

Technical Bulletin:
**Public Safety Signage
Around Dams**

DRAFT FOR DISCUSSION
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Canadian Dam Association
Association Canadienne des Barrages

www.cda.ca

Public Safety Signage Around Dams

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1.0 Introduction

Signage is one of the most effective means in notifying the public of potential hazards which may be present around dams. There is an expectation from the public that signs will indicate ownership, allowable access areas and hazardous areas.

This standard is meant to provide dam owners with a consistent approach to sizing, wording, colour and format for signage around dams.

For help in determining what type of signage or where signage needs to be located at a dam, consult CDA's Guidelines for Public Safety Around Dams.

2.0 Technical Standards

2.1 Material

- The recommended material signage material is aluminium of 2 mm (0.081-inch) thickness. Lexan may also be used due to its bullet resistant characteristics, where warranted.
- Signs should have rounded corners. Smaller signs may be predrilled for ease of installation.
- In order to enhance visibility in low light conditions, the background and lettering should be retro-reflective.
- The reflective background should be laminated and it is recommended the lettering be screen-printed. Vinyl lettering is not recommended with the exception of the facility name and associated 24 hour emergency contact number on large standard waterway signs in the bottom left hand corner

2.2 Installation

- The method of erection will vary depending on the size, ground surface conditions and wind forces where the sign is to be located. When in doubt concerning an adequate mounting arrangement, a professional engineer should be consulted.
- The method of mounting the sign must be adequate to withstand elements that the sign will likely be subjected to, including minor vandalism.
- "Danger" and "Warning" signs should be oriented such that the sign is clearly visible in daylight under normal conditions and from a safe point so that one would not be required to enter the hazardous area in order to be able to read the sign.
- Small signs should typically be located at eye height where the bottom of the sign is approximately 1.5 metres (4.5 feet) from the ground.
- Large signs must be located at a height to maximize viewing capability taking into consideration of issues such as drifting snow and maintenance.
- All signs need to be clearly visible, positioned in the line of sight, and free from any obstructions or clutter. Signs should attract the eye of the intended viewer and stand out

from surroundings. It is important to locate signs so that persons entering an area from normal access points can see one or more of the signs.

- Reservoirs that have large water level fluctuations should have signage placed to be best viewed at full pond or at the level when most people are present.
- Signs should be positioned where they provide adequate time for viewer response, considering things such as approach speed. In some cases consideration should be given to installing a “warning” sign a suitable distance before a “danger” sign.

2.3 Size

- A sign must be of sufficient size that persons would not have to enter the danger zone to read the signs.
- The size of a sign is determined by the maximum viewing distance with a minimum one centimetre of message text height (capital letter) for every 4.1 meters of viewing distance. See Figure 1A below.

