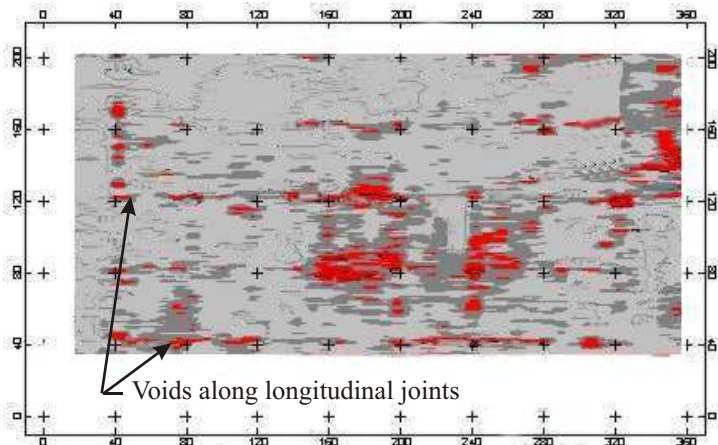


## Ground Penetrating Radar Imaging

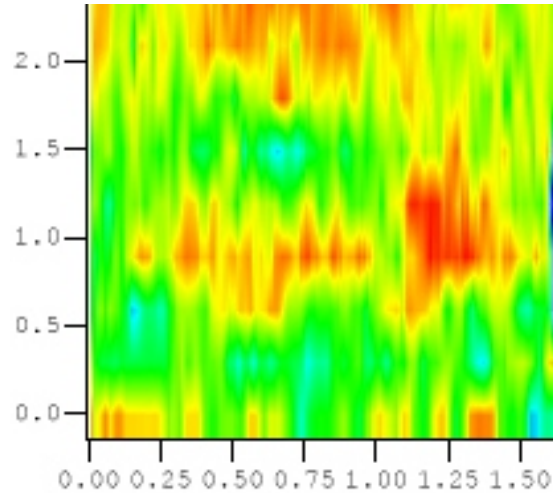
Many concrete and stone masonry problems require investigation of potential defects within the materials or below them. Related problems can be assessment of slab thickness, the presence and distribution of reinforcing steel, detecting voids below a slab or behind walls and locating utility pipes within a concrete structure or detecting cables or tanks below a slab. Tekron Services has acquired Ground Penetrating Radar, Noggin 1000 plus to accomplish this task. The equipment is compact, portable and powered by battery

One of the best methods to detect and display the data is to produce a two dimensional image. The methodology involves making many traverses in a strict pattern and analyzing the data as one complete set. This enables slices of the data at selected depth to be produced, highlighting the presence of anomalies within and below the materials.



**Figure 1. Two dimensional image of GPR traces at 200 mm below the concrete surface**

The two dimensional image shown in figure 1 is the result of many traverses across a slab-on-grade. The owner required to upgrade the loading on this particular slab and was concerned with the possibility of slab thinning and voids below the slab. The GPR traces, confirmed by cores, revealed a thin section at the centre and that most voids ran along the longitudinal construction joint. The racking was subsequently designed to avoid overloading these locations.



**Figure 2. GPR scan through a stone masonry wall at 500 mm below the stone surface**

An historic masonry structure was undergoing remedial work. A two dimensional image of GPR scans through a stone masonry wall revealed the extent of voids within the rubble area ( figure 2 ).



**Figure 3. GPR equipment in use**

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For Further Information Contact

