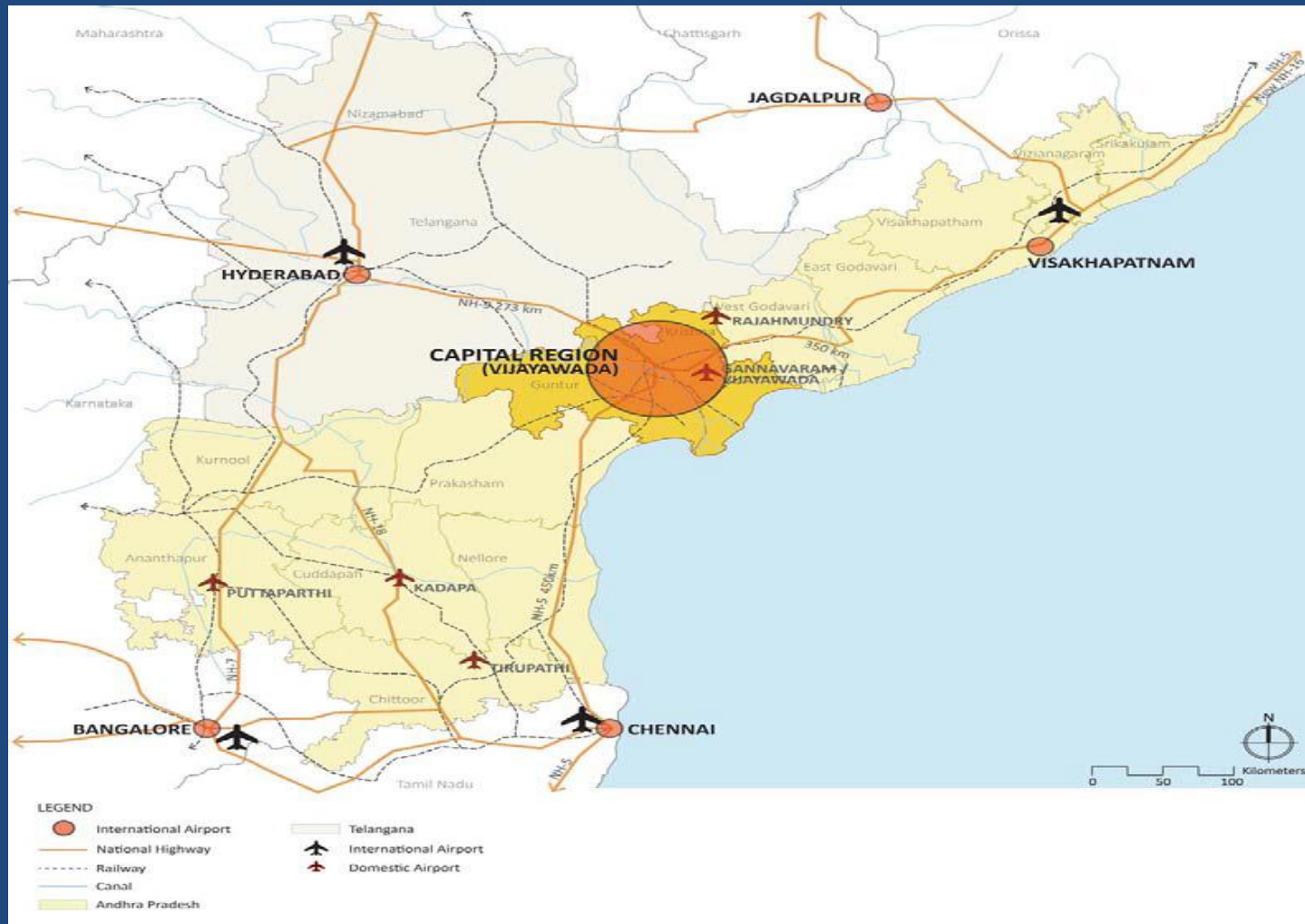


BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

In 2013, the Indian Government announced that Andhra Pradesh will be split into two states.

The bifurcation of states left Andhra Pradesh without a capital.

The old capital, Hyderabad, is now located in the new state of Telangana.

Andhra Pradesh and Telangana will share Hyderabad as a capital for ten years, after which Andhra Pradesh will have to move to a new administrative centre

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

On India Independence Day in 2014. it was announced that the new capital will be located at Amaravati near Gunter and Vijayawada, two of the largest cities in Andhra Pradesh

Amaravati will be India's fifth planned city, but the first planned capital city to come up from scratch in decades.

Land for the capital will be acquired through a Land Pooling process and supplemented by land acquisition.

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

On 08 December 2014, the governments of Singapore and Andhra Pradesh signed a Memorandum of Understanding to collaborate on the master planning and development of the new Andhra Pradesh Capital City.

Surbana Jurong Consultants Pte Ltd was appointed by the Singapore Government to undertake the master planning for the Andhra Pradesh Capital City Project.

In Andhra Pradesh, a new agency APCRDA - Andhra Pradesh Capital Region Development Authority, was established to take charge of the Project

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

The development of the New Capital City will be on a green field site of approximately 217 sq km located centrally within the Capital Region. The Capital Region comprises of 7,420 sq.km straddling on both sides of the Krishna River in both Krishna and Guntur Districts. The Capital Region is well connected to the surrounding economic hubs by air , rail, road, and ports.

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

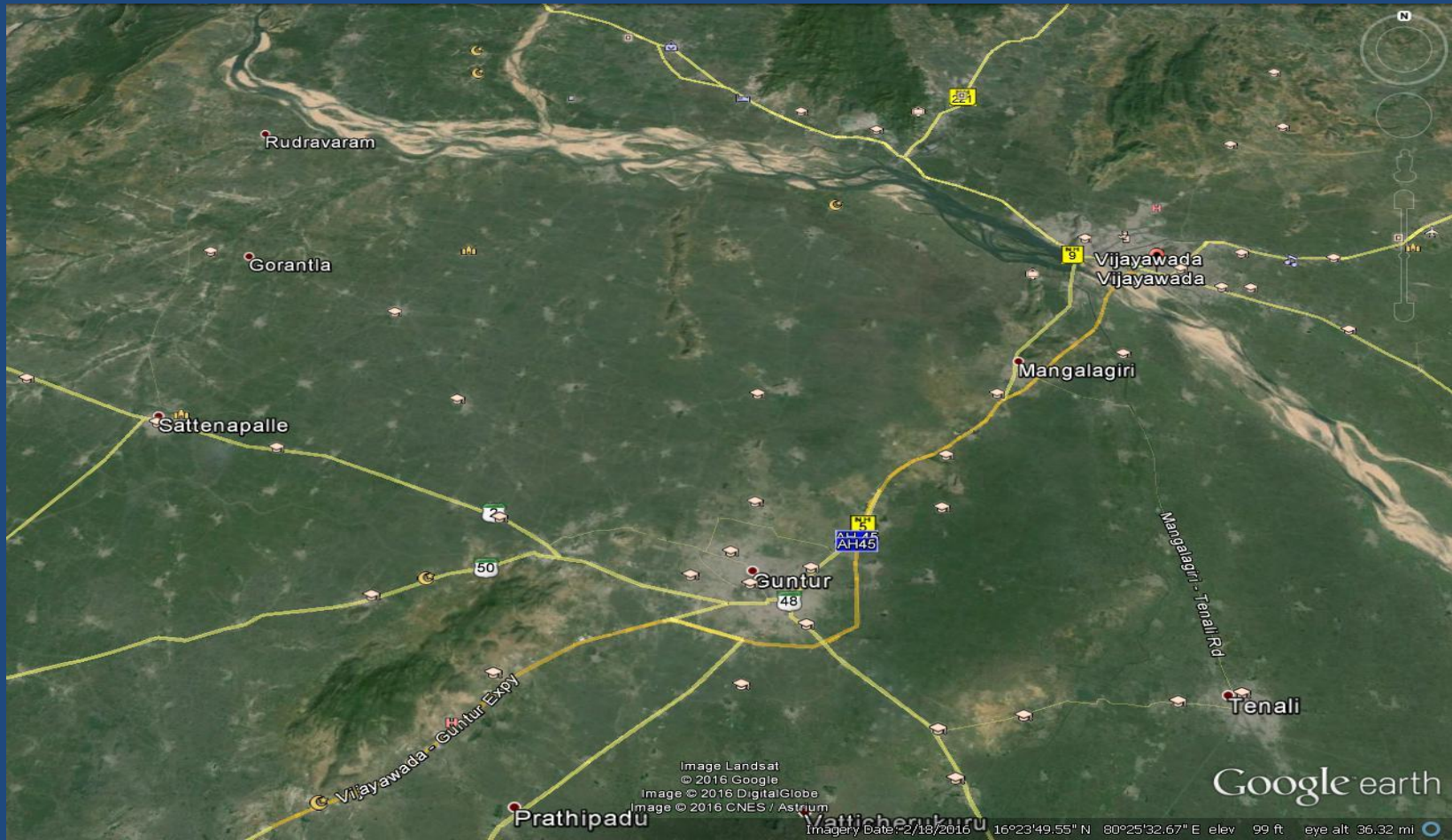
MASTER PLANNING PROJECT – SCOPE OF WORKS

- 1. CAPITAL REGION PLAN**
 - To set the planning direction and strategies for the Capital Region of Andhra Pradesh.

- 2. CAPITAL CITY MASTER PLAN**
 - To prepare a detailed Master plan for the new Capital City of Andhra Pradesh.

