REQUEST AUTHORIZATION FOR MAYOR AND FINANCE OFFICER TO SIGN PROFESSIONAL SERVICES AGREEMENT OR AMENDMENT

Date: 8/2/16

Project Name & Number: Rapid City Primary and Secondary Control Survey Project, 16-2336      CIP #: 51117

Project Description: Project will update positions of existing primary and secondary control points throughout the City.

Consultant: Kadmas, Lee and Jackson

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Addendum No:

Amendment Description:

Current Contract Amount: 
Change Requested: 
New Contract Amount: $0.00

Current Completion Date: 
New Completion Date: 

Funding Source This Request:

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Agreement Review & Approvals

Project Manager: [Signature] 7/14/16
Division Manager: [Signature] 7/14/16
Department Director: [Signature] 7/14/16
City Attorney: [Signature] 7/19/16

Routing Instructions
Route two originals of the Agreement for review and signatures. Finance Office - Retain one original. Project Manager - Retain second original for delivery to Consultant.

Finance Office Use Only
(Write to Finance: Please write date of Agreement in appropriate space in the Agreement document)

Appropriation: 12/01/16
Cash Flow

This Request:
Agreement Between City of Rapid City and Kadrmas, Lee and Jackson
for Professional Services for Establishing new Horizontal and Vertical control on existing primary and secondary City control points,
Project No. 16-2336

AGREEMENT made __________ 2016, between the City of Rapid City, SD (City) and Kadrmas, Lee and Jackson (KLJ, Surveyor). Project will be located Citywide, City intends to obtain services for establishing new Horizontal and Vertical control, Project No. 16-2336 CIP No. 51117. The scope of services is as described within this document and as further described in Exhibits A, B and C (attached).

The City and the Surveyor agree as follows:

The Surveyor shall provide professional surveying services for the City in all phases of the Project and as further defined in Exhibits A, B and C (attached), serve as the City's professional Surveyor representative for the Project, and give professional Surveying consultation and advice to the City while performing its services.

Section 1—Basic Services of Surveyor

1.1 General

1.1.1 The Surveyor shall perform professional services described in this agreement, which include customary Surveying services. Surveyor intends to serve as the City's professional representative for those services as defined in this agreement and to provide advice and consultation to the City as a professional. Any opinions of probable project cost, approvals, and other decisions provided by Surveyor for the City are rendered on the basis of experience and qualifications and represent Surveyor's professional judgment.

1.1.2 All work shall be performed by or under the direct supervision of a professional Surveyor licensed to practice in South Dakota.

1.1.3 All documents including Drawings and Specifications provided or furnished by Surveyor pursuant to this Agreement are instruments of service in respect of the Project and Surveyor shall retain an ownership therein. Reuse of any documents pertaining to this project by the City on extensions of this project or on any other project shall be at the City's risk. The City agrees to defend, indemnify, and hold harmless Surveyor from all claims, damages, and expenses including attorney's fees arising out of such reuse of the documents by the City or by others acting through the City.
1.1.4 The contract will be based on an hourly rate and reimbursable fee schedule with a maximum not-to-exceed amount.

1.2 Scope of Work

The Surveyor shall:

1.2.1 Consult with the City, other agencies, groups, consultants, and/or individuals to clarify and define requirements for the Project and review available data.

1.2.2 Perform the tasks described in the Scope of Services. (See Exhibit A.)

Section 2—Information Provided by City

The City will provide any information in its possession for the project at no cost to the Surveyor.

Section 3—Notice to Proceed

The City will issue a written notification to the Surveyor to proceed with the work. The Surveyor shall not start work prior to receipt of the written notice. The Surveyor shall not be paid for any work performed prior to receiving the Notice to Proceed.

Section 4—Mutual Covenants

4.1 General

4.1.1 The Surveyor shall not sublet or assign any part of the work under this Agreement without written authority from the City.

4.1.2 The City and the Surveyor each binds itself and partners, successors, executors, administrators, assigns, and legal representatives to the other party to this agreement and to the partners, successors, executors, administrators, assigns, and legal representatives of such other party, regarding all covenants, agreements, and obligations of this agreement.

4.1.3 Nothing in this agreement shall give any rights or benefits to anyone other than the City and the Surveyor.

4.1.4 This agreement constitutes the entire agreement between the City and the Surveyor and supersedes all prior written or oral understandings. This agreement may only be amended, supplemented, modified, or canceled by a duly executed written instrument.

4.1.5 The Surveyor shall make such revisions in plans which may already have been completed, approved, and accepted by the City, as are
necessary to correct Surveyor’s errors or omissions in the plans, when requested to do so by the City, without extra compensation therefore.

