

Bidding Document
For
Procurement of
Design, Supply, Installation, Testing and Commissioning of new
400/230/132 kV GIS Substation at Purbachal on turnkey basis
(Package-6)

[Contract No.: PGCB/ADB/L3853/DWZTGEP/GIS/P6]

Addendum 01

1. Volume 1 of 3, Section-3, Clause 1.3.4 Functional Guarantees of the Facilities

The text “L=Average Load loss (copper loss) in kW” shall be replaced by
“L=Average Load loss (copper loss) at 75°C in kW”.

2. Volume 2 of 3, Section 1. Scope of Works, Clause 1. 2 Description of Works, Page 1-2

In sub-clause 1.2.1.1 of Clause 1. 2, the 4th paragraph is revised as follows:

The configuration of the 420kV busbar shall be double busbar scheme. GIS design shall include sufficient jointing plugs/adapters, busbar extension/interface module at both ends of GIS bus comprising sufficient buffer gas compartments and appropriate disconnect facilities for extensions without de-energization of complete GIS.

3. Volume 2 of 3, Section 1. Scope of Works, Clause 1. 2 Description of Works, Page 1-2

In sub-clause 1.2.1.2 of Clause 1. 2, the 4th paragraph is revised as follows:

The configuration of the 230kV busbar shall be double busbar scheme with section. GIS design shall include sufficient jointing plugs/adapters, busbar extension/interface module at both ends of GIS bus comprising sufficient buffer gas compartments and appropriate disconnect facilities for extensions without de-energization of complete GIS.

4. Volume 2 of 3, Section 1. Scope of Works, Clause 1. 2 Description of Works, Page 1-3

In sub-clause 1.2.1.3 of Clause 1. 2, the 4th paragraph is revised as follows:

The configuration of the 132kV busbar shall be double busbar scheme with section. GIS design shall include sufficient jointing plugs/adapters, busbar extension/interface module at both ends of GIS bus comprising sufficient buffer gas compartments and appropriate disconnect facilities for extensions without de-energization of complete GIS.



5. Volume 2 of 3, Section 4, Clause 4.3.7.4 Phases, Page 4-14

The sub-clause 4.3.7.3.1 of clause 4.3.7.4 is revised as follows:

All transformers shall be three phase or single phase as mentioned in the schedule of requirement (Technical Data Sheets) of Volume 3 of the bidding document, with three-legged core or five-legged core form design. The phase relationship of the winding is identified in the specific transformer Data Sheets.

6. Volume 2 of 3, Section 4, Clause 4.3.7.5 Rated MVA

The sub-clause 4.3.7.5.3 of clause 4.3.7.5 is revised as follows:

All the windings (primary, secondary and tertiary windings) of the transformers shall be designed for continuous loading with the maximum rated output kilovolt-ampere load at rated frequency and voltage as specified in the technical data sheet. It shall also be possible to load the tertiary winding at the maximum specified MVA rating continuously. Both continuous thermal capacity & short circuit capacity shall be guaranteed for the tertiary winding as well.

7. Volume 2 of 3, Section 4, Clause 4.3.10 Losses and Evaluation of Losses

The sub-clause 4.3.10.1 of clause 4.3.10 is revised as follows:

Guaranteed values for component losses of the total loss of the transformers shall be as low as is consistent with transport restrictions, reliability and economic use of materials, shall be as stated in the Schedule E: Technical Particulars and Guarantees. The Loading condition shall be treated as Simultaneous Loading in all windings.

8. Volume 2 of 3, Section 4, Clause 4.3.10 Losses and Evaluation of Losses

The sub-clause 4.3.10.2 of clause 4.3.10 is revised as follows:

For the evaluation of the bid as per section 3 (Evaluation and qualification criteria) capitalization cost (Evaluated price of transformer losses) due to transformer guaranteed losses shall be added with the bid price. The evaluated price of the Power Transformer shall be the sum of the quoted bid price of the transformer plus evaluated price of the transformer losses. The evaluated price of transformer loss shall be:

For each unit of the three-phase/single-phase transformers,

Evaluated price of transformer loss = $N * a + L * b + M * c$

Where

N = Average No-load loss (core loss) in kW

L = Average Load loss (copper loss) at 75 °C in kW

M = Total load of transformer cooling fans at transformer maximum continuous rating in kW (when all the cooling fans are in operation)

- a = Cost/kW of average no-load loss (core loss) valued at Taka 600,000
b = Cost/kW of average load loss (copper loss) valued at Taka 300,000
c = Cost/kW of auxiliary power valued at Taka 300,000

9. Volume 2 of 3, Section 4, 4.4.2.4 Core design, Page 4-25

Clause 4.4.2.4.1 is revised as follows:

The core shall be either a three-legged core-form or a five-legged core-form construction using mitred step lap design, unless otherwise specified in specific transformer Data Sheets in the Appendix.

