Title	**PORTABLE AND FIXED LADDER PROCEDURE**	Procedure No.	**2005k**
Department	**ORGANIZATIONAL SUPPORT SERVICES (HUMAN RESOURCES)**		
Reference(s)	- Policy: Health and Safety	Effective Date	2011 Sept. 13

Preamble

The Thames Valley District School Board recognizes within a school environment the need to work for short periods of times at heights that would require the use of a portable ladder. The Thames Valley District School Board also recognizes that not all schools have walk out access to roofs and those authorized individuals who need to access roofs require the assistance of a ladder to perform their duties.

At no time is an individual allowed to use a table, chair, desk, shelf, counter top, window ledge, or other such items in substitution of a ladder.

This document shall provide the standard practice in the selection, inspection and use of portable ladders for Thames Valley District School Board Staff.

Application

Any employee of the Board who, within the scope of his/her work, who may be required to use a ladder for the purpose of performing duties that are at a height which can not be normally reached from ground/floor level.

The use of a ladder is intended to aid the individual in performing the duties required and is not to be used for any other purpose. Duties may include, but are not limited to:

-Custodial cleaning
-Facility Services preventative maintenance duties
-Minor maintenance and repair
-Display setup
-Roof access

Employees are to only use ladders provided by the Thames Valley District School Board.

Legislation

18. (1) Subject to subsection (2), an access ladder fixed in position shall,

(a) be vertical;
(b) have rest platforms at not more than nine metre intervals;
(c) be offset at each rest platform;
(d) where the ladder extends over five metres, above grade, floor or landing, have a safety cage commencing not more than 2.2 metres above grade and continuing at least ninety centimetres above the top landing with openings to permit access by a worker to rest platforms or to the top landing;
(e) have side rails that extend ninety centimetres above the landing; and
(f) have rungs which are at least fifteen centimetres from the wall and spaced at regular intervals.

(2) Subsection (1) does not apply to an access ladder on a tower, water tank, chimney or similar structure which has a safety device which will provide protection should a worker using the ladder fall. **R.R.O. 1990, Reg. 851, s. 18**.

73. A portable ladder shall,

(a) be free from broken or loose members or other faults;
(b) have non-slip feet;
(c) be placed on a firm footing;
(d) where it,
(i) exceeds six metres in length and is not securely fastened, or
(ii) is likely to be endangered by traffic, be held in place by one or more workers while being used; and e. when not securely fastened, be inclined so that the horizontal distance from the top support to the foot of the ladder is not less than 1/4 and not more than 1/3 of the length of the ladder. **R.R.O. 1990, Reg. 851, s. 73.**

1.0 Ladder Selection

1.1 Selection of Grade

All portable ladders must be approved by the Canadian Standards Association (CSA) or the American National Standards Institute (ANSI).

These two groups set standards and different classifications for portable ladders called Grade (CSA) or Type (ANSI). Each of these classifications is used to describe the “Maximum Load Capacity” and “Rated Use”.

The Maximum Load Capacity is calculated as the combined weight of: the user + clothes + tools + material. Once this is calculated the Maximum Load Capacity can not exceed the rating for the portable ladder to be used.

The Rated Use provides which circumstances/tasks the ladder is intended to be used for. The following is a table of the CSA and ANSI Grades/Types.

MAX. LOAD CAPACITY	RATED USE	CSA	ANSI
200 lbs	Light Duty Household Designed for infrequent household chores, cleaning, painting, etc.	Grade 3	Type III
225 lbs	Medium Duty Commercial Designed for moderate use by homeowners, painters, handymen, etc.	Grade 2	Type II
250 lbs	Heavy Duty Industrial Designed for use by contractors in maintenance construction and industrial applications	Grade 1	Type I
300 lbs	Extra Heavy Duty Designed for frequent use in maintenance, construction and industrial applications.	Grade 1	Type 1A
375 lbs	Special Heavy Duty Designed for the most demanding industrial and construction applications.	Grade 1	Type 1AA

While CSA recognizes neither the Type 1A or 1AA duty ratings, many products have been designed and tested to meet or exceed the higher ANSI Type 1A and 1AA load ratings. In many cases both the CSA Grade and ANSI Type will be displayed.

