



# Locating & Marking

## Electronic Marking System - EMS



# Dynatel 2200ME-iD Series Locators and iD Markers



**Locating**



**Fault Finding**



**Electronic  
Marking**





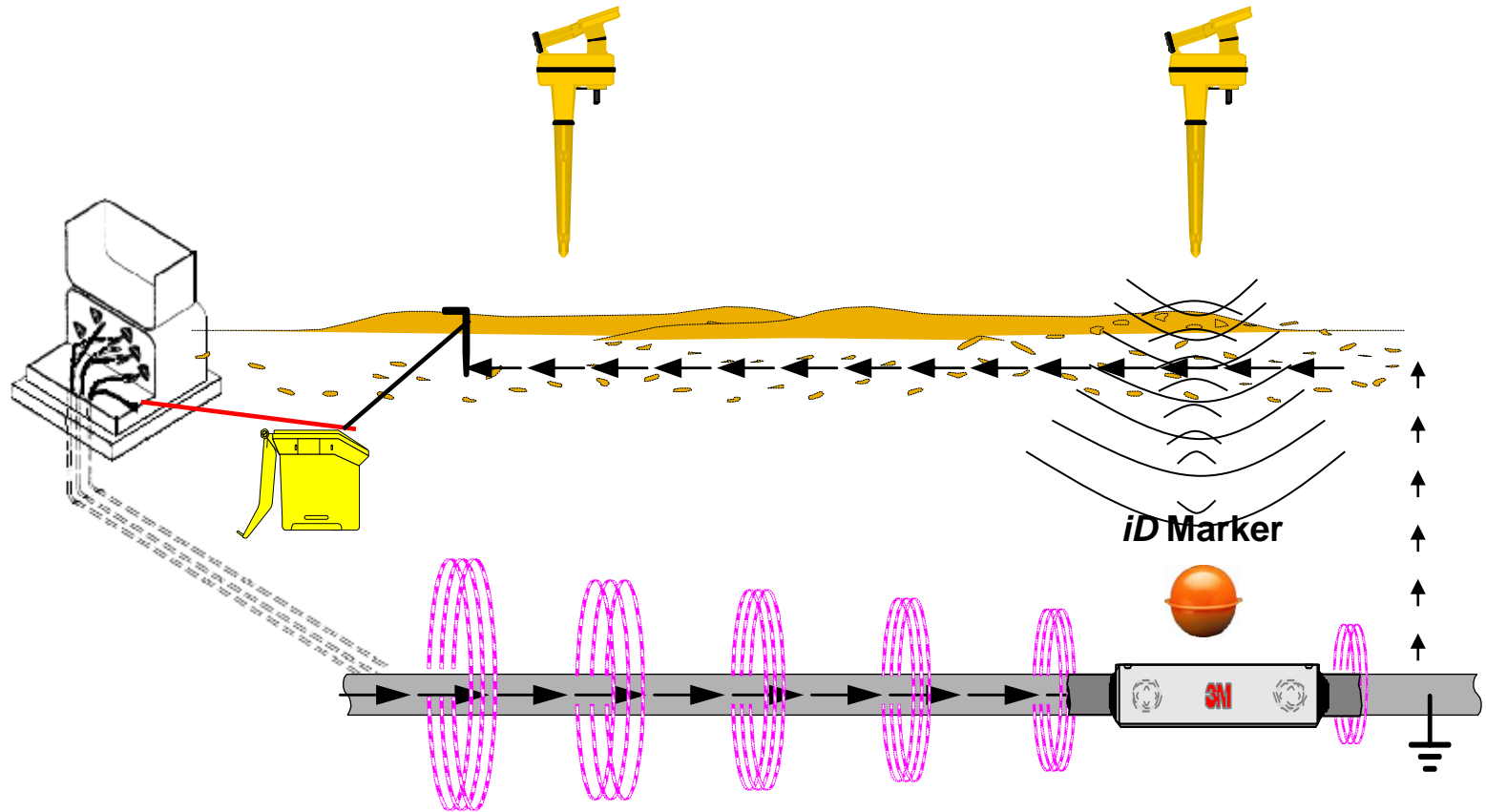
# Model features

Model	Marker locate	Cable locate	Fault locate
1420E	X	-	-
2220M	-	X	-
2250M/E	-	X	-
2250M-iD/E	X	X	-
2273M/E	-	X	X
2273M-iD/E	X	X	X





# General Overview



# Marker Locate

- Mark special points in the infrastructure
- Pinpoint event
- Used for marking path of non-metallic installations
- No external disturbances
- Locate done with marker locator