10. Volume 2 of 3, Section 4, 4.13 Fiber Optic Based Temperature Sensing System, Page 4-81

Clause 4.13.2 is revised as follows:

The winding sensors are typically located at:

- Near top of upper primary oil duct, X-winding -- 2/ph
- Near bottom of lower primary oil duct, Y-winding--- 2/ph
- Near bottom of lower primary oil duct, Z-winding--- 2/ph when applicable
- One (Total 3 for 3-legged core/total 5 for 5-legged core design) more on each core legs

11. Volume 2 of 3, Section 5: Protection, Metering & Control and Substation Automation System, Clause 5.18 Digital Fault and Disturbance Recorder (DFDR), Page No. 5-39

Sub-clause 5.18 (h) is revised as follows:

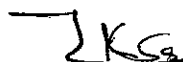
All input signals shall be able to scan and record simultaneously at least 2 or 3 user-programmable sampling rates from 500Hz to 12kHz or higher for fast (short-term) transient monitoring and from 1Hz to 500Hz for slow phenomena (long-term) monitoring in order to detect and record fast (short-term) and slow phenomena (long-term) events.

12. Volume 2 of 3, Section 5: Protection, Metering & Control and Substation Automation System, Clause 5.18 Digital Fault and Disturbance Recorder (DFDR), Page No. 5-39

Sub-clause 5.18 (j) is revised as follows:

At least 25 sec. of memory for transient fault data recording (at 12 kHz or higher sampling rate) and over 1000 sec. for slow (at 30 Hz) phenomena recording shall be provided in addition to the auto-maintained, inbuilt hard disk unit which shall be installed for data storage. The inbuilt hard disk unit shall be managed and operated by the identical industrially proven operating system of the DFDR.









13. Volume 2 of 3, Section 5: Protection, Metering & Control and Substation Automation System

In Appendix, B. Digital Fault and Disturbance Recorder (DFDR), sl. no. 5 (e), page no. 5-129, rating of possible fast sampling rate shall be 500Hz to 12kHz or higher.

14. Volume 2 of 3, Section 10A.3.2, Ground Conditions, Foundations and Site Investigation Para no two of Section 10A.3.2 of Volume 2 of 3 Sub-clause (e) Foundations is replaced as follows:

Piles shall be concrete (cast-in-situ or precast) complying with BS 8004. For structural design of cast in situ piles, guidelines provided in Annexure 10A.1 should be followed. One working piles shall be randomly selected by the employer for pile load test in accordance with BS 8004. One working pile of control building and one of auto-transformers at each site shall be compression load tested and one working pile of gantry tower foundation at each site shall be uplift load tested to 100% of design load in accordance with BS 8004. Integrity tests shall be performed on drilled shaft concrete piled foundations selected by Employer for checking the uniformity, continuity and length of such piles using the acoustic pulse echo method shall be undertaken by a specialist subcontractor appointed by the Contractor. Details of practical experience of the subcontractor along with details of the test equipment, procedure of testing, presentation of test data/results shall be submitted along with tender. The integrity test shall be done at least one time for one pile selected by the Engineer. The actual method of performing the tests and the interpreting the results shall be subject to the Engineer's approval.

15. Volume 2 of 3, Clause 10A.3.23 Concrete

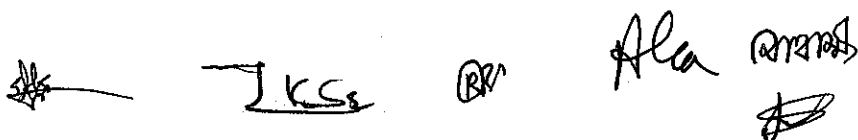
Clause 10A.3.23 Blast Walls shall be replaced with the following

10A.3.23 Blast Walls

The Bidder shall construct blast walls to reduce the risk of fire spreading from each three phase transformer unit to an adjacent transformer unit. IEC guidelines shall be followed for safe distance or fire protection of other structures near to the transformer. Blast walls shall also be constructed to resist impact forces causing from a transformer explosion damaging adjacent equipment.

