

**DOUBLE FENCED INTER COMPARISON REFERENCE (D.F.I.R)
SNOW GAUGE
ASSEMBLY PROCEDURE**

For: Environment Canada
A.E.S.-B. Sheppard

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ASSEMBLY PROCEDURE FOR SNOW GAUGE AND SHIELD (DFIR)

General

These assembly instructions are for the DFIR (Double Fenced Inter comparison Reference) snow gauge (sensor) that is recognized Internationally. The sensor is mounted three meters off the ground, and is enclosed by an inner and outer fence (shield). The construction of the octagonal fences is at a specified distances from the center of the sensor. All dimensions are in International Standard Units (metric) and converted to North American Standard Units (feet/inch) for the purchase of wood materials. The wood used should be pressure treated and closely replicate the International standard in dimensions. The outer fence is over thirty-nine feet in diameter and the enclosed area (grade) should be as level as possible for proper installation and free from surrounding obstructions on a ratio of 1 to 6. Recommendations are made to ensure successful operation of the enclosure and sensor in specified environmental conditions.

This procedure follows the digging of the twenty-five 24-36 inches deep holes.

Equipment and Tools

Shovels – spade & flat-nosed type
Tamping Bar
Step Ladders (2)- 6ft minimum
Tape Measures– 10/12 ft., 25 ft., & 50ft.
Claw Hammer
Power Hand Saw – 71/4” diameter
Sledge Hammer- 5lb.
Carpenter Square
Angle Scribe- 180 degree
Levels–Line level and 2ft. Bricklayers type
Portable Work Bench or Horses
Caulk Line (optional)
Cord/String– 200ft.
Electric /Portable Drill
Extension Cords-100 ft. & 25 ft.
Spray Marker Paint
Screw Driver Set
Carpenters Pencil
Work Benches (2) or Sawhorses

Time Requirements

It will take two experienced persons 5 days to build this enclosure weather and materials permitting. This does not include digging the postholes. A fencing contractor with a machine provided this service.

Procedure

This enclosure is assembled from the center to the inner, then the outer fences.

1. Place a 12foot 4X4 30 inches deep in the center hole, level vertically and temporarily hold in place. If this sensor and enclosure is in a high wind area, it is recommended that this sensor support post be cemented in ground. It will take approximately two 30-kilogram bags for each hole.
2. Using eight 16 ft. 2X4s, mark them to locate the first two inner ring support posts (200-cm radius), and the outer support posts (400-cm radius). Ensure that these units are straight and not bowed or warped. These will be used as measuring fixtures for inner and outer enclosure posts.
3. Secure the center post (0) using cement or tamped gravel. Using a tape measure mark a line at the 1.5m (59"), 2m (79") and 85 inch level on the center post.
4. Place four 4X4X12ft. In holes that align with the center post and 90 degrees apart. **See top view drawing.**
5. Establish your X coordinate (1,2) by using two of marked 16ft. 2X4s. Place one of the measured 2X4's at ground level at the center post (200cm mark), level horizontally, and then tack it to the center post. Repeat the step with the second measured 2X4 at the 1.5m mark of the center post. The 200cm mark on the 2X4's is located at the center post. The 2X4 are tacked on to the 4X4 posts at 0cm and 400cm marks on both levels. The 4X4 posts are vertically leveled and secured in place (with gravel or cement). Ensure that the 4X4's are at least 91/2ft above grade (ground) level.
6. Establish your Y coordinate (3,4) using two marked 16ft.2X4's as in step #5 except at 90 degrees to the first two posts. The 2X4's will have to be tacked above the 2X4 's on the X coordinate at the center post. Measure the outside distance between the four posts (approx. 111 inches). They should all be the same. Using bricklayer's level, ensure four posts and center post are still vertically level before securing them in place. Recommend four inner and outer posts on the X & Y coordinates be cemented in place.
7. The remaining four 4X4 posts (5,6,7,8) are placed in holes between the X and Y-axis (45 degrees) and on a 200-cm radius. The distance between posts is equal (approximately 58 inches). Ensure all 4X4s are vertically level and 9-1/2 ft. above grade before securing in place with tamped gravel.
8. Make inner slat support by cut ting 10ft. 2X4s to suit spacing between posts (approx. 58 in.) and angle the ends at 221/2 degrees. Transfer the 85in.and 1.5M marks from the center post to the eight inner posts using a chalk line and line level. Mount slat supports at proper levels (**see side view drawing**) using rafter support brackets and nails. Slats can be nailed on after the outer posts are installed.
9. Ensure all the holes are properly filled and tamped to prevent further movement.
10. Place four 4X4 X12ft posts in the four outer holes of the X (9,10) and Y (11,12) coordinates. Using a marked 16ft. 2X4 tack it on to the inner post of the X coordinate at the measured 400cm distance and leveled horizontally. The 2X4is tacked to the outer post and the post vertically leveled and 91/2ft.above grade. Repeat this step to position the post at the other side of the X coordinate. Secure these posts in place using tamped gravel or cement.
11. Repeat the procedure using the posts of the inner enclosure and measured 2X4 on the Y-axis. The distances should be equal between these posts (approx. 27ft 10in.). Ensure the post are level vertically and 9-1/2ft above grade. Secure these post in place using tamped gravel or cement.

