DOBHAN HYDROPOWER COMPANY LIMITED
CHANDOL, KATHMANDU, NEPAL

Presentation of Final Draft Report On

Detailed Design of Bailey Bridge over the Budhigandaki Khola for Dobhan Khola Hydropower Project at Dharche Rural Municipality, Gorkha

Presented by:
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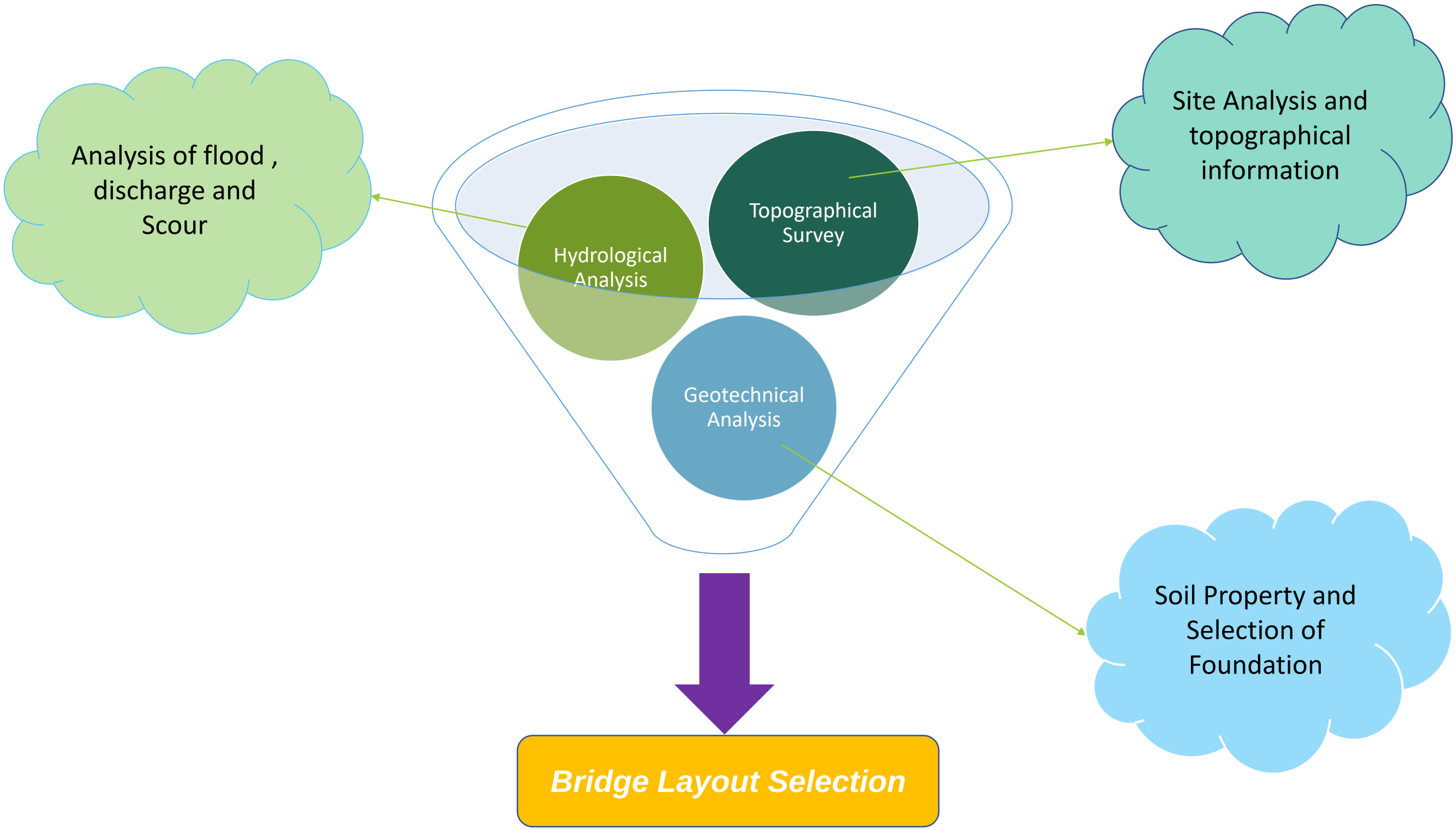
Outline of Presentation

- Introduction
- Procedure for Hydrological Analysis
- Procedure for Geological and Geotechnical Investigation
- Procedure for Structural analysis and Bridge Design.
- Description of the bridge sites and specific Design
- Response to the comment from the client.

Conceptual Framework



Hydrological Procedure

Design Assumptions

1. Hydrological Analysis
2. Hydraulic Analysis

Hydrological analysis

Methods of determine flood discharge value

SN	Method	Q_{10} (m^3/s)	Q20 (m^3/s)
1.0	Modified Dicken's Method	3248.649	4030.265
2.0	WECS Method	2597.29	3014.22
3.0	Tahal Method	2763.406	3231.078
4.0	Fuller's Method	1058.286	1199.876
5.0	Ryves Method	1657.246	
6.0	Dredge or Burge' formula	2236.917	
Maximum Predicted Design Discharge		3249.000	4031.000

Expected linear water way-270 m
Planed span of bridge-42.68 m

SN	Maximum Scour at Bridge	Depth (from HFL)	RL (m)
1	At Abutment	10.679	925.35

- HFL calculated from HEC – RAS software is not applicable and Hence taking observed HFL and manage road level at left bank top level.
- Expecting foundation bottom level will not damage due to scouring.
- Maintain river bed level to soffit level of bridge for water flow is 12m.

Scour depth calculation based on IRC:78 – 2014

Design discharge = 30% increment of design flood.

Mean scour depth, $d_{sm} = 1.34 \times (q^2 / Ksf)^{1/3}$

For pier, Scour depth $= 2 \times d_{sm}$

For Abutment, Scour depth $= 1.27 \times d_{sm}$

- **10 year return period value is taken as design flood.**

Structural Analysis

Limit State of Design Philosophy

Codal Provision

- IRC 6-2017 For Load
- IRC 78-2014 For Foundation
- IRC 112-2020: For design of RCC and PSC Bridge
- IRC 24:2010 : For the design of Steel Truss bridge

Partial Safety Factor as per IRC 6:2017

- Partial Safety Factor for verification of Equilibrium Table B.1(IRC:6-2017)
- Partial Safety Factors for Verification of Structural Strength (Table B.2: IRC6-2017)
- Partial Safety Factors for Verification of Serviceability Limit State(Table B.3: IRC 6-2017)
- Partial Safety Factors for Checking the Base Pressure and Design of Foundation (Table B.4: IRC6-2017)

Structural Analysis

Load in Superstructure

a) Dead Load
   - Structural Deal Load
   - Non Structural Dead Load

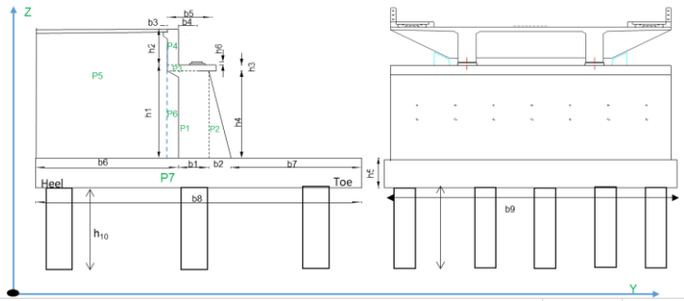
a) Live Load
   - Vehicle Live Load

Structural Analysis

Load in Sub Structure and foundation

- Dead Load due to Super Structure
- Dead load of Approach slab
- Live load
- Buoyancy Force
- Braking load
- Temperature Load
- Dead load due to abutment
- Earth pressure (Static and Dynamic)
- Seismic Loading
- Load due to surcharge
- Water Current

Structure



H = 10.30 m

$$KA = \frac{cos^2(\phi-\alpha)}{cos^2\alpha * cos(\delta+\alpha)} X \frac{1}{[1+\{\frac{\sin(\phi+\delta)*\sin(\phi-i)}{\cos(\alpha-i)*\cos(\alpha+\delta)}\}^{\frac{1}{2}}]^2}$$

where,

angle of internal friction (ϕ)	i	δ=(2/3)xϕ< 22.5 (IRC 6:2017 214.1.1.1)	α	K_A
33	0	22.00	0	0.264

Check for bearing Pressure

Combination of Forces (IRC 78:706.1.1)		
combination I	Combination I I	Combination III
Dead Load (G)	combination I + below conditions	Dead Load (G)
Live Load (Q)	Wind (W) + Wave pressure (F_{wp})	Water Current (F_{wc}
Water Current (F_{wc}	or	Frictional Force in Bearing (F_f)
Frictional Force in Bearing (F_f)	Earthquake (F_{eq})+Wave pressure (F_{wp})	Earth Pressure (F_{ep})
Longitudinal Force due to Braking (F_b)	or	Earthquake (F_{eq})/ Wind (W)
Buoyancy (G_b)	Impact due to flotting (F_{im})+Wave pressure (F_{wp})	
Centrifugal Force (F_{cf})		

