



# Company Profile

- **1994: JV formed for civil engineering consultancy**
  - COWI/KX A/s, Denmark(51%)
  - IFU, Denmark (24% )
  - IL&FS Infrastructure Dev Corp, India(25%)
- **1998: Start of mapping as a new segment of Business. Government approved Export Oriented Unit**
- **2001: Restructured to focus exclusively on mapping and GIS**
- **2002, Mapping production flourished with the start of OSGB & OSi contracts. Receives ISO 9001(2000) status**
- **May 2002: COWI acquires Kampsax A/S**
- **2004 : India's biggest production center for photogrammetric mapping**
- **2006: COWI/KX A/S, Denmark is increasing its share holding to 76% and KIL becomes COWI group member.**

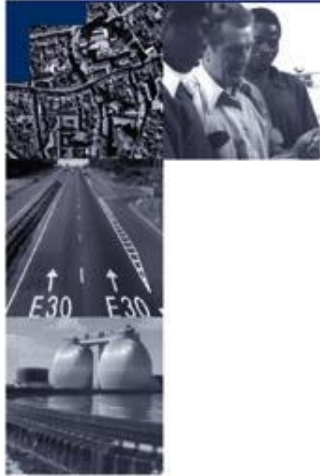




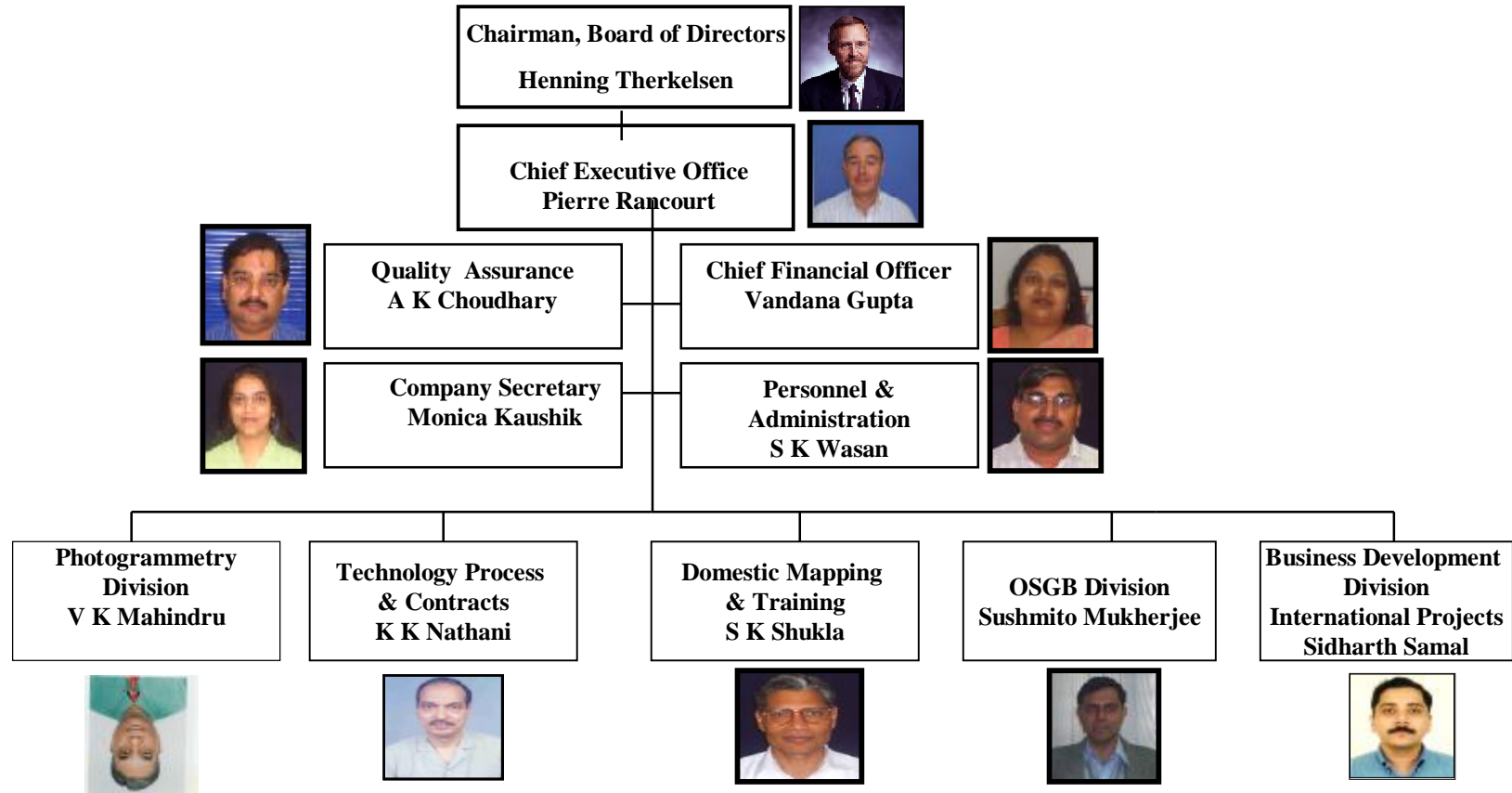
# Kampsax India (P) Limited

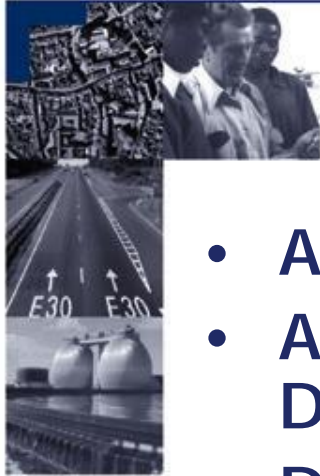
- 350 Photogrammetry, digital mapping & GIS specialist
- 2 & 3 shift production
- Over 250 work stations
- ISO 9001 (2000)
- In-house training school
- Produce over 90% of COWI Mapping Production requirements