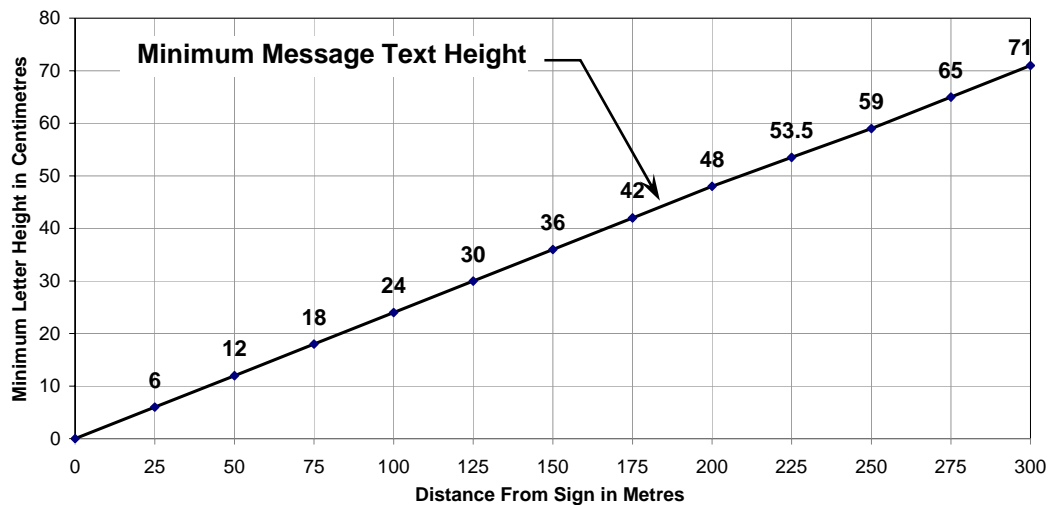


Figure 1A - Viewing Distance Vs Message Text Size

(Source: FERC Guidelines for Public Safety at Hydropower Projects)

- A “small sign” is defined as less than 1.47 m² (<16 ft²).
- A “large sign” is defined as equal to or greater than 1.47 m² (≥16 ft²)

2.4 Colour and Contrast

- The colour red is to be used for “Danger” signs meant to indicate the greatest level of hazard where there is a risk of serious injury or death.
- The colour yellow is to be used for “Warning” signs that are meant to identify a hazardous area where there is risk of minor injury, stranding or as an advance warning.
- White lettering is to be used on red backgrounds and black lettering is to be used on yellow and white backgrounds.

- An “Information” sign typically does not have a “headline text” and is usually on a white background. An exception to this is the standard “No Trespassing” sign, which is on a yellow background.
- The four colours for use on public safety signs:
 - Pantone® Matching System (PMS) 485 Red
 - Pantone® Matching System (PMS) 123 Yellow
 - White
 - Black

2.5 Format

- The size of the text shall be such that the sign is clearly visible in daylight under normal conditions from the approach angle and from a safe point so that one would not be required to enter the hazardous area in order to be able to read the sign.
- The format of a sign may consist of a “headline text” at the top but must have a “message text” in the centre and a white protected space along the bottom with the corporate logo in the bottom right hand corner (see Figure 1B).
- “Headline Text” height shall be a minimum 1.5 times the height of one line of “message text” and capitalized in Helvetica bold font. Typically the headline text is the width of the sign.
- “Message Text” shall be in Helvetica bold font with only the first letter capitalized for each word.
- Figure 1A is provided as a guide for determining the size of lettering required for the “message text”.
- All text on the sign is left aligned except for the company logo. The Headline text due to its size may have the appearance of being centred.
- Large waterway are to have the facility name and 24-hr. emergency phone number located on the bottom left corner of the sign in the white protected space.
- The white protected space at the bottom of all signs is to be equal in height to a single line of “message text”.

