

**SUBMITTAL TO THE FLOOD CONTROL AND
WATER CONSERVATION DISTRICT BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

305B



FROM: General Manager-Chief Engineer

SUBMITTAL DATE:

October 6, 2015

SUBJECT: Approval of Multi-Year Consulting Services Agreements for Aerial Imaging and Light Detection and Ranging (LiDAR) Services; 3 years, [\$1,200,000 total]; [\$400,000 for FY15/16]; [\$400,000 for FY16/17]; [\$400,000 for FY17/18]; All Districts; District Funds 100%

RECOMMENDED MOTION: That the Board of Supervisors:

1. Approve four (4) Multi-year Consulting Services Agreements between the District and the following On-Call Aerial Imaging and LiDAR Services providers: Digital Mapping Incorporated, Geospatial Professional Solutions, Inc., Quantum Spatial, Inc., and Skyview Aerial Photo, Inc. (Consultants); and
2. Authorize the Chairman to execute the Agreement documents on behalf of the District.

BACKGROUND:

Summary

The multi-year Consulting Services Agreement (Agreements) sets the terms and condition by which the Consultants will provide services in support of the District's lowercase aerial imagery and/or Light Detection and Ranging (LiDAR) data compilation on an as-needed basis.

WARREN D. WILLIAMS
General Manager-Chief Engineer

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AMR:rlp

FINANCIAL DATA	Current Fiscal Year:	Next Fiscal Year:	Total Cost:	Ongoing Cost:	POLICY/CONSENT (per Exec. Office)
COST	\$ 400,000	\$ 400,000	\$ 1,200,000	\$ N/A	Consent <input type="checkbox"/> Policy <input type="checkbox"/>
NET DISTRICT COST	\$ 400,000	\$ 400,000	\$ 1,200,000	\$ N/A	

SOURCE OF FUNDS: 25110-25170 947400-947520 525440 Zone 1 through Zone 7 Const/Maint/Misc Professional Services
Budget Adjustment: No
For Fiscal Year: 15/16-17/18

C.E.O. RECOMMENDATION:

APPROVE

BY:
Steven C. Horn

County Executive Office Signature

MINUTES OF THE FLOOD CONTROL AND WATER CONSERVATION DISTRICT

On motion of Supervisor Benoit, seconded by Supervisor Jeffries and duly carried by unanimous vote, IT WAS ORDERED that the above matter is approved as recommended.

Ayes: Jeffries, Tavaglione, Washington, Benoit and Ashley
Nays: None
Absent: None
Date: October 6, 2015
xc: Flood

Kecia Harper-Ihem
Clerk of the Board
By:
Deputy

Prev. Agn. Ref.: _____ District: All Agenda Number:

11-1

FORM APPROVED COUNTY COUNSEL
BY:
DATE: 9-17-15
ANITA C. WILLIS

FISCAL PROCEDURES APPROVED
JEANINE J. REY, FINANCE DIRECTOR
BY:
JEANINE J. REY, Finance Director

- A-30
- Positions Added
- 4/5 Vote
- Change Order

**SUBMITTAL TO THE FLOOD CONTROL AND WATER CONSERVATION DISTRICT
BOARD OF SUPERVISORS, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

FORM 11: Approval of Multi-Year Consulting Services Agreements for Aerial Imaging and Light Detection and Ranging (LiDAR) Services; 3 years, [\$1,200,000 total]; [\$400,000 for FY15/16]; [\$400,000 for FY16/17]; [\$400,000 for FY17/18]; All Districts; District Funds 100%

DATE: October 6, 2015

PAGE: Page 2 of 2

BACKGROUND:

Summary (continued)

These Agreements are for a "not-to-exceed" amount of \$100,000 in any fiscal year with a further cap of \$300,000 for the entire term of the Agreement for each Consultant. The District will fairly apportion the work among the Consultants based on a number of factors such as work load, continuity, special expertise and strength specific to the project.

County Counsel has approved the Agreements as to legal form and the Consultants have executed the Agreements.

Impact on Residents and Businesses

Costs incurred under this Agreement will be funded by ad-valorem property tax revenue and entails no new fees, taxes or bonded indebtedness.

SUPPLEMENTAL:

Additional Fiscal Information

Sufficient funding is available in the District's budget for Fiscal Year 2015-2016 and will be included in the proposed budget(s) for Fiscal Years 2016-2017 and 2017-2018, as appropriate.

Contract History and Price Reasonableness

Pursuant to Board Policy H-7, on March 30, 2015, the District published a notice of availability in The Press Enterprise. Five firms responded and a selection committee comprised of District employees reviewed each firm's qualifications. Digital Mapping Incorporated, Geospatial Professional Solutions, Inc., Quantum Spatial, Inc., and Skyview Aerial Photo, Inc. were selected based on relevant experience, technical competence, past performance and their proposed work plan.

ATTACHMENTS:

1. Four (4) Consulting Services Agreements

1 CONSULTING SERVICES AGREEMENT
2 AERIAL IMAGERY and/or LIGHT DETECTION and RANGING SERVICES
3 (FY 2015/16 through FY 2017/18)

4 The Riverside County Flood Control and Water Conservation District, hereinafter called
5 "DISTRICT", and Quantum Spatial, Inc., hereinafter called "CONSULTANT", hereby agree as
6 follows:

- 7 1. PROJECT – CONSULTANT shall provide "on-call" professional services as further
8 described in the Scope of Services attached hereto as Exhibit "A" and made a part hereof,
9 in support of DISTRICT'S aerial imagery and/or Light Detection and Ranging (LiDAR)
10 data, and in accordance with applicable federal, state, and local laws and regulations.
- 11 2. RETAINER – DISTRICT hereby retains CONSULTANT, as an independent contractor, to
12 provide all technical and professional services including but not limited to expertise, labor,
13 material, equipment, transportation, supervision, and other incidental services to fully
14 and adequately perform and complete in a skillful and professional manner any one or
15 more of the following consulting services: i) analog black and white photography, ii)
16 analog color photography, iii) digital imagery and iv) LiDAR data to assist DISTRICT in
17 the compilation of engineering mapping at various scales.

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20 CONSULTANT'S services under this Agreement shall be procured in the following
21 manner:

- 22 A. DISTRICT will contact CONSULTANT and request a written proposal regarding
23 the specific task or services to be provided by CONSULTANT.
- 24 B. DISTRICT and CONSULTANT shall discuss CONSULTANT'S proposal and
25 mutually agree on CONSULTANT'S proposed scope of services, personnel and
26 project schedule. Following DISTRICT'S approval of CONSULTANT'S proposed
27 scope of services, personnel and project schedule, DISTRICT will issue a written
28 Notice to Proceed for the agreed upon services to CONSULTANT.

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C. CONSULTANT shall commence performance within five (5) calendar days of DISTRICT'S issuance of a Notice to Proceed.

By entering into this Agreement, CONSULTANT assumes responsible charge of the work pursuant to Section 8703 of the Professional Land Surveyors' Act; Chapter 15 (commencing with Section 8700) of Division 3 of the Business and Professions Code, where applicable, and shall be wholly responsible for the completeness and accuracy of all calculations, data, measurements, calibration, plans, specifications, computer files, maps, field notes, reports, estimates and any other materials prepared pursuant to this Agreement, and shall check all such material accordingly.

3. TIME FOR PERFORMANCE – CONSULTANT shall not commence performance of any work or services, for any reason whatsoever, until DISTRICT has provided CONSULTANT with a written Notice to Proceed authorizing CONSULTANT to initiate work pursuant to this Agreement. No payment will be made for any work or services performed prior to the issuance of said Notice to Proceed. The term of this Agreement shall commence on the date it is executed by DISTRICT'S Board of Supervisors and shall terminate at midnight on June 30, 2018.

4. AERIAL IMAGING AND LIGHT DETECTION AND RANGING (LiDAR) SERVICES

A. Specifications and Standards

All work shall be performed in accordance with DISTRICT standards, as described in Exhibits "B" and "C", attached hereto and made a part hereof, and any special criteria established by DISTRICT for specific task or services. All deliverables prepared by CONSULTANT pursuant to this Agreement shall be prepared in accordance with Exhibits "B" and "C" and/or current DISTRICT practices, regulations, policies, procedures and standards where applicable. All deliverables shall be subject to review and approval by DISTRICT.

1 Services provided by CONSULTANT under this Agreement shall be performed in a
2 manner consistent with that standard of care and skill ordinarily exercised by
3 members of the same profession currently practicing under similar circumstances.

4 A. Control Surveys

5 Unless otherwise specified herein, DISTRICT shall provide CONSULTANT with
6 primary survey control monuments including both horizontal (California
7 Coordinate System) and vertical control positions.

8 B. Quality Control

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10 CONSULTANT shall implement and maintain effective quality control procedures
11 throughout all phases of assigned task and/or services. CONSULTANT shall have
12 a quality control plan in effect during the entire time task and/or services are being
13 performed under this Agreement. The plan shall establish a process whereby all
14 calculations and documents prepared under this Agreement are independently
15 checked, corrected and back-checked, and all pertinent job related correspondence
16 and memoranda are bound in appropriate job files. Evidence that the quality
17 control plan is functional may be requested by DISTRICT. All documents and any
18 other items submitted to DISTRICT for review shall be initialed by
19 CONSULTANT'S project manager, or his designee, as being fully checked and that
20 the preparation of the material followed the quality control plan established for the
21 work.
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24 5. COMPENSATION – DISTRICT shall pay CONSULTANT for actual services
25 satisfactorily performed and expenses incurred in accordance with the schedule of
26 professional fees and expenses as set forth on Exhibit "D" attached hereto and made a part
27 hereof. The total amount of compensation paid to CONSULTANT for performance of
28 professional services approved pursuant to this Agreement shall not exceed: i) one hundred

1 thousand dollars (\$100,000) in any given fiscal year, and ii) the total sum of three hundred
2 thousand dollars (\$300,000) over the entire term of this Agreement.

3 6. PAYMENT – CONSULTANT shall submit invoice(s) to DISTRICT (Attention: Business
4 Office-Accounts Payable) following completion of requested services. Upon satisfactory
5 performance of CONSULTANT'S services pursuant to DISTRICT approved scope of
6 services, DISTRICT shall make payment to CONSULTANT within thirty (30) days after
7 receipt of appropriate invoice(s) from CONSULTANT. DISTRICT shall not pay interest
8 or finance charges on any outstanding balance(s). CONSULTANT shall keep employee
9 and expense records according to customary accounting methods and such records shall,
10 upon request, be made available for inspection by DISTRICT to verify CONSULTANT'S
11 invoices. All invoices shall itemize charges to conform to the portion(s) of work and rates
12 as set forth in Exhibits "A", "B", "C" and "D", respectively. Except as specifically
13 provided for and stated in this Agreement or Exhibit "D", DISTRICT shall not be
14 responsible for payment of any of CONTRACTOR'S expenses related to this Agreement.

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17 7. SUBCONTRACTING – CONSULTANT may, at CONSULTANT'S own expense, employ
18 special consultants to accomplish the work covered by this Agreement; however, except
19 as specifically provided in Exhibit "A" or as expressly identified in this Agreement, no
20 portion of the services pertinent to this Agreement shall be subcontracted without prior
21 written approval and authorization by DISTRICT.

22
23 In the event CONSULTANT subcontracts any portion of CONSULTANT'S duties under
24 this Agreement, CONSULTANT shall require its subcontractors to comply with the terms
25 of this Agreement in the same manner as required of CONSULTANT. The fact that
26 CONSULTANT employs special consultants not in his regular employ shall not relieve
27 CONSULTANT of any responsibility regarding the adequacy of the special consultant's
28 designs or other work performed pursuant to this Agreement.

- 1 8. TERMINATION – At any time during the term of this Agreement, DISTRICT may:
- 2 A. Terminate this Agreement without cause upon providing CONSULTANT thirty (30)
- 3 days written notice stating the extent and effective date of termination;
- 4 B. Upon five (5) days written notice, terminate this Agreement for CONSULTANT
- 5 default, if CONSULTANT refuses or fails to comply with the provisions of this
- 6 Agreement or fails to make progress so as to endanger performance and does not
- 7 cure such failure within a reasonable period of time. In the event of such
- 8 termination, DISTRICT may proceed with the work in any manner deemed proper to
- 9 DISTRICT.
- 10

11 In the event DISTRICT issues a Notice of Termination, CONSULTANT shall (i) stop all

12 work under this Agreement on the date specified in the Notice of Termination; and (ii)

13 transfer to DISTRICT and deliver in the manner, and to the extent, if any, as directed by

14 DISTRICT, any financial, statistical, personal, technical data, reports, or other products,

15 which, if the Agreement had been completed, would have been required to be furnished

16 to DISTRICT.

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18 In the event DISTRICT terminates this Agreement, DISTRICT shall make payment for

19 all services performed in accordance with this Agreement to the date of termination, a

20 total amount which bears the same ratio to the total maximum fee otherwise payable

21 under this Agreement as the services actually bear to the total services necessary for

22 performance of this Agreement. Notwithstanding any of the other provisions of this

23 Agreement, CONSULTANT'S rights under this Agreement shall terminate (except for

24 fees accrued prior to the date of termination) upon dishonesty, or a willful or material

25 breach of this Agreement by CONSULTANT, or in the event of CONSULTANT'S

26 unwillingness or inability for any reason whatsoever to perform the duties hereunder, or

27 if Agreement is terminated pursuant to Section 22 herein, titled NON-

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1 DISCRIMINATION. In such event, CONSULTANT shall not be entitled to any further
2 compensation under this Agreement. The rights and remedies of DISTRICT provided in
3 this section shall not be exclusive and are in addition to any other rights and remedies
4 provided by law or under this Agreement.

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6 9. ERRORS AND OMISSIONS – In the event CONSULTANT'S work products or any
7 other documents furnished under this Agreement contain any errors or omissions that
8 cause the DISTRICT to incur additional expense beyond what would have otherwise
9 resulted if there were no errors or omissions in CONSULTANT'S work products or any
10 other documents, the additional imagery and/or LIDAR data expense shall be borne
11 solely by CONSULTANT.

12 10. DISPUTES

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14 A. In the event CONSULTANT considers any work demanded of CONSULTANT to
15 be outside the requirements of this Agreement, or if CONSULTANT considers any
16 order, instruction or decision of DISTRICT to be unfair, CONSULTANT shall
17 promptly, upon receipt of such order, instruction or decision, ask for a written
18 confirmation of the same whereupon CONSULTANT shall proceed without delay to
19 perform the work or to conform to the order, instruction, or decision. However, if
20 CONSULTANT finds such order, instruction or decision unsatisfactory,
21 CONSULTANT shall, within 21 calendar days after receipt of same, file a written
22 protest with DISTRICT stating clearly and in detail its objections and reasons
23 therefore. Except for such protests or objections as are made of record in the manner
24 specified and within the time stated herein, and except for such instances where the
25 basis of a protest could not reasonably have been foreseen by CONSULTANT
26 within the time limit specified for protest, CONSULTANT hereby waives all
27 grounds for protests or objections to orders, instruction, or decisions of DISTRICT
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1 and hereby agrees that, as to all matters not included in such protests, the orders,
2 instructions and decisions of DISTRICT will be limited to matters properly falling
3 within DISTRICT'S authority.

4 B. Any controversy or claim arising out of or relating to this Agreement which cannot
5 be resolved by mutual agreement may be settled by arbitration, provided that the
6 parties hereto mutually agree to submit to arbitration.

7 C. Neither the pendency of a dispute nor its consideration by arbitration shall excuse
8 CONSULTANT from full and timely performance in accordance with the terms of
9 this Agreement.

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11 11. LICENSES – At all times while performing services under this Agreement,
12 CONSULTANT, its employees, agents, contractors and subcontractors shall maintain
13 professional licenses as required by the laws of the State of California, including but not
14 limited to Chapter 15 of Division 3 of the Business and Professions Code (Professional
15 Land Surveyors' Act).

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17 12. INDEPENDENT CONTRACTOR – CONSULTANT and the agents and employees of
18 CONSULTANT, shall act at all times in an independent capacity during the term of this
19 Agreement and in the performance of the services to be rendered hereunder and shall not
20 act as or shall not be and shall not in any manner be considered to be employees or agents
21 of DISTRICT.

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23 13. INSURANCE – CONSULTANT shall not commence operations until DISTRICT has
24 been furnished with original certificate(s) of insurance and original certified copies of
25 endorsements and if requested, certified original policies of insurance including all
26 endorsements and any and all other attachments as required in this Section.

27 Without limiting or diminishing CONSULTANT'S obligation to indemnify or hold
28 DISTRICT harmless, CONSULTANT shall procure and maintain or cause to be

1 maintained, at its sole cost and expense, the following insurance coverage's during the
2 term of this Agreement:

3 A. Workers' Compensation:

4 If CONSULTANT has employees as defined by the State of California,
5 CONSULTANT shall maintain statutory Workers' Compensation Insurance
6 (Coverage A) as prescribed by the laws of the State of California. Policy shall
7 include Employers' Liability (Coverage B) including Occupational Disease with
8 limits not less than \$1,000,000 per person per accident. Policy shall be endorsed to
9 waive subrogation in favor of DISTRICT and, if applicable, to provide a Borrowed
10 Servant/Alternate Employer Endorsement.
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12 B. Commercial General Liability:

13 Commercial General Liability insurance coverage, including but not limited to,
14 premises liability, unmodified contractual liability, products and completed
15 operations liability, personal and advertising injury, and cross liability coverage,
16 covering claims which may arise from or out of CONSULTANT'S performance of its
17 obligations hereunder. Policy shall name the Riverside County Flood Control and
18 Water Conservation District, the County of Riverside, its agencies, districts, special
19 districts, and departments, their respective directors, officers, Board of Supervisors,
20 employees, elected or appointed officials, agents or representatives as additional
21 insureds. Policy's limit of liability shall not be less than \$1,000,000 per occurrence
22 combined single limit. If such insurance contains a general aggregate limit, it shall
23 apply separately to this Agreement or be no less than two (2) times the occurrence
24 limit.
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27 C. Vehicle Liability:
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1 If CONSULTANT'S vehicles or mobile equipment are used in the performance of the
2 obligations under this Agreement, then CONSULTANT shall maintain liability
3 insurance for all owned, non-owned or hired vehicles so used in an amount not less
4 than \$1,000,000 per occurrence combined single limit. If such insurance contains a
5 general aggregate limit, it shall apply separately to this Agreement or be no less than
6 two (2) times the occurrence limit. Policy shall name the Riverside County Flood
7 Control and Water Conservation District, the County of Riverside, its agencies,
8 districts, special districts, and departments, their respective directors, officers, Board
9 of Supervisors, employees, elected or appointed officials, agents or representatives as
10 additional insureds.
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12 D. Professional Liability:
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14 CONSULTANT shall maintain Professional Liability Insurance providing coverage
15 for CONSULTANT'S performance of work included within this Agreement, with a
16 limit of liability of not less than \$1,000,000 per occurrence and \$2,000,000 annual
17 aggregate. If CONSULTANT'S Professional Liability Insurance is written on a
18 claims made basis rather than an occurrence basis, such insurance shall continue
19 through the term of this Agreement and CONSULTANT shall purchase at his sole
20 expense either 1) an Extended Reporting Endorsement (also known as Tail
21 Coverage); or 2) Prior Dates Coverage from a new insurer with a retroactive date
22 back to the date of, or prior to, the inception of this Agreement; or 3) demonstrate
23 through Certificates of Insurance that CONSULTANT has maintained continuous
24 coverage with the same or original insurer. Coverage provided under items: 1), 2) or
25 3) will continue as long as the law allows.
26

27 E. General Insurance Provisions – All Lines:
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- 1 i. Any insurance carrier providing insurance coverage hereunder shall be
2 admitted to the State of California and have an A.M. BEST rating of not
3 less than an A: VIII (A: 8) unless such requirements are waived, in
4 writing, by the County Risk Manager. If the County Risk Manager waives
5 a requirement for a particular insurer such waiver is only valid for that
6 specific insurer and only for one policy term.
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- 8 ii. The CONSULTANT must declare its insurance self-insured retention for
9 each coverage required herein. If any such self-insured retention exceeds
10 \$500,000 per occurrence each such retention shall have the prior written
11 consent of the County Risk Manager before the commencement of
12 operations under this Agreement. Upon notification of self-insured
13 retention deemed unacceptable to the DISTRICT, and at the election of the
14 County Risk Manager, CONSULTANT'S carriers shall either: 1) reduce
15 or eliminate such self-insured retention with respect to this Agreement
16 with DISTRICT, or 2) procure a bond which guarantees payment of losses
17 and related investigations, claims administration, and defense costs and
18 expenses.
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- 21 iii. CONSULTANT shall cause their insurance carrier(s) to furnish DISTRICT
22 with 1) a properly executed original certificate(s) of insurance and certified
23 original copies of endorsements effecting coverage as required herein; and
24 2) if requested to do so orally or in writing by the County Risk Manager,
25 provide original certified copies of policies including all endorsements and
26 all attachments thereto, showing such insurance is in full force and effect.
27 Further, said certificate(s) and policies of insurance shall contain the
28 covenant of the insurance carrier(s) that a minimum of thirty (30) days

1 written notice shall be given to the DISTRICT prior to any material
2 modification, cancellation, expiration or reduction in coverage of such
3 insurance. If CONSULTANT insurance carrier(s) policies does not meet the
4 minimum notice requirement found herein, CONSULTANT shall cause
5 CONSULTANT'S insurance carrier(s) to furnish a 30 day Notice of
6 Cancellation Endorsement. In the event of a material modification,
7 cancellation, expiration or reduction in coverage, this Agreement shall
8 terminate forthwith, unless DISTRICT receives, prior to such effective date,
9 another properly executed original certificate of insurance and original
10 copies of endorsements or certified original policies, including all
11 endorsements and attachments thereto, evidencing coverages set forth herein
12 and the insurance required herein is in full force and effect. An individual
13 authorized by the insurance carrier to do so on its behalf shall sign the
14 original endorsements for each policy and the certificate of insurance.
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17 iv. It is understood and agreed by the parties hereto that CONSULTANT'S
18 insurance shall be construed as primary insurance, and DISTRICT'S
19 insurance and/or deductibles and/or self-insured retentions or self-insured
20 programs shall not be construed as contributory.
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22 v. If, during the term of this Agreement or any extension thereof, there is a
23 material change in the scope of services or there is a material change in the
24 equipment to be used in the performance of the scope of work which will
25 add additional exposures (such as the use of aircraft, watercraft, cranes,
26 etc.); or the term of this Agreement, including any extensions thereof,
27 exceeds five (5) years, DISTRICT reserves the right to adjust the types of
28 insurance required under this Agreement and the monetary limits of

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liability for the insurance coverages currently required herein, if, in the County Risk Manager's reasonable judgment, the amount or type of insurance carried by CONSULTANT has become inadequate.

vi. CONSULTANT shall pass down the insurance obligations contained herein to all tiers of subcontractors working under this Agreement.

vii. The insurance requirements contained in this Agreement may be met with a program(s) of self-insurance acceptable to DISTRICT.

viii. CONSULTANT agrees to notify DISTRICT of any claim by a third party or any incident or event that may give rise to a claim arising from the performance of this Agreement.

