SECTION 281200 – VIDEO GRAPHIC USER INTERFACE

PART 1– GENERAL

1.1 SUMMARY

A. Provide a computerized Video Graphic User Interface (VGUI) system to interface with the PLC system to allow control, monitoring and display of doors, intercoms, paging zones, cameras, lighting, receptacle, TV receptacles and duress stations, and all other control functions shown on Drawings and Specifications. Note that no control logic shall occur within the VGUI software. All control logic occurs within the PLC system. The VGUI for this Project will consist of LCD touch screen and LCD mouse driven graphic screen systems. Provide, install, and program graphic user interface screen software.

B. Electronic Security Systems Contactor: Allow for software operational changes throughout construction period and during final testing and training. It is mandatory that ESSC provide a minimum of four scheduled meetings with Owner for system programming minimum two days each visit. This includes: Video graphic user interface design layout to perform all operations and control styles Owner requires relating to equipment specified and shown on Drawings, operational programming control, CCTV system operational control and camera assignments, and intercom system programming.

C. Incorporate Security Information Management System (SIMS) which will record each event to system hard drive. Provide for automatically collecting, storing and recalling transaction data. Provide computerized sorting, search, and report generation. Recorded event for each activity with date, time, point description, and activity.

D. A multiplex connection will exist between VGUIs and Programmable Logic Controllers (PLCs). The VGUI will not directly control security equipment devices or handle any logic related to control.

1.2 SUBMITTALS

A. Product Data: For each item submitted, provide manufacturer's complete product data.

B. Shop Drawings: Provide complete plans and operating diagrams of all systems. Provide VGUI screen shot images for owner/architect approval and for use during initial programming meetings.

C. Closeout. Provide O and M manuals as well as all final software programming copies.

1.3 GENERAL DESCRIPTION

A. Video Graphic User Interface is an integrated monitoring and control system that includes graphic screen systems and mouse pointer control, interfaced with control panels and programmable logic controllers.

B. The VGUI controls these systems:

1. Section 281100, Programmable Logic Controllers.

2. Section 281300, Detention and Security Administrative Intercom Systems.
3. Section 281500, Closed Circuit Television System.
4. Section 281700, Access Control System.
5. Other systems or functions indicated on Drawings controlled by VGUI.

1.4 VIDEO GRAPHIC USER INTERFACE SOFTWARE

A. VGUI System Software: Non-proprietary, standard, off-the-shelf SCADA system. The VGUI software manufacturer will have produced a product line of SCADA related software for at least ten years and provide local support. The manufacturer will provide internet support, including on-line software updates and technical support. Provide, install, and program graphic screen software. Software will have national distribution and support and operate on latest Microsoft Windows operating system.

B. All VGUI functions are to be programmed within this systems manufacturer's native program. No proprietary DLL or other encrypted software will be considered. If system integrator provides any proprietary programming language or encrypted software, system shall be completely redeveloped at integrator's expense.

C. System integrator will turn over to Owner all programming passwords, configuration files and programming schedules at end of Project.

1.5 VIDEO GRAPHIC USER INTERFACE SYSTEM

A. VGUI stations in locations shown on Drawings provide human interface device for security alarm monitoring and control of security devices, including doors, cameras, intercoms, and alarm receipt devices such as duress systems.

B. The VGUI station consists of 19" high-resolution color video mouse driven graphic screen monitor, mouse, CPU tower, UPS, and cables. Units will be free-standing, rack mounted, or encased in casework shown on Drawings. CPU and keyboard will be located in Security Electronics Room (second floor), mouse will be located at VGUI station and communicate via communication port extender manufactured by Black Box Industries.

