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		IDENTIFICATION			
		LIGO-E980072-03-B ICD-PPH			
TITLE	PUMP PORT HARDWARE TO VACUUM EQUIPMENT	REFERENCE NO. 953570		SHT 1 OF 4	
		OFFICE LIGO		REVISION 3	
PRODUCT	LIGO BEAM TUBE MODULES CALIFORNIA INSTITUTE OF TECHNOLOGY	MADE BY WAC	CHKD BY MLT	MADE BY PBS	CHKD BY MLT
		DATE 3/8/96	DATE 3/8/96	DATE 5/14/98	DATE 5/19/98

1.0 SCOPE

This document provides the interface information for mechanical, electrical, utility and dimensional interfaces associated with the connection of the turbopump and roughing skids to the pump port hardware systems.

2.0 APPLICABLE DOCUMENTS

2.1 The following documents are applicable to the interfaces between the PPH and the VE.

Beam Tube Contract	LIGO-C951080-00-B
Vacuum Equipment Contract	LIGO-C950804-00
Beam Tube Pump Port Hardware	LIGO-D950027 Rev. B

2.2 A current copy of all equipment skids and operations manuals will be available of the use of the acceptance test personnel. CBI shall provide a current copy of the drawings and operations manuals of the pump port hardware and LIGO will provide a current copy of all drawings and operations manuals of the pump carts, cooling carts and air compressor carts.

3.0 INTERFACE REQUIREMENTS

3.1 ELECTRICAL INTERFACES - INTERMEDIATE PUMP PORTS

The following electrical connections will be provided at pump ports for the roughing pumps and turbopumps.

3.1.1 480V 3∅ Power Supply

CBI will provide one 480V, 3∅, 30 A (24 KVA) electrical supply for the roughing pump skids within the beam tube enclosure service entrance in the corner near the doors. The CBI receptacle will be a Hubbell #560R7W receptacle. Three phase power shall be installed with consistant phasing for all of the power supplies. CBI will provide circuit breakers or disconnects if required by the National Electrical Code (NFPA 70).

APPROVED
CBI 5/20/98 DATE
LIGO 5/25/98 DATE

3.1.2 208V Power Supply

CBI will provide one 208V, 3∅, 30 A (10KVA) circuit for the large (roughing pump) water chiller with a Hubbell #460R9W receptacle. One 208V, 3∅, 20 A (7 KVA) circuit for the main turbo pump with a Hubbell #560R9W will be provided. One 208V, 3∅, 15 A (5 KVA) circuit for the small (main turbo pump) cooling water skid with a Hubbell # 420R9W receptacle will be provided. One 208V, 1∅, 15A (5 KVA) circuit for the operation of the large air compressor will also be provided. Three phase power shall be installed with consistant phasing for all of the power supplies. CBI will provide circuit breakers or disconnects if required by the National Electrical Code (NFPA 70).

3.1.3 120V Power Supply

CBI will provide two 120V, 1∅, 20 A (2 KVA) electrical circuits at the doorway into the beam tube enclosure. The circuits will be supplied with Hubbell #2310 A receptacles for the aux. turbomolecular pump system and an air compressor. Additional receptacles will be supplied to operate the type"B" hardware and the calibration skid.

3.2 UTILITIES INTERFACES

Other than electricity, the LIGO Project will provide the utilities and consumable fluids including chiller water, chiller antifreeze, and lubricants for the pump carts.

3.3 MECHANICAL INTERFACES

3.3.1 Lifting Capabilities

The pump skids should be provided with an easy method of lifting, such as a lifting eye or forklift channels. Preliminary lifting mechanism details are provided by the Vacuum Equipment contractor on drawing D-4526-A for the roughing pump systems, drawing D-4507-A for the turbomolecular pump systems and drawing D-4508 for the auxiliary turbomolecular pump systems.

3.3.2 Skid Movement Capabilities

The pump skids should be provided with an easy method of moving the skids over a concrete floor, such as wheels, rollers, forklift channels for a pallet mover, etc. The preliminary moving mechanism details are provided by the Vacuum Equipment contractor on drawing D4526-A for the roughing pump systems, drawing D-4507-A for the turbomolecular pump systems and drawing D-4508-A for the auxiliary turbomolecular pump systems.

3.3.3 Pump Skid Covers

Protection of pump skid flanges which must be assembled during the attachment to the pump port hardware should be provided by others. CBI will supply tarp type covers for the skids during transportation to protect the electronics from rain, etc.

3.3.4 Main Turbomolecular Pump Skid Anchor

The main turbomolecular pump cart requires anchoring to the concrete to prevent excessive stresses in the pump port if the turbo pump should seize. CBI will attach the pump cart to the LIGO supplied anchors.

3.3.5 When the turbomolecular pump cart connection to the pump port is to be made with a bellows, a Caltech supplied mechanical restraint shall be used to protect the bellows from collapsing under atmospheric loads. The mechanical restraint shall be clearly tagged, "WARNING: Vent prior to removal".

3.4 DIMENSIONAL INTERFACES

3.4.1 Dimensional References

The dimensions used in the following paragraph are based on horizontal and vertical distances from the centerline of the tube and distance from the centerline of the pump port along the tube axis.

3.4.2.1 Pump Skid Attachment Flange Location

The pump port valve flange face for connection to the pump cart is located at the horizontal centerline of the tube and is located 2' -6 1/2" (0.775 m) radially from the center of the tube. The pump skid attachment flange face is also on the same horizontal radial line from the center of the tube as the pump port. The nominal centerline of the tube is 3'-6" (1.067m) above the top of the floor slab. The

centerline height is then adjustable by ± 3". The pump skids and their inlet piping will permit pump port elevations of 3'-6" ± 3".

3.4.2.2 Pump Skid Attachment Flange Type

The pump skids inlet piping will permit connection to a 13.25 inch Conflat type flange with blind tapped holes at any orientation. CBI will provide bolts and gaskets .