1. Due to the rated use, at no time is a Grade 3/Type III to be used within the Thames Valley District School Board.

2. Due to the rated use, Facility Services and Information Technology Services staff are to use only Grade 1/Type I or greater.

3. At no time is the Maximum Load Capacity to be exceeded.

1.2 Selection of Style

Within Thames Valley District School Board there are several styles of portable ladders available for use. The user must select the style of ladder that is appropriate for the task to be performed and under the appropriate circumstances.

Step Stools — The step stool type ladder is used for a single momentary rise in elevation such as placing, or removing, something on a shelf that can not be reached safely from ground level. These stools are to be ANSI/CSA rated and preferably have a hand rail. At no time should non-rated plastic/moulded stools be used.

Under no circumstance is Facility Services staff to use a step stool.

Step Ladders — Step Ladders are designed to be self supporting, and come in a variety of styles and sizes and are in most cases, designed to be used by one person at a time and are designed to be used on a level working surface.

Trestle and Two-Way Step Ladders — Can be climbed from either side, or support one person on each side. At no time is the maximum load capacity to be exceeded

Platform Step Ladders — Provide a large standing area which is more comfortable and safer to work from at fixed heights.

Extension Ladders — These types of ladders are used to perform tasks at heights which can not be normally reached with the safe use of a step ladder. These ladders are quite often used to access the roof of a facility that does not have a fixed ladder access or walk out capability. The use of these ladders requires the capability of the ladder to extend three feet (3') beyond the task point.

Combination Ladders — Combination ladders are very versatile, and can often be configured in several different positions, each best suited to a particular task. This style of ladder has been used to perform a task; but due to a fixed obstruction, the user not capable of setting a step or extension ladder up safely. The combination ladder allows for a configuration that bypasses the obstruction in a safe manner.

1.3 Selection of Ladder Size

Selecting the proper size of the ladder will help ensure that the user will be able perform the task while minimizing the risk for injury due to a fall. The following can be used as a guide in determining the proper size of ladder that should be selected. It is important to remember the following:

-when using a step ladder never stand on the top two rungs.
-extension ladders need to extend three feet (3') beyond the point of task.

In selecting the ladder size; the highest point where work, or a task is to be performed must determined. Based on this determination the following size selection can be used. These charts are based on a five and half foot (5 ½') person with a six and a half foot (6 ½') reach with no physical restrictions.

For a Step Ladder

Ladder Size	Maximum Standing Height	Approximate Standing Work Height
4'	1'11"	8'
5'	2'10"	9'
6'	3'9"	10'
7'	4'9"	11'
8'	5'8"	12'
10'	7'7"	14'
12'	9'6"	16'
14'	11'5"	18'
16' (scaffold or lift should be considered)	13'4"	20'

For an Extension Ladder

Ladder Size	Approximate Maximum Working Height	Maximum Roof Access Height

16'	12'6"	9'6"
20'	16'6"	13'6
24'	20'	17'
28'	24'	21'
32'	28'	24'
36'	31'	28'
40'	33'6"	30'6"
44'	37'6"	34'6"
48'	41'	38'6"

1.4 Selection of Ladder Material

Portable ladders are manufactured from many different types of materials, each with its own characteristics. In selecting a ladder material the user must be aware of the task that is to be performed and some of the limitations each material may create.

Aluminum

Aluminum ladders are designed to meet specific load requirements. Ladders of this material are comparatively light weight and are moisture and corrosion resistant. However; aluminum conducts heat and electricity and should not be used where these conditions exist.

Fibreglass

Fibreglass is an “Engineered” material consisting of continuous strands of high-strength glass fibres and mats encapsulated in a resin matrix. Fibreglass ladders are created when this material is pultruded to form I-Beam or channel shapes designed to meet specific load requirements. Ladders of this material are non-conductors of heat and electricity. They are heavier than aluminum and are joined with aluminum rungs/steps for maximum strength to weight ratio. Like aluminum they are moisture and corrosion resistant.

Steel

Steel ladders are designed to meet specific load requirements and are easily assembled by welding. Steel conducts heat and electricity and should not be used in areas where these conditions exist. Steel is susceptible to rust and corrosion.

