

Nondestructive Testing and Advanced Robotic Engineering Services

2018 Services



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SERVICES OFFERED

1. CableScan™
2. CrackScan™
3. BridgeScan™
4. TendonScan™
5. ColumnScan™
6. PoleScan™
7. Wire Rope Inspection
8. Aerial Drone Inspection
9. Nondestructive Testing

“Utilizing unique sensor technology and robotics to help extend the service life of infrastructure.”

Overview

Advanced Testing

Infrastructure Preservation Corporation (IPC) has been a leader in bringing new infrastructure testing methods to the forefront of the 21st century.

Our modern NDT technologies utilizes unique sensor technology and robotics to help extend the service life of infrastructure worldwide saving billions in maintenance and replacement costs.

NDT robotic inspections has become a key component in maintaining the safety of infrastructure involved in:

- ✓ asset management
- ✓ condition assessment reporting
- ✓ planning for new construction

The goal at IPC is to find early stage corrosion and deterioration in structures before it compromises the integrity of those structures and puts the public at risk.

This allows the transportation agency time to repair early stage deterioration to ensure the safety and longevity of their infrastructure and within their budgets.

Cable Stay Inspection Service

Detecting the slightest inconsistencies

CableScan™ is a robotic inspection of a cable stayed bridge from 8" away using high definition video and stills of anomalies on a cable. It records the length and depth of any cracks along a cable. The robotic machine is portable, wireless and is run by an experienced bridge inspector.

"360-degree inspection of the cable without lane closures or bucket trucks obstructing traffic."

Focus on the Transportation Industry

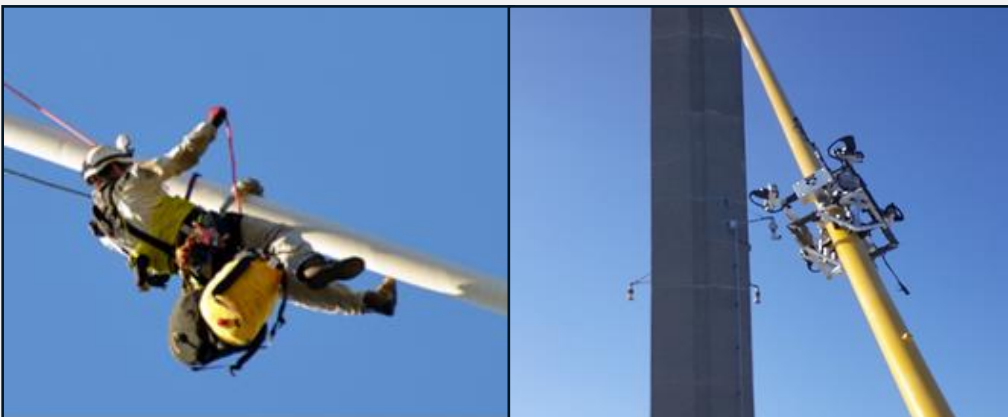
CableScan™ considers all the required parameters of FHWA's (Federal Highway Administration) requirements for bridge cable stay inspections. The location of abnormalities along the cable-stay are recorded to provide instant access for quick repairs or for future reviews.

By maintaining a historical record of the inspection, any inconsistencies however slight can be reviewed over multiple inspection cycles to quickly determine if there has been any increase in deterioration so that further repair action can be taken if needed.

Detail of Grout Ports



Today's Inspection of a Cable Stay Bridge vs IPC's Robotic Cable Stay Inspection



Crack Inspection Service

For concrete and steel structures

CrackScan™ is a laser inspection method that locates cracks in concrete and steel structures. The data then maps out any identified cracks using 2D and 3D images showing the length, width and position on the structure. The data is then stored to monitor progression over time. All this is accomplished without lane closures or bucket trucks.

Focus on the Transportation Industry

Bridge and concrete cracks reflect the deterioration of concrete structures. Crack propagation leads to water leakage and further corrosion of the rebar (steel bars) that reinforce the bridge as well as creating a shifting of the compacted gravel, creation of voids and the overall safety of the structure.

Regular inspections using IPCs concrete and steel bridge inspection services can:

- Locate micro cracking
- Manage crack progression over time
- Create repair schedules with plenty of lead time
- Conduct inspection during the day with no lane closures, traffic disruption or the need to rent expensive equipment or boom trucks

Additional benefits to the agency include:

- No lane closures required
- No traffic disruption or boom lifts
- No danger to personnel
- More efficient, less expensive & more accurate than current concrete crack inspection systems
- Safer for the public and the inspector



Current Inspection Method (above)



IPC's CrackScan™ Concrete Crack Bridge Inspection

“One double blind study with a major engineering firm proved it to be over 1200 times more accurate than current methods.”

