



UHH has not met the General Condition 4 of the CDUP HA-3568.

All of the items listed below were done prior to the approval and issuance of the CDUP Application (dated September 2, 2010)

Petitioner asserts that UHH did not meet the General Condition 4 of the CDUP HA-3568

1. In the CDUP HA-3568 under 2.2.1 Cultural Resources reads as follows;

“Mauna Kea is still a focus of many traditional and customary Native Hawaiian cultural practices and beliefs. It is a source of inspiration and object of reverence for many Hawaiians. Ongoing cultural practices involving Mauna Kea include:  
Performance of prayer and ritual observances important for reinforcement of an individual’s Hawaiian spirituality, including the ERECTION OF AHU OR SHRINES.” *See Exhibit 1.*
2. In the CDUP HA-3568 Under Table 4: Management Actions Detailing in the Mauna Kea Comprehension Management Plan (CMP). *See Exhibit 2.*
3. Stephanie Nagata Tr. December 8, 2016; Vol 14; Page114:2-25, Page 115:1-25. *See Exhibit 3 reads*, “Has the Office of Mauna Kea Management finalized any rules regarding construction of new Hawaiian cultural features, placement and removal of offerings ?  
Office of Mauna Kea Management has not adopted any rules regarding the treatment handling and or removal of any Hawaiian cultural structures. Therefor HRS 711-1107 was committed by the UHH. Also HRS 711-1107 was not in force.
  - a. DLNR administration rules 13-5-2(4) reads “Land Use”  
The construction, reconstruction, demolition, or alteration of any structure, building, or facility on land. For purposes of this chapter, harvesting and removing does not include the taking of aquatic life or wildlife that is regulated by state fishing and hunting laws nor the gathering of natural resources for personal, noncommercial use or pursuant to **Article 12, Section 7** of the Hawaii State Constitution or section 7-1, HRS, relating to certain traditional and customary Hawaiian practices.  
"Natural resource" means resources such as plants, aquatic life and wildlife, cultural, historic, recreational, geologic, and archeological sites, scenic areas, ecologically significant areas, watersheds, and minerals.
  - b. BLNR FOF & COL reads.. 692. The new structures (ahu) built on or near the TMT Project site are modern practices because they were built within the last two years and appear to be, at least in part, for the purpose of protesting the TMT Project by W. Freitas and others. (Nees) Tr. 12/05/16 at 253:14- 22; Tr. 3/2/17 at 259:4-262:17, 268:13-24. The two ahu were encountered by Rechtman during a field reconnaissance survey of the TMT Project site and the access road on July 7, 2015. (Rechtman) Tr. 12/20/16 at 169:16-21. It has not been conclusively established that the two uprights are in fact on the TMT Project site, but they are near the boundary of the TMT Project site. (Rechtman) Tr. 12/20/16 at 88:6-14
4. In the CDUP HA-3568 under Appendix B – Construction Plan page B-2 to page B-6 had been full fill in the application process by making sure that all was met on September 1, 2010. *See Exhibit 4 a, b, c, d, e, f, and g.*
  - a. 1.2 Grading, Underground Utilities, and Foundation. *See Exhibit 4 a*

- b. 1.2.1 Rock Movement Plan. *See Exhibit 4 b*
- c. 1.2.3 Access Way. *See Exhibit 4 c*
- d. Figure B-1: Cross Section of Access Way in Southernmost Cinder Section Overlapping 4 wheel Drive Road. *See Exhibit 4 d*  
  
Figure B-2: General Cross Section of Access Way in Lava Flow Section Overlapping SMA Rd.
- e. B-3: General Cross Section of Access Way in Lava Flow Section Overlapping 4 wheel Drive Rd. *See Exhibit 4 e*
- f. CDUP HA-3568 page 271 “Civil Overall Plan” dated 9-1-10. *See Exhibit 4 f*. Gray Sanders Tr. January 3, 2017; Vol 20; Page 104:6-24. *See Exhibit 4 g*

Therefor the UHH has not met Condition 4 of the CDUP HA-3568. UHH the CDUP HA 3568 should not be extended.

November 3, 2021

\_\_\_\_\_/s/\_\_\_\_\_  
Cindy Freitas Petitioner

## 2.0 Existing Conditions

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### 2.1 Ownership

The TMT Observatory and Access Way would be located on Mauna Kea in the MKSR on Hawai'i Island in the State of Hawai'i. The Batch Plant Staging Area is also within the MKSR. The entire 1,288-acre MKSR is owned by the State of Hawai'i and is designated as part of the State of Hawai'i Conservation District Resource subzone and is leased to the University under General Lease S-4191. The building and operation of the TMT Observatory on Mauna Kea will require a sublease of the area from the University. The sublease will be subject to approval first by the TMT Board and University of Hawai'i Board of Regents (UH BOR) followed by approval by BLNR.

