

CHAPTER 12

Contracting GPS Surveying Services

12-1. General. This chapter describes the process for contracting GPS survey services. It covers development of survey scopes of work, performance specifications, and cost estimates for Architect-Engineer (A-E) contracts. Procedures for developing GPS survey contract specifications and cost estimates are performed similarly to those for A-E design services. Similar technical discipline scheduling and production factors are used to determine the ultimate cost of a task. Although this chapter is intended to provide guidance for estimating costs for GPS surveying services, the explanations herein regarding procurement policies and practices describe only the framework within which cost estimates are used. For detailed guidance on procurement policies and practices, refer to the appropriate procurement regulations: FAR, DFARS, EFARS, EP 715-1-7 (Architect-Engineer Contracting), and the PROSPECT course on A-E contracting.

12-2. Brooks Architect-Engineer Act. In the Federal government, professional architectural, engineering, planning, and related surveying services must be procured under the Brooks Architect-Engineer Act, Public Law 92-582 (10 US Code 541-544). The Brooks A-E Act requires the public announcement of requirements for surveying services, and selection of the most highly qualified firms based on demonstrated competence and professional qualifications. Cost or pricing is not considered during the selection process. After selection, negotiation of a fair and reasonable price for the work is conducted with the highest qualified firm. GPS surveying supporting the Corps' research, planning, development, design, construction, or alteration of real property is considered to be a related or supporting architectural or engineering service, and must therefore be procured using Brooks A-E Act qualifications-based selection, not by bid price competition.

12-3. Contracting Processes and Procedures. Corps procedures for obtaining A-E services are based on a variety of Federal and DoD acquisition regulations. The following paragraphs synopses the overall A-E process used in the Corps.

a. Types of contracts. Two types of A-E contracts are principally used for surveying services: Firm-Fixed-Price (FFP) contracts and Indefinite Delivery contracts (IDC). FFP contracts are used for moderate to large mapping projects (e.g., > \$1 million) where the scope of work is known prior to advertisement and can be accurately defined during negotiations--typically for a large new project site. Due to variable and changing engineering and construction schedules (and funding), most mapping work involving GPS services cannot be accurately defined in advance; thus, these fixed-scope FFP contracts are rarely used, and well over 95% of surveying services are procured using IDC.

b. Announcements for surveying services. Requirements for surveying services are publicly announced and firms are given at least 30 days to respond to the announcement. The public announcement contains a brief description of the project, the scope of the required services, the selection criteria in order of importance, submission instructions, and a point-of-

28 Feb 11

contact. This public announcement is not a request for price proposal, and firms are directed not to submit any price-related information.

c. Selection criteria. Federal and DoD regulations set the criteria for evaluating prospective surveying contractors as listed below. These criteria are listed in the public announcement in their order of importance and the selection process assigns descending weights to each item in that order. (The order listed below may be modified based on specific project requirements.)

(1) Professional qualifications necessary for satisfactory performance.

(2) Specialized experience and technical competence in the type of work required.

(3) Past performance on contracts with Government agencies and private industry in terms of cost control, quality of work, and compliance with performance schedules.

(4) Capacity to perform the work in the required time.

(5) Knowledge of the locality of the project.

(6) Utilization of small or disadvantaged businesses.

(7) Geographic location.

(8) Volume of work awarded by the Department of Defense.

[Note: (6), (7), and (8) are secondary selection criteria--see EP 715-1-7 (Architect-Engineer Contracting) for latest policy on A-E selection procedures and evaluation criteria]

d. Selection process. The evaluation of firms is conducted by a formally constituted Selection Board in the Corps district seeking the services. This board is made up of highly qualified professional employees having experience in architecture, engineering, surveying, etc. A majority of the board members for surveying services must have specific technical expertise in that area. At least one member must be a licensed surveyor if real property surveys are involved. The board evaluates each of the firm's qualifications based on the advertised selection criteria and develops a list of at least three most highly qualified firms. As part of the evaluation process, the board conducts interviews with these top firms prior to ranking them. The firms are asked questions about their experience, capabilities, organization, equipment, quality management procedures, and approach to the project. These interviews are normally conducted by telephone. The top three (or more) firms are ranked and the selection is approved by the designated selection authority--typically the District Commander. The top ranked firms are notified they are under consideration for the contract. Unsuccessful firms are also notified, and are afforded a debriefing as to why they were not selected, if they so request.

e. Negotiations and award. The highest qualified firm ranked by the selection board is provided with a detailed scope of work for the project, project information, and other related

technical criteria, and is requested to submit a detailed price proposal for performing the work. In the case of IDC, price proposals consist simply of unit rates for various disciplines, services, and equipment. This list becomes the contract "Schedule B" of prices, and typically each line item of services contains all overheads, profits, and incidental supplies. Once a fair and reasonable price (to the government) is negotiated, the contract is awarded. The Government Contracting Officer is obligated to strive to obtain a negotiated price that is "fair and reasonable" to both the Government and the contractor.

12-4. Indefinite Delivery Contracts and Task Orders. The vast majority of the Corps surveying services are procured using Indefinite Delivery Contracts (IDC). These IDCs are procured using the selection and negotiation process described above. IDC (once termed "Open-End" or "Delivery Order" contracts) have only a general scope of work--e.g., "GPS surveying services in Southeastern United States." When work arises during the term of the contract, task orders are written for performing that specific work. In the Corps, IDCs are currently (2010) issued for \$1 million with two to five additional \$1 million option term (not year) extensions -- for a total award of \$3 million. Task orders may be issued up to \$1 million each. Larger IDC awards are often made, both in overall award size and task order limit. Task orders are negotiated using the unit rate "Schedule B" developed for the main contract. Thus, negotiations are focused on the level of effort and performance period. Task orders typically have short scopes of work--a few pages. The scope is sent to a contractor who responds with a time and cost estimate, from which negotiations are initiated. Under emergency conditions (e.g., flood fights, hurricanes) contractors can be issued task orders verbally by the Contracting Officer, with the scope of work simply defined as a limiting number of days for survey crew at the contract schedule rate. The entire process--from survey need to task order award--should routinely take only 2 to 4 weeks. From the IDC Schedule B, a GPS survey crew and equipment is pieced together using the various line items--adding or deducting personnel or equipment as needed for a particular project. A number of methods are used for scheduling GPS services in a fixed-price or IDC contract. The most common method is a Daily Rate. A daily rate basis is the cost for a GPS field crew (including all instrumentation, transport, travel, and overhead) over a nominal 8-hour day. A daily crew rate is the preferred unit price basis for estimating contracted GPS services for IDC contracts and their task orders. It provides the most flexibility for IDC contracts, especially when individual project scopes are expected to vary widely. The crew personnel size, number of GPS receivers deployed, vehicles, etc., must be explicitly indicated in the contract specifications, with differences resolved during negotiations. Options to add additional GPS receiver units (along with personnel and/or transport) must be accounted for in the estimate and unit price schedule. As an example, the daily rate for a GPS surveying crew could be estimated using the following detailed analysis method.

Table 12-1. Factors for Estimating A-E Costs

Item	Description
I	Direct labor or salary costs of GPS survey technicians: includes applicable overtime or other differentials necessitated by the observing schedule
II	Overhead on Direct Labor *
III	G&A Overhead Costs (on Direct Labor) *
IV	Material Costs
V	Travel and Transportation Costs: crew travel, per diem, etc. Includes all associated costs of vehicles used to transport GPS receivers
VI	Other Costs: includes survey equipment and instrumentation, such as GPS receivers. GPS receiver costs should be amortized down to a daily rate, based on average utilization rates, expected life, etc. Exclude all instrumentation and plant costs covered under G&A, such as interest
VII	Profit (Computed/ negotiated on individual task order or developed for all task orders in contract)

* these may be combined into a single overhead rate

12-5. Contract Price Schedule. The various personnel, plant and equipment cost items like those shown in Table 12-1 above are used as a basis for negotiating fees for individual line items in the basic IDC contract. During negotiations with the A-E contractor, individual components of the Independent Government Estimate (IGE) and the contractor's price proposal may be compared and discussed. Differences would be resolved in order to arrive at a fair and reasonable price for each line item. The contract may also schedule unit prices based on variable crew sizes and/or equipment. A typical negotiated IDC price schedule (i.e. Section B - Supplies or Services and Prices/Costs) is shown below in Table 12-2. The contract specifications would contain the personnel and equipment requirements for each line item. Each Corps district has its unique requirements and therefore line items used in schedules will vary considerably. For instance, some districts may elect to apply overhead as a separate line item. Others may compute profit separately for each task order and others may not include travel costs with crew rates.

