

LIDAR / DGPS Survey Report for Forest Diversion of
Proposed OFC Cable routes in Korea Division with Route
Length 141.080 Km. under (CG) SKY Project

APPLICATION SUBMITTED BY:

Jio Digital Fibre Private Ltd.



LIDAR / DGPS SURVEY AND GIS MAPPING DONE BY:

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1 Introduction and Background

1.1 Background

The Chhattisgarh Infotech Promotion Society (CHiPS) has selected an implementation partner (i.e. Jio Digital Fibre Private Ltd.) for Sanchar Kranti Yojna (CG-SKY) project. The Government has taken a leap forward to design the Sanchar Kranti Yojna (CG-SKY) for providing a solution to improve the telecom connectivity in the state of Chhattisgarh by incentivizing the telecom operators to install Cell-Sites. In order to create commercial viability for Telecom operators to invest in the network infrastructure the Government is distributing approx. 50 lakh Smartphones. The primary objective is to ensure the mobile network connectivity is extended to all villages in state of Chhattisgarh with a population of 1000 or above as per the 2011 census and to further strengthen network coverage in all towns and villages, which already have coverage by either erecting new telecom towers or upgradation of existing towers. Based on preliminary assessment, besides the urban areas, approximately 14,000 villages will come under network connectivity and approximately 50,80,000 Smartphones will be distributed under the CG-SKY scheme. The scheme would cover all villages and towns in the State of Chhattisgarh, except those villages having less than 1,000 population and not having connectivity. It may be noted that villages with less than 1,000 population, but having connectivity shall be considered for the CG-SKY.

1.2 Proposed Routes

Following image (Fig-1) shows the proposed routes in Korea Division

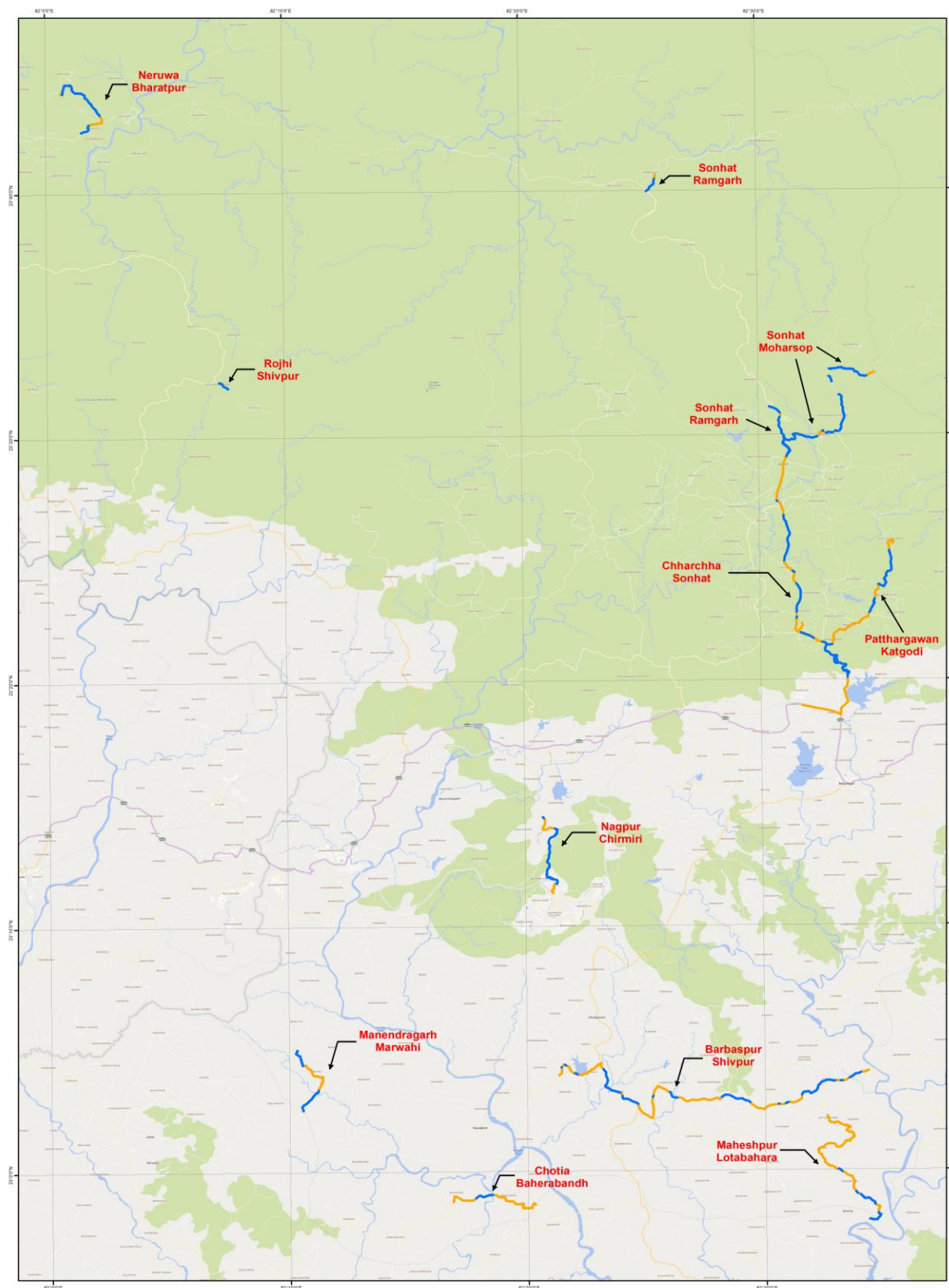


Fig-1: OFC Cable Proposed Routes on Online Map in Korea Division.

1.3 Work Location

The proposed OFC Cable route in Korea Forest Division Tehsils covered along the route is: Sonhat & Khadgawan District: Korea the Division length is approx. 141.080 km. The survey site passes through forest ranges – Sonhat, Sonhat (P), Devgarh, Katmodi, Baikunthpur, Khadgawan & Kotadol of Korea forest division. The OFC Cable route is covered under Survey of India Toposheets 64J5, 64J9, 64I2, 64I4, 64I6, 64I8, 64I10, 64I11 & 64I12 on RF 1:50000.

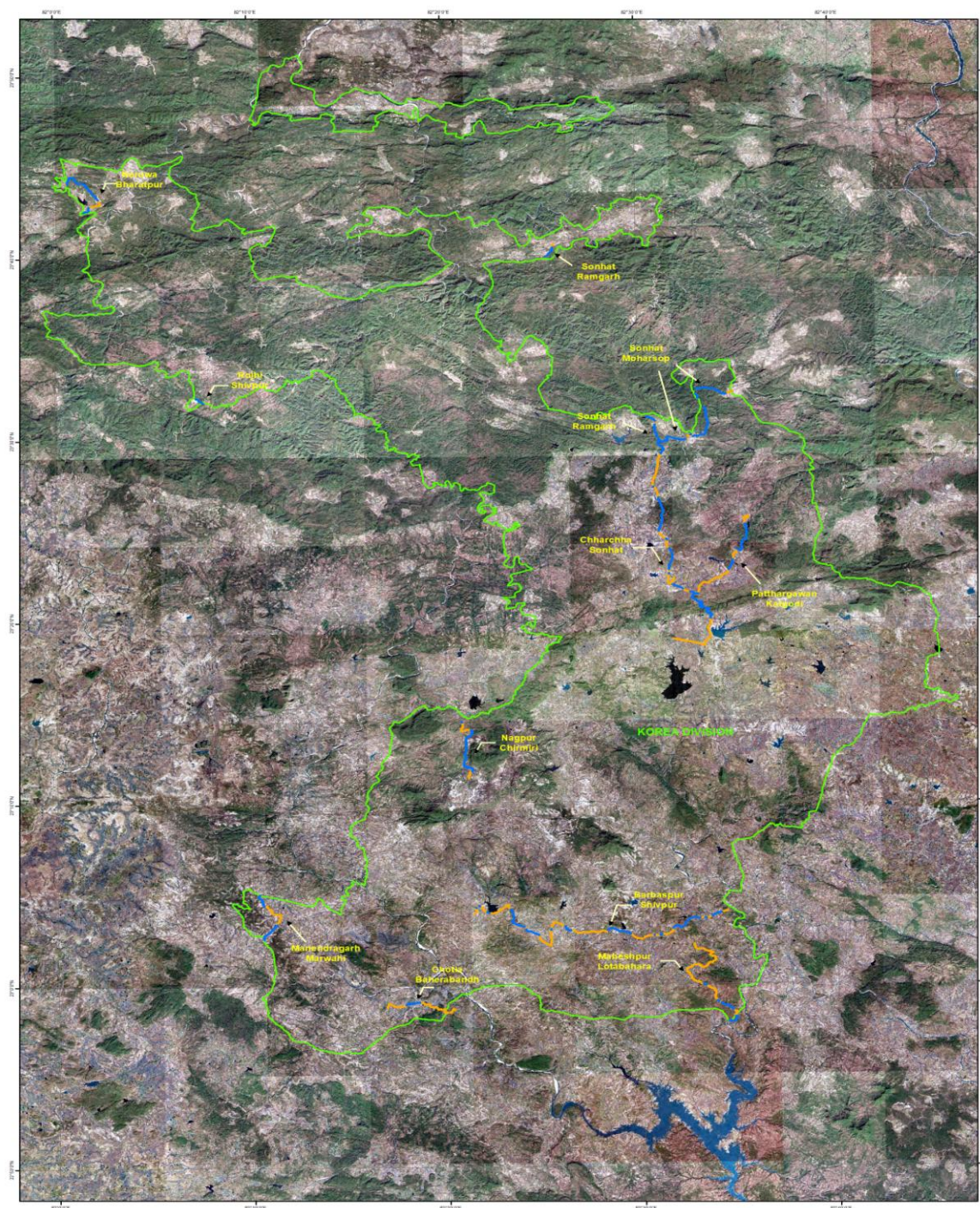


Fig-2: OFC Cable Proposed Routes on Satellite Imagery in Korea Division.

1.4 Objective

As per directives of Ministry of Environment & Forests (MoEF) dated 8th July 2011; all applications for Forest Diversion, under Forest Conservation Act, 1980 must be accompanied with Geo-referenced shape file, showing the boundary of the proposed area (both soft copy and hard copy maps), prepared using Differential GPS (DGPS) and the same should be uploaded to MoEF website along with the online application.

2 cope of Work

1. Establishment of one base station with 72 Hours observation and secondary control points at every 10km along the proposed route.
2. DGPS Survey for collection of ground coordinates along the OFC Cable trench at every 50m interval and/or at every turn/bend along the proposed trench. The DGPS data is collected at forest patches only.
3. Data processing and Interpretation
 - a. Geo-referencing of SOI Toposheet (1:50000), Forest Stock map (1:15000, if available) and satellite imagery
 - b. Creation of OFC Cable trench boundary vector map using the DGPS Surveyed data
 - c. Superimposition of cable route layer on Geo-referenced forest maps, SOI Toposheet and Satellite imagery.
 - d. Computation of Forest area proposed for diversion. It includes Reserved/Protected Forest & Revenue Forest.
 - e. Preparation of Geo-referenced forest map at 1:15000 scale, and SOI Toposheet at 1:50000 scale.
 - f. Preparation of DGPS survey report along with soft copy of maps in shape file format and kml file
4. Printing of report and Geo-referenced maps and Technical compliance.