- 3. SEED DEVELOPMENT MASTER PLAN**
 - To prepare Urban Design and development control guidelines for the first section of the Capital City

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



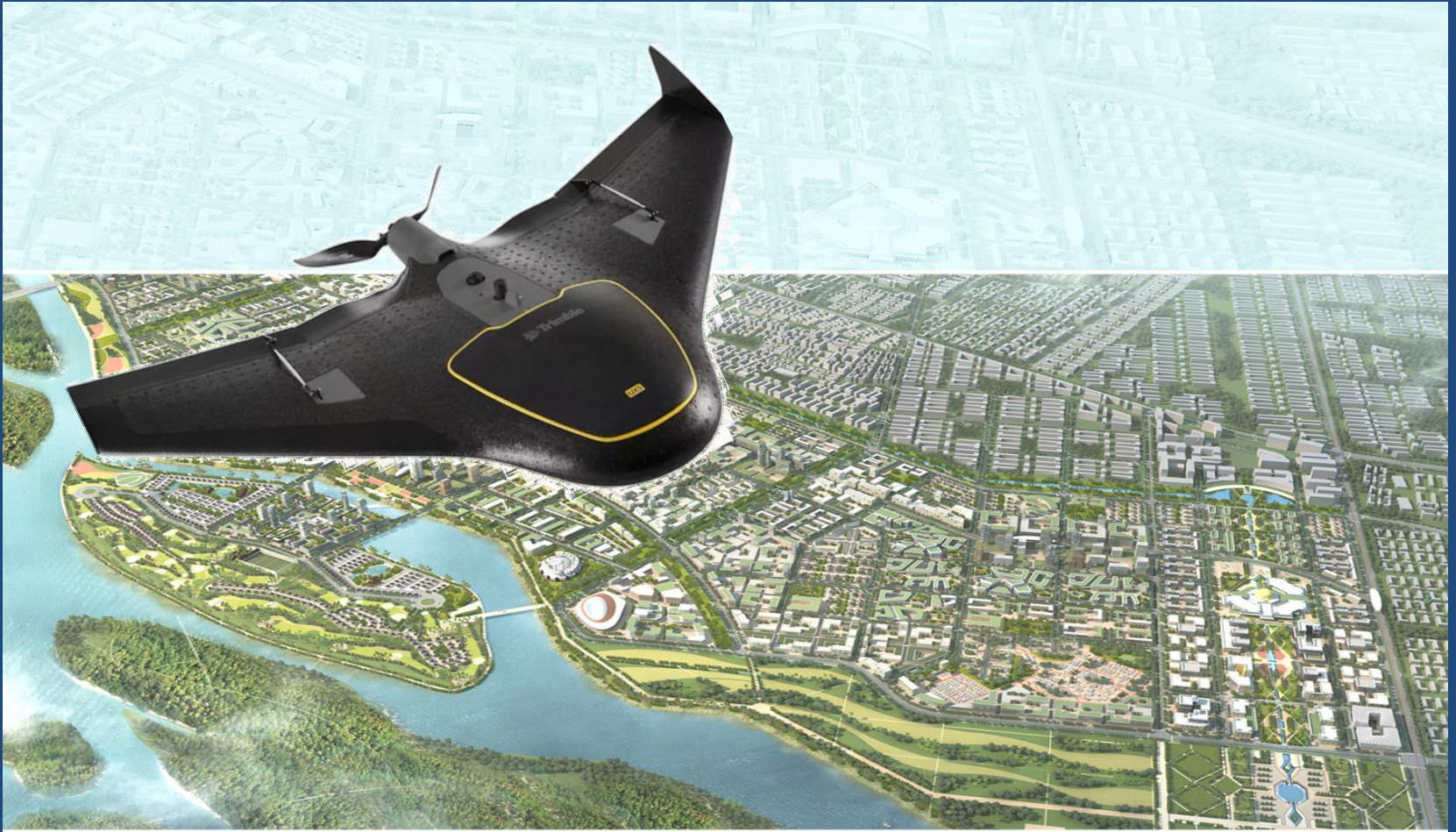
Google view of the designated site

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

**CAPITAL REGION PLAN WAS CONSTRUCTED BASED ON
MAPS DERIVED SATELLITE IMAGERY**

**THE DETAILED CAPITAL CITY MASTER PLAN WAS
DESIGNED BASED ON TOPOGRAPHICAL
SURVEY CONDUCTED FOR THE 217 SQ KM SITE.
UAV TECHNOLOGY WAS USED FOR THE
TOPOGRAPHICAL SURVEY**

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

DRONE SURVEY - PROJECT OVERVIEW

1. Coverage area of Drone Survey is about 350 sq.km.
2. Survey area will be subdivided into 110 Blocks (Flight Strip)
3. Each block will cover an area of 3 to 5 sq.km
4. Flying height is at 383 m above ground level
5. Images are captured at 10 cm GSD (Ground Sampling Distance)
6. Flying is estimated to complete in 2 weeks time (depending on weather condition)
7. Data Processing is estimated to complete in 2 weeks time.

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

DRONE SURVEY – KEY MILESTONES

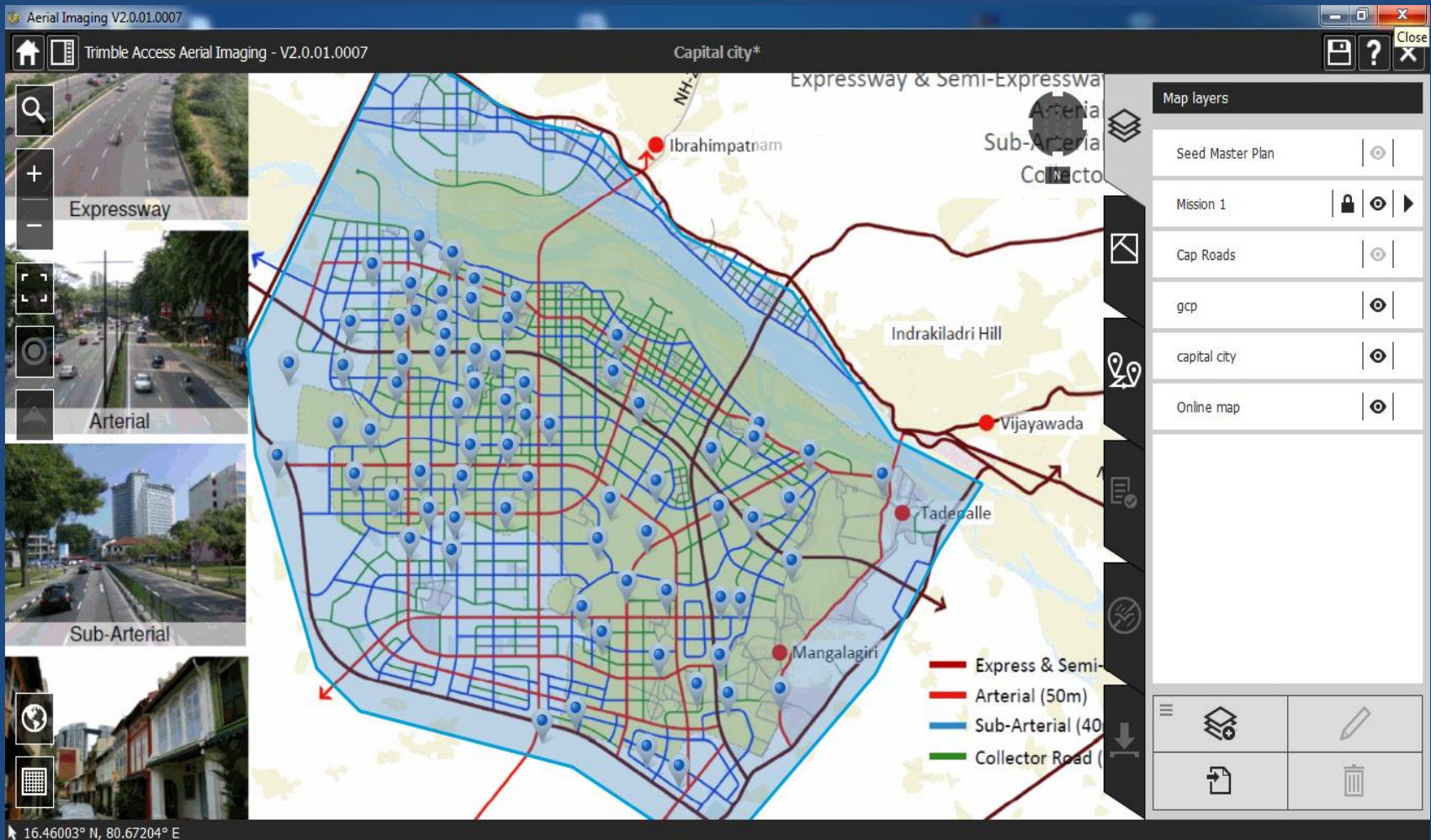
- 1. Reconnaissance Survey of the Site for flight planning**
- 2. Identification/Establishment of Ground Control Points in the Survey Area**
- 3. Flying – Aerial Survey**
- 4. Post Processing – Downloading data and processing**
- 5. Data submission**

