

Technical Proposal for
Sol. 36C24122Q0616

Website Article Management Database (PTSD Article Database)

Submitted to:

For the Department of Veterans Affairs, Network Contracting Office 1,
1 VA Center, Augusta ME 04330

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Submitted by:

Ibex

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Understanding of the Government's Need

Ibex is pleased to offer this technical proposal for the publishing team for the National Center for Post-Traumatic Stress Disorder (NCPTSD), so we may develop an Access database to support the website that uses a content management system (Moveable Type) to stage publication and serve as a backup to VA's Electronic Content Management System (Teamsite). Ibex has the experience and personnel to help NCPTSD with a database to track web article revisions and content development. We understand the database will not be used for any aspects of the NCPTSD website publishing process. Ibex is the perfect fit to create a Microsoft Access Database to assist the NCPTSD team in tracking web article creation, when content is edited, scheduling requirements, and document web page reviews, at: <https://www.ptsd.va.gov>. Ibex has developed numerous databases for similar purposes, including at Federal Acquisition Services (FAS) to support their content management needs, using Access and other web-based tools. We engineer Microsoft Access database solutions from scratch, ensuring that they fit the client's business processes, and have done so for the last decade.

Ibex is registered and certified in the Vendor Information Pages (VIP) database (<http://www.VetBiz.gov>).

Corporate Experience

As our extensive history (and past performances, following) demonstrate, Ibex has the corporate experience and approach to meet all requirements laid out in the VA's Performance Work Statement (PWS). Proper project management (supported by our website project management software) keeps tasks running smoothly. Ibex mitigates the government risk by employing tested approaches that mitigate 404 errors, buggy design, unhappy users, and just about every other type of gremlin that poor planning leads to.

Ibex has developed a similar solution at Federal Acquisition Services (FAS, where we designed and engineered a Microsoft Access solution, then performed maintenance functions during peak and non-peak hours to facilitate functionality of the Access database(s) in support of PSHC's multiple geographic locations in the Eastern to Pacific time-zones of the continental United States and supported alternate platforms and changes to functionality. Our database administrators are responsible for the health of the database(s) by ensuring the quality and integrity of the data itself. We maintain the Access databases, back them up, manage users, and support changes to the database design as we optimize performance.

Ibex has worked for the VA...

Ibex has the bench support and corporate resources to back up our team of experienced technologists.

Ibex will employ our standardized project management approach to make sure this effort is executed seamlessly while meeting the government's exacting requirements. We will draft a Project Management Plan (PMP) that will incorporate our Quality Assurance Plan as an appendix. Our approach is based on the Project Management Body of Knowledge (PMBOK®) — this is the discipline of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria. It is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Ibex integrates five process groups — initiating, planning, executing, monitoring and controlling, and closing — to ensure our projects are delivered as specified, on time and in budget.

We are staffing this effort with skilled and appropriately experienced personnel. Our DBA ... The administrative assistance for this effort has...

Another advantage of working with us is that Ibex uses an online project management portal for oversight of the execution of our PMP, for tracking issues, managing documentation and deliverables, and for team task management. The Ibex project management portal enables the team to track all tasks, share documents, and manage activities for other team members. By viewing the progress of projects in the portal, the VA stakeholders can provide feedback to create a higher quality of our deliverables. This results in improved planning and scheduling, and better collaboration.

Finally, we will ensure open lines of communication that will keep the client “in-the-know” about our progress. This will further mitigate risk because Ibex personnel will provide daily and weekly updates on progress, and work to incorporate customers input through our Joint Application Development (JAD) process. Our quality assurance process will make sure any issues are quickly and thoroughly addressed.

Technical Approach

Ibex presents our technical approach, based on the requirements set forth in Performance Work Statement (PWS). At Ibex, we design Access and other databases thoughtfully — keeping in mind specific parameters —using what we refer to as our “database design best practices.” We consider every viewpoint during planning. Our database architect will choose a database type, and normalize for the data. We aim to make structures transparent and define constraints to maintain data integrity. To aid the government to ensure we “future proof” our work, we

document everything. In this case, we also plan for increasing backup time in the build, as the amount of data stored and managed increases over time. Finally, Ibex is very focused on the need to keep privacy primary in our design considerations.

