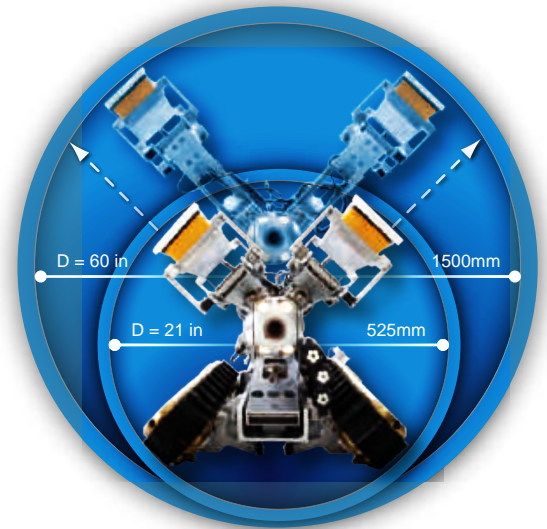
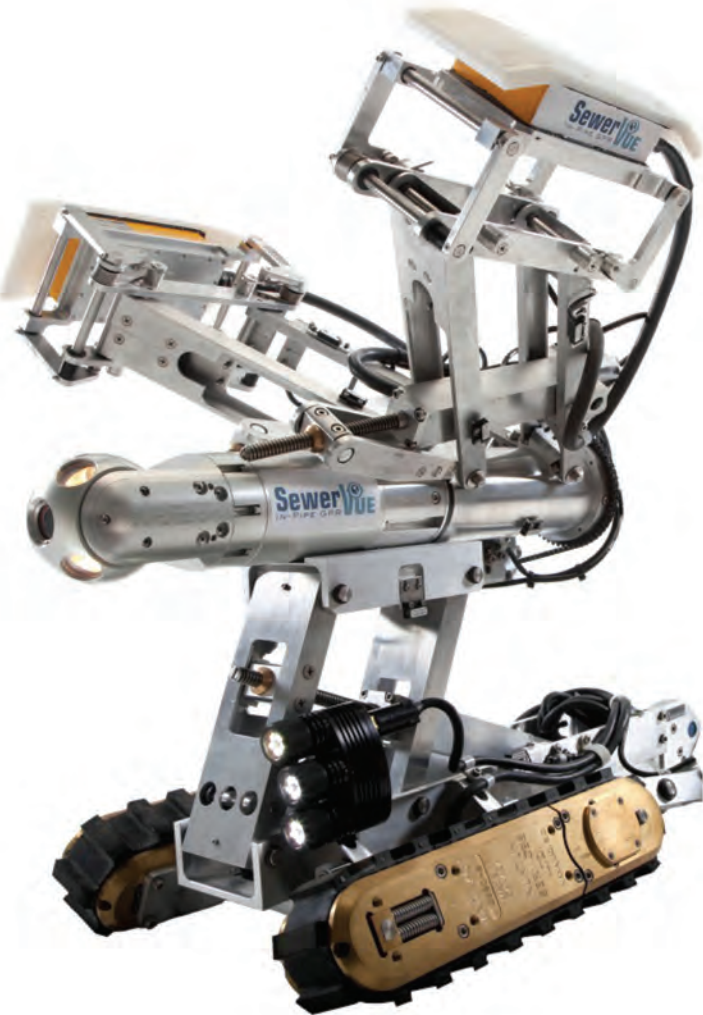


SewerVUE

PIPE PENETRATING RADAR

SEWERVUE SURVEYOR



KEY BENEFITS

- Detects voids outside non-ferrous pipes
- Accurately measures pipe wall thickness & reinforcement cover
- Enables structural integrity asset management
- Enables prevention of catastrophic pipeline failures

ABOUT SEWERVUE

SewerVUE's pipe penetrating radar (PPR) is a revolutionary patented technology for underground pipe inspection. The remotely operated Surveyor robot merges CCTV data with PPR measurements to accurately identify pipe wall thickness, composition defects, reinforcement cover, locate cracks, voids and cavities outside underground non-metallic pipes. The PPR equipment is track mounted and equipped with two high frequency antennae, which can be remotely rotated to any clocking angle between 9 and 3 o'clock positions. The Surveyor can be adjusted for any pipe diameters of 21 - 60 inch (525 - 1500 mm).

SewerVUE's proprietary software analyzes the PPR data and provides easy to understand imagery of all identified elements. Pipe penetrating radar enables pro-active preventative maintenance planning with thorough assessments of critical infrastructure.

