

Nondestructive Testing & Evaluation SYSTEMS FOR STRUCTURAL INTEGRITY

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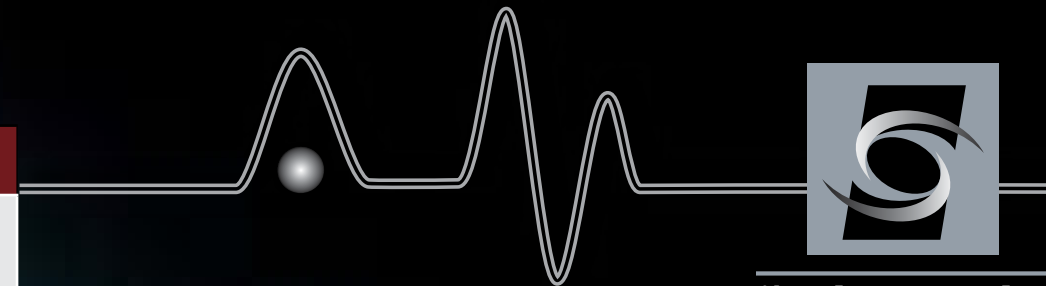
A - FOUNDATIONS DEPTH & INTEGRITY SYSTEMS					NDT PLATFORMS		
ID	Test Method	Standards	Applicable On	Test For	Freedom Data PC	NDE 360	CTG
A1	Crosshole Sonic Logging (CSL)	ASTM D6760-08 ACI 228.2R	<ul style="list-style-type: none"> » Auger Cast Concrete Piles » Cemented Radioactive Wastes » Diaphragm Walls / Slurry Walls » Drilled Shafts (Bored Piles) » Mass Concrete Pours » Mat Foundations & Seal Footings » Pressure Injected Footings » Water Saturated Media 	<ul style="list-style-type: none"> » Cracks » Necking » Sand Lenses » Soil / Water Intrusions » Uncured or Weak Concrete » Voids 	✓		
A2	Tomographic Velocity Imaging Software (for CSL, UPV and CS/DS)		<ul style="list-style-type: none"> » Bridge Substructure » Cemented Radioactive Wastes » Concrete Drilled Shafts » Dams » Mat Foundations » Slurry Walls / Diaphragm Walls » Soil / Rock / Masonry / Wood Structures 	<ul style="list-style-type: none"> » Cracks » Honeycomb » Soil / Rock Moduli » Soil / Rock Velocity Profiles » Soil / Water Intrusions » Uncured or Weak Concrete » Voids 	✓	✓	
A3	Parallel Seismic (PS)	ACI 228.2R	<ul style="list-style-type: none"> » Abutment Piers » Deep Foundations » Sheet Piles and Footings » Timber Piles 	<ul style="list-style-type: none"> » Foundation Type / Integrity » Length Determination » Scour Evaluation 	✓	✓	
A4	Sonic Echo/ Impulse Response (SE/IR)	ASTM D5882-07 ACI 228.2R	<ul style="list-style-type: none"> » Auger Cast Concrete Piles » Bridge Abutments » Drilled Shafts (Bored Piles) » Driven Concrete Piles » Wall Piers » Wood Piles 	<ul style="list-style-type: none"> » Cracks » Deep Foundation Depths » Diameter Changes (Bulb or Necking) » Soil Intrusions » Uncured or Weak Concrete » Voids 	✓	✓	
A5	Ultraseismic (US) Developed by Olson Engineering, Inc.		<ul style="list-style-type: none"> » Auger Cast Concrete Piles » Bridge Abutments » Drilled Shafts (Bored Piles) » Driven Concrete Piles » Wall Piers 	<ul style="list-style-type: none"> » Cracks » Depth » Soil Intrusions » Voids 	✓	✓	