C. Control Functions: The screen transducer is driven by controller interfaced with Pentium based personal computer. Transducer controller feeds X-Y coordinates of finger or mouse contact with monitor area to personal computer. Computer stores graphic images consisting of icons (or targets) which perform functions of typical push button switches. When a particular icon (target) is clicked on by mouse pointer, personal computer sends information to PLC. PLC then performs logic functions (such as timing and interlocking) and activates appropriate field devices (such as door locks or video and intercom switcher controls) based on icon command. A record of all control functions is downloaded to security information management system (SIMS) for data storage and report generation

D. Screen Saver: VGUI system will have means to prevent image burn-in on LCD when system control panel has been inactive for more than five minutes. Any change in status, intercom call-in, card reader action or mouse point of screen will return panel control graphics.

E. Log-In: The VGUI system is password-protected and all operators will log into system. All log-in and log-out will be recorded to system data log (SIMS). Terminal will be limited to three invalid log-in attempts. After three failed attempts, terminal will be disabled and an

alarm will be generated at Master Control. Control of screen must be returned from Master Control.

F. Mouse: Each VGUI station is equipped with mouse to operate terminal using on- screen indicator (mouse pointer) to activate function instead of finger. Selecting program segment or option will require moving display cursor to appropriate screen location with mouse and depressing a pick button.

G. Control Transfer:

1. Substation Transfer: Activating "Log Off" icon on VGUI monitors will automatically transfer all control and indicating functions to designated location. When logged off, transferred terminal will not be capable of performing control functions. Return to normal operation will be accomplished by logging onto system using video keypad.
2. Control Takeover: Activating takeover icon on VGUI monitor will automatically transfer all control and indicating functions to higher control location. No control functions can be initiated from transferred substation. Return to normal substation operation must be accomplished from higher control location. Master control will be capable of taking over every control panel.
3. Panel Disable: A click of cursor on this icon will render terminal inoperative. Control will be transferred to master control and alarm will be generated on master control VGUI. Panel will remain inoperative until control capabilities are returned by Master Control.

H. Transfer Control Hierarchy:

1. Control locations with one or more VGUI terminals will have one terminal assigned as primary and one as secondary and so on. When any terminal is logged off, all control will transfer to the highest hierarchy terminal logged on. If both or all log off simultaneously, all control will be transferred to master control. Any station will be capable of taking control of the other station. If master control takes over control of either station, all stations will be transferred to master control and will remain inoperable until master control returns control to the stations. Clicking the Panel Disable icon on any terminal screen will disable all control stations at that location and transfer all panels control from that location to master control and sound an alarm at master control.
2. Master control terminals will have multiple VGUI terminals and will be assigned control hierarchy. Logging off any terminal will transfer control of selected areas to master control terminal #1. When any logged off terminal is logged back on, the selected areas of control will be restored to that terminal location. Control will always be maintained on master control terminal #1 (MC1) and logging off will be for administration purposes only and operation will be maintained. If MC1 should fail, its current control will transfer to the next master control VGUI.

I. UPS system alarms will send a text message to master control and be logged on the SIMS system.

J. Failure of any VGUI or network PC will not affect the operation of any other VGUI. The VGUI will communicate directly with the PLC's for control functions. PLC's will be located in the equipment rooms, or as shown on Drawings.

K. Spare VGUI system: Spare system consists of a complete VGUI station: Screen, PC, mouse, data extenders as described in this Specification. Each spare VGUI system will be

configured with all of the software and map files required for the station to function when located at any control location other than the master control room. Each station will be configured with an initiation routine that, when power is initially applied, takes the user to a screen that allows the user to select the current location of that station. When the location has been selected, the station will then access only those files required for the selected control station. This allows any spare station to be used at any control location except Master Control.

1.6 VGUI SYSTEM: SCREEN CONTROLS / MONITORING FUNCTIONS

A. Specific Icon Control Functions: Following is a description of the control and monitoring functions for the icons to be represented on the VGUI graphic maps. The following descriptions may not include all control and monitoring functions for all icons required for this project, but does provide a representative sample to indicate the type and level of control and monitoring expected. Although described within this specification, all device control logic must occur within the PLC system. No control logic will take place within the VGUI software. All VGUI stations will be provided with all functions.