# Organization Chart Of KIL

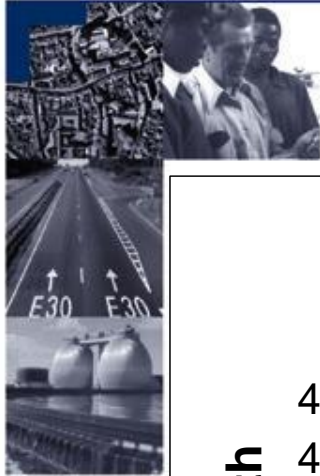




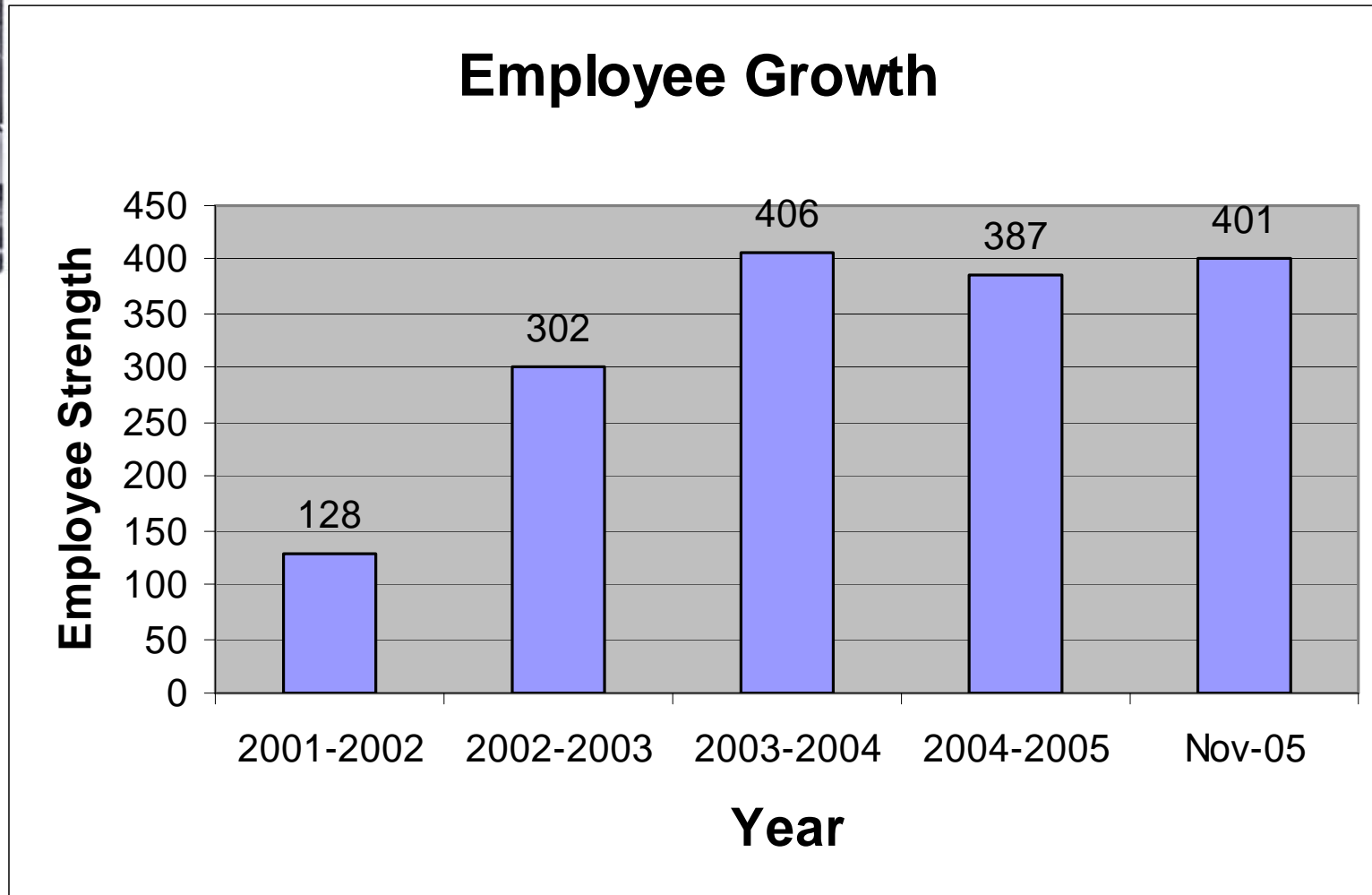
## Services Offered by KIL

- Aerial photography (At COWI)
- Aerial Triangulation and Adjustment for Digital/Analogue with GPS/INS
- Digital Terrain Models
- Orthophoto Generation
- Vector Mapping and preparation of GIS ready Digital maps
- Remote Sensing, Satellite image interpretation and preparation of base maps based on imagery
- Spatial Analysis through Geographical Information System