The height of the blast walls for transformers shall be 500mm higher than the tops of transformer or 500mm higher than the height of the tops of the HV bushing (whichever is higher) and 300mm wider at both sides than the width of transformer. The minimum thickness of blast walls shall be 200mm.

The blast wall will be constructed with Class A reinforced concrete with all exposed edges chamfered, Surface of wall will fare faced concrete and painted as the colour of transformer body.

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16. Volume 2 of 3, Clause 10B.3.25 Concrete

Clause 10B.3.25 Blast Walls shall be replaced with the following

10B.3.25 Blast Walls

The Bidder shall construct blast walls to reduce the risk of fire spreading from each three phase transformer unit to an adjacent transformer unit or control building. IEC guidelines shall be followed for safe distance or fire protection of other structures near to the transformer. Blast walls shall also be constructed to resist impact forces causing from a transformer explosion damaging adjacent equipment.

The height of the blast walls for transformers shall be 500mm higher than the top most part of transformer or 500mm higher than the height of the tops of the HV bushing (whichever is higher) and 300mm wider at both sides than the width of transformer. The minimum thickness of blast walls shall be 200mm.

The blast wall will be constructed with Class A reinforced concrete with all exposed edges chamfered, Surface of wall will fare faced concrete and painted as the colour of transformer body.

17. Volume 2 of 3, Clause 10A.3.26 Concrete

Clause 10A.3.26 Concrete shall be replaced with the following

10A.3.26 Concrete

Only two class of concrete shall be used. Class A shall be used for all structural work, piling and for all foundations which are not unreinforced massive blocks. Class B concrete shall be used for blinding, pipe surround and unreinforced or nominally reinforced concrete. Road slabs and floor slabs all shall be reinforced Class A concrete.

	Class A	Class B
Minimum Cement Content	360kg/m ³	170kg/m ³
Maximum Water Cement ratio	0.55	-
Coarse Aggregate type	Well graded crushed stone chips	Jhama brick chips
Maximum Coarse aggregate size	20mm	25mm
Method of Batching	Volume batching	Volume batching
Minimum characteristic strength of trial mix at 28 days	30N/mm ²	-
Minimum characteristic strength of trial mix at 7 days	14N/mm ²	-
Minimum characteristic strength of works cubes at 28 days	20N/mm ²	-

Slump Range	30mm min-100mm maximum	50mm minimum
Slump for concrete placed below water in piling	150mm minimum	-

It should be noted that minimum specified cement content will produce significantly stronger concrete. The Contractor's design shall be based on a 28 day crushing strength of minimum 20N/mm². Design shall be in accordance with this Contract and BS 8110 or other agreed standard.

For all types of foundation work mild steel of minimum characteristic strength 415 N/mm² shall be used and minimum reinforcement required for pedestals and foundation bases shall be 0.5% and 0.13% of gross cross sectional area respectively.

Minimum clear cover to re-bars shall be 60mm where concrete is in contact with backfilled soil against a shuttered face, 75mm where concrete is cast against soil, and 38mm for all above ground concrete. In detailing bars which traverse a member, a reduction of 5mm shall be made for a bent bar and 10mm for a straight bar to ensure adequate cover. Exposed ends of sunshades and roof projection shall have 70mm minimum cover.

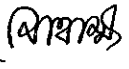
All concrete design shall ensure easy access for vibrators of 50mm minimum diameter. Because of the slowness of concreting using local methods of transport, congested reinforcement details and shapes which are difficult to concrete should not be used. The location of all cold joints shall be agreed in writing with the Engineer and all joint surfaces shall be scabbled. All joints shall be horizontal or formed against vertical stop ends. Shear key shall be provided in joints. All cold joints shall be indicated on drawings. Roof slabs shall generally be cast in one continuous operation. Where curing compounds are used to protect exposed surfaces from solar radiation and improve moisture retention, they shall be subject to the approval of the Employer. This is a **Hold Point**.

18. Volume 2 of 3, Clause 10B.3.28 Concrete

Clause 10B.3.28 Concrete shall be replaced with the following

10B.3.28 Concrete

Only two class of concrete shall be used. Class A shall be used for all structural work, piling and for all foundations which are not unreinforced massive blocks. Class B concrete shall be used for blinding, pipe surround and unreinforced or nominally reinforced concrete. Road slabs and floor slabs all shall be reinforced Class A concrete.



