SECTION 00 2416

REQUESTED SCOPE OF ADDITIONAL SERVICES

GENERAL INFORMATION

1.01 GENERAL INFORMATION

A. This section details the requirements of additional services that maybe required on some projects.

B. These requirements are not to be part of the base bid and are to be priced as separate line items in the bid form.

C. See Section 00 0102 Project Information for information on which (if any) of these addtional services are required for this project.

D. Details for the additional services listed below.

STUDIES, INVESTIGATIONS, & REPORTS

2.01 SURVEYS

A. Boundary/Topographical/Vegetation/Utility Survey
   1. Perform survey using industry standard techniques.
   2. Deliverables:
      a. Final Survey signed and sealed by licensed surveyor, including, but not necessarily limited to, the following, as applicable:
         1) Benchmark monuments located and benchmark monument elevation.
         2) Address and legal description of parcel.
         3) Recorded rights-of-way and easements.
         4) Measured and recorded length & bearing of each boundary.
         5) Locations, exterior dimensions, height, and square footage of existing buildings.
         6) Substantial features observed in the process of conducting the survey such as parking lots, billboards, signs, swimming pools, landscaped areas, all trees, etc.
         7) Striping, number and type of parking spaces in parking areas, lots and structures.
         8) Vertical relief with source of information (e.g. ground survey or aerial map), contour interval, datum, and originating benchmark identified.
         9) Location of existing utilities on or serving the property.
         10) Flood Zone Classification identified.
         11) Current Zoning classification.
         12) Names of adjoining owners of platted lands according to current public records.
         13) Observed evidence of current earth moving work, building construction or building additions
         14) Observed evidence of site use as a solid waste dump, sump or sanitary landfill.
         15) Location of wetland areas as delineated by appropriate authorities.
         16) Gross Land Area.
         17) Proposed changes in street right of way lines, if information is available from the controlling jurisdiction. Observed evidence of recent street or sidewalk construction or repairs.
         18) Rectified orthophotography, photogrammetric mapping, airborne/mobile laser scanning and other similar products, tools or technologies as the basis for the showing the location of certain features (excluding boundaries) where ground measurements are not otherwise necessary to locate those features to an appropriate and acceptable accuracy relative to a nearby boundary. The surveyor shall (a) discuss the ramifications of such methodologies (e.g. the potential precision and completeness of the data gathered thereby) with the insurer, lender and client prior to the performance of the survey and, (b) place a note on the face of the survey explaining the source, date, precision and other relevant qualifications of any such data.

B. Phase I EPA Environmental Site Assessment
   1. Research history of parcel in public records, All Available Inquiries (AAI), and all other publicly available sources.
   2. Deliverables: Final Report, including, but not necessarily limited to:
      a. Report shall adhere to the American Society for Testing & Materials E-1527-13 standard and the United States Environmental Protection Agency 40 Code of Federal Regulations Part 312.
      b. Report Format:
         1) Summary
         2) Introduction
         3) Site Description
         4) User Provided Information
         5) Records Review
         6) Site Reconnaissance
         7) Interviews
         8) Findings
         9) –Known & suspect Recognized Environmental Contaminants (RECs).
         10) –Historic RECs
         11) –De minimis conditions
         12) Opinion
         13) –RECs (yes or no)
         14) –Significant data gaps
         15) –Additional appropriate investigations
         16) Conclusions
         17) –RECs & ASTM declarations
         18) Deviations
         19) Additional Services
         20) References
         21) Signature of EP
         22) Qualifications of EP
         23) Appendices

C. Phase II EPA Environmental Site Assessment
   1. Research history of parcel in public records, All Available Inquiries (AAI), and all other publicly available sources.
   2. Perform soil borings/sampling, as necessary to determine type, distribution and extent, and level of soil contamination, if any.
   3. Deliverables: Final Report, including, but not necessarily limited to:
      a. Report shall adhere to the American Society for Testing & Materials E-1903-11 standard and the United States Environmental Protection Agency 40 Code of Federal Regulations Part 312.
      b. Report Format:
         1) Purpose or goals and objectives
         2) Summary of field activities
         3) Summary of analytical results
         4) Health Risk Assessment
         5) –Published Standards
         6) –Site-Specific HHRA
         7) Data Validation
         8) Results & Recommendations

D. Sub-Surface Investigations/Services
   1. Soil Borings
      a. Perform soil boring(s) in locations and depths indicated in Attachment [Enter Attachment designation].

b. Deliverables: Final Report, including:
    1) Boring location plan, as necessary.
    2) Each boring's data
    3) Foundation recommendations.