4.1.6 If the City requests that previously satisfactorily completed and accepted plans or parts thereof be revised, the Surveyor shall make the revisions requested by the City. This work shall be paid for as extra work.

4.1.7 If the City changes the location from the one furnished to the Surveyor, or changes the basic design requiring a new survey for the portions so changed, the redesign will be paid for as extra work.

4.1.8 The City may at any time by written order make changes within the general scope of this Agreement in the work and services to be performed by the Surveyor. Any changes which materially increase or reduce the cost of or the time required for the performance of the Agreement shall be deemed a change in the scope of work for which an adjustment shall be made in the Agreement price or of the time for performance, or both, and the Agreement shall be modified in writing accordingly. Additional work necessary due to the extension of project limits shall be paid for as extra work.

4.1.9 Extra work, as authorized by the City, will be paid for separately and be in addition to the consideration of this Section.

4.1.10 For those projects involving conceptual or process development services, activities often cannot be fully defined during the initial planning. As the project does progress, facts and conditions uncovered may reveal a change in direction that may alter the scope of services. Surveyor will promptly inform the City in writing of such situations so that changes in this agreement can be renegotiated.

4.1.11 This Agreement may be terminated (a) by the City with or without cause upon seven days’ written notice to the Surveyor and (b) by the Surveyor for cause upon seven days’ written notice to the City. If the City terminates the agreement without cause, the Surveyor will be paid for all services rendered and all reimbursable expenses incurred prior to the date of termination.

If termination is due to the failure of the Surveyor to fulfill its agreement obligations, the City may take over the work and complete it. In such case, the Surveyor shall be liable to the City for any additional cost to the extent directly resulting from Surveyor’s action.

4.1.12 The City or its duly authorized representatives may examine any books, documents, papers, and records of the Surveyor involving transactions
related to this agreement for three years after final payment. All examinations will be performed at reasonable times, with proper notice. Surveyor’s documentation will be in a format consistent with general accounting procedures.

4.1.13 The City shall designate a representative authorized to act on the City’s behalf with respect to the Project. The City or such authorized representative shall render decisions in a timely manner pertaining to documents submitted by the Surveyor in order to avoid unreasonable delay in the orderly and sequential progress of the Surveyor’s services.

4.1.14 Costs and schedule commitments shall be subject to renegotiation for delays caused by the City’s failure to provide specified facilities or information or for delays caused by other parties, excluding subcontractors and sub-consultants, unpredictable occurrences including without limitation, fires, floods, riots, strikes, unavailability of labor or materials, delays or defaults by suppliers of materials or services, process shutdowns, acts of God, or the public enemy, or acts of regulations of any governmental agency or any other conditions or circumstances beyond the control of the City or Surveyor. Temporary delays of services caused by any of the above which results in additional costs beyond those outlined may require renegotiation of this agreement.

4.1.15 The City will give prompt written notice to the Surveyor if the City becomes aware of any fault or defect in the Project or nonconformance with the Project Documents.

4.1.16 Unless otherwise provided in this Agreement, the Surveyor and the Surveyor’s consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to hazardous materials in any form at the project site, including but not limited to asbestos products, polychlorinated biphenyl (PCB), or other toxic substances.

4.1.17 In the event asbestos or toxic materials are encountered at the jobsite, or should it become known in any way that such materials may be present at the jobsite or any adjacent areas that may affect the performance of Surveyor’s services, Surveyor may, at their option and without liability for consequential or any other damages, suspend performance of services on the project until the City retains appropriate specialist CONSULTANT(S) or contractor(s) to identify, abate, and/or remove the asbestos or hazardous or toxic materials.

4.1.18 This agreement, unless explicitly indicated in writing, shall not be construed as giving Surveyor the responsibility or authority to direct or
supervise construction means, methods, techniques, sequences, or procedures of construction selected by any contractors or subcontractors or the safety precautions and programs incident to the work of any contractors or subcontractors.

4.1.19 Neither the City nor the Surveyor, nor its Consultants, shall hold the other liable for any claim based upon, arising out of, or in any way involving the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids, or gases, waste materials, or other irritants, contaminants, or pollutants.

4.1.20 Neither the City nor the Surveyor, nor its Consultants, shall hold the other liable for any claim based upon, arising out of, or in any way involving the specification or recommendation of asbestos, in any form, or any claims based upon use of a product containing asbestos.

4.1.21 Surveyor hereby represents and warrants that it does not fail or refuse to collect or remit South Dakota or City sales or use tax for transactions which are taxable under the laws of the State of South Dakota.