B. Door Control and Monitoring: Controlled doors are represented by a padlock symbol with a square or rectangle frame around it to indicate a target area. Doors that are monitored only and not controlled are represented only by a padlock symbol.

1. Controlled Door: When the door is secure, the icon will represent a closed padlock symbol. Clicking the icon will highlight it in dark gray and allow the selection of controls on the lower screen for desired operation.
2. Swing doors and manual sliding doors will utilize either "Unlock or Lock" icons as dictated by the hardware type. Motorized sliding doors will utilize separate "Open", "Stop", and "Close" icons or icons that change state to perform these functions. The Owner will dictate which switching method will be used. When unlocked or open, the door padlock icon will change color to red with an open padlock symbol. When closed and locked the icon will change to its secure indication. The secure color will be green or gray as selected by the Owner. Garage/overhead doors will have a distinct icon and operate the same as motorized sliding doors. The door must open or close within 15 seconds or the door open alarm will activate. Maximum security cells and step down housing cells: Additional steps and prompts are required before doors are opened. When icon is clicked, the following prompt will be displayed "Maximum Security Cell-Confirm escort officers are present." "Yes" prompt will appear, control operator activates the yes prompt causing the cell location confirmation button led to light. (Confirmation at control will be received by escort officers pressing the led lighted confirmation button at the door) when confirmation button activated, prompt will indicate "Yes-Escort Officer is present". After confirmation received the cell door may be opened, and prompt open door "Yes or No" will appear.
3. Monitored Door: Door status will be indicated on the VGUI screens with a padlock symbol. The padlock will be closed when the door is secure and red and show an open padlock icon when the door is not secure. The secure color will be selected by the Owner. The door cannot be locked or unlocked from the VGUI. Alarm may be silenced if it is known the door will be used, but opening and closing will still be recorded in the security information management system (SIMS).
4. Group Unlock: Cell doors may be unlocked in Owner-defined groups, not to exceed six doors at a time. Group unlock will cause a message box to be displayed that says "Are you sure you want to unlock all cell doors?" "Yes" and "Cancel" icons will be displayed in the message box. Selecting a "Yes" icon will eliminate the message window and begin unlocking the groups of doors. The group icon will change to red during unlocking and the text will change to read "Stop." Clicking the

"Stop" will terminate the group unlock function. For solenoid and full-cycle motorized locks, once the doors have been unlocked, or the "Stop" function has been executed, the icon will change back to the initial "Group Unlock" State. For half-cycle motorized locks, the icon will change to read "Group Lock". Clicking the "Group Lock" icon will extend the latch bolts so the doors will lock when closed and the icon will change back to the "Group Unlock" state. Individual cells may be prevented from opening with the "Group Unlock" function by using the Group "Enable/Disable" function for the selected cells.

5. Group Enable/Disable: Individual cells must be able to be included in or excluded from the "Group Unlock" function. Excluded cells will be indicated by a slash on the cell icon indicating it is excluded from group unlock. Cell may be returned to the Group enable by reversing the enable/disable icon
6. Emergency Release: This function is only available at the Master Control. The program will include the ability for Master Control to execute emergency release for a designated area. Upon executing the emergency release command, a prompt will appear indicating that all door will be opened upon the execution of this command and the operator will have the option to respond "Yes" or "Cancel." The Owner will dictate areas and divisions for emergency release sequence. All VGUI door icons, card access and electric operated will indicate open as the doors are opened. (PLC must be programmed so that no more doors open than the power capacity of the system can handle) Every electrically controlled door in the facility will be capable of being unlocked in emergency release mode. Doors under interlock will have the interlock automatically released for emergency release. An "Emergency Hold Open" icon will appear at the Master Control VGUI accompanied by a pulsing audible tone that will sound every five seconds while the system is armed, and if the "Enable " icon is not activated within three seconds, the system function will reset and discontinue emergency release. The emergency release will continue as long as prompted and the audible tone will continue until the operator activates the "Cancel" icon. When the "Cancel" icon is activated the system will disarm the emergency release function, cancel the audible tone, and reset and lock all doors opened by the emergency release function.
7. Interlock/Interlock Override: Anytime an attempt is made to open a door that is interlocked with an open door, an "Interlocked Door" notice will be displayed on the screen with an "OK?" icon prompt. When "OK?" icon is activated the "interlocked door override" icon will be displayed. When activated a message "Executing this function may cause a breach in security. Are you sure you want to open an Interlock Door.?" A "Yes" or " Cancel" icon will be prompted. "Yes" icon activation will allow the door to open. "No" icon will return the screen to the previous or normal state and the door will not open. No more than two interlocked doors may be overridden in a given area or passage.