2. Utility Location Services
    a. Locate all underground utilities within the defined scope area indicated on [Enter Attachment designation].
    b. Deliverables: Final Report, including, but not necessarily limited to:
        1) Plans, as necessary.
        2) Indicate type, size, and approximate depth of each underground utility.

E. Mechanical (HVAC) Studies/Investigations
1. Develop overall project study schedule, including schedule to meet with Spectrum Health Project Team, as necessary.
2. Investigative Phase
    a. Review "as-built" record drawings and/or digital files provided by Spectrum Health, as applicable.
    b. Field-verify all existing conditions.
    c. Photograph, as necessary.
    d. Perform root cause analysis, as applicable.
    e. Test & Balance System
3. Based upon meetings with Project Team and investigative phase information, develop several conceptual solutions or flow diagrams for review by Spectrum Health and its Project Team members.
4. Develop Draft Report, including advantages and disadvantages of each potential solution, for review and final input by Spectrum Health and its Project Team members.
5. Deliverables: Final Report, including:
    a. Plans and diagrams, as necessary.
    b. Investigative data used, as applicable.
    c. Advantages and disadvantages of each solution.
    d. Written and graphical recommendations, as applicable.
    e. Rough Order of Magnitude Project Budget Estimate including all permitting and plan review fees, all construction related costs and design fees.

F. Electrical Studies/Investigations
1. Develop overall project study schedule, including schedule to meet with Spectrum Health Project Team, as necessary.
2. Investigative Phase
    a. Review "as-built" record drawings and/or digital files provided by Spectrum Health, as applicable.
    b. Field-verify all existing conditions.
    c. Photograph, as necessary.
    d. Perform root cause analysis, as applicable.
    e. Test electrical systems, as necessary.
3. Based upon meetings with Project Team and investigative phase information, develop several conceptual solutions or flow diagrams for review by Spectrum Health and its Project Team members.
4. Develop Draft Report, including advantages and disadvantages of each potential solution, for review and final input by Spectrum Health and its Project Team members.
5. Deliverables: Final Report, including:
    a. Plans and diagrams, as necessary.
    b. Investigative data used, as applicable.
    c. Advantages and disadvantages of each solution.
    d. Written and graphical recommendations, as applicable.
    e. Rough Order of Magnitude Project Budget Estimate including all permitting and plan review fees, all construction related costs and design fees.

G. Plumbing & Med Gas Studies/Investigations
   1. Develop overall project study schedule, including schedule to meet with Spectrum Health Project Team, as necessary.
   2. Investigative Phase
      a. Review “as-built” record drawings and/or digital files provided by Spectrum Health, as applicable.
      b. Field-verify all existing conditions.
      c. Photograph, as necessary.
      d. Perform root cause analysis, as applicable
      e. Test plumbing and/or medical gas systems, as necessary.
   3. Based upon meetings with Project Team and investigative phase information, develop several conceptual solutions or flow diagrams for review by Spectrum Health and its Project Team members.
   4. Develop Draft Report, including advantages and disadvantages of each potential solution, for review and final input by Spectrum Health and its Project Team members.
   5. Deliverables: Final Report, including:
      a. Plans and diagrams, as necessary.
      b. Investigative data used, as applicable.
      c. Advantages and disadvantages of each solution.
      d. Written and graphical recommendations, as applicable.
      e. Rough Order of Magnitude Project Budget Estimate including all permitting and plan review fees, all construction related costs and design fees.

H. Fire Protection Systems Studies/Investigations
   1. Develop overall project study schedule, including schedule to meet with Spectrum Health Project Team, as necessary.
   2. Investigative Phase
      a. Review “as-built” record drawings and/or digital files provided by Spectrum Health, as applicable.
      b. Field-verify all existing conditions.
      c. Photograph, as necessary.
      d. Perform root cause analysis, as applicable.
      e. Test fire protection system, as necessary.
   3. Based upon meetings with Project Team and investigative phase information, develop several conceptual solutions or flow diagrams for review by Spectrum Health and its Project Team members.
   4. Develop Draft Report, including advantages and disadvantages of each potential solution, for review and final input by Spectrum Health and its Project Team members.
   5. Deliverables: Final Report, including:
      a. Plans and diagrams, as necessary.
      b. Investigative data used, as applicable.
      c. Advantages and disadvantages of each solution.
      d. Written and graphical recommendations, as applicable.
      e. Rough Order of Magnitude Project Budget Estimate including all permitting and plan review fees, all construction related costs and design fees.

