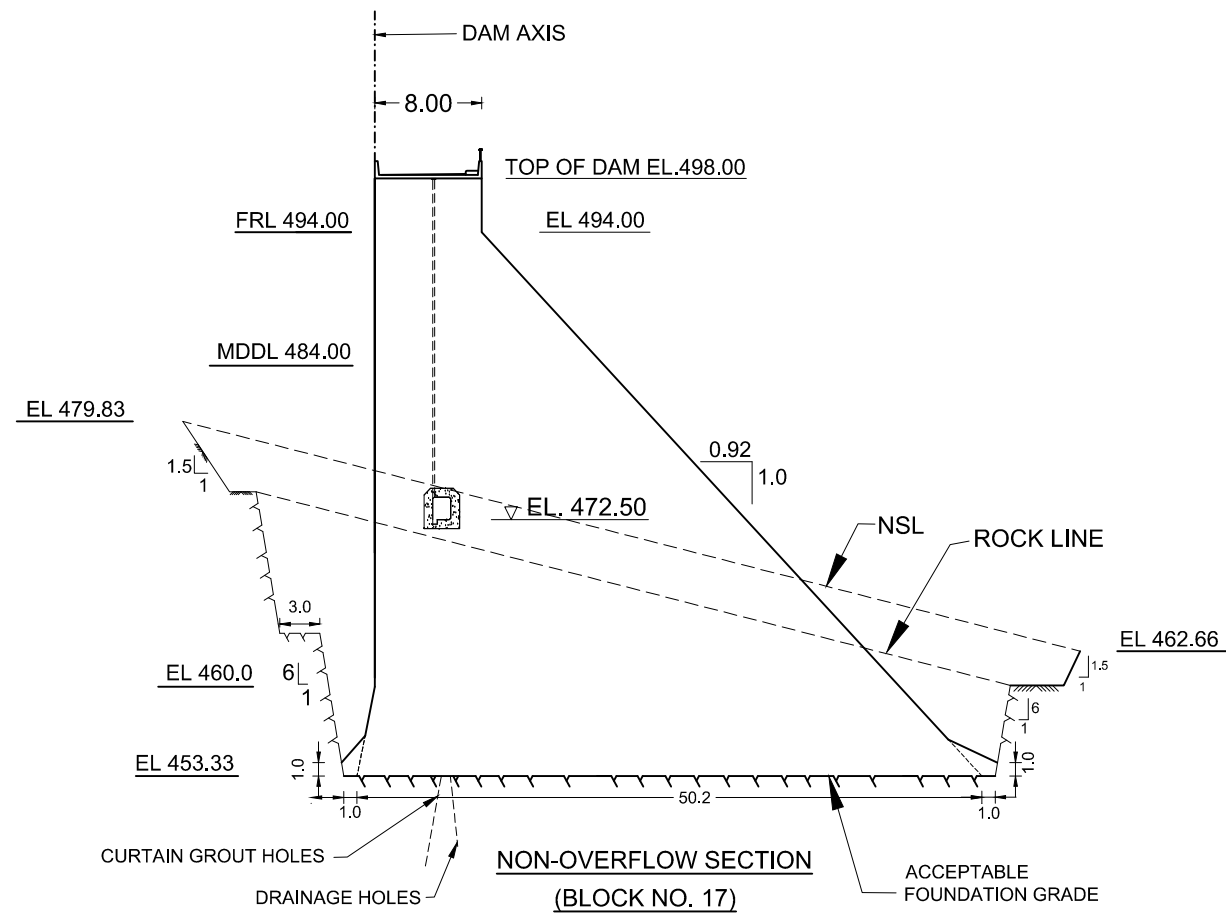
NOTES :-

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

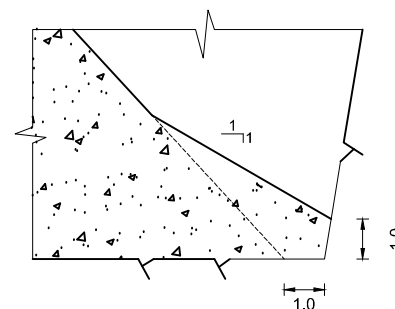
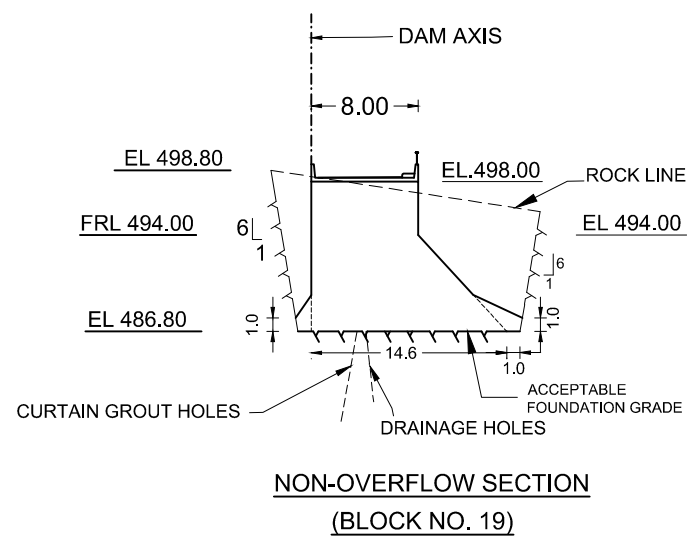
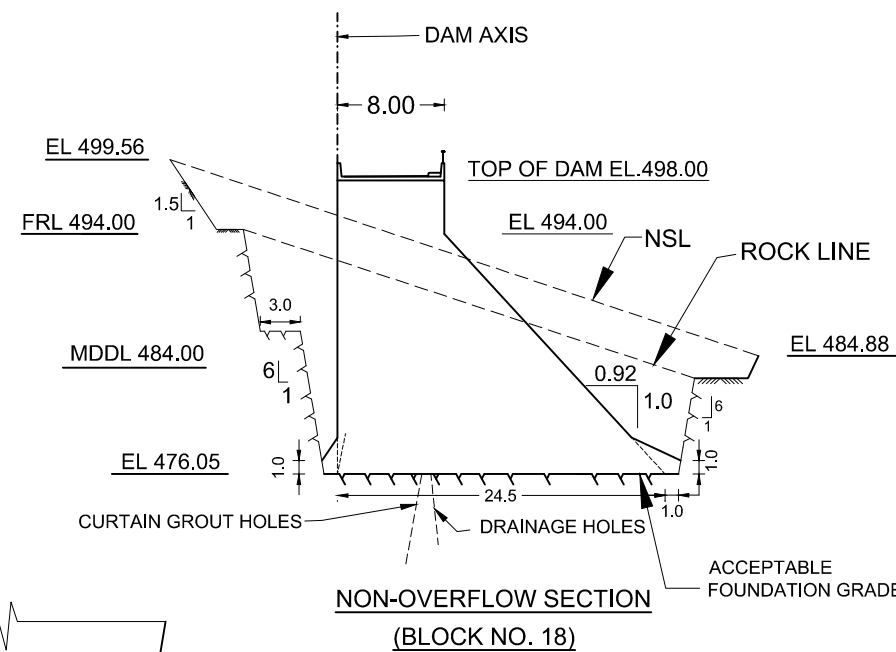
FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WP-DPR01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS



HEEL PROTECTION DETAIL
(NOT TO SCALE)



TOE PROTECTION DETAIL
(NOT TO SCALE)

SCALE



एसजेवीएन लिमिटेड
SJVN Limited

वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
NON- OVERFLOW SECTION
(BLOCK NO. 17, 18 &19)**

