**BHILAI STEEL PLANT**

**BHILAI**

**REPLACEMENT OF DC MOTOR TO AC MOTOR WITH VVFD**

**DRIVE FOR MIXER CUM NODULISING DRUM**

**SINTER PLANT-3**

**TENDER SPECIFICATION**

**FOR**

**MAIN PACKAGE**

**STEEL AUTHORITY OF INDIA LIMITED**

**CENTRE FOR ENGINEERING & TECHNOLOGY**

**RANCHI – 834002**

**JUNE, 2023**

**CET/01/BH/5041/TS/EE/01/R=0**



**CONTENTS - CHAPTERS**

**Chapter No.**

**Description**

**Page No.**

1.1 - 1.2

1

2

Introduction

Scope of Work

2.1 - 2.12

3.1 - 3.52

4.1 - 4.3

3

Technical Specification

Commissioning and Performance Guarantee

Annexures

4.

Schedules

**PACKAGE LEADER(PL)**

**TASK FORCE LEADER(TFL)**

**HOD (PL)**

Pranay Kumar

Paramita Mohanti

DGM(Elect)

Paramita Mohanti

DGM(Elect)

CGM & I/c

BSP, SP-III

CONTENTS

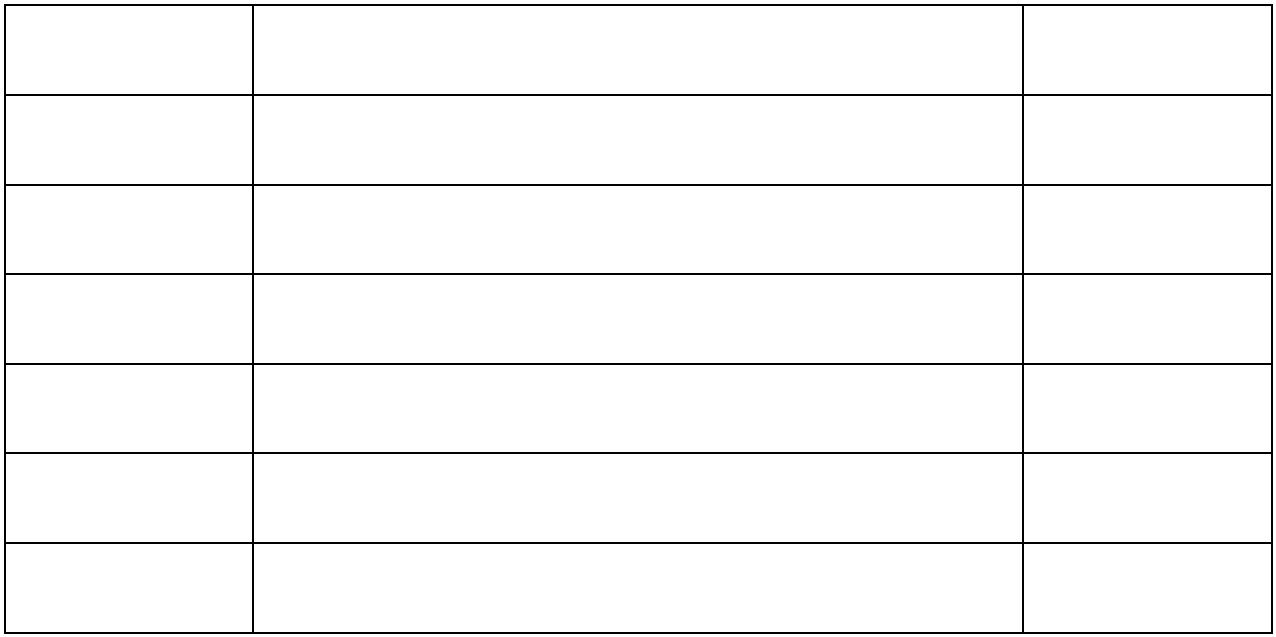
PAGE 1 OF 3

CET/01/BH/5041/TS/EE/01/R=0

Replacement of DC motor to AC motor

with VFD for mixer cum nodulising

drum



**CONTENTS - ANNEXURES**

**Annexure No.**

**Description**

**No. of Pages**

2.1.4-1

List of Acceptable Makes of Equipment and

Supplies

57

1.2.1-1

Location of existing and proposed facilities

at SP-3

1

2.1.9.2-1

2.4.4-1

Implementation Schedule

1

4

7

Existing motor foundation

3.2.2.1-1

Datasheet & GA of existing MND motor

BSP, SP-III

CONTENTS

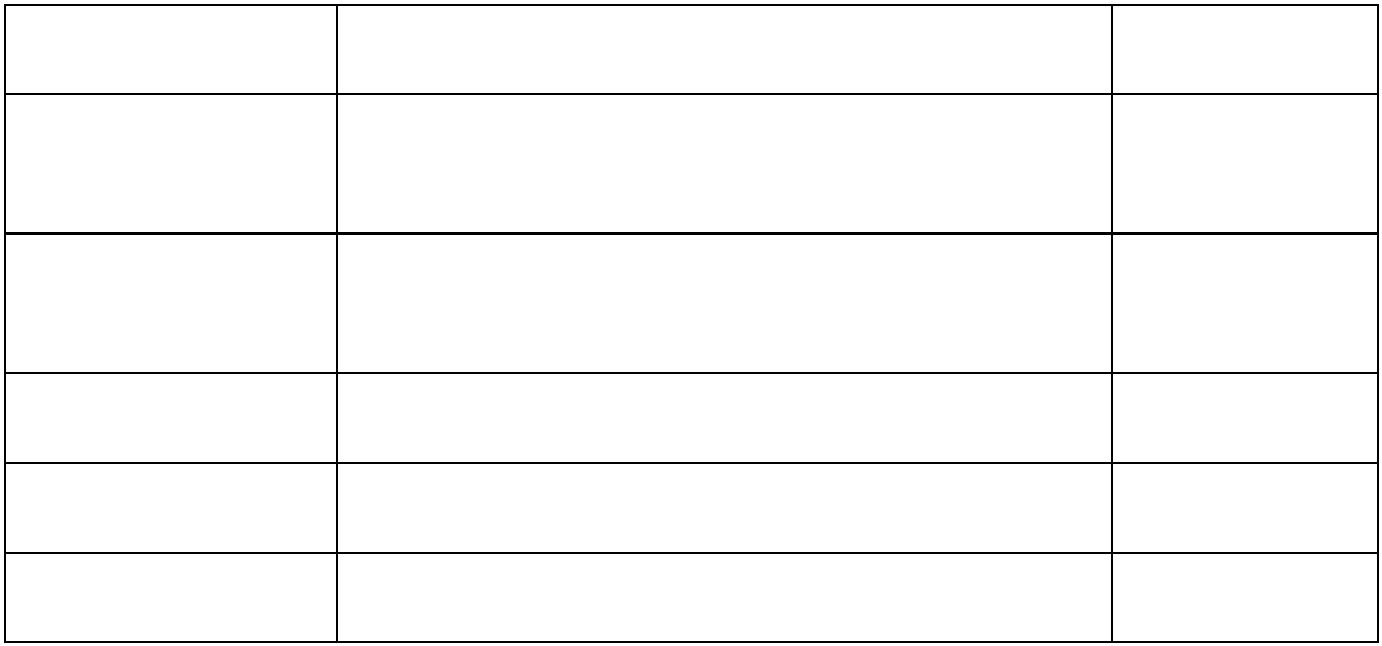
PAGE 2 OF 3

CET/01/BH/5041/TS/EE/01/R=0

Replacement of DC motor to AC motor

with VFD for mixer cum nodulising

drum