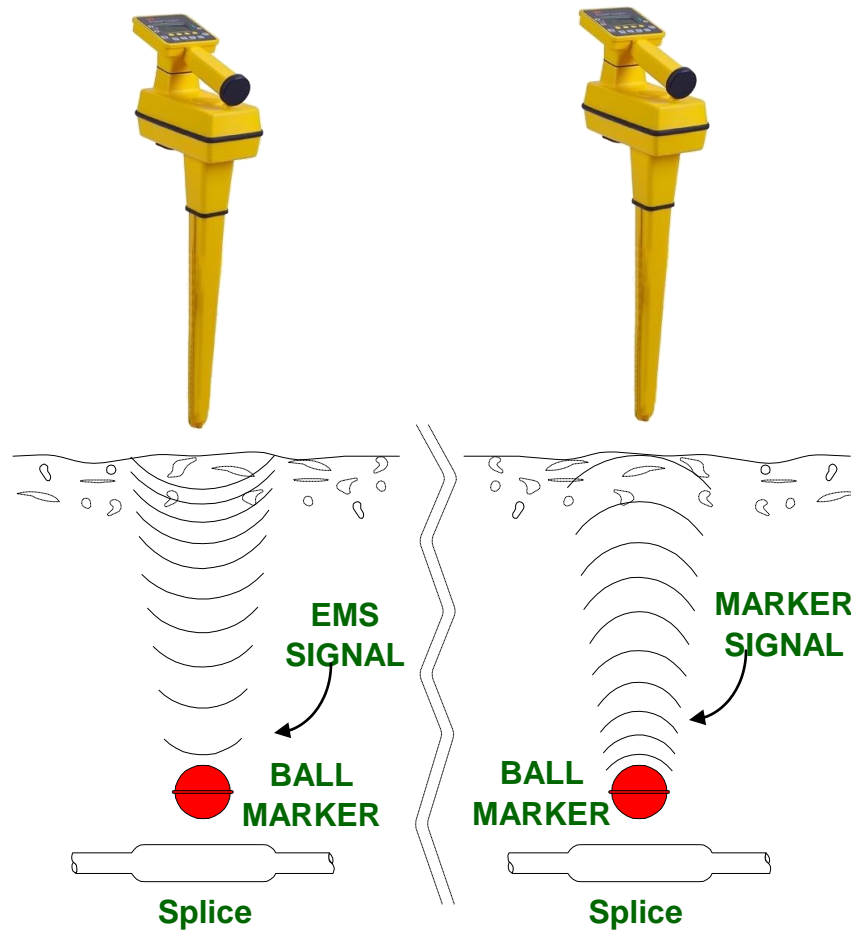


# Marker System

- **Marker:**
  - Passive electronic resonator
  - Different shapes and frequencies available
- **Marker Locator:**
  - Combination RCVR / XMTR
  - Audio and visual indication of marker
  - Available in combination with cable locator

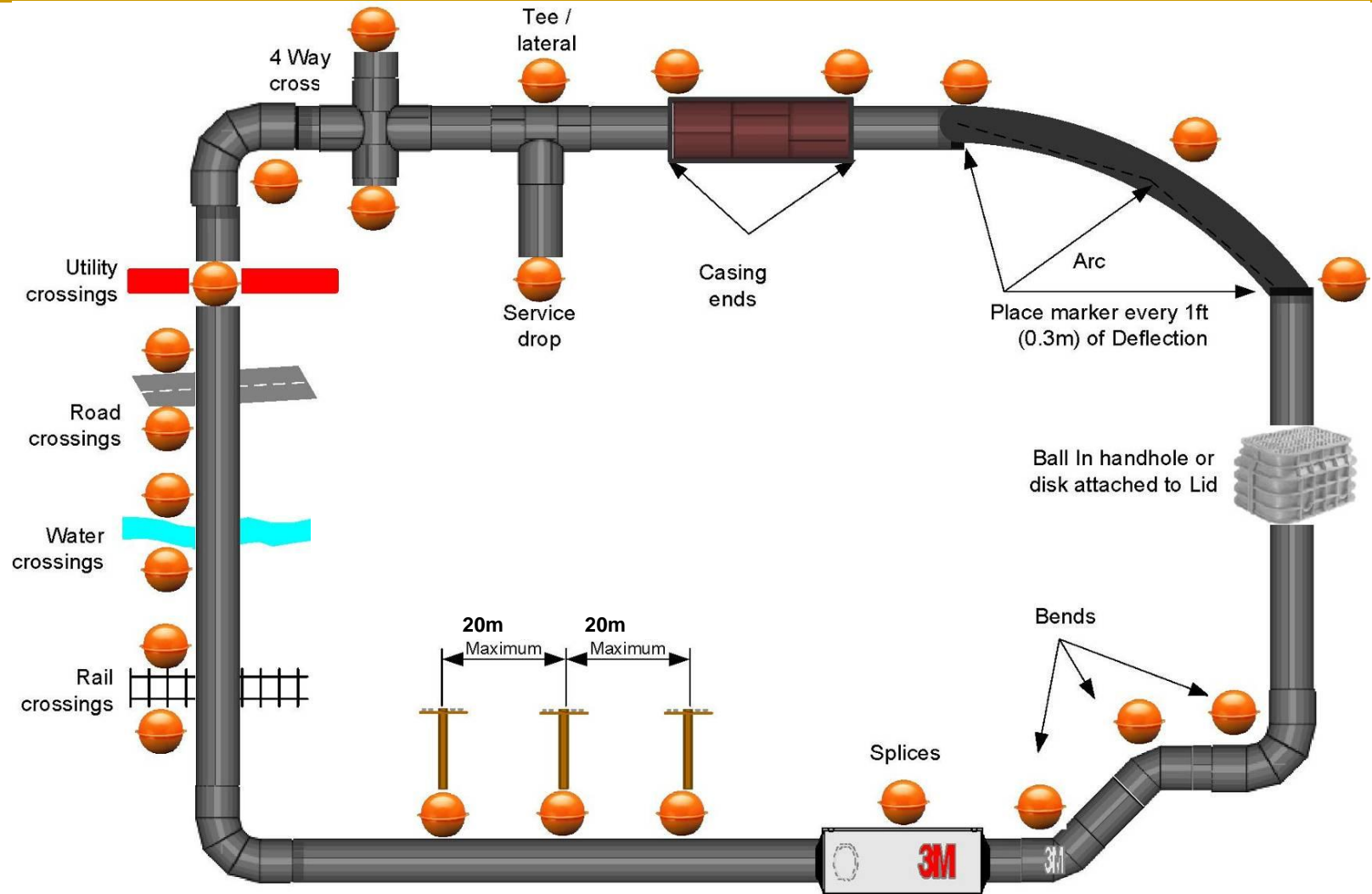


# Principle





# Communications Network Marking



**Crossings**  
- Water  
- Major roads  
- Rail

**Service Stubs & Drops**  
All Types of Splices  
Repair Splices  
Transition Splices

**Breakouts, Laterals & Tees**  
Empty Conduit Banks & Openings  
Fiber Optic Lines  
Handholes and Manholes

# Near Surface Marker



Max. depth = 0,6 m

Horizontal or vertical orientation

Service	Color	Frequ.	Available
Gen. Purp.	pink	66 kHz	no
CATV	or./bl.	77 kHz	no
Gas	yellow	83 kHz	yes
Telephone	orange	101 kHz	yes
WW	green	121 kHz	yes
Water	blue	145 kHz	yes
Power	red	169 kHz	yes*