To implement our “database design best practices,” the Ibex database architect will structure table structure with the primary purpose of the database management system in mind. We use data modeling software to help structure the fields and data types, based on the outline of requirements. Finally, in documenting the solution, we will define a style guide so the government can continue to make the most of our work, long after the Access database is deployed.

To operationalize this, we will first create the appropriate database tables and then define the names of all the fields to store in that table. Access database tables let us divide a file into separate parts.

For example, one database table may hold the titles and summaries of all the articles for the web site, while we may use a second database table may hold the metadata and specialized tags of all the content. Finally, a third database table may hold the names and contact information of content contributors. Access stores all this related information in a single Access file that is saved locally on a hard drive.

We will build a database as the primary deliverable for this task order will be developed in Microsoft Access — at Ibex, designing a database means defining both the number of fields to use for storing information and the maximum amount of data each field can hold. It will be capable of tracking milestones and iterative files (or file locations) for updates to new and existing content.

Capable of tracking progress of new content development

Provide fields for cataloguing metadata (e.g., URL location, subjects, keywords, date of last revision, etc.) for each web article on the NCPTSD site

Capable of producing reports about current status of web article revision and development (e.g., list of articles in-process of revision, list of articles completed in past quarter, list of articles in need of annual revision, etc.)

Capable of producing reports of content development and editing by specific authors (or subject matter experts)

Capable of capturing Subject Matter Expert information

Contain customized forms to add and edit information on articles and SME’s

At NCPTSD, the writing/editing processes are separate from the publishing process. Therefore, we require a database which will allow the Website Content Manager to maintain more efficient and more detailed tracking of content review and development. This database will also facilitate transparency and communication among team members and contributing subject matter experts (SMEs). Previous research into the development of a database for these purposes led to agreement that Microsoft Access is the best software for the project, due to its compatibility with VA computing and the features offered. In particular, the ability to create forms for more efficient data entry, the ability to link to folders and files, the ability to create reports, and the user-friendly interface of MS Access led us to choose this platform.

All content on the NCPTSD Website requires annual review. The article management database will act as a tool in our tracking process, particularly when content is being edited by multiple SMEs. New content is continually in development and generally undergoes multiple revisions. We need to track assigned editors, version control (drafts), readability statistics, deadlines, web promotion workflow, metadata, media type, etc. We are also looking for guidance on other items we should be tracking to make this database valuable while offering us flexibility to expand as our needs change in the future.

The NCPTSD Website contains content for Public and Professionals that is “mirrored” – although written with a different target audience in mind. Therefore, the ability to include information that clarifies the organization of content on the live site is also important to ensure that as changes are made, all relevant content (in potentially multiple sections) is addressed.

Exploratory Meetings

Ibex will ensure the database fulfills the needs of NCPTSD by organizing a series of meetings to outline the features and functionality NCPTSD expects of the final product. To do so, Ibex will employ our tried-and-true technical approach, JAD (Joint Application Development), a methodology that involves the client or end user in the design and development of a database or application, through a succession of collaborative workshops labeled “JAD sessions.” With Ibex using the JAD approach, in comparison with to traditional practices, we will be able to decrease development times and derive greater client satisfaction, because the client is involved throughout the development process. In comparison to the traditional approach to systems development, where a developer investigates the system requirements and develops an application, with client input consisting of a series of interviews, JAD is far superior. Ibex is the best choice for this project because we will create the Access database more quickly using fewer formal methodologies and reusing software components that we have developed over the last decade.

Together with government stakeholders, we will review the current article content (and known forthcoming articles) and work to ensure we size the database appropriately. We understand that, currently, the government maintain ~1,000 web pages and well over 1,000 PDF files as well as

other file types on the web site. Ibex will make use of the review of the desired metadata fields, and we will suggest additional options that the government may not have previously been considered. For example, we are expert at tuning Access for multi user environments. We might recommend turning off AutoCorrect and configure the database to compact and repair automatically as ways to improve performance. Another option is to have a user open the database in exclusive mode — if they are the only person using a database at a specific time, opening the database in exclusive mode prevents other users from using the database and helps improve performance.