**CONTENTS - SCHEDULES**

**Schedule No.**

**Description**

**No. of Pages**

1.8-1

1.8-2

1.8-3

1.8-4

Declaration of Site Visit

List of Exclusions

1

1

1

1

List of Deviations

List of operation & maintenance spares for 2

years

1.8-5

1.8-6

1.8-7

1.8-8

List of Commissioning Spares

List of Special Tools and Tackles

List of first fill of oils and lubricants

1

1

Details of authorized person of bidder

during tender evaluation

1

1

1.8-9

Requirement of construction water & power

BSP, SP-III

CONTENTS

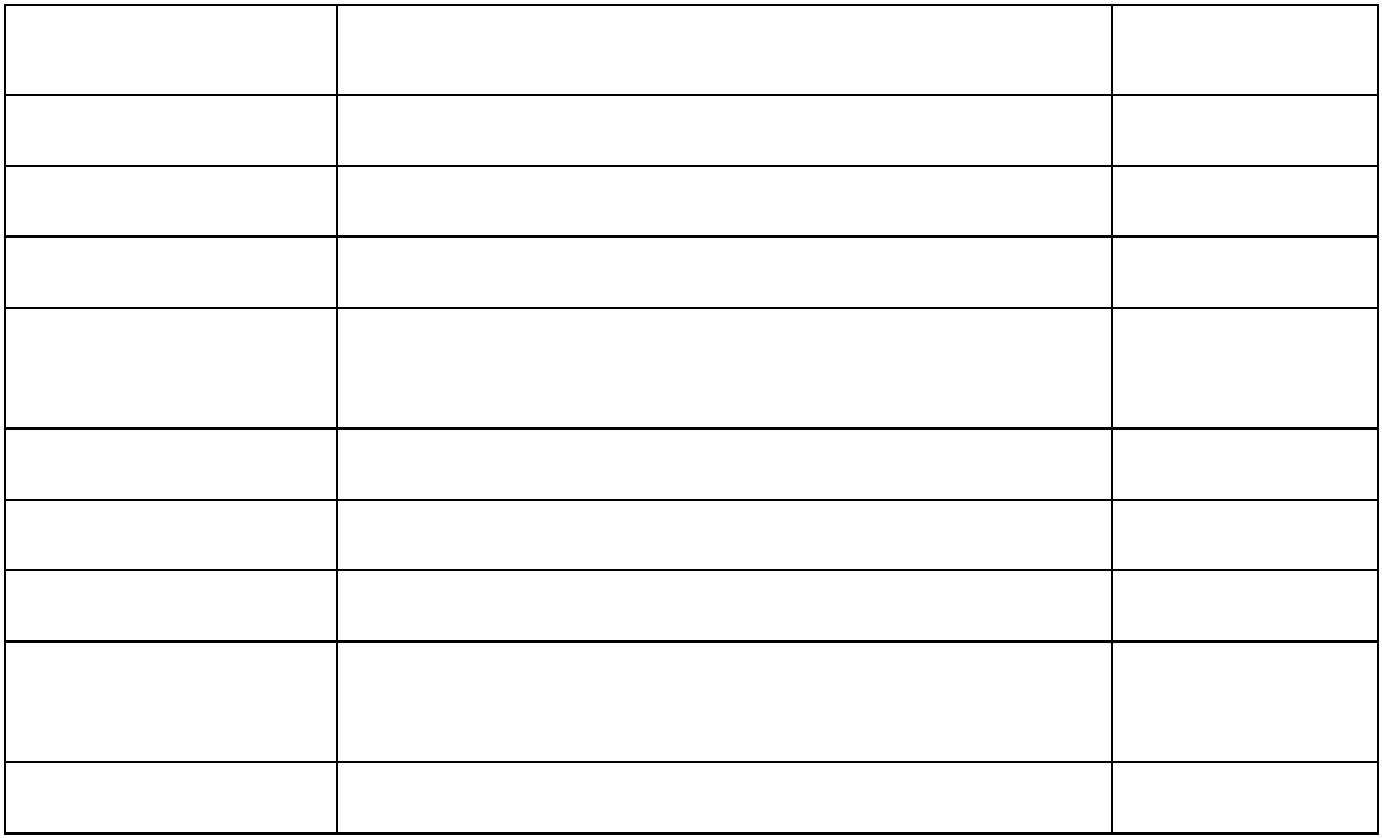
PAGE 3 OF 3

CET/01/BH/5041/TS/EE/01/R=0

Replacement of DC motor to AC motor

with VFD for mixer cum nodulising

drum



**1**

**INTRODUCTION**

1.1

1.1.1

**GENERAL:**

There are two Sinter Plants in operation at Bhilai Steel Plant (BSP),

namely, Sinter Plant-2 and Sinter Plant-3 (Sinter Plant-1 has been

phased out). Sinter Plant-2 (SP2) is having 4 machines (3x75 m2 & 1x80

m2) whereas Sinter Plant-3 (SP-3) is having two machines (1st machine)

of 320 m2 sintering area, and (2nd machine) of 360 m2 machine area.

1.1.2

1.1.3

Sinter Plant- 3 was commissioned in the year 2001 with Sinter Machine-

1. Sinter Machine-2 at SP-3 was installed and commissioned in the year

2014.

Sinter machine -1 has Mixer cum Nodulising Drum (MND) for preparing

raw charge mix required for sintering process. This was installed by M/s.

BHEL in the year 1996. The DC drive for the motor was supplied by M/s

