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A Limited Liability Law Partnership

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**TMT INTERNATIONAL OBSERVATORY, LLC**

BOARD OF LAND AND NATURAL RESOURCES  
FOR THE STATE OF HAWAI'I

RECEIVED  
OFFICE OF CONSERVATION  
AND COASTAL LANDS  
2016 JUN 21 A 9 55  
DEPT. OF LAND &  
NATURAL RESOURCES  
STATE OF HAWAII

IN THE MATTER OF

Case No. BLNR-CC-16-002

A Contested Case Hearing Re Conservation  
District Use Permit (CDUP) HA-3568 for the  
Thirty Meter Telescope at the Mauna Kea  
Science Reserve, Kaohe Mauka, Hamakua  
District, Island of Hawaii TMK (3) 4-4-  
015:009

**DECLARATION OF J. DOUGLAS ING;  
EXHIBITS "A" thru "C" and  
CERTIFICATE OF SERVICE**

**DECLARATION OF J. DOUGLAS ING**

I, J. DOUGLAS ING, hereby declare and state as follows:

1. I am an attorney licensed to practice law in the State of Hawaii and am one of the attorneys representing TMT International Observatory LLC, a non-profit organization, who filed a motion to be admitted as a party in the Contested Case Hearing on April 8, 2016.

2. I make this Declaration based upon my personal knowledge and upon reliance of the files and records maintained by my office and in the normal and regular course of business.

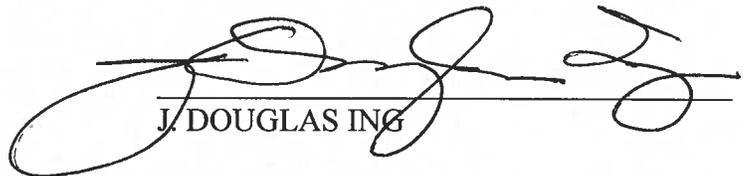
3. Attached hereto as Exhibit "A" is a true and correct copy of the executed Sublease and Non-Exclusive Easement Agreement between TMT International Observatory LLC and the University of Hawaii, dated July 28, 2014.

4. Attached hereto as Exhibit "B" is a true and correct copy of the executed Consent to Sublease and Non-Exclusive Easement Agreement between TMT International Observatory LLC and the University of Hawaii Under General Lease No. S-4191.

5. Attached hereto as Exhibit "C" is a true and correct copy of the executed Scientific Cooperation Agreement between TMT International Observatory LLC and the University of Hawaii, dated July 28, 2014, concerning the design, construction and operation of the Thirty Meter Telescope on Mauna Kea, Hawaii.

I, J. DOUGLAS ING, declare under penalty of law that the foregoing is true and correct.

DATED: Honolulu, Hawaii, June 17, 2016.

  
J. DOUGLAS ING

**SUBLEASE AND NON-EXCLUSIVE EASEMENT AGREEMENT  
BETWEEN  
TMT INTERNATIONAL OBSERVATORY LLC  
AND  
THE UNIVERSITY OF HAWAII**

THIS SUBLEASE AND NON-EXCLUSIVE EASEMENT AGREEMENT (this "Sublease") is made and entered into on this 28 day of July, 2014, effective as of July 28, 2014 (the "Effective Date"), by and between TMT International Observatory LLC, a Delaware limited liability company ("Sublessee"), and the University of Hawaii, a public body corporate and the public university of the State of Hawaii ("Sublessor").

**RECITALS**

This Sublease is entered into with reference to the following:

- A. Sublessor leases certain lands located on and around the summit of Mauna Kea, Island of Hawaii from the State of Hawaii, Board of Land and Natural Resources ("Lessor") pursuant to General Lease No. S-4191, dated June 21, 1968 (the "Master Lease"), a copy of which is attached hereto as **Exhibit A** and incorporated herein by reference.
- B. Sublessee desires to sublease a portion of said lands, as more fully described below, for the purpose of constructing and operating an optical/infrared telescope facility known as the Thirty Meter Telescope ("TMT") in the manner described in, and accordance with, this Sublease and that certain Scientific Cooperation Agreement Between Sublessee and Sublessor Concerning the Design, Construction and Operation of the Thirty Meter Telescope on Mauna Kea, Hawaii (the "Scientific Cooperation Agreement") executed simultaneously herewith and to be effective on the same Effective Date indicated above. The TMT facilities will include, but are not limited to, the TMT telescope and enclosure; the support building (the space necessary to support scientific observers and technical personnel while at the summit); together with instruments, electrical conductors, cableways and tunnels; driveways and parking lots; power, telephone and communications conduits and lines; and access roads within the border of the Subleased Premises (as defined in Section 1 below) ("TMT Facilities"). "TMT Facilities" does not include any facilities outside the Subleased Premises.
- C. The Master Lease provides that Sublessor may not enter into a sublease without the prior written consent of the Lessor. Prior written consent to this Sublease has been obtained pursuant to that certain Consent to Sublease Under General Lease No. S-4191 dated \_\_\_\_\_, 2014, a copy of which is attached hereto as **Exhibit B** and incorporated herein by reference.
- D. In 2000, Sublessor adopted the Mauna Kea Science Reserve Master Plan, which establishes the management structures for Sublessor's stewardship of the areas it

manages on Mauna Kea. In 2009 and 2010, Sublessor adopted, and Lessor approved, the Mauna Kea Comprehensive Management Plan ("CMP") and its subplans: the Cultural Resources Plan, Natural Resources Management Plan, Public Access Plan, and Decommissioning Plan. These plans commit Sublessor to exercise responsible stewardship of Mauna Kea and to ensure that astronomical activities are conducted in a manner that respects the cultural significance of Mauna Kea, protects the environment, and is responsive to the needs and concerns of Native Hawaiians and the public.

E. In May 2010, Sublessor completed an Environmental Impact Statement for the TMT. In September 2010, Sublessor filed an Application for a Conservation District Use Permit to construct the TMT. The permit was approved in April 2013. Sublessee is now seeking a long term sublease to build and operate the TMT.

F. Sublessor has submitted a request to the Lessor for the mutual cancellation of the current Master Lease and issuance of a new master lease for a term of sixty-five (65) years from issuance. Sublessee desires to continue operation of the TMT Facilities beyond 2033. It is desirable for management and planning purposes, including appropriate stewardship of Mauna Kea, to address the potential continued operation of the TMT Facilities beyond 2033 in this Sublease.

#### **AGREEMENT**

Now, therefore, in consideration of the foregoing and of the mutual promises and agreements set forth herein, Sublessor and Sublessee agree as follows:

1. **Subleased Premises.** Sublessor does hereby sublease to Sublessee, and Sublessee does hereby sublease from Sublessor, the parcel of land shown and described in **Exhibits C-1** and **C-2** attached hereto and incorporated herein by reference (the "**Subleased Premises**"), constituting a portion of the land leased by Sublessor under the Master Lease.

2. **Non-Exclusive Easements.** Sublessee shall have the right of access to and egress from the Subleased Premises over and across the Mauna Kea Science Reserve, utilizing the common entrances and rights of way, together with others entitled thereto, under such rules and regulations as may be established by and amended from time to time by Sublessor. Sublessee shall also have the rights to (i) utilize and construct in, grade, fill, and perform work approved by Lessor and Sublessor in the easement area shown and described in **Exhibits C-1** and **C-3** attached hereto and incorporated herein by reference (the "**Easement Area**"), (ii) utilize and construct in and perform work approved by Lessor and Sublessor and consistent with the TMT Access Way Agreement dated September 13, 2012, by and among Sublessor, the Smithsonian Institution Astrophysical Observatory, and the TMT Observatory Corporation, in the spur road from the Mauna Kea Observatory Access Road to the Subleased Premises, (iii) install and utilize power and communications conduits and lines from a central handhole or handholes in the Mauna Kea summit area to the Subleased Premises, and (iv) utilize and access the Batch Plant staging area as authorized by the TMT CDUP (as defined in Section 4 below).

3. Survey/Site Specific Description. The site shown in Exhibit C-1 hereto has been surveyed. The area covered by the Subleased Premises is specifically described in the metes and bounds description in Exhibit C-2 hereto. The area covered by the Easement Area is specifically described in the metes and bounds description in Exhibit C-3 hereto.

4. Use of Subleased Premises. Sublessee shall use the Subleased Premises solely to construct and operate the TMT Facilities in accordance with this Sublease and the Scientific Cooperation Agreement. The construction and operation of the Subleased Premises shall be conducted in strict compliance with the terms and conditions of Conservation District Use Permit HA-3568 approved by the Lessor on April 12, 2013 (the "TMT CDUP"), including performance of all mitigation conditions set forth therein, and any amended or subsequent Conservation District Use Permit. Sublessee shall not at any time during the term of this Sublease construct, place, maintain, or install on the Subleased Premises any other building, structure, or improvement without the prior written approval of Sublessor and Lessor and upon such conditions as Sublessor or Lessor may impose. For purposes of the foregoing sentence, any other "improvement" means improvements that are not specified in or contemplated by the TMT CDUP and not contained within the building envelop of TMT observatory plans approved in accordance with Section 37 below. For the avoidance of doubt, the addition of any instruments, equipment or any other additions that are fully contained within the observatory structure or buildings shall not require the prior written approval of Sublessor or Lessor, provided that such additions are otherwise in compliance with the terms of this Sublease and the Master Lease.

5. Management and Stewardship Obligations. This Sublease shall be subject to the following:

a. The Subleased Premises are within the State Land Use Conservation District and all uses shall comply with the applicable rules and regulations of the State Conservation District, including but not limited to Hawaii Revised Statutes ("HRS") Chapter 183C and Hawaii Administrative Rules ("HAR") Chapter 13-5.

b. Sublessee shall comply with applicable State rules and regulations related to historic preservation including but not limited to HRS Chapter 6E, and HAR Chapters 13-197, 13-198, 13-275 through 13-284 and 13-300, and any applicable amendments of or supplements to such historic preservation regulations.

c. Sublessor shall exercise management jurisdiction over the Subleased Premises pursuant to management plans approved by the Lessor, including the CMP and its subplans, the Natural Resources Management Plan, Cultural Resources Management Plan, Decommissioning Plan, and Public Access Plan, the TMT Management Plan, and any amendments of or supplements to management plans approved by the Lessor for lands that include the Subleased Premises. Sublessee acknowledges that it has reviewed and is familiar with the CMP and subplans. Sublessor shall keep Sublessee informed regarding any future amendments or supplements thereto, and shall promptly provide copies of such documents to Sublessee.

d. All public and commercial activities in the areas of Mauna Kea managed by Sublessor, including recreational activities, shall be governed by administrative rules promulgated pursuant to the authority granted Sublessor by Act 132 (SLH 2009), following consultation with DLNR, the Office of Hawaiian Affairs, and the public in accordance therewith.

e. The Constitution of the State of Hawaii mandates the protection of recognized customary and traditional native Hawaiian rights subject to State regulation. This Sublease shall be subject to the right of Native Hawaiians to exercise protected traditional and customary practices as provided in the CMP and consistent with the laws of the State of Hawaii.

f. Sublessor has established a management structure to manage the lands of which the Subleased Premises are a part, which structure includes the Office of Mauna Kea Management at the University of Hawaii at Hilo, the volunteer community-based Mauna Kea Management Board and the Kahu Kū Mauna advisory council on Hawaiian cultural matters.

6. Operation of the TMT Facilities. Neither Sublessee nor any successor or assign shall operate the TMT Facilities for purposes of research without a valid and effective Scientific Cooperation Agreement with Sublessor. The TMT Facilities may be operated in the absence of a valid and effective Scientific Cooperation Agreement only when necessary to ensure the safety of personnel or of the TMT Facilities.

7. Rent. In consideration for the use of the Subleased Premises, Sublessee shall pay to Sublessor annual rents based on calendar years during the term of this Sublease as set forth below. The annual rent during the construction period is based on the incremental value of the major milestones achieved during the construction of the TMT Facilities. The milestones are set forth below and generally span approximately two (2) year periods. The annual rents shall be paid based upon the specified calendar years below regardless of whether the respective milestone is achieved.

<u>Year</u>	<u>Annual Rent</u>	<u>Milestone</u>
1-3	\$300,000	Civil construction
4-5	\$400,000	Enclosure
6-7	\$600,000	Telescope Structure
8-9	\$700,000	Instruments and Mirrors
10	\$900,000	Commissioning
11 and later	\$1,080,000	Operations

Rent shall be paid in advance, in equal semi-annual installments, on or before January 31 and July 31, of each calendar year during the term of this Sublease. The first installment of rent for the initial, partial year (which will be prorated) shall be due within 30 days of the date of execution of this Sublease. Beginning in January of 2015, and in January of each year thereafter, the annual rental amount for the year shall be based on the initial annual rental amount adjusted for the annual rate of inflation recorded for subsequent years in

accordance with the Consumer Price Index for all Urban Consumers, U.S. City Average (not seasonally adjusted) (base year 1982-1984 - 100) ("CPI"), published by the United States Department of Labor, Bureau of Labor Statistics. The calculation shall be made by comparing the CPI last published for the date nearest to the Effective Date (the "Base Index") with the CPI last published for the date nearest to the current anniversary date (the "Current Index"). If the Current Index has increased or decreased over the Base Index, then the amount subject to adjustment shall be set for the ensuing year by multiplying the initial annual rental amount by a fraction, the numerator of which is the Current Index and the denominator of which is the Base Index. If the base of the CPI changes from the 1982-84 base (100), the CPI shall, thereafter, be adjusted to the 1982-84 base (100) before the computation indicated above is made. If the CPI Index is at any time no longer published, a comparable index generally accepted and employed by the real estate profession shall be used.

Sublessor shall receive, deposit, and apply the rents received hereunder in accordance with the laws of the State of Hawaii, including, without limitation, Section 304A-2170 of the Hawaii Revised Statutes, as amended from time to time. Such deposit shall be net of the funds required by law to be transferred or paid to the Office of Hawaiian Affairs. Sublessor shall be responsible for paying over to the Office of Hawaiian Affairs its ratable share of the rents received in accordance with the laws of the State of Hawaii.

8. Master Lease: Order of Precedence. The rights granted to Sublessee pursuant to this Sublease are subject to the terms and conditions of the Master Lease, as the same may be amended. In the event of any conflict between the terms of this Sublease and the Master Lease, the Master Lease shall be controlling. In the event of any conflict between the terms of this Sublease and the Scientific Cooperation Agreement, this Sublease shall be controlling. Sublessee shall comply with the terms and conditions of the Master Lease at all times. If Sublessee causes a breach or default of any term, covenant, restriction, or condition of the Master Lease, and this breach or default shall continue for a period of more than forty-five (45) days after delivery by the Sublessor of a written notice of breach or default and demand for cure (plus any additional period as the Lessor may allow for good cause), then Sublessor may, subject to the provisions of Section 171-21 of the Hawaii Revised Statutes, at once re-enter the Subleased Premises, or any part, and upon or without the entry, at its option, terminate this Sublease without prejudice to any other remedy or right of action for arrears of rent or for any preceding or other breach of contract; and in the event of termination, at the option of the Sublessor, all buildings and improvements shall remain and become the property of the Sublessor or shall be removed by Sublessee in accordance with the Site Decommissioning Plan at Sublessee's sole cost and expense; furthermore, Sublessor shall retain all rent paid in advance to be applied to any damages.