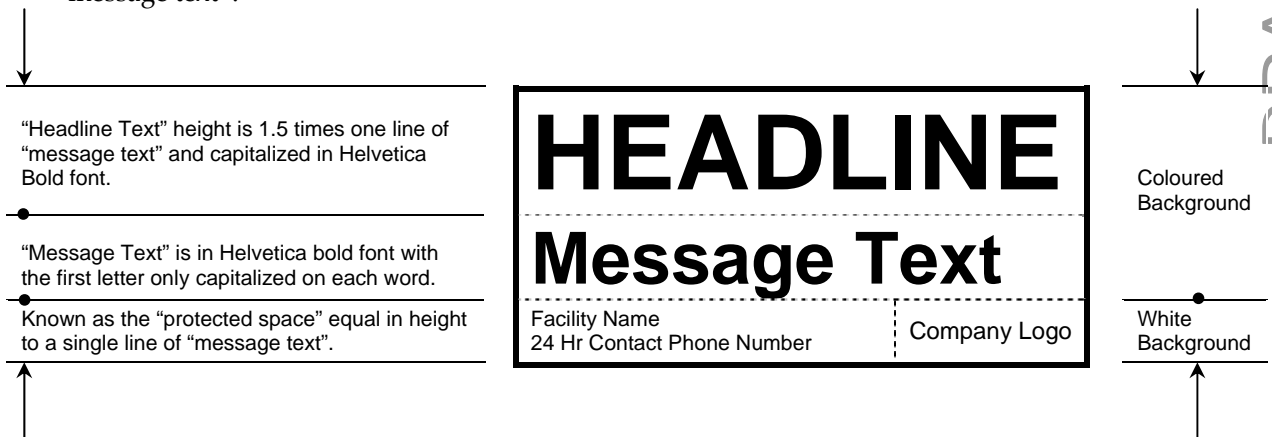


Figure 1B – Sign Format

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2.6 Company Logo

It is important to inform the general public of who the dam owner is. The company Logo or name, is to be placed in the bottom right hand corner.

2.7 Wording

- Concise wording of signs is important to ensure the effectiveness of communication. Signs should convey a message that clearly advises the reader of the actual hazard that is present and the action to take, e.g., Dam Ahead – Keep Out.
- The “Headline Text” and the associated background colour are the primary means of conveying the level of the hazard. As a result, the choice of different “message texts” should be kept to a minimum and as brief as possible.
- In areas of the province where the target audience has been determined to not entirely understand English, use of bilingual signs or signs in a different language may be required.
- Waterway Danger signs must also contain the name of the facility and a 24-hour emergency phone number in the bottom left corner (typically the dam’s operator).
- The message text “**Keep Out**” is more appropriate for waterway “danger” signs than “No Trespassing” in areas where Booms or Buoys are used to delineate a dangerous water area. It is meant to advise the public of what areas they need to keep out of for their safety.
- Instances may exist where large red waterway danger signs are used in locations where Booms or Buoys are not used to delineate the dangerous water area immediately upstream or downstream of a water conveyance structure due to a risk ranking of “low”. In these instances the message text should state “keep away” as opposed to “keep out”.
- At facility locations where audible alarms or video cameras are in place “Information” signs should be used to communicate this fact to the general public. These signs are stand-alone signs but must be mounted directly below existing waterway hazard signs. The waterway hazard signs may be either a Danger sign or a Warning sign depending on the hazard level.
- Appendix A to this document contains signage examples recommended for use around dams.
- In the event that a hazard identified at a site differs from the hazards described in the signage examples in Appendix A, a “message text” should be developed to accurately reflect the hazard identified.

2.8 Quebec Signs

All signs which are to be placed on property within the Province of Quebec are to have the French text equal or greater in size to the English text but the French text cannot be smaller than the English text. (Re: Section 18 of the Regulation respecting the language of commerce and business (r. 9) adopted pursuant to Charter of the French language (R.S.Q., c. C-11, ss. 54.1, 58 and 67).

3.0 Maintenance

The frequency of inspection and maintenance cycles is to be established in the site specific Public Safety Plans. As a minimum all signage at a site should be inspected annually. Deviant behaviour can have the greatest impact on the frequency of inspections required. Signs should be repaired or replaced at any time that damage is sufficient to render the sign unreadable.

As part of a management system, regular reviews of the effectiveness of signage need to be carried out and documented. The following considerations should be made when conducting these reviews:

- Do current signs appropriately convey the importance of a message?
- Are current signs easy to understand?
- Are signs visible, away from clutter or obstructions, and well lit, where appropriate?
- Are signs and colours effective in drawing attention to hazards?
- Are signs posted in the best possible location and within an appropriate distance to the hazard? Are there signs located at all reasonable public access points?
- What is the general condition of existing signs?
- Which areas could benefit from more safety related or general information signs?