C. Intercom Control:

1. Intercom Control: Intercoms are located throughout the facility and areas of intercoms will be assigned to substation control VGUI locations and master control will have access to all intercoms. An incoming intercom call will cause the intercom icon to flash (generally orange) from the map display. The operator will select the flashing icon to be able to hear the call in. Operator will communicate with the selected intercom by pushing the "press to talk button" located on the intercom master station. When finished, turn on a different intercom or select the intercom again to turn off. The icon will change back to gray, indicating the intercom is off. If the camera schedule indicates a remote intercom to be a camera call up, the assigned camera will call up for view on the assigned monitor when the call in button is pushed at the remote intercom location.

2. Protect Intercom: When an intercom is protected, an inmate/caller pressing the remote intercom button will not cause a visual or audio cue at the monitoring VGUI. The icon for the corresponding intercom will flash, indicating the remote intercom call in button was pushed and will flash orange in case there is an emergency. Intercom may be protected or unprotected by clicking or selecting "Prot Com" on the control bar for the intercom. A white letter "X" will appear on the intercom icon. Clicking or selecting the "Unprotect Com" icon on the control bar will unprotect and the white letter "X" will disappear.
3. Intercom Query: The site map area will have an intercom call pending list display that will display all current incoming intercom calls. This display will have two function buttons. In order to perform a function the operator must select an intercom call.
4. Operator selections are as follows:

    a. The "Answer" function will allow the operator to set up communication with the selected intercom.
    b. The "Answer and Zoom" function will set up communication with the selected intercom as well as display the area on the map display where the call was originated.

D. CCTV Control:

1. Select a Camera: Mouse clicking any camera icon on the VGUI will change the camera to Blue and cause this camera view to show on the assigned monitor.
2. Sub VGUI stations can only view cameras on their assigned graphic map displays. Master Control can select and view any camera on any display in the facility. To deselect a camera, mouse clicks the icon and the icon will deselect the camera view and the icon will return to gray color.
3. Automatic Camera Selection: If an intercom or duress with a camera call up view associated is activated, the view will appear on the assigned call-up monitor. If no view is on the call up monitor, a camera may be selected for this monitor by the use of the CCTV slave keypad.

E. Alarm Functions (listed in priority of receipt as follows):

1. Duress Alarm: When a duress alarm is activated, an audible alarm will be sounded at the area VGUI and Master Control. The message "Attention, Attention, There is a Duress Alarm" will be displayed and the duress icon indicating the location of the duress alarm will flash red. The audible alarm will end when the duress alarm is acknowledged. The icon will continue to flash until the duress alarm is reset at the alarm location. If a camera is associated with the general area of the duress alarm, the camera will call up automatically.
2. Interlock Alarm: An audible alarm will sound if any interlock has been manually breached. This alarm and the message "Attention, an interlock has been breached" will sound and be displayed at Master Control and the VGUI substation with control of the breached area.
3. Door Alarm: When a monitored door is open without authorization or if a monitored door is open for more than 15 seconds, an audible alarm will sound and the message "Attention, There is a Door Alarm" will appear at the local VGUI and Master Control. The audible alarm will silence when the alarm is acknowledged and alarm will reset when the door is closed.
4. Intercom Call Alarm: When an intercom is activated an audible alarm will sound and display the message "There is an Intercom Call" on the VGUI the intercom location is

assigned to. When the intercom call is accepted the message will disappear and alarm will silence.