### 2.2 Resources in Project Area

#### 2.2.1 Cultural Resources

Cultural resources is a term that encompasses both physical features, typically referred to as historic properties, as well as cultural practices and beliefs. Each of these resource types are described separately here.

##### ***Cultural Practices and Beliefs***

The CMP, including the CRMP subplan, as well as the Cultural Impact Assessment (CIA) conducted during the preparation of the EIS for the TMT Project, the CIA prepared for the 2000 Master Plan, and other cultural studies performed on behalf of OMKM provide detailed descriptions of the cultural practices and beliefs surrounding Mauna Kea. Those descriptions are briefly summarized here.

Native Hawaiian traditions state that ancestral *akua* (gods, goddesses, deities) reside within the mountain summit area. These personages are embodied within the Mauna Kea landscape and they are believed to be physically manifested in earthly form as various *pu`u* (hills) and as the waters of Lake Waiau. Because these *akua* are connected to the Mauna Kea landscape in Hawaiian genealogies, and because elders and *akua* are revered and looked to for spiritual guidance in Hawaiian culture, Mauna Kea is considered a sacred place.

Mauna Kea is still a focus of many traditional and customary Native Hawaiian cultural practices and beliefs. It is a source of inspiration and object of reverence for many Hawaiians. Ongoing cultural practices involving Mauna Kea include:

- Performance of prayer and ritual observances important for the reinforcement of an individual's Hawaiian spirituality, including the erection of ahu or shrines.
- Collection of water from Lake Waiau and snow from the summit in general for a variety of healing and other ritual uses.
- Deposition of piko (umbilical cords) at Lake Waiau and the summit peaks of Mauna Kea.

**Table 4-1: Management Actions Detailed in the CMP and Subplans**

CMP	Subplans	Management Action	Applicability to TMT Project
<b>7.1.1 Native Hawaiian Cultural Resources</b>			
CR-1	NRMP 4.4.2 CRMP 4.3.3 PAP 4.2, 5.2, 6.1	Kahu Kū Mauna shall work with families with lineal and historical connections to Mauna Kea, cultural practitioners, and other Native Hawaiian groups, including the Mauna Kea Management Board's Hawaiian Culture Committee, toward the development of appropriate procedures and protocols regarding cultural issues.	Not Applicable
CR-2	CRMP 2.4.2.1	Support application for designation of the summit region of Mauna Kea as a Traditional Cultural Property, per the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq. in consultation with the larger community.	Not Applicable
CR-3	NRMP 4.4.2 CRMP 4.3.3 PAP 4.2, 5.2, 6.1	Conduct educational efforts to generate public awareness about the importance of preserving the cultural landscape.	Directly Applicable
CR-4	CRMP 4.2.1.1	Establish a process for ongoing collection of information on traditional, contemporary, and customary cultural practices,	Not Applicable
CR-5	CRMP 4.2.1.3 PAP 6.3, 6.8	Develop and adopt guidelines for the culturally appropriate placement and removal of offerings.	Indirect
CR-6	CRMP 4.2.1.5 PAP 2.7.2, 6.3	Develop and adopt guidelines for the visitation and use of ancient shrines.	Indirect
CR-7	CRMP 4.2.1.6	Kahu Kū Mauna shall take the lead in determining the appropriateness of constructing new Hawaiian cultural features.	Indirect
CR-8	CRMP 4.2.1.7	Develop and adopt a management policy for the UH Management Areas on the scattering of cremated human remains.	Indirect
CR-9	CRMP 4.2.1.8 PAP 6.8	A management policy for the cultural appropriateness of building ahu or "stacking of rocks" will need to be developed by Kahu Kū Mauna who may consider similar policies adopted by Hawai'i Volcanoes National Park.	Indirect
CR-10	CRMP 4.3.1 PAP 5.2	Develop and implement a historic property monitoring program to systematically monitor the condition of the historic district and all historic properties, including cultural sites and burials.	Not Applicable
CR-11	CRMP 4.3.7	Complete archaeological survey of the portions of the Summit Access Road corridor under UH management.	Not Applicable
CR-12	CRMP 4.2.7	Consult with Kahu Kū Mauna about establishing buffers (preservation zones) around known historic sites in the Astronomy Precinct, to protect them from potential future development.	Indirect
CR-13	CRMP 4.3.2, 4.3.7	Develop and implement a burial treatment plan for the UH Management Areas in consultation with Kahu Kū Mauna Council, MKMB's Hawaiian Culture Committee, the Hawai'i Island Burial Council, recognized lineal or cultural descendants, and SHPD.	Not Applicable