9. Term and Termination. The term of this Sublease shall begin on the Effective Date and shall expire on December 31, 2033, unless extended or sooner terminated as provided herein.

a. Mutual Cancellation of Master Lease and Concurrent Issuance of New Master Lease.

(1) Sublessor shall use its best efforts to continue to and shall diligently pursue and take all actions necessary or advisable to complete the process currently underway with Lessor to obtain mutual cancellation of the current Master Lease subject to and concurrent with issuance of a new master lease (the "New Master Lease"), for a term of sixty-five (65) years and on terms and conditions materially consistent with the form of lease document submitted to the Lessor for consideration at its meeting of November 8, 2013. In the foregoing sentence, such "actions" shall include, without limitation, continuing to prepare and process an Environmental Impact Statement for the New Master Lease and such "terms and conditions" shall include, without limitation, that the New Master Lease shall include the provisions stating that "The lease shall be subject to all existing subleases entered into by the Lessee and approved by the Lessor pursuant to General Lease No. S-4191 dated June 21, 1968", and "Should this lease be rendered or declared invalid, illegal, or unenforceable by a court of competent jurisdiction, such invalidation shall cause, without further action, General Lease No. S-4191 dated June 21, 1968 to be revived in its entirety for the duration of the term therein, unless and until the parties subsequently agree otherwise".

(2) If the New Master Lease is approved and duly executed by Lessor and Sublessor, Sublessor shall promptly provide a copy of the New Master Lease to Sublessee. Effective as of the effective date of the New Master Lease, the following shall apply:

i) The provisions of this Sublease shall continue, whether by extension, issuance of a new sublease, or otherwise, provided that any continuance shall be in accordance with the terms herein as a sublease under the New Master Lease (including, without limitation, the rents set forth herein);

ii) The New Master Lease shall become the Master Lease for all purposes of this Sublease or any new sublease, and all references to the Master Lease in this Sublease or any new sublease shall thereafter refer to the New Master Lease; and

iii) The term of this Sublease shall automatically be extended, and shall thereafter expire sixty-five (65) years after the Effective Date, or upon expiration or termination of the New Master Lease, whichever shall first occur.

(3) If the New Master Lease is approved, but the term is not for sixty-five (65) years or the terms and conditions thereof are not materially consistent with the form of lease document submitted to the Lessor for consideration at its meeting of November 8, 2013, Sections 9.a.(2)i, ii), and iii) above shall apply unless Sublessee, at its sole option, provides a notice of termination to Sublessor in accordance with Section 9.d. below within one hundred twenty (120) days after Sublessee's receipt of the New Master Lease from Sublessor. Sublessor further agrees to diligently negotiate in good faith with Sublessee regarding mutually acceptable amendments to this Sublease during such one hundred twenty (120) day period and to promptly and diligently pursue approval by the Lessor of such amendments.

(4) If the New Master Lease is approved on terms and conditions materially consistent with the form of lease document submitted to the Lessor for consideration at its meeting of November 8, 2013 or is otherwise acceptable to Sublessee in Sublessee's sole judgment, Sublessor agrees to execute an amendment to this Sublease to reflect compliance with Sections 9.a.(2)i, ii, and iii) above or a new sublease on the same material terms and conditions as set forth in this Sublease (including, without limitation, the rents set forth herein) and reflecting compliance with Sections 9.a.(2)i, ii, and iii) above.

(5) Sublessee acknowledges that the Lessor has sole authority to determine whether to approve and enter into the New Master Lease, pursuant to and in accordance with Hawaii law, that no such approval has been granted as of the date of this Sublease, and that no prior commitment to issue such approval has been or can be made.

b. Failure to Obtain New Master Lease. If the New Master Lease is not approved by Lessor or if Sublessor otherwise fails to obtain a New Master Lease that automatically extends the term of this Sublease in accordance with Sections 9.a.(3) or 9.a.(4) above, Sublessor agrees to use its best efforts to and will immediately and diligently pursue another means of acquiring sufficient rights to continue to lease the Subleased Premises to Sublessee on substantially the same terms and conditions herein, but for an additional term extending to, on or about March 31, 2079. If a subsequent master lease is approved and duly executed by Lessor and Sublessor, Sublessor shall promptly provide a copy of such subsequent master lease to Sublessee and, at Sublessee's sole option: (I) the provisions of Sections 9.a.(2)i, ii, and iii) above shall apply as if the subsequent master lease is the "New Master Lease" referred to in Section 9.a. above and Sublessor shall execute an amendment to this Sublease to reflect compliance with Sections 9.a.(2)i, ii, and iii) above or a new sublease on the same material terms and conditions as set forth in this Sublease (including, without limitation, the rents set forth herein) and reflecting compliance with Sections 9.a.(2)i, ii, and iii) above, or (II) Sublessor shall diligently negotiate in good faith a new sublease with Sublessee, if so desired by Sublessee, on the same material terms and conditions as set forth in this Sublease (including, without limitation, the rents set forth herein and compliance with the Master Lease then in effect) or on such other terms and conditions as may be mutually agreeable to Sublessor and Sublessee, with a term ending on or after March 31, 2079.

c. Option to Extend Term. Notwithstanding the foregoing in Sections 9.a. and 9.b. above, Sublessee shall have an option to extend the term of this Sublease beyond December 31, 2033 if Sublessor acquires rights to sublease the Subleased Premises to Sublessee, whether under the New Master Lease or other master lease, and such extension shall be coterminous with such New Master Lease or other master lease, but in no event shall the term of this Sublease extend beyond March 31, 2079. Such option shall expire on December 31, 2033 and Sublessee shall have sole discretion regarding whether or not to exercise such option.

d. Termination Without Cause. Sublessee shall have the right to terminate this Sublease at any time upon six (6) months prior written notice to Sublessor.

e. **Termination for Breach.** This Sublease may be terminated for breach as provided in, and in accordance with, Sections 8 above or 25 below.

f. **Non-use and Abandonment.** If the Sublessee shall, at any time for a continuous period of eleven (11) months, fail or cease to use, or abandon the Subleased Premises, this Sublease shall cease and terminate. Sublessor shall provide written notice to Sublessee within thirty (30) days after the sixth (6<sup>th</sup>) month of such eleven (11) month period and shall allow Sublessee three (3) months to cure any such purported abandonment.

10. **Effect of Termination or Expiration: Decommissioning.** Upon termination or expiration of this Sublease, Sublessee shall, at Sublessor's sole option and at Sublessee's sole cost and expense either (a) surrender the Subleased Premises with all improvements existing or constructed thereon, or (b) decommission and remove the TMT Facilities and restore the land in accordance with the CMP and the Decommissioning Plan for Mauna Kea Observatories, A Sub-Plan of the Mauna Kea Comprehensive Management Plan (dated January, 2010 and approved by Lessor in March, 2010) ("**Decommissioning Plan**"), and any amended, supplemental, or successor plans adopted by Sublessor with the approval of the Lessor.

a. **Decommissioning Funding Plan.** Sublessee shall develop and periodically update a Decommissioning Funding Plan as described in, and in accordance with, the Decommissioning Plan, to provide assurance to Sublessor that sufficient funds will be available to carry out deconstruction and site restoration activities upon termination or expiration of this Sublease. The Decommissioning Funding Plan shall include one or more financial assurance mechanisms as described in the Decommissioning Plan. Sublessee shall provide the initial Decommissioning Funding Plan on or before the execution date of this Sublease as set forth above. Sublessee shall submit an updated Decommissioning Funding Plan to Sublessor for Sublessor's review and approval as provided in the CMP, and shall provide such information and documents as Sublessor may reasonably request from time to time to verify the availability and adequacy of funding to meet Sublessee's decommissioning and restoration obligations. If, at any time during the term of this Sublease, Sublessor reasonably determines that the Decommissioning Funding Plan is insufficient, Sublessee shall consult with Sublessor and shall negotiate in good faith to determine the amount of such additional funding and provide such additional funding assurance mechanisms.

b. **Site Decommissioning Plan.** Upon expiration or termination of this Sublease or any extended sublease, decommissioning, including site restoration, shall be carried out in strict compliance with a Site Decommissioning Plan developed and approved in accordance with the Decommissioning Plan ("**Decommissioning Obligations**").

c. **Delivery of Possession.** Except as otherwise provided herein, upon expiration or termination of this Sublease or any extended sublease and completion of Sublessee's Decommissioning Obligations, Sublessee shall peaceably deliver to Sublessor possession of the Subleased Premises in a clean and orderly condition.

d. Payment of Decommissioning Costs of Sublessor or Lessor. Sublessee shall promptly pay on demand any reasonable and necessary costs incurred by Sublessor or Lessor to remedy any failure on the part of Sublessee to fully and timely perform its Decommissioning Obligations.

e. Survival. The obligations of Sublessee under this Section 10, the rights and obligations of Sublessor and Sublessee under Sections 9.a., 9.b., and 9.c. above, and the obligations of Sublessee under Section 11 below shall survive expiration or termination of this Sublease.

f. Termination Without Decommissioning: Assumption of Decommissioning Obligations by Sublessor. If this Sublease expires or is terminated prior to the expiration of the Master Lease and at a time when the TMT Facilities have remaining useful life, at Sublessor's sole option Sublessee shall be relieved of its Decommissioning Obligations and permitted to surrender its subleasehold interest in the Subleased Premises without removal of the TMT Facilities on such terms as may be mutually agreed in writing by Sublessor and Sublessee, which may include payment to Sublessor of an amount to be held in reserve for future decommissioning in exchange for Sublessor's assumption of the Decommissioning Obligations.

11. Indemnity. Sublessee shall indemnify, defend, and hold harmless Lessor, Sublessor, and their officers, agents, employees, and other persons acting on their behalf, from and against any claim or demand for loss, liability, or damages (including, but not limited to, reasonable attorneys' fees and claims for property damage, personal injury, or death, based upon any accident, fire, or other incident on or about the Subleased Premises) to the extent arising or resulting from: (1) any act or omission on the part of Sublessee relating to Sublessee's use, occupancy, maintenance, or enjoyment of the Subleased Premises; (2) any failure on the part of Sublessee to properly maintain the Subleased Premises, and areas adjacent thereto in Sublessee's use and control, including any accident, fire, or nuisance, arising from or caused by any failure on the part of Sublessee to maintain the Subleased Premises in a safe condition; or (3) Sublessee's non-observance or non-performance of any of the terms, covenants, and conditions of this Sublease or the Master Lease or the rules, regulations, ordinances and laws of the Federal, State, or County governments. Sublessee further agrees to indemnify, defend, and hold harmless Lessor and Sublessor from any damages or claims arising from the release of "hazardous material" (as defined in Section 31 below) on the Subleased Premises occurring while Sublessee is in possession, or elsewhere if caused by Sublessee or any person acting under Sublessee.

12. Insurance. Sublessee shall, at its own cost and expense, maintain the following insurance. Such insurance shall be subject to the reasonable approval of Sublessor and Lessor and, except as to any property insurance, shall name Sublessor and Lessor as additional insureds. Sublessee shall deliver executed certificates thereof to Sublessor on or before the Effective Date of this Sublease and thereafter within a reasonable time prior to the expiration of the term of each such policy. As often as any such policy shall expire or terminate, renewal or additional policies shall be procured and maintained by Sublessee in like manner to like extent. If Sublessee has only provided

Sublessor with certificates evidencing the policies required to be carried by Sublessee under this Sublease, Sublessee agrees to deliver executed copies of all such required policies to Sublessor within ten (10) days of Sublessor's written request for the same.

a. Property Insurance. Sublessee shall at its own expense and at all times during the term of this Sublease keep Sublessee's property, including but not limited to the TMT Facilities, insured against (i) all of the risks covered by a standard ISO Commercial Property Special Causes of Loss Form (or equivalent) which shall be in an amount equal to the full replacement cost of such property and shall not have a deductible in excess of Two Hundred and Fifty Thousand Dollars (\$250,000), and (ii) such other hazards or risks which a reasonably prudent telescope operator on Mauna Kea would insure against. Sublessee hereby waives any and all rights of subrogation which it may have against Lessor and/or Sublessor, except to the extent of available insurance. In case the property required to be insured above or any part thereof shall be destroyed or damaged by fire or such other casualty required to be insured against, then and as often as the same shall happen, the proceeds of such insurance shall be paid to Sublessee to be used by Sublessee to promptly repair and restore any damage to such property.

b. Liability Insurance. Sublessee shall procure at Sublessee's expense and keep in force during the term of this Sublease and any extension thereof, the following insurance:

i) General Liability Insurance. Commercial general liability insurance (including coverage for liability caused by the fault of Sublessee, products-completed operations liability, personal and advertising injuries and coverage for contractual liability to the extent provided by ISO Form CGL #00-01-04-13 (or equivalent) covering Sublessee and naming as additional insureds: (i) Sublessor, (ii) Lessor, (iii) Sublessor's and Lessor's managers, officers, agents and employees, and (iv) such other parties as Sublessor may specify, insuring against liability arising out of the use, occupancy or maintenance of the Subleased Premises and areas appurtenant thereto by Sublessee with limits of not be less than One Million Dollars (\$1,000,000) for property damage, and Five Million Dollars (\$5,000,000) for injuries and deaths in any one occurrence or a combined single limit of Five Million Dollars (\$5,000,000) per occurrence and deductibles of no more than Two Hundred and Fifty Thousand Dollars (\$250,000). Such insurance shall be primary and shall not limit the liability of the Sublessee under Section 11 above.

ii) Auto Liability Insurance. Auto liability insurance covering all automobiles used by Sublessee in connection with its operations in the Subleased Premises with limits of not less than Five Hundred Thousand Dollars (\$500,000) for property damage, and Five Million Dollars (\$5,000,000) for injuries or deaths in any one occurrence or a combined single limit of Five Million Dollars (\$5,000,000) per occurrence, with deductibles of no more than Five Thousand Dollars (\$5,000) per occurrence and naming Sublessor and Lessor as additional insureds.

iii) Pollution Liability Insurance. Pollution liability insurance in the amount of not less than Five Million Dollars (\$5,000,000) and with deductibles of no

more than Two Hundred and Fifty Thousand Dollars (\$250,000) per occurrence and naming Sublessor and Lessor as additional insureds. Such insurance shall cover bodily injury, property damage, and environmental damage, including clean up and defense and remediation costs, for occurrences that arise from the occupancy or use of the Subleased Premises during the term of this Sublease by Sublessee.

c. General Insurance Requirements.

i) Sublessee shall use its best efforts to obtain the following terms in each policy of commercial property insurance and general liability insurance required in Sections 12.a. and 12.b. above to the extent that such terms are reasonably available in the commercial marketplace:

a) a provision that the liability of the insurer thereunder shall not be affected by, and that the insurer shall not claim, any right of set-off, counterclaim, apportionment, proration, or contribution by reason of, any other insurance obtained by or for Sublessor, Lessor, Sublessee, or any person claiming by, through, or under any of them; and

b) no provision relieving the insurer from liability for loss occurring while the hazard to buildings and personal property is increased, whether or not within the knowledge or control of, or because of any breach of warranty or condition or any other act or neglect by Sublessor, Lessor, Sublessee, or any person claiming by, through, or under any of them.

ii) Each policy of commercial property insurance and general liability insurance required in Sections 12.a. and 12.b. above shall:

a) be written by an insurance company rated A- or better, Class size VIII or better, by the Best's Key Rating Guide, based upon the rating system in effect on the date this Sublease is signed. In the event that Best's changes its rating system or ceases to provide ratings at some later date, then such insurance company shall have a rating from Best (or some other comparable rating service if Best's ceases to provide ratings) comparable to the "A- or better, Class VIII or better" requirement of the immediately preceding sentence; and

b) be specifically endorsed to provide that they are primary policies, not contributing with and not in excess of any coverage that Sublessor and/or Lessor may carry, notwithstanding anything to the contrary contained in any policies obtained by Sublessor and/or Lessor.