- Utility mapping
- Change detection in urban environment

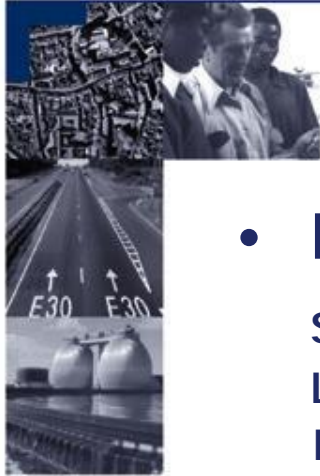




# Employee Growth



# Software



- **Photogrammetric Software**

Socet Set

LPS

INPHO (DT Master, MatchT, Match AT, Orthobox)

PhotoMod

VR1/2

MapCe

Bingo

Photoshop

- **CAD Software**

MicroStation

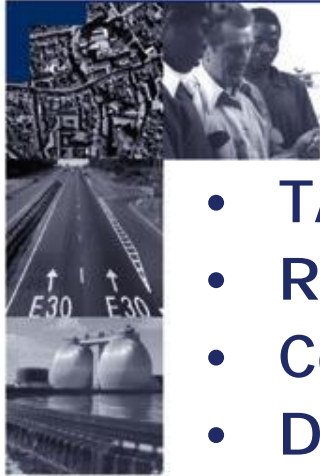
Auto CAD Map

Strumap

Pro600

Dangraf



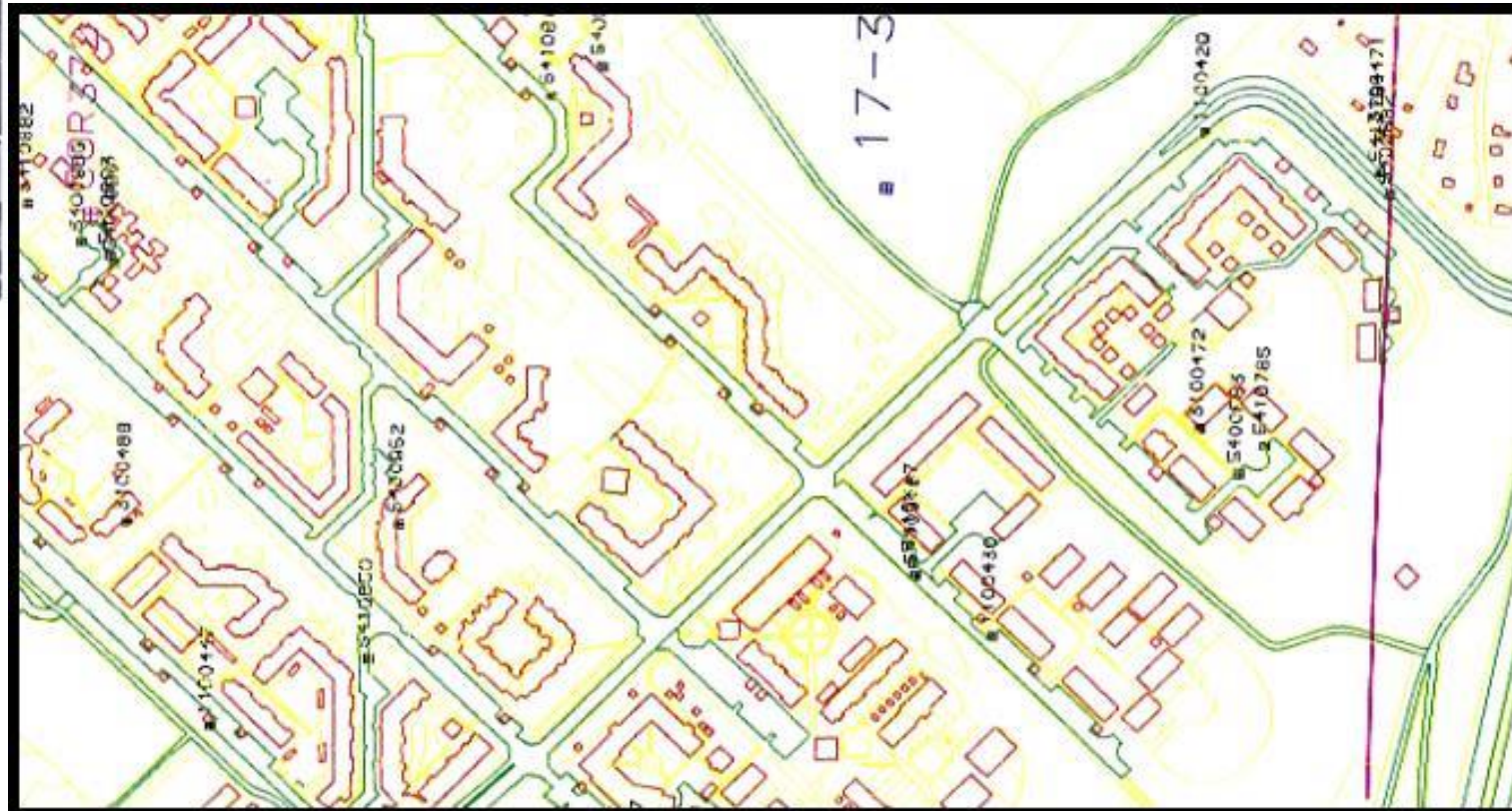
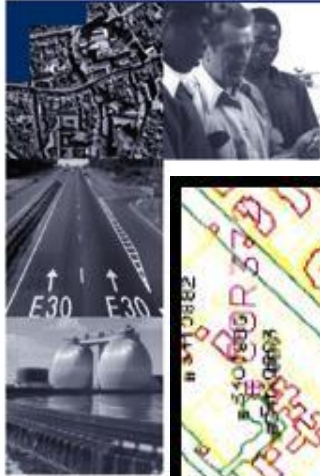