Overall Design of Abutment and foundation

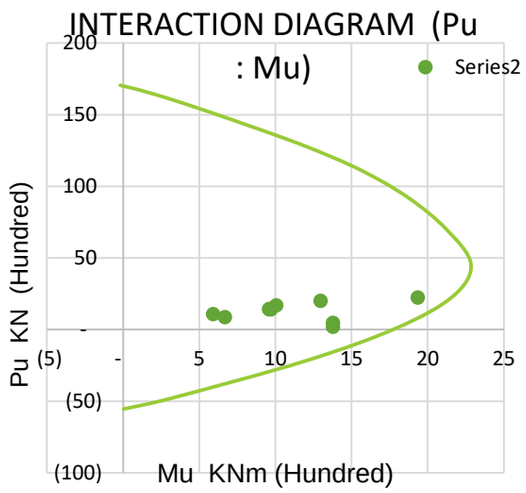
Design of Foundation

Design of Abutment and Check for the Crack section

Computation of the Seismic Force

Computation of force due to earth pressure (backfill)

Calculation of Load from Superstructure



*8) At present the combination of loads shown in **Table B.4** shall be used for structural design of foundation only. For checking the base pressure under foundation, load combination given in IRC:78 shall be used. **Table B.4** shall be used for checking of base pressure under foundation only when relevant material safety factor and resistance factor are introduced in IRC:78.*

i) Calculation of Area of Steel for the section (along the backwall)

Effective Depth Required (d = Sqrt(M/Kxfckxb) (mm)		672.062	478.372	744.776
Ast provided (mm2)				40,803.89
Minimum Area of Steel (IRC 112:2019 Cl16.5.1) Maximum of a) 0.26*fctm/fyk *bw*d b). 0.0015bw*d				17,545.50
Check		OK	OK	OK	OK
Shear Capacity Without Stirrups **Shear Resistance of the Member withour Shear Rebar (IRC 112:2019 Cl 10.1-10.3)** **a)VRdc ={0.12K(80ρ1fck)0.33+0.15σcp)} *bwd** **Subjected to Minimum of bar b) VRdc = (nmin+0.15σcp)*bwd ; nmin = 0.031K3/2 fck 1/2**				
$V_{Rd,c}$	K = 1+Sqrt(200/d)<=2			1.37898
	σcp =Ned/AC <.2fcd	0.67	0.46	0.55
	ρ1 =Asl/bwd <=.02			0.00349
	a) $V_{Rd,c}$	5,100.38	4,744.60	4,896.36
	nmin= (0.031K3/2fck1/2)			0.27495
	b) $V_{Rd,c}$	4,386.21	4,030.42	4,182.19
	∴ $V_{Rd,c}$ Max of a & b	5,100.38	4,744.60	4,896.36
∴ V_{ed} (Maximum of Horizontal Load in all cases)		3,075.37	1,557.17	4,178.37
Check		Shear Rebar Not Required	Shear Rebar Not Required	Shear Rebar Not Required
		OK		

Budhigandaki khola Bailey bridge

Salient Features of the bridge	
Name of Project	*Bailey Bridge over Budhi Gandaki khola*
Name of River	*Budhi Gandaki khola*
Municipality / Rural Municipality	Dharche Rural Municipality
Name of the Road:	Connecting to Dobhan Hydropower Project from Budhigandaki Corridor
Coordinate	28°17'45.47"N, 84°54'14.94"E
Total length of the bridge	42.68m (Single) Standard Width (3.277 M roadway width) and (3.76 M wide from inside edge of the inner most truss)
Types of Bridge	TSR3 or DDR Type Bailey Bridge or Fabricator propose new model

Nomenclature	Width of roadways	Distance between t the inner most truss
Standard Width (SW)	3.277 M (10'-9")	3.76 M (12'-4")
Extra Wide (EW)	4.250 M (13'-11")	4.775 M (15'-8")

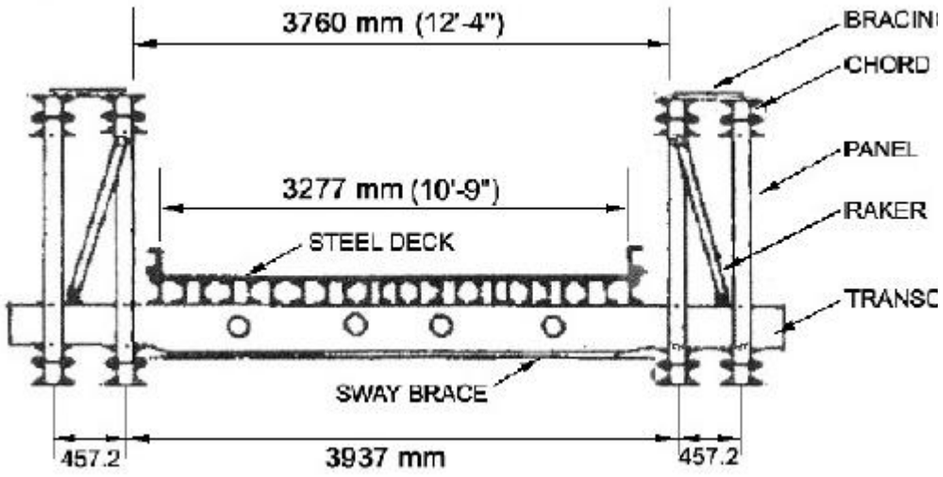


Table-1

Recommended Construction For TWL STANDARD WIDTH Bailey Type Portable Bridge with Steel Deck

LOAD CLASS (as per IRC-6)	SPAN (FEET)																	
	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
5R	SS	SS	SS	SS	SS	SS	SS	SS	SSR	SSR	SSR	DSR	DSR	DSR	DD	DDR	DDR	DDR
9R	SS	SS	SS	SS	SS	SSR	SSR	SSR	SSR	SSR	TS	DSR	DSR	DD	DDR	DDR	DDR	DDR
12R	SS	SS	SS	SS	SS	SSR	SSR	SSR	SSR	TS	DSR	DSR	DD	DD	DDR	DDR	DDR	DDR
18R	SS	SS	SS	SS	SSR	SSR	SSR	TS	DSR	DSR	DSR	DD	TSR	DDR	DDR	DDR	DDR	DDR
24R	SS	SS	SSR	SSR	SSR	DS	TS	TS	DSR	DSR	DD	TSR	TSR	DDR	DDR	DDR	DDR	DDR
B	SS	SS	SS	SS	SSR	SSR	TS	DSR	DD	DD	TSR	DDR	DDR	DDR	DDR	DDR	DDR	TDR
30R	SS	SS	DS	DS	TS	TS	DSR	DD	DD	DDR	DDR	DDR	DDR	DDR	DDR	DDR	TDR	TDR
40R	DS	DS	DS	DS	DSR	DSR	DD	DD	DDR	DDR	DDR	DDR	DDR	DDR	TDR	TDR	TDR	–
A	SS	SS	DS	DS	DSR	DSR	DD	DD	DDR	DDR	DDR	DDR	DDR	TDR	TDR	TDR	TDR	–
60R	DSR	DSR	DSR	DD	DDR	DDR	DDR	TDR	TDR	TDR	TDR	TDR	TDR	TDR	–	–	–	–
70R	TS	TS	TS	DD	DD	TD	TD	TDR	TDR	TDR	TDR	TDR	–	–	–	–	–	–

Table 5–1. Classes of Bailey Bridge M2 (By Type of Construction and Type of Crossing)

Bridge length (feet)	SS			DS			TS			DD			TD			DT			TT	
	N	C	R	N	C	R	N	C	R	N	C	R	N	C	R	N	C	R	N	C
30	30/ /30	42/ /37	47/ /42																	
40	24/ /	36/ /34	40/ /38																	
50	/ /24	33/ /31	36/ /35	75/ /70	83/ /76	88/ /84														
60	20/ /	30/ /29	33/ /32	65/ /65	77/ /73	85/ /79														
70	20/ /	24/ /	30/ /30	60/ /60	68/ /69	78/ /75														
80	16/ /	20/ /	24/ /	50/ /55	60/ /60	66/ /64	85/ /80	95/ /90	100*/ /90*											
90	12/ /	16/ /	19/ /	40/ /45	50/ /50	55/ /55	65/ /65	74/ /75	82/ /82											
100	8/ /	12/ /	14/ /	30/ /30	37/ /39	42/ /44	50/ /55	57/ /60	64/ /66	80/ /80	86/ /90	96/ /90								
110				20/ /	30/ /32	34/ /36	35/ /40	47/ /49	52/ /54	65/ /70	72/ /76	80/ /83	90/ /90*	100*/ /90*	100*/ /90*					
120				16/ /	23/ /	27/ /30	30/ /35	38/ /41	43/ /45	45/ /55	57/ /61	64/ /68	75/ /80	83/ /90*	91/ /90*					
130				12/ /	18/ /	21/ /	20/ /	31/ /33	35/ /38	35/ /45	47/ /50	53/ /56	55/ /60	65/ /72	74/ /80	70/ /80	80/ /90*	90/ /90*		
140				8/ /	14/ /	17/ /	16/ /	24/ /	29/ /31	30/ /35	39/ /42	44/ /48	45/ /55	57/ /62	64/ /70	70/ /70	80/ /90*	88/ /90*		
150							12/ /	18/ /	22/ /	24/ /	32/ /35	36/ /40	35/ /45	47/ /51	54/ /58	60/ /60	77/ /85	85/ /90*		