Table 12-2. Sample Contract Schedule of Services for an Indefinite Delivery Contract used for GPS Surveying Services

ITEM NO.	Description	U/M	U/P
0001	4-Person Conventional Survey Party	HR	\$272.00
0002	4-Person GPS Static Survey Party	HR	\$368.00
0003	1-Person GPS Static Survey Party	HR	\$81.00
0004	2-Person GPS RTK Survey Party	HR	\$225.00
0005	1-Person GPS RTK Survey Party	HR	\$81.00
0006	2-Person Multi-beam Survey Party	HR	\$528.00
0007	2-Person DGPS Survey Pty (Inshore)	HR	\$254.00
0008	2-Person DGPS Survey Pty (Offshore)	HR	\$222.00
0011	Party Chief	HR	\$63.00
0012	Instrument Person	HR	\$48.00
0013	Rodperson/Chainperson	HR	\$37.00
0014	Hydrologic Technician	HR	\$63.00
0015	Vehicle (Sedan/Pickup)	HR	\$9.00
0016	Per Diem.	MD	JTR
0017	Abstractor	HR	\$89.00
0018	Registered Professional Land Surveyor	HR	\$108.00
0019	Cartographic Technician	HR	\$72.00
0020	GIS Technician	HR	\$73.00
0021	Civil Engineering Technician	HR	\$67.00
0022	Class I Closed Cabin Boat	HR	\$37.00
0023	All Terrain Vehicle (ATV)	HR	\$5.00
0024	Special Equipment	LS	

Abbreviations HR = Hour LS = Lump Sum JTR = Joint Travel Regulation
 Scheduled prices include overhead and profit [these could be listed separately if desired]
 GPS survey crew includes all field equipment, auxiliary data loggers, tripods, and computers needed to observe, reduce, and adjust baselines in the field. Per diem is included. [The contract scope of work will specify items that are included with a crew, including GPS receiver quality standards]

* Prices are from 2010 and can vary depending on region. The prices are included to show relative cost, not absolute cost.

12-6. Sample Cost Estimate for Contracted GPS Survey Services. The following cost computation is representative of the procedure used in preparing the IGE for an A-E contract and ultimately the contract price schedule above. The example shows the computation for a three-man GPS survey crew. Larger crew/receiver size estimates would be performed similarly. Costs and overhead percentages are shown for illustration only--they are subject to considerable

28 Feb 11

geographic-, project-, and contractor-dependent variation (e.g., audited G&A rates could range from 50 to 200 percent). GPS instrumentation and labor rates are approximate (2010) costs. Associated costs for GPS receivers, such as insurance, maintenance contracts, interest, etc., are presumed to be indirectly factored into a firm's G&A overhead account. If not, then such costs must be directly added to the basic equipment depreciation rates shown. Other equally acceptable accounting methods for developing daily costs of equipment may be used. Equipment utilization estimates in an IGE may be subsequently revised (during negotiations) based on actual rates as determined from a detailed cost analysis and field price support audits.

SAMPLE COMPUTATION FOR FULLY EQUIPPED 3-MAN GPS SURVEY CREW

[3 geodetic quality receivers, auxiliary equipment, 3-vehicles, laptops, and adjustment software]

LABOR

Supervisory Survey Tech (Party Chief)	\$ 19.50/hr*
G&A and Direct Labor Overhead (165%)	\$ 32.18/hr
Total:	\$ 51.68/hr \$ 413.30/day
Survey Technician--GPS observer	\$ 16.74/hr*
G&A and Direct Labor Overhead (165%)	\$ 27.62/hr
Total	\$ 44.36 \$ 354.89/day
Survey Technician--GPS observer	\$ 16.74/hr*
G&A and Direct Labor Overhead (165%)	\$ 27.62/hr
Total	\$ 44.36 \$ 354.89/day
Total Labor Cost for 3-Man GPS Crew/day:	\$1123.18/day

TRAVEL (NOMINAL RATE)

Per Diem (Nominal): 3 persons @ \$ 116/day	
(subject to JTR adjustment on task orders)	
Total Travel Cost:	\$ 348.00/day

SURVEY INSTRUMENTATION & EQUIPMENT

DGPS Carrier Phase Positioning System - 3 geodetic quality receivers (static or kinematic positioning), batteries, tripods, data collectors, etc.	
\$20,000 ea or \$60,000 @ 4 yrs @ 100 d/yr	\$ 150.00/day
Total Station: data collector, prisms, etc.	
\$32,000 @ 5 yrs @ 120 d/yr (rental rate: \$60/d)	\$ 53.00/day
Survey Vehicle @ 3 reqd @ \$9.91/hr**	\$ 237.84/day
Misc Materials (field books, survey supplies, etc)	\$ 25.00/day
Total Instrumentation & Equipment Cost/day:	\$ 465.84

Subtotal :	\$1937.02
Profit @ 10.0%	\$ 232.44
Total Estimated Cost per Day -- 3 man GPS Survey Crew	<u>\$ 2169.46</u>

Similar computations are made for other line items in the price schedule.

* Hourly rates taken from Department of Labor's Wage Determination Schedules

** Hourly rate taken from Engineering Pamphlet 1110-1-8 - Construction Equipment
Ownership and Operating Expense Schedule

12-7. Cost Per Work Unit (GPS Station) Schedule. If a cost-per-work-unit fee structure is desired on an IDC, the computed daily/hourly crew rates and other applicable cost items can be divided by the estimated daily/hourly productivity in order to schedule work units. Typical work unit measures on a GPS contract might be cost per static point or cost per kinematic point. Both

the estimated crew daily rate and the estimated productivity rates are subject to negotiation. An infinite number of work unit measures could be formed, given the variety in units of measure, survey classifications, expected local conditions, etc. Use of work unit rates is obviously restricted to individual project areas where work is fairly repetitious. Costs per GPS stations were commonly used during the early days of GPS (mid-1980s) when GPS receivers cost \$150,000 and only 3-4 hours of satellite constellation was available each day. Today there is little justification for using work unit costs for pricing GPS surveys.

12-8. Contract Specifications and Accuracy Standards.

a. Contract specifications and standards for Corps surveying work should make maximum reference to existing standards, publications, and other references. The primary reference standard is this manual. Drafting and CADD/GIS standards are referenced in EM 1110-1-2909. Corps headquarters does not specify standard hardware or software for its districts--each district may establish their own standards based on their unique requirements. US Government policy prescribes maximum use of industry standards and consensus standards established by private voluntary standards bodies, in lieu of government-developed standards. This policy is further outlined in EM 1110-1-2909, as follows:

"Voluntary industry standards shall be given preference over non-mandatory Government standards. When industry standards are non-existent, inappropriate, or do not meet a project's functional requirement, ...[other] standards may be specified as criteria sources. Specifications for surveying and mapping shall use industry consensus standards established by national professional organizations, such as the American Society for Photogrammetry and Remote Sensing (ASPRS), the American Society of Civil Engineers (ASCE), the American Congress on Surveying and Mapping (ACSM), or the American Land Title Association (ALTA). Technical standards established by state boards of registration, especially on projects requiring licensed surveyors or mappers, shall be followed when legally applicable. Commands shall not develop or specify local surveying and mapping standards where industry consensus standards or Army standards exist."