Wood

Wood Ladders are not acceptable for use by Thames Valley District School Board Staff.

2.0 Portable Ladder Set Up

2.1 Ladder Inspection and Maintenance

Prior to each use of a portable ladder, the user shall conduct a visual inspection. Where the visual inspection identifies a fault with the ladder, the user shall red tag the ladder for removal. In addition to the visual inspection a written inspection shall be conducted annually in June by the department that made the ladder available. This written inspection shall use the attached form and maintained at the facility in which the ladder is located within the Red Health and Safety Documentation Binders.

Under no conditions is a ladder that is damaged or tagged out of service to be used.

2.1.1 Step Ladder Inspection Procedure

-Inspect Copolymer top for cracks or dents.
-Inspect all side rails for cracks, dents, bends or any other blemishes.
-Ensure that all fasteners are present and tight.
-Ensure that the safety-feet are tight, and rubber foot pads present, tight, and free of wear.
-Ensure spreader arms move freely and lock properly, and that the spreader-to-rail connections are tight.
-Ensure that all steps, horizontal and step braces, are present, free of bends and dents, and are tight.
-Ensure proper duty rating and maximum load capacity are within those listed on the certification label of the ladder
-Inspect pail tray to see that it moves freely, sets up properly, and that all connections are tight (if applicable).

2.1.2 Extension Ladder Inspection

-Inspect the side rails of the base and fly making sure there are no dents, cracks or other blemishes.
-Ensure that all end caps and slide-guides are free from cracks, chips and wear.
-Ensure all fasteners are present and tight.
-Ensure proper duty rating and maximum load capacity are within those listed on the certification label of the ladder
-Inspect rope and pulley, and ensure that the rope moves freely and is not frayed, knotted, or stretched.
-Ensure that the base and fly sections are straight, and not twisted or warped.
-Inspect all rungs for dents and cracks, and, ensure they do not rotate.
-Inspect the safety feet for worn rubber pads and loose or missing fasteners.
-Inspect the gravity locks. They should pivot freely, and the fingers should be in good working condition.

2.1.3 Fibreglass Ladder Inspection

The resin in a fibreglass ladder incorporates colour pigments and Ultra Violet (UV) inhibitors. The UV inhibitors protect the resin from surface UV and atmospheric corrosion. During inspections, the surface of the fibreglass should be checked for “fibre prominence” as may be witnessed by a rough feel when you run your hand across it. This may be the result of ongoing exposure of the ladder to direct sun, and atmospheric pollutants. If prominence is noted, the supplier/manufacturer of the ladder should be contacted for potential remedies.

Despite their strength and durability, fibreglass ladders can be broken, cracked, gouged or punctured if not protected from damage, or used improperly. Fibreglass ladders should be carefully inspected, before each use, for these following defects.

Crack - A see-through separation of the fibreglass laminations visible from both sides. The ladder should be removed from service and red tagged until the ladder can be disposed of.

or

A separation of material, not visible from the other side. The ladder should be removed from service and red tagged until the ladder can be disposed of.

Resin Surface Crack - A surface crack that does not penetrate the laminate layer. Inspect regularly to ensure it has not expanded, especially into the laminate area. If moisture is allowed to penetrate, the non-conductive properties of the rail are greatly reduced.

Gouge/Hole - A puncture that is visible from both sides. The ladder should be removed from service and red tagged until the ladder can be disposed of.

2.1.4 Fixed Ladder Inspection (if applicable)

Prior to each use of a fixed ladder, the user shall conduct a visual inspection to ensure it meets the legislative requirements. Where the visual inspection identifies a fault with the ladder, the user shall tag the ladder for repair and discontinued use until the ladder is repaired. This same individual will notify all others that may use the fixed ladder of the need for repair. In addition to the visual inspection, a written inspection shall be conducted annually in June by the Facility Services appointed personnel. This written inspection shall use the attached form and be maintained at the facility in which the ladder is located within the Red Health and Safety Documentation Binders.