14. INDEMNIFICATION – CONSULTANT shall indemnify and hold harmless DISTRICT (including its officers, Board of Supervisors, elected and appointed officials, employees, agents and representatives) from any and all liability, claim, damage, proceeding or action, present or future, based upon, arising out of or in any way relating to CONSULTANT'S (including its officers, employees, subcontractors and agents) actual or alleged negligent, reckless or willful misconduct, acts or omissions related to this Agreement, performance under this Agreement, or failure to comply with the requirements of this Agreement, including but not limited to: (a) property damage; (b) bodily injury or death; or (c) any other element of any kind or nature whatsoever.

CONSULTANT shall defend, at its sole expense, including all costs and fees (including but not limited to attorney fees, cost of investigation, defense and settlements or awards), DISTRICT (its officers, Board of Supervisors, elected and appointed officials, employees, agents and representatives) in any claim, proceeding or action for which indemnification is required.

1 With respect to any of CONSULTANT'S indemnification requirements, CONSULTANT
2 shall, at its sole cost, have the right to use counsel of their own choice and shall have the
3 right to adjust, settle, or compromise any such claim, proceeding or action without the
4 prior consent of DISTRICT; provided, however, that such adjustment, settlement or
5 compromise in no manner whatsoever limits or circumscribes CONSULTANT'S
6 indemnification obligations to DISTRICT.
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8 CONSULTANT'S indemnification obligations shall be satisfied when CONSULTANT
9 has provided to DISTRICT the appropriate form of dismissal (or similar document)
10 relieving DISTRICT from any liability for the claim, proceeding or action involved.

11 The specified insurance limits required in this Agreement shall in no way limit or
12 circumscribe CONSULTANT'S obligations to indemnify and hold harmless DISTRICT
13 from third party claims.
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15 In the event there is conflict between this section and California Civil Code Section 2782,
16 this section shall be interpreted to comply with California Civil Code Section 2782. Such
17 interpretation shall not relieve CONSULTANT from indemnifying DISTRICT to the
18 fullest extent allowed by law.

- 19 15. WORK PRODUCT – CONSULTANT shall provide DISTRICT with all calculations,
20 data, measurements, plans, specifications, computer files, maps, field notes, reports,
21 estimates and any other documents furnished in accordance with this Agreement. All
22 work products or deliverables furnished under this Agreement shall be and remain the
23 sole property of DISTRICT. CONSULTANT shall not publish or transfer any material
24 produced by CONSULTANT or resulting from activities supported by this Agreement
25 without the written consent of the General Manager-Chief Engineer. If any such material
26 is subject to copyright or trademark, the parties agree that the right to any and all
27 copyright and/or trademark in and to the material is expressly reserved to DISTRICT. If
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1 any such material is copyrighted, the parties hereto understand and agree that DISTRICT
2 reserves a royalty-free, non-exclusive, and irrevocable license to reproduce, publish and
3 use such material, in whole or in part, and to authorize others to do so, provided written
4 credit is given the author.

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6 16. CONFIDENTIALITY OF DATA – All financial, statistical, personal, technical or other
7 data and information which is designated confidential by DISTRICT and subsequently
8 made available to CONSULTANT shall not be disclosed (in whole or in part) by
9 CONSULTANT to any third parties and shall be protected by CONSULTANT from
10 unauthorized use and disclosure. The only exception to this shall be if disclosure is
11 approved in advance in writing by DISTRICT or if the disclosure is made to
12 CONSULTANT'S subcontractors as anticipated by this Agreement.

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14 CONSULTANT shall refer all requests for information to DISTRICT. These same
15 requirements shall be applicable to any of CONSULTANT'S subcontractors.
16 CONSULTANT shall include the requirements stated in this section in the agreement
17 with any of its subcontractors.

18 17. TIME EXTENSIONS – Any delay in providing services required by this Agreement,
19 occasioned by causes beyond the control and not due to the fault or negligence of
20 CONSULTANT, shall be deemed reason for granting an extension of time for the
21 completion of the aforesaid work. If such delay occurs, CONSULTANT shall promptly
22 notify DISTRICT in writing of the cause and of the extent of the delay whereupon
23 DISTRICT shall ascertain the facts and the extent of the delay and grant an extension of
24 time for the completion of the work when, in DISTRICT'S sole judgment, their findings
25 of fact justify such an extension of time.

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27 18. ASSIGNMENT – Neither this Agreement nor any part thereof shall be assigned by
28 CONSULTANT without the prior written consent of DISTRICT.

- 1 19. JURISDICTION/LAW/SEVERABILITY – This Agreement is to be construed in
 2 accordance with the laws of the State of California. If any provision of this Agreement is
 3 held by a court of competent jurisdiction to be invalid, void or unenforceable, the
 4 remaining provisions shall be declared severable and shall be given full force and effect
 5 to the extent possible
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 7 Any legal action, in law or in equity related to the performance or interpretation of this
 8 Agreement shall be filed only in the Superior Court of the State of California located in
 9 Riverside, California, and the parties waive any provision of law providing for a change
 10 of venue to another location. Prior to the filing of any legal action, the parties shall be
 11 obligated to attend a mediation session with a neutral mediator or try to resolve the
 12 dispute.
- 13
 14 20. WAIVER – Any waiver by DISTRICT of any breach of any one or more of the terms of
 15 this Agreement shall not be construed to be a waiver of any subsequent or other breach of
 16 the same or of any other term thereof. Failure on the part of DISTRICT to require exact,
 17 full and complete compliance with any terms of this Agreement shall not be construed as
 18 in any manner changing the terms hereof, or estopping DISTRICT from enforcement
 19 hereof.
- 20
 21 21. CONFLICT OF INTEREST – CONSULTANT warrants, by execution of this Agreement,
 22 that no person or selling agency has been employed or retained to solicit or secure this
 23 Agreement upon an agreement or understanding for a commission, percentage, brokerage
 24 or contingent fee, excepting bona fide employees or bona fide established commercial or
 25 selling agencies maintained by CONSULTANT for the purpose of securing business.
 26 For breach or violation of this warranty, DISTRICT has the right to annul this Agreement
 27 without liability, pay only for the value of the work actually performed, or in its
 28 discretion to deduct from the Agreement price or consideration, or otherwise recover, the

1 full amount of such commission, percentage, brokerage, or contingent fee.
2 CONSULTANT may be requested to complete a Conflict of Interest Statement prior to,
3 during, or after execution of this Agreement. CONSULTANT understands that as a
4 condition of this Agreement, CONSULTANT agrees to complete the Conflict of Interest
5 Statement when requested to do so by DISTRICT.
6

7 22. NON-DISCRIMINATION – In the performance of the terms of this Agreement,
8 CONSULTANT shall not engage in nor permit others he may employ to engage in
9 discrimination in the employment of persons because of the race, color, national origin or
10 ancestry, religion, physical handicap, disability as defined by the Americans with
11 Disabilities Act (ADA), medical condition, marital status or sex of such persons, in
12 accordance with the provision of California Labor Code Section 1735.
13

14 23. NOTICES – Any and all notices sent or required to be sent to the parties of this
15 Agreement will be mailed by first class mail, postage prepaid to the following addresses:

16 RIVERSIDE COUNTY FLOOD CONTROL	QUANTUM SPATIAL, INC.
17 AND WATER CONSERVATION DISTRICT	1410 Indian Trail Road
18 1995 Market Street	Norcross, GA 30093
Riverside, CA 92501	Attn: Jeff Simmons
Attn: Photogrammetry Section	

19 24. NON-APPROPRIATION OF FUNDS – It is mutually agreed and understood that the
20 obligations of DISTRICT are limited by and contingent upon the availability of DISTRICT
21 funds for the reimbursement of CONSULTANT'S fees. In the event that such funds are
22 not forthcoming for any reason, DISTRICT shall immediately notify CONSULTANT in
23 writing. This Agreement shall be deemed terminated and have no further force and effect
24 immediately on receipt of DISTRICT'S notification by CONSULTANT. In the event of
25 such termination, CONSULTANT shall be entitled to payment for work already completed
26 in accordance with Sections 5 and 6 (COMPENSATION AND PAYMENT).
27
28

1 25. DISCREPANCIES – In the event of any conflict between the terms of this Agreement and
2 Exhibit "A", Exhibit "B", Exhibit "C" or Exhibit "D", the terms of this Agreement shall
3 govern. In the event of any conflict between Exhibit "A", Exhibit "B", Exhibit "C" and
4 Exhibit "D", Exhibit "A" shall govern.
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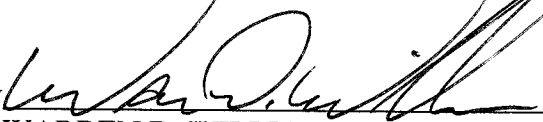
1 IN WITNESS WHEREOF, the parties hereto have executed this Agreement on

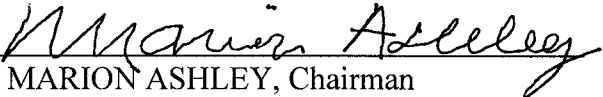
2 OCT 06 2015

3 (to be filled in by Clerk of the Board)

4 RECOMMENDED FOR APPROVAL:

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

5
6 By 
7 WARREN D. WILLIAMS
8 General Manager-Chief Engineer

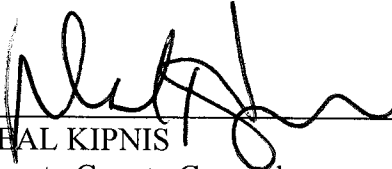
By 
MARION ASHLEY, Chairman
Board of Supervisors, Riverside County Flood
Control and Water Conservation District

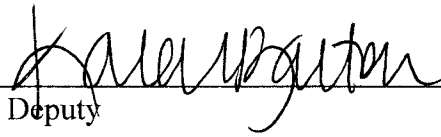
9 APPROVED AS TO FORM:

ATTEST:

10 GREGORY P. PRIAMOS
11 County Counsel

KECIA HARPER-IHEM
Clerk of the Board


12
13 By 
14 NEAL KIPNIS
Deputy County Counsel

By 
Deputy

(SEAL)

25 Consulting Services Agreement FY 2015/16 to 2017/18
26 On-call Aerial Imagery and/or Light Detection and Ranging Services
w/Quantum Spatial, Inc.
27 09/08/15
AMR:rlp

QUANTUM SPATIAL, INC.

By 
JEFF SIMMONS
Vice President of State and Local
Government

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Consulting Services Agreement FY 2015/16 to 2017/18
On-call Aerial Imagery and/or Light Detection and Ranging Services
w/Quantum Spatial, Inc.
09/08/15
AMR:rlp

EXHIBIT "A"

A. SCOPE OF SERVICES

The Consultant will provide any one or more of the following mapping services on an on-call basis: 1) analog black and white photography, 2) analog color photography, 3) digital imagery, and 4) LIDAR data.

B. REQUIREMENTS FOR IMAGERY/LIDAR

1. Requirements for Analog Imagery

All aspects of the aerial flight and acquisition of aerial photography to follow industry best practice. Specifications for aerial photograph have been included in Section C below.

2. Requirements for Digital Imagery

All aspects of the aerial flight and acquisition of aerial photography to follow industry best practice. State the manufacturer and model of the digital sensor you will be using.

2.1 Provide color digital imagery with 60% forward overlap and 30% side overlap.

2.2 When airborne GPS is required, provide the raw airborne GPS data as the District will process the data. District survey staff will have a minimum of two base stations running at the time of the flight so coordination will need to take place between the Consultant and District survey staff. District survey staff will provide the ground receiver information.

2.2.1 Provide the exterior orientation elements; X, Y, Z, T, omega, kappa and phi.

2.2.2 Provide the pilot's log sheet.

2.2.3 Provide a detailed diagram of the separation between the GPS antenna and the camera.

2.2.4 The flight window is from 10:30 a.m. to 2:30 p.m. and will only be flown Monday through Thursday as District survey crews do not work on Fridays or weekends.

2.3 Provide the imagery in 8 and 12 bit format and compress using a Q-factor of 5.

2.4 When labeling the images, the job name, photo scale, date and exposure number should be shown on the first exposure only. All subsequent exposures should have date and exposure number only. Date in upper left corner and Photo No. in upper right corner. Number photos as indicated on the flight plan. Use aerial font size 14.

3. Requirements for LIDAR Data

All aspects of the LIDAR and acquisition to follow industry best practice.

Provide LIDAR generated bare earth Digital Terrain Model (DTM) all points file and a separate file with model key points. High resolution DTM having a vertical accuracy of 95% at 0.6' and 90% at 0.5' and as a separate option a DTM having a vertical accuracy of 95% at 1.2' and 90% at 1.0', when checked in flat open terrain.

EXHIBIT "B"

SPECIFICATIONS FOR AERIAL PHOTOGRAPHY

1. Aircraft and Crew
 - 1.1 All aircraft shall be maintained and operated in accordance with regulations of the Federal Aviation Administration and the Civil Aeronautics Board. The recommended FAA preflight inspection of the aircraft and instruments must be performed prior to each photographic mission. Aircraft shall have a service ceiling (with operating load of crew, camera, film, oxygen, and other required equipment) not less than 5% above the highest altitude necessary to achieve the smallest photographic scale required. If the project is in controlled air space the appropriate Air Traffic Control Center (AIRTCC) must be contacted. If the project area includes a military installation, the contractor must comply with security regulations. At the flight altitudes required for this photography, the aircraft shall have flight characteristics to provide a stable platform for the operation of the camera that will not degrade the orientation or the resolution of the photographic image.
 - 1.2 The design of the aircraft shall be such that when the camera is mounted, an unobstructed view is obtained, shielded from the exhaust gasses, oil, effluence and air turbulence.
 - 1.2.1 If an aircraft camera has a port glass it shall be preferably 50mm thick but not less than 37mm thick. The surface finish shall be 80/50 or better. Glass material shall be polished crown, group category M, Mil Specs Mil-W-1366F (ASG) October 1975, C-1 optical quality or better. The physical characteristics of any port glass shall be reported to the District on request.
 - 1.2.2 The camera shall be mounted vertically in the aircraft in a mount designed to isolate the camera from vibration of the aircraft. Angular vibration of the camera shall be reduced to such a level so as to have no significant detrimental effect on resolution.
 - 1.2.3 The camera window shall be mounted in material eliminating excessive mechanical stress to the window. The opening shall be designed so that the field of view is unobstructed when the camera is mounted.
 - 1.3 Individual crew members shall have two years or more apprenticeship in flying photographic missions for aerial surveys. In addition, it is desirable that crew members have meaningful prior experience with the same type camera and aircraft to which assigned.
2. Camera and Associated Equipment
 - 2.1 The camera will be a metric quality vertical format aerial mapping of nominal focal length of 152mm with format dimensions of 230mm x 230mm. The lens must meet the requirements outlined below based on a U.S. Geological Survey Report of Camera

Calibration. Failure of the camera to meet all of the specified requirements shall be cause for rejection of the proposal.

2.1.1 Lens shall be corrected for the spectral range of the film used. The lens shall meet or exceed all the requirements outlined in items (a), (b), (c) and (d), below.

(a) Calibrated Focal length - 153.0mm \pm 3.0mm;

(b) Usable angular field - at least 90°;

(c) Radial distortion in the usable angular field, based on the calibrated focal length referred to the calibrated principal point (point of symmetry), shall not exceed 12 μ m for any tested point, and 16 of the tested points shall have radial distortion values not exceeding 5 μ m.

(d) Resolution - The lens should have an Area Weighted Average Resolution (AWAR) of at least 72.0 line pairs per millimeter as determined by the U.S. Geological Survey Report of Calibration. The following table lists the minimum acceptable radial and tangential lens resolution at various field angles.

Field angle	0°	7.5°	15°	22.5°	30°	35°	40°
<u>Line pairs per mm</u>							
Radial	95	87	67	57			
Tangential	95	80	70	67	67	57	45

2.1.2 Filters - Only optical filters provided by the lens manufacturer meeting the same optical specifications shall be used. The filter shall have surfaces parallel within 10 seconds of arc and its optical quality shall be such that its addition to the camera shall not cause an undesirable reduction in image definition. The light fall-off in cameras having an angle of view larger than 60 degrees shall be compensated by a graded (anti vignetting) filter.

2.1.3 Shutter - The camera shall be equipped with a between-the-lens shutter with variable speed settings such that in conjunction with flight height and aircraft speed, the camera will produce high definition photographs at full aperture. The shutter shall have a minimum efficiency of 70 percent at a speed of 1/200 second.

2.1.4 Magazine Platen - The camera shall be equipped with an approved means of flattening the film at the instant of exposure. The platen against which the film is pressed shall not depart from a true plane by more than 15 μ m when the camera/magazine vacuum is applied.

2.1.5 Fiducial Marks - The camera shall record eight (8) fiducial marks which are clear and well defined on each negative. The marks shall be located in each

corner and at the center of each side. The corner fiducial marks shall form a quadrilateral whose sides are equal within 0.050mm. The midside fiducial marks shall be equidistant within 0.050mm from the adjacent corner fiducial marks. Lines joining opposite pairs of fiducial marks shall intersect at an angle of $90^{\circ} \pm 30''$. The intersection of the lines shall indicate the true position of the principal point of autocollimation within $\nabla 0.030\text{mm}$.

2.1.6 Stereomodel Flatness - The average departure from flatness (at negative scale) for two computer simulated stereomodels may not exceed 15um for any symmetrically arranged point tested by USGS. The difference between the highest and lowest value shall not exceed 25 um. The average of values given for points tested by USGS (which are averages themselves) shall not exceed 7.5 um.

2.1.7 Calibration Report - The contractor shall provide a camera calibration report prepared by the U.S. Geological Survey Optical Calibration Laboratory, which reflects the current condition of the camera to be used. The report shall be based on the Laboratory's standard tests and measurements, made after complete assembly of all parts of the camera unit, with the light filters in place. This report must be dated within three (3) years of the date of the photography. The combination of camera cone, lens, camera body and magazine(s) submitted for testing shall be, if acceptable, the only combination used for this project. Use of additional equipment shall be equally certified. The camera shall be recalibrated if there is any reason to believe that the dimensional relationship of the lens, fiducial marks, and film plane have been disturbed by partial disassembly or unusual mechanical shock, the camera must be resubmitted for recalibration at the contractor's expense. The District reserves the right to restrict the use of any camera based upon data contained in the calibration report, or based upon operational results.

2.2 Forward Motion Compensation is required for all photography requested at 3000 ft. above mean terrain and for all requested photographic coverage at altitudes lower than 3000 ft. above mean terrain. The contractor shall provide the proper equipment as well as the experience in the use of Forward Motion Compensation.