General Arrangement with Load and length of Belly Bridge (Chinease)

1	Design Length =	42.68	m	(140 ')	
	Loading Capacity =	46	Tons		
	Net Deck Width=	4.2	m		
	Estimated weight=	76-78	Tons		
	Configuration=	TSR3			
	Brdige Type =	Extrawide ZB 200			
	Preventation :	Galvanized			
2	Design Length =	45.72	m	(150 ')	
	Loading Capacity =	46	Tons		
	Net Deck Width=	4.2	m		
	Estimated weight=	80-82	Tons		
	Configuration=	TSR3			

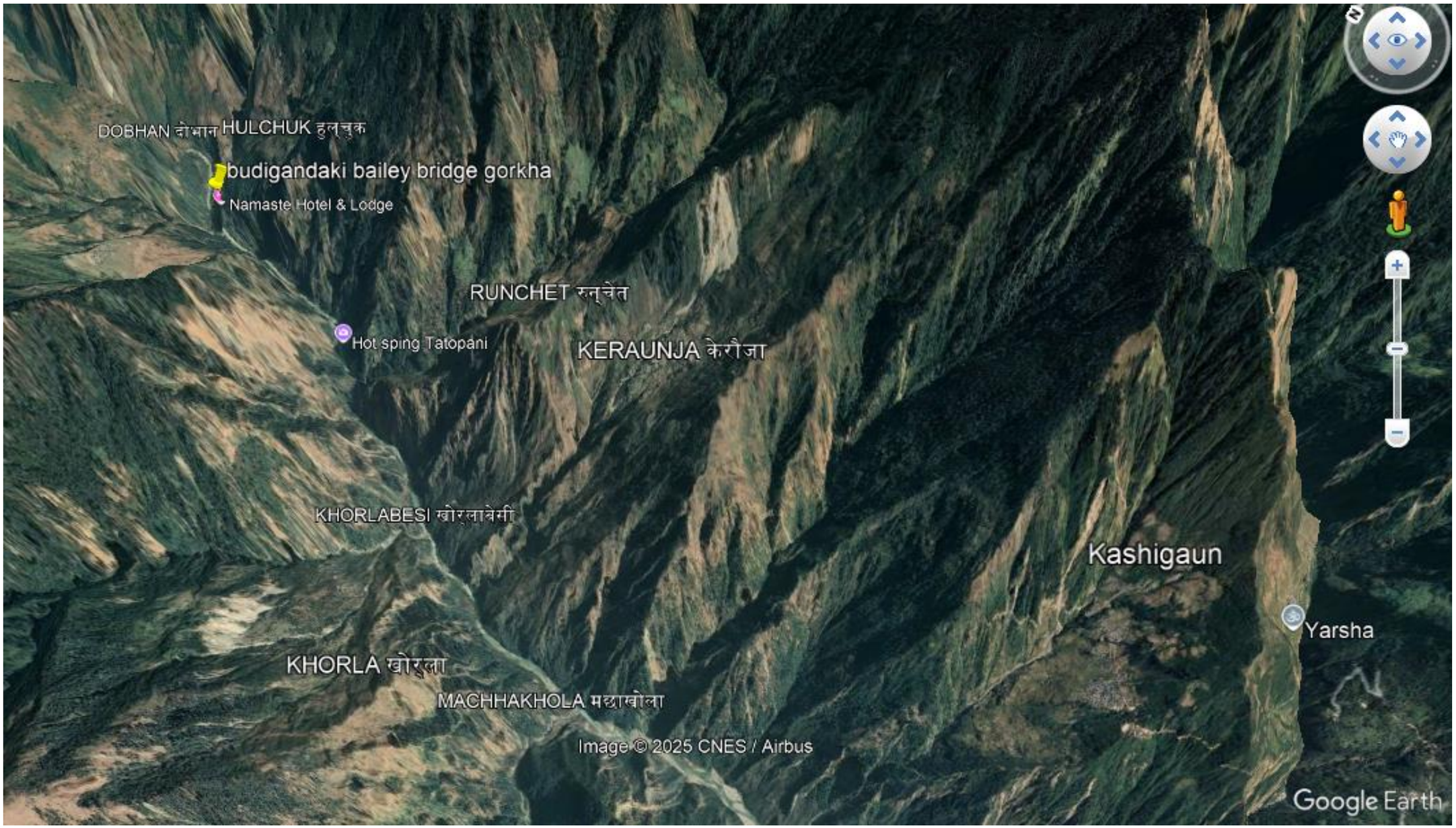
Table 5—3. Maximum Base-Plate and Rocking-Roller Reactions in Tons on Grillage at One Corner of Bridge

SS	Span in feet	30	40	50	60	70	80	90	100		
	Safe capacity	40	32	28	26	22	18	13	10		
	Caution capacity	55	45	38	35	31	23	19	13		
	Base-plate reaction [1]	31	26	24	21.8	21	18	17	15		
	Rocking-roller reaction [2]	5.7	7.4	8.9	10.7	12.7	13.9	15.9	14.4		
DS	Span in feet	50	60	70	80	90	100	110	120	130	140
	Safe capacity	80	67	64	51	44	31	23	18	13	10
	Caution capacity	100	84	80	64	55	40	34	23	19	13
	Base-plate reaction [1]	56	48	45	39	35	30	27	23	22	20
	Rocking-roller reaction [2]	10.5	12.8	14.5	16.8	18.8	20.5	22.8	24.9	26.8	28.9
TS	Span in feet	80	90	100	110	120	130	140	150	160	
	Safe capacity	80	62	52	40	34	23	18	13	10	
	Caution capacity	100	78	65	50	43	32	23	19	13	
	Base-plate reaction [1]	59	50	43.5	38	34.5	31	27	26	25	
	Rocking-roller reaction [2]	19.0	21.5	23.5	26.0	28.0	30.5	33.0	30.5	29.8	
DD	Span in feet	100	110	120	130	140	150	160	170	180	
	Safe capacity	75	64	50	40	31	23	19	13	10	
	Caution capacity	94	80	63	51	44	32	29	19	13	
	Base-plate reaction [1]	60	53	47	42	39	35	35	32	30	
	Rocking-roller reaction [2]	26.8	29.8	32.0	34.8	38.3	41.0	38.0	40.8	38.3	
TD	Span in feet	110	120	130	140	150	160	170	180	190	
	Safe capacity	80	70	57	48	40	31	23	18	12	
	Caution capacity	100	88	75	61	50	43	31	23	16	
	Base-plate reaction [1]	68	62	57	53	49	48	44	42	40	
	Rocking-roller reaction [2]	35.8	39.3	43.3	46.8	50.3	51.0	49.3	47.0	46.0	
DT	Span in feet	130	140	150	160	170	180	190	200	210	
	Safe capacity	80	67	65	56	50	40	31	23	18	
	Caution capacity	100	87	81	70	63	50	44	31	23	
	Base-plate reaction [1]	73	67	55	64	63	60	58	54	51	
	Rocking-roller reaction [2]	47.5	50.8	54.8	59.0	59.8	59.5	56.8	55.5	56.3	
TT	Span in feet	170	180	190	200	210					
	Safe capacity	70	57	50	40	29					
	Caution capacity	88	75	64	50	36					
	Base-plate reaction [1]	85	82	78	75	69					
	Rocking-roller reaction [2]	60	60	60	60	60					

[1] Includes weight of footwalks, ramps, bearings, and base plate. Live load assumed to be caution load on center line of bridge.
[2] Includes weight of rocking rollers, bearings, and template. Bridge launched without footwalks.

Access to Proposed Bridge

The proposed bridge lies on Budhigandaki Corridor to Project site. It is about 8 Km North from Machhakhola Bazar, 18Km from Aarughat Gorkhra and around 85-90 Km from Kathmandu Muglin Highway.



Site Visit/Proposed Axis

- We visited Budhigandaki Khola, on 08/11/2081 with a team of experts (structural engineer and survey engineer etc.) and technical team of DHCL for detailed field study.
- The bridge connects the Budhigandaki corridor to project site.