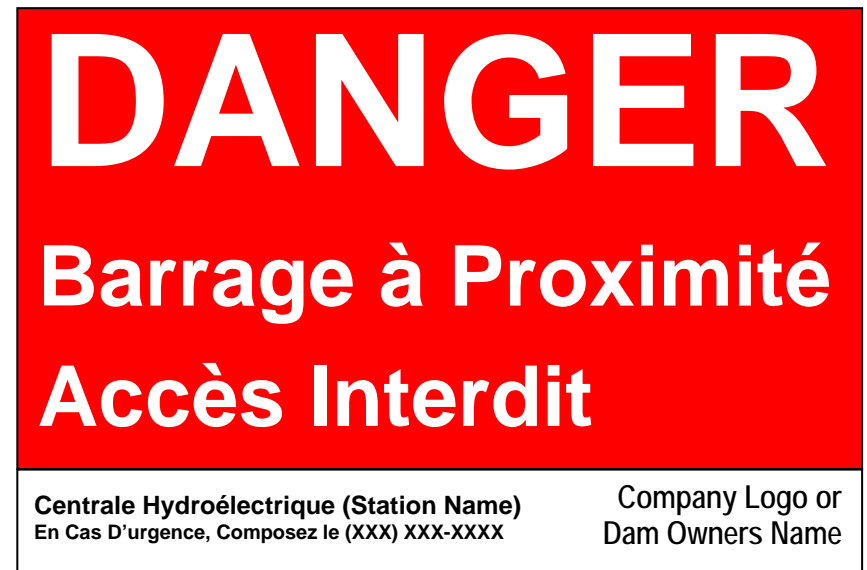
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4.0 Signage Examples

Note: the following examples do not cover all instances where signs may be required. The following may be substituted in applicable situations:

- a) "Keep Away" (Séjour Loin) may be used in rare instances instead of "Keep Out" when it is not feasible/possible to install large signs either upstream or downstream of the structure at the extent of the dangerous water area. In these instances the sign will need to be much larger so that it can be easily read from well outside the dangerous area.
- b) When large waterway signs are installed at a Control Dam instead of a Generating Station the name in the bottom left hand corner should reflect this fact. For the French version it would be "Barrage de Contrôle (Dam Name)".

4.1 Headpond



4.2 Headpond

DANGER	
Dam Ahead – Keep Out	
Access Beyond This Point May Result In Drowning	
Name of Dam In An Emergency Call (XXX) XXX-XXXX	Company Logo or Dam Owners Name

DANGER	
Barrage à Proximité – Accès Interdit	
L'entrée Au-delà De Cet Endroit Peut Mener à Une Noyade	
Centrale Hydroélectrique (Station Name) En Cas D'urgence, Composez le (XXX) XXX-XXXX	Company Logo or Dam Owners Name

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4.3 Headpond

DANGER	
Water Intake – Keep Out	
Access Beyond This Point May Result In Drowning	
Name of Dam In An Emergency Call (XXX) XXX-XXXX	Company Logo or Dam Owners Name

DANGER	
Prises D'eau – Accès Interdit	
L'entrée Au-delà De Cet Endroit Peut Mener à Une Noyade	
Centrale Hydroélectrique (Station Name) En Cas D'urgence, Composez le (XXX) XXX-XXXX	Company Logo or Dam Owners Name

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4.4 Tailrace



DANGER

Keep Out

**Swift Currents & Undertow
May Occur At Anytime**

Name of Dam In An Emergency Call (XXX) XXX-XXXX	Company Logo or Dam Owners Name
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DANGER