3 Deliverables

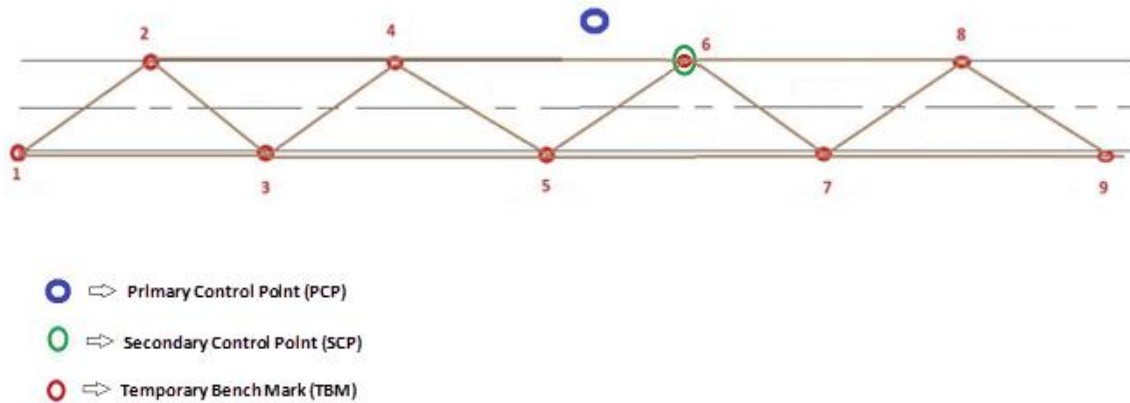
The deliverables envisaged for the assignment are described below

1. Post processed DGPS observations data as well as raw data in RINEX format.
2. DGPS Reports - Base line & network adjustment report for the primary and Secondary Control Points.
3. Geo-referenced SOI maps & forest block maps based on DGPS observations – Hard and Soft Copy (SHP and KML formats).
4. Proposed Forest Diversion area statement as per DGPS Survey.
5. DGPS Survey and mapping report.

4 Technical Approach (Brief Description)

4.1 GCP Establishment for LIDAR (DGPS) Survey:

Example of defined Triangular Network GCP method.



Primary Control Point: 72 Hours of DGPS observation for Post Processing the PCP data with IGS stations.

Secondary Control Point: 2 - 4 Hours of DGPS observation for Post Processing the SCP data with PCP Data.

Temporary Bench Mark: 1 Hour of DGPS observation for improving the spatial accuracy of the LIDAR point cloud data.

4.2 Mobile LIDAR (DGPS) data collection:

DGPS based Mobile LIDAR data was collected along with 360 degree panoramic view of the OFC route corridor (25 meter on each side along the center of the road).



Mobile LiDAR Van

4.3 DRS / GIS Map Creation Using LIDAR data:

All the features along the route are captured using LIDAR data and Panoramic Imagery to create the DRS / GIS Map.



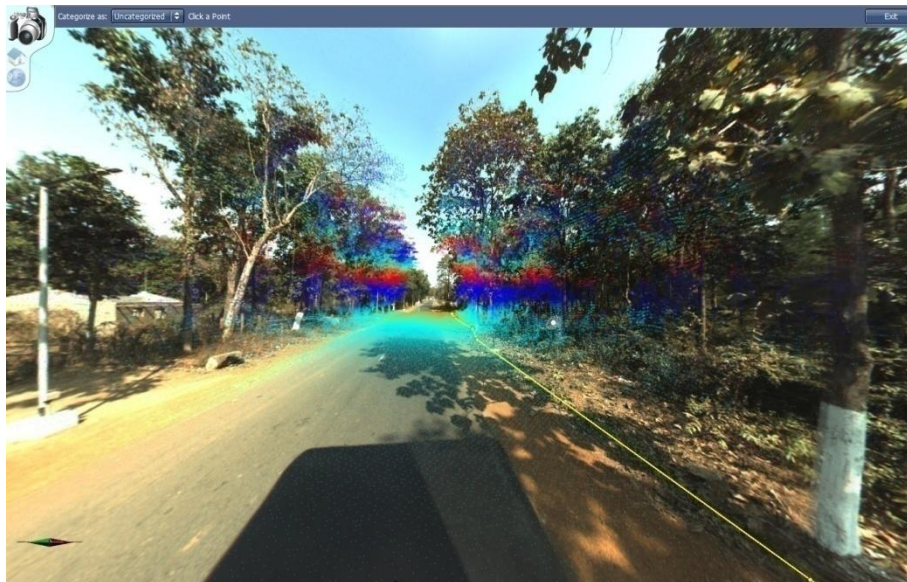
Feature Extraction on LIDAR



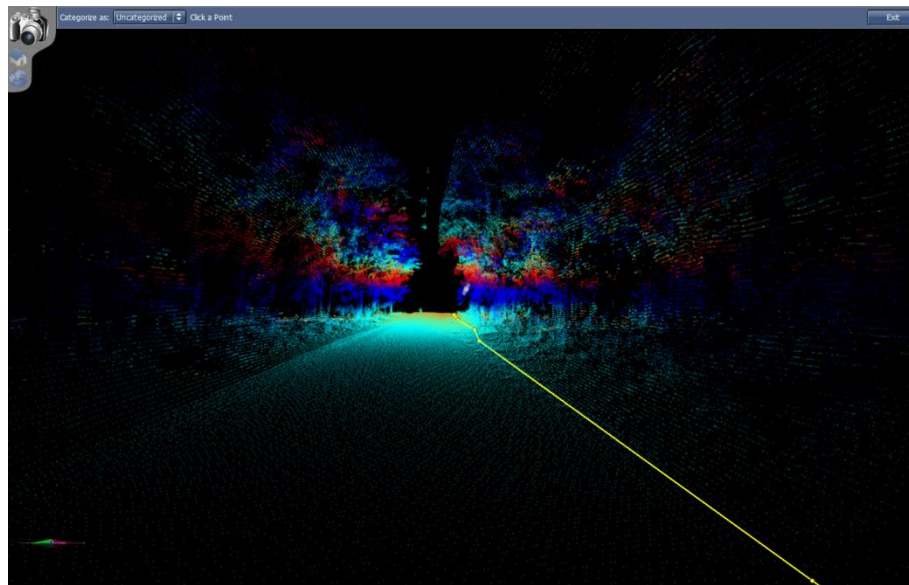
Final DRS / GIS Map

4.4 Demarcation of Proposed OFC on LIDAR data:

Proposed OFC line is demarcated based on the feasibility of trenching to be done on ground by referring the LIDAR data with the Panoramic imagery.



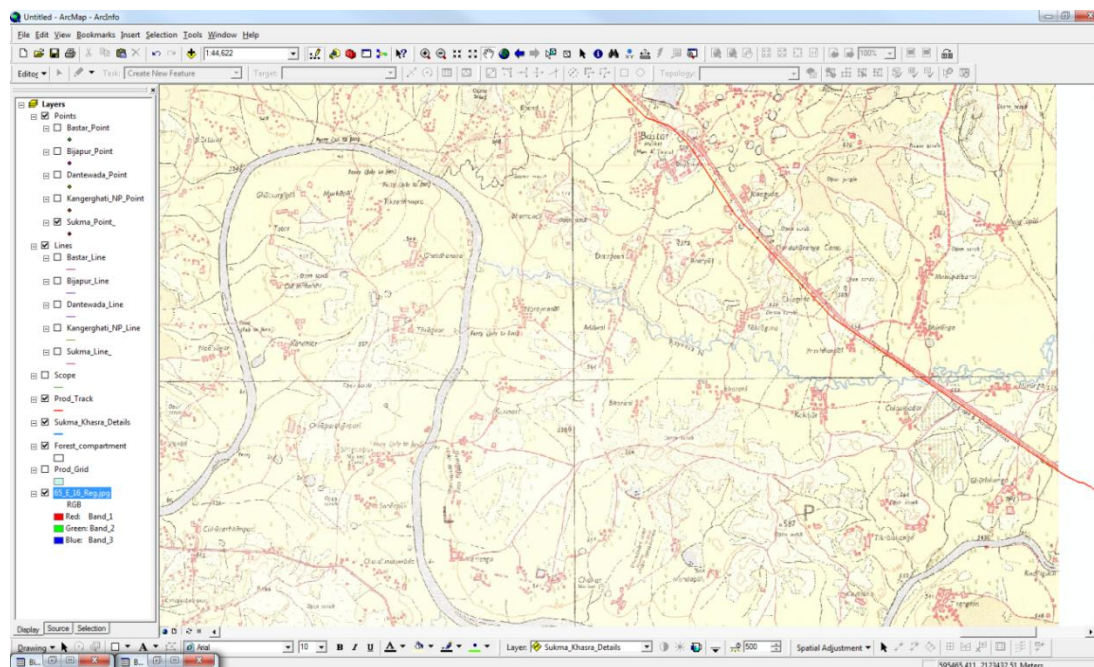
Proposed OFC Line on LIDAR Data (with Panoramic Imagery)



Proposed OFC Line on LIDAR Data only

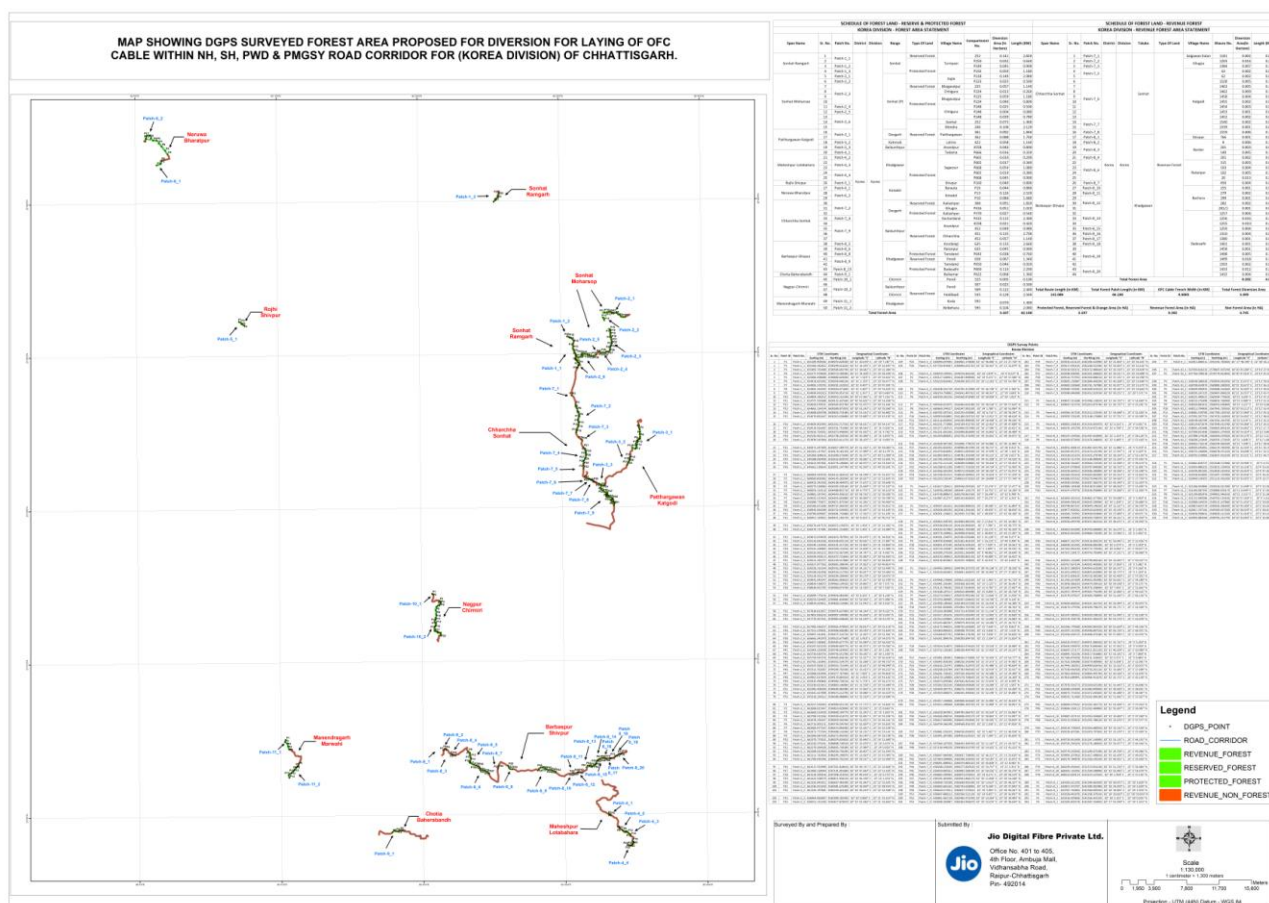
4.5 Geo-referencing of Maps:

Geo-referencing of Revenue Village Maps, SOI Toposheets and Forest Maps are to be done. SOI Toposheets and Forest Maps would be geo-referenced based on the coordinates provided on the maps whereas Revenue Village Maps would be geo-referenced with the help of GCPs collected (at least 5 GCPs for a village having Government Forest Land are to be collected)



4.6 Creation of Vector Data for Forest Diversion:

Different Layers such as Polygon of Reserved/Protected Forest Patch, Centerline of Forest Trench, Non-Forest Trench line, Polygons showing Revenue Forest patches etc. are to be created using the Geo-referenced maps and the provided information by the forest department.