2.3 The camera shall be installed in a mount which attenuates the effects of aircraft vibration. The mount should be regularly serviced and maintained.

3. Aerial Film and Image Quality

3.1 Aerial Film

3.1.1 The type of film to be used shall be unexpired and have a dimensional stable polyester base.

3.1.2 Color and panchromatic emulsions shall be sensitive to the entire visible spectrum with an extended red sensitivity. Color infrared and black and white infrared emulsions shall be sensitive to the visible and near infrared spectrum from 400 to 900 nanometers.

- 3.1.3 Extreme care shall be exercised to ensure proper exposure to minimize vignetting due to differential exposure. This differential shall not exceed that which would result from a basic 1/3 stop difference in exposure.
- 3.1.4 The conditions of the film stock to be used shall be such that when the unexposed film is processed it shall be free of stains, discoloration, or brittleness that can be attributed to aging or improper storage and the base-plus-fog density for all negative films and the minimum-density for all color reversal films shall conform to the manufacturer's predicted density levels.

3.2 Storage and Handling

- 3.2.1 Storage and handling of all photographic film shall be in accordance with the manufacturer's recommendation. All aerial film shall be stored in the original containers to prevent any exchange in moisture between the rolls and their surroundings up to the time they are exposed. The film shall not be rolled tightly on spools or in any way stretched, buckled, distorted, or exposed to direct sunlight or other sources of heat.
- 3.2.2 Adverse storage conditions can affect the color emulsion layers, as well as overall sensitivity. Unexposed color films that are to be stored for several months, shall be stored at 0 to -10 degrees Fahrenheit (-18 to -23 degrees Celsius).
- 3.2.3 Color infrared film stored in the field prior to use shall be refrigerated at all times at a temperature of approximately 40 degrees Fahrenheit (4 degrees Celsius) or lower.

3.3 Processing and Drying

- 3.3.1 All black and white and color aerial film shall be processed in a sensitometrically controlled process using the manufacturer's recommended process monitoring system. Prior to processing the film a calibrated, 21-step sensitometric wedge (in .15 nominal density increments) shall be exposed on one end of the roll of film and become a permanent part of the roll.
- 3.3.2 The film shall be thoroughly fixed and washed to ensure archival quality. The residual thiosulfate content of the processed black and white film should not exceed 0.04 milligrams per square inch as measured using a Kodak Hypo Estimator and Hypo Test Solution HT-2 or other approved method.
- 3.3.3 Processing and drying of film shall be carried out without affecting the metric quality specified in paragraph 3.4.1. At no time shall the film be subjected to extreme temperature and humidity changes.
- 3.3.4 The processed film shall be free from chemicals, stains, tears, scratches, abrasions, watermarks, finger marks, lint, dirt, light streaks, static marks, and any

other physical defects that would interfere with the intended purpose of the photography.

3.4 Metric Quality of Processed Film

3.4.1 The original processed film or contact diapositives produced from them shall not contain residual Y-parallaxes after relative orientation in excess of 20 micrometers anywhere in the model. The dimensional change in any direction across a 9" distance shall not exceed 127 micrometers.

3.5 Image Quality of Processed Film

3.5.1 The imagery on the aerial film shall be clear and sharp and evenly exposed across the format. The film shall be free from clouds, cloud shadows, smoke, haze, snow, shadows, crimps, scratches, and any other blemishes which interfere with the intended purpose of the photography. Allowances will be made for unavoidable shadows, permanent snow fields, or reflectance from water bodies.

3.5.2 When there is doubt concerning the sharpness (resolution) of images obtained on the original film, a comparison will be made of well-defined edges by:

- A 3X enlargement on film, and/or
- By comparison to a calibrated matrix in a visual edge-matched comparator, and/or
- By edge traces in a microdensitometer, and/or
- By a combination of these methods.

If the imagery is obviously degraded the original film shall be rejected for poor image quality.

3.5.3 Density measurements will be taken on processed film using a transmission densitometer with a 2mm probe for scales 1/36,000 and larger and with a 1m probe for scales 1/36,000 and smaller. Readings will be made no closer than 1-1/2' from the image edge. Densities for black and white films shall be:

a. Black and white negative film density measurement.	
Max Base-Plus-Fog	.20 +/- .10
D-Min	.40 +/- .10
D-Max	1.50

Base-Plus-Fog shall be measured between and at the edges of the negative frame, and conform with the manufacturer's predicted density value. The minimum usable density shall be no less than 0.30 and maximum usable density no more than 1.50 after deducting Base-Plus-Fog density. The average density range aim point should be 1.0 and the minimum no less than 0.55.

3.5.4 Maximum photographic image and color quality control is required when exposing and processing color infrared film. The color infrared film shall be exposed and processed to the manufacturer's recommendations unless otherwise

required in project specifications. It is recommended that the following color balance test be conducted prior to using the film on a project. Remove approximately 3 feet of unexposed film from the outside wrap. Expose a 21-step sensitometric wedge (0.15 density increments) on the film strip and process it using the manufacturer's recommended process tolerances. The color balance shall be established by obtaining two points on the characteristic curve at $D=1.0$, one being at the midpoint of the two visible-light curves, and the second at the point of intersection of $D=10$ with the IR-curve. A color balance aim point of 20 has been determined empirically to be optimum for most applications. The processed stepwedge will become part of the roll from which they were removed. These stepwedges will be maintained on file and used as criteria for acceptable color balance of the exposed and processed film. Exposed and processed film which does not have a color balance within $\pm 0.06 \text{ Log E}$ of the color balance aim point will be cause for rejection.

- 3.5.5 The camera instrument panel and all fiducial marks shall be sharp and clearly legible on all processed film.
- 3.5.6 All exposed color films should be processed as soon as possible to avoid desirable color balance shifts.

4. Photographic Operations

- 4.1 Photography shall not be secured when the ground is obscured by haze, snow, smoke, dust, flood waters, or environmental factors that may obscure ground detail. Clouds and/or shadows of clouds shall not appear in the photograph. The solar altitude shall be defined by the application but in general it should not be less than 30 degrees when aerial negatives are exposed. Priorities will be provided to the contractor by the District prior to the date of photography and the contractor shall follow these priorities consistent with local flight conditions and logical flight planning. For projects which will have targeted ground control points, photographic operations must be coordinated with the placing of targets so that a minimum of time will elapse between targeting and photography.
- 4.2 The camera should be checked to be sure it is properly secured onto the mount and that all cable connections are tight. The camera lens, filters, and camera port must be inspected to assure that the surfaces are not scratched, stretched, or discolored and that they are free of foreign particles and condensation.
 - 4.2.1 The camera magazine must be clean, firmly seated on the camera. The transport system must be operating properly and the correct information entered into the data block recording devices.
- 4.3 Flight Lines - The District will provide flight maps, pdf and dgn files for the location of the flight lines. All flying shall be done in strict conformance with the instructions and the intended locations specified on the flight maps. Flight lines shall be continuous and straight with no breaks throughout the entire length of the flight line unless otherwise specified. Each project shall be flown in its entirety with the same camera. The maximum angle of deviation between the actual flight path and the specified flight line

shall not exceed three (3) degrees at any point on the lines. Re-flights for rejected exposures shall include the entire flight line unless the flight line contains more than 15 exposures in which case a portion of the flight line may, with permission of District, be replaced.

- 4.3.1 Every effort shall be made to avoid breaks within individual flight lines. Where breaks within a flight line are necessary, the entire flight line composed of the resulting segments shall meet all of the requirements set forth in these Specifications. Where breaks occur, these shall have an overlap of at least four frames to ensure a stereo model of overlap or tie. All photos within a single flight line shall be acquired with the same aerial camera and with the camera oriented in the same direction.
- 4.3.2 Exposures acquired to replace rejected, damaged, lost or otherwise destroyed exposures shall fully conform to these Specifications. Replacement exposures shall be acquired with the same aerial camera(s) used to acquire the original exposures and shall be exposed as nearly as possible to the same day and lighting conditions as the original exposures.
- 4.4 Flight Height - Departures from flight heights required to produce the desired photo scale shall not exceed -2% or +5% unless changed by Air Route Traffic Control Centers.
- 4.5 Changes in the course of the aircraft between successive overlapping photographs within a flight line shall not exceed 3 degrees.
- 4.6 While exposing aerial photography, the camera shall be compensated for crab of the aircraft, with a resultant error not exceeding 3 degrees.
- 4.7 Exposure Overlap - The overlap shall be sufficient to provide full stereoscopic coverage as follows:
 - 4.7.1 Endlap - Forward overlap in the line of flight shall average not less than 57% or more than 62% at the mean elevation of the terrain, unless otherwise specified. Individual forward overlaps shall not be less than 55% or more than 68% excepting the situation where in a forward overlap in areas of low elevation must exceed 68% to attain the minimum 55% forward overlap in adjacent areas of higher elevation. Wherever there is a change in direction between two flight lines (other than between adjacent parallel flight lines) junction areas between the adjoining flight lines shall be covered stereoscopically by both lines.
 - 4.7.2 Sidelap - Any flight line with an exposure having sidelap (overlap of parallel strips of vertical photography) of less than twenty (20) percent or more than forty (40) percent may be rejected. Sidelap, per strip, shall average thirty (30) percent, plus or minus five (5) percent.
- 4.8 The combined effect of aircraft course corrections, crab and tilt shall result in an apparent crab not greater than 5 degrees on successive photographs. Apparent crab is defined as the angle between a line joining fiducial marks in the direction of flight and

the line between the indicated principal point and the conjugate image of the indicated principal point of the adjacent photograph within the same line of flight.

- 4.9 The tilt within a single frame shall not exceed 4 degrees nor shall the difference in tilt between two consecutive overlapping frames within a flight line exceed 4 degrees. The average tilt for all negatives of the same nominal scale shall not exceed 1 degree.
- 4.10 All film shall be exposed using the fastest shutter speed possible when the aperture is set at its optimum value in consideration of the optical resolution and image motion.
- 4.11 Each roll of aerial film shall have an unexposed leader at least ten frames in length. This unexposed leader will be used to expose a sensitometric wedge before processing. Whenever a roll of aerial film is used in a discontinuous fashion such as from one day to the next or from a morning flight to an afternoon flight, a spacer at least four frames in length shall be rolled forward just prior to the commencement of taking new photographs.
- 4.12 All film shall be exposed using the fastest shutter speed possible when the aperture is set at its optimum value in consideration of the optical resolution and image motion.

5. Preliminary Checks

- 5.1 Each roll of aerial film shall be processed as soon as possible after it is exposed. Navigation of the flight lines and image quality shall be quick-checked for compliance with these Specifications.
- 5.2 Reflights shall be immediately ordered for the purpose of securing replacement exposures for all frames which fail to meet minimum standards set forth in these Specifications, provided ground conditions have not yet terminated the photographic "season".

6. Deliverable Products

Photography shall be taken as early as possible in the flying season once the flight conditions are met. Priorities will be provided to the contractor by the District prior to the date of photography and the contractor shall follow these priorities consistent with local flight conditions and logical flight planning. For projects which will have targeted ground control points, photographic operations must be coordinated with the placing of targets so that a minimum of time will elapse between targeting and photography. Notification shall be sent to the District once a project has been flown. Exposure of the film shall be in accordance with the manufacturer's recommendations and with a goal toward achieving density requirements set forth in paragraph 3.5.3. The negatives shall be clear and sharp in detail, free from light streaks and static marks, and of uniform tone and degree of contrast to permit ground details to show clearly in all scene reflectance, with particular emphasis on pattern recognition in the shadow areas.

6.1 Aerial Film

- 6.1.1 The exposed/processed aerial film should be delivered in accordance with the stipulations of delivery schedule and delivery address.
- 6.1.2 Each processed roll or partial roll of aerial film shall be kept in roll form, on the spool, and in the metal or plastic container supplied by the film manufacturer. Rejected exposures shall be removed. All flights belonging to a project shall be in the **same** container.

6.2 Color and Black and White Contact Prints

The contractor is to furnish three complete sets of 9" x 9" contact color prints of all color flights and one complete set of 9" x 9" contact prints of all black and white flights, unless otherwise specified. Contact prints shall be made on an automatic dodging printer on medium weight resin-coated paper on which ink and pencil can be used on both sides.

- 6.2.1 The photographic emulsion shall be of fine grain and have a suitable light sensitivity range and contrast for the making of prints from the aerial film exposed under this contract. Outdated materials shall not be used.
- 6.2.2 Processing, including exposure, development, fixation, washing, and drying of all photographic materials, shall result in finished photographic prints having a fine grain quality, a normal, uniform density, and such tone and contrast that all photographic details shall show clearly within the dark and light tone areas as well as in areas with intermediate tones. Adequate grades of contact paper and proper laboratory procedures shall be used to achieve the best prints possible. Excessive variance in tone or contrast between adjoining prints shall be cause for rejection.
- 6.2.3 Photographic prints shall be trimmed as specified by the District. When trimmed always leave the camera fiducial marks, GPS and other data recorded in the border of each image. Prints showing fiducial marks of inadequate clarity and definition, or prints omitting fiducial marks, shall be rejected.
- 6.2.4 All prints shall be clear and free from chemical stains, blemishes, uneven spots, air bells, light streaks or fog, and other defects which would, in the opinion of the District, interfere with their intended purpose. Prints shall be delivered to the District in a smooth, flat, and usable condition.
- 6.2.5 Titling and Labeling - All lettering shall be positioned as closely as possible to the inside leading edge of the format of the exposure. The characters used for making the exposures shall be 3/16 inch, drafted or stamped with opaque ink to avoid deformation of the film as to what is manifested with heat embossed titlers. The lettering shall clearly show on all copies of the photographs perpendicular to the line of flight, as indicated in the attached "Method of Negative Identification", Exhibit "B".

All material shall be delivered to the following address:

Riverside County Flood Control and Water Conservation District
Attn: Jim Morrell
Photogrammetry Section
1995 Market Street
Riverside, CA 92501

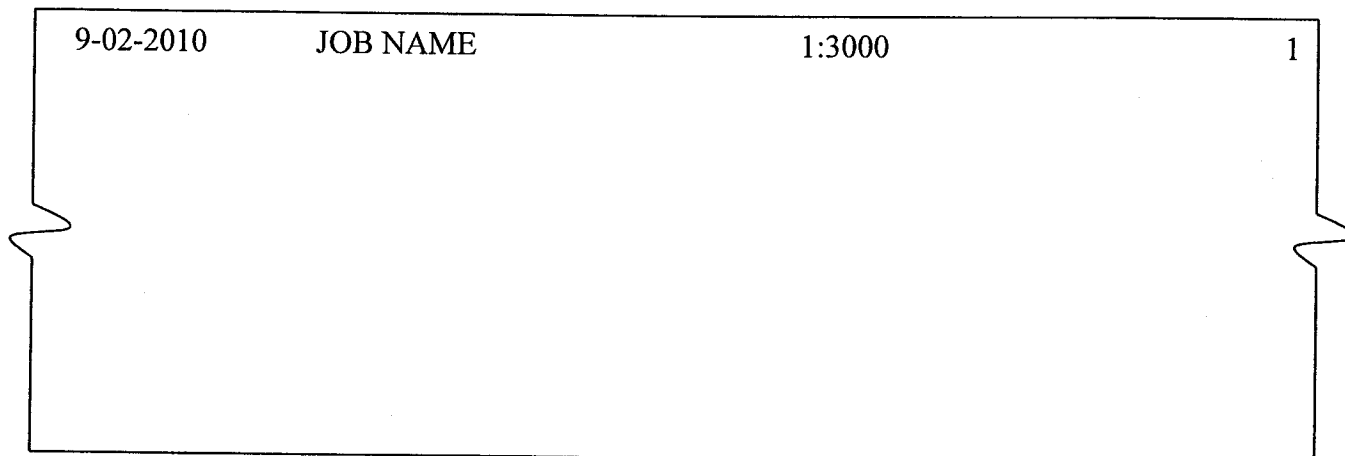
Schedule of Delivery - Materials shall be delivered to the District within 30 days after date of aerial photography.

EXHIBIT "C"

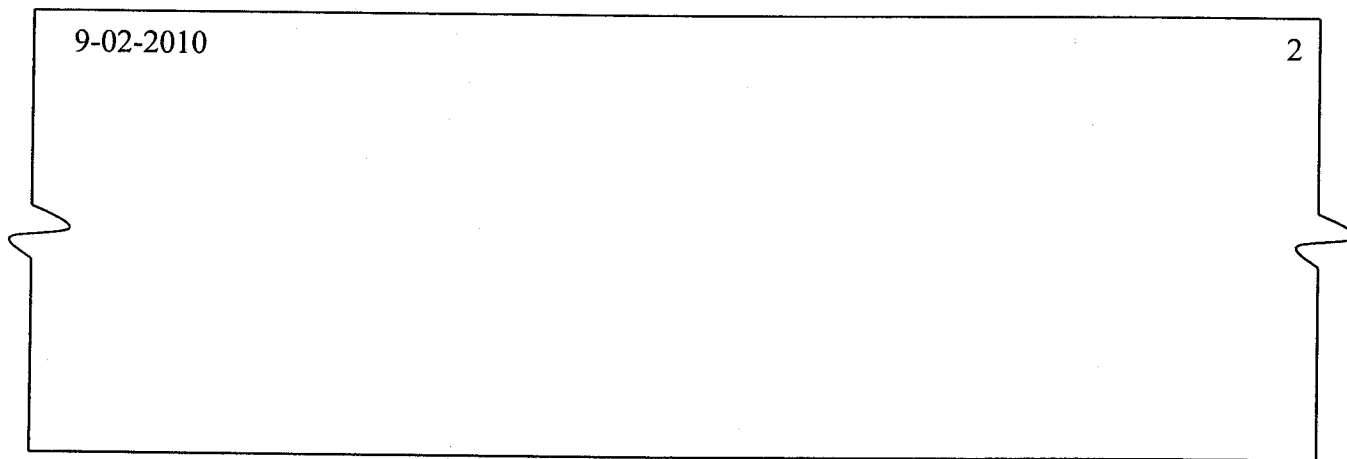
METHOD OF NEGATIVE IDENTIFICATION

FOR 9" x 9" PHOTOS

The exposure numbers shall be consecutive for the entire project. The exposure number shall be in the upper right corner of the photograph printed from each exposure to be read as one looks northerly along the flight line or easterly if lines are east-west. The date of photography shall be in the upper left corner. When labeling the images the District would like the job name, photo scale, date and exposure number on the first exposure only. All subsequent exposures should have the date and exposure number only.



SAMPLE I - NOT TO SCALE
INFORMATION ABOVE TO BE NOTED ON FIRST EXPOSURE



SAMPLE 2 - NOT TO SCALE
ALL OTHER EXPOSURES WILL INDICATE DATE AND NO. OF PHOTO



Labor Rates for Quantum Spatial, Inc.

Aircraft and Sensor Rates for Quantum Spatial, Inc.

	Category	Billing Rate
LiDAR/Imagery Acquisition	ACQ-Ground Crew	\$ 79.45
	ACQ-Manager	\$ 147.00
	ACQ-Pilot	\$ 98.61
	ACQ-Project Coordinator	\$ 115.78
	ACQ-Sensor Operator	\$ 80.16
	ACQ-Surveyor/PLS	\$ 143.79
	ACQ-Technician I	\$ 114.54
	ACQ-Technician II	\$ 112.25
Imagery Processing	IP-Analyst I	\$ 97.59
	IP-Analyst II	\$ 124.03
	IP-Division Lead	\$ 185.40
	IP-Intern	\$ 74.19
	IP-Technical Lead	\$ 113.18
	IP-Technician I	\$ 60.22
	IP-Technician II	\$ 95.95
Stereo Compilation	SC-Division Lead	\$ 289.95
	SC-Technical Lead	\$ 138.80
	SC-Technician I	\$ 93.73
	SC-Technician II	\$ 114.77
LiDAR Calibration	LC-Analyst I	\$ 91.06
	LC-Division Lead	\$ 137.74
	LC-Technical Lead	\$ 109.47
	LC-Technician I	\$ 73.82
	LC-Technician II	\$ 79.49
LiDAR Processing	LP-Analyst I	\$ 94.57
	LP-Analyst II	\$ 96.37
	LP-Division Lead	\$ 108.55
	LP-Intern	\$ 57.27
	LP-Technical Lead	\$ 106.56
	LP-Technician I	\$ 68.06
	LP-Technician II	\$ 83.58
LiDAR Classification	ALC-Analyst I	\$ 87.19
	ALC-Division Lead	\$ 99.12
	ALC-Technician I	\$ 70.00
	ALC-Technician II	\$ 72.54
Management	Account Manager	\$ 190.78
	Project Manager	\$ 153.30

	Category	Billing Rate
Aircraft	Aircraft (Single Piston)	\$ 337.81
	Aircraft (Single Turbine)	\$ 561.99
	Aircraft (Twin Piston)	\$ 546.97
	Aircraft (Twin Turbines)	\$ 1,260.25
Digital Cameras	Ultracam	\$ 940.02
	Large Format DMC	\$ 352.07
	Leica ADS 100	\$ 977.90
	Leica ADS 80	\$ 309.31
	RCD 30	\$ 564.21
	Large Format DMC	\$ 500.00
LiDAR Sensors	Leica ALS 70/60/50	\$ 393.86
	Leica ALS 80	\$ 451.79
	Optech Orion C	\$ 464.47
	Optech Orion H	\$ 317.19
	Mobile Mapper	\$ 390.01
	Topobathy	\$ 692.04
Remote Sensing	Hyperspectral (High Wall)	\$ 737.80
Sensors	FLIR System	\$ 100.00

1 C. CONSULTANT shall commence performance within five (5) calendar days of
2 DISTRICT'S issuance of a Notice to Proceed.