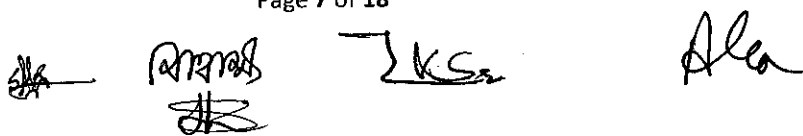

	Class A	Class B
Minimum Cement Content	360kg/m ³	170kg/m ³
Maximum Water Cement ratio	0.55	-
Coarse Aggregate type	Well graded crushed stone chips	Jhama brick chips
Maximum Coarse aggregate size	20mm	25mm
Method of Batching	Volume batching	Volume batching
Minimum characteristic strength of trial mix at 28 days	30N/mm ²	-
Minimum characteristic strength of trial mix at 7 days	14N/mm ²	-
Minimum characteristic strength of works cubes at 28 days	20N/mm ²	-
Slump Range	30mm min-100mm maximum	50mm minimum
Slump for concrete placed below water in piling	150mm minimum	-

It should be noted that minimum specified cement content will produce significantly stronger concrete. The Contractor's design shall be based on a 28 day crushing strength of minimum 20N/mm². Design shall be in accordance with this Contract and BS 8110 or other agreed standard.

For all types of foundation work mild steel of minimum characteristic strength 415 N/mm² shall be used and minimum reinforcement required for pedestals and foundation bases shall be 0.5% and 0.13% of gross cross sectional area respectively.

Minimum clear cover to re-bars shall be 60mm where concrete is in contact with backfilled soil against a shuttered face, 75mm where concrete is cast against soil, and 38mm for all above ground concrete. In detailing bars which traverse a member, a reduction of 5mm shall be made for a bent bar and 10mm for a straight bar to ensure adequate cover. Exposed ends of sunshades and roof projection shall have 70mm minimum cover.

All concrete design shall ensure easy access for vibrators of 50mm minimum diameter. Because of the slowness of concreting using local methods of transport, congested reinforcement details and shapes which are difficult to concrete should not be used. The location of all cold joints shall be agreed in writing with the Engineer and all joint surfaces shall be scabbled. All joints shall be horizontal or formed against vertical stop ends. Shear key shall be provided in joints. All cold joints shall be indicated on drawings. Roof slabs shall generally be cast in one continuous operation. Where curing compounds are used to protect exposed surfaces from solar radiation and improve moisture retention, they shall be subject to the approval of the Employer. This is a **Hold Point**.



19. Volume 2 of 3, Clause 10B.3.32 Stairs

Clause 10B.3.32 Stairs shall be replaced with the following

10B.3.32 Stairs

Except where indicated otherwise in the document, all single/multi-storey non-residential buildings shall have one internal/external staircase up to the roof; the minimum staircase clear width shall be 2.5metre and the maximum slope about 30°, all detail being designed in accordance with BS 5395. These staircases shall be enclosed. The design shall allow free circulation of air over the treads and through the risers. Non slip nosing shall be provided.

GIS with control room building shall have one internal staircase and one emergency staircase for fire escape. All the stair shall extend upto roof and have a minimum clear width of 2.5metre with a maximum slope of 30°, all detailed in accordance with BS 5395. External/fire staircases shall be enclosed and shall be completely protected against rain by roof projections; steps shall be open with non-slip nosing. All staircases shall have homogeneous floor tiles with non-slip nosing. All staircases shall be provided with stainless steel railings (38mm dia. for vertical railing & 50mm dia. for horizontal railing). In GIS building, provision for a lift of capacity of 6 persons should be provided.

All roofs which are not accessible by stairs shall be provided with a galvanized steel fixed ladder.

20. Volume 2 of 3, Section 15, Power Line Carrier, Teleprotection and Communication Equipment, Page 15-2

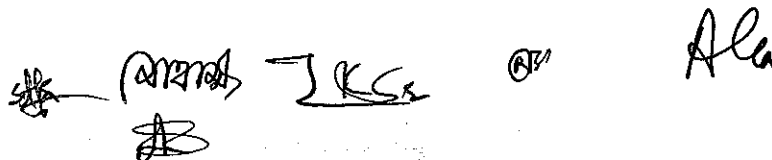
Sub-clause (a) General of clause 15.1.3 Line Coupling is revised as follows:

(a) General

The high voltage transmission system is a three phase 50Hz system solidly earthed with the following design parameter detailed elsewhere in this specification:

Nominal Voltage (kV)	400	230	132
Rated Max. Voltage (kV)	420	245	145
Symmetrical Short Circuit Current, 3 sec (kA)	50	50	40
Lightning Impulse Withstand Voltage (kVp)	1425	1050	650
Continuous Switchgear Rating (A)	4000	3150	2500

All current carrying equipment shall be capable of withstanding these conditions.

