

1 Figure 1.a, Sample Warning Sign for Class 3B and Class 4



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3 Wattage liner optional

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6 Wattage line optional

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8 1b. Sample Warning Sign Class 1M, 2M, 2 and 3R



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10 Wattage line optional

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12 Figure 1c. ANSI Z353.2 Compliant Laser Area Warning Sign Formats

Signal Words:

DANGER Indicates a hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used without the safety alert symbol as an alternative to "NOTICE".

NOTICE: is the preferred signal word to address practices not related to personal injury. The safety alert symbol shall not be used with this signal word. As an alternative to "NOTICE", the word "CAUTION" without the safety alert symbol may be used to indicate a message not related to personal injury.

Message panel. The message shall be in black letters on a white background or white letters on a black background.

Second Language

DANGER **CAUTION**

WARNING **NOTICE**

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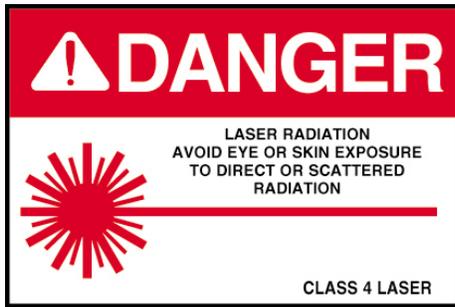
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27 Figure: 2 Laser Warning Signs that have been grandfathered by Z136.1

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30 Would now apply to Kilowatt laser system

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33 Application has not changed

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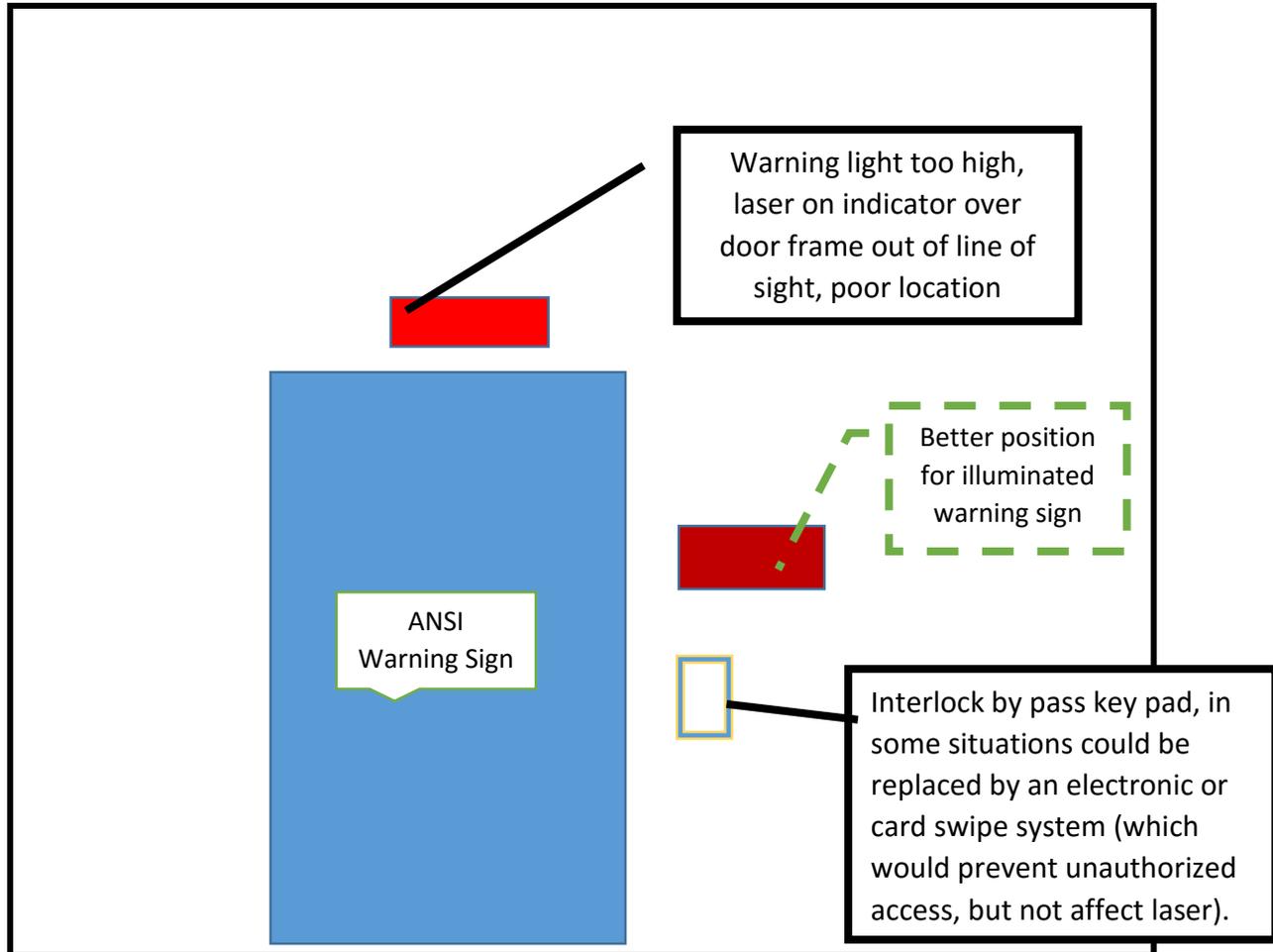
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36 Application would not change, but a strict interpretation of ANSI sign standard,
37 would remove wording on eyewear use

