

LIFE Rail

Installation Procedures

Tilt-up Installation

*** To be kept on site while in use. ***

The contents of this package shall be read and understood fully before the Life Rail system is to be used.

Keeping You on Top



Contact Life Rail at 1 877 785 7245 or liferail@gmail.com

LIFE Rail

CONVERTING TO A GUARDRAIL SYSTEM

Once the roof deck is in place, the perimeter horizontal lifeline may be converted into a rope guardrail system. A Board officer may grant prior approval, required by section 4.58(4)(b) of the OHS Regulation, without a formal written application being submitted, if the employer meets all of the following requirements:

- Posts supporting the top and mid ropes are spaced so that the rope deflection is no more than 30 centimetres (12 inches) under a load of 900 N (200 lbs), and posts are rigged back from an open edge so that the rope will not deflect beyond the edge of the building.
- The top rope is taut so that under its own weight, it is at a height of 102 to 112 centimetres (40 to 44 inches) above the work surface. (Where a wall or parapet is in place along the open edge, the height may be measured with reference to a point anywhere between the work surface and the top of the wall, to the top of the top rope.)
- Flagging is provided in the form of high-visibility coloured markers, attached to the top rail at intervals of 3 metres (10 feet). (If the top wire rope serves as a horizontal lifeline as well as the top rail of a guardrail, and flagging would interfere with the travel of snap hooks along the line, then flagging may be attached to the mid rail instead of the top rail.)
- Inspection and maintenance
 - Equipment used in a fall protection system must be
 - (a) inspected by a qualified person before use on each workshift,
 - (b) kept free from substances and conditions that could contribute to its deterioration, and
 - (c) maintained in good working order.

For complete worksafe BC guidelines refer to:

<http://www2.worksafefbc.com/Publications/OHSRegulation/GuidelinePart11.asp#SectionNumber:G11.2-4>

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LIFE Rail

A single perimeter safety system that provides fall protection for all onsite trades.

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About the Life Rail System

A single perimeter safety system that provides fall protection for all onsite trades.

Until recently, fall protection on Tilt-up projects was a complicated business.

Control zones have been used, but the zone delineator posts had to be moved frequently and the crew members acting as monitors don't get any work done. Tie-off zones have also been used but have to be changed frequently as the work proceeded, which is very inefficient.

Now fall protection for many companies is a snap. A single perimeter system provides both fall protection and arrestment for all the aerial trades from the ironworkers to the roofers.

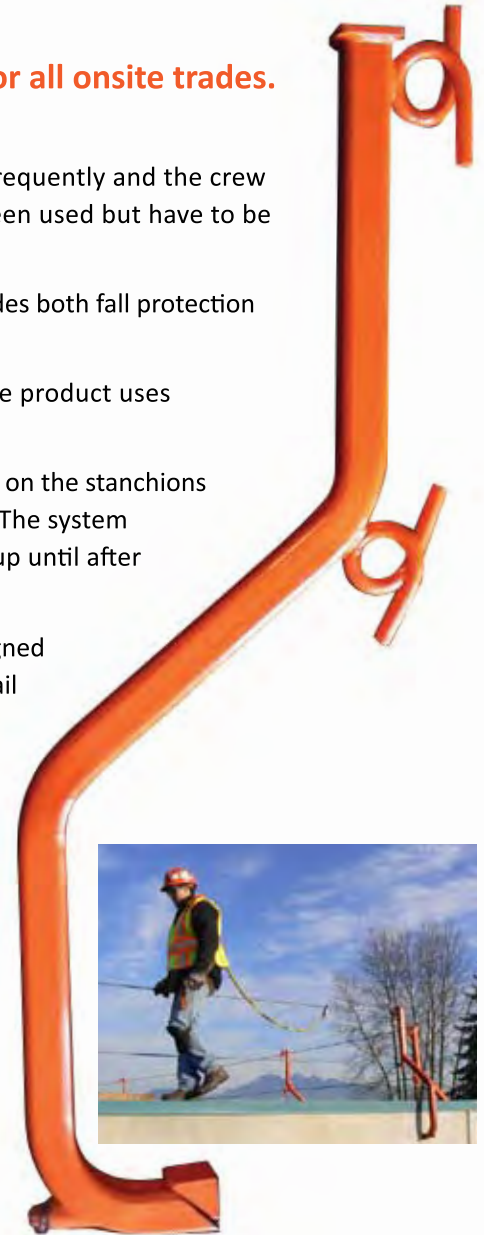
There is a system designed specifically for tilt-up construction called Life Rail. The product uses gooseneck stanchions fastened to inserts cast into the tilt-up panels.

Steel cables stretched taut, and strung through upper and lower pass-through coils on the stanchions functions both as guard railing and as life lines to attach safety harness lanyards. The system is installed as soon as the tilt-up panels have been raised and braced. It remains up until after the roofing, including parapet flashing, is completed.

When crews must work outside of the Life Rail perimeter, on building corners designed without tilt-up panels for example, workers clip their lanyards to the nearest Life Rail cables for fall protection. Additional cables can also be strung across the top of the tilt-up structure as lifelines for ironworkers erecting beams and steel joists or other trades working near roof openings.

The Stanchion Offset

The offset which consists of two bends is in the middle section of the Life Rail stanchion. The gooseneck shape of the posts offsets the cable barrier inward at the top of the panels so ironworkers can walk and stand on the top edge of the panels secured by their safety lanyards to the cable lifelines. Because the top edges of the tilt-up panels are not obstructed, deck and roofing installation is not hindered later on.