अभिकल्पित
DSGN. Er. ASHOK KAPIL

IL	सवीक्षित CHKD. Er KUL DIP GARG	
----	-----------------------------------	--

रेखांकित
DRWN. B.S.BANYAL

प्रस्तुत
SUBM. Er. M.K.SHARMA

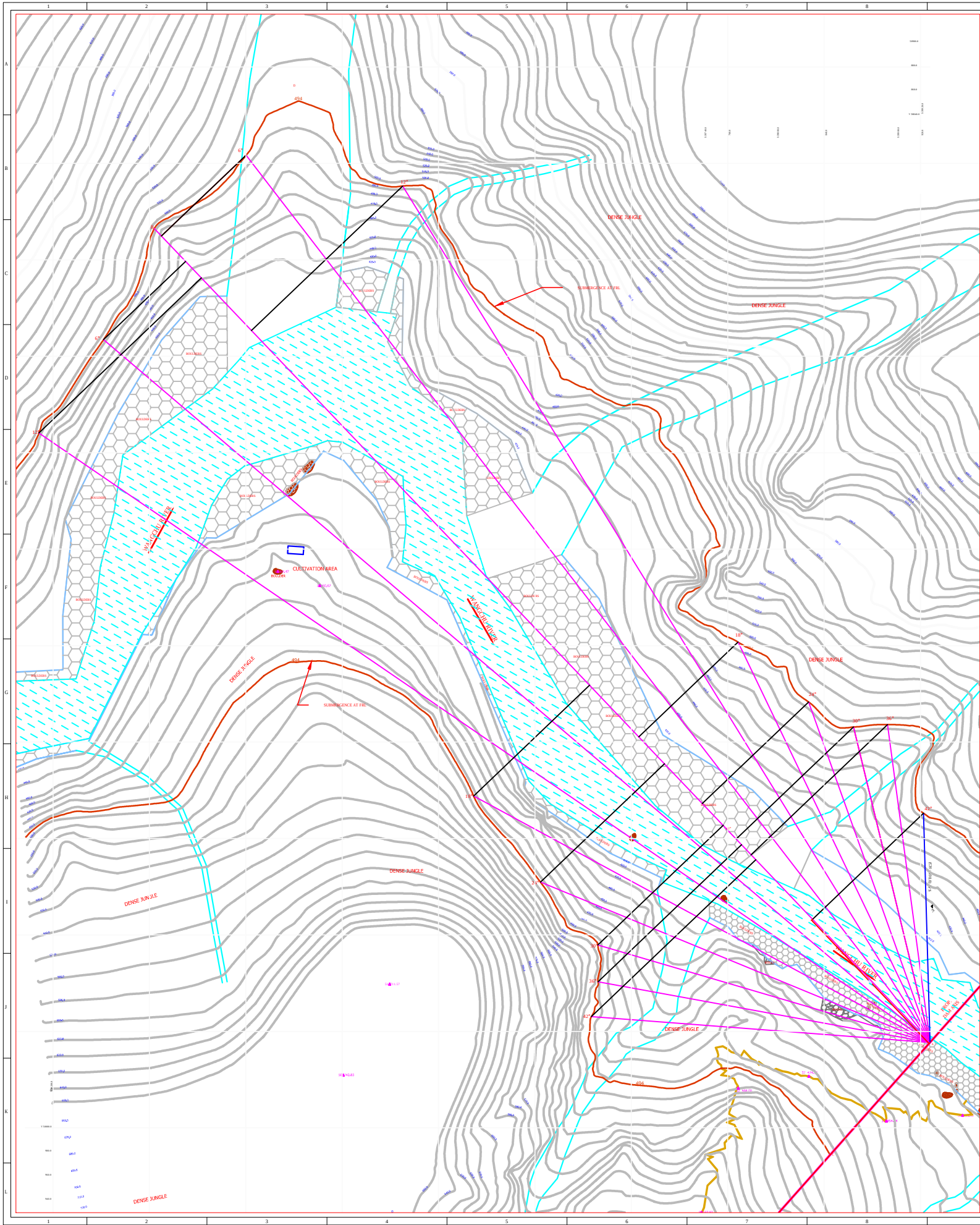
नुमोदित
PPD. Er. L.M. VERMA

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR12/R1

FEB, 2014

CD



CALCULATION FOR EFFECTIVE FETCH				
α (Deg)	α (Rad)	Cos α	X1 in Km	$x1*\text{Cos}\alpha$
42	0.73	0.743	0.141	0.1048
36	0.63	0.809	0.215	0.1739
30	0.52	0.866	0.235	0.2035
24	0.42	0.914	0.274	0.2503
18	0.31	0.951	0.350	0.3329
12	0.21	0.978	0.816	0.7982
6	0.10	0.995	0.924	0.9189
0	0.00	1.000	0.933	0.9330
6	0.10	0.995	0.895	0.8901
12	0.21	0.978	0.876	0.8569
18	0.31	0.951	0.409	0.3890
24	0.42	0.914	0.319	0.2914
30	0.52	0.866	0.249	0.2156
36	0.63	0.809	0.227	0.1836
42	0.73	0.743	0.21	0.1561
$\Sigma \text{Cos } \alpha =$		13.511	$\Sigma x1*\text{Cos } \alpha =$	6.6982
Effective Fetch =			$\frac{\Sigma x1*\text{Cos } \alpha}{\Sigma \text{Cos } \alpha}$	0.4958 Km
Max Fetch =			1.0	Km

Computation of average depth w.r.t. FRL			
S. No.	FRL (m)	GL (m)	Depth (m)
1	494	490	4
2	494	485	9
3	494	480	14
4	494	475	19
5	494	470	24
6	494	465	29
7	494	460	34
8	494	455	39
9	494	450	44
10	494	445	49
11	494	440	54
12	494	435	59
13	494	430	64
14	494	425	69
15	494	420	74
16	494	415	79
17	494	410	84
18	494	405	89
Total =			837
Average Depth (D) =			46.50

Computations for free board for Dam					
(As per IS: 6512)					
Full Reservoir Level (FRL) =	494.00 m				
Reservoir maximum fetch =	1.0 Km			Remarks	
Reservoir effective fetch =	0.50 Km				
Max. wind velocity over land (U) =	160 km/h	IS: 875 Part 3			
Wind Ratio (Q) =	1.1	Table A-1.5 Page 19, IS: 6512-1964			
Wind velocity over water, V =	176 Km/h	(V=Q*U)			
Significant wave height (Hs) =	0.855 m	Fig 5 Page 22, IS: 6512-1964			
Design Wave height (Ho) =	1.42 m	(Ho=1.67*Hs)			
Wind set-up, S = $(V^2 * F) / 62000 * D$	0.011 m				
Computed free board = $(1.333 * Ho + S)$	1.91 m				
Top of Dam = (FRL + Free Board) =	495.91 m	Provided Top of Dam at 498 m			

NOTES :-

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS SPECIFIED OTHERWISE.
- NO DIMENSIONS SHALL BE SCALED OUT. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
PL-WP-DPR 03/R1	PROJECT LAYOUT PLAN
DM-WP-DPR01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN



एसजेवीएन लिमिटेड
SJVN Limited

वांगचू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

DAM COMPLEX
CONCRETE GRAVITY DAM
SUBMERGENCE PLAN FOR FREE BOARD
(FRL CONDITION)