Another example of what we may recommend to help with performance (which is vital for efficient work management and user experience) is to optimize how Access locks a certain amount of data while one edits records. The amount of data that is locked depends on the locking setting that our DBA chooses. We can help improve performance by choosing page-level locking. However, page-level locking needs to be considered thoroughly, as it may decrease data availability, because more data is locked than with record-level locking.

Database Development, Delivery, and Training

The vendor will develop a prototype and then final article management database that meets the requirements outlined above. The vendor will work closely with the Web Content Manager to refine, test, and revise the article management database until a final version is arrived at.

Development —

Testing is part of our Quality Assurance process (see the section, following). SIT UAT etc.

Delivery — We will implement the government's governance process to go from SIT/UAT to deployment into production. Ibex will provide deployment direction in our administrative documentation, as well as automated scripts and information on roll-back procedures.

As part of delivery, we will do deployment testing, we will try adjusting the Refresh interval (sec), Update retry interval (msec), number of update retries, and ODBC refresh interval (sec) settings, as applicable. We may recommend the government use the update retry interval and number of update retries settings to specify how often and how many times Access tries to save a record when it is locked by another user. Ibex has the experience with Access to be able to configure the ODBC refresh interval and refresh interval settings to control how often Access refreshes the VA's data. Refreshing only updates data that already exists in a given data sheet or form. Refreshing does not reorder records, display new records, or remove deleted records and records from query results that no longer meet specified criteria. During training, we will demonstrate to users how to view such changes, with a requirement of the underlying records for the data sheet or form.

As part of delivery, we will document in a CONOPS the recommended and agreed upon backup schedule and procedures, as well as documenting how to recover from backups.

Training —

Deliverables

The deliverables for this task order include:

The article management database, populated with current content on the site and relevant metadata

A codebook that lists all fields (both variable labels and form field labels) included in the database as well as descriptions

Training for the web content management team, including at least 16 hours of consultation for initial work putting the database into practice and training on generating/amending forms and reports

Instruction and Troubleshooting manual

Ongoing consultation and troubleshooting for the remainder of the year post delivery of complete database

Report and data entry template development

Database with estimated 40-50 at the start and a potential for up to 100 fields by contract completion, 20 custom reports, up to 20 queries, and as many forms and tables as necessary to create a fluid user experience and optimize data analytics.

Data import/entry for NCPTSD's ~1,000 current articles

Database Schema

Reports

Articles by Status

Articles by Date of Last Promotion

Articles by SME

Articles by Check-in Notice

Articles by Check-in Contact

Articles with Internal Link

Articles with External Link

Articles in Project

Articles with List Graphic

Articles with List Video

Articles with In-Press Citations

Quality Control Plan

Following is our quality control plan, which explains the Ibex approach to quality control, and outlines our methodologies. The Ibex quality control plan is to focus on four key areas: Documentation; Security and audit standards; User requirement specifications; and Risk mitigation. The standards we use to provide our customers with peace of mind as well as a quality product can help implement this quality control plan that preserves knowledge and makes the VA's business processes more efficient.

Ibex will produce a custom QA/QC plan within seven days of task order issuance, based on the following company standard operating procedures. As it is with development, so too it is with QA: documentation defines roles, preserves the audit trail and establishes repeatable protocols. Consistency is crucial. We have established standard templates that our team can use to document processes, prioritizing detailed, precise information. Whether it be effort estimates, requirement specifications or business case selection, there is an easy way to track progress through the duration of a project with Ibex's online project management portal.

Security and Audit Standards are important, and sometimes unknown. Fortunately, Ibex has worked with VA for many years, so we know, for example, that HIPAA compliance to audit standards can impact even a project such as this one. Ibex is experienced at sussing out external requirements our client must be aware of and accountable to in every project. When we finalize our quality control plan it will confront these requirements and issues and establish processes to meet them. Use clear, plain language to convey rules and protocols around items such as data handling, access and modifications; encrypted data transfers; storage of paper and electronic records; as well as physical and logical protection standards. As we are an experienced technology firm with domain expertise, we will navigate these decisions and processes by mirroring the User Requirement Specifications in our QA plan.