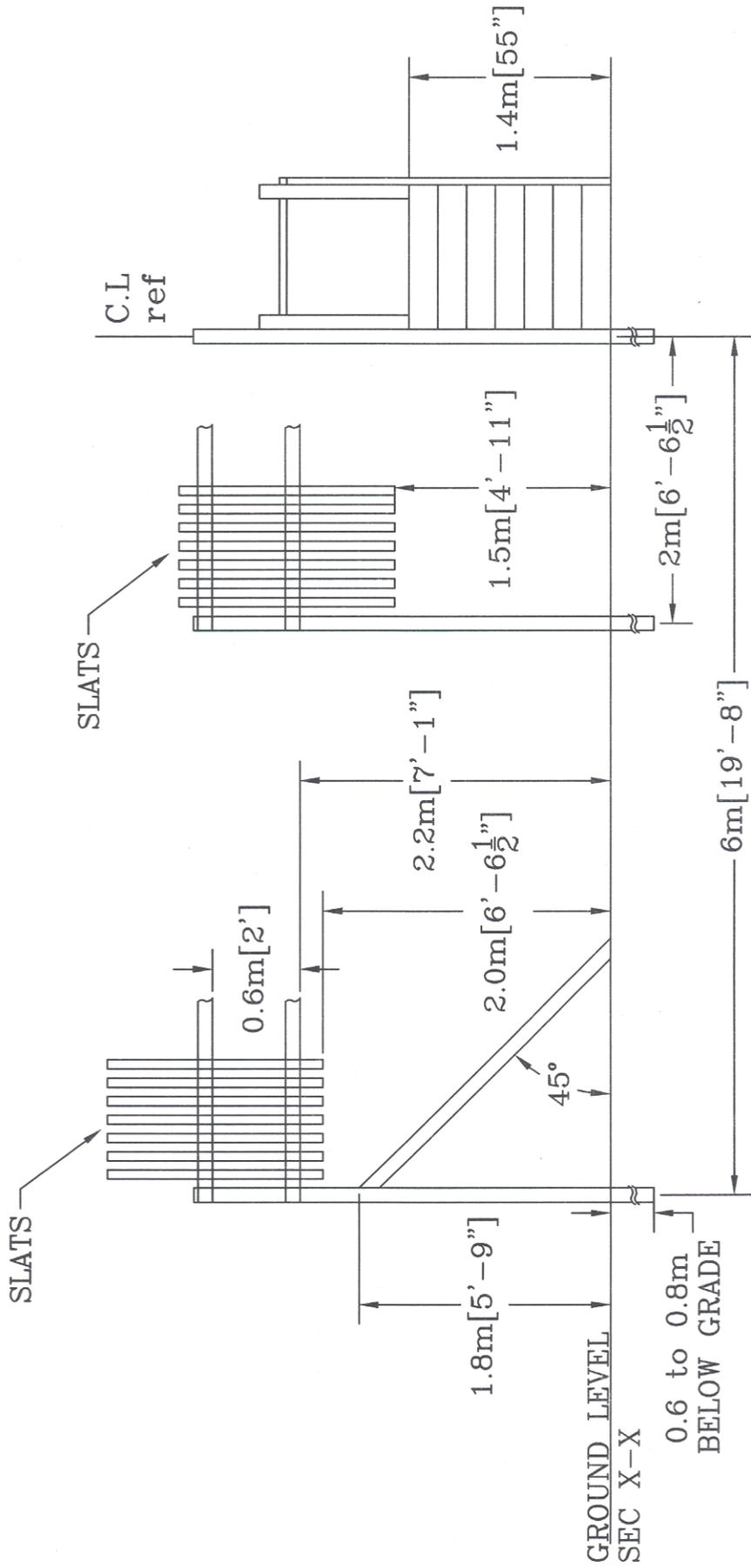
12. Place four 4X4X12ft.posts in the four holes between the X and Y coordinates (13,14,15,16). Measure the distance between the posts. It should be equal (approx. 179inches). Secure the posts at this distance after making sure they are vertically level and 91/2 ft. above grade.
13. Remove all the tacked 16ft. 2X4's from the inner posts. Using chalk line and a line level mark the 2M position and the outer 2X4 slat support position (85in.above grade on the center post) on the outer posts. Mark the upper slat support position (24 in. above the 85in. mark) on the outer posts. These 2X4's will be cut to fit between the eight outer posts (14ft. 10 1/2inches). Cut a 22-1/2 degree angle on both ends and mount using nails and rafter support brackets. Mark the center of this span (approx. 7ft. 5-1/2 in.) to locate the final eight support posts before nailing in place.
14. Place remaining 4X4 posts in outer holes (17,18,19,20,21,22,23,24). Tack post in center of slat supports (2X4) and level vertically. Secure post using tamped gravel or cement. Using joist hangers attach slat support to the post. Repeat step for remaining holes. The slat supports are positioned at the same level for both the inner and outer enclosures.
15. The slats can now be nailed on to both inner and outer enclosures. The slats are made by splitting a 1X6X5ft fence board in half (2-5/8in.). The international standard slat was about 2in.in width and 1.5M in length. The slats are nailed on vertically with equal space (2-5/8in.) between slats. Starting from the center of the span, nail the first slat on ensuring that it is vertical. Using a slat as a spacer nail on the remaining slats measuring every third slat across the top and bottom slat support to ensure the slats are fastened vertically.
16. Support beams can be installed on all outer posts using an eight foot 2X4 with the end cut at 45 degrees. The beam is attached to the post using a joist hanger and a stake at ground level. Recommend that these support beams be used on the four posts at 90 degrees or on each outer post in high wind installation, if cement was not used on the posts.
17. Stairs and a platform are constructed to allow observer to read the gauge. The platform (approx. 40 x 40 inches) is about five feet above the ground and is attached to the center post. There are seven stairs that go up to this platform, and a hand and safety rail must be constructed for safety purposes.
18. One section of the inner enclosure will have a hinged gate to allow for easier access to the stairs and platform (**see pictures for example**).