>> Watch the video [here](#).

Complete Bridge Deck & Approachway Inspection

Reducing the need for traffic barriers

Current inspections of bridge decks involve dragging a chain across part of the deck while listening to any changes in sound. These inspections are often conducted while traffic is driving in the other lanes.

IPC's BridgeScan™ provides complete inspections of bridge deck locating while quantifying deterioration and corrosion. During inspection delamination, deboning, rebar placement, voids, water intrusion and cracks are identified and located using internal imaging.

Our reporting provides actionable items describing the size and severity of deterioration allowing agencies to plan accordingly.

“Complete inspections of bridge deck locating while quantifying deterioration and corrosion.”

>> Watch the video [here](#).



Current Inspection Method



IPC BridgeScan™ Bridge Inspection Method

Post Tension Tendon Inspection Services

Utilizing patented NDT technology

TendonScan™ is a comprehensive post tension tendon inspection service that utilizes the latest in nondestructive evaluation (NDE) and nondestructive testing (NDT) technologies to locate and assess voids, water, bleeding grout (grout not cured) as well as section loss and corrosion in external tendons of segmental structures.

TendonScan™ utilizes proprietary patented leading edge non-destructive testing (NDT) technology. The nondestructive testing NDT method used is Electrical Capacitance Tomography (ECT) and Magnetic Flux. ECT are the industry's newest NDT technologies that allows our inspectors to perform MRI like inspections of external bridge tendons.

The results are three-dimensional color graphical views of the internal sections of the tendon identifying the locations and sizes of water, air, and bleeding grout. The mag flux unit locates section loss and corrosion and is becoming more popular as the need to properly assess our ageing infrastructure becomes more critical.

Focus on the Transportation Industry

Whether your project requires a baseline condition assessment, monitoring healthy tendons for preventative maintenance or locating corrosion, TendonScan™ is the best method for inspecting post tension tendons known today.

Our average inspection team is composed of three personnel, the equipment weights 16 lbs., is self-propelled, operates on battery power with wireless connectivity to the control station. A condition assessment report is provided to the asset owner.

The inspections are real-time with minimum back office processing. TendonScan™ provides the quantitative data the department of transportation requires to properly assess the structure in order of importance to conduct repairs.



Current Inspection Method (above)



IPC's TendonScan™ Inspection

"TendonScan™ is the best method for inspecting post tension tendons known today."

>> Watch the video [here](#).

ColumnScan™ is a robotic inspection system that inspects the inside of bridge columns on complex bridges. It lowers into columns and inspects the interior of the columns with LIDAR, high definition video and stills.

It transmits information to a surface station for onsite evaluation. It is equipped with extending and reticulation arms to maneuver and record around obstructions.

Focus on the Transportation Industry

Reducing risks during inspections

During a typical column inspection, inspectors are lowered into a column with a helmet, flashlight, pad and paper. They may even be required to carry oxygen.

The high definition video and infrared technology helps inspectors to locate deficiencies and report on them all while providing a safer environment.

IPC's devices do not require costly lane closures, boom trucks or night time inspections. All inspections can be conducted during the day and within the budgets currently provided by the federal government.

The robotic inspection services IPC provides not only replaces current inspection methods but provides superior results over these methods.

IPC's robotic services are safer for the public, safer for the inspector and do not require lane closures or boom trucks for many of our inspections.



IPC's ColumnScan™ Column Inspection

“ColumnScan™ is the best method for conducting inspections on bridge columns known today.”

High Mast Light Pole Inspection

A total inspection and repair service

IPC's (HMLP) High Mast Light Pole Inspection Service takes high definition video of High Mast Light Poles and their components. This allows an inspector from the comfort of his office to visually see any imperfections in the pole, seams and luminaries.

IPC retains a history of the inspections allowing a comparison with each subsequent inspection cycle to determine rates of deterioration over time as well as reporting rust, cracking or areas that may need immediate attention.

Our advanced assessment shows all the details required and are much less subjective than current manual inspections. PoleScan™ provides 100% coverage of the entire HMLP including the pole, seams and luminaries.