I. Master Planning
   1. Develop overall project study schedule, including schedule to meet with Spectrum Health Project Team, as necessary.
   2. Investigative Phase
      a. Review “as-built” record drawings and/or digital files provided by Spectrum Health, as applicable.
      b. Field-verify all existing conditions.
      c. Photograph, as necessary.
      d. Review all analytical data provided by Spectrum Health.

3. Based upon meetings with Project Team and investigative phase information, develop several conceptual solutions or flow diagrams for review by Spectrum Health and its Project Team members.
4. Develop Draft Report, including advantages and disadvantages of each potential solution, for review and final input by Spectrum Health and its Project Team members.
5. Deliverables: Final Report, including:
    a. Plans and diagrams, as necessary.
    b. Investigative data used, as applicable.
    c. Advantages and disadvantages of each solution.
    d. Written and graphical recommendations, as applicable.
    e. Rough Order of Magnitude Project Budget Estimate including all permitting and plan review fees, all construction related costs and design fees.

J. Structural/Forensic Analysis Studies/Investigations
1. Develop overall project study schedule, including schedule to meet with Spectrum Health Project Team, as necessary.
2. Investigative Phase
    a. Review “as-built” record drawings and/or digital files provided by Spectrum Health, as applicable.
    b. Field-verify all existing conditions.
    c. Photograph, as necessary.
    d. Perform root cause analysis, as applicable.
    e. Perform tests on structural systems/elements, as necessary.
3. Based upon meetings with Project Team and investigative phase information develop several concepts or flow diagrams for review by Spectrum Health and its Project Team members.
4. Develop Draft Structural/Forensics Report , including advantages and disadvantages of each potential solution, for review and final input by Spectrum Health and its Project Team members.
5. Deliverables: Final Report, including:
    a. Plans and diagrams, as necessary.
    b. Investigative data used, as applicable.
    c. Advantages and disadvantages of each solution.
    d. Written and graphical recommendations, as applicable.
    e. Rough Order of Magnitude Project Budget Estimate including all permitting and plan review fees, all construction related costs and design fees.

K. Site Development Planning Studies/Investigations
1. General
    a. The intent of the Site Development Planning Study/Investigation is to determine viability of the development of a specific parcel of land, or the most viable parcel amongst several parcels of land.
    b. The investigation should research the following requirements:
        1) Zoning issues, as applicable.
        2) Parking requirements for building type.
        3) Site Retention and Water Management.
        4) Buildable area.
2. Develop overall project study schedule, including schedule to meet with Spectrum Health Project Team, as necessary.
3. Investigative Phase
    a. Review “as-built” record drawings and/or digital files provided by Spectrum Health, as applicable.
    b. Field-verify all existing conditions for the parcel(s).
    c. Photograph the parcel(s), as necessary.
    d. Become thoroughly familiar and versed in all local regulations pertinent to development and zoning of the subject parcel.