Accès Interdit

**Des Courants Forts Et Des
Courants Sous-Marin Peuvent
Se Produire En Tout Temps**

Centrale Hydroélectrique (Station Name) En Cas D'urgence, Composez le (XXX) XXX-XXXX	Company Logo or Dam Owners Name
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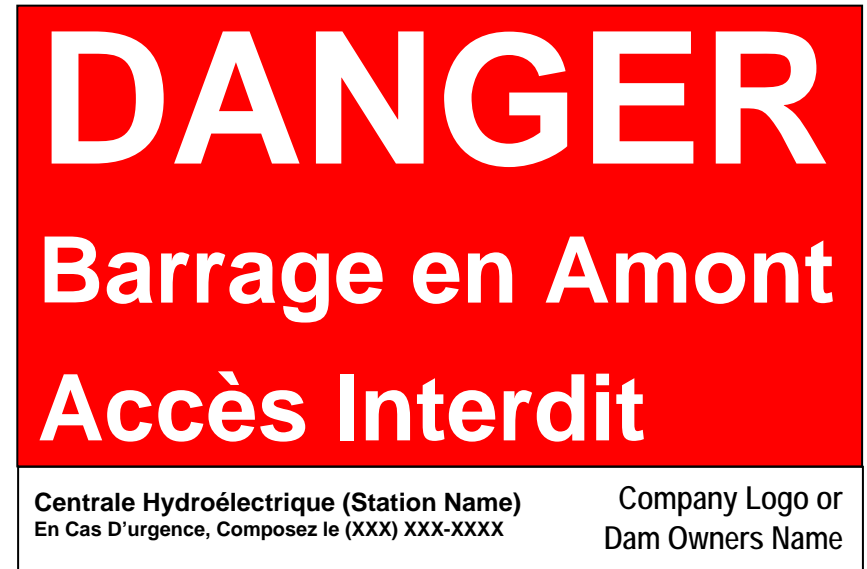
4.5 Tailrace or Spillway

DANGER	
Dam Upstream – Keep Out	
This Riverbed Floods	
Without Warning	
Name of Dam In An Emergency Call (XXX) XXX-XXXX	Company Logo or Dam Owners Name

DANGER	
Barrage en Amont – Accès Interdit	
Les Berges De Cette Rivière Peuvent	
Être Inondées Sans Avertissement	
Centrale Hydroélectrique (Station Name) En Cas D'urgence, Composez le (XXX) XXX-XXXX	Company Logo or Dam Owners Name

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4.6 Tailrace or Spillway



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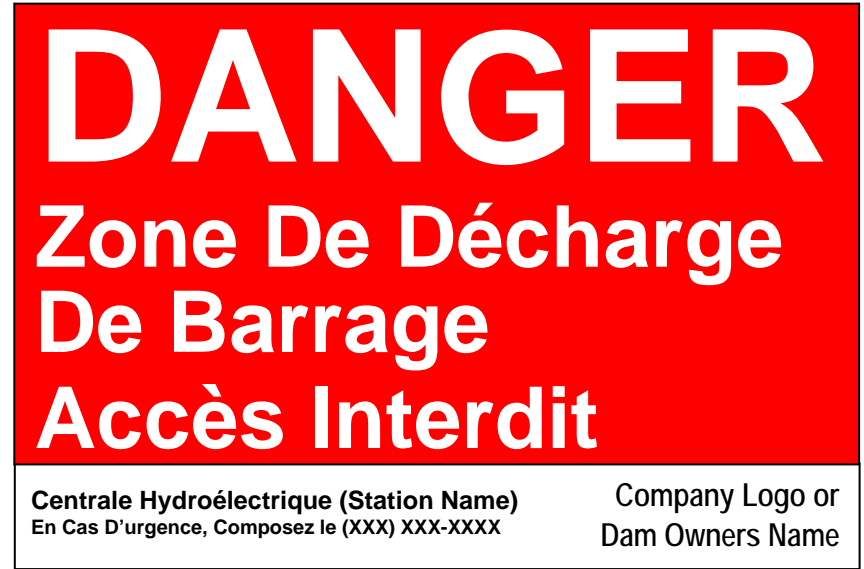
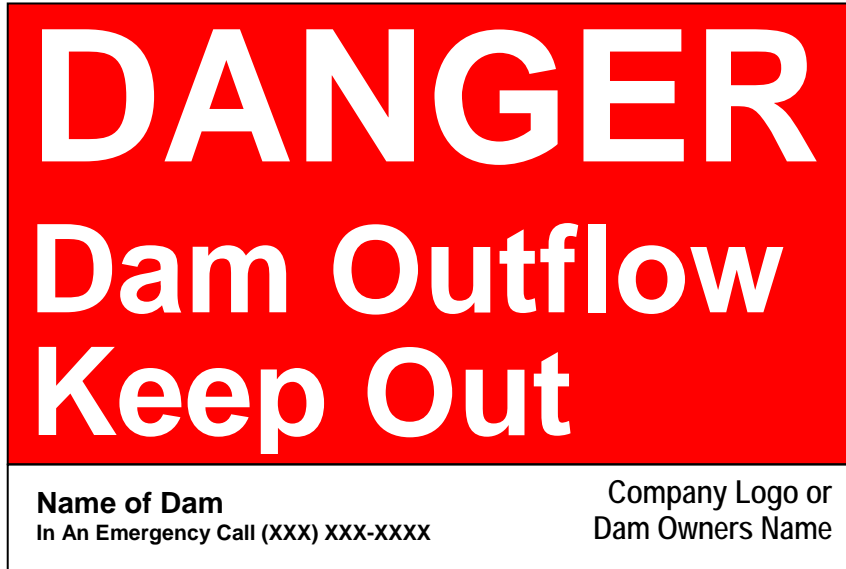
4.7 Tailrace or Spillway