For each stakeholder, we will make clear the business and product requirements governing all actions within both the development and testing phases of the System Development Life Cycle (SDLC). All our decisions within the development process will be guided by an awareness of our end users and the performance of our deliverables. In our Project Management Plan (PMP, see our management approach), we will offer up a solid plan for communication and feedback across the development and testing phases to ensure actions are reflective and motivated by the user requirements.

We will mitigate risk through QA. The only guarantee within any SDLC is that there will be surprises along the way. How will we cope with the discovery of a serious bug or a significant delay in workflow? Ibex developers build these variables into our quality control approach, documented in our PMP, to provide realistic and effective time and resource estimates. Everything is viewed through the prism of the production cycle.

Our final QA plan will also address how VA can ramp up or scale down the Access database in production as the environment around the users evolves and changes—sometimes suddenly.

Methodology: Data Integrity

Just as data checking and review are important components of quality control for data management, so is the step of documenting how these tasks were accomplished. Creating a plan for how to review the data before it is collected or compiled allows a content developer to think systematically about the kinds of errors, conflicts, and other data problems they are likely to encounter in a given data set. When associated with the resulting data and metadata, these documented quality control procedures help provide a complete picture of the content of the dataset. A helpful approach to documenting data checking and review (part of our Quality Assurance/Quality Control, or QA/QC process) is to list the actions taken to evaluate the data, how decisions were made regarding problem resolution, and what actions were taken to resolve the problems at each step in the data life cycle.

For this aspect of quality control and assurance, Ibex includes standard operating procedures (SOPs) in our documentation that covers:

- determining how to identify potentially erroneous data
- how to deal with erroneous data
- how problematic data will be marked (i.e. flagged)

For instance, a content creator may graph a list of particular observations and look for outliers, return to the original data source to confirm suspicions about the validity of certain values, and then make a change to the live dataset. In data subset, the content developer may wish to compare versions of data streams to find discrepancies. Recording how these steps were done can be invaluable for later understanding of the dataset, even by the original content manager.

Exhibit: The final version of the Ibex quality control plan will be embedded on our project management portal, for easy access.

QUALITY CONTROL PLAN TEMPLATE

SOP #	PROCESS STEP	WHAT'S CONTROLLED	INPUT OR OUTPUT	SPECIFICATION CHARACTERISTIC	SPECIFICATIONS	METHOD OF MEASUREMENT	METHOD OF CONTROL	SAMPLE SIZE	FREQUENCY	WHO / WHAT MEASURES	RECORDING LOCATION	DECISION / CORRECTIVE ACTION

The value added by the Ibex approach to quality assurance is that we are able to ensure that we proactively meet production standards with our comprehensive quality control plan template (see the exhibit). We enter the unique standard operating procedure (SOP) numbers from our developer guidelines in order to monitor progress and improvements. Next, our team will enter the process steps, specifications, methods of measurement and control, and the decision or corrective measures, if any, needed. Ibex uses this template approach to facilitate a failsafe quality control process and maintain high-quality software development standards.

Methodology: Automate to Decrease Risk

At Ibex, we separate data entry from the coding activities. We do not ask data entry operators simultaneously to check anything, count anything, etc. Our Access database designs aim to restrict their work to creating a computer-readable facsimile of the data, nothing more. In particular, this principle implies the data-entry forms should reflect the format in which you originally obtain the data, not the format in which you plan to store the data. It is relatively easy to transform one format to another later, but it can be an error-prone process to attempt the transformation on the fly while manually entering data.

As part of the Ibex QA/QC process, we will create a data audit trail: whenever anything is done to the data, starting at the data entry stage, we will document this and record the procedure in a way that makes it easy to go back and check what went wrong (because things will go wrong). Consider filling out fields for time stamps, identifiers of data entry operators, identifiers of sources for the original data (such as source files and their file names), etc. As the old adage goes, "...storage is cheap, but the time to track down an error is expensive."