अभिज्ञान
DSGN. Er. ASHOK KAPIL

समीक्षा
CHKD. Er. PRIYANKA

अनुमोदन
APPD. Er. L.M. VERMA

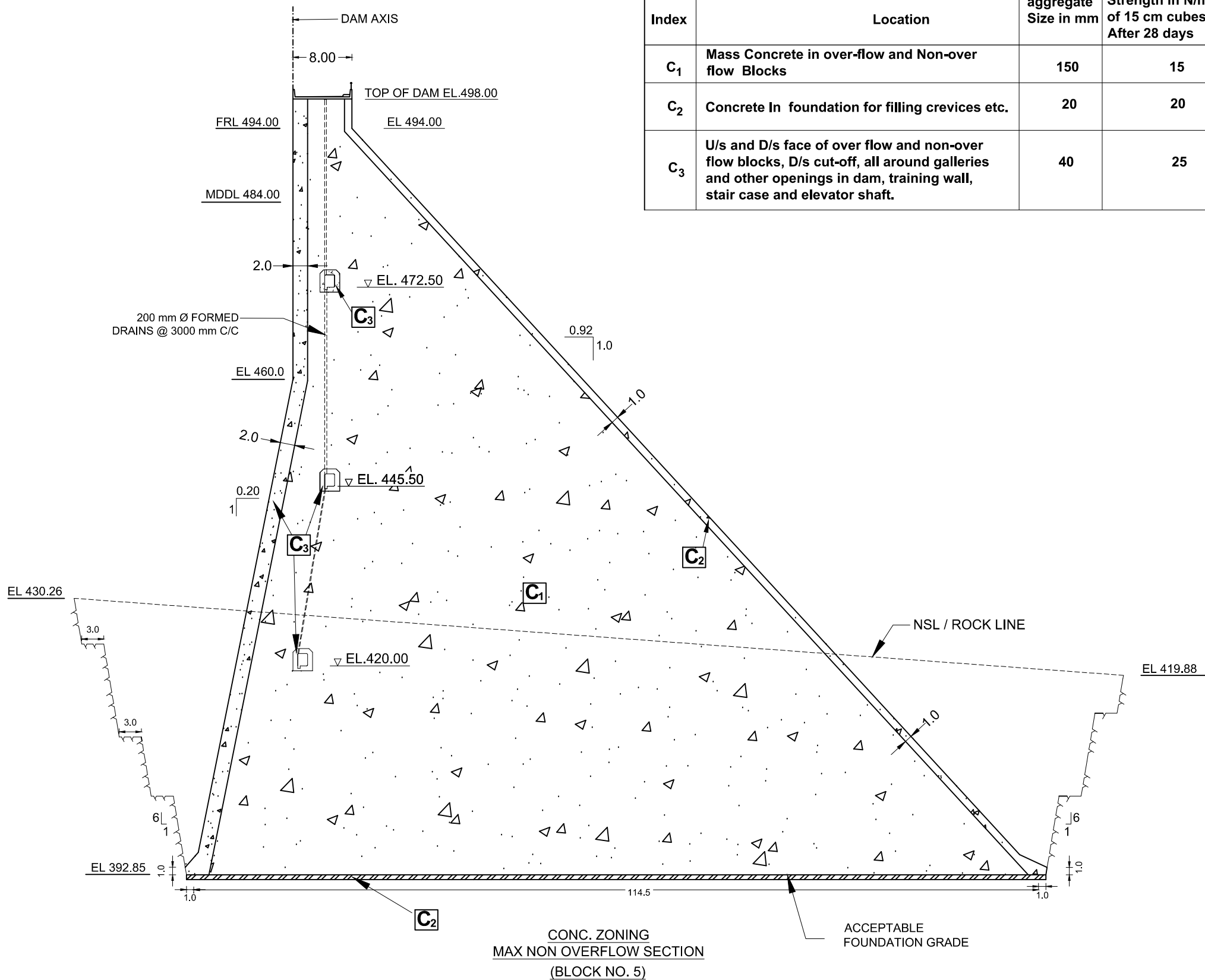
रचयिता
DRWN. B.S. BANYAL

समस्त
SUBM. Er. M.S. THAKUR

DESIGN FOREIGN PROJECTS

DRG. No. DM-WP-DPR 13/00

FEB, 2014



NOTES :-

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WP-DPR 01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR 02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS
DM-WP-DPR 05/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- MAX NOF SECTION (BLOCK-5)

SCALE



एसजेवीएन लिमिटेड
SJVN Limited

वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

DAM COMPLEX
CONCRETE GRAVITY DAM
CONC ZONING MAX NON-OVERFLOW SECTION
(BLOCK NO. 5)