Feasibility and Importance of Bridge

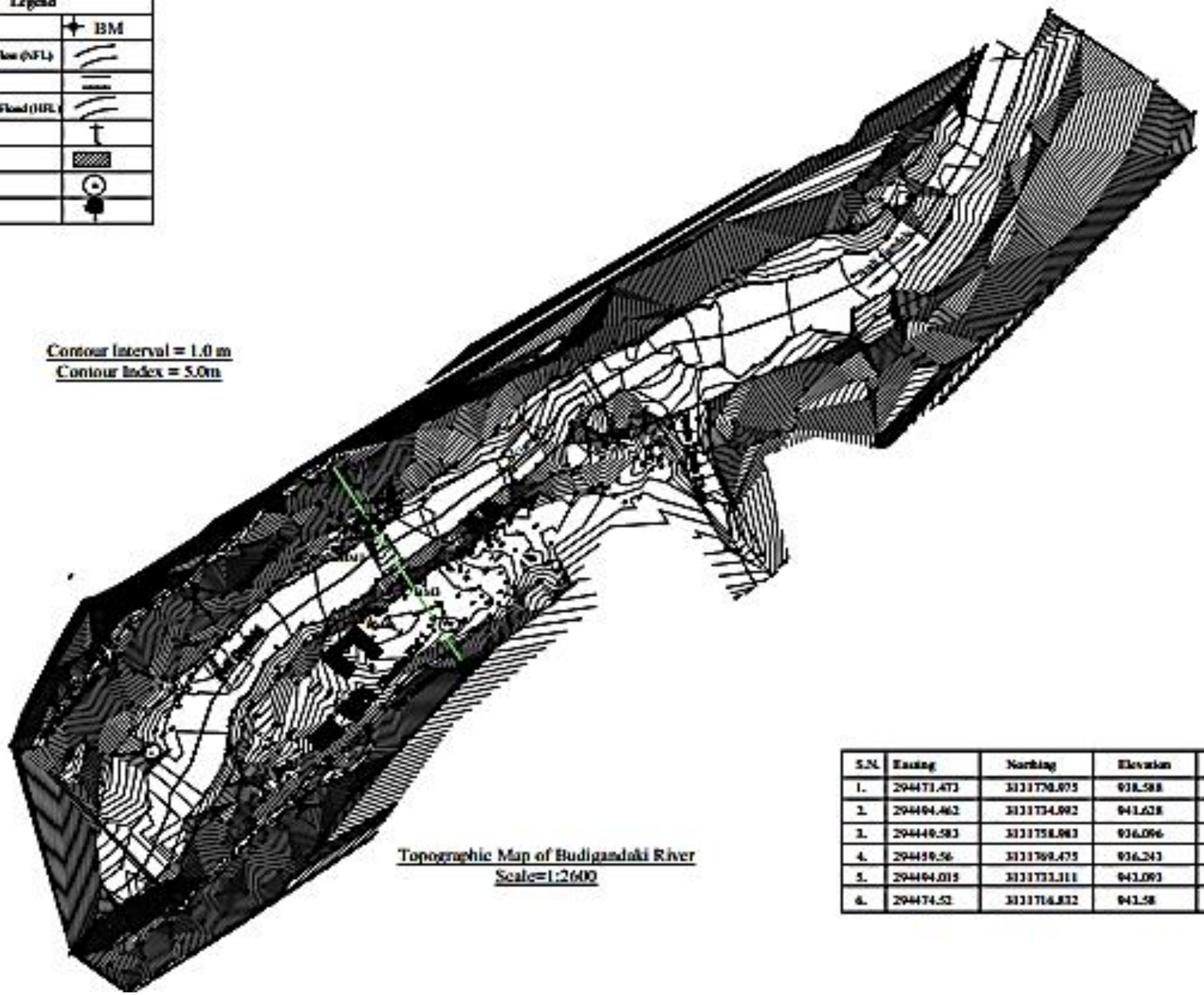
- Bridge should be placed technically stable, economically reliable and socially safe. Our expert team visited the site and proposed the best alignment as per site condition and approved from the client side during the filed visit time.
- This bridge is constructed by Hydropower Company for the transportation of material during the construction phase.
- So this bridge is importance for this Company because of there is no other possible way to transfer material from one bank to another.

Topographic Plan

Legend	
Reach Mark	BM
River Normal Flow (NFL)	
Road Edge	
Observed High Flood (HFL)	
Electric Pole	
House	
Bolder/ Rock	
Tree	

N

Contour Interval = 1.0 m
Contour Index = 5.0m



Topographic Map of Budigandaki River
Scale=1:2600

S.N.	Easing	Northing	Elevation	Description
1.	294471.473	3111750.975	938.588	AXIS RIGHT
2.	294494.462	3111734.992	941.628	AXIS LEFT
3.	294449.583	3111758.983	936.096	BENCH MARK 1
4.	294459.56	3111769.475	936.243	BENCH MARK 2
5.	294494.015	3111733.111	943.093	BENCH MARK 3
6.	294474.52	3111716.832	943.58	BENCH MARK 4

Fig: Topographic Map as per survey data

Geotechnical Study

Based on the Assumption, it is recommended to use **Open Foundation at left bank and Open foundation with anchor rebar on rock at right bank** for this bridge. Bearing capacity of soil at foundation level =420KN/m2 assumed

Report on D50 Calculation of Sand Samples

Date: 19/11/2081

Client:

Project:

Location:

Sample Details and D50 Results

Sample Location	D50 (mm)
Upper	0.301
Mid	0.149
Lower	0.195

Interpretation of Results:

Upper Sample:

The D50 value of 0.301 mm suggests a coarser sand composition.

Mid Sample:

The D50 value of 0.149 mm indicates a finer particle distribution.

Lower Sample:

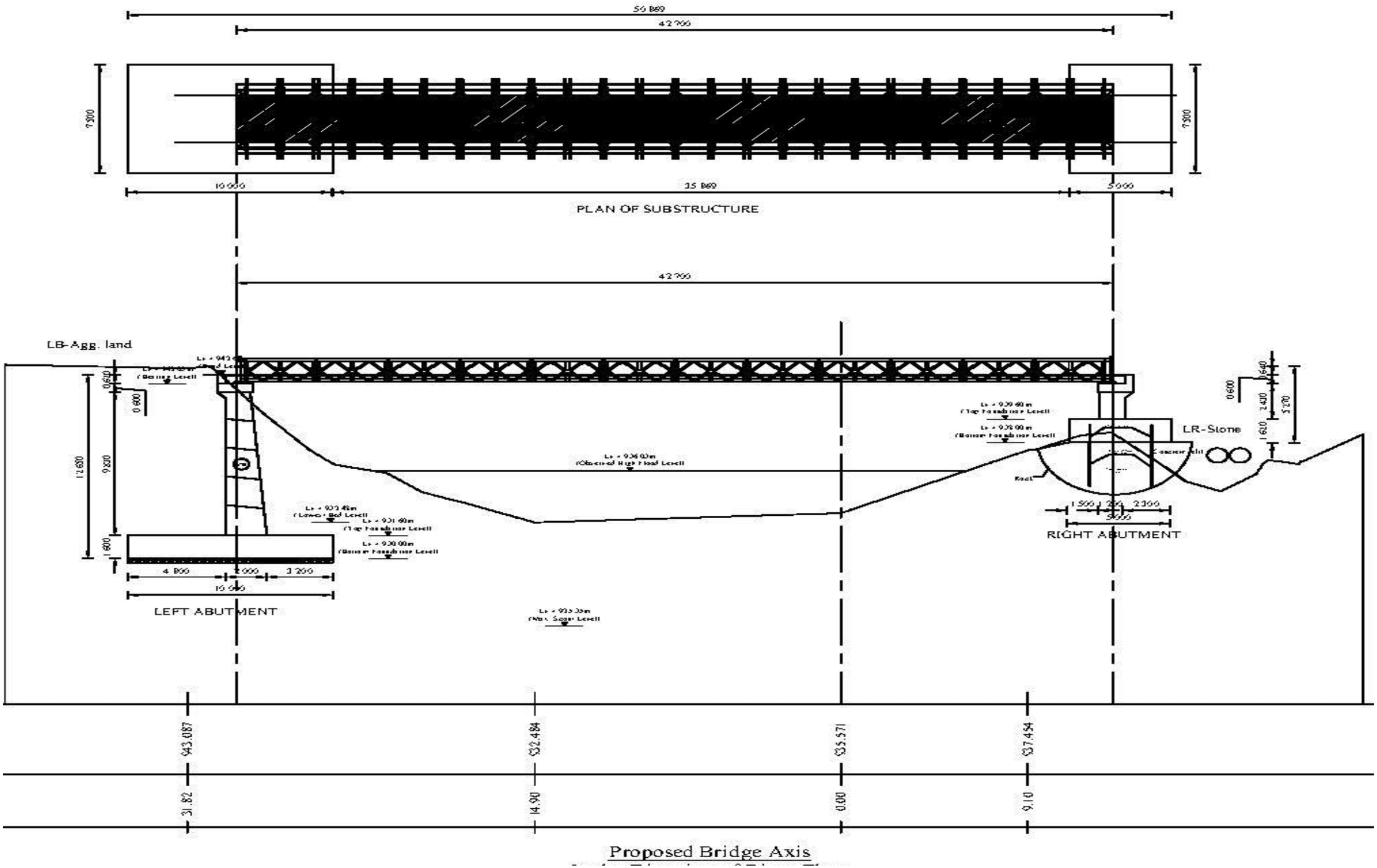
The D50 value of 0.195 mm shows a moderately fine sand composition.

