NEW YORK STATE DEPARTMENT OF TRANSPORTATION

F. A. NO.: ___________ P.I.N.: ___________

COMPTROLLER'S CONTRACT NO. C030867

PROJECT: LAND SURVEY EQUIPMENT SERVICES FOR NYSFOT

This Agreement made this 8th day of September, 2010 pursuant to Section 14 of the Transportation Law, by and between THE PEOPLE OF THE STATE OF NEW YORK (hereinafter referred to as the "STATE") acting by and through the Department of Transportation (hereinafter referred to as "STATE") whose office is at 50 Wolf Road, in the County of Albany, State of New York 12232, and

LEICA GEOSYSTEMS INC.
5051 PEACHTREE CORNERS CIRCLE
SUITE 250
NORCROSS, GEORGIA 30092

(hereinafter referred to as "CONSULTANT")

WITNESSETH:

WHEREAS, the STATE desires the CONSULTANT because of its ability and reputation, to perform the services hereinafter mentioned upon the PROJECT, which is fully described in SCHEDULE A, and SCHEDULE B, and the CONSULTANT agrees to provide these services.

NOW, THEREFORE, the parties hereto, for the consideration hereinafter named, do agree as follows:

ARTICLE 1. PERFORMANCE OF WORK.

The CONSULTANT shall perform all of the work described in SCHEDULE A and cause such work to be performed in an efficient and expeditious manner and in accordance with all of the terms and provisions of this AGREEMENT. The CONSULTANT shall perform the work in accordance with professional standards and with the diligence and skill expected of a company with extensive experience in the performance of work of the type described in SCHEDULE A. The CONSULTANT shall furnish such personnel and shall procure such materials, machinery, supplies, tools, equipment and other items as may reasonably be necessary or appropriate to perform the work in accordance with this AGREEMENT. It is understood and agreed that Andrew Hurley shall serve as the CONSULTANT’s Project Manager and as such shall have the responsibility for the overall supervision and conduct of the work on behalf of the CONSULTANT and that the persons described in SCHEDULE A and SCHEDULE B shall serve in the capacities described therein. Any change of key project personnel by the CONSULTANT shall be subject to the prior written approval of the STATE. The STATE reserves the option to extend the terms and conditions of this AGREEMENT to any other state agency in New York subject to the approval of all necessary state officials.
The CONSULTANT will commence work no later than ten (10) days after receiving notice to proceed from the STATE.

ARTICLE 2. DOCUMENTS FORMING THE AGREEMENT.

The contract documents shall be deemed to include this AGREEMENT, the provisions required by state and federal law to be inserted in the AGREEMENT as set forth in APPENDIX A and APPENDIX B, SCHEDULE A (including EXHIBITS), SCHEDULE B (including EXHIBITS), the CONSULTANT’s Proposal (response to the RFP), and the STATE’s Request for Proposals (RFP).

ARTICLE 3. INSPECTION.

The duly authorized representatives of the STATE, and on federally aided projects, representatives of the Federal Highway Administration, shall have the right at all times to inspect the work of the CONSULTANT.

ARTICLE 4. TERM OF THE AGREEMENT.

The CONSULTANT agrees to complete all the work of this AGREEMENT as required by this AGREEMENT within a 60-month base term for this AGREEMENT, which shall commence on October 1, 2010 and end on September 30, 2015. This AGREEMENT may be extended for such additional periods as are agreed to by the STATE and approved by the Office of the State Comptroller and within the Lump Sum as shown in Item I, ARTICLE 5.

ARTICLE 5. PROVISION FOR PAYMENT.

Item I The STATE shall pay to the CONSULTANT and the CONSULTANT agrees to accept as full compensation for its services under this Agreement, a price of $1,758,667 (in quarterly lump sum payments) unless there is a substantial change in the scope, complexity or character of the work to be performed.

Item II The CONSULTANT specifically agrees that the AGREEMENT shall be deemed executory only to the extent of the monies available, and no liability shall be incurred by the STATE beyond the monies available for the purpose. In no event, however, will monies be deleted from this Agreement except pursuant to ARTICLE 16 hereof, entitled Termination.

ARTICLE 6. MILESTONE PAYMENTS.

The CONSULTANT shall be paid in milestone progress payments based on a payment schedule established by the Project Manager and the CONSULTANT and contained in SCHEDULE B, as follows:

Quarterly all-inclusive lease and professional service lump sum costs shall be provided for performing the scope of services, and paid on a per quarter of year (3 month time period) basis, over the five (5) year contract period for a total of 20 total payments.
The STATE will make payments to the CONSULTANT in accordance with Section 179(f) of the State Finance Law. Payments are subject to the approval of the STATE's Project Manager, Stephen Roden or his successor as identified by the STATE. Payments shall not be withheld unreasonably.

The CONSULTANT shall maintain and update once each month, if changes have taken place or are anticipated, the Project Schedule contained in SCHEDULE A and/or SCHEDULE B hereto.

The CONSULTANT will not include any provisions in their subcontracts that would circumvent the intent of 49 CFR 26.29 to require the CONSULTANT to make partial payments to subcontractors and subconsultants within ten (10) days after receipt of payment from the STATE.

ARTICLE 7. CONTRACT PAYMENT.

The CONSULTANT shall provide complete and accurate billing invoices to the STATE in order to receive payment. Billing invoices submitted to the STATE must contain all information and supporting documentation required by the Contract, the STATE and the State Comptroller. Payment for invoices submitted by the CONSULTANT shall only be rendered electronically unless payment by paper check is expressly authorized by the New York State Department of Transportation Commissioner (hereinafter referred to as “COMMISSIONER”), in the COMMISSIONER'S sole discretion, due to extenuating circumstances. Such electronic payment shall be made in accordance with ordinary State procedures and practices. The CONSULTANT shall comply with the State Comptroller’s procedures to authorize electronic payments. Authorization forms are available at the State Comptroller’s website at www.osc.state.ny.us/epay/index.htm, by email at epunit@osc.state.ny.us, or by telephone at 518-474-4032. CONSULTANT acknowledges that it will not receive payment on any invoices submitted under this contract if it does not comply with the State Comptroller’s electronic payment procedures, except where the COMMISSIONER has expressly authorized payment by paper check as set forth above.

ARTICLE 8. FINAL PAYMENT.

a) Section 179 of the State Finance Law requires the STATE to make final payment within thirty (30) calendar days after receipt of an invoice which is properly prepared and submitted. The STATE in accordance with the provisions of the State Finance Law has determined that the STATE will require a 60 calendar day audit period for final payments at which time the 30 calendar day interest-free period will commence. The CONSULTANT is required to make final payment to all Sub Contractors and Sub Consultants within ten (10) calendar days of receipt of final payment from the STATE.

The CONSULTANT is required, if it is a "foreign" (Out of State) corporation or entity, to obtain and submit the required "Tax Clearance" certificate to the STATE at the time of contract signing and again before processing the final payment. It should be noted that any time taken to satisfy or furnish this Tax Clearance certificate shall extend the required payment date by an equal period of time. The Tax Clearance certificate can be obtained by mailing a request to:
New York State Department of Taxation and Finance
Tax Status Unit
Building 8, Room 938
State Office Building Campus
Albany, NY 12227

Alternatively, it may be obtained by phoning the Corporation Tax Information Center at 1-888-698-2908 and making the request there. The certificate content is public information and the certificate is free of charge.

The acceptance by the CONSULTANT of the final payment shall operate as and shall be a release to the STATE from all claims and liability to the CONSULTANT, its representatives and assigns for any and all things done, furnished for or relating to the services rendered by the CONSULTANT under or in connection with this Agreement or for any part thereof except as otherwise provided in ARTICLE 8 (b).

b) The CONSULTANT shall maintain all books, documents, papers, accounting records and other evidence pertaining to cost incurred and make such materials available at its office at all reasonable times during the period of this Agreement and for the period of time specified in Clause No. 10, "Records" on page 3 of APPENDIX A, for inspection by the STATE, Federal Highway Administration, or any authorized representatives of the Federal Government and copies thereof shall be furnished if requested.

ARTICLE 9. EXTRA WORK.

a) If the CONSULTANT believes that any work is or may be beyond the scope of the Agreement (extra work), or that additional work is necessary, the CONSULTANT shall notify the STATE, in writing, of this fact prior to beginning any of the work. The notification shall include all information required by the Department. The STATE shall be the sole judge as to whether or not such work is in fact beyond the scope of this Agreement and constitutes extra work. No extra or additional work shall be started prior to written authorization from the STATE. The STATE shall be under no obligation to reimburse the CONSULTANT for any extra or additional work performed without the prescribed notification and authorization. The STATE will not allow fixed fee for any extra work undertaken without prescribed notification and authorization. In the event that the STATE determines that such work does constitute extra work, the STATE shall provide extra compensation to the CONSULTANT in a fair and equitable manner. If necessary, a Supplemental Agreement providing the compensation and describing the work authorized shall be issued by the STATE to the CONSULTANT for execution after approvals have been obtained from necessary State officials and, if required, from the Federal Highway Administration.

b) In the event of any claims being made or any actions being brought in connection with the PROJECT, the CONSULTANT agrees to render to the STATE all assistance required by the STATE. Work which the CONSULTANT is obligated to perform in accordance with Article 9 hereof shall be performed without cost to the STATE. Compensation for other work performed and costs incurred in connection with this requirement shall be made in a fair and equitable manner. In all cases provided for in this AGREEMENT for the additional services above described, the STATE's directions shall be exercised by the issuance of a separate Agreement, if necessary.
ARTICLE 10. CONSULTANT LIABILITY.

The CONSULTANT shall be responsible for all damage to life and property due to acts, errors or omissions of the CONSULTANT, its sub-contractors, agents or employees, in the performance of its service under this AGREEMENT. Further, it is expressly understood that the CONSULTANT shall indemnify and save harmless the STATE from claims, suits, actions, damages and costs of every name and description, resulting from the negligent performance of the services of the CONSULTANT under this AGREEMENT, and such indemnity shall not be limited by reasons of enumeration of any insurance coverage herein provided. Negligent performance of service, within the meaning of this Article, shall include claims founded upon tort, claims based upon the CONSULTANT's failure to meet professional standards, or claims based upon breach of copyright, trade secrets or other protected material. Nothing in this Article or in this Agreement shall create or give to third parties any claim or right of action against the CONSULTANT or the STATE beyond such as may legally exist irrespective of this Article or this Agreement.

ARTICLE 11. WORKER'S COMPENSATION AND LIABILITY INSURANCE.

The CONSULTANT agrees to procure and maintain without direct cost to the STATE except as noted, until final acceptance by the STATE, of the services covered by this AGREEMENT, insurance of the kinds and in amounts hereinafter provided in insurance companies authorized to do business in the State of New York, covering all operations under this AGREEMENT whether performed by the CONSULTANT or its subcontractors. Before commencing the work, the CONSULTANT shall furnish to the STATE a certificate or certificates, in form satisfactory to the STATE, showing that they have complied with this Article, which certificate or certificates, shall provide that the policies shall not be changed or canceled until thirty (30) days written notice has been given to the STATE. The kinds and amounts of insurance required are as follows:

(a) policy covering the obligations of the CONSULTANT in accordance with the provisions of Chapter 41, Laws of 1914, as amended, known as the Worker's Compensation Law, and also by the provisions of ARTICLE 9 of the Worker's Compensation Law known as the Disability Benefits Law, and this AGREEMENT shall be void and of no effect unless the CONSULTANT procures such policy and maintains it until acceptance of the work;

(b) policies of bodily injury liability insurance of the types herein-after specified, each with limits of liability of not less than $100,000 for all damages arising out of bodily injury, including death at any time resulting therefrom, sustained by one person in any one accident and, subject to that limit for each person, not less than $300,000 for all damages arising out of bodily injury, including death at any time resulting therefrom, sustained by two or more persons in any one accident, and not less than $100,000 damages arising out of injury to or destruction of property in any one accident and, subject to that limit per accident, not less than $300,000 or all damages arising out of injury to or destruction of property during the policy period.

(1) Professional liability insurance, if the CONSULTANT is a licensed professional, issued to and covering the liability of the CONSULTANT with respect to all work performed by him under this AGREEMENT.
(2) Professional liability insurance issued to and covering the liability of each of the CONSULTANT'S licensed professional subcontractors with respect to all work performed by said subcontractors under this AGREEMENT.

(3) Protective liability insurance issued to and covering the liability of the CONSULTANT with respect to all work performed for the CONSULTANT by its subcontractors under this AGREEMENT.

(4) Protective liability insurance for the benefit of THE PEOPLE OF THE STATE OF NEW YORK and all employees of the DEPARTMENT OF TRANSPORTATION both officially and personally, with respect to all operations under this AGREEMENT by the CONSULTANT or by its subcontractors, including in such coverage any omissions and supervisory acts of the STATE, the DEPARTMENT and its employees.

ARTICLE 12. INTERCHANGE OF DATA.

All technical data in regard to the PROJECT existing in the office of the STATE or existing in the offices of the CONSULTANT shall be made available to the other party to this Agreement without expense to such other party.

ARTICLE 13. DISPOSITION OF DATA.

At the time of completion of the work, the CONSULTANT shall make available to the STATE all documents and data pertaining to the work or to the PROJECT which materials at all times shall be the property of the STATE. It is agreed that the CONSULTANT may maintain copies of all documents and data. Or in the event that this Agreement is terminated for any reason, then, within ten (10) days after such termination, the CONSULTANT shall make available to the STATE the aforementioned data and material.

ARTICLE 14. DAMAGES AND DELAYS.

The CONSULTANT agrees that no charges or claim for damages shall be made by them for any delays or hindrances from any cause whatsoever during the progress of any portion of the services specified in this AGREEMENT. Such delays or hindrances, if any, shall be compensated for by an extension of time for such reasonable period as the STATE may decide, it being understood however, that the permitting of the CONSULTANT to proceed to complete any services or any part of them after the date of completion or after the date to which the time of completion may have been extended, shall in no way operate as a waiver on the part of the STATE of any of its rights herein. Nothing in this ARTICLE will prevent the CONSULTANT from exercising its rights under ARTICLE 8 of this AGREEMENT.

ARTICLE 15. NOTICE OF BANKRUPTCY, VENUE, AUDITS.

If, prior to final audit, CONSULTANT files for relief pursuant to Title 11 of the United States Code under the Bankruptcy Laws or a successor statute, this AGREEMENT shall be treated as an executory contract under 11 USC S365 of the Bankruptcy Laws or successor statute, and be subject to assumption or rejection by the debtor within the time permitted by law.

The CONSULTANT must immediately send written notice to Contract Management of the New York State Department of Transportation at its main office in Albany and send all relevant pleading of the voluntary or involuntary filing of a Bankruptcy proceeding by the CONSULTANT, its subsidiary, its
principals and officers or a related entity whether or not the CONSULTANT believes that any debt is owed to the State by final audit or otherwise.

The determination of any rights under this AGREEMENT shall be adjudicated in a State or Federal Court with jurisdiction over the matter, and venue for the determination of such rights shall be in Albany, New York.

The CONSULTANT agrees that the automatic stay under 11 USC S362 or a successor statute shall be deemed inapplicable or that this agreement shall constitute consent to the lifting of the stay with respect to the State's performance of or completion of any audit pursuant to the terms of this AGREEMENT.

ARTICLE 16. TERMINATION.

The STATE shall have the absolute right to terminate this Agreement, and such action shall in no event be deemed a breach of contract:

(a) If a termination is brought about for the convenience of the STATE and not as a result of unsatisfactory performance on the part of the CONSULTANT, final payment shall be made based on the percentage of work satisfactorily completed by the CONSULTANT, as determined by the STATE, times the Lump Sum amount.

(b) If the termination is brought about as a result of unsatisfactory performance on the part of the CONSULTANT, the value of the work performed by the CONSULTANT prior to termination shall be established by the STATE.

(c) The STATE reserves the right to terminate this AGREEMENT in the event it is found that the certification filed by the CONSULTANT in accordance with the requirements contained in State Finance Law §139-k was intentionally false or intentionally incomplete. Upon such finding, the STATE may exercise its termination right by providing written notification to the CONSULTANT in accordance with the written notification terms of the AGREEMENT.

(d) If termination is initiated by the CONSULTANT, the CONSULTANT shall give the STATE 30 calendar days written notice. If termination is initiated by the STATE, the STATE shall give the CONSULTANT 30 calendar days written notice.

ARTICLE 17. DEATH OR DISABILITY OF THE CONSULTANT.

In case of the death or disability of one or more but not all the persons herein referred to as CONSULTANT, the rights and duties of the CONSULTANT shall devolve upon the survivors of them, who shall be obligated to perform the services required under this AGREEMENT, and the STATE shall make all payments due to them.

In case of the death or disability of all the persons herein referred to as CONSULTANT, all data and records pertaining to the PROJECT shall be delivered within (60) days to the STATE or its duly authorized representative. In case of the failure of the CONSULTANT'S successors or personal representatives to make such delivery on demand, then in that event the representatives of the CONSULTANT shall be liable to the STATE for any damages it may sustain by reason thereof. Upon the
delivery of all such data to the STATE, the STATE will pay to the representatives of the CONSULTANT all amounts due the CONSULTANT, including retained percentages to the date of the death of the last survivor.

ARTICLE 18. CODE OF ETHICS.

The CONSULTANT specifically agrees that this AGREEMENT may be canceled or terminated if any work under this AGREEMENT is in conflict with the provisions of Section 74 of the New York State Public Officer's Law, as amended, establishing a Code of Ethics for State officers and employees.

The CONSULTANT shall not engage, on a full or part-time or other basis any professional or technical personnel who are or have been at any time during the period of this AGREEMENT in the employ of the Federal Highway Administration or the highway organizations of any public employer, except regularly retired employees, without the consent of the public employer of such person.

ARTICLE 19. INDEPENDENT CONTRACTOR.

The CONSULTANT, in accordance with their status as an independent contractor, covenants and agrees that they will conduct themselves consistent with such status, that they will neither hold themselves out as, nor claim to be, an officer or employee of the STATE by reason hereof, and that they will not, by reason hereof, make any claim, demand or application to or for any right or privilege applicable to an officer or employee of the STATE, including but not limited to Worker's Compensation coverage, Unemployment Insurance benefits, Social Security coverage or Retirement membership or credit.

ARTICLE 20. COVENANT AGAINST CONTINGENT FEES.

The CONSULTANT warrants that they have not employed or retained any company or person, other than a bona fide employee working for the CONSULTANT, to solicit or secure this AGREEMENT, and that they have not paid or agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or making of this AGREEMENT. For breach or violation of this warranty, the STATE shall have the right to annul this AGREEMENT without liability, or, in its discretion, to deduct from the AGREEMENT price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee.

ARTICLE 21. TRANSFER OF AGREEMENT.

The CONSULTANT specifically agrees, as required by the State Finance Law, Section 138, that they are prohibited by law from assigning, transferring, conveying, subletting or otherwise disposing of the AGREEMENT or of their right, title or interest therein, or their power to execute such AGREEMENT, to any other person, company or corporation, without the previous consent in writing of the STATE.

If this provision of the law be violated, the STATE shall revoke and annul the Agreement and the STATE shall be relieved from any and all liability and obligations thereunder to the person, company or corporation to whom the CONSULTANT shall assign, transfer, convey, sublet or otherwise dispose of the Agreement, and such transferee shall forfeit and lose all moneys therefore assigned under said Agreement, except so much as may be required to pay his employees.
ARTICLE 22. PROPRIETARY RIGHTS.

The CONSULTANT agrees that if copyrights, patentable discoveries or inventions or rights in data should result from work described herein, all rights accruing from such discoveries or inventions shall be the sole property of the CONSULTANT. However, the CONSULTANT agrees to and does hereby grant to the United States Government and the State of New York an irrevocable, nonexclusive, nontransferable, paid-up license to reproduce, publish, make, use, and sell each subject invention throughout the world by and on behalf of the Government of the United States and States and domestic municipal governments, all in accordance with the provisions of 48 CFR 1-27, and other applicable Federal laws, rules and regulations.

ARTICLE 23. SUBCONTRACTORS/SUBCONSULTANTS.

All subcontractors and subconsultants performing work on this project shall be bound by the same required contract provisions as the prime CONSULTANT. All agreements between the prime CONSULTANT and a subcontractor or subconsultant shall include all standard required contract provisions, and such agreements shall be subject to review by the State.

ARTICLE 24. ORDER OF PRECEDENCE.

In the event of any inconsistency between or among the provisions and contents of this AGREEMENT, it is agreed that such inconsistency shall be resolved in the following descending order of precedence:

1. The provisions required by state and federal law to be inserted in the AGREEMENT as set forth in APPENDIX A and APPENDIX B.

2. This AGREEMENT, including Signature Page, Notary Page and Exhibits.

3. SCHEDULE A (including Exhibits).

4. SCHEDULE B (including Exhibits).

5. The CONSULTANT’s Proposal (response to the RFP).

6. The STATE’s Request for Proposals (RFP).
ARTICLE 25. CERTIFICATION REQUIRED BY 49CFR, PART 29.

The signatory to this Agreement, being duly sworn, certifies that, EXCEPT AS NOTED BELOW, its company and any person associated therewith in the capacity of owner, partner, director, officer, or major stockholder (five percent or more ownership):

1) is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;

2) has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past three years;

3) does not have a proposed debarment pending; and

4) has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

EXCEPTIONS: - None were taken.

ARTICLE 26. CERTIFICATION FOR FEDERAL-AID CONTRACTS.

The prospective participant certifies, by signing this Agreement to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such subrecipients shall certify and disclose accordingly.
ARTICLE 27. RESPONSIBILITY OF THE CONSULTANT.

(a) The CONSULTANT shall be responsible for the professional quality, technical accuracy, and the coordination of all services furnished by the CONSULTANT under this AGREEMENT. The CONSULTANT shall, without additional compensation, correct or revise any errors or deficiencies in its services. However, the STATE may in certain circumstances, provide compensation for such work.

(b) Neither the STATE’s review, approval or acceptance or, nor payment for, the services required under this AGREEMENT shall be construed to operate as a waiver of any rights under this AGREEMENT or of any cause action arising out of the performance of this AGREEMENT, and the CONSULTANT shall be and remain liable to the STATE in accordance with applicable law for all damages to the STATE caused by the CONSULTANT’s negligent performance or breach of contract of any of the services furnished under this AGREEMENT.

(c) The rights and remedies of the STATE provided for under this AGREEMENT are in addition to any other rights and remedies provided by law.

(d) If the CONSULTANT is comprised of more than one legal entity or any group of partners or joint venturers associated for the purposes of undertaking this agreement, each such entity acknowledges and hereby affirmatively represents and agrees that each has the power to bind the CONSULTANT and each of the others hereunder; and as such, each acts both as principal and agent of the CONSULTANT and of each of the others hereunder. Each further acknowledges and agrees that all such entities, partners or joint venturers associated for the purposes of undertaking this agreement shall be jointly and severally liable to third parties, including but not limited to the STATE, for the acts or omissions of the CONSULTANT or any other entity, partner or joint venturer hereunder.

(e) If the CONSULTANT is comprised of more than one legal entity or any group of partners or joint venturers associated for the purposes of undertaking this agreement, each such entity acknowledges and hereby affirmatively represents and agrees that the respective rights, duties and liabilities of each hereunder shall be governed by the laws of the State of New York, including but not limited to the New York Partnership Law.

ARTICLE 28. SECURITY AND CONFIDENTIALITY OF INFORMATION.

Information received as part of this AGREEMENT shall be considered Confidential Information. The CONSULTANT warrants that it will take the appropriate steps as to its personnel, agents, officers and any SUBCONTRACTOR/SUBCONSULTANTS regarding the obligations arising under this clause to insure such confidentiality. The CONSULTANT shall have written policies and/or business procedures in place which will protect Confidential Information from unauthorized disclosure, use, access, loss, alteration or destruction. The CONSULTANT may disclose to other parties, as authorized by the NYSDOT Project Manager, or as described in the scope of services, only the information necessary to perform services under this AGREEMENT. However, the CONSULTANT shall in no circumstance, communicate with the public or news media without prior authorization from the States designee. Neither shall the CONSULTANT disclose information deemed confidential by the State nor shall the CONSULTANT disclose any other information obtained or developed in the performance of services under this agreement without the written authorization of the State. This warranty shall survive termination of this AGREEMENT.
The CONSULTANT shall comply with the provisions of the New York State Information Security Breach and Notification Act, including General Business Law Section §889-aa and State Technology Law §208 as enacted by such Act or subsequently amended. In the event of an information security breach resulting in the unauthorized disclosure of personal information, CONSULTANT shall be liable for the costs associated with such breach if caused by CONSULTANT's negligent or willful acts or omissions, or the negligent or willful acts or omissions of the CONSULTANT's agents, officers, employees or SUBCONSULTANTS.

ARTICLE 29. VENDOR RESPONSIBILITY.

The Department of Transportation has undertaken an affirmative review of the proposed CONSULTANT's responsibility in accordance with the applicable standards outlined in Comptroller's Bulletin No. G-221, and based upon such review, reasonable assurance that the proposed contractor is responsible has been determined.

ARTICLE 30. CONSULTANT DISCLOSURE LEGISLATION.

In accordance with Chapter 10 of the Laws of 2006, the CONSULTANT shall complete the "State Consultant Services Contractor's Annual Employment Report" (Form B, Attachment 1) and submit copies to the Office of the State Comptroller, the Department of Civil Service, and the Department of Transportation on or before May15th of each year the AGREEMENT is in effect. The CONSULTANT shall provide information regarding all employees providing service under this AGREEMENT, whether employed by the CONSULTANT or any subconsultant or subcontractor. Annual employment reports should be submitted to the following addresses. It is recommended, however, that consultants check the agency websites annually to confirm the addresses.