अभिकल्पित

DSGN. Er. ASHOK KAPIL

समीक्षित

CHKD. Er. PRIYANKA

अनुमोदित

APPD. Er. L.M. VERMA

रेखांकित

DRWN. K.K.SHARMA

प्रस्तुत

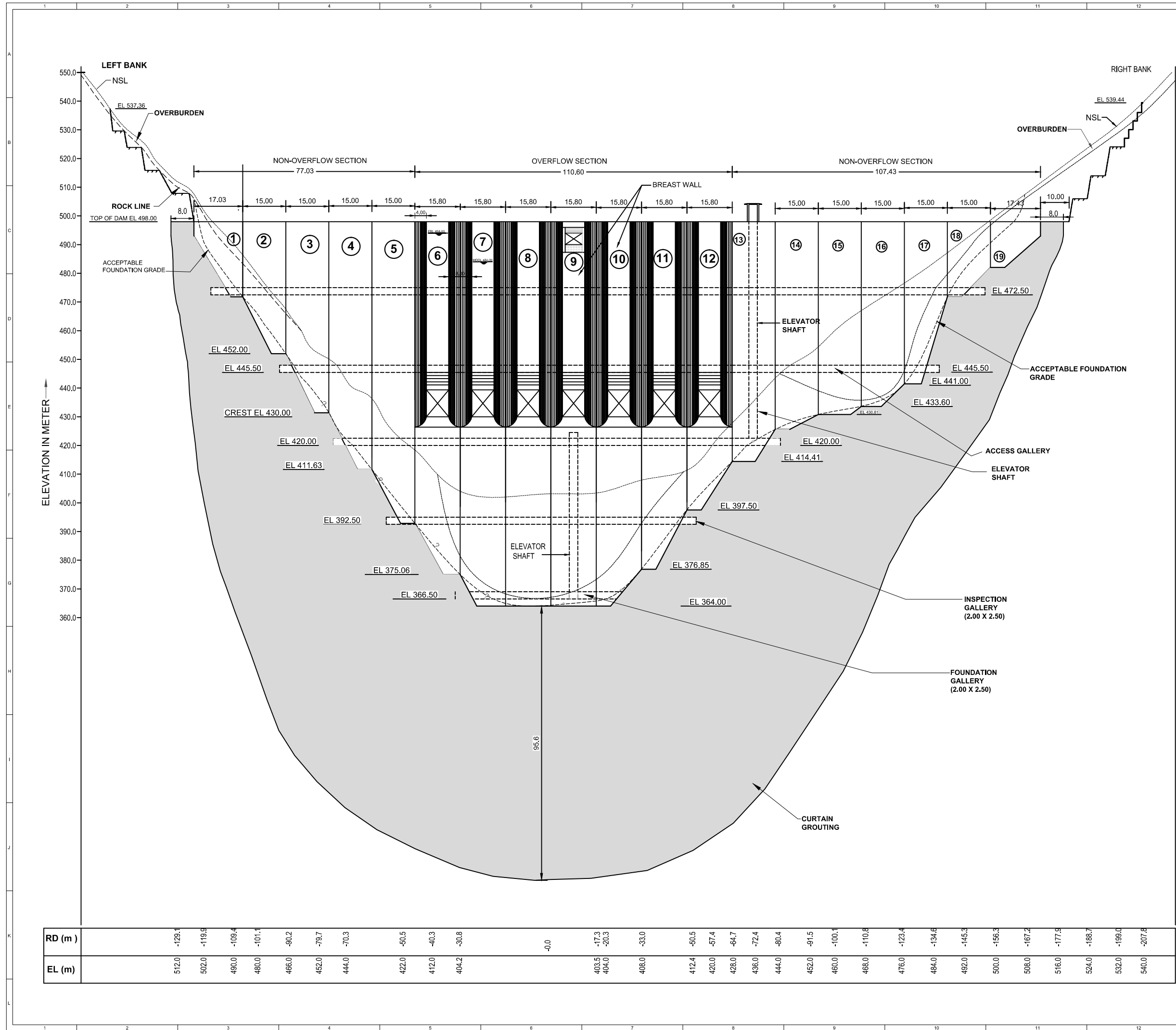
SUBM. Er. M.K.SHARMA

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR 15/R1

FEB, 2014

CD



NOTES :-

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWING

DRG. NO.	TITLE
PL-WP-DPR03/R1	PROJECT LAYOUT PLAN
DM-WP-DPR01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS



एसजेवीएन लिमिटेड
SJVN Limited

वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
CURTAIN GROUTING**

अभिधिकल्पित
DSGN. Er. ASHOK KAPIL

समीक्षित
CHKD. Er. KULDIP GARG

अनुमोदित
APPD. Er. L.M. VERMA

रचयिता
DRWN. B.S.BANYAL

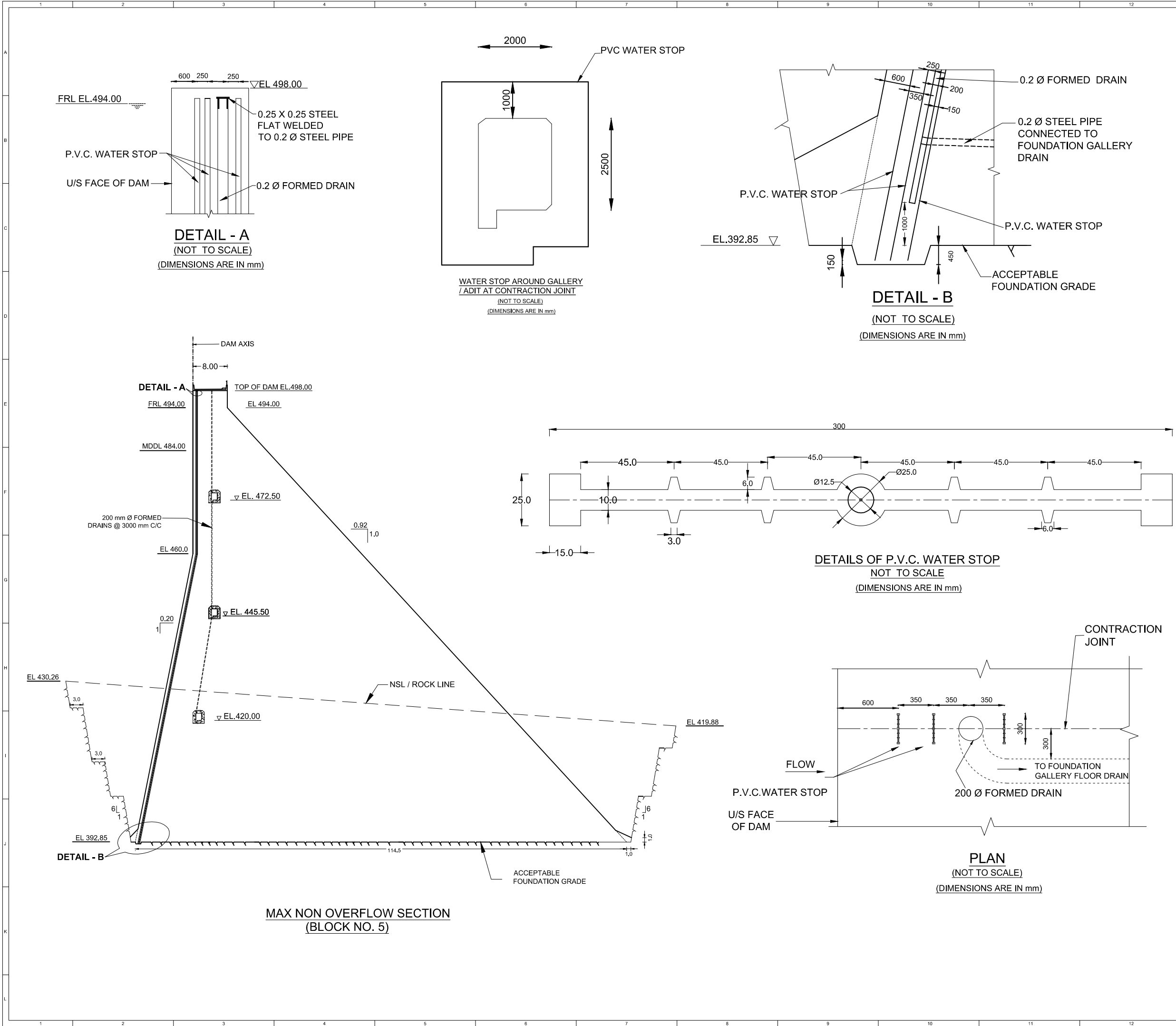
प्रस्तुत
SUBM. Er. M.S.THAKUR

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR17/R1

FEB, 2014

CD



NOTES :-

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

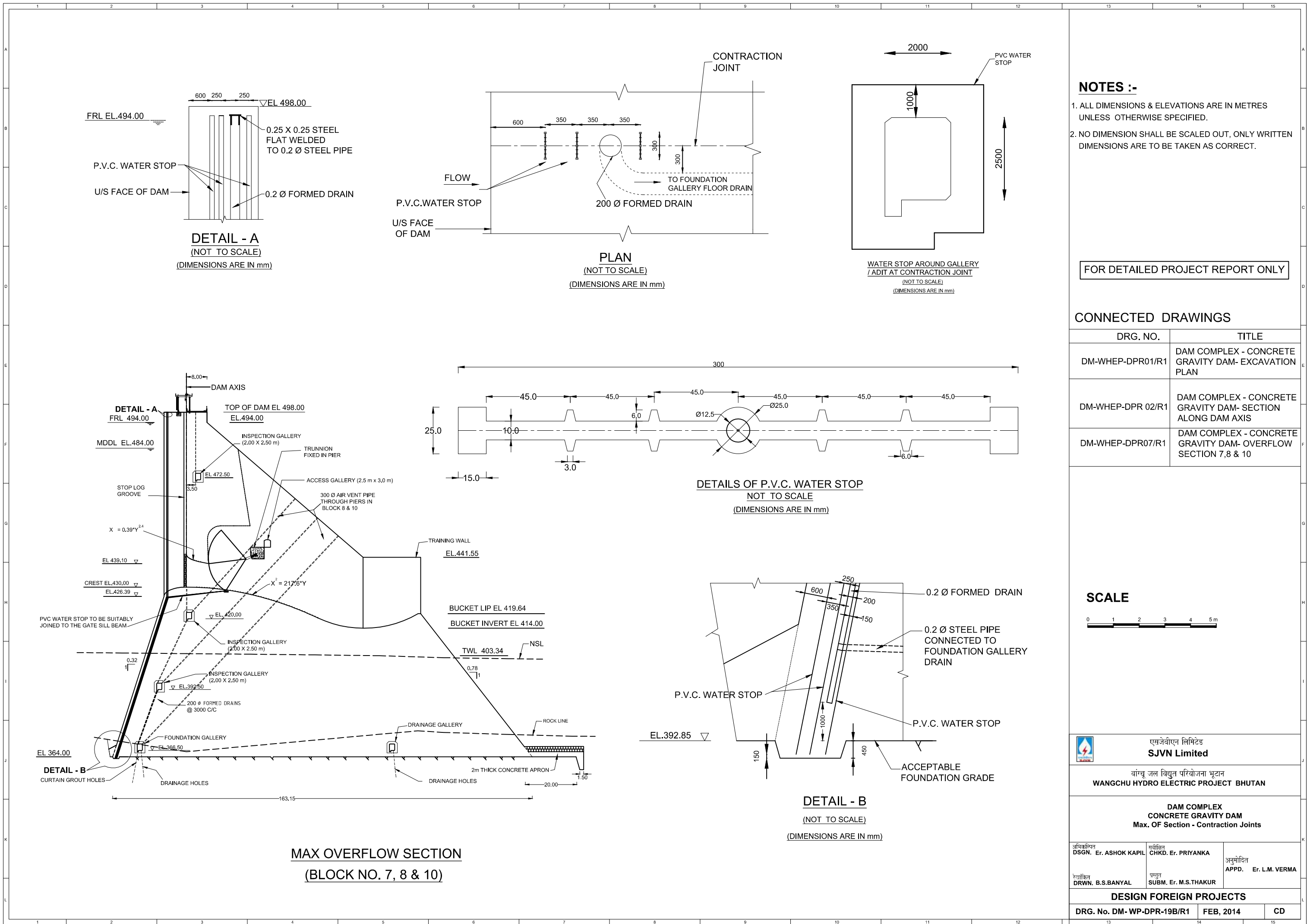
CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WHEP-DPR01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WHEP-DPR 02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS
DM-WHEP-DPR07/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- OVERFLOW SECTION 7,8 & 10

SCALE



 एसजेवीएन लिमिटेड SJVN Limited		
वांगचू जल विद्युत परियोजना भूटान WANGCHU HYDRO ELECTRIC PROJECT BHUTAN		
DAM COMPLEX CONCRETE GRAVITY DAM Max. NOF Section - Contraction Joints		
अभिजात DSGN. Er. ASHOK KAPIL	नवीशित CHKD. Er.SUMIT KUMAR	अनुमोदित APPD. Er. L.M. VERMA
रचयिता DRWN. B.S.BANYAL	प्रस्तुत SUBM. Er. M.S.THAKUR	
DESIGN FOREIGN PROJECTS		
DRG. No. DM- WP-DPR19A-R1	FEB, 2014	CD



NOTES :-

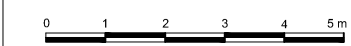
1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS

DRG. NO.	TITLE
DM-WHEP-DPR01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WHEP-DPR 02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS
DM-WHEP-DPR07/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- OVERFLOW SECTION 7,8 & 10