In addition, Sublessor shall request that each such policy be specifically endorsed to provide that such policy may not be cancelled except upon the insurer giving at least thirty (30) days' prior written notice thereof (ten (10) days in the case of nonpayment of premium) to Sublessor, Lessor, Sublessee, and other person having an interest in the property who has requested such notice of the insurer.

13. Taxes, Assessments, etc. Sublessee shall pay or cause to be paid, when due, the amount of all taxes, rates, and assessments of every description as to which the Subleased Premises or any part, or any improvements, or the Lessor, Sublessor, or Sublessee, are now or may be assessed or become liable by authority of law during the term of this Sublease; provided, however, that with respect to any assessment made under any betterment or improvement law which may be payable in installments, Sublessee shall be required to pay only those installments, together with interest, which becomes due and payable during the term of this Sublease.

14. Utility Services. Sublessee shall be responsible for obtaining any utility services and shall pay when due all charges, duties and rates of every description, including water, sewer, gas, refuse collection or any other charges, as to which the Subleased Premises or any part, or any improvements, or the Lessor, Sublessor, or Sublessee may become liable for during the term, whether assessed to or payable by the Lessor, Sublessor, or Sublessee.

15. Covenant against discrimination. The use and enjoyment of the Subleased Premises shall not be in support of any policy which discriminates against anyone based upon race, creed, sex, color, national origin, religion, marital status, familial status, ancestry, physical handicap, disability, age or HIV (human immunodeficiency virus) infection.

16. Sanitation. Sublessee shall keep the Subleased Premises and improvements in a strictly clean, sanitary and orderly condition.

17. Waste and Unlawful, Improper or Offensive Use of Subleased Premises. Sublessee shall not commit, suffer or permit to be committed any waste, nuisance, strip or unlawful, improper or offensive use of the Subleased Premises or any part, nor, without the prior written consent of the Lessor and Sublessor, cut down, remove or destroy, or suffer to be cut down, removed or destroyed, any trees now growing on the premises.

18. Compliance with Laws. Sublessee shall comply with all applicable requirements of all municipal, state, and federal authorities and observe all municipal, state and federal laws applicable to the Subleased Premises, now in force or which may be in force.

19. Inspection of Subleased Premises. Upon reasonable notice by Sublessor to Sublessee, Sublessee shall permit the Lessor, Sublessor, and their respective agents, at all reasonable times during the Sublease term, to enter the Subleased Premises and examine the state of its repair and condition.

20. Improvements. Sublessee shall not at any time during the term of this Sublease construct, place, maintain and install on the premises any building, structure or improvement of any kind and description except with the prior written approval of the Lessor and the Sublessor and upon those conditions as the Lessor or Sublessor may impose, unless otherwise provided in this Sublease. Construction of the TMT Facilities in accordance with Section 4 above is authorized. Except as otherwise provided in this

Sublease, Sublessee shall own all improvements constructed by and installed by Sublessee on the Subleased Premises.

21. Repairs to Improvements. Sublessee shall, at its own expense, keep, repair, and maintain all buildings and improvements now existing or hereafter constructed or installed on the Subleased Premises in good order, condition and repair, reasonable wear and tear excepted.

22. Liens. Sublessee shall not commit or suffer any act or neglect which results in the Subleased Premises, any improvement, the leasehold estate of the Sublessor, or the subleasehold estate of the Sublessee becoming subject to any attachment, lien, charge, or encumbrance, except as provided in this Sublease, and shall indemnify, defend, and hold the Lessor and Sublessor harmless from and against all attachments, liens, charges, and encumbrances and all resulting expenses.

23. Assignments, etc. Sublessee shall not sublease, subrent, transfer, assign, or permit any other person to exclusively occupy the Subleased Premises or any portion or transfer or assign this Sublease or any interest therein, either voluntarily or by operation of law, without the prior written approval of the Lessor and the Sublessor.

24. Costs of Litigation. Sublessee shall pay all costs, including reasonable attorney's fees, and expenses incurred by or paid by the Lessor or Sublessor (i) in enforcing the covenants and agreements of the Master Lease or this Sublease with respect to Sublessee, (ii) in recovering possession of the Subleased Premises, or (iii) in the collection of delinquent rental, taxes, and any and all other charges.

25. Breach. Time is of the essence in this Sublease and if the Sublessee shall become bankrupt, or if this Sublease and Subleased Premises shall be attached or taken by operation of law, or if Sublessee shall fail to observe and perform any of the material covenants, terms, and conditions contained in this Sublease and on its part to be observed and performed (other than a failure that causes a breach of the Master Lease, in which case Sublessor and Sublessee hereby agree that Section 8 above applies), and this failure shall continue for a period of more than sixty (60) days after delivery by the Sublessor of a written notice of breach or default and demand for cure, by personal service, registered mail or certified mail to the Sublessee at its last known address and to each holder of record having a security interest in the premises, then Sublessor may, subject to the provisions of Section 171-21 of the Hawaii Revised Statutes, at once re-enter the premises, or any part, and upon or without the entry, at its option, terminate this Sublease without prejudice to any other remedy or right of action for arrears of rent or for any preceding or other breach of contract; and in the event of termination, at the option of Sublessor, all buildings and improvements shall remain and become the property of the Sublessor or shall be removed by Sublessee in accordance with Section 10 above; furthermore, Sublessor shall retain all rent paid in advance to be applied to any damages.

26. Condemnation. If at any time, during the term of this Sublease, any portion of the Subleased Premises should be condemned, or required for public purposes by any

government authority, the rental shall be reduced in proportion to the value of the portion of the Subleased Premises condemned. Sublessee shall be entitled to receive from the condemning authority the proportionate value of the Sublessee's permanent improvements so taken in the proportion that it bears to the unexpired term of the Sublease; provided, that the Sublessee may, in the alternative, remove and relocate its improvements to the remainder of the lands occupied by Sublessee. Sublessee shall not by reason of the condemnation be entitled to any claim against the Lessor or Sublessor for condemnation or indemnity for leasehold interest and all compensation payable or to be paid for or on account of the leasehold interest by reason of the condemnation shall be payable to and be the sole property of the Lessor or Sublessor. The foregoing rights of the Sublessee shall not be exclusive of any other to which Sublessee may be entitled by law. Where the portion taken renders the remainder unsuitable for the use or uses for which the Subleased Premises were leased, Sublessee shall have the option to surrender this lease and be discharged and relieved from any further liability; provided, that Sublessee shall remove the permanent improvements constructed, erected and placed by it within any reasonable period allowed by the Lessor and Sublessor, in accordance with Section 10 above.

27. Right to Enter. The Lessor, Sublessor, or the County of Hawaii and their agents or representatives shall have the right to enter and cross any portion of the Subleased Premises for the purpose of performing any public or official duties; provided, however, in the exercise of these rights, the Lessor, Sublessor, or the County of Hawaii shall not interfere unreasonably with the Sublessee or Sublessee's use and enjoyment of the Subleased Premises.

28. Extension of Time. Notwithstanding any provision contained in this Sublease, when applicable, Sublessor may for good cause shown, allow additional time beyond the time or times specified in this Sublease for the Sublessee to comply, observe, and perform any of the Sublease terms, conditions, and covenants.

29. Quiet Enjoyment. Sublessor covenants and agrees with Sublessee that upon payment of the rent at the times and in the manner provided and the observance and performance of these covenants, terms, and conditions on the part of the Sublessee to be observed and performed, the Sublessee shall and may have, hold, possess, and enjoy the premises for the term of this Sublease, without hindrance or interruption by the Lessor, Sublessor or any other person or persons lawfully claiming by, through, or under the Lessor or Sublessor.

30. Non-warranty. Neither the Lessor nor Sublessor warrants the conditions of the Subleased Premises, as the same are being subleased as is.

31. Hazardous Materials. Sublessee shall not cause or permit the escape, disposal or release of any hazardous materials except as permitted by law. Sublessee shall not allow the storage or use of such materials in any manner not sanctioned by law or by the highest standards prevailing in the industry for the storage and use of such materials, nor allow to be brought onto the premises any such materials except to use in the ordinary

course of Sublessee's business where the Sublessee has provided Sublessor with a list that contains the identity of such materials used or stored by Sublessee in the ordinary course of its business and in compliance with all applicable federal and state regulations; provided, that if Sublessor disapproves in writing any such materials, the disapproved materials shall not be brought onto the Subleased Premises. If any lender or governmental agency shall ever require testing to ascertain whether or not there has been any release of hazardous materials by Sublessee, then the Sublessee shall be responsible for the reasonable costs thereof. In addition, Sublessee shall execute affidavits, representations and the like from time to time at Lessor's or Sublessor's request concerning Sublessee's best knowledge and belief regarding the presence of hazardous materials on the Subleased Premises placed or released by Sublessee.

For the purpose of this Sublease, "hazardous material" shall mean any pollutant, toxic substance, hazardous waste, hazardous material, hazardous substance, or oil as defined in or pursuant to the Resource Conservation and Recovery Act, as amended, the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, the Federal Clean Water Act, or any other federal, state, or local environmental law, regulation, ordinance, rule, or by-law, whether existing as of the date hereof, previously enforced, or subsequently enacted.

32. Hawaii Law. This Sublease shall be construed, interpreted, and governed by the laws of the State of Hawaii.

33. Exhibits - Incorporation in Sublease. All exhibits referred to herein are attached to this Sublease and hereby are deemed incorporated by reference.

34. Headings. The section headings herein are inserted only for convenience and reference and shall in no way define, describe or limit the scope or intent of any provision of this Sublease.

35. Partial Invalidity. If any term, provision, covenant or condition of this Sublease should be held to be invalid, void or unenforceable, the remainder of this Sublease shall continue in full force and effect and shall in no way be affected, impaired or invalidated thereby.

36. Withdrawal. If and to the extent that Lessor exercises its power of withdrawal under the Master Lease to withdraw any portion of the Subleased Premises for public uses or purposes upon giving reasonable notice and without compensation except as otherwise provided in the Master Lease, HRS Chapter 171, the New Master Lease, or other master lease between Sublessor and Lessor that includes the Subleased Premises, then Sublessor shall have the right to withdraw these same portions of the Subleased Premises during the term of this Sublease upon giving reasonable notice to Sublessee and subject to the Sublessee's claim for any compensation provided under the Master Lease, HRS Chapter 171, the New Master Lease, or other master lease between Sublessor and Lessor that includes the Subleased Premises for any permanent improvement constructed upon the Subleased Premises that is destroyed or made unusable in the process of the withdrawal or

taking. Upon such withdrawal, or upon the taking which causes any portion of the Subleased Premises to become unusable for the specific use or uses for which it was subleased, the rent shall be reduced in proportion to the value of the land withdrawn or made unusable, and to the extent permitted in the Master Lease, HRS Chapter 171, the New Master Lease, or other master lease between Sublessor and Lessor that includes the Subleased Premises, if any permanent improvement constructed upon the land by Sublessee is destroyed or made unusable in the process of the withdrawal or taking, the proportionate value shall be paid based upon the unexpired term of the lease (which value shall also include the cost of decommissioning such improvements including site restoration as required in the Decommissioning Plan).

37. Building Construction. All building construction shall be in full compliance with all applicable laws, rules and regulations of the federal, state, and county governments and in accordance with plans and specifications submitted to and approved by the Sublessor and the Chairman of the Board of Land and Natural Resources prior to commencement of construction.

38. Clearances. Sublessee shall be responsible for obtaining all necessary federal, state or county clearances.

39. Time of Essence. Time is of the essence in all provisions of this Sublease.

40. Written Notice. All notices shall be in writing and shall be deemed to have been delivered on the date sent if sent by certified mail (return receipt requested) or recognized courier (with delivery confirmation) or transmitted by facsimile (with written confirmation of transmission) and in each case with a copy sent by email on the same date as follows:

Sublessor:

Chancellor  
University of Hawaii at Hilo  
200 West Kawili Street  
Hilo, Hawaii 96720-4091  
Telephone: (808) 932-7348  
Facsimile: (808) 932-7338  
Email: dstraney@hawaii.edu

Sublessee:

Project Manager (during construction) or Observatory Director (after first light; contact information for Observatory Director to be delivered to Sublessor by written notice following construction)  
TMT International Observatory LLC  
1111 South Arroyo Parkway, Suite 200  
Pasadena, CA 91105

Telephone: (626) 395-2997  
Facsimile: (626) 296-1887  
Email: sanders@tmt.org

With a copy to:

Ann Martin  
General Counsel  
TMT Observatory Corporation  
Telephone: (626) 395-1646  
Facsimile: (626) 395-6841  
Email: ann.martin@caltech.edu

41. **Dispute Resolution.** Any dispute relating to or arising as a result of or in connection with this Sublease, if not resolved by negotiation, shall be submitted first to non-binding mediation with Dispute Prevention & Resolution, Inc. and if such mediation is not concluded within six (6) months after submission, then shall be decided in legal or equitable proceedings in accordance with Hawaii law in any court having jurisdiction in the State of Hawaii. Such mediation shall take place in the County of Honolulu, State of Hawaii. Each party shall bear its own costs and fees for such mediation and the fees and expenses of the mediator shall be borne by the parties equally.

42. **Historic preservation.** In the event any historic properties or burial sites, as defined in Section 6E-2 of the Hawaii Revised Statutes, are found on the Subleased Premises, Sublessee and Sublessee's agents, employees and representatives shall immediately stop all land utilization and/or work and contact the Historic Preservation Office in compliance with Hawaii Revised Statutes Chapter 6E.

43. **Removal of Trash.** Sublessee shall be responsible for the removal of all illegally dumped trash upon the premises within ninety (90) days from the date of execution of this Sublease and shall so notify the Sublessor in writing at the end of ninety (90) days.

44. **Phase I Environmental Site Assessment.** Prior to termination or revocation of this Sublease, Sublessee shall conduct a Phase I environmental site assessment of the Subleased Premises and conduct a complete abatement and disposal of any such sites, if necessary, satisfactory to the standards required by the Federal Environmental Protection Agency, the Department of Health, and the Department of Land and Natural Resources. Failure to comply with the provisions of this Section 44 shall not extend the term of this Sublease or automatically prevent termination or revocation of the lease. Sublessor, at its sole option, may refuse to approve termination, unless this evaluation and abatement provision has been performed. In addition or in the alternative, Sublessor may, at its sole option if Sublessee does not do so, arrange for performance of the provisions of this Section 44, all costs and expenses of such performance to be charged to and paid by Sublessee.