DANGER	
Dam Outflow – Keep Out	
Access Beyond This Point May Result In Drowning	
Name of Dam In An Emergency Call (XXX) XXX-XXXX	Company Logo or Dam Owners Name

DANGER	
Zone De Décharge De Barrage – Accès Interdit	
L'entrée Au-delà De Cet Endroit Peut Mener à Une Noyade	
Centrale Hydroélectrique (Station Name) En Cas D'urgence, Composez le (XXX) XXX-XXXX	Company Logo or Dam Owners Name

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4.8 Tailrace or Spillway



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4.9 Dam Crest Sign – 4 ft. x 4 ft. (Facing approaches by land)



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4.10 Audible/Visual Alarms or Video Surveillance

Note these would be added to the bottom of a "Waterway" signs. The height of both the sign and the lettering is proportional to the length which matches the length of the waterway sign.

**Siren Indicates Rapid Changes In
Water Levels And Flow**

**La Sirène Signale Des Fluctuations
Rapides Du Niveau D'eau Et Du Courant**

**Siren or Flashing Light Indicates Rapid
Changes In Water Levels And Flow**

**La Sirène Ou Le Feu Clignotant Signale Des
Fluctuations Rapides Du Niveau D'eau Et Du Courant**

**Be Advised You May Be Under
Video Surveillance**

**Notez Que Vous Pouvez Être Sous
Vidéo- Surveillance**

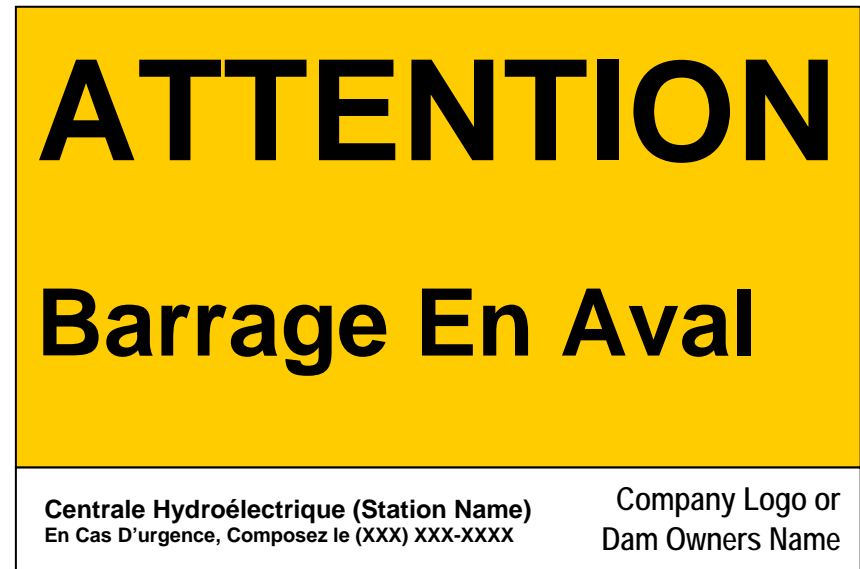
4.11 Warning Sign – Downstream

WARNING	
Dam Upstream	
Water Levels And Flow May Change Without Notice	
Name of Dam In An Emergency Call (XXX) XXX-XXXX	Company Logo or Dam Owners Name

ATTENTION	
Barrage En Amont	
Variation Rapide De Niveaux D'eau Sans Préavis	
Centrale Hydroélectrique (Station Name) En Cas D'urgence, Composez le (XXX) XXX-XXXX	Company Logo or Dam Owners Name

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4.12 Warning Sign - Upstream



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4.13 Public Use Sign

English

Note: 4 ft. x 8 ft. typically to be read by approaching by land.

NOTICE

