

NOAO-S Facilities Operations

Status of FY2016 & FY2017 Projects

At closing of July 2017: Q3+1 month of FY2017

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Executive Summary

In FY2016 the NOAO-S Facilities Operations Department (Facilities Operations) embarked on an ambitious program to upgrade and improve the existing facilities to provide more reliable services and to allow for certification of critical areas and equipment. A first set of projects was planned for FY2016 and are described in *“Budget Fiscal Year 2016, v3.2, Section 4”*. In February 2016 a three-year budget proposal was prepared: *“Outlook budget fiscal years 2017-2019, Facilities Operations NOAO-S, v1.2”*. That document described the most urgent upgrades and improvements and presented a three-year budget outlook. Following this proposal, the FY2017 plan and budget included a second set of upgrade and improvement plans, which are described in *“Budget Fiscal Year 2017, v4.1, Section 4”*. All documents are posted on the NOAO-S Facilities Operations website¹.

In this report we present the status of the FY2016 and FY2017 upgrade and improvement projects and the balance in the project accounts at the end of month 10 of FY2017, including outstanding encumbrances as at July 31, 2017. At the start of FY2017 the total funding for upgrade and improvement projects was 373.7 MCLP, including FY2016 carry forward in the project accounts. On July 31 2017, i.e. FY2017 Q3+1month, the balance in the project accounts and taking into account 42 MCLP in encumbrances, was 236.6 MCLP. Note that 60 MCLP of these 236.6 MCLP is reserved for severance pay. In FY2016 and FY2017 16 projects were planned, and 2 were added during the course of FY2016. Of these 18 projects 9 projects were completed, 6 projects are underway and 3 projects have been deferred to FY2018 or FY2019.

An overview of the funding, expenditures and balances on July 31, 2017 can be found in Table 1. The projects are grouped by category: road repair & maintenance, water & sewage, electric systems, buildings, communications and other. We note that the projects completed, including two unplanned FY2016 projects, come in over budget by a total of about 64 MCLP. Spending on the remaining projects, in particular purchases of equipment, will be adjusted to match funding within each category. For example the budget for road repair projects, FY2016 and FY2017 combined, was 142 MCLP. The projects currently underway are expected to come in at about 94 MCLP, leaving about 48 MCLP for the purchase of the backhoe.

¹ <http://www.ctio.noao.edu/noao/content/Reports-and-documentation>

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1. Introduction

In FY2016 the NOAO-S Facilities Operations Department (Facilities Operations) embarked on an ambitious project to upgrade and improve the common infrastructure on Cerro Tololo, Cerro Pachón and in La Serena, to provide more reliable services, and a safer work environment for the AURA staff. Where feasible critical areas and equipment will be upgraded such that certification under Chilean health and safety standards is possible.

The first set of projects was planned for in FY2016 and are described in “*Budget Fiscal Year 2016, v3.2, Section 4*”. Several of these projects were deferred to FY2017. These projects are: major road repairs; preparation of the electric subsystems for certification; expansion of the Pachón kitchen and dining area; and upgrading or renewing the heating facilities in the buildings on Cerro Tololo and Cerro Pachón. The last two projects will start at the end of FY2017, continuing well into FY2018.

The FY2017 upgrade and improvement projects are described in “*Budget Fiscal Year 2017, v4.1, Section 4*” and progress on these projects has been reported on at the end of each quarter. All reports are posted on the NOAO-S Facilities Operations website.

In the current report, to be released together with the FY2017 Q3 progress report, we present an update on projects at the end of July 2017.

2. Project account balances

Table 1 summarizes the project accounts: total funding, total expenditures including encumbrance and balances on July 31 2017. The projects are grouped by category: road repair & maintenance, water & sewage, electric system, buildings, communications, other.

Details of the project accounts for FY2016 and FY2017 are given in Table 2.

3. Projects completed, reported on previously

The upgrade and improvement program started in FY2016, and several projects were carried out in FY2016 and during the first two quarters of FY2017. Those projects have been reported on previously, and the status reports describing these projects are posted on the NOAO-S Facilities Operations website.