45. **Counterparts.** This Sublease may be executed in counterparts, each of which so executed shall, irrespective of the date of its execution and delivery, be deemed an original (including counterparts delivered by facsimile or email), and said counterparts together shall constitute one and the same agreement binding all of the parties hereto.

*[Remainder of page intentionally left blank; signature page follows.]*

IN WITNESS WHEREOF, Sublessor and Sublessee have executed this Sublease as of the date first written above.

**SUBLESSOR:**

**SUBLESSEE:**

FOR THE UNIVERSITY OF HAWAII:

FOR TMT INTERNATIONAL  
OBSERVATORY LLC:

By David Lassner  
Name: David Lassner  
Title: President  
Date: 7/28/14

By EC Stone  
Name: Edward C. Stone  
Title: Executive Director  
Date: 7/23/14

By Howard Todo  
Name: Howard Todo  
Title: Vice-President for Budget and  
Finance  
Date: 7/28/14

By Donald D. Straney  
Name: Donald Straney  
Title: Chancellor, University  
of Hawai'i at Hilo  
Date: 28 July 14

Approved as to form:

By Lawrence S. Okinaga  
Name: Lawrence S. Okinaga, Carlsmith Ball LLP  
Title: Special General Counsel  
Date: 07/28/2014

STATE OF HAWAII )  
 ) ss.  
CITY AND COUNTY OF HONOLULU )

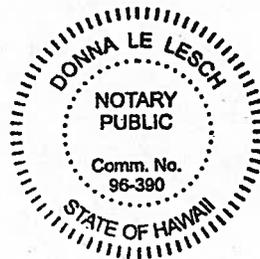
The attached document: **SUBLEASE AND NON-EXCLUSIVE EASEMENT AGREEMENT BETWEEN TMT INTERNATIONAL OBSERVATORY LLC AND THE UNIVERSITY OF HAWAII**, dated July 28, 2014 which consists of 48 pages (including this page), was executed by **DAVID LASSNER** and **HOWARD TODO** and on this 28 day of July, 2014 in the First Judicial Circuit of the State of Hawaii, personally known/proved to me on the basis of satisfactory evidence to be the persons, who personally appeared before me and being by me duly sworn or affirmed, did say that they are the **PRESIDENT** and **VICE-PRESIDENT FOR BUDGET AND FINANCE**, respectively, of the **UNIVERSITY OF HAWAII**, and that such persons executed the foregoing instrument as the free act and deed of such persons, and if applicable in the capacities shown, having been duly authorized to execute such instrument in such capacities.

Donna Le Lesch  
[Notary Signature]

(notary stamp or seal)

Printed Name: Notary Name

My commission expires: DONNA LE LESCH  
Commission No. 96-390  
Notary Public, State of Hawaii  
My commission expires July 18 2016



CITY of  
H

STATE OF HAWAII )  
 ) ss.  
COUNTY OF HAWAII )

The attached document: **SUBLEASE AND NON-EXCLUSIVE EASEMENT AGREEMENT BETWEEN TMT INTERNATIONAL OBSERVATORY LLC AND THE UNIVERSITY OF HAWAII**, dated July 28, 2014 which consists of 48 pages (including this page), was executed by **DONALD STRANEY** on this 28 day of JULY, 2014 in the <sup>3rd</sup> ~~Third~~ Judicial Circuit of the State of Hawaii, personally known/proved to me on the basis of satisfactory evidence to be the person, who personally appeared before me and being by me duly sworn or affirmed, did say that he is the **CHANCELLOR** of **UNIVERSITY OF HAWAI'I AT HILO**, and that such person executed the foregoing instrument as the free act and deed of such person, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.

Donna Le Lesch  
[Notary Signature]

(notary stamp or seal)

Printed Name: Notary Name

**DONNA LE LESCH**  
Commission No. 96-390  
Notary Public, State of Hawaii  
My commission expires July 18 2016



STATE OF CALIFORNIA )  
 )  
COUNTY OF Los Angeles ) ss.

The attached document: **SUBLEASE AND NON-EXCLUSIVE EASEMENT AGREEMENT BETWEEN TMT INTERNATIONAL OBSERVATORY LLC AND THE UNIVERSITY OF HAWAII**, dated July 23, 2014 which consists of 22 pages (including this page), was executed by **EDWARD C. STONE** on this 23<sup>rd</sup> day of JULY, 2014, personally known/proved to me on the basis of satisfactory evidence to be the person, who personally appeared before me and being by me duly sworn or affirmed, did say that he is the **EXECUTIVE DIRECTOR** of **TMT INTERNATIONAL OBSERVATORY LLC** and that such person executed the foregoing instrument as the free act and deed of such person, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.

C.M. Aguilar  
[Notary Signature]

(notary stamp or seal)

Printed Name: Notary Name C.M. Aguilar

My commission expires: Jan. 16, 2017

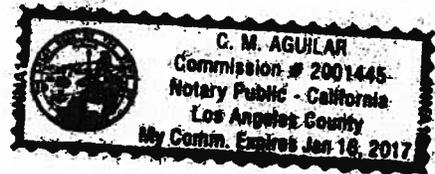


Exhibit A to Sublease

**Master Lease (General Lease No. S-4191)**

**GENERAL LEASE NO. S-4191**

THIS INDENTURE OF LEASE, made this 21st day of June, 1968, by and between the STATE OF HAWAII, by its Board of Land and Natural Resources, pursuant to the provisions of Section 103A-90(b), Revised Laws of Hawaii 1955, as amended, hereinafter referred to as the "LESSOR", and the UNIVERSITY OF HAWAII, a body corporate, whose post office address is 2444 Dole Street, Honolulu, City and County of Honolulu, State of Hawaii, hereinafter referred to as the "LESSEE",

**WITNESSETH THAT:**

FOR and in consideration of the mutual promises and agreements contained herein, the Lessor does hereby demise and lease unto the said Lessee and the said Lessee does hereby rent and lease from the Lessor, all of that certain parcel of land situate at Kaohu, Hamakua, County and Island of Hawaii, State of Hawaii, and more particularly described in Exhibit "A", hereto attached and made a part hereof.

TO HAVE AND TO HOLD, all and singular the said premises, herein mentioned and described, unto the said Lessee, for and during the term of sixty-five (65) years, to commence from the 1st day of January, 1968, and to terminate on the 31st day of December, 2033.

**DEPARTMENT OF LAND AND NATURAL RESOURCES**  
HONOLULU, HAWAII

**EXHIBIT A**

RESERVING UNTO THE LESSOR THE FOLLOWING:

1. Water Rights. All surface and ground waters appurtenant to the demised premises, together with the right to enter and to capture, divert or impound water; provided, that the Lessor shall exercise such rights in such manner as not to interfere unreasonably with the Lessee's use of the demised premises; provided, further, that the Lessee shall have the right to use the waters of Lake Waiau for any purpose necessary or incidental to the use permitted by this lease on the following conditions:

a. No drilling or disturbance of Lake Waiau's bottom, banks or areas adjacent thereto shall be permitted;

b. No activity shall be permitted which will result in the pollution of the waters of Lake Waiau;

c. Lessee shall not take or divert any of the waters arising from springs which furnish the water supply for Pohakuloa, and no alterations to said springs shall be made by Lessee.

2. Access. All rights to cross the demised premises for inspection or for any government purposes.

3. Hunting and Recreation Rights. All hunting and recreation rights on the demised lands, to be implemented pursuant to rules and regulations issued by said Board in discharging its fish and game or state parks responsibilities; provided, however, that such hunting and recreation activities shall be coordinated with the activities of the Lessee on the demised lands; and provided, further, that such hunting and recreation activities shall be limited to day-light hours only.

4. Right to use Demised Lands. The right for itself, and its successors, lessees, grantees and permittees, to use any portion of the lands demised and the right to grant to others rights and privileges affecting said land; provided, however, that, except as otherwise provided herein, no such use shall be permitted or rights and privileges granted affecting said lands, except upon mutual determination by the parties hereto that such use or grant will not unreasonably interfere with the Lessee's use of the demised premises; provided, further, that such agreement shall not be arbitrarily or capriciously withheld.

THE LESSEE, IN CONSIDERATION OF THE PREMISES, COVENANTS WITH THE LESSOR AS FOLLOWS:

1. Surrender. The Lessee shall, at the expiration or sooner termination of this lease, peaceably and quietly surrender and deliver possession of the demised premises to the lessor in good order and condition, reasonable wear and tear excepted.

2. Maintenance of the Premises. The Lessee shall keep the demised premises and improvements in a clean, sanitary and orderly condition.

3. Waste. The Lessee shall not make, permit or suffer, any waste, strip, spoil, nuisance or unlawful, improper or offensive use of the demised premises.

4. Specified Use. The land hereby leased shall be used by the Lessee as a scientific complex, including without limitation thereof an observatory, and as a scientific reserve being more specifically a buffer zone to prevent the intrusion of activities inimical to said scientific complex.

Activities inimical to said scientific complex shall include light and dust interference to observatory operation.

*RWA*  
~~During hours of darkness~~ and certain types of electric or electronic installation on the demised lands, but shall not necessarily be limited to the foregoing.

5. Assignments. The Lessee shall not sublease, subrent, assign or transfer this lease or any rights thereunder without the prior written approval of the Board of Land and Natural Resources.

6. Improvements. The Lessee shall have the right during the existence of this lease to construct and erect buildings, structures and other improvements upon the demised premises; provided, that plans for construction and plot plans of improvements shall be submitted to the Chairman of the Board of Land and Natural Resources for review and approval prior to commencement of construction. The improvements shall be and remain the property of the Lessee, and shall be removed or disposed of by the Lessee at the expiration or sooner termination of this lease; provided, that with the approval of the Chairman such improvements may be abandoned in place. The Lessee shall, during the term of this lease, properly maintain, repair and keep all improvements in good condition.

7. Termination by the Lessee. The Lessee may terminate this lease at any time by giving thirty (30) days' notice in writing to the Lessor.

B. Termination by the Lessor. In the event that (1) the Lessee fails to comply with any of the terms and conditions of this lease, or (2) the lessee abandons or fails to use the demised lands for the use specified under paragraph 4 of these covenants for a period of two years, the Lessor may terminate this lease by giving six months' notice in writing to the Lessee.

9. Non-Discrimination. The Lessee covenants that the use and enjoyment of the premises shall not be in support of any

policy which discriminates against anyone based upon race, creed, color or national origin.

10. General Liability. The Lessee shall at all times, with respect to the demised premises, use due care for safety, and the Lessee shall be liable for any loss, liability, claim or demand for property damage, personal injury or death arising out of any injury, death or damage on the demised premises caused by or resulting from any negligent activities, operations or omissions of the Lessee on or in connection with the demised premises, subject to the laws of the State of Hawaii governing such liability.

11. Laws, Rules and Regulations, etc. The Lessee shall observe and comply with Regulation 4 of the Department of Land and Natural Resources and with all other laws, ordinances, rules and regulations of the federal, state, municipal or county governments affecting the demised lands or improvements.

12. Objects of Antiquity. The Lessee shall not appropriate, damage, remove, excavate, disfigure, deface or destroy any object of antiquity, prehistoric ruin or monument of historical value.

13. Undesirable Plants. In order to prevent the introduction of undesirable plant species in the area, the Lessee shall not plant any trees, shrubs, flowers or other plants in the leased area except those approved for such planting by the Chairman.

IN WITNESS WHEREOF, the STATE OF HAWAII, by its Board of Land and Natural Resources, has caused the seal of the Department of Land and Natural Resources to be hereunto affixed and these presents to be duly executed this 2/1/6



EXHIBIT "A"

MAUNA KEA SCIENCE RESERVE

Kahe, Hamakua, Island of Hawaii, Hawaii

Being a portion of the Government Land of Kahe

Beginning at a point on the south boundary of this parcel of land, the coordinates of said point of beginning referred to Government Survey Triangulation Station "SUMMIT 1955" being 12,325.95 feet South and 471.84 feet West, as shown on Government Survey Registered Map 2789, thence running by azimuths measured clockwise from True South:-

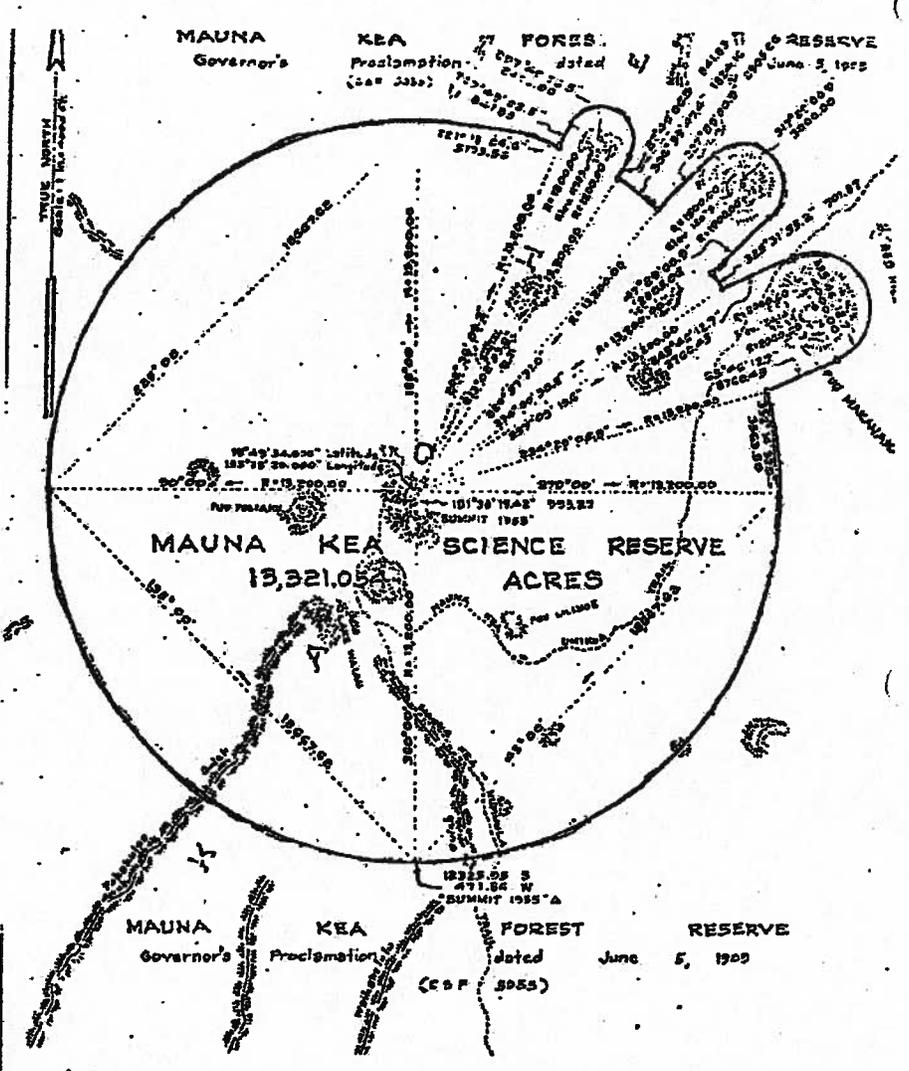
1. Along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 135° 00' 18,667.62 feet;
2. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, still on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 225° 00' 18,667.62 feet;
3. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, still on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 281° 18' 04.6" 5173.56 feet;
4. 207° 49' 06.5" 841.83 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;
5. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 1200.00 feet, the chord azimuth and distance being: 297° 49' 06.5" 2400.00 feet;

6. 27° 49' 06.5" 841.83 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;
7. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 306° 59' 47.4" 1824.16 feet;
8. 227° 29' 00.9" 2805.06 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;
9. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 1500.00 feet, the chord azimuth and distance being: 317° 29' 00.9" 3000.00 feet;
10. 47° 29' 00.9" 2805.06 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;
11. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 13200.00 feet, the chord azimuth and distance being: 325° 31' 55.2" 701.87 feet;
12. 245° 46' 12.7" 2760.45 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;
13. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 2000.00 feet, the chord azimuth and distance being: 335° 46' 12.7" 4000.00 feet;
14. 65° 46' 12.7" 2760.45 feet along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909;
15. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 352° 14' 32.9" 3563.50 feet;

16. Thence along Mauna Kea Forest Reserve, Governor's Proclamation dated June 5, 1909, still on a curve to the right with a radius of 13,200.00 feet, the chord azimuth and distance being: 45' 00' 18,667.62 feet to the point of beginning and containing an AREA OF 13,321.054 ACRES.

