Technical Safety Authority of Saskatchewan

EXPANSION JOINT USE IN RESIDENTIAL PLUMBING SYSTEMS

Protection of piping from thermal expansion and building shrinkage.

In one, two and three storey wood framed buildings, plumbing systems must be protected from damage due to the effects of thermal expansion and building shrinkage. Protection can typically be accomplished by the changes of direction and offsets of the piping that are generally found in the layout and design of the plumbing system. Care needs to be taken to ensure that holes drilled through framing members are large enough to allow for anticipated expansion and contraction. Particularly holes through studs adjacent to vertical stacks to accommodate horizontal takeoffs.

Vertical piping between riser/stack clamps must be protected with either an expansion joint or a horizontal offset that will accommodate any expansion and contraction between the two anchor points. Horizontal offsets used instead of an expansion joint (#1, diagram 1) need to be minimum of 2 feet in length. The horizontal offset should have somewhat greater than minimum grade so that minimum grade is maintained as expansion or contraction occurs. Supports need to be placed in a manner that allows the piping to expand and contract.

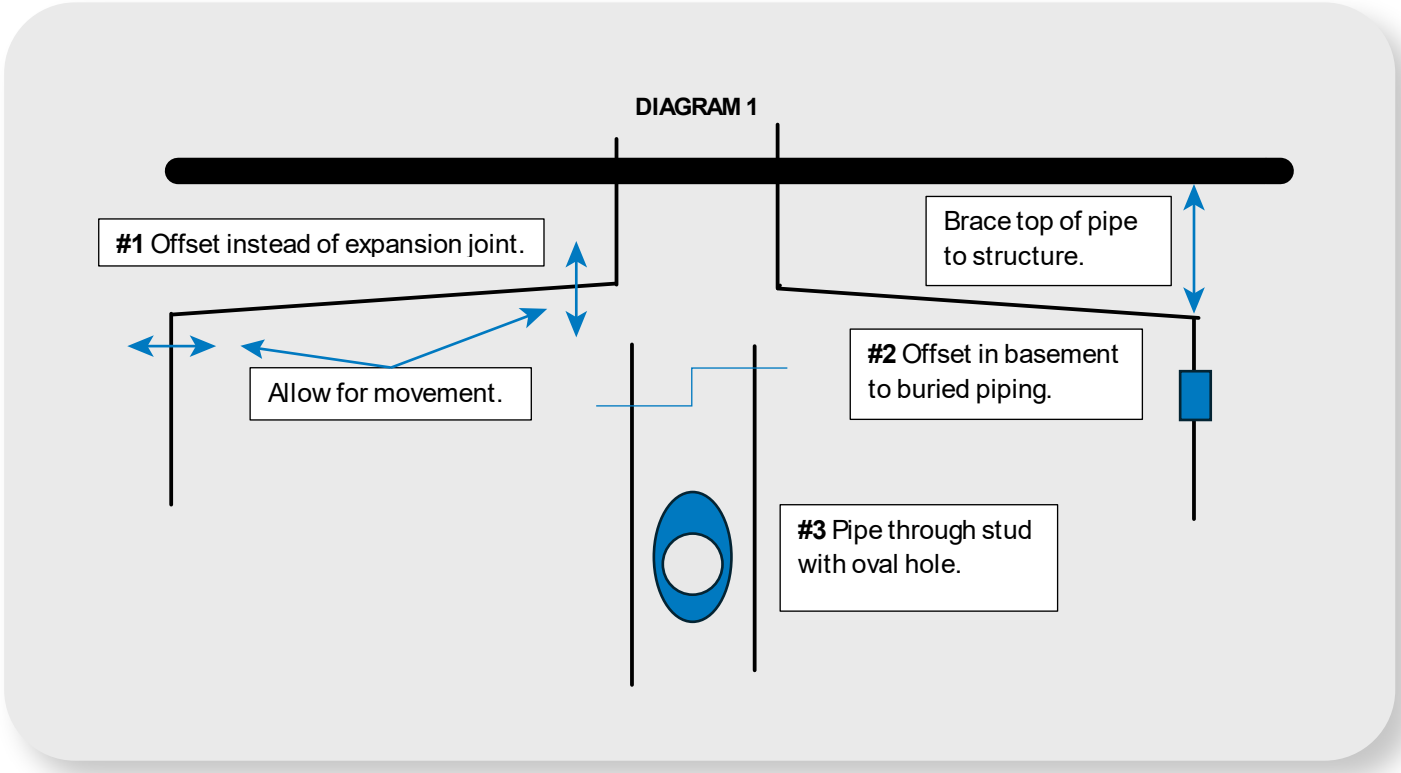
Roof flashings are an acceptable means of accommodating expansion and contraction.