5. PLC Monitoring: Clicking on this icon will display the status of each individual PLC module located in every equipment cabinet regardless of PLC drop. This icon is also a safety feature used to notify the operator of the control station there is loss of communication to the PLC from the control station. Loss of communication to the PLC renders the station inoperable. This icon will slowly flash on the left-hand side of the function bar. Doors will not be operable during this time until the problem is solved.

F. Control Panel and Miscellaneous Functions:

1. Panel Disable: When panel disable icon is activated, panel will shut down and Master Control will receive an alarm and take over control.
2. Log on/Log off: Keyboard log on and off is required. Only system administrator configures user logins. All log on and log off actions will be recorded in the SIMS as activity. Log off will transfer control to the designated location or VGUI as determined by the Owner.
3. Site Map: A section of the screen will display a map reference of the facility as a site map. Activating a section of this map by mouse cursor click will allow the user to navigate between maps and selection of an area of the sitemap will bring up a large version of the selected area which will display control icons
4. Lighting Control: Integrate system with low voltage relay lighting panel being provided by Electrical Contractor. See Electrical Drawings for light panel schedule. Lighting icon buttons will control dayroom lighting levels, cell lights and night-lights.

G. Utility Functions:

1. Elevator Control Operation Overview: Remote operation through integration with the Electronic Security Systems controls. Operation of elevator shall be under control of Master Control Corrections officers. When called by hall detention intercom, Master Control will send the elevator cab to the corresponding floor. Annunciation of the elevator cab shall be annunciated by floor and also display when the cab door is open or closed. Once at the floor the cab door will open and close automatically, via logic from the elevator control. Once closed Master Control will send cab to the required floor. Once at the floor the door will open and close automatically, via logic from the elevator control. If during a travel sequence, another elevator call is required, it will be stored in the order received until the cab becomes available.

    a. Detention intercoms located at the elevator hall are used to call Master Control (MC) when elevator use is required. The MC operator will call up the elevator control screen. This graphic shows an elevation of the elevator shafts with labeled floors and elevator cabs. The elevator cab is shown in its resting position at the floor it is on. In addition, intercom icons corresponding to the hall call intercoms are shown and highlighted when activated allowing the control officer to verify where the cab is required. Mouse clicking the cab icon activates floor icons allowing the control officer to send the cab to the appropriate floor. An error alert will indicate if the officer attempts to send the cab to the wrong floor. Once the cab arrives at the called location, the cab icon will indicate that the cab door is insecure while it is opening automatically, via logic from the elevator control. The icon will then indicate secure when door is closed. The control officer will then mouse click the floor icon which corresponds to the floor where the

cab must be sent. The elevator will travel to the selected floor where it will stop and the cab door opens and closes automatically, via logic from the elevator control. If no other elevator calls are stored in the elevator collective memory, the elevator control screen automatically closes

2. Guard Tour: Provide programming and hardware as required for guard tour monitoring and report generation through the SIMS system. Guard tour buttons with LED are used for this function. VGUI will show icons of guard tour button locations and will change state by color and flashing when pushed during preset guard tour times. Guard tour will have the ability to automatically shunt any and all buttons. During daytime dayroom use by inmates, the guard tour system will not be active. Pushing buttons during these times will have no affect on the system. Guard tour will automatically become active and notify master control when scheduled tours are due. Buttons will become active allowing guard tours to start. LED on button will be programmed to activate giving the guard visual confirmation of a positive check in at the location. LED is turned on from the PLC once the button push is received by the PLC.
3. Additional Utility Control Functions:

    a. Lighting control icon buttons will control lighting. Refer to Division 26 schedules.
    b. Water control icon buttons will control water on and off. Refer to Division 23 schedules.
    c. Inmate telephone system icon buttons will turn individual inmate phones on or off.
    d. TV outlet icon buttons will turn individual TV outlets on or off.
    e. UPS network system alarm enunciation.