Ibex aims to automate nearly everything. Our database administrators assume any step will have to be redone (at the worst possible time, according to Murphy's Law), and plan accordingly. We don't try to save time now by doing a few "simple steps" by hand.

In particular, Ibex developers create support for data entry: we make a front end for each table (even a spreadsheet facsimile can do nicely) that provides a clear, simple, uniform way to get data in. At the same time the front end should enforce the VA's business rules — that is, it should perform as many simple validity checks as it can. We will use Access to enforce relational integrity checks (e.g., every article associated with a metadata tag really exists in the database).

Another unique aspect of the Ibex QA/WC process is that we constantly count things and check that counts exactly agree. For example, if an article is supposed to measure no more than 1,000 words, make sure (as soon as data entry is complete) that the word count is reported. Although checking counts is simple and uninformative, it is great at detecting duplicated and omitted data.

As the VA's data are valuable and important, we may consider independently re-validating manually the entire dataset. This means that each item will proofread by two different non-interacting people. This is a great way to catch typos, missing data, and so on. The cross-

checking can be completely automated. This is faster, better at catching errors, can be as efficient as 100% manual double checking.

While it seems redundant to write this, Ibex will use a database to store and manage the data — before we import it into the final product. Spreadsheets are great for supporting data entry, but we will get the government's data out of the spreadsheets or text files and into a real database as soon as possible. This prevents all kinds of insidious errors while adding lots of support for automatic data integrity checks. We can then use a copy of the actual data as our test data, as well.

After all data are entered and automatically checked, leverage Access: make sorted tables, create summaries of tags used, etc., and look at them all. These are easily automated with Access. We aim to not ask users to do repetitive tasks that the computer can do. The computer is much faster and more reliable at these. To this end Ibex will write (and document) utility scripts to do any task that cannot be completed immediately. These will become part of your audit trail and they will enable work to be redone easily.

Ibex has found, over the last decade, that if our customers follow these guidelines, approximately 50%-80% of the work in getting data into the database will be accomplished by us at the database design phase, and in writing the supporting scripts. It is not unusual to get 90% through such a project and be less than 50% complete, yet still finish on time: once everything is set up and has been tested, data entry of legacy information and checking it can be amazingly efficient.

Data are input into the Access database will be through a web interface or a desktop application. We propose to run checks of the quality of not only the content data, but also the data contained in lookup tables, such as the metadata tags, publishing and retraction dates, etc. As data entry is ongoing, this QA/QC process will need to be run intermittently. As content for articles will not have yet been publicly released, the QA/QC process will align with the publication/editorial calendar. This component of QA/QC involves three steps: (a) a different user checks each article; (b) the editor or content approver will visually inspect each for outliers; and (c) content contributors/writers will flag questionable data after spurious results are obtained.

Methodology: Section 508 Compliance

Ibex employs a Section 508 compliance standard operating procedures (SOP) which include instructions on: staying current, adjusting audit tools, and conducting a formal training program to create Section 508 awareness and adoption of best practices on our team. We strive to comply with the applicable standards of Section 508 of the Rehabilitation Act to the maximum extent possible, ensuring that individuals with disabilities have comparable access to and use of information and data to that provided to the general public, unless an undue burden would be imposed on us.