4.2 City of Rapid City NonDiscrimination Policy Statement

In compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination act of 1975, the Americans with Disabilities Act of 1990, and other nondiscrimination authorities it is the policy of the City of Rapid City, 300 Sixth Street, Rapid City, SD 57701-5035, to provide benefits, services, and employment to all persons without regard to race, color, national origin, sex, disabilities/handicaps, age, or income status. No distinction is made among any persons in eligibility for the reception of benefits and services provided by or through the auspices of the City of Rapid City.

Surveyor will permit access to any and all records pertaining to hiring and employment and to other pertinent data and records for the purpose of enabling the Commission, its agencies or representatives, to ascertain compliance with the above provisions.

This section shall be binding on all subcontractors or suppliers.

Section 5—Payments to the Surveyor

5.1 Schedule of Pay Rates

The City will pay the Surveyor for services rendered or authorized extra work according to the Surveyor's hourly and reimbursable rate schedule described in Exhibit C.
5.2 Fee

The maximum amount of the fee for the services as detailed in Section 1.2 shall not exceed $54,410 unless the scope of the project is changed as outlined in Section 4. If expenses exceed the maximum amount, the Surveyor shall complete the design as agreed upon here without any additional compensation. Sub task dollar amounts may be reallocated to other tasks as long as the total fee is not exceeded. Prime consultant may not mark up sub-consultant or sub-contractor services.

5.3 Progress Payments

Monthly progress payments shall be processed by the City upon receipt of the claim as computed by the Surveyor based on work completed during the month per the hourly rates and allowable reimbursable as established in Section 5.1 and approved by the City.

Net payment to the Surveyor shall be due within forty-five (45) days of receipt by the City.

Section 6—Completion of Services

The Surveyor shall complete services on or before ______________ based on a notice to proceed on or before ______________.

Section 7—Insurance Requirements

7.1 Insurance Required

The Surveyor shall secure the insurance specified below. The insurance shall be issued by insurance company(s) acceptable to the City and may be in a policy or policies of insurance, primary or excess. Certificates of all required insurance including any policy endorsements shall be provided to the City prior to or upon the execution of this Agreement.

7.2 Cancellation

The Surveyor will provide the City with at least 30 days' written notice of an insurer’s intent to cancel or not renew any of the insurance coverage. The Contractor agrees to hold the City harmless from any liability, including additional premium due because of the Contractor's failure to maintain the coverage limits required.
7.3 City Acceptance of Proof

The City's approval or acceptance of certificates of insurance does not constitute City assumption of responsibility for the validity of any insurance policies nor does the City represent that the coverages and limits described in this agreement are adequate to protect the Surveyor, its consultants or subcontractors interests, and assumes no liability therefore. The Surveyor will hold the City harmless from any liability, including additional premium due, because of the Surveyor's failure to maintain the coverage limits required.

7.4 Specific Requirements

7.4.1 Workers' compensation insurance with statutory limits required by South Dakota law. Coverage B-Employer's Liability coverage of not less than $500,000 each accident, $500,000 disease-policy limit, and $500,000 disease-each employee.

7.4.2 Commercial general liability insurance providing occurrence form contractual, personal injury, bodily injury and property damage liability coverage with limits of not less than $1,000,000 per occurrence, $2,000,000 general aggregate, and $2,000,000 aggregate products and completed operations. If the occurrence form is not available, claims-made coverage shall be maintained for three years after completion of the terms of this agreement. The policy shall name the City and its representatives as an additional insured.

7.4.3 Automobile liability insurance covering all owned, nonowned, and hired automobiles, trucks, and trailers. The coverage shall be at least as broad as that found in the standard comprehensive automobile liability policy with limits of not less than $1,000,000 combined single limit each occurrence. The required limit may include excess liability (umbrella) coverage.

7.4.4 Professional liability insurance providing claims-made coverage for claims arising from the negligent acts, errors or omissions of the Surveyor or its consultants, of not less than $1,000,000 each occurrence and not less than $1,000,000 annual aggregate. Coverage shall be maintained for at least three years after final completion of the services.

Section 8—Hold Harmless

The Surveyor hereby agrees to hold the City harmless from any and all claims or liability including attorneys' fees arising out of the professional services furnished under this Agreement, and for bodily injury or property damage arising out of services furnished under this Agreement, providing that such claims or liability are the result of a negligent
act, error or omission of the Surveyor and/or its employees/agents arising out of the professional services described in the Agreement.

