Original

Building knowledge

Request For Proposals - Job Order Contracting (JOC) Consulting Services

RFP 9596 | March 2020

GORDIAN®

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SECTION

GORDIAN®

March 13, 2020

City of Shoreline
City Clerk's Office – RFP 9596
17500 Midvale Avenue North
Shoreline, WA 98133-4905

Attention: Clerk's Office – RFP 9596

Re: Request for Proposals RFP 9596 for Job Order Contracting (JOC) Consulting Services

The Gordian Group, Inc. ("Gordian") is pleased to submit our Proposal in response to the Request for Proposals for JOC Application Management Services for the City of Shoreline (the "City"). We are in receipt of RFP 9596 issued on February 21, 2020.

This project will be managed by our regional team: Joie Serra, Region Director for Pac North will manage our Washington-based team of Charles Meyer, Project Manager, and Tom Widlits, Account Manager. Our regional team will be supported by our software development, customer support, marketing, operations administration and accounting teams located in our main office at 30 Patewood Drive, Greenville, SC 29615. In addition, our construction cost research and database administration functions are primarily performed in our office at 1099 Hingham St., Suite 201, Rockland, MA 02370.

Gordian is the best-qualified firm to provide the requested products and services for the following reasons:

- We are the leading firm that can provide single point responsibility for all of the products and services necessary for a JOC program. We prepare, customize and support, with in-house staff, the Contract Documents, Construction Task Catalog, Technical Specifications and the JOC Information Management System that we provide to our clients. We do not rely on third parties or independent vendors, and we do not subcontract or white-label third-party products. We will be 100% responsible for the success of your JOC program using in-house resources for software, data and services.
- Gordian has successfully implemented and supported our JOC solutions for over 250 public owners throughout the United States, including the Seattle Housing Authority, City of Bellevue, Snohomish County, Port of Everett, City of Kirkland, and City of Everett. In 2019 more than $2.3 billion dollars of construction work was procured using Job Order Contracting programs implemented and supported by Gordian.
- Building a JOC program takes more than preparing customized documents and providing software. The devil is in the details. Our experience provides us with the knowledge to develop a comprehensive, fully functioning JOC program that will deliver the most value possible. We possess the best personnel, software, and construction cost data in the industry. No other firm has our knowledge, experience and available resources for establishing and managing JOC programs.

We appreciate the opportunity to present our Proposal for Job Order Contracting products and services to the City of Shoreline. If you have any questions concerning the information provided in this response, please contact me at (800) 874-2291 or A.Lesher@Gordian.com.

Sincerely,

Ammon T. Lesher
Vice President, General Counsel

Approach

Gordian has nearly three decades of experience developing, implementing and support JOC programs. We have established and currently support hundreds of JOC programs for city, county, state, school district and university clients. No other firm can match the level of experience Gordian possesses in connection with the advertisement, evaluation and award of JOC contracts. A description of all phases of Gordian's approach to developing, implementing and supporting JOC programs is provided below. **Gordian will provide any and all services required by the RFP or offered in this proposal to ensure that the City of Shoreline ("City") has a successful JOC program.**

Methodology

The core of Gordian's approach to JOC is the rigorous and proven process we will follow to identify the City's needs and create a customized Job Order Contracting program around those needs. We do not cobble together generic unit price books or limited purpose software off the shelf and try to make them work. Our experience has taught us that to achieve maximum performance, a JOC program needs to be carefully crafted using a disciplined and thorough process. The process has been time tested and designed to minimize the effort required by the owner while producing maximum repair, alteration and minor construction results. Gordian will provide on-going technical support for the City's JOC program for the duration of the contract term, including outreach and education initiatives, JOC program updates to the Contract Documents, Construction Task Catalog and Technical Specifications, Job Order development services, additional contractor procurement, contract implementation support and training, and IMS maintenance, upgrades and system support. Gordian's job order development services, which will be included for all Job Orders, include onsite assistance with the Joint Scope Meeting, development of the Detailed Scope of Work, review and revision of the JOC contractor's Price Proposal and facilitation of the NTP from the City to the JOC contractor. Additional detail on these services will be available to the City during the evaluation process if requested.

Program Development

The Program Development process incorporates all the activities necessary to establish the structure of the City's JOC program. While JOC is a method of procurement, it is very different from the traditional methods and many factors must be considered when organizing a JOC program. We will assist the City in making educated decisions about the structure of its JOC program, from the minimum and maximum value of the contracts to the differentiation between individual Bid Factors. We will not reinvent the wheel or learn as we go. We will bring with us our experience and knowledge gained from other similar facility and infrastructure owners.

To ensure a successful JOC program, the proper policies and procedures must be prepared and implemented. Our experience will enable us to develop a comprehensive set of Execution Procedures that adhere to the City's general operating and organizational philosophies. These Execution Procedures must incorporate all phases of the JOC process. Specific issues that must be addressed include:

- **Project Initiation**
- **Project Development**
- **LSEDV Compliance Procedures**
- **Subcontractor Identification**
- **Permit Procedures**
- **Project Review and Approval**
- **Construction Inspection and Acceptance**
- **Project Close Out Procedures**
- **Payment Policy and Process**

Our experience has given us insight into each of these issues and allows us to make proven, efficient and cost effective recommendations. We propose to organize and manage a series of conferences and meetings with key City staff to create a comprehensive set of Execution Procedures that will be used to implement and administer the JOC program.

The Work Plan for our comprehensive Job Order Contracting Solutions details the major resource components necessary for a successful JOC program: Data, Technology and Services. A detailed description of our approach to develop, implement and support the City's JOC program is provided below.

Construction Task Catalog (Unit Price Book)

During the past 29 years, our team has prepared thousands of customized Construction Task Catalogs, specifically designed for JOC programs. We have customized thousands of Construction Task Catalogs for state, municipal, educational, transportation, healthcare, housing and water management clients. This depth of experience has created a comprehensive database from which we can draw upon when customizing a Construction Task Catalog for a particular client.

Gordian recognizes that each client is unique and has proven that the best JOC results are achieved when a program is tailored to fit the client's requirements. To reach the highest level of success in efficiency, client control and cost savings, the City's JOC program must have documents prepared and customized specifically for your use. Gordian prepares all of the Job Order Contracting Documents for the City including the Construction Task Catalog®, Technical Specifications, Contract and General Conditions, and Bid Documents. No other firm provides this level of service.

When we build a new Construction Task Catalog, we start with our 380,000 line item database that is continually improved and updated. As part of our ongoing support role, we produce updated Construction Task Catalogs for each JOC solicitation. When we notice areas for improvement, we bring in our engineering and estimating team to incorporate the improvement into the very next published book. With over 1,000 catalogs currently in use, client feedback and requests have allowed us to continually raise our level of quality. If any items are not already included in our database, Gordian will develop them for the City. These new tasks will be for the exact construction product or material that the City requires for its projects including, if necessary, unique owner supplied material and equipment.

Gordian currently employs more than 50 full-time personnel including engineers, estimators, construction cost researchers, data scientists, database administrators and statisticians that continuously research, update, QA and analyze construction data and construction tasks for our construction cost database. Gordian's construction cost data team performs more than 22,000 hours of cost research alone annually. This is in stark juxtaposition to other firms that may propose the use of off-the-shelf estimating data or a database managed by only a few persons.

Revision Methodology

As part of our ongoing support role, we will produce an updated Construction Task Catalog for each new City JOC contract. When we notice areas for improvement, we bring in our cost estimating and engineering team to incorporate the improvement into the very next published book using our DMAP (Database Manager and Publishing) software and its component pricing capability. As described above, Gordian has substantial resources dedicated to the continuous tracking, updating and development of construction costs. Our construction cost database is updated every day to ensure that the unit prices provided as part of each bid package are the most accurate on the

market today. Updates are not an "as-needed" exercise; they are performed continuously across all markets to ensure that when updated cost data is required, it's readily available in all 930 geographic regions served by Gordian's Construction Task Catalog. No other firm can come close to matching the dedicated resources and expertise of Gordian when it comes to building an updated, accurate and flexible construction cost database. In addition to continuous updates, Gordian's account team will work with our Data and Engineering team to develop and publish any construction tasks identified as recurring non-prepriced tasks during a previous JOC contract term.

Localized Pricing

We use local prevailing wages and local material and equipment costs (which we obtain directly from local subcontractors and suppliers) to price our Construction Task Catalog. That allows us to be extremely accurate. The pricing of the Construction Task Catalog will be specific for the City and will incorporate current actual local equipment and material prices, along with local area prevailing wage rates. Gordian currently serves several agencies surrounding the King County metropolitan area and the City of Shoreline, including the Seattle Housing Authority, City of Kirkland, and Snohomish County. We are continuously collecting, analyzing and compiling new and updated construction tasks within King County and the surrounding area.

If any items are not already included in our database, Gordian will gladly develop them for the City. These new tasks will be for the exact construction product or material that the City requires for its projects including, if necessary, unique owner supplied material and equipment. Prior to the publication of any new Construction Task Catalog, Gordian can identify and provide all non-prepriced tasks approved by the City under the previous contracts. Working directly with the City, Gordian can create line items for recurring non-prepriced tasks which are anticipated for the new contracts. We understand that new technologies and materials are being developed every day, as these materials become available, Gordian will assist the City with incorporating these new tasks into current and future Construction Task Catalogs.

Technical Specifications – We have prepared more than 3,000 sets of Technical Specifications specifically for JOC. The Technical Specifications will include the same CSI specification numbers as the applicable tasks, and dictate the quality of the workmanship and the quality of the materials for the tasks detailed in the Construction Task Catalog. Customization of the JOC Technical Specifications will also allow the City the flexibility to standardize equipment and materials. Preferred vendors and suppliers can be incorporated into the Technical Specifications with the City having the final approval of "or equal" substitutions.

Procurement Support

This phase incorporates all the activities necessary to establish the structure of the City's JOC program, inform internal City staff and the contracting community about JOC, and procure the JOC contractors. Specific services will include preparing and conducting an external marketing program, an internal marketing program and pre bid seminars.

Pre-Bid Seminars – A central feature of Gordian's procurement plan for Job Order Contracting is the pre-bid seminar for intending bidders. Since most facility owners want to attract local contractors, but often many of the local contractors are not familiar with the JOC process, it is essential that a proactive educational program occur prior to bidding. Gordian believes that the increased information exchange between the owner and the intending bidders will lead to a better understanding of the JOC program, less bid risk for the contractors and ultimately, lower bids.

We will take the lead in reaching out to local contractors to inform them about JOC. We will prepare and conduct extensive pre-bid conferences that have been refined over time to secure for the City the very best qualified contractors at a meaningful, competitive price.

Software

Gordian will provide unlimited access to our IMS (the "JOC Software") that is required to run a Gordian JOC program. Our JOC Software is capable of generating all of the JOC documents, including the contractor's Price Proposal, the independent estimate, Job Orders, and all management reports and forms. Our proven software was specifically designed to support JOC programs and will be configured to meet the information management needs of the City's JOC program. It is essential to optimizing the efficiency and convenience of a Gordian JOC system. Gordian's JOC Software is a web solution, making it accessible anytime and anywhere there is an Internet connection. Best of all, the JOC Software can handle an unlimited number of Users, Job Orders, Construction Task Catalogs and other information. As part of the JOC System License, the City will receive with a Gordian JOC solution, you will be provided with unlimited access to the JOC Software for the term of the contract.

The JOC Software is a critical component of any JOC program, and it must be designed and configured specifically for JOC. Gordian's JOC Software was developed using 25+ years of experience in managing JOC programs, and it ensures efficiency, ease of use, and maximum control at each step in the JOC process. For instance, our JOC Software enables tracking of price proposal revisions to ensure no changes go unnoticed, locks adjustment factors and unit prices to ensure no price manipulation can occur, and can generate custom reports and forms which will enable the City to tailor the software to its workflow, and ensure proactive management with advanced reporting capabilities.

Software Support and Maintenance

In terms of supporting and maintaining system applications for JOC, Gordian is the most experienced firm. Our in-house software design and development team created and supports the JOC Software. They are available 8:00 AM EST – 10 PM EST, Monday thru Friday. When you need help, we are there.

Training

Gordian will be responsible for providing a comprehensive JOC Master Training Program, which will include different course modules so that all elements of the City and JOC contractor staff will receive specialized training. Gordian will develop and publish all training aids and materials necessary to support the JOC training courses. The JOC Master Training Program will be modified to fit the City's processes and procedures.

Below is a description of each module:

The JOC Overview Module is a general purpose introduction designed to familiarize the City staff with the JOC concept. Topics include an overall JOC orientation as well as a discussion of how JOC will be implemented. In addition, JOC is presented from a contractor's perspective so the City staff can better understand the contractor's risk and potential reward. Included in this module is a discussion of how a contractor prepares a JOC bid.

The JOC Contract Documents Module is a detailed discussion of the contractual terms of the contract. This module is designed for project managers and procurement staff. The contract

documents are the "rules" under which the JOC program will be implemented. It is critical that key operational and procurement staff fully understand the Contract Documents. Copies of all materials and the contract terms and conditions are contained in the training manual.

The JOC Program Execution Module includes a detailed, comprehensive review of the City's approved JOC Execution Procedures. Training for this module includes ensuring that the City facilities and procurement staff have a full understanding of the procedures and forms that will be used to approve JOC work.

The Job Order Development Module includes training on a complete series of practical exercises designed to prepare a complete Job Order based on actual City projects. Gordian will be performing the Job Order development tasks for the City under this contract, but will provide an overview of the process for the benefit of City staff.

The JOC Software Module provides a thorough overview of our proprietary JOC Software, designed for project managers. JOC Software training is provided for each step of the JOC process, from project initiation, to reviewing and validating a contractor's Price Proposal, to project closeout. Because the primary interface is Windows Explorer-based, the City staff will readily adapt to the user-friendly nature of our software. This Module is presented in a mixed lecture and practical exercise format using computer generated overhead projection materials, handouts and hands-on computer exercises.

Gordian will provide **JOC Refresher Training** as needed or requested by the City. Our refresher training consists of a workshop discussion of all aspects of the JOC process and is offered to those who have had an opportunity to get some actual experience with the JOC process. The focus of this session is on the lessons learned and the sharing of those lessons with other staff members. We recommend that everyone attend at least two refresher training workshops; one after about a month's experience and the second one after three month's experience.

Gordian will conduct as many training sessions as required to ensure that City staff and the JOC contractors are fully prepared to execute the JOC program. Training will include a comprehensive training/reference manual with sample Job Orders, flowcharts, and forms.

Technical Support

Gordian will provide ongoing technical support in a number of areas during the term of the contract. Specific technical assistance will include:

JOC Program Updates

During the term of the contract, Gordian will provide continual updates for the City's JOC program as follows:

- Provide the City updated JOC Contract Documents for all new JOC contracts and JOC re-bids. This support will include: updating Construction Task Catalogs and Technical Specifications; monitoring recent changes and recommending improvements to the Contract and General Conditions to clearly specify the requirements of the City; further developing and implementing pre-award criteria; identifying new processes to further define contract requirements and contractor capabilities to ensure that the City retains qualified JOC contractors; and customizing the JOC process and documents to meet the ever changing needs of the City.

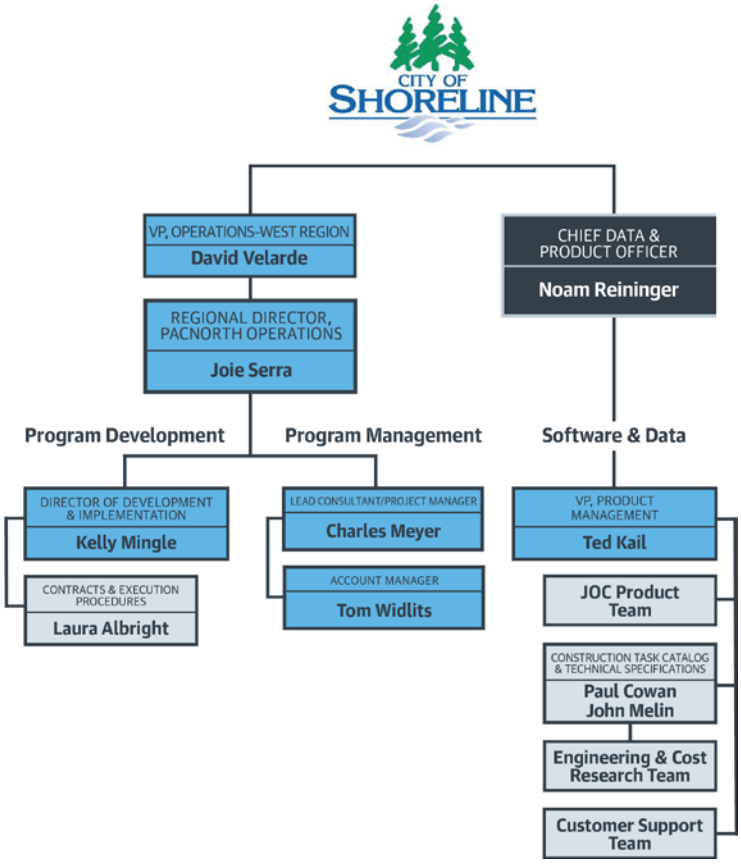
- Provide procurement and marketing support during the solicitation of JOC contracts. This support will include preparing all necessary documents and notices, preparing and participating in all pre-bid conferences, external marketing to the local contracting community, evaluating the contractor's proposed management plan, staffing and personnel plans, and assisting new contractors during mobilization.

