		BGR ENERGY SYSTEMS LTD.		
		POWER PROJECTS DIVISION		
		BOP EPC CONTRACTOR DOCUMENT NO. **GID-208-CV-UPC-CA-3501**		
		OWNERS DOCUMENT NO. **-**		**REV**
		SBC AND SETTLEMENT CALCULATION FOR GRANULAR/COHESIVE NON SWELLING /MURRUM SOIL		**0**

ODISHA POWER GENERATION CORPORATION LIMITED

2 X 660 MW IB THERMAL POWER STATION

BANHARPALLI, JHARSUGUDA, ODISHA-768234

SBC AND SETTLEMENT CALCULATION FOR GRANULAR/COHESIVE NON SWELLING /MURRUM SOIL

GID-208-CV-UPC-CA-3501

BGR ENERGY SYSTEMS LIMITED

POWER PROJECTS DIVISION

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28.05.16	0	ISSUED FOR APPPROVAL			
			GM	VSK	TVBSSM
DATE	**REV**	**DESCRIPTION**	**PRPD**	**CHKD**	**APPD**

As per site condition

1) BEARING CAPACITY OF SOIL BASED ON SHEAR FAILURE CRITERIA   (as per IS: 6403-1981)

Granular / Murrum / CNS material shall be used for replacement of loose soils/ash fill where encountered, compaction to 95%

Foundation resting on Non Plastic Strata,

The Ultimate net bearing capacity of soil can be obtained using the equation given below

$Qu = q (Nq-1) S_q d_q i_q + 0.5 B \gamma N\gamma s\gamma d\gamma I\gamma w'$	as per Cl. 5.2.2.1

Where,

q	=	Effective overburden pressure at foundation level in t/m2
B	=	Width of footing in m
γ	=	Bulk unit of soil in t/m3
Nq, Nγ	=	Bearing capacity factors as per table-1
Sq, Sγ	=	Shape factors as per table-2
dq, dγ	=	Depth factors as per Cl 5.1.2.2
iq, iγ	=	Inclination factors as per Cl 5.1.2.3
W'	=	Water table correction factor as per Cl 5.1.2.4

Input data

B	=	2.0	Width of footing in m
L	=	2.0	Length of footing in m
Df	=	2.0	Depth of footing in m
Dw	=	0.0	Depth of ground water table in m
γ	=	1.8	Bulk unit of soil in t/m3
γ'	=	0.8	Submerged unit of soil in t/m3
Φ	=	33	Angle of shearing resistance of soil in degrees
W'	=	0.5	Water table correction factor
FoS	=	2.5	Factor of safety

For Φ' =	25	For square shape	d-factors	i-factors
Nq =	10.66	Sq = 1.2	dq = 1.0	iq = 1.0
Nγ =	10.88	Sγ = 0.8	dγ = 1.0	iγ = 1.0

Ultimate Bearing Capacity

Qulti	=	$q (Nq-1) S_q d_q i_q + 0.5 B \gamma N\gamma s\gamma d\gamma I\gamma w'$
	=	27 t/m2

Safe Bearing Capacity using factor of safety of 2.5

Qsafe	=	**11**	t/m2

2) BEARING CAPACITY OF SOIL BASED ON SETTLEMENT CRITERIA   (as per IS: 8009(Part 1) - 1976)

The Imposed load at foundation level is likely to compress the soil below and depth of influence shall be upto a depth of 1.5B. The Settlements can be calculated using Figure 9 for given width of footing and SPT-N values.

$$D = 2.0 \qquad \frac{D}{\sqrt{L \times B}} = 1.0$$

$$L = 2.0$$

$$B = 2.0 \qquad \frac{L}{B} = 1.0$$

Sf - depth correction factor from Fig 12

Df (RL of Foundation depth in m)	Df @ RL
B (Width of foundation depth in m)	2 m
Settlement under footing with a load intensity of 10 t/m2 in dry condition	14.0 mm
Settlement under footing with a load intensity of 10 t/m2 with water correction	28.0 mm
Settlement under footing with a load intensity of 10 t/m2 with water and depth correction	24.4 mm
Net safe bearing pressure for allowable settlement of 25mm	**10 t/m2**

3) Recommendations.

   The net safe bearing pressure of   10   t/m2 is recommended for design.