Section 9—Independent Business

The parties agree that the Surveyor operates an independent business and is contracting to do work according to his own methods, without being subject to the control of the City, except as to the product or the result of the work. The relationship between the City and the Surveyor shall be that as between an independent contractor and the City and not as an employer-employee relationship. The payment to the Surveyor is inclusive of any use, excise, income or any other tax arising out of this agreement.

Section 10—Indemnification

If this project involves construction and Surveyor does not provide consulting services during construction including, but not limited to, onsite monitoring, site visits, site observation, shop drawing review and/or design clarifications, City agrees to indemnify and hold harmless Surveyor from any liability arising from the construction activities undertaken for this project, except to the extent such liability is caused by Surveyor's negligence.

Section 11—Controlling Law and Venue

This Agreement shall be subject to, interpreted and enforced according to the laws of the State of South Dakota, without regard to any conflicts of law provisions. Parties agree to submit to the exclusive venue and jurisdiction of the State of South Dakota, 7th Judicial Circuit, Pennington County.

Section 12—Severability

Any unenforceable provision herein shall be amended to the extent necessary to make it enforceable; if not possible, it shall be deleted and all other provisions shall remain in full force and effect.

Section 13—Funds Appropriation

If funds are not budgeted or appropriated for any fiscal year for services provided by the terms of this agreement, this agreement shall impose no obligation on the City for payment. This agreement is null and void except as to annual payments herein agreed upon for which funds have been budgeted or appropriated, and no right of action or damage shall accrue to the benefit of the Surveyor, its successors or assignees, for any further payments. For future phases of this or any project, project components not identified within this contract shall not constitute an obligation by the City until funding for that component has been appropriated.
IN WITNESS WHEREOF, the parties hereto have made and executed this Agreement as of the day and year first above written.

City of Rapid City:

MAYOR

DATE: ________________________

ATTEST:

FINANCE OFFICER

Reviewed By:

__________________________, PROJECT MANAGER

DATE: ________________________

Surveyor:

______________________________

DATE: ________________________
1. EXHIBIT A
PROJECT No. 16-2336 / CIP 51117
Rapid City Primary and Secondary Control Surveys

Project Narrative

The Rapid City Static Control Survey project consists of The Primary Static GPS Control Survey, Secondary Fast Static GPS Control Survey Pilot Project and the Secondary Fast Static GPS Control Survey. KLJ will also draft Survey Control Criteria Guidelines that can be used for Development and Infrastructure projects in the City of Rapid City Jurisdictional Boundaries. The Guidelines may be inserted into the “City of Rapid City Infrastructure Design Criteria” manual or used to create a City Ordinance regarding Survey Control procedures in Rapid City. KLJ will work hand in hand with Rapid City Survey staff to survey 153 control stations using static/fast static GPS survey methods and least squares adjustment. The specific survey procedures will vary depending on the type of control being surveyed.

Project Goals and Narrative:

The Primary Control project’s main goal is to accurately survey twelve of the existing Rapid City Pennington County Primary Control Stations in or near Rapid City. The Primary Control stations will create a framework for the survey of the Secondary Control Stations. The static control surveys will update the original station position datums from NAD83/96 and NGVD29 to NAD83/2011 Horizontal Datum and NAVD/1988 Vertical Datum using CORS Stations, including the Rapid City CORS Station known as the “Rapid City Base”. HARN Stations I90.066.2 and RAP D are also included in the network as are Benchmarks TT 5 RA and I90.066.2. Approximately ten existing Stations from the original Rapid City Pennington County Primary Control Survey are not being included in this survey because they are not in or near the Rapid City development areas. The surveyed positions will be compared to the NGS Datasheets (NAD 83/11, NAVD 88). A determination will be made whether the NGS position on the primary control stations are accurate or if the KLJ/City survey coordinates will be used for future City projects including the Rapid City Secondary Control Survey. The Rapid City Primary Control points will not be “Blue Booked”. The survey will not be conducted with procedures that are compatible with the “Blue Book” process.

The primary objective of this project is to make the Rapid City Primary and Secondary Control compatible with the “Rapid City Base” (CORS Station) NAD 83/2011 and NAVD 88 Position. After the Primary control is completed a pilot project surveying a portion of the Rapid City Secondary Control Stations will be conducted tying some of the Secondary Control Stations to the Primary Control. The Pilot program data will be analyzed and used to set expectations and help determine procedures for the Rapid City Secondary Control Survey.
The Secondary Control Survey will consist of a Static/Fast Static GPS Survey locating the remaining Secondary Control Stations relative to the Rapid City CORS Station and the Primary Control noted above. The intent is that the Secondary Control Stations will be used as project control for projects designed and constructed within the jurisdictional boundaries of Rapid City.