# Ball Marker

Max. depth = 1,5 m

Self-levelling



Service	Color	Frequ.	Available
Gen. Purp.	pink	66 kHz	yes
CATV	or./bl.	77 kHz	yes
Gas	yellow	83 kHz	yes
Telephone	orange	101 kHz	yes
WW	green	121 kHz	yes
Water	blue	145 kHz	yes
Power	red	169 kHz	yes*



# Full Range Marker



Max. depth = 2,4 m

Horizontal orientation

Service	Color	Frequ.	Available
Gen. Purp.	pink	66 kHz	no
CATV	or./bl.	77 kHz	no
Gas	yellow	83 kHz	yes
Telephone	orange	101 kHz	yes
WW	green	121 kHz	yes
Water	blue	145 kHz	yes
Power	red	169 kHz	yes*



# Mini Marker

Max. depth = 1,8 m

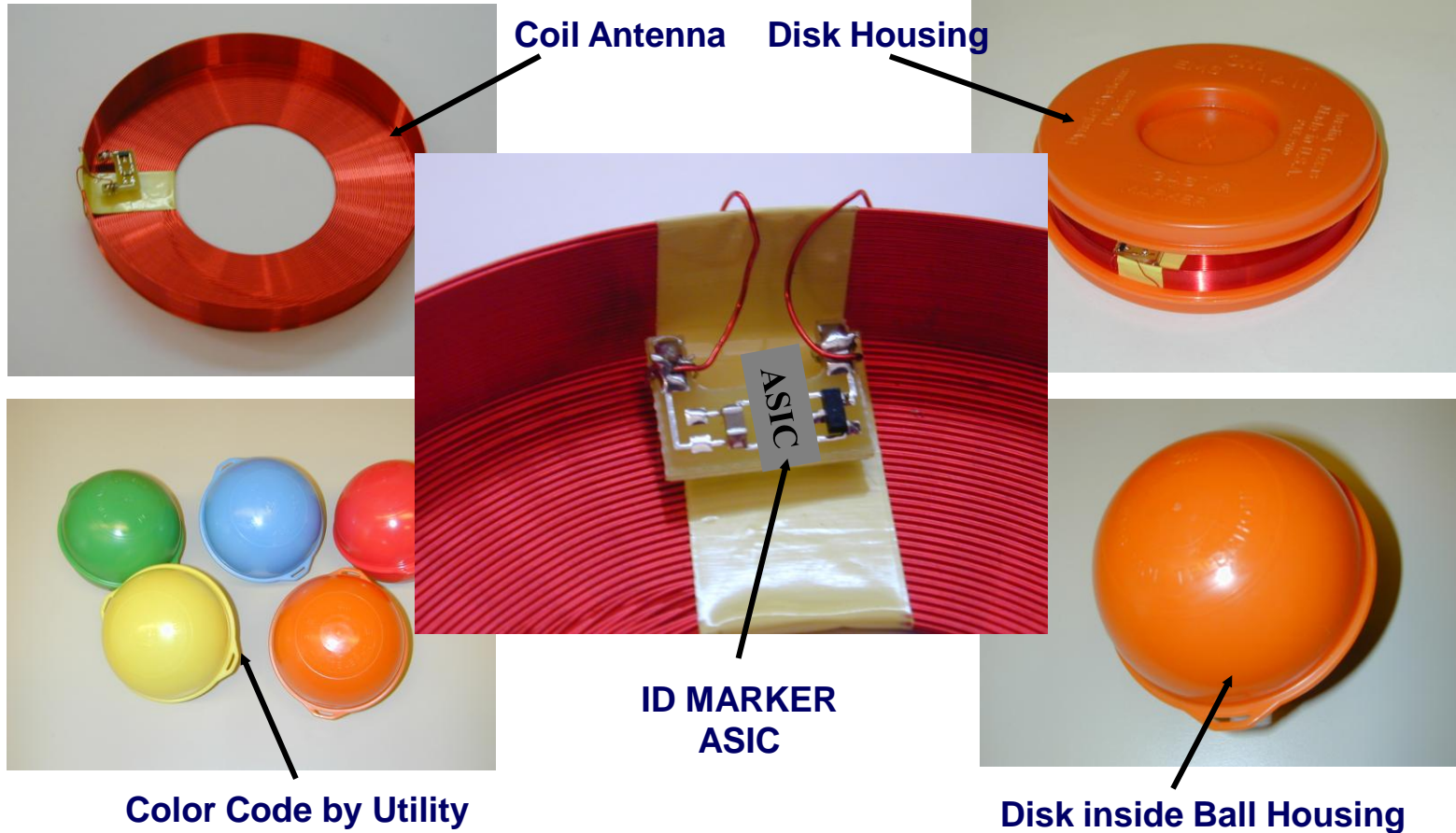
Horizontal orientation



Service	Color	Frequ.	Available
Gen. Purp.	pink	66 kHz	no
CATV	or./bl.	77 kHz	no
Gas	yellow	83 kHz	yes
Telephone	orange	101 kHz	yes
WW	green	121 kHz	yes
Water	blue	145 kHz	yes
Power	red	169 kHz	yes*



# *iD* Marker Technology





# Near Surface iD-Marker



Read depth = max. 0,6 m

Write distance = 0,3 m

Horizontal or vertical

10 digit serial number

192 Bit user data memory

Data lock function

Service	Color	Frequ.	Available
Gen. Purp.	pink	66 kHz	yes
CATV	or./bl.	77 kHz	no
Gas	yellow	83 kHz	yes
Telephone	orange	101 kHz	yes
WW	green	121 kHz	yes
Water	blue	145 kHz	yes
Power	red	169 kHz	yes*