4.7 Generation of Map and Survey Reports for Forest Diversion:

A map is created by overlaying the created vector data for the forest patches on the Geo-referenced SOI Toposheets / Forest Maps. The reports are generated for DGPS Points (with Lat/long) placed at the regular intervals of 150m on the proposed OFC route in the forest area. Another report is generated having area calculation for the proposed trench area in different type of Forest Lands. Samples of these are as below.

Geo-referenced Map showing forest patches and survey points.

SCHEDULE OF FOREST LAND - RESERVE & PROTECTED FOREST										SCHEDULE OF FOREST LAND - REVENUE FOREST										
KOREA DIVISION - FOREST AREA STATEMENT										KOREA DIVISION - REVENUE FOREST AREA STATEMENT										
Span Name	Sc. No.	Patch No.	Division	Range	Type of Land	Village Name	Compartment No.	Observed Area (Sq. Meters)	Length (M)	Span Name	Sc. No.	Patch No.	Division	Taluk	Type of Land	Village Name	Whara No.	Observed Area (Sq. Meters)	Length (M)	
Sorath-Rangpur	1	Patch-1.1			Reserved Forest	Tumkur	2201	0.12	2.250	Chitradurga-Sorath	1	Patch-1.1				Reserved Forest	Chitradurga	1201	0.12	2.250
	2	Patch-1.2			Protected Forest	Chitradurga	2202	0.12	2.250		2	Patch-1.2				Protected Forest	Chitradurga	1202	0.12	2.250
	3	Patch-1.3			Reserved Forest	Chitradurga	2203	0.12	2.250		3	Patch-1.3				Reserved Forest	Chitradurga	1203	0.12	2.250
	4	Patch-1.4			Protected Forest	Chitradurga	2204	0.12	2.250		4	Patch-1.4				Protected Forest	Chitradurga	1204	0.12	2.250
	5	Patch-1.5			Reserved Forest	Chitradurga	2205	0.12	2.250		5	Patch-1.5				Reserved Forest	Chitradurga	1205	0.12	2.250
Sorath-Mulapeta	6	Patch-1.6			Protected Forest	Chitradurga	2206	0.12	2.250	Chitradurga-Sorath	6	Patch-1.6				Protected Forest	Chitradurga	1206	0.12	2.250
	7	Patch-1.7			Reserved Forest	Chitradurga	2207	0.12	2.250		7	Patch-1.7				Reserved Forest	Chitradurga	1207	0.12	2.250
	8	Patch-1.8			Protected Forest	Chitradurga	2208	0.12	2.250		8	Patch-1.8				Protected Forest	Chitradurga	1208	0.12	2.250
	9	Patch-1.9			Reserved Forest	Chitradurga	2209	0.12	2.250		9	Patch-1.9				Reserved Forest	Chitradurga	1209	0.12	2.250
	10	Patch-1.10			Protected Forest	Chitradurga	2210	0.12	2.250		10	Patch-1.10				Protected Forest	Chitradurga	1210	0.12	2.250
Pathargawan-Kargali	11	Patch-1.11			Reserved Forest	Pathargawan	2211	0.12	2.250	Chitradurga-Sorath	11	Patch-1.11				Reserved Forest	Chitradurga	1211	0.12	2.250
	12	Patch-1.12			Protected Forest	Chitradurga	2212	0.12	2.250		12	Patch-1.12				Protected Forest	Chitradurga	1212	0.12	2.250
	13	Patch-1.13			Reserved Forest	Chitradurga	2213	0.12	2.250		13	Patch-1.13				Reserved Forest	Chitradurga	1213	0.12	2.250
	14	Patch-1.14			Protected Forest	Chitradurga	2214	0.12	2.250		14	Patch-1.14				Protected Forest	Chitradurga	1214	0.12	2.250
	15	Patch-1.15			Reserved Forest	Chitradurga	2215	0.12	2.250		15	Patch-1.15				Reserved Forest	Chitradurga	1215	0.12	2.250
Maheshpur-Lakshabara	16	Patch-1.16			Protected Forest	Chitradurga	2216	0.12	2.250	Chitradurga-Sorath	16	Patch-1.16				Protected Forest	Chitradurga	1216	0.12	2.250
	17	Patch-1.17			Reserved Forest	Chitradurga	2217	0.12	2.250		17	Patch-1.17				Reserved Forest	Chitradurga	1217	0.12	2.250
	18	Patch-1.18			Protected Forest	Chitradurga	2218	0.12	2.250		18	Patch-1.18				Protected Forest	Chitradurga	1218	0.12	2.250
	19	Patch-1.19			Reserved Forest	Chitradurga	2219	0.12	2.250		19	Patch-1.19				Reserved Forest	Chitradurga	1219	0.12	2.250
	20	Patch-1.20			Protected Forest	Chitradurga	2220	0.12	2.250		20	Patch-1.20				Protected Forest	Chitradurga	1220	0.12	2.250
Narayan-Khatoli	21	Patch-1.21			Reserved Forest	Khatoli	2221	0.12	2.250	Chitradurga-Sorath	21	Patch-1.21				Reserved Forest	Chitradurga	1221	0.12	2.250
	22	Patch-1.22			Protected Forest	Chitradurga	2222	0.12	2.250		22	Patch-1.22				Protected Forest	Chitradurga	1222	0.12	2.250
	23	Patch-1.23			Reserved Forest	Chitradurga	2223	0.12	2.250		23	Patch-1.23				Reserved Forest	Chitradurga	1223	0.12	2.250
	24	Patch-1.24			Protected Forest	Chitradurga	2224	0.12	2.250		24	Patch-1.24				Protected Forest	Chitradurga	1224	0.12	2.250
	25	Patch-1.25			Reserved Forest	Chitradurga	2225	0.12	2.250		25	Patch-1.25				Reserved Forest	Chitradurga	1225	0.12	2.250
Chitradurga-Sorath	26	Patch-1.26			Protected Forest	Chitradurga	2226	0.12	2.250	Chitradurga-Sorath	26	Patch-1.26				Protected Forest	Chitradurga	1226	0.12	2.250
	27	Patch-1.27			Reserved Forest	Chitradurga	2227	0.12	2.250		27	Patch-1.27				Reserved Forest	Chitradurga	1227	0.12	2.250
	28	Patch-1.28			Protected Forest	Chitradurga	2228	0.12	2.250		28	Patch-1.28				Protected Forest	Chitradurga	1228	0.12	2.250
	29	Patch-1.29			Reserved Forest	Chitradurga	2229	0.12	2.250		29	Patch-1.29				Reserved Forest	Chitradurga	1229	0.12	2.250
	30	Patch-1.30			Protected Forest	Chitradurga	2230	0.12	2.250		30	Patch-1.30				Protected Forest	Chitradurga	1230	0.12	2.250
Bhatnagar-Dhargu	31	Patch-1.31			Reserved Forest	Dhargu	2231	0.12	2.250	Chitradurga-Sorath	31	Patch-1.31				Reserved Forest	Chitradurga	1231	0.12	2.250
	32	Patch-1.32			Protected Forest	Chitradurga	2232	0.12	2.250		32	Patch-1.32				Protected Forest	Chitradurga	1232	0.12	2.250
	33	Patch-1.33			Reserved Forest	Chitradurga	2233	0.12	2.250		33	Patch-1.33				Reserved Forest	Chitradurga	1233	0.12	2.250
	34	Patch-1.34			Protected Forest	Chitradurga	2234	0.12	2.250		34	Patch-1.34				Protected Forest	Chitradurga	1234	0.12	2.250
	35	Patch-1.35			Reserved Forest	Chitradurga	2235	0.12	2.250		35	Patch-1.35				Reserved Forest	Chitradurga	1235	0.12	2.250
Bhatnagar-Dhargu	36	Patch-1.36			Protected Forest	Chitradurga	2236	0.12	2.250	Chitradurga-Sorath	36	Patch-1.36				Protected Forest	Chitradurga	1236	0.12	2.250
	37	Patch-1.37			Reserved Forest	Chitradurga	2237	0.12	2.250		37	Patch-1.37				Reserved Forest	Chitradurga	1237	0.12	2.250
	38	Patch-1.38			Protected Forest	Chitradurga	2238	0.12	2.250		38	Patch-1.38				Protected Forest	Chitradurga	1238	0.12	2.250
	39	Patch-1.39			Reserved Forest	Chitradurga	2239	0.12	2.250		39	Patch-1.39				Reserved Forest	Chitradurga	1239	0.12	2.250
	40	Patch-1.40			Protected Forest	Chitradurga	2240	0.12	2.250		40	Patch-1.40				Protected Forest	Chitradurga	1240	0.12	2.250
Chitradurga-Sorath	41	Patch-1.41			Reserved Forest	Chitradurga	2241	0.12	2.250	Chitradurga-Sorath	41	Patch-1.41				Reserved Forest	Chitradurga	1241	0.12	2.250
	42	Patch-1.42			Protected Forest	Chitradurga	2242	0.12	2.250		42	Patch-1.42				Protected Forest	Chitradurga	1242	0.12	2.250
	43	Patch-1.43			Reserved Forest	Chitradurga	2243	0.12	2.250		43	Patch-1.43				Reserved Forest	Chitradurga	1243	0.12	2.250
	44	Patch-1.44			Protected Forest	Chitradurga	2244	0.12	2.250		44	Patch-1.44				Protected Forest	Chitradurga	1244	0.12	2.250
	45	Patch-1.45			Reserved Forest	Chitradurga	2245	0.12	2.250		45	Patch-1.45				Reserved Forest	Chitradurga	1245	0.12	2.250
Bhatnagar-Dhargu	46	Patch-1.46			Protected Forest	Chitradurga	2246	0.12	2.250	Chitradurga-Sorath	46	Patch-1.46				Protected Forest	Chitradurga	1246	0.12	2.250
	47	Patch-1.47			Reserved Forest	Chitradurga	2247	0.12	2.250		47	Patch-1.47				Reserved Forest	Chitradurga	1247	0.12	2.250
	48	Patch-1.48			Protected Forest	Chitradurga	2248	0.12	2.250		48	Patch-1.48				Protected Forest	Chitradurga	1248	0.12	2.250
	49	Patch-1.49			Reserved Forest	Chitradurga	2249	0.12	2.250		49	Patch-1.49				Reserved Forest	Chitradurga	1249	0.12	2.250
	50	Patch-1.50			Protected Forest	Chitradurga	2250	0.12	2.250		50	Patch-1.50				Protected Forest	Chitradurga	1250	0.12	2.250
Chitradurga-Sorath	51	Patch-1.51			Reserved Forest	Chitradurga	2251	0.12	2.250	Chitradurga-Sorath	51	Patch-1.51				Reserved Forest	Chitradurga	1251	0.12	2.250
	52	Patch-1.52			Protected Forest	Chitradurga	2252	0.12	2.250		52	Patch-1.52				Protected Forest	Chitradurga	1252	0.12	2.250
	53	Patch-1.53			Reserved Forest	Chitradurga	2253	0.12	2.250		53	Patch-1.53				Reserved Forest	Chitradurga	1253	0.12	2.250
	54	Patch-1.54			Protected Forest	Chitradurga	2254	0.12	2.250		54	Patch-1.54				Protected Forest	Chitradurga	1254	0.12	2.250
	55	Patch-1.55			Reserved Forest	Chitradurga	2255	0.12	2.250		55	Patch-1.55				Reserved Forest	Chitradurga	1255	0.12	2.250
Bhatnagar-Dhargu	56	Patch-1.56			Protected Forest	Chitradurga	2256	0.12	2.250	Chitradurga-Sorath	56	Patch-1.56				Protected Forest	Chitradurga	1256	0.12	2.250
	57	Patch-1.57			Reserved Forest	Chitradurga	2257	0.12	2.250		57	Patch-1.57				Reserved Forest	Chitradurga	1257	0.12	2.250
	58	Patch-1.58			Protected Forest	Chitradurga	2258	0.12	2.250		58	Patch-1.58				Protected Forest	Chitradurga	1258	0.12	2.250
	59	Patch-1.59			Reserved Forest	Chitradurga	2259	0.12	2.250		59	Patch-1.59				Reserved Forest	Chitradurga	1259	0.12	2.250
	60	Patch-1.60			Protected Forest	Chitradurga	2260	0.12	2.250		60	Patch-1.60				Protected Forest	Chitradurga	1260	0.12	2.250
Bhatnagar-Dhargu	61	Patch-1.61			Reserved Forest	Chitradurga	2261	0.12	2.250	Chitradurga-Sorath	61	Patch-1.61				Reserved Forest	Chitradurga	1261	0.12	2.250
	62	Patch-1.62			Protected Forest	Chitradurga	2262	0.12	2.250		62	Patch-1.62				Protected Forest	Chitradurga	1262	0.12	2.250
	63	Patch-1.63			Reserved Forest	Chitradurga	2263	0.12	2.250		63	Patch-1.63				Reserved Forest	Chitradurga	1263	0.12	2.250
	64	Patch-1.64			Protected Forest	Chitradurga	2264	0.12	2.250		64	Patch-1.64				Protected Forest	Chitradurga	1264	0.12	2.250
	65	Patch-1.65			Reserved Forest	Chitradurga	2265	0.12	2.250		65	Patch-1.65				Reserved Forest	Chitradurga	1265	0.12	2.250
Chitradurga-Sorath	66	Patch-1.66			Protected Forest	Chitradurga	2266	0.12	2.250	Chitradurga-Sorath	66	Patch-1.66				Protected Forest	Chitradurga	1266	0.12	2.250
	67	Patch-1.67			Reserved Forest	Chitradurga	2267	0.12	2.250		67	Patch-1.67				Reserved Forest	Chitradurga	1267	0.12	2.250
	68	Patch-1.68			Protected Forest	Chitradurga	2268	0.12	2.250		68	Patch-1.68				Protected Forest	Chitradurga	1268	0.12	2.250
	69	Patch-1.69			Reserved Forest	Chitradurga	2269	0.12	2.250		69	Patch-1.69				Reserved Forest	Chitradurga	1269	0.12	2.250
	70	Patch-1.70			Protected Forest	Chitradurga	2270	0.12	2.250		70	Patch-1.70				Protected Forest	Chitradurga	1270	0.12	2.250
Bhatnagar-Dhargu	71	Patch-1.71			Reserved Forest	Chitradurga	2271	0.12	2.250	Chitradurga-Sorath	71	Patch-1.71				Reserved Forest	Chitradurga	1271	0.12	2.250
	72	Patch-1.72			Protected Forest	Chitradurga	2272	0.12	2.250		72	Patch-1.72				Protected Forest	Chitradurga	1272	0.12	2.250
	73	Patch-1.73			Reserved Forest	Chitradurga	2273	0.12	2.250		73	Patch-1.73				Reserved Forest	Chitradurga	1273	0.12	2.250
	74	Patch-1.74			Protected Forest	Chitradurga	2274	0.12	2.250		74	Patch-1.74				Protected Forest	Chitradurga	1274	0.12	2.250
	75	Patch-1.75			Reserved Forest	Chitradurga	2275	0.12	2.250		75	Patch-1.75				Reserved Forest	Chitradurga	1275	0.12	2.250
Chitradurga-Sorath	76	Patch-1.76			Protected Forest	Chitradurga	22													