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21. Volume 2 of 3, Section 15 Power Line Carrier, Teleprotection and Communication Equipment, Page 15-16

In Appendix Power Line Carrier, Teleprotection and Communication Equipment, A. 400kV Wave Trap, Sl. No. 7 is revised as follows:

SL. No.	ITEM	SPECIFICATION
7	Rated Short time current for 3 second	50kA

22. Volume 2 of 3, Section 17 Power Cables and Cable Terminating Accessories, Page 17-18

“Annex-17B.1: HV Cable connections” is revised as follows:

Sl.	Site	Voltage level, U kV	Cable Size, mm ²	Connection
1.	Purbachal	132	2000	132kV GIS indoor cable termination to outdoor CSE in front of gantry.

23. Volume 2 of 3, Section 19, 19.2 List of Bid Drawings, 19.2.1 Purbachal Substation Drawing List

Drawing No. 2. Purbachal grid substation layout and Drawing No. 4. Purbachal grid substation SLD (230kV side) are revised and attached as **Attachment 1**.

24. Volume 2 of 3, Section 19, 19.2.1 Purbachal Substation Drawing List

SL No. 27 is replaced with SL No. 27A as follows:

SL No	Drawing No.	Title
27A	PGCB/DESIGN/2021/PURBACHAL/C02A	230kV and 132kV GIS Building

25. Volume 2 of 3, Section 19, 19.2.1 Purbachal Substation Drawing List

SL No. 33 is replaced with SL No. 33A as follows:

SL No	Drawing No.	Title
33A	PGCB/DESIGN/2021/PURBACHAL/C08A	Single storied Ansar Barrack with foundation for two storied building

26. Volume 2 of 3, Section 19, 19.2.1 Purbachal Substation Drawing

SL No. 37 is replaced with SL No. 37A as follows:

SL No	Drawing No.	Title
37A	PGCB/DESIGN/2021/PURBACHAL/C12A	Boundary wall with retaining wall

27. Volume 3 of 3, Section 1, 1.2.1 Technical Requirements for 400/230/132KV GIS Substation at Purbachal

Quantity of “145kV, 40kA/3s single phase, Current Transformer” in item no. 1C3 is revised and serial number of sub-items of item no. 1C3 is renumbered as follows:

Item No.	Description of Equipment Requirement	Unit	Quantity
1C3	145kV Bus Coupler Bays, comprises with:	Set	02
	i. 145kV, 3150A, 40kA/3s, single/three phase Enclosure double busbar	Lot	1
	ii. 145kV, 3150A, 40kA/3s, three phase, gang operated Circuit Breaker complete with spring operating mechanism	Set	01
	iii. 145kV, 3150A, 40kA/3s, three phase, three positions, busbar disconnector with earth switch, complete with motor operating mechanism	Set	02
	iv. 145kV, 40kA/3s single phase, Current Transformer	No.	06
	v. Local Control Cubicle	Set	01
	vi. Complete Set of miscellaneous items required for safe and efficient operation of the switchgear, busbar end covers or link to adjacent switchgear panel, cables, metal support structure, grounding, etc. as appropriate	Lot	1
	vii. Partial Discharge monitoring internal sensor	Lot	1

Quantity of “145kV, 40kA/3s single phase Current Transformer” in item no. 1C4 is revised and serial number of sub-items of item no. 1C4 is renumbered as follows:

Item No.	Description of Equipment Requirement	Unit	Quantity
1C4	145kV Bus Section Bays, comprises with:	Set	02
	i. 145kV, 3150A, 40kA/3s, three phase Enclosure double busbar	Lot	1
	ii. 145kV, 3150A, 40kA/3s, three phase, gang operated Circuit Breaker complete with spring operating mechanism	Set	01
	iii. 145kV, 3150A, 40kA/3s, three phase, three positions, busbar disconnector with earthing switch, complete with motor operating mechanism	Set	02
	iv. 145kV, 40kA/3s single phase Current Transformer	No.	06
	v. Local Control Cubicle	Set	1
	vi. Complete Set of miscellaneous items required for safe and efficient operation of the switchgear, terminal arrangements for multi-core cables, busbar end covers or link to adjacent switchgear panel as appropriate	Lot	1
	vii. Partial Discharge monitoring internal sensor	Lot	1

28. Volume 3 of 3, Section 1, 1.2.1 Technical Requirements for 400/230/132KV GIS Substation at Purbachal

Item No. 1F7 is revised as follows:

Item No.	Description of Equipment Requirement	Unit	Quantity
230kV Circuits			
1F7	Control, Protection, Monitoring including SAS Function for overhead line circuits, along with Control & Protection Cubicles	Set	2
	Each comprising		
	i. BCU and Backup Mimic panel with all accessories including monitoring		
	ii. Protection main relay [To match with remote end substation (Bashundhara Substation) Main-1 protection shall be Line Differential protection with SIEMENS, Germany make relay (Model 7SD52) and Main-2 protection shall be distance protection]		
	iii. Auxiliary relays (TCS, Lockout etc.) & accessories (TTB etc.)		
	iv. Complete Protection Panel (Front opening, Swing frame type) including wiring, lighting, heater, Contactors, humidity controller, MCBs & other accessories		

29. Volume 3 of 3, Section 1, 1.2.1 Technical Requirements for 400/230/132KV GIS Substation at Purbachal

Serial number of sub-items of item no. 1A2 shall be in Roman numerals and in ascending order.

Serial number of sub-items of item no. 1A5 shall be in Roman numerals and in ascending order.

Serial number of sub-items of item no. 1A6 shall be in Roman numerals and in ascending order.

Serial number of sub-items of item no. 1B1 shall be in Roman numerals and in ascending order.

Serial number of sub-items of item no. 1B2 shall be in Roman numerals and in ascending order.

Serial number of sub-items of item no. 1B3 shall be in Roman numerals and in ascending order.

Serial number of sub-items of item no. 1B4 shall be in Roman numerals and in ascending order.

Serial number of sub-items of item no. 1B5 shall be in Roman numerals and in ascending order.

Serial number of sub-items of item no. 1C1 shall be in Roman numerals and in ascending order.

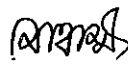
Serial number of sub-items of item no. 1C2 shall be in Roman numerals and in ascending order.

30. Volume 3 of 3, Section 1.2, 1.2.1 Technical Requirements for 400/230/132KV GIS Substation at Purbachal

Item 1M1, 1M2, 1M3 & 1M4 is revised as follows:

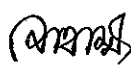
IM	Civil Works, Building and Foundation			
1M1*	Complete land development			
	i.	Complete compacted land development with carried/dredged earth filling including approach road	CuM	406843
	ii.	Slpoe protection		
	a)	_Slpoe (1V:2H) protection with turfing	sqm	550
1M2*	Complete civil items required for outdoor works			
	i	Outdoor gantry foundation in 400kV switchyard		
	a)	_Gantry column	Nos	5
	ii	Outdoor equipment foundation in 400kV switchyard		
	a)	_SA/LA	Nos	21
	b)	_CVT	Nos	12
	c)	_Busduct support	Lot	1
	iii.	Outdoor gantry foundation in 230kV switchyard		
	a)	_Gantry column	Nos	17
	iv.	Outdoor equipment foundation in 230kV switchyard		
	a)	_SA/LA	Nos	24
	v.	Outdoor gantry foundation in 132kV switchyard		
	a)	_Gantry column	Nos	8
	vi.	Outdoor equipment foundation in 132kV switchyard		
	a)	_SA/LA	Nos	24
	vii.	Outdoor equipment foundation 33kV switchyard		
	a)	_CB	Set**	2
	b)	_DS	Set**	4
	c)	_CT	Nos	6
	d)	_IVT	Nos	15
	e)	_SA/LA	Nos	15
	f)	_Zigzag/auxiliary transformer	Nos	2
	g)	_Tertiary bus connection	Nos	2
	viii.	Transformer foundation	Nos	5