# iD Ball Marker

Read depth = max. 1,2 m

Write distance = 0,3 m

Self-levelling

10 digit serial number

192 Bit user data memory

Data lock function



Service	Color	Frequ.	Available
Gen. Purp.	pink	66 kHz	yes
CATV	or./bl.	77 kHz	yes
Gas	yellow	83 kHz	yes
Telephone	orange	101 kHz	yes
WW	green	121 kHz	yes
Water	blue	145 kHz	yes
Power	red	169 kHz	yes*



# Full Range iD-Marker



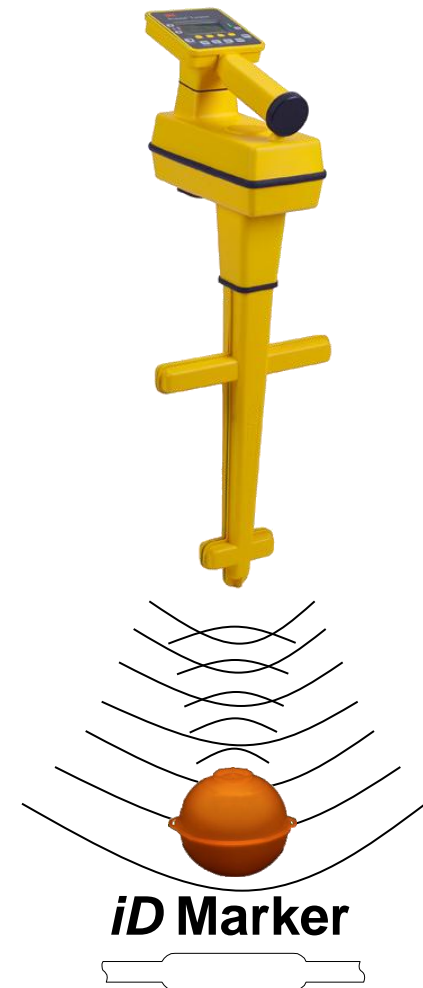
Read depth = 2,2 m  
Write distance = 0,3 m  
horizontal Orientation  
10 digit serial number  
192 Bit user data memory  
Data lock function

Service	Color	Frequ.	Available
Gen. Purp.	pink	66 kHz	yes
CATV	or./bl.	77 kHz	no
Gas	yellow	83 kHz	yes
Telephone	orange	101 kHz	yes
WW	green	121 kHz	yes
Water	blue	145 kHz	yes
Power	red	169 kHz	yes*

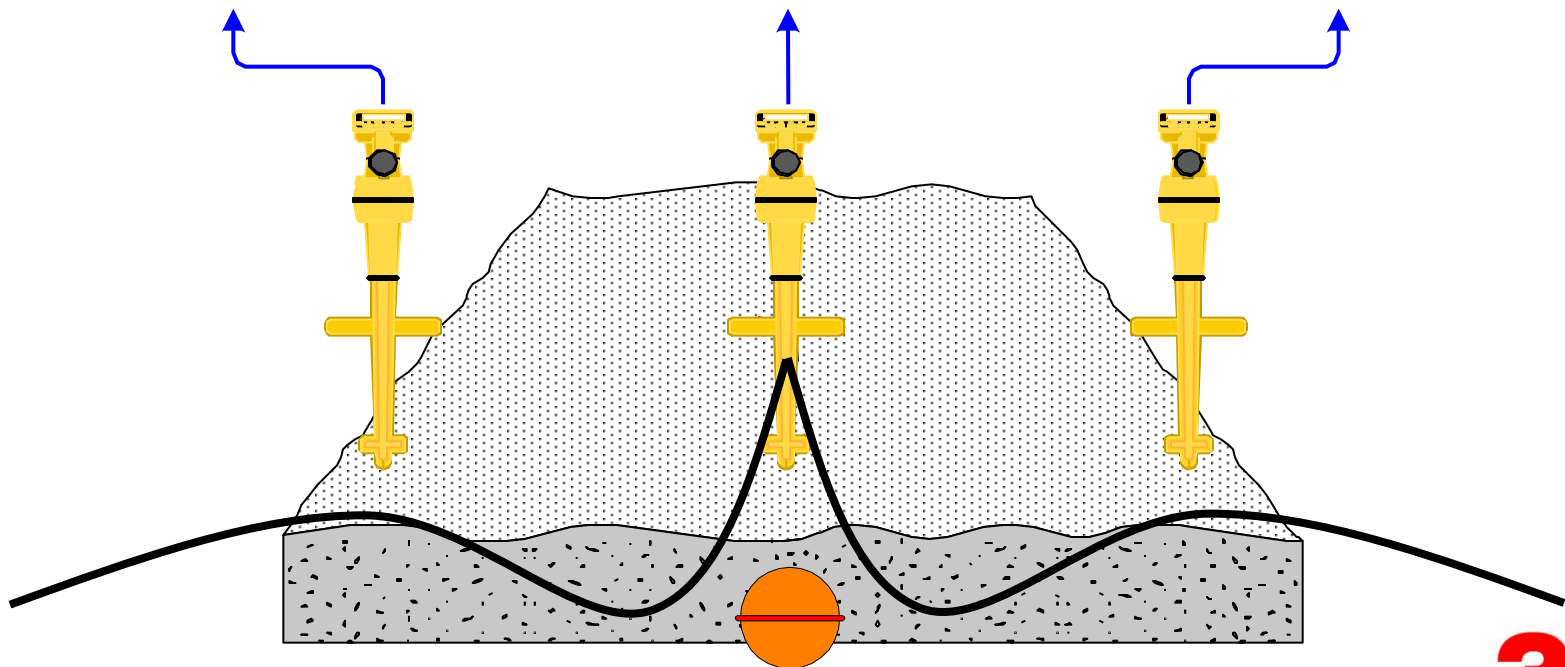
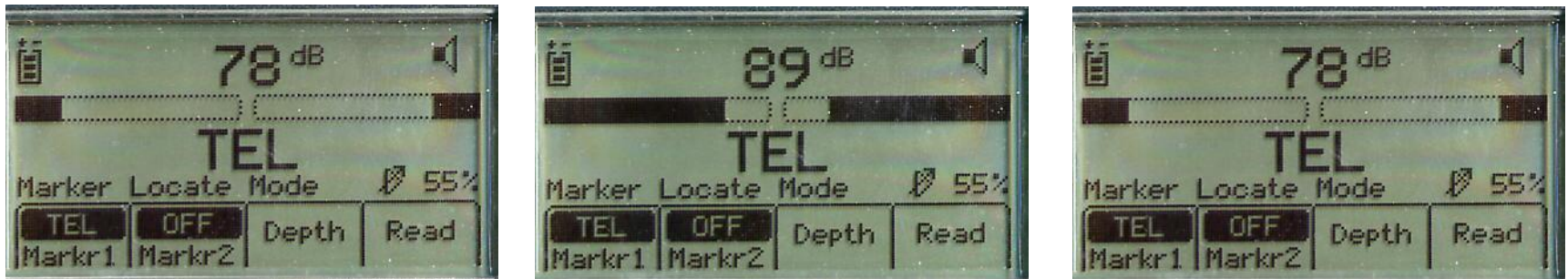


