

## *UH Managed lands – Project Proposal*

for projects anticipated to be classified as having “Minimal Impact”

**Applicant Name:** W.M. Keck Observatory (WMKO Project Manager: Mark Devenot, Infrastructure Specialist)

**Project Name:** HELCO Transformer Relocation

- Brief Description of the Project

This project proposes to remove the HELCO (750 KVA) high voltage transformer from within the WMKO Observatory and replace it with a new, weather proof equivalent at a safer location outside the WMKO Observatory.

- Identified Land Use (see HAR § 13-5-22 through 13-5-25)

§13-5-22 P-9 STRUCTURES, ACCESSORY  
(B-1) Construction or placement of structures accessory to existing facilities or uses.

- Identify the existing CDUP this proposal alters or affects, if any

Keck I HA-1646 (1984) and Keck II HA-2509 (1991)

- Identify [University of Hawai'i exemption](#) per HAR § 11-200-8(a), if any

Exemption Class #6 Construction or placement of minor structures accessory to existing facilities.

1. Construction or placement of: Utilities and trash enclosures.

- Tax Map Key(s): 4-4-015:009 – Mauna Kea Science Reserve (por.)
- Proposed Commencement Date: 12-2-2017
- Proposed Completion Date: 12-30-2019
- Estimated Project Cost: \$ 200,000.00
- Total size / area of proposed use: 256 sq./ft.

### **Project Purpose and Need**

- WMKO is proposing to remove its aging HELCO transformer located inside the building out of concern for the risk a fire and potential harm to WMKO personnel, the public and the observatory. The possibility of a fire is small but not insignificant. Voltage transients, heat, moisture, dirt, insulating fluid decay, faulty wiring connections etc. could all be a cause of such a failure. The age of the transformer and its location within the observatory increase the possibility of a problem and the risk posed. Relocating the transformer outside is in line with all the observatories on Mauna Kea. WMKO is the only observatory with a transformer located inside.
- The present HELCO (750 KVA) high voltage transformer would be removed from within the WMKO Observatory and replaced with a weather proof (750 KVA) HELCO transformer at a safer location outside the WMKO observatory.

- In 2005 the WMKO Observatory experienced a fire when the HELCO transformer's primary conductor connection shorted and ignited. This event set off the fire alarm, personnel evacuation and loss of power for several days. Fortunately, HELCO's circuit protection responded quickly and de-energized the circuit allowing for the fire to extinguish itself and not spread.
- Due to the inherent electrical/electrocution risk of the existing transformer and its surrounding area, the transformer vault within the observatory is always locked and maintained by HELCO. Unauthorized access is prohibited. With this present arrangement, if an actual fire was to ignite within the confinements of the transformer vault, important critical assessments, responses and/or actions would be delayed or restricted due to the present access restrictions.
- HELCO has peer-reviewed and approved the proposal (attached) to remove and replace our existing transformer with one much safer and more suitable for our collective needs. The new transformer would be a weather proof equivalent of our current transformer. The design and installation of these types of transformers is also such that connections are not accessible, thus mitigating accidental electrocution risks.

### Existing Conditions at Project Site(s)

- Geology, Climate, & Hazard

The project site is located on the eastern side of the WMKO Observatory in the parking area where the soil is previously excavated backfill. There are no climate issues or hazards at the proposed project site. The relocation of the transformer will be coordinated with HELCO during non-snow days or other bad weather conditions.

- Flora, Fauna, Ecology, Water Resources

No Flora, Fauna, Ecology or Water Resources will be altered or disturbed. We are conducting all work in an area that was previously excavated and is currently used as a parking and delivery area.

- Cultural Resources

No cultural resources will be disturbed. All work will be conducted in an area that was previously excavated and is currently used as a parking and delivery area.

- Recreation

No recreational activities are conducted at the project site. This site is currently used as a parking and delivery area.