b. According to Corps policy, technical specifications for obtaining GPS survey data shall be "performance-based" and not overly prescriptive or process oriented. Performance-based specifications shall be derived from the functional project requirements and use recognized industry standards where available. Performance-oriented (i.e. outcome based) specifications set forth the end results to be achieved (i.e. final drawing/chart format or accuracy standard) and not the means, or technical procedures, used to achieve those results. A performance-oriented specification provides the most flexibility and allows the most economical and efficient methods to achieve the desired end product. Performance specifications should succinctly define the basic mapping limits, feature location and attribute requirements, scale, contour interval, map format, sheet layout, and final data transmittal, archiving or storage requirements, the required accuracy criteria standards for topographic and planimetric features that are to be depicted, and describe quality assurance procedures that will be used to verify conformance with the specified criteria. Performance-oriented specifications should be free from unnecessary equipment, personnel, instrumentation, procedural, or material limitations; except as needed to establish

comparative cost estimates for negotiated services. This would include any in-progress reviews or approvals during various phases of the project.

c. EM 1110-1-2909 also states that use of prescriptive (i.e. procedural) specifications shall be kept to a minimum, and called for only on highly specialized or critical projects where only one prescribed technical method, in the opinion of the Government, is appropriate or practical to perform the work. Overly prescriptive specifications typically require specific field instrumentation (e.g., brand name GPS receiver), personnel, office adjustment procedures (e.g., product-specific software or output format), or rigid project phasing with on-going design or construction. Prescriptive specifications reduce flexibility, efficiency, and risk, and can adversely impact project costs if antiquated survey methods or instrumentation are required.

d. Engineering Regulation 1110-2-8160 states that each project shall have a minimum of three survey control monuments documented, one of which must be included in the National Spatial Reference System. U-SMART may be used for this purpose. Suggested contract language is found below.

The contractor shall describe all recovered and/or established survey control points including gage reference points, using the latest U-SMART form available at <http://www.agc.army.mil/ndsp/usmart.asp>. The location map shall show sufficient detail such as street names and significant land marks to adequately display the general location of the mark. The image of the mark if possible should show the stamping and where possible, the horizon/setup image should show the actual setup. The image sizes shall be kept small enough to limit the size of the resultant document to 3 megabytes.

Additional information on U-SMART is available at <http://www.agc.army.mil/ndsp>

12-9. Contract Statements of Work. Technical specifications for GPS surveying that are specific to the project (including items such as the scope of work, procedural requirements, and accuracy requirements) are inserted in the appropriate section of the contract (e.g., Statement of Work--Section C). This GPS engineer manual should be attached to and made part of any A-E service or construction contract requiring GPS surveying. References to USACE survey classifications (and related criteria tables) may also be made if required. References to this manual will normally suffice for most USACE survey specifications; however, areas where deviations from (or additions to) this manual must be considered in developing the Statement of Work. A guide specification for GPS surveying services is found in Appendix C of this manual. This guide specification is readily adaptable to all types of GPS surveying services.

12-10. Contract Quality Control and Quality Assurance. Under the Corps professional contracting system, contractors are responsible for performing all quality control (QC) activities associated with their work. The Corps is responsible for quality assurance (QA) oversight of the contractor's QC actions. Therefore, Corps QA or testing functions should be focused on whether the contractor meets the required performance specification (e.g., survey accuracy) and not the intermediate surveying or compilation steps performed by the contractor. As a result, for surveys procured using the Brooks A-E Act qualifications-based selection method, Corps representatives do not regularly observe work in progress (i.e. perform QC activities)--the contractor was selected as being technically qualified to perform the work; including all QC associated with it.

28 Feb 11

Corps-performed field testing of a contractor's work is an optional QA requirement, and should be performed only when technically and economically justified.

12-11. Task Order Time and Cost Estimates. Once unit prices have been negotiated and established in the basic IDC schedule as illustrated in the above sections, each IDC task order is negotiated primarily for effort, i.e. time. The process for estimating the time to perform any particular survey function in a given project is highly dependent on the knowledge and personal field experience of the government and contractor estimators. The negotiated fee on a task order is then a straight mathematical procedure of multiplying the agreed-upon effort against the established unit prices in Schedule B, plus an allowance for profit if not included in the unit rates. An IGE is required for task orders over \$100,000, along with a detailed profit computation, documented records of negotiations, etc. The scope is attached to a DD 1155 order placed against the basic contract. If a preliminary site investigation is scheduled for this project, any such adjustments should be investigated and resolved prior to negotiating subsequent task orders for the various phases of the work, to the maximum extent possible. As such, the negotiated costs for the subsequent work phases would be considered fixed price agreements. Any later adjustments to these agreed to prices would be issued in the form of modifications to task orders (i.e. change orders), and would have to be rigorously defended as significant, unforeseen changes in the scope. The contractor would be expected to immediately notify the contracting officer (KO) or Contracting Officer's Technical Representative (COTR) of the need for cost adjustments.

12-12. Sample Task Order for GPS Services. Following is an example of a task order for GPS surveying services that are performed within a task order for monitoring a beach renourishment project. Included in this example is the letter request for proposal to the IDC contractor. Attached to this letter request is the detailed statement of work that identifies the scope, standards, and specifications that are to be performed. The final record of negotiations compares the Independent Government Estimate with the contractor's proposal, and records the final negotiated cost to perform the task order.

SAMPLE LETTER REQUEST FOR PROPOSAL

Engineering Division
Design Branch

Sea Systems, Inc.
3456 Northwest 27th Avenue
Pompano Beach, Florida 33069-1087
SUBJECT: Contract No. DACW17-98-D-0004

Gentlemen:

Enclosed are marked drawings depicting the scope of work required for the following project:

Brevard County, Sand Bypass System Post Construction
One-Year Monitoring Beach Erosion Survey
Canaveral Harbor, Florida (Survey 99-267)

28 Feb 11

General Scope. Furnish all personnel, plant, equipment, transportation, and materials necessary to perform and deliver the survey data below in accordance with the conditions set forth in Contract No. DACW17-98-D-0004. Services not specifically described herein are nonetheless a firm requirement, if they can be identified as an item or items commonly a part of the professional grade work of a comparative nature required by your contract. All work shall be accomplished in accordance with the Manuals and TM's specified in your contract.

Your attention is directed to the Site Investigation and Conditions Affecting the Work clause of your contract. After we have reached agreement on a price and time for performance of this work, neither the negotiated price nor the time for performance will be exchanged as a consequence of conditions at the site except in accordance with the clause. Costs associated with the site investigation are considered overhead costs which are reimbursed in the overhead rates included in your contract. Additional reimbursement will not be made.

a. Scope of Work. Hydrographic and topographic monitoring data shall be collected for CCAFS-29, CCAFS-30, CCAFS-33 through CCAFS-42, BC-5 through BC-14, and DEP R-0 through DEP R-18 including DEP R-1-AA and DEP R-1A. The area is shown on Enclosure 1, USGS quads. Enclosure 2 is the control monument descriptions and profile line azimuth. Enclosure 3 is the technical requirements for the surveys.

b. Data Processing. The Contractor shall make the necessary computations to verify the accuracy of all measurements and apply the proper theory of location in accordance with the law or precedent and publish the results of the survey.

c. CADD. The survey data shall be translated or digitally captured into Intergraph IGDS 3D design files according to the specifications furnished. The survey data shall be provided in Intergraph MicroStation Version 5.0 or higher.

d. Digital Geospatial Metadata. Metadata are "data about data". They describe the content, identification, data quality, spatial data organization, spatial reference, entity and attribute information, distribution, metadata reference, and other characteristics of data. Each survey project shall have metadata submitted with the final data submittal.

e. Compliance. Surveying and Mapping shall be in strict compliance with EM-1110-1-1000 Photogrammetric Mapping, EM-1110-1-1002 Survey Markers and Monumentation, EM-1110-1-1003 NAVSTAR Global Positioning System Surveying, EM-1110-1-1004 Deformation Monitoring and Control Surveying, EM-1110-1-1005 Topographic Surveying, EM-1110-2-1003 Hydrographic Surveying, EM-1110-1-2909 Geospatial Data and System, Tri-Services A/E/C CADD Standards, Tri-Services Spatial Data Standards, Related Spatial Data Products and Chapter 177, Chapter 472, and Chapter 61G17 of the Minimum Technical Standards set by the Florida Board of Professional Surveyors and Mappers.

