



PROVISION OF SPACE FOR LHO aLIGO OPLEV & PHOTCAL INSTALLATIONS

Abstract:

The purpose of this document is to depict a general set of needs & ideas, and to support dialog, regarding provision of necessary floor & elevation space for the proposed LHO aLIGO Optical Lever and Photon Calibrator installations.

CONTENTS	Page
● Problem Description	2
● Photo Example	2 - 7
● Summary List of Problem Areas	8
● Maps of Problem Areas	9 - 11



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- Description of the Problem:

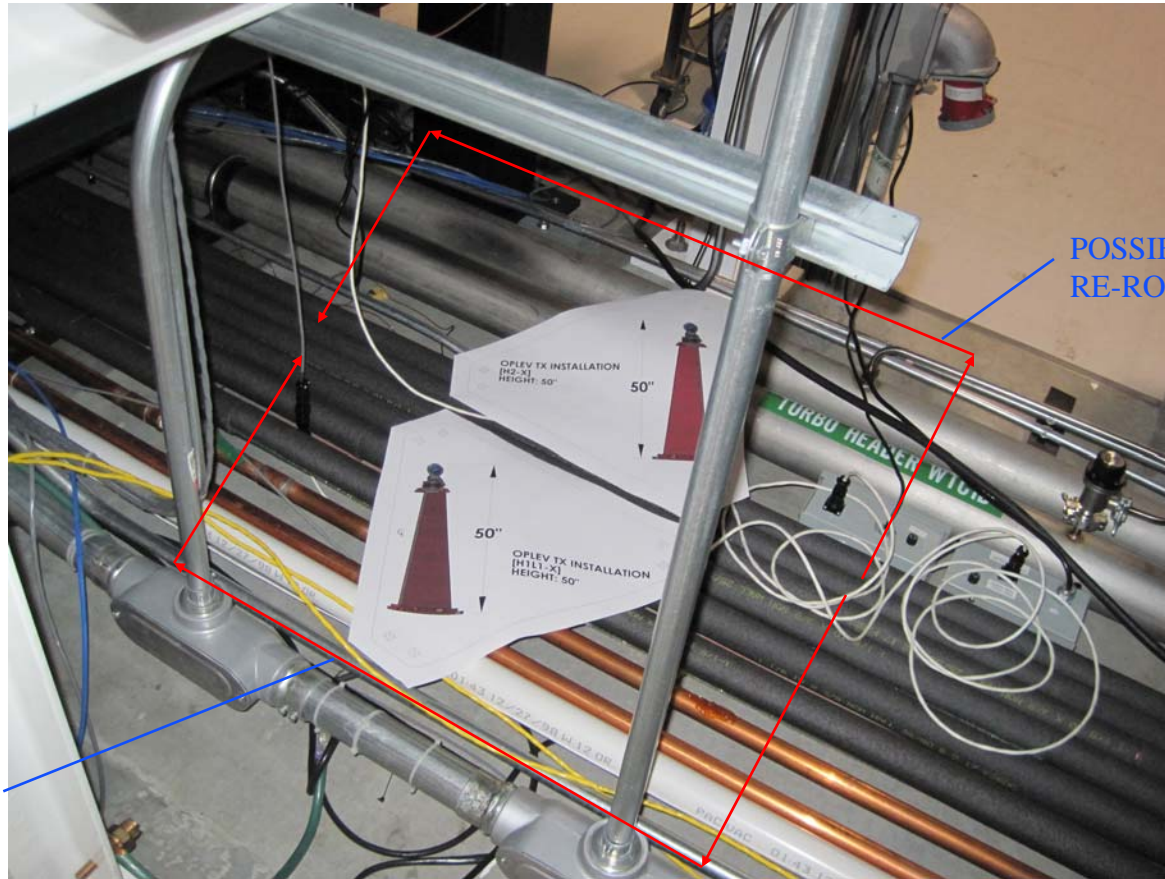
Approximately 50% of all proposed LHO aLIGO Optical Lever and Photon Calibrator installations in their planned locations conflict or may conflict with current infrastructure such as pipes (various kinds & sizes), conduits, cable trays, pump stations, etc.. Also TCS camera installations, which are not yet defined, may become a factor. It is perceived that some of the preceding are more problematic than others to deal with. Existing piping for instance, is a less trivial undertaking to re-route. Conduits and cable trays will be generally less challenging. Of the more significant obstacles, pipes seem to be the most abundant. Where they exist, 2", 4", and/or 6" vacuum/clean air pipes are usually included.