When the plumbing system is being installed, the ambient air temperature needs to be con-sidered. Piping being installed in cold or hot conditions will need room to expand or contract as it becomes room temperature.

Protection of vertical piping from ground movement.

Vertical piping connected at its lower end to buried horizontal piping needs to be protected against damage caused by ground movement. For basements with earth supported concrete floors, expansion joints are required on the vertical stack. The expansion joint shall be installed below any horizontal piping taken off the stack. The stack should be supported and anchored with a riser / stack clamp on the floor of the 1st storey.

A horizontal offset of the stack in the basement must have an expansion joint installed below it to maintain grade. In this case, the horizontal piping needs to be braced to prevent the horizontal piping from rising in the event of ground movement. (Tag 6)



Vertical piping shall be supported at

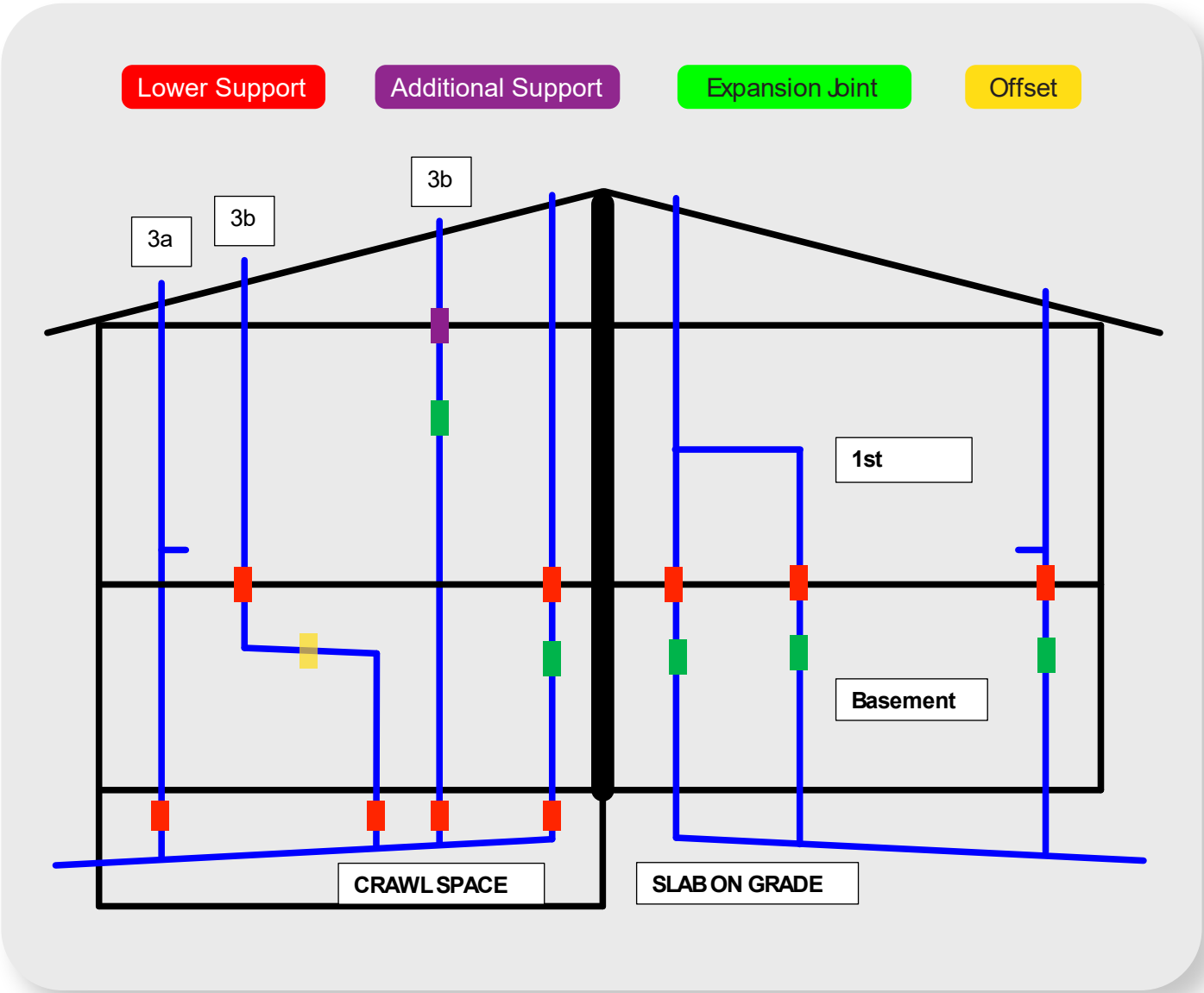
1. It's base.
2. At the floor of alternating storeys, and