2.1.5 Ladder Maintenance

Like any equipment, your ladder requires periodic preventive maintenance. The entire ladder should be cleaned on a regular basis, and moving parts should be kept clean and lightly lubricated. Slide guides and safety feet should be replaced if worn as with the rope assembly. In order to maintain the maximum dielectric properties of fibreglass ladders, the manufacturer's recommendations for cleaning should be adhered to.

Repairs to ladders are only to be completed by authorized dealers of the manufacturer or a manufacturer representative.

2.2 General Set Up Considerations

Once a portable ladder has been selected there are few general considerations before use. Before using any ladder, first read, then follow, all the labelled warnings and instructions specific to that ladder; and, pay close attention to what you are doing. Do not use a ladder if you are in poor health, tired, under the influence of drugs or alcohol, or have physical restrictions. Wear clean, sturdy shoes with slip-resistant soles. Always secure a ladder from movement. Unless specifically labelled otherwise, ladders are designed to be used by one person

only, at a time. Do not exceed the labelled load-rating. Never store materials on ladders. Securely support ladder in transit. Avoid dropping, or applying an impact load to a ladder. If it has been dropped or subjected to impact, remove it from service until it can be inspected for damage. Except for small identification marks in translucent, acrylic lacquer, never paint any ladder. Paint can hide cracks and other defects, and may alter the flash over-voltage properties of fibreglass or wood ladders.

Three points of contact is to maintained at all times. Due to comfort levels or where an individual can not maintain three points of contact due to the task, or carrying of equipment or tools; assistance is to be requested.

Three points of contact is described as:

Ascending/Descending - Is at least two feet and one hand on the ladder.

While Stationary - Is at least two feet and one hand or a portion of the body between hips and knees when performing overhead work with two hands.

2.3 Working Environment Set Up Considerations

Equally important to the selection of the proper ladder for the task to be performed is the environment in which the task is to be performed while using the portable ladder.

Do not use metal ladders where they may contact wires. Metal ladders conduct electricity. Never use in high winds, or during an electrical storm. Never leave a ladder set up and unattended. If ladder may be exposed to chemical or other corrosive environment, consult manufacturer before use to ensure resistance. Place ladder where access is not obstructed. Do not place in front of unlocked doors. Remove oil, grease, mud, snow, ice or other foreign substance from hands, shoe-soles, steps and rungs, before climbing any ladder.

2.4 Extension Ladder Set Up and 1:4 Rule

For extension ladders the correct set-up angle-from-horizontal is approximately 76-degrees (1:4); At 76-degrees, the anti-slip feet of the ladder provide the maximum resistance to sudden outward “kick-out” of the ladder feet. Angles steeper than 80-degrees expose the user to falling over backwards; while, at angles shallower than 70-degrees, “kick-out” force intensifies perilously. Ladders “kick-out” when the slip-resistance provided by the ladder feet, is exceeded by an opposing force that intensifies as a user ascends a ladder.

“Kick-out” occurs for one or more of the following reason:

-Ladder is set up at too shallow an angle from horizontal.
-Ladder-foot friction pads are worn, missing, oily, or wet.
-Underfoot surface is slippery, icy, wet, oily, loose, etc.

-User climbed beyond the ladder upper support point.

Opposing slip-resistance is a frictional force dependent upon the combined weight of ladder and user; type and condition of the rubber foot-pads; and, type and condition of the surface underfoot.

If the user climbs higher than available friction allows, the ladder feet suddenly and irreversibly, accelerate outward under the force of gravity.

To avoid “kick-out”, watch your set-up angle, ensure a clean, slip-free footing, and if in doubt secure the feet from moving.

In addition to the horizontal distance from the top support to the foot of the ladder not being less than 1/4 it is not to be more than 1/3 the length of the ladder.

2.5 Extension Ladder Set Up

Set-up on level ground. Use rubber safety feet on asphalt and concrete, and secure feet on grass or slippery/icy surfaces. Securing should occur at the front of both feet to prevent outward movement.

Tie-off the top, or side-rails to prevent sideways slip of the ladder. Where the ladder exceeds six metres (6m) and can not be securely fastened , or is likely to be endangered by traffic; the ladder must be held by one or more people.