Project Organization and Staffing

With an employee count of more than 550, including more than 300 JOC professionals, no other firm can match the level of experience Gordian possesses in connection with the advertisement, evaluation and award of JOC contracts.

The breadth of support provided to the City is not limited to the direct day-to-day interactions with our account management team, but will cover all aspects of our organization dedicated to supporting our JOC clients. Gordian's direct support for the City's program will include members of the following teams: Program Development, Program Management, Software and Construction Cost Data. Additional resources are provided by Program Analysts, Product Management, Engineering Cost Research and Customer Support.

Organizational Chart



Program Management

Key Staff is comprised of three **Program Management team members. This team is led by Joie Serra, Region Director** of the PacNorth Operations. Ms. Serra is the JOC Project Executive with primary oversight of the development of the City's JOC system. She becomes the management point of contact for communications with the City, relevant stakeholders, and the public. Reporting directly to Ms. Serra, **Charles (Chuck) Meyer** will serve as the **Lead Consultant/Project Manager** for the City's JOC program. His primary responsibilities will include overseeing the implementation phase, training, and day-to-day management and support of the City's JOC program. Mr. Meyer will collaborate with the City staff as part of their JOC bidding process, and assist to develop and finalize bidding documents; customize the Construction Task Catalog; participate in pre-bid presentations; conduct scope identification and proposal review; and assist with JOC Contractor training. Mr. Meyer will be directly supported by **Tom Widlets, Account Manager** for the City's JOC Program. Mr. Widlets will assist with responsibilities that include day-to-day development, implementation, training and support of the City's JOC program.

Program Development

This team is led by **Kelly Mingle, Director of Development and Implementation**. Ms. Mingle will manage Gordian's activities relating to the compilation of bid documents, general conditions, and other program documents required to procure the City's JOC contractors. This includes the citation and incorporation of best practices during each rebidding process, and providing standard work for contractor outreach and pre-bid meetings. The team includes a Contracts and Execution Procedures Specialist, Laura Albright, and works under the guidance of our Vice President and General Counsel, Ammon Lesher. As a licensed attorney, Mr. Lesher will work with Ms. Mingle and her team to ensure all contracts and bid documents meet City requirements.

Software and Data

The Software and Data team is led by Noam Reininger, **Chief Data & Product Officer** for Gordian. Mr. Reininger leads all aspects of product development and management, including product & data strategy, innovation, software development & data operations. He will be supported by Ted Kail for Product Management; and John Melin and Paul Cowan for Estimating services.

Implementation Schedule

Gordian can develop and implement a JOC program for the City within 120 days of the receipt of a contract. **Meeting the 120-day schedule will require working as a team.** Timely response from the City staff to our requests for information and requests to review draft documents is critical to the development and implementation process. We are aware that your staff has multiple demands placed on them in addition to your JOC program. Experience has shown us that it is best to work in our client's facilities during the early stages of the contract, so we are available to meet with client staff at their convenience. We request that the City assume the following duties and responsibilities:

- Review all documentation and requests for information submitted by Gordian in a timely manner.
- Provide full information regarding requirements for the JOC program, including but not limited to, facilities lists, current Owner procedures, programs, technical specifications and bidding information.

- Designate, in writing, a representative who shall render or obtain decisions pertaining to the JOC program in a timely manner.
- Provide work space and access to the Internet, copiers, printers, facsimile machines, and local telephone service for use by Gordian's on-site JOC development staff, which shall consist of two on-site employees during the program development phase and one employee during implementation and support phases.
- Provide reproduction services for the Construction Task Catalog, Technical Specifications, Contract and General Conditions, Instructions to Bidders and Bid Forms, including the bid packages distributed to construction contractors.

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Related Experience

The Scope of Work for the following client references include the products and services required by RFP 9596.

Seattle Housing Authority

Construction Value: $2,503,325 of construction completed to date
Program Type: Implementation and Support of a Job Order Contracting Program, including Job Order Development
Period of Service: October 2017 – On Going
Reference: Jena Richmond, CPPB
Contracts and Procurement Manager
190 Queen Anne Ave N
Seattle, WA 98109
Tel.: (206) 615-3473
Jena.Richmond@seattlehousing.org

City of Everett

Construction Value: $17,000,000 of construction completed to date
Program Type: Implementation and Support of a Job Order Contracting Program, including Job Order Development, Construction Management, and Estimating Services
Period of Service: July 2014 – On Going
Reference: Ms. Theresa Bauccio-Teschlog, Purchasing Manager
3200 Cedar Street, Door #5
Everett, WA 98201
Tel.: (425) 257-8901
TBauccio@everettwa.gov

City of Kirkland

Construction Value: $5,242,241 of construction completed to date
Program Type: Implementation and Support of a Job Order Contracting Program, including Job Order Development
Period of Service: April 2013 – On Going
Reference: Ms. Anneke Davis, Senior Capital Projects Coordinator
123 5th Avenue
Kirkland, WA 98033
Tel.: (425) 587-3828
ADavis@kirklandwa.gov

Port of Everett

Construction Value: $4,800,000 of construction completed to date
Program Type: Implementation and Support of a Job Order Contracting Program, including Job Order Development
Period of Service: July 2014 – On Going
Reference: Maija Lampinen, CPPB - Contracts Administrator
1205 Craftsman Way, Suite 200
Everett, WA 98201
Tel.: (425) 388-0606
maijal@portofeverett.com

Statement of Experience

Project Management Team Experience

Joie Serra serves as **Region Director for PacNorth Operations**. As such, she is the JOC Project Executive whose primary role will be oversight of the development and migration of the City's JOC system. She becomes the management point of contact for communications with the City, relevant stakeholders, and the public. Mrs. Serra is currently responsible for the operations of many Pacific Northwest programs, including the Seattle Housing Authority; City of Kirkland; Port of Everett, and City of Everett. Mrs. Serra has been with Gordian for nine years. She will devote 15% of her time overseeing program management team for the City's new JOC Program. During her time with Gordian, Mrs. Serra has worked many JOC programs, including:

- Jackson Health System
- Miami Dade County Schools
- City of Miami
- City of Miami Beach
- Broward County
- Pinellas County
- Palm Beach County
- City of Portland
- City of Richmond, BC
- Anchorage School District
- Hawaii Dept. of Education
- Seattle Housing Authority
- City of Kirkland
- City of Everett
- City of Bellevue
- Snohomish County
- Community Transit

Charles (Chuck) Meyer will serve as the **Lead Consultant/Project Manager** for the City and will report directly to Mrs. Serra. Mr. Meyer has been supporting PacNorth region programs for more than two years, and has been involved in all aspects of the programs. Before joining Gordian Mr. Meyer worked for 5 years as a project manager on JOC projects for a local contractor. Mr. Meyer will be the City's primary point of contact for all day-to-day activities associated with the implementation and execution of the JOC program. Mr. Meyer will devote 50% of his time to the City. During, and prior to, his time with Gordian, Mr. Meyer has worked on the following JOC programs:

- City of Richmond, BC
- Whatcom Transit Authority
- City of Everett
- Port of Everett
- Snohomish County
- Community Transit
- City of Bellevue
- University of Washington
- Sound Transit

Tom Widlets will serve as **Account Manager** for the City's JOC Program. He will assist Mr. Meyer with responsibilities including handling day-to-day development, implementation, training and support of the JOC program. Mr. Widlets will devote 35% of his time to the City. During, and prior to, his time with Gordian, Mr. Meyer has worked on the following JOC programs:

- Port of Portland
- City of Vancouver
- City of Bellevue
- Hawaii Dept. of Education
- Seattle Housing Authority
- City of Kirkland

Cost

Gordian Fees

A significant benefit of Gordian's approach to providing our JOC solutions is that we do not charge an upfront fee to our clients to implement a JOC program. Our contracts are pure performance-based contracts; we do not succeed unless you succeed. Accordingly, there is no risk to the City for the development and implementation of a Gordian JOC program since the City is under no obligation to use the program once it is operational. However, we are 100% confident that the City will continue to see the substantial time and cost savings afforded by a Gordian JOC program.

The pricing set forth below includes all of the development, implementation and technical support services required by the RFP, as well as the Job Order Development Services, Gordian will provide for every project. The fees for these products and services consist of a City License Fee and Job Order Development Fee, as set forth below:

City License Fee:	One and ninety-five hundredths percent (1.95%) of the value of construction work procured through the City's JOC program; and
Job Order Development Fee:	Three and five hundredths percent (3.05%) of the value of construction work procured through

The City License Fee and Job Order Development Fee are payable upon the issuance of each Job Order by the City. It is important to note that the pricing set forth above includes additional training for new employees and contractors beyond the implementation period, which is included at no additional cost.

Gordian's implementation of the City JOC program includes a license to our proprietary JOC System and other related materials which includes our JOC software, construction cost data and training materials, among other documentation. Our proposal is being submitted with the understanding that City agrees to incorporate into any agreement between City and Gordian the standard JOC System License.

Gordian will charge each JOC contractor a contractor license fee ("Contractor License Fee") of one percent (1.00%) of the value of each Job Order, Purchase Order, or similar purchasing document issued to the JOC contractor by the City. The Contractor License Fee is assessed to the JOC contractor in return for their access to our proprietary construction data, JOC applications and training, and is not a fee assessed to the City. Gordian is responsible for all administrative duties related to the invoicing and collections of the Contractor License Fee. The Contractor License Fee is payable by the JOC contractor when a Job Order is issued by the City, and will be assessed to the JOC contractor for all work ordered by County using the JOC program.

APPENDIX

Dave Velarde

Vice President of Operations – West Region

19 years of employment with Gordian

Education

- B.S. Electrical Engineering, Texas Tech University

Licensures

- State of Florida Class "A" General Contractors License, #CGCO057291

Relevant JOC Experience

Gordian

As Vice President of Operations, Mr. Velarde is responsible for the development, implementation and continued support for the western sector of Gordian's client base, including but not limited to the following:

- Alameda County
- University of California
- California State University
- City of Long Beach
- Port of Long Beach
- Los Angeles County Community Development Commission
- Los Angeles County Housing Authority

As the Mountain Region Director, Mr. Velarde was responsible for the development, implementation and continued support of the Job Order Contracting program for the following:

- University of New Mexico
- New Mexico Cooperative Educational Services
- New Mexico State University
- Los Alamos Public Schools, NM
- City of Las Cruces

Davis Monthan AFB, AZ

At Davis Monthan Mr. Velarde served as Project Manager and was responsible for the on-site performance of the account with full authority to commit resources to ensure successful project completion. Mr. Velarde maintained full responsibility and authority to manage the team responsible for planning, designing, estimating, project negotiation, scheduling and execution of the Simplified Acquisition of Base Engineering Requirements (SABER) projects. Completed 334 projects in the 3-year period for a contract value of $10 million.

White Sands Missile Range, NM

As the Project Engineer at the White Sands Missile Range, Mr. Velarde was responsible for all areas of JOC Construction Management including construction quality control, estimating, scheduling, testing and closeout procedures. Mr. Velarde processed all construction invoices and submittals, and solved all on-site problems while still ensuring project completion.

Other Experience

Roy Jorgensen Associates, Inc., MD

Project Director overseeing 102 Toyota Motor Sales, USA facilities nationwide, totaling 6.5 million square feet and $15 million in maintenance activities and $40 million in construction. Responsibilities included development of a strong customer service relationship with the client and solving related problems. Developed and implemented programs to incorporate all aspects of facilities management, day-to-day operations, negotiate contracts, long range planning, expense and capital budgeting, and construction management.

NBD/BankOne, MI

As Director of Facilities overseeing 602 Branch Banks for NBD, renamed BankOne, across Michigan and Indiana, Mr. Velarde's responsibilities included the initial startup of the NBD contract in Southeast Michigan and two subsequent increases for Indiana and the remainder of Michigan branches. The startup included the hiring and training of 85 employees. Maintenance included full facilities components, utility management, bank equipment maintenance and project management of the capital budget.

NationsBank of Florida

As the Director of Facilities at NationsBank of Florida, Mr. Velarde was responsible to oversee the startup and day-to-day operations of 475 Branch Banks and remote ATM locations across Florida. While there, Mr. Velarde helped develop and implement all related programs to incorporate all aspects of facilities management, routine maintenance, preventative maintenance, negotiate contracts, construction management, disaster planning, cost accounting, and quality benchmarking. Further, Mr. Velarde developed and adhered to operating and capital budgets, conducted on-site facility inspections to benchmark overall quality of services performed by Jorgensen and subcontractors.

Dieter & James, Inc. TX

As the Project Engineer at Dieter Mr. Coffey was responsible for the complete overview of the project engineering aspects from estimating to the closeout of projects. Quality control of on-going projects such as: scheduling and its control, submittal review and distribution, direct contact with owners representatives for specific requirements, all inspections, punch lists, as-builts and operations and maintenance manuals. Completed 17 projects totaling $14.6 million. Some examples of these projects include: Hoover Vacuum's 112,000 SF tilt-up plastic stamping plant, Paragon Cable's 40,000 SF tilt-up offices, Two Home Club's exposed aggregate 120,000 SF tilt-up buildings and International Paper's 140,000 SF tilt-up building.

Professional Associations

International Facility Management Association - Associate Member

Joie M. Serra

Region Director, PacNorth Operations

9 years of employment with Gordian

Education

- B.S., Architectural Engineering; University of Miami, FL
- A.A., Edison State College, FL

Relevant JOC Experience

Gordian

As the Account Executive, Ms. Serra works closely with client's upper management to maintain a successful and sustainable JOC program through varying communication including program reports consisting of data analysis and benchmarks. She is also responsible for identifying new revenue opportunities across Gordian's solution offerings and partnering with Gordian's product team to ensure innovations and enhancements to our services, data, and software satisfy clients' needs.

Other Experience

F.H. Paschen, S.N. Nielsen

As a Project Engineer, Ms. Serra supported all Miami office contracts regarding permits, notice of commencement as well as project close out. She was responsible for preparing scopes of work, PROGEN proposals and estimates, developed schedules, field reports and submittals.

Pulte Homes

As an Assistant Superintendent responsible for in assisting on all phases of home construction. Constructed two sales models to new national specifications. Assisted customer relations manager on service appointments and homeowner meetings.

Charles (Chuck) Meyer

Lead Consultant/Project Manager

2.5 years of employment with Gordian
Over 19 years of Construction Experience

Education

B.S., Architecture, The Ohio State University, Columbus OH

Relevant JOC Experience

Gordian

Mr. Meyer provides management services and communicates with clients to ensure JOC products and services are implemented and properly carried through. He conducts pre-bid presentations, assists with training of staff and new contractors, and responds to questions involving tasks in the CTC, bids or proposals. Mr. Meyer's JOC program experience includes the following:

- City of Everett
- Port of Everett
- Snohomish County
- Transit Authority
- Community Transit
- City of Bellevue
- Whatcom

Other Experience

Hazel Point Company

As Project Manager and Lead Carpenter, duties included executing and managing all phases of construction. Supervised all subcontractor coordination including contract negotiation, change order log, and SOV approvals. Worked directly with architects.

Forma Construction Co.

Project Manager responsible for managing multiple projects simultaneously to complete over 80 JOC Work Orders in 4 years. Developed job means and methods of execution while value engineering project scope to meet jurisdictional budget requirements. Full project management from initial scoping to negotiation of contract, buy-out, procurement of materials, processing submittals, and securing change orders. Coordinated with superintendents to manage budgets, schedules, and subcontractors to deliver projects on-time and within budget. Trained and supported new employee PEs and Managers on adjacent JOC contracts within the company.

Charles Meyer Design, LLC

As the General Contractor, procured, bid, managed and supervised the project with responsibilities that included conducting value engineering meetings with the owner and architect. Coordinated, scheduled and supervised subcontractors and suppliers to deliver the completed project on time, within budget, and with desired quality standards.

Certifications

- Construction Management Certificate
- OSHA 30
- 48-Hour Revit Certificate
- Certified Lead Renovator

Tom Widlits

Account Manager

2.5 years of employment with Gordian
Over 13 years of Project Management experience

Education

- BBA, Landscape Architecture, University of Oregon
- A.A.., Landscape Architecture, San Diego State University

Relevant JOC Experience

Gordian

As the Account Manager, Mr. Widlits responsibilities include handling day-to-day development, implementation and support of the JOC program. He assists in training staff in the proper execution of the JOC program and use of the eGordian system, developing project assignments, scope identification, contractor proposal accuracy, and overall contract compliance. Additional duties include assisting the Owner with proposal review and ensuring the use of appropriate line items. Mr. Widlits has worked with the following JOC programs:

- City of Vancouver
- City of Kirkland
- City of Bellevue
- Port of Portland
- Seattle Housing Authority
- Hawaii Dept. of Education

Other Experience

Nike, Inc.

As a Project Manager undertook and successfully completed a wide range of tenant improvement projects including 3-D print labs, Innovation spaces for apparel, football equipment testing, collaboration/lounge spaces, apparel merchandising rooms and commercial office space. Developed RFPs as well as RFIs in the research phase of various projects. Responsibilities included contractor bid development, contractor response reviews, contractor selection, contract negotiation as well as development of project charter, timeline and budget. Collaborated with other organizations at Nike to develop long term sustainable processes for prioritization of Tenant requested projects and facility upgrades. Developed a strategic planning matrix to enable a rolling five-year site plan. Responsible for reporting project status to senior leadership teams, as well as maintaining great rapport with project stakeholders and trades.

Tri-Met

Project Manager responsible for construction on Tri-Met's "Special Needs Assessment" facility in NW Portland. Facilitated processing of RFIs, submittals and samples among the general contractor, the owner and the owner's consultants. Submitted all project closeout documents in accordance with the contract. Worked with facilities department to set long term strategic plans for track protections prioritizing security concerns and setting plans and budgets for various projects.