5 DGPS Survey Results

The total route length is approx. 141.080 km and the proposed forest area for diversion is 3.309 Ha. Forest Area Statement Report is in Annexure-1, and DGPS coordinates and forest patch boundary coordinates is in Annexure-2. The geo-referenced maps are in Annexure -3, and DGPS Maps of the Proposed Route (Annexure-4)

5.1 Forest Area Statement (Annexure-1):

SCHEDULE OF FOREST LAND - RESERVE & PROTECTED FOREST										
KOREA DIVISION - FOREST AREA STATEMENT										
Span Name	Sr. No.	Patch No.	District	Division	Range	Type Of Land	Village Name	Compar tment	Diversion Area (In Hectare)	Length (KM)
Sonhat-Ramgarh	1	Patch-1_1	Korea	Korea	Sonhat	Reserved Forest	Turripani	252	0.141	2.820
	2					Protected Forest		P250	0.032	0.640
	3	Patch-1_2						P249	0.045	0.900
	4	Patch-1_3						P192	0.059	1.180
Sonhat-Moharsop	5	Patch-2_1			Sonhat (P)	Protected Forest	Jogia	P218	0.149	2.980
	6	Patch-2_2						P223	0.025	0.500
	7	Patch-2_3				Reserved Forest	Bhagwatpur	235	0.057	1.140
	8					Protected Forest	Chhigura	P224	0.013	0.260
	9						Bhagwatpur	P225	0.059	1.180
	10							P224	0.040	0.800
	11	Patch-2_4				Protected Forest	Chhigura	P248	0.025	0.500
	12	Patch-2_5						P248	0.004	0.080
	13	Patch-2_6						P248	0.039	0.780
	14					Reserved Forest	Sonhat	252	0.073	1.460
	15						Mendra	246	0.106	2.120
Patthargawa n-Katgodi	16	Patch-3_1			Devgar h	Reserved Forest	Patthargawa n	361	0.092	1.840
	17				362			0.088	1.760	
	18	Patch-3_2			Katmo di		Latma	422	0.058	1.160
	19	Patch-3_3			Baikun thpur		Anandpur	455B	0.040	0.800
Maheshpur-Lotabahara	20	Patch-4_1			Khadg awan	Protected Forest	Tedama	P666	0.016	0.320
	21	Patch-4_2					Sagarpur	P665	0.010	0.200

SCHEDULE OF FOREST LAND - RESERVE & PROTECTED FOREST											
KOREA DIVISION - FOREST AREA STATEMENT											
Span Name	Sr. No.	Patch No.	District	Division	Range	Type Of Land	Village Name	Compar tment	Diversion Area (In Hectare)	Length (KM)	
Maheshpur-Lotabahara	22	Patch-4_3	Korea	Korea	Khadgawan	Protected Forest	Sagarpur	P665	0.017	0.340	
	23							P668	0.054	1.080	
	24	Patch-4_4						P665	0.019	0.380	
	25							P668	0.045	0.900	
Rojhi-Shivpur	26	Patch-5_1			Kotadol		Shivpur	P160	0.040	0.800	
Neruwa-Bharatpur	27	Patch-6_1					Barauta	P16	0.044	0.880	
	28	Patch-6_2					Kotadol	P13	0.126	2.520	
	29							P10	0.084	1.680	
Chharchha-Sonhat	30	Patch-7_2			Devgarh	Reserved Forest	Kailashpur	368	0.091	1.820	
	31					Protected Forest	Ghugra	P416	0.051	1.020	
	32						Kailashpur	P370	0.027	0.540	
	33	Patch-7_4				Kachardand	P415	0.115	2.300		
	34	Patch-7_9			Baikunthpur	Reserved Forest	Anandpur	455B	0.021	0.420	
	35						452	0.049	0.980		
	36						Chharchha	451	0.135	2.700	
	37						452	0.057	1.140		
Barbaspur-Shivpur	38	Patch-8_5			Khadgawan		Protected Forest	Kondangi	635	0.133	2.660
	39	Patch-8_6						Ratanpur	635	0.045	0.900
	40	Patch-8_8				Tamdand		P643	0.038	0.760	
	41	Patch-8_9				Reserved Forest	Pondi	658	0.067	1.340	
	42					Protected Forest	Tamdand	P650	0.046	0.920	
	43	Patch-8_13					Badesalhi	P660	0.110	2.200	
Chotia-Baherabandh	44	Patch-9_1				Belkamar	P622	0.068	1.360		
Nagpur-Chirmiri	45	Patch-10_1			Chirmiri	Reserved Forest	Pondi	525	0.005	0.100	
	46	Patch-10_2			Baikunthpur		Pendi	507	0.025	0.500	
	47							509	0.122	2.440	
	48				Chirmiri		Haldibadi	535	0.128	2.560	

SCHEDULE OF FOREST LAND - RESERVE & PROTECTED FOREST										
KOREA DIVISION - FOREST AREA STATEMENT										
Span Name	Sr. No.	Patch No.	District	Division	Range	Type Of Land	Village Name	Compar tment	Diversion Area (In Hectare)	Length (KM)
Manendragarh-Marwahi	49	Patch-11_1	Korea	Korea	Khadgawan	Reserved Forest	Koda	592	0.070	1.400
	50	Patch-11_2					Belbehara	595	0.104	2.080
Total Forest Area									3.107	62.140

SCHEDULE OF FOREST LAND - REVENUE FOREST											
KOREA DIVISION - REVENUE FOREST AREA STATEMENT											
Span Name	Sr. No.	Patch No.	District	Division	Taluka	Type Of Land	Village Name	Khasra No.	Diversion Area(In Hectare)	Length (KM)	
Chharchha-Sonhat	1	Patch-7_1	Korea	Korea	Sonhat	Revenue Forest	Salgawan Kalan	1181	0.002	0.040	
	2	Patch-7_2					Ghugra	1203	0.014	0.280	
	3	Patch-7_3						1384	0.007	0.140	
	4	Patch-7_5					Katgodi	63	0.002	0.040	
	5							62	0.002	0.040	
	6	1528						0.005	0.100		
	7	1463						0.005	0.100		
	8	1462						0.009	0.180		
	9	1458						0.004	0.080		
	10	1455						0.002	0.040		
	11	1454						0.003	0.060		
	12	1453						0.001	0.020		
	13	1452						0.002	0.040		
	14	Patch-7_7						1540	0.002	0.040	
	15							1539	0.001	0.020	
	16	Patch-7_8						1559	0.006	0.120	
Barbaspur-Shivpur	17	Patch-8_1			Khadgawan			Shivpur	766	0.001	0.020
	18	Patch-8_2						Bardar	8	0.006	0.120
	19	Patch-8_3							201	0.003	0.060