# iD-Locators

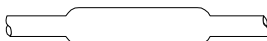
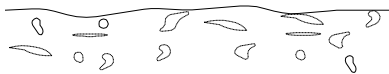
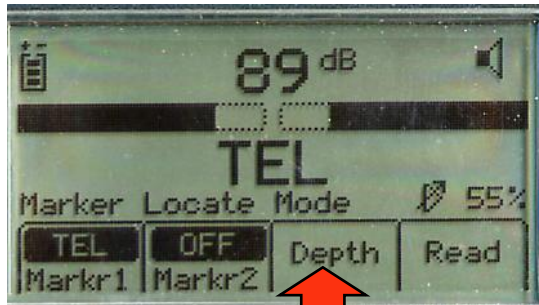
- Compatible with existing markers
- One unit for all frequencies
- Scans two marker frequencies simultaneously
- Depth estimate on markers
- Memory storage with date/time stamp:
  - Read marker records: 100
  - Written marker records: 100
- User defined ID templates 32
- GPS/GIS support
- *PC Locator Tools* software for PC based marker programming and glossary management



# Signal Response



# Marker Depth Estimate

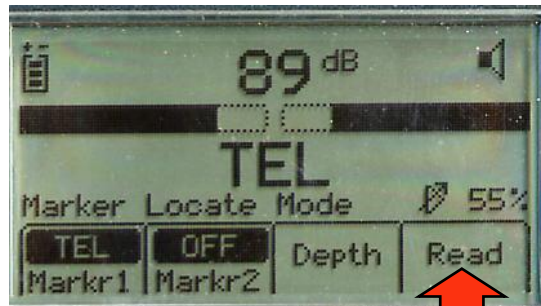


Splice





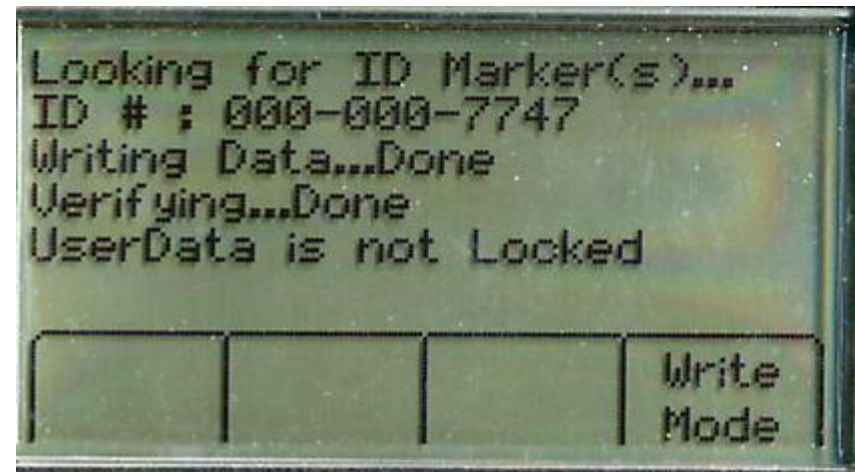
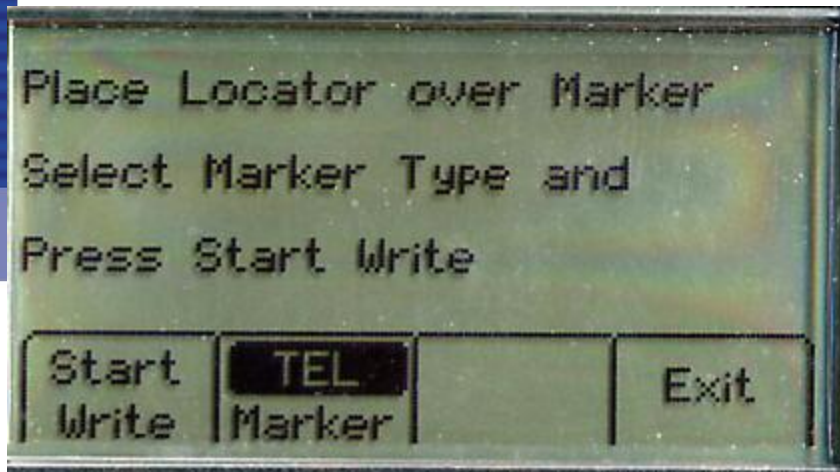
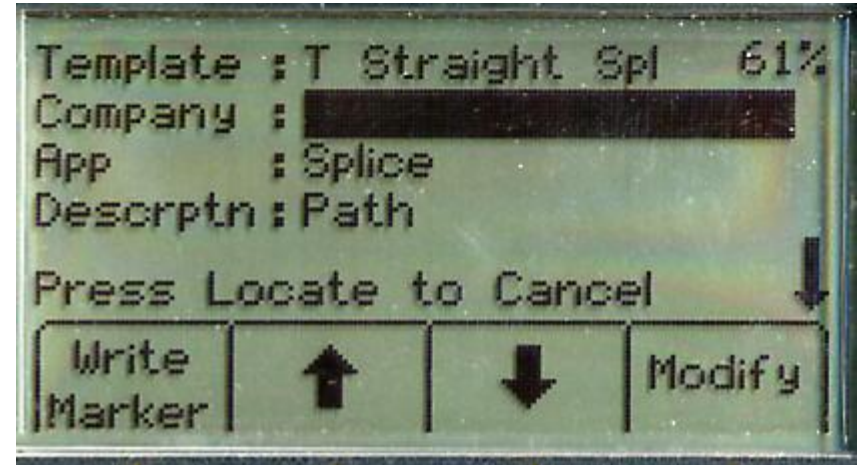
# iD Marker Read