4. Traffic Studies
    a. Perform, and provide, any traffic studies as required by the local municipality or authority having jurisdiction.
5. Hydrological Studies
    a. Groundwater: Groundwater hydrology considers quantifying groundwater flow and solute transport. Problems in describing the saturated zone include the characterization of aquifers in terms of flow direction, groundwater pressure and, by inference, groundwater depth. Measurements here can be made using a piezometer . Aquifers are also described in terms of conductivity, storativity and transmisivity. There are a number of geophysical methods for characterizing aquifers. There are also problems in characterizing the unsaturated zone.
    b. Infiltration: The infiltration of water from precipitation into the soil is an important topic. In some circumstances a dry soil may not absorb rainfall as readily as a soil that is already wet. Infiltration can sometimes be measured by an infiltrometer. Cold season processes can significantly alter the exchange of water and energy between the land surface and the atmosphere, affect the storage and movement of water through the soil and within a watershed, and in turn affect the storage and movement of nutrients, contaminants, and carbon.
    c. Soil moisture: The patterns of soil moisture in arid environments are very important for the conservation and restoration of vegetation but have been rarely studied due to the difficulty of sampling in these environments. Soil moisture can be measured in various ways; by capacitance probe, time domain reflectometer or Tensiometer. Other methods include solute sampling and geophysical methods. Soil moisture in arid environments is a key factor limiting the growth of vegetation, is the main constraint on permanently controlling desertification.
    d. Surface water flow: Hydrology considers quantifying surface water flow and solute transport, although the treatment of flows in large rivers is sometimes considered as a distinct topic of hydraulics or hydrodynamics. Surface water flow can include flow both in recognizable river channels and otherwise. Methods for measuring flow once water has reached a river include the stream gauge, and tracer techniques. Other topics include chemical transport as part of surface water, sediment transport and erosion.
        1) One of the important areas of hydrology is the interchange between rivers and aquifers (stream-aquifer exchange). While in many geographical regions it is natural to think only of water moving out of aquifers into rivers, the reverse can also happen.
    e. Precipitation and evaporation: In some considerations, hydrology is thought of as starting at the land-atmosphere boundary and so it is important to have adequate knowledge of both precipitation and evaporation. Precipitation can be measured in various ways: disdrometer for precipitation characteristics at a fine time scale; radar for cloud properties, rain rate estimation, hail and snow detection; Rain gauge for routine accurate measurements of rain and snowfall; satellite – rainy area identification, rain rate estimation, land-cover/land-use, soil moisture.
        1) Evaporation is an important part of the water cycle. It is partly affected by humidity, which can be measured by a sling psychrometer It is also affected by the presence of snow, hail and ice and can relate to dew, mist and fog. Hydrology considers evaporation of various forms: from water surfaces; as transpiration from plant surfaces in natural and agronomic ecosystems. A direct measurement of evaporation can be obtained using Symon's evaporation pan.
        2) Detailed studies of evaporation involve boundary layer considerations as well as momentum, heat flux and energy budgets.
    f. Uncertainty analyses: Statistical and dynamical downscaling techniques have been proposed to bridge the gaps between coarse-scale and generally biased climate model outputs and the point-scale requirements of impact model inputs. Amongst the various statistical approaches, empirical downscaling methods are the most commonly used due to their ease of implementation.

g. Remote sensing: Remote sensing of hydrologic processes can provide information of various types. Sources include land based sensors, airborne sensors and satellite sensors. Information can include clouds, surface moisture, and vegetation cover. Remote sensing techniques, which inherently have the ability to provide spatial and temporal information of the land surface, may be the only viable way to obtain the data needed for distributed process models. Among remotely sensed, hydrologically significant, variables that are under-utilized, are vegetation parameters derived from optical remote sensing. In particular, vegetation structural parameters, such as leaf area index (LAI), can play an important role in precipitation interception and evapotranspiration, and thus the water balance of a watershed.

h. Water quality: In hydrology, studies of water quality concern organic and inorganic compounds, and both dissolved and sediment material. In addition, water quality is affected by the interaction of dissolved oxygen with organic material and various chemical transformations that may take place. Measurements of water quality may involve either in-situ methods, in which analyses take place on-site, often automatically, and laboratory-based analyses and may include microbiological analysis. The implications of a changing climate for global water resources are diverse. It has been suggested that increasing temperatures and altered precipitation patterns may alter the timing and magnitude of runoff and soil moisture, change lake levels and groundwater availability, and affect water quality.

i. Integrating measurement and modelling:
   1) Budget analyses
   2) Parameter estimation
   3) Scaling in time and space
   4) Data assimilation
   5) Quality control of data – see for example Double mass analysis

j. Prediction: Observations of hydrologic processes are used to make predictions of the future behavior of hydrologic systems (water flow, water quality). One of the major current concerns in hydrologic research is "Prediction in Ungauged Basins" (PUB), i.e. in basins where no or only very few data exist. In response to the paucity of in-situ/ground measurements, model-based prediction of soil moisture, evapotranspiration, and runoff is often used as the primary source for information on soil wetness for large scale studies.

k. Statistical hydrology: By analyzing the statistical properties of hydrologic records, such as rainfall or river flow, hydrologists can estimate future hydrologic phenomena. When making assessments of how often relatively rare events will occur, analyses are made in terms of the return period of such events. Other quantities of interest include the average flow in a river, in a year or by season.
   1) These estimates are important for Design Professionals and economists so that proper risk analysis can be performed to influence investment decisions in future infrastructure and to determine the yield reliability characteristics of water supply systems. Statistical information is utilized to formulate operating rules for large dams forming part of systems which include agricultural, industrial and residential demands.

l. Modeling: Hydrological models are simplified, conceptual representations of a part of the hydrologic cycle. They are primarily used for hydrological prediction and for understanding hydrological processes. Two major types of hydrological models can be distinguished:
   1) Models based on data. These models are black box systems, using mathematical and statistical concepts to link a certain input (for instance rainfall) to the model output (for instance runoff). Commonly used techniques are regression, transfer functions, and system identification. The simplest of these models may be linear models, but it is common to deploy non-linear components to represent some general aspects of a catchment's response without going deeply into the real physical processes involved. An example of such an aspect

is the well-known behavior that a catchment will respond much more quickly and strongly when it is already wet than when it is dry.