1.7 SECURITY INFORMATION MANAGEMENT SYSTEM (SIMS)

A. The Security Information Management System (SIMS) will log all activities and event associated with the integrated control system including, door control, door monitoring, door interlock, CCTV system use, intercom system use, guard tour, lighting control and operator logged-on and log-off activity. Through a system workstation the SIMS will perform the following functions:

1. Provide a means to search, sort and generate reports of the logged data based upon Owner-defined criteria. Data will be searchable by event, time, date, door/device, operator, and other criteria, in any combinations, as dictated by the Owner. Reports can be displayed in chronological order, or by other logic, or data groups. Provide menu-selectable, packaged data reporting programs to generate activity and event reports based upon user criteria.
2. Provide a means to archive the logged data for long-term storage to Owner defined medium such as CD or tape storage.
3. Provide a single terminal for managing, programming and troubleshooting the electronic security systems.

B. The SIMS (Security Information Management System) includes the following major components:

1. File Server/Data logger
2. Tape Drive
3. Systems workstation

4. Laser printer
5. Local Area Network (LAN)
6. Non-proprietary software

C. The file server/data logger and systems workstation will be located in Master Control. The SIMS will receive and store in a data base all of the control and alarm data from the VGUI terminals and the PLC system.

D. In addition to data base management, the SIMS system workstation will serve as the diagnostic and programming terminal for the PLC, SIMS, and CCTV system. Provide software and interface as required.

PART 2 PRODUCTS

2.1 VIDEO GRAPHICS USER INTERFACE (VGUI)

A. VGUI Software:

1. Basis of Design: Wonderware Intouch (wonderware.com).
2. Subject to compliance with Specifications, products by these manufacturers may be submitted:

    a. Omron Indusoft

3. Although described within this specification, all device control logic must occur within the PLC system. No control logic will take place within the VGUI software. No proprietary DLL or other encrypted software will be considered. If it is found that system integrator provided any proprietary programming language or encrypted software the system shall be completely redeveloped at the integrators expense.
4. The system integrator shall turn over to the Owner all programming passwords, source codes and programming schedules at the end of the project.
5. Software is non-proprietary, standard off-the-shelf product of a company other than the ESSC contractor or manufacturer.
6. The product will have been in use for 10 or more years, be nationally distributed, and provide national technical support and local service.
7. The software will be capable of reporting all desired functions, data acquisition, graphics, alarming and reporting as a stand-alone operation.
8. Software is based on the latest Microsoft Windows operating system. Provide documentation to allow user programming.
9. Software will provide an interactive on-line tutorial as part of the software to teach the basic operations of the system, including graphics and tag development. The tutorial will demonstrate the configuration operations using interactive on-screen instructions.
10. The software will be a 32-bit packaged product operating on the latest Microsoft Windows platform. It will exhibit strong compliance with Microsoft's Windows Open Systems Architecture (WOSA) standards, such as in its use of dialog boxes and menus. The system must support running as a service under Windows, making it independent of the user login limitations. Sixteen bit software code is not permitted.
11. The system will provide complete user documentation, including examples of how to operate the various modules within the system. The documentation must be in

electronic format, HTML based with the ability to search for topics by keyword or search for specific text.

B. Touch Screen and/or Mouse Driven VGUI Monitor:

1. Provide and install a minimum 22" 16:10 aspect,LCD mouse driven monitor.
2. Provide and install a minimum 22" 16:10 aspect,LCD touchmonitor. Accoustic Wave technology.
3. Subject to compliance with Specifications, these products may be submitted:

a. ELO
b. NEC
c. Dell

C. VGUI Computer Workstation: The VGUI will consist of PC-based workstations and microcomputer controllers of modular design providing distributed processing capacity with:

1. 2.4 GHz Intel Pentium Dual Core.
2. 4GB SDRAM
3. 320 GB hard drive.
4. DVD+RW drive.
5. PCI SVCA display board.
6. PCI local bus IDE controller.
7. 10/100 Base-T network interface card.
8. 104 key keyboard, mouse, latest Windows software and NTFS file system.
9. Provide rack mounted, industrial grade computers by Dell, Gateway, or IBM.
10. UPS, 120V input, 750VA, rack mounted.