Splice



# iD Marker Write



# PC Locator Tools













# Locating & Marking

Enhanced Asset Management using GPS + Dynatel



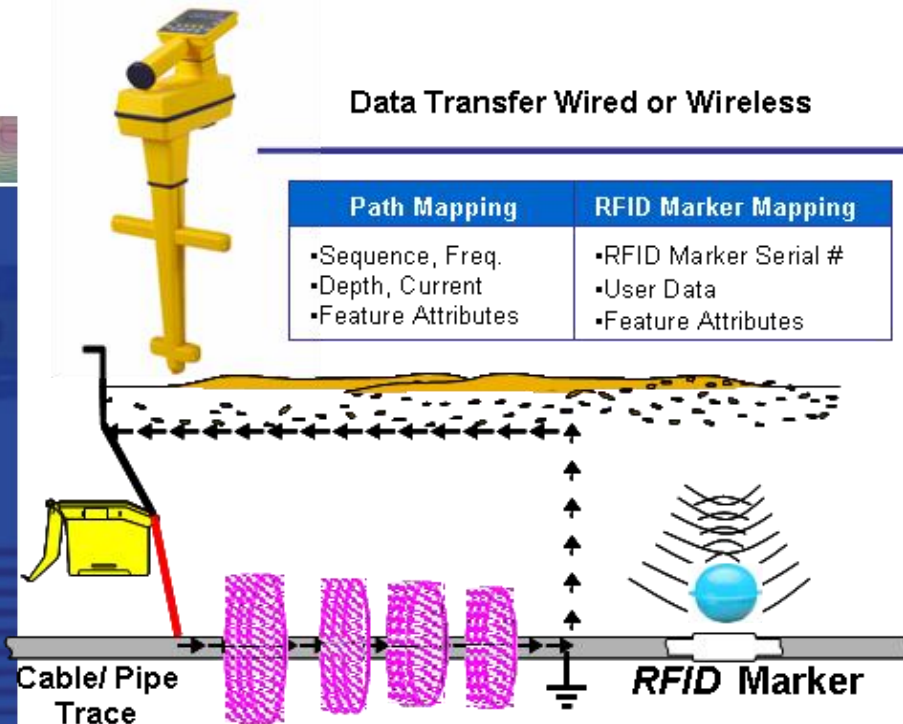


# GPS/GIS Implementation Overview

## Type 2



# ARCPAD and Path Marking



- Mapping solution for new and legacy facilities
- Maps facility path in x,y,z
- Simple operation for generalist workforce
- Arcpad runs on 20 standard handheld devices
- Support for 15 languages

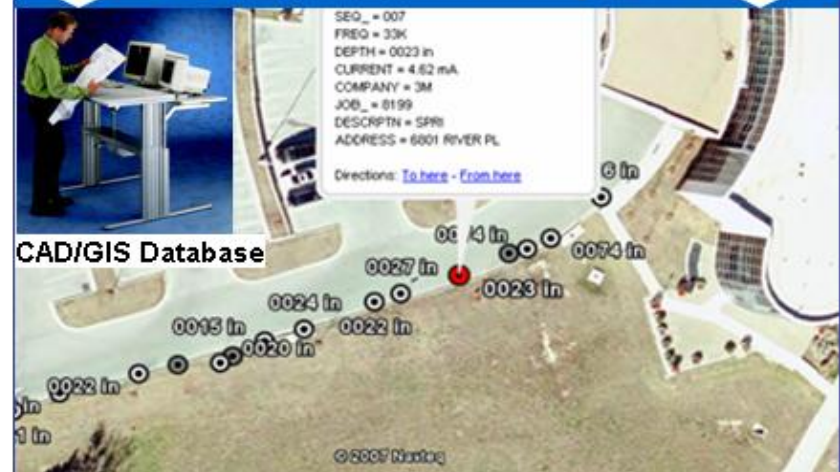
**Handheld GPS Units - Open System**  
Windows Mobile GPS Units - Arcpad