MBank

As a Facilities Director, oversaw construction on bank branch expansions as well as Bank Operations Center. Assigned projects and tasks to employees based on their competencies and specialties. Performed construction site pre-inspections and coordinated post-construction audits. Led and managed resolution of all issues during project construction and commissioning phases. Facilitated processing of RFI's submittals and samples among the general contractor, the owner and the owner's consultants. Collaborated with senior leadership to develop a long-term strategy for maintenance and equipment obsolescence on all bank owned properties to allow for better utilization of operational budgets. Initiated process for multi-trade maintenance schedules for all bank properties, setting Service Level Agreements with vendors, contract negotiation for long term maintenance and oversight of the program.

Certifications

- LEEDS
- Project Management Professional

Kelly Mingle

Director of Development and Implementation

9.5 years of employment with Gordian

Education

- A.S., Environmental Design/Architecture, Cosumnes River College

Relevant JOC Experience

Gordian

As Director of Development and Implementation, Ms. Mingle coordinates the accurate development and preparation of Contracts and General Conditions used to procure the JOC construction contractors.

In her previous role as an Account Manager, Ms. Mingle was responsible for the implementation and continued support of the Job Order Contracting programs for the following:

- California Administrative Office of the Courts
- Sacramento County

Other Experience

County of Sacramento, Architectural Services Division

Ms. Mingle was with the County of Sacramento for 9 years, serving primarily as a JOC Program Coordinator following one year as a Program Manager with the Architectural Services Division (ASD). Responsibilities included project management, supervision of 3 Project Managers, and coordination of the JOC program County-wide. ASD utilized JOC for the Sheriff, Probation, Parks, Courts, General Services, Department of Water Resources, County Airports System and Department of Transportation completing 300+ construction projects with a combined value greater than $88 million.

Gap, Inc.

While at the Gap, Inc., Ms. Mingle was the Senior Project Manager and was responsible for multiple, simultaneous retail projects including indoor malls, outdoor malls, and strip center locations throughout the United States and Puerto Rico.

Ray Bailey Architects, Inc., MD

While at Ray Bailey Architects, Inc., Ms. Mingle performed construction administration duties on a multi-phased, $85 million renovation/addition to The Mall of Columbia, Columbia Maryland. The Scope of the project included three new multi-level parking decks, a new two-level wing to the mall, relocation of the food court, and extensive site work.

Laura Albright, CSI, CDT

Development and Implementation Specialist

7 years of employment with Gordian

Education

- B.A., California State University/ Sacramento
  Bachelor of Arts - Design, cum laude

Credentials

- Construction Specifications Institute
- Construction Document Technologist

Relevant JOC Experience

Gordian

As a Development and Implementation Specialist, Ms. Albright is responsible for preparing the Contract and General Conditions that are used to procure the JOC construction contractors.

Other Experience

Gap, Inc.

While at the Gap, Inc., Ms. Albright was a Project Manager and was responsible for multiple, simultaneous retail projects including indoor malls, outdoor malls, and strip center locations throughout the United States and Puerto Rico.

Tech Events, Inc.

While at Tech Events, Inc., Ms. Albright was the Director of Client Service, managed and implemented full delivery for corporate technical event logistics, composed and managed all client contracts and renewals, managed all aspects of client relationships, department and team coordination, and solutions implementation. Business strategy development and launch of sister company SolvD, marketing strategy, and social media strategy, content and implementation.

Closed Loop, Inc.

While at Closed Loop, Inc., Ms. Albright was the Director of Operations managing all aspects of facilities, finances, office operations, remote office coordination, business development and resource allocation.

Borges Architectural Group

While at Borges Architectural Group, Ms. Albright was the Design Project Manager and was responsible for all Interior Design projects, client services, design specifications, construction management, proposals and bid reviews.

Noam Reininger

Chief Product & Data Officer

3 years of employment with Gordian and over 15 years of Data and IT industry experience

Education

- B.B.A., Information Systems and East Asian Studies, University of Wisconsin

Experience

Gordian

Mr. Reininger is the Chief Product & Data Officer responsible for the development of Gordian's portfolio of technology and data solutions that solve the unique challenges of the construction industry. Mr. Reininger leads all aspects of development including product & data strategy, innovation, software development & data operations.

Other Experience

Dun & Bradstreet

As the Senior Vice President, Master Data and Data-as-a Service Solutions, lead global product management organization responsible for $330 million in annual revenue. Organization includes both strategy and execution teams with over 150+ cross-functional staff members responsible for D&B's Master Data & Data-as-a-Service Portfolio.

DELL

As the Director of Solution Centers started up and led an enterprise class pre-sales organization from the ground up. Hired, trained and lead a staff of 22 solution architects and oversaw multi-million-dollar facility bring-ups in Austin, Chicago, DC and New York. Engaged with senior government dignitaries and drove media relation activities.

SALESVU

As the Chief Operating Officer was a founding member, started up, staffed and oversaw offshore development and drove sales and marketing activities. Responsibilities included investor relations, strategy and operations.

Ted Kail

Vice President of Product Management

15 years of employment with Gordian

Education

- Executive M.B.A., Northeastern University
- B.S., Business, Northeastern University

Relevant JOC Experience

Gordian

As the VP of Product Management, Mr. Kail is responsible for determining the strategic direction of all products across the construction lifecycle, which includes Planning, Estimating, and Procurement solutions.

Other Experience

Sightlines, LLC

Sr. Director of Product Management responsible for directing Sightlines' offerings across the full life cycle – from ideation through service implementation. Determined the strategic direction of all Sightlines' current products and made decisions around all new services and markets. Directed the acquisition and integration of the Pacific Partners Consulting Group (PPCG). Prior to product, Ted managed all new client relationships in the operations department. Implemented and provided Sightlines' services at over 100 institutions throughout North America.

John B. Melin, Jr.

CTC Cost Estimator - Manager

24 years of employment with Gordian

Education

- B.S., Building Construction, Georgia Institute of Technology

Licensures

- Certified Cost Professional, #1194, Originally certified 9/1/1991
- Project Management Professional, #04539, Originally certified 5/17/1995

Relevant JOC Experience

Gordian

Mr. Melin is the Manager for the CTC Data Team and responsible for gathering and processing data for use in developing our Construction Task Catalog database. Mr. Melin has prepared customized Construction Task Catalogs for over 100 public facility owners, including:

- New York Department of Transportation
- New York State Department of Environmental Conservation
- New York State Dormitory Authority
- State University Construction Fund

Project Time and Cost, Atlanta

Department of Defense, Worldwide

Project Manager responsible for the coordination and preparation of site specific Unit Price Books for DOD Job Order Contracts worldwide.

Database and Estimating Software Experience

- CACES, MCACES, M-CACES Composer Gold, MC2, Navy's CES, CEG

Professional Associations

- Association for the Advancement of Cost Engineers International

Paul Cowan

Senior CTC Engineer

13 years of employment with Gordian

Education

- B.S., Management, Georgia Institute of Technology, Atlanta, GA, 2001

Certification

- Information Technology Certificate, Georgia Institute of Technology, 2001

Relevant JOC Experience

Gordian

As a Senior CTC Engineer, Mr. Cowan is responsible for improving, expanding and maintaining Gordian's proprietary Construction Task Database and for customizing and publishing client specific Construction Task Catalogs. He has well developed company expertise in design engineering and construction consulting, as well as value engineering.

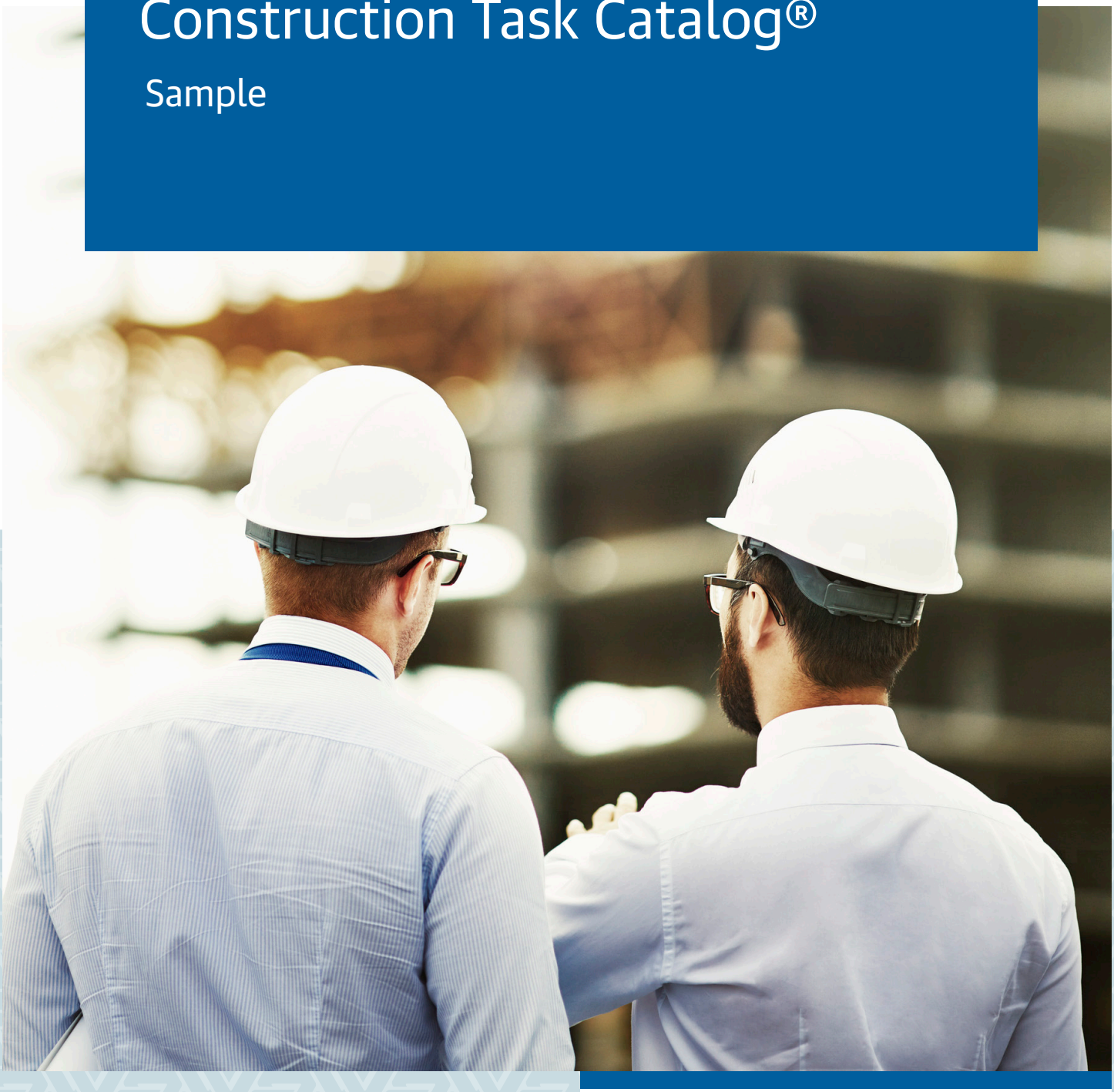
Other Experience

Mr. Cowan has worked with manufacturing partners to design and produce products to assist the US Air Force with production and safety requirements.

Building knowledge

Job Order Contract Construction Task Catalog®

Sample



GORDIAN®

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MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST

28 Electronic Safety And Security

Note: Termination costs are included with all safety and security equipment, panel boards, and devices. Terminations are not included with patch panels.

28 05 Common Work Results For Electronic Safety And Security *(28)*

28 05 13 Conductors And Cables For Electronic Safety And Security *(28 05)*

28 05 13 13 CCTV Communications Conductors And Cables *(28 05 13)*

See CSI section 26 05 19 00-0000 for low-voltage electrical power cable, 26 05 23 00-0000 for control-voltage electrical power cable, 27 14 00 00-0000 for conductors and cables.

28 05 13 16 Access Control Communications Conductors And Cables *(28 05 13)*

See CSI section 26 05 19 00-0000 for low-voltage electrical power cable, 26 05 23 00-0000 for control-voltage electrical power cable, 27 14 00 00-0000 for conductors and cables.

28 05 13 19 Intrusion Detection Communications Conductors And Cables *(28 05 13)*

See CSI section 26 05 19 00-0000 for low-voltage electrical power cable, 26 05 23 00-0000 for control-voltage electrical power cable, 27 14 00 00-0000 for conductors and cables, 28 05 13 23-0000 for Type FPLP.

28 05 13 23 Fire Alarm Communications Conductors And Cables *(28 05 13)*

28 05 13 23-0001 Fire Alarm/Life Safety Cable *(28 05 13 23)*

28 05 13 23-0002 Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable *(28 05 13 23-0001)*

28 05 13 23-0003 Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit *(28 05 13 23-0002)*

28 05 13 23-0004	MLF	1-Pair, 18 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,328.71	430.93
28 05 13 23-0005	MLF	2-Pair, 18 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,759.48	446.52
28 05 13 23-0006	MLF	1-Pair, 16 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,517.51	489.83
28 05 13 23-0007	MLF	2-Pair, 16 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	2,215.57	507.32
28 05 13 23-0008	MLF	1-Pair, 14 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,765.72	548.36
28 05 13 23-0009	MLF	2-Pair, 14 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	2,767.90	568.12
28 05 13 23-0010	MLF	1-Pair, 12 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	2,378.53	627.02
28 05 13 23-0011	MLF	2-Pair, 12 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	3,948.41	649.38

28 05 13 23-0012 Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed *(28 05 13 23-0002)*

28 05 13 23-0013	MLF	1-Pair, 18 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,046.94	861.99
28 05 13 23-0014	MLF	2-Pair, 18 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,503.67	893.04
28 05 13 23-0015	MLF	1-Pair, 16 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,333.91	979.80
28 05 13 23-0016	MLF	2-Pair, 16 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	3,061.09	1,014.63
28 05 13 23-0017	MLF	1-Pair, 14 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,679.65	1,096.97
28 05 13 23-0018	MLF	2-Pair, 14 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	3,714.77	1,136.24
28 05 13 23-0019	MLF	1-Pair, 12 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	3,423.56	1,254.04
28 05 13 23-0020	MLF	2-Pair, 12 AWG, Twisted Pair, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	5,030.82	1,299.01

28 05 13 23-0021 Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit *(28 05 13 23-0001)*

28 05 13 23-0022	MLF	2/c #22 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	720.54	352.65
28 05 13 23-0023	MLF	4/c #22 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	804.19	365.19
28 05 13 23-0024	MLF	2/c #18 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	873.62	430.93
28 05 13 23-0025	MLF	3/c #18 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	963.73	438.72
28 05 13 23-0026	MLF	4/c #18 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,014.12	446.52
28 05 13 23-0027	MLF	6/c #18 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,190.56	462.09

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
28 05 13 23-0028	MLF	8/c #18 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,454.20	477.68
28 05 13 23-0029	MLF	2/c #16 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,039.22	489.83
28 05 13 23-0030	MLF	4/c #16 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,236.07	507.32
28 05 13 23-0031	MLF	2/c #14 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,233.28	548.36
28 05 13 23-0032	MLF	4/c #14 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,552.43	568.12
28 05 13 23-0033	MLF	2/c #12 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,570.36	627.02
28 05 13 23-0034	MLF	4/c #12 AWG, Shielded, Non-Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	2,099.66	649.38
28 05 13 23-0035		Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable *(28 05 13 23-0001)*		
28 05 13 23-0036		Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit *(28 05 13 23-0035)*		
28 05 13 23-0037	MLF	2/c #22 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	710.09	352.65
28 05 13 23-0038	MLF	2/c #18 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	866.83	430.93
28 05 13 23-0039	MLF	3/c #18 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,029.35	438.72
28 05 13 23-0040	MLF	4/c #18 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,032.29	446.52
28 05 13 23-0041	MLF	6/c #18 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,285.39	462.09
28 05 13 23-0042	MLF	2/c #16 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,028.96	489.83
28 05 13 23-0043	MLF	4/c #16 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,259.09	507.32
28 05 13 23-0044	MLF	2/c #14 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,187.10	548.36
28 05 13 23-0045	MLF	4/c #14 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,735.96	568.12
28 05 13 23-0046	MLF	2/c #12 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,555.27	627.02
28 05 13 23-0047	MLF	4/c #12 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	2,378.28	649.38
28 05 13 23-0048		Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed *(28 05 13 23-0035)*		
28 05 13 23-0049	MLF	2/c #22 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,297.84	705.56
28 05 13 23-0050	MLF	2/c #18 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,585.06	861.99
28 05 13 23-0051	MLF	3/c #18 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,760.24	877.20
28 05 13 23-0052	MLF	4/c #18 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,776.48	893.04
28 05 13 23-0053	MLF	6/c #18 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,055.55	924.07
28 05 13 23-0054	MLF	2/c #16 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,845.36	979.80
28 05 13 23-0055	MLF	4/c #16 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,104.61	1,014.63
28 05 13 23-0056	MLF	2/c #14 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,101.03	1,096.97
28 05 13 23-0057	MLF	4/c #14 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,682.83	1,136.24
28 05 13 23-0058	MLF	2/c #12 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,600.30	1,254.04
28 05 13 23-0059	MLF	4/c #12 AWG, Non-Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	3,460.69	1,299.01
28 05 13 23-0060		Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable *(28 05 13 23-0001)*		
28 05 13 23-0061		Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit *(28 05 13 23-0060)*		
28 05 13 23-0062	MLF	2/c #22 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	753.11	352.65
28 05 13 23-0063	MLF	2/c #18 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	897.55	430.93
28 05 13 23-0064	MLF	3/c #18 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,143.39	438.72

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
28 05 13 23-0065	MLF	4/c #18 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,063.73	446.52
28 05 13 23-0066	MLF	6/c #18 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,317.54	462.09
28 05 13 23-0067	MLF	2/c #16 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,099.57	489.83
28 05 13 23-0068	MLF	4/c #16 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,291.75	507.32
28 05 13 23-0069	MLF	2/c #14 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,339.39	548.36
28 05 13 23-0070	MLF	4/c #14 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,659.60	568.12
28 05 13 23-0071	MLF	2/c #12 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	1,667.96	627.02
28 05 13 23-0072	MLF	4/c #12 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed In Conduit	2,146.44	649.38
28 05 13 23-0073		Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed *(28 05 13 23-0060)*		
28 05 13 23-0074	MLF	2/c #22 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,340.86	705.56
28 05 13 23-0075	MLF	2/c #18 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,615.78	861.99
28 05 13 23-0076	MLF	3/c #18 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,874.28	877.20
28 05 13 23-0077	MLF	4/c #18 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,807.92	893.04
28 05 13 23-0078	MLF	6/c #18 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,087.70	924.07
28 05 13 23-0079	MLF	2/c #16 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	1,915.97	979.80
28 05 13 23-0080	MLF	4/c #16 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,137.27	1,014.63
28 05 13 23-0081	MLF	2/c #14 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,253.32	1,096.97
28 05 13 23-0082	MLF	4/c #14 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,606.47	1,136.24
28 05 13 23-0083	MLF	2/c #12 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	2,712.99	1,254.04
28 05 13 23-0084	MLF	4/c #12 AWG, Shielded, Plenum Rated, Solid Type FPLP (Red), Fire Alarm/Life Safety Cable, Installed Exposed	3,228.85	1,299.01

28 05 26 Grounding And Bonding For Electronic Safety And Security *(28 05)*

See CSI section 26 05 26 00-0000 for grounding and bonding.