Survey Control Criteria Guidelines will be developed that can be used for Development and Infrastructure projects in the City of Rapid City Jurisdictional Boundaries. The Guidelines may be inserted into the “City of Rapid City Infrastructure Design Criteria” manual or used to create a City Ordinance regarding Survey Control procedures in Rapid City. A standard note that may be used on design plan Survey Control Sheets will also be developed.

Another project goal is to conduct the project efficiently. To minimize the project cost Rapid City Survey personnel will work with KLJ personnel as outlined below.

**Scope of Services:**

1. **Primary GPS Static Control Survey:** Twelve existing Primary control stations are to be included in the Primary GPS Static Control Survey. NAD83/11 NAVD 88 positions will be determined using Static Survey procedures.
   1.1. **Station Reconnaissance** and final determination of the twelve Stations to be included in the Primary Control Survey: This task is to be accomplished by the Rapid City Survey staff (it is understood that this task is underway and almost complete). The results will be reviewed by KLJ personnel and incorporated into the network design and final submittal. The twelve Primary Control Stations that have been recognized to be included in the survey are 190 066.2, RAP D, RCPC 6, RCPC 7, RCPC 8, RCPC 9, RCPC 12, RCPC 13, RCPC 14, RCPC 17, RCPC 18 and TT 5 RA. The condition and suitability for GPS observation of each station will be assessed and documented. Digital photographs of each station will be obtained.
   1.2. **Survey Preparation:** Network design, network diagram and an observation plan will be produced. Field survey preparation will be achieved including adjusting the equipment, recording the serial numbers of GPS receivers, compiling field paper work packets, and conducting a pre-survey meeting with field personnel to review procedures and mandatory information to be collected for each observation/station.
   1.3. **Static GPS observations** will be conducted on each Primary Station. A minimum of two sessions will be observed, with **two hours of data common to all stations** active in each session. One session will be observed in the morning, the second session will be observed in the afternoon. The plan is to have two KLJ surveyors and one City surveyor. Each surveyor will be responsible for two stations during each session (6 receivers running during each “two hour” session). The GPS data will be downloaded daily and copied onto the KLJ network drive daily. Log sheets, sketches etc. will be submitted to the KLJ Project Surveyor daily for review and checking. The City surveyor may provide the data via USB drive or email and deliver it to the KLJ Project Surveyor the following morning. The GPS files will be imported into Trimble Business Center on
a regular basis. The Logs and Sketches will also be reviewed on a regular basis. Any data that does not process cleanly will be re-observed.

1.4. **Network Adjustment**: The data will be checked and imported into Trimble Business Center (including CORS stations). Precise ephemeris files will be obtained and used in the final adjustment (available about a 2 week wait after observation). The vectors will be processed and checked. A minimally constrained three dimensional least squares adjustment will be conducted holding the Rapid City CORS station position fixed, (datum NAD83/2011, NAVD 1988, projection NAD 83 State Plane Coordinates South Dakota South Zone in U.S. Survey Feet). Additional adjustments will be processed constraining various Stations. It is anticipated that multiple adjustments will be conducted holding various Stations fixed. The results of the various adjustments will be analyzed and the “final results” compiled. A Spreadsheet comparing surveyed positions with NGS Datasheets positions of the Stations will be prepared. KLI’s representative(s) will meet with Rapid City representative(s) to review the survey results and determine if the NGS position of the Primary Control Stations can/should be held. One final adjustment may be needed depending on the outcome of the above noted meeting.

1.5. **A Primary Control Project Report** will be compiled. The final report will include the following:

- A narrative discussing the survey procedures and conclusions;
- Network adjustment report;
- A Coordinate list including SD South Zone State Plane Coordinates (NAD83/11, NAVD 88, U.S. Survey feet) and Geodetic Coordinates (Latitude, Longitude, and Ellipsoid Height in NAD 83/2011);
- Copies of the NGS Data Sheets for key control stations;
- Copies of the station sketches and visibility diagrams;
- Copies of the observation logs;
- Copies of the Station Photos;
- Copies of the GPS observation data files (.T0x files);
- Copies of the final TBC project file (.VCE file Version 3.60 or newer) including the data folders.