Siemens.

1.2

**EXISTING FACILITIES**

1.2.1

MND has 730KW DC motor of BHEL make and the speed variation is

done through DC drive Siemens Sinamics 6RA80. The DC motor as well

as the DC drive has frequent breakdowns calling for frequent

maintenance. The drive cards have become obsolete and spares for the

same are not available. The expertise for maintain DC motor is also

gradually depleting. Bidder to refer “Location of existing and proposed

facilities” attached as **Annexure-1.2.1-1**

1.3

**OVERVIEW OF THE PROJECT**

In view of the above problems, it is proposed to replace the existing DC

motor with state of the art AC squirrel cage induction motor with

variable frequency drive for the Mixer cum Nodulising Drum of machine

-1. This will improve the reliability of the overall system and reduce the

down time required now for frequent maintenance.

It is suggested to go for AC motor with variable voltage drive system

along with replacement of input transformer.

The existing gearbox will be retained. The existing civil foundation of DC

motor and foundation plates will be retained to the extent possible. In

case minor modification is required same is to be done by the Bidder.

However, base frames can be modified/ new base frame can be installed

by the Bidder to suit the mounting arrangement of the new AC motor,

such that motors could be coupled with gear box and centre line of the

existing gearbox input shaft & motor shaft are in the same axis.