Keep body centred between side rails. At no time is an individual allowed to reach more than an arm’s length of the ladder while both feet are firmly pace, on the same side, of the middle of the ladder. Do not overreach, get down and move ladder.

While working off a ladder, the task point is never to be greater than 3 feet from the top of the ladder.

There is to be no pushing or pulling off to the side of ladder and “walking” or “shifting” the ladder while on it is prohibited. The maintenance of the 3-point contact must occur at all times.

If using a ladder to go onto a roof, the top of the ladder should extend at least 3 feet and no more than 4-feet above the roof line.

Extend fly section and engage rung locks. Make sure rope does not create a tripping hazard or interfere with activity near the ladder. Securing the bottom fly rung to adjacent base rung is recommended. Extend and retract fly section only from the ground and when no one is on the ladder.

Do not overextend the fly section beyond the following minimum overlap of sections:

Extended Ladder Size	Minimum Overlap Required
Up to and including 32 feet	3 feet
Over 32 feet, up to and including 36 feet	4 feet
Over 36 feet, up to and including 48 feet	5 feet
Over 48 feet	6 feet

2.6 Step Ladder Set Up

Open step Ladders completely and ensure spreaders are locked and ladder is stable before climbing. Set all 4 feet on firm, level surface. Do not place on unstable, loose, or slippery surfaces. Climb only front side of ladder and face ladder when climbing up and down. Maintain a firm grip and 3-point contact when ascending and descending the ladder.

Keep body centred between side rails. At no time is an individual allowed to reach more than an arm's length of the ladder while both feet are firmly pace, on the same side, of the middle of the ladder. Do not overreach, get down and move ladder.

Do not climb, stand, or sit on spreaders, rear braces, ladder top, or pail shelf. Do not straddle front and back and do not climb from one ladder onto another. There is to be no pushing or pulling off to the side of ladder and "walking" or "shifting" the ladder while on it is prohibited. The maintenance of the 3-point contact must occur at all times. Never climb a step ladder while it is closed and leaning against anything for "support".

LADDER SAFETY - INSPECTION CHECKLIST

Inspected by:	Date:
Location:	Ladder Serial #: CSA/ANSI Grade:

Instructions:
1. Inspect all step / extension ladders and stools using checklist below.
2. Red tag defective ladders "Out of Service" and discard if beyond repair.
3. Note deficiencies/corrective actions in comment section below.
4. Keep a copy of inspection sheet in files.

Y	N	
		1. Broken, bent or missing steps, rungs, cleats, or rails?

		2. Steps and rungs free of water, grease, oil or other slippery substances?
		3. Free of splits, cracks, and rust corrosion?
		4. Free of sharp edges, cuts, burrs, etc.?
		5. Fallen or misused ladders for excessive dents or other damage?
		6. Loose or bent hinges that can't be fully opened or locked in place?
		7. Stable and completely balanced (not shaking or swaying) with all legs resting firmly on the floor?
		8. Loose, broken or missing extension locks / pawls to ensure safe overlap extension ladder sections?
		9. Damaged or worn non-slip bases, safety feet, wheels or casters?
		10. Halyards / Ropes in good condition?
		11. Damaged or corroded parts of foot pads?
		12. Weight capacity label attached?
		13. Any UV damage / de-lamination on Fibreglass ladders?
		14. Other structural defects or operating problems?
Comments: (Note deficiencies and corrective actions)		
Signed By:		

FIXED LADDER - INSPECTION CHECKLIST

Inspected by:	Date:

Administered By	**ORGANIZATIONAL SUPPORT SERVICES (HUMAN RESOURCES)**
Amendment Date(s)	2011 September 13

Location:	Level:

Y	N	
		1. Loose, worn and damaged rungs or side rails?
		2. Damaged or corroded cage?
		3. Corroded guard, bolts or rivet heads?
		4. Damaged or corroded handrails, brackets, or platforms?
		5. Broken or loose anchorages?
		6. Weakened or damaged rungs on brick or concrete slabs?
		7. Defects in climbing devices, including loose or damaged carrier rails or ropes?
		8. Slippery surfaces from oil and ice?
		9. Clutter obstructing the based of the ladder or platform?
Comments: (Note deficiencies and corrective actions)		
Signed By:		