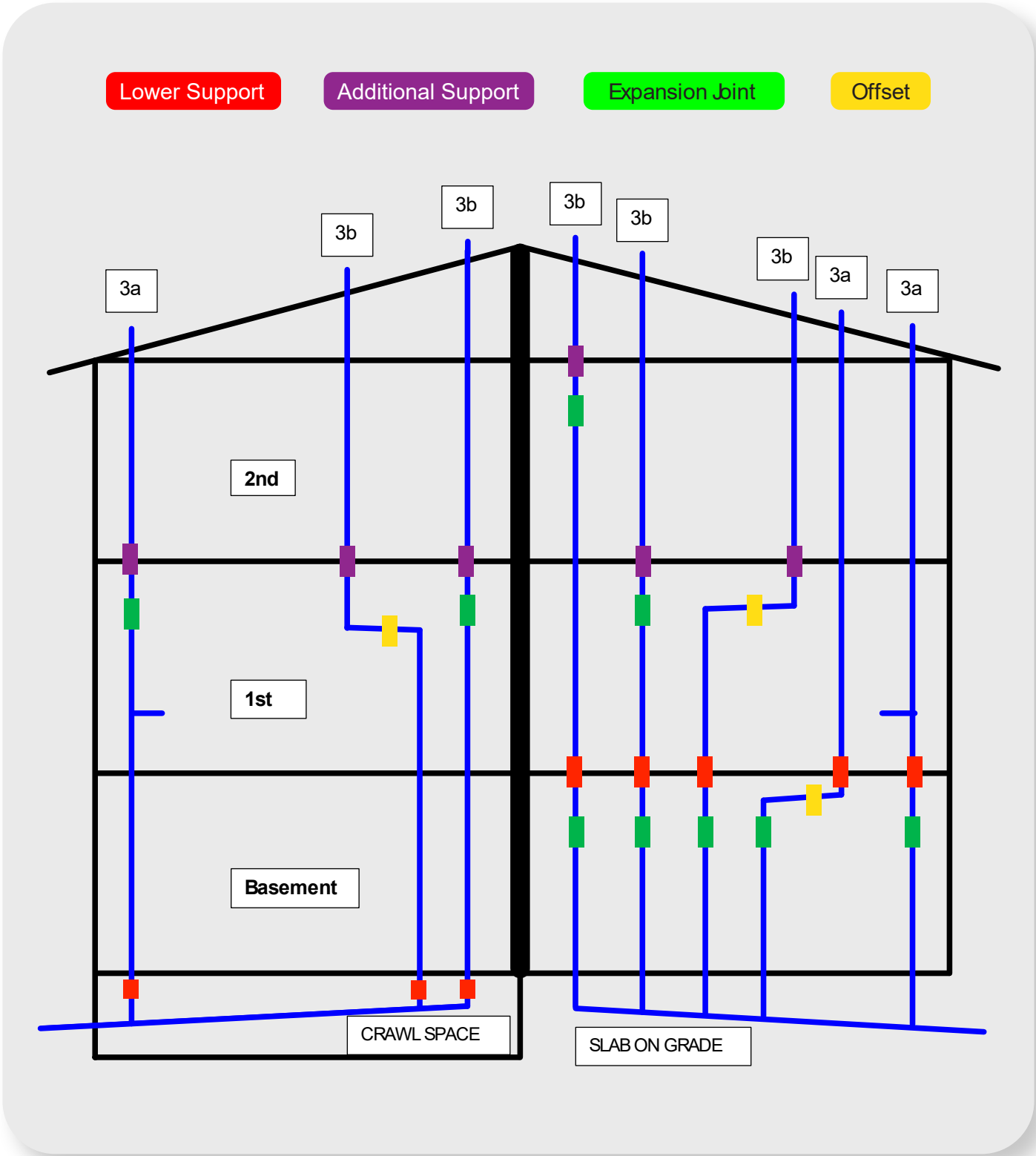
3. Maximum vertical height from a lower support shall not exceed 7.5 meters.
   a. Does not exceed 7.5 meters, additional support is not required. (Tag 3a)
   b. Exceeds 7.5 meters, additional support is required. (tag 3b)
      Note: Length of horizontal offset is not included in the calculation of vertical height.