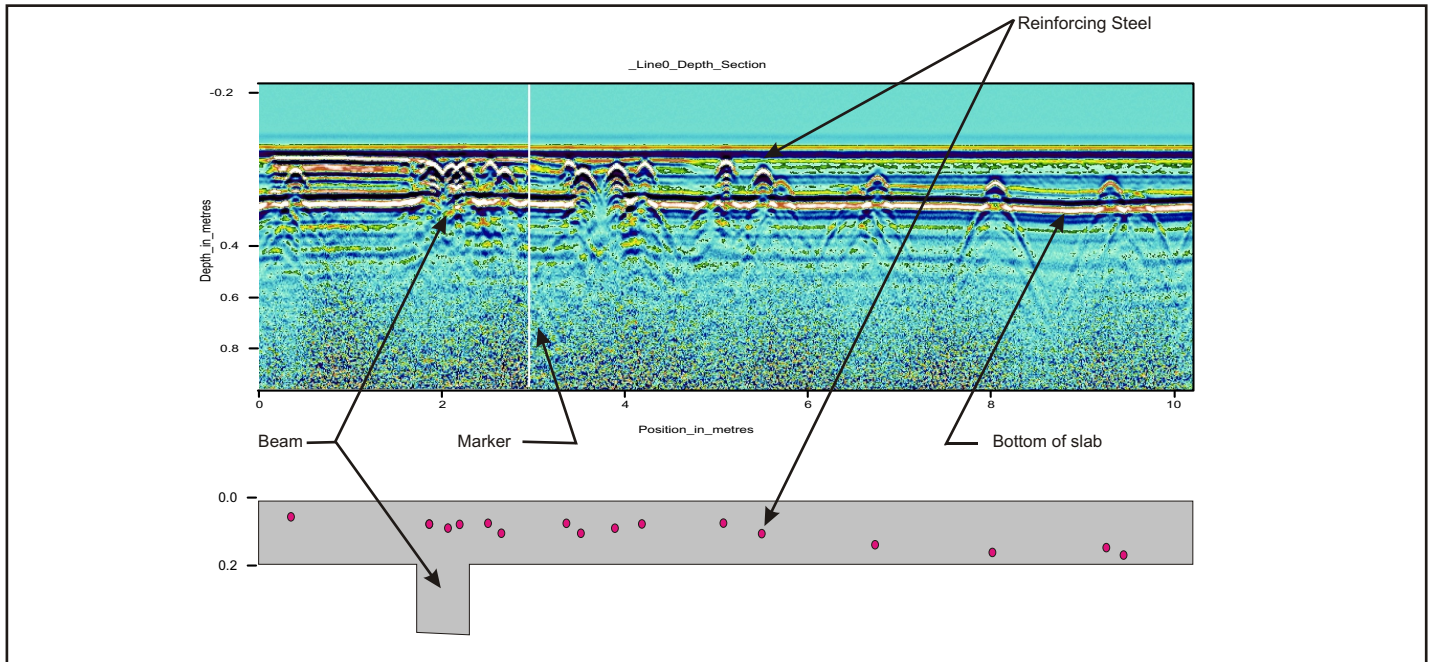
Tel. (905) 279-8072

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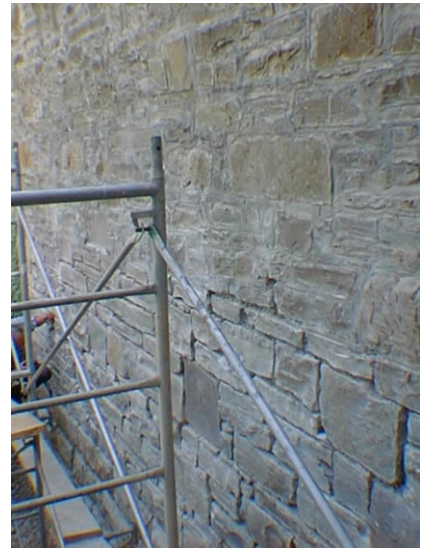
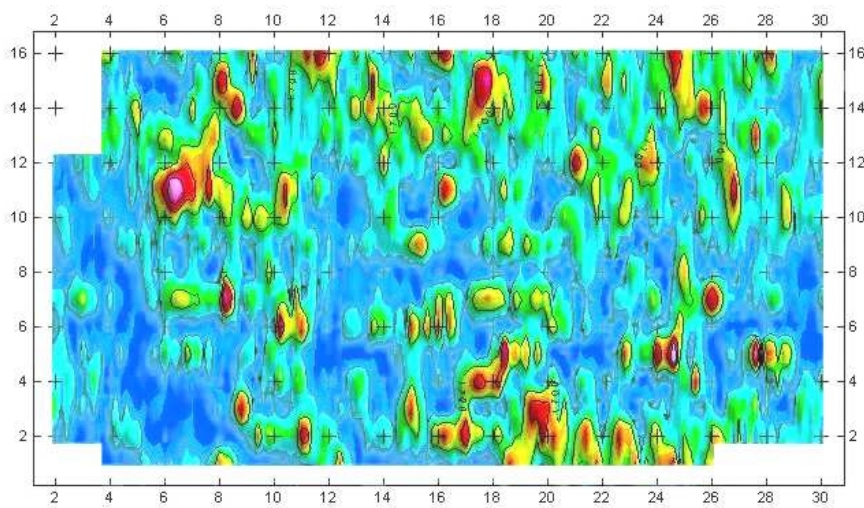
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**Figure 4. Cross section through a parking garage floor showing reinforcing steel configuration**



**Figure 5. Two dimensional image of voids in stone masonry wall**      **Figure 6. View of stone masonry wall**

An evaluation of the inner condition of a stone masonry wall was required, during the restoration of an historical building. Linear traverses were made across the wall using ground penetrating radar. Two dimensional images were then prepared of slices through the data which revealed that there was significant voiding (red, yellow, green) in the rubble between the withes of the stone masonry. To stabilize the wall, the centre core was injected with foamed grout through ports drilled into the mortar joints.

## Company Profile

Tekron Services is a Canadian company providing specialized inspection and testing of construction materials. Incorporated in 1987, the company offers a wide range of inspection and non-destructive testing services to evaluate structures and construction materials. Since the formation of the company our goal has been to incorporate emerging technology into tools and techniques for the construction industry.

### **Tekron Services Inc.**

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