2) Models based on process descriptions. These models try to represent the physical processes observed in the real world. Typically, such models contain representations of surface runoff, subsurface flow, evapotranspiration, and channel flow, but they can be far more complicated. These models are known as deterministic hydrology models. Deterministic hydrology models can be subdivided into single-event models and continuous simulation models.

m. Transport: Water movement is a significant means by which other material, such as soil, gravel, boulders or pollutants, are transported from place to place. Initial input to receiving waters may arise from a point source discharge or a line source or area source, such as surface runoff. Since the 1960s rather complex mathematical models have been developed, facilitated by the availability of high speed computers. The most common pollutant classes analyzed are nutrients, pesticides, total dissolved solids and sediment.

6. Develop schedule to meet with Project Team, Executive Leadership Team, and User Groups, as necessary.
7. Based upon meetings with Project Team, Executive Leadership, and User Groups and investigative phase information develop several concepts or flow diagrams for review and comment by Spectrum Health.
8. Develop approved concept to presentation to local planning and zoning boards for review and comment.
9. Attend and/or arrange any public meetings required for the proposed development.
10. Develop Draft Report, including advantages and disadvantages of each potential solution, for review and final input by Spectrum Health.
11. Deliverables:
    a. Final Report & Recommendations
    b. Site Development Plan approved by municipality or authority having jurisdiction.
    c. Estimate of Probable Total Project Costs
        1) An estimated Total Project Cost, including, but not limited to, design consulting fees, permitting and plan review fees, site development costs including landscaping and irrigation, all building construction related costs including construction management fees and contingency.
        2) The following items are to be included in the estimated Total Project Cost, but will be provided by Spectrum Health:
            (a) Furnishings
            (b) Equipment
            (c) Information System costs
12. Testing Services
    a. Soil Compaction
    b. Concrete/Masonry
    c. Steel
    d. Air/Water Infiltration
    e. Test & Balance

L. Space & Operational Programming
1. Develop schedule to meet with Project Team, Executive Leadership Team, and User Groups, as necessary.
2. Based upon meetings with Project Team, Executive Leadership, and User Groups and investigative phase information develop several concepts or flow diagrams for review by Spectrum Health.
3. Develop Draft Report, including advantages and disadvantages of each potential solution, for review and final input by Spectrum Health.
4. Deliverables:
    a. Final written Program defining spaces, uses, and approximate square footages.
    b. Written Operational Narrative, as applicable.

M. Conceptual Planning/Master Planning Studies
   1. General:
      a. The Conceptual/Master Planning Study is used to graphically define the project scope, a preliminary project schedule, and rough order of magnitude budget requirements that will meet project program and requirements. Upon approval both by the Spectrum Health End User and Project Team the Conceptual/Master Planning package along with an approved business plan function as the primary documents used for funding approvals. Once funded the Conceptual/Master Planning package is used as the starting point for the Schematic Design phase of the work.
   2. Conceptual/Master Planning
      a. Develop overall project study schedule, including schedule to meet with Spectrum Health Project Team, as necessary.
      b. Investigative Phase
         1) Review “as-built” record drawings and/or digital files provided by Spectrum Health, as applicable.
         2) Field-verify all existing conditions.
         3) Photograph, as necessary.
         4) Perform root cause analysis, as applicable.
         5) Perform tests on structural systems/elements, as necessary.
      c. Based upon meetings with Project Team and investigative phase information develop several concepts or flow diagrams for review by Spectrum Health and its Project Team members.
      d. Develop Draft Report, including advantages and disadvantages of each potential solution, for review and final input by Spectrum Health and its Project Team members.
   3. Deliverables:
      a. Written Program
      b. Written Operational Program
      c. Plans/Block Diagrams indicating general arrangement of spaces and functions.
      d. Preliminary Project Development and Construction Schedule.
      e. Estimate of Probable Total Project Costs
         1) An estimated Total Project Cost, including, but not limited to, design consulting fees, permitting and plan review fees, site development costs including landscaping and irrigation, all building construction related costs including construction management fees and contingency.
         2) The following items are to be included in the estimated Total Project Cost, but will be provided by Spectrum Health:
            (a) Furnishings
            (b) Equipment
            (c) Information System costs

END OF SECTION 00 2416