3 By entering into this Agreement, CONSULTANT assumes responsible charge of the work
4 pursuant to Section 8703 of the Professional Land Surveyors' Act; Chapter 15
5 (commencing with Section 8700) of Division 3 of the Business and Professions Code,
6 where applicable, and shall be wholly responsible for the completeness and accuracy of all
7 calculations, data, measurements, calibration, plans, specifications, computer files, maps,
8 field notes, reports, estimates and any other materials prepared pursuant to this Agreement,
9 and shall check all such material accordingly.

10
11 3. TIME FOR PERFORMANCE – CONSULTANT shall not commence performance of any
12 work or services, for any reason whatsoever, until DISTRICT has provided
13 CONSULTANT with a written Notice to Proceed authorizing CONSULTANT to initiate
14 work pursuant to this Agreement. No payment will be made for any work or services
15 performed prior to the issuance of said Notice to Proceed. The term of this Agreement
16 shall commence on the date it is executed by DISTRICT'S Board of Supervisors and shall
17 terminate at midnight on June 30, 2018.

18
19 4. AERIAL IMAGING AND LIGHT DETECTION AND RANGING (LiDAR) SERVICES

20
21 A. Specifications and Standards

22 All work shall be performed in accordance with DISTRICT standards, as described
23 in Exhibits "B" and "C", attached hereto and made a part hereof, and any special
24 criteria established by DISTRICT for specific task or services. All deliverables
25 prepared by CONSULTANT pursuant to this Agreement shall be prepared in
26 accordance with Exhibits "B" and "C" and/or current DISTRICT practices,
27 regulations, policies, procedures and standards where applicable. All deliverables
28 shall be subject to review and approval by DISTRICT.

1 Services provided by CONSULTANT under this Agreement shall be performed in a
2 manner consistent with that standard of care and skill ordinarily exercised by
3 members of the same profession currently practicing under similar circumstances.

4 A. Control Surveys

5 Unless otherwise specified herein, DISTRICT shall provide CONSULTANT with
6 primary survey control monuments including both horizontal (California
7 Coordinate System) and vertical control positions.

8 B. Quality Control

9
10 CONSULTANT shall implement and maintain effective quality control procedures
11 throughout all phases of assigned task and/or services. CONSULTANT shall have
12 a quality control plan in effect during the entire time task and/or services are being
13 performed under this Agreement. The plan shall establish a process whereby all
14 calculations and documents prepared under this Agreement are independently
15 checked, corrected and back-checked, and all pertinent job related correspondence
16 and memoranda are bound in appropriate job files. Evidence that the quality
17 control plan is functional may be requested by DISTRICT. All documents and any
18 other items submitted to DISTRICT for review shall be initialed by
19 CONSULTANT'S project manager, or his designee, as being fully checked and that
20 the preparation of the material followed the quality control plan established for the
21 work.
22
23

24 5. COMPENSATION – DISTRICT shall pay CONSULTANT for actual services
25 satisfactorily performed and expenses incurred in accordance with the schedule of
26 professional fees and expenses as set forth on Exhibit "D" attached hereto and made a part
27 hereof. The total amount of compensation paid to CONSULTANT for performance of
28 professional services approved pursuant to this Agreement shall not exceed: i) one hundred

1 thousand dollars (\$100,000) in any given fiscal year, and ii) the total sum of three hundred
2 thousand dollars (\$300,000) over the entire term of this Agreement.

3 6. PAYMENT – CONSULTANT shall submit invoice(s) to DISTRICT (Attention: Business
4 Office-Accounts Payable) following completion of requested services. Upon satisfactory
5 performance of CONSULTANT'S services pursuant to DISTRICT approved scope of
6 services, DISTRICT shall make payment to CONSULTANT within thirty (30) days after
7 receipt of appropriate invoice(s) from CONSULTANT. DISTRICT shall not pay interest
8 or finance charges on any outstanding balance(s). CONSULTANT shall keep employee
9 and expense records according to customary accounting methods and such records shall,
10 upon request, be made available for inspection by DISTRICT to verify CONSULTANT'S
11 invoices. All invoices shall itemize charges to conform to the portion(s) of work and rates
12 as set forth in Exhibits "A", "B", "C" and "D", respectively. Except as specifically
13 provided for and stated in this Agreement or Exhibit "D", DISTRICT shall not be
14 responsible for payment of any of CONTRACTOR'S expenses related to this Agreement.
15

16
17 7. SUBCONTRACTING – CONSULTANT may, at CONSULTANT'S own expense, employ
18 special consultants to accomplish the work covered by this Agreement; however, except
19 as specifically provided in Exhibit "A" or as expressly identified in this Agreement, no
20 portion of the services pertinent to this Agreement shall be subcontracted without prior
21 written approval and authorization by DISTRICT.
22

23 In the event CONSULTANT subcontracts any portion of CONSULTANT'S duties under
24 this Agreement, CONSULTANT shall require its subcontractors to comply with the terms
25 of this Agreement in the same manner as required of CONSULTANT. The fact that
26 CONSULTANT employs special consultants not in his regular employ shall not relieve
27 CONSULTANT of any responsibility regarding the adequacy of the special consultant's
28 designs or other work performed pursuant to this Agreement.

- 1 8. TERMINATION – At any time during the term of this Agreement, DISTRICT may:
- 2 A. Terminate this Agreement without cause upon providing CONSULTANT thirty (30)
- 3 days written notice stating the extent and effective date of termination;
- 4 B. Upon five (5) days written notice, terminate this Agreement for CONSULTANT
- 5 default, if CONSULTANT refuses or fails to comply with the provisions of this
- 6 Agreement or fails to make progress so as to endanger performance and does not
- 7 cure such failure within a reasonable period of time. In the event of such
- 8 termination, DISTRICT may proceed with the work in any manner deemed proper to
- 9 DISTRICT.
- 10

11 In the event DISTRICT issues a Notice of Termination, CONSULTANT shall (i) stop all

12 work under this Agreement on the date specified in the Notice of Termination; and (ii)

13 transfer to DISTRICT and deliver in the manner, and to the extent, if any, as directed by

14 DISTRICT, any financial, statistical, personal, technical data, reports, or other products,

15 which, if the Agreement had been completed, would have been required to be furnished

16 to DISTRICT.

17

18 In the event DISTRICT terminates this Agreement, DISTRICT shall make payment for

19 all services performed in accordance with this Agreement to the date of termination, a

20 total amount which bears the same ratio to the total maximum fee otherwise payable

21 under this Agreement as the services actually bear to the total services necessary for

22 performance of this Agreement. Notwithstanding any of the other provisions of this

23 Agreement, CONSULTANT'S rights under this Agreement shall terminate (except for

24 fees accrued prior to the date of termination) upon dishonesty, or a willful or material

25 breach of this Agreement by CONSULTANT, or in the event of CONSULTANT'S

26 unwillingness or inability for any reason whatsoever to perform the duties hereunder, or

27 if Agreement is terminated pursuant to Section 22 herein, titled NON-

28

1 DISCRIMINATION. In such event, CONSULTANT shall not be entitled to any further
2 compensation under this Agreement. The rights and remedies of DISTRICT provided in
3 this section shall not be exclusive and are in addition to any other rights and remedies
4 provided by law or under this Agreement.

- 5
6 9. ERRORS AND OMISSIONS – In the event CONSULTANT'S work products or any
7 other documents furnished under this Agreement contain any errors or omissions that
8 cause the DISTRICT to incur additional expense beyond what would have otherwise
9 resulted if there were no errors or omissions in CONSULTANT'S work products or any
10 other documents, the additional imagery and/or LIDAR data expense shall be borne
11 solely by CONSULTANT.

12 10. DISPUTES

13
14 A. In the event CONSULTANT considers any work demanded of CONSULTANT to
15 be outside the requirements of this Agreement, or if CONSULTANT considers any
16 order, instruction or decision of DISTRICT to be unfair, CONSULTANT shall
17 promptly, upon receipt of such order, instruction or decision, ask for a written
18 confirmation of the same whereupon CONSULTANT shall proceed without delay to
19 perform the work or to conform to the order, instruction, or decision. However, if
20 CONSULTANT finds such order, instruction or decision unsatisfactory,
21 CONSULTANT shall, within 21 calendar days after receipt of same, file a written
22 protest with DISTRICT stating clearly and in detail its objections and reasons
23 therefore. Except for such protests or objections as are made of record in the manner
24 specified and within the time stated herein, and except for such instances where the
25 basis of a protest could not reasonably have been foreseen by CONSULTANT
26 within the time limit specified for protest, CONSULTANT hereby waives all
27 grounds for protests or objections to orders, instruction, or decisions of DISTRICT
28

1 and hereby agrees that, as to all matters not included in such protests, the orders,
 2 instructions and decisions of DISTRICT will be limited to matters properly falling
 3 within DISTRICT'S authority.

4 B. Any controversy or claim arising out of or relating to this Agreement which cannot
 5 be resolved by mutual agreement may be settled by arbitration, provided that the
 6 parties hereto mutually agree to submit to arbitration.

7 C. Neither the pendency of a dispute nor its consideration by arbitration shall excuse
 8 CONSULTANT from full and timely performance in accordance with the terms of
 9 this Agreement.
 10

11 11. LICENSES – At all times while performing services under this Agreement,
 12 CONSULTANT, its employees, agents, contractors and subcontractors shall maintain
 13 professional licenses as required by the laws of the State of California, including but not
 14 limited to Chapter 15 of Division 3 of the Business and Professions Code (Professional
 15 Land Surveyors' Act).
 16

17 12. INDEPENDENT CONTRACTOR – CONSULTANT and the agents and employees of
 18 CONSULTANT, shall act at all times in an independent capacity during the term of this
 19 Agreement and in the performance of the services to be rendered hereunder and shall not
 20 act as or shall not be and shall not in any manner be considered to be employees or agents
 21 of DISTRICT.
 22

23 13. INSURANCE – CONSULTANT shall not commence operations until DISTRICT has
 24 been furnished with original certificate(s) of insurance and original certified copies of
 25 endorsements and if requested, certified original policies of insurance including all
 26 endorsements and any and all other attachments as required in this Section.

27 Without limiting or diminishing CONSULTANT'S obligation to indemnify or hold
 28 DISTRICT harmless, CONSULTANT shall procure and maintain or cause to be

1 maintained, at its sole cost and expense, the following insurance coverage's during the
2 term of this Agreement:

3 A. Workers' Compensation:

4 If CONSULTANT has employees as defined by the State of California,
5 CONSULTANT shall maintain statutory Workers' Compensation Insurance
6 (Coverage A) as prescribed by the laws of the State of California. Policy shall
7 include Employers' Liability (Coverage B) including Occupational Disease with
8 limits not less than \$1,000,000 per person per accident. Policy shall be endorsed to
9 waive subrogation in favor of DISTRICT and, if applicable, to provide a Borrowed
10 Servant/Alternate Employer Endorsement.
11

12 B. Commercial General Liability:

13 Commercial General Liability insurance coverage, including but not limited to,
14 premises liability, unmodified contractual liability, products and completed
15 operations liability, personal and advertising injury, and cross liability coverage,
16 covering claims which may arise from or out of CONSULTANT'S performance of its
17 obligations hereunder. Policy shall name the Riverside County Flood Control and
18 Water Conservation District, the County of Riverside, its agencies, districts, special
19 districts, and departments, their respective directors, officers, Board of Supervisors,
20 employees, elected or appointed officials, agents or representatives as additional
21 insureds. Policy's limit of liability shall not be less than \$1,000,000 per occurrence
22 combined single limit. If such insurance contains a general aggregate limit, it shall
23 apply separately to this Agreement or be no less than two (2) times the occurrence
24 limit.
25
26

27 C. Vehicle Liability:
28

1 If CONSULTANT'S vehicles or mobile equipment are used in the performance of the
2 obligations under this Agreement, then CONSULTANT shall maintain liability
3 insurance for all owned, non-owned or hired vehicles so used in an amount not less
4 than \$1,000,000 per occurrence combined single limit. If such insurance contains a
5 general aggregate limit, it shall apply separately to this Agreement or be no less than
6 two (2) times the occurrence limit. Policy shall name the Riverside County Flood
7 Control and Water Conservation District, the County of Riverside, its agencies,
8 districts, special districts, and departments, their respective directors, officers, Board
9 of Supervisors, employees, elected or appointed officials, agents or representatives as
10 additional insureds.
11

12 D. Professional Liability:
13

14 CONSULTANT shall maintain Professional Liability Insurance providing coverage
15 for CONSULTANT'S performance of work included within this Agreement, with a
16 limit of liability of not less than \$1,000,000 per occurrence and \$2,000,000 annual
17 aggregate. If CONSULTANT'S Professional Liability Insurance is written on a
18 claims made basis rather than an occurrence basis, such insurance shall continue
19 through the term of this Agreement and CONSULTANT shall purchase at his sole
20 expense either 1) an Extended Reporting Endorsement (also known as Tail
21 Coverage); or 2) Prior Dates Coverage from a new insurer with a retroactive date
22 back to the date of, or prior to, the inception of this Agreement; or 3) demonstrate
23 through Certificates of Insurance that CONSULTANT has maintained continuous
24 coverage with the same or original insurer. Coverage provided under items: 1), 2) or
25 3) will continue as long as the law allows.
26

27 E. General Insurance Provisions – All Lines:
28

- 1 i. Any insurance carrier providing insurance coverage hereunder shall be
2 admitted to the State of California and have an A.M. BEST rating of not
3 less than an A: VIII (A: 8) unless such requirements are waived, in
4 writing, by the County Risk Manager. If the County Risk Manager waives
5 a requirement for a particular insurer such waiver is only valid for that
6 specific insurer and only for one policy term.
- 7
- 8 ii. The CONSULTANT must declare its insurance self-insured retention for
9 each coverage required herein. If any such self-insured retention exceeds
10 \$500,000 per occurrence each such retention shall have the prior written
11 consent of the County Risk Manager before the commencement of
12 operations under this Agreement. Upon notification of self-insured
13 retention deemed unacceptable to the DISTRICT, and at the election of the
14 County Risk Manager, CONSULTANT'S carriers shall either: 1) reduce
15 or eliminate such self-insured retention with respect to this Agreement
16 with DISTRICT, or 2) procure a bond which guarantees payment of losses
17 and related investigations, claims administration, and defense costs and
18 expenses.
- 19
- 20
- 21 iii. CONSULTANT shall cause their insurance carrier(s) to furnish DISTRICT
22 with 1) a properly executed original certificate(s) of insurance and certified
23 original copies of endorsements effecting coverage as required herein; and
24 2) if requested to do so orally or in writing by the County Risk Manager,
25 provide original certified copies of policies including all endorsements and
26 all attachments thereto, showing such insurance is in full force and effect.
27 Further, said certificate(s) and policies of insurance shall contain the
28 covenant of the insurance carrier(s) that a minimum of thirty (30) days

1 written notice shall be given to the DISTRICT prior to any material
2 modification, cancellation, expiration or reduction in coverage of such
3 insurance. If CONSULTANT insurance carrier(s) policies does not meet the
4 minimum notice requirement found herein, CONSULTANT shall cause
5 CONSULTANT'S insurance carrier(s) to furnish a 30 day Notice of
6 Cancellation Endorsement. In the event of a material modification,
7 cancellation, expiration or reduction in coverage, this Agreement shall
8 terminate forthwith, unless DISTRICT receives, prior to such effective date,
9 another properly executed original certificate of insurance and original
10 copies of endorsements or certified original policies, including all
11 endorsements and attachments thereto, evidencing coverages set forth herein
12 and the insurance required herein is in full force and effect. An individual
13 authorized by the insurance carrier to do so on its behalf shall sign the
14 original endorsements for each policy and the certificate of insurance.
15

16
17 iv. It is understood and agreed by the parties hereto that CONSULTANT'S
18 insurance shall be construed as primary insurance, and DISTRICT'S
19 insurance and/or deductibles and/or self-insured retentions or self-insured
20 programs shall not be construed as contributory.
21

22 v. If, during the term of this Agreement or any extension thereof, there is a
23 material change in the scope of services or there is a material change in the
24 equipment to be used in the performance of the scope of work which will
25 add additional exposures (such as the use of aircraft, watercraft, cranes,
26 etc.); or the term of this Agreement, including any extensions thereof,
27 exceeds five (5) years, DISTRICT reserves the right to adjust the types of
28 insurance required under this Agreement and the monetary limits of

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liability for the insurance coverages currently required herein, if, in the County Risk Manager's reasonable judgment, the amount or type of insurance carried by CONSULTANT has become inadequate.

vi. CONSULTANT shall pass down the insurance obligations contained herein to all tiers of subcontractors working under this Agreement.

vii. The insurance requirements contained in this Agreement may be met with a program(s) of self-insurance acceptable to DISTRICT.

viii. CONSULTANT agrees to notify DISTRICT of any claim by a third party or any incident or event that may give rise to a claim arising from the performance of this Agreement.

14. INDEMNIFICATION – CONSULTANT shall indemnify and hold harmless DISTRICT (including its officers, Board of Supervisors, elected and appointed officials, employees, agents and representatives) from any and all liability, claim, damage, proceeding or action, present or future, based upon, arising out of or in any way relating to CONSULTANT'S (including its officers, employees, subcontractors and agents) actual or alleged negligent, reckless or willful misconduct, acts or omissions related to this Agreement, performance under this Agreement, or failure to comply with the requirements of this Agreement, including but not limited to: (a) property damage; (b) bodily injury or death; or (c) any other element of any kind or nature whatsoever. CONSULTANT shall defend, at its sole expense, including all costs and fees (including but not limited to attorney fees, cost of investigation, defense and settlements or awards), DISTRICT (its officers, Board of Supervisors, elected and appointed officials, employees, agents and representatives) in any claim, proceeding or action for which indemnification is required.

1 With respect to any of CONSULTANT'S indemnification requirements, CONSULTANT
2 shall, at its sole cost, have the right to use counsel of their own choice and shall have the
3 right to adjust, settle, or compromise any such claim, proceeding or action without the
4 prior consent of DISTRICT; provided, however, that such adjustment, settlement or
5 compromise in no manner whatsoever limits or circumscribes CONSULTANT'S
6 indemnification obligations to DISTRICT.
7

8 CONSULTANT'S indemnification obligations shall be satisfied when CONSULTANT
9 has provided to DISTRICT the appropriate form of dismissal (or similar document)
10 relieving DISTRICT from any liability for the claim, proceeding or action involved.

11 The specified insurance limits required in this Agreement shall in no way limit or
12 circumscribe CONSULTANT'S obligations to indemnify and hold harmless DISTRICT
13 from third party claims.
14

15 In the event there is conflict between this section and California Civil Code Section 2782,
16 this section shall be interpreted to comply with California Civil Code Section 2782. Such
17 interpretation shall not relieve CONSULTANT from indemnifying DISTRICT to the
18 fullest extent allowed by law.

- 19 15. WORK PRODUCT – CONSULTANT shall provide DISTRICT with all calculations,
20 data, measurements, plans, specifications, computer files, maps, field notes, reports,
21 estimates and any other documents furnished in accordance with this Agreement. All
22 work products or deliverables furnished under this Agreement shall be and remain the
23 sole property of DISTRICT. CONSULTANT shall not publish or transfer any material
24 produced by CONSULTANT or resulting from activities supported by this Agreement
25 without the written consent of the General Manager-Chief Engineer. If any such material
26 is subject to copyright or trademark, the parties agree that the right to any and all
27 copyright and/or trademark in and to the material is expressly reserved to DISTRICT. If
28

1 any such material is copyrighted, the parties hereto understand and agree that DISTRICT
2 reserves a royalty-free, non-exclusive, and irrevocable license to reproduce, publish and
3 use such material, in whole or in part, and to authorize others to do so, provided written
4 credit is given the author.

5
6 16. CONFIDENTIALITY OF DATA – All financial, statistical, personal, technical or other
7 data and information which is designated confidential by DISTRICT and subsequently
8 made available to CONSULTANT shall not be disclosed (in whole or in part) by
9 CONSULTANT to any third parties and shall be protected by CONSULTANT from
10 unauthorized use and disclosure. The only exception to this shall be if disclosure is
11 approved in advance in writing by DISTRICT or if the disclosure is made to
12 CONSULTANT'S subcontractors as anticipated by this Agreement.