- Built Infrastructure

No buildings will be added. The HELCO transformer will be installed within the WMKO parking lot and surrounded by a shield of bollards to protect it from vehicles running into it. (See conceptual drawing below)

- Landscaping & Visual Conditions

WMKO expects very little impact from the addition of the proposed relocation of the HELCO transformer to its present day facility appearance/aesthetics and surroundings (See conceptual drawing Figure 1 and picture Figure 2 below). Other observatories on the

summit locate their transformers just outside their facilities. The principle effect of our conformance to this practice is a minor reduction in parking area available to the general public.

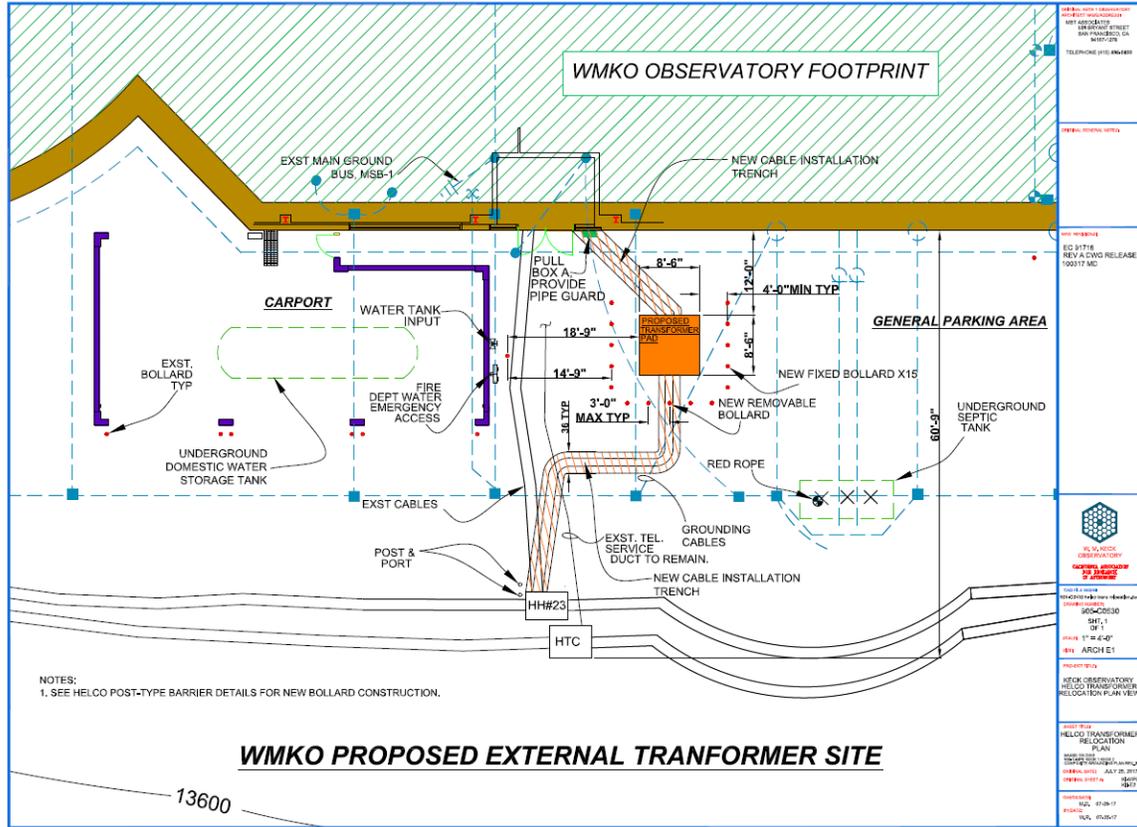


Figure 1

## WMKO Site and Facility Overview

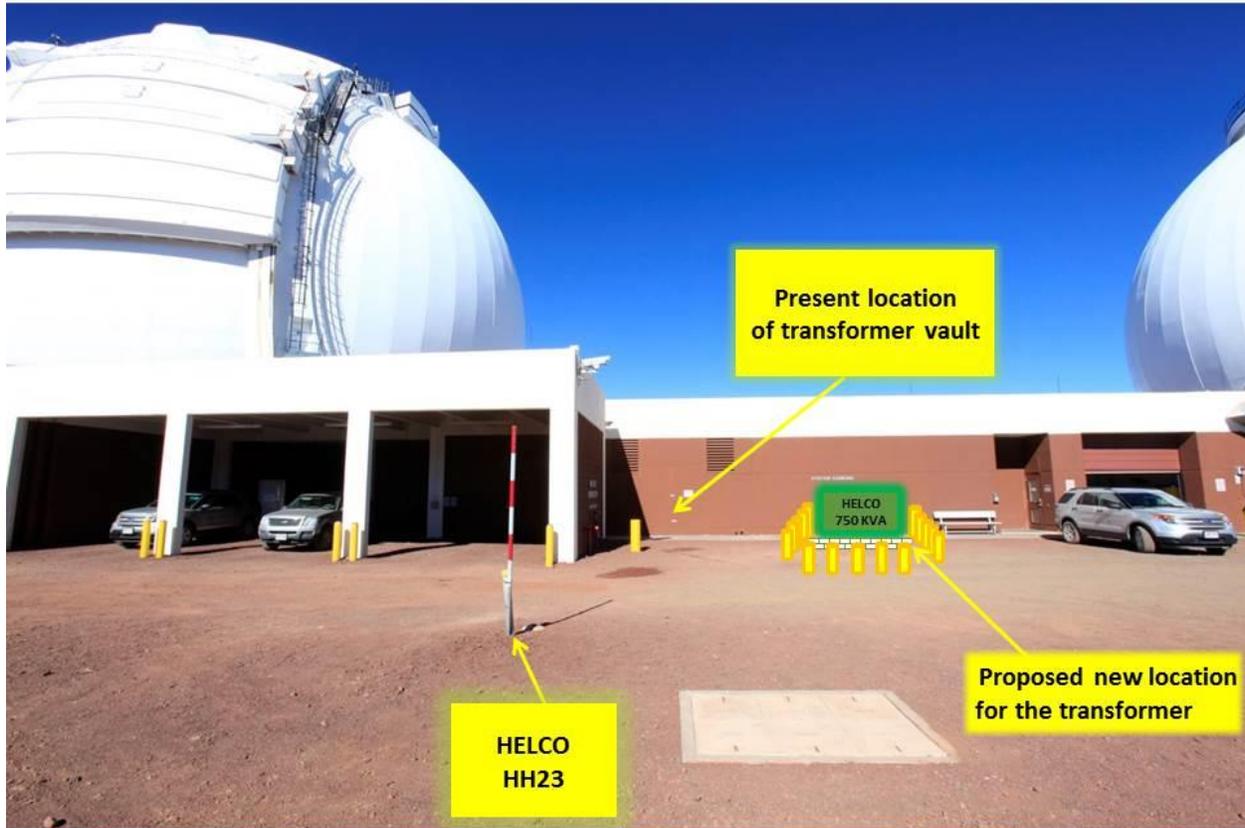


Figure 2

### Description of the Project

WMKO'S consulting Electrical PE will provide recommendations regarding the specifications, layout, planning, and permitting requirements. The consultant is highly experienced and has been involved in projects similar to this one with HELCO.

- Standard WMKO engineering and safety processes will be followed. These include submission of an Engineering Change Request (ECR) to change control boards and submission of a Project Specific Safety Plan (PSSP) to the WMKO Safety Committee.
- Standard WMKO project planning methodology will be followed. WMKO will have a dedicated Project Manager assigned to the project. Schedule milestones, deliverables, and success criteria will be developed.
- A Statement of Work (SOW) that includes detailed technical, schedule, safety, and environmental requirements will be developed. This SOW will be sent to licensed electrical/general contractors for bid.
- Once a contractor has been chosen and all required Federal, State, and County permits are in place, pre-implementation meetings will finalize details with respect to deliverables and

schedule. These meetings will include all stake holders and participants including HELCO engineers, contractor, PE, WMKO safety and project personnel, etc.