- Example:

The following photos depict the problems facing the LHO X-arm ITM Optical Lever installation. These involve piping and possibly aLIGO TCS camera installations.



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POSSIBLE PIPE
RE-ROUTING SCHEME

POSSIBLE PIPE
RE-ROUTING SCHEME

LIGO-G1000103-v2

Advanced LIGO

3

Form F0900040-v1



PROVISION OF SPACE FOR LHO aLIGO OPLEV & PHOTCAL INSTALLATIONS

The preceding page photo depicts the floor plans (with embedded elevation views) of the LHO H1&2 ITM-X Optical Lever launchers. They are placed about 2 ft. longitudinally right of the design location WRT/the beam tube. The current-LIGO Optical Lever installation is at the design location. As can be seen, the new installation will necessitate local re-routing of at least eleven pipes including 4" & 6" vacuum/clean air pipes. The re-routing will need to preserve space for the new receiver installations with leaning piers on either side of the manifold end section. Pipes may need to be arranged vertically in some places.



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5

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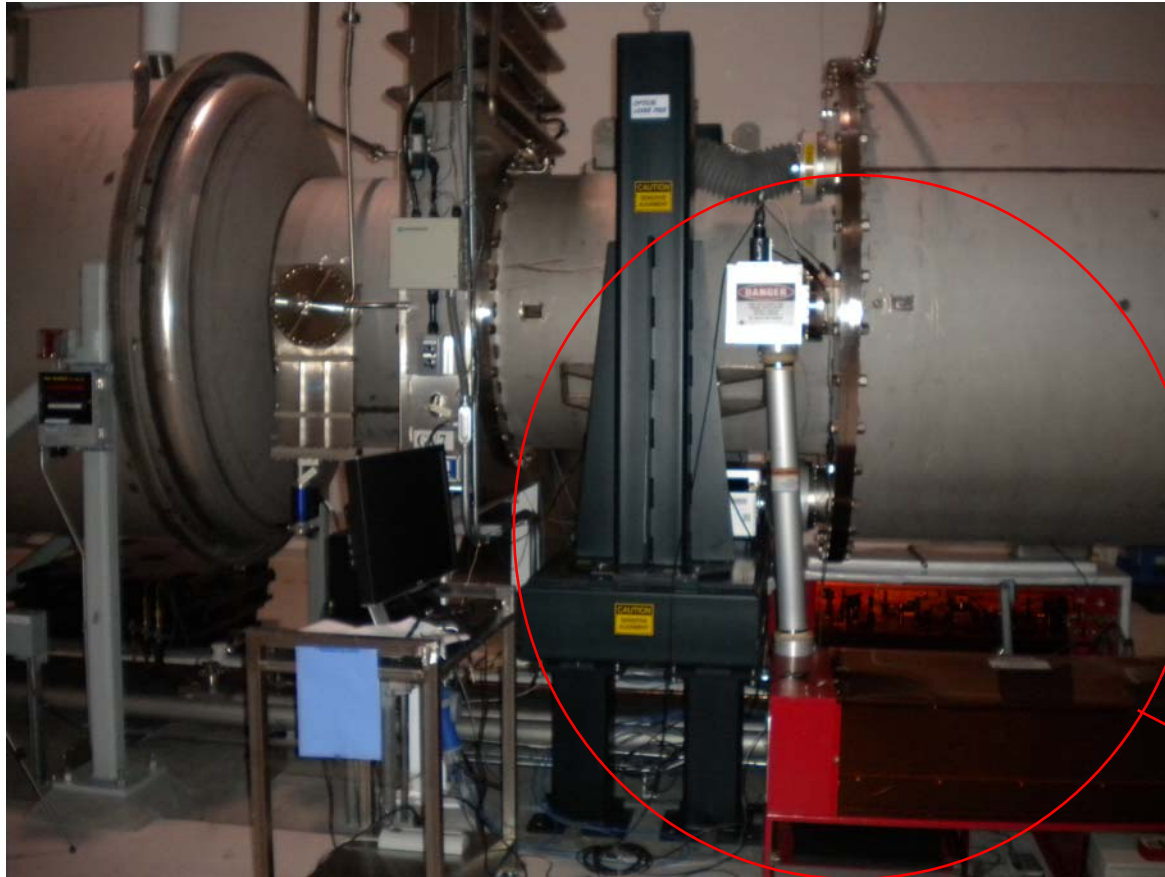
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The preceding photo shows a left hand receiving pier mock-up. On the floor is a footprint & elevation view offset longitudinally ~2 ft. in the direction of LHO GV7. The green current-LIGO Optical Lever installation can be seen at the design position. A current-LIGO TCS installation is shown at the left of the frame with the camera near the top.