SCALE



एसजेवीएन लिमिटेड
SJVN Limited

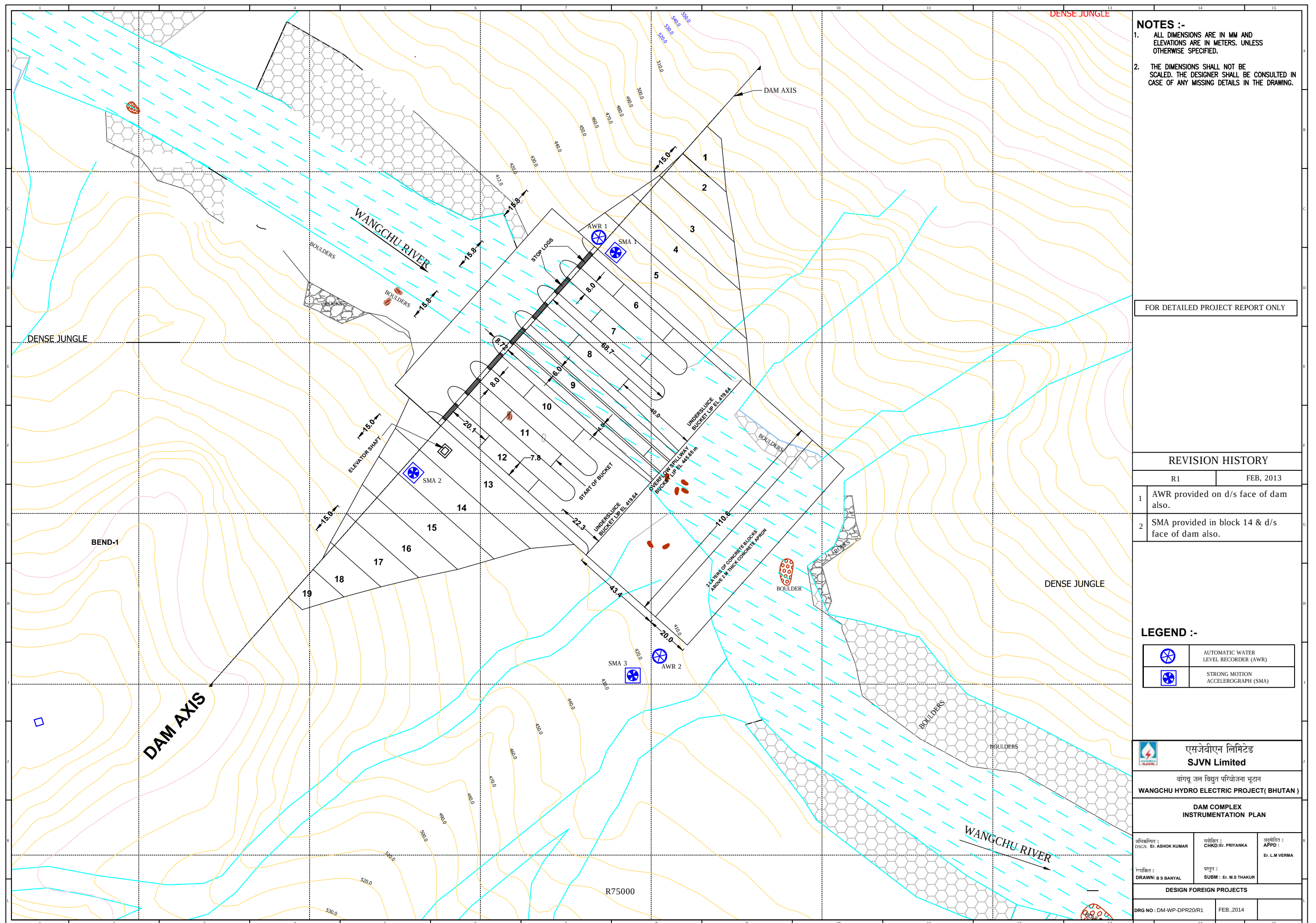
वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

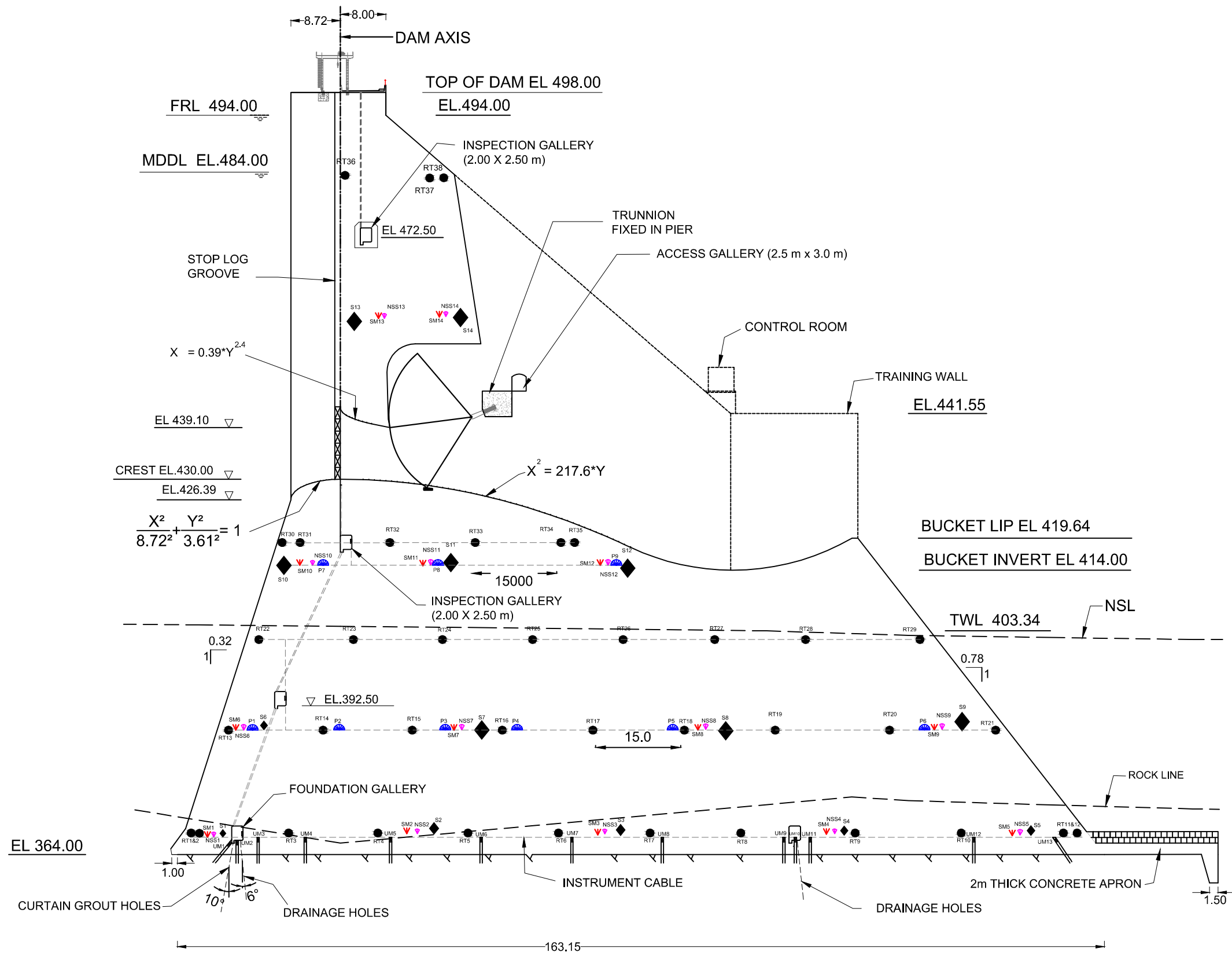
**DAM COMPLEX
CONCRETE GRAVITY DAM
Max. OF Section - Contraction Joints**

अभिेकल्पित DSGN. Er. ASHOK KAPIL	समीक्षित CHKD. Er. PRIYANKA	अनुमोदित APPD. Er. L.M. VERMA
रेखांकित DRWN. B.S.BANYAL	प्रस्तुत SUBM. Er. M.S.THAKUR	

DESIGN FOREIGN PROJECTS

DRG. No. DM - WP-DPR-19B/R1	FEB, 2014	CD
-----------------------------	-----------	----





MAX OVERFLOW SECTION (BLOCK NO. 10)

NOTES :

1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

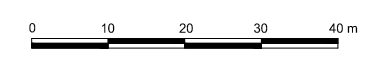
REVISION HISTORY

R1		FEB, 2013
1	Density of resistance thermometers increased (as per IS 7436, Part 2)	
2	No stress strain meters provided in combination with stress & strain meters.	
R2		APR, 2013
1	Uplift pressuremeters and Piezometers provided (as per IS 7436, Part 2)	
2	Stress meters, strain meters and no stress strain meters provided as per IS 7436 (part 2)	

LEGEND:-

●	RESISTANCE THERMOMETER(RT)
◆	STRESS METER (S)
▼	V-W STRAIN METER (GROUP OF FIVE) (SM)
▼	V-W NO STRESS STRAIN METER (NSS)
●	PIEZOMETR (P)
■	UPLIFT PRESSURE METER (UM)