SCHEDULE OF FOREST LAND - REVENUE FOREST										
KOREA DIVISION - REVENUE FOREST AREA STATEMENT										
Span Name	Sr. No.	Patch No.	District	Division	Taluka	Type Of Land	Village Name	Khasra No.	Diversion Area(In Hectare)	Length (KM)
Barbaspur-Shivpur	20	Patch-8_3	Korea	Korea	Khadgawan	Revenue Forest	Bardar	140	0.005	0.100
	21	Patch-8_4						201	0.002	0.040
	22	Patch-8_6					Ratanpur	315	0.003	0.060
	23							103	0.004	0.080
	24							102	0.005	0.100
	25							20	0.013	0.260
	26	Patch-8_7						450	0.004	0.080
	27	Patch-8_10					Bachara	255	0.001	0.020
	28	Patch-8_11						279	0.002	0.040
	29	Patch-8_12						299	0.001	0.020
	30							282	0.002	0.040
	31							281/1	0.001	0.020
	32	Patch-8_14					Badesalhi	1257	0.004	0.080
	33							1256	0.016	0.320
	34							1255	0.010	0.200
	35	Patch-8_15						1259	0.004	0.080
	36	Patch-8_16						1310	0.004	0.080
	37	Patch-8_17						1380	0.001	0.020
	38	Patch-8_18						1401	0.001	0.020
	39	Patch-8_19						1458	0.001	0.020
	40							1498	0.005	0.100
	41							1499	0.018	0.360
	42							1503	0.002	0.040
	43	Patch-8_20						1433	0.012	0.240
	44							1432	0.004	0.080
Total Forest Area									0.202	4.040

Total Route Length (in KM)	Total Forest Patch Length (in KM)	OFC Cable Trench Width (in KM)	Total Forest Diversion Area
141.080	66.180	0.0005	3.309
Protected Forest, Reserved Forest & Orange Area (in HA)	Revenue Forest Area (in HA)		Non Forest Area (in HA)
3.107	0.202		3.745

5.2 DGPS Surveyed coordinates of Forest Patches (Annexure-2):

DGPS Survey Points						
Korea Division						
Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
1	P1	Patch-1_1	655184.409582	2598070.620500	82° 31' 10.678" E	23° 29' 7.287" N
2	P2	Patch-1_1	655284.582822	2598299.614420	82° 31' 14.293" E	23° 29' 14.697" N
3	P3	Patch-1_1	655405.765480	2598506.602790	82° 31' 18.642" E	23° 29' 21.384" N
4	P4	Patch-1_1	655277.478699	2598719.509300	82° 31' 14.200" E	23° 29' 28.349" N
5	P5	Patch-1_1	655086.498088	2598880.628300	82° 31' 7.529" E	23° 29' 33.652" N
6	P6	Patch-1_1	654919.825092	2599058.046230	82° 31' 1.720" E	23° 29' 39.477" N
7	P7	Patch-1_1	654993.578705	2599291.532010	82° 31' 4.407" E	23° 29' 47.041" N
8	P8	Patch-1_1	654965.354992	2599494.071600	82° 31' 3.487" E	23° 29' 53.635" N
9	P9	Patch-1_1	654930.491923	2599703.953710	82° 31' 2.337" E	23° 30' 0.469" N
10	P10	Patch-1_1	654804.180252	2599910.152340	82° 30' 57.961" E	23° 30' 7.216" N
11	P11	Patch-1_1	654757.559488	2600132.447440	82° 30' 56.401" E	23° 30' 14.458" N
12	P12	Patch-1_1	654629.678531	2600345.915700	82° 30' 51.972" E	23° 30' 21.441" N
13	P13	Patch-1_1	654663.154104	2600589.875920	82° 30' 53.243" E	23° 30' 29.360" N
14	P14	Patch-1_1	654608.828708	2600820.719180	82° 30' 51.414" E	23° 30' 36.882" N
15	P15	Patch-1_1	654676.862447	2601015.628480	82° 30' 53.885" E	23° 30' 43.195" N
16	P16	Patch-1_2	654693.901945	2601352.717550	82° 30' 54.611" E	23° 30' 54.147" N
17	P17	Patch-1_2	654519.924487	2601531.753380	82° 30' 48.544" E	23° 31' 0.026" N
18	P18	Patch-1_2	654316.754952	2601673.440640	82° 30' 41.435" E	23° 31' 4.702" N
19	P19	Patch-1_2	654135.462122	2601738.250530	82° 30' 35.068" E	23° 31' 6.870" N
20	P20	Patch-1_2	653939.545904	2601823.011170	82° 30' 28.193" E	23° 31' 9.693" N
21	P21	Patch-1_3	645071.347909	2618017.509770	82° 25' 21.235" E	23° 39' 59.083" N
22	P22	Patch-1_3	645261.117947	2618176.181150	82° 25' 27.989" E	23° 40' 4.179" N
23	P23	Patch-1_3	645383.308616	2618390.272640	82° 25' 32.377" E	23° 40' 11.099" N
24	P24	Patch-1_3	645588.839409	2618532.059370	82° 25' 39.681" E	23° 40' 15.641" N
25	P25	Patch-1_3	645622.967601	2618776.106840	82° 25' 40.972" E	23° 40' 23.564" N
26	P26	Patch-1_3	645661.538634	2618951.147790	82° 25' 42.395" E	23° 40' 29.241" N
27	P1	Patch-2_1	660903.929550	2604142.464510	82° 34' 34.598" E	23° 32' 22.657" N

DGPS Survey Points						
Korea Division						
Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
28	P2	Patch-2_1	660660.803982	2604145.283500	82° 34' 26.027" E	23° 32' 22.835" N
29	P3	Patch-2_1	660423.245350	2604198.404970	82° 34' 17.672" E	23° 32' 24.646" N
30	P4	Patch-2_1	660273.528084	2604395.528140	82° 34' 12.469" E	23° 32' 31.107" N
31	P5	Patch-2_1	660054.133118	2604488.852710	82° 34' 4.770" E	23° 32' 34.219" N
32	P6	Patch-2_1	659881.187342	2604643.426510	82° 33' 58.732" E	23° 32' 39.305" N
33	P7	Patch-2_1	659632.513503	2604655.603080	82° 33' 49.969" E	23° 32' 39.789" N
34	P8	Patch-2_1	659388.770657	2604671.875540	82° 33' 41.381" E	23° 32' 40.404" N
35	P9	Patch-2_1	659166.671366	2604737.365410	82° 33' 33.576" E	23° 32' 42.612" N
36	P10	Patch-2_1	658943.064589	2604752.556920	82° 33' 25.697" E	23° 32' 43.185" N
37	P11	Patch-2_1	658706.005687	2604691.716480	82° 33' 17.316" E	23° 32' 41.291" N
38	P12	Patch-2_1	658457.124815	2604671.183710	82° 33' 8.533" E	23° 32' 40.711" N
39	P13	Patch-2_2	658276.447570	2604072.135870	82° 33' 1.934" E	23° 32' 21.302" N
40	P14	Patch-2_2	658379.717981	2603851.215600	82° 33' 5.491" E	23° 32' 14.084" N
41	P15	Patch-2_3	659072.870639	2602653.787950	82° 33' 29.470" E	23° 31' 34.916" N
42	P16	Patch-2_3	659116.643266	2602438.035110	82° 33' 30.931" E	23° 31' 27.887" N
43	P17	Patch-2_3	659144.116950	2602191.517120	82° 33' 31.805" E	23° 31' 19.864" N
44	P18	Patch-2_3	659141.100883	2601949.131910	82° 33' 31.606" E	23° 31' 11.986" N
45	P19	Patch-2_3	659232.691222	2601719.567240	82° 33' 34.747" E	23° 31' 4.492" N
46	P20	Patch-2_3	659244.928113	2601472.731840	82° 33' 35.083" E	23° 30' 56.464" N
47	P21	Patch-2_3	659312.182727	2601239.517880	82° 33' 37.365" E	23° 30' 48.859" N
48	P22	Patch-2_3	659327.877592	2600992.208540	82° 33' 37.823" E	23° 30' 40.814" N
49	P23	Patch-2_3	659228.155354	2600763.298960	82° 33' 34.221" E	23° 30' 33.409" N
50	P24	Patch-2_3	659128.416296	2600534.117350	82° 33' 30.617" E	23° 30' 25.994" N
51	P25	Patch-2_3	659118.591279	2600290.299940	82° 33' 30.178" E	23° 30' 18.072" N
52	P26	Patch-2_3	659041.043247	2600062.958810	82° 33' 27.357" E	23° 30' 10.709" N
53	P27	Patch-2_3	658829.538072	2599964.139330	82° 33' 19.865" E	23° 30' 7.571" N
54	P28	Patch-2_3	658649.852785	2599960.074790	82° 33' 13.530" E	23° 30' 7.503" N
55	P29	Patch-2_4	658499.779156	2599858.084490	82° 33' 8.201" E	23° 30' 4.240" N
56	P30	Patch-2_4	658254.524405	2599881.834940	82° 32' 59.566" E	23° 30' 5.098" N
57	P31	Patch-2_4	658024.654811	2599828.110380	82° 32' 51.443" E	23° 30' 3.432" N
58	P32	Patch-2_5	657818.812857	2599976.637600	82° 32' 44.244" E	23° 30' 8.332" N
59	P33	Patch-2_5	657801.836233	2600007.549480	82° 32' 43.658" E	23° 30' 9.343" N
60	P34	Patch-2_5	657770.367531	2599983.438440	82° 32' 42.539" E	23° 30' 8.570" N
61	P35	Patch-2_6	657385.436257	2599565.479050	82° 32' 28.813" E	23° 29' 55.118" N
62	P36	Patch-2_6	657151.378441	2599486.836380	82° 32' 20.534" E	23° 29' 52.644" N