3.1. Projects completed in FY2016

- **Power Line Stability**
Installation of three automatic circuit re-closers at critical points in the AURA power line system.
- **Communication Network**
Upgrade of the mountain communication system, consisting of replacement and relocation of the antenna on Cerro Pachón and replacement of the repeater.
- **Hotels Tololo, Pachón and La Serena**
Roof repair Hotel Tololo; Maintenance bathrooms Hotel Pachón
- **Mountain Water Supply System**
Submersible pump repaired and a spare pump purchased

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- **Maintenance shop roof repair**
Roof repair CTIO Instrument and Facilities Operations Maintenance workshops

3.2. Projects completed in Q1+Q2 of FY2017

- **Policlinic Pachón**
The 2-units building was converted into a policlinic and has been in use as such since October 2016.
- **Hotel Pachón**
Room #7, which used to be in use as policlinic, was converted back into a hotel room
- **Hotel Tololo**
The outside of the hotel Tololo was painted (Q1) and room doors were varnished and room numbers replaced (Q2)
- **Kitchen Tololo**
The kitchen Tololo was renovated. This project started at the end of FY2016 and was completed with the inauguration on January 6, 2017.

4. Projects completed in Q3+1month FY2017

4.1. Road Maintenance: repair of road berm (FY2016 project)

A severe storm in March 2015 washed out part of the road at “kilometer 30” and produced severe damage to the retaining wall at “kilometer 27”. In Q1 of FY2017 repairs were defined in detail: a ford, with culverts at kilometer 30 and replacement of the damaged gabions at kilometer 27. A call for bids was launched in December and in January and February 2017 quotes were received. Work on both areas started on March 25, 2017.

Repair of the road berm consisted of replacing damaged gabions and cleaning out the riverbed upstream. This work was completed at the beginning of May, just before the first winter storm on May 10, 2017. Repairs have held out well despite severe winter weather this year. Installation of a ford is in progress, see Section 5.1.

4.2. Cerro Pachón electric substation (FY2016 project)

In order to certify the Cerro Pachón electric substation, the critical areas of this station have been fenced off and, electrical warning signboards have been installed, and with this the preparations for certification of the Cerro Pachón electric substation are complete. We plan to certify this electric substation together with the Cerro Tololo electric substation by the end of FY2018 or beginning of FY2019, once the upgrade of the Cerro Tololo substation is complete (see Section 5.2)

4.3. La Serena Hotel (FY2017 project)

With the arrival of LSST a new office building and data center will be constructed on the La Serena compound. And, to make space in the area near the existing office buildings, the La Serena hotel building had to be removed. We continue to offer a hotel service in La Serena; we have converted House 9 into a

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guesthouse/hotel. We have added two full bathrooms, so that all four bedrooms in the house have a private bathroom. We have also added a lavatory for daytime users of the hotel. The renovation was completed in the last week of June, and furniture was moved over, in time to receive the first guests in Casa 9 on June 30 2017.

5. Projects in progress

5.1. Road Maintenance: repair of wash-out (FY2016 project)

The second part of the road repair project described under Section 4.1, repair of the wash out at “kilometer 30”, is nearing completion. A ford is being installed, containing four culverts and a concrete road deck. The project suffered delays because of the various winter storms, but the work itself was not affected. The project is expected to be complete before the end of September 2017.

5.2. Cerro Tololo electric substation (NCE project)

Renovation and upgrades of the equipment in the Tololo Power House are underway, and are funded through the No-Cost-Extension of the NOAO Cooperative Agreement 2010-2015. Most of the new equipment has arrived and has been installed. Remaining is the installation of the protection cells, which are expected to arrive in first quarter of FY2018.

In parallel with the renewal of equipment, improvements have been made to the general area of the powerhouse and transformers. Access to the powerhouse has been improved and part of the bodega was converted to host a new 1MVA transformer. This additional work was funded through the regular operations budget.

5.3. Kitchen Pachón (FY2016 project)

Planning of the Pachón dining room and kitchen expansion has just started, with the goal of receiving quotes before the end of October 2017. Work will start shortly after and is expected to last half a year. The project includes an enlargement of the kitchen, renewal of equipment where necessary, and expansion of the dining area. It will also include improving the gym area.