- Figures 1 & 2 above depict the intended location of the new transformer.
- Survey and groundwork will allow the work area to be staked out and pre-staging of material to occur. At this point closure of all or part of the WMKO parking lot to the public may be necessary.
- Minor excavation will be conducted in pre-excavated soil to lay the cement pad for the new transformer and to install the protective bollards. The length, width and depth of the excavation are length 50 feet, width 24 inches, depth 42 inches.
- A minimal amount of trenching will be conducted in the same area that has been previously trenched to run the new conduit lines for the transformer. The depth of trenching required along with length of trenching is depth 42 inches, length 50 feet.
- Concrete coring will be planned, scheduled and completed for conduit connections at HELCO pull box #23 and the facility entry.
- Concrete forms will be constructed, conduits installed, and rebar laid, followed by pouring for the transformer pad and conduit encasements. The concrete pad will be 8' 6" x 8' 6". The form will be for that dimension and will have 10" high sides.
- In coordination with HELCO, the new transformer will be delivered, installed on the pad and preliminary electrical connections made. The dimensions of the transformer are 7' wide, 6' high and 6' deep.
- HELCO will schedule and complete the transfer of power and hook-up of the new transformer.
- HELCO will remove the old transformer from the vault and transport it off summit.
- A new bollard enclosure will be constructed around the transformer to prevent accidental vehicle collisions. There will be a total of 15 bollards each with a height of 42" above ground and the diameter will be 4" and 6" (maximum).
- Final operations handover to the observatory staff will occur pending satisfaction of WMKO success criteria and OMKM inspections.

#### Equipment & Transportation:

- We do not anticipate the need to use heavy equipment such as cranes. Materials and components are not anticipated to be large or numerous enough to warrant a tractor trailer for delivery.
- WMKO anticipates the use of a cement truck, flatbed, mini-excavator with backhoe extension, and forklift for delivery and mobilization of materials and components.

## Measures to protect the environment and/or mitigate impacts

### Protective Measures

- It is WMKO's top priority (if approved) to complete and ensure this project herein is planned and carried out without any negative impact to our sensitive facility or surrounding location.
- We will notify OMKM in writing after all required permits are obtained and at least 5 days prior to beginning field work on UH managed lands (Hale Pōhaku, Road Corridor, Maunakea Science Reserve, or Astronomy Precinct).
- All project participants must attend a Maunakea orientation prior to commencing work.
- Transportation will be by 4-wheel drive vehicle when traveling above Halepōhaku.
- OMKM Rangers will be allowed to visit and monitor activities.
- WMKO will comply with all actions and measures described in the proposal, including (community) benefits, CMP compliance list, and mitigation measures.
- Loose tools or equipment will not be left unattended and are to be properly stored at the end of each day.
- In preparation for high wind conditions, protocols will include measures to ensure debris and equipment is not blown from the job site.
- All waste material will be removed and properly disposed of. All perishable items including food, food wrappers and containers, etc. will be removed from the site at the end of each day and properly disposed of.
- WMKO intends to employ invasive species prevention best practices, including inspections of materials by a DLNR-approved biologist as appropriate prior to entering UH managed lands.
- Motorized equipment, when stationary, must have a drain-pan in place suitable for catching fuel or fluid leaks. To allow for expansion with reduced atmospheric pressure, fuel tanks should not be more than 3/4 full prior to transport to the summit (unless used as the fuel source for transport to the summit).
- The approval may not be transferred or assigned. All persons associated with this project must carry a copy of the permit while they are working on University-managed lands.
- Unless otherwise stated in the proposal, upon project completion copies of all data, field notes, photos, log books, collected specimens, and other forms of documentation will be shared with OMKM for future, unrestricted, use by OMKM or its designee. All geospatial data, metadata or applications must be in a format compatible with OMKM GIS software or other industry standard identified in advance.
- No use of mechanized equipment is allowed unless authorized by this permit.
- Electronic and paper copies of all publications resulting from the work will be provided to OMKM.
- Notify OMKM in writing when field activity associated with the project is completed.
- The project must be completed within the timeframe specified. Projects not completed within this timeframe are not allowed to continue (or commence) without explicit, prior, written approval from OMKM.

