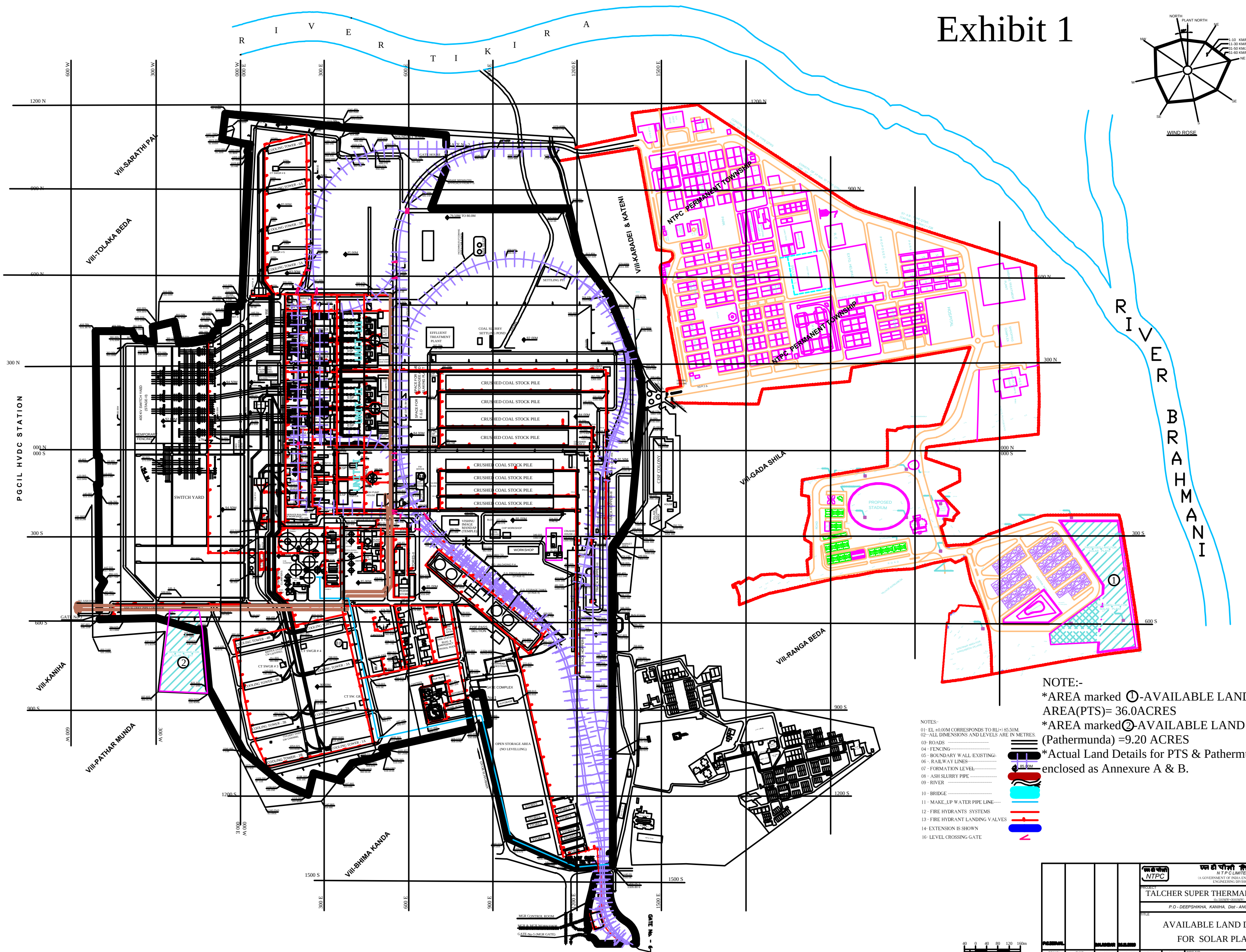
PART- B

List of Exhibits

1.0	**Available land Drawing**
2.0	**Schematic drawing of Power evacuation system**
3.0	**Topographical Survey of the proposed area**
a)	**Topographical Survey of the proposed solar plant at PTS Stage-2**
b)	**Topographical Survey of the proposed solar plant at Patharmuda**
4.0	**Geotechnical studies of the proposed area**
5.0	**List of mandatory spares**
6.0	**Indicative Single Line Diagram**
7.0	**Indicative PV array layout**
8.0	**Site photos**
9.0	**Data sheet of PV module**
10.0	**FQP for Civil Works**

Exhibit 1



NOTE:-
*AREA marked ①-AVAILABLE LAND AREA(PTS)= 36.0ACRES
*AREA marked②-AVAILABLE LAND AREA (Pathermunda) =9.20 ACRES
*Actual Land Details for PTS & Pathermunda are enclosed as Annexure A & B.

NOTES:-
01- EL ±0.00M CORRESPONDS TO RL(+) 85.50M.
02--ALL DIMENSIONS AND LEVELS ARE IN METRES.
03- ROADS
04 - FENCING
05 - BOUNDARY WALL (EXISTING)
06 -. RAILWAY LINES
07 - FORMATION LEVEL (85.00M)
08 - ASH SLURRY PIPE
09 - RIVER
10 - BRIDGE
11 - MAKE_UP WATER PIPE LINE
12 - FIRE HYDRANTS SYSTEMS
13 - FIRE HYDRANT LANDING VALVES
14- EXTENSION IS SHOWN
16- LEVEL CROSSING GATE

SCALE: 40 0 40 80 120 160m

एन टी पी सी लिमिटेड
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TALCHER SUPER THERMAL POWER PROJECT (6x 500MW=3000MW)

P.O - DEEPSHIKHA, KANIHA, Dist - ANGUL, ORISSA, Pin - 759147

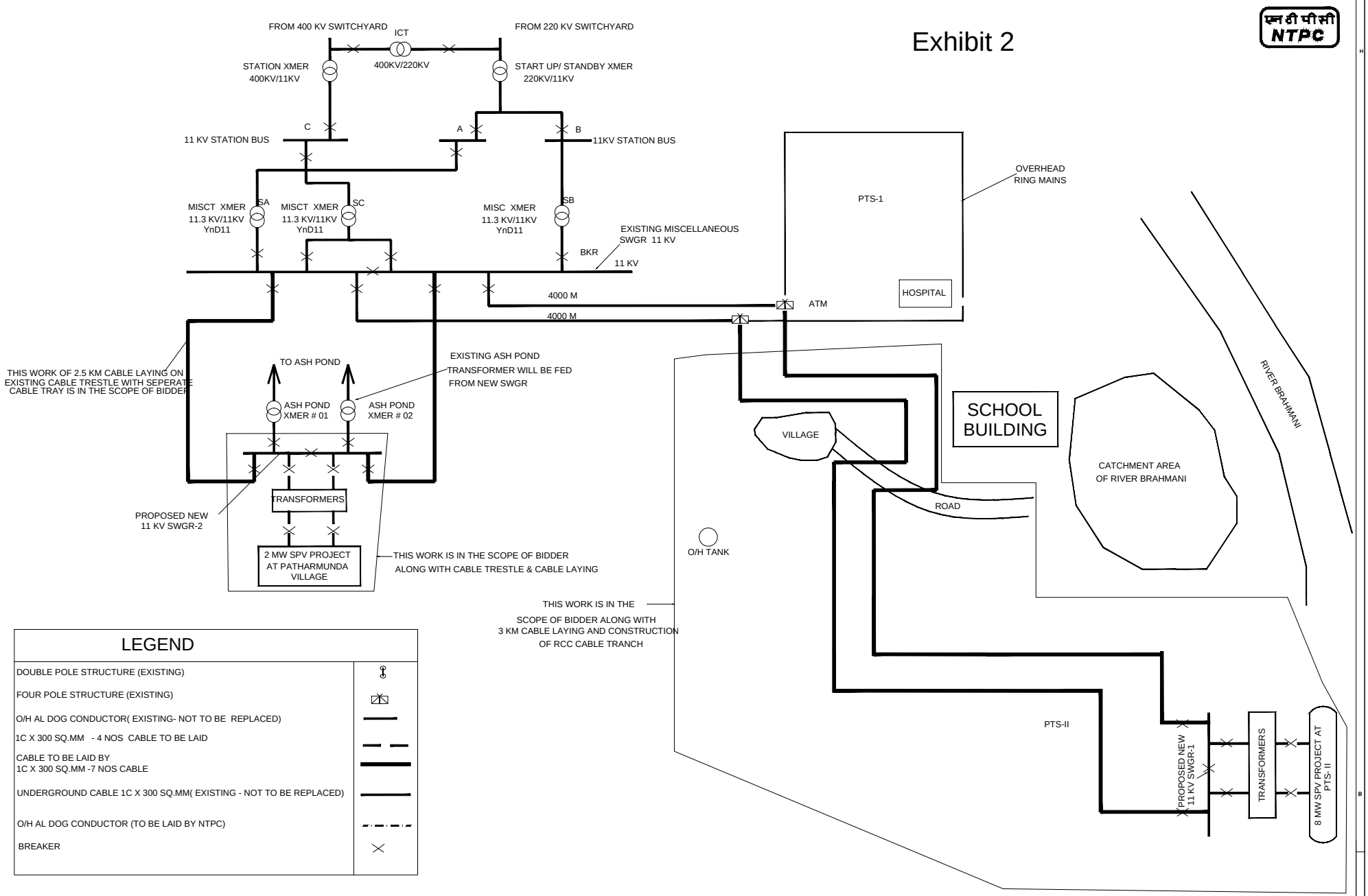
TITLE: AVAILABLE LAND DETAILS FOR FOR SOLAR PLANT AT TSTPS

DRAWN	CHKD.	APPD.	DATE	SIZE	SCALE	DRG.NO	REV.NO
				A0	1 : 4000	9500-FES-C-2011-139	0

CABLE TRESTLE WITH SEPERATE CABLE TRAY IS IN THE SCOPE OF BIDDER

CABLE TRESTLE WITH SEPERATE CABLE TRAY

Exhibit 2

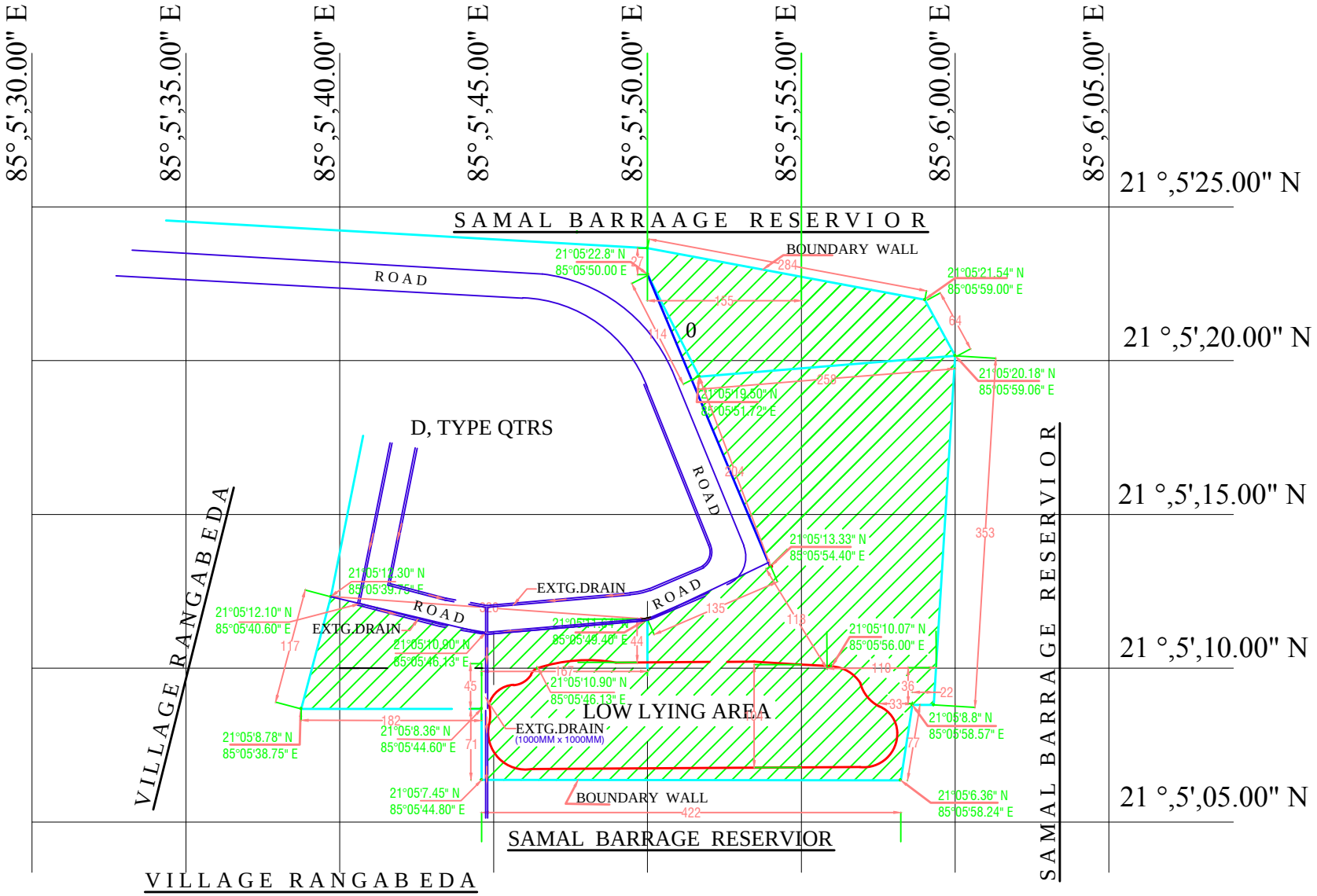


LEGEND

DOUBLE POLE STRUCTURE (EXISTING)	
FOUR POLE STRUCTURE (EXISTING)	
O/H AL DOG CONDUCTOR(EXISTING- NOT TO BE REPLACED)	
1C X 300 SQ.MM - 4 NOS CABLE TO BE LAID	
CABLE TO BE LAID BY 1C X 300 SQ.MM -7 NOS CABLE	
UNDERGROUND CABLE 1C X 300 SQ.MM(EXISTING - NOT TO BE REPLACED)	
O/H AL DOG CONDUCTOR (TO BE LAID BY NTPC)	
BREAKER	