DGPS Survey Points

Korea Division

Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
63	P37	Patch-2_6	656907.241831	2599475.516720	82° 32' 11.925" E	23° 29' 52.361" N
64	P38	Patch-2_6	656665.342970	2599525.677680	82° 32' 3.418" E	23° 29' 54.075" N
65	P39	Patch-2_6	656427.160601	2599595.677770	82° 31' 55.049" E	23° 29' 56.433" N
66	P40	Patch-2_6	656197.025250	2599690.093770	82° 31' 46.973" E	23° 29' 59.582" N
67	P41	Patch-2_6	655964.229058	2599746.654950	82° 31' 38.789" E	23° 30' 1.501" N
68	P42	Patch-2_6	655720.018755	2599745.551780	82° 31' 30.181" E	23° 30' 1.550" N
69	P43	Patch-2_6	655759.925376	2599585.030130	82° 31' 31.527" E	23° 29' 56.318" N
70	P44	Patch-2_6	655781.132842	2599352.534170	82° 31' 32.188" E	23° 29' 48.753" N
71	P45	Patch-2_6	655537.928172	2599355.715540	82° 31' 23.617" E	23° 29' 48.940" N
72	P46	Patch-2_6	655311.762007	2599269.702340	82° 31' 15.613" E	23° 29' 46.222" N
73	P47	Patch-2_6	655068.819946	2599377.767460	82° 31' 7.091" E	23° 29' 49.818" N
74	P48	Patch-2_6	654967.027834	2599170.065010	82° 31' 3.426" E	23° 29' 43.102" N
75	P49	Patch-2_6	655035.990866	2598960.758310	82° 31' 5.778" E	23° 29' 36.274" N
76	P50	Patch-2_6	655230.021813	2598803.146900	82° 31' 12.558" E	23° 29' 31.084" N
77	P51	Patch-2_6	655385.408289	2598609.982480	82° 31' 17.963" E	23° 29' 24.751" N
78	P52	Patch-2_6	655441.427898	2598474.212790	82° 31' 19.886" E	23° 29' 20.319" N
79	P53	Patch-2_6	655319.236312	2598308.988800	82° 31' 15.518" E	23° 29' 14.990" N
80	P1	Patch-3_1	662557.592063	2590999.651720	82° 35' 27.772" E	23° 25' 14.845" N
81	P2	Patch-3_1	662608.815947	2590810.029900	82° 35' 29.502" E	23° 25' 8.663" N
82	P3	Patch-3_1	662660.553439	2590600.194770	82° 35' 31.243" E	23° 25' 1.823" N
83	P4	Patch-3_1	662708.522266	2590339.614570	82° 35' 32.831" E	23° 24' 53.336" N
84	P5	Patch-3_1	662678.130267	2590059.502340	82° 35' 31.652" E	23° 24' 44.241" N
85	P6	Patch-3_1	662715.001151	2589734.245760	82° 35' 32.824" E	23° 24' 33.655" N
86	P7	Patch-3_1	662683.977547	2589474.994300	82° 35' 31.631" E	23° 24' 25.239" N
87	P8	Patch-3_1	662471.772564	2589408.116340	82° 35' 24.131" E	23° 24' 23.141" N
88	P9	Patch-3_1	662360.087330	2589272.042420	82° 35' 20.144" E	23° 24' 18.758" N
89	P10	Patch-3_1	662370.779101	2589079.035810	82° 35' 20.446" E	23° 24' 12.480" N
90	P11	Patch-3_1	662220.379241	2588898.749520	82° 35' 15.079" E	23° 24' 6.674" N
91	P12	Patch-3_1	662279.564028	2588695.730180	82° 35' 17.084" E	23° 24' 0.053" N
92	P13	Patch-3_1	662268.922464	2588430.756290	82° 35' 16.607" E	23° 23' 51.444" N
93	P14	Patch-3_1	662111.742664	2588295.190970	82° 35' 11.019" E	23° 23' 47.093" N
94	P15	Patch-3_1	661784.095396	2588443.765530	82° 34' 59.537" E	23° 23' 52.040" N
95	P16	Patch-3_2	661517.333989	2587351.818610	82° 34' 49.721" E	23° 23' 16.640" N
96	P17	Patch-3_2	661460.128044	2587191.091680	82° 34' 47.644" E	23° 23' 11.435" N
97	P18	Patch-3_2	661519.399169	2587048.314250	82° 34' 49.676" E	23° 23' 6.773" N
98	P19	Patch-3_2	661422.508579	2586871.928110	82° 34' 46.196" E	23° 23' 1.074" N
99	P20	Patch-3_2	661332.045912	2586697.483390	82° 34' 42.943" E	23° 22' 55.435" N
100	P21	Patch-3_2	661236.451018	2586481.676300	82° 34' 39.494" E	23° 22' 48.454" N

DGPS Survey Points						
Korea Division						
Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
101	P22	Patch-3_2	661150.787881	2586330.424160	82° 34' 36.419" E	23° 22' 43.568" N
102	P23	Patch-3_3	658464.065897	2583900.182430	82° 33' 0.890" E	23° 21' 25.514" N
103	P24	Patch-3_3	658251.131260	2583877.870070	82° 32' 53.384" E	23° 21' 24.863" N
104	P25	Patch-3_3	658040.647095	2583963.179600	82° 32' 46.006" E	23° 21' 27.710" N
105	P26	Patch-3_3	657764.919467	2584094.641710	82° 32' 36.347" E	23° 21' 32.079" N
106	P1	Patch-4_1	658970.194455	2544376.865330	82° 33' 3.879" E	23° 0' 0.527" N
107	P2	Patch-4_1	659127.540941	2544287.898900	82° 33' 9.371" E	22° 59' 57.580" N
108	P3	Patch-4_1	659210.816442	2544200.365170	82° 33' 12.263" E	22° 59' 54.706" N
109	P4	Patch-4_2	660208.591718	2542705.317890	82° 33' 46.740" E	22° 59' 5.760" N
110	P5	Patch-4_2	660254.750082	2542641.487310	82° 33' 48.337" E	22° 59' 3.669" N
111	P6	Patch-4_2	660330.262316	2542560.873080	82° 33' 50.958" E	22° 59' 1.022" N
112	P7	Patch-4_3	660546.615975	2542464.641580	82° 33' 58.518" E	22° 58' 57.819" N
113	P8	Patch-4_3	660669.244327	2542347.992330	82° 34' 2.780" E	22° 58' 53.984" N
114	P9	Patch-4_3	660782.507541	2542235.659080	82° 34' 6.714" E	22° 58' 50.293" N
115	P10	Patch-4_3	660959.818803	2542186.029710	82° 34' 12.921" E	22° 58' 48.618" N
116	P11	Patch-4_3	661116.692850	2542209.488500	82° 34' 18.438" E	22° 58' 49.326" N
117	P12	Patch-4_3	661231.771908	2542139.412750	82° 34' 22.452" E	22° 58' 47.008" N
118	P13	Patch-4_3	661377.163515	2542006.027480	82° 34' 27.506" E	22° 58' 42.621" N
119	P14	Patch-4_3	661531.601166	2541908.863890	82° 34' 32.892" E	22° 58' 39.408" N
120	P15	Patch-4_3	661594.883041	2541745.371040	82° 34' 35.052" E	22° 58' 34.072" N
121	P16	Patch-4_4	661828.407199	2541096.774670	82° 34' 43.006" E	22° 58' 12.905" N
122	P17	Patch-4_4	661935.833592	2540990.467390	82° 34' 46.737" E	22° 58' 9.412" N
123	P18	Patch-4_4	661970.816092	2540921.063940	82° 34' 47.939" E	22° 58' 7.143" N
124	P19	Patch-4_4	661892.049151	2540782.192300	82° 34' 45.121" E	22° 58' 2.657" N
125	P20	Patch-4_4	661785.345559	2540684.554980	82° 34' 41.338" E	22° 57' 59.520" N
126	P21	Patch-4_4	661732.111118	2540589.628860	82° 34' 39.434" E	22° 57' 56.453" N
127	P22	Patch-4_4	661598.411199	2540572.723350	82° 34' 34.734" E	22° 57' 55.950" N
128	P23	Patch-4_4	661466.501344	2540572.035600	82° 34' 30.103" E	22° 57' 55.973" N
129	P24	Patch-4_4	661338.451312	2540616.949810	82° 34' 25.624" E	22° 57' 57.478" N
130	P25	Patch-4_4	661203.520145	2540623.671820	82° 34' 20.890" E	22° 57' 57.744" N
131	P1	Patch-5_1	614417.102611	2603546.055920	82° 7' 15.276" E	23° 32' 17.477" N
132	P2	Patch-5_1	614658.240268	2603447.134170	82° 7' 23.752" E	23° 32' 14.199" N
133	P3	Patch-5_1	614738.888673	2603278.867260	82° 7' 26.549" E	23° 32' 8.708" N
134	P4	Patch-5_1	614987.412757	2603143.840620	82° 7' 35.275" E	23° 32' 4.255" N

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Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
135	P1	Patch-6_1	604507.261222	2622369.808520	82° 1' 30.580" E	23° 42' 31.894" N
136	P2	Patch-6_1	605028.405294	2622581.356160	82° 1' 49.035" E	23° 42' 38.650" N
137	P3	Patch-6_1	605051.154022	2622935.712780	82° 1' 49.929" E	23° 42' 50.166" N
138	P4	Patch-6_2	605835.430769	2623683.882340	82° 2' 17.815" E	23° 43' 14.305" N
139	P5	Patch-6_2	605548.030110	2624126.866630	82° 2' 7.780" E	23° 43' 28.775" N
140	P6	Patch-6_2	605102.417083	2624632.783380	82° 1' 52.173" E	23° 43' 45.329" N
141	P7	Patch-6_2	604779.249963	2624998.876630	82° 1' 40.854" E	23° 43' 57.307" N
142	P8	Patch-6_2	604501.234975	2625365.032680	82° 1' 31.128" E	23° 44' 9.277" N
143	P9	Patch-6_2	604078.918460	2625365.461420	82° 1' 16.213" E	23° 44' 9.390" N
144	P10	Patch-6_2	603831.073149	2625676.544320	82° 1' 7.539" E	23° 44' 19.561" N
145	P11	Patch-6_2	603720.150487	2625982.527080	82° 1' 3.699" E	23° 44' 29.535" N
146	P12	Patch-6_2	603300.274258	2625952.266490	82° 0' 48.862" E	23° 44' 28.649" N
147	P13	Patch-6_2	603193.189652	2625590.801150	82° 0' 44.989" E	23° 44' 16.922" N
148	P14	Patch-6_2	603136.853962	2625255.768830	82° 0' 42.915" E	23° 44' 6.042" N
149	P1	Patch-7_1	654495.100433	2594709.327370	82° 30' 45.138" E	23° 27' 18.258" N
150	P2	Patch-7_1	654518.662062	2594691.260670	82° 30' 45.962" E	23° 27' 17.663" N
151	P3	Patch-7_2	654968.178968	2593621.023160	82° 31' 1.403" E	23° 26' 42.719" N
152	P4	Patch-7_2	654991.242495	2593368.181390	82° 31' 2.122" E	23° 26' 34.491" N
153	P5	Patch-7_2	655125.799102	2593157.824030	82° 31' 6.785" E	23° 26' 27.607" N
154	P6	Patch-7_2	655188.197517	2592915.800980	82° 31' 8.893" E	23° 26' 19.718" N
155	P7	Patch-7_2	655274.536917	2592676.991580	82° 31' 11.846" E	23° 26' 11.926" N
156	P8	Patch-7_2	655359.389985	2592437.638420	82° 31' 14.746" E	23° 26' 4.116" N
157	P9	Patch-7_2	655409.198369	2592194.027500	82° 31' 16.410" E	23° 25' 56.180" N
158	P10	Patch-7_2	655301.856068	2591964.735700	82° 31' 12.544" E	23° 25' 48.763" N
159	P11	Patch-7_2	655264.385888	2591723.425090	82° 31' 11.134" E	23° 25' 40.932" N
160	P12	Patch-7_2	655317.201676	2591475.025440	82° 31' 12.902" E	23° 25' 32.839" N
161	P13	Patch-7_2	655313.659865	2591224.104190	82° 31' 12.684" E	23° 25' 24.683" N
162	P14	Patch-7_2	655245.882367	2590979.365530	82° 31' 10.206" E	23° 25' 16.751" N
163	P15	Patch-7_2	655175.446915	2590735.629690	82° 31' 7.634" E	23° 25' 8.852" N
164	P16	Patch-7_2	655064.896452	2590508.797240	82° 31' 3.656" E	23° 25' 1.516" N
165	P17	Patch-7_2	655048.837762	2590364.174290	82° 31' 3.036" E	23° 24' 56.820" N
166	P18	Patch-7_2	655031.084576	2590209.994730	82° 31' 2.354" E	23° 24' 51.814" N
167	P19	Patch-7_3	655634.314875	2589424.974420	82° 31' 23.310" E	23° 24' 26.089" N
168	P20	Patch-7_3	655752.159183	2589338.494740	82° 31' 27.429" E	23° 24' 23.237" N
169	P21	Patch-7_4	655901.285901	2588464.572800	82° 31' 32.356" E	23° 23' 54.777" N