SCALE



एसजेवीएन लिमिटेड
SJVN Limited

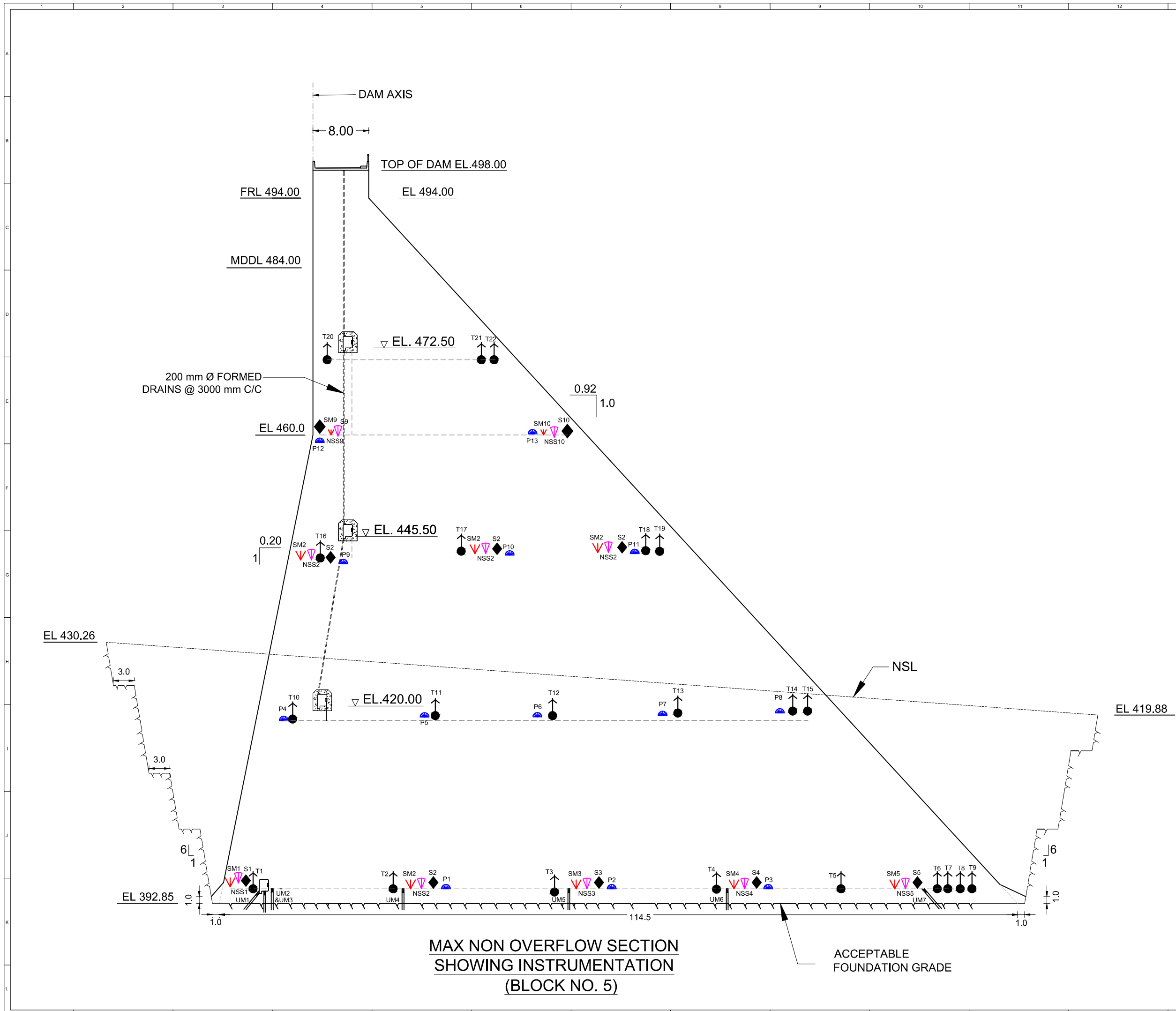
वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT.

CONCRETE GRAVITY DAM
MAX OVERFLOW SECTION
SHOWING INSTRUMENTATION

अभिकल्पित DSGN. Er. ASHOK KAPIL	संशोधित CHKD. Er. PRIYANKA	अनुमोदित APPD. Er. L.M. VERMA
रेखांकित DRWN. DEVI CHAND	प्रस्तुत SUBM. Er. M.S.THAKUR	

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR22/R2	FEB, 2014	
--------------------------	-----------	--

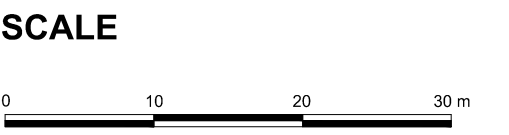


- NOTES :**
1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
 2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

REVISION HISTORY	
R1	FEB, 2013
1	Density of resistance thermometers increased as per IS 7436 (Part 2)
2	No stress strain meters provided in combination with stress & strain meters.
R2	APR, 2013
1	Provided Uplift Pressuremeters and Piezometers as per IS 7436 (Part 2)

LEGEND:-	
	RESISTANCE THERMOMETER(RT)
	STRESS METER (S)
	V-W STRAIN METER (GROUP OF FIVE) (SM)
	V-W NO STRESS STRAIN METER (NSS)
	PIEZOMETR (P)
	UPLIFT PRESSURE METER (UM)





एसजेवीएन लिमिटेड
SJVN Limited

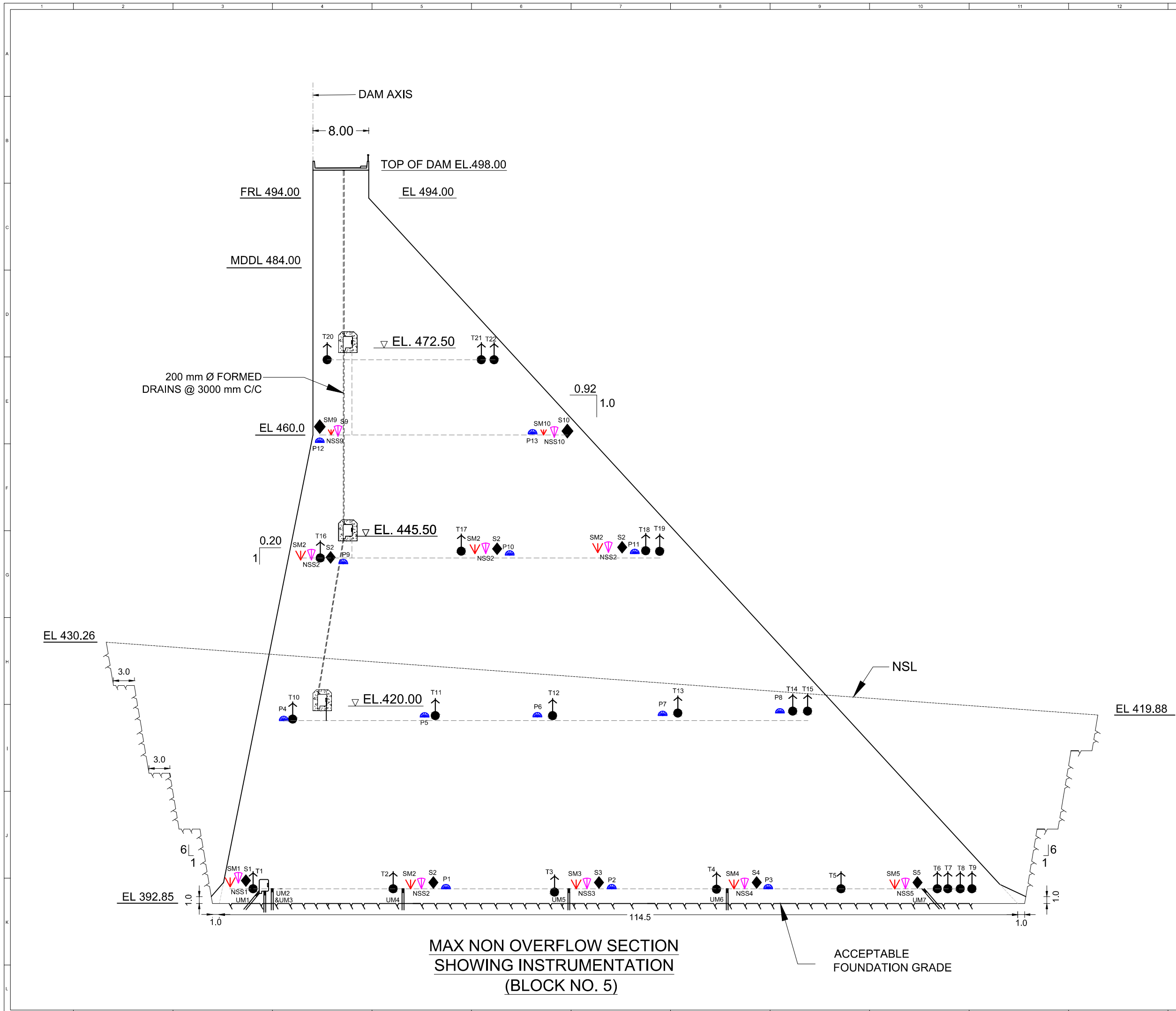
वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT.

**DAM COMPLEX
CONCRETE GRAVITY DAM
MAX NON- OVERFLOW SECTION
SHOWING INSTRUMENTATION**

अभिकल्पित DSGN. Er. ASHOK KAPIL	समीक्षित CHKD. Er.KULDIP GARG	अनुमोदित APPD. Er. L.M. VERMA
मेसॉकित DRWN. B.S. BANYAL	प्रमूत SUBM. Er. M.S.THAKUR	

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR23/R2	FEB, 2014	
--------------------------	-----------	--

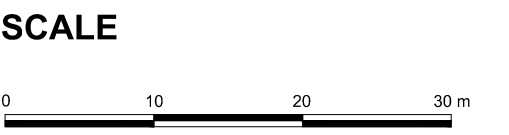


- NOTES :**
1. ALL DIMENSIONS & ELEVATIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
 2. NO DIMENSION SHALL BE SCALED OUT, ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN AS CORRECT.