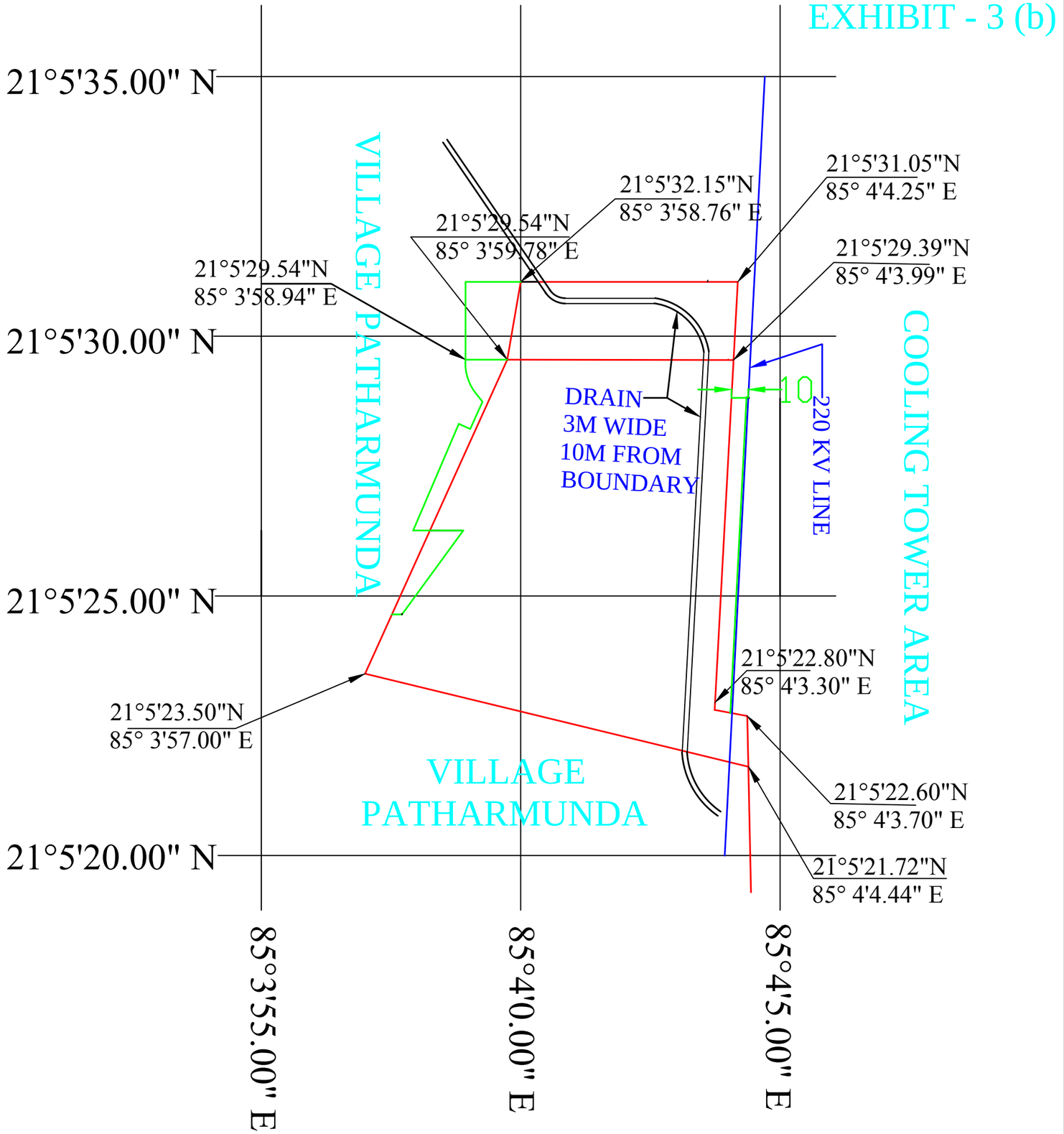
SCHEMATIC DIAGRAM OF PROPOSED POWER EVACUATION SCHEME FOR SOLAR PV PROJECT AT NTPC TALCHER KANIHA

Exibit 3 (a)


85° 5',30.00" E
85° 5',35.00" E
85° 5',40.00" E
85° 5',45.00" E
85° 5',50.00" E
85° 5',55.00" E
85° 6',00.00" E
85° 6',05.00" E
21 °,5'25.00" N
21 °,5',20.00" N
21 °,5',15.00" N
21 °,5',10.00" N
21 °,5',05.00" N
SAMAL BARRAAGE RESERVIOR
BOUNDARY WALL
ROAD
21°05'22.8" N
85°05'50.00 E
21°05'21.54" N
85°05'59.00" E
21°05'20.18" N
85°05'59.06" E
21°05'19.50" N
85°05'51.72" E
D, TYPE QTRS
ROAD
ROAD
ROAD
VILLAGE RANGABEDA
21°05'13.33" N
85°05'54.40" E
21°05'12.30" N
21°05'12.10" N
85°05'40.60" E
EXTG.DRAIN
EXTG.DRAIN
21°05'10.90" N
85°05'46.13" E
21°05'10.07" N
85°05'56.00" E
21°05'10.90" N
85°05'46.13" E
LOW LYING AREA
EXTG.DRAIN
(1000MM x 1000MM)
21°05'8.78" N
85°05'38.75" E
21°05'8.36" N
85°05'44.60" E
21°05'8.8" N
85°05'58.57" E
21°05'7.45" N
85°05'44.80" E
BOUNDARY WALL
21°05'6.36" N
85°05'58.24" E
SAMAL BARRAGE RESERVIOR
SAMAL BARRAGE RESERVIOR
VILLAGE RANGABEDA

SWITCHYARD AREA

EXHIBIT - 3 (b)



TENTATIVE AREA AVAILABLE FOR SOLAR PLANT AT PATHARMUNDA

Exhibit-4

Due to huge file size, contractor is advised to collect the soft copy of the Geo Technical Investigation report of both the sites (8 MW and 2 MW) from BHEL EDN Bangalore

EXHIBIT - 5

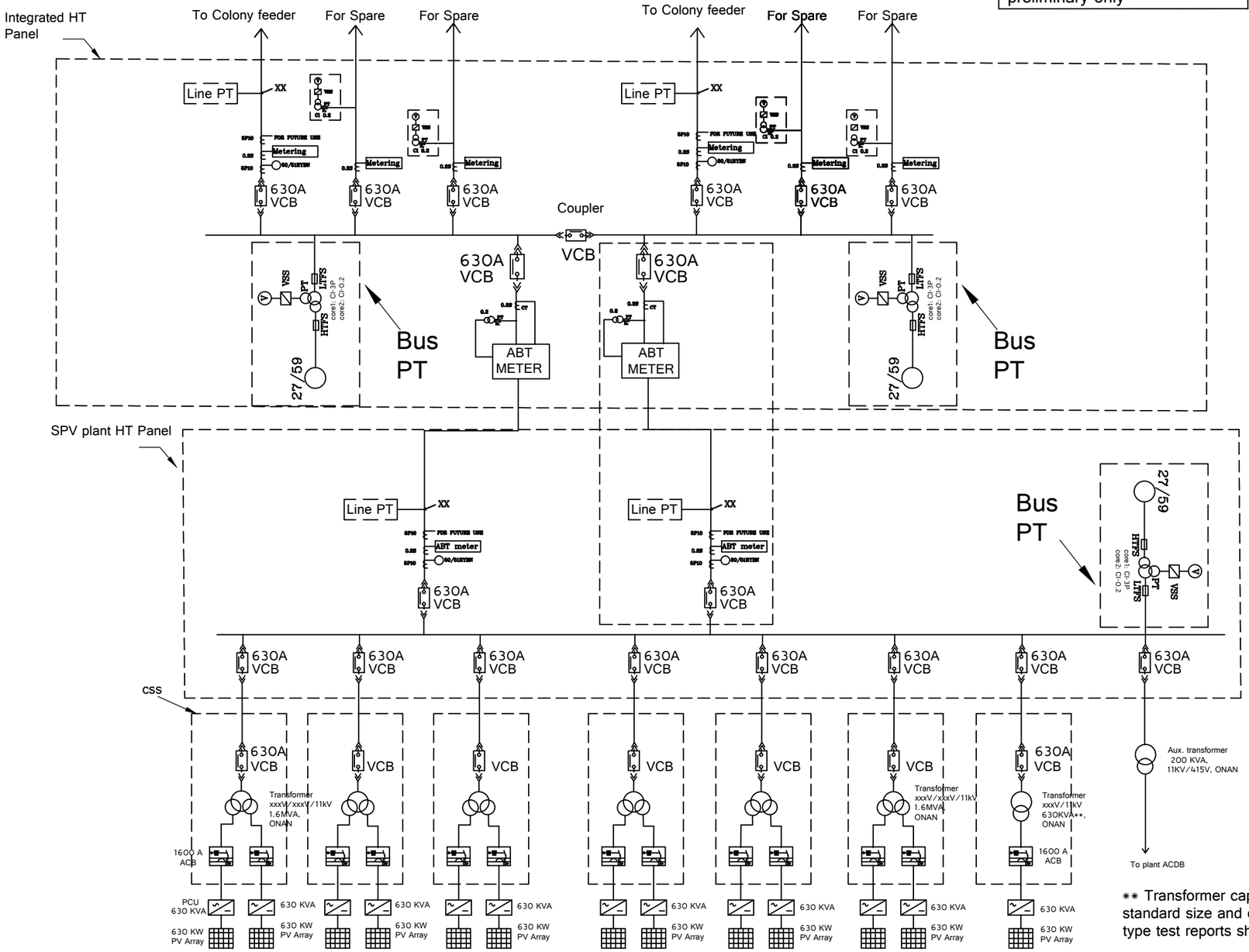
LIST OF MANDATORY SPARES FOR 10 MWP TALCHER SOLAR PV POWER PLANT

Sl No:	Description	Quantity	Unit Price
1	2	3	4
Mandatory Spares			
1	Inverters/ Power Conditioning Unit (PCU)	10% of Total Population (Minimum one no.)	
2	Combiner Box with String Monitoring Unit	2% of Total Population for each type (Minimum one no.)	
3	Control Card for PCU	5% of Total Population for each type (Minimum one no.)	
4	Surge Protection Device/ MOV	5% of Total Population (Minimum one no.)	
5	Fuses of each type for ac and dc systems	10% of Total Population (Minimum one no.)	
6	LV Bushing with metal parts and gaskets	1 no.	
7	Set of valves for Transformer	1 no.	
8	Pressure Relief Device	1 no.	
9	HV Bushing with Metal parts and Gaskets	1 no.	
10	WTI with contacts of Transformer	1 no.	
11	OTI with contacts of Transformer	1 no.	
12	Buchholz relay complete of transformer	1 no.	
13	Set of gasket of each type of Transformer	1 no.	
14	Magnetic Oil Guage (MOG) of Transformer	1 no.	
15	HT Circuit Breaker	1 no.	
16	LT Circuit Breaker	5% of Total Population for each type (Minimum one no.)	
17	Earthing Trolley	1 no.	
18	Bus Potential Transformer	1 no.	
19	Current Transformer for HT & LT System	1 no. of each type	

DRG. No.