28 05 28 Pathways For Electronic Safety And Security *(28 05)*

28 05 28 29 Hangers And Supports For Electronic Safety And Security *(28 05 28)*

See CSI section 26 05 29 00-0000 for hangers and supports.

28 05 28 33 Conduits And Backboxes For Electronic Safety And Security *(28 05 28)*

See CSI section 26 05 33 13-0000 for conduits.

28 05 28 36 Cable Trays For Electronic Safety And Security *(28 05 28)*

See CSI section 26 05 36 00-0000 for cable trays.

28 05 28 39 Surface Raceways For Electronic Safety And Security *(28 05 28)*

See CSI section 26 05 33 23-0000 for surface raceways.

28 05 53 Identification For Electronic Safety And Security *(28 05)*

See CSI section 26 05 53 00-0000 for identification.

28 10 Electronic Access Control And Intrusion Detection *(28)*

Note: Includes testing of new devices and certification.

28 13 Access Control *(28 10)*

28 13 33 Access Control Interfaces *(28 13)*

28 13 33 16 Access Control Interfaces to Access Control Hardware *(28 13 33)*

28 13 33 16-0001		Stand Alone Access Controls *(28 13 33 16)*		
28 13 33 16-0002		Push Button Controls, Stand Alone Access Controls *(28 13 33 16-0001)*		
28 13 33 16-0003		Interior Mount, Push Button Controls, Stand Alone Access Controls *(28 13 33 16-0002)*		
28 13 33 16-0004	EA	Exit Push Button, Push Button Controls, Interior Stand Alone Access Controls Note: Controls mount to a standard mullion.	67.67	15.84
28 13 33 16-0005	EA	Exit Push Button, Push Button Controls, Interior Stand Alone Access Controls Note: Controls mount into a single gang electrical box. Excludes electrical box.	70.67	15.84
28 13 33 16-0006	EA	Three Button, Push Button Controls, Interior Stand Alone Access Controls For Gate Operators Note: Controls mount into a single gang electrical box. Excludes electrical box.	87.92	15.84
28 13 33 16-0007		Exterior Mount, Push Button Controls, Stand Alone Access Controls *(28 13 33 16-0002)* Note: Includes a lockable, gasketed 16 gauge steel enclosure. Excludes mounting posts.		
28 13 33 16-0008	EA	Handicap/Push To Open, Push Button Controls, Exterior Stand Alone Access Controls Note: Controls mount into a single gang electrical box. Excludes electrical box.	83.67	15.84
28 13 33 16-0009	EA	42" High Aluminum Post With Handicap/Push To Open, Push Button Controls, Exterior Stand Alone Access Controls Note: Includes post, mounting base and push button control. Excludes concrete foundation.	394.00	47.50
28 13 33 16-0010	EA	Three Button, Exterior Stand Alone Access Controls For Gate Operators Note: Includes open, close and stop controls.	132.92	15.84

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
28 13 33 16-0011		Key Controls, Stand Alone Access Controls *(28 13 33 16-0001)*		
28 13 33 16-0012		Interior Mount, Key Controls, Stand Alone Access Controls *(28 13 33 16-0011)*		
28 13 33 16-0013	EA	Standard Mortise Key, Key Controls, Interior Stand Alone Access Controls Note: Controls mount into a single gang electrical box. Excludes electrical box.	93.55	15.84
28 13 33 16-0014		Exterior Mount, Key Controls, Stand Alone Access Controls *(28 13 33 16-0011)* Note: Includes a lockable NEMA rain resistant steel enclosure. Excludes mounting posts.		
28 13 33 16-0015	EA	Postal Or Fire Department Lock Box, Key Controls, Exterior Stand Alone Access Controls Note: Opens door or gate with a postal or fire department key.	145.84	31.67
28 13 33 16-0016	EA	Standard Mortise Key, Key Controls, Exterior Stand Alone Access Controls	225.34	31.67
28 13 33 16-0017	EA	Ace Key, Key Controls, Exterior Stand Alone Access Controls	225.34	31.67
28 13 33 16-0018	EA	Standard Mortise Key And Push Button Intercom, Key Controls, Exterior Stand Alone Access Controls	339.34	31.67
28 13 33 16-0019		Keypad Controls, Stand Alone Access Controls *(28 13 33 16-0001)*		
28 13 33 16-0020		Interior Mount, Keypad Controls, Stand Alone Access Controls *(28 13 33 16-0019)*		
28 13 33 16-0021	EA	One Code Memory, Keypad Control, Interior Stand Alone Access Controls Note: Stores one 4-digit entry code and one 4-digit hold code. Controls mount into a single gang electrical box. Excludes electrical box.	129.17	15.84
28 13 33 16-0022		Exterior Mount, Keypad Controls, Stand Alone Access Controls *(28 13 33 16-0019)* Note: Includes a surface mounted lockable NEMA rain resistant steel enclosure. Excludes mounting posts.		
28 13 33 16-0023		Keypad Controls, Exterior Stand Alone Access Controls *(28 13 33 16-0022)*		
28 13 33 16-0024	EA	1000 Code Memory, Keypad Control, Exterior Stand Alone Access Controls Note: Includes lighted keypad. Stores one thousand 4-digit entry codes and six 5-digit entry codes.	539.17	63.34
		For Flush Mount, Add	*92.81*	
28 13 33 16-0025		Keypad Controls With Push Button Intercom, Exterior Stand Alone Access Controls *(28 13 33 16-0022)* Note: Includes intercom sub-station. Excludes additional receiving intercoms.		
28 13 33 16-0026	EA	1000 Code Memory, Keypad Controls With Push Button Intercom, Exterior Stand Alone Access Controls Note: Includes lighted keypad. Stores one thousand 4-digit entry codes and six 5-digit entry codes.	652.51	71.25
		For Flush Mount, Add	*114.75*	
28 13 33 16-0027		RF Controls, Stand Alone Access Controls *(28 13 33 16-0001)*		
28 13 33 16-0028		Exterior Mount, RF Controls, Stand Alone Access Controls *(28 13 33 16-0027)* Note: Includes a lockable NEMA rain resistant steel enclosure. Excludes mounting posts and transmitters.		
28 13 33 16-0029		RF Receivers, RF Controls, Exterior Stand Alone Access Controls *(28 13 33 16-0028)* Note: Includes a lockable NEMA rain resistant steel enclosure. Excludes mounting posts and transmitters.		
28 13 33 16-0030	EA	50 Code Memory, RF Receiver, RF Controls, Exterior Stand Alone Access Controls	329.17	63.34
28 13 33 16-0031	EA	100 Code Memory, RF Receiver, RF Controls, Exterior Stand Alone Access Controls	369.67	63.34
28 13 33 16-0032	EA	250 Code Memory, RF Receiver, RF Controls, Exterior Stand Alone Access Controls	408.67	63.34
28 13 33 16-0033	EA	500 Code Memory, RF Receiver, RF Controls, Exterior Stand Alone Access Controls	450.67	63.34
28 13 33 16-0034	EA	1000 Code Memory, RF Receiver, RF Controls, Exterior Stand Alone Access Controls	489.67	63.34
28 13 33 16-0035	EA	5000 Code Memory, RF Receiver, RF Controls, Exterior Stand Alone Access Controls	531.67	63.34
28 13 33 16-0036	EA	16000 Code Memory, RF Receiver, RF Controls, Exterior Stand Alone Access Controls	570.67	63.34
28 13 33 16-0037		RF Transmitters, RF Controls, Exterior Stand Alone Access Controls *(28 13 33 16-0028)*		
28 13 33 16-0038	EA	1 Button, RF Transmitter, RF Controls, Exterior Stand Alone Access Controls	25.50	
		For >40 To 110, Deduct	*-1.28*	
		For >110, Deduct	*-2.55*	
		For Built In Proximity Tags, Add	*5.10*	
28 13 33 16-0039	EA	2 Button, RF Transmitter, RF Controls, Exterior Stand Alone Access Controls	27.00	
		For >40 To 110, Deduct	*-1.35*	
		For >110, Deduct	*-2.70*	
		For Built In Proximity Tags, Add	*5.40*	
28 13 33 16-0040	EA	3 Button, RF Transmitter, RF Controls, Exterior Stand Alone Access Controls	28.50	
		For >40 To 110, Deduct	*-1.43*	
		For >110, Deduct	*-2.85*	
		For Built In Proximity Tags, Add	*5.70*	
28 13 33 16-0041		Accessories For RF Receivers, Exterior Stand Alone Access Controls *(28 13 33 16-0028)*		
28 13 33 16-0042	EA	Coax Antenna Kit For RF Receivers, Exterior Stand Alone Access Controls Note: Includes 15' of coax cable.	131.00	47.50
28 13 33 16-0043	EA	Antenna Amplifier For RF Receivers, Exterior Stand Alone Access Controls Note: Includes 20' of coax cable.	245.00	47.50
28 13 33 16-0044	EA	Yagi High-Gain Antenna Kit For RF Receivers, Exterior Stand Alone Access Controls Note: Includes 15' of coax cable.	224.00	47.50

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
28 13 33 16-0045		Proximity Card Controls, Stand Alone Access Controls *(28 13 33 16-0001)*		
28 13 33 16-0046		Exterior Mount, Proximity Card Controls, Stand Alone Access Controls *(28 13 33 16-0045)* Note: Includes a lockable NEMA rain resistant steel enclosure. Excludes mounting posts.		
28 13 33 16-0047		DKS Proximity Card Controls, Exterior Stand Alone Access Controls *(28 13 33 16-0046)*		
28 13 33 16-0048		DKS Proximity Card Readers, Exterior Stand Alone Access Controls *(28 13 33 16-0047)*		
28 13 33 16-0049	EA	DKS Proximity Card Reader, Exterior Stand Alone Access Controls	614.17	63.34
28 13 33 16-0050		AWID Proximity Card Controls, Exterior Stand Alone Access Controls *(28 13 33 16-0046)*		
28 13 33 16-0051		AWID Proximity Card Readers, Exterior Stand Alone Access Controls *(28 13 33 16-0050)*		
28 13 33 16-0052	EA	AWID Proximity Card Reader, Exterior Stand Alone Access Controls	666.67	63.34
28 13 33 16-0053		HID Proximity Card Controls, Exterior Stand Alone Access Controls *(28 13 33 16-0046)*		
28 13 33 16-0054		HID Proximity Card Readers, Exterior Stand Alone Access Controls *(28 13 33 16-0053)*		
28 13 33 16-0055	EA	HID Proximity Card Reader, Exterior Stand Alone Access Controls	786.67	63.34
28 13 33 16-0056		Magnetic Stripe Card Controls, Stand Alone Access Controls *(28 13 33 16-0001)*		
28 13 33 16-0057		Interior Mount, Magnetic Stripe Card Controls, Stand Alone Access Controls *(28 13 33 16-0056)*		
28 13 33 16-0058	EA	Magnetic Stripe Reader, Interior Stand Alone Access Controls	374.17	63.34
28 13 33 16-0059		Exterior Mount, Magnetic Stripe Card Controls, Stand Alone Access Controls *(28 13 33 16-0056)* Note: Includes a lockable NEMA rain resistant steel enclosure. Excludes mounting posts.		
28 13 33 16-0060	EA	Magnetic Stripe Reader, Exterior Stand Alone Access Controls	458.87	63.34
28 13 33 16-0061		Other Stand Alone Access Controls *(28 13 33 16-0001)*		
28 13 33 16-0062	EA	Toggle Switch, Interior Access Controls For Gate Operators Note: Controls mount into a single gang electrical box. Excludes electrical box.	65.42	15.84
28 13 33 16-0063		Wiegand Output Access Controls *(28 13 33 16)* Note: Excludes controllers.		
28 13 33 16-0064		Proximity Card Controls, Wiegand Output Access Controls *(28 13 33 16-0063)*		
28 13 33 16-0065		DKS, Proximity Card Controls, Wiegand Output Access Controls *(28 13 33 16-0064)*		
28 13 33 16-0066		DKS, Proximity Cards *(28 13 33 16-0065)*		
28 13 33 16-0067	EA	Clamshell Type, DKS Proximity Card (DKS 170)	3.99	
28 13 33 16-0068	EA	ISO Compliant Graphics Card, DKS Proximity Card (DKS 80)	6.58	
28 13 33 16-0069	EA	DKS Proximity Key Fob (DKS 50)	6.93	
28 13 33 16-0070	EA	Active Tag, DKS Proximity Tag (DKS 150) Note: Battery powered tag to boost signal.	39.20	
28 13 33 16-0071	EA	Active Tag, DKS Proximity Tag (DKS 200) Note: Battery powered tag to boost signal.	51.10	
28 13 33 16-0072		DKS, Proximity Card Readers, Wiegand Output Access Controls *(28 13 33 16-0065)*		
28 13 33 16-0073	EA	Up To 2" Read Range, 12 Volt DC, DKS Proximity Card Reader, Wiegand Output Access Controls (DKS Small)	238.14	79.17
28 13 33 16-0074	EA	Up To 3" Read Range, 12 Volt DC, DKS Proximity Card Reader, Wiegand Output Access Controls (DKS Mullion)	238.14	79.17
28 13 33 16-0075	EA	Up To 4" Read Range, 12 Volt DC, DKS Proximity Card Reader, Wiegand Output Access Controls (DKS Single Gang)	238.14	79.17
28 13 33 16-0076	EA	Up To 30" Read Range, 12 Volt DC, DKS Proximity Card Reader, Wiegand Output Access Controls (DKS) Note: Includes mounting bracket and 12 VDC regulated power supply.	611.94	79.17
28 13 33 16-0077		AWID, Proximity Card Controls, Wiegand Output Access Controls *(28 13 33 16-0064)*		
28 13 33 16-0078		AWID, Proximity Cards *(28 13 33 16-0077)*		
28 13 33 16-0079	EA	Clamshell Type, AWID Proximity Card (AWID Prox-Linc CS)	3.36	
28 13 33 16-0080	EA	ISO Compliant Graphics Card, AWID Proximity Card (AWID Prox-Linc GR)	5.25	
28 13 33 16-0081	EA	AWID Proximity Key Fob (AWID Prox-Linc KT)	5.60	
28 13 33 16-0082	EA	Windshield Tag For LR 2000 Readers, AWID Proximity Tag	19.60	
28 13 33 16-0083	EA	Metal Mount Tag For LR 2000 Readers, AWID Proximity Tag	19.60	
28 13 33 16-0084		AWID, Proximity Card Readers, Wiegand Output Access Controls *(28 13 33 16-0077)*		