Material List

<u>Description</u>		<u>Quantity</u>
4X4 12ft. Long	POSTS	25
2X4 16ft. Long	OUTER SLAT SUPPORT	16
2X4 10ft. Long	INNER SLAT SUPPORT	12
2X4 8ft. Long	SUPPORT BEAM	16
1X6 5ft. Long (cut in middle)	SLATS	220
4X4 10ft.long	PLATFORM POSTS	2
4X4 8ft. long	PLATFORM POSTS	3
2X6 12ft. Long	PLATFORM & STAIRS	3
3-in. spiral galvanized nails		5 lbs.
2-in. spiral galvanized nails		5 lbs.
1-1/2 spiral galvanized nails	SLATS	10 lbs.
Rafter hangers (left)	SLAT SUPPORT	32
Rafter hanger (right)	SLAT SUPPORT	32
Joist hanger	SUPPORT BEAM	32
Stair Stringer (seven riser)	PLATFORM	2
Deck Blocks	PLATFORM POSTS	6
Patio Stone (24X24)	WALKWAY	5
Crushed Stone (Gravel)	POSTS	2 cu. yds.
Hinges	GATE SECTION	3 pr.
Deadbolt	GATE SECTION	2
Bolts ¼ x 2-1/2 in.(c/w nuts)	GATE SECTION	9
Bolts ¼ x 3 in.(c/w nuts)	GATE SECTION	9
Washers ¼ in.	GATE SECTION	20