	ix.	Blast wall with foundation	Nos	5
	x.	Property line demarkation	Meter	230
	xi.	Security Boundary Wall		
	a)	_Boundary Wall with Retaining wall	Meter	675
	b)	_Boundary Wall without Retaining wall	Meter	230
	xii.	Substation main gate	Nos	2
	xiii.	Approach road (pavement width 6m)	Meter	40
	xiv.	Internal road		
	a)	_6m wide road	Meter	550
	b)	_4.5m wide road	Meter	600
	c)	_3m wide road	Meter	50
	xv.	Surface drain	Meter	900
	xvi.	Cable trench/tunnel with soakpit		
	a)	_For LV control, communication, relay <i>etc.</i> cables	Lot	1
	b)	_For HV power cables	Meter	280
	xvii.	Whole substation surface finishing with drainage system including outlet (excluding surface drain)	Lot	1
	xviii.	Gravelling in switchyard area	Lot	1
	xix.	Septic tank (capacity: 25users for 5 years) and soakpit	Nos	4
	xx.	Pump shed including deep tubewell, motor, pump, water reservoir, water pipe line, electrical connetion <i>etc.</i>	Nos	4
	xxi.	Guard house	Nos	1
	xxii.	Sentry post	Nos	4
	xxiii.	Car port	Nos	1
	xxiv.	RCC box culvert	Nos	1
1M3	i.	Complete civil works for 400kV Indoor GIS Building including Protection & Metering Room, Control Room, 110V Battery Room, 48 Battery Room, Warehouse <i>etc.</i>		
	a)	_Foundation works	Lot	1
	b)	_Super structures	Lot	1
	c)	_All finish works like rendering, painting, water supply, sanitary, floor finish, furniture <i>etc.</i>	Lot	1
	d)	_10 ton EOT crane installation arrangement (excluding price for supply of EOT crane)	Lot	1
	e)	Elevator system (Capacity: 6 People)	Lot	1

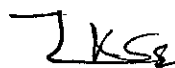





	f)	_ Warehouse _separate spare materials by installing shelves and labels.	Lot	1
	ii.	Complete civil works for 230kV Indoor GIS Building including Protection & Metering Room, 110V Battery Room <i>etc.</i>		
	a)	_ Foundation works	Lot	1
	b)	_ Super structures	Lot	1
	c)	_ All finish works like rendering, painting, water supply, sanitary, floor finish, furniture, <i>etc.</i>	Lot	1
	d)	_ 10 ton EOT crane installation arrangement (excluding price for supply of EOT crane)	Lot	1
	e)	Elevator system (Capacity: 6 People)	Lot	1
	iii.	Complete civil works for 132kV Indoor GIS Building		
	a)	_ Foundation works	Lot	1
	b)	_ Super structures	Lot	1
	c)	_ All finish works like rendering, painting, water supply, sanitary, floor finish, furniture, <i>etc.</i>	Lot	1
	d)	_ 5 ton EOT crane installation arrangement (excluding price for supply of EOT crane)	Lot	1
	iv.	Emergency auxiliary power room & water feeding room		
	a)	_ Foundation works	Lot	1
	b)	_ Super structures	Lot	1
	c)	_ All finish works like rendering, painting, water supply, sanitary, floor finish, furniture, <i>etc.</i>	Lot	1
	d)	_ Complete civil work for CAF system including pipe network	Lot	1
	v.	Single storied ansar barrack with foundation for two storied	Lot	1
1M4*		Testing of foundation		
	i.	Compression test of pile	No	6
	ii.	Uplift test of pile	No	3
	iii.	Pile Integrity Test	No	125
* actual payment shall be as per actual work at site				
** set means three phase				







31. Volume 3 of 3, Schedule B: Bid Prices & Schedules

In Schedule B1: Mandatory Spare, Maintenance & Test Equipment Supplied from Outside the Employer's Country, quantity of "Item No. FS1 a) Line Differential Protection Relay with backup Distance Protection & Directional Earth Fault Protection Functions" is revised as **14 nos.** Accordingly, the revised Price Schedule is attached as **Attachment 2.**

32. Volume 3 of 3, Schedule B4.1: Bid Prices & Schedules for 400/230KV GIS Substation at Purbachal

In Item No. 1M1, 1M2, 1M3 & 1M4, some items have been revised and a few new items have been added. Accordingly the price schedule is revised and attached as 'Attachment 2'.

33. Volume 3 of 3, Schedule E: Technical Particulars and Guarantees

In clause 1.2.1.4 Wave Trap: 400kV, description of item no. 8 is revised as follows:

No	Description	Unit	Minimum Requirements	Guaranteed
8.	Rated Short time current for 3 second	kA	50	

34. Volume 3 of 3, Schedule E: Technical Particulars and Guarantees

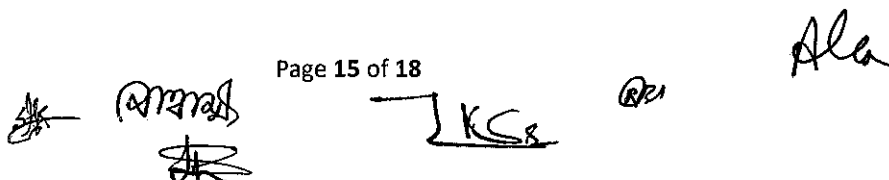
In clause 1.2.1.5 Post Insulator 400 kV (If needed), minimum requirements in item no. 1.7 is revised as follows:

No.	Description	Minimum Requirements		Guaranteed
		Unit	Data	
1.7	Design		Porcelain, outdoor	

35. Volume 3 of 3, Schedule E: Technical Particulars and Guarantees

In clause 1.2.2.3 230kV XLPE Cable, item no. 17 is revised as follows:

Sl. No	Description	Unit	Minimum Requirements	Guaranteed
17	Sheath Earth Fault Current Carrying capacity for three second cable loaded as above prior to each fault	KA/3sec	50	
	Final Conductor temperature	°C	250°	



36. Volume 3 of 3, Schedule E: Technical Particulars and Guarantees

In clause 1.2.2.4 132kV XLPE Cable, item no. 39, 44 and 50 are revised as follows:

Sl. No	Description	Unit	Minimum Requirements	Guaranteed
39	Insulation			
	Material		XLPE	
	Process		Triple simultaneous extrusion	
	Type of curing (dry)		Dry Curing (VCV)	
	Average Thickness		Insert	
	Minimum Thickness		Insert	
	Nominal Diameter over insulation		Insert	
44	Outer Covering			
	Material		MDPE	
	Colour		Black	
	Minimum average thickness		Insert	
	Type of termite repellent		Insert	
50	Sheath Earth Fault Current Carrying capacity	kA/3sec	40	
	Final Conductor temperature	°C	Insert	

37. Volume 3 of 3, Schedule E: Technical Particulars and Guarantees

In clause 1.2.3.4 Voltage Transformer 33kV, minimum requirements in item no. 2.13 is revised as follows:

No.	Description	Minimum Requirements		Guaranteed
		Unit	Data	
1.5	Standards		IEC 61869-3	
2.13	Voltage factor	p.u./s	1.2 continuous 1.5/30 for effectively earthed neutral system 1.9/30 for non-effectively earthed neutral system	

38. Volume 3 of 3, Schedule E: Technical Particulars and Guarantees, 1.2.4 D: Transformers

In clause 1.2.4.1 400/235/34.5 kV 520/750 MVA ONAN/ONAF Autotransformer, minimum requirements in item nos. 2.2.3 & 4.3.5 are revised as follows:

No.	Description	Minimum Requirements		Guaranteed
		Unit	Data	
2.2.3	Loading Type		Simultaneous on HV-LV-TV, (It shall also be possible to load the tertiary winding at the maximum specified MVA rating continuously)	
4.3.5	Maximum hot spot temperature rises in core at rated power	°C	[Insert]	

39. Volume 3 of 3, Schedule E: Technical Particulars and Guarantees, 1.2.4 D: Transformers

In clause 1.2.4.2 230/135/34.5 kV 350/450 MVA ONAN/ONAF Autotransformer, minimum requirements in item nos. 2.2.3, 3.3.3, 3.3.4, 3.3.5 & 4.3.6 are revised as follows:

No.	Description	Minimum Requirements		Guaranteed
		Unit	Data	
2.2.3	Loading Type		Simultaneous on HV-LV-TV, (It shall also be possible to load the tertiary winding at the maximum specified MVA rating continuously)	
3.3.3	HV winding	kA	Infinite	
3.3.4	LV winding	kA	Infinite	
3.3.5	TV winding	kA	Infinite	
4.3.6	Maximum hot spot temperature rises in core at rated power	°C	[Insert]	



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40. Volume 3 of 3, Schedule E: Technical Particulars and Guarantees

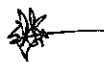
In clause 1.2.5.43 **Fibre Optic Multiplexer Equipment**, minimum requirement in item no. 1.3 is revised as follows:

No.	Description	Minimum Requirements		Guaranteed
		Unit	Data	
1.3	Transmission Capacity	Mbit/s	• STM-4 for 132kV voltage level • STM-4/16 for 230kV voltage level • STM-16 for 400kV voltage level	

41. Volume 3 of 3, Schedule E: Technical Particulars and Guarantees

In clause 1.2.6 F: Digital Fault and Disturbance Recorder (DFDR), item nos. 2.1 & 2.5.5.2 are revised as follows:

No.	Description	Minimum Requirements		Guaranteed
		Unit	Data	
2.1	Number of channels		Refer to B-1 of Vol-2	
2.5.5.2	Fast: 0.5 kHz - 12kHz or higher	Samples / sec	Insert	



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