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
28 13 33 16-0085	EA	Up To 4" Read Range, 5-12 Volt DC, AWID Proximity Card Reader, Wiegand Output Access Controls (AWID SR 2400)	284.34	79.17
		Note: For mullion mounting.		
28 13 33 16-0086	EA	Up To 8" Read Range, 5-12 Volt DC, AWID Proximity Card Reader, Wiegand Output Access Controls (AWID MM 6800)	385.14	79.17
		Note: For mullion mounting.		
28 13 33 16-0087	EA	Up To 8" Read Range, 5-12 Volt DC, AWID Proximity Card Reader, Wiegand Output Access Controls (AWID MM 6820)	385.14	79.17
		Note: For single gang electrical box mounting.		
28 13 33 16-0088	EA	Up To 24" Read Range, 5-12 Volt DC, AWID Proximity Card Reader, Wiegand Output Access Controls (AWID MR 1824)	613.34	79.17
		Note: Includes 12 VDC regulated power supply.		
28 13 33 16-0089	EA	Up To 11' Read Range, 12 Volt DC, AWID Proximity Card Reader, Wiegand Output Access Controls (AWID LR 2000)	3,351.74	79.17
		Note: Includes mounting bracket and 12 VDC regulated power supply.		
28 13 33 16-0090		HID, Proximity Card Controls, Wiegand Output Access Controls *(28 13 33 16-0064)*		
28 13 33 16-0091		HID, Proximity Cards *(28 13 33 16-0090)*		
28 13 33 16-0092	EA	Clamshell Type, HID Proximity Card (HID ProxCard II)	8.81	
28 13 33 16-0093	EA	ISO Compliant Graphics Card, HID Proximity Card (HID ISOProx II)	11.33	
28 13 33 16-0094	EA	HID Proximity Key Fob (HID ProxKey II)	11.61	
28 13 33 16-0095		HID, Proximity Card Readers, Wiegand Output Access Controls *(28 13 33 16-0090)*		
28 13 33 16-0096	EA	Up To 3" Read Range, 5-16 Volt DC, HID Proximity Card Reader, Wiegand Output Access Controls (HID ProxPoint Plus)	281.08	79.17
		Note: For mullion mounting. (HID P/N 6005).		
28 13 33 16-0097	EA	Up To 5" Read Range, 5-16 Volt DC, HID Proximity Card Reader, Wiegand Output Access Controls (HID ThinLine II)	330.68	79.17
		Note: For single gang electrical box mounting. (HID P/N 5395).		
28 13 33 16-0098	EA	Up To 5" Read Range, 5-16 Volt DC, HID Proximity Card Reader, Wiegand Output Access Controls (HID MiniProx)	367.87	79.17
		Note: For mullion mounting. (HID P/N 5365).		
28 13 33 16-0099	EA	EntryProx Single-Door Proximity Access Control	468.30	79.17
		Note: (HID P/N 4045) Stores up to 2,000 users and 1,000 time-stamped transactions 12 position keypad for Pin entry or programming optional use with card/key fob, code only or card plus pin code Wiegand output mode. Continental Instrument CICR2358P.		
28 13 33 16-0100		Contactless Smart Card Controls, Wiegand Output Access Controls *(28 13 33 16-0063)*		
28 13 33 16-0101		HID, Contactless Smart Cards *(28 13 33 16-0100)*		
28 13 33 16-0102	EA	2K Bits, Clamshell Type, HID iClass, Contactless Smart Card	6.16	
28 13 33 16-0103	EA	16K Bits, ISO Compliant Graphics Card, HID iClass, Contactless Smart Card	6.72	
28 13 33 16-0104	EA	16K Bits, Contactless Smartcard Key Fob, HID iClass, Contactless Smart Card	8.80	
28 13 33 16-0105	EA	16K Bits, Contactless Smartcard Tag, HID iClass, Contactless Smart Card	4.76	
		Note: Battery powered tag to boost signal.		
28 13 33 16-0106		HID, Contactless Smart Card Readers, Wiegand Output Access Controls *(28 13 33 16-0100)*		
28 13 33 16-0107	EA	Up To 3-1/4" Read Range, 5-16 Volt DC, HID iClass Contactless Smart Card Reader, Wiegand Output Access Controls (HID R10)	269.44	79.17
		Note: For mullion mounting.		
28 13 33 16-0108	EA	Up To 4-1/4" Read Range, 5-12 Volt DC, HID iClass Contactless Smart Card Reader, Wiegand Output Access Controls (HID R40)	361.84	79.17
		Note: For mullion mounting.		
28 13 33 16-0109	EA	Up To 4-1/4" Read Range, 5-12 Volt DC, HID iClass Contactless Smart Card Reader With Keypad, Wiegand Output Access Controls (HID RK40)	569.74	79.17
		Note: For mullion mounting.		
28 13 33 16-0110		HID, Contactless Smart Card Programmer, Wiegand Output Access Controls *(28 13 33 16-0100)*		
28 13 33 16-0111	EA	HID iClass Contactless Smart Card Programmer, Wiegand Output Access Controls (HID CP400)	1,739.04	79.17
		Note: For mullion mounting.		
28 13 33 16-0112		Call Station Controls, Wiegand Output Access Controls *(28 13 33 16-0063)*		
		Note: Includes intercom sub-station. Excludes additional receiving intercoms.		
28 13 33 16-0113	EA	Call Station With Entry Keypad, Exterior Wiegand Output Access Controls	698.34	79.17
		Note: For mullion mounting.		
28 13 33 16-0114	EA	Call Station With Proximity Card Reader, Exterior Wiegand Output Access Controls	585.84	79.17
		Note: For mullion mounting.		
28 13 33 16-0115		Biometrics Readers, Wiegand Output Access Controls *(28 13 33 16-0063)*		
28 13 33 16-0116	EA	Palm Reader Recognition System, Biometrics Readers, Wiegand Output Access Controls	3,052.62	63.34
28 13 33 16-0117	EA	CCD Camera, Face Image, Biometrics Readers, Wiegand Output Access Controls	3,724.97	63.34
28 13 33 16-0118	EA	Video Grabber Card For DFR Reader, Biometrics Readers, Wiegand Output Access Controls	1,478.15	63.34
28 13 33 16-0119	EA	Fingerprint Reader, Biometrics Readers, Wiegand Output Access Controls (Bioscrypt V-Pass)	891.17	63.34

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
28 13 33 16-0120	EA	Fingerprint Reader With HID Card Reader, Biometrics Readers, Wiegand Output Access Controls (Bioscrypt V-Prox)	990.17	63.34
28 13 33 16-0121	EA	Fingerprint Reader With Contactless Smart Card Reader, Biometrics Readers, Wiegand Output Access Controls (Bioscrypt V-Smart)	891.17	63.34
28 13 33 16-0122		Exterior Mounting Posts For Gate Operator Access Controls *(28 13 33 16)*		
		Note: Includes mounting plate for access controls, baked on enamel finish and mounting bolt covers. Excludes concrete pads and electrical connections.		
28 13 33 16-0123		2" x 2" Steel, Exterior Mounting Posts For Gate Operator Access Controls *(28 13 33 16-0122)*		
28 13 33 16-0124	EA	44" Tall, Gooseneck Style, Single Mount, 2" x 2" Steel, Exterior Mounting Post For Gate Operator Access Controls	194.18	16.83
		Note: Includes a 5" x 5" base plate.		
28 13 33 16-0125	EA	73" Tall, Gooseneck Style, Dual Mount, 2" x 2" Steel, Exterior Mounting Post For Gate Operator Access Controls	371.18	16.83
		Note: Includes an 8" x 8" base plate.		
28 13 33 16-0126	EA	Anchor Post For 2" x 2" Steel, Exterior Mounting Post For Gate Operator Access Controls	176.18	16.83
		Note: Includes a 24" in-ground post with matching base plate, conduit access and mounting hardware.		
28 13 33 16-0127		4" x 4" Steel, Exterior Mounting Posts For Gate Operator Access Controls *(28 13 33 16-0122)*		
28 13 33 16-0128	EA	59" Tall, Straight Style, Single Mount, 4" x 4" Steel, Exterior Mounting Post For Vehicular Gate Operator Access Controls	342.68	16.83
		Note: Includes an 8" x 8" base plate.		
28 13 33 16-0129	EA	49" Tall, Offset Style, Single Mount, 4" x 4" Steel, Exterior Mounting Post For Vehicular Gate Operator Access Controls	408.68	16.83
		Note: Includes an 8" x 8" base plate and a 14" offset from back of post.		
28 13 33 16-0130	EA	Anchor Post For 4" x 4" Steel, Exterior Mounting Post For Vehicular Gate Operator Access Controls	251.18	16.83
		Note: Includes a 24" in-ground post with matching base plate, conduit access and mounting hardware.		
28 13 33 16-0131		4" x 8" Steel, Exterior Mounting Posts For Gate Operator Access Controls *(28 13 33 16-0122)*		
28 13 33 16-0132	EA	59" Tall, Straight Style, Single Mount, 4" x 8" Steel, Exterior Mounting Post For Gate Operator Access Controls	1,106.18	16.83
		Note: Includes a 11" x 13" base plate.		
28 13 33 16-0133	EA	50" Tall, Offset Style, Single Mount, 4" x 8" Steel, Exterior Mounting Post For Gate Operator Access Controls	1,158.68	16.83
		Note: Includes a 10" x 14" base plate and a 14" offset from back of post.		
28 13 33 16-0134	EA	Anchor Post For 4" x 8" Steel, Exterior Mounting Post For Gate Operator Access Controls	476.18	16.83
		Note: Includes a 24" in-ground post with matching base plate, conduit access and mounting hardware.		
28 13 33 16-0135	EA	48" Light Tower For 4" x 8" Steel, Exterior Mounting Post For Gate Operator Access Controls	761.18	16.83
28 13 33 16-0136		Access Control Accessories *(28 13 33 16)*		
28 13 33 16-0137	EA	Modem: Multitech, Mt2834L	1,256.88	
28 13 33 16-0138	EA	6 Volt DC, 12 Volt DC, Or 24 Volt DC, @ 4 Amps, Power Supply/Charger (Altronix SMP-5)	326.43	
28 13 33 16-0139	EA	12 Volt, 7 Amp, Battery	42.86	
28 13 33 16-0140	EA	12 Volt, 18 Amp, Battery	95.53	
28 13 33 16-0141	EA	Door Personality Module (Sensormatic RM-4)	355.46	15.84
28 13 33 16-0142	EA	Mini-Alert Door Ajar Sounder (System Sensor PA400)	144.84	31.67
28 13 33 16-0143	EA	Recessed Contact For Steel Doors, Door Monitor Switch (Sentrol 1078C)	49.12	19.00
28 13 33 16-0144	EA	Access Control Systems Power Supply (Altronix AL400ULACMCB)	390.95	12.67
28 13 33 16-0145	EA	Surge Suppressor (Tripp-Lite IBAR4)	59.02	3.18
28 13 33 16-0146	EA	Door Strike Relay (Altronix RBSN-TTL)	41.59	12.67
28 13 33 16-0147		Access Controllers *(28 13 33 16)*		
28 13 33 16-0148		Microterm Controller *(28 13 33 16-0147)*		
28 13 33 16-0149	EA	Microterm Stand Alone One Or Two Door Processing Panel (Continental Instruments CICP1100)	920.64	79.17
		Note: Up to 1,000 card capacity. Includes 2 alarm inputs, tamper alarm, and 3 relay outputs.		
28 13 33 16-0150	EA	Microterm PC Board (Continental Instruments CICP1100PCB)	665.93	47.50
28 13 33 16-0151	EA	Battery Standby For Microterm (Continental Instruments CICP1100BAT-2)	317.27	
		Note: Input 120VAC, output 12VDC to temporarily power the Microterm only.		
28 13 33 16-0152		Miniterm Controller *(28 13 33 16-0147)*		
28 13 33 16-0153	EA	Miniterm Two Reader Processing Panel (Continental Instrument CICP1200)	1,443.99	79.17
		Note: Up to 3,000 card capacity. Includes 8 EOL Class A supervised alarm inputs, temper alarm, and 5 relay outputs. Complete in a lockable steel enclosure with battery standby for memory and system operation.		
28 13 33 16-0154	EA	Miniterm PC Board (Continental Instrument CICP1200PCB)	1,093.69	47.50
28 13 33 16-0155		Super-2 Controller *(28 13 33 16-0147)*		
28 13 33 16-0156	EA	Super-Two - Two Reader Processing Panel (Continental Instruments CICP1300)	1,067.72	79.17
		Note: For use with CA3000 V2.0.25 and above. Up to a 125,000 card capacity, 8 EOL supervised alarm inputs, tamper, 5 relay outputs. Support for on-board LAN adapter, 57,600 baud rate, 6 access groups per card-holder and compressed data mode. Complete in a lockable steel enclosure with battery standby for memory and system operation.		
28 13 33 16-0157	EA	Super-Two - PC Board (Continental Instruments CICP1300BD)	734.08	47.50
28 13 33 16-0158	EA	Network Interface Board For Super-2 (Continental Instruments CICP1300NETBD)	201.34	47.50
		Note: Optional on-board adapter allows for communication over TCP/IP.		

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
28 13 33 16-0159		**Smarterm Controller** *(28 13 33 16-0147)*		
28 13 33 16-0160	EA	Smarterm Four Reader Processing Panel (Continental Instrument CICP1400) Note: Card capacity up to 2,500. Includes 16 alarm inputs, tamper alarm, and 9 relay outputs. Complete in a lockable steel enclosure with battery standby for memory and system operation.	3,036.99	95.00
28 13 33 16-0161	EA	Smarterm PC Board (Continental Instrument CICP1400PCB)	2,340.54	47.50
28 13 33 16-0162	EA	Smarterm Memory Board - 256K (Continental Instrument CICP1400MB256-1) Note: Up to 10,000 cardholders.	909.15	47.50
28 13 33 16-0163	EA	Smarterm Memory Board - 2MB (Continental Instrument CICP1400MB2-1) Note: Up to 50,000 cardholders.	1,293.62	47.50
28 13 33 16-0164	EA	Smarterm Relay Expander Board (Continental Instrument CICP1400RB) Note: 16 Output relays, 8 alarm inputs.	1,005.52	47.50
28 13 33 16-0165	EA	Smarterm Alarm Expander Board (Continental Instrument CICP1400RB) Note: (Supervised) 16 alarm inputs.	1,005.52	47.50
28 13 33 16-0166		**Superterm-4 Controller** *(28 13 33 16-0147)*		
28 13 33 16-0167	EA	Superterm-4 - Four Reader Processing Panel (Continental Instrument CICP1400UL) Note: 20,000 card capacity, 12 supervised alarm inputs, tamper alarm, and 9 relay outputs. Complete in a painted steel enclosure with 7 AH battery standby for system operation.	2,802.37	95.00
28 13 33 16-0168	EA	Superterm-4 PC Board (Continental Instrument CICP1400ULPCB)	2,301.10	47.50
28 13 33 16-0169		**Superterm-8 Controller** *(28 13 33 16-0147)*		
28 13 33 16-0170	EA	Superterm-8 - Eight Reader Processing Panel (Continental Instrument CICP1800) Note: Up to 20,000 card capacity, 24 supervised alarm inputs, tamper alarm, and 17 relay outputs. Complete in a steel enclosure including 7 AH battery standby for memory and system operation.	3,727.54	158.34
28 13 33 16-0171	EA	Superterm-8 - Eight Reader Processing Panel, Expanded Power (Continental Instrument CICP1800EXP) Note: With expanded power supply. (required if more than 1 relay expander board is used.) Up to 20,000 card capacity, 24 supervised alarm inputs, tamper alarm, and 17 relay outputs. Complete in a steel enclosure including 7 AH battery standby for memory and system operation.	4,047.94	158.34
28 13 33 16-0172	EA	Superterm-8 PC Board (Continental Instrument CICP1800PCB)	3,099.60	47.50
28 13 33 16-0173		**Turbo Superterm-4 Controller** *(28 13 33 16-0147)*		
28 13 33 16-0174	EA	Turbo Superterm-4 - Four Reader Processing Panel (Continental Instrument CICP1400ULT) Note: 20,000 Card capacity, 12 supervised alarm inputs, tamper alarm, and 9 relay outputs. Complete in a painted steel enclosure with 7 AH battery standby for system operation.	2,802.37	95.00
28 13 33 16-0175	EA	Turbo Superterm-4 PC Board (Continental Instrument CICP1400ULTPCB)	2,301.10	47.50
28 13 33 16-0176		**Turbo Superterm-8 Controller** *(28 13 33 16-0147)*		
28 13 33 16-0177	EA	Turbo Superterm-8 - Eight Reader Processing Panel (Continental Instrument CICP1800T) Note: For use with CA3000 V2.0.25 and above. Up to 40,000 card capacity, 24 supervised alarm inputs, tamper alarm, and 17 relay outputs. Complete in a steel enclosure including a 7 AH battery standby for memory and system operation.	3,727.54	158.34
28 13 33 16-0178	EA	Turbo Superterm-8 -Eight Reader Processing Panel, Expanded Power (Continental Instrument CICP1800TEXP) Note: Required if more than one relay expander board is used. Up to 40,000 card capacity, 24 supervised alarm inputs, tamper alarm, and 17 relay outputs. Complete in a steel enclosure including a 7 AH battery standby for memory and system operation.	4,047.94	158.34
28 13 33 16-0179	EA	Turbo Superterm-8 PC Board (Continental Instrument CICP1800TPCB)	3,099.60	47.50
28 13 33 16-0180	EA	Superterm Memory Board - 2MB (Continental Instrument CICP1800MB2) Note: Up to 140,000 cardholders.	1,293.62	47.50
28 13 33 16-0181	EA	Turbo/Superterm-8 Memory Board - 2MB (Continental Instrument CICP1800MB2X2) Note: Up to 140,000 cardholders.	1,088.56	47.50
28 13 33 16-0182	EA	Turbo Superterm-8 Relay Expander Board (Continental Instrument CICP1800RB) Note: 16 Output relays, 8 alarm inputs.	1,006.56	47.50
28 13 33 16-0183	EA	Turbo Superterm-8 Alarm Expander Board (Continental Instrument CICP1800RB) Note: (Supervised) 16 Alarm inputs.	1,006.56	47.50
28 13 33 16-0184	EA	Expanded Power Supply For Superterm Or Turbo Superterm (Continental Instrument CICPEXPPWS)	410.97	
28 13 33 16-0185		**Access Control Bundled System** *(28 13 33 16)*		
28 13 33 16-0186	EA	CA 3000 Bundled System, Supports 25 Users (Continental Instrument CA3B250P4O3V0R0) Note: System includes PC, monitor, keyboard, mouse, OS, Card Access 3000 file server software, MS SQL 2000, 1 SQL host license, and security key.	20,342.55	
28 13 33 16-0187		**Magnetic Locks** *(28 13 33 16)* Note: Excludes access controls.		
28 13 33 16-0188		**Magnetic Door Locks** *(28 13 33 16-0187)*		
28 13 33 16-0189		**300 LB Magnetic Door Locks** *(28 13 33 16-0188)*		
28 13 33 16-0190	EA	Single Door, Surface Mount, 300 LB Magnetic Door Lock	305.17	63.34
28 13 33 16-0191		**600 LB Magnetic Door Locks** *(28 13 33 16-0188)*		
28 13 33 16-0192	EA	Single Door, Surface Mount, 600 LB Magnetic Door Lock	428.92	63.34
		For LED Status Indicator And Signal Relay, Add	*37.78*	
		For LED Status Indicator, Signal Relay And Built-In Delay Timer, Add	*75.56*	
		For Mortise Mount, Deduct	*-60.45*	