11:42 1 **perspective it has, but we've taken it -- although**  
 11:42 2 **not required we've taken it to Mauna Kea Management**  
 11:42 3 **Board for their review and input.**  
 11:42 4 **Q** So you still haven't answered the question,  
 11:42 5 a legal yes or no question.  
 11:42 6 **MR. FLORES:** So can I ask the Hearing  
 11:42 7 Officer to ask the witness to please answer the  
 11:42 8 question correctly?  
 11:42 9 **HEARINGS OFFICER AMANO:** Would you repeat  
 11:42 10 question, please?  
 11:42 11 **MR. FLORES:** Yes.  
 11:42 12 **Q** (By Mr. Flores): Has the Office of Mauna  
 11:42 13 Kea Management finalized any rules regarding  
 11:42 14 construction of new Hawaiian cultural features?  
 11:42 15 **MR. LUI-KWAN:** I'm going to object, vague  
 11:42 16 and ambiguous. As to rules, I know the previous  
 11:42 17 cross-examiner -- he used rules in a different  
 11:42 18 fashion, and I think maybe that might be confusing  
 11:42 19 the witness in terms of what they may mean by  
 11:42 20 finalizing the rules.  
 11:42 21 **HEARINGS OFFICER AMANO:** Do you understand  
 11:43 22 the question?  
 11:43 23 **THE WITNESS:** Not really.  
 11:43 24 **MR. FLORES:** Well, I mean --  
 11:43 25 **HEARINGS OFFICER AMANO:** Maybe you can

11:43 1 rephrase.  
 11:43 2 **MR. FLORES:** Rephrase.  
 11:43 3 **Q** Has the Office of Mauna Kea Management  
 11:43 4 finalized any administrative rules regarding the  
 11:43 5 construction of new Hawaiian cultural features?  
 11:43 6 **A No.**  
 11:43 7 **Q** Thank you.  
 11:43 8 Has the Office of Mauna Kea Management  
 11:43 9 finalized any administrative rules regarding the  
 11:43 10 placement and removal of offerings?  
 11:43 11 **A Can I qualify this? Being those particular**  
 11:43 12 **management items are not in the draft administrative**  
 11:43 13 **rules.**  
 11:43 14 **Q** And where are they?  
 11:43 15 **A They're policies.**  
 11:43 16 **Q** When you say "policies", whose policies?  
 11:43 17 **A They're policies that were required under**  
 11:44 18 **the comprehensive management plan.**  
 11:44 19 **Q** Okay.  
 11:44 20 So has the Office of Mauna Kea Management  
 11:44 21 finalized these policies regarding the placement and  
 11:44 22 removal of offerings?  
 11:44 23 **A We have taken to Kahu Ku Mauna, and it's**  
 11:44 24 **their policy. But as I said that we -- although not**  
 11:44 25 **required by the CMP, we have taken it to the Mauna**

11:44 1 **Kea Management Board for their review, input and**  
 11:44 2 **approval.**  
 11:44 3 **Q** So what is the next step?  
 11:44 4 **A Then once -- then we would have a policy in**  
 11:44 5 **place regarding those particular actions.**  
 11:44 6 **Q** Who approved those policies?  
 11:44 7 **A We were taking it to the Mauna Kea**  
 11:44 8 **Management Board for their review and approval.**  
 11:44 9 **Q** Has the Mauna Kea Management Board approved  
 11:44 10 those policies?  
 11:44 11 **A Not yet.**  
 11:45 12 **Q** Okay. That's the question -- I mean,  
 11:45 13 that's the answer I was looking for. Thank you. It  
 11:45 14 was really a yes or no answer.  
 11:45 15 So has the Office of Mauna Kea Management  
 11:45 16 finalized any policies regarding the building of 'ahu  
 11:45 17 or standing rocks?  
 11:45 18 **A No.**  
 11:45 19 **Q** Okay.  
 11:45 20 I guess I should go back to the first  
 11:45 21 questions: Has the Office of Mauna Kea Management  
 11:45 22 finalized any policies regarding construction of any  
 11:45 23 new Hawaiian culture features?  
 11:45 24 **A No.**  
 11:45 25 **Q** Thank you.