13
14 CONSULTANT shall refer all requests for information to DISTRICT. These same
15 requirements shall be applicable to any of CONSULTANT'S subcontractors.
16 CONSULTANT shall include the requirements stated in this section in the agreement
17 with any of its subcontractors.

18 17. TIME EXTENSIONS – Any delay in providing services required by this Agreement,
19 occasioned by causes beyond the control and not due to the fault or negligence of
20 CONSULTANT, shall be deemed reason for granting an extension of time for the
21 completion of the aforesaid work. If such delay occurs, CONSULTANT shall promptly
22 notify DISTRICT in writing of the cause and of the extent of the delay whereupon
23 DISTRICT shall ascertain the facts and the extent of the delay and grant an extension of
24 time for the completion of the work when, in DISTRICT'S sole judgment, their findings
25 of fact justify such an extension of time.

26
27 18. ASSIGNMENT – Neither this Agreement nor any part thereof shall be assigned by
28 CONSULTANT without the prior written consent of DISTRICT.

1 19. JURISDICTION/LAW/SEVERABILITY – This Agreement is to be construed in
2 accordance with the laws of the State of California. If any provision of this Agreement is
3 held by a court of competent jurisdiction to be invalid, void or unenforceable, the
4 remaining provisions shall be declared severable and shall be given full force and effect
5 to the extent possible

6 Any legal action, in law or in equity related to the performance or interpretation of this
7 Agreement shall be filed only in the Superior Court of the State of California located in
8 Riverside, California, and the parties waive any provision of law providing for a change
9 of venue to another location. Prior to the filing of any legal action, the parties shall be
10 obligated to attend a mediation session with a neutral mediator or try to resolve the
11 dispute.
12

13 20. WAIVER – Any waiver by DISTRICT of any breach of any one or more of the terms of
14 this Agreement shall not be construed to be a waiver of any subsequent or other breach of
15 the same or of any other term thereof. Failure on the part of DISTRICT to require exact,
16 full and complete compliance with any terms of this Agreement shall not be construed as
17 in any manner changing the terms hereof, or estopping DISTRICT from enforcement
18 hereof.
19

20 21. CONFLICT OF INTEREST – CONSULTANT warrants, by execution of this Agreement,
21 that no person or selling agency has been employed or retained to solicit or secure this
22 Agreement upon an agreement or understanding for a commission, percentage, brokerage
23 or contingent fee, excepting bona fide employees or bona fide established commercial or
24 selling agencies maintained by CONSULTANT for the purpose of securing business.
25 For breach or violation of this warranty, DISTRICT has the right to annul this Agreement
26 without liability, pay only for the value of the work actually performed, or in its
27 discretion to deduct from the Agreement price or consideration, or otherwise recover, the
28

1 full amount of such commission, percentage, brokerage, or contingent fee.
2 CONSULTANT may be requested to complete a Conflict of Interest Statement prior to,
3 during, or after execution of this Agreement. CONSULTANT understands that as a
4 condition of this Agreement, CONSULTANT agrees to complete the Conflict of Interest
5 Statement when requested to do so by DISTRICT.
6

7 22. NON-DISCRIMINATION – In the performance of the terms of this Agreement,
8 CONSULTANT shall not engage in nor permit others he may employ to engage in
9 discrimination in the employment of persons because of the race, color, national origin or
10 ancestry, religion, physical handicap, disability as defined by the Americans with
11 Disabilities Act (ADA), medical condition, marital status or sex of such persons, in
12 accordance with the provision of California Labor Code Section 1735.
13

14 23. NOTICES – Any and all notices sent or required to be sent to the parties of this
15 Agreement will be mailed by first class mail, postage prepaid to the following addresses:

16 RIVERSIDE COUNTY FLOOD CONTROL	DIGITAL MAPPING
17 AND WATER CONSERVATION DISTRICT	INCORPORATED
18 1995 Market Street	21062 Brookhurst Street, Suite 101
Riverside, CA 92501	Huntington Beach, CA 92646
Attn: Photogrammetry Section	Attn: Gencaga Aliyazicioglu

19 24. NON-APPROPRIATION OF FUNDS – It is mutually agreed and understood that the
20 obligations of DISTRICT are limited by and contingent upon the availability of DISTRICT
21 funds for the reimbursement of CONSULTANT'S fees. In the event that such funds are
22 not forthcoming for any reason, DISTRICT shall immediately notify CONSULTANT in
23 writing. This Agreement shall be deemed terminated and have no further force and effect
24 immediately on receipt of DISTRICT'S notification by CONSULTANT. In the event of
25 such termination, CONSULTANT shall be entitled to payment for work already completed
26 in accordance with Sections 5 and 6 (COMPENSATION AND PAYMENT).
27
28

1 25. DISCREPANCIES – In the event of any conflict between the terms of this Agreement and
2 Exhibit "A", Exhibit "B", Exhibit "C" or Exhibit "D", the terms of this Agreement shall
3 govern. In the event of any conflict between Exhibit "A", Exhibit "B", Exhibit "C" and
4 Exhibit "D", Exhibit "A" shall govern.

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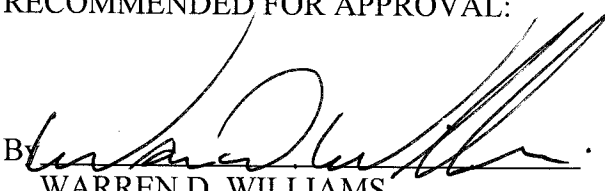
1 IN WITNESS WHEREOF, the parties hereto have executed this Agreement on

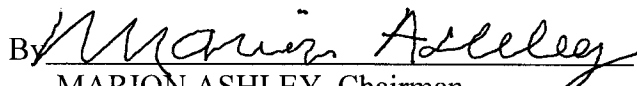
2 OCT 06 2015

3 (to be filled in by Clerk of the Board)

4 RECOMMENDED FOR APPROVAL:

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

5
6
7 By 
8 WARREN D. WILLIAMS
9 General Manager-Chief Engineer


By 
MARION ASHLEY, Chairman
Board of Supervisors, Riverside County Flood
Control and Water Conservation District

10
11 APPROVED AS TO FORM:

ATTEST:

12 GREGORY P. PRIAMOS
13 County Counsel

KECIA HARPER-IHEM
Clerk of the Board


14
15 By 
16 NEAL KIPNIS
17 Deputy County Counsel

By 
Deputy

(SEAL)

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26 Consulting Services Agreement FY 2015/16 to 2017/18
27 On-call Aerial Imagery and/or Light Detection and Ranging Services
w/Digital Mapping Incorporated
28 09/09/15
AMR:rlp

DIGITAL MAPPING INCORPORATED

By 
GENCAGA ALIYAZICIOGLU
Chief Financial Officer

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Consulting Services Agreement FY 2015/16 to 2017/18
On-call Aerial Imagery and/or Light Detection and Ranging Services
w/Digital Mapping Incorporated
09/09/15
AMR:rlp

EXHIBIT "A"

A. SCOPE OF SERVICES

The Consultant will provide any one or more of the following mapping services on an on-call basis: 1) analog black and white photography, 2) analog color photography, 3) digital imagery, and 4) LIDAR data.

B. REQUIREMENTS FOR IMAGERY/LIDAR

1. Requirements for Analog Imagery

All aspects of the aerial flight and acquisition of aerial photography to follow industry best practice. Specifications for aerial photograph have been included in Section C below.

2. Requirements for Digital Imagery

All aspects of the aerial flight and acquisition of aerial photography to follow industry best practice. State the manufacturer and model of the digital sensor you will be using.

2.1 Provide color digital imagery with 60% forward overlap and 30% side overlap.

2.2 When airborne GPS is required, provide the raw airborne GPS data as the District will process the data. District survey staff will have a minimum of two base stations running at the time of the flight so coordination will need to take place between the Consultant and District survey staff. District survey staff will provide the ground receiver information.

2.2.1 Provide the exterior orientation elements; X, Y, Z, T, omega, kappa and phi.

2.2.2 Provide the pilot's log sheet.

2.2.3 Provide a detailed diagram of the separation between the GPS antenna and the camera.

2.2.4 The flight window is from 10:30 a.m. to 2:30 p.m. and will only be flown Monday through Thursday as District survey crews do not work on Fridays or weekends.

2.3 Provide the imagery in 8 and 12 bit format and compress using a Q-factor of 5.

2.4 When labeling the images, the job name, photo scale, date and exposure number should be shown on the first exposure only. All subsequent exposures should have date and exposure number only. Date in upper left corner and Photo No. in upper right corner. Number photos as indicated on the flight plan. Use aerial font size 14.

3. Requirements for LIDAR Data

All aspects of the LIDAR and acquisition to follow industry best practice.

Provide LIDAR generated bare earth Digital Terrain Model (DTM) all points file and a separate file with model key points. High resolution DTM having a vertical accuracy of 95% at 0.6' and 90% at 0.5' and as a separate option a DTM having a vertical accuracy of 95% at 1.2' and 90% at 1.0', when checked in flat open terrain.

EXHIBIT "B"

SPECIFICATIONS FOR AERIAL PHOTOGRAPHY

1. Aircraft and Crew

- 1.1 All aircraft shall be maintained and operated in accordance with regulations of the Federal Aviation Administration and the Civil Aeronautics Board. The recommended FAA preflight inspection of the aircraft and instruments must be performed prior to each photographic mission. Aircraft shall have a service ceiling (with operating load of crew, camera, film, oxygen, and other required equipment) not less than 5% above the highest altitude necessary to achieve the smallest photographic scale required. If the project is in controlled air space the appropriate Air Traffic Control Center (AIRTCC) must be contacted. If the project area includes a military installation, the contractor must comply with security regulations. At the flight altitudes required for this photography, the aircraft shall have flight characteristics to provide a stable platform for the operation of the camera that will not degrade the orientation or the resolution of the photographic image.
- 1.2 The design of the aircraft shall be such that when the camera is mounted, an unobstructed view is obtained, shielded from the exhaust gasses, oil, effluence and air turbulence.
 - 1.2.1 If an aircraft camera has a port glass it shall be preferably 50mm thick but not less than 37mm thick. The surface finish shall be 80/50 or better. Glass material shall be polished crown, group category M, Mil Specs Mil-W-1366F (ASG) October 1975, C-1 optical quality or better. The physical characteristics of any port glass shall be reported to the District on request.
 - 1.2.2 The camera shall be mounted vertically in the aircraft in a mount designed to isolate the camera from vibration of the aircraft. Angular vibration of the camera shall be reduced to such a level so as to have no significant detrimental effect on resolution.
 - 1.2.3 The camera window shall be mounted in material eliminating excessive mechanical stress to the window. The opening shall be designed so that the field of view is unobstructed when the camera is mounted.
- 1.3 Individual crew members shall have two years or more apprenticeship in flying photographic missions for aerial surveys. In addition, it is desirable that crew members have meaningful prior experience with the same type camera and aircraft to which assigned.

2. Camera and Associated Equipment

- 2.1 The camera will be a metric quality vertical format aerial mapping of nominal focal length of 152mm with format dimensions of 230mm x 230mm. The lens must meet the requirements outlined below based on a U.S. Geological Survey Report of Camera

Calibration. Failure of the camera to meet all of the specified requirements shall be cause for rejection of the proposal.

2.1.1 Lens shall be corrected for the spectral range of the film used. The lens shall meet or exceed all the requirements outlined in items (a), (b), (c) and (d), below.

- (a) Calibrated Focal length - 153.0mm \pm 3.0mm;
- (b) Usable angular field - at least 90°;
- (c) Radial distortion in the usable angular field, based on the calibrated focal length referred to the calibrated principal point (point of symmetry), shall not exceed 12 μ m for any tested point, and 16 of the tested points shall have radial distortion values not exceeding 5 μ m.
- (d) Resolution - The lens should have an Area Weighted Average Resolution (AWAR) of at least 72.0 line pairs per millimeter as determined by the U.S. Geological Survey Report of Calibration. The following table lists the minimum acceptable radial and tangential lens resolution at various field angles.

Field angle	0°	7.5°	15°	22.5°	30°	35°	40°
<u>Line pairs per mm</u>							
Radial	95	87	67	57			
Tangential	95	80	70	67	67	57	45

- 2.1.2 Filters - Only optical filters provided by the lens manufacturer meeting the same optical specifications shall be used. The filter shall have surfaces parallel within 10 seconds of arc and its optical quality shall be such that its addition to the camera shall not cause an undesirable reduction in image definition. The light fall-off in cameras having an angle of view larger than 60 degrees shall be compensated by a graded (anti vignetting) filter.
- 2.1.3 Shutter - The camera shall be equipped with a between-the-lens shutter with variable speed settings such that in conjunction with flight height and aircraft speed, the camera will produce high definition photographs at full aperture. The shutter shall have a minimum efficiency of 70 percent at a speed of 1/200 second.
- 2.1.4 Magazine Platen - The camera shall be equipped with an approved means of flattening the film at the instant of exposure. The platen against which the film is pressed shall not depart from a true plane by more than 15 μ m when the camera/magazine vacuum is applied.
- 2.1.5 Fiducial Marks - The camera shall record eight (8) fiducial marks which are clear and well defined on each negative. The marks shall be located in each

corner and at the center of each side. The corner fiducial marks shall form a quadrilateral whose sides are equal within 0.050mm. The midside fiducial marks shall be equidistant within 0.050mm from the adjacent corner fiducial marks. Lines joining opposite pairs of fiducial marks shall intersect at an angle of $90^{\circ} \pm 30''$. The intersection of the lines shall indicate the true position of the principal point of autocollimation within $\nabla 0.030\text{mm}$.

- 2.1.6 Stereomodel Flatness - The average departure from flatness (at negative scale) for two computer simulated stereomodels may not exceed 15um for any symmetrically arranged point tested by USGS. The difference between the highest and lowest value shall not exceed 25 um. The average of values given for points tested by USGS (which are averages themselves) shall not exceed 7.5 um.
- 2.1.7 Calibration Report - The contractor shall provide a camera calibration report prepared by the U.S. Geological Survey Optical Calibration Laboratory, which reflects the current condition of the camera to be used. The report shall be based on the Laboratory's standard tests and measurements, made after complete assembly of all parts of the camera unit, with the light filters in place. This report must be dated within three (3) years of the date of the photography. The combination of camera cone, lens, camera body and magazine(s) submitted for testing shall be, if acceptable, the only combination used for this project. Use of additional equipment shall be equally certified. The camera shall be recalibrated if there is any reason to believe that the dimensional relationship of the lens, fiducial marks, and film plane have been disturbed by partial disassembly or unusual mechanical shock, the camera must be resubmitted for recalibration at the contractor's expense. The District reserves the right to restrict the use of any camera based upon data contained in the calibration report, or based upon operational results.
- 2.2 Forward Motion Compensation is required for all photography requested at 3000 ft. above mean terrain and for all requested photographic coverage at altitudes lower than 3000 ft. above mean terrain. The contractor shall provide the proper equipment as well as the experience in the use of Forward Motion Compensation.
- 2.3 The camera shall be installed in a mount which attenuates the effects of aircraft vibration. The mount should be regularly serviced and maintained.

3. Aerial Film and Image Quality

3.1 Aerial Film

- 3.1.1 The type of film to be used shall be unexpired and have a dimensional stable polyester base.
- 3.1.2 Color and panchromatic emulsions shall be sensitive to the entire visible spectrum with an extended red sensitivity. Color infrared and black and white infrared emulsions shall be sensitive to the visible and near infrared spectrum from 400 to 900 nanometers.

- 3.1.3 Extreme care shall be exercised to ensure proper exposure to minimize vignetting due to differential exposure. This differential shall not exceed that which would result from a basic 1/3 stop difference in exposure.
 - 3.1.4 The conditions of the film stock to be used shall be such that when the unexposed film is processed it shall be free of stains, discoloration, or brittleness that can be attributed to aging or improper storage and the base-plus-fog density for all negative films and the minimum-density for all color reversal films shall conform to the manufacturer's predicted density levels.
- 3.2 Storage and Handling
- 3.2.1 Storage and handling of all photographic film shall be in accordance with the manufacturer's recommendation. All aerial film shall be stored in the original containers to prevent any exchange in moisture between the rolls and their surroundings up to the time they are exposed. The film shall not be rolled tightly on spools or in any way stretched, buckled, distorted, or exposed to direct sunlight or other sources of heat.
 - 3.2.2 Adverse storage conditions can affect the color emulsion layers, as well as overall sensitivity. Unexposed color films that are to be stored for several months, shall be stored at 0 to -10 degrees Fahrenheit (-18 to -23 degrees Celsius).
 - 3.2.3 Color infrared film stored in the field prior to use shall be refrigerated at all times at a temperature of approximately 40 degrees Fahrenheit (4 degrees Celsius) or lower.
- 3.3 Processing and Drying
- 3.3.1 All black and white and color aerial film shall be processed in a sensitometrically controlled process using the manufacturer's recommended process monitoring system. Prior to processing the film a calibrated, 21-step sensitometric wedge (in .15 nominal density increments) shall be exposed on one end of the roll of film and become a permanent part of the roll.
 - 3.3.2 The film shall be thoroughly fixed and washed to ensure archival quality. The residual thiosulfate content of the processed black and white film should not exceed 0.04 milligrams per square inch as measured using a Kodak Hypo Estimator and Hypo Test Solution HT-2 or other approved method.
 - 3.3.3 Processing and drying of film shall be carried out without affecting the metric quality specified in paragraph 3.4.1. At no time shall the film be subjected to extreme temperature and humidity changes.
 - 3.3.4 The processed film shall be free from chemicals, stains, tears, scratches, abrasions, watermarks, finger marks, lint, dirt, light streaks, static marks, and any

other physical defects that would interfere with the intended purpose of the photography.

3.4 Metric Quality of Processed Film

3.4.1 The original processed film or contact diapositives produced from them shall not contain residual Y-parallaxes after relative orientation in excess of 20 micrometers anywhere in the model. The dimensional change in any direction across a 9" distance shall not exceed 127 micrometers.

3.5 Image Quality of Processed Film

3.5.1 The imagery on the aerial film shall be clear and sharp and evenly exposed across the format. The film shall be free from clouds, cloud shadows, smoke, haze, snow, shadows, crimps, scratches, and any other blemishes which interfere with the intended purpose of the photography. Allowances will be made for unavoidable shadows, permanent snow fields, or reflectance from water bodies.

3.5.2 When there is doubt concerning the sharpness (resolution) of images obtained on the original film, a comparison will be made of well-defined edges by:

- A 3X enlargement on film, and/or
- By comparison to a calibrated matrix in a visual edge-matched comparator, and/or
- By edge traces in a microdensitometer, and/or
- By a combination of these methods.

If the imagery is obviously degraded the original film shall be rejected for poor image quality.

3.5.3 Density measurements will be taken on processed film using a transmission densitometer with a 2mm probe for scales 1/36,000 and larger and with a 1m probe for scales 1/36,000 and smaller. Readings will be made no closer than 1-1/2' from the image edge. Densities for black and white films shall be:

- a. Black and white negative film density measurement.
- | | |
|-------------------|-------------|
| Max Base-Plus-Fog | .20 +/- .10 |
| D-Min | .40 +/- .10 |
| D-Max | 1.50 |

Base-Plus-Fog shall be measured between and at the edges of the negative frame, and conform with the manufacturer's predicted density value. The minimum usable density shall be no less than 0.30 and maximum usable density no more than 1.50 after deducting Base-Plus-Fog density. The average density range aim point should be 1.0 and the minimum no less than 0.55.

3.5.4 Maximum photographic image and color quality control is required when exposing and processing color infrared film. The color infrared film shall be exposed and processed to the manufacturer's recommendations unless otherwise

required in project specifications. It is recommended that the following color balance test be conducted prior to using the film on a project. Remove approximately 3 feet of unexposed film from the outside wrap. Expose a 21-step sensitometric wedge (0.15 density increments) on the film strip and process it using the manufacturer's recommended process tolerances. The color balance shall be established by obtaining two points on the characteristic curve at $D=1.0$, one being at the midpoint of the two visible-light curves, and the second at the point of intersection of $D=10$ with the IR-curve. A color balance aim point of 20 has been determined empirically to be optimum for most applications. The processed stepwedge will become part of the roll from which they were removed. These stepwedges will be maintained on file and used as criteria for acceptable color balance of the exposed and processed film. Exposed and processed film which does not have a color balance within $\pm 0.06 \text{ Log E}$ of the color balance aim point will be cause for rejection.

- 3.5.5 The camera instrument panel and all fiducial marks shall be sharp and clearly legible on all processed film.
- 3.5.6 All exposed color films should be processed as soon as possible to avoid desirable color balance shifts.