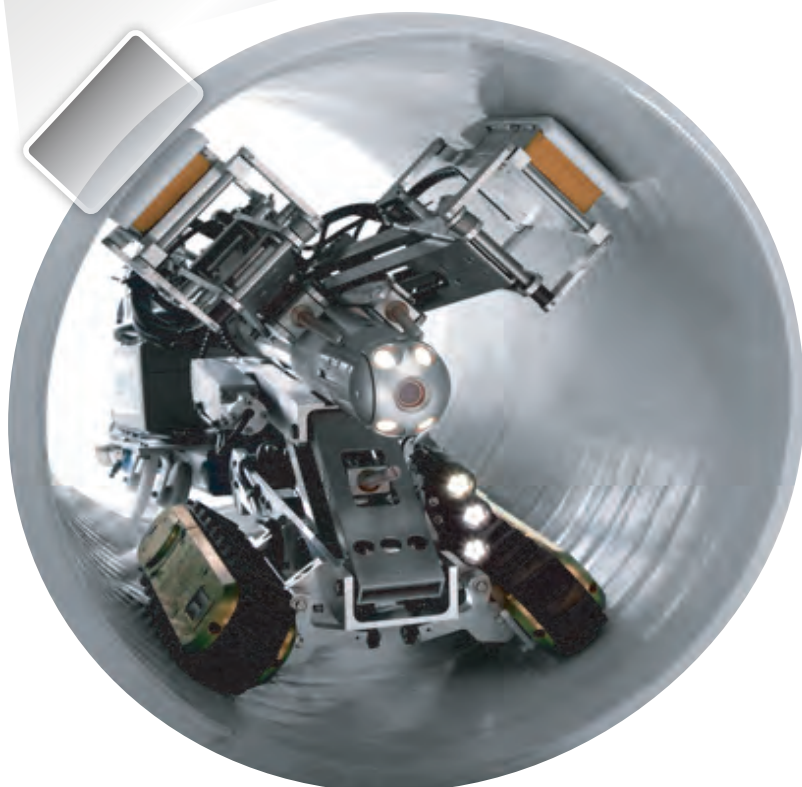
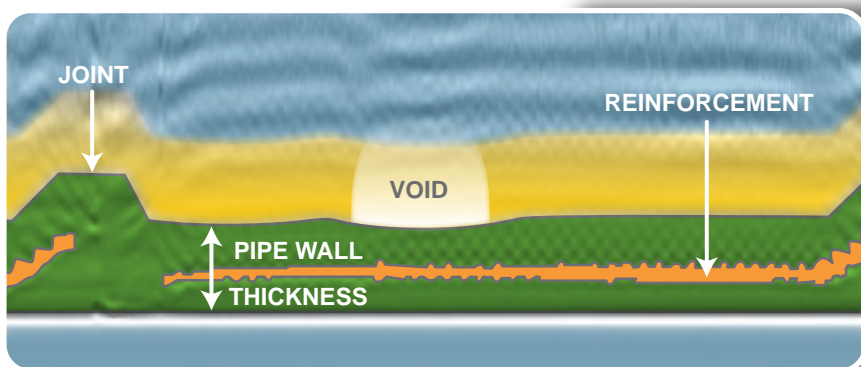


HOW GPR and PPR WORKS

Ground penetrating radar (GPR) is a real time, non-destructive testing technique that uses electromagnetic (EM) waves to image pipes, man-made structures or the subsurface. A short pulse of EM waves are sent into the ground where targets of different dielectric properties reflect some of the waves. A receiver antenna captures the reflected signals which are then displayed on a computer screen. Data collection is continuous, allowing capturing several miles of data in a few hours.

Pipe Penetrating Radar (PPR) is the in-pipe application of GPR where the EM waves are sent into the pipe bedding envelope through the pipe wall (concrete, HDPE, vitrified clay, soil etc.) High frequency PPR can detect cracks, exterior voids, exterior repair couplings, changes in material, water content or salinity to a distance of 36 inches (920 mm) and greater.

Interpreted PPR data in reinforced concrete pipe



SPECIFICATIONS

PPR

- **Frequency options:** 1.6 GHz or 2.3 GHz
- **Maximum signal penetration:** ~8" to 36"/200mm to 920mm
- **Accuracy:** 0.39"/10mm
- **Horizontal sampling rate:** 0.2"/5mm
- **Antenna position:** 9 o'clock to 3 o'clock
- **Data collection:** continuous, both in and out directions

VEHICLE

- **Speed:** up to 32ft/10m per minute
- **Tether Cable:** 1500ft/500m (6000ft optional; Multiconductor; Abrasion Resistant Rilsan yellow jacket)
- **Transporter:** Inuktun Versatrax 150
- **Weight:** ~ 240lbs/110kg
- **Pipe Diameter:** min: 21"/525mm, max: 60"/1500mm

CAMERAS

- **Front:** Inuktun Spectrum 90
- **Active controls:** Pan, tilt, zoom, focus and light
- **Rear:** Inuktun Crystal Cam fixed focus camera
- **Auxiliary Lighting:** High Intensity LED

OPERATING ENVIRONMENT

- **Temp:** 32° to 122°F (0° to 50°C)
- **Depth Rating:**
 - Vehicle 100ft/30m
 - GPR splash proof

CONTROL SYSTEM

- **Power:** 110/220 VAC
- **Control:** PC based graphical user interface (GUI)
- **Tether reel:** Electric variable speed
- **Options:** Manual crank tether reel

REPORT

- Continuous wall thickness and reinforcement data
- Colour coded features including voids and collars
- CCTV reporting can be PACP / WRc compliant
- Fold out correlated CCTV and PPR visualizations

Specifications subject to change