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Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
170	P22	Patch-7_4	656045.950109	2588256.542040	82° 31' 37.373" E	23° 23' 47.965" N
171	P23	Patch-7_4	656165.153747	2588032.312470	82° 31' 41.488" E	23° 23' 40.634" N
172	P24	Patch-7_4	656208.433789	2587783.969160	82° 31' 42.919" E	23° 23' 32.547" N
173	P25	Patch-7_4	656201.720165	2587530.196240	82° 31' 42.588" E	23° 23' 24.300" N
174	P26	Patch-7_4	656170.120809	2587279.758630	82° 31' 41.382" E	23° 23' 16.169" N
175	P27	Patch-7_4	656073.059380	2587045.843540	82° 31' 37.876" E	23° 23' 8.599" N
176	P28	Patch-7_4	655942.562310	2586828.093600	82° 31' 33.200" E	23° 23' 1.565" N
177	P29	Patch-7_4	655920.387741	2586575.732820	82° 31' 32.325" E	23° 22' 53.369" N
178	P30	Patch-7_4	655919.000075	2586345.490040	82° 31' 32.190" E	23° 22' 45.885" N
179	P31	Patch-7_5	655917.146068	2585968.561660	82° 31' 31.985" E	23° 22' 33.633" N
180	P32	Patch-7_5	655915.298968	2585886.349750	82° 31' 31.889" E	23° 22' 30.961" N
181	P33	Patch-7_6	656228.967001	2584785.966710	82° 31' 42.524" E	23° 21' 55.083" N
182	P34	Patch-7_6	656466.696516	2584696.633170	82° 31' 50.862" E	23° 21' 52.097" N
183	P35	Patch-7_6	656627.605090	2584635.650940	82° 31' 56.505" E	23° 21' 50.059" N
184	P36	Patch-7_6	656794.566148	2584568.426720	82° 32' 2.359" E	23° 21' 47.816" N
185	P37	Patch-7_7	656881.533235	2584530.650070	82° 32' 5.407" E	23° 21' 46.558" N
186	P38	Patch-7_7	656941.397380	2584503.619210	82° 32' 7.504" E	23° 21' 45.659" N
187	P39	Patch-7_8	657046.167350	2584433.309760	82° 32' 11.167" E	23° 21' 43.337" N
188	P40	Patch-7_8	657136.446258	2584368.923790	82° 32' 14.322" E	23° 21' 41.213" N
189	P41	Patch-7_9	658047.984588	2583837.738690	82° 32' 46.217" E	23° 21' 23.629" N
190	P42	Patch-7_9	657964.500000	2583598.239430	82° 32' 43.187" E	23° 21' 15.873" N
191	P43	Patch-7_9	658041.908432	2583374.885210	82° 32' 45.828" E	23° 21' 8.585" N
192	P44	Patch-7_9	658268.155630	2583277.820520	82° 32' 53.757" E	23° 21' 5.351" N
193	P45	Patch-7_9	658434.805561	2583095.588200	82° 32' 59.556" E	23° 20' 59.370" N
194	P46	Patch-7_9	658682.599495	2583072.076910	82° 33' 8.271" E	23° 20' 58.519" N
195	P47	Patch-7_9	658785.365690	2582941.806170	82° 33' 11.840" E	23° 20' 54.248" N
196	P48	Patch-7_9	658838.735508	2582698.995390	82° 33' 13.627" E	23° 20' 46.337" N
197	P49	Patch-7_9	658683.665165	2582743.658840	82° 33' 8.184" E	23° 20' 47.843" N
198	P50	Patch-7_9	658620.571921	2582817.570510	82° 33' 5.991" E	23° 20' 50.267" N
199	P51	Patch-7_9	658647.868212	2582566.521130	82° 33' 6.857" E	23° 20' 42.097" N
200	P52	Patch-7_9	658861.962118	2582485.972340	82° 33' 14.364" E	23° 20' 39.404" N
201	P53	Patch-7_9	659098.304987	2582464.994870	82° 33' 22.676" E	23° 20' 38.639" N
202	P54	Patch-7_9	659335.613129	2582396.533990	82° 33' 31.005" E	23° 20' 36.331" N
203	P55	Patch-7_9	659417.092165	2582268.552500	82° 33' 33.825" E	23° 20' 32.142" N
204	P56	Patch-7_9	659210.565151	2582152.088420	82° 33' 26.510" E	23° 20' 28.428" N

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Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
205	P57	Patch-7_9	659298.300381	2581921.698820	82° 33' 29.511" E	23° 20' 20.908" N
206	P58	Patch-7_9	659514.757953	2581920.088210	82° 33' 37.131" E	23° 20' 20.780" N
207	P59	Patch-7_9	659605.159087	2581880.468290	82° 33' 40.298" E	23° 20' 19.460" N
208	P60	Patch-7_9	659682.550660	2581761.767980	82° 33' 42.977" E	23° 20' 15.575" N
209	P61	Patch-7_9	659580.729281	2581609.610410	82° 33' 39.335" E	23° 20' 10.664" N
210	P62	Patch-7_9	659580.040008	2581452.919530	82° 33' 39.251" E	23° 20' 5.571" N
211	P1	Patch-8_1	639047.311688	2551996.118910	82° 21' 26.725" E	23° 4' 14.660" N
212	P2	Patch-8_1	639047.513754	2552013.973740	82° 21' 26.737" E	23° 4' 15.241" N
213	P3	Patch-8_2	639266.247326	2552212.223530	82° 21' 34.488" E	23° 4' 21.620" N
214	P4	Patch-8_2	639359.702185	2552148.176880	82° 21' 37.751" E	23° 4' 19.509" N
215	P5	Patch-8_3	640002.258183	2551555.035070	82° 22' 0.133" E	23° 4' 0.031" N
216	P6	Patch-8_3	640135.192709	2551510.972140	82° 22' 4.790" E	23° 3' 58.558" N
217	P7	Patch-8_4	640147.554926	2551497.610840	82° 22' 5.219" E	23° 3' 58.120" N
218	P8	Patch-8_4	640183.872836	2551476.348830	82° 22' 6.489" E	23° 3' 57.418" N
219	P9	Patch-8_5	642041.468154	2551867.641740	82° 23' 11.886" E	23° 4' 9.570" N
220	P10	Patch-8_5	642205.857471	2551674.155190	82° 23' 17.597" E	23° 4' 3.229" N
221	P11	Patch-8_5	642228.615254	2551425.370700	82° 23' 18.314" E	23° 3' 55.134" N
222	P12	Patch-8_5	642313.711793	2551186.900640	82° 23' 21.224" E	23° 3' 47.355" N
223	P13	Patch-8_5	642336.334467	2550944.722530	82° 23' 21.938" E	23° 3' 39.474" N
224	P14	Patch-8_5	642247.070830	2550707.840300	82° 23' 18.723" E	23° 3' 31.801" N
225	P15	Patch-8_5	642239.669513	2550506.206890	82° 23' 18.396" E	23° 3' 25.248" N
226	P16	Patch-8_5	642466.031618	2550403.062000	82° 23' 26.314" E	23° 3' 21.824" N
227	P17	Patch-8_5	642686.655532	2550279.946370	82° 23' 34.024" E	23° 3' 17.754" N
228	P18	Patch-8_5	642930.014061	2550207.383270	82° 23' 42.549" E	23° 3' 15.319" N
229	P19	Patch-8_5	643086.149188	2550158.911680	82° 23' 48.018" E	23° 3' 13.695" N
230	P20	Patch-8_5	643247.478756	2550106.958680	82° 23' 53.668" E	23° 3' 11.956" N
231	P21	Patch-8_6	643404.361324	2549862.477960	82° 23' 59.098" E	23° 3' 3.959" N
232	P22	Patch-8_6	643494.996109	2549645.599990	82° 24' 2.209" E	23° 2' 56.880" N
233	P23	Patch-8_6	643748.867537	2549644.146520	82° 24' 11.127" E	23° 2' 56.754" N
234	P24	Patch-8_6	643977.902032	2549543.623630	82° 24' 19.139" E	23° 2' 53.414" N
235	P25	Patch-8_6	644204.719952	2549430.654690	82° 24' 27.069" E	23° 2' 49.671" N
236	P26	Patch-8_6	644380.239184	2549359.720870	82° 24' 33.211" E	23° 2' 47.310" N
237	P27	Patch-8_6	644536.649748	2549257.662510	82° 24' 38.671" E	23° 2' 43.943" N

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Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
238	P28	Patch-8_7	645601.855099	2549793.606800	82° 25' 16.274" E	23° 3' 1.031" N
239	P29	Patch-8_7	645622.833284	2549866.726590	82° 25' 17.036" E	23° 3' 3.402" N
240	P30	Patch-8_8	646827.162797	2550156.993510	82° 25' 59.445" E	23° 3' 12.456" N
241	P31	Patch-8_8	646938.323345	2549936.685390	82° 26' 3.274" E	23° 3' 5.259" N
242	P32	Patch-8_8	647101.965230	2549772.759430	82° 26' 8.966" E	23° 2' 59.877" N
243	P33	Patch-8_8	647337.230175	2549743.795840	82° 26' 17.221" E	23° 2' 58.860" N
244	P34	Patch-8_9	650561.124489	2549790.804140	82° 28' 10.492" E	23° 2' 59.347" N
245	P35	Patch-8_9	650767.837194	2549935.403830	82° 28' 17.805" E	23° 3' 3.981" N
246	P36	Patch-8_9	651017.280024	2549943.618290	82° 28' 26.571" E	23° 3' 4.166" N
247	P37	Patch-8_9	651251.699222	2549855.643890	82° 28' 34.775" E	23° 3' 1.229" N
248	P38	Patch-8_9	651472.006105	2549729.385280	82° 28' 42.469" E	23° 2' 57.052" N
249	P39	Patch-8_9	651705.657699	2549655.992990	82° 28' 50.651" E	23° 2' 54.589" N
250	P40	Patch-8_9	651958.386183	2549679.509120	82° 28' 59.538" E	23° 2' 55.271" N
251	P41	Patch-8_9	652185.834378	2549576.338690	82° 29' 7.491" E	23° 2' 51.842" N
252	P42	Patch-8_9	652427.787474	2549507.742340	82° 29' 15.966" E	23° 2' 49.532" N
253	P43	Patch-8_9	652579.679227	2549404.768890	82° 29' 21.265" E	23° 2' 46.134" N
254	P44	Patch-8_10	654650.066032	2549267.262750	82° 30' 33.944" E	23° 2' 40.974" N
255	P45	Patch-8_10	654673.579706	2549269.798270	82° 30' 34.771" E	23° 2' 41.049" N
256	P46	Patch-8_11	655147.585915	2549320.198120	82° 30' 51.440" E	23° 2' 42.528" N
257	P47	Patch-8_11	655179.704778	2549337.456370	82° 30' 52.574" E	23° 2' 43.078" N
258	P48	Patch-8_12	655266.778368	2549382.893320	82° 30' 55.650" E	23° 2' 44.526" N
259	P49	Patch-8_12	655297.212783	2549396.897520	82° 30' 56.724" E	23° 2' 44.971" N
260	P50	Patch-8_12	655330.458725	2549400.479180	82° 30' 57.893" E	23° 2' 45.076" N
261	P51	Patch-8_13	656315.974217	2549971.096550	82° 31' 32.721" E	23° 3' 3.293" N
262	P52	Patch-8_13	656445.939970	2550176.896460	82° 31' 37.362" E	23° 3' 9.939" N
263	P53	Patch-8_13	656697.271177	2550211.821120	82° 31' 46.204" E	23° 3' 10.989" N
264	P54	Patch-8_13	656895.762236	2550117.916860	82° 31' 53.142" E	23° 3' 7.869" N
265	P55	Patch-8_13	657106.876928	2550151.318620	82° 32' 0.571" E	23° 3' 8.883" N
266	P56	Patch-8_13	657325.508388	2550279.989990	82° 32' 8.298" E	23° 3' 12.991" N
267	P57	Patch-8_13	657443.182013	2550499.026410	82° 32' 12.513" E	23° 3' 20.072" N
268	P58	Patch-8_13	657530.934500	2550734.261110	82° 32' 15.683" E	23° 3' 27.689" N
269	P59	Patch-8_13	657662.093016	2550864.445760	82° 32' 20.339" E	23° 3' 31.876" N
270	P60	Patch-8_13	657815.684841	2550966.421670	82° 32' 25.772" E	23° 3' 35.139" N