11:45 1 I'm going to bring your attention to  
 11:45 2 Exhibit A-11. And I'll provide you a copy of that.  
 11:46 3 Looking at Exhibit A-11 entitled A Cultural  
 11:46 4 Resources Management Plan for the University of  
 11:46 5 Hawaii management areas on Mauna Kea, Ka'oh'e,  
 11:46 6 Hamakua, Hawaii Island, State of Hawaii TMK  
 11:46 7 (3)4-4-015, parcel 09 and 12, a sub-plan for the  
 11:46 8 Mauna Kea comprehensive management plan.  
 11:46 9 And we're -- bring your attention to Page  
 11:46 10 5-2. It's the bottom. So Exhibit A-11, page 5-2 and  
 11:47 11 you're looking at Table 5.1.  
 11:47 12 So once again the table is entitled summary  
 11:48 13 of management actions. Is that correct?  
 11:48 14 **A Yes.**  
 11:48 15 **Q** And the page you have before you is page  
 11:48 16 5.2 from Exhibit A-11; is that correct?  
 11:48 17 **A I'm not exactly sure, I'm taking your word**  
 11:48 18 **for it.**  
 11:48 19 **Q** That is Exhibit A-11. Are you taking my  
 11:48 20 word that it's page 5.2 -- 5-2.  
 11:48 21 **HEARINGS OFFICER AMANO:** No, that it's  
 11:48 22 A-11.  
 11:48 23 **MR. FLORES:** Okay. I affirm that it's from  
 11:48 24 Exhibit A-11, unless the UH counsel have any  
 11:48 25 opposition that it's not at this time.

- National Pollutant Discharge Elimination System (NPDES) permit. The Project will obtain a Notice of General Permit Coverage (NGPC) for general construction activities. The contractor will prepare a Site-Specific Best Management Practice (BMP) plan and submit it to the State of Hawaii, Department of Health (HDOH) for review prior to construction. The BMP plan will include a Materials Storage/Waste Management Plan and Spill Prevention and Response Plan; the plan will include measures outlined in Sections 3.15.1 and 3.15.2 of the Final EIS, including measures related to Erosion and Water Quality, Solid and Hazardous Materials and Waste, Air Quality and Lighting, and Additional Disturbance and Encroachment. This permit and component plans will comply with CMP Management Action C-2.
- Noise permit and noise variance. TMT's contractor will obtain and comply with both a noise permit and a noise variance, as applicable.
- Oversize and Overweight Vehicles Permit (OOVP). TMT's contractor will obtain and comply with an OOVP, as applicable.

## 1.1 Schedule

The conceptual Project construction schedule is presented in Table B-1. Project construction could begin as early as 2011 and take approximately seven years to complete.

**Table B-1: Anticipated Construction Timeline**

Phase	Start	End
Grading and foundation	2011	2013
Access Way	2011	2012
TMT Observatory 13N Site grading	2011	2012
TMT Observatory foundation	2012	2013
Electrical upgrades	2012	2012
Observatory construction	2012	2017
Dome assembly (exterior cranes active)	2013	2015
Internal telescope assembly	2015	2017
Support building construction (including foundation)	2015	2017
Observatory finish	2015	2017
Batch Plant Staging Area restoration/naturalization	2017	2017
Telescope/instrument testing	2017	2018

Source: TMT Observatory Corporation, July 17, 2010.

Drawings illustrating the construction phasing are provided in Attachment A.

Construction activities will take place 12-15 hours a day, seven days a week; however, work times will vary depending on activities and some special operations or construction phases will require longer work hours. Winter weather conditions at the TMT Observatory site will interrupt construction at times, until the dome is completed.

## 1.2 Grading, Underground Utilities, and Foundation

This section discusses ground level and underground construction activities. The grading of the Access Way and TMT Observatory will take place first, followed by TMT Observatory

# Exhibit 4 a

foundation work. Plans, which illustrate proposed changes in contours, are included in Attachment B.

### 1.2.1 Rock Movement Plan

Project construction will require the excavation of rock from the TMT Observatory site and along the Access Way. Along the Access Way, the need to excavate rock is primarily governed by the need to generate a smoothly sloping road and the need to bury utilities within the Access Way. At the TMT Observatory site, excavation is necessary to prepare a level work surface plus place a foundation for the telescope and the observatory dome. TMT and their contractor will prepare a Rock Movement Plan prior to construction in compliance with CMP Management Action C-3 and submit it to the Office of Mauna Kea Management (OMKM) for review and approval. The Rock Movement Plan will detail excavation and grading activities.