By mail:

**NYS Office of the State Comptroller**
Bureau of Contracts
110 State Street, 11th Floor
Albany, NY 12236
**Attn:** Consultant Reporting

**NYS Department of Civil Service**
Alfred E. Smith Building
Albany, NY 12239
**Attn:** Chapter 10

**NYS Department of Transportation**
50 Wolf Road, Suite 1CM
Albany, NY 12232
**Attn:** Chapter 10
ARTICLE 31. NOTICES.

Item 1. All notices permitted or required hereunder shall be in writing and shall be transmitted either:

(a) via certified or registered United States mail, return receipt requested;
(b) by facsimile transmission;
(c) by personal delivery;
(d) by expedited delivery service; or
(e) by e-mail.

Such notices shall be addressed as follows or to such different addresses as the parties may from time-to-time designate:

New York State Department of Transportation:

Contact Person’s Name: Mr. William A. Howe (Contract #C030867)
Title: Director
Address: NYSDOT Contract Management, 50 Wolf Road, Suite ICM, Albany, NY 12232
Telephone Number: 518-457-2600
Facsimile Number: 518-457-2875
E-Mail Address: whowe@dot.state.ny.us

Consultant’s Name: LEICA GEOSYSTEMS INC.
Contact Person’s Name: Andrew Hurley
Title: Business Manager Survey & Engineering—NAFTA Region
Address: 5051 Peachtree Corners Circle, Suite 250, Norcross, Georgia 30092
Telephone Number: 800-367-453 ext 1551
Cell phone: 404-493-0895
Facsimile Number: 770-447-0710
E-Mail Address: Andrew.hurley@leicaus.com

Item 2. Any such notice shall be deemed to have been given either at the time of personal delivery or, in the case of expedited delivery service or certified or registered United States mail, as of the date of first attempted delivery at the address and in the manner provided herein, or in the case of facsimile transmission or email, upon receipt.

Item 3. The parties may, from time to time, specify any new or different address in the United States as their address for purpose of receiving notice under this Agreement by giving fifteen (15) days written notice to the other party sent in accordance herewith. The parties agree to mutually designate individuals as their respective representatives for the purposes of receiving notices under this Agreement. Additional individuals may be designated in writing by the parties for purposes of implementation and administration/billing, resolving issues and problems and/or for dispute resolution.
IN WITNESS WHEREOF, this Contract No. C030867 has been executed by the STATE, acting by and through the Commissioner of Transportation, and the CONSULTANT has duly executed this agreement effective the day and year first above written.

In addition to the acceptance of this Agreement, the Department also certifies that original copies of this signature page will be attached to all other exact copies of this Agreement.

RECOMMENDED BY  

[Signature]

DATE: 09-08-10

FOR THE PEOPLE OF THE STATE OF NEW YORK  

By:  

[Signature]

DATE: 9/8/10

CONSULTANT Certifications: I certify that all the information with respect to the “Vendor Responsibility Questionnaire” submitted by LEICA GEOSYSTEMS INC. on the 21st day of May, 2010 pursuant to the requirements set forth in OSC Bulletin G-221 is complete true and accurate. I additionally certify nothing has occurred since the date of that submission that would result in requiring a change or alteration to any of the answers provided on the “Vendor Responsibility Questionnaire” submitted that date.

I certify that all information provided to the STATE with respect to the requirements contained in State Finance Laws 139j & 139k is complete, true and accurate.

By  

[Signature]

Date: 8/26/10

LEICA GEOSYSTEMS INC.

LAND SURVEY EQUIPMENT SERVICES FOR NYS DOT

APPROVALS

ATTORNEY GENERAL

[Signature]

APPROVED AS TO FORM NYS ATTORNEY GENERAL

SEP 14 2010

[Signature]

ASSOCIATE ATTORNEY

THOMAS P. DI NAPOLI

STATE COMPTROLLER

By  

[Signature]

APPROVED

DEPT. OF AUDIT & CONTROL

SEP 28 2010

[Signature]

FOR THE STATE COMPTROLLER
Acknowledgement for Contract #C030867

For contracts signed in New York State

State of New York   
County of           

On the ______ day of _________ in the year 20___, before me the undersigned, personally appeared ____________________, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

______________________________
NOTARY PUBLIC

My Commission Expires:

For contracts signed outside New York State

State of Georgia        
County of Hall          

On the 26th day of August in the year 2010 before me, the undersigned, personally appeared Ken Moodyman, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument, and that such individual made such appearance before the undersigned in Norcross, GA (insert the city or other political subdivision and the state or country or other place the acknowledgement was taken).

______________________________
Kristin K. Cheek
NOTARY PUBLIC

______________________________
(Signature and office of individual taking acknowledgement.)
My Commission Expires: 9/10/13
EXHIBIT A

It is the policy of New York State to maximize opportunities for the participation of New York State business enterprises, including minority and women-owned business enterprises as proposers, subcontractors and suppliers on its procurement contracts.

Information on the availability of New York State subcontractors and suppliers is available from:

NYS Department of Economic Development
Division for Small Business
30 South Pearl St -- 7th Floor
Albany, New York 12245
Telephone: 518-292-5220
Fax: 518-292-5884
http://www.empire.state.ny.us

A directory of certified minority and women-owned business enterprises is available from:

NYS Department of Economic Development
Division of Minority and Women's Business Development
30 South Pearl St -- 2nd Floor
Albany, New York 12245
Telephone: 518-292-5250
Fax: 518-292-5803
http://www.empire.state.ny.us

Proposers located in foreign countries are hereby notified that New York State may seek to obtain and assign or otherwise transfer offset credits created by this procurement contract to third parties located in New York State. The successful contractor shall agree to cooperate with the State in efforts to get foreign countries to recognize offset credits created by the procurement contract.

The Omnibus Procurement Act requires that by signing this bid proposal, contractors certify that whenever the total bid amount is greater than $1 million:

1. The successful contractor shall document efforts to encourage the participation of New York State Business Enterprises as suppliers and subcontractors on this project, and has retained the documentation of these efforts to be provided upon request to the State.

2. Documented efforts by a successful contractor shall consist of and be limited to showing that such contractor has:
   a. Solicited bids, in a timely and adequate manner, from New York State business enterprises including certified minority and women-owned business, or
   b. Contacted the New York State Department of Economic Development to obtain listings of New York State business enterprises, or
   c. Placed notices for subcontractors and suppliers in newspapers, journals and other trade publications distributed in New York State, or
   d. Participated in bidder outreach conferences.
   e. If the contractor determines that New York State business enterprises are not available to participate on the contract as subcontractors or suppliers, the contractor shall provide a statement indicating the method by which such determination was made.
   f. If the contractor does not intend to use subcontractors on the contract, the contractor shall provide a statement verifying such intent.
3. The contractor has complied with the Federal Equal Opportunity Act of 1972 (P.L. 92-261), as amended;

4. The contractor agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this project through listing any such positions with the Community Services Division of the New York State Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The contractor agrees to document these efforts and to provide said documentation to the State upon request.

Bidders are hereby notified that if their principal place of business is located in a state that penalizes New York State vendors, and if the goods or services they offer will be substantially produced or performed outside New York State, the Omnibus Procurement Act 1994 amendments (Chapter 684, Laws of 1994) require that they be denied placement on bidders mailing lists and contracts for which they would otherwise obtain. Bidders of construction services must be denied the award of a contract if their principal place of business is located in a state that discriminates or imposes a preference against New York State firms.

A current list of states which penalize New York State firms is available from the office letting this contract, or from the Procurement Assistance Unit, NYS Department of Economic Development, Albany NY (518-292-5224).

Last Updated: Monday, April 27, 2010
APPENDIX A
STANDARD CLAUSES FOR NYS CONTRACTS

The parties to the attached contract, license, lease, amendment or other agreement of any kind (hereinafter, "the contract" or "this contract") agree to be bound by the following clauses which are hereby made a part of the contract (the word "Contractor" herein refers to any party other than the State, whether a contractor, licensor, licensee, lessee or any other party):

1. EXECUTORY CLAUSE. In accordance with Section 41 of the State Finance Law, the State shall have no liability under this contract to the Contractor or to anyone else beyond funds appropriated and available for this contract.

2. NON-ASSIGNMENT CLAUSE. In accordance with Section 138 of the State Finance Law, this contract may not be assigned by the Contractor or its right, title or interest therein assigned, transferred, conveyed, sublet or otherwise disposed of without the previous consent, in writing, of the State and any attempts to assign the contract without the State's written consent are null and void. The Contractor may, however, assign its right to receive payment without the State's prior written consent unless this contract concerns Certificates of Participation pursuant to Article 5-A of the State Finance Law.

3. COMPTROLLER'S APPROVAL. In accordance with Section 112 of the State Finance Law (or, if this contract is with the State University or City University of New York, Section 355 or Section 6218 of the Education Law), if this contract exceeds $15,000 (or the minimum thresholds agreed to by the Office of the State Comptroller for certain S.U.N.Y. and C.U.N.Y. contracts), or if this is an amendment for any amount to a contract which, as so amended, exceeds said statutory amount, or if by this contract, the State agrees to give something other than money when the value or reasonably estimated value of such consideration exceeds $10,000, it shall not be valid, effective or binding upon the State until it has been approved by the State Comptroller and filed in his office. Comptroller's approval of contracts let by the Office of General Services is required when such contracts exceed $30,000 (State Finance Law Section 163.6.a).

4. WORKERS' COMPENSATION BENEFITS. In accordance with Section 142 of the State Finance Law, this contract shall be void and of no force and effect unless the Contractor shall provide and maintain coverage during the life of this contract for the benefit of such employees as are required to be covered by the provisions of the Workers' Compensation Law.

5. NON-DISCRIMINATION REQUIREMENTS. To the extent required by Article 15 of the Executive Law (also known as the Human Rights Law) and all other State and Federal statutory and constitutional non-discrimination provisions, the Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, national origin, sexual orientation, age, disability, genetic predisposition or carrier status, or marital status. Furthermore, in accordance with Section 220-e of the Labor Law, if this is a contract for the construction, alteration or repair of any public building or public work or for the manufacture, sale or distribution of materials, equipment or supplies, and to the extent that this contract shall be performed within the State of New York, Contractor agrees that neither it nor its subcontractors shall, by reason of race, creed, color, disability, sex, or national origin: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this contract. If this is a building service contract as defined in Section 230 of the Labor Law, then, in accordance with Section 239 thereof, Contractor agrees that neither it nor its subcontractors shall by reason of race, creed, color, national origin, age, sex or disability: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this contract. Contractor is subject to fines of $50.00 per person per day for any violation of Section 220-e or Section 239 as well as possible termination of this contract and forfeiture of all moneys due hereunder for a second or subsequent violation.

6. WAGE AND HOURS PROVISIONS. If this is a public work contract covered by Article 8 of the Labor Law or a building service contract covered by Article 9 thereof, neither Contractor's employees nor the employees of its subcontractors may be required or permitted to work more than the number of hours or days stated in said statutes, except as otherwise provided in the Labor Law and as set forth in prevailing wage and supplement schedules issued
by the State Labor Department. Furthermore, Contractor and its subcontractors must pay at least the prevailing wage rate and pay or provide the prevailing supplements, including the premium rates for overtime pay, as determined by the State Labor Department in accordance with the Labor Law.

7. NON-COLLUSIVE BIDDING CERTIFICATION. In accordance with Section 139-d of the State Finance Law, if this contract was awarded based upon the submission of bids, Contractor affirms, under penalty of perjury, that its bid was arrived at independently and without collusion aimed at restricting competition. Contractor further affirms that, at the time Contractor submitted its bid, an authorized and responsible person executed and delivered to the State a non-collusive bidding certification on Contractor's behalf.

8. INTERNATIONAL BOYCOTT PROHIBITION. In accordance with Section 220-f of the Labor Law and Section 139-h of the State Finance Law, if this contract exceeds $5,000, the Contractor agrees, as a material condition of the contract, that neither the Contractor nor any substantially owned or affiliated person, firm, partnership or corporation has participated, is participating, or shall participate in an international boycott in violation of the federal Export Administration Act of 1979 (50 USC App. Sections 2401 et seq.) or regulations thereunder. If such Contractor, or any of the aforesaid affiliates of Contractor, is convicted or is otherwise found to have violated said laws or regulations upon the final determination of the United States Commerce Department or any other appropriate agency of the United States subsequent to the contract's execution, such contract, amendment or modification thereto shall be rendered forfeit and void. The Contractor shall so notify the State Comptroller within five (5) business days of such conviction, determination or disposition of appeal (2NYCRR 105.4).

9. SET-OFF RIGHTS. The State shall have all of its common law, equitable and statutory rights of set-off. These rights shall include, but not be limited to, the State's option to withhold for the purposes of set-off any moneys due to the Contractor under this contract up to any amounts due and owing to the State with regard to this contract, any other contract with any State department or agency, including any contract for a term commencing prior to the term of this contract, plus any amounts due and owing to the State for any other reason including, without limitation, tax delinquencies, fee delinquencies or monetary penalties relative thereto. The State shall exercise its set-off rights in accordance with normal State practices including, in cases of set-off pursuant to an audit, the finalization of such audit by the State agency, its representatives, or the State Comptroller.

10. RECORDS. The Contractor shall establish and maintain complete and accurate books, records, documents, accounts and other evidence directly pertinent to performance under this contract (hereinafter, collectively, "the Records"). The Records must be kept for the balance of the calendar year in which they were made and for six (6) additional years thereafter or three (3) years after final payment, whichever is later. The State Comptroller, the Attorney General and any other person or entity authorized to conduct an examination, as well as the agency or agencies involved in this contract, shall have access to the Records during normal business hours at an office of the Contractor within the State of New York or, if no such office is available, at a mutually agreeable and reasonable venue within the State, for the term specified above for the purposes of inspection, auditing and copying. The State shall take reasonable steps to protect from public disclosure any of the Records which are exempt from disclosure under Section 87 of the Public Officers Law (the "Statute") provided that: (i) the Contractor shall timely inform an appropriate State official, in writing, that said records should not be disclosed; and (ii) said records shall be sufficiently identified; and (iii) designation of said records as exempt under the Statute is reasonable. Nothing contained herein shall diminish, or in any way adversely affect, the State's right to discovery in any pending or future litigation.

11. IDENTIFYING INFORMATION AND PRIVACY NOTIFICATION.
(a) FEDERAL EMPLOYER IDENTIFICATION NUMBER and/or FEDERAL SOCIAL SECURITY NUMBER. All invoices or New York State standard vouchers submitted for payment for the sale of goods or services or the lease of real or personal property to a New York State agency must include the payee's identification number, i.e., the seller's or lessor's identification number. The number is either the payee's Federal employer identification number or Federal social security number, or both such numbers when the payee has both such numbers. Failure to include this number or numbers may delay payment. Where the payee does not have such number or numbers, the payee, on its invoice or New York State standard voucher, must give the reason or reasons why the payee does not have such number or numbers.

(b) PRIVACY NOTIFICATION. (1) The authority to request the above personal information from a seller of goods or services or a lessor of real or personal property, and the authority to maintain such information, is found in Section 5 of the State Tax Law. Disclosure of this information by the seller or lessor to the State is mandatory. The
principal purpose for which the information is collected is to enable the State to identify individuals, businesses and others who have been delinquent in filing tax returns or may have understated their tax liabilities and to generally identify persons affected by the taxes administered by the Commissioner of Taxation and Finance. The information will be used for tax administration purposes and for any other purpose authorized by law.

(2) The personal information is requested by the purchasing unit of the agency contracting to purchase the goods or services or lease the real or personal property covered by this contract or lease. The information is maintained in New York State’s Central Accounting System by the Director of Accounting Operations, Office of the State Comptroller, 110 State Street, Albany, New York 12236.

12. **EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITIES AND WOMEN.** In accordance with Section 312 of the Executive Law, if this contract is: (i) a written agreement or purchase order instrument, providing for a total expenditure in excess of $25,000.00, whereby a contracting agency is committed to expend or does expend funds in return for labor, services, supplies, equipment, materials or any combination of the foregoing, to be performed for, or rendered or furnished to the contracting agency; or (ii) a written agreement in excess of $100,000.00 whereby a contracting agency is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon; or (iii) a written agreement in excess of $100,000.00 whereby the owner of a State assisted housing project is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon for such project, then:

(a) The Contractor will not discriminate against employees or applicants for employment because of race, creed, color, national origin, sex, age, disability or marital status, and will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination. Affirmative action shall mean recruitment, employment, job assignment, promotion, upgradings, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation;

(b) at the request of the contracting agency, the Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the contractor's obligations herein; and

(c) the Contractor shall state, in all solicitations or advertisements for employees, that, in the performance of the State contract, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

Contractor will include the provisions of "a", "b", and "c" above, in every subcontract over $25,000.00 for the construction, demolition, replacement, major repair, renovation, planning or design of real property and improvements thereon (the "Work") except where the Work is for the beneficial use of the Contractor. Section 312 does not apply to: (i) work, goods or services unrelated to this contract; or (ii) employment outside New York State; or (iii) banking services, insurance policies or the sale of securities. The State shall consider compliance by a contractor or subcontractor with the requirements of any federal law concerning equal employment opportunity which effectuates the purpose of this section. The contracting agency shall determine whether the imposition of the requirements of the provisions hereof duplicate or conflict with any such federal law and if such duplication or conflict exists, the contracting agency shall waive the applicability of Section 312 to the extent of such duplication or conflict. Contractor will comply with all duly promulgated and lawful rules and regulations of the Empire State Development Corporation’s Division of Minority and Women's Business Development (MWBD) pertaining hereto.

13. **CONFLICTING TERMS.** In the event of a conflict between the terms of the contract (including any and all attachments thereto and amendments thereof) and the terms of this Appendix A, the terms of this Appendix A shall control.

14. **GOVERNING LAW.** This contract shall be governed by the laws of the State of New York except where the Federal supremacy clause requires otherwise.

15. **LATE PAYMENT.** Timeliness of payment and any interest to be paid to Contractor for late payment shall be governed by Article 11-A of the State Finance Law to the extent required by law.
16. **NO ARBITRATION.** Disputes involving this contract, including the breach or alleged breach thereof, may not be submitted to binding arbitration (except where statutorily authorized), but must, instead, be heard in a court of competent jurisdiction of the State of New York.

17. **SERVICE OF PROCESS.** In addition to the methods of service allowed by the State Civil Practice Law & Rules ("CPLR"), Contractor hereby consents to service of process upon it by registered or certified mail, return receipt requested. Service hereunder shall be complete upon Contractor's actual receipt of process or upon the State's receipt of the return thereof by the United States Postal Service as refused or undeliverable. Contractor must promptly notify the State, in writing, of each and every change of address to which service of process can be made. Service by the State to the last known address shall be sufficient. Contractor will have thirty (30) calendar days after service hereunder is complete in which to respond.

18. **PROHIBITION ON PURCHASE OF TROPICAL HARDWOODS.** The Contractor certifies and warrants that all wood products to be used under this contract award will be in accordance with, but not limited to, the specifications and provisions of State Finance Law §165. (Use of Tropical Hardwoods) which prohibits purchase and use of tropical hardwoods, unless specifically exempted, by the State or any governmental agency or political subdivision or public benefit corporation. Qualification for an exemption under this law will be the responsibility of the contractor to establish to meet with the approval of the State.

In addition, when any portion of this contract involving the use of woods, whether supply or installation, is to be performed by any subcontractor, the prime Contractor will indicate and certify in the submitted bid proposal that the subcontractor has been informed and is in compliance with specifications and provisions regarding use of tropical hardwoods as detailed in §165 State Finance Law. Any such use must meet with the approval of the State; otherwise, the bid may not be considered responsive. Under bidder certifications, proof of qualification for exemption will be the responsibility of the Contractor to meet with the approval of the State.

19. **MACBRIDE FAIR EMPLOYMENT PRINCIPLES (APPLICABLE ONLY IN NON-FEDERAL AID NEW YORK STATE CONTRACTS).** In accordance with the MacBride Fair Employment Principles (Chapter 807 of the Laws of 1992), the Contractor hereby stipulates that the Contractor either (a) has no business operations in Northern Ireland, or (b) shall take lawful steps in good faith to conduct any business operations in Northern Ireland in accordance with the MacBride Fair Employment Principles (as described in Section 165 of the New York State Finance Law), and shall permit independent monitoring of compliance with such principles.

20. **OMNIBUS PROCUREMENT ACT OF 1992 (APPLICABLE ONLY IN NON-FEDERAL AID NEW YORK STATE CONTRACTS).** It is the policy of New York State to maximize opportunities for the participation of New York State business enterprises, including minority and women-owned business enterprises as bidders, subcontractors and suppliers on its procurement contracts.

Information on the availability of New York State subcontractors and suppliers is available from:

NYS Department of Economic Development
Division for Small Business
30 South Pearl St -- 7th Floor
Albany, New York 12245
Telephone: 518-292-5220

A directory of certified minority and women-owned business enterprises is available from:

NYS Department of Economic Development
Division of Minority and Women's Business Development
30 South Pearl St -- 2nd Floor
Albany, New York 12245
http://www.empire.state.ny.us

The Omnibus Procurement Act of 1992 requires that by signing this bid proposal or contract, as applicable, Contractors certify that whenever the total bid amount is greater than $1 million:
(a) The Contractor has made reasonable efforts to encourage the participation of New York State Business Enterprises as suppliers and subcontractors, including certified minority and women-owned business enterprises, on this project, and has retained the documentation of these efforts to be provided upon request to the State;

(b) The Contractor has complied with the Federal Equal Opportunity Act of 1972 (P.L. 92-261), as amended;

(c) The Contractor agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this project through listing any such positions with the Job Service Division of the New York State Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The Contractor agrees to document these efforts and to provide said documentation to the State upon request; and

(d) The Contractor acknowledges notice that the State may seek to obtain offset credits from foreign countries as a result of this contract and agrees to cooperate with the State in these efforts.

21. RECIPROCITY AND SANCTIONS PROVISIONS (APPLICABLE ONLY IN NON-FEDERAL AID NEW YORK STATE CONTRACTS). Bidders are hereby notified that if their principal place of business is located in a country, nation, province, state or political subdivision that penalizes New York State vendors, and if the goods or services they offer will be substantially produced or performed outside New York State, the Omnibus Procurement Act 1994 and 2000 amendments (Chapter 684 and Chapter 383, respectively) require that they be denied contracts which they would otherwise obtain. NOTE: As of May 15, 2002, the list of discriminatory jurisdictions subject to this provision includes the states of South Carolina, Alaska, West Virginia, Wyoming, Louisiana and Hawaii. Contact NYS Department of Economic Development for a current list of jurisdictions subject to this provision.

22. PURCHASES OF APPAREL. In accordance with State Finance Law 162 (4-a), the State shall not purchase any apparel from any vendor unable or unwilling to certify that: (i) such apparel was manufactured in compliance with all applicable labor and occupational safety laws, including, but not limited to, child labor laws, wage and hours laws and workplace safety laws, and (ii) vendor will supply, with its bid (or, if not a bid situation, prior to or at the time of signing a contract with the State), if known, the names and addresses of each subcontractor and a list of all manufacturing plants to be utilized by the bidder.

SPECIAL EQUAL EMPLOYMENT OPPORTUNITY PROVISIONS

Specific Equal Employment Opportunity Responsibilities

1. GENERAL

(a) Equal employment opportunity requirements not to discriminate and to take affirmative action to assure equal employment opportunity, as required by Federal Executive Order 11246, Federal Executive Order 11375, and NYS Executive Order 45, are set forth in required Contract Provisions (Form PR-1273 or 1316, as appropriate) and those Special Provisions which are imposed pursuant to Section 140 of Title 23, U.S.C., as established by Section 22 of the Federal-Aid Highway Act of 1968. Non-discrimination and affirmative action are also required by the State Labor Law, Section 220-e, as amended, and the Regulations of the NYS Department of Transportation relative to federally-assisted programs (Title 49, Code of Federal Regulations, Part 21 and Section 21.5), including employment practices when the agreement covers a program set forth in Appendix B of the Regulations. The requirements set forth in these Special Provisions shall constitute the specific affirmative action requirements for projects activities under this contract.

(b) The CONSULTANT will work with the STATE and the Federal Government in carrying out equal employment opportunity obligations and in their review of their activities under this contract.

(c) The CONSULTANT and all their sub-consultants and/or sub-contractors holding sub-contracts of $10,000 or more will comply with the following minimum specific requirements of equal employment opportunity: (The equal employment opportunity requirements of Executive Order 11246, as set forth in Volume 6, Chapter 4, Section 1, Subsection 1 of the Federal-Aid Highway Program Manual, are applicable to contractors and sub-contractors.) The CONSULTANT will include these requirements in every sub-contract with such modification of language as is necessary to make them binding on the sub-contractor.
2. EQUAL EMPLOYMENT OPPORTUNITY POLICY

The CONSULTANT, their sub-consultant and/or sub-contractor or any person acting on behalf of the CONSULTANT or sub-consultant and/or sub-contractor will accept as their operating policy the following statement which is designed to further the provision of equal employment opportunity to all persons without regard to their race, color, religion, sex, national origin, age, disability or marital status, and to promote the full realization of equal employment opportunity through a positive continuing program.

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, or during consideration for employment, without regard to their race, religion, sex, or color, national origin, age, disability or marital status. Such non-discriminatory action shall include, but not be limited to: employment, job assignment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

3. EQUAL EMPLOYMENT OPPORTUNITY OFFICER

The CONSULTANT will designate and make known to the New York State Department of Transportation contracting officers an Equal Employment Opportunity Officer and a Minority Business Enterprise officer (hereinafter referred to as the EEO Officer and M.B.E. Officer) who will have the responsibility for and must be capable of effectively administering and promoting an active equal employment opportunity program and who must be assigned adequate authority and responsibility to do so.

4. DISSEMINATION OF POLICY

(a) All members of the CONSULTANT's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the CONSULTANT's equal employment opportunity policy and contractual responsibilities to provide equal employment opportunity in each grade and classification of employment. To insure that the above agreement will be met, the following actions will be taken as a minimum:

(1) Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less than once every six months, at which time the CONSULTANT's equal employment opportunity policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.
(2) All new supervisory (first level of supervision and above) or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable company official covering all major aspects of the CONSULTANT's equal employment opportunity obligations within thirty days following their reporting for duty with the CONSULTANT.
(3) All personnel who are engaged in direct recruitment for the project will be instructed in the CONSULTANT's procedures for locating and hiring minority group employees by the EEO Officer or appropriate company official. (Minority group referred to herein shall mean Black, Hispanic, Asian/Pacific Islander, American Indian/Alaskan.)