FOR DETAILED PROJECT REPORT ONLY

REVISION HISTORY	
R1	FEB, 2013
1	Density of resistance thermometers increased as per IS 7436 (Part 2)
2	No stress strain meters provided in combination with stress & strain meters.
R2	APR, 2013
1	Provided Uplift Pressuremeters and Piezometers as per IS 7436 (Part 2)

LEGEND:-	
	RESISTANCE THERMOMETER(RT)
	STRESS METER (S)
	V-W STRAIN METER (GROUP OF FIVE) (SM)
	V-W NO STRESS STRAIN METER (NSS)
	PIEZOMETR (P)
	UPLIFT PRESSURE METER (UM)





एसजेवीएन लिमिटेड
SJVN Limited

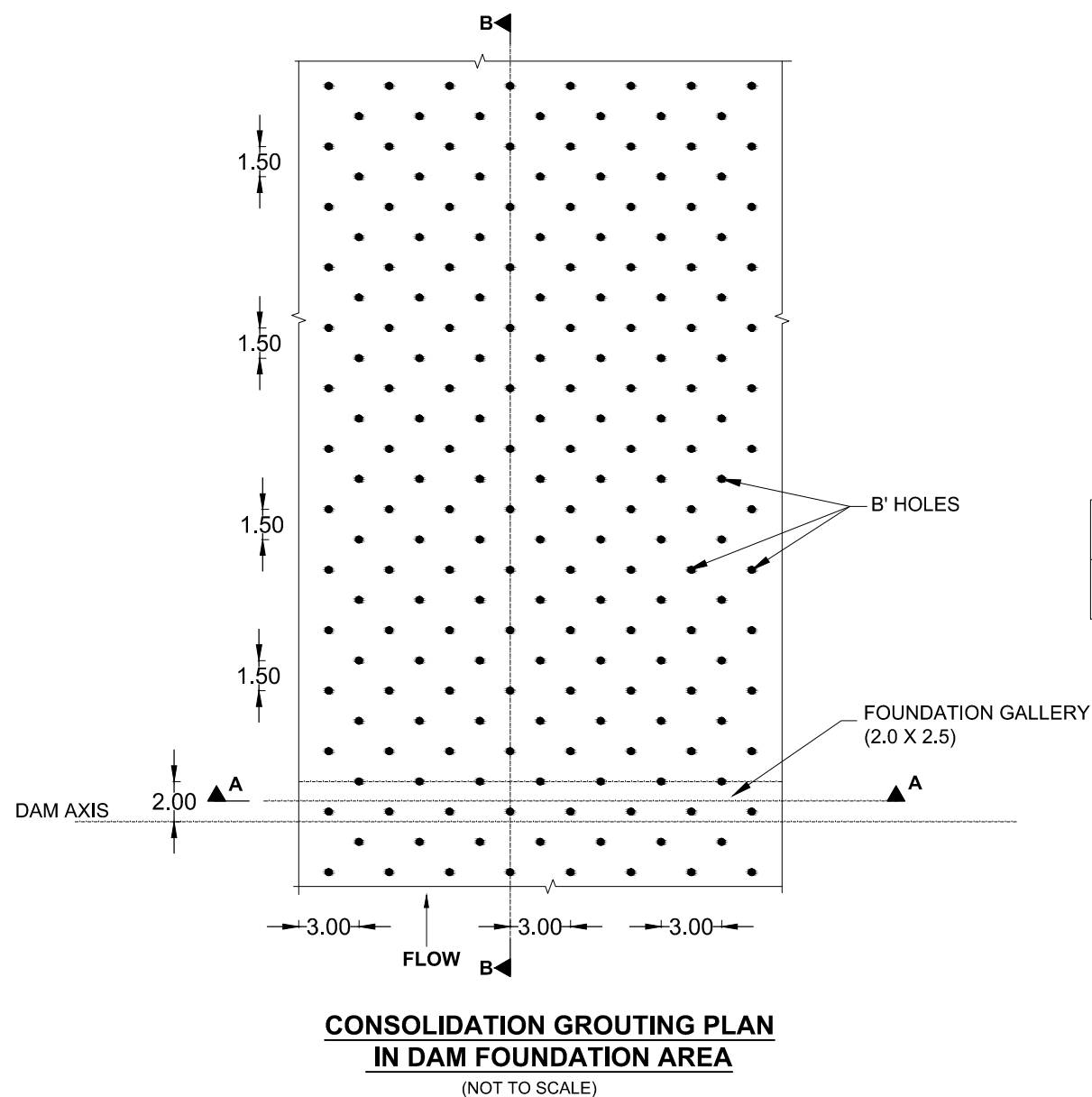
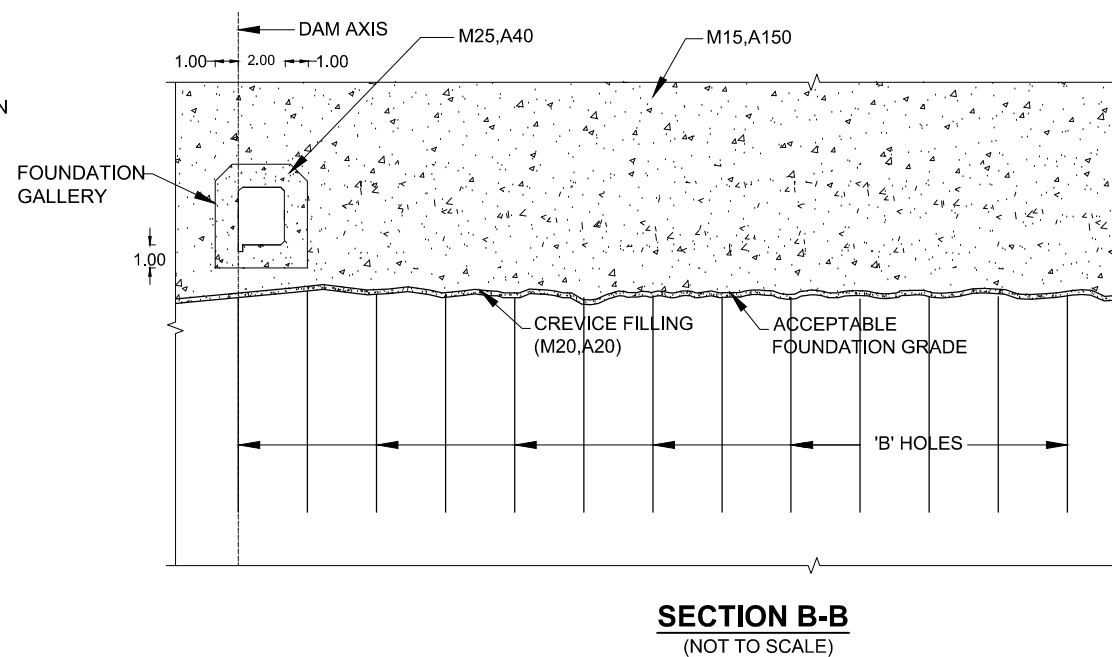
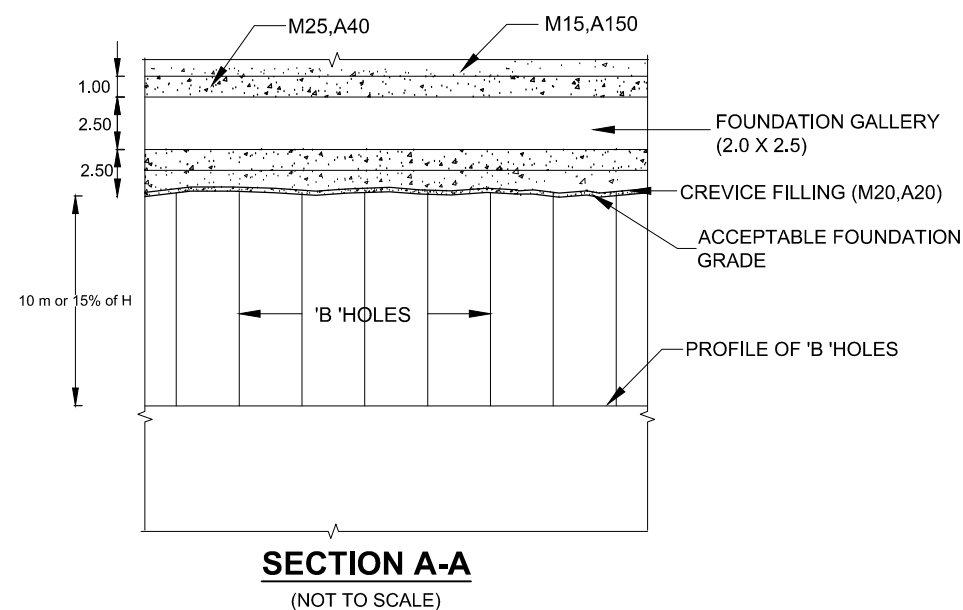
वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT.