4. Photographic Operations

- 4.1 Photography shall not be secured when the ground is obscured by haze, snow, smoke, dust, flood waters, or environmental factors that may obscure ground detail. Clouds and/or shadows of clouds shall not appear in the photograph. The solar altitude shall be defined by the application but in general it should not be less than 30 degrees when aerial negatives are exposed. Priorities will be provided to the contractor by the District prior to the date of photography and the contractor shall follow these priorities consistent with local flight conditions and logical flight planning. For projects which will have targeted ground control points, photographic operations must be coordinated with the placing of targets so that a minimum of time will elapse between targeting and photography.
- 4.2 The camera should be checked to be sure it is properly secured onto the mount and that all cable connections are tight. The camera lens, filters, and camera port must be inspected to assure that the surfaces are not scratched, stretched, or discolored and that they are free of foreign particles and condensation.
 - 4.2.1 The camera magazine must be clean, firmly seated on the camera. The transport system must be operating properly and the correct information entered into the data block recording devices.
- 4.3 Flight Lines - The District will provide flight maps, pdf and dgn files for the location of the flight lines. All flying shall be done in strict conformance with the instructions and the intended locations specified on the flight maps. Flight lines shall be continuous and straight with no breaks throughout the entire length of the flight line unless otherwise specified. Each project shall be flown in its entirety with the same camera. The maximum angle of deviation between the actual flight path and the specified flight line

- shall not exceed three (3) degrees at any point on the lines. Rerlights for rejected exposures shall include the entire flight line unless the flight line contains more than 15 exposures in which case a portion of the flight line may, with permission of District, be replaced.
- 4.3.1 Every effort shall be made to avoid breaks within individual flight lines. Where breaks within a flight line are necessary, the entire flight line composed of the resulting segments shall meet all of the requirements set forth in these Specifications. Where breaks occur, these shall have an overlap of at least four frames to ensure a stereo model of overlap or tie. All photos within a single flight line shall be acquired with the same aerial camera and with the camera oriented in the same direction.
 - 4.3.2 Exposures acquired to replace rejected, damaged, lost or otherwise destroyed exposures shall fully conform to these Specifications. Replacement exposures shall be acquired with the same aerial camera(s) used to acquire the original exposures and shall be exposed as nearly as possible to the same day and lighting conditions as the original exposures.
 - 4.4 Flight Height - Departures from flight heights required to produce the desired photo scale shall not exceed -2% or +5% unless changed by Air Route Traffic Control Centers.
 - 4.5 Changes in the course of the aircraft between successive overlapping photographs within a flight line shall not exceed 3 degrees.
 - 4.6 While exposing aerial photography, the camera shall be compensated for crab of the aircraft, with a resultant error not exceeding 3 degrees.
 - 4.7 Exposure Overlap - The overlap shall be sufficient to provide full stereoscopic coverage as follows:
 - 4.7.1 Endlap - Forward overlap in the line of flight shall average not less than 57% or more than 62% at the mean elevation of the terrain, unless otherwise specified. Individual forward overlaps shall not be less than 55% or more than 68% excepting the situation where in a forward overlap in areas of low elevation must exceed 68% to attain the minimum 55% forward overlap in adjacent areas of higher elevation. Wherever there is a change in direction between two flight lines (other than between adjacent parallel flight lines) junction areas between the adjoining flight lines shall be covered stereoscopically by both lines.
 - 4.7.2 Sidelap - Any flight line with an exposure having sidelap (overlap of parallel strips of vertical photography) of less than twenty (20) percent or more than forty (40) percent may be rejected. Sidelap, per strip, shall average thirty (30) percent, plus or minus five (5) percent.
 - 4.8 The combined effect of aircraft course corrections, crab and tilt shall result in an apparent crab not greater than 5 degrees on successive photographs. Apparent crab is defined as the angle between a line joining fiducial marks in the direction of flight and

the line between the indicated principal point and the conjugate image of the indicated principal point of the adjacent photograph within the same line of flight.

- 4.9 The tilt within a single frame shall not exceed 4 degrees nor shall the difference in tilt between two consecutive overlapping frames within a flight line exceed 4 degrees. The average tilt for all negatives of the same nominal scale shall not exceed 1 degree.
- 4.10 All film shall be exposed using the fastest shutter speed possible when the aperture is set at its optimum value in consideration of the optical resolution and image motion.
- 4.11 Each roll of aerial film shall have an unexposed leader at least ten frames in length. This unexposed leader will be used to expose a sensitometric wedge before processing. Whenever a roll of aerial film is used in a discontinuous fashion such as from one day to the next or from a morning flight to an afternoon flight, a spacer at least four frames in length shall be rolled forward just prior to the commencement of taking new photographs.
- 4.12 All film shall be exposed using the fastest shutter speed possible when the aperture is set at its optimum value in consideration of the optical resolution and image motion.

5. Preliminary Checks

- 5.1 Each roll of aerial film shall be processed as soon as possible after it is exposed. Navigation of the flight lines and image quality shall be quick-checked for compliance with these Specifications.
- 5.2 Reflights shall be immediately ordered for the purpose of securing replacement exposures for all frames which fail to meet minimum standards set forth in these Specifications, provided ground conditions have not yet terminated the photographic "season".

6. Deliverable Products

Photography shall be taken as early as possible in the flying season once the flight conditions are met. Priorities will be provided to the contractor by the District prior to the date of photography and the contractor shall follow these priorities consistent with local flight conditions and logical flight planning. For projects which will have targeted ground control points, photographic operations must be coordinated with the placing of targets so that a minimum of time will elapse between targeting and photography. Notification shall be sent to the District once a project has been flown. Exposure of the film shall be in accordance with the manufacturer's recommendations and with a goal toward achieving density requirements set forth in paragraph 3.5.3. The negatives shall be clear and sharp in detail, free from light streaks and static marks, and of uniform tone and degree of contrast to permit ground details to show clearly in all scene reflectance, with particular emphasis on pattern recognition in the shadow areas.

6.1 Aerial Film

- 6.1.1 The exposed/processed aerial film should be delivered in accordance with the stipulations of delivery schedule and delivery address.
- 6.1.2 Each processed roll or partial roll of aerial film shall be kept in roll form, on the spool, and in the metal or plastic container supplied by the film manufacturer. Rejected exposures shall be removed. All flights belonging to a project shall be in the **same** container.

6.2 Color and Black and White Contact Prints

The contractor is to furnish three complete sets of 9" x 9" contact color prints of all color flights and one complete set of 9" x 9" contact prints of all black and white flights, unless otherwise specified. Contact prints shall be made on an automatic dodging printer on medium weight resin-coated paper on which ink and pencil can be used on both sides.

- 6.2.1 The photographic emulsion shall be of fine grain and have a suitable light sensitivity range and contrast for the making of prints from the aerial film exposed under this contract. Outdated materials shall not be used.
- 6.2.2 Processing, including exposure, development, fixation, washing, and drying of all photographic materials, shall result in finished photographic prints having a fine grain quality, a normal, uniform density, and such tone and contrast that all photographic details shall show clearly within the dark and light tone areas as well as in areas with intermediate tones. Adequate grades of contact paper and proper laboratory procedures shall be used to achieve the best prints possible. Excessive variance in tone or contrast between adjoining prints shall be cause for rejection.
- 6.2.3 Photographic prints shall be trimmed as specified by the District. When trimmed always leave the camera fiducial marks, GPS and other data recorded in the border of each image. Prints showing fiducial marks of inadequate clarity and definition, or prints omitting fiducial marks, shall be rejected.
- 6.2.4 All prints shall be clear and free from chemical stains, blemishes, uneven spots, air bells, light streaks or fog, and other defects which would, in the opinion of the District, interfere with their intended purpose. Prints shall be delivered to the District in a smooth, flat, and usable condition.
- 6.2.5 Titling and Labeling - All lettering shall be positioned as closely as possible to the inside leading edge of the format of the exposure. The characters used for making the exposures shall be 3/16 inch, drafted or stamped with opaque ink to avoid deformation of the film as to what is manifested with heat embossed titlers. The lettering shall clearly show on all copies of the photographs perpendicular to the line of flight, as indicated in the attached "Method of Negative Identification", Exhibit "B".

All material shall be delivered to the following address:

Riverside County Flood Control and Water Conservation District
Attn: Jim Morrell
Photogrammetry Section
1995 Market Street
Riverside, CA 92501

Schedule of Delivery - Materials shall be delivered to the District within 30 days after date of aerial photography.

EXHIBIT "C"

METHOD OF NEGATIVE IDENTIFICATION

FOR 9" x 9" PHOTOS

The exposure numbers shall be consecutive for the entire project. The exposure number shall be in the upper right corner of the photograph printed from each exposure to be read as one looks northerly along the flight line or easterly if lines are east-west. The date of photography shall be in the upper left corner. When labeling the images the District would like the job name, photo scale, date and exposure number on the first exposure only. All subsequent exposures should have the date and exposure number only.

9-02-2010	JOB NAME	1:3000	1
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SAMPLE I – NOT TO SCALE
INFORMATION ABOVE TO BE NOTED ON FIRST EXPOSURE

9-02-2010			2
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SAMPLE 2 – NOT TO SCALE
ALL OTHER EXPOSURES WILL INDICATE DATE AND NO. OF PHOTO



DIGITAL MAPPING, INC.

SCHEDULE OF FEES

VALID as of 1/1/2015

PROFESSIONAL		RATE	UNIT
1	Principal (Technical Advisor)	\$ 200.00	Hour
2	Project Manager	\$ 175.00	Hour
3	Certified Photogrammetrist/Land Surveyor	\$ 150.00	Hour
4	Photogrammetric Technician	\$ 100.00	Hour
5	3-Man Survey Crew	\$ 300.00	Hour
6	2-Man Survey Crew	\$ 200.00	Hour
7	Photogrammetrist	\$ 85.00	Hour
8	Engineering Draftsmen	\$ 60.00	Hour
9	Cad/System Programmer	\$ 75.00	Hour
10	Cad/Specialist	\$ 70.00	Hour
11	Cad/Technician	\$ 60.00	Hour
12	Digital Orthophoto technician	\$ 85.00	Hour
13	Clerical	\$ 50.00	Hour

DIRECT CHARGES

DIGITAL AERIAL PHOTOGRAPHY (DMC)

21	Digital Aerial Photography (mobilization)	\$ 1,000.00	Each
22	Airborne GPS/IMU Data	\$ 750	Hour
23	DMC-IIE-230-Digital Mapping Camera (DMC) image frame (PAN/RGB) (15,552 x 14,144 pixels)	\$ 60	Each
24	DMC-IIE-230- Digital Mapping Camera (DMC) image frame (PAN/RGB/CIR) (15,552 x 14,144 pixels)	\$ 80	Each
25	DMC-1-Digital Mapping Camera (DMC) image frame (PAN/RGB) (7,680 x 13,824 pixels)	\$ 35	Each
26	DMC-1- Digital Mapping Camera (DMC) image frame (PAN/RGB/CIR) (7,680 x 13,824 pixels)	\$ 50	Each
GEMINI ALTM LIDAR ACQUISITION			
27	Lidar Data Acquisition (mobilization)	\$ 1,500.00	Each
28	Lidar Data Expert	\$ 100	Hour
29	Lidar Data Technician	\$ 75	Each
30	Black & White Exposures	\$ 30	Each
31	Color Exposures	\$ 60	Each
32	Black & White Contact Prints	\$ 10	Each
33	Color Contact Prints	\$ 15	Each
34	Black & White Diapositives	\$ 30	Each
35	Color Diapositives	\$ 50	Each
36	Scanning – Diapositives (B&W)	\$ 25	Diapositives
22	Scanning – Diapositives (Color)	\$ 30	Diapositives

OTHER

30	Analytical Triangulation	\$ 5	Plate
31	Manuscript Materials	\$ 20	Square Feet
32	Final Sheets	\$ 300	Each

1 CONSULTING SERVICES AGREEMENT
2 AERIAL IMAGERY and/or LIGHT DETECTION and RANGING SERVICES
3 (FY 2015/16 through FY 2017/18)

4 The Riverside County Flood Control and Water Conservation District, hereinafter called
5 "DISTRICT", and Geospatial Professional Solutions, hereinafter called "CONSULTANT",
6 hereby agree as follows:

- 7 1. PROJECT – CONSULTANT shall provide "on-call" professional services as further
8 described in the Scope of Services attached hereto as Exhibit "A" and made a part hereof,
9 in support of DISTRICT'S aerial imagery and/or Light Detection and Ranging (LiDAR)
10 data, and in accordance with applicable federal, state, and local laws and regulations.
- 11 2. RETAINER – DISTRICT hereby retains CONSULTANT, as an independent contractor, to
12 provide all technical and professional services including but not limited to expertise, labor,
13 material, equipment, transportation, supervision, and other incidental services to fully
14 and adequately perform and complete in a skillful and professional manner any one or
15 more of the following consulting services: i) analog black and white photography, ii)
16 analog color photography, iii) digital imagery and iv) LiDAR data to assist DISTRICT in
17 the compilation of engineering mapping at various scales.

18
19
20 CONSULTANT'S services under this Agreement shall be procured in the following
21 manner:

- 22 A. DISTRICT will contact CONSULTANT and request a written proposal regarding
23 the specific task or services to be provided by CONSULTANT.
- 24 B. DISTRICT and CONSULTANT shall discuss CONSULTANT'S proposal and
25 mutually agree on CONSULTANT'S proposed scope of services, personnel and
26 project schedule. Following DISTRICT'S approval of CONSULTANT'S proposed
27 scope of services, personnel and project schedule, DISTRICT will issue a written
28 Notice to Proceed for the agreed upon services to CONSULTANT.

1 C. CONSULTANT shall commence performance within five (5) calendar days of
2 DISTRICT'S issuance of a Notice to Proceed.

3 By entering into this Agreement, CONSULTANT assumes responsible charge of the work
4 pursuant to Section 8703 of the Professional Land Surveyors' Act; Chapter 15
5 (commencing with Section 8700) of Division 3 of the Business and Professions Code,
6 where applicable, and shall be wholly responsible for the completeness and accuracy of all
7 calculations, data, measurements, calibration, plans, specifications, computer files, maps,
8 field notes, reports, estimates and any other materials prepared pursuant to this Agreement,
9 and shall check all such material accordingly.

11 3. TIME FOR PERFORMANCE – CONSULTANT shall not commence performance of any
12 work or services, for any reason whatsoever, until DISTRICT has provided
13 CONSULTANT with a written Notice to Proceed authorizing CONSULTANT to initiate
14 work pursuant to this Agreement. No payment will be made for any work or services
15 performed prior to the issuance of said Notice to Proceed. The term of this Agreement
16 shall commence on the date it is executed by DISTRICT'S Board of Supervisors and shall
17 terminate at midnight on June 30, 2018.

19 4. AERIAL IMAGING AND LIGHT DETECTION AND RANGING (LiDAR) SERVICES

21 A. Specifications and Standards

22 All work shall be performed in accordance with DISTRICT standards, as described
23 in Exhibits "B" and "C", attached hereto and made a part hereof, and any special
24 criteria established by DISTRICT for specific task or services. All deliverables
25 prepared by CONSULTANT pursuant to this Agreement shall be prepared in
26 accordance with Exhibits "B" and "C" and/or current DISTRICT practices,
27 regulations, policies, procedures and standards where applicable. All deliverables
28 shall be subject to review and approval by DISTRICT.

1 Services provided by CONSULTANT under this Agreement shall be performed in a
2 manner consistent with that standard of care and skill ordinarily exercised by
3 members of the same profession currently practicing under similar circumstances.

4 A. Control Surveys

5 Unless otherwise specified herein, DISTRICT shall provide CONSULTANT with
6 primary survey control monuments including both horizontal (California
7 Coordinate System) and vertical control positions.

8 B. Quality Control

9
10 CONSULTANT shall implement and maintain effective quality control procedures
11 throughout all phases of assigned task and/or services. CONSULTANT shall have
12 a quality control plan in effect during the entire time task and/or services are being
13 performed under this Agreement. The plan shall establish a process whereby all
14 calculations and documents prepared under this Agreement are independently
15 checked, corrected and back-checked, and all pertinent job related correspondence
16 and memoranda are bound in appropriate job files. Evidence that the quality
17 control plan is functional may be requested by DISTRICT. All documents and any
18 other items submitted to DISTRICT for review shall be initialed by
19 CONSULTANT'S project manager, or his designee, as being fully checked and that
20 the preparation of the material followed the quality control plan established for the
21 work.
22
23

- 24 5. COMPENSATION – DISTRICT shall pay CONSULTANT for actual services
25 satisfactorily performed and expenses incurred in accordance with the schedule of
26 professional fees and expenses as set forth on Exhibit "D" attached hereto and made a part
27 hereof. The total amount of compensation paid to CONSULTANT for performance of
28 professional services approved pursuant to this Agreement shall not exceed: i) one hundred

1 thousand dollars (\$100,000) in any given fiscal year, and ii) the total sum of three hundred
2 thousand dollars (\$300,000) over the entire term of this Agreement.

3 6. PAYMENT – CONSULTANT shall submit invoice(s) to DISTRICT (Attention: Business
4 Office-Accounts Payable) following completion of requested services. Upon satisfactory
5 performance of CONSULTANT'S services pursuant to DISTRICT approved scope of
6 services, DISTRICT shall make payment to CONSULTANT within thirty (30) days after
7 receipt of appropriate invoice(s) from CONSULTANT. DISTRICT shall not pay interest
8 or finance charges on any outstanding balance(s). CONSULTANT shall keep employee
9 and expense records according to customary accounting methods and such records shall,
10 upon request, be made available for inspection by DISTRICT to verify CONSULTANT'S
11 invoices. All invoices shall itemize charges to conform to the portion(s) of work and rates
12 as set forth in Exhibits "A", "B", "C" and "D", respectively. Except as specifically
13 provided for and stated in this Agreement or Exhibit "D", DISTRICT shall not be
14 responsible for payment of any of CONTRACTOR'S expenses related to this Agreement.

15
16
17 7. SUBCONTRACTING – CONSULTANT may, at CONSULTANT'S own expense, employ
18 special consultants to accomplish the work covered by this Agreement; however, except
19 as specifically provided in Exhibit "A" or as expressly identified in this Agreement, no
20 portion of the services pertinent to this Agreement shall be subcontracted without prior
21 written approval and authorization by DISTRICT.

22
23 In the event CONSULTANT subcontracts any portion of CONSULTANT'S duties under
24 this Agreement, CONSULTANT shall require its subcontractors to comply with the terms
25 of this Agreement in the same manner as required of CONSULTANT. The fact that
26 CONSULTANT employs special consultants not in his regular employ shall not relieve
27 CONSULTANT of any responsibility regarding the adequacy of the special consultant's
28 designs or other work performed pursuant to this Agreement.

- 1 8. TERMINATION – At any time during the term of this Agreement, DISTRICT may:
- 2 A. Terminate this Agreement without cause upon providing CONSULTANT thirty (30)
- 3 days written notice stating the extent and effective date of termination;
- 4 B. Upon five (5) days written notice, terminate this Agreement for CONSULTANT
- 5 default, if CONSULTANT refuses or fails to comply with the provisions of this
- 6 Agreement or fails to make progress so as to endanger performance and does not
- 7 cure such failure within a reasonable period of time. In the event of such
- 8 termination, DISTRICT may proceed with the work in any manner deemed proper to
- 9 DISTRICT.
- 10

11 In the event DISTRICT issues a Notice of Termination, CONSULTANT shall (i) stop all

12 work under this Agreement on the date specified in the Notice of Termination; and (ii)

13 transfer to DISTRICT and deliver in the manner, and to the extent, if any, as directed by

14 DISTRICT, any financial, statistical, personal, technical data, reports, or other products,

15 which, if the Agreement had been completed, would have been required to be furnished

16 to DISTRICT.

17

18 In the event DISTRICT terminates this Agreement, DISTRICT shall make payment for

19 all services performed in accordance with this Agreement to the date of termination, a

20 total amount which bears the same ratio to the total maximum fee otherwise payable

21 under this Agreement as the services actually bear to the total services necessary for

22 performance of this Agreement. Notwithstanding any of the other provisions of this

23 Agreement, CONSULTANT'S rights under this Agreement shall terminate (except for

24 fees accrued prior to the date of termination) upon dishonesty, or a willful or material

25 breach of this Agreement by CONSULTANT, or in the event of CONSULTANT'S

26 unwillingness or inability for any reason whatsoever to perform the duties hereunder, or

27 if Agreement is terminated pursuant to Section 22 herein, titled NON-

28

1 DISCRIMINATION. In such event, CONSULTANT shall not be entitled to any further
2 compensation under this Agreement. The rights and remedies of DISTRICT provided in
3 this section shall not be exclusive and are in addition to any other rights and remedies
4 provided by law or under this Agreement.