2. **Pilot Program Secondary Control GPS Fast Static Survey** of approximately 24 secondary control Stations will be conducted to fine tune the survey and adjustment approach used to survey the remainder of the Secondary Survey Control. The Pilot project will include stations in multiple locations across the City, using various Primary Control Stations as well as the Rapid City CORS Station. At this time two fifteen minute sessions on each station is anticipated. As discussed above the GPS data files and appropriate logs, etc. will be downloaded daily. The Pilot project includes a similar data adjustment process as noted above for the Primary Control Network. The KLI Project Surveyor will review the results of the Survey(s) and will discussed the results with the City Surveyor and how best to meet the project goals for the remainder of the Secondary Control Stations to be surveyed.

2.1. **Station Reconnaissance** and determination of the Stations to be included in the Pilot Survey Project. This task is to be accomplished by the Rapid City Survey staff (it is understood that this task is underway and almost complete). The results will be reviewed by KLI personnel and incorporated into the network design and final submittal. The condition and suitability for GPS
observation of each station will be assessed and documented. Digital photographs of each station will be obtained.

2.2. **Survey Preparation:** Network design, network diagram and an observation plan will be prepared. Field survey preparation will include adjusting (checking) the equipment, compiling field paper work packets, and conducting a pre-survey meeting with field personnel to review procedures and mandatory information needed for each observation (this will vary from the Primary Control Survey).

2.3. **Fast Static GPS observations** will be conducted on 24 Secondary Stations. A minimum of two sessions will be observed, with 15 minutes common to all stations active in each session is anticipated. One session will be observed in the morning, the second session will be observed in the afternoon. Additional receivers will be placed at key primary control stations. At this time the plan is to have two KLJ surveyors and one City surveyor. Each surveyor will be responsible for one station during each session plus a “key point receiver(s)” (5-8 receivers running during each session). The receivers at the primary control will remain stationary and not be reset for each session. The GPS data will be downloaded daily and copied onto the KLJ network drive. Log sheets, sketches etc. will be submitted to the KLJ Project Surveyor daily for review and checking. The City surveyor may provide the data via USB drive or email and deliver it to the KLJ Project Surveyor the following morning. The GPS files will be imported into Trimble Business Center on a regular basis. The Logs and Sketches will also be reviewed on a regular basis. Any data that does not process cleanly will be re-observed. During the Pilot project the procedures may vary to determine the most efficient way to achieve the appropriate accuracies.

2.4. **Network Adjustment:** The data will be checked and imported into Trimble Business Center including the Rapid City CORS Stations data files. Precise ephemeris files will be obtained and used in the final adjustment (about a 2 week wait after observation). The vectors will be processed and checked. A minimally constrained three dimensional least squares adjustment will be conducted holding the Rapid City CORS station position fixed, (datum NAD83/2011, NAVD 1988, projection NAD 83 State Plane Coordinates South Dakota South Zone in U.S. Survey Feet). Additional adjustments will be processed constraining key Primary Stations. It is anticipated that multiple adjustments will be conducted holding various Stations fixed. The results of the various adjustments will be analyzed and the “final results” compiled. A Spreadsheet comparing surveyed positions will be prepared. KLJ representative(s) will meet with Rapid City representative(s) to review the survey results and a determination of the Secondary Control Survey approach will be made.

2.5. **A Pilot Program Project Report** will be compiled. The final report will include the following:
   - A narrative discussing the survey procedures and conclusions;
   - Network adjustment report;
   - A Coordinate list including SD South Zone State Plane Coordinates (NAD83/11, NAVD 88, U.S. Survey feet) and Geodetic Coordinates (Latitude, Longitude, and Ellipsoid Height in NAD 83/2011);
   - Copies of the NGS Data Sheets for key control stations;
   - Copies of the station sketches and visibility diagrams;
   - Copies of the observation logs;
Copies of the Station Photos;
Copies of the GPS observation data files (.T0x files);
Copies of the final TBC project .VCE file (Version 3.60 or newer) including the data folders.
A summary of the results of the pilot program will be included in the report as well as the survey procedures for the Secondary Control GPS Fast Static Survey. KLJ and the City Surveyor will determine the procedures for the Secondary Control based on the results of the Pilot Program.

3. **Secondary Control GPS Fast Static Survey** of the remaining Secondary Control Stations (approximately 24) will be conducted using the procedures developed in the Pilot Program. All of the Secondary Control Stations will be tied directly to the Rapid City CORS Station.

3.1. **Station Reconnaissance** and determination of the Stations to be included in the Secondary Control Survey. This task is to be accomplished by the Rapid City Survey staff (it is understood that this task is underway and almost complete). The results will be reviewed by KLJ personnel and incorporated into the network design and final submittal. The condition and suitability for GPS observation of each station will be assessed and documented. Digital photographs of each station will be obtained.