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
28 13 33 16-0193	EA	Dual Doors, Surface Mount, 600 LB Magnetic Door Lock	632.17	63.34
		For LED Status Indicator And Signal Relay, Add	*63.19*	
		For LED Status Indicator, Signal Relay And Built-In Delay Timer, Add	*126.38*	
28 13 33 16-0194		**1,200 LB Magnetic Door Locks** *(28 13 33 16-0188)*		
28 13 33 16-0195	EA	Single Door, Surface Mount, 1,200 LB Magnetic Door Lock	447.67	63.34
		For LED Status Indicator And Signal Relay, Add	*73.83*	
		For LED Status Indicator, Signal Relay And Built-In Delay Timer, Add	*96.30*	
28 13 33 16-0196	EA	Dual Doors, Surface Mount, 1,200 LB Magnetic Door Lock	672.67	63.34
		For LED Status Indicator And Signal Relay, Add	*125.58*	
		For LED Status Indicator, Signal Relay And Built-In Delay Timer, Add	*163.80*	
28 13 33 16-0197		**2,000 LB Shear Lock, Magnetic And Mechanical Locks** *(28 13 33 16-0188)*		
		Note: Includes LED status indicator and built-in signal relay.		
28 13 33 16-0198	EA	Single Door, Mortise Mount, 2,000 LB Shear Lock, Magnetic And Mechanical Door Lock	467.92	63.34
28 13 33 16-0199		**Magnetic Gate Locks** *(28 13 33 16-0187)*		
28 13 33 16-0200		**600 LB Magnetic Gate Locks** *(28 13 33 16-0199)*		
28 13 33 16-0201	EA	600 LB Magnetic Gate Lock	354.67	63.34
28 13 33 16-0202		**1,200 LB Magnetic Gate Locks** *(28 13 33 16-0199)*		
28 13 33 16-0203	EA	1,200 LB Magnetic Gate Lock	422.92	63.34
		For LED Status Indicator And Signal Relay, Add	*37.03*	
		For LED Status Indicator, Signal Relay And Built-In Delay Timer, Add	*74.06*	
		For Mortise Mount, Deduct	*-59.25*	
28 13 33 16-0204		**Magnetic Lock Power Supply And Chargers** *(28 13 33 16-0187)*		
		Note: Includes lockable metal enclosure, batteries, battery charger and electronically regulated outputs.		
28 13 33 16-0205	EA	12/24 Volt DC At 1 Amp, Magnetic Lock Backup Power Supply And Charger	267.35	63.34
28 13 33 16-0206	EA	12/24 Volt DC At 2-1/2 Amp, Magnetic Lock Backup Power Supply And Charger	335.35	63.34
28 13 33 16-0207	EA	12 Volt DC At 4 Amp And 24 Volt DC At 3 Amp, Magnetic Lock Backup Power Supply And Charger	375.35	63.34
28 13 33 16-0208	EA	12/24 Volt DC At 6 Amp, Magnetic Lock Backup Power Supply And Charger	467.35	63.34
28 13 33 16-0209		**Master Door Buzzer Stations** *(28 13 33 16)*		
28 13 33 16-0210		**Master Stations** *(28 13 33 16-0209)*		
28 13 33 16-0211	EA	Master Stations, 5 Station Intercommunication Equipment	593.84	98.80
28 13 33 16-0212	EA	Master Stations, 10 Station Intercommunication Equipment	892.83	191.27
28 13 33 16-0213	EA	Master Station, Desk Style Remote Intercommunication Equipment	255.31	49.40
28 13 33 16-0214	EA	Master Station, Flush Wall Remote Intercommunication Equipment	326.98	82.34
28 13 33 16-0215	EA	Sound System Outlet, Protector	84.08	32.23
28 13 33 16-0216	EA	Sound System Microphone Outlet	147.19	65.99
28 13 33 16-0217	EA	Sound System Speaker Ceiling Or Wall	112.39	32.23
28 13 33 16-0218	EA	Sound System Monitor Panel	328.00	65.99
28 13 33 16-0219	EA	Sound System Volume Control	97.14	32.23
28 13 33 16-0220	EA	Sound System Amplifier 250 W	1,516.95	263.92
28 13 33 16-0221	EA	Sound System Cabinet	887.22	263.92
28 13 33 16-0222		**Master Door Stations** *(28 13 33 16-0209)*		
28 13 33 16-0223	EA	Master Door Stations, Button Buzzer Type, 25 Station	1,310.66	
		For Intercom Type Master Door Station, Add	*108.76*	
28 13 33 16-0224	EA	Master Door Stations, Button Buzzer Type, 50 Station	2,170.68	
		For Intercom Type Master Door Station, Add	*176.19*	
28 13 33 16-0225	EA	Master Door Stations, Button Buzzer Type, 75 Station	2,978.92	
		For Intercom Type Master Door Station, Add	*228.39*	
28 13 33 16-0226	EA	Master Door Stations, Button Buzzer Type, 100 Station	3,405.12	
		For Intercom Type Master Door Station, Add	*267.54*	
28 13 33 16-0227	EA	Master Door Stations, Button Buzzer Type, 150 Station	4,132.57	
		For Intercom Type Master Door Station, Add	*391.53*	
28 13 33 16-0228	EA	Master Door Stations, Button Buzzer Type, 200 Station	4,848.89	
		For Intercom Type Master Door Station, Add	*504.64*	
28 13 33 16-0229	EA	Master Door Stations, Button Buzzer Type, 250 Station	6,104.15	
		For Intercom Type Master Door Station, Add	*652.55*	
28 13 33 16-0230	EA	Master Door Stations, Button Buzzer Type, 300 Station	7,292.31	
		For Intercom Type Master Door Station, Add	*748.25*	
28 13 33 16-0231	EA	Transformer	91.62	
28 13 33 16-0232	EA	Door Opener	135.59	
28 13 33 16-0233	EA	Buzzer With Door Release And Plate	167.27	
28 13 33 16-0234	EA	Amplifier For Intercom Type Unit	274.07	
28 13 33 16-0235	EA	Speaker With Door Release	115.18	

28 13 53 Security Access Detection *(28 13)*

28 13 53 13 Security Access Metal Detectors *(28 13 53)*

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
28 13 53 13-0001		**Metal Detectors** *(28 13 53 13)*		
28 13 53 13-0002	EA	Hand-Held Metal Detector	203.33	15.84
28 13 53 13-0003	EA	Walk-Through Metal Detector, Complete Unit	4,839.62	253.34

28 20 Electronic Surveillance *(28)*

Note: Includes testing of new devices and certification.

28 23 Video Surveillance *(28 20)*

28 23 00 00-0001		**Closed Circuit Television And Surveillance Systems** *(28 23)* Note: Includes programming of equipment, testing of new devices and certification.		
28 23 00 00-0002		**Cameras And Accessories** *(28 23 00 00-0001)*		
28 23 00 00-0003		**Cameras** *(28 23 00 00-0002)*		
28 23 00 00-0004		**General Use Video Camera** *(28 23 00 00-0003)*		
28 23 00 00-0005	EA	Video Dome Spectra III, CIR/BW 23x Heavy Duty, Pendant Note: Environmental clear bubble.	3,953.57	124.60
28 23 00 00-0006	EA	Ipak Enclosed Dust Tight Color Camera, Standard Resolution Lens Note: 3.5-8mm AI shields, wall mount.	657.16	62.38
28 23 00 00-0007	EA	Esprit Image Pak PTZ Camera	3,096.70	124.76
28 23 00 00-0008	EA	UF-LED 30 Degree, 850mm (252 LEDs) Includes Power Supply, 120 Volt AC	1,304.70	62.38
28 23 00 00-0009		**Camera Power Supply** *(28 23 00 00-0003)*		
28 23 00 00-0010	EA	100 VA Outdoor Power Supply	226.61	31.19
28 23 00 00-0011	EA	Surge Protector, Isolated Coax Protector For CCTV	102.21	15.40
28 23 00 00-0012	EA	Altronics Power Supply With 8 Fused Outputs	479.84	62.38
28 23 00 00-0013		**Miscellaneous Accessories** *(28 23 00 00-0002)*		
28 23 00 00-0014	EA	8 Channel DVR NTSC/PAL 250 GB With CD-RW	7,153.69	111.37
28 23 00 00-0015	EA	High Resolution Ethernet Video Server, Encoder, 12 Volt DC	1,075.47	124.76
28 23 00 00-0016	EA	High Resolution Ethernet Video Server, With Audio, Encoder, 12 Volt DC	1,222.96	124.76
28 23 00 00-0017	EA	High Resolution Ethernet Video Server, Decoder, 12 Volt DC	886.67	124.76
28 23 00 00-0018	EA	High Resolution Ethernet Video Server, With Audio, Decoder, 12 Volt DC	998.77	124.76
28 23 00 00-0019	EA	Outdoor Multi-Band Wireless Ethernet Bridge, 4 Inputs Note: 5.3 or 5.8 GHz.	2,007.61	124.76
28 23 00 00-0020	EA	24 dBi Gain, 5.25-5.85 GHz Band, 9 Degree Beamwidth, Patch Antenna	898.48	124.76
28 23 00 00-0021	EA	Extreme IR Illuminator, ZXLED850.20	2,837.51	124.76
28 23 00 00-0022	EA	Extreme IR Illuminator, UFLED850.30	1,304.70	62.38
28 23 00 00-0023	EA	Extreme IR Illuminator, EX26LED850M	714.73	62.38
28 23 00 00-0024	EA	Smart Sight Wireless Link	3,546.58	62.38
28 23 00 00-0025	EA	S1000 System Including Transmitter And Receiver	4,261.30	124.60
28 23 00 00-0026	EA	S1600e-R Video Decoder	1,038.81	62.38
28 23 00 00-0027	EA	Pole Mount Adapter	189.44	62.38
28 23 00 00-0028		**Camera Mounting** *(28 23 00 00-0002)*		
28 23 00 00-0029		**Camera Wall Mounts** *(28 23 00 00-0028)*		
28 23 00 00-0030	EA	Parapet Camera Wall Mount, 1.5" Diameter Pipe	501.39	62.30
28 23 00 00-0031	EA	Spectra Wall Mount, Gray	114.75	31.19
28 23 00 00-0032	EA	Spectra Wall Mount Pole Adapter For SWM-GY	93.53	31.19
28 23 00 00-0033	EA	Wall Mount Bracket For Exterior CCTV	372.26	62.38
28 23 00 00-0034		**Control Panels** *(28 23 00 00-0002)*		
28 23 00 00-0035	EA	CCTV Control Panel With Keyboard And Battery Backup, Up To 7 Cameras	18,740.00	
28 23 00 00-0036	EA	CCTV Control Panel With Keyboard And Battery Backup, 7 To 14 Cameras	22,488.00	
28 23 00 00-0037	EA	CCTV Control Panel With Keyboard And Battery Backup, 15 To 20 Cameras	26,236.00	
28 23 00 00-0038	EA	CCTV Control Panel With Keyboard And Battery Backup, >21 Cameras	29,984.00	
28 23 00 00-0039		**Closed Circuit Television And Surveillance Systems (Vicon)** *(28 23)* Note: Includes a 3 year manufacturer's warranty. Use Vicon replacement models, "or equal", when the listed models are superseded.		
28 23 00 00-0040		**Vicon CCTV Factory Project Management Program** *(28 23 00 00-0039)* Note: For first time installations at a facility.		
28 23 00 00-0041	EA	Factory Project Management Program For 1 To 20 Camera System Vicon CCTV Installation Support Note: Includes two site visits by a Vicon technical representative. First site visit to generate punch list and 2nd site visit for final inspection and training.	3,499.80	
28 23 00 00-0042	EA	Factory Project Management Program For 21 To 40 Camera System Vicon CCTV Installation Support Note: Includes two site visits by a Vicon technical representative. First site visit to generate punch list and 2nd site visit for final inspection and training.	4,374.75	
28 23 00 00-0043	EA	Factory Project Management Program For >40 Camera System Vicon CCTV Installation Support Note: Includes three site visits by a Vicon technical representative. First site visit during installation commencement, 2nd to generate punch list, and 3rd site visit for final inspection and training.	5,249.70	

Building knowledge

Job Order Contract Technical Specifications

Sample

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SECTION 28 13 33 16 - PERIMETER SECURITY

1.1 GENERAL

A. Description Of Work
1. This specification covers the furnishing and installation of materials for perimeter security. Products shall be as follows or as directed by the Owner. Installation procedures shall be in accordance with the product manufacturer's recommendations. Demolition and removal of materials shall be as required to support the work.

B. Summary
1. Section Includes:
a. Perimeter detection and alarm system.
b. Integration of other electronic and electrical systems and equipment.

C. Definitions
1. CCTV: Closed-circuit television.
2. EMI: Electromagnetic interference.
3. PIR: Passive infrared.
4. RFI: Radio-frequency interference.
5. UPS: Uninterruptible power supply.
6. Control Unit: System component that monitors inputs and controls outputs through various circuits.
7. Master Control Unit: System component that accepts inputs from other control units and may also perform control-unit functions. The unit has limited capacity for the number of protected zones and is installed at an unattended location or at a location where it is not the attendant's primary function to monitor the security system.
8. Monitoring Station: Facility that receives signals and has personnel in attendance at all times to respond to signals. A central station is a monitoring station that is listed.
9. Protected Zone: A protected premises or an area within a protected premise that is provided with means to prevent an unwanted event.
10. Standard Intruder: A person who weighs 100 lb (45 kg) or less and whose height is 60 inches (1525 mm) or less; dressed in a long-sleeved shirt, slacks, and shoes unless environmental conditions at the site require protective clothing.
11. Standard-Intruder Movement: Any movement, such as walking, running, crawling, rolling, or jumping, of a "standard intruder" in a protected zone.
12. Systems Integration: The bringing together of components of several systems containing interacting components to achieve indicated functional operation of combined systems.
13. Zone. A defined area within a protected premise. It is a space or area for which an intrusion must be detected and uniquely identified. The sensor or group of sensors must then be assigned to perform the detection, and any interface equipment between sensors and communication must link to master control unit.

D. Action Submittals
1. Product Data: Components for sensing, detecting, systems integration, and control, including dimensions and data on features, performance, electrical characteristics, ratings, and finishes.
2. Shop Drawings: Detail assemblies of standard components that are custom assembled for specific application on this Project.
a. Functional Block Diagram: Show single-line interconnections between components including interconnections between components specified in this Section and those furnished under other Sections. Indicate methods used to achieve systems integration. Indicate control, signal, and data communication paths and identify programmable logic

controllers **OR** networks, **as directed,** and control interface devices and media to be used. Describe characteristics of network and other data communication lines.
1) Indicate methods used to achieve systems integration.
2) Indicate control, signal, and data communication paths and identify PLCs, networks, control interface devices, and media to be used.
3) Describe characteristics of network and other data communication lines.
4) Describe methods used to protect against power outages and transient voltages including types and ratings of isolation and surge suppression devices used in data, communication, signal, control, and ac and dc power circuits.

b. Raceway Riser Diagrams: Detail raceway runs required for perimeter security and for systems integration. Include designation of devices connected by raceway, raceway type, and size, and type and size of wire and cable fill for each raceway run.
c. UPS: Sizing calculations.
d. Site and Floor Plans: Indicate final outlet and device locations, routing of raceways, and cables inside and outside the building. Include room layout for central-station control-unit console, terminal cabinet, racks, and UPS.
e. Master Control Unit Console Layout: Show required artwork and device identification.
f. Device Address List: Coordinate with final system programming.
g. System Wiring Diagrams: Include system diagrams unique to Project. Show connections for all devices, components, and auxiliary equipment. Include diagrams for equipment and for system with all terminals and interconnections identified.
h. Details of surge-protection devices and their installation.
i. Sensor detection patterns and adjustment ranges.

3. Equipment and System Operation Description: Include method of operation and supervision of each component and each type of circuit. Show sequence of operations for manually and automatically initiated system or equipment inputs. Description must cover this specific Project; manufacturer's standard descriptions for generic systems are not acceptable.
4. Samples for Initial Selection: For units with factory-applied color finishes.
5. Samples for Verification: For each type of exposed finish required.