## PROJECT REFERENCES

- TASA 1998-02 75,000 Hrs.
- Railroad in DK 1998-99 6000 Hrs
- Coastal Authority 1999-00 1000 Hrs
- Dublin/Cork/Ireland 1999-02 15,000 Hrs
- Road Directorate 1999-02 10,000 Hrs
- DDO (Including AT) 1999-02 10,000 Hrs
- TK Mapping (DK) 1999-02 40,000 Hrs
- Domestic (NRSA-Hyd.) 2001-03 35,000 Hrs
- El Salvador 2001-03 40,000 Hrs
- OS Ireland 2001-04 75,000 Hrs
- Ordnance Survey-GB 2002-06 800,000 Hrs
- 2005 & onwards
  - Ordnance Survey
  - US Projects
  - Danish Domestic Projects
  - Indian Market



# Municipalities of Denmark



**Danish Technical Maps-TK Mapping**  
**15000 to 20000 Hrs/Year**







# TASA-UTILITY MAPPING

## ARGENTINA



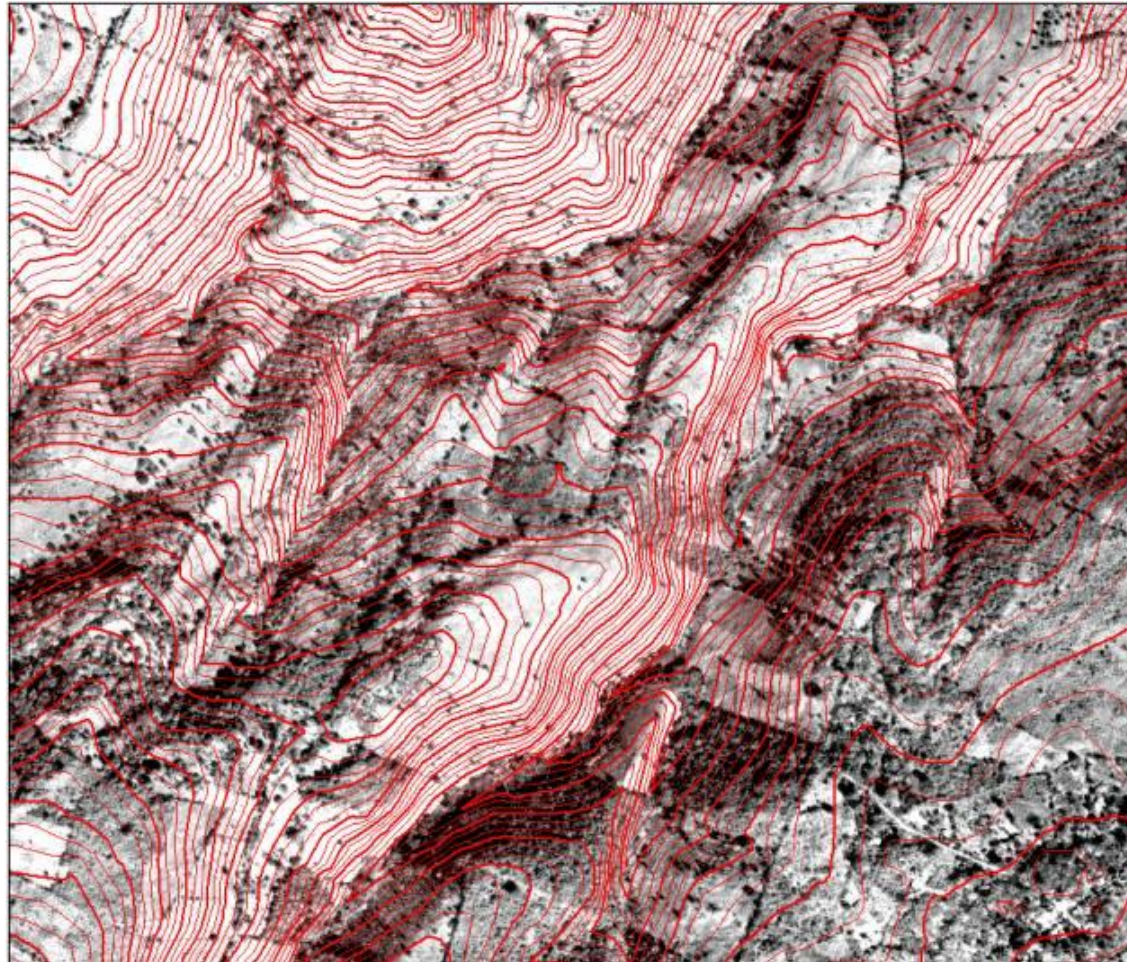