Conclusion:

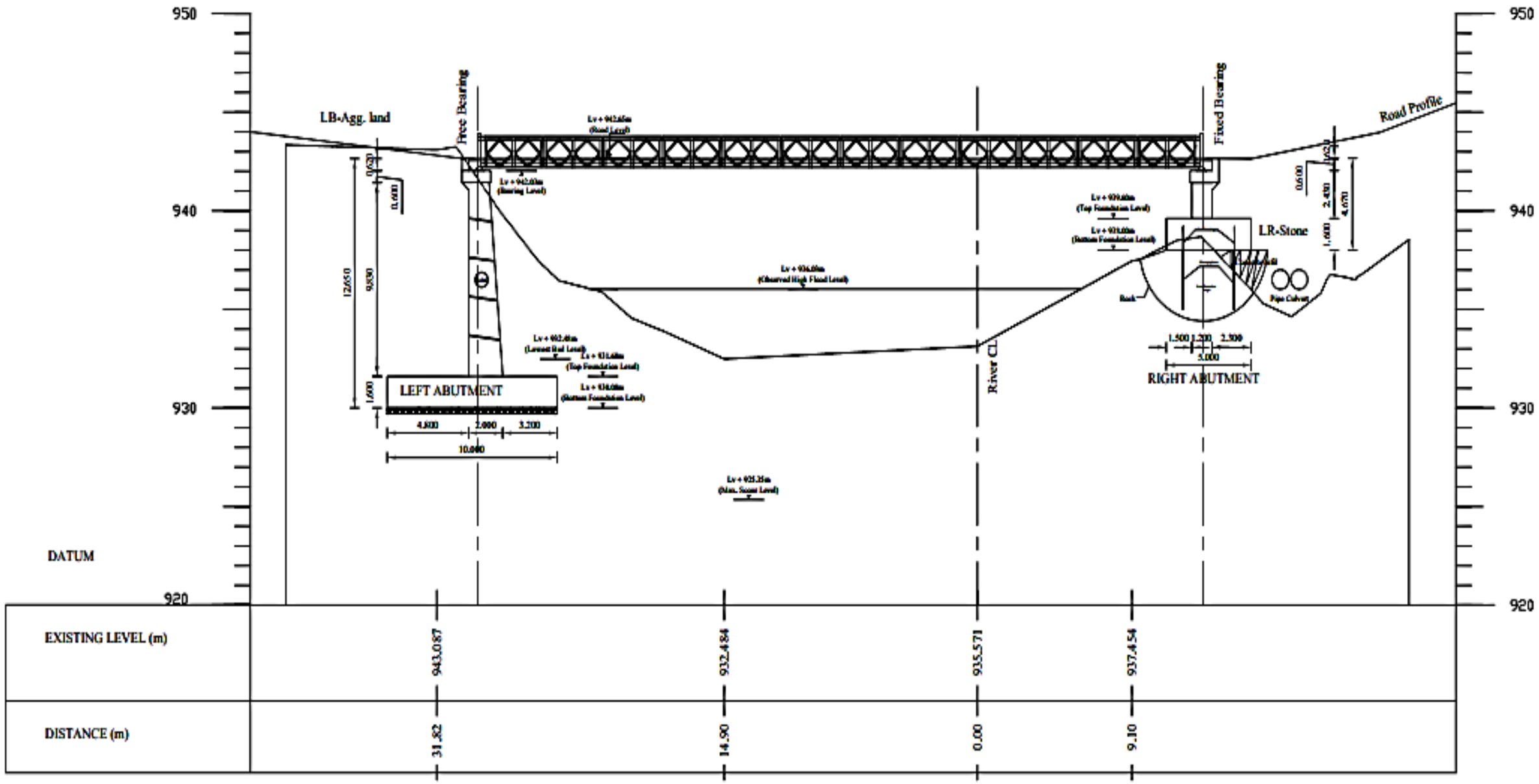
The D50 values indicate varying particle sizes across locations. These values help understand the gradation and suitability of sand.Further analysis can be conducted for more detailed insights.

Bridge Design

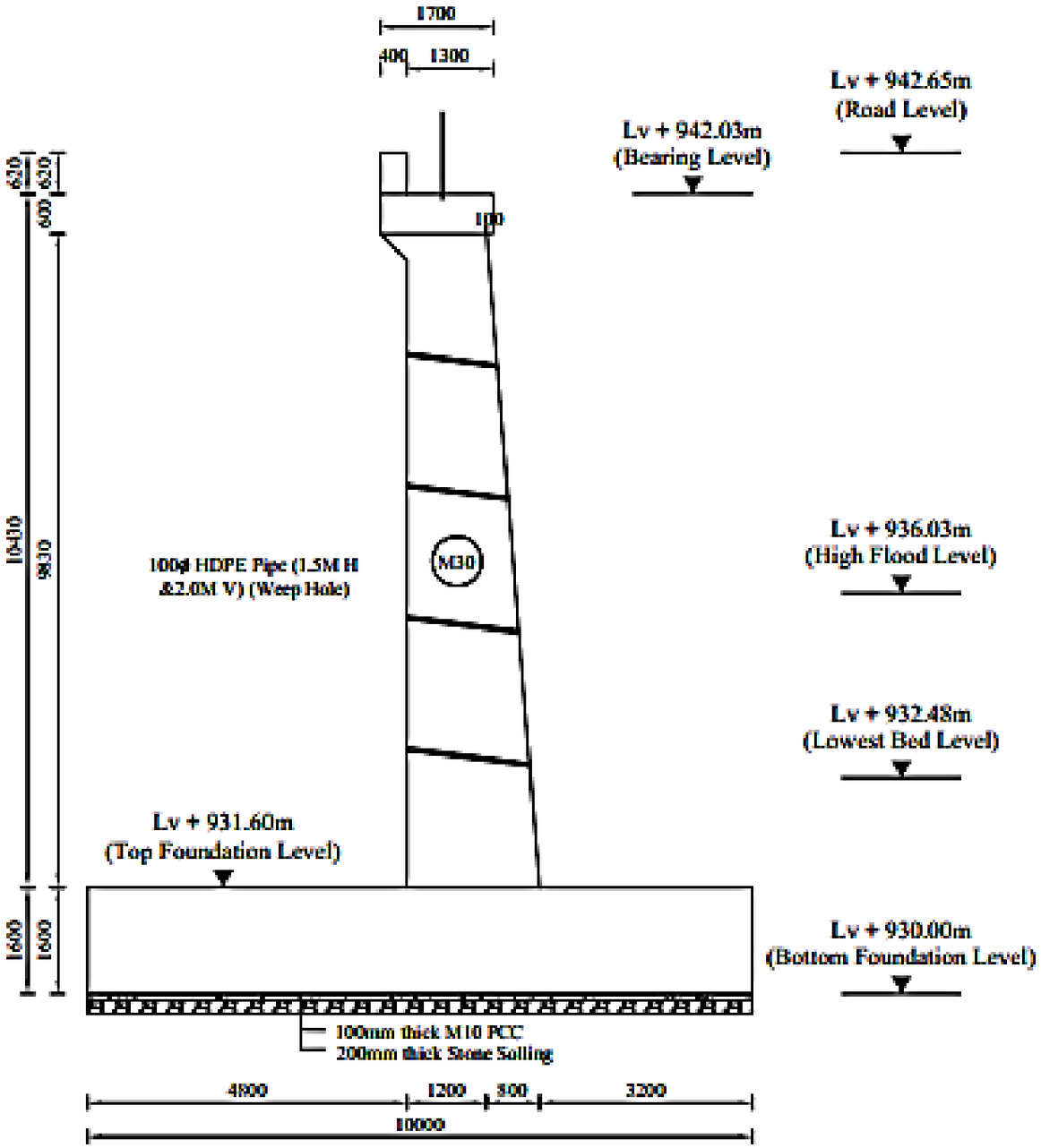
Bridge Span = 14 bay x 3.048m=42.68m TSR3/DDR bailey bridge