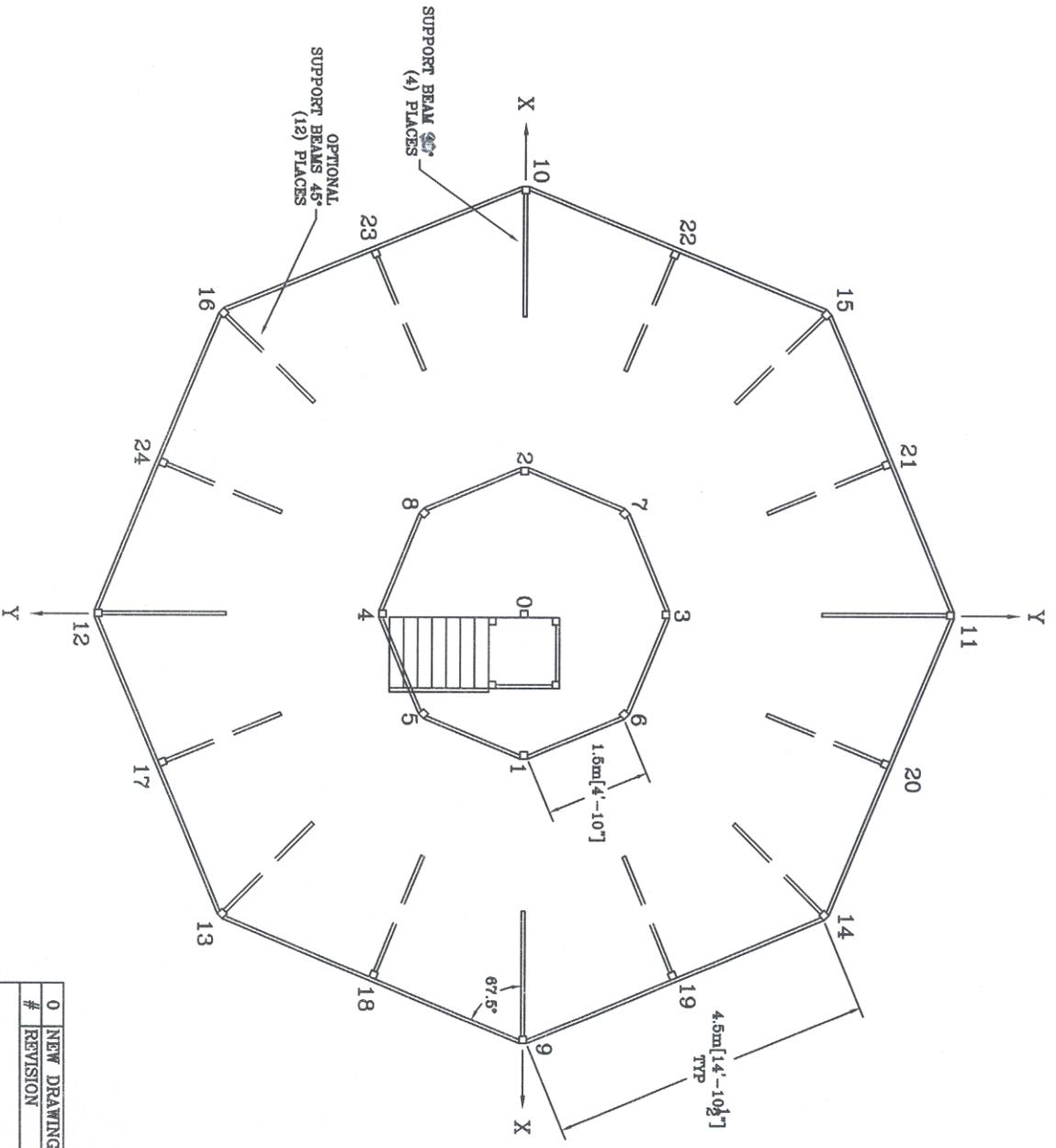
ALL WOOD SHOULD BE PRESSURE TREATED (WOLMANIZED) TO PRESERVE TH STRUCTURE.

ALL METAL PRODUCTS SHOULD BE GALVANIZED, STAINLESS STEEL, OR PLATED TO REDUCE OXIDIATION.