E. Informational Submittals
1. Qualification Data: For Installer, security systems integrator, and testing agency.
2. Field quality-control test reports.
3. Warranty: Sample of special warranty.
4. Other Information Submittals:
a. Test Plan and Schedule: Test plan defining all tests required to ensure that system meets technical, operational, and performance specifications within 60 days of date of Contract award.
b. Examination reports documenting inspections of substrates, areas, and conditions.
c. Anchor inspection reports documenting inspections of built-in and cast-in anchors.

F. Closeout Submittals
1. Operation and Maintenance Data: For perimeter security system to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation And Maintenance Data", include the following:
a. Data for each type of product, including features and operating sequences, both automatic and manual.
b. Master control-unit hardware and software data.

G. Maintenance Material Submittals
1. One spare control-unit board(s) for strain-sensitive cable system and one cable repair and splice kit(s).
2. One of each type of microwave sensor and one of each type of power supply for microwave perimeter security system.

3. One of each spare sensor and PIR unit and one alignment telescope(s) for long-range PIR system.
4. One spare control-unit board(s) for electrostatic-field system.
5. One spare control-unit board(s) for buried, ported coaxial cable system, 10 feet (3 m) of cable; and one cable repair and splice kit(s).
6. Fuses: Three of each kind and size.
7. Tool Kit: Provide six sets of tools for use with security fasteners, each packaged in a compartmented kit configured for easy handling and storage.
8. Security Fasteners: Furnish no fewer than 1 box for every 50 boxes or fraction thereof, of each type and size of security fastener installed.

H. Quality Assurance
1. Installer Qualifications:
   a. An employer of workers, at least one of whom is a technician certified by the National Burglar & Fire Alarm Association.
   b. Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
2. Security Systems Integrator Qualifications: An experienced perimeter security equipment supplier and Installer who has completed systems integration work for installations similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
3. Testing Agency Qualifications: Member company of NETA or an NRTL.
   a. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
4. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
5. FMG Compliance: FMG-approved and -labeled perimeter security devices and equipment.
6. Comply with NFPA 70.

I. Project Conditions
1. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
   a. Altitude: Sea level to 4000 feet (1220 m).
   b. Master Control Unit: Rated for continuous operation in an ambient of 60 to 85 deg F (16 to 29 deg C) and a relative humidity of 20 to 80 percent, noncondensing.
   c. Exterior Environment: System components installed in locations exposed to weather shall be rated for continuous operation in ambients of minus 30 to plus 122 deg F (minus 34 to plus 50 deg C) dry bulb and 20 to 90 percent relative humidity, condensing. Comply with UL 294 and UL 639 for outdoor-use equipment. Rate for continuous operation when exposed to rain as specified in NEMA 250, winds up to 85 mph (137 km/h) and snow cover up to 24 inches (610 mm) thick.
   d. Hazardous Environment: System components located in areas where fire or explosion hazards may exist because of flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or flyings shall be rated, listed, and installed according to NFPA 70.

J. Warranty:
1. Special Warranty: Manufacturer's standard form in which manufacturer and Installer agree to repair or replace components of perimeter security devices and equipment that fail in materials or workmanship within specified warranty period.
   a. Warranty Period: Two years from date of Final Completion.

1.2 PRODUCTS

A. Functional Description Of System

1. Description: Perimeter protection system with fence-mounted systems **OR** buried sensors **OR** volumetric detectors, **as directed,** integrated into a single perimeter detection and alarm system.
2. Supervision: System components shall be continuously monitored for normal, alarm, supervisory and trouble conditions. Indicate deviations from normal conditions at any location in system. Indication includes identification of device or circuit in which deviation has occurred and whether deviation is an alarm or malfunction.
   a. Alarm Signal: Display at central-station control unit and actuate audible and visual alarm devices.
   b. Trouble Condition Signal: Distinct from other signals, indicating that system is not fully functional. Trouble signal shall indicate system problems such as battery failure, open or shorted transmission line conductors, or controller failure.
   c. Supervisory Condition Signal: Distinct from other signals, indicating an abnormal condition as specified for the particular device or controller.
3. System Control: Central-station control unit shall directly monitor gate detection devices, perimeter detection units, and connecting wiring.
   OR
   System Control: One or more remote, addressable controllers operate under control of a central-station control-unit microcomputer in a multiplexed distributed control system or as part of a network. Controllers shall receive programming by multiplexed signal transmission from a central-station control-unit microprocessor or microcomputer and hold data in nonvolatile memory. System shall automatically reboot program without error or loss of status or alarm data after any system disturbance, **as directed**.
4. Operator Commands:
   a. Help with System Operation: Display all commands available to operator. Help command, followed by a specific command, shall produce a short explanation of the purpose, use, and system reaction to that command.
   b. Acknowledge Alarm: To indicate that alarm message has been observed by operator.
   c. Place Protected Zone in Access: Disable all intrusion-alarm circuits of a specific protected zone. Tamper circuits may not be disabled by operator.
   d. Place Protected Zone in Secure: Activate all intrusion-alarm circuits of a protected zone.
   e. Protected Zone Test: Initiate operational test of a specific protected zone.
   f. System Test: Initiate system-wide operational test.
   g. Print Reports.
5. Timed Control at Central-Station Control Unit: Allow automatically timed "secure" and "access" functions of selected protected zones.
6. Automatic Control of Related Systems: Alarm or supervisory signals from certain perimeter security devices control the following functions in related systems:
   a. Switch selected lights.
   b. Open a signal path between certain intercommunication stations.
   c. Shift sound system to "listening mode" and open a signal path to certain system speakers.
   d. Switch signal to selected monitor from closed-circuit television camera in vicinity of sensor signaling an alarm.
7. Printed Record of Events: Print a record of alarm, supervisory, and trouble events on system printer. Sort and report by protected zone, device, and function. When central-station control unit receives a signal, print a report of alarm, supervisory, or trouble condition. Report type of signal (alarm, supervisory, or trouble), protected zone description, date, and time of occurrence. Differentiate alarm signals from other indications. When system is reset, report reset event with the same information concerning device, location, date, and time. Commands shall initiate the reporting of a list of current alarm, supervisory, and trouble conditions in system or a log of past events.
8. Response Time: Two seconds between actuation of any alarm and its indication at central-station control unit.
9. Circuit Supervision: Supervise all signal and data transmission lines, links with other systems, controllers, and sensors from central-station control unit. Indicate circuit and detection device

faults with both protected zone and trouble signals, sound a distinctive audible tone, and illuminate an LED. Maximum permissible elapsed time between occurrence of a trouble condition and indication at central-station control unit is 20 seconds. Initiate an alarm in response to opening, closing, shorting, or grounding of a signal or data transmission line.

10. Programmed Secure-Access Control: System shall be programmable to automatically change status of various combinations of protected zones between secure and access conditions at scheduled times. Status changes may be preset for repetitive, daily, and weekly; specially scheduled operations may be preset up to a year in advance. Manual secure-access control stations shall override programmed settings.
11. Manual Secure-Access Control: Coded entries at manual stations shall change status of associated protected zone between secure and access conditions.

B. System Component Requirements
   1. Compatibility: Detection devices and their communication features, connecting wiring, and master control unit shall be selected and configured with accessories for full compatibility with the existing equipment.
   2. Perimeter Security Units: Listed and labeled by a qualified testing agency for compliance with UL 639.
   3. Surge Protection: Protect components from voltage surges originating external to equipment housing and entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor entry connection to components.
      a. Minimum Protection for Power Lines 120 V and More: Auxiliary panel suppressors complying with requirements in Division 26 Section "Transient-voltage Suppression For Low-voltage Electrical Power Circuits".
      b. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Lines: Comply with requirements in Division 26 Section "Transient-voltage Suppression For Low-voltage Electrical Power Circuits" as recommended by manufacturer for type of line being protected.
   4. Interference Protection: Components shall be unaffected by radiated RFI and electrical induction of 15 V/m over a frequency range of 10 to 10,000 MHz and conducted interference signals up to 0.25-V RMS injected into power supply lines at 10 to 10,000 MHz.
   5. Tamper Protection: Tamper switches on detection devices, controllers, annunciators, pull boxes, junction boxes, cabinets, and other system components shall initiate a tamper-alarm signal when unit is opened or partially disassembled and when entering conductors are cut or disconnected. Central-station control-unit alarm display shall identify tamper alarms and indicate locations.
   6. Self-Testing Devices: Automatically test themselves periodically, but not less than once per hour, to verify normal device functioning and alarm initiation capability. Devices transmit test failure to central-station control unit.
   7. Antimasking Devices: Automatically check operation continuously or at intervals of a minute or less, and use signal-processing logic to detect blocking, masking, jamming, tampering, or other operational dysfunction. Devices transmit detection of operational dysfunction to central-station control unit as an alarm signal.
   8. Addressable Devices: Transmitter and receivers shall communicate unique device identification and status reports to central-station control unit.
   9. Remote-Controlled Devices: Individually and remotely adjustable for sensitivity and individually monitored at central-station control unit for calibration, sensitivity, and alarm condition.

C. Enclosures
   1. Interior Sensors: Enclosures that protect against dust, falling dirt, and dripping noncorrosive liquids.
   2. Interior Electronics: NEMA 250, Type 12.
   3. Exterior Electronics: NEMA 250, Type 4X fiberglass **OR** stainless steel, **as directed**.
   4. Corrosion Resistant: NEMA 250, Type 4X PVC **OR** stainless steel, **as directed**.
   5. Terminal cabinets in handholes and manholes shall be NEMA 250, Type 6 **OR** 6P, **as directed**.

6. Screw Covers: Where enclosures are accessible to inmates, secure with security fasteners of type appropriate for enclosure.

D. Secure And Access Devices
1. Keypad and Display Module: Arranged for entering and executing commands for system-status changes and for displaying system-status and command-related data.
2. Key-Operated Switch: Change protected zone between secure and access conditions.

E. Strain-Sensitive Cable
1. Description: Strain-sensitive, coaxial transducer cable shall monitor chain-link-type and welded-mesh-type fence and generate an alarm when a standard intruder attempts to climb over, cut through, or lift fence fabric.
2. Environment: Suitable for exterior installation and the following conditions:
   a. Ambient Temperatures: Ranging from minus 22 to plus 158 deg F (minus 30 to plus 70 deg C).
3. Transducer Cable:
   a. Ultraviolet-resistant cable furnished by system manufacturer.
   b. Suitable for up to 1000 feet (300 m) of sensor cable per single-zone controller and up to 2000 feet (600 m) of sensor cable per dual-zone processor.
   c. Sensitivity shall be uniform throughout its entire length, requiring only one variable sensitivity adjustment throughout its entire length.
4. Control Unit:
   a. Field mounted, with tamper switch at controller board.
   b. Electronic circuitry shall discriminate between acceptable fence movement and intrusion-related disturbances.
   c. Sensitivity, count control, and climb-over processors shall be adjustable with a minimum of five individual count-control and climb-over adjustments.
   d. Controller output shall have adjustable pulse width to adjust the time the alarm relay will activate per detected intrusion attempt.
5. System Performance:
   a. Immune to RFI and EMI environments; interference shall have no effect on normal operational characteristics.
   b. Trouble and Tamper: Entire sensor system shall be fully supervised with individually monitored tamper and supervision alarms. Disconnecting, cutting, or shorting of strain-sensitive cable results in supervisory alarm.
   c. Intrusion Simulation: Each zone shall have a self-test feature that, when activated by a signal from central-station control unit, will produce an intrusion alarm and verify operation of sensor.

F. Microwave Intrusion Detectors
1. Description: Volumetric microwave detection system.
2. Device Performance: Microwave transmitter establishes an electromagnetic field in an adjustable detection pattern and detects intrusion by monitoring changes in that pattern.
   a. Movement Sensitivity: Adjustable, able to detect standard-intruder movement within sensor's detection pattern at any speed between 0.1 to 50 fps (0.03 to 15.2 m/s). Sensor sensitivity adjustments shall be accessible only when sensor housing is removed, and sensors shall comply with 47 CFR 15.
   b. Detection range: 15 to 600 feet (5 to 180 m).
   c. Range Sensitivity: Adjustable for setting area of protection between 15 to 500 feet (5 to 152 m) in range and from 2 to 40 feet (0.6 to 12 m) in beam diameter.
   d. Trouble and Tamper: Fully supervised with individually monitored tamper and supervision alarms. System failure shall result in tamper alarm. System jamming or wrong modulation shall result in supervisory alarm.

e. Activation Indicator: LED indicator shall not be visible during normal operation. Indicator shall light when sensor detects a standard intruder. Locate test-enabling switch under sensor housing cover.
f. Remote Test: When initiated by central-station control unit, start a test sequence for each detector element that simulates standard-intruder movement within sensor's detection patterns, causing an alarm.

3. Environment: Suitable for exterior installation and the following conditions:
a. Ambient Temperatures: Ranging from minus 30 to plus 158 deg F (minus 34 to plus 70 deg C) and in rainfall up to 4 inches (100 mm).

G. Electrostatic Field
1. Description: Electronically balanced phase electrostatic-field detection system consisting of a field generator that generates an electrical field in one or more field wires and that has two or more sensing wires, a sense filter, amplifier, and a controller. Detection fields shall have a minimum of four different frequencies so adjacent zones cannot interfere with each other.
2. Environment: Suitable for exterior installation and the following conditions:
a. Ambient Temperatures: Ranging from minus 22 to plus 158 deg F (minus 30 to plus 70 deg C).
3. System Performance:
a. Detect, via sense wires, a compound signal form consisting of amplitude change, rate of change, and pre-set time disturbance that forms a "signature" of human movement. Generate an alarm when all exist simultaneously. Provide detection fields of not less than four different frequencies so adjacent zones do not interfere with each other.
b. Control Units: Single or multiple zone, with sense filter. Front panel with calibration meter, status of alarm transmitter, sensitivity selector, test point selector, power indicator, and power control. Control unit shall reject signals due to wind and small objects striking the wires.
c. Motion Detection: Sense standard-intruder movement at rates from 0.15 to 26 fps (0.045 to 8.0 m/s).
d. Zone Length: Not to exceed 500 feet (152 m) **OR** 325 feet (100 m), **as directed**.
e. Supervision: Generate trouble signal if field or sense wires are cut or shorted to ground or to each other. Generate supervisory alarm if received signal is substantially reduced.
4. Insulators, Wire-Tensioning Devices, and Brackets: Manufacturer's standard for mounting and tensioning of wires.
5. Field and Sensing Wires: Stainless steel.

H. Buried, Ported Coaxial Cable
1. Description: Buried electrostatic-field detection system consisting of parallel, ported coaxial cables that generate a detection field between cables.
2. Environment: Suitable for exterior installation and the following conditions:
a. Ambient Temperatures: Ranging from minus 22 to plus 158 deg F (minus 30 to plus 70 deg C).
3. System Performance: One of two parallel cables receives a continuous wave signal from a transmitter module. Second cable, connected to a sensor module, detects, preamplifies, and analyzes variations in signal. When system senses "signature" of a standard intruder in the detection zone, based on mass, motion, and time of day, it generates an alarm.
a. Transmitter: Locate at one end of zone, with standby battery.
b. Preamplifier-Sensor: Locate at opposite end from transmitter, with standby battery.
c. Front panel with sensitivity calibration meter, calibrated self-test potentiometer, power switch, and LED normal and malfunction indicators.
d. Electromagnetic Radiation: Less than 50 mV per meter at 30 m.
e. Motion Detection: Sense standard-intruder movement at rates from 0.17 to 26 fps (0.05 to 8.0 m/s).
f. Zone Length: Not to exceed 500 feet (152 m) **OR** 325 feet (100 m), **as directed**.
g. Zone Width: Not to exceed 15 feet (4.6 m), with an average width of 12 feet (3.7 m).

h. Zone Height: Approximately 3.3 feet (1.0 m), depending on sensitivity setting.
i. Supervision: Generate trouble signal if cable is cut or shorted to ground. Generate supervisory alarm if cabinets are tampered with.

4. Enclosures: Hinged cover with tamper switch and security fasteners.
5. Buried, Ported Coaxial Cable: Approximately 1/2-inch (1.3-mm) diameter, minimum 10 AWG center conductor, foam polyethylene dielectric, braided copper outer conductor, and polyethylene jacket.

I. Long-Range PIR Detectors
1. Description: Volumetric passive infrared detection system.
2. Listed and labeled by a qualified testing agency for compliance with SIA PIR-01.
3. Environment: Suitable for exterior installation and the following conditions:
a. Ambient Temperatures: Ranging from minus 30 to plus 150 deg F (minus 34 to plus 65 deg C).
4. System Performance: Detect an interruption of dual-infrared light beams that link transmitters and receivers. Generate an alarm when signal is interrupted due to presence of an object that interrupts both beams.
a. Sensitivity: Field adjustable to allow adjustment of range from 25 to 500 feet (7.6 to 152 m), generating an alarm within 20 to 50 ms when both beams are interrupted.
b. Detection system shall adjust automatically to compensate for weather, including fog, rain, snow, blowing dust, and rapid temperature changes.
c. Motion Detection: Detect standard-intruder movement at rates from 0.1 to 50 fps (0.03 to 15.2 m/s).
d. Supervision: Generate supervisory alarm if any portion of system is tampered with.
e. Remote Test: When initiated by central-station control unit, start a test sequence for each detector element that simulates standard-intruder movement within sensor's detection patterns, causing an alarm.