## Compliance with Lease, Sublease, or Comprehensive Management Plan (CMP)

University of Hawai'i master lease and the Keck Sub-lease require that both entities maintain the premises in a safe condition for all users and visitors.

## Identify other required or associated permits

- County Permits, HELCO Service Interconnect Agreement

## Five Year Outlook

- This project is listed in the WMKO Five-Year Outlook and identified for in-depth consultation with the Kahu Kū Mauna Council due to ground disturbance involved.

## Community Benefits

- Benefits to other Maunakea entities and/or global astronomy community

The safety benefits will be for the WMKO personnel and the Observatory as well as visitors to the Observatory.

- Benefits to the Hawaii Island community

The safety benefits will be for the WMKO personnel, the Observatory and the community at large.

Will data, publications, or other products be free and available to the public?

Not applicable.

## DLNR Evaluation Criteria

After approval by the Mauna Kea Management Board, the Department of Land & Natural Resources or Board of Land & Natural Resources will evaluate the merits and approve the project based on the following eight criteria (§13-5-30). See <http://dlnr.hawaii.gov/occl/files/2013/08/13-5-2013.pdf>

1. The purpose of the Conservation District is to conserve, protect, and preserve the important natural and cultural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare. (ref §13-5-1) How is the proposed land use consistent with the purpose of the conservation district?

The proposed HELCO transformer relocation does not negatively impact the level of conservation, protection or preservation of the natural and cultural resources of the site. The transformer and its associated bollard enclosure are designed to ensure public health, safety and welfare.

2. How is the proposed use consistent with the objectives of the Resource subzone of the land on which the land use will occur? (§13-5-13 The objective of this subzone is to ensure, with proper management, the sustainable use of the natural resources of those areas. This subzone shall encompass: lands necessary for providing future parkland and lands presently used for national, state, county, or private parks. Land suitable for outdoor recreational uses such as hunting, fishing, hiking, camping, and picnicking. [And other lands not applicable to Mauna Kea.]

The proposed HELCO transformer is consistent with the resource subzone objectives. It does not negatively impact the natural resources. The site is not currently used for recreational purposes it is located in the observatory parking lot on a pre-excavated site.

3. Describe how the proposed land use complies with the provisions and guidelines contained in chapter 205A, HRS, entitled "Coastal Zone Management".

This criterion does not apply to the proposed activity. The site of proposed use is over 20 miles from the coast and is not hydrologically connected to shoreline resources.

4. Describe how the proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.

The HELCO transformer relocation will not cause adverse impact to existing natural resources within the surrounding area, community or region. The transformer will be located in an area outside the observatory in an area that has previously been excavated and is used as part of the observatory parking area.

5. Describe how the proposed land use, including buildings, structures and facilities, is compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.

The proposed activity is limited to the existing disturbed area used for vehicle parking. It will not directly affect the scientific, natural resource, or historic properties in the summit region.

6. Describe how the existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon.

The transformer will use the same aesthetics that currently exists around the observatory so it will not appear out of character with its surroundings.

7. If applicable, describe how subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District.

N/A

8. Describe how the proposed land use will not be materially detrimental to the public health, safety and welfare.

The proposed use remedies existing safety and welfare concerns. The new transformer is a HELCO approved and provided transformer that meets all government mandated safety standards and requirements. The surrounding bollards are designed to prevent vehicular damage.