- 5
6 9. ERRORS AND OMISSIONS – In the event CONSULTANT'S work products or any
7 other documents furnished under this Agreement contain any errors or omissions that
8 cause the DISTRICT to incur additional expense beyond what would have otherwise
9 resulted if there were no errors or omissions in CONSULTANT'S work products or any
10 other documents, the additional imagery and/or LIDAR data expense shall be borne
11 solely by CONSULTANT.

12
13 10. DISPUTES

- 14 A. In the event CONSULTANT considers any work demanded of CONSULTANT to
15 be outside the requirements of this Agreement, or if CONSULTANT considers any
16 order, instruction or decision of DISTRICT to be unfair, CONSULTANT shall
17 promptly, upon receipt of such order, instruction or decision, ask for a written
18 confirmation of the same whereupon CONSULTANT shall proceed without delay to
19 perform the work or to conform to the order, instruction, or decision. However, if
20 CONSULTANT finds such order, instruction or decision unsatisfactory,
21 CONSULTANT shall, within 21 calendar days after receipt of same, file a written
22 protest with DISTRICT stating clearly and in detail its objections and reasons
23 therefore. Except for such protests or objections as are made of record in the manner
24 specified and within the time stated herein, and except for such instances where the
25 basis of a protest could not reasonably have been foreseen by CONSULTANT
26 within the time limit specified for protest, CONSULTANT hereby waives all
27 grounds for protests or objections to orders, instruction, or decisions of DISTRICT
28

1 and hereby agrees that, as to all matters not included in such protests, the orders,
 2 instructions and decisions of DISTRICT will be limited to matters properly falling
 3 within DISTRICT'S authority.

4 B. Any controversy or claim arising out of or relating to this Agreement which cannot
 5 be resolved by mutual agreement may be settled by arbitration, provided that the
 6 parties hereto mutually agree to submit to arbitration.

7 C. Neither the pendency of a dispute nor its consideration by arbitration shall excuse
 8 CONSULTANT from full and timely performance in accordance with the terms of
 9 this Agreement.
 10

11 11. LICENSES – At all times while performing services under this Agreement,
 12 CONSULTANT, its employees, agents, contractors and subcontractors shall maintain
 13 professional licenses as required by the laws of the State of California, including but not
 14 limited to Chapter 15 of Division 3 of the Business and Professions Code (Professional
 15 Land Surveyors' Act).
 16

17 12. INDEPENDENT CONTRACTOR – CONSULTANT and the agents and employees of
 18 CONSULTANT, shall act at all times in an independent capacity during the term of this
 19 Agreement and in the performance of the services to be rendered hereunder and shall not
 20 act as or shall not be and shall not in any manner be considered to be employees or agents
 21 of DISTRICT.
 22

23 13. INSURANCE – CONSULTANT shall not commence operations until DISTRICT has
 24 been furnished with original certificate(s) of insurance and original certified copies of
 25 endorsements and if requested, certified original policies of insurance including all
 26 endorsements and any and all other attachments as required in this Section.

27 Without limiting or diminishing CONSULTANT'S obligation to indemnify or hold
 28 DISTRICT harmless, CONSULTANT shall procure and maintain or cause to be

1 maintained, at its sole cost and expense, the following insurance coverage's during the
2 term of this Agreement:

3 A. Workers' Compensation:

4 If CONSULTANT has employees as defined by the State of California,
5 CONSULTANT shall maintain statutory Workers' Compensation Insurance
6 (Coverage A) as prescribed by the laws of the State of California. Policy shall
7 include Employers' Liability (Coverage B) including Occupational Disease with
8 limits not less than \$1,000,000 per person per accident. Policy shall be endorsed to
9 waive subrogation in favor of DISTRICT and, if applicable, to provide a Borrowed
10 Servant/Alternate Employer Endorsement.
11

12 B. Commercial General Liability:

13 Commercial General Liability insurance coverage, including but not limited to,
14 premises liability, unmodified contractual liability, products and completed
15 operations liability, personal and advertising injury, and cross liability coverage,
16 covering claims which may arise from or out of CONSULTANT'S performance of its
17 obligations hereunder. Policy shall name the Riverside County Flood Control and
18 Water Conservation District, the County of Riverside, its agencies, districts, special
19 districts, and departments, their respective directors, officers, Board of Supervisors,
20 employees, elected or appointed officials, agents or representatives as additional
21 insureds. Policy's limit of liability shall not be less than \$1,000,000 per occurrence
22 combined single limit. If such insurance contains a general aggregate limit, it shall
23 apply separately to this Agreement or be no less than two (2) times the occurrence
24 limit.
25
26

27 C. Vehicle Liability:
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1 If CONSULTANT'S vehicles or mobile equipment are used in the performance of the
2 obligations under this Agreement, then CONSULTANT shall maintain liability
3 insurance for all owned, non-owned or hired vehicles so used in an amount not less
4 than \$1,000,000 per occurrence combined single limit. If such insurance contains a
5 general aggregate limit, it shall apply separately to this Agreement or be no less than
6 two (2) times the occurrence limit. Policy shall name the Riverside County Flood
7 Control and Water Conservation District, the County of Riverside, its agencies,
8 districts, special districts, and departments, their respective directors, officers, Board
9 of Supervisors, employees, elected or appointed officials, agents or representatives as
10 additional insureds.
11

12 D. Professional Liability:

13 CONSULTANT shall maintain Professional Liability Insurance providing coverage
14 for CONSULTANT'S performance of work included within this Agreement, with a
15 limit of liability of not less than \$1,000,000 per occurrence and \$2,000,000 annual
16 aggregate. If CONSULTANT'S Professional Liability Insurance is written on a
17 claims made basis rather than an occurrence basis, such insurance shall continue
18 through the term of this Agreement and CONSULTANT shall purchase at his sole
19 expense either 1) an Extended Reporting Endorsement (also known as Tail
20 Coverage); or 2) Prior Dates Coverage from a new insurer with a retroactive date
21 back to the date of, or prior to, the inception of this Agreement; or 3) demonstrate
22 through Certificates of Insurance that CONSULTANT has maintained continuous
23 coverage with the same or original insurer. Coverage provided under items: 1), 2) or
24 3) will continue as long as the law allows.
25
26

27 E. General Insurance Provisions – All Lines:
28

- 1 i. Any insurance carrier providing insurance coverage hereunder shall be
2 admitted to the State of California and have an A.M. BEST rating of not
3 less than an A: VIII (A: 8) unless such requirements are waived, in
4 writing, by the County Risk Manager. If the County Risk Manager waives
5 a requirement for a particular insurer such waiver is only valid for that
6 specific insurer and only for one policy term.
- 7
- 8 ii. The CONSULTANT must declare its insurance self-insured retention for
9 each coverage required herein. If any such self-insured retention exceeds
10 \$500,000 per occurrence each such retention shall have the prior written
11 consent of the County Risk Manager before the commencement of
12 operations under this Agreement. Upon notification of self-insured
13 retention deemed unacceptable to the DISTRICT, and at the election of the
14 County Risk Manager, CONSULTANT'S carriers shall either: 1) reduce
15 or eliminate such self-insured retention with respect to this Agreement
16 with DISTRICT, or 2) procure a bond which guarantees payment of losses
17 and related investigations, claims administration, and defense costs and
18 expenses.
- 19
- 20 iii. CONSULTANT shall cause their insurance carrier(s) to furnish DISTRICT
21 with 1) a properly executed original certificate(s) of insurance and certified
22 original copies of endorsements effecting coverage as required herein; and
23 2) if requested to do so orally or in writing by the County Risk Manager,
24 provide original certified copies of policies including all endorsements and
25 all attachments thereto, showing such insurance is in full force and effect.
26 Further, said certificate(s) and policies of insurance shall contain the
27 covenant of the insurance carrier(s) that a minimum of thirty (30) days
28

1 written notice shall be given to the DISTRICT prior to any material
2 modification, cancellation, expiration or reduction in coverage of such
3 insurance. If CONSULTANT insurance carrier(s) policies does not meet the
4 minimum notice requirement found herein, CONSULTANT shall cause
5 CONSULTANT'S insurance carrier(s) to furnish a 30 day Notice of
6 Cancellation Endorsement. In the event of a material modification,
7 cancellation, expiration or reduction in coverage, this Agreement shall
8 terminate forthwith, unless DISTRICT receives, prior to such effective date,
9 another properly executed original certificate of insurance and original
10 copies of endorsements or certified original policies, including all
11 endorsements and attachments thereto, evidencing coverages set forth herein
12 and the insurance required herein is in full force and effect. An individual
13 authorized by the insurance carrier to do so on its behalf shall sign the
14 original endorsements for each policy and the certificate of insurance.

17 iv. It is understood and agreed by the parties hereto that CONSULTANT'S
18 insurance shall be construed as primary insurance, and DISTRICT'S
19 insurance and/or deductibles and/or self-insured retentions or self-insured
20 programs shall not be construed as contributory.

22 v. If, during the term of this Agreement or any extension thereof, there is a
23 material change in the scope of services or there is a material change in the
24 equipment to be used in the performance of the scope of work which will
25 add additional exposures (such as the use of aircraft, watercraft, cranes,
26 etc.); or the term of this Agreement, including any extensions thereof,
27 exceeds five (5) years, DISTRICT reserves the right to adjust the types of
28 insurance required under this Agreement and the monetary limits of

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liability for the insurance coverages currently required herein, if, in the County Risk Manager's reasonable judgment, the amount or type of insurance carried by CONSULTANT has become inadequate.

vi. CONSULTANT shall pass down the insurance obligations contained herein to all tiers of subcontractors working under this Agreement.

vii. The insurance requirements contained in this Agreement may be met with a program(s) of self-insurance acceptable to DISTRICT.

viii. CONSULTANT agrees to notify DISTRICT of any claim by a third party or any incident or event that may give rise to a claim arising from the performance of this Agreement.

14. INDEMNIFICATION – CONSULTANT shall indemnify and hold harmless DISTRICT (including its officers, Board of Supervisors, elected and appointed officials, employees, agents and representatives) from any and all liability, claim, damage, proceeding or action, present or future, based upon, arising out of or in any way relating to CONSULTANT'S (including its officers, employees, subcontractors and agents) actual or alleged negligent, reckless or willful misconduct, acts or omissions related to this Agreement, performance under this Agreement, or failure to comply with the requirements of this Agreement, including but not limited to: (a) property damage; (b) bodily injury or death; or (c) any other element of any kind or nature whatsoever. CONSULTANT shall defend, at its sole expense, including all costs and fees (including but not limited to attorney fees, cost of investigation, defense and settlements or awards), DISTRICT (its officers, Board of Supervisors, elected and appointed officials, employees, agents and representatives) in any claim, proceeding or action for which indemnification is required.

1 With respect to any of CONSULTANT'S indemnification requirements, CONSULTANT
2 shall, at its sole cost, have the right to use counsel of their own choice and shall have the
3 right to adjust, settle, or compromise any such claim, proceeding or action without the
4 prior consent of DISTRICT; provided, however, that such adjustment, settlement or
5 compromise in no manner whatsoever limits or circumscribes CONSULTANT'S
6 indemnification obligations to DISTRICT.
7

8 CONSULTANT'S indemnification obligations shall be satisfied when CONSULTANT
9 has provided to DISTRICT the appropriate form of dismissal (or similar document)
10 relieving DISTRICT from any liability for the claim, proceeding or action involved.

11 The specified insurance limits required in this Agreement shall in no way limit or
12 circumscribe CONSULTANT'S obligations to indemnify and hold harmless DISTRICT
13 from third party claims.
14

15 In the event there is conflict between this section and California Civil Code Section 2782,
16 this section shall be interpreted to comply with California Civil Code Section 2782. Such
17 interpretation shall not relieve CONSULTANT from indemnifying DISTRICT to the
18 fullest extent allowed by law.

- 19 15. WORK PRODUCT – CONSULTANT shall provide DISTRICT with all calculations,
20 data, measurements, plans, specifications, computer files, maps, field notes, reports,
21 estimates and any other documents furnished in accordance with this Agreement. All
22 work products or deliverables furnished under this Agreement shall be and remain the
23 sole property of DISTRICT. CONSULTANT shall not publish or transfer any material
24 produced by CONSULTANT or resulting from activities supported by this Agreement
25 without the written consent of the General Manager-Chief Engineer. If any such material
26 is subject to copyright or trademark, the parties agree that the right to any and all
27 copyright and/or trademark in and to the material is expressly reserved to DISTRICT. If
28

1 any such material is copyrighted, the parties hereto understand and agree that DISTRICT
2 reserves a royalty-free, non-exclusive, and irrevocable license to reproduce, publish and
3 use such material, in whole or in part, and to authorize others to do so, provided written
4 credit is given the author.

5
6 16. CONFIDENTIALITY OF DATA – All financial, statistical, personal, technical or other
7 data and information which is designated confidential by DISTRICT and subsequently
8 made available to CONSULTANT shall not be disclosed (in whole or in part) by
9 CONSULTANT to any third parties and shall be protected by CONSULTANT from
10 unauthorized use and disclosure. The only exception to this shall be if disclosure is
11 approved in advance in writing by DISTRICT or if the disclosure is made to
12 CONSULTANT'S subcontractors as anticipated by this Agreement.

13
14 CONSULTANT shall refer all requests for information to DISTRICT. These same
15 requirements shall be applicable to any of CONSULTANT'S subcontractors.
16 CONSULTANT shall include the requirements stated in this section in the agreement
17 with any of its subcontractors.

18 17. TIME EXTENSIONS – Any delay in providing services required by this Agreement,
19 occasioned by causes beyond the control and not due to the fault or negligence of
20 CONSULTANT, shall be deemed reason for granting an extension of time for the
21 completion of the aforesaid work. If such delay occurs, CONSULTANT shall promptly
22 notify DISTRICT in writing of the cause and of the extent of the delay whereupon
23 DISTRICT shall ascertain the facts and the extent of the delay and grant an extension of
24 time for the completion of the work when, in DISTRICT'S sole judgment, their findings
25 of fact justify such an extension of time.

26
27 18. ASSIGNMENT – Neither this Agreement nor any part thereof shall be assigned by
28 CONSULTANT without the prior written consent of DISTRICT.

1 19. JURISDICTION/LAW/SEVERABILITY – This Agreement is to be construed in
2 accordance with the laws of the State of California. If any provision of this Agreement is
3 held by a court of competent jurisdiction to be invalid, void or unenforceable, the
4 remaining provisions shall be declared severable and shall be given full force and effect
5 to the extent possible

6 Any legal action, in law or in equity related to the performance or interpretation of this
7 Agreement shall be filed only in the Superior Court of the State of California located in
8 Riverside, California, and the parties waive any provision of law providing for a change
9 of venue to another location. Prior to the filing of any legal action, the parties shall be
10 obligated to attend a mediation session with a neutral mediator or try to resolve the
11 dispute.
12

13 20. WAIVER – Any waiver by DISTRICT of any breach of any one or more of the terms of
14 this Agreement shall not be construed to be a waiver of any subsequent or other breach of
15 the same or of any other term thereof. Failure on the part of DISTRICT to require exact,
16 full and complete compliance with any terms of this Agreement shall not be construed as
17 in any manner changing the terms hereof, or estopping DISTRICT from enforcement
18 hereof.
19

20 21. CONFLICT OF INTEREST – CONSULTANT warrants, by execution of this Agreement,
21 that no person or selling agency has been employed or retained to solicit or secure this
22 Agreement upon an agreement or understanding for a commission, percentage, brokerage
23 or contingent fee, excepting bona fide employees or bona fide established commercial or
24 selling agencies maintained by CONSULTANT for the purpose of securing business.
25 For breach or violation of this warranty, DISTRICT has the right to annul this Agreement
26 without liability, pay only for the value of the work actually performed, or in its
27 discretion to deduct from the Agreement price or consideration, or otherwise recover, the
28

1 full amount of such commission, percentage, brokerage, or contingent fee.
2 CONSULTANT may be requested to complete a Conflict of Interest Statement prior to,
3 during, or after execution of this Agreement. CONSULTANT understands that as a
4 condition of this Agreement, CONSULTANT agrees to complete the Conflict of Interest
5 Statement when requested to do so by DISTRICT.
6

7 22. NON-DISCRIMINATION – In the performance of the terms of this Agreement,
8 CONSULTANT shall not engage in nor permit others he may employ to engage in
9 discrimination in the employment of persons because of the race, color, national origin or
10 ancestry, religion, physical handicap, disability as defined by the Americans with
11 Disabilities Act (ADA), medical condition, marital status or sex of such persons, in
12 accordance with the provision of California Labor Code Section 1735.
13

14 23. NOTICES – Any and all notices sent or required to be sent to the parties of this
15 Agreement will be mailed by first class mail, postage prepaid to the following addresses:

16 RIVERSIDE COUNTY FLOOD CONTROL	GEOSPATIAL PROFESSIONAL
AND WATER CONSERVATION DISTRICT	SOLUTIONS, INC.
17 1995 Market Street	35151 Airway Avenue #G2
Riverside, CA 92501	Costa Mesa, CA 92626
18 Attn: Photogrammetry Section	Attn: Paul Hamilton-Rivers

19 24. NON-APPROPRIATION OF FUNDS – It is mutually agreed and understood that the
20 obligations of DISTRICT are limited by and contingent upon the availability of DISTRICT
21 funds for the reimbursement of CONSULTANT'S fees. In the event that such funds are
22 not forthcoming for any reason, DISTRICT shall immediately notify CONSULTANT in
23 writing. This Agreement shall be deemed terminated and have no further force and effect
24 immediately on receipt of DISTRICT'S notification by CONSULTANT. In the event of
25 such termination, CONSULTANT shall be entitled to payment for work already completed
26 in accordance with Sections 5 and 6 (COMPENSATION AND PAYMENT).
27
28

1 25. DISCREPANCIES – In the event of any conflict between the terms of this Agreement and
2 Exhibit "A", Exhibit "B", Exhibit "C" or Exhibit "D", the terms of this Agreement shall
3 govern. In the event of any conflict between Exhibit "A", Exhibit "B", Exhibit "C" and
4 Exhibit "D", Exhibit "A" shall govern.

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1 IN WITNESS WHEREOF, the parties hereto have executed this Agreement on

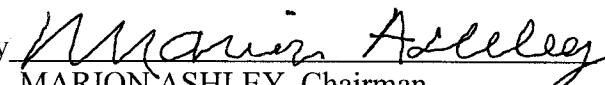
2 **OCT 06 2015**

3 (to be filled in by Clerk of the Board)

4 RECOMMENDED FOR APPROVAL:

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

5
6
7 By 
8 WARREN D. WILLIAMS
9 General Manager-Chief Engineer


By 
MARION ASHLEY, Chairman
Board of Supervisors, Riverside County Flood
Control and Water Conservation District

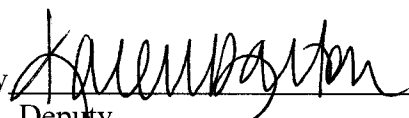
10 APPROVED AS TO FORM:

ATTEST:

11 GREGORY P. PRIAMOS
12 County Counsel

KECIA HARPER-IHEM
Clerk of the Board

13
14 By 
15 NEAL KIPNIS
16 Deputy County Counsel

By 
Deputy

(SEAL)

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25 Consulting Services Agreement FY 2015/16 to 2017/18
26 On-call Aerial Imagery and/or Light Detection and Ranging Services
27 w/Geospatial Professional Solutions, Inc.
28 09/08/15
AMR:rlp

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GEOSPATIAL PROFESSIONAL SOLUTIONS, INC.

By 
PAUL HAMILTON-RIVERS
Chief Operating Officer

Consulting Services Agreement FY 2015/16 to 2017/18
On-call Aerial Imagery and/or Light Detection and Ranging Services
w/Geospatial Professional Solutions, Inc.
09/08/15
AMR:rlp

EXHIBIT "A"

A. SCOPE OF SERVICES

The Consultant will provide any one or more of the following mapping services on an on-call basis: 1) analog black and white photography, 2) analog color photography, 3) digital imagery, and 4) LIDAR data.

B. REQUIREMENTS FOR IMAGERY/LIDAR

1. Requirements for Analog Imagery

All aspects of the aerial flight and acquisition of aerial photography to follow industry best practice. Specifications for aerial photograph have been included in Section C below.

2. Requirements for Digital Imagery

All aspects of the aerial flight and acquisition of aerial photography to follow industry best practice. State the manufacturer and model of the digital sensor you will be using.

2.1 Provide color digital imagery with 60% forward overlap and 30% side overlap.

2.2 When airborne GPS is required, provide the raw airborne GPS data as the District will process the data. District survey staff will have a minimum of two base stations running at the time of the flight so coordination will need to take place between the Consultant and District survey staff. District survey staff will provide the ground receiver information.

2.2.1 Provide the exterior orientation elements; X, Y, Z, T, omega, kappa and phi.

2.2.2 Provide the pilot's log sheet.

2.2.3 Provide a detailed diagram of the separation between the GPS antenna and the camera.

2.2.4 The flight window is from 10:30 a.m. to 2:30 p.m. and will only be flown Monday through Thursday as District survey crews do not work on Fridays or weekends.