Portable wireless and light weight. Travels with two inspectors both experienced in high mast light pole inspections and on the equipment.

"No traffic disruptions, lane closures or bucket trucks required. PoleScan™ is portable wireless and light weight."

>> Watch the video on "inspection" [here](#).

>> Watch the video on "repair" [here](#).



PoleScan™'s repair service robotically sands down rust spots, paints & repairs the high mast light pole.



HMLP robotic inspection of mast arms and luminaries



Wire Rope Inspection Service

Utilizing modern technology

Wire ropes are critical to many of our most important equipment and infrastructure assets. IPC utilizes modern technology in its robotic wire rope inspections without needing to wedge cables apart by peering through steel strands to look for section loss caused by unplanned stresses and corrosion and addresses issues based on their severity.

This is a major advancement for the bridge inspection industry as well as other mission critical wire ropes. Wire rope inspections are a part of IPC's CableScan™ services to provide quantitative condition assessment data to asset owners.

“Providing quantitative condition assessment data to asset owners.”

>> Watch the video [here](#).

Focus on the Transportation Industry

Deteriorated suspension and suspender cables on bridges can lead to bridge and roadway failures. It is important to regularly inspect wire ropes beyond the visual manual inspections that have been conducted in the past.

Benefits include:

- Lightweight and portable
- Locates Broken Wires
- Quantitative Results
- Fast interpretation
- Detailed Reports
- Proven Results



IPC's Wire Rope Inspection

Aerial Drone Inspection Service

Creating safe detailed infrastructure assessments

IPC utilizes GPS positioning and coordinate specific inspection zones to create safe detailed infrastructure assessments. It utilizes high definition videos mounted on aerial drones to inspect hard to reach places located anywhere on a structure.

Our customized drone can take stable images for easy viewing and has a flight time approaching 60 minutes to quickly complete any inspection project.

Focus on the Transportation Industry

Utilizing drones, modern technology and robotics for bridge inspections and other hard to reach infrastructure assets can help us quickly restore our infrastructure at a fraction of the price that current conventional methods are able. Benefits include:

- Lower cost (minimal personnel)
- High definition images show progression over time
- No lane closures
- Can reach all areas of the bridge including the pylons and underneath of the bridge.
- No boom trucks required
- Reduction in inspection time
- Increased Safety
- Customized drone for more flight time, picture stabilization and accuracy
- Higher Detail of accuracy of inspection
- Inspections can be used on
 - Bridges, railroad bridges, pipelines, wind turbines, cell tower inspections and utilities
- UAV Certified



IPC's Drone Inspection of High Mast Light Pole

“Utilizing drones to inspect infrastructure is faster, more efficient and less expensive than conventional methods.”

>> Watch the video [here](#).

Infrastructure Preservation Corporation (IPC) values the importance of quality and safety. The nondestructive testing (NDT) services we provide are key in maintaining the serviceability of your asset. The inspection and testing methods performed can be done in the manufacturing shop, during fabrication or in-service.

Our team of Certified Welding Inspectors (CWI) have extensive experience performing various NDT services and are familiar with the principles and

practices in accordance with AWS, AASHTO and ASNT specifications.

We also have trained technicians that operate our advanced robotic inspection equipment. The team will work directly with you to quickly identify and resolve problems. Deliverables include detailed investigation results, assessments and recommendations.

The services offered focus on promoting asset quality, integrity and reliability while reducing costs and improving safety.

Focus on the Transportation Industry

IPC leads the industry in the Advancement of Nondestructive Testing

IPC is focused on providing the right inspection and testing services for the department of transportation (DOT) on various infrastructure types including Conventional Bridges, Movable Bridges, Complex Bridges and Roadways.

We use non-intrusive methods to inspect and supply condition assessment reports on the integrity of assets. The methods used help to identify defects and irregularities before they result in severe damage or become a risk to the public or your operation.

The advanced technologies that IPC offers help to save on time and money and put the facts into the decision makers hands.

NDT Services Offered

Magnetic Particle Testing (MT), identifying surface cracks in the material.

Ultrasonic Testing (UT), using high frequency waves to detect subsurface flaws.

Liquid Penetrant Testing (PT), using liquids and dyes to detect flaws not visibly seen on the surface.



Visual Testing (VT), visually identifying flaws in the material.

Ground Penetrating Radar (GPR), an advanced alternative method to radiographic inspection (RI) for concrete testing.