5.4. Heaters Hotel & Kitchens Tololo and Pachón (FY2016 projects)

In Q2 we reviewed the status of all heaters on Cerro Tololo and Cerro Pachón and defined for each heater if it needs to be replaced and if the area and piping needs to be upgraded. In the coming few years we plan to replace all air heaters with water heaters to comply with Chilean safety standards.

Replacement of the air heaters of the Tololo houses and the upgrade of the piping and manifold of the water heaters of the Tololo Technician and 10-units buildings is planned for the half of FY2018. The upgrade of the heating system of the hotel/restaurant building on Cerro Pachón will be planned for and carried out in conjunction with the amplification of the Pachón kitchen/dining facilities.

The upgrades of the heating systems of the Round-Office-Building on Cerro Tololo are included in the FY2018 plan, towards the end of FY2018. The upgrade of the heating system of the Tololo hotel/restaurant building will be deferred to FY2019. These last two projects involve major upgrades not

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only of the heating equipment, but also of the heat distribution system (from hot air to radiators) and, in the case of the hotel/restaurant building will include the construction of a caseta to separate the heating system from electric panels.

5.5. Electric equipment and spares (FY2017 project)

We planned to purchase a spare automatic circuit re-closer, as well as electric equipment. However, as the cost of installations of the automatic circuit re-closers was higher than budgeted by 4 MCLP (see Table 2), the budget available for electric equipment and spares is only 10MCLP. Purchases will therefore be limited to a spare automatic circuit re-closer only.

5.6. Medium Tension Power Lines (FY2017 project)

We will be renewing parts of the medium tension power lines, in the part bifurcation to Cerro Pachón. Most of the materials have been purchased, but the actual installation by an external contractor, will start after winter. The project will continue into the first half of FY2018.

6. Projects that are late or on-hold

6.1. Tololo Water Supply System improvements (FY2017 project)

We plan to upgrade the fill system for the water tanks on Tololo, renew the chlorination system and implement a water level measurement system. This project will be included in the AURA Potable Water System upgrade, as part of the AURA Major Improvement Projects, and will be carried out in FY2018 (by external contract).

6.2. Upgrade Tololo Sewage System (FY2017 project)

As part of the renovation of the Tololo kitchen, the kitchen sewage system was renewed, including a new degreasing chamber. Expenses for this part of the project were part of the kitchen renovation. Originally we had planned to install a water treatment plant for the sewage system of the Tololo hotel/restaurant building only. However, we now plan to revise all septic tanks on Cerro Tololo, and evaluate whether major maintenance is sufficient or whether it is necessary to replace the tank with a water treatment plant. Definition of this project will be on hold until after winter, and will be executed in FY2018.

6.3. Backhoe purchase (FY2017 project)

We plan to use part of the upgrade and improvement budgets for renewal of major equipment, e.g. heavy equipment to be used for road maintenance. When the FY2017 budget was being prepared, funds for the purchase of a backhoe were included. However, the repair at kilometer 30 and 27 is significantly more costly than what was budgeted, and the purchase of the backhoe is on-hold.

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Table 1: Summary Project Accounts, July 31 2017