The completion date for this assignment is 60 days after the Notice to Proceed is signed by the Contracting Officer.

Contact Design Branch at 904-232-1613 for assistance, questions, and requirements.

You are required to review these instructions and make an estimate in writing of the cost and number of days to complete the work. Please mark your estimate to the attention of Chief, Design Branch.

This is not an order to proceed with the work. Upon successful negotiation of this delivery order the Contracting Officer will issue the Notice to Proceed.

Sincerely,

Enclosures

Walter Clay Sanders, P.E.
Assistant Chief, Engineering Division

Sample Task Order Scope of Work—National Levee Database

January 21, 2009

STATEMENT OF WORK

NEW ORLEANS DISTRICT
NATIONAL LEVEE FOOT PRINT DATA BASE SURVEYS

ACME SURVEYING, INC

CONTRACT No. W912P9-07-D-0545

1. BACKGROUND AND PURPOSE:

As a result of Congressional action, the USACE has received the mandate and resources to design and build a National Levee Database (NLD). The NLD will play a role in a possible National Levee Safety Program, the Inspection of Completed Works (ICW) program, emergency response and coordination with FEMA's MapMod and Levee Certification programs.

The following information will be used by the Contractor to prepare a proposal for providing support to update a National Levee Database and complete controlled land surveys for profiles of completed flood damage reduction works (federal levees) and their associated features.

2. DESCRIPTION OF WORK:

The contractor shall acquire and develop a levee footprint and obtain profiles for active federal levees within the U.S. Army Corps of Engineers– New Orleans District. Levee footprint shall include the levee centerlines, floodwalls, I-walls, and associated pump stations, drains, relief wells, piezometers, etc. The levee footprint will consist of horizontal and vertical measurements of the required features for each levee segment, beginning and ending of features, centerline profiles, cross-section, and specific locations at required objects shall be collected. Approximately one thousand four hundred (1400.0) feature miles are within the New Orleans District for this scope of work that require field surveys. The Contractor shall also populate the database with additional structural, cultural, and geographic features along the levees as required for the National Levee Database model (ie. protected areas). All work performed under this task order shall be under the supervision of a registered engineer and/or land surveyor with current registration in the State or States where the surveys are performed.

The Contractor will prepare their proposal based upon estimated quantities of work to be performed. Exact numbers of features such as gravity drains, relief wells, piezometers, cross sections, crossings, pump stations, closure structures, encroachments, etc., are not known at this time. The proposal shall be presented in sections to separate the field survey collection, vertical control effort, and GIS effort, from coordination with the District office and any research

28 Feb 11

necessary, and the effort to populate the levee data base effort. The typical mile should include items such as piezometers, relief wells, concrete wall section, cross sections, profile, vertical survey control, crossings, closure structure, etc.

3. INFORMATION SUPPLIED BY THE GOVERNMENT:

3.1. Data listing, maps, photos, engineering drawings, and project maps of the required levees to be used for orientation and estimating purposes. These engineering drawings and maps will also provide stationing for the profiles to be obtained and shall be made available to the Contractor for use at the New Orleans District office. Some of the items furnished shall include:

- Locations of encroachments from the Levee Inspection Tool.
- Sand boils.
- Imagery (2006/07).
- Exports from the NLD GDB.
- Cross section shapefiles (derived from LiDAR)
- Plan and Profile maps (PDFs)
- Vulnerability maps (PDFs)
- Polder Completion Maps (PDFs)
- Structure drawings for pump stations
- TBD: Flood Wall drawings.
- Survey control DB
- Survey codes (codes.dat)

Imagery transfer will require the contractor to mail storage devices to the New Orleans District (Point of contact for imagery transfer: Michelle LaPrawn). The Contractor will mail a maximum of 2 hard drives with at least 500GB of combined storage space to the New Orleans district.

3.2. Guidance and specifications for vertical control for levee profiles as provided in the EC 1110-2-6065, Dated 1 July 2007, "Comprehensive Evaluation of Project Datums".

3.3. Copies of all available existing levee survey data will be made available to the Contractor to assist in locating features and project survey control

3.4. Template geodatabase with metadata file, and software, designed for data collection and attributions, feature level metadata guidance, and a project metadata file.

3.5. Lists and/or maps, drawings, etc. showing location information for existing located/known relief wells, pump stations, gravity drains, crossings, etc to assist in locating all known required features along the levees. This information shall be used for assigning the required attributes to the features. The list will not be comprehensive and may have omissions. The Contractor shall use this list merely as a guide to assist in finding all the required features.

3.6. Allowable points of contact for all levees. Names, phone numbers, addresses, and alternates.

3.7 List of required features to be surveyed/collected in the field.

3.8 Primary New Orleans Point of Contact is Ed Magill (505-862-9999)
edward.j.magill@usace.army.mil Alternate POC is Dillo Gautreau (505-862-9998)
dillo.b.gautreau@usace.army.mil.

3.9 The list of New Orleans District flood damage risk reduction projects (levees) that require survey for data collection for the NLD.

4. WORK TO BE PERFORMED BY THE CONTRACTOR:

4.1 General Work Plan:

4.1.1 New Orleans District will appoint a POC to work with the Contractor providing access to District materials needed to populate the NLD and resolving questions that may arise in the course of the work. The NLD PDT will provide the District POC materials from the Inventory in a timely manner, as well as the NLD Data Model, metadata template and Workflow diagrams. The NLD PDT is available to support the District POC in resolving any questions or issues relating to the database, workflow, software or specifications.

4.1.2 After coordinating with the District POC, and receiving the list and location of the District's qualifying levees, the Contractor will develop and implement field survey plans and operations. The data will be processed as required to populate those items in the NLD Data Dictionary flagged for "Field" population. They are Levee Centerline, Floodwall line, Closure Structure Line, Crossings, Relief Wells, Gatewells Pump Stations, Gravity Drains, Cross Sections, and Piezometers. Features such as Borehole points, Encroachment points, Flood Fighting point, Sand Boil Point, Rehabilitation Line, Protected Areas, Cross Sections, and Levee Stationing will be populated and attributed from existing data provided by the District. Additional research will be performed to locate pump station attribution that is not readily available. For those data elements that require office research, the local district will identify the type of source material that will be used to obtain those data (e.g. spreadsheets, drawings, DGN files, etc). All surveys will be conducted in accordance with the USACE New Orleans District Guide for Minimum Survey Standards. All surveyed feature points will have corresponding entries in the Contractor's EM files submission as cross-sections for cross-section features, profiles for linear features, and miscellaneous shot points for all other feature types.

4.1.3 The District POC will make all required design and as-built drawings, operations manuals, geotechnical and hydrologic investigations and other records available to the Contractor for his use in populating those items in the NLD Data Dictionary flagged "Research". The District may, at its discretion, copy these materials and provide the copies to the Contractor, and/or provide work space within the District for the Contractor to work on them. It will most likely be a combination of both methods. Access issues with allowing the Contractor access to the District office will be worked out and coordinated with the District POC. The Contractor will populate the database accordingly, and all sources and methods will be documented. The

28 Feb 11

features associated with this task are piezometers, toe drains, relief wells, gravity drains and pump stations.