BSP, SP-III

PAGE 1.1

CET/01/BH/5041/TS/EE/01/R=0

Replacement of DC motor to AC motor

with VFD for mixer cum nodulising

drum



Dismantling work:

Existing motor (DC motor 730 kW) along with the respective coupling

shall be dismantled. Existing base frames of the motor shall be modified

to suit the new AC motor. All the power and control cables shall be

disconnected from motor end as well thyristor converter end. Field

devices connected with the motor shall be also be disconnected and

removed. The motors, brakes and couplings shall be dismantled without

damaging the equipment and shall be handed over to BSP for future

use. All the foundation bolts, coupling bolts shall be opened through

tools. No gas cutting shall be allowed during dismantling of motors and

coupling.

VFD panel shall be installed in existing Electrical control building.

1.4

**IMPLEMENTATION STRATEGY**

1.4.1

The complete job of “Replacement of DC motor with AC motor and VFD

for Mixer cum Nodulising Drum of Sinter Machine-1, Sinter Plant-3” is

envisaged to be executed through single package on Turnkey basis.

1.4.2

This tender specification pertains to be executed through single

package on turnkey basis which includes installation of AC motor,

Variable Frequency drive for MND motor, necessary cabling, interfacing

with existing system, air conditioning and minor modification of civil

foundation for placing motor drive etc.