Exhibit - 6 (a)

This drawing is indicative and preliminary only

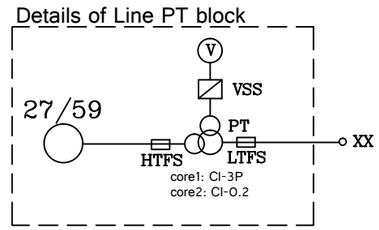


Notes:

1. Plant Layout Design:
   a) 12X630 KWp and 1X630 KWp PV array
   b) 13 Nos of 630 KWp PCUs (transformer less)
   c) Six Nos of CSS with 1.6 MW Capacity and One No. of CSS with 0.63** MW Capacity
   d) SPV Plant HT Panel comprises of 8 Incoming feeders with LBS. Out of 8, seven are from seven Nos of CSS and one for Aux. Transformer. Two outgoing VCB panels will be fed to 11kV Switchgear cubicle. Additionally Bus PT is also there.
   e) 11 kV Switchgear cubicle comprises of 9 panels: 2 Incomer panels from SPV Plant HT Panel, 2 Outgoing panels to Colony feeders, 4 panels for spare and one panel for coupler. Additionally Bus PT is also there.
2. Metering & protection provided:
   a) at CSS level
   b) at SPV Plant HT Panel level
   c) at 11kV Proposed new switchgear cubicle
3. ACB can be part of PCU(inverter).
4. This scheme depends on type of PCU
5. SCADA output from each inverter room will be taken to SCADA room.
6. Protection in CSS:
   a) LT switchgear: over current, short circuit and earth fault
   b) Transformer: Oil Temp., Winding Temp., and Pressure Relief Device
   c) HT switchgear: Over current and Earth fault

** Transformer capacity shall be of standard size and corresponding type test reports shall be available.

Details of Line PT block



PROJECT NAME : 8.23 MWp Solar Project

CUSTOMER NAME : NTPC Talcher

REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED

	NAME	SIGN	DATE
DRAWN			
CHECKED			
APPROVED			

BHEL

DEPT. SC&PV | CODE 439

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

TITLE: SINGLE LINE DIAGRAM OF 8.23 MWp SPV PLANT

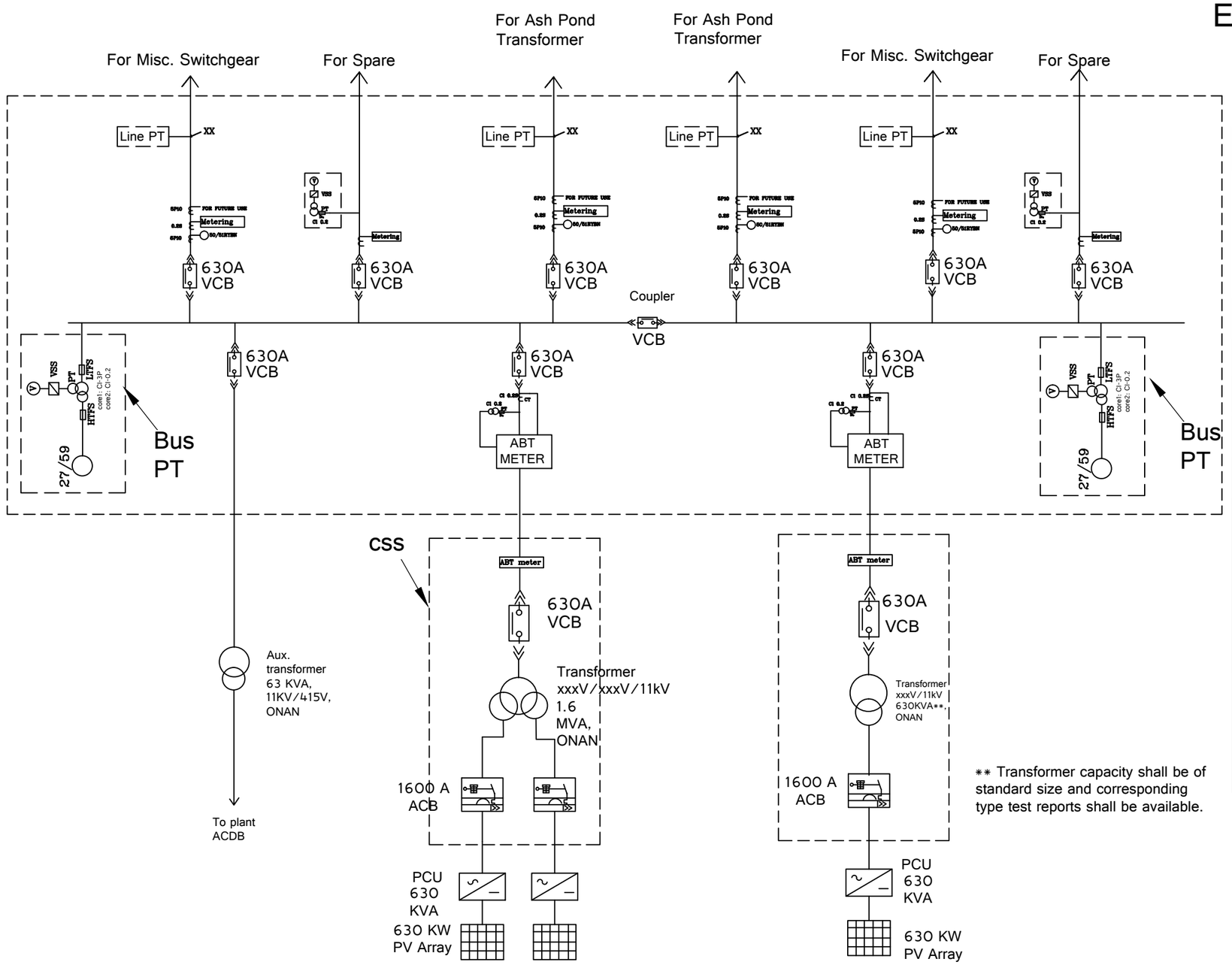
No. OF SHEETS 01 | SHEET No. 01

WBS. No. | DRG. No. | REV

REF. DRG. No. | SIGN. & DATE | INVENTORY No.

DRG. No.

Exhibit - 6 (b)



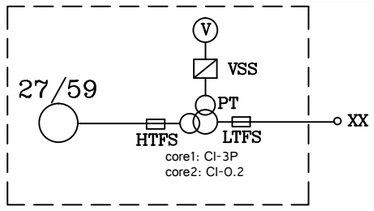
This drawing is indicative and preliminary only

Notes:

1. Plant Layout Design:
   a) 2X630 KWp and 1X630 KWp PV array
   b) 3 Nos of 630 KWp PCUs (transformer less)
   c) One CSS with 1.6 MW Capacity and other CSS with 0.63** MW Capacity
   d) HT Panel comprises of 9 panels: 2 Incomer panels from PV Plant, 2 Outgoing panels to Ash pond transformer, 2 Panels for misc. switchgear, 2 panels for spare and one panel for coupler. Addition to this Bus PT also is there.
2. Metering & protection provided:
   a) at CSS level
   b) at HT Panel (proposed new switchgear) level
3. ACB can be part of PCU(inverter).
4. This scheme depends on type of PCU
5. SCADA output from each inverter room will be taken to SCADA room.
6. Protection in CSS:
   a) LT switchgear: over current, short circuit and earth fault
   b) Transformer: Oil Temp., Winding Temp., and Pressure Relief Device
   c) HT switchgear: Over current and Earth fault

** Transformer capacity shall be of standard size and corresponding type test reports shall be available.

Details of Line PT block



PROJECT NAME : 1.90 MWp Solar Project

CUSTOMER NAME : NTPC Talcher

REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED

	NAME	SIGN	DATE
DRAWN			
CHECKED			
APPROVED			

DEPT. SC&PV | CODE 439

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

TITLE: SINGLE LINE DIAGRAM OF 1.90 MWp SPV PLANT

No. OF SHEETS 01 | SHEET No. 01

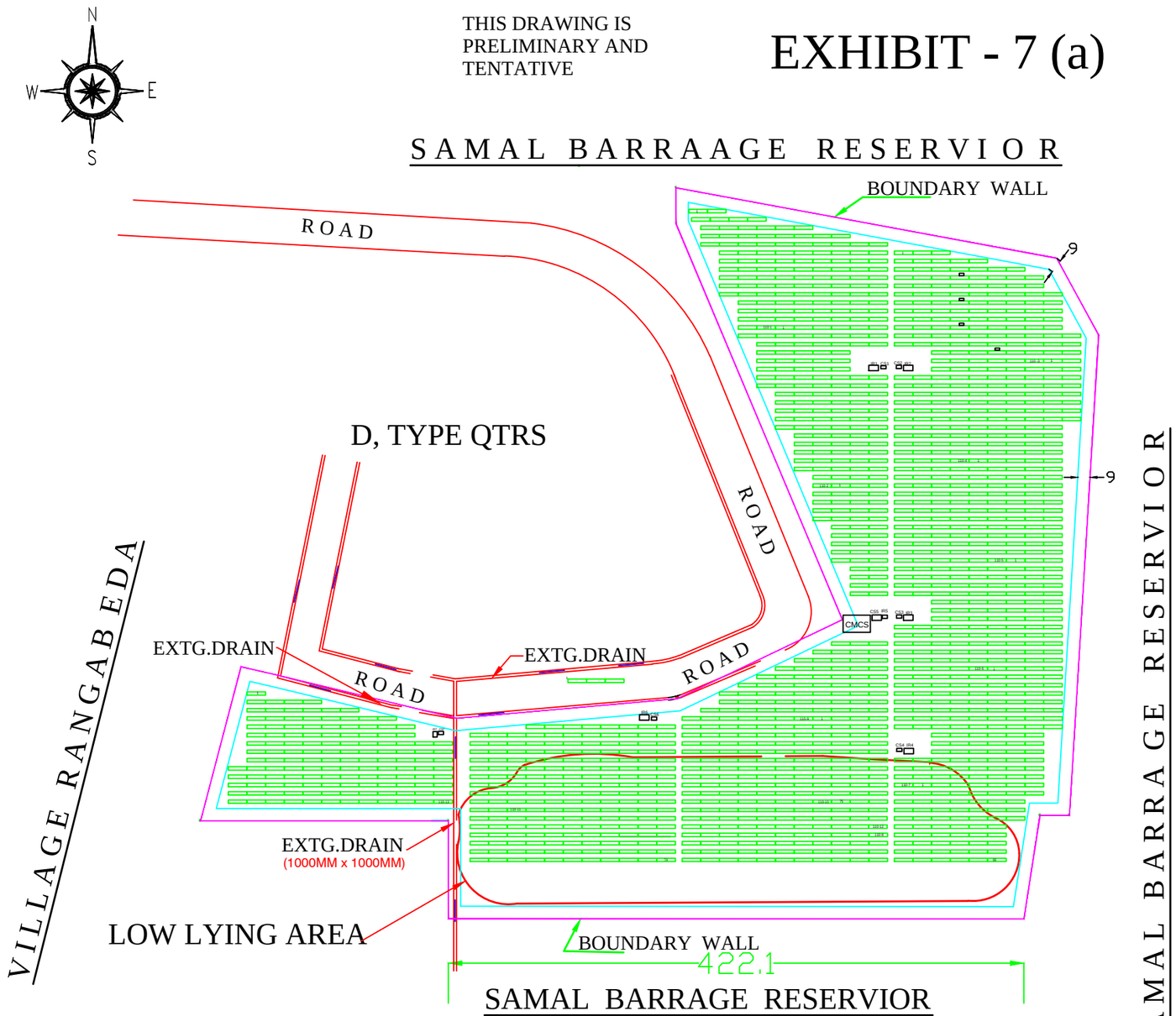
WBS. No. | DRG. No. | REV

REF. DRG. No. | SIGN. & DATE | INVENTORY No.