Preliminary engineering plans indicate that the total volume of excavated material (“cut” material) will be 64,000 cubic yards. These preliminary engineering plans, which illustrate proposed changes in contours, are included in Attachment B. The estimated cut and fill volumes are based on geotechnical assumptions concerning the subsurface in the area and could change following the completion of geotechnical borings. As summarized in Table B-2, roughly 32,000 cubic yards of the cut material will be reused at the TMT Observatory site or Access Way. An estimated 32,000 cubic yards of material will be excess cut and will be used to provide some restoration of the Batch Plant Staging Area and a portion of which will be stored at a location designated by OMKM for use as determined by OMKM. By using most of the material on the TMT Observatory site and Access Way, that material will be available for later use to restore the TMT Observatory site and the portion of the Access Way exclusively used by TMT during decommissioning.

**Table B-2: Estimated Cut and Fill Volumes**

Site	Cut (cubic yards)	Fill (cubic yards)
TMT Observatory 13N site	34,000	29,000
Access Way	30,000	3,000
Batch Plant Staging Area	None	30,000
Saved for OMKM Use	NA	2,000

Source: TMT Observatory Corporation, July 17, 2010.

No soil or cinder that originates off the mountain used as fill within the Conservation District. Some courser material from on-island quarries will be transported to the TMT Observatory site and used under concrete foundation slabs as “base course”. Aggregate from on-island quarries will also be used to make the foundation concrete.

### 1.2.2 Batch Plant

TMT will re-establish a temporary concrete batch plant at the previously utilized “Batch Plant Staging Area”. Prior to utilizing the Batch Plan Staging Area, the site will be cleared of invasive species to the extent practicable, if any are observed by a biologist inspecting the area prior to use. Best management practices (BMPs) will also be installed to (a) limit the potential for the later establishment of invasive species; (b) limit the production of dust and mud; (c) limit and

## Exhibit 4 b



control stormwater run-on, runoff, and quality; and (d) prevent disturbance of undisturbed areas beyond the previously disturbed batch plant area.

The batch plant will be required to produce roughly 5,900 cubic yards of concrete for the TMT Observatory foundations. As discussed above, this volume is an estimate based on geotechnical assumptions concerning the subsurface in the area and could change following the completion of geotechnical borings.

No mass grading of the Batch Plant Staging Area is planned prior to use of the site as a batch plant other than the storage of excess material from the TMT Observatory site and Access Way within the area. The stored material will be placed such that the entire Batch Plant Staging Area can be utilized (i.e., it will be graded and compacted after placement so that it can be driven over rather than left in a pile). The Project will utilize the area using a layout similar to that used by previous projects that utilized the area as a batch plant. During the Project's use of the Batch Plant Staging Area there will be temporary stockpiles of soil and rock, a concrete batch plant, and construction materials staged within the area.

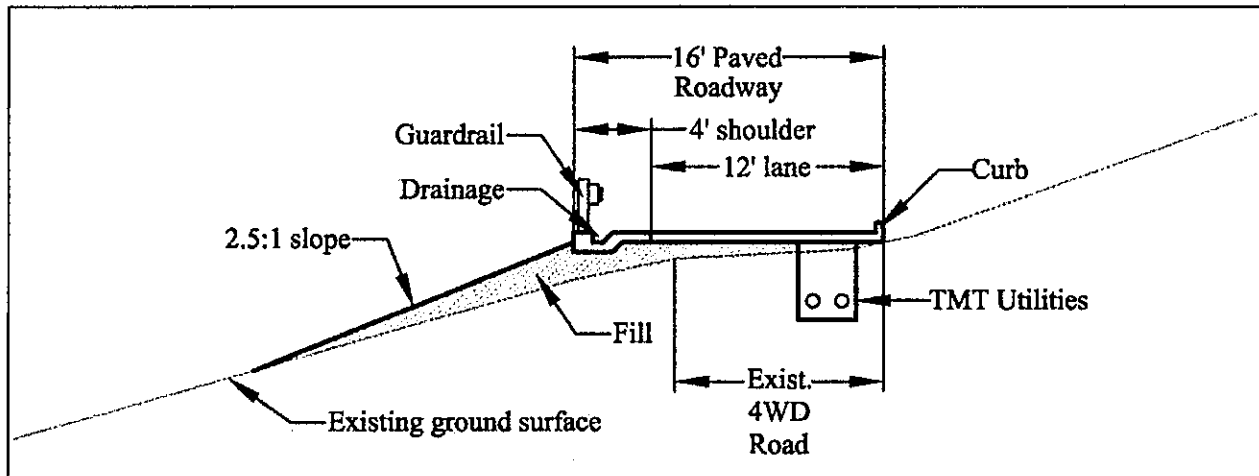
Once the Project's use of the Batch Plant Staging Area is complete, the stored excess material will be regraded. The excess material will be utilized to restore/naturalize the Batch Plant Staging Area to the degree practicable. A portion or all of the excess material will be spread over a portion of the Batch Plant Staging Area in such a way as to create a rough, more natural surface that could not be driven over. Some of the excess material may be left in a stockpile within the Batch Plant Staging Area depending on OMKM's desires. This restoration of the Batch Plant Staging Area would reduce the size of the Batch Plant Staging Area that could be used for parking and other uses following the construction of the TMT Observatory; however, the restored area could be temporarily reclaimed as a staging area by future projects, if needed.