**Magellan MobileMapper**

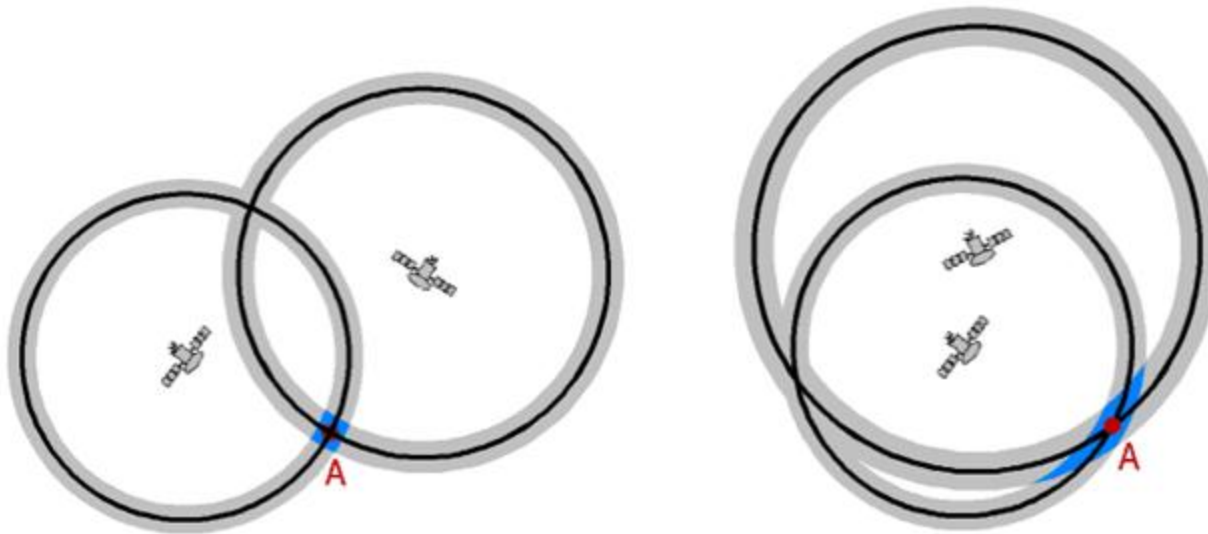


**Export to CAD and GIS Systems**



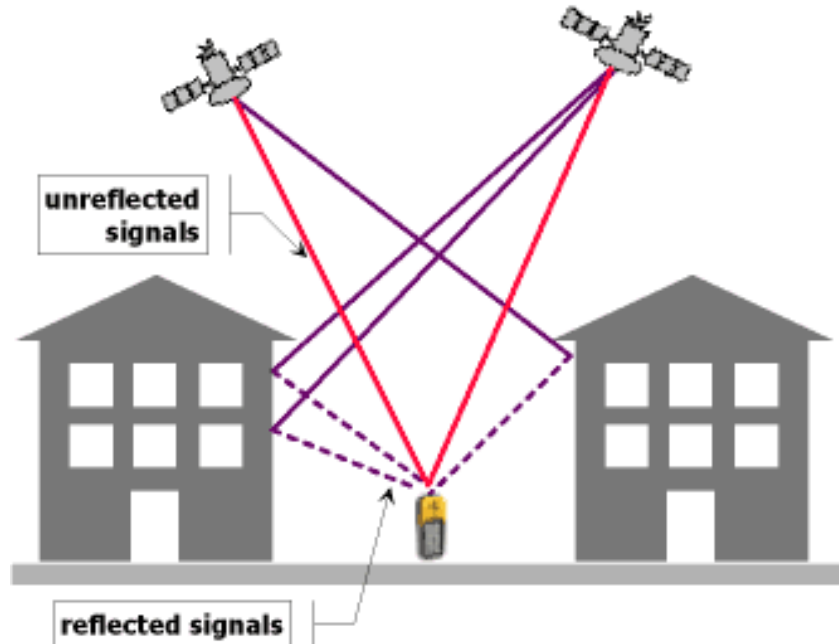
# GPS Locating Challenges

- Many factors can affect GPS accuracy
  - *Number AND location of satellites*



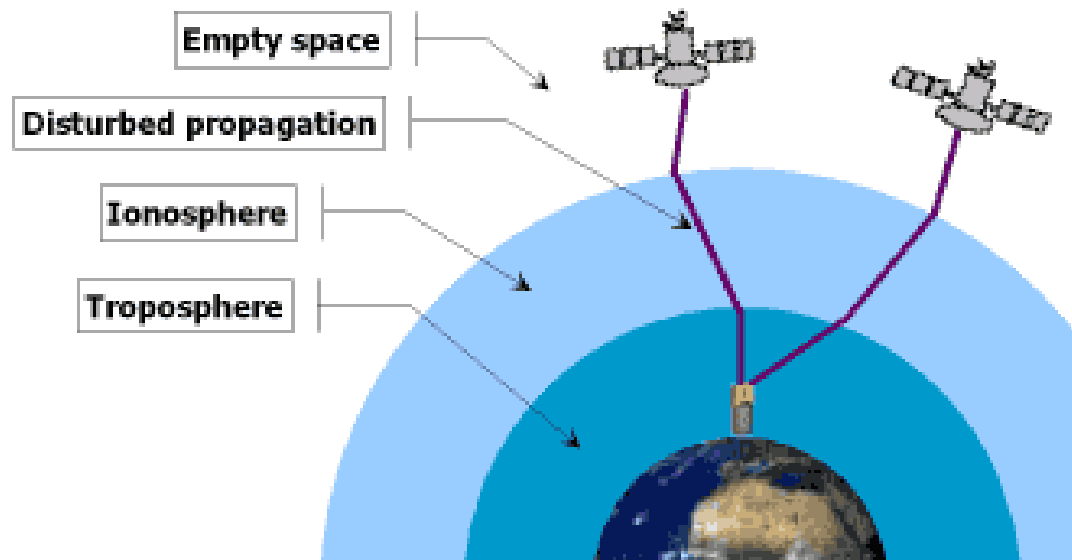
# GPS Locating Challenges

- Many factors can affect GPS accuracy
  - *Multi-path or “ghosting” (signal reflection)*



# GPS Locating Challenges

- Many factors can affect GPS accuracy
  - *Varying atmospheric conditions*



# GPS Locating Challenges

- Many factors can affect GPS accuracy
  - *Number AND location of satellites*
  - *Multi-path or “ghosting” (signal reflection)*
  - *Varying atmospheric conditions*
- Typically operated by trained professionals, when higher accuracy is required.
- Cold-starting and lock time on at least 4 satellites can be time consuming