(b) In order to make the CONSULTANT's equal employment opportunity policy known to all employees, prospective employees and potential sources or employees, i.e., schools, employment agencies, labor unions (where appropriate), college placement officers, etc., the CONSULTANT will take the following actions:

(1) Notices and posters setting forth the CONSULTANT'S equal employment opportunity policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
(2) The CONSULTANT's equal employment opportunity policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
(c) In all solicitations either by competitive bidding or negotiation made by the CONSULTANT for work to be performed under a sub-contract, including procurements of materials or equipment, each potential sub-
contractor or supplier shall be notified by the CONSULTANT of the CONSULTANT's obligations under this agreement and the Regulations relative to non-discrimination.

5. RECRUITMENT

(a) When advertising for employees, the CONSULTANT will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be published in newspapers or other publications having a large circulation among minority groups in the area from which the project work force would normally be derived. These advertisements shall state that all qualified applicants will be afforded equal employment opportunity without regard to race, religion, sex, color, national origin, age, disability or marital status.

(b) The CONSULTANT will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants, including, but not limited to, State employment agencies, schools, colleges and minority group organizations. To meet this requirement, the CONSULTANT's EEO Officer will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the CONSULTANT for employment consideration.

In the event the CONSULTANT has a valid bargaining agreement providing for exclusive hiring hall referrals, the CONSULTANT is expected to observe the provisions of that agreement to the extent that the system permits the CONSULTANT's compliance with equal employment opportunity contract provisions. (The U.S. Department of Labor has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the CONSULTANT to do the same, such implementation violates Executive Order 11246.

(c) The CONSULTANT will encourage present employees to refer minority group applicants for employment by posting appropriate notices or bulletins in areas accessible to all such employees. In addition, information and procedures with regard to referring minority group applicants will be discussed with employees.

6. PERSONNEL ACTIONS

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age, disability or marital status. The following procedures shall be followed:

(a) The CONSULTANT will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

(b) The CONSULTANT will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory practices.

(c) The CONSULTANT will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the CONSULTANT will promptly take corrective action. If the review indicated that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

(d) The CONSULTANT will promptly investigate all complaints of alleged discrimination made in connection with obligations under this agreement, will attempt to resolve such complaints, and will take appropriate corrective action within 15 days. All subsequent corrective actions or decisions will also be documented and forwarded to the NYS Department of Transportation Compliance Officer within 7 days after such action has taken place. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the CONSULTANT will inform every complainant of the results and all of their avenues of appeal should the complaint be denied.
7. TRAINING AND PROMOTION

(a) The CONSULTANT will assist in locating, qualifying and increasing the skills of minority group and women employees, and applicants for employment.

(b) Consistent with the CONSULTANT’s work force requirements and as permissible under the Federal and State regulations, the CONSULTANT shall make full use of training programs; i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance. In the event the Training Special Provision is provided under this contract, this subparagraph is superseded thereby.

(c) The CONSULTANT will advise employees and applicants for employment of available training programs and entrance requirements for each.

(d) The CONSULTANT will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

8. UNIONS

If the CONSULTANT relies in whole or in part upon unions as a source of employees, the CONSULTANT will use their best effort to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and, to effect referrals by such unions of minority and female employees. The CONSULTANT will send to each labor union or representative of workers with which he has or is bound by a collective bargaining or other agreement or understanding, a notice to be provided by the State Division of Human Rights, advising such labor union or representative of the CONSULTANT’s compliance and with the non-discrimination clauses. Actions by the CONSULTANT, either directly or through a CONSULTANT’s association acting as agent, will include the procedures set forth below:

(a) The CONSULTANT will use their best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

(b) The CONSULTANT will use their best efforts to incorporate an equal employment opportunity clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age, disability or marital status.

(c) The CONSULTANT is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union, and such labor union refuses to furnish such information to the CONSULTANT. The CONSULTANT shall so certify to the STATE and shall set forth what efforts have been made to obtain such information. Further, if the CONSULTANT was directed to do so by the contracting agency as part of the bid or negotiations of this contract, the CONSULTANT shall request such labor union or representative to furnish him with a written statement that such labor union or representative accepts the non-discrimination clauses and will affirmatively cooperate, within the limits of its legal and contractual authority, in the implementation of the policy and provisions of these non-discrimination clauses or that it consents and agrees that recruitment, employment and the terms and conditions of employment under this contract shall be in accordance with the purposes and provisions of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request that it furnish such a statement, the CONSULTANT shall promptly notify the State Division of Human Rights and set forth what efforts have been made to obtain such information.

(d) In the event the union is unable to provide the CONSULTANT with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the CONSULTANT will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age, disability or marital status, making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The U.S. Department of Labor has held that it shall be no excuse that the union with which the CONSULTANT has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the
CONSULTANT from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such CONSULTANT shall immediately notify the New York State Department of Transportation.

9. **AFFIRMATIVE ACTION IN SUBCONTRACTING**

(a) The CONSULTANT will not discriminate on the grounds of race, religion, sex, color, national origin, age, disability or marital status in the selection of subcontractors, including procurements and leases of equipment.

(b) If the CONSULTANT determines to use a subcontractor as part of this agreement, affirmative action shall be taken to increase the participation of minority business firms in that work. As part of that affirmative action, the CONSULTANT will identify and contact minority business firms and solicit proposals for the work to be subcontracted. The STATE will provide a list of names of minority business firms to the CONSULTANT. Another source that should be contacted for a list of minority business firms is the Governor's Office of Minority & Women's Business Development (GOMWBD).

(c) The CONSULTANT will document the affirmative action steps taken to comply with paragraph 9b. Such documentation will be provided at the time or submittal of a formal proposal to the State's Contracts Bureau.

(d) By execution of this agreement, the CONSULTANT certifies that the affirmative action steps in 9a, 9b & 9c above were taken when soliciting proposals for the work in this agreement indicated to be subcontracted and that these steps will be taken should any work be subcontracted in the future.

(e) The CONSULTANT will insure binding subcontractor and vendor compliance with their EEO obligations. The CONSULTANT will take such actions in enforcing such provisions of such subcontract or purchase order as the contracting agency may direct, including sanctions or remedies for noncompliance. If the CONSULTANT becomes involved in or is threatened with litigation with a subcontractor or a vendor as a result of such direction by the contracting agency, the CONSULTANT shall promptly so notify the Attorney General, requesting him to intervene and protect the interest of the State of New York.

10. **RECORDS AND REPORTS**

(a) The CONSULTANT will keep such records as are necessary to determine compliance with the CONSULTANT's equal employment opportunity obligations. The records kept by the CONSULTANT will be designed to indicate:

1. The number of minority and non-minority group members and women employed in each work classification on the project, where required by the NYS D.O.T Compliance Officer.

2. The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women (applicable only to CONSULTANTS who rely in whole or in part on unions as a source of their work force).

3. The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees.

4. The progress and efforts being made in securing the services of minority group subcontractors or subcontractors with meaningful minority and female representation among their employees.

5. Compliance with all other requirements in these provisions such as meetings, instructions, employment efforts, etc.

(b) The CONSULTANT will comply with Sections 291-299 of the Executive Law and Civil Rights Law and will provide all information and reports required by the Regulations, or orders and instructions issued pursuant thereto, and will permit access to its books, records, accounts other sources of information, and its
facilities as may be determined by State or Federal officials to be pertinent to ascertain compliance with such Regulations, orders and instructions. All such records must be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the State and the Federal Highway Administration.

(c) The CONSULTANT will submit to the New York State Department of Transportation, a monthly report Form (AAP-46) for the first three months after beginning work, thereafter upon request, indicating the number of minority, women and non-minority group employees currently engaged in each work classification required by the contract work.

(d) Failure to comply with these Special EEO Provisions may be considered unsatisfactory performance and may subject the agreement to termination under the termination article of this agreement. Non-compliance may result in the CONSULTANT's being declared ineligible for future agreements made by or on behalf of the STATE or a public authority or agency of the STATE, until he satisfies the State Commissioner of Human Rights that he has established and is carrying out a program in conformity with the provisions of these non-discrimination clauses. Such finding shall be made by the State Commissioner of Human Rights after conciliation efforts by the State Division of Human Rights have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the State Division of Human Rights, notice thereof has been given to the CONSULTANT and an opportunity has been afforded them to be heard publicly before the State Commissioner of Human Rights or official designee. Such sanctions may be imposed and remedies invoked independently of or in addition to sanctions and remedies otherwise provided for by law. These may include, but are not limited to:

(1) withholding of payments to the CONSULTANT under the agreement until the CONSULTANT complies, and/or

(2) cancellation, termination or suspensions of the agreement in whole or in part.

11. TRAINING SPECIAL PROVISIONS

This Training Special Provision supersedes paragraph 7.b above and is in implementation of 23 CFR Subpart A, Section 230.111 & Executive Order 11246.

As part of the CONSULTANT's equal employment opportunity affirmative action program training shall be provided as follows:

The CONSULTANT shall provide on-the-job training aimed at developing full competence in the job classification involved.

The number of months of training to be provided under these special provisions is previously stated in Article II.

In the event that the CONSULTANT subcontracts a portion of the contract work, it shall be determined how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the CONSULTANT shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The CONSULTANT shall also insure that this training special provision is made applicable to such subcontract.

The number of trainees shall be distributed among the work classifications on the basis of the CONSULTANT's needs. Along with their proposal, the CONSULTANT shall submit to the New York State Department of Transportation for approval the proposed number of trainees to be trained in each selected classification, their estimated salaries and a training schedule. The salaries to be paid trainees shall not be less that 75 percent of the average hourly rate approved in the agreement for the classification to be trained. During the period from the beginning of the project to its completion, the trainee shall receive reasonable salary increases commensurate to the abilities and effort exerted by the trainee. The training schedule required should indicate the start of work and appropriate incremental salary steps in accord with the above.
Training and upgrading the proficiency of minorities and women is a primary objective of this Training Special Provision. Accordingly, the CONSULTANT shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The CONSULTANT will be responsible for demonstrating the steps that have been taken in pursuance thereof, prior to a determination as to whether the CONSULTANT is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training program or in a classification in which they have been employed. The CONSULTANT should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the CONSULTANT's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training schedule developed by the CONSULTANT and approved by the State and Federal Highway Administration. The State and the Federal Highway Administration shall approve a program if it reasonably calculated to meet the equal employment opportunity obligations of the CONSULTANT and to assist in qualifying the average trainee toward proficiency in the classification concerned by the end of the training period. Approval of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. Training is permissible in lower level management positions. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

The CONSULTANT will be reimbursed for the cost of any and all training under the payment terms of this agreement. This can include offsite training cost as discussed above. All offsite training must be defined in the training schedule. All costs claimed or calculated for training must be directly related to the work defined in the scope of this agreement and/or added by supplemental agreement.

The CONSULTANT must demonstrate their best efforts and evidence good faith in hiring trainees for positions in the classification in which they have completed training.

The CONSULTANT shall furnish the trainee a copy of the program they will follow in the training. The CONSULTANT shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The CONSULTANT will provide for the maintenance of records and furnish periodic reports documenting their performance under this Training Special Provision.
APPENDIX B

REQUIREMENTS FOR FEDERALLY AIDED TRANSPORTATION PROJECTS

There is a substantial body of requirements attached to the use of Federal highway or transportation aid. These requirements create or overlay processes, procedures, documentation requirements, authorizations, approvals and certifications that may be substantially greater or different from those that are not funded with Federal-aid and proceed under applicable State and local laws, customs and practices. Under Title 23 of the United States Code, NYS DOT is responsible for the administration of transportation projects in New York State to which NYS DOT provides Federal highway or transportation-related aid. Through this Agreement, which provides or is associated with such funding, NYS DOT delegates various elements of project and funding administration as described elsewhere in this Agreement. In undertaking a Federally aided project, the Municipality/Sponsor, Authority or Project Manager designated under this Agreement with Federal-aid funding or project administration undertakes to proceed in compliance with all the applicable Federal-aid requirements.

NYS DOT has, in cooperation with FHWA, assembled the body of Federal-aid requirements, together with information, NYS DOT procedures and practices in its A Procedures for Locally Administered Federal-Aid Projects available through NYS DOT's website at: https://www.nysdot.gov/portal/page/portal/divisions/operating/opdm/community-assistance-delivery-bureau/locally-administered-federal-aid-projects. In addition, the Municipality/Sponsor, Authority or Project Manager designated under this Agreement with Federal-aid funding or project administration that enters Federally aided project construction contracts is required to physically incorporate into all its Federally aided construction contracts and subcontracts there under the provisions that are contained in Form FHWA-1273 (available from NYS DOT or electronically at: http://www.fhwa.dot.gov/programadmin/contracts/1273.htm).

In addition to the referenced requirements, the attention of Municipality/Sponsor hereunder is directed to the following requirements and information:

NON DISCRIMINATION/EEO/DBE REQUIREMENTS

The Municipality/Sponsor and its contractors agree to comply with Executive Order 11246, entitled "Equal Employment Opportunity" and Department of Transportation regulations (49 CFR Parts 21, 23, 25, 26 and 27) and the following:

1. **NON DISCRIMINATION.** No person shall, on the ground of race, color, creed, national origin, sex, age or handicap, be excluded from participation in, or denied the benefits of, or be subject to, discrimination under the Project funded through this Agreement.

2. **EQUAL EMPLOYMENT OPPORTUNITY.** In connection with the execution of this Agreement, the Municipality/Sponsor's contractors or subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, age, color, sex or national origin. Such contractors shall take affirmative actions to ensure that applicants are employed, and that employees are treated during their employment, without regard to their race, religion, color, sex, national origin or age. Such actions shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

3. **DISADVANTAGED BUSINESS ENTERPRISES.** In connection with the performance of this Agreement, the Municipality/Sponsor shall cause its contractors to cooperate with the State in meeting its commitments and goals with regard to the utilization of Disadvantaged Business Enterprises (DBEs) and will use its best efforts to ensure that DBEs will have opportunity to compete for subcontract work under this Agreement. Also, in this connection the Municipality or Sponsor shall cause its contractors to undertake such actions as may be necessary to comply with 49 CFR Part 26.

FEDERAL SINGLE AUDIT REQUIREMENTS

Non-Federal entities that expend $500,000 or more in a year in Federal awards from all sources are required to comply with the Federal Single Audit Act provisions contained in U.S. Office of Management and Budget (OMB)
Circular No. A-133, AAudits of States, Local Governments, and Non-Profit Organizations@. Non-Federal entities that expend Federal awards from a single source may provide a program specific audit, as defined in the Circular. Non-Federal entities that expend less than $500,000 in a year in Federal awards from all sources are exempt from Federal audit requirements for that year, except as noted in Sec. 215 (a) of OMB Circular A-133 Subpart B--Audits, records must be available for review or audit by appropriate officials of the cognizant Federal agency the New York State Department of Transportation, the New York State Comptroller’s Office and the U.S. Governmental Accountability Office (GAO).

Non-Federal entities are required to submit a copy of all audits, as described above, within 30 days of issuance of audit report, but no later than 9 months after the end of the entity’s fiscal year, to the New York State Department of Transportation, Contract Audit Bureau, 50 Wolf Road, Albany, NY 12232. Unless a time extension has been granted by the cognizant Federal Agency and has been filed with the New York State Department of Transportation’s Contract Audit Bureau, failure to comply with the requirements of OMB Circular A-133 may result in suspension or termination of federal award payments.

THE CATALOG OF FEDERAL DOMESTIC ASSISTANCE

The Catalog of Federal Domestic Assistance (CFDA), is an on-line database of all Federally-aided programs available to State, and local governments (including the District of Columbia); federally -recognized Indian tribal governments; Territories (and possessions) of the United States; domestic public, quasi-public, and private profit and nonprofit organizations and institutions; specialized groups; and individuals. The database is accessible at http://www.cfda.gov/.

THE CFDA IDENTIFICATION NUMBER

OMB Circular A-133 requires all Federal-aid recipients to identify and account for awards and expenditures by CFDA Number. The Municipality/Sponsor is required to identify in its accounts all Federal awards received and expended, and the Federal programs under which they were received. Federal program and award identification shall include, as applicable, the CFDA title and number, award number and year, name of the Federal agency, and name of the pass-through entity.

The most commonly used CFDA number for the Federal-aid Highway Planning and Construction program is 20.205. Additional CFDA numbers for other transportation and non-transportation related programs are:

20.215, Highway Training and Education
20.219, Recreational Trails Program
20.XXX, Highway Planning and Construction - Highways for LIFE;
20.XXX, Surface Transportation Research and Development;
20.500, Federal Transit-Capital Investment Grants
20.505, Federal Transit-Metropolitan Planning Grants
20.507, Federal Transit-Formula Grants
20.509, Formula Grants for Other Than Urbanized Areas
20.600, State and Community Highway Safety
23.003, Appalachian Development Highway System
23.008, Appalachian Local Access Roads

PROMPT PAYMENT MECHANISMS

(a) You must establish, as part of your DBE program, a contract clause to require prime contractors to pay subcontractors for satisfactory performance of their contracts no later than 7 calendar days from receipt of each payment you make to the prime contractor.

(b) You must ensure prompt and full payment of retainage from the prime contractor to the subcontractor within 7 calendar days after the subcontractor's work is satisfactorily completed. You must use one of the following methods to comply with this requirement:

---

¹The designated cognizant agency for audit shall be the Federal awarding agency that provides the predominant amount of direct funding to a recipient unless OMB changes it.
(1) You may decline to hold retainage from prime contractors and prohibit prime contractors from holding retainage from subcontractors.

(2) You may decline to hold retainage from prime contractors and require a contract clause obligating prime contractors to make prompt and full payment of any retainage kept by prime contractor to the subcontractor within 7 calendar days after the subcontractor's work is satisfactorily completed.

(3) You may hold retainage from prime contractors and provide for prompt and regular incremental acceptances of portions of the prime contract, pay retainage to prime contractors based on these acceptances, and require a contract clause obligating the prime contractor to pay all retainage owed to the subcontractor for satisfactory completion of the accepted work within 7 calendar days after your payment to the prime contractor.

(c) For purposes of this section, a subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished and documented as required by the recipient. When a recipient has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed.

(d) Your DBE program must provide appropriate means to enforce the requirements of this section. These means may include appropriate penalties for failure to comply, the terms and conditions of which you set. Your program may also provide that any delay or postponement of payment among the parties may take place only for good cause, with your prior written approval.

(e) You may also establish, as part of your DBE program, any of the following additional mechanisms to ensure prompt payment:

(1) A contract clause that requires prime contractors to include in their subcontracts language providing that prime contractors and subcontractors will use appropriate alternative dispute resolution mechanisms to resolve payment disputes. You may specify the nature of such mechanisms.

(2) A contract clause providing that the prime contractor will not be reimbursed for work performed by subcontractors unless and until the prime contractor ensures that the subcontractors are promptly paid for the work they have performed.

(3) Other mechanisms, consistent with this part and applicable state and local law, to ensure that DBEs and other contractors are fully and promptly paid.
Schedule A

LAND SURVEY EQUIPMENT SERVICES FOR NYSDOT

Scope of Services

A. Executive Summary

Overview

Leica Geosystems Inc. shall demonstrate a strong commitment in partnership with the New York State Department of Transportation. Leica Geosystems looks forward to having the opportunity to share new ideas, improvements and solutions for New York Department of Transportation throughout the duration of this project.

Leica Geosystems shall provide choices to the New York State Department of Transportation (at no additional charge). These choices are intended to allow the New York State Department of Transportation to best maximize the solutions basket on offer from Leica Geosystems to best fit the New York State Department of Transportation's application needs and workflows. It is important to point out that the choices on offer meet and exceed all technical specifications as outlined in Contract C030867.

Leica Geosystems has submitted two pricing options for consideration in Part II of this proposal. However, only Option 1 is included in this Agreement.

Option 1 – This pricing option is based on the specifications for the Total Stations, GNSS Receivers, Data Collectors & Software, Digital Levels, All Accessories, Office Software, Scanner and Accessories and Scanner Office Software complies and exceeds specifications.

THIS CONTRACT INCLUDES LEICA'S PROPOSED OPTION 1 ONLY.

Project Management Team

Upon the receipt of the New York State Department of Transportation RFP, Leica Geosystems formed a Project Team. This Project team was charged with reviewing the RFP, understanding the Scope of Services and schedule and the preparation of Leica Geosystems proposal. Additionally this team shall be responsible for executing the Agreement's scope of services.

The following Organizational chart shows the reporting relationships associated with the management and support of this contract.
The following table lists the key personnel and additional people that contributed to the development of this proposal along with the estimated time spent on the different tasks.

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Time Spent/Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Hurley</td>
<td>Business Manager S&amp;E</td>
<td>Proposal Preparation - 50 hrs</td>
</tr>
<tr>
<td>Shannon Hixon</td>
<td>Geomatics Product Manager</td>
<td>Reviewing Technical Spec. Survey – 6 hrs</td>
</tr>
<tr>
<td>Mike Harvey</td>
<td>Scanning (HDS) Product Manager</td>
<td>Reviewing Technical Spec. and Training Development Scanning – 6 hrs</td>
</tr>
<tr>
<td>Craig Martin</td>
<td>General Manager Eastern US</td>
<td>Consultative Role – 4hrs</td>
</tr>
<tr>
<td>Tony Wilson</td>
<td>Segement Sales Manager</td>
<td>Consultative Role – 4 hrs</td>
</tr>
<tr>
<td>Mark Williams</td>
<td>Geo Central Support</td>
<td>Training Development Consultative – 4 hrs</td>
</tr>
<tr>
<td>Ken Mooyman</td>
<td>President Leica Geosystems NAFTA</td>
<td>Consultative Role – 3hrs</td>
</tr>
<tr>
<td>Mark Gullans</td>
<td>CFO Leica Geosystems NAFTA</td>
<td>Consultative Role – 4 hrs</td>
</tr>
<tr>
<td>Collin Web</td>
<td>Legal Counsel</td>
<td>Consultative Role – Review Contracts, – 6 hrs</td>
</tr>
</tbody>
</table>

**About PM Team Members**

**Andrew Hurley**

Upon graduation from the Dublin Institute of Technology in Ireland in 1985 Andrew practiced Land Surveying for a firm in Boston, MA. His career then brought him to Saudi Arabia where he gained experience in Geodetic Surveying. From there he went to London England to work the area of Precision Construction Surveying. An opportunity come forth in the SW United Kingdom to work for a company utilizing early generation GPS equipment for control/photogrammetric control and highway mapping projects. In 1994 Andrew joined Leica Geosystems as a Technical Support Engineer for GPS. He is currently the NAFTA Business Manager for Survey & Engineering

**Michael Harvey**

Upon graduation from the Wentworth Institute of Technology in Boston, MA in 1994, Mike practiced Land Surveying for a firm based in Boston, MA. In 2001 this firm purchased one the early generation Scanners where Mike become the Companies Scanning Division Manager. In 2004 Mike joined Leica Geosystems as the SE US Sales/Support Engineer. He is currently the NAFTA HDS Scanning Product Manager.

**Shannon Hixon**

Upon graduation from the Colorado School of Mines in 1997 Shannon worked in the Gulf of Mexico for an oil company as a Project Management Engineer. He then took a position within the family owned Surveying Dealership in Colorado. He joined Leica Geosystems in 2006 where he was the SW Regional Sales Manager. He is currently the NAFTA Geomatics Product Manager.

Details about other team members are available upon request.

**B. Deliver Equipment.**

All software required by this contract shall be delivered to NYSDOT within 10 business days after the Agreement is executed. All hardware shall be delivered and distributed by the Leica Geosystems at the training facility during the first afternoon of each training session. All delivery costs shall be included in the total contract price.
Narrative Description

Leica Geosystems shall provide to the New York State Department of Transportation the following equipment under Contract Number C030867:

<table>
<thead>
<tr>
<th>Deliverables</th>
<th>Equipment from Leica Geosystems</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Stations &amp; Accessories</td>
<td>○ TPS12000+ (TCRP1201+ 1&quot;) Total Station with Robotic and Reflectorless capability and Accessories.</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>○ CS15 Data Collector w/Integrated Radio Modem with Viva SmartWorx Data Collection SW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ CS15 Data Collector w/Integrated Radio Modem with Viva SmartWorx Data Collection SW</td>
<td></td>
</tr>
<tr>
<td>GNSS Receivers &amp; Accessories</td>
<td>○ GS15 GNSS Receiver and Accessories</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>○ CS15 Data Collector w/Integrated Radio Modem with Viva SmartWorx Data Collection SW</td>
<td></td>
</tr>
<tr>
<td>Digital Level and Accessories</td>
<td>○ DNA03 Digital Level (First Order Level) and Accessories.</td>
<td>39</td>
</tr>
<tr>
<td>Office Software</td>
<td>○ Leica Geo Office (Only authorized for use within the NYSDOT)</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Laser Scanner</td>
<td>○ ScanStation C10 with Cyclone SCAN</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>○ Scanner Office Software.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ Cyclone SURVEY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ Cyclone REGISTER</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ CloudWorx for Bentley MicroStation</td>
<td></td>
</tr>
</tbody>
</table>
Overview

Leica Geosystems is synonymous with, quality and reliability – as well as considerable innovative power. This is evident in a number of technological innovations that have been implemented into the equipment being provided to the New York State Department of Transportation. To mention a few:

- GNSS receivers – “intenna technology” – the receiver utilizes an antenna array built-into the receiver covering the complete range of possible RTK communication devices. “RINEX Logging”, this feature allows the receiver while in static mode to record RINEX data. This means that typical raw data files do not need to be converted into RINEX.

- The new C10 Scanner offers full dome scan 10x faster than its predecessor by utilizing its “Smart X-Mirror design”. CloudWorx for MicroStation is an efficient plug-in for using point cloud data captured with laser scanners directly within MicroStation.