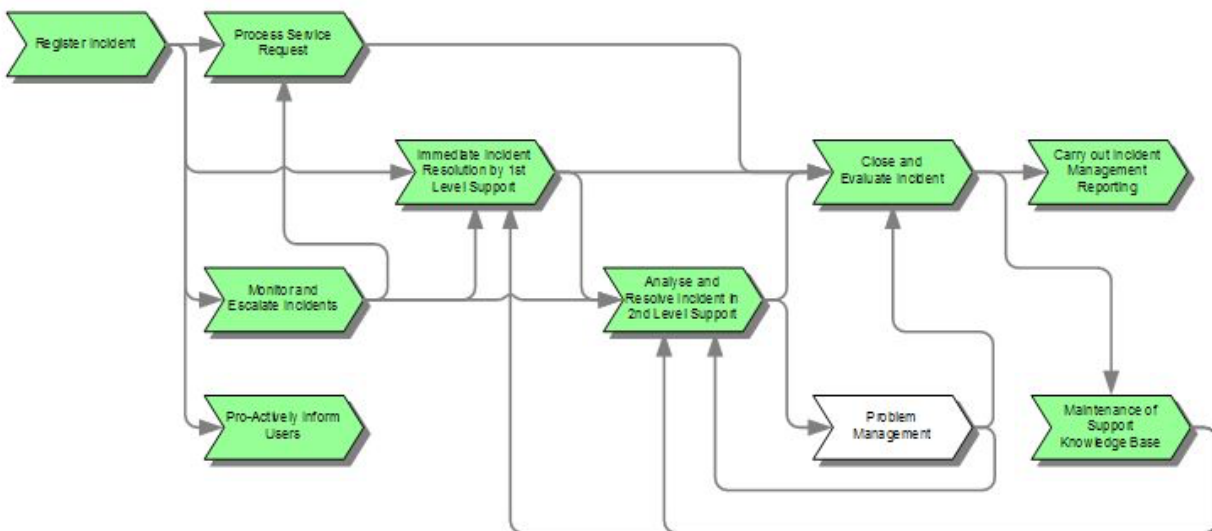
We acknowledge that we may use several Commercially Off-the-Shelf (COTS) products such as Access to produce the products and services deliver to our clients which may have Voluntary Product Accessibility Templates (VPAT) provided by their respective vendors. For the purpose of a VPAT, we will focus on proprietary EIT that Ibex develops using one or more COTS products. Section 1194.25 Self-Contained, Closed Products means we must address requirements for Compatibility to ensure accessibility to as many disabilities as possible. To comply with these requirements, Ibex products and services as applicable will be readable with screen readers and Braille displays when equipped with compatible assistive technologies.

For deliverables such as documentation and training, we will ensure PDFs meet the criteria outlined at <https://www.section508.gov/create/pdfs/>

Methodology: Issue Management

An issue typically means deviance in the functionality of an end product developed by the project team, from the specified requirements. Since the utmost responsibility of this project will revolve around ensuring that it works the way it should when this fails to confirm, it becomes an Issue or Defect, that needs to be fixed. Ibex tracks issues in our online issue management tool, part of our online project management portal. The QA process for Issues Management is the entire set of steps from identifying an issue in the product, to resolving it.

Exhibit: Ibex workflow for issue management



This includes a full workflow of: the methods used to identify issues; Allocating responsibility to handle issues; Steps the team uses to resolve an issue; and, Learning from past issue records for optimization. The VA client can open a ticket at our project management portal when an issue arises, and Ibex will track the the issue through to resolution.

Staffing Plan

At Ibex, we have discrete processes for staff planning and recruiting processes that alleviate how time-consuming these steps are. With a 95% staff retention rate, our clients win by leveraging the Ibex team's expertise in IT consulting services. With our experience and pool of tested, qualified technologists, we are able to provide the right talent for this effort. If the government requires additional resources, Ibex has the ability to source personnel quickly, from our other full time employees or from our pool of vetted contractors.

Our PMP will include a resource plan, where we identify, list, and organize the resources needed to complete this project, as well as help determine the quantity needed for each resource, the cost and when they are needed in the project work breakdown structure (WBS).

Position	Hours	Role
0001 - Junior Programmer	600	Develops and maintains databases, while ensuring high levels of data availability. Responsible for reviewing requirements, specifications and technical design documents to provide timely and meaningful feedback. Implements design into database schema, front end user interface, and reports. Diagnoses and resolve database access and performance issues. Coordinates data migrations between systems. Develop, implement, and maintain change control and testing processes for modifications to databases. Interfaces with customer during JAD sessions.
0002- Administrative Assistant	200	Assists with JAD sessions (meeting minutes, followup on issues). Ensures documentation is maintained. Performs processes related to quality assurance testing. Identifies and reviews activities and deliverables critical to project quality. Develops software test plans and test cases as required. Validate database integrity after each test. Logs and tracks defects, working directly with the client and programmer to ensure appropriate follow-through and defect resolution.
Project Manager	40	Ibex will supply a corporate liaison as the project manager. This person will ensure the PMP is executed as planned, QA/QC is carried out, and acts as the single point of contact for the government. This person is responsible for the end-to-end project management of this task. Responsible for engagement with client and the team throughout project phases as well as the management of and interaction with all relevant stakeholders; responsible for regular reporting on project progress.