EXCEPTING and RESERVING to the State of Hawaii and to all others entitled thereto, the Mauna Kea-Hunoula and Mauna Kea-Uaikea Trails, and all other existing trails within the above-described parcel of land, together with rights of access over and across said trails.

ALSO, EXCEPTING and RESERVING to the State of Hawaii, its successors and assigns, the waters and all riparian and other rights in and to all the streams within the above-described parcel of land.



**MAUNA KEA SCIENCE RESERVE**  
Kaohe, Hamakua, Island of Hawaii, Hawaii  
Scale: 1 inch = 4000 feet

JOB 4-3078  
C. D. 1961, June 20/61

TAX MAP # 4-1E  
SURVEY DIVISION  
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
STATE OF HAWAII

Exhibit B to Sublease

**Consent to Sublease Under General Lease No. S-4191**

(attached)

CONSENT TO SUBLEASE OF GENERAL LEASE NO. S-4191

CONSENT is hereby given by the STATE OF HAWAII, by its Board of Land and Natural Resources, Lessor under unrecorded General Lease No. S-4191 dated June 21, 1968, leased to the University of Hawaii, a public body corporate, as Lessee, to the attached Sublease and Non-Exclusive Easement Agreement ("Sublease") dated \_\_\_\_\_, 2014, from the UNIVERSITY OF HAWAII, a public body corporate, as "Sublessor," to TMT INTERNATIONAL OBSERVATORY LLC, a Delaware limited liability company, as "Sublessee"; SUBJECT, HOWEVER, to the provisions of Section 171-21, Hawaii Revised Statutes, as amended, relating to the rights of holder of security interests, PROVIDED, FURTHER, that nothing contained herein shall change, modify, waive or amend the provisions, terms, conditions and covenants or the duties and obligations of the Lessee or Sublessee under General Lease S-4191.

IT IS UNDERSTOOD that except as provided herein, should there be any conflict between the terms of General Lease No. S-4191 and the terms of the Sublease, the former shall control; and that no further sublease or assignment of any interest of the premises or any portion thereof shall be made without the prior written consent of the Board of Land and Natural Resources.

IT IS FURTHER UNDERSTOOD AND AGREED by the STATE OF HAWAII, by its Board of Land and National Resources, that in the event said General Lease No. S-4191 is surrendered or defaulted upon by Lessee, UNIVERSITY OF HAWAII, prior to the expiration of the term thereof, the Sublease shall remain in full force and effect for the remainder of the term thereof, and Sublessee, TMT INTERNATIONAL OBSERVATORY LLC, shall be allowed its continued right to quiet enjoyment of the demised premises, upon and subject to the terms, conditions and covenants of General Lease No. S-4191. For the avoidance of doubt, for purposes of the immediately preceding sentence, a "surrender" by Lessee, UNIVERSITY OF HAWAII, does not include a mutual cancellation of said General Lease No. S-4191 and concurrent issuance of a New Master Lease (as defined in Section 9.a. of the Sublease) on terms that are acceptable to Sublessee or other master lease on terms that are acceptable to Sublessee, TMT INTERNATIONAL OBSERVATORY LLC, as contemplated by Section 9 of the Sublease.

FURTHERMORE, Lessee hereby acknowledges that the Lessor's consent to sublease under General Lease No. S-4191 does not release the Lessee of any and all responsibilities, obligations, liabilities, and claims respecting or arising under or out of said General Lease prior to the effective date of this consent.

---

DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
P. O. Box 621  
Honolulu, Hawaii 96809

IN WITNESS WHEREOF, the STATE OF HAWAII, by its Board and Land and Natural Resources, has caused the seal of the Department of Land and Natural Resources to be hereunto affixed and these presents to be fully executed on this \_\_\_\_ day of \_\_\_\_\_, 2014.

STATE OF HAWAII

Approved by the Board  
of Land and Natural  
Resources at its  
meeting held on  
\_\_\_\_\_, 2014

By \_\_\_\_\_  
Chairperson and Member  
Board of Land and  
Natural Resources

LESSOR

UNIVERSITY OF HAWAII, a public body  
corporate

By \_\_\_\_\_  
DAVID LASSNER  
Its President

By \_\_\_\_\_  
HOWARD TODO  
Its Vice-President for Budget and Finance

By \_\_\_\_\_  
DONALD STRANEY  
Chancellor, University of Hawai'i at Hilo

LESSEE

APPROVED AS TO FORM:

\_\_\_\_\_  
Deputy Attorney General  
Dated: \_\_\_\_\_

DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
P. O. Box 621  
Honolulu, Hawaii 96809

STATE OF HAWAII )  
 ) ss.  
CITY AND COUNTY OF HONOLULU )

On this \_\_\_\_ day of \_\_\_\_\_, 2014, before me personally appeared **DAVID LASSNER, HOWARD TODO** and **DONALD STRANEY** personally known , who, being by me duly sworn or affirmed, did say that they are the President of the University of Hawai'i, the Vice-President for Budget and Finance of the University of Hawai'i, and the Chancellor of the University of Hawai'i at Hilo, respectively, and that the foregoing instrument was signed in the capacity shown, having been duly authorized to execute such instrument on behalf of the University of Hawai'i, a public body corporate, by authority of its Board of Regents, and that said **DAVID LASSNER, HOWARD TODO** and **DONALD STRANEY** acknowledged the foregoing instrument as the free act and deed of said University.

Name: \_\_\_\_\_

Notary Public, State of Hawaii

My commission expires: \_\_\_\_\_

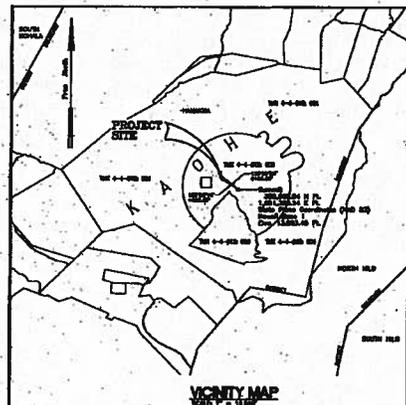
(Notary Stamp or Seal)

<b>NOTARY CERTIFICATION STATEMENT</b>	
Document Identification or Description: <u>CONSENT TO SUBLEASE OF GENERAL LEASE NO. S-4191</u>	
Document Date: _____	
No. of Pages: _____	
Jurisdiction (in which notarial act is performed): Third Judicial Circuit of the State of Hawaii	
Signature of Notary	Date of Notarization and Certification Statement
(Notary Stamp or Seal)	
Printed Name of Notary	

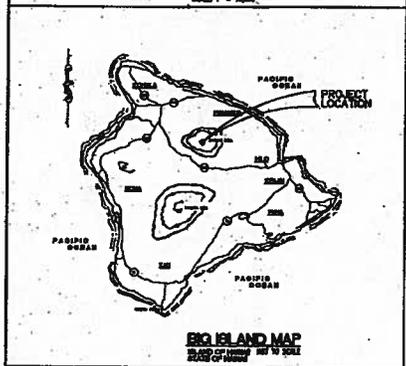
Exhibit C-1 to Sublease

**Subleased Premises and Easement Area**

(attached)



VICINITY MAP  
SCALE 1" = 1.25 MI.

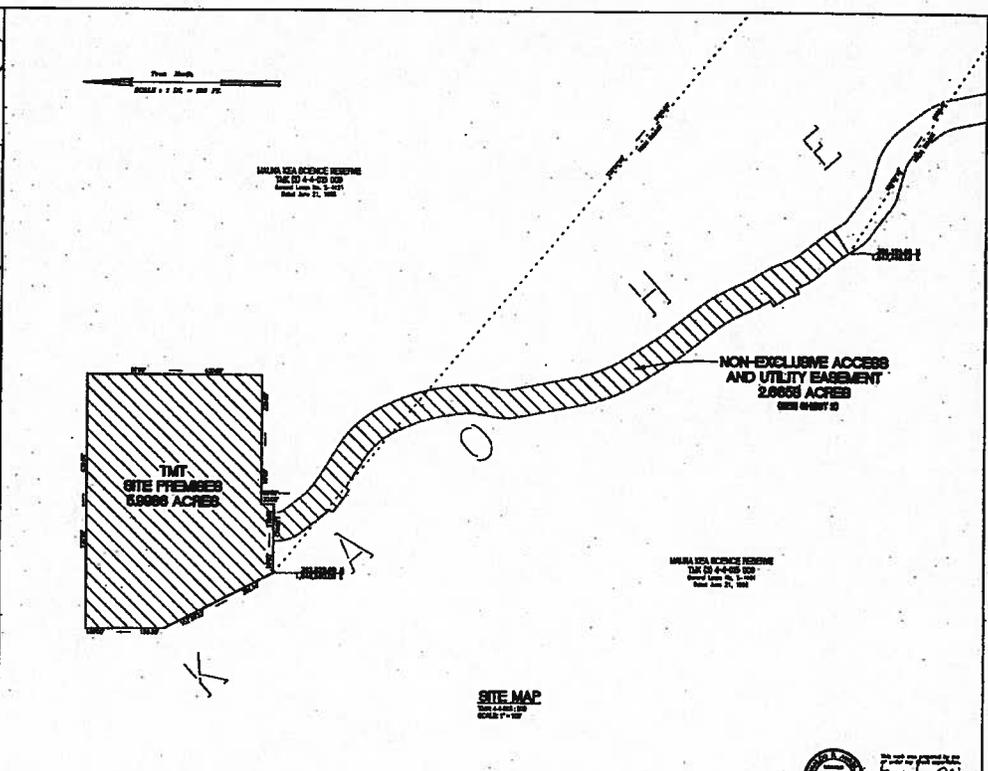


BIG ISLAND MAP  
ISLAND OF HAWAII

1. Coordinates are referred to State Plane Coordinates, Hawaii Zone 2 (Zone 10) - Datum: 1983 and 1" = 125,000.00 FEET. LATITUDE IS LABELED IN DEGREES AND MINUTES AND LONGITUDE IS LABELED IN DEGREES AND MINUTES.

2. Adjacent to the Historical Catalogue from the South.

3. Map is compiled from various maps of the State Survey Office, County of Hawaii Planning Department, State of Hawaii Bureau of Oceanography.



SITE MAP  
SCALE 1" = 100 FT.

MAP SHOWING

TMT (30 METER TELESCOPE) SITE PREMISES AND NON-EXCLUSIVE ACCESS AND UTILITY EASEMENT, KAHOOLAWE SEA SCIENCE RESERVE, GENERAL LEASE NO. 2-4181, DATED JUNE 12, 1993, KAHOOLAWE ISLAND OF HAWAII, HAWAII. THE (C) 4-2-0182 009 SCALE: 1" = 100'

THIS EASEMENT SURVEY MAP WAS PREPARED BY ENGINEERING PARTNERS, INC. FOR THE OBSERVATORY CORPORATION, 2823 E. WASHINGTON BLVD., FRESNO, CA. 93702. DATE: MARCH 6, 2004

Engineering Partners, Inc.  
P.O. Box 4928  
San Jose, CA 95128  
Tel: (408) 261-1000  
Fax: (408) 261-1000  
www.epi.com



Exhibit C-2 to Sublease

**Legal Description of Subleased Premises**

(attached)

DESCRIPTION

TMT SITE PREMISES

All of that certain parcel of land being a portion of the Government Land of Kaohe, being also a portion of Mauna Kea Science Reserve covered by General Lease S-4191 to the University of Hawaii Situate at Kaohe, Hamakua, Island of Hawaii, Hawaii

Beginning at the southwest corner of this parcel of land referred to the Hawaii State Plane Coordinate System, Zone 1 (NAD83) 362,519.00 feet North and 1,646,660.00 feet East and the direct azimuth and distance from the Government Survey Triangulation Station "SUMMIT 1955" being 129° 52' 08"; 6,166.86 feet and running by azimuths measured clockwise from True South:

1. 152° 35' 33" 304.14 feet along the remainder of the Government Land of Kaohe and the remainder of Mauna Kea Science Reserved covered by General Lease S-4191 to the University of Hawaii;
2. 180° 00' 00" 190.00 feet same;
3. 270° 00' 00" 630.00 feet along same;
4. 0° 00' 00" 430.00 feet along same;
5. 90° 00' 00" 320.00 feet along same;
6. 0° 00' 00" 30.00 feet along same;
7. 90° 00' 00" 170.00 feet along the same to the point of beginning and containing an area of 5.9986 acres, more or less.



Description Prepared By:  
Engineering Partners Inc.