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

DRONE SURVEY – DELIVERABLES

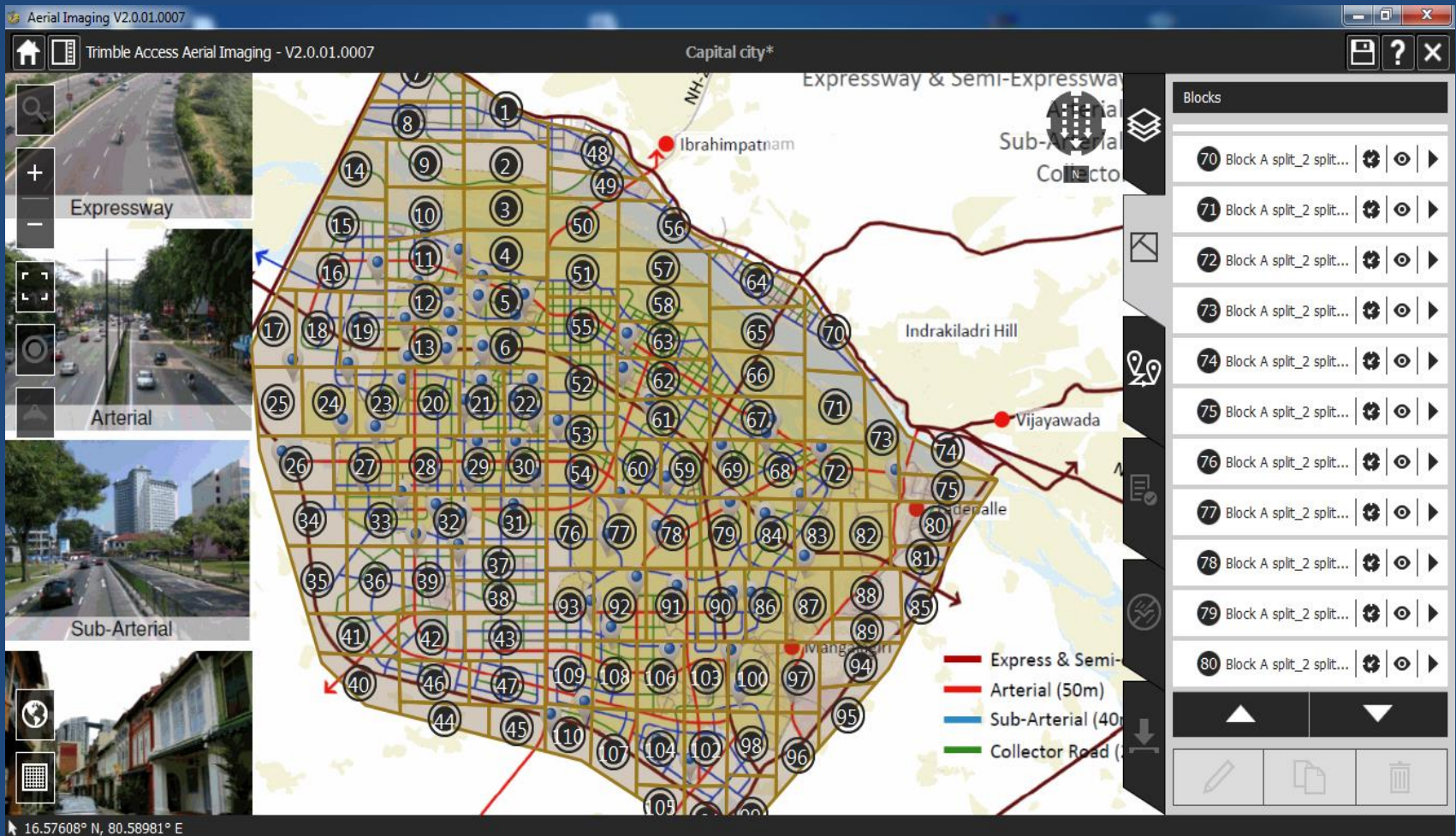
1. Aerial photo blocks of the 350 sq km site
2. 10 GSD resolution orthomosaic the Capital Area
3. High resolution raster digital elevation model and contours
4. Point cloud data