- The CS15 Data Collector also utilizes “intenna technology” for Robotic Surveying with a Total Station. The unit offers WiFi capability, built-in camera, and full QWERTY style keyboard. QVGA screen.

- The new user interface has been completely re-designed for the user. It is far more intuitive than before. ICONS are used and always visible to inform the user of the instrument status. Wizards help guide a user much more easily through traditionally complex configuration setups. Perspective View Graphics are always used where appropriate.

- The Total Station has patented “System Analyzer” technology to ensure when reflectorless measurements are being made at long range are always correct.

- SmartPole – allows a GNSS receiver to be mounted on a prism pole and through the data collector allow the user to choose GNSS or the Robotic Total Station as their instrument of choice to accomplish the task at hand. The user can easily swap between the technologies with one key stroke. In support of this concept Leica Geosystems has develop a new Orientation method titled “Set-up On the Fly” – eliminating the need to bring control onto a project.

The company holds more than 1,000 patents and has a full product pipeline.

Leica Geosystems has repeatedly revolutionized the science and technology of geographic information. The company has always been at the forefront of technological developments and time after time has successfully sought ways of overcoming obstacles: whether it was improving the optical quality of the instruments to increase surveying effectiveness, enhancing the manufacturing accuracy of devices to increase precision, or devising ways of handling large quantities of data effectively.
Upon the receipt of the New York State Department of Transportation RFP, Leica Geosystems formed a Project Team. This Project team was charged with reviewing the RFP, understanding the Scope of Services and schedule and the preparation of Leica Geosystems proposal. Additionally this team shall be responsible for executing on the scope of services.

This project team has, collectively, decades of experience in the surveying and construction industry and working with Department of Transportation.

The Scope of Services contains a plan to deliver all specified equipment to the New York State Department of Transportation. All software shall be delivered with 10 days of the contract being signed and the hardware distributed at the first training. Additionally a detailed break-down of all components is included in the Agreement.

The Scope of Services includes a section to show how data collected with Leica Geosystems equipment flows, bi-directionally, into Bentley InRoads. Leica Geosystems has a strong relationship with Bentley. Leica and Bentley are continuously working together to enable the best connectivity between field and office. As Leica Geosystems fine tunes the data-flow, Leica Geosystems shall always ensure that the NYSDOT is made aware of changes for the better. Additionally it is our understanding that a number of construction crews use GNSS Receivers connected to a tablet PC via a Bluetooth connection running Bentley OnSite. Leica Geosystems shall make this capability available to the NYSDOT with the GS15 GNSS Receivers.

New York Department of Transportation took the initiative to install and make available to the public a State Wide Real Time Network CORS Network – NYSnet. Leica Geosystems GNSS equipment supports the Master Auxiliary Concept and shows connectivity.

All equipment and software shall be covered under a 5 year warranty program. In the event that a piece of Hardware needs repairs under the warranty program Leica Geosystems has established a single point of contact to arrange for the equipment to be repaired. All hardware and software shall be covered under a 5 year maintenance program. Through a new web portal “myWorld” Firmware and Software updates shall be readily available for download. This site allows a user to connect their instrument to the web and the myWorld website can automatically upload the latest firmware to an instrument. This eliminates the need for a user to remember multiple keystrokes. The myWorld website also allows for service history to be reviewed, access to a library of technical and training material and the archiving of all software codes.

Training is an important aspect when adopting new equipment. The Project Team has reviewed the training requirements of the New York State Department of Transportation. Based on existing training material, the Agreement includes a training course to address the initial needs of the NYS DOT. Leica shall make the necessary adjustments and customize training accordingly before deploying into the State to conduct the training. At the conclusion of each training session in each given year next steps shall be discussed. This shall ensure that all the latest knowledge is shared throughout the duration of the contract.

Leica Geosystems maintains a network of highly experienced and technically knowledgeable support engineers. The Scope of Services shows the organizational structure of the support network and describes how a support call is routed to a support engineer so that the callers issue is addressed to a point of closure.

As the team spent time reviewing the RFP Leica identified areas where Leica could present choice to the New York State Department of Transportation. These choices would be made available to the NYSDOT (at no additional cost) and will be of benefit to certain crews within different divisions. The choices that Leica presents would be to offer to those crews that use Bentley OnSite SW running on Tablet PC a back-pack solution in lieu of an All-On the Pole GNSS Solution. Shall offer a specially compiled version of SurvCE 2.5 to those crews within the New York State DOT that would prefer this as their choice data collection SW in lieu of SmartWorx Viva.

Maine Technical Source is a valued Business Partner (Dealer) of Leica Geosystems. They provide an invaluable service in the State of New York Department of Transportation in representing our product basket.

Leica Geosystems has made every good faith effort to solicit a minority/women-owned business enterprise to participate in this Agreement.
Leica Viva – GNSS Receivers

New GNSS Receivers

The GS15 SmartAntenna – shown on the right is the GNSS Rover/Base Receiver that Leica Geosystems shall supply to the New York State Department of Transportation in response to Bid Contract Number C030867. The following is a list of features and benefits to the New York State Department of Transportation along with some key technical specifications.

Feature: Leica SmartCheck+

Customer Benefit: Using parallel processing algorithms to calculate satellite ambiguities, users get the benefit of two independent solutions every 10 seconds in the field. This makes users more productive and data more reliable since all measurements have an independent solution calculated while at the point.

- Leica patented SmartTrack+ technology:
  - Advanced measurement engine
  - Jamming resistant measurements
  - High precision pulse aperture multipath correlator for pseudorange measurements
  - Excellent low elevation tracking
  - Very low noise GNSS carrier phase measurements with <0.5 mm precision
  - Minimum acquisition time

Feature: Leica SmartTrack+

Customer Benefit: Using the latest in GNSS technology a 120 channel measurement engine can track up to 60 different SV’s at one time. This shall allow all in view tracking of all SV’s no matter the number of signals generated from each. Lesser featured receivers may have more channels but they are correlated to tracked satellites, some capable of tracking over 200 channels but only 25 SV’s not guaranteeing full all in view tracking.

The GS15 SmartAntenna can track the following

- GPS: L1, L2, L2C, L5
- GLONASS: L1, L2
- Galileo (Test): GIOVE-A, GIOVE-B
- Galileo: E1, E5a, E5b, Alt-BOC
- Compass
- SBAS: WAAS, EGNOS, GAGAN, MSAS

The GS15 SmartAntenna has fully independent code and phase measurements of all frequencies:

- GPS: carrier phase full wave length, Code (C/A, P, C Code)
- GLONASS: carrier phase full wave length, Code (C/A, P narrow Code)
- Galileo: carrier phase full wave length, Code
The following summarizes the GS15’s GNS SmartAntenna’s measurement performance and accuracy:

**Measurement Performance and Accuracy**

- Code Differential GNSS Positioning:
  - Typically < 25cm (rms).

- Accuracy (rms) with RTK
  - Rapid static (phase):
    - Horizontal: 5 mm + 0.5 ppm (rms).
    - Vertical: 10 mm + 0.5 ppm (rms)
  - Kinematic (phase):
    - Moving mode after initialization:
      - Horizontal: 10 mm + 1 ppm (rms)
      - Vertical: 20 mm + 1 ppm (rms)
  - Accuracy (rms) with Post Processing:
    - Static (phase) with long observations
      - Horizontal: 3 mm + 0.5 ppm (rms)
      - Vertical: 6 mm + 0.5 ppm (rms)
    - Static and rapid static (phase):
      - Horizontal: 5 mm + 0.5 ppm (rms)
      - Vertical: 10 mm + 0.5 ppm (rms)
    - Kinematic (phase):
      - Horizontal: 10 mm + 1 ppm (rms)
      - Vertical: 20 mm + 1 ppm (rms)

- On the Fly (OTF) Initialization:
  - RTK technology Leica SmartCheck+ technology
  - Reliability of OTF initialization Better than 99.99%
  - Time for initialization Typically 8 sec
  - OTF range up to 50 km.

- Network RTK
  - Network technology - Leica SmartRTK technology
  - Supported RTK network solutions VRS, FKP, iMAX
  - Supported RTK network standards MAC (Master Auxiliary Concept) approved by RTCM SC 104.

The GS15 is capable of operation in and providing data for the following GNSS survey scenarios:

- Static, Rapid Static, Stop-and-Go, Kinematic, Real Time Kinematic (RTK), Kinematic On-The-Fly, Single Point Positioning, Post-Processed Ambiguity Resolution in OFT mode or static initialization.

Data recording is selectable up to 20Hz on the GS15 GNSS Receiver.

Leica Geosystems shall supply to the New York State Department of Transportation the GS15 GNSS Receiver with 1 GB of memory.

The GS15 SmartAntenna has the following Ports:

- 1 X Serial / RS232
- 1 x USB / RS232 Lemo
- 1 X UART Serial & USB (for removable Internal RTK devices).
- Bluetooth Ports for connecting to Data Collector.

The GS15 GNSS Receiver has a nominal 12V DC with range of 105 – 28V DC with over-voltage protection.

The receiver can utilize 2 x Rechargeable/removable Li-Ion Batteries (as shown in the picture on the right) that allow the receiver to operate 10.0 hrs receiving.

The Receiver shall indicate to the user by way of its LED lights that power is low. In the event of a power failure the receiver shall automatically close down all open files so that no data is lost.

An external 12 V power source can also be utilized.
### Environ. Specification

The following table lists the GS15’s Environmental Specifications:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temp</td>
<td>Compliance with: ISO 9022-10-08, ISO9022-11-special and MIL-STD-810F Method 502.4-I, MIL-STD-810F Method 501.4-I</td>
</tr>
<tr>
<td>-40° to +65° C</td>
<td></td>
</tr>
<tr>
<td>-40° to 80° C</td>
<td></td>
</tr>
<tr>
<td>Humidity 100%</td>
<td>Compliance with: ISO 9022-13-06, ISO9022-12-04 and MIL-STD-810F Method 507.4-I</td>
</tr>
<tr>
<td>Protection against Water Sand &amp; Dust</td>
<td>IP67 – according IEC60529 and MIL STD 810F – 506.4-1 and MIL STD 810F – 512.4-1. Protected against blowing rain and dust temporary submersion into water (max depth 1.0m).</td>
</tr>
<tr>
<td>Vibration</td>
<td>Withstands vibrations during operations. Compliance with: ISO9022-36-08 and MIL-STD-810F Method 414.5-Cat24</td>
</tr>
<tr>
<td>Drops &amp; Topple Over</td>
<td>Withstands 1.0m drop onto hard surfaces (SmartAntenna Only). Withstands topple over from a 2.0m survey pole onto hard surfaces.</td>
</tr>
<tr>
<td>Functional Shock</td>
<td>40g/15 to 23msec, compliance with MIL STD 810F – 516.5-1</td>
</tr>
</tbody>
</table>

### RTK Comm. Devices

Leica Geosystems shall supply to the New York State Department of Transportation an integrated low watt (that does not require licensing) UHF Transmit/Receive Radio module that slots into the GS15 GNSS Receiver. When this module is slotted into the receiver it is completely integrated and sealed with the unit. Leica Geosystems also plans to supply the New York Department of Transportation an integrated CDMA device. This device too when slotted into the GNSS receiver is completely integrated and sealed. In the event that these modules are not available at the time of delivery Leica Geosystems shall make available external cell modems.

The GS15 GNSS Receiver features: **Intenna** technology: This new feature is unique to Leica Geosystems and integrates all necessary antenna technology inside the GNSS receiver guarantees users shall always have the antenna with them. Lost time due to forgotten pieces at the office is no longer an issue. UHF radios no longer risk damage by being operated without a proper antenna attached.

The GS15 SmartAntenna can be configured for use as either a Portable Base Station or a RTK Rover.

### GNSS Receiver

The picture on the right shows the GS15 SmartAntenna on a Tripod. In this configuration the SmartAntenna is utilizing the Internal low powered transmit radio.

### Base & Rover Configurations

**Feature: RINEX Logging**

Customer Benefit: Onboard RINEX data collection speeds the processing of static data. Without having to use PC based processing software to generate the files required by service like OPUS it is now possible to send data to OPUS or Spider Net for processing from the field using a Bluetooth cell phone and Viva controller.

**Feature: Instant “Here” Function**

Customer Benefit: Reference receivers can set up and started in a matter of seconds without the need of a controller to set information. Small site surveys can be completed faster without the need to use a controller to set the base for use. Inexperienced field operators can now be sent to start a base while rover units are prepared for the survey.

Leica Geosystems always supplies the NGS all new antennas for calibration and has the results posted on the NGS calibration web site.
Leica Viva – TPS1200+ Robotic Solution

Leica
TPS1200+
Technology

The TPS1200+ (TCRP1201+) Robotic Total Station – shown on the right is the Total Station that Leica Geosystems shall supply to the New York State Department of Transportation in response to Bid Contract Number C030867. The following is a description of the technology employed by this instrument along with features and benefits to the New York State Department of Transportation.

Angular Measurement System

The highly accurate and reliable angle measurement system consists of a static line-coded glass circle, which is read by a linear CCD array. A special algorithm determines the exact position of the code lines on the array and determines the precise measurement instantly. As the code on the glass circle is absolute and continuous, no initialization of the instrument is required prior to measurements.

A dual axis compensator constantly monitors both axes of the vertical axis tilt. The compensator consists of an illuminated line pattern on a prism, which is reflected twice by a liquid mirror forming the reference horizon. The reflected image of the line pattern is read by a linear CCD array and then used to mathematically determine both tilt components. These components are then used to immediately correct all angle measurements.

Model TCRP1201+ 1" Accuracy (std. dev. ISO 17123-3)
(Display Least Count 0.1")

Proposed TPS1200 Robotic Solution - Details

Distance Measurement (EDM)

The IR mode EDM transmits a visible laser beam to specular targets such as prisms or reflector tapes. The reflected light is detected by a sensitive photo receiver and converted into an electrical signal. After digitizing and accumulating the signal, the distance is determined by means of modern phase measurement techniques. A modulation frequency of 100 MHz is the time base for the high distance accuracy. The coaxiality and the divergence angle of the laser beam together with the automatic target recognition (ATR), allow dynamic tracking of targets quickly and accurately in 3 dimensions.

<table>
<thead>
<tr>
<th>Prism Type</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Circular Prism (GPR1)</td>
<td>3,000m</td>
</tr>
</tbody>
</table>

Specification based on Atmospheric Conditions: Light Haze, visibility over 20Km, moderate sunlight, slight heat shimmer.

The EDM Type is self contained coaxial and reflectorless.

Accuracy of EDM (std. dev. ISO 17123-4) in standard mode is: 1mm + 1.5ppm
**Reflectorless Measurement**

The reflectorless EDM PinPoint R1000 measures to targets more than 1000 m away. To measure to targets at such long distances with high measurement accuracy, a new measurement technology was developed. The main component of the EDM is a system analyzer, which uses modulation frequencies in the range of 100 MHz. The system analyzer properties are defined for each individual measurement for both the EDM beam and the target qualities. As a result of the system analysis, the parameters for every individual measurement are now known. The distance is calculated using modern signal processing based on the principle of maximum-likelihood. Besides the drastically increased sensitivity which leads to a sensational increase in reflectorless measurement range, the new EDM system provides many other advantages such as a very high measurement quality and reliability even when measuring in rain, fog, dust or snow. In addition, the measurement system helps to prevent errors, by detecting if there are multiple targets within the measurement beam.

<table>
<thead>
<tr>
<th>Reflectivity</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kodak Gray Card, 90% Reflective</td>
<td>&gt;1,000m</td>
</tr>
</tbody>
</table>

Accuracy of Reflective Measurements at 500m (std. dev. ISO 17123-4) in standard mode is: 2mm + 2ppm.

**Automatics Target Recognition**

The ATR sensor transmits an invisible laser beam, which is reflected by any standard prism (no active prisms emitting special signals are required) and is received by an internal high-resolution CMOS camera. The intensity and the "spot" characteristics of the reflected light are calculated in respect to the CMOS camera center. The offset components from this reference are computed in both the vertical and horizontal planes. These offsets are then used to control the motors of the telescope axes, which react immediately to position the instrument's crosshairs onto the prism. To minimize measurement time the crosshairs are only positioned within a 5 mgon tolerance (EDM mode IR-Fine) of the actual prism center. The remaining offsets are then mathematically applied to the Hz and V angles.

**PowerSearch**

This fast and reliable prism search uses a sender / receiver couple to detect prisms by means of digital signal processing algorithms. An invisible, vertical laser fan sized 40 gon in height and 0.025 gon in width is sent out while the instrument rotates around its standing axis. Once this fan comes across a prism, the reflected signal is evaluated on the fly to verify the target. If the specified signal patterns are matched, the horizontal position of the prism is determined and the rotation is stopped. Now an ATR search limited to the vertical line of the fan is launched, which precisely positions to the prism center. With this technique any standard prism (no active prisms emitting special signals are required) can be used.

**General**

- The TCRP1201+ has a 30x magnification telescope.
- The Robotic Instrument does not require an active prism to lock onto its center.
- Utilizing technology as explained above, the Total Station can track the prism once locked. If lock is lost the instrument can re-lock onto the center of the prism automatically.
- When used with a data collector for full robotic control the user can control the instrument up to 800m away.
- The Instrument has Horizontal and Vertical endless tangent screws.
- Connecting to the instrument is accomplished in one of two ways:
  - Using Bluetooth
  - Using a cable. – the necessary cable(s) to connect to the Data collector and PC shall be supplied as part of this agreement
- The instrument display, reserves its top line to show by way of Icons the status of the instrument at all times, this includes the battery status.
- The Traverse application allows the user to automatically turn a pre-defined number of sets of angles (once sighted on the back-sight and fore-sight).
- The instrument has an IP54 Rating and can operate in the temperature range of -20 to 40degC.
- Each Total Station Package shall come with a Hard Shell Container to protect the instrument while being transported. Included with the hard shell container is a tool kit, silicon cloth, rain cover, plumb bob set, lens cap and instruction manual.
- Each Total Station shall be supplied with three (3) Lithium Ion batteries. Each battery is 7.4V and is capable of powering the instrument for 5-8 hours. Leica Geosystems shall supply.
- Each Total Station shall supply with the required number of chargers. These chargers allow the battery to be recharged within 3 hours.
- Leica Geosystems shall supply with each instrument the cabling with alligator clips necessary to connect the instrument to a 12V portable power source.

**Prisms**

Leica Geosystems shall supply with each Total Station the required number of:
- Single prisms (4) including prism holders with sighting collimators. Each prism shall have the same prism offset and can be tracked by the instrument without the aid of diodes or batteries.
- 36 degree prism (1). The 360 degree prism that Leica Geosystems shall supply shall have a 5/8" thread built-in to enable the GS15 GNSS Receiver to be mounted and centered.
- The mini-prism shall come with a bull’s eye bubble, target spike and protective bag.
Leica Geosystems shall supply with each Total Station:

- (4) GST 120-9 Heavy Duty wooden tripods with Quick Clamp locking mechanism
- (4) GDF122 Pro Tribrachs with Optical Plummets
- (4) GRT144 Carries that are adjusted to the Total Station height.

Leica Geosystems shall supply:
One 2.5meter lightweight composite telescoping pole and one 3.6m aluminum telescoping pole as defined in the Request for Proposal.

In addition Leica Geosystems shall supply (2) hard shell containers with each Total Station so that fits (2) prisms, (2) tripods and (2) carriers.

**Leica Viva – Data Collectors**

**Data Collector**

The CS15 Data Collector with Integrated Radio – shown on the right is the Data Collector that Leica Geosystems shall supply to the New York State Department of Transportation in response to Bid Contract Number C030867. The following is a description of the technology employed by this instrument along with features and benefits to the New York State Department of Transportation.

The data collector is capable of steering and configuring both the Total Station – (either manually in auto-tracking mode or in full robotic mode) and the GNSS Receiver. Configuration files can be saved and copied to similar devices.

**Feature: Five Bluetooth ports**

Customer Benefit: Controlling a GNSS rover, GNSS base and TPS instrument with dedicated Bluetooth ports allows the user to instantly switch between devices. The parameters and connectivity for each of the devices remains constant in the controller, never having to unbind one device to use another. This means there does not have to be an association process each time a user switches instruments, simply change devices and work.

**Feature: Integrated Camera**

Customer Benefit: Site visualization is simple and convenient when the camera is in the controller. If the system is at the point the user now has a camera at the point.

**Feature: Wi-Fi**

Customer Benefit: Internet access, file sharing and RTK corrections are all supported with the integrated Wi-Fi.

**Feature: 2.4 MHz internal radio**

Customer Benefit: Integrated robotic radio makes sure you always have the components with you to control the sensor you need. Using a radio rather than Bluetooth or infrared means you have reliable connectivity to the instrument no matter the surrounding conditions.
Feature: “Intenna”

Customer Benefit: Integrated antennas eliminate the need for plastic breakable and forgettable antennas. Having all antennas integrated also means there is no possibility to harm a radio by forgetting to attach the antenna before use. Integrating the antennas internally also makes the unit more rugged and water resistant than one with open external ports on the body of the controller.

Feature: VGA display

Customer Benefit: High Definition VGA display allows more room and brighter colors to display maps and navigate through menus. Brilliant background maps can easily be seen and worked on top of. Layer control of background maps makes sure that users only have to see what is important to the task at hand without having the spend time in the office manipulating a drawing to only show what should be needed in the field.

Feature: Docking Station

Customer Benefit: Desktop docking station can host the USB connection from the controller to a PC as well as charge the internal battery in the controller.

Feature: Batteries

Customer Benefit: Same batteries used throughout the system. The GNSS sensor batteries and the controller batteries are the same using a single charger for all batteries used in the entire system.

The following table list the CS15 Data Collector Technical Specifications:

<table>
<thead>
<tr>
<th>Operating Systems</th>
<th>Windows CE 6.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Freescale i.MX31 533 MHZ ARM Core</td>
</tr>
<tr>
<td>Display</td>
<td>640 x 480 (VGA) color TTF touch screen with LED backlight</td>
</tr>
<tr>
<td>Display Graphical ICONS</td>
<td>YES</td>
</tr>
<tr>
<td>Communications</td>
<td>RS232, USB Host and Client DC Power Port. Can be connected to the Total Station and GNSS Receiver using a cable or wirelessly.</td>
</tr>
<tr>
<td>System Memory</td>
<td>512MB DDR SDRAM</td>
</tr>
<tr>
<td>Flash Storage Memory</td>
<td>1 GB</td>
</tr>
<tr>
<td>Interfaces</td>
<td>SD card slot, CF Type I/II slot</td>
</tr>
<tr>
<td>Environmental:</td>
<td>-30° to 60 °C</td>
</tr>
<tr>
<td>o Operating</td>
<td>-40° to 80 °C</td>
</tr>
<tr>
<td>o Storage</td>
<td>100% (MIL-STD-810F)</td>
</tr>
<tr>
<td>o Humidity</td>
<td>IP67</td>
</tr>
<tr>
<td>o IP Rating</td>
<td>4’ drop onto hard surface</td>
</tr>
<tr>
<td>o Drop</td>
<td></td>
</tr>
<tr>
<td>Keyboard:</td>
<td></td>
</tr>
<tr>
<td>o Type</td>
<td>Alphas Numeric (QWERTY Style)</td>
</tr>
<tr>
<td>o Number of Keys</td>
<td>65</td>
</tr>
<tr>
<td>o Illuminated</td>
<td>YES</td>
</tr>
<tr>
<td>o Multi-Tasking Capability</td>
<td>YES</td>
</tr>
<tr>
<td>o Help</td>
<td>YES</td>
</tr>
<tr>
<td>Audio</td>
<td>Integrated sealed speaker and microphone – Bluetooth audio headset support</td>
</tr>
<tr>
<td>Radio Modem</td>
<td>YES</td>
</tr>
<tr>
<td>o Integrated</td>
<td>Type</td>
</tr>
<tr>
<td>o 2.4GHZ Total Station Radio</td>
<td>2.4GHZ Total Station Radio</td>
</tr>
<tr>
<td>Bluetooth</td>
<td>YES (Class 2)</td>
</tr>
<tr>
<td>Camera</td>
<td>Integrated 2MP fixed focus camera</td>
</tr>
<tr>
<td>WiFi</td>
<td>YES</td>
</tr>
</tbody>
</table>
Power

- Each Data Collector shall be supplied with one (1) Lithium Ion batteries. Each battery is 7.4V and is capable of powering the data collector for 10 hours hours.
- Each data collector battery shall supply a battery charger. These chargers allow the battery to be recharged fully within 3 hours. Additionally they can use the cigarette lighter adapter to get a quick charge.
- While the battery is in the data collector and being charger there is no risk of the battery being overcharged. Leica Geosystems shall supply with each data collector a A/C cable that enables the battery to be charged while still in the data collector.

Leica Geosystems shall supply to the New York State of Transportation with each Data Collector the following items:

- All reference and user manuals for the Data Collector and Software.
- One (1) heavy duty protective case.
- A Stylus
- Display screen covers
- Two (2) Cable to connect the data collector to the Total Station, GNSS Receiver & a PC.
- Handstrap
- Docking Station

The following image shows the CS15 Data Collector and Docking Station that Leica Geosystems shall be supplying as part of this agreement.

Each data collector shall supply the following additional software:

- Internet Explorer Mobile.
- File Explorer
- Word Mobile
- MS Windows Media Player
- Camera SW

Leica Viva – Data Collection Software

Data Collection Software

The SmartWorX Viva Software – shown on the right is the Data Collector that Leica Geosystems shall supply to the New York State Department of Transportation in response to Bid Contract Number C030867.

