

**High-Resolution Geophysical Scanning and UXO Remediation, Penny's Bay (Disneyland) Site, Hong Kong****Client Names:**

Walt Disney Imagineering - Hong Kong
 China State Construction & Engineering, Inc.
 Gammon-Skanska, Inc.
 Taisei-Hip Hing Joint Venture
 Chun Wo Construction Co.
 Arup Engineering, Inc.

**Project Description**

High-resolution geophysical scanning and UXO remediation was conducted on a commercial property located at Penny's Bay, Hong Kong. During a 14-month period ending in September 2003, over 150 hectares (370 acres) were screened for the equivalent of 152-mm unexploded WWII Era UXO with magnetic equipment. The effective depth of screening and remediation was 3 meters. Performing high-resolution magnetic scanning during the active phase of site construction led to many unique challenges and solutions. The most significant challenge was to identify UXO in the presence of large amounts of near-surface, ferrous construction debris. Nearly 24,000 ferrous targets were identified and excavated in an iterative multiple-pass approach during remedial activities.

**Geometrics G-858 Magnetic Gradiometer System w/ DGPS****Work Performed**

A Geometrics G-858G cesium vapor magnetic gradiometer operated in the man-portable cart mode was used to collect total magnetic field data semicontinuously (10 readings/second) along profiles spaced 0.5 meters. The magnetic instruments were coupled to survey-grade RTK-GPS to provide real-time data positioning. Detailed scaled site maps showing areas covered, target

surveying was conducted and used to construct precisely characteristics and distributions, and exclusion areas where the presence

**12-lb UXO**

of permanent surface and underground metallic features constructed during the investigation limited the effectiveness of identifying UXO.

**Deep Target Excavation**

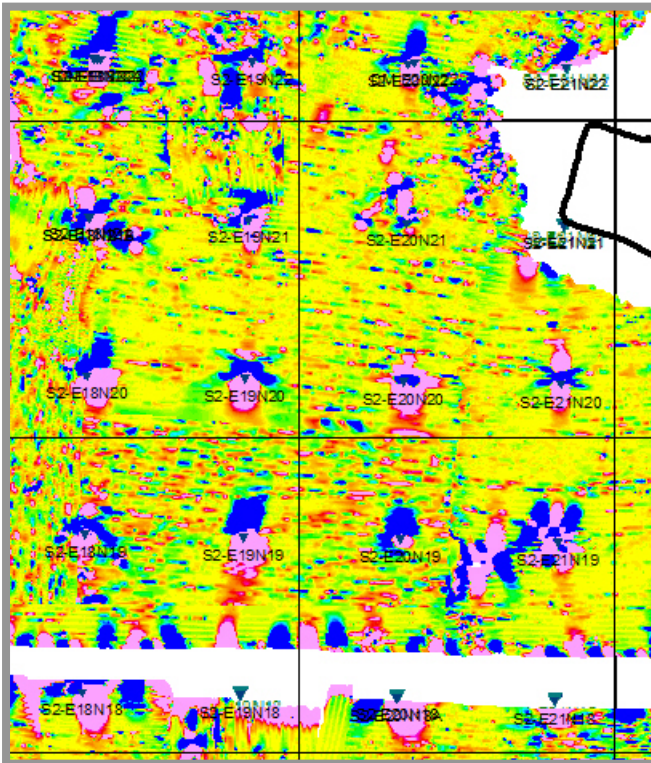
For more information, please contact:

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Analysis and Results

Over 15,000,000 magnetic data points were processed using Geosoft's Oasis Montaj® and UX-Detect® programs. Each day nearly 200,000 data points were analyzed and 300 targets remediated. UXO target analysis was used to select potential UXO objects based on magnetic amplitude and signal strength, target depth, and estimated mass. Target information was prepared into detailed site maps and loaded electronically into the RTK-GPS to expedite field remediation work. The high-resolution magnetic scanning and UXO remediation work was successful in screening the upper few meters for ferrous metal objects potentially representing UXO and there were no UXO accidents recorded.



Portion of G-858 survey data



Target Excavation w/ Schonstedt GA-52