*Ronaldo B. Aurelio*

RONALDO B. AURELIO  
Licensed Professional Land Surveyor  
Certificate Number 7564  
Expires April 30, 2014

Hilo, Hawaii, March 10, 2014

Exhibit C-3 to Sublease

**Legal Description of Easement Area**

(attached)

DESCRIPTION

NON-EXCLUSIVE ACCESS AND UTILITY EASEMENT

All of that certain parcel of land being a portion of the Government land of Kaohe, being also a portion of Mauna Kea Science Reserve covered by General Lease S-4191 to the University of Hawaii Situate at Kaohe, Hamakua, Island of Hawaii, Hawaii

Beginning at the southwest corner of this parcel of land referred to the Hawaii State Plane Coordinate System, Zone 1 (NAD83) 361,104.89 feet North and 1,647,460.58 feet East and the direct azimuth and distance from the Government Survey Triangulation Station "SUMMIT 1955" being 122° 50' 16"; 4,680.47 feet and running by azimuths measured clockwise from True South:

1. 147° 03' 17" 30.07 feet along the remainder of the Government Land of Kaohe and the remainder of Mauna Kea Science Reserved covered by General Lease S-4191 to the University of Hawaii;

Thence along the same on a curve to the left with a radius of 15.00 feet, the chord azimuth and distance being;

2. 144° 25' 01" 1.38 feet;
3. 141° 46' 45" 73.94 feet along same;

Thence along the same on a curve to the right with a radius of 135.00 feet, the chord azimuth and distance being;

4. 149° 50' 37" 37.88 feet;
5. 157° 54' 28" 14.29 feet along same;
6. 67° 54' 28" 15.00 feet along same;
7. 157° 54' 28" 32.04 feet along same;
8. 148° 47' 42" 37.18 feet along same;
9. 238° 47' 42" 15.00 feet along same;

Thence along the same on a curve to the right with a radius of 435.00 feet, the chord azimuth and distance being;

10. 152° 25' 35" 55.11 feet;

11. 156° 03' 28" 17.62 feet along same;

Thence along the same on a curve to the left with a radius of 365.00 feet, the chord azimuth and distance being;

12. 149° 09' 32" 87.69 feet;

13. 142° 15' 36" 89.55 feet along same;

Thence along the same on a curve to the right with a radius of 435.00 feet, the chord azimuth and distance being;

14. 145° 06' 28" 43.22 feet;

15. 147° 57' 20" 86.90 feet along same;

Thence along the same on a curve to the right with a radius of 435.00 feet, the chord azimuth and distance being;

16. 158° 27' 14" 158.52 feet;

17. 168° 57' 08" 156.20 feet along same;

Thence along the same on a curve to the right with a radius of 155.00 feet, the chord azimuth and distance being;

18. 179° 43' 11" 57.92 feet;

19. 190° 29' 14" 45.76 feet along same;

Thence along the same on a curve to the left with a radius of 85.00 feet, the chord azimuth and distance being;

20. 181° 19' 15" 22.08 feet;

21. 172° 09' 16" 43.65 feet along same;  
 Thence along the same on a curve to the left with a radius of 365.00 feet, the chord azimuth and distance being;
22. 163° 49' 06" 105.84 feet;
23. 155° 28' 55" 25.44 feet along same;  
 Thence along the same on a curve to the left with a radius of 185.00 feet, the chord azimuth and distance being;
24. 138° 43' 43" 106.65 feet;
25. 121° 58' 31" 82.07 feet along same;
26. 31° 58' 31" 10.00 feet along same;
27. 121° 58' 31" 15.18 feet along same;  
 Thence along the same on a curve to the right with a radius of 275.00 feet, the chord azimuth and distance being;
28. 127° 44' 21" 55.24 feet;
29. 223° 30' 11" 10.00 feet along same;  
 Thence along the same on a curve to the right with a radius of 265.00 feet, the chord azimuth and distance being;
30. 138° 12' 29" 43.47 feet;
31. 142° 54' 46" 47.07 feet along same;  
 Thence along the same on a curve to the right with a radius of 105.00 feet, the chord azimuth and distance being;
32. 162° 13' 04" 69.43 feet;
33. 181° 31' 22" 1.83 feet along same;
34. 270° 00' 00" 70.02 feet along the TMT Building Site Easement;

35. 1° 31' 22" 3.69 feet along the remainder of the Government Land of Kaohe and the remainder of Mauna Kea Science Reserved covered by General Lease S-4191 to the University of Hawaii;
- Thence along the same on a curve to the left with a radius of 35.00 feet, the chord azimuth and distance being;
36. 342° 13' 04" 23.14 feet;
37. 322° 54' 46" 47.07 feet along same;
- Thence along the same on a curve to the left with a radius of 195.00 feet, the chord azimuth and distance being;
38. 312° 26' 39" 70.86 feet;
39. 301° 58' 31" 97.25 feet along same;
- Thence along the same on a curve to the right with a radius of 255.00 feet, the chord azimuth and distance being;
40. 318° 43' 43" 147.01 feet;
41. 335° 28' 55" 25.44 feet along same;
- Thence along the same on a curve to the right with a radius of 435.00 feet, the chord azimuth and distance being;
42. 343° 49' 06" 123.13 feet;
43. 352° 09' 16" 43.65 feet along same;
- Thence along the same on a curve to the right with a radius of 155.00 feet, the chord azimuth and distance being;
44. 1° 19' 15" 49.38 feet;
45. 10° 29' 14" 45.76 feet along same;

Thence along the same on a curve to the left with a radius of 85.00 feet, the chord azimuth and distance being;

46. 359° 43' 11" 31.76 feet;  
47. 348° 57' 08" 156.20 feet along same;

Thence along the same on a curve to the left with a radius of 365.00 feet, the chord azimuth and distance being;

48. 338° 27' 14" 133.01 feet;  
49. 327° 57' 20" 86.90 feet along same;

Thence along the same on a curve to the left with a radius of 365.00 feet, the chord azimuth and distance being;

50. 325° 06' 28" 36.27 feet;  
51. 322° 15' 36" 89.55 feet along same;

Thence along the same on a curve to the right with a radius of 435.00 feet, the chord azimuth and distance being;

52. 329° 09' 32" 104.50 feet;  
53. 336° 03' 28" 17.62 feet along same;

Thence along the same on a curve to the left with a radius of 365.00 feet, the chord azimuth and distance being;

54. 332° 25' 35" 46.24 feet;  
55. 328° 47' 42" 43.96 feet along same;  
56. 337° 54' 28" 53.11 feet along same;

Thence along the same on a curve to the left with a radius of 65.00 feet, the chord azimuth and distance being;

57. 329° 50' 37" 18.24 feet;

58. 321° 46' 45" 73.94 feet along same;

Thence along the same on a curve to the right with a radius of 85.00 feet, the chord azimuth and distance being;

59. 324° 25' 01" 7.82 feet;

60. 327° 03' 17" 30.07 feet along same;

61. 57° 03' 17" 70.00 feet along same to the point of beginning and containing an area of 2.6653 acres, more or less.



Description Prepared By:  
Engineering Partners Inc.

*Ronaldo B. Aurelio*

RONALDO B. AURELIO  
Licensed Professional Land Surveyor  
Certificate Number 7564  
Expires April 30, 2014

Hilo, Hawaii, March 10, 2014



SUBJECT FURTHER, that:

1. The Lessee shall submit construction plans of the Sublessee's improvements to the Land Division, Department of Land and Natural Resources, State of Hawaii, for the Chairperson of the Board of Land and Natural Resources' approval prior to constructing any improvements on the premises.

2. The Sublessee shall comply with all the conditions of Conservation District Use Permit No. HA-3568, as approved by the Board of Land and Natural Resources' Findings of Fact, Conclusions of Law, and Decision and Order issued on April 12, 2013.

IT IS UNDERSTOOD that except as provided herein, should there be any conflict between the terms of General Lease No. S-4191 and the terms of the Sublease, the former shall control; and that no further sublease or assignment of any interest of the premises or any portion thereof shall be made without the prior written consent of the Board of Land and Natural Resources.

IN WITNESS WHEREOF, the STATE OF HAWAII, by its Board of Land and Natural Resources, has caused the seal of the Department of Land and Natural Resources to be hereunto affixed and these presents to be duly executed this 9th day of April, 2015.

STATE OF HAWAII

Approved by the Board of Land and Natural Resources at its meeting held on June 27, 2014. *R*

By *[Signature]*  
WILLIAM J. ASIA, JR. CARTY S. CHANG  
Interim Chairperson  
Board of Land and  
Natural Resources

LESSOR

APPROVED AS TO FORM:

UNIVERSITY OF HAWAII, a public body corporate and the public university of the State of Hawaii

*[Signature]*  
JULIE H. CHINA  
Deputy Attorney General

By *[Signature]*  
David Lassner  
Its President

Dated: October 24, 2014

APPROVED AS TO FORM:

By *[Signature]*  
Jan Gouvia  
Its VP for Administration

*[Signature]*  
Print Name: Frank Davidson  
Carlsmith Bell  
Title: Partner  
Dated: 2/9/15

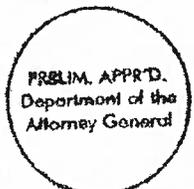
By *[Signature]*  
Donald O. Straney  
Its Chancellor, UH Hilo

LESSEE/SUBLESSOR

TMT INTERNATIONAL OBSERVATORY LLC, a Delaware limited liability company

By *[Signature]*  
Edward C. Stone  
Its EXECUTIVE DIRECTOR

SUBLESSEE



STATE OF HAWAII )  
 ) SS.  
CITY AND COUNTY OF HONOLULU )

On this 09th day of February, 20 15, before me appeared David Lassner and Jan Gouveia, to me personally known, who, being by me duly sworn, did say that they are the David Lassner, President and Jan Gouveia, VP for Administration, respectively, of the UNIVERSITY OF HAWAII, a body corporate, and that the seal affixed to the foregoing instrument is the corporate seal of said University and that the foregoing instrument was signed and sealed in behalf of said University by authority of its Board of Regents, and the said Jan Gouveia and David Lassner acknowledged said instrument to be the free act and deed of said University.

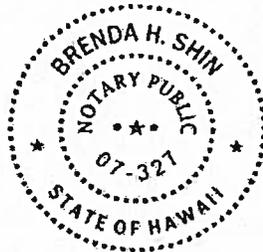


Brenda H. Shin

Notary Public, State of Hawaii

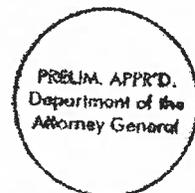
Brenda H. Shin

My commission expires: 7-08-15



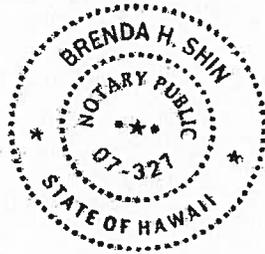
Doc Date none at time of notary # Pages 6  
Brenda H. Shin First Circuit  
Doc. Description Consent to sublease and Non-Exclusive Easement Agreement Between The International Observatory LLC + the UH  
Notary Signature Brenda H. Shin Date 2-06-15

NOTARY CERTIFICATION



STATE OF HAWAII )  
 ) SS.  
COUNTY OF )

On this 9th day of February, 2015, before me appeared Donald Straney, to me personally known, who, being by me duly sworn, did say that he/she is the Chancellor, UH Hilo, of the UNIVERSITY OF HAWAII, a body corporate, and that the seal affixed to the foregoing instrument is the corporate seal of said University and that the foregoing instrument was signed and sealed in behalf of said University by authority of its Board of Regents, and the said Donald Straney acknowledged said instrument to be the free act and deed of said University.

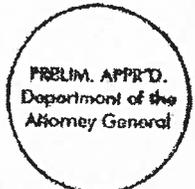


Brenda H Shin  
Notary Public, State of Hawaii

Brenda H. Shin  
My commission expires: 07/08/15



*none at time*  
Doc Date of notarization # Pages 6  
Brenda H Shin First Circuit  
Doc Description Consent to sublease  
and Non-Exclusive Easement Agreement  
Between TMT International Observatory LLC + the UH  
Brenda H Shin 2/09/15  
Notary Signature Date  
NOTARY CERTIFICATION





**SCIENTIFIC COOPERATION AGREEMENT**

**BETWEEN**

**TMT INTERNATIONAL OBSERVATORY LLC**

**AND**

**THE UNIVERSITY OF HAWAII**

**CONCERNING THE DESIGN, CONSTRUCTION AND OPERATION  
OF THE THIRTY METER TELESCOPE  
ON  
MAUNA KEA, HAWAII**

**EXHIBIT "C"**

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**SCA ATTACHMENT A: SUBLEASE AND NON-EXCLUSIVE EASEMENT AGREEMENT  
BETWEEN TMT INTERNATIONAL OBSERVATORY LLC AND THE UNIVERSITY OF  
HAWAII**

- Exhibit A to Attachment A – Master Lease (General Lease S-4191)
- Exhibit B to Attachment A – Consent to Sublease under General Lease S-4191
- Exhibit C-1 to Attachment A – Subleased Premises and Easement Area
- Exhibit C-2 to Attachment A – Legal Description of Subleased Premises
- Exhibit C-3 to Attachment A – Legal Description of Easement Area

**SCA ATTACHMENT B: ACCESS ROADS**

## SCIENTIFIC COOPERATION AGREEMENT

THIS AGREEMENT is made this 28 day of July, 2014, by and between TMT INTERNATIONAL OBSERVATORY LLC, a Delaware limited liability company ("TIO"), and the UNIVERSITY OF HAWAII, a public body corporate and the public university of the State of the Hawaii ("UH"), and shall be effective as provided in Section XV below.

### RECITALS

WHEREAS, the optical and infrared regions of the electromagnetic spectrum have shown great scientific potential for contributing to our understanding of the astronomical universe;

WHEREAS, the summit area of Mauna Kea is exceptionally well-endowed as a site for observations in these wavelengths;

WHEREAS, TIO and UH believe that the best interests of both parties are to be served through a program of close scientific cooperation centered around the TMT Telescope (as defined below) and related facilities;

WHEREAS, the operation of the TMT Telescope on Mauna Kea will greatly benefit the educational and research programs at UH;

WHEREAS, TIO and UH have a common interest in ensuring that the development of the Mauna Kea site will enhance the effective operation of the TMT Telescope; and

WHEREAS, the presence of the TMT Telescope on Mauna Kea will bring substantial community benefits, in addition to educational and research benefits;

NOW, THEREFORE, in consideration of the mutual agreements herein contained, TIO and UH agree as follows:

#### I. DEFINITIONS

For purposes of construing the provisions of this Scientific Cooperation Agreement, the following definitions apply:

**"Base Support Facilities"** refers to any possible headquarters in Hawaii for the operations of TIO on Mauna Kea.

**"BLNR"** stands for the Board of Land and Natural Resources of the State of Hawaii.

**"HELCO"** stands for the Hawaii Electric Light Company, Inc., the public utility which provides electricity to the Mauna Kea Observatories (as defined below).

**"IfA"** stands for the Institute for Astronomy, an organized research unit of the University of Hawaii at Manoa.

**"Information Station"** is the building and associated infrastructure (access, parking, utilities) near the Mid-Level Facilities which is used as a public information building.

**"Infrastructure Improvements"** are any capital improvements made for the common good of the Mauna Kea Observatories including, but not limited to, roads, power, telephone and communications installations, and the Mid-Level Facilities.

**"Instruments"** include cameras, spectrometers, and other special-purpose equipment used to detect and analyze light, together with computers, test equipment, and tools required to equip the Facilities.

**"Major Astronomical Facilities"** are: UH 88-inch Telescope, Canada-France-Hawaii Telescope (CFHT), NASA Infrared Telescope Facility (IRTF), United Kingdom Infrared Telescope (UKIRT), James Clerk Maxwell Telescope (JCMT), Caltech Submillimeter Observatory (CSO), Keck I, Keck II, VLBA Antenna, Subaru, Gemini North, and the Submillimeter Array. Future telescope facilities forming a part of the Mauna Kea Observatories shall be considered "Major Astronomical Facilities" unless otherwise agreed in writing by UH.

**"Mauna Kea Observatories"** includes, but is not limited to, the Mauna Kea Science Reserve, the astronomical facilities and infrastructure improvements on Mauna Kea, and UH operations which support the astronomical facilities on Mauna Kea.

**"Mauna Kea Observatory Access Road"** is the roadway between the Mid-Level Facilities and the Mauna Kea summit including roadways currently in use through the Mauna Kea Science Reserve.

**"Mauna Kea Science Reserve"** is the land in the summit area of Mauna Kea consisting specifically of land which is leased by UH from the BLNR under General Lease S-4191.