This is private property. Members of the public are authorized to use this Boat Launch by Ontario Power Generation under the following conditions:

- No camping
- No fires
- No cutting of wood
- No garbage
- No damage to OPG property

Failure to abide by the above conditions will result in loss of privilege to access this property.

For further information contact (XXX) XXX-XXXX Company Logo or Dam Owners Name

French

Note: 4 ft. x 8 ft. typically to be read by approaching by land.

AVIS

Ceci est un terrain privé. Ontario Power Generation autorise l'utilisation de cette rampe de mise à l'eau sous les conditions suivantes:

- Coupe de bois interdit
- Camping interdit
- Vandalisme interdit
- Déchets interdits
- Feux interdits

Les abus mèneront à la perte d'accès à ce site.

Pour de plus amples renseignements, composez le (xxx) xxx-xxxx Company Logo or Dam Owners Name

NOTICE

This is private property. Members of the public are authorized to use this Boat Launch by Ontario Power Generation under the following conditions:

- No fires
- No garbage
- No camping
- No cutting of wood
- No damage to OPG property

Failure to abide by the above conditions will result in loss of privilege to access this property.

For further information contact (XXX) XXX-XXXX Company Logo or Dam Owners Name

24" x 36 "

AVIS

Ceci est un terrain privé. Ontario Power Generation autorise l'utilisation de cette rampe de mise à l'eau sous les conditions suivantes:

- Coupe de bois interdit
- Déchets interdits
- Camping interdit
- Feux interdits
- Vandalisme interdit

Les abus mèneront à la perte d'accès à ce site.

Pour de plus amples renseignements, composez le (xxx) xxx-xxxx Company Logo or Dam Owners Name

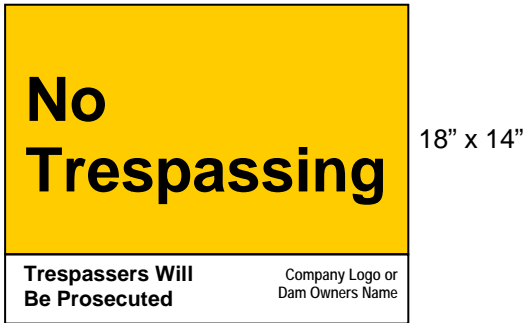
24" x 36 "

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4.14 Small Signs

4.14.1 No Trespassing

English



French



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4.14.2 Access Beyond This Point May Result In Drowning

English



18" x 24"

French



18" x 24"



18" x 24"