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40 Figure 3 Exterior of LCA Entryway Class 4 Lasers Utilizing a positive
41 access mechanism (interlock, electronic lock)
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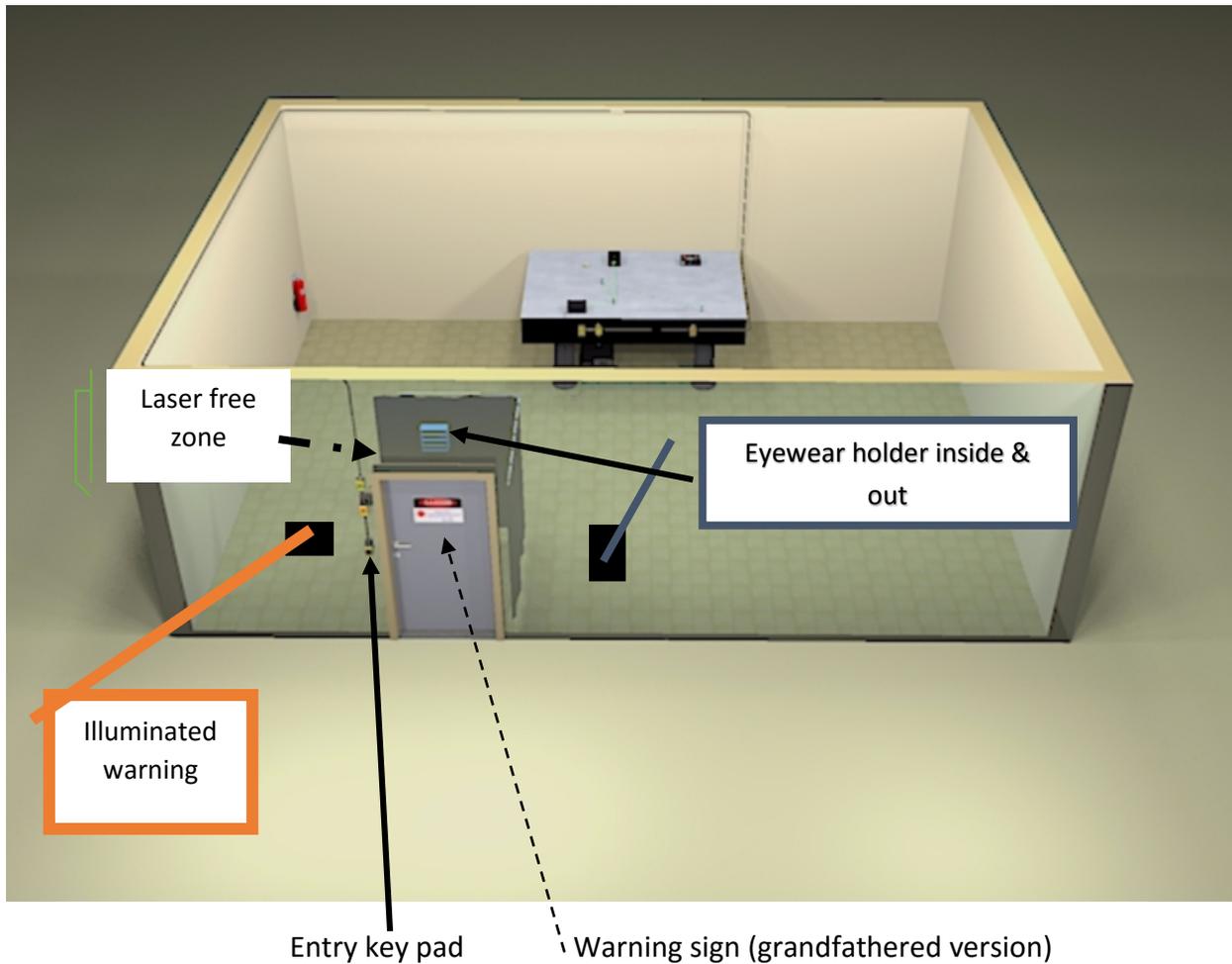


73 **Figure Key & Additional Comments:**

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1. ANSI Warning sign, can be integrated into Institution Hazard Communication Posting, but must contain required information, not just laser symbol
 2. Illuminated Warning sign most commonly indicates that power is on to the laser, not that the beam is accessible. This can be corrected with a dual or tri-light system or programmable digital or flat screen sign.
 3. Missing from figure is Emergency Stop button, LSO needs to determine if this is required as well as possible alternatives to the red mushroom crash button, indication to wear circuit breaker is located.
 4. Light over door frame with no indication of its function can lead to false impressions to area staff and visitors

82 Figure 4 Class 4 laser lab

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87 Note: This example shows a laser free zone upon entry (dog leg maze). Eyewear, SOPs, Safety
88 notices, bench to put on booties are examples of items that could be in this area. This also
89 prevents stray beams from exiting LCA.

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96 Figure 5 Perimeter guard around optical table

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100 Perimeter guard, purpose to contain beams and reflections on the optical table.
101 Best practice is to have the guard made with a diffuse surface, at least on the
102 inside and to be noncombustible for the laser output in use.

- 103 1. Guard walls need to be higher than optics on post, 8- 12 inches works well.
104 Depending on how installed, sections can be removed for access.
- 105 2. A step on platform or step stool will allow greater access to center of table,
106 this avoids lend in and back strain.
- 107 3. Over any periscope optics should have a cover or block a best practice is to
108 label it indicating upward beams present.
- 109 4. Optical tables with energized equipment on them need to be grounded.
- 110 5. If shelves are hanging over optical table, the edges of such shelves need to
111 be padded (pipe instillation works very well for this).
- 112 6. Note this set up only allows access from three sides, this might create
113 safety concerns or be acceptable due to space limitations in LCA.

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