1.4.3

**Details Of Pre-Shutdown And Shutdown Activities With Duration**

1.4.3.1

Details of activities pre-shutdown as well as during shutdown and their

duration shall be mentioned by the bidder in their offer and also to be

shown in the implementation schedule.

Employer shall give need based shutdown without

affecting the shop operation.

Major jobs including interfacing with existing system

shall be done by the bidder during one week of capital

repair shut down of sinter machine 1.

1)

Following are major pre shutdown activities: -

Tapping power from Substation 41

Cabling between Substation 41 to drive and from drive to new

motor

Panel enclosure for drive system along with ventilation system

Installation and parameterization of drive

Earthing

BSP, SP-III

PAGE 1.2

CET/01/BH/5041/TS/EE/01/R=0

Replacement of DC motor to AC motor

with VFD for mixer cum nodulising

drum



1.4.3.2

Shutdown activities during 7 days annual/planned shutdown shall be as

shown below:

**Sl.**

**No**

**Activity**

**Day 1 of**

**Shutdown**

**Day 2 - 5**

**of**

**Day 6-7 Shut**

**down**

**Shutdown**

1 Preliminary

shut Shop /

down to take out planned

major portion of shutdown

existing MND motor.

2 Chipping/Dismantlin

g of existing Motor

foundation as per

Civil

activities

during

requirement

match the

to

shaft

shutdown

height of the gear

box.

Drilling & grouting

of dowels & RCC

concreting

with

epoxy/non-shrink

grouts to integrate

the old concrete

suiting to incoming

load of proposed

motor.

Necessary curing

3 Inline Installation of

new motor

Motor

installation,

cable

Cable termination &

Drives

Interfacing etc.

System

termination,

drive

interfacing etc

4 Preliminary

Shop /

shutdown to take out planned

existing transformer shutdown

by

disconnecting

cable etc.

