WFMOS PROJECT

90.00.00.01_30.00.00.00_ICD

Version: 6

WFMOS to Telescope Enclosure

ICD

Version:	**6**	**Date:**
Issued by:	Scot Kleinman	15Oct08
Approved by:	**Subaru Manager:**	
	Gemini Manager:	
	Gemini Engineering:	

90.00.00.01_30.20.00.00_ICD, Revision Control

Revision: 1, Scot Kleinman, 3Apr08

Revision: 2, Scot Kleinman, 15Apr08 – minor clarifications.

Revision: 3, Scot Kleinman, 13May08 – allow 5% heat dissipation in spectrograph room(s). Added discussion of 80.10.10.01_REF which includes enclosure vibration analysis results. Added elevator information.

Revision: 4, Scot Kleinman, 16May08 – clarified :5% of 3000W = 150W.

Revision: 5, Scot Kleinman 1Jul08 – added weight limit of control building to dome elevator.

Revsion: 6, Scot Kleinman, 15Oct08 – added more information about cooling options (closed-cycle systems, not liquid cryogens).

Contents

1. Introduction

This document describes the interfaces between WFMOS and the Subaru telescope enclosure. It includes relevant details about the available spectrograph rooms, fiber bundle mounting, TUE floor and other aspects of interfacing an instrument to the Subaru enclosure.

2. Related Documents

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Document Number	Document Name
30.00.00.00_DWG	Subaru Enclosure and Floor Drawings
80.10.10.01_REF	Subaru Telescope Performance Paper
82.00.00.00_DWG	BSIT Load Schematic
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3. Spectrograph Room

There are other possibilities if usage can be justified, but the preferred room for the WFMOS spectrographs is the third (tertiary) floor room on the -X (IR) side of the enclosure. This room is immediately below FMOS and is available exclusively for WFMOS. Document 30.00.00.00_DWG shows the three-dimensional plan of the room. There is crane access to the observing (first) floor of the dome through which a 1.8x1.8x2.0m (LxWxH) object could be maneuvered and positioned into place on the floor. The corresponding room on the +X (Optical) side of the dome could also be used, although there is no direct crane access for this room.

3.1 Weight limits – Spectrograph Room

There is currently no floor in either of these two rooms. A Subaru-provided element is the completion of a room for the WFMOS spectrographs. Based on the floor recently installed for FMOS, the following weight limits can be expected for WFMOS:
Total weight limit: 10 metric tons.
Maximum weight distribution: 250 kg/m^2.

3.2 Heat allowance – Spectrograph Room

The dome coolant system can be used to carry away excess heat. Current coolant capacity is ~3kW, but more could be added, with additional cost. (This is a Subaru-provided element.) Up to 150W of generated heat can be dissipated directly to the surroundings.

Currently, Subaru offers only closed-cycled helium and glycol for cooling. Other closed-cycle systems are allowed, but like Gemini, liquid cryogens are not allowed for routine operations. Sumitomo helium compressors are preferred.

3.3 Vibration – Spectrograph Room

Since the spectrograph room(s') floors have not been built yet, precise vibration information is not available, but there is a discussion of vibration as measured in the FMOS room (labeled *Dome* in their Figure 13) and Nasmyth platforms in the 2004 SPIE Ground-Based Telescopes proceedings, volume 5489, page 278. An electronic version of this paper is provided in document 80.10.10.01_REF.

3.4 Power – Spectrograph Room

Power is not currently available in the two proposed spectrograph rooms. However, there are some existing circuits nearby that could easily be brought in. If these available circuits cannot meet power needs, new circuits can be run, at additional cost to this Subaru-provided element. The currently available circuits are:

UPS and Generator backed: 2x 0.5 kVA, 3 phase 208V or 1 phase 120V, 15A breaker.

Non-backed up power: 2kVA, 3 phase 480V or 2 phase 277V, and/or
1kVA 3 phase 208V or 1 phase 120V, 15A breaker.

3.5 Other services – Spectrograph Room

There are currently no other services in these rooms, but the following services can be installed, if needed:
Network, glycol, closed-cycle He, and dry compressed air and nitrogen.

4. TUE Room

The TUE room will include space for the swapping and storage of WFMOS in/out of the PFU. Similar services as to those available at the PF will be available in the TUE room as well.

5. Fiber routing

Fiber /cable routing from the Prime Focus to the WFMOS spectrograph room is covered in the WFMOS to Telescope ICD, 90.00.00.01_10.00.00.00_ICD.

6. Equipment <-> Dome Access

Document 30.00.00.00_DWG shows some of the crane and instrument access routes within the Subaru Enclosure.

7. Telescope Access

It is possible to access the PF using the “cherry picker” from the observing floor with the telescope tilted appropriately in altitude.

The Subaru Enclosure has three elevators. The freight elevator is outside the dome and connects the Control Building to the ground floor of the dome. It has a weight limit of 3628kg. The IR (-x) side internal elevator travels between the dome floor and the Nasmyth floor. The Optical (+x) side elevator travels between the dome floor and the TUE floor, with stops at the Nasmyth and Tertiary floors as well. The internal dome elevators have a weight limit of 1580kg.

8. Transport to Summit

Subaru has a vehicle, the BSIT, specifically designed to transport instruments from the base facility to the summit. While originally designed to accommodate the footprint of Cassegrain instruments, it has recently been modified to include some adaptor plates and a different instrument-mounting scheme to transport instruments of slightly different footprints as well (notably, some IR Nasmyth instruments including IRCS and AO188). Drawing 82.00.00.00_DWG illustrates the loading capacity of the BSIT.