Feature: SmartWorx Viva Wizards

Customer Benefit: Longer processes that used to be time consuming and complicated are simplified with standard walk through wizards in the software. Configuring RTK devices and setting up surveying parameters is quick, easy and intuitive. Once the wizard is completed all of the settings are saved in a specific profile that can be recalled and used as simply as starting the wizard again. If a user needs to use multiple mount points in a network these different profiles can be set up using the RTK configuration wizards and recalled as needed. Changing from UHF to Cellular modem is as simple as changing the RTK profile, not changing any of the other users configurations. Users spend less time configuring systems and more time working.
Feature: Icon based menus or pull down menus

Customer Benefit: Displays can be set to operate in the user's most comfortable style; icons with true descriptions can help users who do not use the system often. Simple text and descriptive icons launch each function. For experienced users that are comfortable navigating the system, pull downs can be used instead of icons making navigating through the screens extremely fast and efficient.

Feature: Geodetic Coordinate Systems

Customer Benefit: mapping projections are the only way to work in large areas without causing distortion. Simple software that can only scale and rotate a mapping plane will not allow large projects to have a single coordinate system used through the project. Leica Geodetic coordinate systems allow users to build the projection and datum that is appropriate for all jobs from the small planar systems to the large Highway projections that span 10-20 miles. Distortion issues can be handled correctly using true geodetic coordinate computations.

Feature: Quick Grid

Customer Benefit: Simple graphical methods to generate local Grid systems. Users who are not comfortable using the projections and ellipsoid information required for true geodetic coordinates have a simple application to use on small sites of less than a few miles in area. Simple measuring a few points that are to be used as control users are quickly and easily in a local ground coordinate system in as few as two button clicks.

Feature: Quick Shift

Customer Benefit: Coordinate systems and datum's that are built on positions today shall be updated and adjusted at a later date. If the reference datum is to move then all local control has to be updated and new coordinate systems built for each project if you don't have a tool like Quick Shift. This application will take an existing coordinate system with a single known location in that system, and shift that with a single measurement from the new reference datum. This updates the coordinate system then to work in the new reference datum and maintains the same grid locations.

Feature: Leica System Firmware

Customer Benefit: By updating software on all components of a system at the same time, Leica Geosystems is able to test all components of each version of firmware completely before it is sent to the end users. Over 20,000 man hours of testing goes into each release of firmware making sure that the system shall operate correctly when given to customers. By testing with all of the components there is no possibility of an accidental incompatibility that is found by an end user. Untested firmware causes delays and wrong answers in the field, by testing and using the software on all sensors before release to users Leica Geosystems makes sure there are no wrong answer bugs and product incompatibilities that users have to solve for us.

Feature: Leica Sensor Control

Customer Benefit: Using SmartWorx software to control every feature offered in the sensors means there is no need for an office application to set certain settings in the receivers. Every possible setting and configuration can be done through the software for the receivers. This means there is no setting problem that can not be fixed in the field, returning to the office or having to carry a laptop and special cable to make a simple setting change wastes time and effort.
Connectivity to Bentley InRoads

A detailed description of how data collected in the field flows or downloaded into Leica Geo Office flows bi-directionally into Bentley InRoads. Please refer to page 67.

The following table lists all the functionality that the SmartWorX Viva Software shall provide the New York State Department of Transportation.

<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Job, Data and Full Coordinate Management (Localizations, Transformations, Projections, Geoid Models)</td>
<td></td>
</tr>
<tr>
<td>Create store and copy configuration sets</td>
<td></td>
</tr>
<tr>
<td>Data import: ASCII, DXF, LandXML</td>
<td></td>
</tr>
<tr>
<td>Data export: Custom ASCII, DXF, LandXML, FBK, RW5, RAW</td>
<td></td>
</tr>
<tr>
<td>Full map view functionality</td>
<td></td>
</tr>
<tr>
<td>View DXF files as background images</td>
<td></td>
</tr>
<tr>
<td>Field to Office Transfer using FTP</td>
<td></td>
</tr>
<tr>
<td>ICON Bar to show full instrument status</td>
<td></td>
</tr>
<tr>
<td>Record raw observations including offset shots &amp; multiple obs. sets.</td>
<td></td>
</tr>
<tr>
<td>Point Averaging with user defined limits</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Survey</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Coding:</td>
<td></td>
</tr>
<tr>
<td>o Enter Point Descriptors, attribute and line control</td>
<td></td>
</tr>
<tr>
<td>o Free Coding, Quick, Thematical Coding</td>
<td></td>
</tr>
<tr>
<td>o Accept and work with NYSDOT standard Code List and meet NYSDOT CADD Standards.</td>
<td></td>
</tr>
<tr>
<td>Switch between GNSS and TPS with one button press</td>
<td></td>
</tr>
<tr>
<td>Auto logging points with quality control</td>
<td></td>
</tr>
<tr>
<td>User defined survey screen – define the information you want to see</td>
<td></td>
</tr>
<tr>
<td>Measure offset points</td>
<td></td>
</tr>
<tr>
<td>Surface and Volumes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stake-Out</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Staking of points and DTM’s</td>
<td></td>
</tr>
<tr>
<td>Navigate to points using various methods</td>
<td></td>
</tr>
<tr>
<td>Quality control between surveyed and design</td>
<td></td>
</tr>
<tr>
<td>Auto selection of next closest point to stake</td>
<td></td>
</tr>
<tr>
<td>Graphical selection of point from map</td>
<td></td>
</tr>
<tr>
<td>Edit offsets and heights of points</td>
<td></td>
</tr>
<tr>
<td>Acoustic beeps to assist staking</td>
<td></td>
</tr>
<tr>
<td>Staking Simple Alignments &amp; Complex Alignments</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COGO</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Routines include: Inverse traversing, intersections, line arc calculations/segmentation, shift rote, scale blocks of points</td>
<td></td>
</tr>
<tr>
<td>Reporting.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calculations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigorous computations of Coordinate Systems</td>
<td></td>
</tr>
<tr>
<td>QuickGrid calculations for fast localization</td>
<td></td>
</tr>
<tr>
<td>Surface and Volumes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SmartStation – GNSS mounted on TPS</td>
<td></td>
</tr>
<tr>
<td>SmartPole – GNSS mounted on Robotic Prism Pole</td>
<td></td>
</tr>
<tr>
<td>Traverse Application Reference Line and RoadRunner supplied</td>
<td></td>
</tr>
</tbody>
</table>
Leica Viva – SmartStation

SmartStation

Feature: “Position Coordinates at the Touch of a Key”

Customer Benefit: SmartStation allows the GS15 GNSS Receiver to be mounted on the TPS1200+ Total Station and let GNSS/GPS determine the position. No need for control points on a project site. Positions can be determined to centimeter accuracy within a few seconds at ranges up to 50 km from a reference station.

Feature: “Modular Design”

Customer Benefit: SmartStation’s modular design, you can use the equipment in any way you like. Use SmartStation when there are no control points available. Once SmartStation is accurately positioned, take off the SmartAntenna, put it on a pole, and use it with the CS15 data collector and GS15 GNSS sensor as a fully-fledged RTK rover.

Leica Viva – SmartPole

SmartPole

Feature: “True Flexibility”

Customer Benefit: With Leica SmartPole, both TPS and GPS are available at all times to ensure every point can be measured. When GPS is restricted by overhead obstructions... use TPS; when no TPS line-of-sight is available... use GPS. Benefit from easy-to-use GPS and continuous productivity.

Feature: “Common Hardware Components”

Customer Benefit: Leica SmartPole is fully compatible with the Viva Surveying System. The same SmartAntenna can be used together with a TPS1200+ as a SmartStation, together with the CS15 Data Collector as a SmartRover or together with a 360° reflector and CS15 Data Collector as a SmartPole. Common hardware components reduce costs and increase the flexibility of equipment deployment.

Feature “Setup On-the-Fly”

Customer Benefit: Leica SmartPole removes reliance on existing control and allows surveys to immediately begin. Avoid time consuming traverses to bring control to the survey area. Never make compromises with the TPS location and never search for control points. With SmartPole, setup the TPS in the most convenient location, instantly begin the survey and determine the TPS coordinates and orientation On-the-Fly whilst conducting the survey.

Feature “Increased Flexibility”

Customer Benefit: Every survey site is different. Some are best suited to TPS, others to GNSS. With SmartPole both TPS and GNSS are available. When GNSS is restricted by overhead obstructions... use TPS; when no TPS line-of-sight is available... use GNSS. If upon completing the SmartPole TPS setup GNSS is no longer needed, then the SmartAntenna can always be used as a SmartRover in parallel with the robotic TPS for double productivity.
Leica DNA Series – Digital Levels

Digital Level

The DNA03 Digital for 1st and 2nd Order Leveling – shown on the right is the Digital Level that Leica Geosystems shall supply to the New York State Department of Transportation in response to Bid Contract Number C030867.

Experience has shown that there is up to a 50% time saving when compared to conventional levels when used on Construction sites and for Land Surveying applications. The main reasons are:

- Faster data capture
- Shorter measuring times
- Automated onboard routines
- Alpha/Numeric Keyboard Input
- Electronic Data Storage
- Transparent data to flow to the office
- Office SW designed to reduce Leveling data with reports

This Contract calls for thirty nine digital levels and accessories that allow data to flow into the Bentley InRoads SW and meets the requirements for performing at least 2nd order class II leveling as defined by in the FGCS Specifications and Procedures. The Leica DNA03 Digital Level meets the requirement as set forth in Contract Number C030867.

The following lists the technical specifications for the DNA Digital Series

- Accuracy – Standard Deviation height measurement per 1Km Double Run (ISO 17123-23)
  - With Standard bar coded Staff: 1.0mm

- Optical Measurements: With Standard bar coded staff 2.0mm

- Distance Measurement : With standard bar coded staff 1cm/20m

- Measuring Range
  - Electronic: 1.8m to 110m
  - Optical: from 0.6m

- Telescope magnification: 24X

- Measuring Time Typically 3 seconds

- Memory
  - Internal: 6,000 measurements
  - External PCMCIA Card – two to be supplied with each Digital Level

- Tilt Range: 10°

- Setting Accuracy <0.3”

Each DNA03 Digital Level shall be supplied with the following:

Standard Components

- 1 x Hard Shell protective carrying case
- 1 x Adjusting Pin
- 1 x Silicon Cloth
- 1 x Rain Cover
- 1 x Plumb Bob Set
- 1 x Lens Cap
- 1 x Instruction Manual
- 2 x Download Cables

Each DNA03 Digital Level shall supply the following batteries and chargers:

- 2 x Rechargeable 6 volt batteries with an operating time of 24 hours
- 1 x Battery charger

Page 48
Accessories

Each DNA03 Digital Level shall supply the following accessories:

- 1 x Heavy Duty Fixed Height Rod
- 1 x 13’ sectional dual face polymer staff with bar code / ft graduations.
- Front side of bar code, reverse side with continuous feet graduations.
- 1 x Turning Plate
- 1 x Turning Pin

Leica Geo Office - Office Software

Leica Geo Office is a fully integrated office software allowing:

- Project Management
- Data Management
- Import/Export of raw data all data collected from GNSS Receivers, Total Stations, SmartStation, SmartPole, Digital Levels to produce final results.
- Data Processing, GNSS, TPS, Digital Levels, Perform Loop Closures
- Mission Planning
- Network Adjustments
- Coordinate System Management
- Utilities – NGS Blue Booking, RINEX
- Customizable HTML Reporting.
- Scripting for automating repetitive tasks.

Leica Geo Office allows the user to manage all aspects of a project such that all data, code lists, GNSS antennas, Coordinate Systems etc all organized in a logical manner within the project. There is no limit on the number of projects that can be registered within LGO.

Leica Geosystems shall supply to the New York State Department of Transportation a simulator that allows the user to connect to the GNSS Receiver or Total Station and change settings as required.

Additionally ASCII/Binary files containing coordinates and RINEX data can also be imported.

A detailed description of how data in LGO flows into Bentley InRoads is presented later in this agreement.

Coordinate Computation

Leica Geo Office has a complete range of libraries of ellipsoids, projections and geoidal models, as well as six different transformation methods that give you the flexibility to select the transformation technique that suits your project best. Convert ellipsoidal to orthometric heights and vice versa using imported and user defined geoidal models.

Project Reporting

Leica Geo Office has HTML-based reporting tools to provide the basis for generating modern, professional reports. Measurement logs in field book format, reports on averaged coordinates, various processing log files and other information can be prepared and saved. Reports can be configured to contain the information that you require and define templates to determine the presentation style.

Utilities

- Leica Geo Office has the ability to export data to the major CAD and GIS packages through its GIS/CAD module. E.g. MicroStation design files.
- GNSS Antennas parameters can be edited and defined.
- NGS B & G Files can be created.
- Import Geoid Models
- Import Bentley InRoads DTM and geometry data.
Mission Planning

Leica Geo Office can:

- Generate sky plots of satellite positions, represent in tabular and graphic form computed precisions, rise/set time, and elevation and azimuth of satellites for a specific geographic position using ephemeris data taken from the receiver or manually selected and imported.
- Allow the user to plan the GNSS fieldwork by combining the obstruction information for multiple points in session planning. Software shall combine obstructions from at least 4 stations in a session.
- Provide graphical and numerical information on the satellite constellation for any location at a given time.
- Be able to enter site location, cut-off angle, time zone, date and times for GNSS satellite window prediction.
- Allow almanac files to be imported for the session planning.
- Always use the most current almanac in the system database.
- User can manually select an older almanac for use in the survey preparations.
- Older almanacs may be deleted from the system by the operator.
- Provide an individual point or combined session sky plot and observation chart, summary of available satellites, satellite geometry (including PDOP and GDOP) and elevation angle to the individual satellites. The above information shall be output in either graphic or tabular form.
- Specify a time and duration of interest for the observations, or view the entire 24-hour period of the selected date of prediction.
- Allow the user to introduce obstructions either graphically or from ASCII file input.
- Allow the obstructions to be reflected in satellite availability, PDOP and GDOP computations.
- Provide the ability to show multiple site obstructions (combined curtain) with the satellite orbits for the selected date, time and duration on a single sky plot.
- Allow the user to enable or disable individual satellite(s), depending on the health status of each satellite.

Reporting

Leica Geo Office allows the reporting of the Combined Scale Factor for each point. The software allows the user to graphical select an area to compute a Project Specific Scale Factor. All coordinate data (Geodetic, Cartesian Coordinates, Ellipsoidal, Orthometric Heights, Combined Scale Factors can easily be exported into an ASCII text file.

Digital Level Data

Leica Geo Office allows the user to edit Level Book data, process and reduce leveling data, perform loop closures, adjust the leveling data and generate reports.

Total Station Function

Leica Geo Office allows all Total Station Data to be imported and managed in a similar way to GNSS and Level Data. Data can be edited processed and adjusted – it can also be combined with GNSS and Leveling data. Total Station Data is exported using the same reporting tools as described earlier.

GNSS Processing

Leica Geo Office is able:

- To process baselines of several measurement types including static, rapid static, stop and go, kinematic, continuous kinematic, kinematic on the fly, real time kinematic (RTK) and single point positioning.
- To process RINEX 2 data. The processing of RINEX 2 data shall be identical to processing GNSS raw observation data.
- To process data using .e18 or .sp3 format precise ephemeris files.
- To process all baselines automatically in a batch process, allow the user to select baselines to be processed and/or by observation session.
- Automatically or manually select and/or disable the baselines graphically that are to be processed.
- To report an ASCII text file of all stored baselines including processing statistics.
- To change processing parameters including elevation mask angle, session times, ionospheric and tropospheric models, code and/or phase data used, enable/disable individual satellites.
- To select stations and baselines graphically or from selected point lists in order to view/edit the properties. This includes viewing and editing station ID's, antenna heights, station coordinates, coordinate classes, color and fonts of stations, coding and attributes.
- Be capable of processing different antenna modules using NGS phase center tables.

Loop Closure

Leica Geo Office and GNSS, TPS and Digital Level to be combined in one adjustment. The software allows the user to perform a free, minimally constrained or fully constrained adjustment. When conducting a minimally constrained or fully constrained adjustment the user can fix or free horizontal and or vertical components, edit station coordinates and enable, disable delete stations or baselines.
Leica Geo Office allows loop closure to be calculated and analyzed for all data sets measuring quality of GNSS positions showing ratio statistics and error statistics. The user can manually select baselines to compute a loop closure or have the software automatically calculate all possible loop closures.

LGO’s network adjustment module uses the powerful MOVE3 kernel with rigorous algorithms. When the adjustment is complete the result includes graphical and tabular representation of the residuals in Geodetic or Cartesian formats, error detection, statistical information, absolute and relative error ellipses, external reliability, adjusted variance/covariance matrices, and adjusted station coordinates with standard deviations.

LGO allows the adjustment (as a whole) to be viewed graphically to help identify outliers, remove adjustment, if necessary, without losing baseline processing results, refer back to the GNSS baseline processing report, remove raw GNSS data, reprocess the baseline and re-adjust the network in a simple workflow.

Leica ScanStation C10 Scanner

Overview

The Leica Scanstation C10 – shown on the right is the scanner that Leica Geosystems shall supply to the New York State Department of Transportation in response to Bid Contract Number C030867.

This is the latest generation of scanner (terrestrial LIDAR) from Leica Geosystems. The C10 is a new platform and represents the most capabilities and best value packed into a single laser scanner instrument. Users can take advantage of surveyor-friendly, onboard total station-like control or use an external laptop for even more powerful, onsite viewing and data processing.

C10 Scanner

The C10 Scanner combines, all-in-one portability with the ability of users to traverse, resection or use scan targets for maximum flexibility in dealing with site logistics. Full 360° x 270° field-of-view, high accuracy, long range (300m @90% reflectivity), and high scan speed (50k pts/sec) add to ScanStation C10’s position as the industry’s most versatile scanner.

The Leica C10 Scanner is faster than its predecessor in many ways:

- It does full dome scans up to 10X faster – now, less than 2 minutes for a typical room.
- It also conducts general 360° and focused areas scans faster, can be setup & moved faster. Lets users locate targets, register & geo-reference faster, and lets users check scan results faster.

The Leica C10 Scanner is easy to learn, with a total station-like interface and intuitive, onboard graphic color touch screen display. It is also incrementally upgradeable over time, uses standard total station batteries, and features fewer accessories— all of this contributes to a reduced cost of ownership.

The Leica C10 Scanner supports standard field workflows with a rich, familiar total station interface. Easy to learn touch screen operation.

Office Software

For fast, accurate selection of scene and targets to be scanned. The auto-adjusting, internal, high-resolution camera image can also be used for texture mapping of point clouds.

Leica’s HDS software suite - Cyclone, CloudWorx, and TruView - is considered by many as the industry standard solution to capture, visualize, extract, analyze, share and represent point cloud data as traditional or enhanced deliverables. The suite includes powerful standalone modules and convenient CAD plug-ins for working with point cloud data directly within CAD applications.
### Product Specification

The following table lists the C10 Scanner Specifications.

<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument Type</td>
<td>Compact, pulsed, dual-axis compensated, high speed laser scanner with survey grade accuracy range and field of view, integrated camera and laser plummet.</td>
</tr>
<tr>
<td>User Interface</td>
<td>Onboard Control, notebook or Tablet PC</td>
</tr>
<tr>
<td>Data Storage</td>
<td>Integrated Hard drive or external PC</td>
</tr>
<tr>
<td>Camera</td>
<td>Auto-adjusting, integrated high-res. Digital camera with zoom video</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System Performance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy of a Single Measurement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6mm</td>
</tr>
<tr>
<td></td>
<td>4mm</td>
</tr>
<tr>
<td>Type</td>
<td>Pulsed: proprietary microchip</td>
</tr>
<tr>
<td>Laser Class</td>
<td>3R (IEC 60825-1)</td>
</tr>
<tr>
<td>Range</td>
<td>300m 90% Kodak Gray Card</td>
</tr>
<tr>
<td>Scan Rate</td>
<td>Up to 50,000 points/sec</td>
</tr>
<tr>
<td>Scan Resolution</td>
<td>From 0 – 50m 4.5mm</td>
</tr>
<tr>
<td>Field of View</td>
<td>360°</td>
</tr>
<tr>
<td></td>
<td>270°</td>
</tr>
<tr>
<td>Scanning Optics</td>
<td>Vertically rotating mirror on horizontally rotating base. Smart X-mirror automatically spins or oscillates for min. scan time.</td>
</tr>
<tr>
<td>Data Storage Capacity</td>
<td>80GB On-Board</td>
</tr>
<tr>
<td>Communications</td>
<td>Dynamic IP Address, Ethernet</td>
</tr>
<tr>
<td>On-Board Display</td>
<td>Touch screen control with stylus, full color graphic display, QVGA (320 x 240)</td>
</tr>
<tr>
<td>Level Indicator</td>
<td>External Bubble, electronic bubble in onboard control and Cyclone SW.</td>
</tr>
<tr>
<td>Data Transfer</td>
<td>Ethernet or USB 2.0 device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Supply</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Type</td>
<td>Internal Lithium Ion</td>
</tr>
<tr>
<td>Power Ports</td>
<td>Internal x 2, External x 1</td>
</tr>
<tr>
<td>Duration</td>
<td>Internal 3.6hrs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temp</td>
<td>0° to 40° C</td>
</tr>
<tr>
<td>Dust/humidity</td>
<td>IP54 (IEC 60529)</td>
</tr>
</tbody>
</table>

### Leica Scanning Software

**Cyclone SCAN**  
Cyclone-SCAN is the software interface for operating the Leica ScanStation C10. User-specified scan area and density, data filtering, scan scripting, and automatic recognition and extraction of both planar and spherical Leica Geosystems HDS targets – all contribute to this easy-to-use, intelligent data capture application.

### Cyclone SURVEY

Cyclone-SURVEY allows quick extraction of relevant feature and coordinate information from the point cloud data via the Cyclone Virtual Surveyor™ function. Powerful tools support complex topographic models, with intelligent mesh decimation that minimizes file size while retaining accurate geometry.
Cyclone REGISTER

Cyclone REGISTER provides the complete set of tools for aligning point clouds captured from different scanning positions, quickly and accurately. Cyclone REGISTER supports the use of Leica Geosystems HDS targets to geo-reference scan data, as well as the ability to align overlapping areas of point clouds – without the use of targets. This results in optimum registration, and provides significant time- and cost-savings by reducing the need to place and extract targets.

Leica CloudWorx 4.0 for MicroStation is a plug-in software for using as-built point cloud data – captured by laser scanners – directly within MicroStation. Users can take advantage of the familiar MicroStation interface and tools to shorten the learning curve for working with laser scan data. Leica CloudWorx and the powerful Leica Cyclone point cloud engine let users efficiently visualize and process large point cloud data sets. Users can create accurate 2D and 3D as-builts, check proposed designs against existing conditions, perform critical construction & fabrication QA, and more... all directly within MicroStation.

C. Scope of Services

Section A – Task

This section lists the Tasks associated with the Scope of Services. The column on the right shows that Leica Geosystems complies or exceeds with the required specification.

| 1) | All software required by this contract shall be delivered to NYSDOT within 10 business days after the contract is signed. All hardware shall be delivered and distributed by the Leica Geosystems at the training facility during the first afternoon of the training. All delivery costs shall be included in the total contract price. | Complies |

| 2) | All the following listed training shall be provided at no additional expense to the Department under the terms and conditions and over the complete duration of the lease agreement. The cost of all training shall be included in the total contract price. Initial training shall consist of a minimum of ten (10) business days of training. One (10) day on site session shall be held for design surveyors and one (10) day on site session for construction surveyors. Follow-up training shall occur yearly and shall consist of two (2), five (5) days on site training sessions, one for design survey and one for construction survey. All training shall be at a facility provided by NYSDOT. NYSDOT will provide computers for the training sessions. There will be about 40 persons at each training session. Any on-line training webinars, recorded videos, support groups and documentation shall be made available to NYSDOT as part of this contract with no additional charge. | Leica Geosystems shall conduct training per the RFP’s specs. Complies |
3) All the following listed maintenance and technical support shall be provided at no additional expense to the Department under the terms and conditions and over the complete duration of the lease agreement. The cost of all maintenance and technical support shall be included in the total contract price. Leica Geosystems shall provide one contact to arrange maintenance of all equipment included in this contract. This contact shall provide same day response to coordinate maintenance.

Leica Geosystems shall provide a dealer within NYSDOT that shall accept all items in need of maintenance and shall provide replacement items within 48 hours of the time item was delivered. NYSDOT shall pay for any shipping needed to deliver items to the dealer within NYS. Leica Geosystems shall be responsible for any shipping costs to/from the manufacturer or repair center and any shipping back to NYSDOT. Maintenance shall include all repairs of day to day breakdowns of any equipment included in this contract. This might include, but is not limited to cable breakage; batteries which don’t hold their charge; motor malfunctions; horizontal or vertical circle malfunction, tangent screw malfunction; memory, program or electrical power malfunction; maladjustment of measuring or centering devices or any item that may inhibit the package from performing as required. Maintenance of equipment including calibration, cleaning and adjustment of equipment shall occur as required for repair or yearly, at a time to be determined by the Department.

All software including firmware and office importing or processing applications provided by the Leica Geosystems under this contract shall be kept current with the most recently released versions, upgrades, service packs and/or fixes. Leica Geosystems shall notify the Department of all new firmware or software upgrades, fixes or new versions when they become available. These changes shall be evaluated by the Department and if deemed appropriate, the software and/or firmware shall be provided to the Department or be installed by Leica Geosystems at the Department’s discretion and at no additional cost.

Hardware and software support shall include telephone assistance during normal NYSDOT business hours, programming fixes to correct operational problems, and provisions to provide service patches. The technical support group shall respond to all trouble calls within eight (8) business hours, and shall provide software fixes. Leica Geosystems shall provide a written description of how this phone support will be provided in their proposal.

Leica Geosystems has included within its bid price the cost for technical service support and maintenance. Leica Geosystems shall arrange for one primary contact within Leica to arrange maintenance of all equipment on this contract.

Leica Geosystems dealer, Maine Technical Source is capable of accepting all items in need of maintenance.

Leica Geosystems shall provide to the NYSDOT all software and firmware upgrades to ensure the NYSDOT stay current throughout the duration of the contract. The NYSDOT shall be notified of any new upgrades.

Leica Geosystems shall make available to the NYSDOT access to our technical Support Group. A written description on how Technical Support works within the Leica Geosystems organization.