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



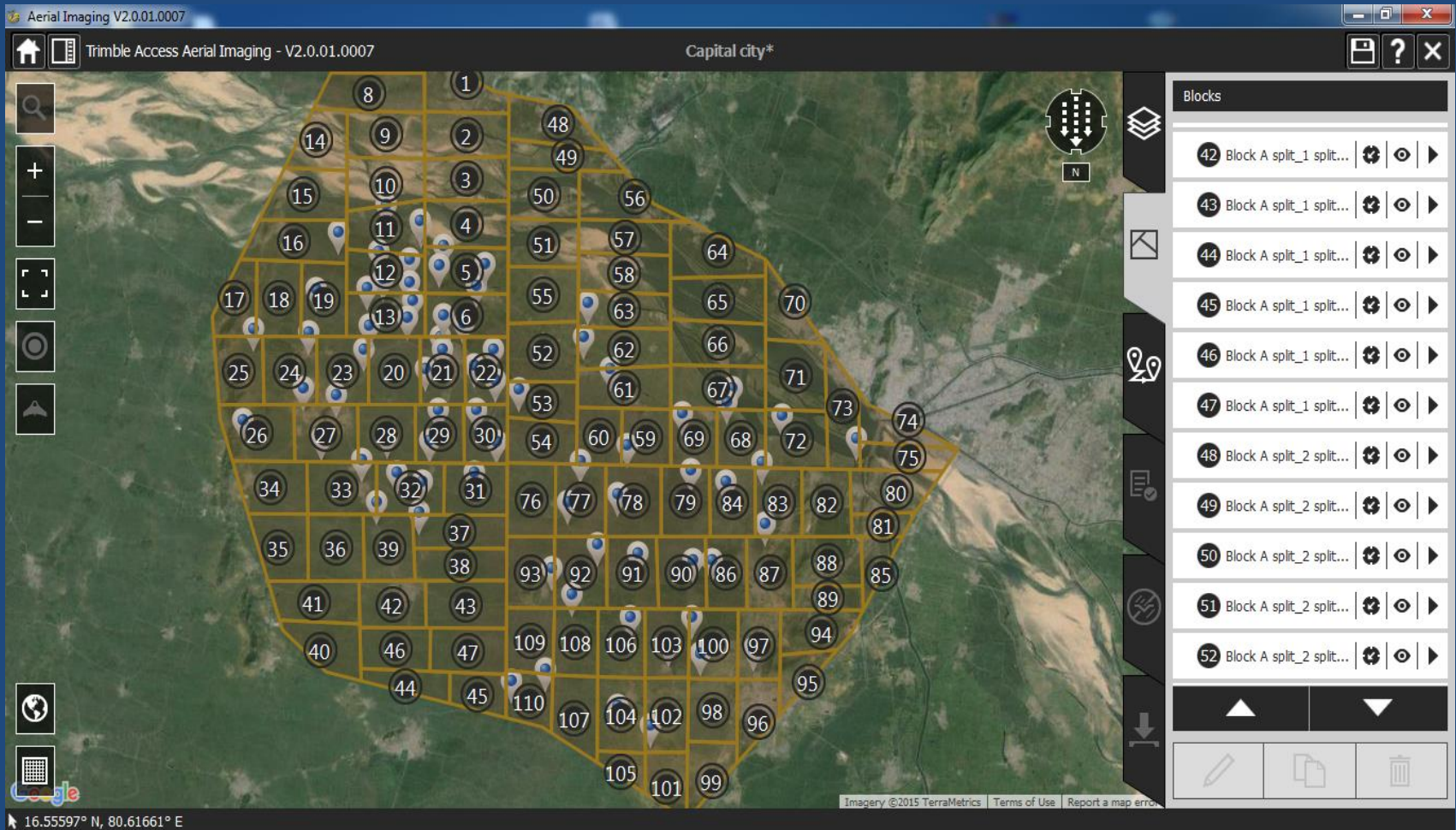
Mission Area Boundaries and GCP's

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



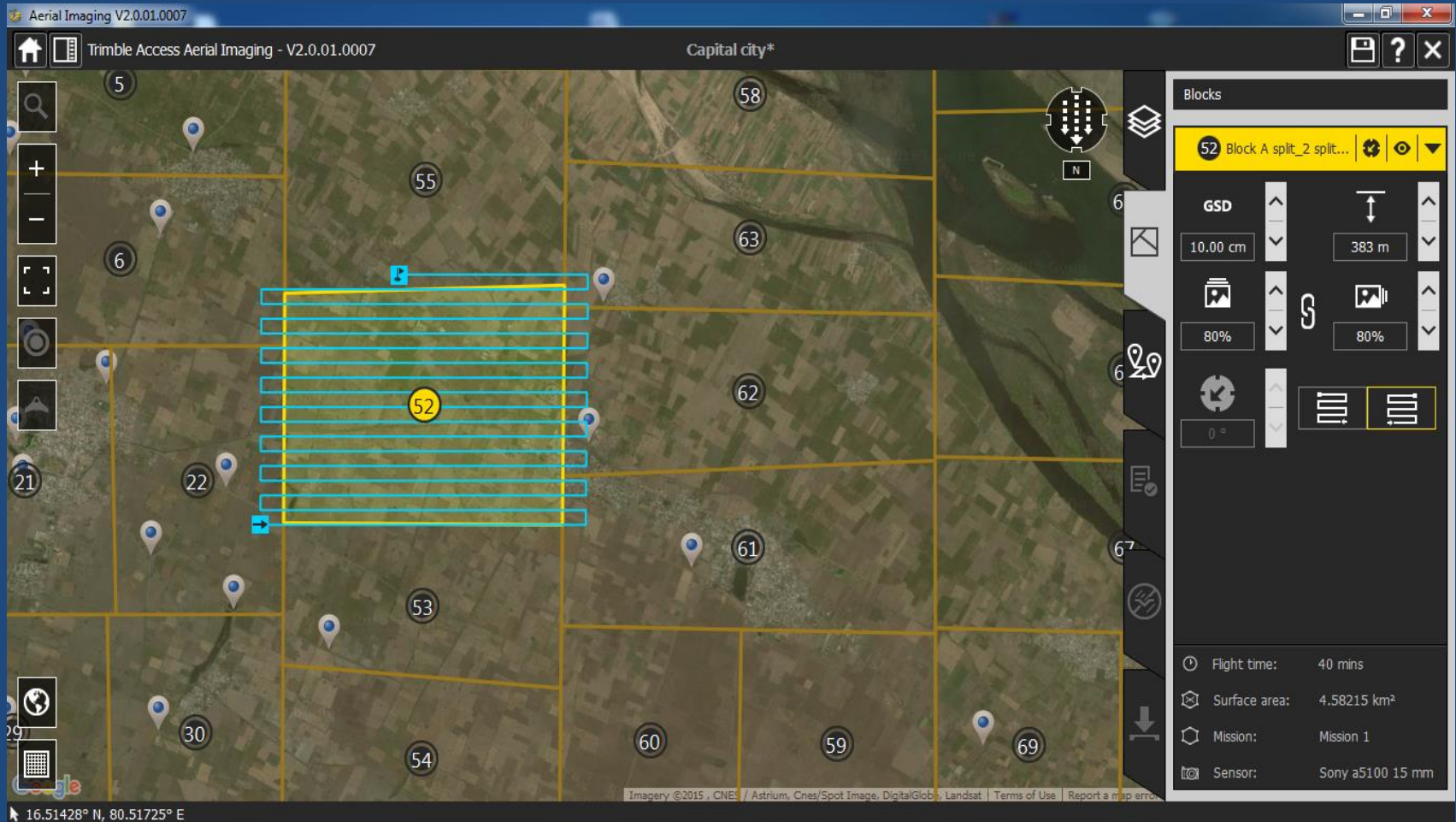
Flight Blocks with GCPs

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Flight Blocks overlay on Satellite Map

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Flight Blocks Details with Flight Lines

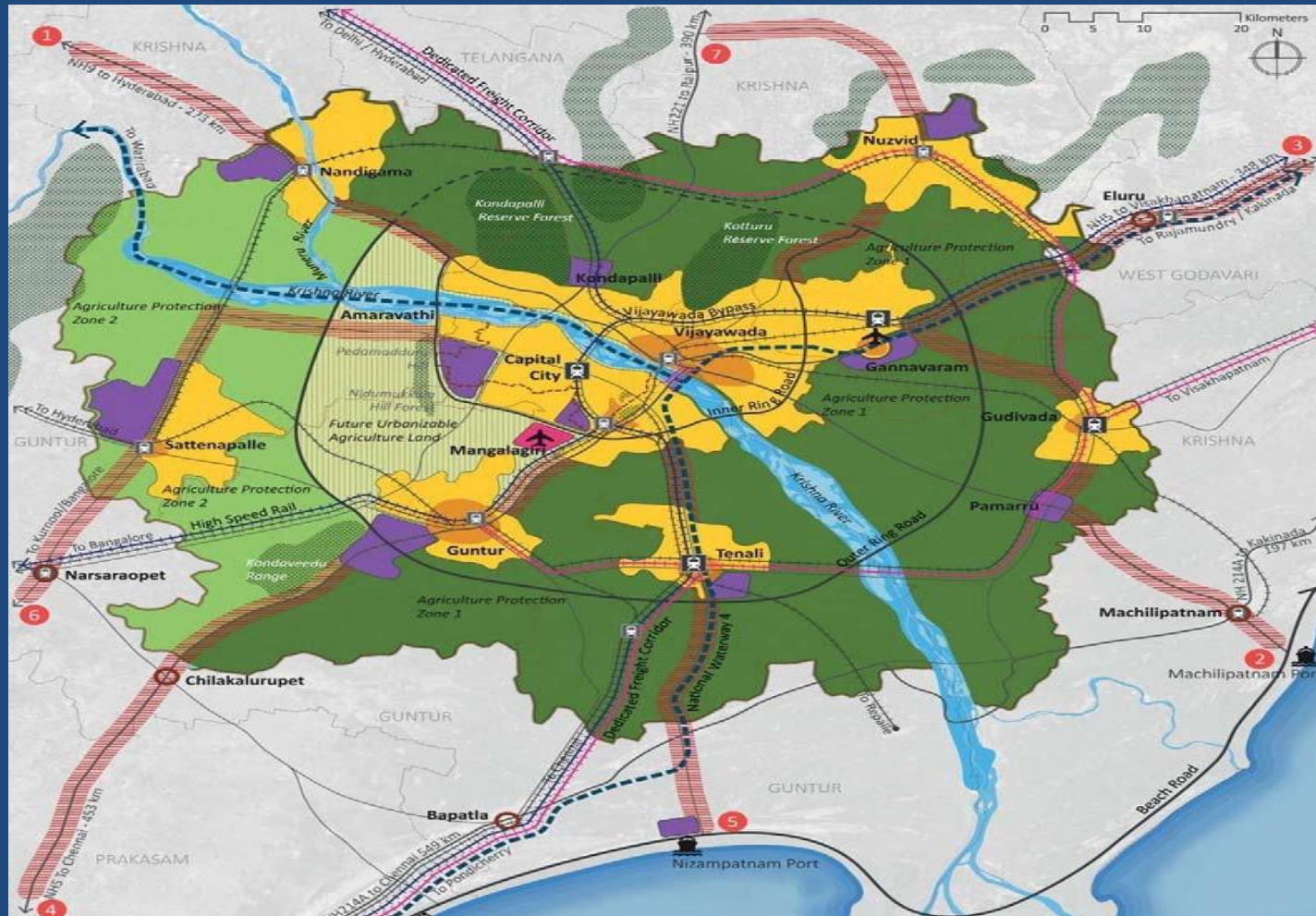
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DRONE SURVEY - GROUND CONTROL POINT MARKERS (GCP)

GCP target marker has to be put on with the size of 2 x 2 M



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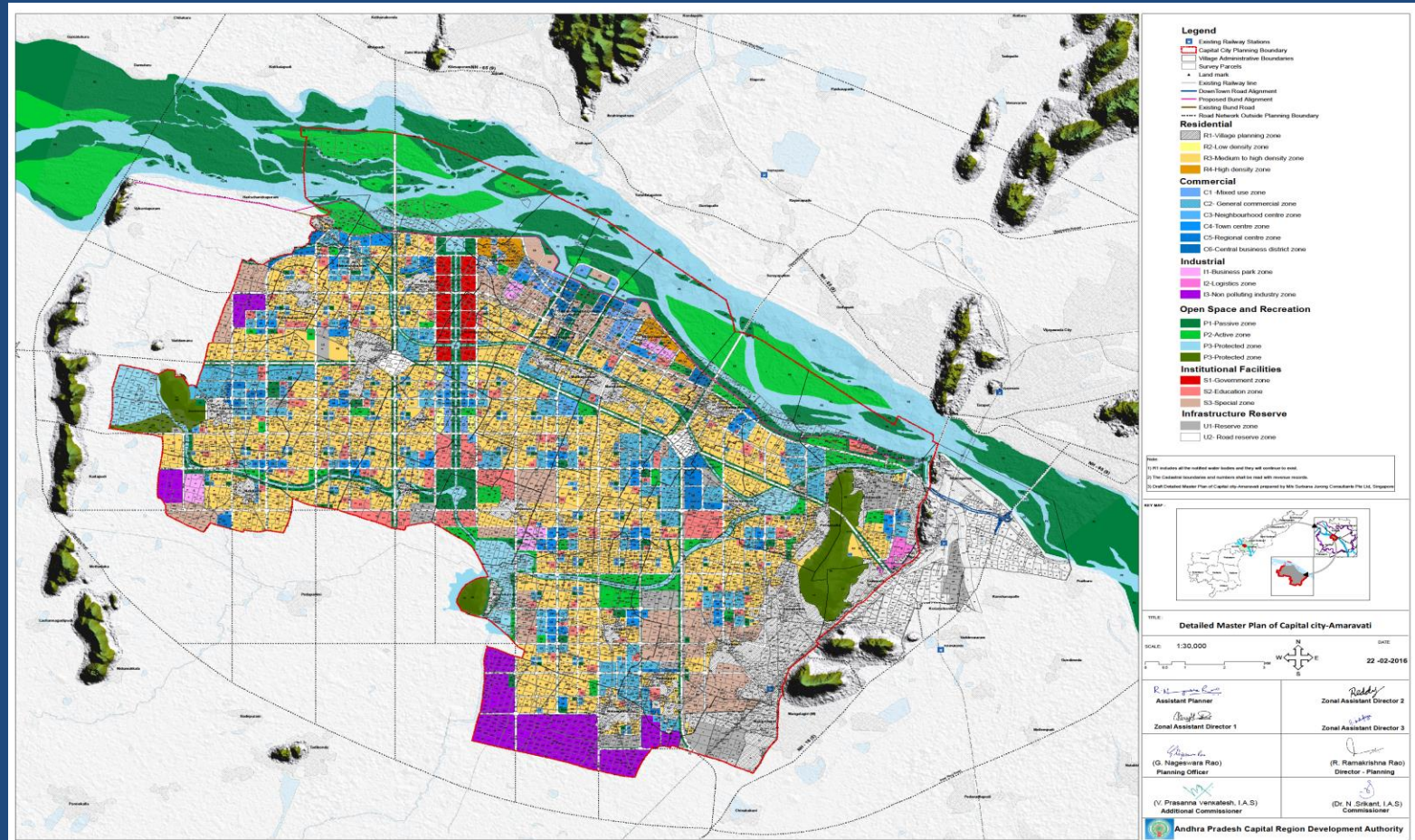
CENTRAL REGION PLAN