### **1.2.3 Access Way**

The Access Way has two distinct sections (1) the southernmost portion where the Access Way will follow existing roads on cinder, and (2) the rest of the Access Way where it will primarily follow existing roads on lava flows. These two sections are discussed below.

#### ***Southernmost Cinder Section***

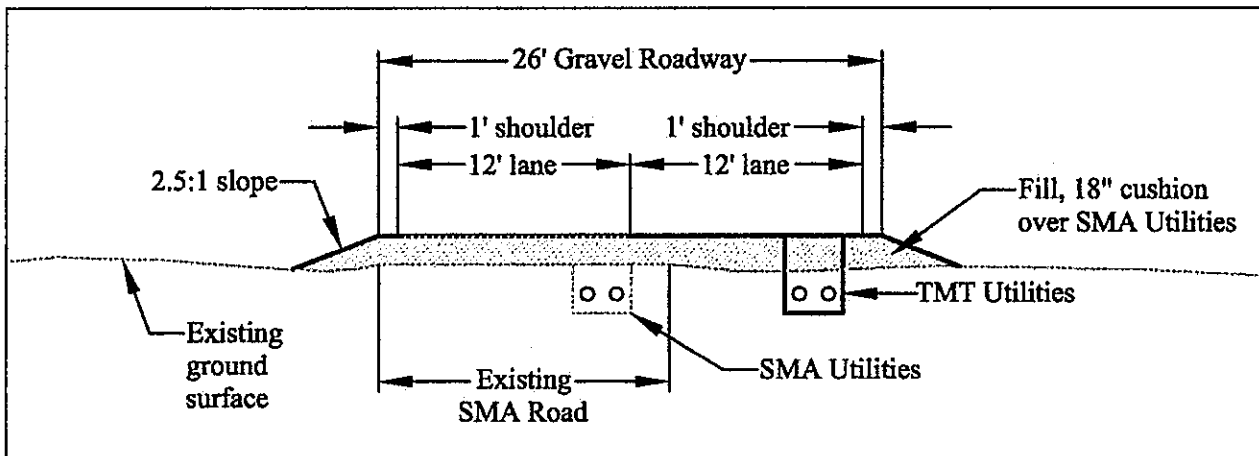
Generally, grading along the Access Way will be performed to achieve a smooth and level travel surface. In the cinder section, the existing 4-wheel drive road (the "jeep trail") travel surface has degraded over the years and no longer provides a level travel surface. Where the Access Way occurs on the cinder lower slope of Pu,,u Hau,,oki, the Access Way features will be as illustrated in Figure B-1 – a 12 foot wide paved travel way (1 lane), a four foot paved shoulder with drainage channel and guardrail, and slope graded to 2.5:1.



**Figure B-1: Cross Section of Access Way in Southernmost Cinder Section Overlapping 4-Wheel Drive Road**

**Lava Flow Section**

Generally, grading along the Access Way will be performed to achieve a smooth travel surface. In the lava flow section the Access Way will follow an existing SMA road and the 4-wheel drive road through Area E. Although the SMA road already provides a smooth travel surface, grading will be done to raise the grade of the travel surface in order to protect the SMA utilities under the roadway, as illustrated in Figure B-2. During early construction activities when sufficient material has not been cut to install the 18-inch cushion over the SMA utilities as shown in the figure, steel plates will be used to cover and protect the SMA utilities until sufficient material is available.