DRAWING NO. 2-679-05-00xxx

THIS DRAWING IS PRELIMINARY AND TENTATIVE

EXHIBIT - 7 (a)



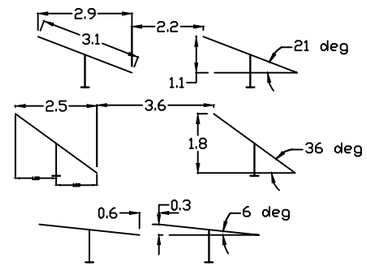
ARRAY DETAILS

PV ARRAY CAPACITY	8.236 MWp
Total no.of PV Modules (240Wp)	34320 nos
PV Modules in series string	24 nos
Total No. of strings	1430 nos
Series strings/630kW	110 nos
No. of Inverters (630kW)	13 nos
String Monitoring Units (SMU)	52 Nos (16 i/p-1 o/p)

LEGEND

13.6 × 2.5 X	2x12-240W STRUCTURE , 1430 Nos.
CMCS	Centralised Main Control System 250 sq.mtrs (RCC Type)
IR1-IR6 7x4	Prefab Inverter Rooms, 6 nos
IR7 3x4	Prefab Inverter Room, 1 no.
CS1-CS6	Compact Sub Station, 6 nos. 3.83x 2.33 x2.41(h) mtrs
CS7	Compact Sub Station, 1 no. 3.2 x 2 x2.41(h) mtrs

Distance between rows:
(2xheight of the PV modules mounted on structure)



At Latitude 21 deg

At Latitude 21+15 deg

At Latitude 21-15 deg

So, the distance between row is = 3.6 mtrs

All dimensions are in metres

REV.	DATE	ALTERED / CHECKED / APPROVED
REV.	DATE	ALTERED / CHECKED / APPROVED
REV.	DATE	ALTERED / CHECKED / APPROVED
REV.	DATE	ALTERED / CHECKED / APPROVED
REV.	DATE	ALTERED / CHECKED / APPROVED

PROJECT: 8 MWp SPV POWER PLANT
CUSTOMER : NTPC, TALCHER

BHARAT HEAVY ELECTRICALS LIMITED
ELECTRONICS DIVISION, BANGALORE

	NAME	SIGN.	DATE
DRN	ASN		Mar'13
CKD	MS		
APPD	SK		

No.OF VAR

DEPT. SCPV
CODE 439
FOR UNSPECIFIED– TOLERANCES REFER ED 0230499
SCALE NTS
WEIGHT(Kg)
REF. TO ASSY. DRG.
ITEM NO.
No.OF ITEM

TITLE
8 MWp PV ARRAY LAYOUT FOR NTPC TALCHER

DRAWING NO. 2-679-05-00xxx
REV. 00

SHEET NO. 01
NO. OF SHEETS 01

REF. DRG.NO. | SIGN & DATE | INVENTORY NO.

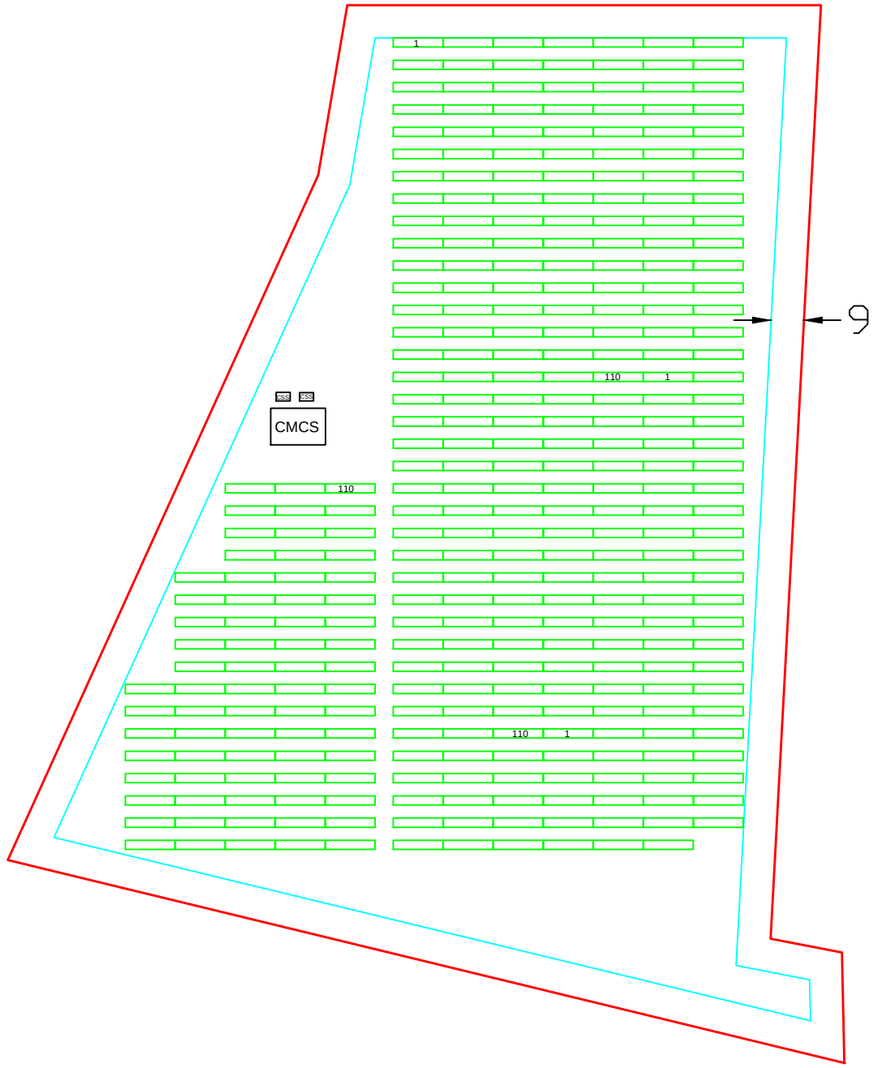
DRAWING NO. 3-679-05-00xxx

EXHIBIT - 7 (b)

N
W E
S

THIS DRAWING IS PRELIMINARY AND TENTATIVE

SWITCHYARD AREA



VILLAGE PATHARMUNDA

VILLAGE
PATHARMUNDA

All dimensions are in metres

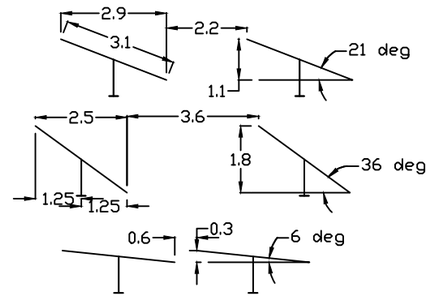
ARRAY DETAILS

PV ARRAY CAPACITY	1.9 MWp
Total no.of PV Modules (240Wp)	7920 nos
PV Modules in series string	24 nos
Total No. of strings	330 nos
Series strings/630kWp	110 nos
No. of Inverters (630 kW)	3 nos
String Monitoring Units	12 nos (16 i/p-1 o/p)

LEGEND

13.6 × 2.5 X	2x12-240W STRUCTURE - 330 Nos.
CMCS	Centralised Main Control System 150 sq.mtrs (RCC Type)
CSS CS1	Compact Sub Station 3.83x 2.33 x2.41(h) mtrs -1 no
CSS CS2	Compact Sub Station 3.2 x 2 x2.41(h) mtrs - 1 no.

Distance between rows:
(2xheight of the PV modules mounted on structure)



At Latitude 21 deg

At Latitude 21+15 deg

At Latitude 21-15 deg

So, the distance between row is = 3.6 mtrs

REV.	DATE	ALTERED	CHECKED	APPROVED

PROJECT: 1.9 MWp SPV POWER PLANT
CUSTOMER: NTPC, TALCHER

BHARAT HEAVY ELECTRICALS LIMITED
ELECTRONICS DIVISION, BANGALORE

	NAME	SIGN.	DATE	No.OF VAR
DRN	ASN		Mar'13	
CKD	MS			
APPD	SK			

DEPT.	FOR UNSPECIFIED– TOLERANCES REFER ED 0230499	SCALE	WEIGHT(Kg)	REF. TO ASSY. DRG.	ITEM NO.	No.OF ITEM
SCPV		NTS				
CODE 439						

TITLE
2MWp PV ARRAY LAYOUT
FOR NTPC TALCHER

DRAWING NO. 3-679-05-00xxx REV. 00

SHEET NO. 01 NO. OF SHEETS 01

REF. DRG.NO. | SIGN & DATE | INVENTORY NO.

8 MW SITE

2 MW SITE

TECHNICAL SPECIFICATION FOR PV MODULE L20220 (240 WATTS)

1. PV MODULE TYPE NO.	: L20220
2. CONFIGURATION	: SINGLE GLASS LAMINATED TYPE WITH 60 NOS. OF 156-mm MONO CRYSTALLINE SILICON SOLAR CELLS (10*6) IN SERIES CONFIGURATION.
3. OVERALL SIZE	: 1656 (±3) * 996 (±2) * 50 (±1) mm
4. WEIGHT	: 20 Kg. (Typ.)
5. PV MODULE FRAME MATERIAL	: ANODISED ALUMINIUM
6. JUNCTION BOX	: IP65 GRADE JUNCTION BOX WITH CABLES AND CONNECTORS
7. RFID Tag	: RFID Tag containing Module data

8. TYPICAL ELECTRICAL CHARACTERISTICS:

8.1 OPEN CIRCUIT VOLTAGE (Voc)	: 36.0 V
8.2 SHORT CIRCUIT CURRENT (Isc)	: 8.5 A
8.3 VOLTAGE AT PEAK POWER POINT (Vmp)	: 29 V
8.4 CURRENT AT PEAK POWER POINT (Imp)	: 8.28 A
8.5 PEAK POWER OUTPUT (Pmax.)	: ≥ 240 Wp
8.6 MODULE EFFICIENCY	: 14.6 %
8.7 CELL EFFICIENCY (@ Module level)	: 16.7 %
8.8 FILL FACTOR	: ≥ 0.70

NOTE :

1. Electrical specifications mentioned above are at Standard Test Conditions of 1000 W/sq. m solar insolation (AM 1.5) and at 25 deg C temperature.
2. Measurement repeatability of peak power output: ± 3 %

REFER MODULE DRAWING NO. : 3-679-02-00366

EXHIBIT - 10

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN						ANNEXURE- I			
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :		1 0 Page 1 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
1	**GENERAL REQUIREMENTS**										
A	All bought out items to be procured from the approved Contractor and on approval of Quality plans by NTPC as		-	B	Verification of TC and/or Testing	100%	NTPC Tech. Spec. /BOQ		SR/LB	√	The TC submitted should bear proper identification or correlation with the batch of material supplied and same shall be brought out in the challan/ consignment note .
B	Submission of list of Bought out items and their Contractors for each of the bought out item identified for approval within the period agreed in LoA.		-	A	Physical	One time	NTPC Tech. Spec. /BOQ		SR/LB		To be submitted to CQA for approval with a copy to site .
2	**EXCAVATION AND FILLING IN FOUNDATION WORKS**										
	Excavations-										
2.1		Nature, type of soil/rock before and during excavations	As agreed / required	B	Visual	Random in eah shift	Tech Specs and Const. Drawings		SR		
2.2		Initial ground level before start of excavations	As agreed / required	B	Measurement	100%	Tech Specs and Const. Drawings		SR	√	
2.3		Final shape and Dimensions of excavations.	As agreed / required	B	Measurement	100%	Tech Specs and Const. Drawings		SR		
2.4		Final excavation lelvels	As agreed / required	B	Measuement	100%	Tech Specs and Const. Drawings		SR	√	
2.5		Side slope of final excavation	As agreed / required	B	Measurement	Random in eah shift	Tech Specs and Const. Drawings		SR		
2.6		Excavation in Hard Rock- If required									
i		Receipt, Storage, accountability of Explosive	As agreed / required	B	Physical	Random in each week	Indian Explosive Act 1940/all statutory norms, Tech Specs and Const. Drawings		SR	√	NTPC approved specialist blasting agency such as CMRI, NIRM shall be deployed at site for trial blasts, design blasts, blast vibration monitoring etc. Seismographs shall be deployed at site for monitoring of blast operation vibrations.
ii		Execution of Blasting Operation	As agreed / required	B	Physical	Random in eah shift	IS:4081, Tech Specs and Const. Drawings		SR	√	
iii		Submission of Blasting report to EIC	As agreed / required	C	Physical	Each blast	Tech Specs and Const. Drawings			√	
2.7		Excavation in Hard Rock (Blasting Prohibited)	As agreed / required	B	Physical	100%	As per approved drawing/ scheme, Tech Specs and Const. Drawings		SR	√	
	Fill/ Backfill -										
2.8 A	**Suitability of borrow fill material - If earth is brought from area within the NTPC acquired area**										
		Suitability	As agreed / required	B	Visual	Randon in each shift	As per technical specifications				
2.8 B	**Suitability of borrow fill material- Applicable in case the earth is brought from an area, out of the NTPC aquired land area**										
i		Grain size analysis	Set of Seives, Hydrometer etc.	B	Physical	Once per each type of source or change of source	IS:2720 (Pt.IV), Tech Specs and Const. Drawings		SR/TR	√	
ii		Liquid & plastic limit	Mechanical liquid limit device, grooving tools, Evaporating Disc,Spatula, Palette knives, Balance oven containers, etc.	B	Physical	Once per each type of source or change of source	IS:2720 (Pt.IV) , Tech Specs and Const. Drawings		SR/TR	√	
iii		Shrinkage limit	-do-	B	Physical	Once per each type of source or change of source	IS:2720 (Pt.IV), Tech Specs and Const. Drawings		SR/TR	√	
iv		Free Swell Index	Measuring cylinders, etc.	B	Physical	Once per each type of source or change of source	IS:2720 (Pt.XI), Tech Specs and Const. Drawings		SR/TR	√	
v		**Chemical Analysis**									