B - GEOPHYSICAL SYSTEMS					NDT PLATFORMS		
ID	Test Method	Standards	Applicable On	Test For	Freedom Data PC	NDE 360	CTG
B1	Crosshole / Downhole Seismic Systems (CS/DS)	ASTM D4428/ D4428M-00/ D5882/D7400	<ul style="list-style-type: none"> » Soil & Rock for Seismic Vibrating and Machine Foundation Design » Soil Modulus Measurement 	<ul style="list-style-type: none"> » Image voids, Solution Caverns, Washouts with Tomography » Locate Faults, Fractures » Seismic Shear & Compressional Wave Velocities 	✓		
B2	Seismic Refraction / Seismic Reflection (SRR)	ASTM D5777-00 ASTM D7128-05	<ul style="list-style-type: none"> » Mass Concrete » Mass Cyclopean Masonry » Rock / Soil 	<ul style="list-style-type: none"> » Bedrock Topography » Compressional Wave Velocity Profiles » Fractures » Layer Thickness » Rippability / Excavatability » Water Table Depth / Mapping 	✓		
B3	Spectral Analysis of Surface Waves - G (SASW-G)	ASTM D6758-02 ACI 228.2R	<ul style="list-style-type: none"> » Asphalt » Concrete » Masonry » Soil / Rock » Wood 	<ul style="list-style-type: none"> » Layer Thickness » Shear Wave Velocity Profiles » Soil & Rock Moduli 	✓	✓	

C - STRUCTURAL, PAVEMENT & TUNNEL SYSTEMS

NDT PLATFORMS

ID	Test Method	Standards	Applicable On	Test For	Freedom Data PC	NDE 360	CTG
C1	Impact Echo (IE)	ASTM C1383-04	<ul style="list-style-type: none"> » Beams » Bridge Decks » Columns » Dams » Pavements » Pipes » Post-Tensioned Duct Grouting » Runways » Slabs » Tunnels » Walls 	<ul style="list-style-type: none"> » Cracks » Delaminations » Honeycomb » Thickness » Voids 	✓	✓	✓
C2	Impact Echo Scanner (IES) <small>Patented technology by Olson</small>	ASTM C1383-04	» same as Impact Echo (IE) above	» same as Impact Echo (IE) above	✓	✓	
C3	Multiple Impact Surface Waves (MISW)		<ul style="list-style-type: none"> » Asphalt » Base » Concrete » Rock » Subbase » Subgrade Soil 	<ul style="list-style-type: none"> » Layer Shear Moduli » Layer Poisson's Ratio » Layer Thickness » Layer Young's (Elastic) Moduli 	✓	✓	
C4	Slab Impulse Response (SIR)	ASTM C1740-10 ACI 228.2R	<ul style="list-style-type: none"> » Concrete Slabs / Retaining Walls » Pavements » Pond or Pool Bottoms » Runways » Spillways » Tunnel Liners 	<ul style="list-style-type: none"> » Delaminations in Decks » Soft or Weak Subgrade Support » Voids Below Slabs » Voids Below Tunnel Linings 	✓	✓	
C5	Spectral Analysis of Surface Waves - S (SASW-S)	ACI 228.2R	<ul style="list-style-type: none"> » Asphalt » Concrete » Masonry » Stone » Wood 	<ul style="list-style-type: none"> » Layer Thickness » Material Moduli » Shear Wave Velocity Profiles 	✓	✓	
				» Velocity Calibration Only			✓
C6	Ultrasonic Pulse Velocity (UPV)	ASTM C597-02, E494-95 ACI 228.R BSI 98/105795	<ul style="list-style-type: none"> » Beams » Bridge Decks » Elevated Slabs » Shaft Tops » Walls 	<ul style="list-style-type: none"> » Cracks » Delaminations » Honeycomb » Velocity vs. Strength Correlation with Cores » Voids 	✓	✓	



Olson Instruments, Inc.

Find, Characterize, & Assess the Condition of Structures - Nondestructively!

Imaging the Infrastructure for ASSESSMENT, MONITORING & REPAIR



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- NONDESTRUCTIVE EVALUATION (NDE)
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