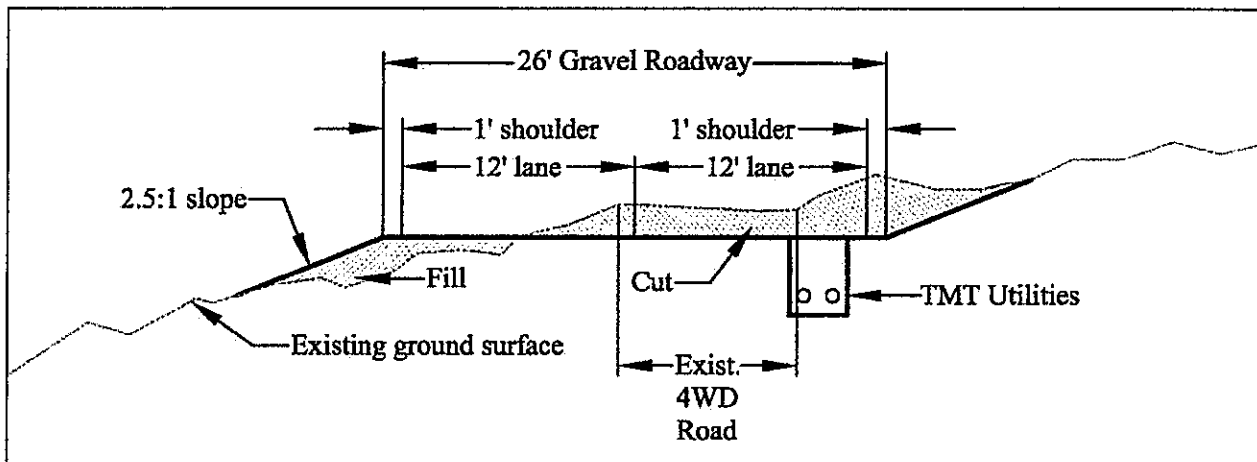


**Figure B-2: General Cross Section of Access Way in Lava Flow Section Overlapping SMA Road**

In addition to the steps discussed above to protect the SMA utilities where the SMA utilities and TMT utilities run parallel to each other, additional measures will be taken where they cross. They will cross at two points – (1) where the SMA road branches to a SMA pad on the east side

of the SMA Area near where the Access Way comes off the cinder cone, and (2) where the SMA road and the 4-wheel drive road split. At those locations additional measures will be taken to protect the SMA utilities, including the use of steel plates and additional cushion so that the TMT utilities can cross over the SMA utilities but still provide the necessary cover over the TMT utilities.

The 4-wheel drive road portion in the cinder cone section will have to be graded to a greater extent because it is not straight and the slope changes dramatically. Throughout the lava flow section, the Access Way features will be as illustrated in Figure B-3 – a 24 foot wide gravel travel way (two lanes), one foot shoulders, and slopes graded to 2.5:1. The slopes beyond the shoulder of the Access Way will vary depending on the topography and steeper embankment slopes may be used depending on geotechnical conditions encountered.



**Figure B-3: General Cross Section of Access Way in Lava Flow Section Overlapping 4-Wheel Drive Road**

### **Utilities**

A trench for electrical and communications lines will be excavated along the Access Way on one side of the road as illustrated in Figure B-1, Figure B-2, and Figure B-3. The conduits will be encased in concrete per governing code requirements. Excavated material will be used to raise the Access Way road surface where required to improve grades on the road and to provide a smooth and level driving surface where a rough surface from excavation will otherwise be exposed.

### **1.2.4 TMT Observatory**

The limits of grading activities (the area that will be affected by the cut and fill), the existing contours, and proposed contours at the TMT Observatory 13N site are shown in Figure B-4. Grading and foundation details are illustrated on preliminary plans included in Attachment A and B.



11:17 1 details provided here represent the current design?  
 11:17 2 It's possible that you might have answered this  
 11:17 3 before, but I thought I would try to get the actual  
 11:18 4 facts more clearly.  
 11:18 5 **A I think I answered it before.**  
 11:18 6 **Q** Okay. Okay.  
 11:18 7 On the same page in the last paragraph, you  
 11:18 8 begin saying:  
 11:18 9 The TMT Adaptive Optics (AO) System, you  
 11:18 10 say, The TMT Observatory will be the first  
 11:18 11 optical/infrared observatory of its size to integrate  
 11:18 12 AO into its original design.  
 11:18 13 Is that correct?  
 11:18 14 **A Correct.**  
 11:18 15 **Q** Are you saying that the Giant Magellan and  
 11:18 16 the EELT don't use AO in their designs?  
 11:19 17 **A I can't speak to how they're integrating it**  
 11:19 18 **into the design. I believe they are -- I believe we**  
 11:19 19 **may have we may have been doing it first, but that's**  
 11:19 20 **a detail. So your question is what now?**  
 11:19 21 **Q** In fact, we may not know, you know, what  
 11:19 22 the details of their developments are?  
 11:19 23 **A Today, I don't.**  
 11:19 24 **Q** And then when you say "of its size", do you  
 11:19 25 mean, like, specifically 30 meters, or are you