---

**Data Flow using to/from Bentley InRoads**

**Overview**

The following represents how Leica Geosystems manages the data flow between the SmartWorx Viva Field Data Collection Software and Bentley InRoads.

**Bentley InRoads Road Design Work Flow**

Bentley reading files can easily be exported for use in Leica RoadRunner and Reference Line applications, as fixed elements that can not be altered in the field. Horizontal and vertical alignments are exported along with cross section templates and assignments using one of two methods. Using LGO's design to field application, users can export GSI data directly from Bentley and import to LGO. This method allows users to review and rename elements that are going to be used in the road stakeout and field design. The direct export from Bentley places the entire default element names in the RoadRunner file for field use, while faster the user does not get the chance to rename elements for easy identification in the field.
Using LandXML data directly exported from Bentley, users can view and modify horizontal and vertical alignments and assign cross-sections before building the road alignments. LandXML road designs can be generated in Bentley and copied to SmartWorx Viva for field use without the need for special office converts. Using the Alignment editor in SmartWorx Viva field operators can modify and view the entire road design. Once the design is settled in the field the RoadRunner job can be created for staking. Alignment editor works in LandXML, allowing the final changes to be copied back into Bentley for archiving and review once the field work is completed.

Several data flow paths are available that shall allow the field operators to use all of the extended Leica linework features in SmartWorx and see the linework in Bentley. Using legacy export files shall allow data to be used in Bentley InRoads as long as linear data is collected. LandXML and the InRoads export tool built for LGO shall allow users to take full advantage of the coding and linework functions in SmartWorx Viva. Work processes are already built for exports in all formats.
Compatibility and Connectivity to NYSNet

Compatibility and Connection

New York State Department of Transportation currently runs a Real-Time Continuously Operating Reference Station Network - NYSNet.

Leica Geosystems GNSS Receivers (GS15) are capable of using RTCM Version 3 MAC Network RTK Corrections.

The Master Auxiliary Concept gives the rover the flexibility to perform either a simple interpolation of the network corrections like FKP, or a more rigorous calculation (e.g. calculate multiple baselines from the auxiliary reference stations). This means the rover can monitor the RTK solution and change its calculation on-the-fly to optimize the RTK solution.
The Leica SmartWorx Viva Software has been developed with the user in mind. Tasks such as configuring RTK communication devices and connecting to Reference Station Networks were deemed complex in the past. In order to address this Leica Geosystems created Wizards to help simplify the process by creating logical steps and using everyday words to guide an operate through the process. At the conclusion of these steps the system displays a check list to ensure all is good for initial connection. The system only has to be configured once.

The screen shots shown below is an example of how a user would utilize the Wizard to configure and connect to the NYSNet.

(1)

(2)

(3)

(4)
Product Literature and Components List

Proposal Guaranty

This section contains the product literature and a list of all components to be supplied by Leica Geosystems to the NYS Department of Transportation:

List of Components to be Supplied:
- Total Stations and Accessories
- Field Controllers and SW for Total Stations
- GNSS Receivers and Accessories
- Field Controllers and SW for GNSS Receivers
- Digital Levels and Accessories
- Scanner and Accessories
- Scanner Office Software

Brochures:
- Total Stations – TPS1200+
- GNSS Receivers – GS15 GNSS Receiver
- Data Collectors – CS15 Field Controller
- Data Collection Software – SmartWorX Viva.
- Digital Levels – DNA Series Digital Levels
- myWorld@Leica Geosystems.
- Scanner – ScanStation C10
- Scanner Software Field and Office
  - Cyclone SCAN
  - Cyclone REGISTER
  - Cyclone SURVEY
  - CloudWorx for MicroStation

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>754326</td>
<td>TCRP1201+ w/PowerSearch, PinPoint R1000, Automatic Target Recognition Total Stat</td>
<td>34</td>
</tr>
<tr>
<td>733257</td>
<td>MCF256, industrial grade CompactFlash card 256MB.</td>
<td>34</td>
</tr>
<tr>
<td>772300</td>
<td>RH15 Radio Handle with integrated radio modem and radio antenna. Used as radio mod</td>
<td>34</td>
</tr>
<tr>
<td>667307</td>
<td>Trinbach GDF122 PRO, with optical plummet, pale green.</td>
<td>34</td>
</tr>
<tr>
<td>756367</td>
<td>GEV217 Data transfer cable, connects CS10/CS15 field controller with CBC01 Lemo connector</td>
<td>102</td>
</tr>
<tr>
<td>733270</td>
<td>GEB221, Lithium-Ion battery, 7.4V/4.4Ah, chargeable.</td>
<td>102</td>
</tr>
<tr>
<td>734752</td>
<td>GKL211, Charger BASIC, for Li-Ion batteries GEB221 and GEB211, car adapter cable at</td>
<td>34</td>
</tr>
<tr>
<td>409678</td>
<td>GEV52 Cable, connects TPS1200+ or DNA to external battery.</td>
<td>34</td>
</tr>
<tr>
<td>439038</td>
<td>GEV71, 4m car battery cable, connects all battery cables to 12V car battery.</td>
<td>34</td>
</tr>
<tr>
<td>667301</td>
<td>Tripod GST120-9, telescopic, self-closing, with accessories, without pouch.</td>
<td>135</td>
</tr>
<tr>
<td>667307</td>
<td>Trinbach GDF122 PRO, with optical plummet, pale green.</td>
<td>136</td>
</tr>
<tr>
<td>667313</td>
<td>Carrier GRT144 for GPS antenna, EDM reflectors and target plates, pale green.</td>
<td>136</td>
</tr>
<tr>
<td>641617</td>
<td>Circular prism GPR121 PRO, with holder and target plate</td>
<td>136</td>
</tr>
<tr>
<td>667401</td>
<td>GVP609, Container for 2 Circular Prisms – GPR111/112, 2 Laser Plummets and 2 Trinbad</td>
<td>34</td>
</tr>
<tr>
<td>641662</td>
<td>GMP101 Mini prism, incl. bubble, target plate and spike, in bag, also suitable for GLS1</td>
<td>34</td>
</tr>
<tr>
<td>754384</td>
<td>GR2123 360° reflector with 5/8” thread adapter for mounting of GPS antenna.</td>
<td>34</td>
</tr>
<tr>
<td>5507-17</td>
<td>Telescopic quick change prism pole 8.53ft (Carbon Fiber) &amp; S33441 S191 Prism Pole Ti</td>
<td>34</td>
</tr>
<tr>
<td>5507-20</td>
<td>Telescopic quick change prism pole 12ft (Aluminium) &amp; S33441 S191 Prism Pole Topo S</td>
<td>34</td>
</tr>
<tr>
<td>2090-10</td>
<td>Leica Series Pole Adapter</td>
<td>34</td>
</tr>
</tbody>
</table>
### Field Controller and Software for Total Station

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>767871</td>
<td>CS15 Field Controller. Ruggedized WinCE field controller with full VGA touch display.</td>
<td>34</td>
</tr>
<tr>
<td>767875</td>
<td>CBC02. DSUB Connector module with Power jack, DSUB 9-pin, USB A Host and USB M</td>
<td>34</td>
</tr>
<tr>
<td>772806</td>
<td>GEB212, Lithium Ion battery, 7.4V / 2.6Ah, chargeable</td>
<td>34</td>
</tr>
<tr>
<td>767905</td>
<td>GVP644. Soft bag for CS15 field controller field controller for transportation and protection</td>
<td>34</td>
</tr>
<tr>
<td>767907</td>
<td>SPF01. Anti - glare display foils for CS10 or CS15 field controller.</td>
<td>34</td>
</tr>
<tr>
<td>767877</td>
<td>GHT61. Hand strap for CS10 and CS15 field controller with utility hook for attaching tool</td>
<td>34</td>
</tr>
<tr>
<td>773753</td>
<td>GEV235-1, AC/DC-adapter US, for power supply CS15 and CS10.</td>
<td>34</td>
</tr>
<tr>
<td>764700</td>
<td>GEV223 Data transfer cable for connecting CS10/CS15 field controller to PC (USB A to USB B)</td>
<td>34</td>
</tr>
<tr>
<td>734752</td>
<td>GKL211, Charger BASIC, for Li-ion batteries GEB221 and GEB211, car adapter cable at</td>
<td>34</td>
</tr>
<tr>
<td>767876</td>
<td>GDZ68. Extra pen with screw-driver for CS10 and CS15 field controller</td>
<td>34</td>
</tr>
<tr>
<td>767906</td>
<td>CCS01. Docking station for CS10 or CS15 field controller for charging and data transfer</td>
<td>34</td>
</tr>
<tr>
<td>767877</td>
<td>GHT61. Hand strap for CS10 and CS15 field controller with utility hook for attaching tool</td>
<td>34</td>
</tr>
<tr>
<td>767879</td>
<td>GHT62, Pole holder base plate for CS10 and CS15 field controller.</td>
<td>34</td>
</tr>
<tr>
<td>767880</td>
<td>GHT63, Clamp arrangement for attaching the GHT62 holder to all poles.</td>
<td>34</td>
</tr>
<tr>
<td>767908</td>
<td>SmartWorX Viva Software and DVD</td>
<td>34</td>
</tr>
<tr>
<td>767909</td>
<td>SmartWorX Viva license key</td>
<td>34</td>
</tr>
<tr>
<td>767919</td>
<td>DTM Stakeout</td>
<td>34</td>
</tr>
<tr>
<td>767915</td>
<td>Reference Line</td>
<td>34</td>
</tr>
<tr>
<td>767927</td>
<td>Traverse</td>
<td>34</td>
</tr>
<tr>
<td>767920</td>
<td>Surface and Volumes</td>
<td>34</td>
</tr>
<tr>
<td>767921</td>
<td>RoadRunner</td>
<td>34</td>
</tr>
</tbody>
</table>

### GNSS Receivers and Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6004250</td>
<td>GS15 Performance, (GPS L1/L2 &amp; GLONASS) RTK GNSS SmartAntenna. Geodetic 120°</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Incl., GPS L5, Galileo &amp; RINEX Option</td>
<td></td>
</tr>
<tr>
<td>767856</td>
<td>MSD1000, industrial grade SD memory card 1GB for GS10/GS15 receiver and CS10</td>
<td>84</td>
</tr>
<tr>
<td>XXXXXXXXXX</td>
<td>PCMCIA Adapter</td>
<td></td>
</tr>
<tr>
<td>772806</td>
<td>GEB212, Lithium Ion battery, 7.4V / 2.6Ah, chargeable</td>
<td>168</td>
</tr>
<tr>
<td>734752</td>
<td>GKL211, Charger BASIC, for Li-ion batteries GEB221 and GEB211, car adapter cable at</td>
<td>168</td>
</tr>
<tr>
<td>767824</td>
<td>SLIC1, Dual Band Teit CDMA Module</td>
<td>84</td>
</tr>
<tr>
<td>767822</td>
<td>SLR3-2, Pacific Crest ADL RX/TX radio 430-470 Mhz. RTK receive and transmit UHF</td>
<td>84</td>
</tr>
<tr>
<td>752292</td>
<td>GLS30, telescopic carbon GNSS pole with 5/8&quot; thread. Snap locks at 1.80m and 2.00m</td>
<td>84</td>
</tr>
<tr>
<td>5217-50</td>
<td>Quick lever bi-pod (Seco # 5217-50-XXX)</td>
<td>84</td>
</tr>
<tr>
<td>5114-00</td>
<td>Magnet GNSS mag mount (Seco # 5114-00-XXX)</td>
<td>84</td>
</tr>
<tr>
<td>5187-00</td>
<td>GNSS quick release adapter for a 5/8&quot; thread (Seco#S187-00)</td>
<td>84</td>
</tr>
<tr>
<td>5119-11</td>
<td>Aluminum adjustable (1.5, 1.8, and 2 meter) graduated height tripod with integrate</td>
<td>84</td>
</tr>
<tr>
<td>8154-00</td>
<td>Carry bag (Seco #8154-00-XXX)</td>
<td>84</td>
</tr>
<tr>
<td>767828</td>
<td>GVP642, Hard container for GS15 SmartAntenna and CS15/CS10 field controller, Tool</td>
<td>84</td>
</tr>
<tr>
<td>772807</td>
<td>GEV237, 1.65 m USB connection cable, to connect GS15/GS10 receiver to Lemo pot</td>
<td>84</td>
</tr>
</tbody>
</table>
### Field Controllers and Software for GNSS Receivers and Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>767871</td>
<td>CS15 Field Controller. Ruggedized WinCE field controller with full VGA touch display</td>
<td>84</td>
</tr>
<tr>
<td>767875</td>
<td>CBC02. DSUB Connector module with Power jack, DSUB 9-pin, USB A Host and USB B</td>
<td>84</td>
</tr>
<tr>
<td>772006</td>
<td>GEB212, Lithium Ion battery, 7.4V / 2.6Ah, chargeable</td>
<td>84</td>
</tr>
<tr>
<td>767905</td>
<td>GVP644. Soft bag for CS15 field controller field controller for transportation and protection</td>
<td>84</td>
</tr>
<tr>
<td>767907</td>
<td>SPF01. Anti-glare display foils for CS10 or CS15 field controller</td>
<td>84</td>
</tr>
<tr>
<td>767877</td>
<td>GHT61. Hand strap for CS10 and CS15 field controller with utility hook for attaching</td>
<td>84</td>
</tr>
<tr>
<td>773753</td>
<td>GEV235-1, AC/DC-adapter US, for power supply CS15 and CS10.</td>
<td>84</td>
</tr>
<tr>
<td>764700</td>
<td>GEV223 Data transfer cable for connecting CS10/CS15 field controller to PC (USB A)</td>
<td>84</td>
</tr>
<tr>
<td>734752</td>
<td>GKL211, Charger BASIC, for Li-Ion batteries GEB221 and GEB211, car adapter cable</td>
<td>84</td>
</tr>
<tr>
<td>767976</td>
<td>GDZ68. Extra pen with screw-driver for CS10 and CS15 field controller</td>
<td>84</td>
</tr>
<tr>
<td>767906</td>
<td>CCS01. Docking station for CS10 or CS15 field controller for charging and data transfer</td>
<td>84</td>
</tr>
<tr>
<td>767877</td>
<td>GHT61. Hand strap for CS10 and CS15 field controller with utility hook for attaching</td>
<td>84</td>
</tr>
<tr>
<td>767879</td>
<td>GHT62, Pole holder base plate for CS10 and CS15 field controller</td>
<td>84</td>
</tr>
<tr>
<td>767880</td>
<td>GHT63, Clamp arrangement for attaching the GHT62 holder to all poles.</td>
<td>84</td>
</tr>
<tr>
<td>767908</td>
<td>SmartWorX Viva Software and DVD</td>
<td>84</td>
</tr>
<tr>
<td>767909</td>
<td>SmartWorX Viva license key</td>
<td>84</td>
</tr>
<tr>
<td>767919</td>
<td>DTM Stakeout</td>
<td>84</td>
</tr>
<tr>
<td>767915</td>
<td>Reference Line</td>
<td>84</td>
</tr>
<tr>
<td>767927</td>
<td>Traverse</td>
<td>84</td>
</tr>
<tr>
<td>767920</td>
<td>Surface and Volumes</td>
<td>84</td>
</tr>
<tr>
<td>767921</td>
<td>RoadRunner</td>
<td>84</td>
</tr>
</tbody>
</table>

### Digital Levels and Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>723289</td>
<td>DNA03, 0.3mm, precision digital level, magnetically damped compensator, with</td>
<td>39</td>
</tr>
<tr>
<td>667123</td>
<td>Plug-in Camcorder battery GEB212, NiMH, 6V/4.2Ah, rechargeable (for TPS340G)</td>
<td>78</td>
</tr>
<tr>
<td>733256</td>
<td>MCF32, Compact Flash Card, 32MB</td>
<td>78</td>
</tr>
<tr>
<td>733258</td>
<td>MCFAD1, CompactFlash PC Card adapter</td>
<td>78</td>
</tr>
<tr>
<td>328422</td>
<td>Tripod GST40, with rigid legs, with accessories.</td>
<td>39</td>
</tr>
<tr>
<td>522793</td>
<td>Dual face levelling staff GKNL4F, 13.3ft, 3 sections, code/ft graduation, with</td>
<td>39</td>
</tr>
<tr>
<td>734753</td>
<td>GKL112, Charger BASIC, for Ni-Mh batteries GEB121 and GEB111, car adapter cable</td>
<td>39</td>
</tr>
<tr>
<td>563625</td>
<td>GEV102 Data transfer cable, connects TPS1200+ to PC (9-pin RS232 serial), 2</td>
<td>78</td>
</tr>
<tr>
<td>8225995</td>
<td>LO Ink Level Turning Pin</td>
<td>39</td>
</tr>
<tr>
<td>197000</td>
<td>Base plate for GPLE and GPCL rods</td>
<td>39</td>
</tr>
</tbody>
</table>
## D. Deliverables

Leica Geosystems shall supply hardware and software to include 34 Robotic Total Stations with accessories and field controllers, 84 GNSS receivers with accessories and field controllers, 39 digital levels with accessories, office processing software and 2 laser scanners (terrestrial LIDAR) with software and accessories.

This section lists the minimally required specifications. The column on the right shows that Leica Geosystems complies or exceeds the specification.

### 1. Total Station Minimum Requirements:

#### a) Angle Measurement

<table>
<thead>
<tr>
<th>Accuracy</th>
<th>1&quot;</th>
</tr>
</thead>
</table>

Leica Geosystems shall supply to the NYDOT the TCRP1201 + R1000 Robotic Total Stations. This is a 1” Total Station – (Accuracy std. dev. ISO 17123-3) Complies

#### b) Distance Measurement

<table>
<thead>
<tr>
<th>EDM Types</th>
<th>Self contained coaxial, and reflectorless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>2mm +2ppm or less</td>
</tr>
<tr>
<td>Reflectorless Accuracy</td>
<td>3mm +2ppm or less</td>
</tr>
<tr>
<td>Range with Prism</td>
<td>3,000m or greater</td>
</tr>
<tr>
<td>Range Reflectorless</td>
<td>500m or greater</td>
</tr>
</tbody>
</table>

Complies and Exceeds
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>c)</strong> Axis Compensation.</td>
<td></td>
<td>Complies</td>
</tr>
<tr>
<td>o Shall be Dual Axis</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>d)</strong> Setting Accuracy</td>
<td></td>
<td>Complies</td>
</tr>
<tr>
<td>o Shall be 1.0&quot; or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>e)</strong> Instrument Hardware – the Total Station shall:</td>
<td></td>
<td>Complies</td>
</tr>
<tr>
<td>o Be motorized, servo driven, or have some method of automated drive.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Have telescope magnification of 30x or greater.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Have fully robotic Auto Tracking (can track prism automatically with no special target/prisms required).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Automatically and precisely lock onto the center of the target/prism after getting target into field of view using a passive (standard) prism. (Auto Aiming)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Have some method of target recognition to avoid locking onto other reflective surfaces.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Automatically track prism once locked on. (Auto Tracking)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Automatically locate the prism in or out of the field of view by means other than standard search modes and have the ability to direct the instrument to the prism within 5 seconds of loss of lock. (Auto Searching)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Have Automatic Traverse Sets (once sighted on backsight and foresight, instrument must be capable of turning two (2) sets of angles in direct and reverse face using BS direct, FS direct, FS inverted and BS inverted using the auto tracking capability. Each set of horizontal observations shall resolve to a sum of 360 deg. +/- 5 seconds. Each set of vertical observations shall resolve to a sum of 360 deg. +/- 10 seconds. Both sets of observations combined shall also be required to close within these specifications.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Be controllable using the data collector at the prism pole to a distance of at least 800 meters.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>f)</strong> Batteries/Chargers</td>
<td></td>
<td>Complies</td>
</tr>
<tr>
<td>o Three (3) O.E.M. onboard 7V or greater rechargeable Li-ion batteries with minimum operating time of five (5) hours each operating under normal conditions at 20° C.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) O.E.M. battery charger (110V) for supplied Li-ion batteries.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) O.E.M. 12 volt auto converter with alligator clips and connecting cable to the supplied total station.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Onboard Instrument Operation Software including all versions and updates as they become available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>g)</strong> Standard Components not listed above</td>
<td></td>
<td>Complies</td>
</tr>
<tr>
<td>Each total station package shall include:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) hard shell protective carrying case (Pelican quality or equal).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) tool kit with case.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) silicon cloth.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) rain cover.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) plumb bob set.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) lens cap.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Any other standard components normally delivered</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>h)</strong> Accessories - ALL ACCESSORIES SHALL BE THE BEST AVAILABLE PROFESSIONAL GRADE ORIGINAL EQUIPMENT (O.E.M.) UNLESS OTHERWISE SPECIFIED.</td>
<td></td>
<td>Complies and Exceeds</td>
</tr>
<tr>
<td>Accessories to be included with each total station package:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Four (4) heavy duty wooden tripods with Quick Clamp locking mechanisms.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Four (4) optical plummet tribrachs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Four (4) single prisms including tilting prism holders with sighting collimators. All four single prisms shall have the same prism offset and be appropriate for use with auto tracking (shall be able to be tracked by instrument without the aid of batteries or diodes).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) mini prism with bulb’s eye bubble, target spike and protective bag. The mini prism offset shall have the same prism offset as the single prisms listed in item 3 above.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) 360 deg. prism (prism shall be able to be tracked without having to aim it at instrument).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Four (4) H.I. adjustable rotatable tribrach adapters. Tribrach adapters shall be adjusted to supplied total station height.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o One (1) 2.5 meter lightweight composite telescoping prism pole.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Leica Geosystems shall supply the transport cases necessary to carry for two (2) prism’s carries and tribrachs.
2) GNSS Receiver Requirements

a) General Requirements - The GNSS receivers shall:
   o Be capable of performing FGCC order-B geodetic surveys on baselines of 20-70 km in static mode, order-C1 and C2-1 surveys on baselines <20 km in static mode, order C2-11 on baselines <7km in fast static or kinematic modes and order C2-11 surveys on baselines <5km in Real Time Kinematic mode.
   o Be capable of obtaining accurate three-dimensional survey data in static, rapid-static, stop & go, kinematic, and RTK modes.
   o Provide the full range of currently practical and useful static and dynamic operating modes, regardless of the specific terminology used to label those capabilities.
   o Incorporate some inherent means for overcoming the effects of P-code encryption without loss of accuracy or performance.
   o Be able to operate as a RTK base rover or repeater regardless of configurations and include integrated or modular RTK communication modes.
   o Include the latest technology which accepts triple frequency signals.

b) Frequencies
   o Triple Frequency, L1, L2 and L5 for GPS/GLONASS/Galileo

Complies and Exceeds

The GS15 receiver has 120 Channels and is capable of tracking all signals listed. With regards to Galileo the GS15 is capable of tracking the following: Galileo (Test): GIOVE-A, GIOVE-B; Galileo: E1, E5a, E5b, Alt-BOC

Complies and Exceeds

c) Channels
   Shall include a minimum 72 channels with the capacity to track the following signals from all available satellites simultaneously.

<table>
<thead>
<tr>
<th>GPS Channels</th>
<th>L1 C/A Code, L2C, L1/L2/L5 Full Cycle Carrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLONASS</td>
<td>L1 C/A Code, L1 P Code, L2 P Code, L1/L2 Full Cycle</td>
</tr>
<tr>
<td>Channels</td>
<td>Carrier</td>
</tr>
<tr>
<td>Galileo</td>
<td>E1/2/5a and L1</td>
</tr>
</tbody>
</table>

Complies

Accuracy specifications for the GS15 GNSS Receiver Compliant with ISO17123-8.