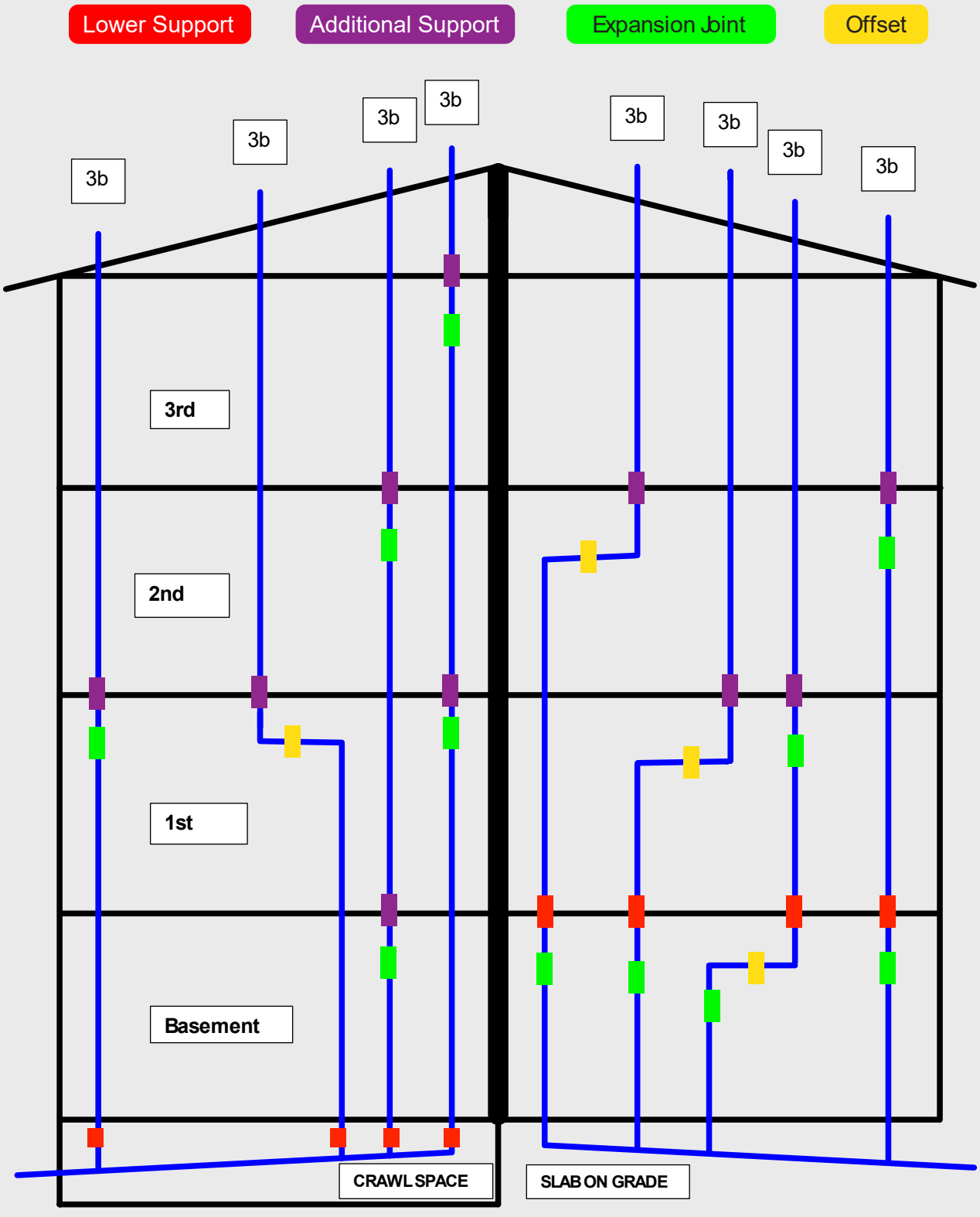
Expansion

1. Between supports or anchor points, vertical piping shall be protected from damage due to the affects of thermal expansion of the piping and from building shrinkage by either,
   a. The installation of an expansion joint, or
   b. A horizontal offset of the piping arranged and supported in a manner that will accommodate anticipated movement. Length of the horizontal offset shall be no less than 2 feet.

2. Vertical piping that connects to buried piping shall be protected from damage due to ground movement by anchoring the vertical piping to the floor of the first storey and the installation of an expansion joint. (Tag 5)




Lower Support
Additional Support
Expansion Joint
Offset
3a
3b
3b
3b
3b
3b
3a
3a
2nd
1st
Basement
CRAWL SPACE
SLAB ON GRADE


Lower Support
Additional Support
Expansion Joint
Offset
3b
3b
3b
3b
3b
3b
3b
3b
3rd
2nd
1st
Basement
CRAWL SPACE
SLAB ON GRADE