1 inch equals 134 feet

Subdivision Development  
*Pre Development*

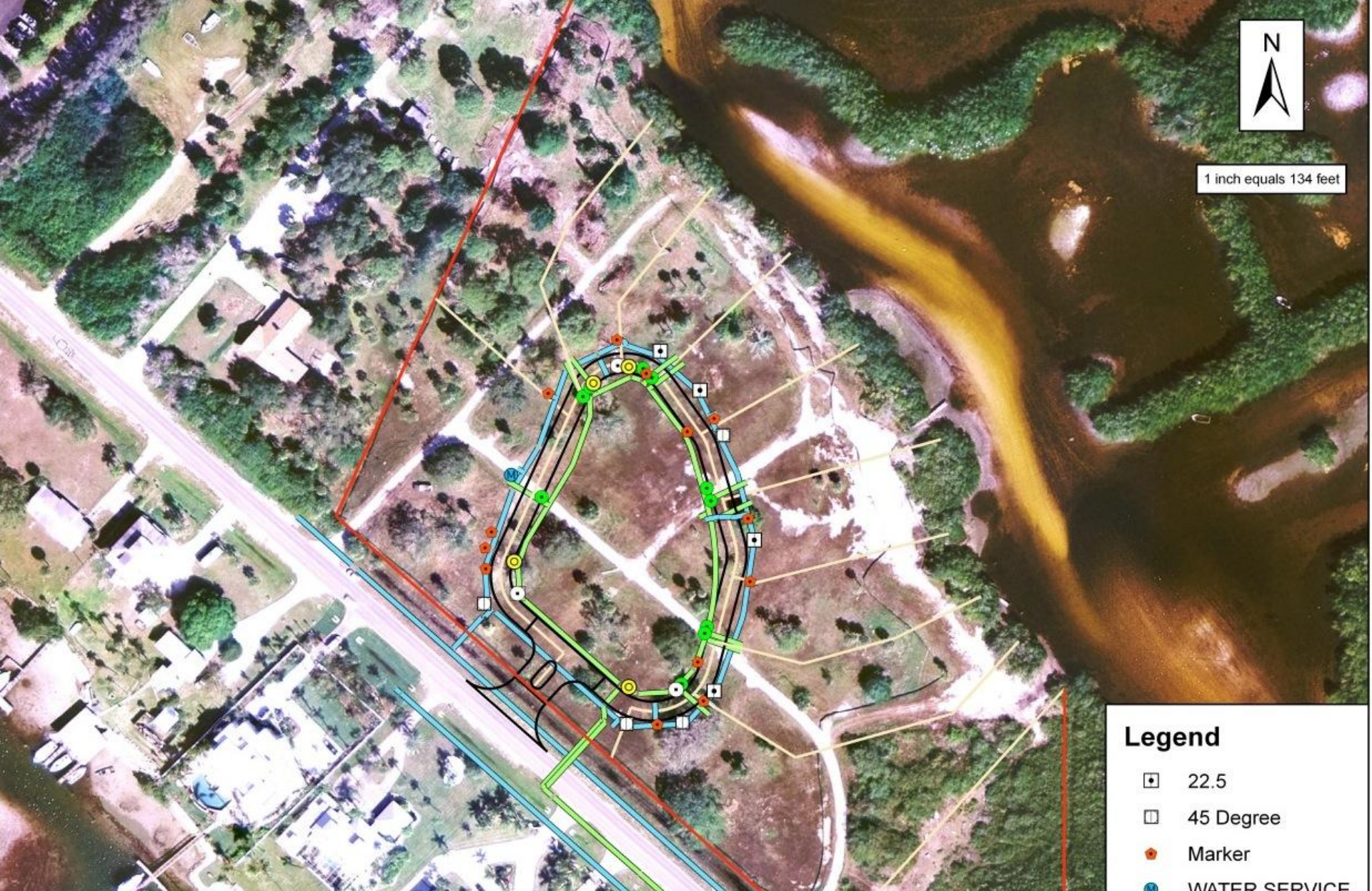




1 inch equals 134 feet

Subdivision Development  
*Aerial Image with CAD Overlay*





# Subdivision Development

## *CAD Overlay W/Electronic Markers*



# EMS-iD Marking System - Mobile Mapper Upload

The screenshot shows the MobileMapper Office interface. A map displays two markers with IDs 0000016711 and 0000016710. A green oval labeled 'Selected ID Marker' points to the 0000016710 marker. Another green oval labeled 'GPS Data' points to the 0000016711 marker. A third green oval labeled 'Marker GIS Data' points to the 0000016710 marker. An 'Export GIS Data' dialog box is open, showing the 'Look in' folder as 'GisImages' and the 'To Folder' as 'Program Files\MobileMapper Office\GisImages\'. The 'Files of type' dropdown is set to 'Feature Library Files (\*.mmf)', and a list of file formats is shown, including '3D-Shape Files (\*.shp)'. A green oval labeled 'GIS Data can be Exported to Industry Standard GIS Formats' points to this list. On the right, a 'Feature Properties' window displays the following data:

Property	Value
Feature	Marker
Geometry	Point
<b>Observation</b>	
Date/Time	08/02/2004 03:46:25 PM
Duration	00:00:01
<b>Current Position</b>	
Easting (m)	-763113.101
Northing (m)	-656976.246
Altitude (m)	342.196
Num. Sat.	5
PDOP	9.3
Correction	Uncorrected
<b>Attributes</b>	
ID#	0000016710
Label1	1425-XR/ID Gas ID Ball
Company	Gas
Descrptn	Stub
Type	Polyethylene
Size	2 IN
Address	60432
Label2	



# GPS Export to Google Earth Pro