The following page shows a current-LIGO TCS installation on the H2 side of the of the arm in the same general location discussed. As mentioned, the yet TBD aLIGO TCS installations may conflict with space for Optical Lever receivers, which use the next higher viewport above the TCS camera shown.



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CURRENT-LIGO
TCS SYSTEMS
(EACH SIDE OF ARM)

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7

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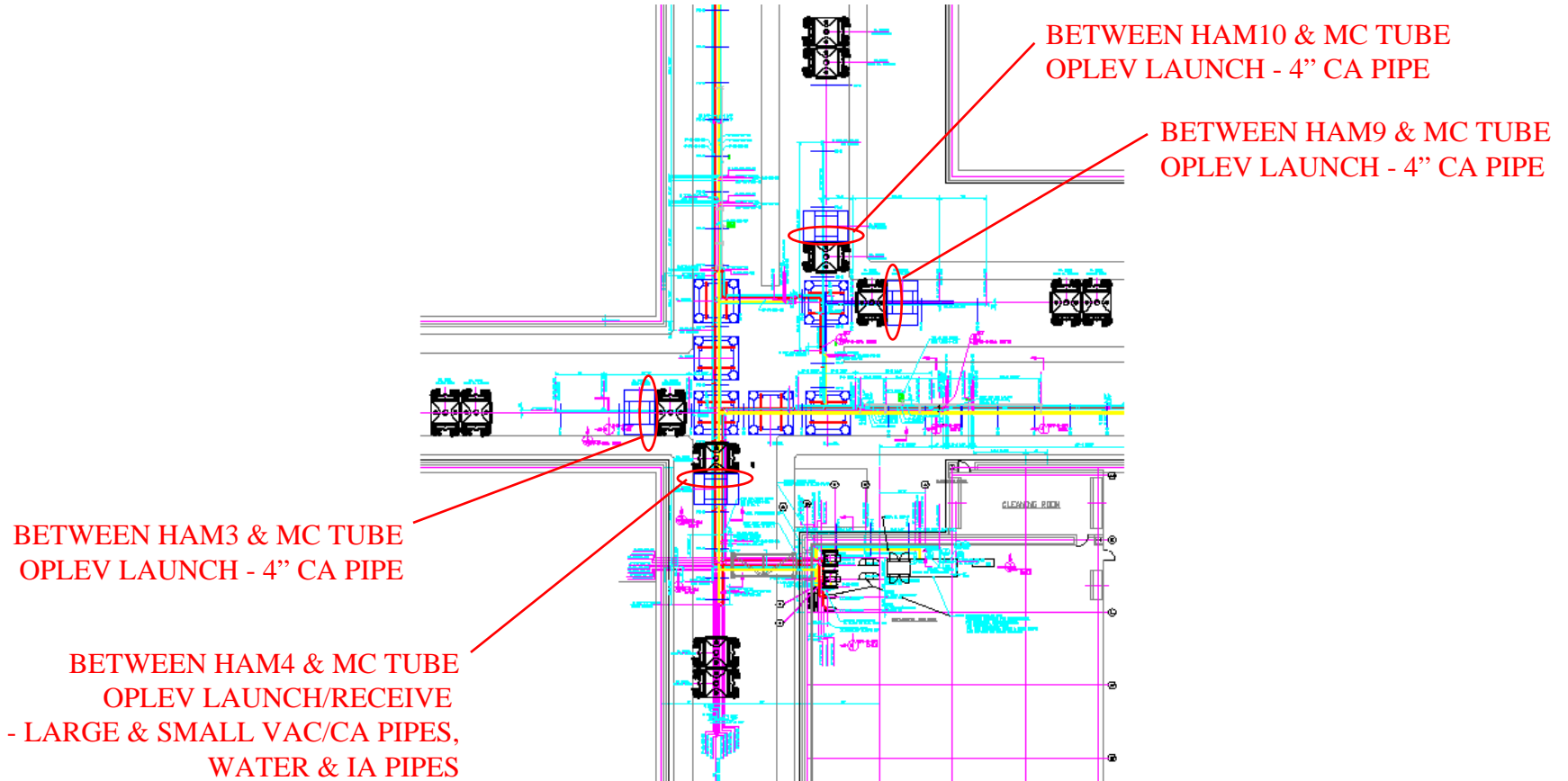
Summary List of LHO Problem Areas:

- IO Oplev Problem Areas (Between HAMs 3, 4, 9, 10, & MC Tubes)
Oplevs for PRs, SRs, HAM Mirrors 2, 5, 8, 11
- ITM Oplev Problem Areas (Far ends of X & Y Arm Manifolds)
Oplevs for H1&2 ITMs
- ETM Oplev & Photcal Problem Areas (End Stations)
Oplevs & Photcals for H1 (only) ETMs



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LHO IO OPLEV PROBLEM AREAS

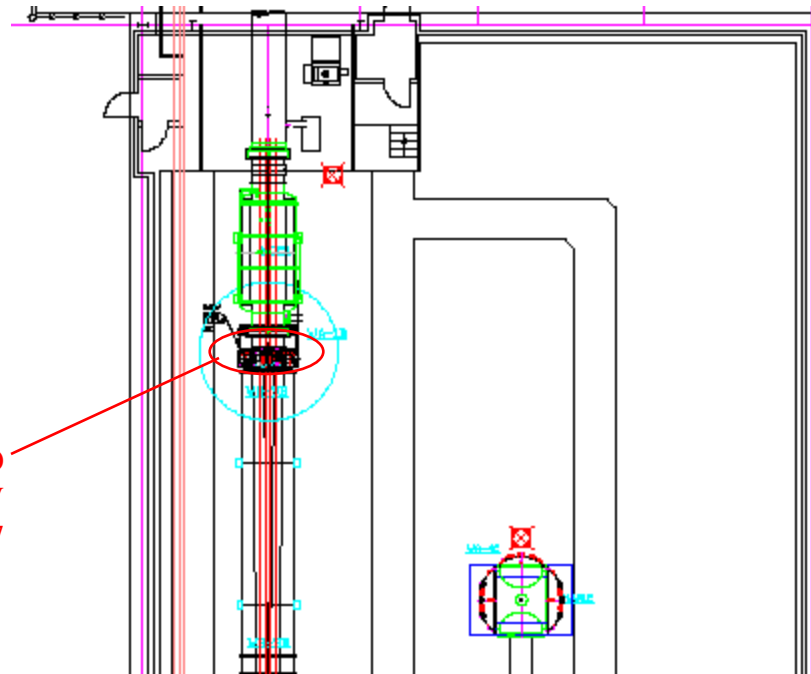


LIGO-G1000103-v2

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LHO ITM-Y OPLEV PROBLEM AREA
(SIMILAR TO LHO ITM-X, SEE PHOTO EXAMPLE P. 2-7)



SEE SIMILAR SCENARIO
ITM-X OPLEV
PHOTO EXAMPLE P. 2-7

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LHO ETM-X OPLEV & PHOTCAL PROBLEM AREA (LHO ETM-Y SCENARIO IS SIMILAR)