Projects	Fiscal Year	Status	Total FY2016 + FY2017		Encumbrance	Balance
			Budget	Spent		
Road Repair / Maintenance	FY2016	In Progress	37,189,072			
	FY2016	Complete FY2017Q3	18,594,536	52,027,342	41,774,270	-4,585,198
	FY2017	Postponed, depending funding	86,014,158			-33,432,806
Total			141,797,765	52,027,342	41,774,270	86,014,158
Water & sewage	Extra FY2016	Complete FY2016		2,527,155		-2,527,155
	FY2017	Postponed to FY2018/FY2019	16,176,975			16,176,975
	FY2017	In Progress	20,780,179	2,527,155		20,780,179
Total			36,957,154	2,527,155		34,429,999
Electric System	FY2016	Complete FY2016	37,189,072	41,094,836		-3,905,764
	FY2017	In Progress	14,993,294			14,993,294
	FY2016	In Progress	3,718,907	124,325		3,594,582
	FY2016	Complete FY2017Q3	8,677,450	11,778,434		-3,100,984
	FY2017	In Progress	25,383,383	2,627,800		22,755,583
	Total		89,962,105	55,625,394		34,336,711
Buildings	FY2016	Complete FY2017Q1	11,776,539	15,938,422		-4,161,883
	FY2016	In Progress	61,981,786	766,809		61,214,977
	FY2016	Complete FY2017Q1	14,131,847	20,019,667		-5,887,819
	FY2016	Postponed to FY2018	23,553,079	3,801,766		19,751,312
	FY2017	Complete FY2017Q3	13,152,012	9,858,045	387,500	2,906,467
	Total	Extra FY2016	124,595,263	60,590,319	387,500	-10,205,609
Communications	FY2016	Complete FY2017Q1	11,528,612	14,834,929		-3,306,317
	Total		11,528,612	14,834,929		-3,306,317
Other	FY2016		66,196,547	6,700,816		59,495,732
Overhead & IPC	FY2016		66,196,547	6,700,816		59,495,732
Business Service Charges						
Overhead						
Total			471,037,447	192,305,954	42,161,770	236,569,723

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Table 2: Overview Project Accounts, July 31 2017

Projects	Fiscal Year	Status	FY2016		Carry forward from FY2016 to FY2017	FY2017		Encumbrance 7/31/17	Balance 07/31/2017
			Budget	Budget Including overhead		Budget	Budget Including overhead		
Road Repair / Maintenance Repair of washout Repair of road berm Backhoe Total	FY2016	In Progress	30,000,000	37,189,072	37,189,072				-4,585,198
	FY2016	Complete FY2017Q3	15,000,000	18,594,536	18,594,536			41,774,270	-33,432,806
	FY2017	Postponed, depending funding				65,400,000	86,014,158	52,027,342	86,014,158
Water & sewage Renew pumps for water supply system Water Treatment System and Water level meters Improvement Sewage System Tololo Total	Extra FY2016	Complete FY2016		2,527,155	-2,527,155				-2,527,155
	FY2017	Postponed to FY2018/FY2019							16,176,975
	FY2017	In Progress				12,300,000	16,176,975		20,780,179
Electric System Automatic Circuit Reclosers Equipment & spares Electric Substation Tololo Electric Substation Pachón Replace cables, MT Lines Pachon Total	FY2016	Complete FY2016	30,000,000	37,189,072	-3,887,645		18,119		-3,905,764
	FY2017	In Progress	3,000,000	3,718,907	3,718,907	11,400,000	14,893,294	124,325	14,993,294
	FY2016	Complete FY2017Q3	7,000,000	8,677,450	8,677,450			11,778,434	3,594,582
Buildings Kitchen Tololo Kitchen Pachón Hotel Buildings Improvements Heaters Hotel/Kitchen Tololo/Pachon Move Hotel La Serena to house #9 Roof repairs La Serena Maintenance Shop Total	FY2016	Complete FY2017Q1	9,500,000	11,776,539	6,824,004				-4,161,883
	FY2016	In Progress	50,000,000	61,981,786	61,214,977			10,985,887	61,214,977
	FY2016	Complete FY2017Q1	11,400,000	14,131,847	1,658,336			7,546,155	-5,887,819
Communications Communication Network Total	FY2016	Complete FY2017Q3	19,000,000	23,553,079	19,751,312				19,751,312
	FY2017	Complete FY2017Q3				10,000,000	13,152,012	387,500	2,906,467
	Extra FY2016	Complete FY2016		10,205,609	-10,205,609			387,500	-10,205,609
Other Severance Pay Overhead & IPC IPC Business Service Charges Overhead Total	FY2016	Complete FY2017Q1	9,300,000	11,528,612	-3,306,317				-3,306,317
	FY2016		53,400,000	66,196,547	59,495,732				59,495,732
			9,504,000 13,590,720 33,842,727			4,700,000 7,600,000 30,000,000			59,495,732
Total			294,537,447	294,537,447	197,197,600	176,500,000	176,500,000	42,161,770	236,569,723