<table>
<thead>
<tr>
<th>Measurement Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Differential GNSS Positioning Performance</td>
</tr>
<tr>
<td>Horizontal</td>
</tr>
<tr>
<td>Vertical</td>
</tr>
<tr>
<td>WASS Differential Positioning Accuracy</td>
</tr>
<tr>
<td>Static and Fast Static GNSS Surveying Performance</td>
</tr>
<tr>
<td>Horizontal</td>
</tr>
<tr>
<td>Vertical</td>
</tr>
<tr>
<td>Kinematic Surveying Performance</td>
</tr>
<tr>
<td>Horizontal</td>
</tr>
<tr>
<td>Vertical</td>
</tr>
<tr>
<td>Initialization Time</td>
</tr>
<tr>
<td>Initialization Reliability</td>
</tr>
<tr>
<td>Section</td>
</tr>
<tr>
<td>---------</td>
</tr>
</tbody>
</table>
| c) Tracking | GNSS Receivers shall be capable of tracking:  
- All available satellites, even if SV is unhealthy, to an elevation angle of 0°.  
- Existing Block II satellites.  
- L2C signals.  
- GLONASS satellites.  
- Galileo satellites.  
GNSS Receivers shall:  
- Have technology that enhances low power satellite signal acquisition.  
- Provide improved tracking in areas of high radio interference such as under power lines, around airports, near radio-intensive construction sites.  
- Also increase the ability to work near trees due to minimal signal lock loss.  
- Have extremely low noise C/A code tracking technology.  
- Have multipath mitigation techniques. | Complies and Exceeds  
With regards to Galileo the GS15 is capable of tracking the following:  
Galileo (Test): GIOVE-A, GIOVE-B  
Galileo: E1, E5a, E5b, Alt-BOC |
| f) Encryption Handling | When Anti-Spoofing (A/S) (P-code encryption) is activated, the receiver shall measure L1 C/A pseudo ranges, L2, L2C range measurements and the full cycle L1, L2 and L5 carrier phases.  
- Receivers shall be capable of automatically switching tracking modes when P-code is encrypted without losing accuracy and have the same capability to measure the same length baseline as prior to P-code encryption.  
- Performance shall not be lower during times when A/S is activated, compared to times when A/S is not activated. | Complies |
| g) Collection Methods | GNSS receivers shall be capable of operating in and providing data for all the following GNSS survey scenarios:  
- Static  
- Rapid Static  
- Stop-and-Go  
- Kinematic  
- Real Time Kinematic (RTK)  
- Kinematic On-The-Fly  
- Single Point Positioning  
- Post-Processed Ambiguity Resolution in OTF mode or static initialization  
- When used with a data collector/controller, the receiver shall be capable of performing Static, Rapid-Static, Kinematic, RTK surveys.  
- When used with a data collector/controller and an RTK communication device, the receiver shall be capable of performing Real Time Kinematic surveys. | Complies |
| h) Memory | Memory must be recoverable and capable of recording at least 5 days of data at a 1 second sampling interval with a minimum of 9 SVs. The satellite data shall be logged on either a removable Industry Standard PCMCIA card or fixed internal memory residing in the GNSS receiver.  
PCMCIA Card Data Storage:  
- If the system uses PCMCIA cards for memory storage then they shall be PCMCIA ATA Flash RAM card, or Type I or Type II PCMCIA SRAM card. The industry standard PCMCIA memory cards shall fit into the GNSS receiver. The memory card shall be able to download into any PCMCIA card reader that allows PCMCIA Flash RAM, Type I or Type II PCMCIA SRAM card.  
- GNSS data shall be able to download to personal computer either by direct transfer through a standard PCMCIA slot, or an external PCMCIA card reader or USB download connection.  
Fixed Internal Memory Storage:  
- Data shall be stored in flash memory, so that no battery backup is required for the data storage memory.  
- When data is deleted using an external controller or PC, the files shall be recoverable at a later date if the memory has not been used for storage of new data. The reuse of data storage used by previously deleted files shall be on a first in first out basis. The system shall never automatically delete files. | Complies and Exceeds  
Leica Geosystems shall supply a 1GB memory card that is capable of logging 280 days of raw data at a 15second rate of GPS & GLONASS (8+4 satellites). |
<table>
<thead>
<tr>
<th>i) Data Recording</th>
<th>Complies and Exceeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Data recording rate shall be user-selectable from 1 to 60 seconds.</td>
<td>The GS15 GNSS Receiver shall be supplied with 20Hz Data</td>
</tr>
<tr>
<td>- Upon startup and satellite tracking the receiver shall be capable of automatically logging GNSS data using predefined data collection parameters to a data file.</td>
<td>Complies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>j) Data Interface</th>
<th>Complies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The GNSS receiver shall have a method of indicating the following information without requiring a separate hand held unit:</td>
<td></td>
</tr>
<tr>
<td>- If the power is acceptable or low.</td>
<td></td>
</tr>
<tr>
<td>- If the system receiver is tracking four (4) or more satellites, less than four (4) satellites or no satellites.</td>
<td></td>
</tr>
<tr>
<td>- The receiver shall have:</td>
<td></td>
</tr>
<tr>
<td>- Dual RS232 ports for serial input/output and data collector control.</td>
<td></td>
</tr>
<tr>
<td>- At least one (1) external power port.</td>
<td></td>
</tr>
<tr>
<td>- At least one (1) Bluetooth port.</td>
<td></td>
</tr>
<tr>
<td>- The ability to communicate with any third party interface.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>k) Batteries/Chargers</th>
<th>Complies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Each receiver shall be supplied, as a part of this contract, with a primary internal or modular removable, rechargeable battery system sufficient to operate the receiver for five (5) continuous hours in a post-processed mode and eight (8) continuous hours in an RTK mode. If two batteries are needed to achieve they shall be hot swappable and shall be supplied.</td>
<td></td>
</tr>
<tr>
<td>- The battery shall be of a technology that does not have memory effects (i.e. lithium ion).</td>
<td></td>
</tr>
<tr>
<td>- The battery shall be fully sealed.</td>
<td></td>
</tr>
<tr>
<td>- There shall be protection within the system to protect against over charging.</td>
<td></td>
</tr>
<tr>
<td>- The system shall automatically swap between power sources due to a low battery or battery removal without any effect on the survey. There shall not be a cycle slip or a new logging file created.</td>
<td></td>
</tr>
<tr>
<td>- The system shall alert the operator that power level is low and allowing sufficient time to connect another power source without interrupting the measurement process.</td>
<td></td>
</tr>
<tr>
<td>- Should power failure occur, the system shall save all GNSS measurements recorded before power failure, on either a PCMCIA card or internal memory.</td>
<td></td>
</tr>
<tr>
<td>- After a power failure the system shall restart with the same settings that were used before the power failure.</td>
<td></td>
</tr>
<tr>
<td>- On a dual battery power system, batteries shall be interchange without powering down the GNSS system or interfering with the GNSS operation.</td>
<td></td>
</tr>
<tr>
<td>- It shall be possible to use any 12 Volt lead acid battery with the system.</td>
<td></td>
</tr>
<tr>
<td>- Each receiver shall also be accompanied by enough charging units of an appropriate type so that all batteries can be recharged simultaneously in no longer than twelve hours.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>l) Antenna</th>
<th>Complies and Exceeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The antenna component shall be integrated with the receiver.</td>
<td>With regards to Galileo the GS15 is capable of tracking the following:</td>
</tr>
<tr>
<td>- The antenna supplied shall have a current phase center calibration completed by the National Geodetic Survey.</td>
<td>Galileo (Test): GIOVE-A, GIOVE-B, Galileo: E1, E5a, E5b, Alt-BOC</td>
</tr>
<tr>
<td>- The antenna shall be capable of receiving L1, L2, L2C, GLONASS, and Galileo Frequencies.</td>
<td></td>
</tr>
<tr>
<td>- The antenna shall have an extremely stable horizontal phase center stability that does not require orientation and include an integrated ground plane.</td>
<td></td>
</tr>
<tr>
<td>- The design and construction of the antenna shall protect it from all environmental elements.</td>
<td>100%, compliance with ISO9022-13-06, ISO9022-12-04 and MIL STD 810F – 507.4-</td>
</tr>
<tr>
<td>- The antenna shall be waterproof and dustproof and able to function reliably under extreme adverse weather conditions (i.e. rain, sleet, snow, and direct sunlight) in temperatures ranging from -20°F to 120°F and up to 100% humidity without sustaining any damage.</td>
<td></td>
</tr>
<tr>
<td>- Mounting for the antenna shall fit any standard surveying tribach adapter with 5/8&quot; threads.</td>
<td></td>
</tr>
<tr>
<td>- The antenna shall be able to communicate with the data collector by both cable and Bluetooth connections. A cable shall be included for this purpose.</td>
<td></td>
</tr>
</tbody>
</table>
### Environmental
- Each receiver and antenna shall:
  - Operate in a temperature range that meets Military Standards without sustaining damage.
  - Be able to be stored in a temperature range that meets Military Standards without sustaining damage.
  - Be designed and built so that no damage shall result from operation in these weather conditions:
    - Temperature from -20°F to +120°F.
    - Maximum humidity up to 100%.
    - Be fully sealed and waterproof
    - Tolerate a three (3) foot drop to a hard surface.

Complies and Exceeds
-40°C to +65°C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810F - 502.4-II, MIL STD 810F - 501.4-II
100%, compliance with ISO9022-13-06, ISO9022-12-04 and MIL STD 810F - 507.4-
IP67 according IEC60529 and MIL STD 810F - 506.4-1, MIL STD 810F - 510.4-1 and MIL STD 810F - 512.4-1
Withstands 1.0 m drop onto hard surfaces

### Real Time Kinematic (RTK) Communications
- Each GNSS receiver shall be capable of operating as an RTK base, rover, or repeater.
- All receivers shall include a CDMA modem and a radio communication modem for transmitting/receiving RTK corrections.

Complies and Exceeds

### n) Cell Modem
- Each GNSS receiver shall be supplied with an integrated or modular CDMA modem capable of connection to the Verizon data network in NYS. CDMA modems shall be activated on the Verizon network by NYSDOT. NYSDOT shall be responsible for the monthly activation fees.

Complies

### o) Radio Modem
- Each GNSS receiver shall be supplied with an integrated or modular UHF, spread spectrum radio modem that does not require FCC licensing.
- The radio modem shall be capable of operating as a base, rover or repeater, and capable of a range of at least 2 miles.

Complies

### p) Accessories - Each GNSS receiver shall:
- Be supplied with all components and accessories required to properly conduct static and rapid-static surveys.
- Be supplied with all hardware, software, data collectors/controllers, range poles, attachments and accessories to conduct kinematic surveys, post-processed OTF kinematic surveys, and RTK surveys as base or rover units.
- Include a two (2) meter carbon fiber snap lock range pole (Seco #5128-20 or OEM equivalent), capable of being fixed at two (2) meters in height, and collapsed for transport. Each range pole shall have an attachable quick lever bi-pod (Seco # 5217-50-XXX or OEM equivalent).
- Include a three (3)-magnet GNSS mag mount (Seco # 5114-00-XXX or equivalent) and a GNSS quick release adapter for a 5/8" thread (Seco#5187-00).
- Include a standard aluminum adjustable (1.5, 1.8, and 2 meter) graduated height tripod with integrated liquid filled compass, precise leg adjusters (Seco #5119-11-XXX or OEM equivalent), and carry bag (Seco #8154-00-XXX or OEM equivalent).
- Be supplied with an OEM carry case (hard or soft) for safe transportation of the equipment.

Complies

### 3 Data Collector/Controller Requirements

#### a) Hardware
- One handheld Data Collector/Controller (latest model available) shall be supplied with each GNSS receiver and each total station. Each data collector/controller shall:
  - Be capable of configuring the GNSS receiver and total station.
  - Permit the user to program and store multiple survey configurations prior to the actual field measurements.
  - Allow such configuration files to be saved and copied to other similar hardware in a simple manner.
  - Have a color touch screen.

Complies
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>b)</strong> Operating System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o The data collector/controller shall be Microsoft Windows-based with a graphical user interface.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Operating system software versions and updates shall be provided as required to run the most current version of the data collection software.</td>
<td>Complies</td>
<td></td>
</tr>
<tr>
<td><strong>c)</strong> Survey Software</td>
<td></td>
<td>Complies</td>
</tr>
<tr>
<td>The data collector/controller shall:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Include the manufacturer’s current data collector software that shall produce a file that Leica Geosystems guarantees can be opened or imported flawlessly into Bentley InRoads Survey (latest available version) to produce mapping and digital terrain models (DTMs).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Communicate with the supplied total station and GNSS receiver.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Operate the supplied total station auto tracking functions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o All software version updates shall be provided as available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Allow creating of configuration sets or styles for use with different survey methods.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Be able to enter point descriptions, attribute information, and line control coding.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Be able to record all raw observations including multiple observation sets, offset shots, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Include a map view that allows editing of survey shots interactively.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Include programs to perform coordinate system localizations/transformations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Allow averaging of multiple points within user defined averaging limits.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Allow importing of delimited ASCII text files, .dxf files, and LandXML files.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Include programs for survey stakeout to points, alignments and DTM’s.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Include programs to compute volumes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Be able to control all specified GNSS survey methods, including the collection or stakeout of terrain data which is collected/set by RTK GNSS methods using NYSDOT standard feature coding per the NYSDOT CADD Standards and Procedures Manual.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Be capable of defining feature attributes and storing attribute values with the terrain data observations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Include a map view including point and line work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Allow entering offset shots.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Include COGO functions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Allow stakeout to an alignment, reference plane, DTM, crosssections, and roadway templates.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>d)</strong> Display</td>
<td>Complies and Exceeds</td>
<td></td>
</tr>
<tr>
<td>The data collector/controller shall have:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o A 240 x 320 pixel or better (QVGA) color TFT display with LED front light with adjustable contrast. The display shall also have a back light and touch screen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o The ability to display graphical icons with a LCD type of display. Text-only displays are not acceptable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Shall have variable contrast capability to provide optimal viewing ability in sunny locations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>e)</strong> Communications - The data collector/controller shall have the following:</td>
<td>Complies</td>
<td></td>
</tr>
<tr>
<td>o Integrated Bluetooth wireless technology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o RS232 9-pin serial port.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o USB client.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o USB host.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o DC power port.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Wireless download capability.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Both a wireless and wire communication device to both the total station and GNSS receiver.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>f)</strong> Processor</td>
<td>Freescale i.MX31 533 MHz ARM Core</td>
<td></td>
</tr>
<tr>
<td>o The processor shall be 520 MHz CPU or greater.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>g)</strong> Memory Storage Expansion</td>
<td></td>
<td>Complies</td>
</tr>
<tr>
<td>The data collector/controller shall have:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o 1GB MB SDRAM or greater with 512 MB or greater internal nonvolatile storage memory.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Type I Compact Flash (CF) slot.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Type II Compact Flash (CF) slot.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Secure Data (SD) memory card slot.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
h) Batteries/Chargers
   Each data collector/controller shall have:
   - One (1) Li-ion rechargeable battery pack, 2600 mAh, with a minimum battery life of 10 hours under normal operating conditions.
   - One (1) manufacturer supplied 120V battery charger for supplied Li-ion batteries.
   - One (1) manufacturer supplied 12 volt battery charger with cigarette lighter adapter for vehicle for supplied Li-ion batteries. (2 hour maximum charging time)
   - Battery charge status LED indicator.

   The battery shall be able to be recharged while in the data collector. There shall be no risk of overcharging the battery when in the data collector. The battery should fast charge to 80% in 2 hours and achieve a full charge in 4.5 hours.

i) Environmental - Each data collector/controller shall:
   - Operate in a temperature range that meets Military Standards without sustaining damage.
   - Be able to be stored in a temperature range that meets Military Standards without sustaining damage.
   - Be designed and built so that no damage shall result from operation in these weather conditions:
   - Temperature from -20° F to + 120° F.
   - Maximum humidity up to 100%.
   - Tolerate a 4-foot drop to hard surface.
   - Be resistant to rain, snow, dust, sand, cold and heat under reasonable field operating circumstances.

   Operation: -30 to 60° C
   IP67 (IEC 60529)
   100% condensing (MIL-STD-810F, Method 507.4-1)
   4 foot drop onto hard surfaces

j) Cables
   - Two (2) download cables to connect the data collector to a USB port on a PC or laptop shall be provided with each data collector.

k) Additional Software
   The data collector/controller shall come with software that allows for:
   - Wired and/or wireless downloading of files from the data collector to a computer.
   - The editing of files. The software shall be able to create an ASCII coordinate file.
   - Exploring files
   - Opening text documents
   - Playing windows media
   - Utilizing all other features of the data collector hardware and software.

l) Manuals and Accessories
   - All standard supplied manuals shall be provided including:
     - An operation manual for the data collector hardware and software.
     - An operation manual for the data collector/controller shall come with one (1) heavy duty protective case.
   - Stylus
   - Display screen covers
   - Docking station
   - Wire cable to connect to Total Station, GNSS Rover and PC.
   - Hand Strap
   - Pole holder to mount data collector on prism/GPS pole.

m) Keyboard
   - The data collector/controller shall have a full alphanumeric keyboard.
   - On-board 'Help' shall be available at all times to aid user through the menus.
   - The data collector/controller shall have multi-tasking capability to allow the user to switch between available menus.

   The CS15 has a QWERTY Style Keyboard.

n) Audio
   - The data collector/controller shall have an integrated speaker and microphone for audio system events, warnings and notifications.

o) Radio Modem
   - The data collector/controller shall have an internal 2.4 GHz frequency-hopping spread-spectrum radio-modem.
p) Memory
   - The data collector/controller shall have internal RAM storage, fully
     protected from sand, dust, moisture and 100% humidity.
   - The technology used shall not require a battery backup.
   - The data collector/controller shall not lose data if there is no power
     supplied (battery or external) to the unit.
   - Program space and data storage shall not use the same memory areas.
   - An increase in the size of the program shall not reduce the size of the data
     storage for the unit.
   - Storage for at least 6,000 data points shall be provided in internal RAM.
   - Data storage shall be possible both with and without the use of a
     PCMCIA card.
   - A type II PCMCIA card slot shall be provided for memory expansion.

4 Digital Level Requirements:

a) Angle Measurement
   - **Electronic measurement**
     - Standard bar code staff: 1.0 mm (0.004 ft)
     - Visual measurement: 2.0 mm (0.008 ft)
   - **Distance measurement with a 20 m (65.62 ft) sighting distance**
     - Standard bar code staff: 25 mm (0.082 ft)
     - Visual measurement: 0.2 m (0.656 ft)

b) Measuring Range
   - **Electronic measurement**: 1.5 m – 100 m (5 ft – 325 ft)
   - **Visual Measurement**: from 1.3 m (4.265 ft)

   - Telescope magnification - 24x or higher
   - Setting accuracy - <0.2"

   Batteries / Chargers
   - The digital level shall come with:
     - Two (2) rechargeable 6 Volt or greater Li-ion batteries with minimum
       operating time of 24 hours at 20°C.
     - One (1) 120 Volt wall charger.

   - Measuring time - 3 sec. or better
   - Maximum tilt range - <15°
   - Setting accuracy - <0.2"

   Batteries / Chargers
   - The digital level shall come with:
     - Two (2) rechargeable 6 Volt or greater Li-ion batteries with minimum
       operating time of 24 hours at 20°C.
     - One (1) 120 Volt wall charger.

h) Data Storage
   - **Internal Memory**: At least 6000 measurements and/or 30,000 data lines
   - **External Memory**:
     - PCMCIA Card Slot with two (2) 2Mb PCMCIA cards or USB Flash
     - Drive Support
     - The ability to download data directly from the level to a laptop or PC

i) Standard Components of each digital level not listed above
   - One (1) hard shell protective carrying case
   - One (1) adjusting pin
   - One (1) silicon cloth
   - One (1) rain cover
   - One (1) plumb bob set
   - One (1) lens cap
   - One (1) instruction manual
   - Two (2) download cables
   - Any other standard components normally delivered

Complies
j) Accessories
   - One (1) heavy duty fixed height tripod
   - One (1) 13 ft. sectional dual face polymer staff with bar code / ft graduations
   - Staff must contain a bulls eye level bubble and a simple mechanism for quick and accurate engagement of the individual sections
   - Front side with bar code, reverse side with continuous ft graduations for leveling and height measurements
   - Graduations and accuracy must be in accordance with DIN 18703
   - One (1) Turning plate (Turtle)
   - One (1) Turning pin

5 Office Software Requirements

a) General Requirements

Leica Geosystems shall provide a 32-bit software package to operate on a compatible computer under Microsoft Windows Vista, Windows XP Professional and Windows Mobile 5.0 environments.

This software shall allow data transfer, editing, processing and reporting of all GNSS, total station, and digital leveling data. The software shall include the following functionality

1) Project Management
   - Allow user to organize all data collected within a single project.
   - Contain all data relating to a particular contract or client.
   - Allow for unlimited projects.

2) Data Download
   - The user shall be able to:
     - Configure the type of data.
     - Configure communication parameters (baud rate, port, etc.).
     - Send and receive files.
     - Change the file destination.
     - Perform file management functions on the storage location (delete files, etc.).

3) Data Collection
   - The user shall be able to change:
     - Settings on the GNSS receivers for different collection methods (static, fast static, kinematic, RTK, etc.).
     - Settings such as antenna type, antenna measurement methods (examples: measured to bottom of antenna mount, measured to antenna phase center, etc.) and logging rate.
     - Settings on the total station.

4) Data Import
   - The user shall be able to:
     - Import GNSS raw observation, total station, and digital level data.
     - Import ASCII/Binary files containing either coordinates or system specific baseline vectors.
     - Import RINEX data in the same manner as proprietary GNSS data.
     - Edit field-entered data and the receiver default file naming convention including station ID, antenna height, antenna type, antenna height measurement method, point offsets, initial station coordinates, and attributes at the time of input using the data download module (data check in).

5) Data Export
   - The software shall be capable of producing field notes which can be imported into Bentley InRoads Survey.
   - The field note file shall include GNSS data, total station data, digital level data, and NYSDOT CADD standard feature coding and attribute names and values.

6) Coordinate Computations/Datum Transformations
   - Shall provide a module to manage different coordinate systems and datum transformations including the capability to add, edit and delete different ellipsoids, map projections, geoid models and datum transformations.

7) Project Reporting
   - The software shall allow for the creation of custom Import, Export and Report formats.
o Examples of subjects to be included in the custom report function shall include information such as station occupation scenario, observation time, operation type, computed station coordinate/baseline vectors and the corresponding statistics, processing parameters and satellite information.

o Subjects of the reporting application shall be user selectable.

o The software shall be capable of exporting data/results to other systems.

8) Utilities - The software shall:

o Be able to export data to major CAD, design and GIS software packages. MicroStation design files, ArcGIS shapefiles are examples of exported data types. The export data shall use existing or compatible features tables.

o Have features that allow users to define and edit parameters for different GNSS antennas.

o Have an NGS Bluebooking utility to generate NGS Bluebook g and b files.

o Be able to export raw GNSS data to RINEX 2 data files.

o Be able to import Geoid models.

o Be able to import Bentley InRoads DTM and geometry data and transfer to the supplied data collector for stakeout purposes.

b) GNSS Requirements

1) General Requirements - The software shall:

o Provide the full range of GNSS survey applications necessary to achieve precise geodetic measurements according to NGS standards.

o Have the ability to export all data to a format acceptable to Bentley InRoads Survey.

o Be capable of producing data in “Blue Book” format as specified by NGS for inclusion in the National Spatial Reference System.

o Shall contain the following GPS applications:

  o Project Management
  o Mission Planning
  o Data Download
  o Data File Editing and Check in
  o Baseline Processing
  o Loop Closure Analysis
  o Network Adjustment
  o Coordinate Computations/Datum Transformations
  o Project Reporting (viewing network diagrams, viewing independent baselines by session, summary of baseline statistics, adjustment reports, adjusted coordinates with coordinate system information, NGS Bluebooking files etc.)

  o RTK data processing including the ability to produce a file which can be imported or opened in Bentley InRoads Survey including NYSDOT standard future coding and automated mapping control coding.

Leica Geosystems shall:

o Provide sufficient licenses, authorizations, or other necessary permissions (as determined by the Department) to utilize the software on an unlimited number of NYSDOT computers without the need for hardware locks or dongles.

o Provide complete sets of software documentation.

2) GNSS Mission Planning - The software shall:

o Provide the capability for generation of sky plots of satellite positions, a tabular and graphic representation of computed precisions, rise/set time, and elevation and azimuth of satellites for a specific geographic position using ephemeris data taken from the receiver or manually selected and imported.

o Allow the user to plan the GNSS fieldwork by combining the obstruction information for multiple points in session planning. Software shall be capable of combining obstructions from at least 4 stations in a session.

o Provide graphical and numerical information on the satellite constellation for any location at a given time.

o Be able to enter site location, cut-off angle, time zone, date and times for GNSS satellite window prediction.

o Allow almanac files to be imported for the session planning.

Complies
Always use the most current almanac in the system database.

User can manually select an older almanac for use in the survey preparations.

Older almanacs may be deleted from the system by the operator.

Output shall include individual point or combined session sky plot and observation chart, summary of available satellites, satellite geometry (including PDOP and GDOP) and elevation angle to the individual satellites. The above information shall be output in either graphic or tabular form.

Shall be able to specify a time and duration of interest for the observations, or view the entire 24-hour period of the selected date of prediction.

Shall allow the user to introduce obstructions either graphically or from ASCII file input.

Effects of the obstructions shall be reflected in satellite availability, PDOP and GDOP computations.

Shall provide the ability to show multiple site obstructions (combined curtain) with the satellite orbits for the selected date, time and duration on a single sky plot.

Shall allow the user to enable or disable individual satellite(s), depending on the health status of each satellite.

3) GNSS Baseline Processing - The software shall:

- Be capable of processing baselines of several measurement types including static, rapid static, stop and go, kinematic, continuous kinematic, and real time kinematic (RTK) and single point positioning.

- Be able to process RINEX 2 data. The processing of RINEX 2 data shall be identical to processing GNSS raw observation data. The user shall not be required to treat RINEX 2 data processing separately from raw data.

- Be able to process data using .g18 or .sp3 format precise ephemeris files.

- Be capable of processing all baselines automatically in a batch process, allow the user to select baselines to be processed and/or by observation session.

- Allow the user to manually select the non-trivial set of baselines for processing using graphical and tabular selections.

- Automatically or manually select and/or disable the baselines graphically that are to be processed.

- Be able to report an ascii text file of all stored baselines including processing statistics.

- Allow for changing processing parameters including elevation mask angle, session times, ionospheric and tropospheric models, code and/or phase data used, enable/disable individual satellites.

- Allow the user to select stations and baselines graphically or from selected point lists in order to view/edit the properties. This includes viewing and editing station ID’s, antenna heights, station coordinates, coordinate classes, color and fonts of stations, coding and attributes.

- Be capable of processing different antenna modules using NGS phase center tables.

4) GNSS Loop Closure Analysis - The software shall:

- Provide for loop closure analysis of all data sets measuring quality of GNSS positions showing ratio statistics and error statistics.

- Provide a manual selection of baselines for analysis.

- Also provide automatic closures of all baselines in a batch type mode.

5) GNSS Network Adjustment - The software shall:

- Include an integrated least network adjustment module for performing least squares adjustments to the processed GNSS baselines.

- Be capable of performing free, minimally constrained, and fully constrained adjustments. Each station may be individually set as fixed or free in either horizontal and/or vertical component.

- Allow the user to edit station coordinates and enable, disable, and/or delete stations or baselines.