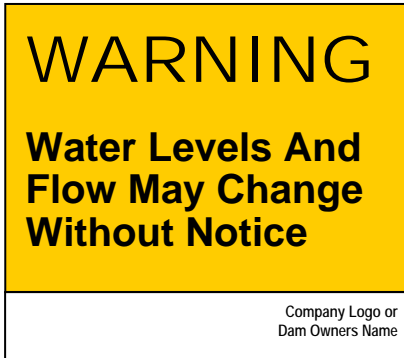


18" x 24"

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4.14.3 Warning – Water Levels & Flows May Change Without Notice

English

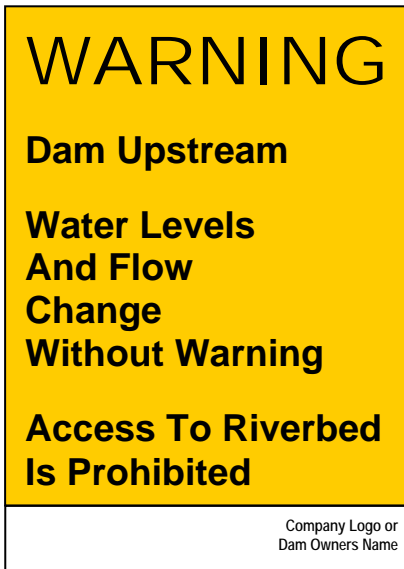


18" x 16"

French



18" x 16"



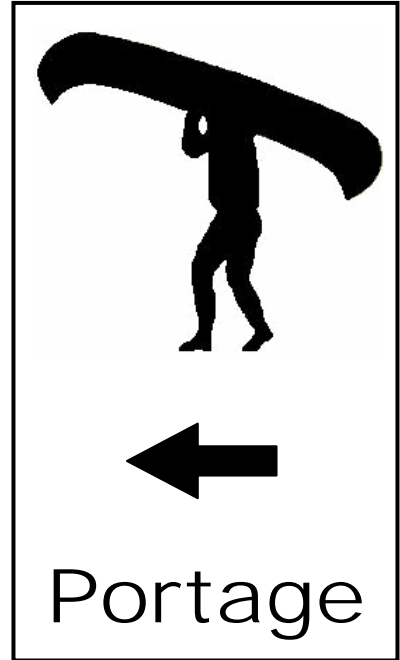
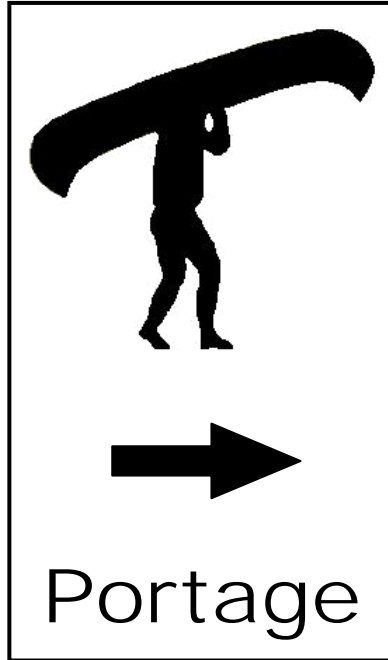
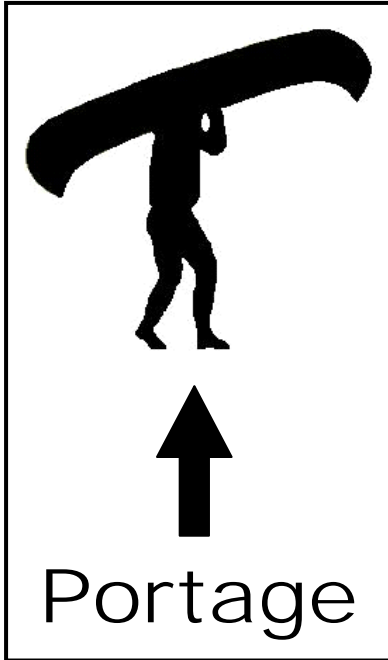
18" x 30"



18" x 30"

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4.14.4 Portage Sign , 12" x 20"



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