**AREA : 33,000 Ha**

**SCALE : 1:8000**





# ELSALVADOR PROJECT



Planimetric Data Capture and Digital Terrain

Model for Cadastral Mapping



# Orthophoto



Aerial Triangulation Adjustment, Digital Terrain Model,  
Orthophoto Production for Danish Digital Orthophoto and  
Ordnance Survey Great Britain





# ROAD PROJECT, DENMARK



**AREA : 410 KM**

**SCALE : 1:5000**





# 1-Meter Resolution Satellite Imagery (Urban Area)



Mapping for part of about 60 Indian Towns for Mobile Telephone Company

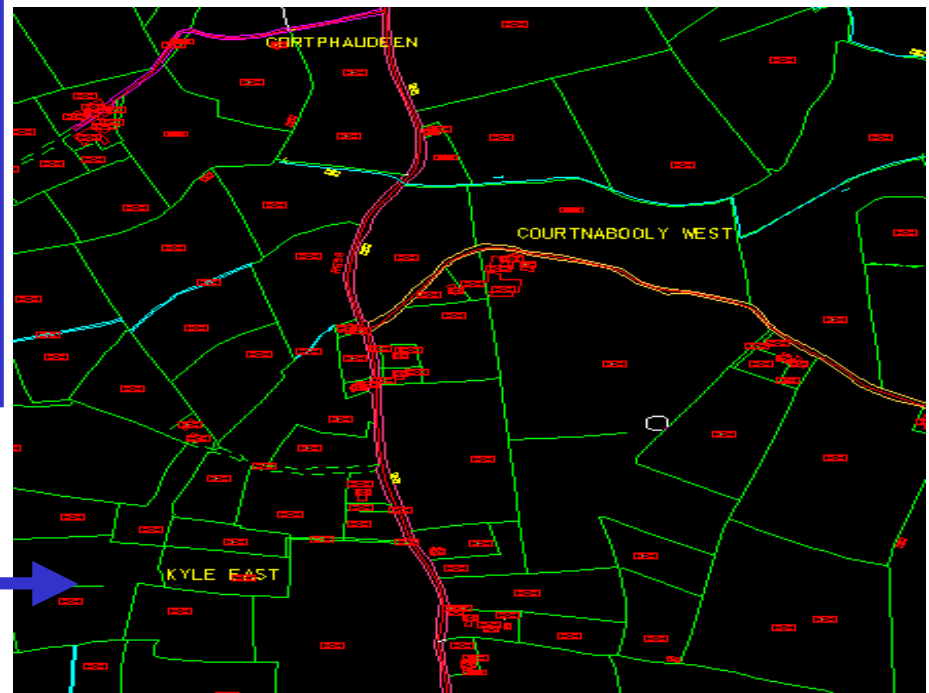
KIL also contributed for design of Mapping Specifications



## Ordnance Survey Ireland

Mapping of Ireland on 1:5,000 mapping Scale, The interesting part of this project is that, we have following references for mapping except world class specification provided by client.