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



CENTRAL REGION PLAN

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Legend

- Village Road
- Township Boundary
- Cape Metro Planning Boundary
- Roadway
- Proposed Road Upgrade
- International Airport
- Nature
- SAR
- Airport
- Water Management Structure
- Waste Water Treatment Plant
- Potential Future Land Use
- Green Space - Forest Allocation
- Rural Reserve - Future Planning Boundary

Residential

- R1 Single detached zone
- R2 Low density zone
- R3 Medium to high density zone
- R4 High density zone

Commercial

- C1 Mixed-use zone
- C2 General commercial zone
- C3 Regional business centre zone
- C4 Local centre zone
- C5 Regional centre zone
- C6 Central business district zone

Industrial

- I1 Heavy industrial zone
- I2 Light industrial zone
- I3 Urban jobbing industry zone

Open Space and Recreation

- O1 Passive park zone
- O2 Active zone
- O3 Recreational zone
- O4 Environmental zone

Institutional Facilities

- I1 Government zone
- I2 Education zone
- I3 Research zone

Infrastructure Reserve

- U1 Portwater zone
- U2 Water storage zone

LAND PARCELS WITH CRDA

Active Project Capital Region Development Authority

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



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The Capital Region Plan was completed on 30 March 2015.

The Capital City Master Plan and Seed Development Master Plan were handed over to APCRDA on 20 July 2015

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FOUNDATION STONE FOR THE NEW CAPITAL

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LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Along the bank of Krishnan River

LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



Landmark for the new capital - AMARAVATHI

LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



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LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



FUTURE CITY OF AMARAVATI

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



FUTURE CITY OF AMARAVATI

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

The new city will be built at an expected cost of 1 trillion rupees (£10.7bn) and is expected to generate jobs to sustain a population of 9-12 million people in the surrounding capital region.

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

Upon Completion of the Master Planning Project, Surbana Jurong also secured the **'Consulting Services for Preparation of Land Pooling schemes for Amaravati (Capital City) Area of APCRDA'** through a competitive tender.

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

Terms of Reference for the 'Consulting Services for Preparation of Land Pooling schemes for Amaravati (Capital City) Area of APCRDA' are:

- 1. Demarcate the entire road network for the Capital City area.**
- 2. Demarcate all the new land parcels created for the entire Capital City.**
- 3. Implement the land lot numbering system**
- 4. Create Cadastre GIS**
 - To facilitate easy urban planning, development control, land use and land management**

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

‘Land Pooling Scheme’ –

assembly of small land parcels under different ownerships voluntarily into a large land parcel;
provide the enlarged land parcel with infrastructure in a planned manner and return the reconstituted land to the owners, after deducting the land required for public open spaces such as parks and play grounds, social housing for economically weaker sections, social amenities such as school, dispensary and other civic amenities, road network, and other infrastructure as specified under the Act as well as such extent of land in lieu of the cost of development towards the provision of infrastructure and amenities and other costs and expenses to be incurred for the scheme and external trunk infrastructure;

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

‘Land Pooling Scheme’ –

Land Pooling process is not new to India.

It had been implemented in other Indian state, like Gujarat.

However, the land pooling exercise in Amaravati is the largest such exercise India has seen.

against angry farmers, disappearing land records and ancient architectural beliefs. Despite these hurdles, is Amaravati still on track?

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

PROBLEMS ENCOUNTERED BY PLANNERS & SURVEYORS

- 1. ANCIENT ARCHITECTURAL BELIEFS**
- 2. DISAPPEARING LAND RECORDS**
- 3. ANGRY FARMERS**

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

ANCIENT ARCHITECTURAL BELIEFS

The traditional Hindu system of *Vaasthu Shastra* ,
dating back from the 6th century belief the alignment of
buildings can bring about bad or good luck

The people of Andhra Pradesh have a deep-rooted
belief and will not buy any property that is not north-
or east-facing.

The draft plan had to be send back to the master
planners for amendment taking these principles into
account. The whole capital city project would have
had no buyers if the initial draft had been
implemented

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DISAPPEARING LAND RECORDS

The Capital City covers an area of 35,000 acres. Land records of the affected land parcels have to be verified for the purpose of acquisition and compensation.

More than 100 government surveyors were dispatched to physically verify and record land ownership details. They were stumped by the humongous task.

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

DISAPPEARING LAND RECORDS

In many cases, land records had not been updated for 90 years. There were survey records dating back to the British era, but none of the new survey numbers were recorded. For instance, in 1908, there was a record of 9.5 acres of land belonging to one person. When physically verified the same plot of land, is now owned by 12 people – and there is no records of them at all.

Thus began a Herculean task of updating land records over 35,000 acres of land. Until and unless these details were finalised, land pooling and actual building of the new capital could not begin.

BUILDING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI

ANGRY FARMERS DISPUTES OVER LAND BOUNDARIES

Updating of land records also created a large number of settlement disputes,
From the old land records, land boundaries were identified using vague markers such as 'a tamarind tree in the south-west corner of the plot'.
Once the tamarind tree is cut down, you have no idea where the land boundary is.

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FARMERS DISPUTES OVER COMPENSATIONS

To date, the state government has successfully managed to pool together 33,000 of the required 35,000 acres of land for the new capital.

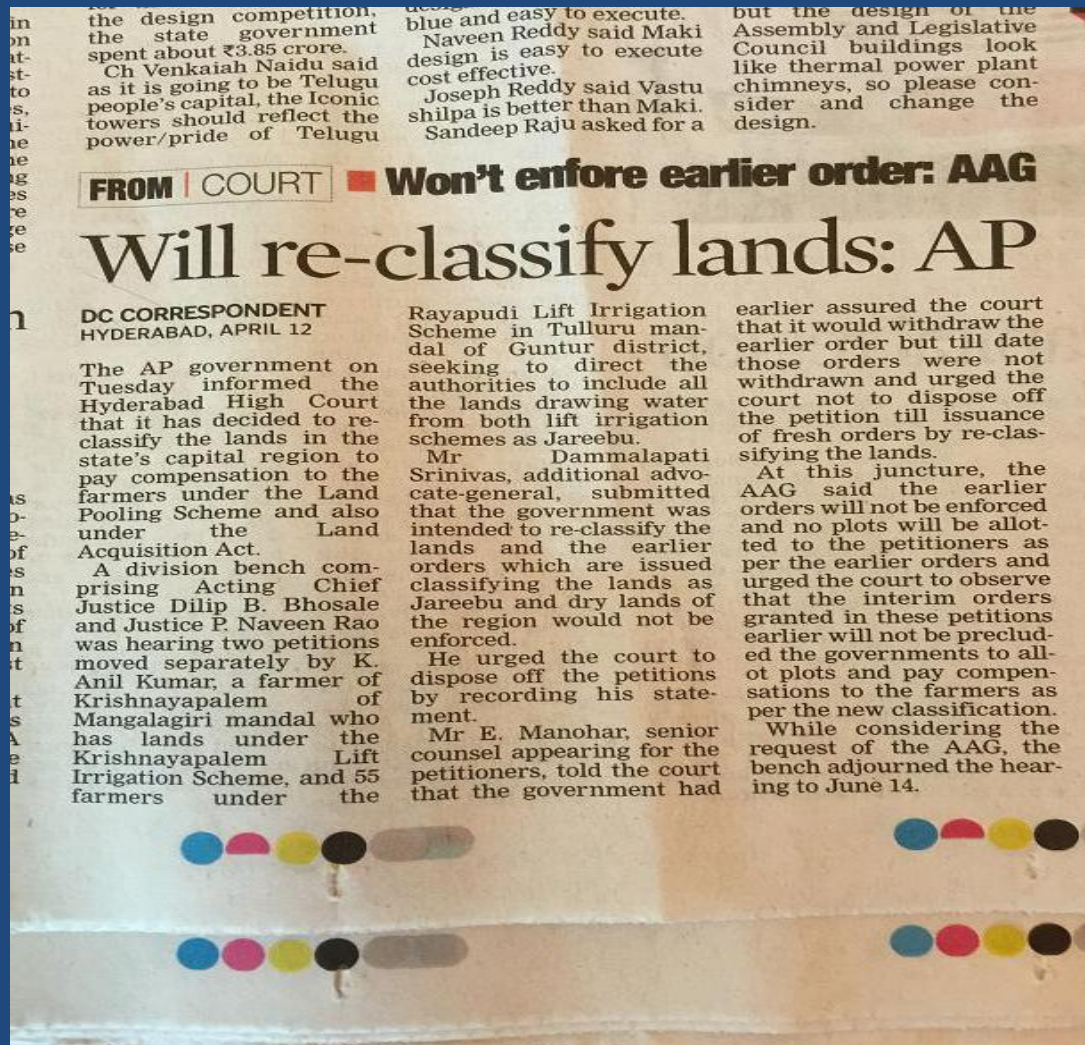
Difficulties remain, with farmers in more urban and fertile areas refusing to pool their land as the compensation offered by government is regarded as much less than the prevailing land value.