4.1.4 Following the data population and QC processes, the Contractor will combine the data from the various sources in the ESRI ArcGIS 9.2 personal geodatabase provided, taking care to establish and preserve all the foreign key relationships and domain constraints indicated in the NLD Data Model Version 2.2. It is assumed that Version 2.2 schema definition will be backward-compatible with version 2.1. The Contractor will build final metadata using ArcCatalog within the populated database, following the constraints listed in the Metadata Template. All spatial data collected, including unprocessed and intermediate products will be delivered to the District

4.1.5 The Contractor shall prepare and maintain a work plan – to be submitted to the USACE for approval – that includes at a minimum:

- Resource names and contact information
- Schedule
- A process diagram depicting the steps required to locate features including all decision points
- Protocol for client communications
- Progress measures and reporting
- Risk management strategy, including identifying and prioritizing key anticipated risks and *proactively* documenting risk mitigation strategies
- Quality Assurance/Quality Control (QA/QC) plan
- Change management strategy
- Closure strategy

The contractor shall prepare a Project Plan describing the technical approach, organizational resources and management controls to be employed to meet the cost, performance and schedule requirements for this effort. The Project Plan shall detail the key activities and milestones, the schedule for installation visits, and the allocation of staff and other resources necessary for successful completion of this effort, resource names and contact information, schedule, including identifying key dependencies and contingencies, protocol for client communications, including at a minimum weekly status reports, progress measures and reporting, risk management strategy, including identifying and prioritizing key anticipated risks and *proactively* documenting risk mitigation strategies, quality assurance / quality control (QA/QC) plan, change management strategy and closure strategy. The Plan shall include an organizational diagram that specifically identifies key personnel for the overall contract and for support staff, and subcontractors, including personnel and their documented training and professional experience and license required to support the task and sub-tasks. The project plan shall be completed no later than seven (7) days after receiving NTP. The COTR shall receive the Project Plan in both hard copy and electronic form, Microsoft Word. Based on the Project Plan, the COTR will provide approval to move forward on activities planned. The contractor shall request prior approval on

all activities not included in the plan or any modifications to the plan after approval has been given.

4.2 Datums, Projections and Units

All positions for the geodatabase submission will be in geographic coordinates (decimal degrees recorded to 7 decimal places) and referenced to [North American Datum of 1983 \(NAD83\)](#). Survey source data submitted in EM format shall be referenced to State Plane Coordinate System Louisiana South (1702) using the NAD83 datum and U.S. survey feet. Any control network established under this task shall be properly connected to National Spatial Reference System (NSRS) control points with established network accuracy values. Continuously operating reference station (CORS) data shall be incorporated into all Global Positioning System (GPS) network computations. Positional accuracy (x and y) for control points established under this task order must meet or exceed NSSDA Class 1(1:240) both horizontally and vertically (z) value. This equates to an accuracy of 0.2 feet at the 95% confidence level.

All elevations shall be referenced to North American Vertical Datum 1988 (NAVD88). New Orleans District is presently referenced to 2004.81. Ellipsoid heights acquired by GPS should be converted to Orthometric heights NAVD88 using GEIOD09. The IPET Guidance and references provided must be strictly followed. The relationship between any project datums used in design and construction with IPET guidance shall be developed, document, and provided in the deliverables.

In all cases where GPS is used, the full 3D ellipsoid designation and geoid name should be noted in the “Supplemental Section” of the metadata and Orthometric heights supplied.

All linear units not otherwise annotated, including elevations, are in US Survey feet.

4.3 Work to be Performed by the Contractor.

The Contractor shall provide equipment, supplies, and personnel to perform the following work:

- I. First Phase complete 395 miles.
- II. Second Phase complete 780 miles
- III. Third Phase complete 225 miles for a total of 1400 levee feature miles for all three phases.

4.3.1. Establish the location and survey profiles along the center lines of the required levees and all associated structures (pump stations, floodwalls, etc). Obtain the profiles along the existing centerline tops of levees/embankments and associated structures from one-hundred feet before the beginning and one-hundred feet past the end of both embankments. For many of the levees this data exists and will be used to populate the database. In these areas a “sampling” of CL, FLD, TSP, and other points will be done to validate the data. In the EM survey file, centerline of levees, top of floodwalls and structures shall be included in the same profile. Also, miscellaneous shot points shall be sampled at the floodside toe of floodwalls and structures at a

maximum interval of one point every 500 feet or where significant changes in toe topography are observable by the survey party.

4.3.2. Levee profile elevations and locations shall be obtained at a minimum of 50 ft intervals along all levees, flood walls, and closure structures. Precision shall be 0.1 ft or better. The profiles shall clearly show the gaps and lowered crown areas and any raised areas which are the result of excavation, erosion, subsidence, consolidation, or fill activities. All of the control points recovered at a surveyed site shall be plotted at the appropriate coordinate point on a planimetric or a topographic map to provide an overall control diagram of the entire project. Stationing shall be reference to features at locations discovered along the way from the data provided by the District in 3.5 above. The profiles shall show all significant terrain breaks in the levee with elevations obtained at approximately 50 foot interval stationing, or closer, to develop the profile with additional elevations obtained, as necessary, to show road crossings, fence crossings, power line crossings, ramps, pump stations, gravity drains, pipe line crossings, railroads, and other cultural features associated with the levees. Stationing shall be shown around the curves of the levees.

4.3.3. Provide stationing for road edges and centerlines, railroads, ramps, closure structures, power line crossings, pipeline crossings, levee barricades, drains, and all other significant cultural features such as pump stations, gravity drains, pipe lines, levee gates, fence crossings, levee district boundaries(as provided by the district), etc. The Contractor shall utilize Government-provided stationing developed for stationing of all levees. Coordinates and stationing /offsets shall be computed for all structures that are new or were not identified on the previous furnished maps, drawings, photos, etc.

4.3.4. Provide location, station, size of pipe, and invert and outlet elevations of all visible drains landside and waterside of the levee(s). Obtain and populate all attributes required in the database fields such as type of pipe, etc. Note: sill elevations may or may not be the invert elevations.

4.3.5. Locate the elevations and locations of National Geodetic Survey (NGS) and US Army Corps of Engineers (USACE) vertical and horizontal control discovered/found along the levee and provide a report of the condition of the monument that is necessary to comply with the "Comprehensive Evaluation of Project Datum" guidelines. All recovered control points shall be documented on the U-SMART monument description form.

4.3.6. In the instances where stationing has not been developed, the beginning (zero) of each levee shall be obtained, recorded, and described for future use by others. The zero shall be established by using stationing from the nearest object that has known stationing as provided in the maps, drawings, aerial photography, and references provided in Section 2 above and measuring from that known station back to the beginning (zero) of the levee. The high ground of the zero station will be considered in locating the levee beginning. The Contractor shall utilize Government provided stationing developed for beginning stationing of all levees. Coordinates and stationing /offsets shall be computed for all structures that are new or were not identified on the previous furnished maps, drawings, photos, etc.

4.3.7. The District POC, in coordination with the Contractor and all sub-contractors, shall contact the levee commissioners of the levee districts prior to beginning physical work along the levees to acquire any necessary right-of-entry and keys for entry through any the levee district entrance points, coordinate with any mowing or maintenance activity that may be occurring, and inform the levee commissioners of the Contractors and sub-contractors presence on the levees. Points of contract shall be provided by the Districts as furnished in Section 3.6 above.

4.3.8. Project Benchmarks and Control Points. All control points or benchmarks used in the collection of features for this project shall be tied to points in the NSRS database. Control points, benchmarks, and gage stations (benchmarks) used for previous design, construction, or as-built surveys and listed on existing drawings and used in the data collection shall be tied in to the NSRS database if provided by the Government or discovered during the field data collection process. Unless these marks are used as control points or base stations during the feature data collection, an updated position (x,y, z) can be determined using the same techniques as those used in the feature data collection (i.e. RTK, Total Station). The difference between the elevation value listed on the drawings or other records provided by the government and the newly established NAVD 88 elevation shall be computed and provided to the government clearly identifying and labeling the elevation value on the drawing with its datum, the newly established elevation with datum (NAVD 88), and the difference between the two elevations. A minimum of three (3) permanent benchmarks / control points are required for all data collection areas for connection to NSRS. The LADOT VRS system may be sufficient to meet these specifications with verification of accuracy and the determination of the scale and rotation between the local monuments and the GPS derived coordinates. If the boundary of the data collection area is greater than 40 km then additional benchmarks / control points may need to be incorporated in the data collection effort. The contractor shall use every effort to make use of existing NSRS monuments as project control for all data collection and only set new benchmarks as a last resort. Published NGS monuments shall be accepted as reliably connected to the NSRS after checks into two (2) surrounding NSRS points with measured differences meeting the required accuracy tolerances. Horizontal positions can be obtained by two-four (4) hour CORS/OPUS observations. The Contractor shall keep the number of new points established to a minimum and make best use of existing published NGS monuments. If new permanent control points or benchmarks are needed they shall be established relative to approved NGS published monuments at the minimum required accuracy (0.25 ft / 8 cm) as stated in this statement of work unless working in high subsidence areas where a higher accuracy may be required. All new control points or benchmarks should be thoroughly described (U-SMART description form), referenced for future recovery by others, and prepared and submitted for inclusion into the NSRS OPUS-DB where they will be published to the final vertical accuracy achieved during the survey. Existing monuments, such as a cap on a bridge or other hardened structure, may be sufficient to use as a reference BM and a new one will not be installed. The Contractor shall report what control was used to establish the vertical elevations. The contractor should submit the data collection plan for the OPUS-DB when establishing or reestablishing control points or benchmarks to Mr. Bob Mesko, St. Louis District or a POC determined by him who will assist in coordinating with NGS for approval of this plan, if needed. All of the new control or benchmarks established will be published to the resulting vertical accuracy. It is the Contractor's responsibility to insure the data collection plan follows the NGS policy listed above. All control points or benchmarks listed