Photography Information	1:40,000	Latest
Old Raster	1:2,500	100 yrs old map
Series Map	1:50,000	Classification & feature identification
Final Product	1:5,000	(Latest & high accuracy Map with all information )



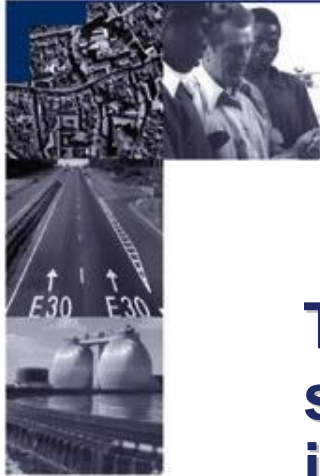


# Ordnance Survey Ireland

## Project Description

- 1:5000 scale mapping from color aerial images in the scale of 1:42000.
- COWI-Kampsax to produce about 800 map sheets covering about 12000 sq km over a period of 3 years.
- Mapping to be based on old 1:2500 cadastral maps available in raster form
- Real world changes are identified and captured from the imagery and features, which have not changed like cadastral plot boundaries, are traced off the old raster maps.





# Innovations at Kampsax India- New Production Methods

The need to maintain the shapes of features such as cadastral boundaries resulted in innovations at Kampsax India for development of new production method. The other reasons include:

- To make use of any vector data previously produced
- To retain the shape of various features as appearing in raster TIFF files
- To introduce automation in production flow thus making operators job easier
- To achieve consistency in plotting







# New Production Methods

## Step-1

- Input of Vector data of coarse accuracy
- 2D Digitizing of the raster TIFF files from scanned paper maps
- Most of the features are digitized; water bodies & buildings are avoided at this stage

## Step-2

- Carry out Automatic Terrain Extraction in SocetSet for the models falling in the map-sheet
- Obtain the result of DTM in TIN format





# New Production Methods

## Step-3

- Automatic program merges Z value from TIN data with X,Y values from 2D digitized file
- The Z value of corresponding X, Y points is obtained from the functional library provided in SocetSet

## Step-4

- 3D vector data so obtained is now ready for Positional Accuracy Improvement





# New Production Methods

## Step-5

- Add links based on the displacement provided between vector data and 3D stereo model
- Generate triangles automatically by in-house program
- Run program for Positional Accuracy Improvement
- Repeat step 3 for improved Z accuracy

## Step-6

- Run smoothening filter for heights to remove distortions





# New Production Methods

## Step-7

- Multi Coding of the features
- Carry out 3D digitization for the remaining features

## Step-8

- Carry out quality check for accuracy (Planimetry & Height)





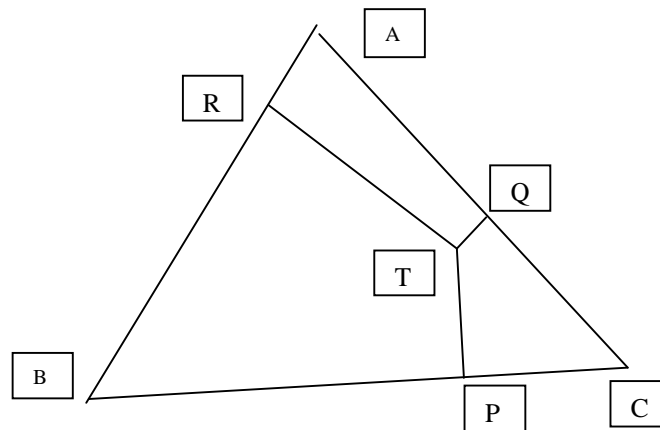
## **PAI (Positional Accuracy Improvement)**

- **This tool is designed for OSi project to improve the absolute accuracy within the range of 1 meter.**
- **Positional Accuracy Improvement (PAI) is a kind of transformation of the data in which the following accuracy must be with in the limits**
  - 1. Relative accuracy**
  - 2. Absolute accuracy**
  - 3. Geometric fidelity**
- **This is achieved through triangle based transformation approach**