3.2. **Survey Preparation:** Network design, network diagram and an observation plan will be prepared. Field survey preparation will include adjusting (checking) the equipment, compiling field paper work packets, and conducting a pre-survey meeting with field personnel to review procedures and mandatory information needed for each observation.

3.3. **Fast Static GPS observations** will be conducted on 117 Secondary Station using the procedure determined in the Pilot Program. At this time the plan is to have two KLJ surveyors and one City surveyor. The GPS data will be downloaded daily and copied onto the KLJ network drive. Log sheets, sketches etc. will be submitted to the KLJ Project Surveyor daily for review and checking. The City surveyor may provide the data via USB drive or email and deliver it to the KLJ Project Surveyor the following morning. The GPS files, will be imported into Trimble Business Center on a regular basis. The Logs and Sketches will also be reviewed on a regular basis. Any data that does not process cleanly will be re-observed.

3.4. **Network Adjustment:** The data will be checked and imported into Trimble Business Center including the Rapid City CORS Stations data files. Precise ephemeris files will be obtained and used in the final adjustment (available about a 2 week wait after observation). The vectors will be processed and checked. The adjustment scheme determine in the Pilot program will be used. The data will be adjusted using NAD83/2011 and NAVD 1988 Datums. The projection will be NAD 83(11) State Plane Coordinates South Dakota South Zone in U.S. Survey Feet. The adjustment results will be checked and analyzed relative to the project goals and target accuracies.

3.5. A **Secondary Control Project Report** will be compiled. The final report will include the following:

   A narrative discussing the survey procedures and conclusions;
   Network adjustment report;
A Coordinate list including SD South Zone State Plane Coordinates (NAD83/11, NAVD 88, U.S. Survey feet) and Geodetic Coordinates (Latitude, Longitude, and Ellipsoid Height in NAD 83/2011);
Copies of the NGS Data Sheets for key control stations if appropriate;
Copies of the station sketches and visibility diagrams;
Copies of the observation logs;
Copies of the Station Photos;
Copies of the GPS observation data files (.T0x files);
Copies of the final TBC project (.VCE file, version 3.60 or newer) including the data folders.

4. Implementation:
   4.1. Survey Control Criteria Guidelines that can be used for Development and Infrastructure projects in the City of Rapid City Jurisdictional Boundaries will be developed. The Guidelines may be inserted into the “City of Rapid City Infrastructure Design Criteria” manual or used to create a City Ordinance regarding Survey Control procedures in Rapid City.
   4.2. A standard Survey Control Note that may be used on design plan “Survey Control Sheets” will be developed.
   4.3. An Open House for area Surveyors will be conducted presenting the results of the survey including the Survey Control Criteria Guidelines and the “Standard Plan Note” regarding survey control. A Map depicting the Survey points will be available. City GIS and Survey personnel will be invited to present how the City will make the new data available to the public, if that component of the project is available when the Open House is held. Implementation dates may also be presented if the date has been determined.

City Responsibilities:

KLJ plans to complete the above described services with the assistance of Rapid City Survey personnel. The City will perform the following:

1. Reconnaissance of the Primary and Secondary Control Stations to be surveyed prior to preparation of the network design and observation plan. The City will determine the existence, condition, and GPS observation suitability of each station.
2. Take digital photos of each station and provide the photos to KLJ prior to observation.
3. Provide a SD SPC South zone csv file (PT, N, E, EL) of the existing stations to be used to navigate to the Stations.
4. The City will provide 1 surveyor and 2 GPS receivers including the necessary accessories such as tripods, tripod实景, sandbags, etc. The City Surveyor will participate in the pre-survey preparations and the field survey of the Rapid City Primary and Secondary Control. The City surveyor will provide KLJ with original observation logs, station sketches, visibility diagrams, GPS data files for all observations, etc. daily. The network observation plan may include observations at times outside the normal work schedule. It is assumed the City field surveyor will adapt to the observation schedule.
5. It is assumed the City surveyor will participate in activities necessary to complete successful field operations including procedural meetings, meeting reviewing the results of the surveys, and the equipment adjustment session(s).

6. KLJ and City survey personnel will schedule the activities to reasonably accommodate all parties. It is understood, like all field survey activities, that schedules may change to adapt to changing conditions and situations and that all participants in the survey will respond as needed.

**Deliverables:**

KLJ will deliver the following to the City:

1. **Primary Control Project Report** as noted above.
2. **Pilot Program Project Report** as noted above.
3. **Secondary Control Project Report** as noted above.
4. **Implementation information** as noted above.