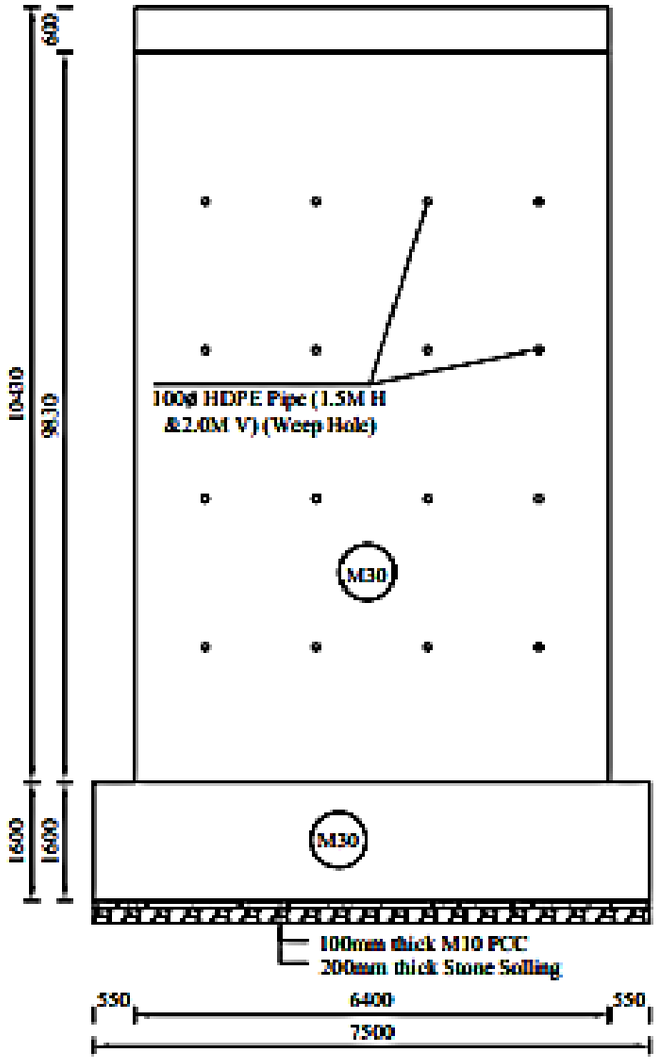
General Arrangement



Sub Structure Details

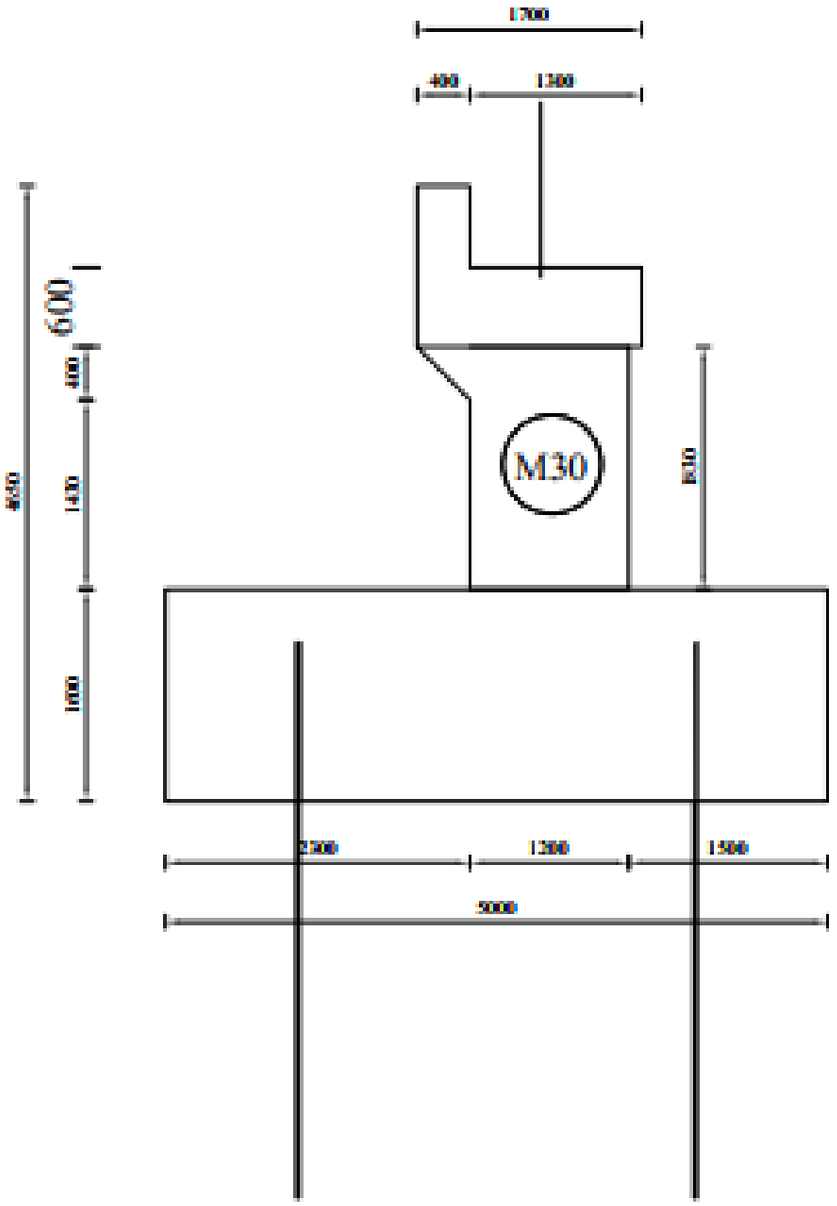


Section of Left Abutment @ A-A
Scale-1:100

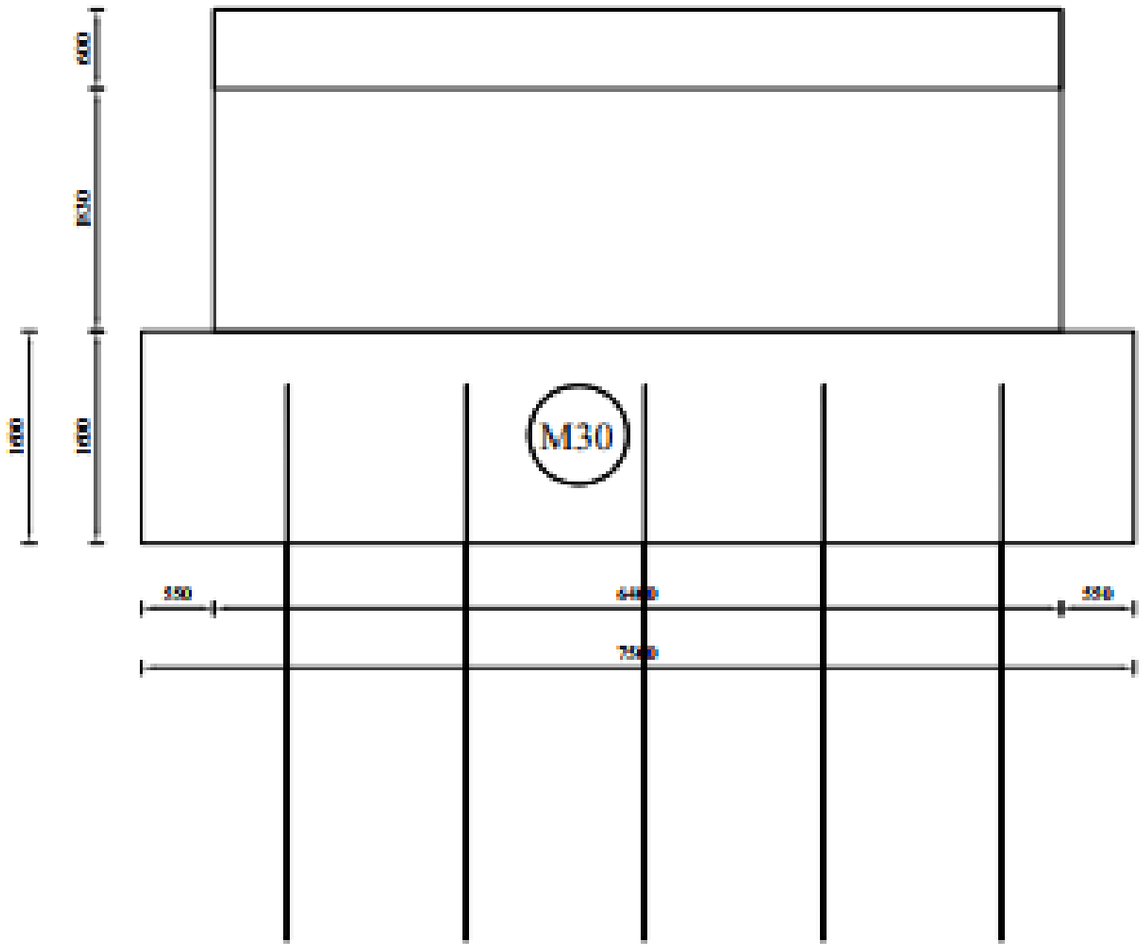


Section of Left Abutment @ B-B
Scale-1:100

Sub Structure Details

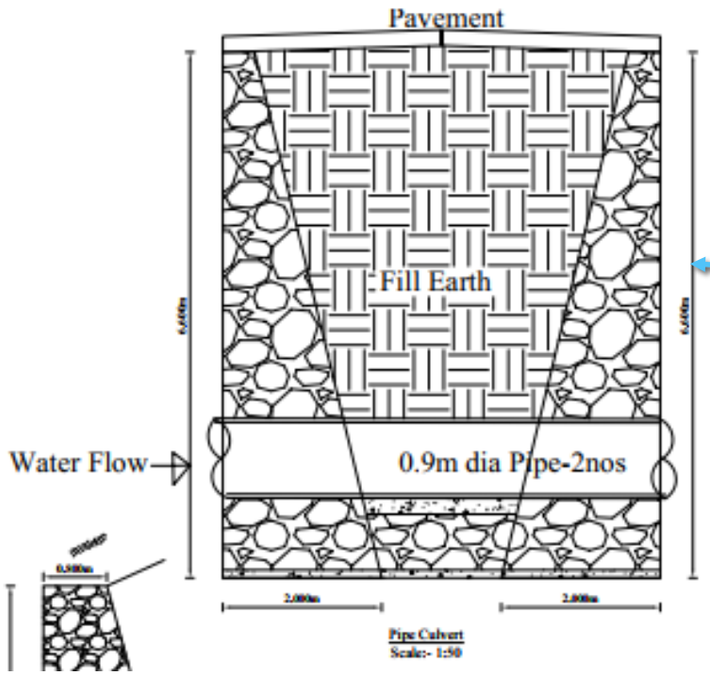


Section of Right Abutment @ C-C
Scale-1:50

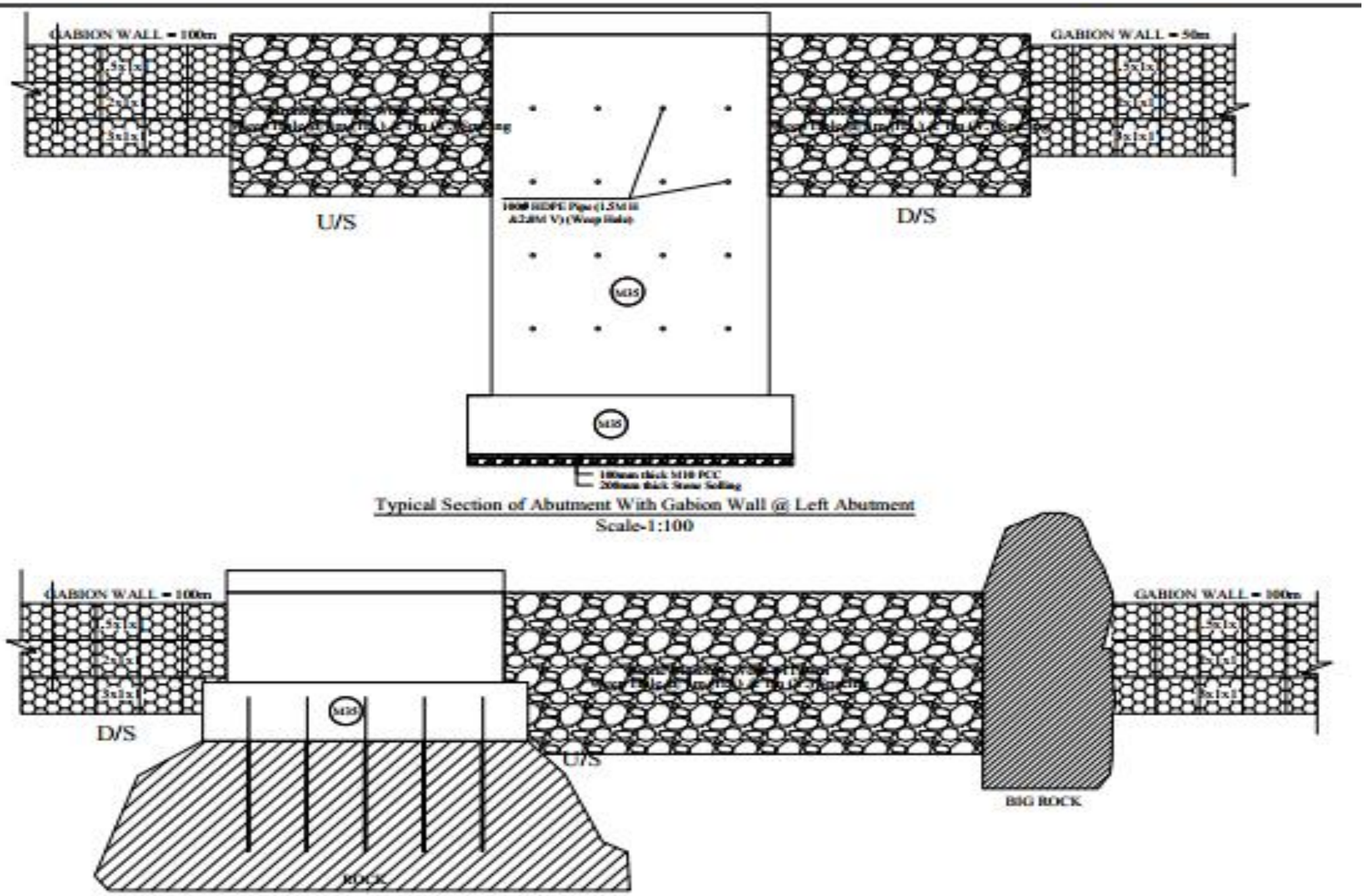


Section of Right Abutment @ D-D
Scale-1:50

River Training Works



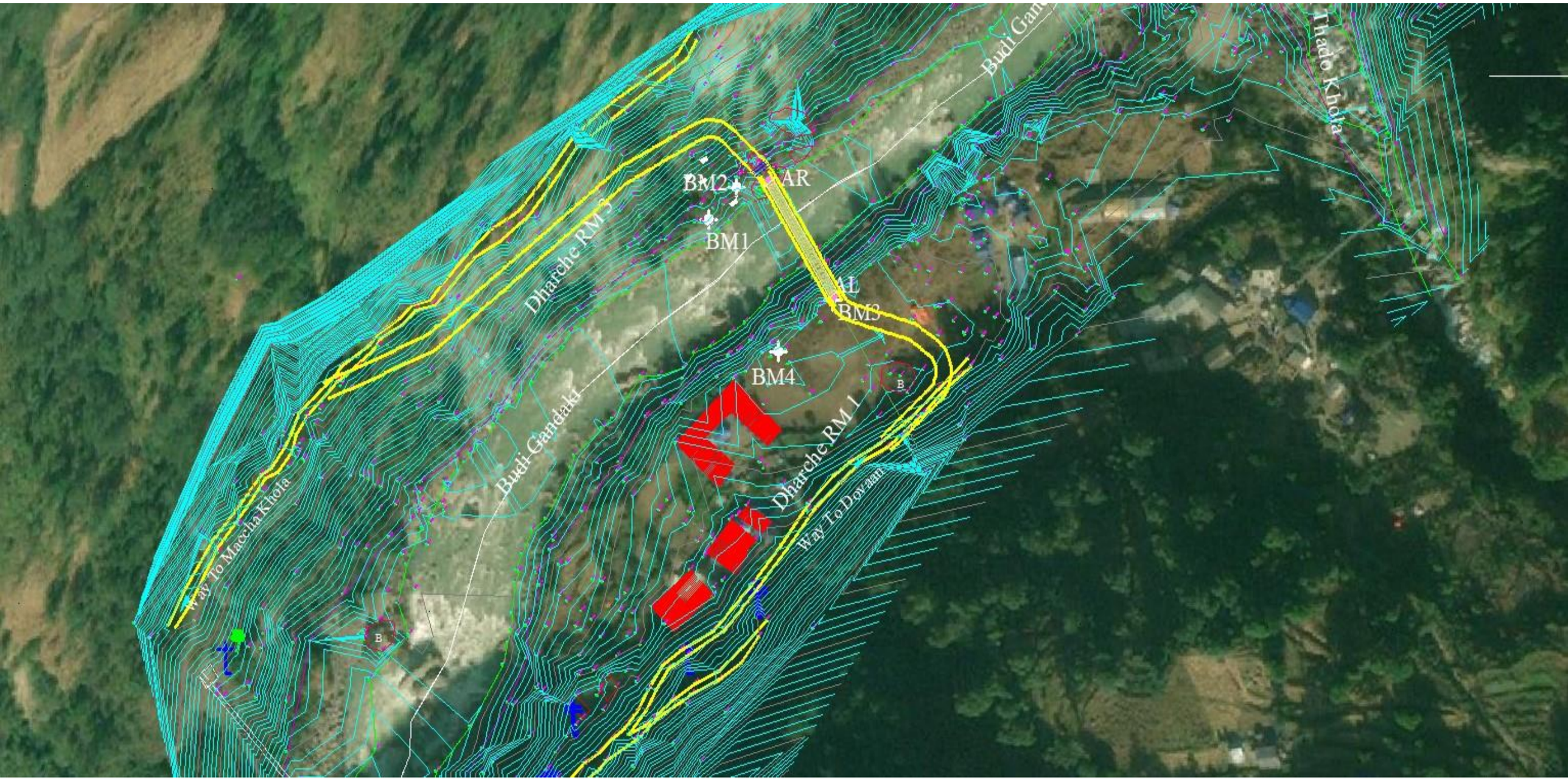
River Training Works



Typical Section of Abutment With Gabion Wall @ Left Abutment
Scale-1:100

Typical Section of Abutment With Gabion Wall @ Right Abutment

Approach Plan



Summary of Cost Estimate

Summary of Cost Estimate with District Rate of Gorkha				
Name of Bridge: Budhi Gandaki Khola Bailey Bridge				Span=1 x 42.68m
S.No	Description	Amount	In words	Remarks
1	Provisional Sum	436,381.58	Four Hundred Thirty Six Thousand Three Hundred Eighty One Rupees and Fifty Eight Paisa	
2	General Item	235,000.00	Two Hundred Thirty Five Thousand Rupees and No Paisa	
3	Foundation Works	4,839,915.84	Four Million Eight Hundred Thirty Nine Thousand Nine Hundred Fifteen Rupees and Eighty Four Paisa	
4	Sub-Structural Works	5,454,966.94	Five Million Four Hundred Fifty Four Thousand Nine Hundred Sixty Six Rupees and Ninety Four Paisa	
5	Super-Structural Works	17,940,000.00	Seventeen Million Nine Hundred Forty Thousand Rupees and No Paisa	78 ton by 230/Kg