Many affected owners have petitioned the High Court in Hyderabad for more equitable compensation.

LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Land owners
bring AP
government to
Court over
classification of
lands and
compensations

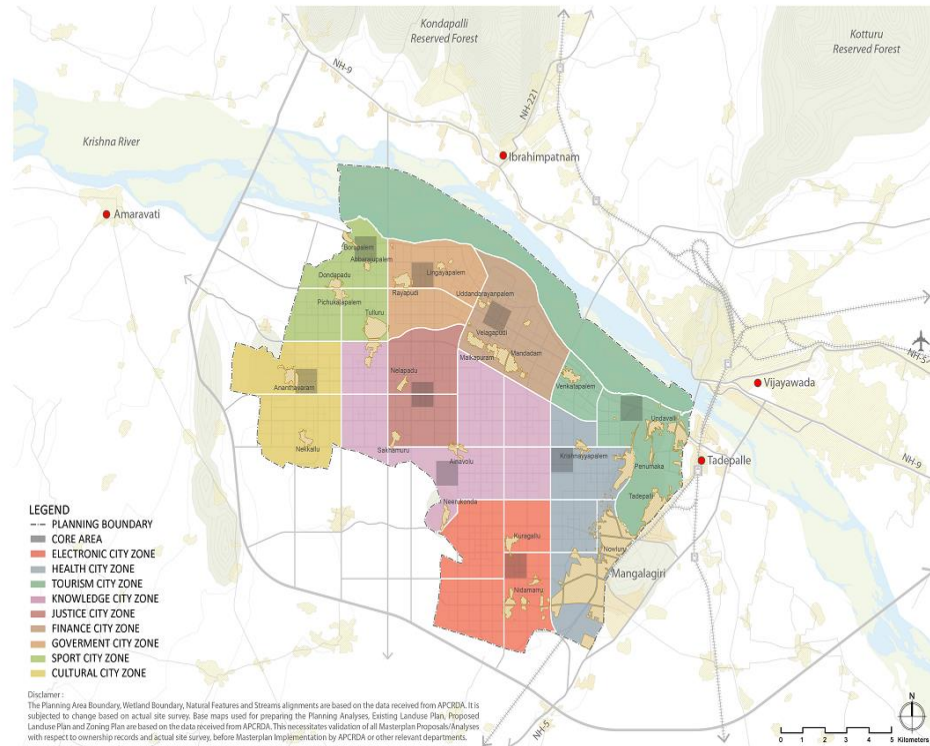
LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATI



Farmers protesting outside APCRDA Office in Vijayawada

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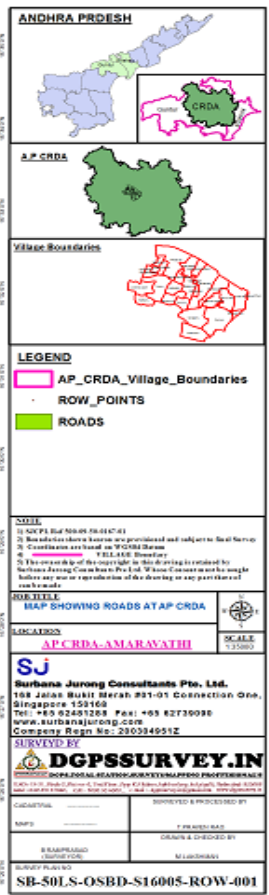
FOR EFFICIENT
MANAGEMENT
OF SURVEY
WORKS THE
CAPITAL CITY IS
SUBDIVIDED
INTO 29
DISTRICTS, EACH
NAMED BY THE
VILLAGE IT
ENCOMPASSED