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN								ANNEXURE- I
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :	1 0 Page 2 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record	Remarks
1	2	3		4	5	6	7	8	9 D*	10
a		Organic Matter	Oven chemical balance, volumetric flasks, burettes, pipettes, conical flasks, set of seives, measuring cylinders etc.	B	Physical	Once per each type of source or change of source	IS:2720 Pt.XXII, Tech Specs and Const. Drawings		SR/TR √	
b		Calcium carbonate	Reagents and indicators,Burette,flasks,funnels etc.	B	Physical	Once per each type of source or change of source	Part XXIII of IS-2720, Tech Specs and Const. Drawings		SR/TR √	
c		pH value	As agreed / required	B	Physical	Once per each type of source or change of source	Part XXVI of IS-2720, Tech Specs and Const. Drawings		SR/TR √	
d		Total soluble sulphate	As agreed / required	B	Physical	Once per each type of source or change of source	Part XXVII of IS-2720, Tech Specs and Const. Drawings		SR/TR √	
2.9	**Standard proctor Test**	Optimum moisture content and max. dry density before fill	As per IS: 2720, Proctor needle apparatus,etc.	A	Physical	Once per each type of source or change of source	IS 2720 (Pt.VII), Tech Specs and Const. Drawings		SR/TR √	
2.10	**Moisture content**	Moisture content of fill before compaction	As per IS: 2720, balance, oven etc.	A	Physical	Once per each type of source or change of source	IS 2720 (Pt.II), Tech Specs and Const. Drawings		SR/TR √	
2.11	**Degree Of Compaction Of Fill / Backfill**									
i		Dry density by core cutter method ---- OR---- Dry density in place by sand displacement method	As per IS: 2720/compaction test (core cutter), balance etc.	A	Physical	i) For foundation fill/ backfill one for every 10 foundations for each compacted layer.	IS 2720 (Pt. XXIX), Tech Specs and Const. Drawings		SR/TR √	
						ii) For area filling, one every 1000 SQM area for each compacted layer.	IS 2720 (Pt. XXVIII), Tech Specs and Const. Drawings		SR/TR √	
ii		Relative density (Density Index)	As per IS: 2720, balance oven etc.	A	Physical	----do----- (i) & (ii) above	IS 2720 (Pt. XIV), Tech Specs and Const. Drawings		SR/TR √	
iii		Dry Density by proctor needle penetration	As per IS-2720, proctor nedle apparatus etc.	B	Physical	Random checks to be carried out for each compacted layer	Tech Specs and Const. Drawings		SR/TR √	
3.0	**MATERIALS**									
	Expert openion regarding suitability of construction materials shall be taken from Specialist Institute (Identified during pre award)									
3.1	**CEMENT**									
		Retesting of cement	as per IS:4031	A	Testing	At Random	As per relevant IS Codes		Test Report √	Each consignment of cement shall be duly correlated with manufactureres TC,in case the cement is supplied by the contractor one sample from each lot shall be tested for stetting time and compressive strength . Acceptance norms shall be as per relevant IS. If cement is stored more than 60 days in godown of contractor same shall be retested for comp. Strength & setting time.
3.2	**Coarse Aggregate**	Moisture content	as per IS:2386	B	Physical	Once for each stack of 100 Cu.M. or part	IS : 456 IS : 383/Tech Spec		SR/LB √	during monsoon when this has to be done every day before start of concreting
ii		Specific gravity, water absorption	IS:2386	A	Physical	Once for each source & for every change of source	IS: 2386 Part-III, IS:456, IS:383/Tech Spec		SR/LB/ Test Report √	
iii		Sieve analysis, flakiness index, elongation index,	IS:2386	B	Physical	One per 100 cum., or part thereof	IS: 2386 Part-I, IS:383/Tech Spec		SR/LB √	
iv		Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale)	IS:2386	A	Physical	Once per source/ on every change of source	IS: 2386 Part-II, IS:383/Tech Spec		SR/LB/ Test Report √	

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN									ANNEXURE- I
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :		1 0 Page 3 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
v		Soundness	IS:2386	A	Physical	-do-	IS: 2386 Part-V, IS:383		SR/LB/ Test Report	√	
vi		Crushing value abrasion value and impact value	IS:2386	A	Physical	-do-	IS:383, IS-2386 Part IV/Tech Spec		SR/LB/ Test Report	√	
3.3	Fine Aggregate										
i		Moisture content, water absorption	balance , oven etc	B	Physical	To be done every day before start of work	IS: 2386 Part-III IS:383		SR/LB/TR	√	
ii		Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale)	IS:2386	B	Physical	Once per source& for on every change of source	IS: 2386 Part-II, IS:383		SR/LB/TR	√	
iii		All other tests similar to coarse aggregates as mentioned above.					IS-2386, IS-383		SR/LB/TR	√	except test for flankiness index,elongation index, abrasion value, impact value
3.4	Water										
i		Complete tests as per IS:456	Buret, conical flask, pipette etc	B	Testing	One per 3 month for each source.	IS:3025 part 22 and 23 (for test procedure), IS:456(for acceptance criteria)		SR/LB/TR	√	
3.5	CONCRETE										
i		4 Trial mixes to ascertain the workability and cube strength	After receiving the recommended mix design from specialis agency,	A	Physical	One for each mix proportion	NTPC tech specification		SR/LB	√	
ii		Crushing strength (works Tests cubes)	IS:516	A	Physical	IS 456-2000	IS:516, IS:456, NTPC Tech. Spec.		SR/LB/ Test Report	√	Min. of 6 cubes for each mix, 3 specimen shall be tested at 7 days remaining 3 shall be for 28 days comp. Strength.
iii		Workability - slump test	IS:1199	B	Physical	At the time of concrete pouring at site every two hrs	IS:456/NTPC Tech. Spec.		SR/LB/TR	√	
iv		Water content		B	Physical	Once per shift	As per approved design mix.		SR/LB	√	At batching plant
3.5.1	Admixtures for Concrete	Type of admixture	As per IS:9103	A	EIC Approved source and review of MTC/ test reports	For each lot received at site	Designed mix and IS:9103		Test Report	√	Admixture of appd. Brand and tested quality shall be used (each lot of admixture will included with brochure in which the type of admixture and its properties shall be clearly indicated)
		Suitability	As per IS:9103	B	Physical	For each lot received at site	Designed mix and IS:9103		SR/LB/TR	√	Relative density, pH and slump retention on each batch / lot of admixture and to compare these properties with MTC
3.6	Concrete conveying, placing& compaction										
i		mixing of concrete shall be done in a approved mixer such as to produce a homogenous mix				To be calibrated at the time of starting and subsequently once in three months, and shall conform to IS:4925	Review of calibration chart/ Certificate, IS 4926			√	
ii		Arrangement for transportation & placement of concrete.	As required	C	Visual	100%	Before clearance for concreting		Inspection Report	√	
iii		Calibration of Batching Plant	batcher should comply with reqirement of IS 4926/IS:4925	A	Physical	To be calibrated at the time of starting and subsequently once in three months, and shall conform to IS:4925	Review of calibration chart/ Certificate		Calibration Certificate	√	Provision of online printer is manadatory
iv		Handling and Transportation of concrete	As required	B	Physical	100%	As per construction/erection methodology (to be approved one week prior to start of work)		SR		

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN						ANNEXURE- I			
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :		1 0 Page 4 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
v		Placement of concrete	Visual	B	Physical	100%	As per construction/erection methodology and tech.specs / No segregation		SR	√	
vi		Placement	Visual	B	Physical	100%	As per approved construction methodology		SR	√	
vii		Compacting	As required	B	Physical	At Random	IS:456		SR	√	
viii		Curing	As required	B	Physical	At Random	Period of curing as per IS 456 (use gunny bags / curing compound)		SR	√	
3.7	TEST/CHECK ON RCC STRUCTURE IN HARDENDED CONDITIONS										
i		Visual inspection of concrete surface of all dynamic foundations just after removal of shuttering	As required	A	Visual	100%	As per Technical Specification		SR	√	
ii		Embeddment of inserts in concrete shall be checked for gap if any using hammer for all dynamic foundations	Hammer	A	Visual	100%	As per Technical Specification		SR	√	No hollow sound
iii		Dimensional check on finished structures & Dimensional tolerances	As required	B	Measurement	Approved Drawing	As per IS:456/ tech. Specification.		SR/LB	√	
iv		Water Tightness Test of liquid retaining structure/ tanks	As required	A	Test	100%	IS:3370/ Tech. Specification		SR/LB	√	
3.8	REINFORCEMENT STEEL										
i		Physical and Chemical Properties for each lot as per relevant IS codes	As required/ agreed	A	EIC Approved source and review of MTC/ test reports	Each batch of delivery	IS : 1786, IS:432, IS:1566, Tech Specs and Const. Drawings		MTC	√	Applicable if steel is procured by Contractor
ii		Freedom from cracks surface flaws, Lamination.	As agreed / required	B	Visual	Random in each shift	IS: 1852, IS:432, IS:1786, Tech Specs and Const. Drawings		SR		To be checked at site. Steel collected from source should be free from excessive rust. To be stored as per Technical Specs.
3.9	PLACEMENT OF REINFORCEMENT STEEL										
i		Bar bending schedule with necessary lap, Spacers & Chairs	As agreed / required	B	Visual & Measurement	Random in each shift	Approved Drawings, Tech Specs and Const. Drawings, IS:2502		SR	√	
ii		Bending of bars, cutting tolerance	As agreed / required	B	Visual & Measurement	Random in each shift	Approved Drawings, Tech Specs and Const. Drawings, IS:2502		SR	√	
iii		Acceptance - Cover, spacing of bars, spacers and chairs after the reinforcement cage is put inside the formwork	As agreed / required	B	Visual & Measurement	Random in each shift	Approved Drawings, Tech Specs and Const. Drawings		SR	√	
3.10	STAGING AND FORMS										
i		Materials and accessories	As agreed / required	B	Visual	Once before start of work	As per relevant IS, Tech Specs and Const. Drawings		SR		
ii		Soundness of staging, shuttering and scaffolding including application of mould oil / release agent	As agreed / required	B	Visual	Once before start of work	As per manufacturer's spec.and as per 3696,4014, 4990, Tech Specs and Const. Drawings		SR		
iii		Acceptance of formwork before start of concreting		B	Physical / visual	Before start of each concreting	As per provisions and tolerances, Tech Specs and Const. Drawings		SR	√	
3.11	INSPECTION OF CONCRETE SURFACE JUST AFTER REMOVAL OF FORM WORK										
i	Visual inspection jointly with NTPC	Concrete surface, position and alignment of embedded parts and inserts	--	B	Visual	Once for TG, BFP & MILL foundations	As per provisions and tolerances of equipment supplier, Tech Specs and Const. Drawings			√	Inspection protocol shall be signed Jointly by Contractor and NTPC CCD & Erection
ii	Submission of grouting / repair methodology if concrete surface / position and alignment of embedded parts / inserts are found defective		--	B	Review and approval	once for each type of defect	As per provisions and tolerances, Tech Specs and Const. Drawings			√	