6	River Training Works	3,957,173.47	Three Million Nine Hundred Fifty Seven Thousand One Hundred Seventy Three Rupees and Forty Six Paisa	
7	Approach Road	27,471,962.87	Twenty Seven Million Four Hundred Seventy One Thousand Nine Hundred Sixty Two Rupees and Eighty Seven Paisa	
8	Miscellaneous Works	1,587,307.24	One Million Five Hundred Eighty Seven Thousand Three Hundred Seven Rupees and Twenty Four Paisa	
9	Day Works	775,538.28	Seven Hundred Seventy Five Thousand Five Hundred Thirty Eight Rupees and Twenty Eight Paisa	
Total of 2 to 9		62,261,864.64	Sixty Two Million Two Hundred Sixty One Thousand Eight Hundred Sixty Four Rupees and Sixty Three Paisa	
Provisional Sum		436,381.58	Four Hundred Thirty Six Thousand Three Hundred Eighty One Rupees and Fifty Eight Paisa	
Total including P.S.		62,698,246.22	Sixty Two Million Six Hundred Ninety Eight Thousand Two Hundred Forty Six Rupees and Twenty One Paisa	
VAT @ 13% of Total		8,094,042.40	Eight Million Ninety Four Thousand Forty Two Rupees and Forty Paisa	
Grand Total including VAT		70,792,288.62	Seventy Million Seven Hundred Ninety Two Thousand Two Hundred Eighty Eight Rupees and Sixty Two Paisa	
Cost per m span		1,658,675.93	One Million Six Hundred Fifty Eight Thousand Six Hundred Seventy Five Rupees and Ninety Two Paisa	
Cost per m span(Without VAT)		1,469,031.07	One Million Four Hundred Sixty Nine Thousand Thirty One Rupees and Seven Paisa	
Cost per m span (Without Approach Road and River Training Work)		732,640.81	Seven Hundred Thirty Two Thousand Six Hundred Forty Rupees and Eighty One Paisa	