in the deliverables shall be clearly marked with the datum and epoch designations (e.g. lat, long (NAD83 (1995), elevation (NAVD88 (year if applicable))).

4.3.9. Obtain both stationing and offsets from as-built drawings provided in Section 3 above and obtain new coordinates for all seepage relief wells. The Contractor shall populate the data base with all required fields required in the database.

4.3.10. Obtain typical cross sections of the levees at approximately one mile intervals or as provided by MVN. Cross sections shall be surveyed from the centerline to typical terrain on the landside and to typical terrain past the toe on the waterside. Waterside sections should go to the high bank whenever the high bank is within approximately 200 feet of the riverside toe. It is not anticipated that surveys will be conducted during periods of high water and use of a boat to obtain any additional elevations in the water should not be necessary.

4.3.11. Provide stationing from Government provided data and survey top of riser elevations of all piezometers landside and riverside of the levee. Obtain coordinates for all piezometers that do not have geospatial information, if possible

4.3.12. Locate by stationing and offset, obtain point feature coordinates, elevations and locations of all Pump Stations. The Contractor shall populate the database with as many required fields available on historic documents.

4.3.13. Provide GPS photos of floodgates, piezometers, relief wells, pump stations, crossings, gravity drains, toe drains, floodwall transitions. Photos shall be provided as JPEGs consisting of EXIF data with latitude and longitudes.

5. POSITIONAL ACCURACY, UNITS, & DATUMS:

Positional Accuracy Standards for the NLD

Control – Positional accuracy for control points established under this task must meet or exceed NSSDA Class 1 standards for a map scale of 1" = 20' (1:240) both horizontally (x and y) and vertically (z value). This equates to an accuracy of 0.2 feet at the 95% confidence level. The Contractor shall submit the collection plan, including ground control network, and a QA plan for meeting these accuracy standards as part of the Project Management Plan required in Section 4 above. In addition, at its discretion, the Government may require additional accuracy testing as described below.

Features (Hard Surfaces) – Positional accuracy for control points established under this task order must meet or exceed NSSDA Class 1 standards for a map scale of 1" = 30' (1:360) both horizontally (x and y) and vertically (z value). This equates to 0.3 feet at the 95% confidence level.

Features (Natural Ground) – Positional accuracy for control points established under this task order must meet or exceed NSSDA Class 1 standards for a map scale of 1" = 50'; (1:600) both

horizontally (x and y) and vertically (z) value. This equates to an accuracy of 0.5 feet at the 95% confidence level.

Accuracy and Accuracy_z will be calculated as required by FGDC-STD-007.3-1998. This FGDC standard is available at <http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3/chapter3>.

Ground Checkpoints - Collection of adequate numbers of appropriate ground checkpoints (GCPs) by appropriate means to meet the accuracy reporting requirements above is the responsibility of the contractor. The District may, at its discretion, supply existing or independently collected GCPs to be used by the contractor in the required accuracy assessments, or elect to do the accuracy assessment itself. All GCPs collected by the contractor will be submitted to the District as a single ESRI PointZ shapefile with the following attributes:

<u>Attribute</u>	<u>Data Type</u>	<u>Units</u>	<u>Definition</u>
gcp_id	long		point label
X	double	decimal degrees	longitude
Y	double	decimal degrees	latitude
Z	double	feet NAVD88	elevation
method	text		collection method
surface	text		ground surface
comments	text		comments

The metadata submitted for the GCP shapefile may specify positional accuracy as “compiled to meet” and the appropriate accuracy statistic.

Application of the standards – The accuracy standards above are intended to be applied once to each shapefile (except for the GCP shapefile) delivered under this order. For example, if the levee_station_point shapefile contained 400 (or any other number > 20) points when field work was completed, then 20 to 30 of these could be selected at random, and their positions re-surveyed by a method of greater accuracy than the original. The differences between the original and the re-surveyed positions would be used to calculate Accuracy_r and Accuracy_z as detailed above. These values would then be used to populate the Horiz_Accuracy and Vert_Accuracy columns of all the rows of the levee_station_point table.

6. DELIVERABLES AND END RESULTS EXPECTED:

Submittal List:

- a. NLD personal geodatabase with standard entities populated IAW the Data Dictionary, and feature level metadata for all populated entities completed IAW in accordance with the Metadata Template
- b. Sources and methods documentation for attribute data derived from District drawings and studies as well as a spreadsheet that documents the levels of efforts required to complete all aspects of this delivery order.

28 Feb 11

- c. All GCPs and other field data collected for this project Based on the guidelines defined in the USACE New Orleans District Guide for Minimum Survey Standards.
- d. A detailed report for each levee (project), prepared by a licensed profession engineer or surveyor, with current registration in the respective State , listing of all coordinates and elevations of points as identified in Section 4 above, fully describing surveying methods and procedures used. The report shall be provided in Microsoft Word format as well as furnishing five (5) bound hardcopies.
- e. All original field books with index, raw and processed GPS data, showing level loops and horizontal control networks, and reference monuments as well as all other information as required in paragraph 3 above. Recovery notes, sketches and written descriptions of each of the control points shall be provided to the Government on a U-SMART Description Form. The original field books shall contain the coordinate value, in pencil, for each point on the page with the sketch for that point.
- f. Any additional survey control (eg. NGS, USGS, USC&G, DOT or local District) that may have been discovered and/or utilized during the survey.
- g. A report detailing any GPS derived coordinates and/or elevations obtained. Disk and hardcopy print of vectors and adjustments for GPS coordinates.
- h. Copies of daily field progress report shall be submitted to the Corps of Engineers along with invoices for payments.
- i. Corps of Engineers U-SMART Description Form completed with information concerning any new control points which may have been set.
- j. Bi-Weekly comprehensive progress report in electronic format shall be sent weekly to Mr. Robert Nacho (Robert.D.Nacho@usace.army.mil) and to Ed Magill (Edward.J.Magill@usace.army.mil).
- k. Incremental submittal of data is required as projects (levees) are completed to receive partial payment and allow the Government to begin inspection and Quality Assurance of all deliverables, with all field work completed by 30 September and all final submittals being completed by 30 October 2009.

7. DOCUMENTATION OF SPATIAL DATASETS:

Executive Order 12906 established the Federal Geographic Data Committee (FGDC) in 1990 as the federal standards body for geospatial data. Office of Management and Budget (OMB) Circular A-16, as revised 19 August 2002, requires compliance with all applicable FGDC standards whenever federal funds are spent to collect spatial data. The FGDC Content Standard for Digital Geospatial Metadata (CSDGM), FGDC-STD-001-1998 is applicable to all geospatial data collected by the USACE in performance of its civil works and other missions. A complete metadata file in ASCII text format that conforms to this standard will be submitted for each

geospatial dataset delivered under this contract. A dataset may consist of multiple files, as in the case of data tiled to meet file size or other requirements. If all collection parameters except extent are the same for all files, one metadata file can be submitted for the set, with its bounding coordinates indicating the combined area of the constituent files.