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN									ANNEXURE- I
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :		1 0 Page 5 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
3.12	EMBEDDED PART(INCLUDING LAYING OF RAILS & ANCHOR FASTENERS)										
i		Position / alignment / levels of embedded parts / bolt hole / pipe sleeves / rails / PVC pipes / etc	As agreed / required	B	Physical/ measurement	100%	As per drawing, Tech Specs and Const. Drawings		SR/ Protocol	√	Exposed surfsce of the embeded parts other than holding down bolts are to be painted with as per technical specifications
ii		Welding / tieing of embeddment to reinforce-ment	As agreed / required	B	Physical/ measurement	Random in each shift	As per drawing, Tech Specs and Const. Drawings		SR		
3.13	PRE-CAST CONCRETE										
i		Crushing strength	compression strength testing machine	A	Physical	one sample of six cubes per 50m m3 or part thereof	IS:516 & IS: 456		SR/LB	√	A minimum of three specimen shall be tested for 7 and 28 days compressive strength
ii		Workmanship and dimentions	Visual	B	Physical	100%	As per IS:456/NTPC Tech. specification.		Register		
iii		Load Test	As required	B	Physical	1% up to 1000 nos. and 0.5% for more than 1000 nos. for each type	IS:456/ As decided by NTPC Site Engr. Incharge.		Inspectio n Report	√	
3.14	JOINTS IN CONCRETE										
i		Joint material - bitumen impregnated fibre board, PVC water stops, Sealing compound, Expanded polystyrene board, Hydrophillic strip, Acrylic polymer etc.	As per manufacturer Standards	A	EIC Approved source and review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings, IS 1838, IS 1834, IS12200		MTC	√	
ii		Acceptance of installation	As agreed / required	B	Acceptance	Each installation randomly	Tech Specs and Const. Drawings				
3.15	DAMP PROOF COURSE						Tech Specs and Const. Drawings				
i		Material - Hot bitumen and water proofing materials etc	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each batch of delivery at site	Tech Specs and Const. Drawings, IS 702		SR	√	
ii		Acceptance of damp proof course	As agreed / required	B	Acceptance	100%	Tech Specs and Const. Drawings		SR		
3.16	GROUTING										
i		Material	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings		SR	√	
		Type of mix - fluid mix, plastic mix, stiff mix etc.	As agreed / required	B	Physical	Prior to start of work	Tech Specs and Const. Drawings		SR	√	
ii		Mixing, placement, application and grout pressure	As agreed / required	B	Physical	Random in each shift	Tech Specs and Const. Drawings		SR		
iii		Compressive strength	As agreed / required	A	Physical	Random in each shift	Tech Specs and Const. Drawings		SR	√	
iv		Acceptance of the grouts	As agreed / required	B	Physical	Each grout section	Tech Specs and Const. Drawings		SR		
4.00	BRICK MASONARY										
4.1	Test on Bricks										
		Dimensions , shape, compressive strength, water absorption, warpage, efflorescence.	As agreed / required	A	Measurement/ Physical Test	As per relevant IS Code/ One Sample for 30,000 nos. or part thereof	IS: 1077, IS:13757, IS: 12894 / Tech Specs and const. Drawings		Inspectio n Report	√	Efflorescence shall be checked at each source.
4.2	Test on Mortar										
i		Compressive strength	As agreed / required	B	Test	At random	IS 2250-1981, Tech Specs and Const. Drawings		LB		
ii	Sand	Grading	As agreed / required	B	Test		IS:2116		SR/LB		
4.3	Masonry construction	Workmanship, verticality and alignment	As agreed / required	B	Visual/ Physical	100%	IS 2212, IS 1905 , Tech Specs and Const. Drawings		SR/LB		
5.00	FINISHING AND ALLIED WORKS								.		
5.1	PLASTERING- MATERIAL										

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN									ANNEXURE- I
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :	1 0 Page 6 of 12		PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
i	**Sand**	Deleterious Material	As agreed / required	B	Physical	Once per source	IS : 2386 (Part-I &II) & IS :2116, Tech Specs and Const. Drawings		SR		
ii		Grading	As agreed / required	B	Physical	50 Cum./or part thereof	Tech Specs and Const. Drawings		SR		
iii	**Galvanised wire mesh**	Galvanized hexagonal wire netting for lath plastering	As agreed / required	B	EIC Approved source and review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings		SR		
5.2	**PLASTERING - WORKMANSHIP**										
i		Curing	As agreed / required	C	Physical	100%	Tech specifications, construction drawings and agreed methodology		SR		
ii		Thickness and finishing of plaster, grooves etc	As agreed / required	B	Visual/ Measurement	Random in each shift	Tech Specs and Const. Drawings		SR/LB		
iii		Truness of plastering system	As agreed / required	B	Visual/ Physical	Random in each shift	Tech Specs and Const. Drawings		SR		
5.3	**STONE GRIT PLASTER/ GRANULAR TEXTURED COAT FINISH**										
i		Material	As agreed / required	B	Approved source and review of MTC	For each lot received at site	Tech Specs and Const. Drawings		SR	√	
ii		Thickness, finishing and grooves etc	As agreed / required	B	Visual/ Measurement	Random in each shift	Tech Specs and Const. Drawings		SR	√	
6.00	**SHEETING AND OTHER WORKS**										
6.1	**PAINTING SYSTEM - CONCRETE WORKS AND PLASTERED MASONARY SURFACES**										
i	Materials and accessories- Oil Bound, Acrylic Emulsion, Chemical Resistant, Oil Resistant Paint etc.	Shade, type from brand and manufacturer as approved by NTPC EIC	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC	√	
ii	Surface prepration	As required	As agreed / required	C	Physical /visual	Random in each shift	Tech Specs and Const. Drawings		SR		
iii	Acceptance of painted surfaces	As required	As agreed / required	B	Physical	Each surface at random	Tech Specs and Const. Drawings		SR		
6.1.1	**PAINTING SYSTEM - STEEL WORKS (OTHER THAN STRUCTURAL STEEL WORKS)**										
i		Paining Materials and accessories	-	A	EIC Approved source and review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC	√	Mfr.'s T.C. shall be correlated with the consignment received.
ii		Submission of painting methodology	-	B	For Review of painting system	Before start of painting work	Tech Specs and Const. Drawings				
iii		Surface prepration	As agreed / required	B	Physical /visual	Each Erection Mark	Tech Specs and Const. Drawings, Relevant code/ standards		SR	√	
iv		Primer Thickness	Elcometer	B	Measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR	√	
v		DFT of paint	Elcometer	B	Measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR	√	
vi		Acceptance of painted surfaces	Elcometer	B	Visual and measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR		
7.00	**DOORS , WINDOWS VENTILATORS & GRILL**										
7.1	**Steel doors**										
i		Materials (MS sheet, fasteners, hinges, jambs, lock strike plate etc	As agreed / required	A	Visual/ Physical / test report	For each lot received at site	Tech Specs and Const. Drawings		SR / LB	√	Review of test report
ii		Flush Door shutters, teak beading	As agreed / required	A	EIC Approved source and review of MTC/ test reports	For each lot received at site	IS 2202, Tech Specs and Const. Drawings		SR	√	Review of test report
iii		Hollow metal doors (material and dimensions)	As agreed / required	A	Visual/ Physical/Test report	For each lot received at site	Tech Specs and Const. Drawings			√	Review of test report
iv		Acceptance	As agreed / required	B	Visual/ Physical	Random	Tech Specs and Const. Drawings		SR/LB		
7.2	**Anodised aluminium works**										

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN								ANNEXURE- I
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :		1 0 Page 7 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR			
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record	Remarks
1	2	3		4	5	6	7	8	9 D*	10
i		Materials- Aluminium sections, alkali resistant paint	As agreed / required	A	Visual/ Physical / test report	For each lot received at site	IS: 1948, IS: 1949, IS:733, IS1285, IS:1868, IS:11857/ Tech Specs and Const. Drawings		SR / LB √	Review of test report For aluminium door/windows, check for anodisation as per Tech. Spec
ii		Particle Door	As agreed / required	A	EIC Approved source and review of MTC/ test reports	For each lot received at site	IS:12823 (phenol formaldehyde sythentic resin, BWP type), Tech Specs and Const. Drawings		SR √	Review of test report
iii		Acceptance	As agreed / required	B	Visual/ Physical	Random	Tech Specs and Const. Drawings		SR	
7.3	**Fire proof doors**									
i		Source of supply	As agreed / required	A	Review of purchase order (unpriced copy) / drawings of suppliers / certificate of CBRI	For each source	Tech Specs and Const. Drawings		SR √	Procured from Approved parties as per relevant IS/Tech, The door drawing proposed for supply should have been tested and approved by CBRI Roorkee for the similar dimensions for minimum 2 hours fire rating.
ii		Receipt inspection	As agreed / required	A	Visual/ Physical/ Review of MTC	For each lot received at site	Tech Specs and Const. Drawings		SR √	
iii		Finishing and acceptance	As agreed / required	B	Visual / physical	Random	Tech Specs and Const. Drawings		SR	
7.4	**Rolling shutters**									
i		Surface finish and thickness of plate of approved make and DFT	As agreed / required	A	Physical / visual / review of MTC	Random for each lot of delivery	Tech Specs and Const. Drawings		SR √	
ii		Finishing and acceptance	As agreed / required	B	Physical and acceptance	Random	Tech Specs and Const. Drawings		SR	
7.5	**Steel windows / Grills/ Louvre**									
i		Material fabrication and fixtures	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each lot of delivery	IS: 1038 / IS:1361, IS: 7452 and Tech Specs and Const. Drawings		SR √	
ii		Finishing and acceptance	As agreed / required	B	Visual / physical	Random	IS: 1038 / IS:1361, IS: 7452 and Tech Specs and Const. Drawings		SR √	
7.6	**Glass and glazing**									
i	Clear float glass, wired glass, tinted glass, curtain glass, hermetically sealed glass	Material	As agreed / required	B	EIC Approved source and review of MTC/ test reports	For each lot received at site	IS: 14900, IS:1081, IS: 3548, IS:5437 Tech Specs and Const. Drawings		SR √	
ii		Installation finishing and acceptance	As agreed / required	B	Visual/ Physical	Random	Tech Specs and Const. Drawings		SR	Leak proof installation with neoprene gasket
7.7	**Curved dome on roof/ Poly Carbonate Sheet**									
i	Source of supply	Impact strength, K value, light transmission value with class -I fire rating	As agreed / required	A	EIC Approved source and review of MTC/ test reports	For each lot received at site	Tech Specs and Const. Drawings		SR √	
ii		Installation finishing and acceptance	As agreed / required	B	Visual / physical	Random	Tech Specs and Const. Drawings		SR	
7.8	**Reflective toughened glass**									
i		Material	As agreed / required	A	EIC Approved source and review of MTC/ test reports	For each lot received at site	Tech Specs and Const. Drawings		SR √	
ii		Installation finishing and acceptance	As agreed / required	B	Visual / physical	Random	Tech Specs and Const. Drawings		SR	
7.9	**False Ceiling**									
i		Materials (gypsum glass, glass fibre membrane, fibre board acoustical tiles etc)	As agreed / required	A	EIC Approved source and review of MTC/ test reports	For each lot received at site	Tech Specs and Const. Drawings		SR √	Compare MTC with technical specification and requirement
ii		Installation finishing and acceptance	As agreed / required	B	Visual / physical	Random	Tech Specs and Const. Drawings		SR	

