

Type of Facility Represented	Entry control and surveillance systems for multiple Navy Base Gates
Firm's Name	ECSI International, Inc.
Name of Project	Anti-terrorism Force Protection Gate Automation
Location of Project	Metropolitan Washington, DC
Owner	U.S. Navy – Navy Facilities Engineering
Summary of Project Role	ECSI was a subcontractor to a Prime Contractor. ECSI self-performed 95% of its scope – site survey, installation design package, fabrication, factory testing, installation quality oversight, system transitioning, systems testing and commissioning, and user documentation and training.

Project Description: ECSI executed a task order to provide gate automation and surveillance systems for nine gates at six locations in the greater Washington DC area. As a subcontractor in a DB team, ECSI's work scope included: site surveys, design and engineering in accordance with NAVFAC/SPAWAR requirements; preparation of submittals drawings and specifications; selection, acquisition, assembly and integration of systems and components; quality control



oversight to meet NAVFAC performance specifications for automating gates, enhancement of surveillance and lighting at each gate, and integration of the systems into the existing police dispatch center at each base; preparation and execution of factory test and inspection; performance of Information Assurance tests and verification; periodic installation supervision; integration and final testing; preparation and execution of training and acceptance test plans; and provision of post installation depot level support.

Facility Descriptions: Each of the nine gates to be automated was operating with guard personnel manually checking ID's. Vehicles entering varied from personal cars to tractor trailers making deliveries. Each site presented unique challenges to provide a uniform gate automation solution while taking into account the differences in each base's operations.

Project Execution

Phase 1 – Site Survey

Using our site survey procedural handbook, ECSI planned and completed an extensive site survey of all gates, including CCTV systems, infrastructure and facility systems. All available as-built drawings were reviewed and retained for use during the design phase. Interviews were held with stakeholders at each base including base commander, security, facility engineering and IT. At the conclusion of the site survey, ECSI prepared and submitted a Scope Validation Report for review with the client. The report documented existing conditions, identified any discrepancies with the RFP and provided recommendations for improvements, system by system and items by item. The survey also indicated there were physical and infrastructure issues, such as power sources that were not adequate for the new system requirements.

Phase 2 – Design Development

ECSI designers prepared the necessary design and engineering drawings to document the physical, electrical, and network requirements of the project. These drawings included civil drawings, showing physical placement of all elements including any foundation or mounting details, and electrical drawings showing conduit sizes and routing, electrical power single-line drawings and lighting enhancement and coverage validation.

The project included 3 types of access control points. High-volume where the entry control was automated and the sentry remained for operational oversight. Low-volume where the entry control was automated to operate without a sentry. This entailed the implementation of a vehicle trap that limited passage to only one vehicle at a time. The third type is a hybrid of the two where the mode can be changed by security to operate as a high volume or low volume gate. In this version, the inner gates were K-4 crash rated.

The ECSI design included a high-volume gate automation package consisting of entry lift arm gates that are controlled by smart card (employee) and bar code card (contractor and visitor) readers to control the gates after a valid card read has been processed. For the low volume gate, two interlocked sliding gates were used to create the vehicle trap. Since this type of gate would be unmanned, the ECSI design incorporated the security of the base perimeter at the entry gate.

At each of the gates, cameras were positioned to provide situational awareness of gate activity using a combination of fixed and PTZ cameras. Each gate's guard house is equipped with a workstation to monitor and view the gates activities. The workstations are connected via the Navy PSNet to the local dispatch center where the access control system server and workstation are located in a secure equipment room.

ECSI designed and commissioned a campus-wide fiber optic network for data, video, and voice. This network was designed to take advantage of the existing campus network infrastructure by adding capacity to support the additional data handling requirements required by the cameras, additional alarms and intercom traffic.

ECSI developed detailed system operational and verification test (SOVT) plans and a training program for the entire system. ECSI prepared operator and administrator instructions, system documentation and modifications required to meet NAVFAC requirements prior to installation and onsite checkout.

Energy Efficiency – ECSI uses all low-voltage equipment and power consumption is minimized based on energy efficient equipment of the system.

Sustainability – ECSI's system is configured to be controlled by one or two people in a central area, maximizing control and minimizing response time. ECSI also specifies sufficient spare parts (5% to 8%) shipped to the site at the same time as the installation. This not only facilitates final system inspection replacements, but also allows operations to replace equipment and systems immediately should they fail at any time.