Summary of Cost Estimate

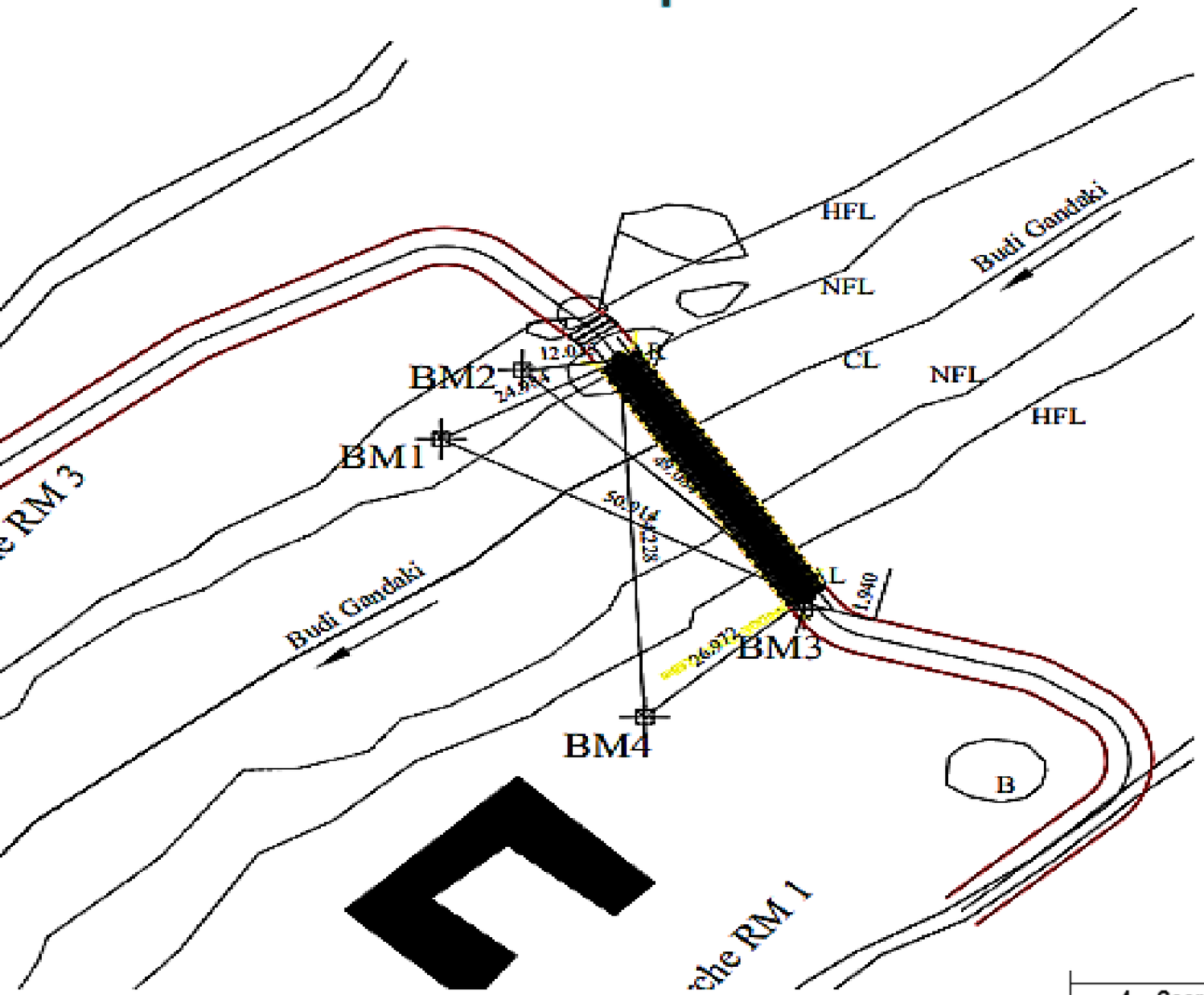
Summary of Cost Estimate ignoring the local material cost							
Name of Bridge: Budhi Gandaki Khola Bailey Bridge				Span=1 x 42.68m			
S.No	Description	Amount	In words	Remarks			
1	Provisional Sum	246,998.09	Two Hundred Forty Six Thousand Nine Hundred Ninety Eight Rupees and Nine Paisa		Consider		
2	General Item	235,000.00	Two Hundred Thirty Five Thousand Rupees and No Paisa		Sand	locally available	50%
3	Foundation Works	4,497,407.89	Four Million Four Hundred Ninety Seven Thousand Four Hundred Seven Rupees and Eighty Nine Paisa		Rubble stone	locally available	20%
4	Sub-Structural Works	4,824,619.80	Four Million Eight Hundred Twenty Four Thousand Six Hundred Nineteen Rupees and Eighty Paisa		Crushed Aggregate		0%
5	Super-Structural Works			78 ton by 230/Kg	20-40mm	mobile crusher	50%
6	River Training Works	2,931,881.68	Two Million Nine Hundred Thirty One Thousand Eight Hundred Eighty One Rupees and Sixty Seven Paisa		10-20mm	mobile crusher	50%
7	Approach Road	10,968,088.01	Ten Million Nine Hundred Sixty Eight Thousand Eighty Eight Rupees and One Cent	50% masonry and gabion	5-10mm	mobile crusher	50%
8	Miscellaneous Works	1,561,310.88	One Million Five Hundred Sixty One Thousand Three Hundred Ten Rupees and Eighty Eight Paisa		River Gravel (chips)	mobile crusher	50%
Total of 2 to 8		25,018,308.26	Twenty Five Million Eighteen Thousand Three Hundred Eight Rupees and Twenty Five Paisa		Water	River userd	0%
Provisional Sum		246,998.09	Two Hundred Forty Six Thousand Nine Hundred Ninety Eight Rupees and Nine Paisa		Back Filling Soil	locally available	20%
Total including P.S.		25,265,306.35	Twenty Five Million Two Hundred Sixty Five Thousand Three Hundred Six Rupees and Thirty Four Paisa		Sub-base material S1 or S2 type	locally available	20%
VAT @ 13% of Total		3,252,380.07	Three Million Two Hundred Fifty Two Thousand Three Hundred Eighty Rupees and Seven Paisa				
Grand Total including VAT		28,517,686.42	Twenty Eight Million Five Hundred Seventeen Thousand Six Hundred Eighty Six Rupees and Forty Two Paisa				
Cost per m span		668,174.47	Six Hundred Sixty Eight Thousand One Hundred Seventy Four Rupees and Forty Seven Paisa				
Cost per m span(Without VAT)		591,970.63	Five Hundred Ninety One Thousand Nine Hundred Seventy Rupees and Sixty Two Paisa				
Cost per m span (Without Approach Road and River Training Work)		266,291.86	Two Hundred Sixty Six Thousand Two Hundred Ninety One Rupees and Eighty Six Paisa				

Minutes and verification

आज मिती २०८१।११।०९ गते शुक्रवार थल पुर्दि गाउको खोलामा बेली ब्रिजको सर्भे, दोभान हाइड्रोपावर कम्पनि लिमिटेड, टन्डोल, काठमाण्डौंको कार्यक्रम अन्तर्गत यहि स्थानियवहरुको रोहबरमा सम्पन्न गरियो ।

क्रम	नाम, थर	सम्पर्क	ठेगाना	हस्ताक्षर
१	भुमन गुरुङ	9701595257	थाचे, ९	
२	धन प्र. गुरुङ	9842468665	"	
३	धन वि. गुरुङ	9842466580	"	
४	देस बा. गुरुङ	9761607957	"	
५	सविता गुरुङ	9842468665	"	

Implementation Phase: Layout



4. Coordinate of BM		**BM1**	3131758.983N, 294449.583E
BM2	3131769.475N, 294459.56E	**BM3**	3131733.111N, 294494.015E
BM4	3131716.832N, 294474.52E	**Reference/Axis Point**	BM1-right axis=24.984m Bm2-Right axis=12.035m Bm3-Left axis=1.94m Bm4-Left axis=26.97m

THANK YOU