**DAM COMPLEX
CONCRETE GRAVITY DAM
MAX NON- OVERFLOW SECTION
SHOWING INSTRUMENTATION**

अभिकल्पित DSGN. Er. ASHOK KAPIL	समीक्षित CHKD. Er.KULDIP GARG	अनुमोदित APPD. Er. L.M. VERMA
मेसॉकित DRWN. B.S. BANYAL	प्रमूत SUBM. Er. M.S.THAKUR	

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR23/R2	FEB, 2014	
--------------------------	-----------	--



SCHEDULE OF HOLES

SYMBOL	HOLES	DIAMETER (mm)	SPACING (m)	DEPTH (m)
	B	38	3.0m c/c	15% OF THE HEAD OF WATER AT THE PARTICULAR LOCATION OR 10 m WHICHEVER IS MORE.

NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METER, UNLESS SPECIFIED OTHERWISE.
2. THE DIMENSIONS SHALL NOT BE SCALED.
3. THE TYPICAL FOUNDATION TREATMENT SHOWN IN THIS DRAWING IS VALID FOR ALL N.O.F. & O.F. EXCEPT SHEAR ZONES AND FAULTS.
4. ALL THE LOOSE MATERIALS SHALL BE REMOVED FROM THE FOUNDATION GRADE AND THE SURFACE SHALL BE CLEANED WITH WATER/AIR JET PROPERLY MOISTENED AND COATED WITH CEMENT SLURRY.
5. THE DEPTH AND SPACING OF CONSOLIDATION GROUT HOLES SPECIFIED IN THIS DRAWING ARE TENTATIVE AND MAY NEED MODIFICATION IN CONSULTATION WITH GEOLOGIST DEPENDING UPON ACCEPTANCE OF GROUT AND POST-GROUT WATER LOSS TEST.
6. DEPENDING UPON TEST GROUT THE SPACING OF THE HOLES SHALL BE DECIDED AND HOLES DRILLED AND GROUTED.
7. ALL THE GROUTING SHALL BE PERFORMED WITH STABLED GROUT MIXTURE.
8. DEPTH OF CONSOLIDATION GROUTING HOLES SHALL BE 15% OF THE HEAD OF WATER AT THE PARTICULAR LOCATION OR 10 m WHICHEVER IS MORE.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWING

DRG. NO.	TITLE
PL-WP-DPR03/R1	PROJECT LAYOUT PLAN
DM-WP-DPR01/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- EXCAVATION PLAN
DM-WP-DPR02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS



एसजेवीएन लिमिटेड
SJVN Limited

वांग्चू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
CONSOLIDATION GROUTING / FOUNDATION
TREATMENT IN DAM SEAT AREA**

अभिकल्पित
DSGN. Er. ASHOK K

रेखांकित
DRWN. B.S.BANYAL

समीक्षित
CHKD. Er. PRIYANKA

अनुमोदित
APPD. Er. L.M. VERMA

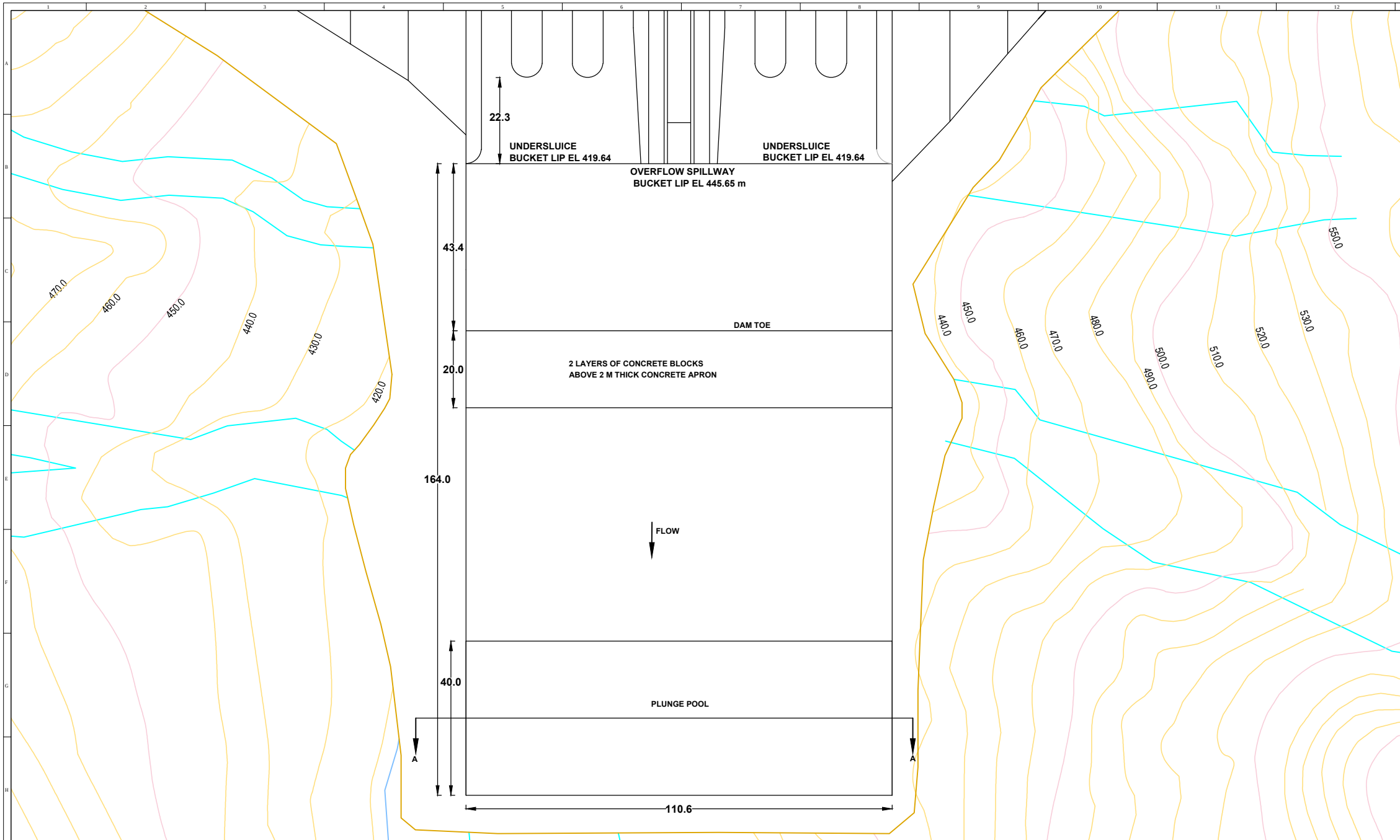
प्रस्तुत
SUBM. Er. M.S.THAKUR

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR24/R1

	FEB, 2014
--	------------------

CD



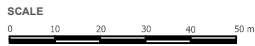
NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS.
2. NO DIMENSIONS SHALL BE SCALED OUT. ONLY WRITTEN DIMENSIONS ARE TO BE TAKEN.

FOR DETAILED PROJECT REPORT ONLY

CONNECTED DRAWINGS :

DRG. NO.	TITLE
DM-WP-DPR02/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- SECTION ALONG DAM AXIS
DM-WP-DPR-07/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- OVERFLOW SECTION 7,8 & 10
DM-WP-DPR08/R1	DAM COMPLEX - CONCRETE GRAVITY DAM- OVERFLOW SECTION I/C SPILLWAY -BLOCK 9



एसजेवीएन लिमिटेड
SJVN Limited

वांगचू जल विद्युत परियोजना भूटान
WANGCHU HYDRO ELECTRIC PROJECT BHUTAN

**DAM COMPLEX
CONCRETE GRAVITY DAM
PLUNGE POOL DETAIL**

अभिकल्पित
DSGN. Er. ASHOK KAPIL

समीक्षित
CHKD. Er.KULDIP GARG

अनुमोदित
APPD. Er. L.M. VERMA

रेखांकित
DRWN. DEVI CHAND

परामर्श
SUBM. Er. M.S.THAKUR

DESIGN FOREIGN PROJECTS

DRG. No. DM- WP-DPR 24 A | FEB., 2014 | CD