- The result of the adjustment shall include both graphical and tabular representation of the residuals in Geodetic or Cartesian formats, error detection, statistical information, absolute and relative error ellipses.
6) Reporting - Software shall be capable of:
   - Reporting a project combined factor as ASCII text.
   - Reporting both WGS84 and State Plane coordinates to one ASCII text file.
   - Level Book editing
   - Level Processing
   - Level Loop adjustment
   - Reporting

6. Laser Scanner Requirements

   a) Type: pulsed laser with dual axis compensation with survey accuracy, range and
      field of view. Onboard control and/or wireless control from a computer. Shall have
      on board memory with USB data transfer. Shall have integrated digital camera.
      Complies

   b) Shall have on board power supply using at least 2 hot swappable batteries capable
      of powering the scanner for at least 4 hours without recharging. Shall include 4 Li-
      ion batteries total. Shall include an AC charger and a vehicle charger.
      Complies

   c) Shall include all standard accessories including transport case, tribrach, and tripod.
      Complies

   d) Shall include addition accessories necessary for performing typical laser scans
      including control targets.
      Complies

   e) Shall include all necessary software for onboard control and wireless control from a
      laptop.
      Complies

   f) Shall include all necessary office software needed to transfer data, view scans,
      register scans, develop mapping and digital terrain models that can be used with the
      departments Bentley MicroStation and InRoads software.
      Complies

E. Training

All the following listed training shall be provided at no additional expense to the Department
under the terms and conditions and over the complete duration of the lease agreement. The cost
of all training shall be included in the total contract price. Initial training shall consist of a
minimum of ten (10) business days of training. One (10) day on site session shall be held for
design surveyors and one (10) day on site session for construction surveyors. Follow-up training
shall occur yearly and shall consist of two (2), five (5) day on site training sessions, one for
design survey and one for construction survey. All training shall be at a facility provided by
NYSDOT. NYSDOT will provide computers for the training sessions. There will be about 40
persons at each training session. Any on-line training webinars, recorded videos, support groups
and documentation shall be made available to NYSDOT as part of this contract with no
additional charge. NYSDOT will work with Leica Geosystems to coordinate the training
agendas.

<table>
<thead>
<tr>
<th>Key Support and Training Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerr, T</td>
</tr>
<tr>
<td>L.L.S.</td>
</tr>
<tr>
<td>Masters Science</td>
</tr>
<tr>
<td>Geodesy</td>
</tr>
<tr>
<td>Purdue University</td>
</tr>
<tr>
<td>West Lafayette, IN</td>
</tr>
<tr>
<td>Bachelor Science Surveying</td>
</tr>
<tr>
<td>Direct Field Support for High End Surveying Equipment and Software</td>
</tr>
<tr>
<td>Various projects throughout North America</td>
</tr>
<tr>
<td>Years of Experience</td>
</tr>
<tr>
<td>30</td>
</tr>
</tbody>
</table>
Training – Details (Surveying)

Training

Leica Geosystems has developed, over the years, training courses for its surveying products. These training programs have proven successful in getting users up to speed and productive in a timely manner. The following is Leica Geosystems recommendation to the NYSDOT to ensure that Surveying and Construction personal become familiar and knowledgeable on the product.

In the first year Leica recommends running two parallel courses – one for the construction group and one for the surveying group. Each course shall cover common material. The differences will be in the applications as it pertains to each groups area of focus.

Week 1:

<table>
<thead>
<tr>
<th>Day 1</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introductions and Student expectations</td>
</tr>
<tr>
<td></td>
<td>Overview of the Course</td>
</tr>
<tr>
<td></td>
<td>Overview of GNSS Receiver, Total Station Data Collector and Digital Level.</td>
</tr>
<tr>
<td></td>
<td>Setting up the hardware includes:</td>
</tr>
<tr>
<td></td>
<td>Configuration Styles for GNSS &amp; Total Stations</td>
</tr>
<tr>
<td></td>
<td>Connecting the Data Collector to the GNSS Receiver &amp; Total Station</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 2</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good Practices – Surveying with GNSS RTK and Total Stations</td>
</tr>
<tr>
<td></td>
<td>Field Exercise</td>
</tr>
<tr>
<td></td>
<td>Group a – Total Stations.</td>
</tr>
<tr>
<td></td>
<td>Group b – GNSS RTK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 3</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Review previous day</td>
</tr>
<tr>
<td></td>
<td>Working with NYSDOT Code lists</td>
</tr>
<tr>
<td></td>
<td>Topographic Surveying, Coding and Linework</td>
</tr>
<tr>
<td></td>
<td>Staking Points</td>
</tr>
<tr>
<td></td>
<td>Field Exercise incl. Connecting to NYSNet.</td>
</tr>
<tr>
<td></td>
<td>Introduction to Applications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 4</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Staking Alignments and DTM’s</td>
</tr>
<tr>
<td></td>
<td>Manually entering an alignment</td>
</tr>
<tr>
<td>Day 5</td>
<td>All Day</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>• Uploading an existing design alignment</td>
</tr>
<tr>
<td></td>
<td>• Field Exercises</td>
</tr>
<tr>
<td></td>
<td>• Review</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 2:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Day 1</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Mission Planning</td>
</tr>
<tr>
<td></td>
<td>• Processing GNSS and TPS Data in LGO</td>
</tr>
<tr>
<td></td>
<td>• Network Adjustments</td>
</tr>
<tr>
<td></td>
<td>• Coordinate Systems</td>
</tr>
<tr>
<td></td>
<td>• Generating RINEX Files</td>
</tr>
<tr>
<td></td>
<td>• Overview of NGS Blue Booking example</td>
</tr>
<tr>
<td></td>
<td>• Exporting Data</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 2</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Office Software Exercises</td>
</tr>
<tr>
<td></td>
<td>• Managing a Project</td>
</tr>
<tr>
<td></td>
<td>• Importing and Editing Data</td>
</tr>
<tr>
<td></td>
<td>• QC Data</td>
</tr>
<tr>
<td></td>
<td>• Process Data</td>
</tr>
<tr>
<td></td>
<td>• Network Adjustment</td>
</tr>
<tr>
<td></td>
<td>• Coordinate System and Combined Scale Factors</td>
</tr>
<tr>
<td></td>
<td>• Exporting data in different formats</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 3</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Digital Leveling</td>
</tr>
<tr>
<td></td>
<td>• Review FGCS Standard Practices</td>
</tr>
<tr>
<td></td>
<td>• Using the Digital Level</td>
</tr>
<tr>
<td></td>
<td>• Field Exercise</td>
</tr>
<tr>
<td></td>
<td>• Reducing the data in LGO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 4</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Moving data to and from Bentley InRoads</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 5</th>
<th>All Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Questions and Answers – revisit topics already covered</td>
</tr>
</tbody>
</table>

Leica Geosystems proposes that the NYSDOT identify key people that will champion the training on Surveying Products. The above training outline is a guide and can be adjusted and customized. The customization would be based on meeting with the NYSDOT Training champions to ensure there is an understanding of the goals and objectives and that the content meets the expectations of the NYSDOT.

Leica Geosystems also recommends in following years that Leica and NYSDOT sit together to discuss the training needs of all those who will be involved.

The training deliverables shall include:

• User Manuals
• Simulator
• Quick Guides
• Exercises.

Each attendee shall be supplied with a Hardcopy and digital copy of the training material.
In addition Leica Geosystems shall supply each trainee the Leica Geosystems GNSS/TPS Simulator.

The following is a screen capture of the simulator. It has been in our experience that this has been a great tool for users to self learn and for support.

Training Details (Scanning)

Training

Leica Geosystems has developed, over the years, and has just completed the updating of our Basic and Intermediate Training Course. The goal of the Basic Course is enable new users to, plan a projects, Scan and collect data, Edit and QC Data, Register the data, extract info and create products.

The basic training course follows the following syllabus:

<table>
<thead>
<tr>
<th>Day 1</th>
<th></th>
</tr>
</thead>
</table>
| Morning | o Introductions and Student expectations  
  o Overview of the Course  
  o Review of pre-course work  
  o Knowing the Scanner and associated Accessories  
  o How to set-up the scanner and target poles |
| Afternoon | o Hands on setting up the scanner and target poles  
  o Your first Scan  
  o Group feedback and review |
| Day 2 | |
| Morning | o Question and Answers about previous day  
  o Introduction to the Navigator and Scan Control  
  o Scanning, target acquisition and 3pt registration  
  o Hands-on exercise |
| Afternoon | o Continue out doors scanning exercise  
  o Field Set-up, Traversing  
  o Group feedback and Quiz |
| Day 3 | |
| Morning | o Review previous day  
  o Introduction to Registration  
    o Concepts of registration, Free Station registration, Cloud-to-cloud registration, Two Point registration, Traverse registration  
  o Hands on Registration practice |
| Afternoon | o Unify v merging  
  o ScanWorld.  
  o Group Feedback Explorer  
  o Reference Plane |
| Day 4 | |
| Morning | o Review previous day  
  o Field Exercises to review days 1-3  
  o Software instruction- Surveying, Smooth Surfaces, Data clean-up, unification, TIN creation, sample grid, contouring |
| Afternoon | o Field Exercises to review days 1-3  
  o Software instruction- Surveying, Smooth Surfaces, Data clean-up, unification, TIN creation, sample grid, contouring |
| Day 5 | |
| Morning | o Review previous day  
  o Office Exercises to review day 4  
  o CloudWorX |
| Afternoon | o CloudWorX and MicroStation  
  o Closing comments |
The intermediate training course follows the following syllabus:

<table>
<thead>
<tr>
<th>Day 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All Day</td>
<td>○ Introductions and Student expectations</td>
</tr>
<tr>
<td></td>
<td>○ Field Trouble shooting based on experience</td>
</tr>
<tr>
<td></td>
<td>○ Traversing</td>
</tr>
<tr>
<td></td>
<td>○ Free stationing</td>
</tr>
<tr>
<td></td>
<td>○ Stakeout</td>
</tr>
<tr>
<td></td>
<td>○ Registration techniques</td>
</tr>
<tr>
<td></td>
<td>○ Registration Hybrid Combinations</td>
</tr>
<tr>
<td></td>
<td>○ Nested registrations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All Day</td>
<td>○ Limit Box</td>
</tr>
<tr>
<td></td>
<td>○ Reference Plane</td>
</tr>
<tr>
<td></td>
<td>○ Viewing active plane</td>
</tr>
<tr>
<td></td>
<td>○ View locks</td>
</tr>
<tr>
<td></td>
<td>○ Edit reference plane</td>
</tr>
<tr>
<td></td>
<td>○ Alignments and sections</td>
</tr>
<tr>
<td></td>
<td>○ Importing alignment from MicroStation</td>
</tr>
<tr>
<td></td>
<td>○ Surveying with Alignments</td>
</tr>
<tr>
<td></td>
<td>○ Animation</td>
</tr>
<tr>
<td></td>
<td>○ 3D Modeling</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All Day</td>
<td>○ Review previous day</td>
</tr>
<tr>
<td></td>
<td>○ User Coordinate Systems</td>
</tr>
<tr>
<td></td>
<td>○ Cut Planes</td>
</tr>
<tr>
<td></td>
<td>○ 2D Drawing tools</td>
</tr>
<tr>
<td></td>
<td>○ Setting the Fence with a 2D Drawing</td>
</tr>
<tr>
<td></td>
<td>○ Volumes</td>
</tr>
<tr>
<td></td>
<td>○ Surface deviations</td>
</tr>
</tbody>
</table>

Each attendee shall be supplied with a Hardcopy and digital copy of the training material.

Leica Geosystems proposes that the NYSDOT identify key people that will utilize the Scanner and SW and prior to visiting NY State to conduct the training sit with these key people to discuss their training needs and expectations. Leica Geosystems shall customize the training as outlined above to best meet their expectations.

Training – Details (Surveying and Scanning)

Webinars

Over the past couple of years Leica Geosystems has developed a number of Webinars and plans to conduct future webinars. These webinars are educational and are intended to help users enhance their knowledge in the use of the equipment. Leica Geosystems shall make these past webinars available to all NYSDOT employees and invite them to all future webinars.

New Training Material

The Leica Geosystems Product Management Team and Support Group work close together to develop and update training material. This training material can be in the form of:

○ Getting Started Guides.
○ Quick Guides for advance topics.
○ Self Learning Tutorials.

All this material shall be posted on the Leica myWorld website.

Customized Training

Based on the above Training outline – Leica Geosystems would like to review the training material that is used or has been developed for past trainings and fine tune it for the NYSDOT. This would ensure that the training time is optimized for the NYSDOT.
F. Provide Maintenance and Technical Support.

All the following listed maintenance and technical support shall be provided at no additional expense to the Department under the terms and conditions and over the complete duration of the lease agreement. The cost of all maintenance and technical support shall be included in the total contract price. Leica Geosystems shall provide one contact to arrange maintenance of all equipment included in this contract. This contact shall provide same day response to coordinate maintenance. Leica Geosystems shall provide a dealer within New York State that shall accept all items in need of maintenance and shall provide replacement items within 48 hours of the time item was delivered. This dealer has been identified as Maine Technical Source. NYSDOT shall pay for any shipping needed to deliver items to the dealer within NYS. Leica Geosystems shall be responsible for any shipping costs to/from the manufacturer or repair center and any shipping back to NYSDOT. Maintenance shall include all repairs of day to day breakdowns of any equipment included in this contract. This might include, but is not limited to cable breakage; batteries which don’t hold their charge; motor malfunctions; horizontal or vertical circle malfunction, tangent screw malfunction; memory, program or electrical power malfunction; maladjustment of measuring or centering devices or any item that may inhibit the package from performing as required. Maintenance of equipment including calibration, cleaning and adjustment of equipment shall occur as required for repair or yearly, at a time to be determined by the Department.

All software including firmware and office importing or processing applications provided by Leica Geosystems under this contract shall be kept current with the most recently released versions, upgrades, service packs and/or fixes. Leica Geosystems shall notify the Department of all new firmware or software upgrades, fixes or new versions when they become available. These changes shall be evaluated by the Department and if deemed appropriate, the software and/or firmware shall be provided to the Department or be installed by Leica Geosystems at the Department’s discretion and at no additional cost.

Hardware and software support shall include telephone assistance during normal NYSDOT business hours, programming fixes to correct operational problems, and provisions to provide service patches. The technical support group shall respond to all trouble calls within eight (8) business hours, and shall provide software fixes. Leica Geosystems shall provide a written description of how this phone support shall be provided.
Leica Geosystems shall supply a 5 year parts and labor warranty for all equipment provided in the project. This includes the GNSS Receivers, Total Stations, Data Collectors, Digital Levels and Laser Scanners.

- Leica Geosystems has an unparalleled network of authorized service centers throughout the United States of America. This includes local service capability in the state of New York with our Business Partner Maine Technical Source who maintain two facilities within the State to provide technical service on the Leica Geosystems equipment.

Leica Geosystems agrees to repair or replace any defective equipment which is not the result of negligence or misuse.

Upon award of the contract, Leica Geosystems shall provide New York State Department of Transportation a toll-free telephone number for service and warranty notification during regular business hours (7:30 A.M. to 4:30 P.M. Central Time), Monday thru Friday, excluding New York State DOT defined holidays, for the duration of the Warranty Service period.

In addition Leica Geosystems shall encourage the New York State Department of Transportation to register all their Leica Geosystems equipment on our new on-line management system. Please see later in this section for further details.

Leica Geosystems agrees to provide to the New York Department of Transportation a loaner piece of equipment if NYSDOT equipment provided under this contract shall not be repaired within 2 business days of receipt by Leica Geosystems.

The following organizational network shows Leica Geosystems Technical Service Structure.

---

**Maine Technical Source Technical Supply**

**Business Partner**

Maine Technical Source was started 25 years ago by Gus MacDonald, (President) They currently provide products and services to customers in the Survey, Engineering and Construction fields throughout New England and New York State.

Maine Technical Source has over 10 years experience in representing Leica Geosystems Surveying, Engineering, Construction and Scanning Products. They are an authorized Service Center and are qualified to provide local support on all Leica Geosystems products.

More than half of their employees have been with the company for more than ten years.
Maine Technical Source have two office facilities in New York State:

**Wappingers Falls, New York**
787 Old Route 9 North
Wappingers Falls,
New York 12590
Tel: 1-845-297-4316

**Syracuse, New York**
2634 James Street
Syracuse,
New York 13206
Tel: 1-888-475-2479

Over the course of the years Leica Geosystems and Maine Technical Source work hand in hand servicing and supporting new and existing customers. From Leica Geosystems perspective they are an invaluable Business Partner.

**Hardware/Software Maintenance & Support - Details**

**Hardware Maintenance**

Included in this agreement is Hardware Maintenance. This enables on an annual basis the Total Station to be taken to an Authorized Service Center where the instrument shall undergo a standard maintenance. This standard maintenance includes:

- Retrieve customer settings and uploading latest firmware.
- Circle cleanliness inspection and cleaning (if necessary).
- Cleaning and greasing of focusing system (if necessary).
- Inspection & adjustment of laser beam paths (IR/RL EDM)
- Adjusting HZ-collimation and V-index.
- Determination of EDM additive constant and storing.
- Reset customer settings
- Instrument cleaning.
- Service Certificate issued

This procedure takes a Service Technician about 4 hours.

**Firmware and Software Maintenance**

This annual maintenance applies to the Scanners as well. Leica Geosystems agrees to supply to the New York State Department of Transportation all Software and Firmware upgrades, updates and patches for Hardware and Software throughout the duration of the contract.

When Leica Geosystems releases new Software and /or Firmware updates or upgrades, New York State Department of Transportation shall automatically be notified by e-mail that the new updates and upgrades are available. The FW and SW is available to the New York Department of transportation for download from the Leica Geosystems myWorld website. This web area makes available the following:

- Software and Firmware – all necessary files to upload to the latest available version.
- Release Notes

Leica Geosystems has recently launched a new web portal to enable users of Leica Geosystems better manage their equipment, software, support and knowledge on-line. This new web portal is called myWorld@Leica Geosystems. It comprises four primary components, namely:

![myWorld@Leica Geosystems](image)
**myWorld @ Leica Geosystems Details**

**myEquipment**
- This area allows a user to register their equipment online. By logging into this area and connecting your GNSS Receiver, Total Station or Data Collector you can have the FW/SW Versions verified, review any SW codes to activate applications and update/upgrade new firmware and software. The advantage of this new support feature is that a user does not have to upgrade/update firmware or software themselves – it's managed online. In addition all the latest user and reference manuals are available at your fingertips.

**myService**
- This area allows a user to view the complete service history of a piece of equipment. And have instant availability as to the status of current service cases.

**mySupport**
- Support cases can be created on-line and in turn answered by our team of professionals. View your past history.

**myTraining**
- This shall contain all on-line training material and registration for newsletters, local seminars and training courses. In addition locally developed quick guides and tutorials shall be posted.

The following is a screen capture of myWorld@Leica Geosystems login page:

![myWorld@Leica Geosystems Login Page](image)

Leica Geosystems shall ensure that all equipment delivered shall be registered on the myWorld website. Leica Geosystems shall work with the NYSDOT to have the right people have the right access rights. This shall ensure that all SW codes, FW Versions, SW Versions are visible to all registered users.
Support - Details

Phone Support

Leica Geosystems has a team of factory trained/certified support personnel that are experienced in troubleshooting, diagnosing and resolving hardware and software problems associated with the GNSS Rover, Total Stations, Data Collectors, Digital Levels, Laser Scanners and Software proposed.

Our Geomatics Products Support Center is maintained at our Lawrenceville, GA facilities and is accessible via both e-mail and 1-800 327-4773 toll free telephone number.

Our Scanning products (HW and SW) are supported via a toll free number out of our San Ramon, CA facilities. They are a dedicated team of people whose primary focus is scanning – data capture, applications, data flow and software.

Incoming telephone support calls are handled via an automated call routing and management system. This system ensures prompt callback (usually within 4 – 6 hours depending on call volume) and accurate message management.

In addition to a toll phone support number the Leica Support group maintains an e-mail service. In the event that a customer does not require a live voice to provide assistance the customer can e-mail the support team with their questions. Questions submitted by e-mail are normally returned within 24 hours.

When a call is received by one of our Technical Specialists it is logged and assigned a case number. This allows the query to be tracked and managed properly all the way through to closer. The advantage of such a system is that if the call requires a technical specialist to undertake some investigative work others can see the status and assist if need be. The myWorld website allows registered users to view their support cases and its status.

In the event one of Technical Specialist is unable to answer a question they have full access to the program directors in our development team to ensure the question is answered to the customer’s satisfaction.

Leica Geosystems has 128 authorized support and service centers with offices and business partners covering every continent. In the event a Support Specialist is unable to answer a question directly the depth of the team supporting that person is unparalleled.

Organizational Network

The following organizational network shows Leica Geosystems Support for Surveying and HDS Scanning Products.

G. Schedule

Contract: Signed August 2010
Contract Start Date: October 1, 2010
Delivery/Initial Training: October 2010
Services Delivery: Through September 2015
Schedule B

EXHIBIT 1

LAND SURVEY EQUIPMENT SERVICES FOR NYSDOT

Cost Schedule and Deliverables

Contract Number C030867

<table>
<thead>
<tr>
<th>(1) Total Contract Cost:</th>
<th>$1,758,667</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) Quarterly Cost</td>
<td>$87,933.35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(3) Quarterly Price Per Item</th>
<th>Total Station</th>
<th>Digital Level</th>
<th>GNSS Rover</th>
<th>Laser Scanner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Item Cost Qtr. 1</td>
<td>$983.65</td>
<td>$201.58</td>
<td>$582.39</td>
<td>$3,224.43</td>
</tr>
<tr>
<td>Add Item Qtr. 2</td>
<td>$1,027.73</td>
<td>$211.10</td>
<td>$609.65</td>
<td>$3,329.03</td>
</tr>
<tr>
<td>Add Item Qtr. 3</td>
<td>$1,076.72</td>
<td>$221.68</td>
<td>$639.95</td>
<td>$3,445.29</td>
</tr>
<tr>
<td>Add Item Qtr. 4</td>
<td>$1,131.49</td>
<td>$233.50</td>
<td>$673.82</td>
<td>$3,575.25</td>
</tr>
<tr>
<td>Add Item Qtr. 5</td>
<td>$1,193.12</td>
<td>$246.81</td>
<td>$711.93</td>
<td>$3,721.50</td>
</tr>
<tr>
<td>Add Item Qtr. 6</td>
<td>$1,262.99</td>
<td>$261.89</td>
<td>$755.14</td>
<td>$3,887.30</td>
</tr>
<tr>
<td>Add Item Qtr. 7</td>
<td>$1,342.86</td>
<td>$279.14</td>
<td>$804.53</td>
<td>$4,076.82</td>
</tr>
<tr>
<td>Add Item Qtr. 8</td>
<td>$1,435.04</td>
<td>$299.04</td>
<td>$861.53</td>
<td>$4,295.55</td>
</tr>
<tr>
<td>Add Item Qtr. 9</td>
<td>$1,542.60</td>
<td>$322.26</td>
<td>$928.05</td>
<td>$4,550.79</td>
</tr>
<tr>
<td>Add Item Qtr. 10</td>
<td>$1,669.74</td>
<td>$349.71</td>
<td>$1,006.67</td>
<td>$4,852.49</td>
</tr>
<tr>
<td>Add Item Qtr. 11</td>
<td>$1,822.33</td>
<td>$382.66</td>
<td>$1,101.04</td>
<td>$5,214.59</td>
</tr>
<tr>
<td>Add Item Qtr. 12</td>
<td>$2,008.86</td>
<td>$422.94</td>
<td>$1,216.39</td>
<td>$5,657.23</td>
</tr>
<tr>
<td>Add Item Qtr. 13</td>
<td>$2,242.07</td>
<td>$473.29</td>
<td>$1,360.61</td>
<td>$6,210.60</td>
</tr>
<tr>
<td>Add Item Qtr. 14</td>
<td>$2,541.93</td>
<td>$538.03</td>
<td>$1,546.05</td>
<td>$6,922.18</td>
</tr>
<tr>
<td>Add Item Qtr. 15</td>
<td>$2,941.80</td>
<td>$624.37</td>
<td>$1,793.33</td>
<td>$7,871.04</td>
</tr>
<tr>
<td>Add Item Qtr. 16</td>
<td>$3,501.66</td>
<td>$745.25</td>
<td>$2,139.55</td>
<td>$9,199.59</td>
</tr>
<tr>
<td>Add Item Qtr. 17</td>
<td>$4,341.53</td>
<td>$926.58</td>
<td>$2,658.93</td>
<td>$11,192.55</td>
</tr>
<tr>
<td>Add Item Qtr. 18</td>
<td>$5,741.39</td>
<td>$1,228.83</td>
<td>$3,524.62</td>
<td>$14,514.37</td>
</tr>
<tr>
<td>Add Item Qtr. 19</td>
<td>$8,541.24</td>
<td>$1,833.35</td>
<td>$5,256.08</td>
<td>$21,158.32</td>
</tr>
<tr>
<td>Add Item Qtr. 20</td>
<td>$16,941.06</td>
<td>$3,646.97</td>
<td>$10,450.60</td>
<td>$41,090.81</td>
</tr>
</tbody>
</table>

RECEIVED
AUG 30 2010
Contract Management
Page 83
## EXHIBIT 2

**Consultant Disclosure Legislation Form B**

### FORM B

<table>
<thead>
<tr>
<th>OSC Use Only:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting Code:</td>
</tr>
<tr>
<td>Category Code:</td>
</tr>
</tbody>
</table>

### State Consultant Services

**Contractor's Annual Employment Report**

**Report Period:** April 1, to March 31,

- **Contracting State Agency Name:** DOT
- **Agency Code:** 17000
- **Contract Number:** C030867
- **Contract Term:** 09/01/2010 to 08/31/2015
- **Contractor Name:** Leica Geosystems Inc.
- **Contractor Address:**
- **Description of Services Being Provided:** Land Survey Equipment Services for NYSDOT (Non-Engineering)

### Scope of Contract (Choose one that best fits):

- Analysis
- Evaluation
- Research
- Training
- Data Processing
- Computer Programming
- Other IT consulting
- Engineering
- Architect Services
- Surveying
- Environmental Services
- Health Services
- Mental Health Services
- Accounting
- Auditing
- Paralegal
- Legal
- Other Consulting

<table>
<thead>
<tr>
<th>O*Net Employment Category &amp; Name</th>
<th>Number of Employees</th>
<th>Number of Hours Worked</th>
<th>Amount Payable Under the Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>$ 0.00</td>
</tr>
</tbody>
</table>

**Total this page**: 0 0 $ 0.00

**Grand Total**

---

**Name of person who prepared this report:**
**Preparer's Signature:**
**Title:**
**Phone #:**
**Date Prepared:** / /

---

Page 84