The Ibex online project management portal automatically compares planned resources with our actual resources and displays the results in a Gantt chart. This helps stay on track when we are executing the project.

Exhibit: Ibex provides automated reports of progress towards goals



Ibex uses a workload chart to make sure the team isn't over extended. The Ibex project manager can balance staff work to keep them more productive, working towards the VA's goals.

Past Performances

Provide (3) references of work, similar in scope and size with the requirement detailed in the Performance Work Statement. Refer to Past Performance sheet in section D. References must include contact information, brief description of the work completed, and contract # (if relevant).

Part I: Project Identification

Contractor Name:	International Business Express, Inc. (IBEX)
Contract Number:	GS06F0775Z
Order Number (If Applicable):	GS-10F-14-LP-P-0024
Project Title:	PSHC Database Administration Services
Customer Name:	GSA – Federal Acquisition Services (FAS)
Total Period of Performance, Including Options: (MM/YYYY - MM/YYYY or MM/YYYY – Present)	6/2/2014 – 6/1/2019
Project Value:	\$849,974.83
Funding Agency Id (If Applicable):	General Services Administration
Fair Opportunity Task Order Against A Multiple Award IDIQ Federal Government Contract	Yes No

Part II: Project Information
Contracting Officer

Name:	Kenny Yiu
Title:	Contracting Officer
Agency or Customer:	GSA – Federal Acquisition Services
Phone:	kenny.yiu@gsa.gov
E-mail:	253-931-7915

Contracting Officer's Representative

Name:	Tina Burns
Title:	COR
Agency:	Federal Acquisition Services
Phone:	253-931-7000
E-Mail:	Tina.burns@gsa.gov

Part III: Project Description

International Business Express, Inc. (IBEX) project was awarded as a task order procured under the General Services Administration (GSA), GSA 8 (a) STARS II GWAC, Contract Number GS06F0775Z. IBEX obligated funding upon award was \$849,974.83.

The Federal Acquisition Services (FAS) possesses unrivaled capability to deliver comprehensive products and services across government at the best value possible. FAS offers a continuum of innovative solutions and services in the areas of Products and Services, technology, travel, transportation and procurement and online acquisition tools. In 2014, FAS contracted with IBEX to provide Database Administration Services for FAS' PSHC Databases. The SOW focused on continuous improvement and maintenance across of the PHSC Databases.

IT Operations and Maintenance, Modernization and Enhancement Development, Modernization and Enhancement — IBEX Database Administrators focused on managing, maintenance, support, and increasing the reliability of PHSC databases. The PSHC database has multiple Access databases to facilitate the management of GSA Schedule contract information, pricing, business development data, workload management, and performance management. The Database Administrators oversee maintenance issues with end users, provide Ad hoc reports, data analysis, and updating the database documentation, as well as helping to troubleshoot issues that may arise.

d. Database Management

The Database Administrators provide Database Administrative Services that ensured that PSHC databases are protected and monitored by establishing backup and recovery procedures, providing a secure database environment, and monitoring database performance.

e. Software Maintenance & Upgrades

Perform maintenance functions during peak and non-peak hours to facilitate functionality of the Access database(s) in support of PSHC's multiple geographic locations in the Eastern to Pacific time-zones of the continental United States and supported alternate platforms and changes to functionality.

f. Data Quality Management

Our database administrators are responsible for the health of the database(s) by ensuring the quality and integrity of the data itself. We maintain the Access databases, back them up, manage users, and support changes to the database design as we optimize performance.

d. Production Deployment

IBEX performed deployment reviews to ensure specification for additions, deletions, and corrections to content, workflow or other data-related issues and scheduled inspection, System Requirements (SR), Design, Test Readiness (TRR), and final production and deployment to be reviewed by the Project Manager and COR.