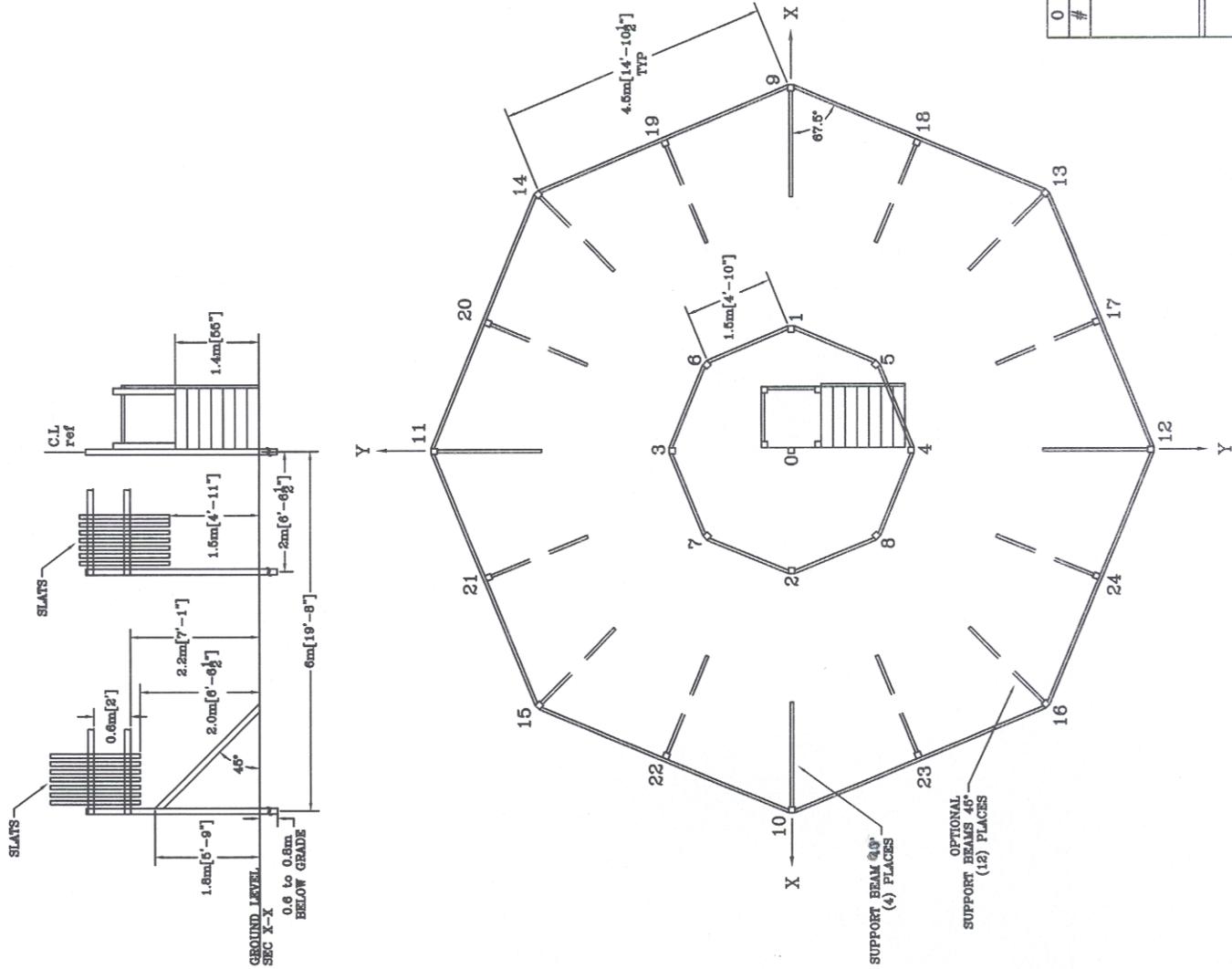


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			DRAWING NUMBER
			SNOW GAUGE & SHIELD (DFTD)
			N.T.S
			SIDE VIEW
			CROSS SECTION



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		SNOW GAUGE & SHIELD (DFIR)					
TOP VIEW		N.T.S					
		SCALE					



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