11:19 1 talking about these large segmented telescopes?  
 11:19 2 **A I'm talking about large telescopes in**  
 11:19 3 **general.**  
 11:19 4 **Q** Not necessarily one just all 30 meters?  
 11:19 5 **A Not just 30 meters, but large.**  
 11:19 6 **Q** It could be the 39 meters of the EELT or  
 11:19 7 the smaller Magellan?  
 11:19 8 **A Right, right, right.**  
 11:20 9 **Q** On Page 5, that's paragraph number four,  
 11:20 10 you say:  
 11:20 11 The Calotte dome base, cap, and shutter  
 11:20 12 structures will appear rounded and smooth and have a  
 11:20 13 reflective aluminum-like exterior coating, is that  
 11:20 14 correct?  
 11:20 15 **A Correct.**  
 11:20 16 **Q** What you mean when you say a "reflective  
 11:20 17 aluminum-like exterior coating"?  
 11:20 18 **A The dome will be made of steel, plain**  
 11:20 19 **common steel. It will be painted with a reflective**  
 11:20 20 **paint that will have a metallic component in the**  
 11:20 21 **paint to make the paint reflective, and it will look**  
 11:20 22 **something like an aluminized surface.**  
 11:20 23 **Q** Okay.  
 11:20 24 So it won't really have an aluminum skin?  
 11:20 25 **A No.**

11:20 1 **Q** And what kind of appearance will we -- will  
 11:21 2 this thing look like? In other words, would it be --  
 11:21 3 it's a -- would it be a shiny kind of, glossy kind of  
 11:21 4 finish, would it be a buffed, dull kind of surface,  
 11:21 5 what -- or have you decided?  
 11:21 6 **A We haven't decided. Your question is**  
 11:21 7 **well-founded. So if you look at Exhibit C-3, you see**  
 11:21 8 **a general representation. It's not highly polished**  
 11:21 9 **like a mirror --**  
 11:21 10 **Q** Yes.  
 11:21 11 **A -- a real mirror, and it's not very dull.**  
 11:21 12 **Q** Although you say somewhere, I believe, that  
 11:21 13 it will reflect something about the sky or the colors  
 11:21 14 of sky or the colors of the ground or something like  
 11:21 15 that?  
 11:21 16 **A Right. It will be reflective enough so**  
 11:21 17 **that it will reflect the colors of sky, but it won't**  
 11:21 18 **be so highly polished and reflective that it's like a**  
 11:21 19 **mirror --**  
 11:21 20 **Q** I see.  
 11:21 21 **A -- and the exact level of reflectivity or**  
 11:21 22 **specularity will be decided when we choose the paint**  
 11:22 23 **with the contractor.**  
 11:22 24 **Q** I see.  
 11:22 25 So you didn't happen to bring a sample of

11:22 1 this --  
 11:22 2 **A No.**  
 11:22 3 **Q** -- or possibilities of what this outside  
 11:22 4 surface might look like with you?  
 11:22 5 **A No.**  
 11:22 6 **Q** On the bottom of Page 7, you say:  
 11:22 7 Finally, some site preparation for the TMT  
 11:22 8 groundbreaking was done in 2015 also within the TMT  
 11:22 9 site boundaries.  
 11:22 10 Now, I believe that early on you testified  
 11:22 11 that a grading permit had been obtained by the  
 11:22 12 contractor to do this work? Is that correct?  
 11:22 13 **A For the groundbreaking?**  
 11:22 14 **Q** Yes.  
 11:22 15 **A Yes. The grading --**  
 11:22 16 **Q** And the accessway, I believe, he's already  
 11:22 17 testified?  
 11:22 18 **A Well, I believe that grading permit was for**  
 11:22 19 **the entire civil package that included the**  
 11:22 20 **groundbreaking and all of the work in the civil**  
 11:23 21 **package including the accessway --**  
 11:23 22 **Q** I see.  
 11:23 23 **A -- and the rough grading of the site. It's**  
 11:23 24 **a single grading permit.**  
 11:23 25 **Q** So my question to you is: Is the -- was

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the following documents:

1. Cindy Freitas Breif in Response to Petitioner's Motion  
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