**"Mauna Kea Users' Committee"** is the committee established by UH to serve as the official forum in which the Major Astronomical Facilities may discuss aspects of the management of the Mauna Kea Observatories. The committee is chaired by the Director of the IfA. Currently, each Major Astronomical Facility is entitled to two representatives on the Mauna Kea Users' Committee.

**"Mid-Level Facilities"** include, but are not limited to, the Information Station, bedrooms, laboratories, common areas, and offices at Hale Pohaku on Mauna Kea.

**"MKSS"** stands for Mauna Kea Observatories Support Services, which is operated by UH through the IfA, and is responsible for providing services to support the Mauna Kea Observatories.

**"MKSS Oversight Committee"** is the committee established by UH to oversee the activities and management of MKSS and to recommend changes to the Director of the IfA. Currently each Major Astronomical Facility is entitled to one representative on the MKSS Oversight Committee.

**"Principal Parties"** are TIO and UH, and refer to the Principal Parties to this SCA.

**"SCA"** stands for this "Scientific Cooperation Agreement Between TMT International Observatory LLC and the University of Hawaii Concerning the Design, Construction, and Operation of the Thirty Meter Telescope on Mauna Kea, Hawaii," and to which is attached the Sublease.

**"Sublease"** is the Sublease and Non-Exclusive Easement Agreement between TIO and UH, and approved by BLNR, attached hereto as Attachment A, including the exhibits thereto.

**"Subleased Premises"** refers to the land subleased to TIO by UH with the approval of the BLNR. The Subleased Premises are a portion of that certain land area leased to UH by BLNR and described in General Lease S-4191, which is included as Exhibit A of Attachment A hereto, and which Subleased Premises are shown and described in Exhibits C-1 and C-2 of Attachment A hereto; Exhibits A, C-1, and C-2 of Attachment A hereto are incorporated herein by reference.

**"TIO Board"** refers to the governing and policy setting body for TIO.

**"TMT Director"** means the Observatory Director for the TMT Telescope.

**"TMT Facilities"** include, but are not limited to, the TMT Telescope and enclosure; the support building (the space necessary to support scientific observers and technical personnel while at the summit); together with Instruments, electrical conductors, cableways and tunnels; driveways and parking lots; power, telephone and communications conduits and lines; and access roads within the border of the Subleased Premises. "TMT Facilities" does not include the Mid-Level Facilities, the Base Support Facilities, or any other facilities outside the Subleased Premises.

**"TMT Infrastructure Contribution"** has the meaning set forth in Section VI.D.1.c below.

**"TMT Parties"** refers to the members of TIO.

**"TMT Telescope"** means the Thirty Meter Telescope on Mauna Kea, to be located on the Subleased Premises and used for astronomical observations.

## II. LOCATION OF THE TMT FACILITIES

The Sublease (Attachment A) specifies the location on Mauna Kea where the TMT Facilities will be situated.

## III. INTERACTION BETWEEN TIO AND UH

Day-to-day interaction between the Principal Parties regarding design, construction and operation of the TMT Facilities shall usually be carried out by specified representatives of TIO and UH or their designees. In the case of UH, the specified representative will normally be the IfA Director (or the designee of the IfA Director) and, in the case of TIO, this will normally be the Project Manager for the TMT Facilities (during construction) and the TMT Director (during operations, commencing at first light).

## IV. SOLE RESPONSIBILITIES OF UH

### A. Management of the Mauna Kea Observatories

UH shall provide a forum to allow the Major Astronomical Facilities which form a part of the Mauna Kea Observatories to discuss, on an equal footing, aspects of the management of the Mauna Kea Observatories. Such a forum currently exists and is referred to as the Mauna Kea Users' Committee. TIO shall be entitled to appoint two representatives to the Mauna Kea Users' Committee. Should this committee be replaced with another forum at some time in the future, TIO shall be entitled to participate on the same basis as the other agencies, entities, or persons operating Major Astronomical Facilities. Since UH, the Sublessor under the Sublease, is the Lessee with the State of Hawaii, it is recognized that final responsibility for management of the Mauna Kea Science Reserve resides with UH.

## V. SOLE RESPONSIBILITIES OF TIO

### A. Design, Fabrication, Construction, Installation, and Operation of the TMT Facilities

TIO shall be solely responsible for securing the funding for the design, fabrication, construction, installation, and operation of the TMT Facilities. TIO commits to taking reasonable measures consistent with Conservation District Use Permit HA-3568 and the TMT Access Way Agreement dated September 13, 2012 by and among UH, the Smithsonian Institution Astrophysical Observatory, and the TMT Observatory Corporation to minimize inconvenience which TMT construction activities may create for other telescope facilities.

### B. Power and Communications Conduits and Lines

TIO shall fund and arrange for the installation of electric power and communications conduits from handholes near the TMT Telescope site to the TMT Facilities. These handholes

will be at the new terminus of the summit electric power and communications distribution system as indicated in Section VI.D.1.c.(ii) below. The conduits shall conform to the standards set for the summit power and communications distribution system. TIO shall also fund and arrange for connection of commercial power and communications service via these conduits to the TMT Facilities.

## VI. RESPONSIBILITIES SHARED JOINTLY BY TIO AND UH

### A. Research Environment

Under General Lease S-4191 between UH and BLNR (Exhibit A of Attachment A), UH is to use the Mauna Kea Science Reserve as a scientific complex. UH carries the responsibility also to protect the site from interference that may emanate from within or from outside the Mauna Kea Science Reserve.

#### 1. UH:

a. UH shall continue to protect the interests of the astronomical facilities in the Mauna Kea Science Reserve from interference emanating from within the Mauna Kea Science Reserve which would affect the scientific integrity of the sites on which the astronomical facilities are located.

b. UH shall continue to pursue actively the initiation and/or improvement of such State and County laws and ordinances as are necessary to assure that man-made light emanating from outside the Mauna Kea Science Reserve during nighttime does not over time increase significantly or change in character, so as to interfere with the effectiveness of optical or infrared observations.

c. UH shall ensure that no other astronomical facilities will be constructed or operated within an 800-foot radius surrounding the TMT Telescope during the term of the Sublease, as it may be extended pursuant to Sections 9.a., 9.b., or 9.c. thereto.

#### 2. TIO:

TIO shall conduct its activities in the Mauna Kea Science Reserve in a manner compatible with the activities of other astronomical facilities located there, and shall conform to applicable regulations established by UH and by federal, state, and county authorities for the preservation of the environmental quality and the scientific integrity of the Mauna Kea Science Reserve.

B. Rights of Access

1. UH:

UH shall ensure TIO's right of access to the Subleased Premises, to the Mauna Kea Observatory Access Road, and to the Mid-Level Facilities (to be documented separately) and shall ensure its right to have access to a handhole or handholes for the electric power, and communications described in Section V.B. above. UH shall grant to or use its best efforts to obtain for TIO such other rights of access as may be needed for utilities and cableways.

2. TIO:

TIO shall pay any additional costs, fees and other charges assessed by third parties (such as HELCO) associated with the rights of access described in Section VI.B.1. above.

C. Access Roads to the TMT Facilities

1. UH:

UH shall provide to TIO the use of existing roads for access to the TMT Facilities, subject to any limitation in the TMT Access Way Agreement dated September 13, 2012 by and among UH, the Smithsonian Institution Astrophysical Observatory, and the TMT Observatory Corporation. The existing roads in the vicinity of the Mauna Kea summit are shown in Attachment B hereto. Improvements to the access road to the TMT Telescope site are discussed in Section VI.D.1.c.(i) below.

D. Infrastructure Improvements Shared in Common with Other Astronomical Facilities at the Mauna Kea Observatories

UH has taken responsibility to fully or partially fund and arrange for Infrastructure Improvements to the Mauna Kea Observatories which are and will be of common benefit to all the astronomical facilities which operate there. All such Infrastructure Improvements are subject to State and County permits, approvals, and funding.

1. Commercial Power, Data Communications Conduits and Lines, and Road Improvements

a. Description of Improvements:

UH has installed commercial electric power infrastructure at Hale Pohaku and at the Mauna Kea summit. At the summit, the power is distributed by means of a distribution loop, comprising two conduits containing the electrical cables, and conforming to HELCO standards, which passes near each of the Major Astronomical Facilities. Each facility accesses the commercial power by connecting to the distribution loop at a suitable handhole near its location. UH has also provided two communications conduits from Hale Pohaku to a central point at the summit, and from there to a distribution system comprising two or more conduits

which generally follows the same path as that used for the power. UH has installed fiber-optic cable in one of these conduits. This cable is part of the Mauna Kea Observatories Communications Network, a high-bandwidth communications system which is intended to link the facilities of the Mauna Kea Observatories with each other, with base facilities, and with commercial carriers which can provide links to home institutions and other institutions around the world. UH has completed improvement and paving of the upper section of the Mauna Kea Observatory Access Road (above elevation 11,800 feet) and of the connecting roads to the existing facilities at the summit.

b. Access to Existing Improvements by TIO:

For purposes of TMT, TIO shall have access to the Infrastructure Improvements described in Section VI.D.1.a. above as follows:

(i) The TMT Facilities shall connect to the electric power and communications lines as described in Section V.B. above.

(ii) Use of the access roads within the Mauna Kea Science Reserve in accordance with Section VI.C. above.

(iii) The right to join the Mauna Kea Observatories Communications Network and to participate in the network on the same terms as other network members. The costs associated with connecting the TMT Facilities to the network shall be borne by TIO.

c. Contribution by TIO to Future Improvements:

Subject to the provisions below in this Section VI.D.1.c., TIO shall contribute a total of SIX MILLION SIX HUNDRED THOUSAND Dollars (\$6,600,000) (in first-half 2013 dollars, with escalation following the most recently published State of Hawaii All Urban Consumer Price Index) (not seasonally adjusted) ("TMT Infrastructure Contribution") toward the cost of continued development of the Mauna Kea infrastructure.

This TMT Infrastructure Contribution shall first be used to fund three specific improvements, to the extent these funds allow:

(i) Extension of the summit spur road system to the TMT Telescope site.

(ii) Extension of the summit electric power and communications distribution system from its current terminus near the Submillimeter Array to a new terminus near the TMT Telescope site.

(iii) Upgrade of the electrical power infrastructure to accommodate the eventual requirements of the TMT Facilities. This includes an upgrade to the substation at Hale Pohaku and new cable from there to the summit.

TIO shall be responsible for the design and construction of items (i) and (ii) above and for the implementation of item (iii) above, in collaboration with HELCO. The design and implementation of these improvements shall be subject to approval by UH, by HELCO, and by the Department of Land and Natural Resources of the State of Hawaii, and subject to the funds allowing for the improvements.

TIO shall make this TMT Infrastructure Contribution on or before the date that is SIXTY (60) days after the effective date of this SCA pursuant to Section XV below. UH agrees that TIO may withhold from the payment an amount equal to TIO's initial cost estimate provided to UH for any infrastructure improvements described in (i) through (iii) above. Should the sum of the approved cost estimates equal or exceed the TMT Infrastructure Contribution, then TIO may withhold the entire contribution.

Before any contracts for these improvements are let, TIO shall provide UH with a cost estimate for the improvements, which figure may include a contingency factor up to 10% and be subject to revision following the receipt of actual bids for the improvements. If UH approves this cost estimate, as revised, then UH shall authorize TIO to use all or part of its infrastructure contribution to pay for the actual cost of these improvements, as verifiable by contractors' invoices, up to a maximum amount equal to the above-mentioned cost estimate, as revised, or the entire contribution, whichever is less. Should the contractor(s) default or otherwise fail to complete these improvements necessitating additional contracts and/or expense, or should major change orders be required, then TIO shall provide UH with a new cost estimate. If UH approves this new cost estimate, TIO may continue to use all or part of its infrastructure contribution to pay for the actual cost of these improvements, as verifiable by contractors' invoices, up to a maximum amount equal to the new cost estimate or the entire contribution, whichever is less.

Should the TMT Infrastructure Contribution be insufficient to complete items (i) through (iii) above, TIO shall be responsible for providing the required additional funding.

Should the TMT Infrastructure Contribution exceed the amount needed to fund items (i) through (iii) above, then UH shall be free to use such excess funds for other Infrastructure Improvements which UH considers desirable.

Following acceptance of the work and within NINETY (90) days of the receipt of final invoices, TIO shall provide UH with a final accounting of the cost of these infrastructure improvements, and shall remit to UH the amount, if any, by which the sum withheld exceeds the actual cost.

Notwithstanding anything to the contrary in this SCA, should this SCA be terminated in accordance with Section XVII below on or prior to the fourth anniversary of the effective date of this SCA, then the TMT Infrastructure Contribution shall not be payable by TIO to UH (or shall be refunded by UH to TIO, if applicable) to the extent of any amounts not theretofore expended in accordance with this Section VI.D.1.c.

2. Other Infrastructure Improvements to the Mauna Kea Observatories

It may become necessary or desirable for the greater benefit of the Mauna Kea Observatories to construct Infrastructure Improvements beyond those described in Section VI.D.1. above. If such Infrastructure Improvements are funded entirely by contributions from new funding sources (e.g., new astronomical facilities which join the Mauna Kea Observatories) and/or UH, then TMT shall enjoy access to such improvements on an equal footing with the other astronomical facilities. If such Infrastructure Improvements require contributions from some or all of the astronomical facilities for which there are signed agreements with UH, then TIO shall have access to such improvements, and TIO shall be liable to contribute to the cost of such improvements, only if and to the extent that TIO and UH have agreed in writing to such access and contributions. If TIO elects to participate in any such improvements, TIO and UH shall negotiate in good faith to determine the fair share of the cost of such improvements which TIO shall contribute. The amount of this fair share shall be set forth in separate written agreements and normally shall be based on the fractional utilization by TIO of any such improvements. In cases where utilization is not readily quantifiable, the share paid by TIO shall not exceed a fraction, the numerator of which is ONE (1), and the denominator of which is the number of Major Astronomical Facilities, including the TMT Telescope.

E. Operations and Maintenance

1. UH:

a. UH shall provide services on a basis of no profit, no loss to TIO through MKSS. Such services may include, but shall not be limited to: food and lodging; fuel, water and utilities; data communications; road maintenance; snow removal; weather forecasting; emergency services; public information, outreach and educational services including access control and facilities; and general administration.

b. The cost of MKSS services shall be shared among the astronomical facilities operating or under construction at the time the costs are incurred. For some services the costs may be allocated to each facility as shares. For others a rate will be set and the charge to the facility will be based on actual utilization of that service. Each year, in its budget, MKSS will establish the shares and rates so that projected costs equal projected revenue for each service. MKSS will adjust said shares and rates if actual expenditures or revenues differ significantly from the projections.

c. TIO, or its designee, shall be represented on the MKSS Oversight Committee, which reviews MKSS activities, recommends changes to the activities, and reviews and makes recommendations on the MKSS budget.

2. TIO:

a. TIO shall provide the funds necessary to operate and maintain the TMT Facilities.

b. TIO shall pay its share of the cost of MKSS services as described in Section VI.E.1. above. Said share shall include all MKSS services except that data communications is not included until TIO becomes a participant in the Mauna Kea Observatories Communications Network.

c. TIO shall fund the cost of operating and maintaining the power and communications lines from the handhole described in Section V.B. above to the TMT Facilities.