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN									ANNEXURE- I
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :		1 0 Page 8 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
7.10	**WATER PROOFING**										
		Methodology for the application of water proofing system	As required	B	Review	for each type of treatment	Tech Specs and Const. Drawings		SR	√	
7.10.1	**General Requirement- Water Proofing**										
i	Polyurethene based coating, polyester scrim cloth, extruded HD dimpled polyurethene	Material	As agreed / required	A	EIC Approved source and review of MTC/ test reports	For each lot received at site	Tech Specs /Const. Drawings		SR	√	MTC shall contain all the parameters specified in the technical specifications
ii		Acceptance of water proofing work	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings				
7.10.2	**Roof / Basement Treatment**										
i	Graded under bed	Levels / slopes	As required	C	Physical	100%	Tech Specs and Const. Drawings				
ii	Elastomaric coatings	Material- Primer coat, finishing coat	As required	B	EIC Approved source and review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings		SR	√	
iii	Wearing course	Materials - PCC, chicken wire mesh, elastomeric sealant	As required	B	Review of MTC	Each lot of delivery	Tech Specs and Const. Drawings		SR	√	
iv		Acceptance of water proofing work	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings				
7.11	**Fencing and Gates**										
i	PVC coated chain link fencing (IS 2720), Welded wire mesh (IS 1566), Reinforced barbed tape galvanised (IS 2629) etc.	Materials	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications
ii	Structural steel, painting system, caster wheel, ball and bearing, fixtures and fasteners	Materials	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC	√	MTC shall contain all the parameters specified in the technical specifications
iii		Alignments, erection painting, DFT etc.	As agreed / required	B	Physical / measurements	Each installation	Tech Specs and Const. Drawings		SR		
iv		Acceptance of the installation and working	As agreed / required	B	Physical / measurements	Each installation	Tech Specs and Const. Drawings		SR		
7.12	**FLOOR FINISHES AND ALIED WORKS**										
7.12.1	**Cement Concrete Flooring**										
i		Glass/ PVC strips in joints	As agreed / required	B	Physical	Random in each shift	Tech Specs and Const. Drawings		SR		
ii		Finishing and acceptance	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings		SR		
7.12.2	**Tiles**										
i	**Ceramic, vitrified, glass mosaic, acid alkali resistant, heavy duty cement concrete tiles**	Materials	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings		SR	√	MTC shall contain all the parameters specified in the technical specifications
ii		Finishing and acceptance	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings		SR		
7.12.3	**Interlocking Blocks**										
i		Materials	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each lot of delivery	Tech Specs and Const. Drawings		SR	√	MTC shall contain all the parameters specified in the technical specifications
ii		Finishing and acceptance	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings		SR		
7.12.4	**Kota Stone, Granite and Marble**										
i		Quality, texture, thickness, colour for each lot of delivery from approved source	As agreed / required	B	Physical	Each batch of delivery	Tech Specs and Const. Drawings		SR	√	
ii		Finishing and acceptance	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings		SR		
7.12.5	**Metallic / non-metallic hardener**										
i		Material	As agreed / required	B	Physical	Each batch of delivery	Tech Specs and Const. Drawings		SR	√	

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN						ANNEXURE- I			
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :	1 0 Page 9 of 12		PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
ii		Finishing and acceptance	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings		SR		
7.12.6	**Acid / alkali and oil resistant high built seamless epoxy based resin and treatment**										
i	Material	Bricks, vitreous tiles, mortar, sealing, paints, coatings, sheets, fillers etc	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each batch of delivery	Tech Specs and Const. Drawings		SR	√	Experienced workers under supervisors recommended/ appointed by manufacturer to be deployed
ii		Surface preparation	As agreed / required	B	Physical	Random in each shift	Tech Specs and Const. Drawings, IS				
iii		Finishing and acceptance	As agreed / required	B	Physical	100%	Tech Specs and Const. Drawings		SR		
7.13	**Doors/Windows Sections**										
i	Material - Rolled Steel, Z Sections,T-iron frames sections, Plates etc.	Review of MTC/ make / Physical checks, tests (if MTC is not available)	As agreed / required	A	EIC Approved source and review of MTC/ test reports	For each batch of delivery	Tech Specs and Const. Drawings		SR	√	
ii		Acceptance of Steel Glazed doors and T-iron frames sections after fixing	As agreed / required	B	Physical and acceptance	Random for each installation	Tech Specs and Const. Drawings		SR		
8.0	**WATER SUPPLY / SANITORY INSTALLATIONS**										
8.1	**Water supply fittings and fixtures**										
i	Materials	GI/ MS pipes and fittings	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each lot of delivery as per Specifications	Tech Specs and Const. Drawings		SR	√	
ii	Disinfection	Before use	As agreed / required	B	Physical	Each installation	Tech Specs and Const. Drawings		SR		
iii	Hydraulic test	Before use / leakage	As agreed / required	A	Physical	Each installation	Tech specs and const drawings		SR	√	
iv		Acceptance and working	As agreed / required	B	Acceptance	Random	Tech Specs and Const. Drawings		SR		
8.2	**Sand cast iron / cast iron pipes**										
i	**Material**	SCI / CI pipes and fittings / joints	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each lot of delivery as per Specifications	Tech Specs and Const. Drawings		SR	√	
ii		Acceptance and leakage	As agreed / required	B	Physical	Random	Tech Specs and Const. Drawings		SR		
8.3	**Sanitary fittings and fixtures**										
i	**Material**	Sanitory items and fixtures i.e. water closets, urinals, wash basins, sinks, mirrors, shelves, towel rail, soap containers, geyser, water cooler, etc, water supply / sanitation pipes, manhole cover and frames etc	As agreed / required	B	EIC Approved source and review of MTC/ test reports	Each lot of delivery as per Specifications	Tech Specs and Const. Drawings		SR	√	
ii		Acceptance of installations of all sanitory items and fixtures	As agreed / required	B	Acceptance	100%	Tech Specs and Const. Drawings		SR		
8.4	**RCC Pipes**										
i	Material	RCC pipes	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each lot of delivery as per Specifications	Tech Specs and Const. Drawings /IS 458		SR	√	
ii		Acceptance and leakage	As agreed / required	B	Physical	Random	Tech Specs and Const. Drawings		SR		
8.5	**Water Storage Tanks**										
i	Material	Over head / loft type	As agreed / required	A	EIC Approved source and review of MTC/ test reports	Each lot of delivery as per Specifications	Tech Specs and Const. Drawings		SR	√	
ii		Aceptance and leakage	As agreed / required	B	Acceptance	Random	Tech Specs and Const. Drawings		SR		
9.0	**ROAD WORKS**										

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN						ANNEXURE- I			
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :		1 0 Page 10 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
9.1	**Construction of Sub-Grade and earthen/hard soulders**										
i		Standard proctor Test	As per IS: 2720	A	Physical	One in every 2000 cum for each type and source of fill materials	As per Tech Specs and Const. Drawings,Section 900 of MOSRTH specification, IS 2720 (Pt.VII)		SR/TR	√	In cutting or existing levelled ground - quantum of check shall be one per 1000 SQM
ii		Moisture content of fill before compaction	As per IS: 2720	B	Physical	One in every 2000 cum for each type and source of fill materials	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification, IS 2720 (Pt.II)		SR/TR		In cutting or existing levelled ground - quantum of check shall be one per 1000 SQM
iii		Dry density by core cutter method ---- OR---- Dry density in place by sand displacement method	As per IS: 2720	A	Physical	One in every 500 SQM area for each compacted layer.	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification, IS 2720 (Pt. XXIX)/ IS 2720 (Pt. XXVIII)		SR/TR	√	Both for embankment and cut formation quantum of check - One in every 1000 SQM area for each compacted layer.
iv		Lines, grade and cross section	As required / agreed	B	Physical	One in every 500 SQM area	As per Tech Specs and Const. Drawings		SR		Template, straight edge
9.2	**Water Bound Macadam (Non-Bituminous) for base course and sub-base course**										
i		Aggregate Impact value	Agrregate Impact value Test Apparatus	A	Physical	One test per 200 cum of Test aggregate	As perTech Specs and Const. Drawings, Section 900 of MOSRTH specification,		SR	√	
ii		Grading	Set of IS Sieves	B	Physical	One test per 100 cum of aggregate	As perTech Specs and Const. Drawings, Section 900 of MOSRTH specification,		SR		
iii		Flakiness index and elongation index	Flakiness test gauge	B	Physical	One test per 200cun of agregate	As perTech Specs and Const. Drawings, Section 900 of MOSRTH specification,		SR		
iv		Atterberg Limits of binding material	Atterberg limits determination	A	Physical	One test per 25 cum of binding material	As perTech Specs and Const. Drawings, Section 900 of MOSRTH specification,		SR	√	
v		Atterberg Limits of portion of agreggate passing 425 micron sieve	Atterberg limits determination	A	Physical	One test per 100cum of aggregate	As perTech Specs and Const. Drawings, Section 900 of MOSRTH specification,		SR	√	
vi		Camber, surface, slope	As required / agreed	B	Physical	One in every 500 SQM area	As per Tech Specs and Const. Drawings		SR		Template, straight edge
9.3	**Bituminous Macadam for base and binder course**										
i		Quality of binder	Penetrometre with St. needle	A	Physical	No. of samples per Lot & tests as per IS:73, IS:217, IS:8887 as applicable	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification, IS 73		SR	√	
ii		Aggregate Impact Value / Los angeles abrasion value	Aggregate Impact ValueTest apparatus	A	Physical	Once per source	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
iii		Flakiness Index and elongation index of aggregates	Flakiness test gauge	B	Physical	One test per 50 cum of aggregate	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
iv		Stripping value of aggregate (Immersion tray test)	As required / agreed	B	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
v		Water sensitivity of mix	As required / agreed	A	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
vi		Grading of aggregates	Set of Sieves	B	Physical	Two test per day per plant both on individual constituents and mixed aggregate from dryer	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
vii		Water absorption of aggregate	As required / agreed			Initially one set of 3 representative specimen per source, and on every change of source.	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
viii		Soundness (Magnesium and Sodium Sulphate)	As required as per IS:2386	A	Physical	Once per source by each method and on every change of source	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
ix		Percentage of fractured faces	As required / agreed	B	Physical	When gravel is used one test per 50cum of aggregates	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN									ANNEXURE- I
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :		1 0 Page 11 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
x		Binder content and aggregate grading	Bitumen extractor	A	Physical	Periodic, subject to a min of two tests per day per plant	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
xi		Control of Temperature of binder and aggregate for mixing and of the mix at the time of laying and rolling	Thermometer	B	Physical	At regular close intervals	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
xii		Rate of spread of mixed materials	As required / agreed	B	Physical	Regular control through checks of layer thickness	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
xiii		Density of compacted Layer	As required / agreed	A	Physical	One test per 250 sqm of area	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
9.4	Bituminous Surfacing - Open graded premix carpet and Seal coat										
i		Quality of binder	Penetrometre with St. needle	A	Physical	No. of samples per Lot & tests as per IS:73, IS:217, IS:8887 as	IS 73,Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
ii		Aggregate Impact Value / Los angeles abrasion value	Aggregate Impact ValueTest apparatus	A	Physical	One test per 50 cum of aggregate	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
iii		Flakiness Index and elongation indexof aggregates	Flakiness test gauge	B	Physical	One test per 50 cum of aggregate	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
iv		Stripping value of aggregate (Immersion tray test)	As required / agreed	B	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
v		Water absorption test		A	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
vi		Water sensitivity of mix	As required / agreed	A	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
vii		Grading of aggregates	Set of Sieves	B	Physical	One test per 25 cum of aggregates	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
viii		Soundness (Magnesium and Sodium Sulphate)	As required as per IS:2386	A	Physical	Once per source by each method and on every change of source	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
ix		Polished stone value	As required as per BS:812(Part 114)	B	Physical	As required	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
x		Temperature of binder at application	Thermometer	B	Physical	At regular close intervals	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
xi		Binder content	Bitumen extractor	A	Physical	One test per 500 cum& not less than two tests per day	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
xii		Rate of spread of materials	As required / agreed	B	Physical	One test per 500 cum and not less than 2 tests per day	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
xiii		Percentage of fractured faces	Bitumen extractor	A	Physical	When gravel is used one test per 50cum of aggregates	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
9.5	Tack Coat/ Prime coat/ fog coat										
i		Quality of binder	Penetrometre with Standard needle	A	Physical	No. of samples per Lot & tests as per IS:73, IS:217, IS:8887 as	IS 73,Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
ii		Temperature of binder at application	Thermometer	B	Physical	At regular close intervals	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN						ANNEXURE- I			
		ITEM : CIVIL WORK SUB-SYSTEM : GEOTECH INVI, FOUNDATIONS, EXCAVATION & FILL, SITE LEVELLING, CONCRETE, ROAD, BUILDING ETC.		QP NO. : REV. NO .: DATE : PAGE :		1 0 Page 12 of 12	PROJECT: PACKAGE: CONTRACT NO. MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
iii		Rate of spread of binder	As required / agreed	B	Physical	One test per 500 cum and not less than 2 tests per day	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
9.6	RCC Pavements	Concrete - Material, Mix design, Trial Mixes, Production, Transportation, Placement, Compaction, Curing, Test on green concrete, Test on hardened concrete etc.	As required / agreed	-	-	Refer FQP for concrete Works	Refer FQP for concrete Works, , Tech Specs and Const. Drawings, IRC & MOST		-	–	FQP for Concrete Works shall be application for all concrete works
9.7	Alignment, Level, Surface regularity and rectification										
i		Horizontal alignment, Surface levels and Surface regularity	As required / agreed	B	Physical	As per section 900 of MOSRTH specification	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR		
ii		Rectification	As required / agreed	B	Physical	Each rectification	As per Tech Specs and Const. Drawings, Section 900 of MOSRTH specification		SR	√	
		Legend to be used: Class # : A = Critical, B=Major, C=Minor; SR, TR, MTC, LB									
Manufacturer/ Sub-supplier	Main-supplier	Categorization Witnessing & Accepting (As per NTPC QA&I System) Category 'A' FQA Engineer in association with Executing Engineer, Category 'B' Executing Engineer, Category 'C' Executing Engineer ;SR = Site Register , TR= Test Report,MfrTC = Manufacturer's Test Certificate					For NTPC USE				
Signature		This document shall be read in conjunction with NTPC Tech. Specifications, BOQ, Drawings						REVIEWED BY	APPROVED BY		APPROVAL SEAL