2.2 LOCAL AREA NETWORK (LAN)

A. LAN: High speed, fault tolerant, self healing Ethernet industrial communication network. It will be a 100 Mbps ring topology using fiber optic media as required and in compliance with IEEE 802.3.

1. Provide a network that includes redundant connections between PLC system, VGUI, SIMS, audio system, camera system, and other integration system CPU's.
2. The network will be a high speed, fault tolerant, self healing Ethernet industrial communication network. It will be a 100 Mbps ring topology using fiber optic media as required and in compliance with IEEE 802.3.
3. Network Switches: Hirschmann Network Systems (hirschmann-usa.com) or approved equal.

PART 3 – EXECUTION

3.1 SYSTEM PERFORMANCE

A. Control: Outputs to PLC will activate within 300 msec of the mouse click or touch on screen or discrete control switch activation.

B. Graphics: The graphics package must provide means of creating and displaying color object-orientated graphic displays that will be used by the operator to monitor and control the process. The development and runtime graphics packages must both be multi-document architecture applications.

1. Graphic displays will be standard Microsoft Windows files and will be able to be stored on the system disk, and on CD.
2. Graphic screens will be based on objects, not individual pixels. The object graphics will consist of an image and image attributes, such as size, color, and position that will define the properties of the object. An object is defined as anything that can be created with drawing tools from within the package or an image imported into the package. All properties, events, and methods of the object must be exposed to the system.
3. The graphic screens must be an active X document and have the ability to have third party active X OCX, controls dropped in. The system will be capable of containing any control placed onto the graphic screen.
4. The graphics package will provide support for an unlimited choice of colors with 256 supported at any one time. The package will provide configurable toolboxes the graphics developer can customize as to what tools it contains and their position in the toolboxes. These toolboxes must be a window where its shape, size and location can easily be changed with the mouse. Users will have the ability to define their own buttons.
5. Graphic package will contain the ability to animate any graphic icon.

C. Annunciation: The system will annunciate alarms including display and audible tone in 500 msec or less from the time the alarm from the PLC is activated. Alarm audibles will be distinctly different from intercom call-in tones and mouse click audible feedback tones.

D. VGUI terminals will not be interdependent. The failure of one terminal will not affect the operation of any other VGUI terminals.

E. System faults or crashes will not have the effect of activating outputs to the PLC that could control devices.

3.2 SYSTEM TEST

A. Inspect and test entire system before initiating acceptance tests.

B. Acceptance Tests: Conducted by Contractor to ensure compliance with Drawings and Specifications, witnessed by Owner's representatives. Provide at least seven days prior notice of acceptance testing to Architect and Owner.

C. System Shakedown: For the first two weeks of Owner occupancy, after final acceptance, the Electronic Security Systems Contractor will provide a person capable of full operation and maintenance of system to assist Owner on a full time basis with all initial operation, maintenance, and adjustment as required.

3.3 SPARES

A. Provide (1) spare, complete VGUI system including CPU, keyboard, mouse, and touch screen monitor as described in Paragraph 2.1.

1. The spare will be configured with all of the software and map files required for the station to function as the Central Control room.

B. Each station will be configured with an initiation routine that, when turned on, takes the user to a screen that allows the user to select the current location of that station. When the location has been selected, the station will then access only those files required for the selected control station.

3.4 OPERATION TRAINING

A. Conduct operator training in accordance with Section 280100 Electronic Security Systems.

3.5 OPERATION AND MAINTENANCE MANUALS

A. Provide six (6) copies of Operation and Maintenance Manuals indicating schematics, as-built conditions, parts list and all other information required for proper repair and maintenance of systems.

B. Operation and Maintenance Manuals will be referenced during Owner training.

END OF SECTION 281200