All applicable sections of the metadata file must be completed. The contractor is responsible for the completeness and correctness of the metadata and its fidelity to the FGDC structure. Five of the seven sections of the FGDC metadata file are coded as “Mandatory if Applicable”. These sections and their similarly coded sub-sections are applicable (and therefore, mandatory) whenever the data elements they refer to are present in the data.

Specifically, for geospatial data collected under this contract, Section 2. Data Quality Information, Section 3. Spatial Reference Information and Section 4. Spatial Data Organization Information are always applicable. If the geospatial data has attributes, Section 5. Entity and Attribute Information must be filled out, and the attributes and their domains and ranges documented. Likewise, the various accuracy sub-sections under Data Quality Information must be completed whenever the items they apply to are present.

Horizontal Positional Accuracy is always applicable.

Vertical Positional Accuracy is applicable whenever the dataset encodes elevation or depth. Positional accuracy reporting for these items must be consistent with Geospatial Positioning Accuracy Standard, Part 1, Reporting Methodology FGDC-STD-007.1-1998 and Geospatial Positioning Accuracy Standard, Part 3, National Spatial Data Accuracy Standard FGDC-STD-007.3-1998. If attributes are present, the Attribute Accuracy sub-section must be completed. Completing the Lineage and Process Step sub-sections is also required if any processing has intervened between the initial raw measurements and the finished dataset delivered to the government.

For datasets based on GPS height measurements, (i.e., lidar, RTK, etc) effective management of the data by the government requires additional documentation. Although not required by the FGDC, the full name of the 3D datum used to establish ellipsoid heights, and the name of the geoid model used to convert ellipsoid heights to orthometric heights should be documented in the Supplemental Information sub-section of the Identification Information Section.

8. INSPECTION

Inspection of the finished items to determine their conformance to the specifications will be made by a representative of the Contracting Officer upon delivery to the destination. If the inspection reveals any defect or deviation in the manufacture of the items which would make them unfit for the purpose intended, the Contractor will be required to satisfactorily remedy such conditions at no additional cost to the Government.

9. ACCEPTANCE

If the finished items are found to be in full compliance with the specifications, they will be accepted. The acceptance of any item by an inspector shall not preclude subsequent rejection if such an item is later found to be defective.

10. TIME EXTENSION

In the event these schedules are exceeded due to causes beyond the control and without fault or negligence of the contractor, as determined by the Contracting Officer, this delivery order completion date will be extended one (1) calendar day for each day of delay.

Requests for time extension for an individual task should be forwarded to the Contracting Officer no later than fourteen (14) days preceding the completion date shown on the task order without fault or negligence of the contractor, as determined by the Contracting Officer, this delivery order completion date will be extended one (1) calendar day for each day of delay.

Requests for time extensions for an individual task order should be forwarded to the Contracting Officer no later than fourteen (14) days preceding the completion date shown on the task order.

11. REFERENCE DOCUMENTS

The National Standard for Spatial Data Accuracy (NSSDA) is a Federal Geographic Data Committee (FGDC) standard that federal agencies are suppose to use in determining geospatial accuracy.

<http://www.fgdc.gov/standards/documents/standards/accuracy/chapter3.pdf>

The National Digital Elevation Program (NDEP) has created a set of recommended guidelines for digital data that provides information on digital elevation types, product descriptions, metadata profiles, definitions, and map accuracy standards.

<http://www.ndep.gov/TechSubComm.html>

Other References

PMP Project Management Plan/PIF (Project #136476, *Pilot Effort: Populating a National Levee Database*, 21 June 2006)

USACE New Orleans District Guide for Minimum Survey Standards
(<http://www.mvn.usace.army.mil/ed/edss/surveyingguidelines.asp>)

FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix A* April 2003 [FEMA Guide]

FGDC-STD-007.3-1998 <http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3/chapter3>

EM 1110-1-1000 *Photogrammetric Mapping* USACE, 31 July 2002

EM 1110-1-1003 NAVSTAR GPS Surveying, 1 July 03.

EM 1110-2-1005 CONTROL AND TOPOGRAPHIC SURVEYING

EC 1110-1-6065 ENGINEERING AND DESIGN: COMPREHENSIVE EVALUATION OF PROJECT DATUMS

IPET 2006, "Performance Evaluation of the New Orleans and Southeast Louisiana Hurricane Protection System, "Draft Final Report of the Interagency Performance Evaluation Task Force, US Army Corps of Engineers, 1 June 2006, Volume II—"Geodetic Vertical and Water Level Datums." (entire document)

Enclosures

National Levee Database Data Model, Visio and PDF

National Levee Database District Workflow, version 2.0, PDF

National Levee Database Data Dictionary version 1.5, MS Excel

National Levee Database District Inventory data and key structure

National Levee Database Metadata Template

National Levee Database POC List

12. REVIEW AND PAYMENT SCHEDULES:

Partial payments shall be made as verification that the Contractor has began gathering maps, performing field surveys, and researching other necessary data. As progress reports from the Contractor indicate the percentage of completion progress and reviewed by the Government, progress payments will be made.

Deliverables shall be submitted to the St. Louis District with copies of all transmittals showing materials delivered. Final Deliverables from the Contractor must be reviewed and approved by the USACE before final payment is made.

13. DEFINITIONS:

Federal Levees – Are Flood Control Works (Levees/Flood Protection Projects) built by the Corps of Engineers that were authorized for construction by Congress or by USACE continuing authorities (e.g., Section 205); Levee project constructed by non-Federal interests, or other (non-USACE) Federal agencies, and incorporated into the USACE Federal system by specific Congressional action are also designated as Federal levees. Federal projects can be either operated and maintained by the Corps or have been turned over to a public sponsor for operation and maintenance.

Non-Federal Levees – Are Flood Control Works (Levees/Flood Protection Projects) not authorized by Congress or other federal agency authority.

28 Feb 11

Inspection of Completed Works, (ICW) – Is a program of the Corps of Engineers to perform periodic inspection of projects. These projects are typically Federally Built and Federally Built and Locally Maintained Levees and fall under ER1110-2-530.

Rehabilitation and Inspection Program – Is a program of the Corps of Engineers to perform inspection of non-federal projects under the provisions of Public Law 84-99 if so requested by the local sponsor. An initial eligibility inspection must be performed by the COE and subsequent maintenance inspection required.

Inspection – Performed by the Corps of Engineers on projects in the ICW and RIP program. These are visual inspection to verify if the local sponsor is performing the required maintenance.

Assessment – Is an evaluation of a project by Professional Engineers to verify the project is capable of performing the authorized function. Evaluation is a risk based analysis with the associated consequences identified.

Certified Levees – Are Levee that will meet the requirements of FEMA CFR 65.10 to be included in the *National Flood Insurance Program (NFIP)*. Minimum level of protection is the 100 year flood plus 3 feet of freeboard per CFR 65.10.

Federally Built and Maintained Levees – Are federal projects constructed and maintained by the Corps of Engineers. Projects are like the Mississippi River and Tributaries (MR&T), which was built for flood control and maintenance of the Mississippi River channel for Navigation.

Federally Built and Locally Maintained Levees – Are federal projects built by the Corps of Engineers and have been turned over to a local sponsor to operate and maintain. These projects are included in the ICW Program.

Locally Built and Maintained Levees – Are non-federal projects built by a local community. These projects can be incorporated into the *Rehabilitation and Inspection Program, RIP*, at the request of a local community. These projects if properly maintained and operated by the community can stay in this Program.

Privately Built and Maintained Levees – Projects built by non-public, individual or organization. These projects can be incorporated into the *Rehabilitation and Inspection Program, RIP*, at the request of a levee owner. These projects if properly maintained and operated can stay in this Program.