# PAI (Positional Accuracy Improvement)



The  $W_t$  are calculated as follows

$$W_{tA} = TP / (TP + TQ + TR)$$

$$W_{tB} = TQ / (TP + TQ + TR)$$

$$W_{tC} = TR / (TP + TQ + TR)$$

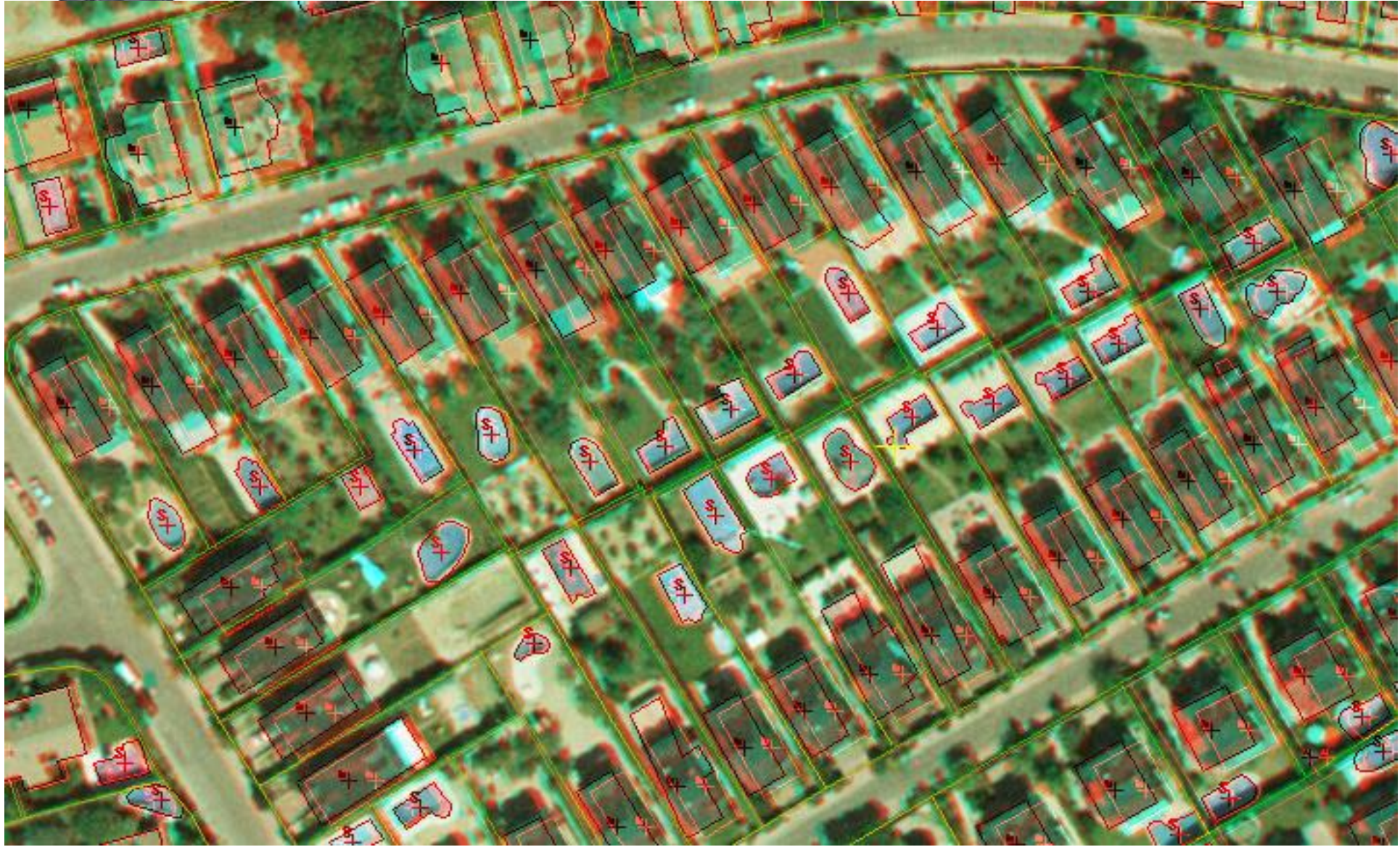
**The most important outcome of PAI is that it improves the absolute accuracy without disturbing fidelity of objects, thereby it maintains the topology.**