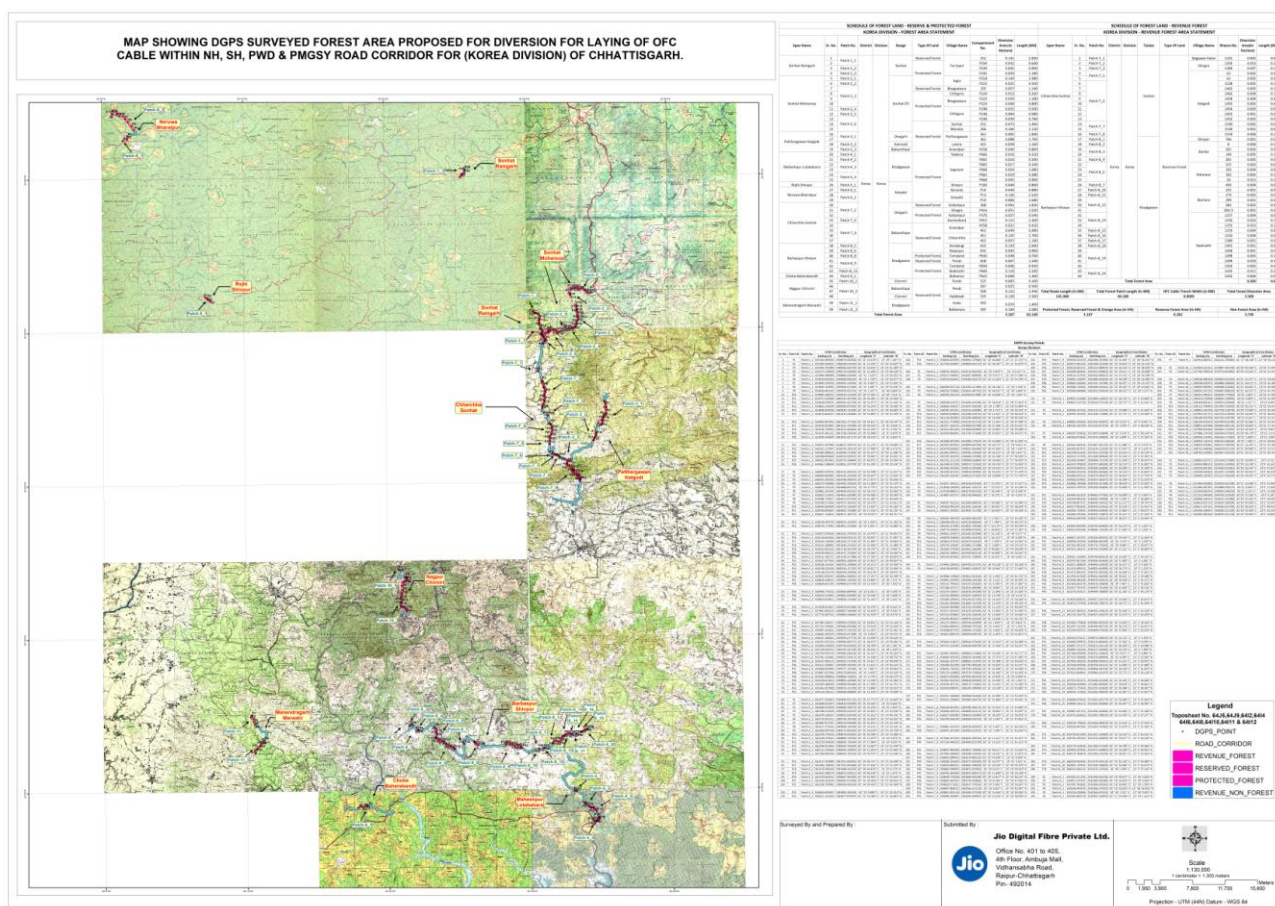
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Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
271	P61	Patch-8_14	657976.591273	2551020.625200	82° 32' 31.445" E	23° 3' 36.846" N
272	P62	Patch-8_14	658208.634689	2551083.849600	82° 32' 39.620" E	23° 3' 38.821" N
273	P63	Patch-8_14	658375.772454	2551072.265820	82° 32' 45.488" E	23° 3' 38.387" N
274	P64	Patch-8_14	658535.711460	2551032.096190	82° 32' 51.092" E	23° 3' 37.027" N
275	P65	Patch-8_15	658609.679542	2551032.365770	82° 32' 53.690" E	23° 3' 37.010" N
276	P66	Patch-8_15	658684.166113	2551032.460860	82° 32' 56.307" E	23° 3' 36.987" N
277	P67	Patch-8_16	659087.437153	2551054.344660	82° 33' 10.483" E	23° 3' 37.560" N
278	P68	Patch-8_16	659172.633616	2551055.788220	82° 33' 13.476" E	23° 3' 37.577" N
279	P69	Patch-8_17	659219.778019	2551054.480550	82° 33' 15.132" E	23° 3' 37.518" N
280	P70	Patch-8_17	659229.407381	2551053.797820	82° 33' 15.470" E	23° 3' 37.493" N
281	P71	Patch-8_18	659729.951409	2551267.140900	82° 33' 33.135" E	23° 3' 44.255" N
282	P72	Patch-8_18	659745.295243	2551276.180920	82° 33' 33.677" E	23° 3' 44.544" N
283	P73	Patch-8_19	659774.533926	2551289.475390	82° 33' 34.709" E	23° 3' 44.966" N
284	P74	Patch-8_19	659993.207810	2551417.498810	82° 33' 42.439" E	23° 3' 49.052" N
285	P75	Patch-8_19	660179.784878	2551569.195330	82° 33' 49.051" E	23° 3' 53.918" N
286	P76	Patch-8_20	660239.456445	2551574.924130	82° 33' 51.150" E	23° 3' 54.084" N
287	P77	Patch-8_20	660391.119392	2551594.598090	82° 33' 56.485" E	23° 3' 54.670" N
288	P78	Patch-8_20	660531.834114	2551672.137620	82° 34' 1.458" E	23° 3' 57.142" N
289	P1	Patch-9_1	634105.611292	2542390.462030	82° 18' 30.072" E	22° 59' 3.829" N
290	P2	Patch-9_1	633957.473797	2542389.302480	82° 18' 24.870" E	22° 59' 3.834" N
291	P3	Patch-9_1	633787.762892	2542360.695910	82° 18' 18.901" E	22° 59' 2.953" N
292	P4	Patch-9_1	633558.442976	2542266.379310	82° 18' 10.819" E	22° 58' 59.953" N
293	P5	Patch-9_1	633316.429696	2542266.453150	82° 18' 2.321" E	22° 59' 0.025" N
294	P6	Patch-9_1	633105.802578	2542307.318950	82° 17' 54.938" E	22° 59' 1.414" N
295	P7	Patch-9_1	632913.680311	2542142.783660	82° 17' 48.140" E	22° 58' 56.120" N
296	P1	Patch-10_1	637693.616213	2570847.307240	82°20' 45.280" E	23°14' 27.934" N
297	P2	Patch-10_1	637760.708518	2570774.813850	82°20' 47.616" E	23°14' 25.557" N
298	P3	Patch-10_2	638548.388328	2569993.832050	82°21' 15.072" E	23°13' 59.928" N
299	P4	Patch-10_2	638708.654974	2569880.280020	82°21' 20.672" E	23°13' 56.188" N
300	P5	Patch-10_2	638699.990935	2569688.262660	82°21' 20.305" E	23°13' 49.948" N
301	P6	Patch-10_2	638595.247225	2569497.898220	82°21' 16.557" E	23°13' 43.791" N
302	P7	Patch-10_2	638231.490521	2569294.779650	82°21' 3.695" E	23°13' 37.298" N

DGPS Survey Points						
Korea Division						
Sr. No.	Point ID	Patch No.	UTM Coordinates		Geographical Coordinates	
			Easting (m)	Northing (m)	Longitude "E"	Latitude "N"
303	P8	Patch-10_2	638133.270498	2568833.768990	82°21' 0.089" E	23°13' 22.340" N
304	P9	Patch-10_2	638169.802412	2568352.636840	82°21' 1.217" E	23°13' 6.687" N
305	P10	Patch-10_2	638113.794850	2567943.739550	82°20' 59.113" E	23°12' 53.411" N
306	P11	Patch-10_2	638081.539700	2567700.128740	82°20' 57.899" E	23°12' 45.500" N
307	P12	Patch-10_2	637992.507753	2567470.218630	82°20' 54.692" E	23°12' 38.053" N
308	P13	Patch-10_2	638148.592784	2567292.165700	82°21' 0.124" E	23°12' 32.217" N
309	P14	Patch-10_2	638129.872679	2567049.615780	82°20' 59.386" E	23°12' 24.337" N
310	P15	Patch-10_2	638001.432488	2566845.865140	82°20' 54.802" E	23°12' 17.752" N
311	P16	Patch-10_2	637990.951046	2566601.374950	82°20' 54.354" E	23°12' 9.807" N
312	P17	Patch-10_2	637988.174538	2566364.670920	82°20' 54.179" E	23°12' 2.112" N
313	P18	Patch-10_2	638206.213445	2566335.172650	82°21' 1.838" E	23°12' 1.087" N
314	P19	Patch-10_2	638363.716219	2566244.466590	82°21' 7.348" E	23°11' 58.091" N
315	P20	Patch-10_2	638503.593461	2566174.783590	82°21' 12.245" E	23°11' 55.783" N
316	P21	Patch-10_2	638725.246006	2566078.071220	82°21' 20.008" E	23°11' 52.572" N
317	P22	Patch-10_2	638702.529083	2565837.423230	82°21' 19.131" E	23°11' 44.755" N
318	P1	Patch-11_1	620062.810727	2553248.572980	82°10' 19.996" E	23°5' 0.722" N
319	P2	Patch-11_1	619954.886225	2553015.159450	82°10' 16.138" E	23°4' 53.161" N
320	P3	Patch-11_1	620249.001281	2552839.323010	82°10' 26.424" E	23°4' 47.367" N
321	P4	Patch-11_1	620338.024605	2552497.135990	82°10' 29.456" E	23°4' 36.218" N
322	P5	Patch-11_1	620469.130355	2552115.361030	82°10' 33.955" E	23°4' 23.771" N
323	P6	Patch-11_2	621586.933866	2550234.011390	82°11' 12.698" E	23°3' 22.309" N
324	P7	Patch-11_2	621466.987345	2550080.950170	82°11' 8.440" E	23°3' 17.364" N
325	P8	Patch-11_2	621299.802976	2549901.946550	82°11' 2.515" E	23°3' 11.588" N
326	P9	Patch-11_2	621152.099286	2549702.519100	82°10' 57.269" E	23°3' 5.143" N
327	P10	Patch-11_2	620988.104554	2549515.107880	82°10' 51.454" E	23°2' 59.093" N
328	P11	Patch-11_2	620814.655714	2549335.396500	82°10' 45.309" E	23°2' 53.295" N
329	P12	Patch-11_2	620617.197162	2549183.657200	82°10' 38.329" E	23°2' 48.413" N
330	P13	Patch-11_2	620436.038431	2549020.111330	82°10' 31.918" E	23°2' 43.143" N
331	P14	Patch-11_2	620495.082560	2548705.311740	82°10' 33.903" E	23°2' 32.893" N

5.3 Geo-Referenced Maps of the Proposed Route (Annexure-3):



5.4 DGPS Maps of the Proposed Route (Annexure-4):