LIST OF LEVEES AND PRIORITY

FC_SYSTEM_NAME	FC_SEGMENT_NAME	TOTAL_LENGTH (MILES)
Bayou Sale Area	St. Mary Parish Council LD - Bayou Sale Area	17
Atchafalaya Basin	Atchafalaya Basin LD - Atchafalaya Basin	393
	Red, Atch, Bayou Boeuf LD - Atchafalaya Basin	350
Grand Isle Polder	Grand Isle LD - Grand Isle Polder	7

Melville Ring Area	Red, Atch, Bayou Boeuf LD - Melville Ring	103
St. Bernard Polder	Orleans LD - St. Bernard Polder	47
	Lake Borgne LD - St. Bernard Polder	122
Wax Lake East Area	Atchafalaya Basin LD - Wax Lake East Area	464
	St. Mary Parish Council LD - Wax Lake East Area	547
	Atchafalaya Basin LD - Wax Lake West Area	613
	St. Mary Parish Council LD - Wax Lake West Area	107
Belle Chasse Polder	Orleans LD - Belle Chasse Polder	48
	Plaquemines LD - Belle Chasse Polder	25
Simmesport Ring Area	Red, Atch, Bayou Boeuf LD - Simmesport Ring	36
Harvey/Algiers Polder	Orleans LD - Harvey/Algiers Polder	39
	West Jefferson LD - Harvey/Algiers Polder	161
Westwego/Harvey Polder	West Jefferson LD - Westwego/Harvey Polder	50
Krotz Springs Ring Area	Red, Atch, Bayou Boeuf LD - Krotz Springs Ring	150
New Orleans East Polder	Orleans LD - New Orleans East Polder	40
New Orleans Metro Polder	Orleans LD - New Orleans Metro Polder	88
Phoenix to Bohemia Polder	Plaquemines LD - Phoenix to Bohemia Polder	74
St. Jude to Venice Polder	Plaquemines LD - St. Jude to Venice Polder	145
West of Atchafalaya Basin	Atchafalaya Basin LD - West of Atch. Basin	249
	Red, Atch, Bayou Boeuf LD - West of Atch. Basin	111
Larose/Golden Meadow Polder	South Lafourche LD - Larose/Golden Meadow Polder	48
Mississippi River East Bank	Metro. Council of Baton Rouge LD	2
	Pontchartrain LD - Above Bonnet Carre	106
East Plaquemines Non-Federal Polder	Plaquemines LD - East Plaq. Non-Federal Polder	40
West Plaquemines Non-Federal Polder	Plaquemines LD - West Plaq. Non-Federal Polder	80
St. Charles/Jefferson East Bank Polder	Pontchartrain LD - St. Charles/Jefferson Polder	226
	East Jefferson LD - St. Charles/Jefferson Polder	186
Mississippi River West Bank - Above Morganza	Atchafalaya Basin LD - Above Morganza Spillway	90
Mississippi River West Bank - Below Morganza	Atchafalaya Basin LD - Below Morganza Spillway	535

28 Feb 11

Mississippi River West Bank - Above Old River	Fifth Louisiana LD - Above Old River	17
Mississippi River West Bank - Lafourche Basin	Lafourche Basin LD - Lafourche Basin	62

SAMPLE RECORD OF NEGOTIATIONS

CESAJ-EN-DT (1110-2-1150a)

24 Jun 99

MEMORANDUM FOR: CONTRACT FILES

SUBJECT: Negotiations Memorandum: Contract No. DACW17-98-D-0004, Brevard County, Sand Bypass System Post Construction One-Year Monitoring Beach Erosion Survey, Canaveral Harbor, Florida (Survey 99-267)

1. References.

- a. Letter RFP CESAJ-EN-DT, 9 Jun 99, subject: Contract No. DACW17-98-D-0004.
 - b. Government Survey Estimate, 3 Jun 99, prepared by Mr. Burchfield (CESAJ-EN-DT), in the amount of \$60,831.00 and approved by Mr. Walter Clay Sanders, Assistant Chief, Engineering Division, 9 Jun 99.
 - c. Contractor's (Sea System, Inc - SEA) initial letter of proposal, 23 Jun 99, in the amount of \$76,135.00.
 - d. Contractor's (Sea System, Inc - SEA) revised letter of proposal, 24 Jun 99, in the amount of \$59,775.00.
2. The Contractor's initial proposal of \$76,135.00 is above the Government Estimate of \$60,831.00 by \$15,304.00. The Contractor's revised proposal of \$59,775.00 is below the Government Estimate of \$60,831.00 by \$1,056.00.
3. On 24 Jun 99, a line-by-line comparison of the estimate and proposal was performed (per References 1b and 1c) as follows:

CONTRACTOR'S PROPOSAL (23 JUN 99)

	<u>Item</u>	<u>Quantity</u>	<u>Amount</u>
2002	5-Man Hydro Crew	38.0 CD @ \$1,404.00	\$ 53,352.00
2003	Survey Helper (Deduct)	38.0 MD @ 144.00	- 5,472.00
2004a	Per Diem	152.0 MD @ 65.00	9,880.00
2005	Project Manager	5.0 MD @ 436.00	2,180.00
2006a	Per Diem (PM)	5.0 MD @ 92.00	460.00
2007	CADD Operator	15.0 MD @ 333.00	4,995.00
2008	Survey Computer	20.0 MD @ 318.00	6,360.00
2011	Establish Monuments	4.0 EA @ 25.00	100.00
2015a	GPS First Unit	26.0 DY @ 130.00	3,380.00
2015b	Second Unit	10.0 DY @ 90.00	900.00
	Total-----		\$ 76,135.00

GOVERNMENT ESTIMATE (3 JUN 99)

	<u>Item</u>	<u>Quantity</u>	<u>Amount</u>
2002	5-Man Hydro Crew	30.0 CD @ \$1,404.00	\$ 42,120.00
2003	Survey Helper (Deduct)	30.0 MD @ 144.00	- 4,320.00
2004a	Per Diem	120.0 MD @ 65.00	7,800.00
2005	Project Manager	7.0 MD @ 436.00	3,052.00
2006a	Per Diem (PM)	7.0 MD @ 92.00	644.00
2007	CADD Operator	27.0 MD @ 333.00	8,991.00
2008	Survey Computer	8.0 MD @ 318.00	2,544.00

28 Feb 11

Total-----

\$ 60,831.00

4. Line-by-line discussions with the Contractor took place on 24 Jun 99 between Jerry T. Burchfield (CESAJ-EN-DT) and Stan Copeland (SEA). The Request for Proposal (RFP), the technical requirements (TR), work effort, line items, and time period were reviewed with the Contractor.

4a. Line item's 2005, 2006a, and 2007 were the same or below the Government Estimate. Line item's 2002, 2003, 2004a, 2008, 2011, 2015a, and 2015b of the Contractor's proposal is above the Government Estimate. We agreed to use the existing positions of the control monuments therefore line item's 2011, 2015a, and 2015b of the Contractor's proposal are not required and line item's 2002, and 2003 were reduced. Line item 2008 was reduced and line item 2007 was increased base on the computation and CADD requirements.

4b. During discussion with the Contractor, it was discovered that line item's 2002 requires 30 days, 2003 requires 30 days (Deduct), 2004a requires 120 days, 2005 requires 5 days, 2006a requires 5 days, 2007 requires 27 days, and 2008 requires 8 days.

5. The Contractor and the Government agreed to a completion date of 60 days after the Notice To Proceed is signed by the Contracting Officer and that these negotiations are subject to approval of the Contracting Officer and do not authorize the Contractor to commence work. The Contracting Officer will issue the Notice to Proceed.

6. The Contractor's Proposed cost of \$59,775.00 is considered fair and reasonable based on time and effort reasonably expected of a prudent contractor or Government forces performing the same services, and is recommended for acceptance by the Contracting Officer.

7. Sea System, Inc was selected for this Task Order based on an equitable distribution of work among our AE Contractors.

PREPARED BY _____ DATE _____
JERRY T. BURCHFIELD/CESAJ-EN-DT

REVIEWED BY _____ DATE _____
D. TONEY LANIER
CHIEF, SPECIFICATIONS SECTION

APPROVAL RECOMMENDED _____ DATE _____
WALTER CLAY SANDERS, P.E.
ASSISTANT CHIEF, ENGINEERING DIVISION

APPROVED BY _____ DATE _____