Installation of new

transformer

in

existing transformer

BSP, SP-III

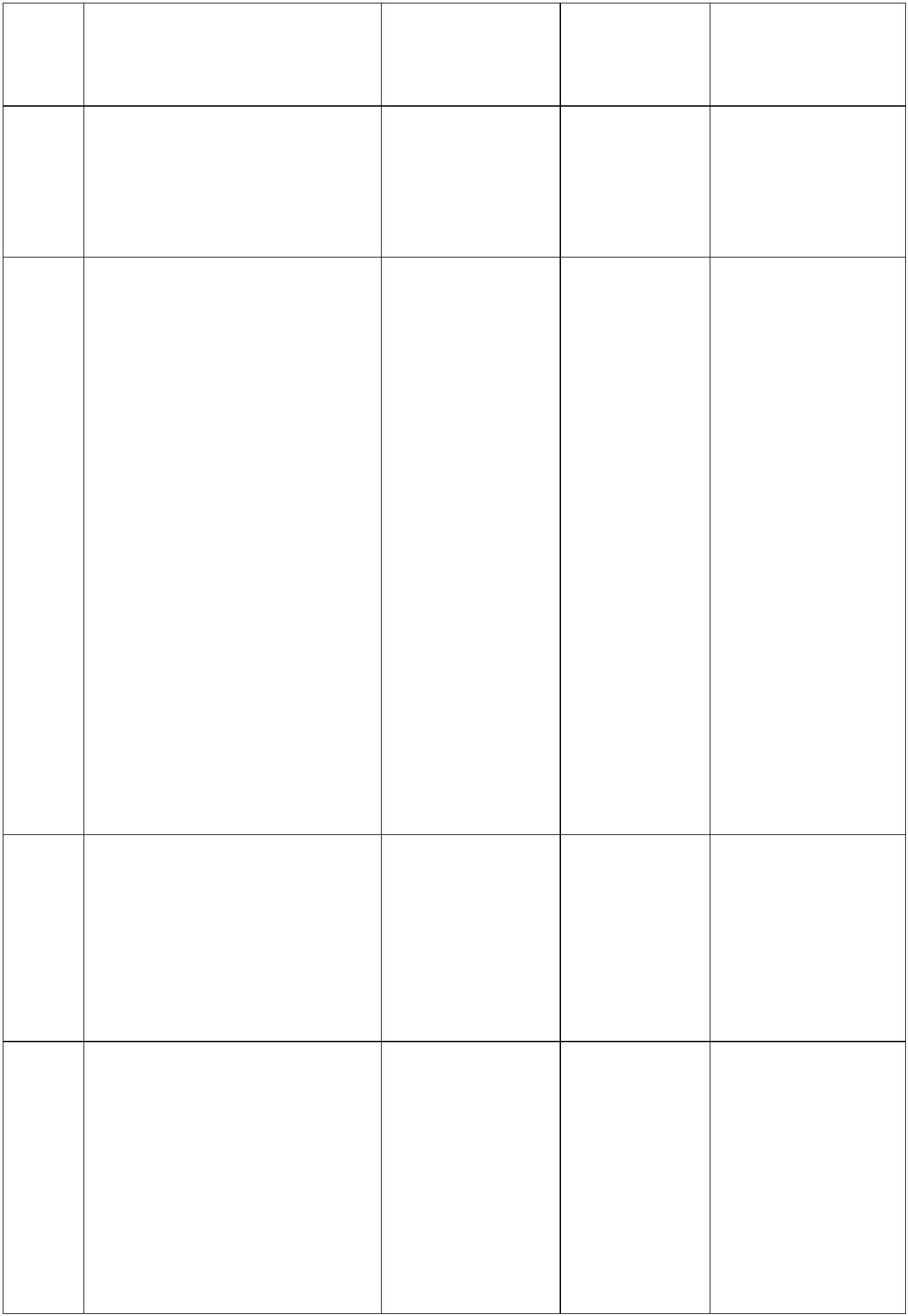
PAGE 1.3

CET/01/BH/5041/TS/EE/01/R=0

Replacement of DC motor to AC motor

with VFD for mixer cum nodulising

drum



pane

Cable termination to

new transformer

1.4.4

**Other site related details**

1.4.4.1

Details of over ground facilities at erection site which may need

diversion and special handling equipment to be deployed at site, if any,

are to be clearly brought out by the bidder in their offer.

1.5

**INTENT OF SPECIFICATION**

1.5.1

The intent of this tender specification is to furnish required details for

enabling the bidder to submit their best offers (technical & commercial)

as per the scope of work mentioned at chapter 2.0, technical

specifications at chapter 3.0, and commissioning & performance

guarantee at chapter 4.0.

1.5.2

This tender specification shall be read in conjunction with other

documents enclosed with the NIT.

1.6

**SITE VISIT AND OTHER REQUIREMENTS**

1.6.1

The bidder shall visit the site, study drawings/ documents and discuss

with the employer/ consultant, if required, regarding any technical

clarification and get satisfied with respect to the nature and extent of

work involved. The bidder shall also obtain first-hand information

regarding location, work terrain, climate condition, railways, roads,

airports and communication etc. before offering the bid for the job.

1.6.2

All materials/ equipment/ machinery/ fabricated items used in the

subject package shall be according to the specification given herein and

any deviation should be clearly brought-out in schedules of exclusions

and deviations attached with this TS. No mention of exclusions and

deviations will mean that the bidder has accepted the scope and

specification given herein.

1.7

**DRAWINGS AND TECHNICAL DOCUMENTS TO BE SUBMITTED**

**WITH THE OFFER**

1.7.1

The Bidder shall submit along with the bid, drawings / documents / data

as per the following details:

1)

kW rating calculation & Data sheet & GA drawing of proposed

motor

2)

Single line diagram.

BSP, SP-III

PAGE 1.4

CET/01/BH/5041/TS/EE/01/R=0

Replacement of DC motor to AC motor

with VFD for mixer cum nodulising

drum