**F. Sublease; Order of Precedence**

a. Immediately upon execution of this SCA, and for so long as this SCA shall remain in force, UH and TIO shall each fulfill all of their respective obligations, as Sublessor and Sublessee, respectively, as specified in Attachment A hereto.

b. In the event of any conflict between the terms of this SCA and the Sublease, the Sublease shall be controlling.

**VII. DELEGATION OF RESPONSIBILITIES BY TIO**

TIO may delegate certain of its obligations and responsibilities hereunder to other agents for the purpose of constructing or operating the TMT Facilities. However, it is understood and agreed that TIO shall remain ultimately responsible for the obligations and responsibilities undertaken by it in this SCA.

**VIII. ASSIGNMENT OF RIGHTS BY TIO**

Any proposed assignment of ownership rights to the TMT Facilities shall require the consent of UH and shall be to the same person or entity to which the Sublease (or any rights therein) is to be assigned in accordance with Section 23 of the Sublease. In the event that TIO decides that it would be beneficial to involve yet further parties in the construction and/or operation of the TMT Facilities, TIO shall so notify UH so as to provide adequate time for UH to review the proposed terms and conditions of such partnership and to obtain the necessary prior consent of the UH Board of Regents, the State of Hawaii Board of Land and Natural Resources, and any other bodies whose consent is required under the terms of the Lease, the Sublease, or other agreements and documents; provided, however, that nothing in this SCA shall be interpreted or construed to require that TIO obtain any consent or approval of UH, the UH Board of Regents, the State of Hawaii Board of Land and Natural Resources, or any other entities or bodies regarding any parties to be admitted as liability limited company members of TIO or regarding any use of Federal grant funds for construction and/or operation of the TMT Facilities. TIO shall further provide UH with written assurance that such new party or parties concur with this SCA and that they are legally bound to abide by it. In any case, TIO shall not assign or transfer any of its rights under this SCA without the prior written consent of UH.

## IX. SCIENTIFIC COOPERATION

In recognition of the potential for scientific interaction between TIO and UH which the TMT Facilities offer, and of the contribution of UH in making the site available for TIO, TIO and UH agree on the following matters with regard to the operational phase of the TMT Facilities.

### A. UH Use of the TMT Facilities

1. Recognizing UH's considerable investment in the development of Mauna Kea as an astronomical site, UH shall be entitled to a guaranteed fraction of the observing time on the TMT Telescope. The UH observing time shall be allocated to proposals sponsored by UH as follows:

a. During each calendar year, UH shall be entitled to seven and one-half percent (7.5%) of the observing time after engineering time has been subtracted from the total time. Engineering time is telescope time whose purpose is not astronomical research (astronomical research includes demonstration science), but is rather the development, modification, or maintenance of the TMT Telescope, including commissioning of Instruments. During the third and subsequent years after first light, and for the purpose of determining the UH entitlement to observing time, engineering time may include time allocated to an extended shutdown of the TMT Telescope for the purpose of major repair or improvements, provided the shutdown has been approved by the TIO Board.

b. The UH observing time shall be equally distributed over the seasons of the year and the phases of the Moon.

c. In the event of a major failure of the TMT Facilities, the resulting lost observing time shall be accommodated by reducing the UH entitlement and the entitlement of the TMT Parties in the same proportion.

d. Only proposals having a UH-affiliated Principal Investigator, and forwarded by the IfA Director, shall be considered in scheduling the UH allocation of observing time. UH shall be solely responsible for evaluation and selection of proposals to be included in the UH allocation of time. The selection shall be made on the basis of scientific merit. There shall be no restrictions on the eligibility of co-investigators to collaborate on observing programs utilizing the UH observing time.

e. Detailed scheduling of observing time is the responsibility of the TMT Director.

f. In the event that UH and one or more of the TMT Parties each forward proposals for the same time-critical observation, the TMT Director shall attempt to achieve a resolution satisfactory to TIO and UH. If this cannot be achieved, selection between the proposals shall be done by the TMT Director on the basis of scientific merit.

g. TIO and UH recognize that, in order to achieve the full scientific potential of the TMT Telescope, it may be necessary to adopt innovative and flexible approaches to the scheduling of the TMT Facilities. Policies for scheduling of observations shall be approved by the TIO Board and shall in general apply to UH in the same manner as they apply to the TMT Parties.

2. UH-sponsored observers shall receive technical and logistic support while at the TMT Facilities and shall have access to the TMT Facilities, all on the same basis as TIO-sponsored observers.

3. UH-sponsored personnel shall be subject to the authority of the TMT Director when using the TMT Facilities and shall follow all rules, policies and procedures of TIO.

4. Data obtained by UH observers during UH time on TMT shall be subject to TIO's data rights policy which will include a period of time during which the data will be proprietary to UH, consistent with the proprietary period applicable to the TMT Parties, and after which such data will be released to all of the TMT Parties.

**B. UH Participation in TMT Facilities Instrument Development**

TIO shall provide UH with opportunities to participate in the development of Instruments for the TMT Facilities. Any decision concerning awarding Instrument proposals to UH shall be in TIO's sole discretion.

**C. UH Participation in the TIO Board**

UH shall be entitled to appoint one member to the TIO Board, which member shall have non-voting observer status.

**D. UH Participation in TIO Science Advisory Committee**

UH shall be entitled to have either one representative or representation in proportion to its share of observing time, whichever is greater on the TIO Science Advisory Committee.

**E. TMT Facilities Attribution**

In all publications and news releases regarding results obtained from work performed at the TMT Facilities, the TMT Telescope shall be given appropriate credit in a form approved by TIO. Results obtained at the TMT Facilities by IfA faculty shall have credit for these results also given to "the University of Hawaii, Institute for Astronomy" in any publications or news releases.

**F. Interaction with News Media**

Except for the publication of scientific results, external communications regarding the TMT Telescope or the TMT Facilities shall be reasonably coordinated between TIO and UH. UH

and/or TIO may request one another to coordinate specific media events. Each party shall keep the other informed of press releases, filming and live television transmissions.

**X. INSURANCE**

TIO shall, at all times, maintain insurance as required under the Sublease.

**XI. ATTORNEY'S FEES**

Except as otherwise provided in Attachment A hereto, TIO and UH shall each pay their own attorney's fees and any other legal expenses.

**XII. DISPUTE RESOLUTION**

Any dispute relating to or arising as a result of or in connection with this SCA, if not resolved by negotiation, shall be submitted first to non-binding mediation with Dispute Prevention & Resolution, Inc. and if such mediation is not concluded within six (6) months after submission, then shall be decided in legal or equitable proceedings in accordance with Hawaii law in any court having jurisdiction in the State of Hawaii. Such mediation shall take place in the County of Honolulu, State of Hawaii. Each party shall bear its own costs and fees for such mediation and the fees and expenses of the mediator shall be borne by the parties equally.

**XIII. GOVERNING LAW: SEVERABILITY**

The validity, construction and performance of this SCA and the legal relations between the Principal Parties shall be governed by and construed in accordance with the laws of the State of Hawaii. In the event any provision of this SCA shall be held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions of this SCA shall remain in full force and effect.

**XIV. AMENDMENTS TO THIS SCA**

This SCA may be amended in writing at any time by mutual agreement of the Principal Parties.

**XV. TERM OF THIS SCA**

This SCA shall become effective on the effective date of the Sublease and shall terminate as provided in Section XVII below.

## XVI. RENEGOTIATION OF THIS SCA

If the Master Lease (as defined in the Sublease) is replaced with a New Master Lease (as defined in the Sublease) as contemplated by Section 9.a. of the Sublease or other master lease between UH and the BLNR pursuant to Section 9.b. of the Sublease and the Sublease is not thereafter terminated or if the term of the Sublease is extended pursuant to Section 9.c. of the Sublease, the Principal Parties agree to negotiate in good faith any revisions to this SCA proposed at the time by either TIO or UH, provided that the material terms of this SCA shall be substantially the same and not changed.

## XVII. TERMINATION

This SCA shall be terminated upon the first of any of the following events to occur:

1. Mutual written agreement of the Principal Parties.
2. Termination of the Sublease (Attachment A), including as it may be extended pursuant to Sections 9.a., 9.b., or 9.c. thereto.
3. Termination of management or operation of the TMT Facilities by TIO or its assignee, if any, as approved under Section VIII above.

## XVIII. DISPOSITION OF TMT FACILITIES ON TERMINATION

Disposition of the TMT Facilities on termination of this SCA shall be conducted pursuant to the provisions of the Sublease.

## XIX. COUNTERPARTS

This SCA may be executed in counterparts, each of which so executed shall, irrespective of the date of its execution and delivery, be deemed an original (including counterparts delivered by facsimile or email), and said counterparts together shall constitute one and the same agreement binding all of the parties hereto.

*[Remainder of page intentionally left blank; signature page follows.]*

IN WITNESS WHEREOF, the parties hereto have executed this Scientific Cooperation Agreement as of the day and year first above written.

FOR THE UNIVERSITY OF HAWAII:

TMT INTERNATIONAL  
OBSERVATORY LLC:

By David Lassner  
Name: David Lassner  
Title: President  
Date: 7/28/14

By Edward C. Stone  
Name: Edward C. Stone  
Title: Executive Director  
Date: 7/23/14

By Howard Todo  
Name: Howard Todo  
Title: Vice-President for Budget and Finance  
Date: 7/28/14

By Donald Straney  
Name: Donald Straney  
Title: Chancellor, University of Hawai'i at Hilo  
Date: 28 July 14

Approved as to form:

By Lawrence S. Okinaga  
Name: Lawrence S. Okinaga, Carlsmith Ball LLP  
Title: Special General Counsel  
Date: 07/28/2014

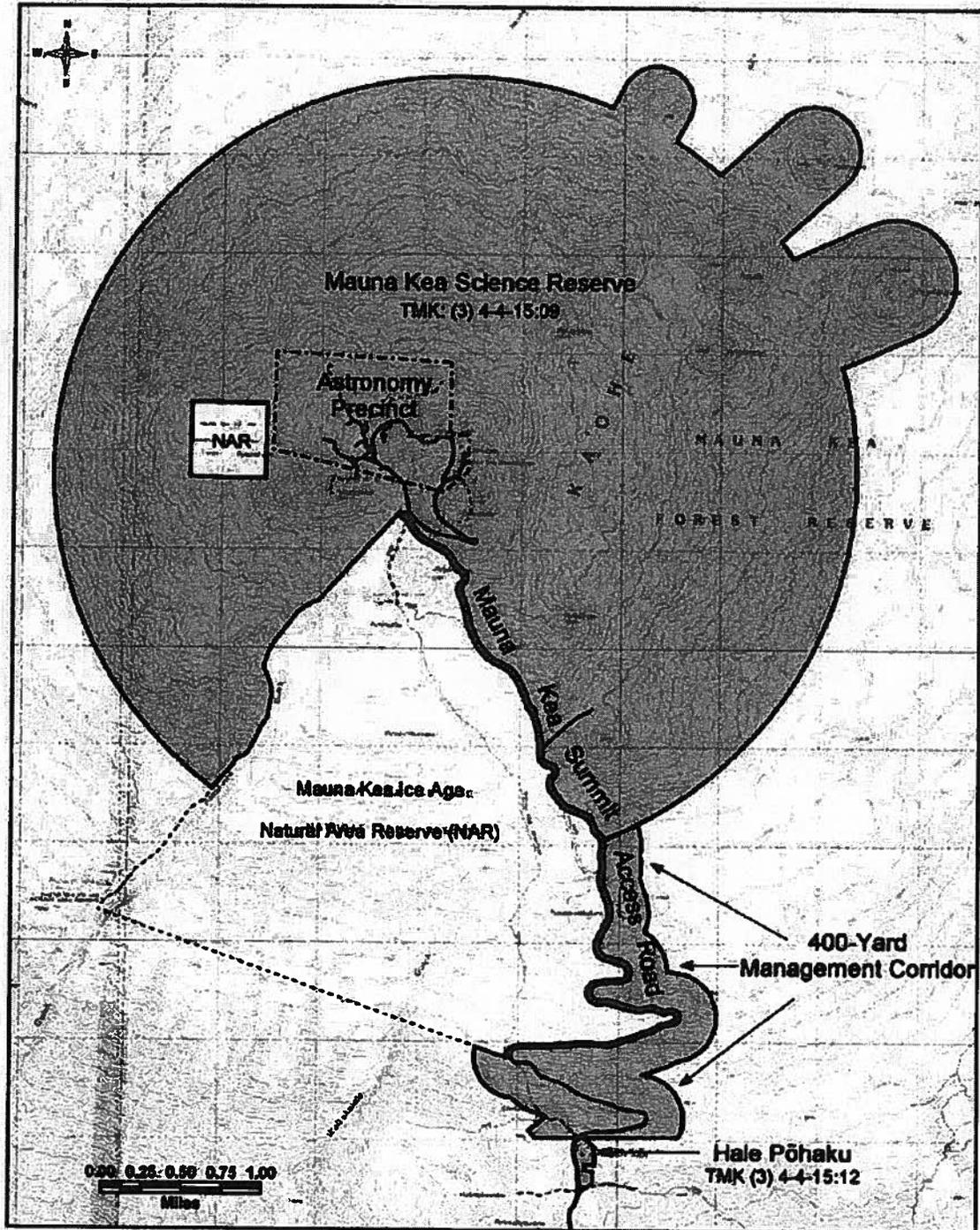
Attachment A to Scientific Cooperation Agreement Between TIO and UH

**Sublease**

(attached)

Attachment B to Scientific Cooperation Agreement Between TIO and UH

**Access Roads**





BOARD OF LAND AND NATURAL RESOURCES

FOR THE STATE OF HAWAII

IN THE MATTER OF

Case No. BLNR-CC-16-002

A Contested Case Hearing Re Conservation  
District Use Permit (CDUP) HA-3568 for the  
Thirty Meter Telescope at the Mauna Kea  
Science Reserve, Kaohe Mauka, Hamakua  
District, Island of Hawaii, TMK (3) 4-4-  
015:009

**CERTIFICATE OF SERVICE**

**CERTIFICATE OF SERVICE**

I hereby certify that on this day, a copy of the foregoing was duly served on the following parties  
by mail, postage pre-paid to their last known address:

Julie H. China  
Deputy Attorney General  
Department of the Attorney General  
465 South King Street, Room 300  
Honolulu, HI 96813

Counsel for the BOARD OF LAND AND NATURAL RESOURCES

Riki May Amano  
1003 Bishop Street  
Suite 1155, Pauahi Tower  
Honolulu, HI 96813

HEARING OFFICER

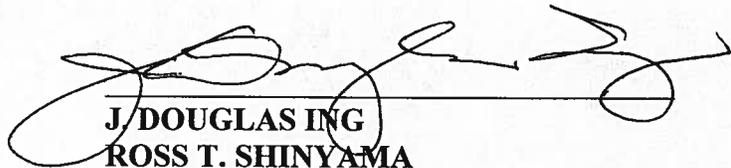
Richard N. Wurdeman  
Attorney at Law  
1003 Bishop Street, Suite 720  
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A handwritten signature in black ink, appearing to read 'J. Douglas Ing', is written over a horizontal line. The signature is stylized and cursive.

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