**For this above process we use auto correction program to maintain the geometrical fidelity**



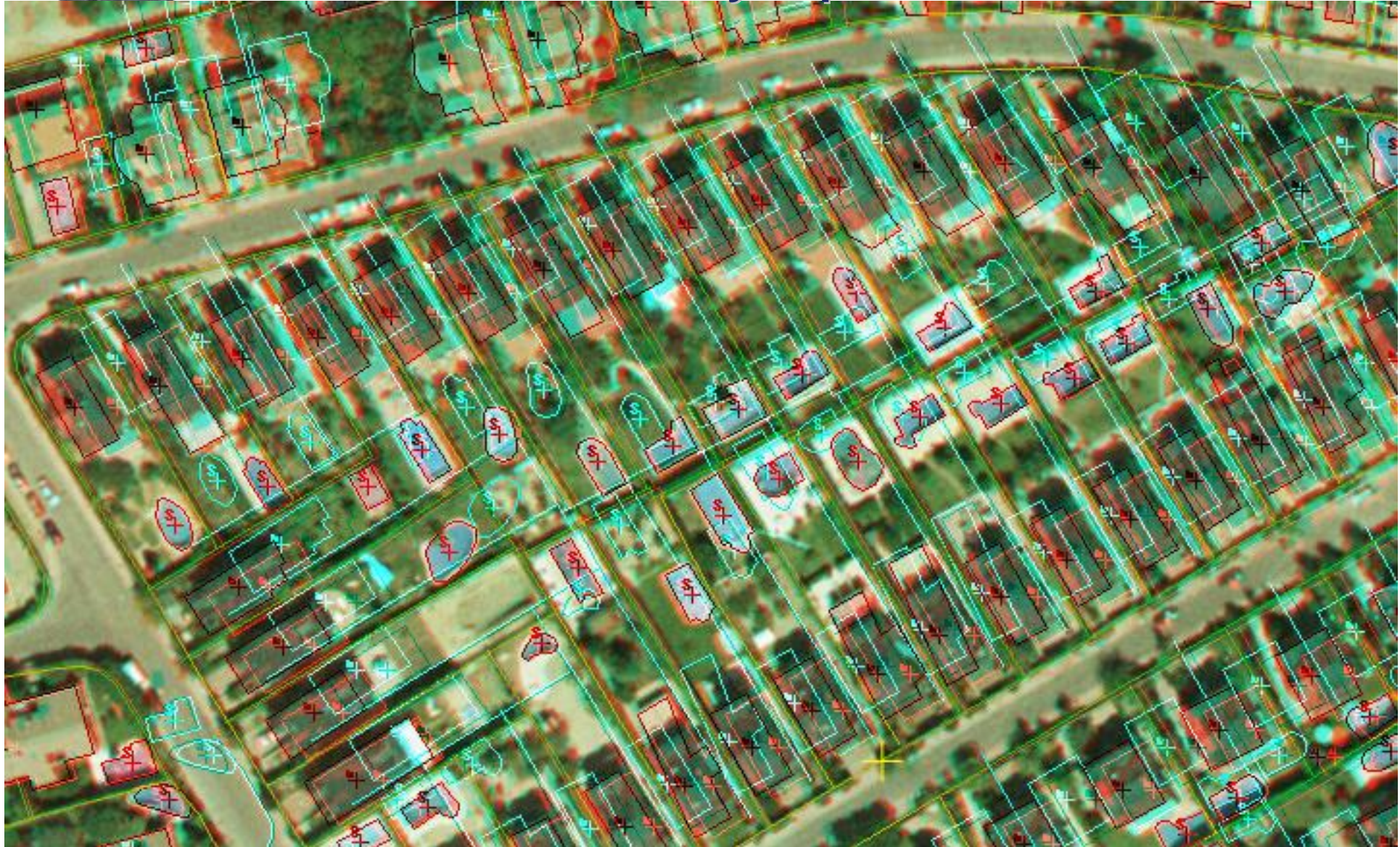


# 3D Data Rectified after Positional Accuracy Improvement

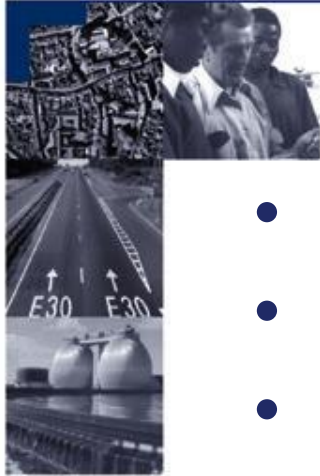




# Vector Data Before and After Positional Accuracy Improvement







# New Areas

- 3D City Modelling
- Preparation of True Orthophotos
- Compatibility with LIDAR Data
- Web Based Geo-Spatial Data Applications
- Real Time Location Based Services
- Satellite Imagery including Stereo Satellite Data Processing





## Research & Development

- Monitoring latest technology trends, forecasting and adopting state-of-art process and technology
- Reliance on in-house software development
- Increasing productivity through automation
- developing software tools for better quality control
- Adopting best practices on advise of clients as part of co-creation of values

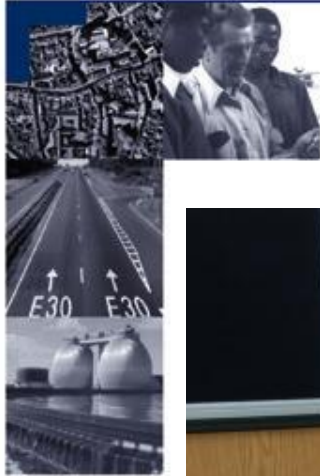




# STRENGTHS

- Technical support - COWI with 40 years mapping & GIS experience
- Detailed Project References
- Fully trained photogrammetric operators
- Backing of financial institution (IFU)
- ISO 9001 Quality procedures in place
- In-house Training School
- Low cost high quality output
- Experience in working on variety of Software





## Largest Photogrammetric facility in 3 shifts



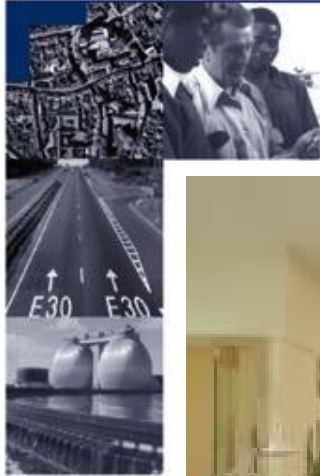


# India in the 3D era



**Director General Ordnance Survey Great Britain –  
Visit to KIL**





## Oct 2004 : KIL Completes 10 years



**Visit of Deputy Prime Minister and Minister for  
Economics and Business Affairs, H.E. Mr. Bendt  
Bendtsen to KIL on Oct 14**