**Proposed Schedule:**

1) **Notice to proceed:** On or before August 15, 2016;

2) **Primary Control Survey:** August 15 thru September 10, 2016 (remember it takes approximately 2 weeks after GPS observation before the precise ephemeris is available);

3) **Secondary Control Pilot Project:** September 12 thru October 15, 2016 (remember it takes approximately 2 weeks after GPS observation before the precise ephemeris is available);

4) **Secondary Control Survey:** October 17 thru December 23, 2016 (remember it takes approximately 2 weeks after GPS observation before the precise ephemeris is available);

5) **Implementation:** December 12, 2016 thru January 20, 2017.
<table>
<thead>
<tr>
<th>Task</th>
<th>Project Assignment</th>
<th>DIRECT LABOR</th>
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<tr>
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Because of the nature of this project the number of hours per worker category may vary. The fee for individual Subtasks and Tasks may be more or less than the individual fees noted above. The Total fee will not exceed the Total Fee shown above.
| Task  | Project Assignment | Task | Task | Task | Task | Task | Task | Task | Task | Task | Task | Task | Task | Task | Task | Task | Task |
|-------|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|       |                    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1     | RC Primary Control Survey | 1.1  | Station Reconnaissance | 1    | 1    | 1    | 3    | $ 338.00 |
|       |                    | 1.2  | Survey Preparation | 12   | 5    | 3    | 20   | $ 2,766.00 |
|       |                    | 1.3  | GPS Observation | 3    | 20   | 18   | 41   | $ 4,140.00 |
|       |                    | 1.4  | Network Adjustment | 24   | 2    | 1    | 27   | $ 4,240.00 |
|       |                    | 1.5  | Project Report | 4    | 10   | 4    | 2    | $ 2,488.00 |
|       | Task 1 Subtotal | 5    | 50   | 32   | 24   | 111  | $ 13,972.00 |
| 2     | Pilot Program | 2.1  | Station Reconnaissance | 1    | 1    | 1    | 3    | $ 338.00 |
|       |                    | 2.2  | Survey Preparation | 8    | 4    | 2    | 14   | $ 1,920.00 |
|       |                    | 2.3  | GPS Observation | 4    | 18   | 18   | 40   | $ 4,076.00 |
|       |                    | 2.4  | Network Adjustment | 18   | 2    | 1    | 21   | $ 3,258.00 |
|       |                    | 2.5  | Project Report | 4    | 10   | 4    | 2    | $ 2,488.00 |
|       | Task 2 Subtotal | 5    | 41   | 29   | 23   | 98   | $ 12,078.00 |
| 3     | Secondary Control Survey | 3.1  | Station Reconnaissance | 1    | 2    | 2    | 5    | $ 616.00 |
|       |                    | 3.2  | Survey Preparation | 16   | 4    | 2    | 22   | $ 3,232.00 |
|       |                    | 3.3  | GPS Observation | 12   | 56   | 56   | 124  | $ 12,608.00 |
|       |                    | 3.4  | Network Adjustment | 24   | 8    | 3    | 35   | $ 5,076.00 |
|       |                    | 3.5  | Project Report | 5    | 8    | 4    | 3    | $ 2,296.00 |
|       | Task 3 Subtotal | 6    | 62   | 74   | 64   | 206  | $ 23,828.00 |
| 4     | Implementation | 4.1  | Survey Control Criteria & Guidelines | 2    | 6    | 2    | 10   | $ 1,332.00 |
|       |                    | 4.2  | Survey Control Note | 1    | 2    | 3    | 1   | $ 388.00 |
|       |                    | 4.3  | Open House | 8    | 8    | 4    | 6    | $ 2,812.00 |
|       | Task 4 Subtotal | 11   | 16   | 6    | 6    | 39   | $ 4,532.00 |
|       |                   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|       | Total Hours | 27   | 169  | 141  | 111  | 6    | 421  | $ 54,410.00 |
|       | LABOR | $ 1,620.00 | $ 27,716.00 | $ 16,074.00 | $ 8,436.00 | $ 564.00 | $ 54,410.00 |
|       | TOTAL | $ 54,410.00 |

Because of the nature of this project the number of hours per worker category may vary. The fee for individual Subtasks and Tasks may be more or less than the individual fees noted above. The Total Fee will not exceed the Total Fee shown above.
EXHIBIT C

PROJECT No. 16-2336 / CIP 51117

Rapid City Primary and Secondary Control Surveys

KLJ Billing Rates

<table>
<thead>
<tr>
<th>Position</th>
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