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN					ANNEXURE II				
		ITEM : STRUCTURAL STEEL WORK		QP NO. :			PROJECT:				
				REV. NO .:		0	PACKAGE:				
		SUB-SYSTEM : FABRICATION & ERECTION		DATE :			CONTRACT NO.				
				PAGE :		1 of 4	MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class# of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
1.00	STRUCTURAL STEEL MATERIAL										
i	Issed by NTPC	Material- Visual Examination, Identification and marking for grade/ type of steel		B	Visual	Each plate/ Section	Tech Specs and Const. Drawings				MS steel conforming to IS 2062 and IS 8500 to be clearly demarcated by application of distinct coloured paint strips on each piece/ off-cuts of respective grades/ type of steel
ii	Procured by contractor	Structural steel procured from NTPC approved sources- Mechanical (YS, UTS, Elg, UT if specified),,and Chemical properties (CE as per IS)		A	Review	For each batch of each section delivered at site	Technical Specification and Construction Drawings, IS 2062, 8500		SR	√	Correlated MTC shall be verified. In the event of non submission of MTC , sample shall be selected by FQA for testing
1.01	PRE-WELDING REQUIREMENTS										
i		Welding Procedure Specification * (WPS*)	-	A	Review	Each Welding Process	Technical Specification and Construction Drawings, ASME-IX/ AWS D 1.1		WPS	√	*To be approved by CQA
ii		PQR and Welder's Qualification	-	A	Physical	Each welder	PQR/ WQR, AWS-D1.1/ASME-IX, Technical		Test Report	√	
iii		Welding consumables	-	B	Physical	Random in each shift	Approved WPS, Latest NTPC		SR	√	
1.02	FIT-UP										
i		Marking and Cutting	Tape, ruler etc	B	Visual & Measurement	Each plate/ Section	Technical Specification and Construction Drawings/ Approved cutting plan		SR		
ii		Match markings for trial assembled components	-	B	Physical	Each fit-up	Technical Specification and Construction Drawings		SR		
iii		Weld Fit Up- Edge Preparation/ Gap/ Alignment	Tape, ruler etc	B	Physical	Each fit-up	Technical Specification and Construction Drawings, IS 7215		SR	√	If required suitable stiffners shall be provided to prevent deflection.
1.03	PRE HEATING (wherever applicable)										
i		Pre-Heating Temperature	Thermal chalk	B	Measurement	Each pre-heating	Technical Specification and Construction Drawings, Approved WPS		SR	√	
ii		Post Weld Heat Treatment (PWHT), if required	Thermo couple with time temperature recorder	A	Time & Temperature	Each PWHT	Technical Specification and Construction Drawings, Approved WPS		SR	√	
1.04	WELDING REQUIREMENTS										
i		Sequence of welding	-	B	Physical	Random in each shift	Technical Specification and Construction Drawings, Agreed scheme		SR		
ii		Removal/ grinding of temporary attachments	-	B	Measurement	All cleats/ attachments	Technical Specification and Construction Drawings, Approved Drg.		SR		
iii		Completeness after welding- Dimensions/ distortion	Weld gauge	B	Visual	Each structure component	Technical Specification and Construction Drawings, IS 822		SR	√	
iv		Completeness of welding (each butt & fillet weld)		B	Visual	Each structure component	Technical Specification and Construction Drawings, Approved Drg.		SR	√	

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN								ANNEXURE II
		ITEM : STRUCTURAL STEEL WORK		QP NO. :			PROJECT:			
				REV. NO .:		0	PACKAGE:			
		SUB-SYSTEM : FABRICATION & ERECTION		DATE :			CONTRACT NO.			
				PAGE :		2 of 4	MAIN CONTRACTOR			
Sl. No	Activity and operation	Characteristics / instruments		Class# of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record	Remarks
1	2	3		4	5	6	7	8	9 D*	10
2.00	NON DESTRUCTIVE AND DESTRUCTIVE TESTING									
2.1	FILLET WELDS									
i		size and visual examination	As required/ agreed	B	Visual/ Measurement	100%	As per technical specifications and construction drawings, IS 822, AWS D 1.1		SR	As per requirement of NTPC Engineer
ii		Dye Penetration Test	As required/ agreed	B	Physical	25% weld length of tension member of crane girder and 5% of Weld length with min. 300mm at each loaction except crane girder to all other fillet welds	As per technical specifications and construction drawings, IS 822, AWS D 1.1		SR	
2.2	BUTT WELDS									
i		Visual examination	As required/ agreed	B	Visual	Random in each shift	As per technical specifications and construction drawings, IS 822, AWS D 1.1		SR	As per requirement of NTPC Engineer
ii		DPT	As required/ agreed	B	Physical	100% on all butt welds after back gouging on root run and 10% on final weld.	As per technical specifications and construction drawings, IS 822, AWS D 1.1		IR	All butt welds to be back gouged before DPT
iii		Mechanical testing on production test coupons	As required/ agreed	B	Physical	Min. one joint per built up beams, coloums and crane girder.	As per technical specifications and construction drawings, IS 822, AWS D 1.1		IR √	Test on production test coupons
iv		Radiography Test	As required/ agreed	A	Physical	100% radiography test on butt welds of tension flange (bottom flange) of crane girder. All other butt welds shall be subjected to 10% weld length of each welder.	As per technical specifications and construction drawings, IS 822, AWS D 1.1		IR √	Wherever RT is not feasible UT to be carried out. In case of failure of any welds in SPOT/RT or UT the % of retesting shall be doubled at that particular loaction. Acceptance criteria of NDT on welds shall be as per AWS D1.1.
2.4	FULL PENETRATION WELDS (OTHER THAN BUTT WELDS)									
		Ultrasonic Testing	As required/ agreed	A	Physical	i) 100% UT on the web to flange joint of crane girder ii) 10% UT on other full penetration joints	As per technical specifications and construction drawings, IS 822, AWS D 1.1		IR √	In case of failure of any welds in SPOT/RT or UT the % of retesting shall be doubled at that particular loaction. Acceptance criteria of NDT on welds shall be as per AWS D1.1.
3.00	FOUNDATION CHECKS									
i		Dimensions and levels- Shape, lines (including diagonal checks)	Theodolite, Tape etc	B	Physical/ Measurement	Each Foundation	Tech Specs and Const. Drawings		SR √	
ii		Foundation Bolts and Embedments- Verticality, Levels, pitch distance	Theodolite, Tape, Piano wires etc	B	Physical/ Measurement	Each Foundation	Tech Specs and Const. Drawings		SR √	
4.00	PAINTING SYSTEM									
i		Paining Materials and accessories	-	A	Review of MTC	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC √	Mfr.'s T.C. shall be correlated with the consignment received.

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN									ANNEXURE II
		ITEM : STRUCTURAL STEEL WORK		QP NO. :			PROJECT:				
				REV. NO .:		0	PACKAGE:				
		SUB-SYSTEM : FABRICATION & ERECTION		DATE :			CONTRACT NO.				
				PAGE :		3 of 4	MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class# of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
ii		Submission of painting methodology	-	B	For Review of painting system	Before start of painting work	Tech Specs and Const. Drawings				
iii		Surface prepration	As agreed / required	B	Physical /visual	Each Erection Mark	Tech Specs and Const. Drawings, Relevant code/ standards		SR	√	
iv		Primer Thickness	Elcometer	B	Measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR	√	
v		DFT of paint	Elcometer	B	Measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR	√	
vi		Acceptance of painted surfaces	Elcometer	B	Visual and measurement	Each Erection Mark	Tech Specs and Const. Drawings		SR		
5.00	PRE-ASSEMBLY CHECKS										
i		Punch Erection marks and match marks on members	-	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings				Markings for - Assembly designation, Part number, Weight, Any other important identifications.
ii		Pre-assembly as per match mark	-	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings				
iii		Camber, sweep and total length after trial assembly of structure.	Theodolite, Tape, plumb, piano wires etc	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings		SR	√	
iv		Control assembly check at shop	Theodolite, Tape, plumb, piano wires etc	B	Visual/ Physical	Every first and tenth set of identical structure	Tech Specs and Const. Drawings				
V		Completion of primer & intermediate coat of paint		B	Visual / Physical	Random	Tech Specs and Const. Drawings		SR		
6.00	ERECTION CHECKS										
i		Alignment, slopes, level, tolerances of erected member	Theodolite, Tape, plumb, piano wires etc	B	Measurement	Each structural member	Tech Specs and Const. Drawings		SR	√	
ii		Tightening of bolts/ Torque including foundation bolts with lock nuts	Wrench/ Torque wrench if specified	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings		SR	√	
iii		Completion of all erection fillet & butt welds		B	Visual	Each structural member	Tech Specs and Const. Drawings		SR	√	
iv		Acceptance of erected structure	Theodolite, Tape, plumb, piano wires etc	B	Visual/ Physical	Each erected structure	Tech Specs and Const. Drawings, IS 7215 and IS 12843		SR	√	
7.00	PERMANENT BOLTS AND NUTS AND WASHERS										
i		Material- Permanent mild steel Bolts, mild steel Nuts, High strength structural Bolts, Washers- Dimensions, properties, Class, storage along with MTC	Screw gauge, Vernier, Tape etc.	A	Physical and MTC Review	Once for each lot of delivery	Tech Specs and Const. Drawings		SR/MTC	√	
ii		Contact surfaces before bolting	-	B	Physical	Random before asembly for	Tech Specs and Const. Drawings, IS 4000		SR		
iii		Inspection of the assembled bolts	-	B	Physical	Randomly in each shift for assembeled bolts	Tech Specs and Const. Drawings, IS 4000		SR		
iv		Tensioning	As agreed / required	B	Physical	Randomly during snug tight test and after full tensinoning	Tech Specs and Const. Drawings, IS 4000		SR	√	
v		Acceptance of installed bolts	-	B	Physical	Each bolt	Tech Specs and Const. Drawings		SR		
8.00	ELECTROFORGED GRATINGS										
i		Material from approved source	As agreed / required	A	Physical and MTC Review	Once for each lot of delivery	Tech Specs and Const. Drawings		SR/MTC	√	Also refer the approved MQP

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN					ANNEXURE II			
		ITEM : STRUCTURAL STEEL WORK		QP NO. :			PROJECT:			
				REV. NO .:		0	PACKAGE:			
		SUB-SYSTEM : FABRICATION & ERECTION		DATE :			CONTRACT NO.			
				PAGE :		4 of 4	MAIN CONTRACTOR			

Sl. No	Activity and operation	Characteristics / instruments		Class # of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record	D*	Remar
1	2	3		4	5	6	7	8	9		10
ii		Acceptance of Erection, alignment and each installation	As agreed / required	B	Physical	100	Tech Specs and Const. Drawings		SR		
9.00	GALVANISED STEEL HAND RAILS										
i		Material		A	Physical	Once per lot	Grade IS:2062,		SR/LB	√	Galvanising shall be carried out as per the technical specifications
ii		DPT	As required	A	Physical	Random	AWS D1.1 / Technical specifications		SR/LB	√	
		LEGEND: D * Records, indentified with "Tick" (√) shall be essentially included						DOC. NO.: CS - Project Code - XXX-XX-QVC-G-002			
		Legend to be used: Class # : A = Critical, B=Major, C=Minor; SR, TR, MTC,									
Manufacturer/ Sub supplier	Main-supplier	Categorization Witnessing & Accepting (As per owner QA&I System) Category 'A' FQA Engineer in association with Executing Engineer, Category 'B' Executing Engineer, Category 'C' Executing Engineer ;SR = Site Register , TR= Test Report,MfrTC = Manufacturer's Test Certificate					For NTPC use				
Si		This document shall be read in conjunction with owner Tech. Specifications, BOQ, Drawings						REVIEWED BY	APPROVED BY		APPROVAL SEAL