Capital City Nine Cities Boundary Plan

THE NEW CAPITAL CITY OF ANDHRA PRADESH | CAPITAL CITY MASTERPLAN REPORT - PART 2

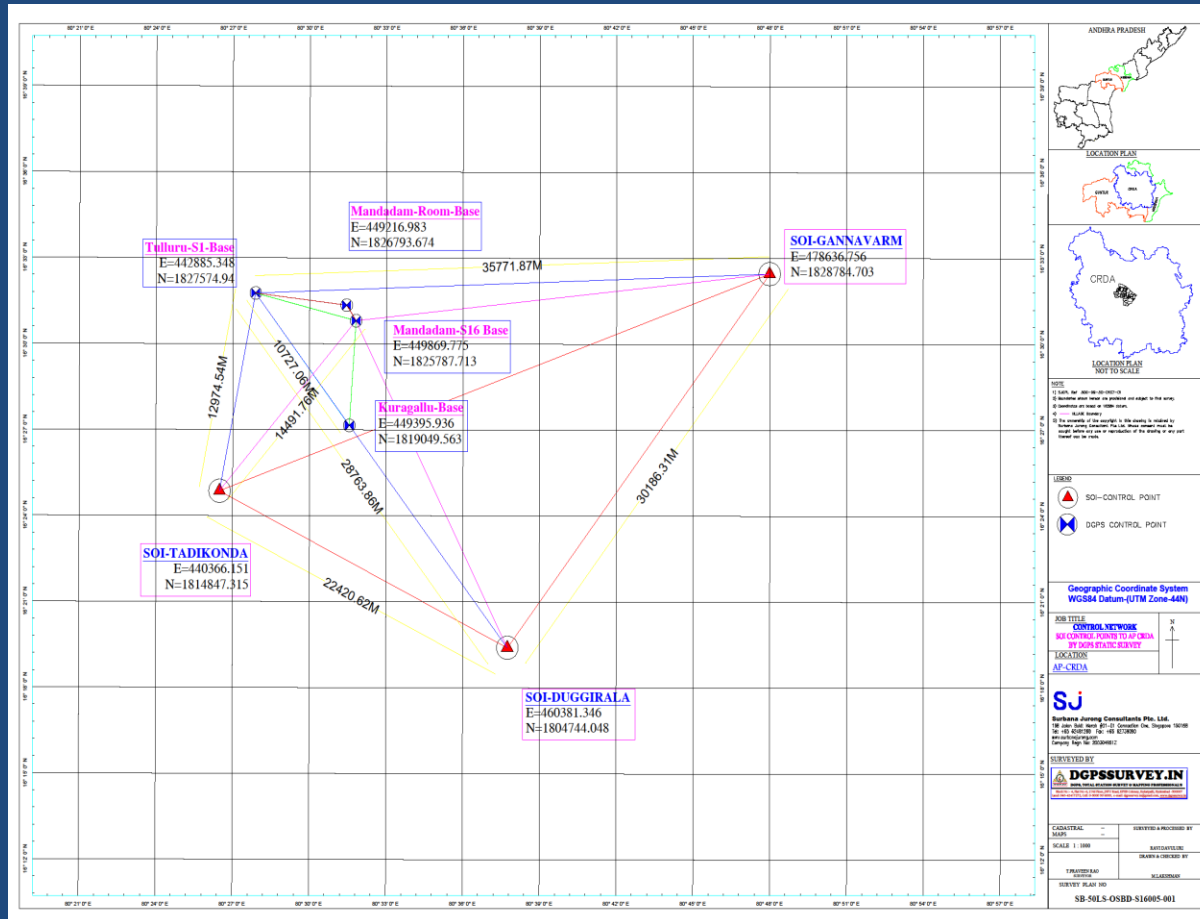
IA - AMARAVATI



BOUNDARY OF THE 29 VILLAGES

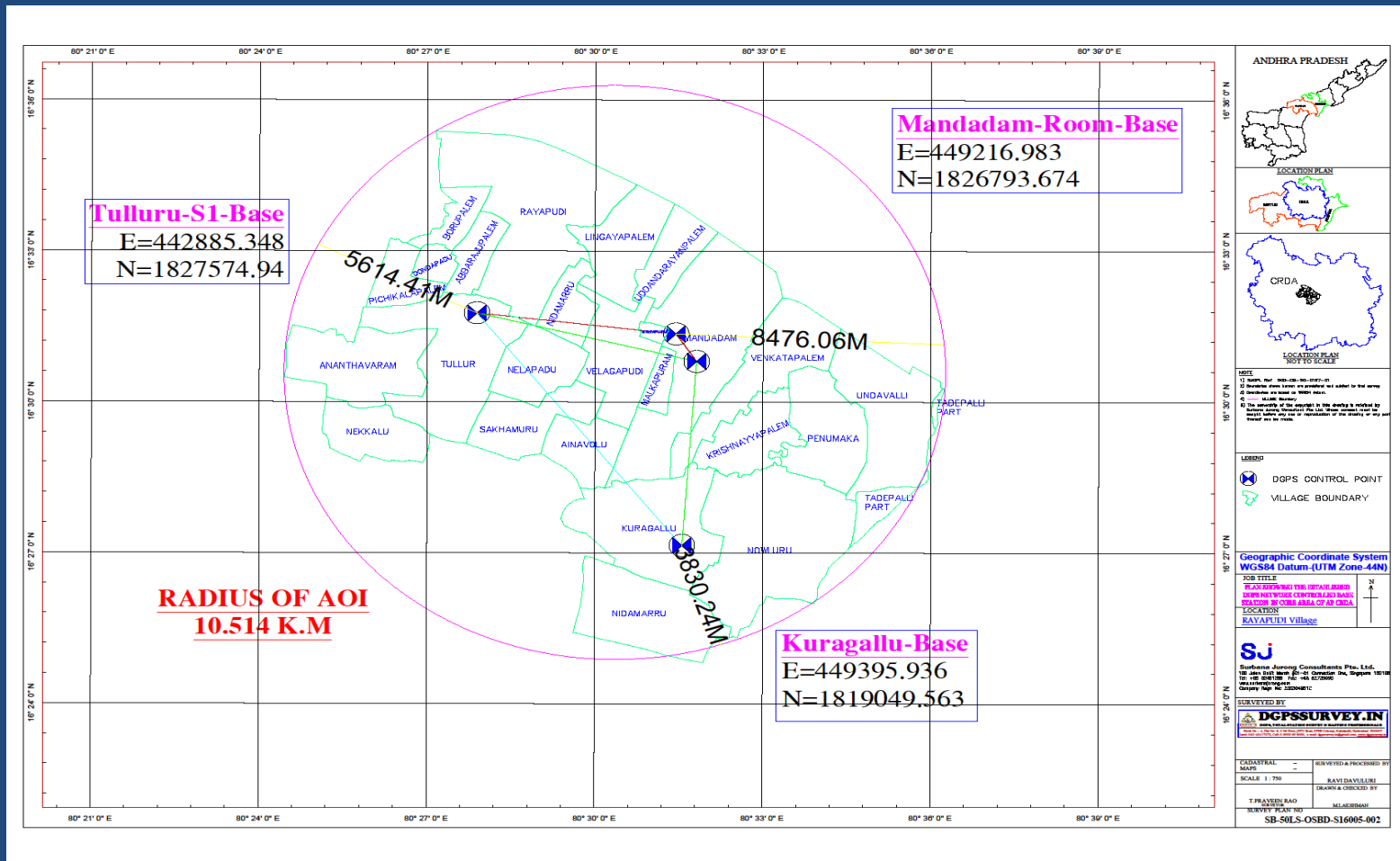
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ROW (RIGHT OF WAY SURVEY) – DEMARCATION OF ROAD NETWORKS



DATUM FOR
SURVEY IS
FROM
HORIZONTAL
SURVEY
CONTROL
MARKERS
ESTABLISHED
BY SURVEY OF
INDIA (SOI)

PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



**ADDITIONAL HORIZONTAL SURVEY CONTROL MARKERS
ESTABLISHED TO FACILITATE RTK SURVEY**

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**SOI Control Station at
GANNAVARAM**



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SOI Control Station at DUGGIRALA

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**PROJECT Control Station
at KRISHNAYAPALEM**



**PROJECT Control Station
at KURRAGALU**

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**PROJECT Control Station
at MANDADAM**



**PROJECT Control Station
at TULLUR**

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**PROJECT Control Station
at MANDADAM ROOM**

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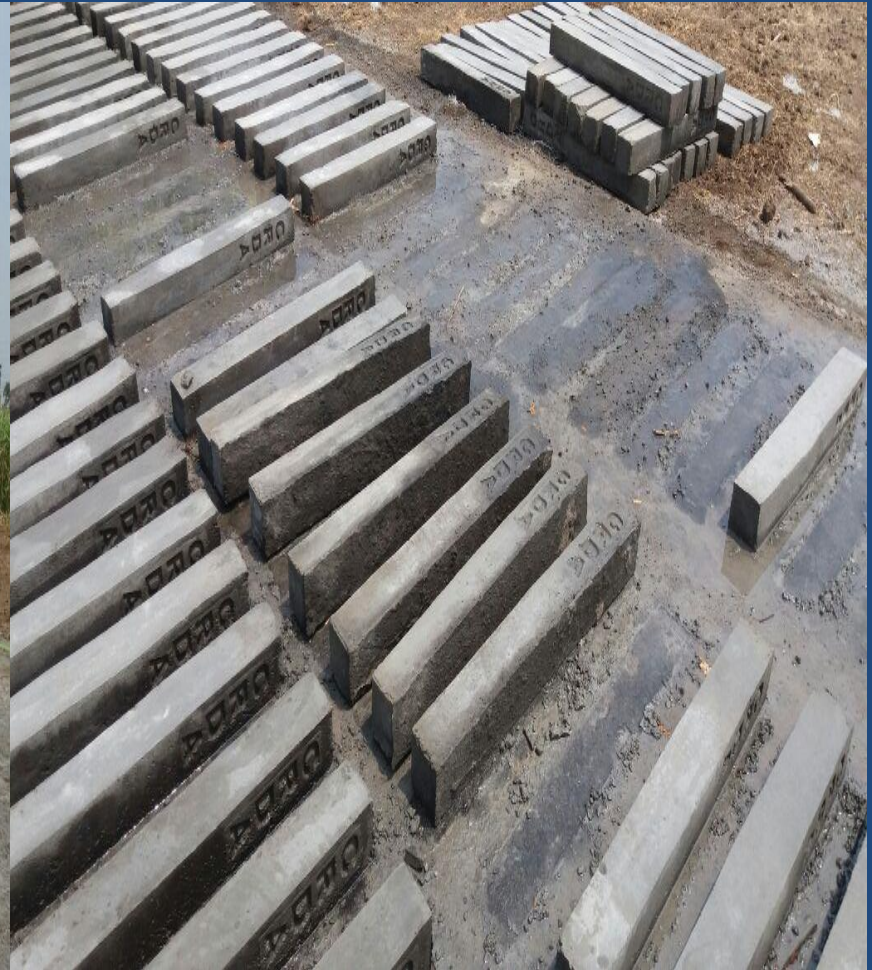


**PROJECT Control Station
at KRISHNAYAPALEM**



**PROJECT Control Station
at KURRAGALU**

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ON SITE CASTING OF CONCRETE MARKERS

LAND SURVEY FOR NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - AMARAVATHI



CONCRETE MARKERS FOR
ROW



CONCRETE MARKERS FOR
LAND PARCELS

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5 Survey Teams were deployed for the ROW Survey

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MEETING SURVEY TEAM ON SITE

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INSPECTING SURVEY BASE STATION

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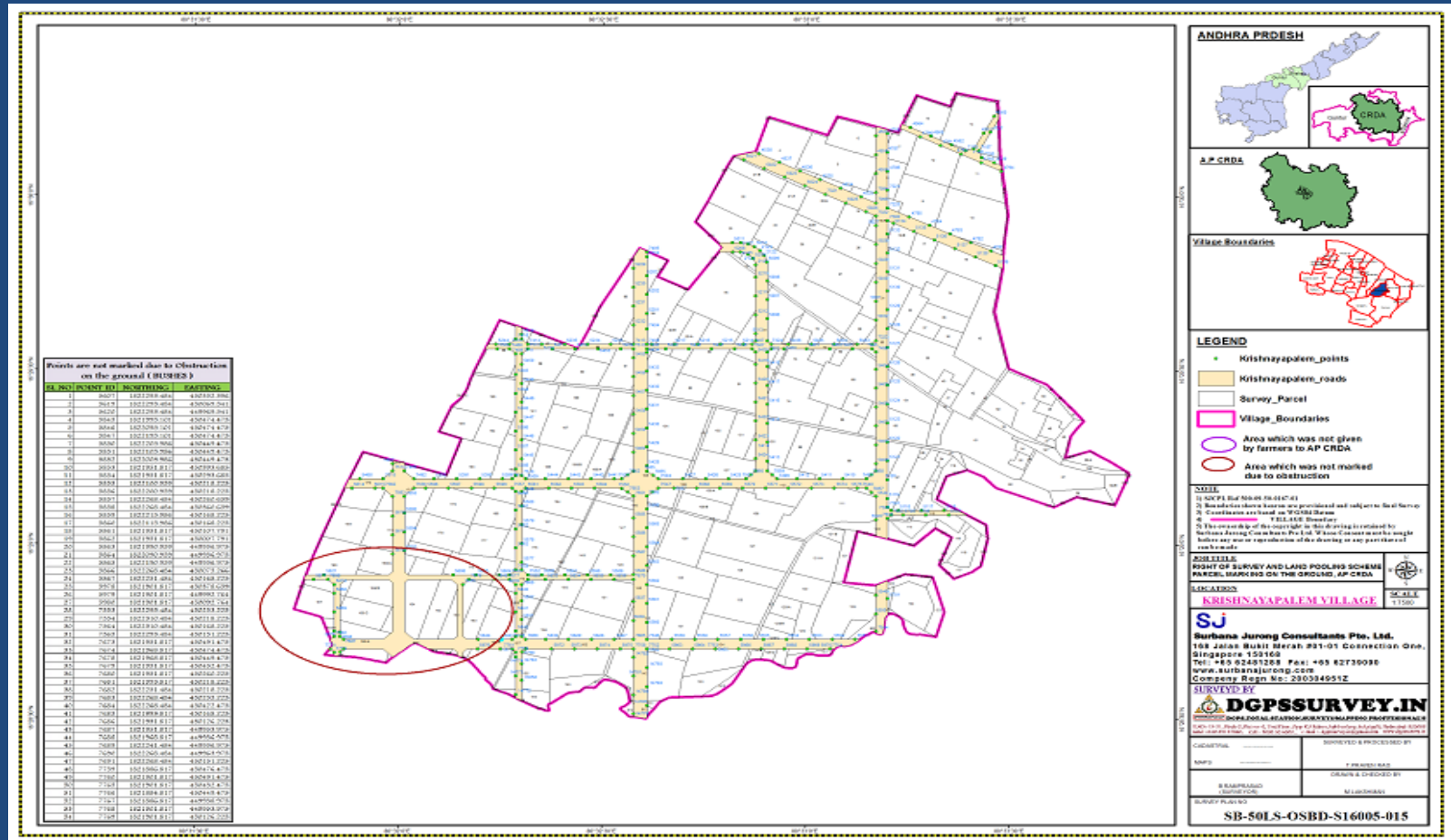