The ECSI design used any available conduit and power sources, especially UPSs and emergency generators for its scope of work reducing the need for additional material and equipment. Where possible we used existing conduits for new wiring.

Innovative Elements – There were multiple challenges associated with this project, which ECSI addressed successfully, including:



[Situational Awareness Cameras](#)

1. Design and implementation of a wireless network integration for data, video and voice from each gate.
2. Design and integration of physical gate automation elements to fit within existing available space to minimize demolition and construction requirements.
3. Design and implementation of the gate surveillance system to enhance the performance of the existing cameras, while expanding and adding video surveillance and recording capacity.

Phase 3 – Implementation

ECSI's fabrication managers and field support people were in communication continually during fabrication of the equipment, and coordinating testing in both in the factory and on site. Prior to shipping the equipment and systems to the site, ECSI worked with the prime contractor and Navy representatives to complete Pre-Installation Test and Check-Out (PITCO) at ECSI's factory in New Jersey. This allowed for all components to be tested before shipment and



ECSI System Test Facility



Typical Manual Gate

displayed on the system and programmed all IP devices to operate on the network. ECSI then completed on-site testing, final commissioning, and training on the system. ECSI provided in-depth training to security, facilities and IT/network personnel in the management, maintaining, and operation of the new system.

Phase 4 – Post Completion Support

Through our Depot support program, ECSI

system specialists can communicate with on-site operations personnel to trouble-shoot any problems that might arise. If necessary, the test system in our support facility can be used to recreate field problems to facilitate resolution. If there was an equipment failure, replacement parts are available immediately and additional spare parts could be ordered. To date, there have been no system failures.

Project Evaluation

installation on the site.

As is ECSI's practice for timely installation and testing, it also shipped replacement parts. Should a system or equipment fail during testing, it could be replaced quickly. This also would facilitate maintainability for future operations as all materials are on site.

During the installation phase, ECSI personnel were on site to monitor installation (executed by the Prime Contractor), and they provided quality control oversight and technical support to the installation subcontractor. ECSI defined alarm messages and cameras to be



Automated High Volume Gate

Quality – On this project, equipment delivery has been judged to be excellent. ECSI is ISO 9001:2008 compliant and all purchasing, manufacturing, assembly, packaging and shipping are tightly controlled under the ISO system. Factory test and demonstration were provided as a no-cost option to the customer. The test was successfully conducted and the customer was satisfied prior to shipment to site.

Effectiveness of Management/Business Relations – ECSI, as the subcontractor, provided an extensive site survey and prepared a report that documented site conditions and made recommendations for repair and upgrades. Design was developed around these approved upgrades and ECSI coordinated with NAVFAC to coordinate fabrication and factory acceptance testing. ECSI developed and provided complete training to security operations facilities engineering and IT/network personnel for use, maintenance, and troubleshooting system issues should they occur.

Timeliness –Due to ECSI’s detailed site survey and acceptance testing during fabrication in New Jersey, the risks for this program were considered low, the primary risk being timely receipt of material and equipment. ECSI used a freight forwarder or dedicated truck to ensure that all shipments were received in time and in good condition. Equipment delivery was consistent with ECSI compliance with ISO 9001:2008, including purchasing, manufacturing, assembly, packaging and shipping tightly controlled under the ISO system. On-site ECSI personnel provided quality oversight of installation and completed the integration, testing, commissioning and testing of all systems.

Compliance with Safety Standards – As part of the general contractor’s team, ECSI complied with all contractor and NAVFAC facility safety requirement and participated in daily safety meetings.

Small Business Utilization – ECSI, as a small business subcontractor, self-performed 95% of its scope under the Prime Contractor. Specialty contractors were hired to supplement our efforts as required.

Challenges Encountered/Corrective Actions Taken –

Challenge: ECSI was required to use the Navy’s secure network system for systems communications. In order to do so, it was necessary to certify the gate automation system for Information Assurance (IA), which was not part of the task order requirements.

Solution: Working with NAVFAC IT department, ECSI developed a procedure to conform the system to and verify its compliance with the IA requirements. We were able to use our factory test system to facilitate the implementation of the procedure.

Challenge: The site survey uncovered that power sources designated by the Navy at several sites would not be adequate for the system load.

Solution: Working with the facilities department, ECSI was able to devise a design that reconfigured the existing power panels allowing for the load to be handled according to National Electric Code requirements.