2.3 Provide the imagery in 8 and 12 bit format and compress using a Q-factor of 5.

2.4 When labeling the images, the job name, photo scale, date and exposure number should be shown on the first exposure only. All subsequent exposures should have date and exposure number only. Date in upper left corner and Photo No. in upper right corner. Number photos as indicated on the flight plan. Use aerial font size 14.

3. Requirements for LIDAR Data

All aspects of the LIDAR and acquisition to follow industry best practice.

Provide LIDAR generated bare earth Digital Terrain Model (DTM) all points file and a separate file with model key points. High resolution DTM having a vertical accuracy of 95% at 0.6' and 90% at 0.5' and as a separate option a DTM having a vertical accuracy of 95% at 1.2' and 90% at 1.0', when checked in flat open terrain.

EXHIBIT "B"

SPECIFICATIONS FOR AERIAL PHOTOGRAPHY

1. Aircraft and Crew

- 1.1 All aircraft shall be maintained and operated in accordance with regulations of the Federal Aviation Administration and the Civil Aeronautics Board. The recommended FAA preflight inspection of the aircraft and instruments must be performed prior to each photographic mission. Aircraft shall have a service ceiling (with operating load of crew, camera, film, oxygen, and other required equipment) not less than 5% above the highest altitude necessary to achieve the smallest photographic scale required. If the project is in controlled air space the appropriate Air Traffic Control Center (AIRTCC) must be contacted. If the project area includes a military installation, the contractor must comply with security regulations. At the flight altitudes required for this photography, the aircraft shall have flight characteristics to provide a stable platform for the operation of the camera that will not degrade the orientation or the resolution of the photographic image.
- 1.2 The design of the aircraft shall be such that when the camera is mounted, an unobstructed view is obtained, shielded from the exhaust gasses, oil, effluence and air turbulence.
 - 1.2.1 If an aircraft camera has a port glass it shall be preferably 50mm thick but not less than 37mm thick. The surface finish shall be 80/50 or better. Glass material shall be polished crown, group category M, Mil Specs Mil-W-1366F (ASG) October 1975, C-1 optical quality or better. The physical characteristics of any port glass shall be reported to the District on request.
 - 1.2.2 The camera shall be mounted vertically in the aircraft in a mount designed to isolate the camera from vibration of the aircraft. Angular vibration of the camera shall be reduced to such a level so as to have no significant detrimental effect on resolution.
 - 1.2.3 The camera window shall be mounted in material eliminating excessive mechanical stress to the window. The opening shall be designed so that the field of view is unobstructed when the camera is mounted.
- 1.3 Individual crew members shall have two years or more apprenticeship in flying photographic missions for aerial surveys. In addition, it is desirable that crew members have meaningful prior experience with the same type camera and aircraft to which assigned.

2. Camera and Associated Equipment

- 2.1 The camera will be a metric quality vertical format aerial mapping of nominal focal length of 152mm with format dimensions of 230mm x 230mm. The lens must meet the requirements outlined below based on a U.S. Geological Survey Report of Camera

Calibration. Failure of the camera to meet all of the specified requirements shall be cause for rejection of the proposal.

2.1.1 Lens shall be corrected for the spectral range of the film used. The lens shall meet or exceed all the requirements outlined in items (a), (b), (c) and (d), below.

- (a) Calibrated Focal length - 153.0mm \pm 3.0mm;
- (b) Usable angular field - at least 90°;
- (c) Radial distortion in the usable angular field, based on the calibrated focal length referred to the calibrated principal point (point of symmetry), shall not exceed 12 μ m for any tested point, and 16 of the tested points shall have radial distortion values not exceeding 5 μ m.
- (d) Resolution - The lens should have an Area Weighted Average Resolution (AWAR) of at least 72.0 line pairs per millimeter as determined by the U.S. Geological Survey Report of Calibration. The following table lists the minimum acceptable radial and tangential lens resolution at various field angles.

Field angle	0°	7.5°	15°	22.5°	30°	35°	40°
<u>Line pairs per mm</u>							
Radial	95	87	67	57			
Tangential	95	80	70	67	67	57	45

- 2.1.2 Filters - Only optical filters provided by the lens manufacturer meeting the same optical specifications shall be used. The filter shall have surfaces parallel within 10 seconds of arc and its optical quality shall be such that its addition to the camera shall not cause an undesirable reduction in image definition. The light fall-off in cameras having an angle of view larger than 60 degrees shall be compensated by a graded (anti vignetting) filter.
- 2.1.3 Shutter - The camera shall be equipped with a between-the-lens shutter with variable speed settings such that in conjunction with flight height and aircraft speed, the camera will produce high definition photographs at full aperture. The shutter shall have a minimum efficiency of 70 percent at a speed of 1/200 second.
- 2.1.4 Magazine Platen - The camera shall be equipped with an approved means of flattening the film at the instant of exposure. The platen against which the film is pressed shall not depart from a true plane by more than 15 μ m when the camera/magazine vacuum is applied.
- 2.1.5 Fiducial Marks - The camera shall record eight (8) fiducial marks which are clear and well defined on each negative. The marks shall be located in each

corner and at the center of each side. The corner fiducial marks shall form a quadrilateral whose sides are equal within 0.050mm. The midside fiducial marks shall be equidistant within 0.050mm from the adjacent corner fiducial marks. Lines joining opposite pairs of fiducial marks shall intersect at an angle of $90^{\circ} \pm 30''$. The intersection of the lines shall indicate the true position of the principal point of autocollimation within $\nabla 0.030\text{mm}$.

2.1.6 Stereomodel Flatness - The average departure from flatness (at negative scale) for two computer simulated stereomodels may not exceed 15um for any symmetrically arranged point tested by USGS. The difference between the highest and lowest value shall not exceed 25 um. The average of values given for points tested by USGS (which are averages themselves) shall not exceed 7.5 um.

2.1.7 Calibration Report - The contractor shall provide a camera calibration report prepared by the U.S. Geological Survey Optical Calibration Laboratory, which reflects the current condition of the camera to be used. The report shall be based on the Laboratory's standard tests and measurements, made after complete assembly of all parts of the camera unit, with the light filters in place. This report must be dated within three (3) years of the date of the photography. The combination of camera cone, lens, camera body and magazine(s) submitted for testing shall be, if acceptable, the only combination used for this project. Use of additional equipment shall be equally certified. The camera shall be recalibrated if there is any reason to believe that the dimensional relationship of the lens, fiducial marks, and film plane have been disturbed by partial disassembly or unusual mechanical shock, the camera must be resubmitted for recalibration at the contractor's expense. The District reserves the right to restrict the use of any camera based upon data contained in the calibration report, or based upon operational results.

2.2 Forward Motion Compensation is required for all photography requested at 3000 ft. above mean terrain and for all requested photographic coverage at altitudes lower than 3000 ft. above mean terrain. The contractor shall provide the proper equipment as well as the experience in the use of Forward Motion Compensation.

2.3 The camera shall be installed in a mount which attenuates the effects of aircraft vibration. The mount should be regularly serviced and maintained.

3. Aerial Film and Image Quality

3.1 Aerial Film

3.1.1 The type of film to be used shall be unexpired and have a dimensional stable polyester base.

3.1.2 Color and panchromatic emulsions shall be sensitive to the entire visible spectrum with an extended red sensitivity. Color infrared and black and white infrared emulsions shall be sensitive to the visible and near infrared spectrum from 400 to 900 nanometers.

- 3.1.3 Extreme care shall be exercised to ensure proper exposure to minimize vignetting due to differential exposure. This differential shall not exceed that which would result from a basic 1/3 stop difference in exposure.
- 3.1.4 The conditions of the film stock to be used shall be such that when the unexposed film is processed it shall be free of stains, discoloration, or brittleness that can be attributed to aging or improper storage and the base-plus-fog density for all negative films and the minimum-density for all color reversal films shall conform to the manufacturer's predicted density levels.

3.2 Storage and Handling

- 3.2.1 Storage and handling of all photographic film shall be in accordance with the manufacturer's recommendation. All aerial film shall be stored in the original containers to prevent any exchange in moisture between the rolls and their surroundings up to the time they are exposed. The film shall not be rolled tightly on spools or in any way stretched, buckled, distorted, or exposed to direct sunlight or other sources of heat.
- 3.2.2 Adverse storage conditions can affect the color emulsion layers, as well as overall sensitivity. Unexposed color films that are to be stored for several months, shall be stored at 0 to -10 degrees Fahrenheit (-18 to -23 degrees Celsius).
- 3.2.3 Color infrared film stored in the field prior to use shall be refrigerated at all times at a temperature of approximately 40 degrees Fahrenheit (4 degrees Celsius) or lower.

3.3 Processing and Drying

- 3.3.1 All black and white and color aerial film shall be processed in a sensitometrically controlled process using the manufacturer's recommended process monitoring system. Prior to processing the film a calibrated, 21-step sensitometric wedge (in .15 nominal density increments) shall be exposed on one end of the roll of film and become a permanent part of the roll.
- 3.3.2 The film shall be thoroughly fixed and washed to ensure archival quality. The residual thiosulfate content of the processed black and white film should not exceed 0.04 milligrams per square inch as measured using a Kodak Hypo Estimator and Hypo Test Solution HT-2 or other approved method.
- 3.3.3 Processing and drying of film shall be carried out without affecting the metric quality specified in paragraph 3.4.1. At no time shall the film be subjected to extreme temperature and humidity changes.
- 3.3.4 The processed film shall be free from chemicals, stains, tears, scratches, abrasions, watermarks, finger marks, lint, dirt, light streaks, static marks, and any

other physical defects that would interfere with the intended purpose of the photography.

3.4 Metric Quality of Processed Film

3.4.1 The original processed film or contact diapositives produced from them shall not contain residual Y-parallaxes after relative orientation in excess of 20 micrometers anywhere in the model. The dimensional change in any direction across a 9" distance shall not exceed 127 micrometers.

3.5 Image Quality of Processed Film

3.5.1 The imagery on the aerial film shall be clear and sharp and evenly exposed across the format. The film shall be free from clouds, cloud shadows, smoke, haze, snow, shadows, crimps, scratches, and any other blemishes which interfere with the intended purpose of the photography. Allowances will be made for unavoidable shadows, permanent snow fields, or reflectance from water bodies.

3.5.2 When there is doubt concerning the sharpness (resolution) of images obtained on the original film, a comparison will be made of well-defined edges by:

- A 3X enlargement on film, and/or
- By comparison to a calibrated matrix in a visual edge-matched comparator, and/or
- By edge traces in a microdensitometer, and/or
- By a combination of these methods.

If the imagery is obviously degraded the original film shall be rejected for poor image quality.

3.5.3 Density measurements will be taken on processed film using a transmission densitometer with a 2mm probe for scales 1/36,000 and larger and with a 1m probe for scales 1/36,000 and smaller. Readings will be made no closer than 1-1/2' from the image edge. Densities for black and white films shall be:

- a. Black and white negative film density measurement.
- | | |
|-------------------|-------------|
| Max Base-Plus-Fog | .20 +/- .10 |
| D-Min | .40 +/- .10 |
| D-Max | 1.50 |

Base-Plus-Fog shall be measured between and at the edges of the negative frame, and conform with the manufacturer's predicted density value. The minimum usable density shall be no less than 0.30 and maximum usable density no more than 1.50 after deducting Base-Plus-Fog density. The average density range aim point should be 1.0 and the minimum no less than 0.55.

3.5.4 Maximum photographic image and color quality control is required when exposing and processing color infrared film. The color infrared film shall be exposed and processed to the manufacturer's recommendations unless otherwise

required in project specifications. It is recommended that the following color balance test be conducted prior to using the film on a project. Remove approximately 3 feet of unexposed film from the outside wrap. Expose a 21-step sensitometric wedge (0.15 density increments) on the film strip and process it using the manufacturer's recommended process tolerances. The color balance shall be established by obtaining two points on the characteristic curve at $D=1.0$, one being at the midpoint of the two visible-light curves, and the second at the point of intersection of $D=10$ with the IR-curve. A color balance aim point of 20 has been determined empirically to be optimum for most applications. The processed stepwedge will become part of the roll from which they were removed. These stepwedges will be maintained on file and used as criteria for acceptable color balance of the exposed and processed film. Exposed and processed film which does not have a color balance within $\pm 0.06 \text{ Log E}$ of the color balance aim point will be cause for rejection.

- 3.5.5 The camera instrument panel and all fiducial marks shall be sharp and clearly legible on all processed film.
- 3.5.6 All exposed color films should be processed as soon as possible to avoid desirable color balance shifts.

4. Photographic Operations

- 4.1 Photography shall not be secured when the ground is obscured by haze, snow, smoke, dust, flood waters, or environmental factors that may obscure ground detail. Clouds and/or shadows of clouds shall not appear in the photograph. The solar altitude shall be defined by the application but in general it should not be less than 30 degrees when aerial negatives are exposed. Priorities will be provided to the contractor by the District prior to the date of photography and the contractor shall follow these priorities consistent with local flight conditions and logical flight planning. For projects which will have targeted ground control points, photographic operations must be coordinated with the placing of targets so that a minimum of time will elapse between targeting and photography.
- 4.2 The camera should be checked to be sure it is properly secured onto the mount and that all cable connections are tight. The camera lens, filters, and camera port must be inspected to assure that the surfaces are not scratched, stretched, or discolored and that they are free of foreign particles and condensation.
 - 4.2.1 The camera magazine must be clean, firmly seated on the camera. The transport system must be operating properly and the correct information entered into the data block recording devices.
- 4.3 Flight Lines - The District will provide flight maps, pdf and dgn files for the location of the flight lines. All flying shall be done in strict conformance with the instructions and the intended locations specified on the flight maps. Flight lines shall be continuous and straight with no breaks throughout the entire length of the flight line unless otherwise specified. Each project shall be flown in its entirety with the same camera. The maximum angle of deviation between the actual flight path and the specified flight line

shall not exceed three (3) degrees at any point on the lines. Rerlights for rejected exposures shall include the entire flight line unless the flight line contains more than 15 exposures in which case a portion of the flight line may, with permission of District, be replaced.

- 4.3.1 Every effort shall be made to avoid breaks within individual flight lines. Where breaks within a flight line are necessary, the entire flight line composed of the resulting segments shall meet all of the requirements set forth in these Specifications. Where breaks occur, these shall have an overlap of at least four frames to ensure a stereo model of overlap or tie. All photos within a single flight line shall be acquired with the same aerial camera and with the camera oriented in the same direction.
- 4.3.2 Exposures acquired to replace rejected, damaged, lost or otherwise destroyed exposures shall fully conform to these Specifications. Replacement exposures shall be acquired with the same aerial camera(s) used to acquire the original exposures and shall be exposed as nearly as possible to the same day and lighting conditions as the original exposures.
- 4.4 Flight Height - Departures from flight heights required to produce the desired photo scale shall not exceed -2% or +5% unless changed by Air Route Traffic Control Centers.
- 4.5 Changes in the course of the aircraft between successive overlapping photographs within a flight line shall not exceed 3 degrees.
- 4.6 While exposing aerial photography, the camera shall be compensated for crab of the aircraft, with a resultant error not exceeding 3 degrees.
- 4.7 Exposure Overlap - The overlap shall be sufficient to provide full stereoscopic coverage as follows:
 - 4.7.1 Endlap - Forward overlap in the line of flight shall average not less than 57% or more than 62% at the mean elevation of the terrain, unless otherwise specified. Individual forward overlaps shall not be less than 55% or more than 68% excepting the situation where in a forward overlap in areas of low elevation must exceed 68% to attain the minimum 55% forward overlap in adjacent areas of higher elevation. Wherever there is a change in direction between two flight lines (other than between adjacent parallel flight lines) junction areas between the adjoining flight lines shall be covered stereoscopically by both lines.
 - 4.7.2 Sidelap - Any flight line with an exposure having sidelap (overlap of parallel strips of vertical photography) of less than twenty (20) percent or more than forty (40) percent may be rejected. Sidelap, per strip, shall average thirty (30) percent, plus or minus five (5) percent.
- 4.8 The combined effect of aircraft course corrections, crab and tilt shall result in an apparent crab not greater than 5 degrees on successive photographs. Apparent crab is defined as the angle between a line joining fiducial marks in the direction of flight and

the line between the indicated principal point and the conjugate image of the indicated principal point of the adjacent photograph within the same line of flight.

- 4.9 The tilt within a single frame shall not exceed 4 degrees nor shall the difference in tilt between two consecutive overlapping frames within a flight line exceed 4 degrees. The average tilt for all negatives of the same nominal scale shall not exceed 1 degree.
- 4.10 All film shall be exposed using the fastest shutter speed possible when the aperture is set at its optimum value in consideration of the optical resolution and image motion.
- 4.11 Each roll of aerial film shall have an unexposed leader at least ten frames in length. This unexposed leader will be used to expose a sensitometric wedge before processing. Whenever a roll of aerial film is used in a discontinuous fashion such as from one day to the next or from a morning flight to an afternoon flight, a spacer at least four frames in length shall be rolled forward just prior to the commencement of taking new photographs.
- 4.12 All film shall be exposed using the fastest shutter speed possible when the aperture is set at its optimum value in consideration of the optical resolution and image motion.

5. Preliminary Checks

- 5.1 Each roll of aerial film shall be processed as soon as possible after it is exposed. Navigation of the flight lines and image quality shall be quick-checked for compliance with these Specifications.
- 5.2 Reflights shall be immediately ordered for the purpose of securing replacement exposures for all frames which fail to meet minimum standards set forth in these Specifications, provided ground conditions have not yet terminated the photographic "season".

6. Deliverable Products

Photography shall be taken as early as possible in the flying season once the flight conditions are met. Priorities will be provided to the contractor by the District prior to the date of photography and the contractor shall follow these priorities consistent with local flight conditions and logical flight planning. For projects which will have targeted ground control points, photographic operations must be coordinated with the placing of targets so that a minimum of time will elapse between targeting and photography. Notification shall be sent to the District once a project has been flown. Exposure of the film shall be in accordance with the manufacturer's recommendations and with a goal toward achieving density requirements set forth in paragraph 3.5.3. The negatives shall be clear and sharp in detail, free from light streaks and static marks, and of uniform tone and degree of contrast to permit ground details to show clearly in all scene reflectance, with particular emphasis on pattern recognition in the shadow areas.

6.1 Aerial Film

- 6.1.1 The exposed/processed aerial film should be delivered in accordance with the stipulations of delivery schedule and delivery address.
- 6.1.2 Each processed roll or partial roll of aerial film shall be kept in roll form, on the spool, and in the metal or plastic container supplied by the film manufacturer. Rejected exposures shall be removed. All flights belonging to a project shall be in the **same** container.

6.2 Color and Black and White Contact Prints

The contractor is to furnish three complete sets of 9" x 9" contact color prints of all color flights and one complete set of 9" x 9" contact prints of all black and white flights, unless otherwise specified. Contact prints shall be made on an automatic dodging printer on medium weight resin-coated paper on which ink and pencil can be used on both sides.

- 6.2.1 The photographic emulsion shall be of fine grain and have a suitable light sensitivity range and contrast for the making of prints from the aerial film exposed under this contract. Outdated materials shall not be used.
- 6.2.2 Processing, including exposure, development, fixation, washing, and drying of all photographic materials, shall result in finished photographic prints having a fine grain quality, a normal, uniform density, and such tone and contrast that all photographic details shall show clearly within the dark and light tone areas as well as in areas with intermediate tones. Adequate grades of contact paper and proper laboratory procedures shall be used to achieve the best prints possible. Excessive variance in tone or contrast between adjoining prints shall be cause for rejection.
- 6.2.3 Photographic prints shall be trimmed as specified by the District. When trimmed always leave the camera fiducial marks, GPS and other data recorded in the border of each image. Prints showing fiducial marks of inadequate clarity and definition, or prints omitting fiducial marks, shall be rejected.
- 6.2.4 All prints shall be clear and free from chemical stains, blemishes, uneven spots, air bells, light streaks or fog, and other defects which would, in the opinion of the District, interfere with their intended purpose. Prints shall be delivered to the District in a smooth, flat, and usable condition.
- 6.2.5 Titling and Labeling - All lettering shall be positioned as closely as possible to the inside leading edge of the format of the exposure. The characters used for making the exposures shall be 3/16 inch, drafted or stamped with opaque ink to avoid deformation of the film as to what is manifested with heat embossed titlers. The lettering shall clearly show on all copies of the photographs perpendicular to the line of flight, as indicated in the attached "Method of Negative Identification", Exhibit "B".

All material shall be delivered to the following address:

Riverside County Flood Control and Water Conservation District
Attn: Jim Morrell
Photogrammetry Section
1995 Market Street
Riverside, CA 92501

Schedule of Delivery - Materials shall be delivered to the District within 30 days after date of aerial photography.