J. Geophone Fence Detection
1. Description: Fence-mounted system to detect attempts to cut or climb the protected fence, using geophone sensors that respond to specific shock or vibrations.
2. Environment: Suitable for exterior installation and the following conditions:
a. Ambient Temperatures: Ranging from minus 30 to plus 150 deg F (minus 34 to plus 65 deg C).
3. System Performance:
a. Controller: 10 zone capacity for processing geophone generated analog signals. Each zone shall consist of not more than 10 sensors.
1) Adjustments: For each zone provide stepped gain control for sensitivity, and switches for geophone signal filters to minimize nuisance alarms. System shall adjust automatically to compensate for weather, including fog, rain, snow, blowing dust, and rapid temperature changes.
2) Trouble Condition Signal: Generate when any zone fails.
3) Supervisory Condition Signal: Generate on interference with controller operation or when detecting a break-in into a enclosure housing electronics.
b. Sensors: Fence mounted 20 feet (6 m) o.c.
c. Cable for Interconnection of System Components: Shielded, PVC jacketed and armored, as supplied by system manufacturer.
d. Test each zone simulating an alarm condition. Test by command from central-station control **OR** test switch at controller inside the enclosure, **as directed**.

K. Video Motion Sensor
1. Description: Video-surveillance based detection system.
2. Device Performance: Detect changes in video signal within a user-defined protected zone. Provide an alarm output for each video input.

a. Detect movement within protected zone of standard intruders wearing clothing with a reflectivity that differs from that of background scene by a factor of 2. Reject all other changes in video signal.
b. Modular design that allows for expansion or modification of number of inputs.
c. Adjustable Controls:
1) Number of detection zones.
2) Size of detection zones.
3) Sensitivity of detection of each protected zone.
d. Mounting: Standard 19-inch (480-mm) rack as described in EIA 310.
3. Environment: Suitable for installation in interior air-conditioned spaces.

L. Gate Units
1. Description: Fence mounted gate-movement detector, blanced-magnetic type, UL listed for outdoor locations. Units shall be designed for mounting on single- or double-leaf swinging or rolling gates and have armored jumper cables between switch and stationary junction box for wiring to central-station control unit and tamper switches in junction box.
2. Device Performance: Bias magnet and at least three encapsulated-reed switches that resist compromise from introduction of foreign magnetic fields, with integral overcurrent protective device to limit current to 80 percent of switch capacity.
3. Remote Test: Simulate movement of actuating magnet from central-station control unit.

M. Field-Mounted Control Units
1. Field-mounted control units shall include the power supply and detector specific functions, and provide for communications with the master control unit. Control unit shall include read-only resident software needed for startup, a time clock, and all automatic operations. Software shall be downloaded from the master control unit.
2. Battery Backup: UPS, providing 6 hours of run time during a power outage, with 2-rate automatic battery charger to fully recharge batteries within 12 hours after normal power is restored.
a. Batteries: Rechargeable, valve-regulated, recombinant, sealed, lead-acid type with nominal 10-year life expectancy.
b. Battery Charger: Solid-state, fully automatic, variable-charging-rate type. Charger shall recharge fully discharged battery within 24 hours.
3. Annunciation: Indicate a change in system condition and switching of system or component to backup power.

N. Master Control Unit
1. Description: Supervise sensors and detection subsystems and their connecting communication links, status control (secure or access) of sensors and detector subsystems, activation of alarms and supervisory and trouble signals, and other indicated functions.
a. System software and programs shall be held in flash electrically erasable programmable read-only memory (EEPROM), retaining the information through failure of primary and secondary power supplies.
b. Include a real-time clock for time annotation of events on the event recorder and printer.
c. Addressable initiation devices that communicate device identity and status.
d. Control circuits for operation of mechanical equipment in response to an alarm.
2. Construction: Freestanding equipment rack **OR** Desk-mounted console, **as directed,** modular, with separate and independent alarm and supervisory system modules. Alarm-initiating protected zone boards shall be plug-in cards. Arrangements that require removal of field wiring for module replacement are unacceptable.
3. Comply with UL 609 **OR** UL 681 **OR** UL 1076, **as directed**.
4. Console Controls and Displays: Arranged for interface between human operator at master control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

a. Annunciator and Display: LCD type, one **OR** two **OR** three line(s) of 40 **OR** 80 characters, minimum, **as directed**.
b. Keypad: Arranged to permit entry and execution of programming, display, and control commands
c. Control-Unit Network: Automatic communication of alarm, status changes, commands, and other communications required for system operation. Communication shall return to normal after partial or total network interruption such as power loss or transient event. Total or partial signaling network failures shall identify the failure and record the failure at the annunciator display and at the system printer.
d. Field Device Network: Communicate between the control unit and field devices of the system. Communications shall consist of alarm, network status, and status and control of field-mounted processors. Each field-mounted device shall be interrogated during each interrogation cycle.
e. Operator Controls: Manual switches and push-to-test buttons that do not require a key to operate. Prevent resetting of alarm, supervisory, or trouble signals while alarm or trouble condition persists. Include the following:
    1) Acknowledge alarm.
    2) Silence alarm.
    3) System reset.
    4) LED test.
f. Timing Unit: Solid state, programmable, 365 days.
g. Confirmation: Relays, contactors, and other control devices shall have auxiliary contacts that provide confirmation signals to system for their on or off status. Software shall interpret such signals, display equipment status, and initiate failure signals.
h. Alarm Indication: An audible signal sounds and an LED lights at master control unit identifying the protected zone **OR** addressable detector, **as directed,** originating the alarm. Annunciator panel displays a common alarm light and sounds an audible tone.
i. Alarm Indication: An audible signal sounds and a plain-language identification of the protected zone **OR** addressable detector, **as directed** originating the alarm appears on LED or LCDdisplay at master control unit. Annunciator panel displays a common alarm light and sounds an audible tone.
j. Alarm Indication: An audible signal sounds and a plain-language identification of the protected zone **OR** addressable detector, **as directed** originating the alarm appears on LED, LCD or cathode-ray-tube display, **as directed** at master control unit. Annunciator panel alarm light and audible tone identify protected zone signaling an alarm.
k. Alarm activation sounds a bell **OR** siren **OR** strobe **OR** bell or siren and strobe, **as directed**.

5. Protected Zones: Quantity of alarm and supervisory zones as indicated, with capacity for expanding number of protected zones by a minimum of 25 percent.
6. Power Supply Circuits: Master control units shall provide power for remote power-consuming detection devices. Circuit capacity shall be adequate for at least a 25 percent increase in load.
7. UPS: Comply with Division 26 Section "Static Uninterruptible Power Supply". UPS shall be sized to provide a minimum of six hours of master control-unit operation.
8. Cabinet: Lockable, steel enclosure arranged so operations required for testing, normal operation, and maintenance are performed from front of enclosure. If more than a single cabinet is required to form a complete control unit, provide exactly matching modular enclosures. Accommodate all components and allow ample gutter space for field wiring. Identify each enclosure by an engraved, laminated, phenolic-resin nameplate. Lettering on enclosure nameplate shall not be less than 1 inch (25 mm) high. Identify, with permanent labels, individual components and modules within cabinets.
9. Transmission to Monitoring Station: A communications device to automatically transmit alarm, supervisory, and trouble signals to the monitoring station, operating over a standard voice grade telephone leased line. Comply with UL 1635.

10. Printout of Events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble) and date and time of occurrence. Differentiate alarm signals from all other printed indications. Also print system reset event, including same information for device, location, date, and time. Commands initiate the printing of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.

O. Audible And Visual Alarm Devices
1. Bell: UL listed, 10 inches (254 mm) in diameter, rated to produce a minimum sound output of 84 dB at 10 feet (3 m) from central-station control unit.
a. Enclosure: Weather-resistant steel box equipped with tamper switches on cover and on back of box.
2. Klaxon Weatherproof Motor-Driven Hooter: UL listed, rated to produce a minimum sound output of 120 dB at 3 feet (1 m), plus or minus 3 dB, at a frequency of 470 Hz. Rated for intermittent use - two minutes on, five minutes off.
a. Designed for use in industrial areas and in high noise, severe weather marine environments.
3. Siren: 30-W speaker with siren driver, rated to produce a minimum sound output of 103 dB at 10 feet (3 m) from central-station control unit.
a. Enclosure: Weather-resistant steel box with tamper switches on cover and on back of box.
4. Strobe: Xenon light complying with UL 1638, with a clear polycarbonate lens.
a. Light Output: 115 cd, minimum.
b. Flash Rate: 60 per minute.

P. Security Fasteners
1. Operable only by tools produced for use on specific type of fastener by fastener manufacturer or other licensed fabricator. Drive system type, head style, material, and protective coating as required for assembly, installation, and strength.
2. Drive System Types: Pinned Torx-Plus, pinned Torx, or pinned hex (Allen).
3. Socket Flat Countersunk Head Fasteners:
a. Heat-treated alloy steel, ASTM F 835 (ASTM F 835M).
b. Stainless steel, ASTM F 879 (ASTM F 879M), Group 1 CW.
4. Socket Button Head Fasteners:
a. Heat-treated alloy steel, ASTM F 835 (ASTM F 835M).
b. Stainless steel, ASTM F 879 (ASTM F 879M), Group 1 CW.
5. Socket Head Cap Fasteners:
a. Heat-treated alloy steel, ASTM A 574 (ASTM A 574M).
b. Stainless steel, ASTM F 837 (ASTM F 837M), Group 1 CW.
6. Protective Coatings for Heat-Treated Alloy Steel:
a. Zinc chromate, ASTM F 1135, Grade 3 or 4; for exterior applications and interior applications where indicated.
b. Zinc phosphate with oil, ASTM F 1137, Grade I, or black oxide, unless otherwise indicated.

Q. Source Quality Control
1. Electrostatic-Field and Buried, Ported Coaxial Cable Systems Electronics: Precondition at factory by subjecting modules to at least 4 days' operational burn-in at temperatures not less than 140 deg F (60 deg C).

1.3 EXECUTION

A. Examination
1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of perimeter security.

2. Examine roughing-in for embedded and built-in anchors to verify actual locations of perimeter security connections before perimeter security installation.
3. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of perimeter security.
4. Inspect built-in and cast-in anchor installations, before installing perimeter security, to verify that anchor installations comply with requirements. Prepare inspection reports.
    a. Remove and replace anchors where inspections indicate that they do not comply with requirements. Reinspect after repairs or replacements are made.
    b. Perform additional inspections to determine compliance of replaced or additional anchor installations. Prepare inspection reports.
5. For material whose orientation is critical for its performance as a ballistic barrier, verify installation orientation.
6. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Systems Integration
1. Integrate perimeter security system with the following systems and equipment:
    a. Electronic door hardware.
    b. Elevators.
    c. Network lighting controls.
    d. Intercommunications and program systems.
    e. Public address and mass notification systems.
    f. Access control.
    g. Fire-alarm system.
    h. Intrusion detection system.
    i. Video surveillance.

C. System Installation
1. Comply with UL 681 and NFPA 731.
2. Equipment Mounting: Install master control unit on finished floor with tops of cabinets not more than 72 inches (1830 mm) above the finished floor.
    a. Comply with requirements for seismic-restraint devices specified in Division 26 Section "Vibration And Seismic Controls For Electrical Systems".
3. Install wall-mounted equipment, with tops of cabinets not more than 72 inches (1830 mm) above the finished floor.
    a. Comply with requirements for seismic-restraint devices specified in Division 26 Section "Vibration And Seismic Controls For Electrical Systems".
4. Connecting to Existing Equipment: Verify that existing perimeter security system is operational before making changes or connections.
    a. Connect new equipment to existing control panel in existing part of the building.
    b. Connect new equipment to existing monitoring equipment at the Supervising Station.
    c. Expand, modify, and supplement existing **control** or **monitoring** equipment as necessary to extend existing **control** or **monitoring**] functions to the new points. New components shall be capable of merging with existing configuration without degrading the performance of either system.
5. Security Fasteners: Where accessible to inmates, install perimeter security components using security fasteners with head style appropriate for fabrication requirements, strength, and finish of adjacent materials except that a maximum of two different sets of tools shall be required to operate security fasteners for Project. Provide stainless-steel security fasteners in stainless-steel materials.
6. Wiring Method: Install power, signal, and data transmission wire and cable in raceways according to Division 26 Section(s) "Underground Ducts And Raceways For Electrical Systems" AND "Raceway And Boxes For Electrical Systems". Minimum conduit size shall be 1/2 inch (13 mm). Control and data transmission wiring shall not share raceways with any other system.

City of Shoreline

JOC Program Development and Implementation Schedule

Proposal for Consultant Services for Job Order Contracting (JOC) System

● Meeting

Gordian Task

City Task

Senior Project Manager	Project Manager	JOC Front End Documents	Construction Task Catalog	Technical Specifications	Marketing of JOC System	Software Development/Test	Procurement Support	JOC Training	Contractor Training	City Procurement	City Legal	City Staff	TASKS	DAYS
✓	✓									✓	✓	✓	**Orientation Kick Off Meeting**	● 1
✓	✓	✓								✓	✓	✓	**JOC Front End Documents Kick-off Meeting**	● 1
		✓								✓	✓	✓	City Compiles Draft Documents for Gordian Review	2-10
		✓								✓	✓	✓	City Delivers Draft Documents to Gordian	● 11
		✓								✓	✓	✓	Meeting to Discuss Method for Customizing Documents	● 11
		✓											Gordian Customizes City Documents for JOC	12-22
	✓	✓											Gordian Submits Draft Documents for City Review	● 22
		✓								✓	✓	✓	City Reviews Draft Documents & Comments	23-31
	✓	✓								✓	✓	✓	Meeting to Discuss City Comments	● 32
	✓	✓											Gordian Revises Draft Documents	34-42
	✓	✓											Gordian Delivers 2nd Draft for City Review	● 43
		✓								✓	✓	✓	City Reviews & Approves Contract Documents	44-50
	✓	✓											Gordian Publishes Contract Documents	51
✓	✓		✓							✓		✓	**Construction Task Catalog (CTC) Kick-off Meeting**	● 1
	✓		✓										Gordian Provides Sample CTC for City Review	● 1
			✓									✓	City Reviews CTC and Prepares Comments	1st Round Comments 2-10 / 2nd Round Comments 12-31
			✓									✓	City Collects Sample Drawings for Gordian Review	
			✓									✓	City Delivers Sample Drawings to Gordian	● 11
			✓									✓	Gordian Compares Drawings to CTC to Identify Additions	12-31
	✓		✓									✓	Meeting to Discuss Changes to the CTC	● 32
	✓		✓										Gordian Customizes CTC (Create New Work Tasks, Delete Extisting Tasks)	34-53
	✓		✓										Gordian Provides 2nd Draft CTC for City Review	● 53
			✓									✓	City Reviews Current Draft CTC & Comments	55-61
	✓		✓									✓	Meeting to Discuss Final Changes to the CTC	● 62
	✓		✓										Gordian Customizes CTC with Final Changes	63-72
	✓		✓									✓	Gordian Provides Final CTC to City	● 73
			✓							✓		✓	City Reviews and Approves Final CTC	74-84
	✓		✓										Gordian Publishes City CTC	85
✓	✓			✓						✓		✓	**Technical Specifications Kick-off Meeting**	● 1
				✓								✓	City Compiles Specifications for Gordian Review	2-10
				✓								✓	City Delivers Specifications to Gordian	● 11
	✓			✓									Gordian Customizes JOC Specifications	12-48
	✓			✓									Gordian Provides Draft Specs for City Review	● 49
				✓								✓	City Reviews Current Draft Specs & Comments	50-61
	✓			✓								✓	Meeting to Discuss Final Changes to the Specs	● 62
	✓			✓									Gordian Customizes Specs with Final Changes	63-72
	✓			✓									Gordian Cross ReferenCity Specs with CTC	
	✓			✓									Gordian Provides Final Specifications to City	● 73
				✓						✓		✓	City Reviews and Approves Final Specifications	74-84
	✓			✓									Gordian Publishes Technical Specifications	85
	✓									✓		✓	**Organize Workshops for Execution Concepts**	20-25
	✓												Gordian Develops Draft Internal Execution Procedures	26-32
	✓									✓		✓	Meeting to Discuss Draft Execution Procedures	● 33
										✓		✓	City Reviews & Approves Execution Procedures	34-49
	✓												Gordian Finalizes Execution Procedures	50-54
			✓										**Internal and External Marketing Presentations**	
	✓		✓										Gordian Conducts Internal Presentations for City Personnel	● 53
	✓		✓										Gordian Conducts External Presentation for Contracting Community	● 58
	✓			✓								✓	**JOC Software System**	● 61
	✓			✓								✓	Gordian Configures JOC Software System	70-108
	✓			✓									Gordian Loads CTC into JOC Software	109
	✓			✓									Gordian Tests JOC Software	110-112
	✓			✓								✓	Gordian Conducts Client JOC Software Training	● 113
													Gordian Conducts Contractor JOC Software Training - After Contract Award	
✓	✓				✓					✓		✓	**Procurement Support for Job Order Contracts**	● 1
	✓				✓					✓		✓	Gordian Provides Bidding Related Support	87-120
	✓				✓					✓		✓	Gordian Prepares Contract Advertisements	87-90
					✓					✓		✓	City Advertises Job Order Contracts	● 91
	✓				✓					✓		✓	Gordian Conducts Pre-Bid Conference	● 96
	✓				✓					✓		✓	Gordian Assists City with Bid Opening/Analysis	86-120
	✓							✓				✓	**Develop JOC Training Program & Reference Manual**	117-120
	✓							✓		✓		✓	Gordian Conducts Client JOC Training - After Contract Award	
	✓							✓	✓	✓		✓	Gordian Conducts Contractor JOC Training - After Contract Award	
	✓							✓		✓		✓	Gordian Prepares Initial Project Package - After Contract Award	

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