PROJECT PROGRESS MEETING CONDUCTED AT SITE OFFICE

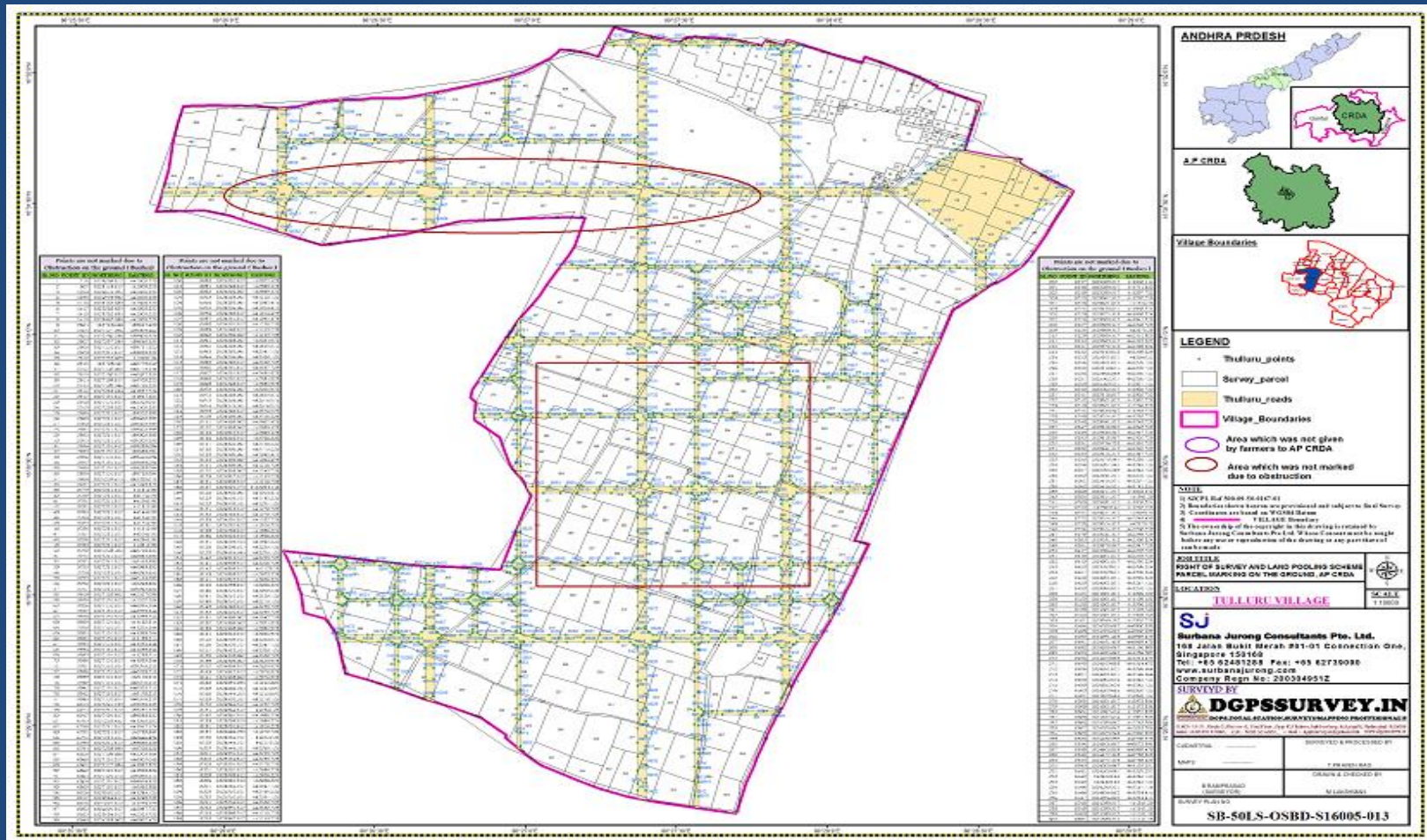
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MEETING WITH
SRIKANT NAGULAPALLI
IAS, COMMISSIONER,
APCRDA

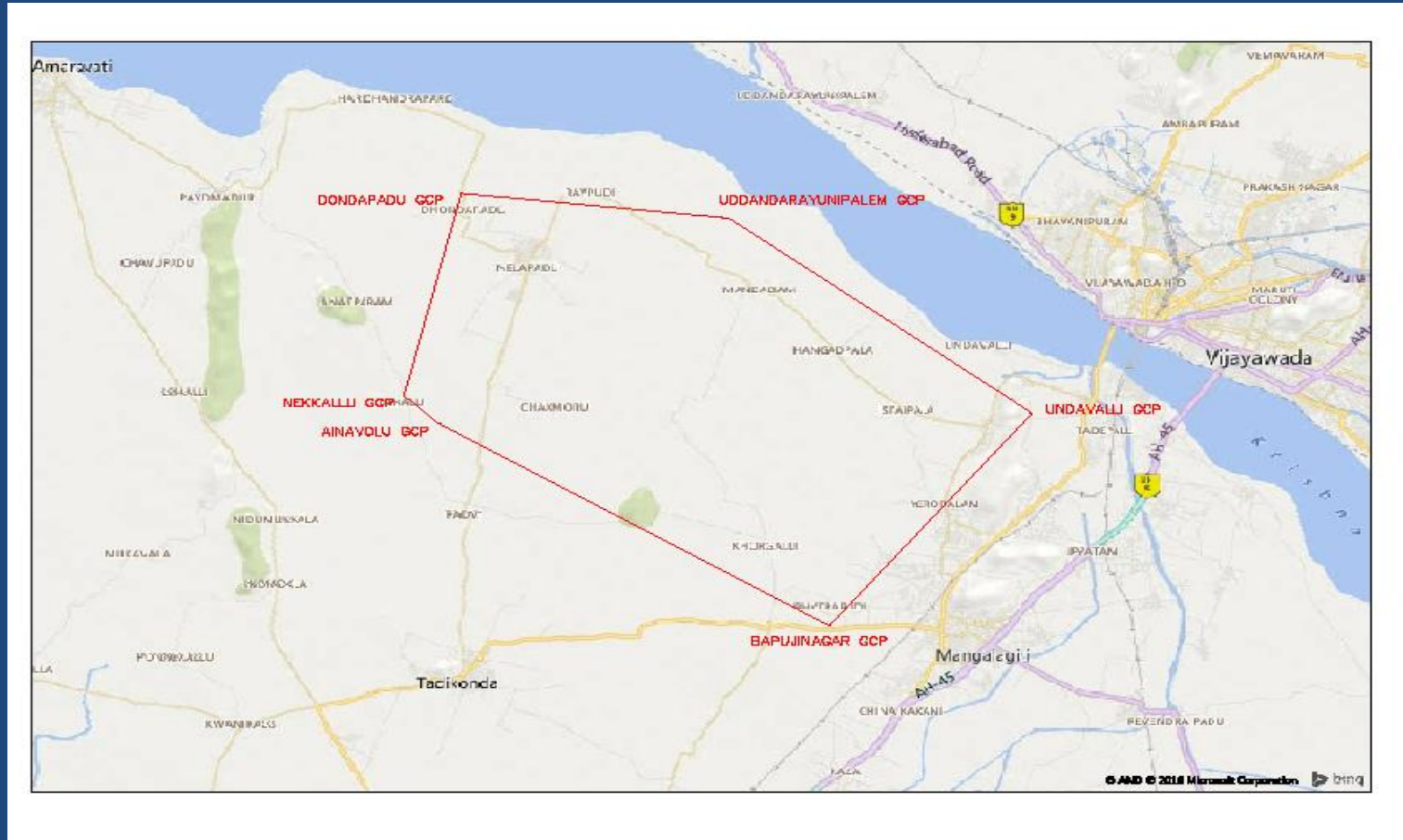


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DEMARCATED ROW AT TULLURU VILLAGE

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JUNE 2016 – ADDITIONAL CONTROL POINTS PROVIDED BY SOI

PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



JULY 2016 – FINAL DEMARCATION OF ROWS AND LAND PLOTS

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JULY 2016 – FINAL DEMARCATION OF ROWS AND LAND PLOTS

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SEPTEMBER 2016 – QC CHECK ON PLANTED BDY MARKS

PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



JULY 2017 – MEETING APCRDA SURVEYORS IN SITE OFFICE

PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



JULY 2017 – SITE INSPECTION

PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**



JULY 2017 – PLANTING CONCRETE MARK

PLANNING AND SURVEYING NEW CAPITAL CITY OF ANDHRA PRADESH, INDIA - **AMARAVATI**

Thank You

SEE SENG GUAN
SENIOR CONSULTANT, LAND SURVEY
SURBANA JURONG CONSULTANTS PTE. LTD