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LIFE Rail



The Pass Through Coil

- The Pass-Coil is designed for simplicity.
- There are two coils on each stanchion, one is located at the top and the other is approximately 21" lower, which assists in establishing guard rail status.
- Trades people are able to stay clipped to either cable while passing through a stanchion.
- The design facilitates easy installation of the horizontal life line by enabling you to engage the 3/8" wire rope without pulling through lengthy cables.



The Horizontal Life line

- The horizontal life line consists of 300 ft. 3/8" engineered certified wire rope.
- The horizontal life line is divided into 300 ft. sections; each section of the life line is to be no longer than 300 ft. in order to meet engineer requirements.

The Anchor

- The Life Rail anchor is located at the bottom of the rail stanchion and consists of an anchor wedge and bolt. Simply establish full penetration with a guard rail into a Life Rail panel insert, then tighten the anchor bolt to a minimum of 75 foot pounds (a strong pull on a wrench).
- An additional advantage to the Life Rail anchor is on completion of the project, the rail stanchion can be released simply by a secure worker loosening the anchor bolt and removing the rail, thus eliminating the need for expensive equipment.

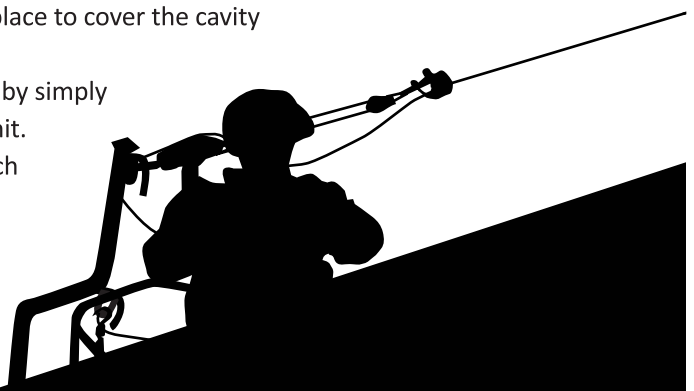


The Panel Insert

- The Life Rail panel insert is constructed of light-weight, durable PVC plastic in order to prevent any future corrosion. It is also designed to fit all tilt panels (ie. wall thickness).
- A paint grade, flush mounted cap is supplied with the insert. The purpose of this cap is to withhold concrete from entering the insert during the pour. It simply snaps in place to cover the cavity on completion of construction.
- The stability legs of the panel insert facilitate hassle-free installation by simply replacing the rebar chair or chairs in the desired location with the unit.
- The insert is sealed off and does not protrude to the inside face which prevents possible leakage and minimizes concrete finish.

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Installation Procedures

Tilt-up Installation

The Life-Rail system for tilt-up concrete and masonry walls is engineered to provide guardrail and fall protection when used in accordance with these instructions.

A maximum of two workers may be attached via lanyards to the cables between termination points. The two workers may attach to separate cables or a single cable.

Step-by-step

1. Load stanchions into man lift. Do not overload man lift.
2. String out two cables on ground parallel to wall. Bring looped ends into man lift.
3. Raise man lift to first stanchion location.
4. **For Tilt-up Wall:** Place stanchion anchor in insert opening. Ensure full penetration. Tighten expansion wedge bolt to 75 foot-pounds of torque.
For Masonry Wall: Unscrew the two bolts from the wall. Thread bolts through openings in stanchion post and back into the wall. Tighten bolts to 75 foot-pounds of torque.
5. Thread looped end of first cable through lower pass-through coil of stanchion and hook cable loop on upper pass-through coil.
6. With cables loosely suspended from man lift basket, proceed to next stanchion location. Install stanchion. Place cables in pass through coils. Stanchions must be no more than 25 feet apart. At corners, stanchions must be secured to each adjoining tilt-up panel.
7. If an anchor insert has been misplaced or damaged, install masonry-type stanchion using two 8-inch long, 3/4 inch diameter concrete bolts into holes drilled into concrete or solid masonry.
8. Continue installing stanchions and placing cable in pass-through coils. Load additional stanchions in man lift as required.
9. When remaining cable length is insufficient to continue, terminate and tension each cable as follows:
 - A. Pass cable around stanchion post and through coil at coil level.
 - B. Use come-along and cable gripper to tension cable. Cable sag must not exceed stanchion spacing divided by 120.
 - C. Attach three cable clamps, all facing the same direction and torque nuts to 35' lbs. (ensure 9.5" of turnback min.)
 - D. Before tightening clamp nearest stanchion post, slide clamp as close to stanchion as possible to choke cable tightly around post.
10. String out two more cables as per step 2. Attach second set of cables to termination stanchions as per step 5. Never attach cables to one another.
11. Continue installing stanchions and placing cable in pass-through coils until completed. Terminate and tension cable at last stanchion as per step 9. Coil excess cable and hang on stanchions.
12. Whether the Life-Rail system has been installed by user or supplier, user must inspect the system daily for damage or alterations which could affect performance. Immediately correct any variations discovered. Report damage at once to Life-Rail Ltd 1 877 785 7245

Helpful Hints

Avoid Snarls – To uncoil cable quickly without snarls, impale cable coil on a plank end and draw cable off pulling from the unlooped end. When cable is entirely strung out, the looped end remains at the plank ready for attachment to first stanchion. Discard plank.

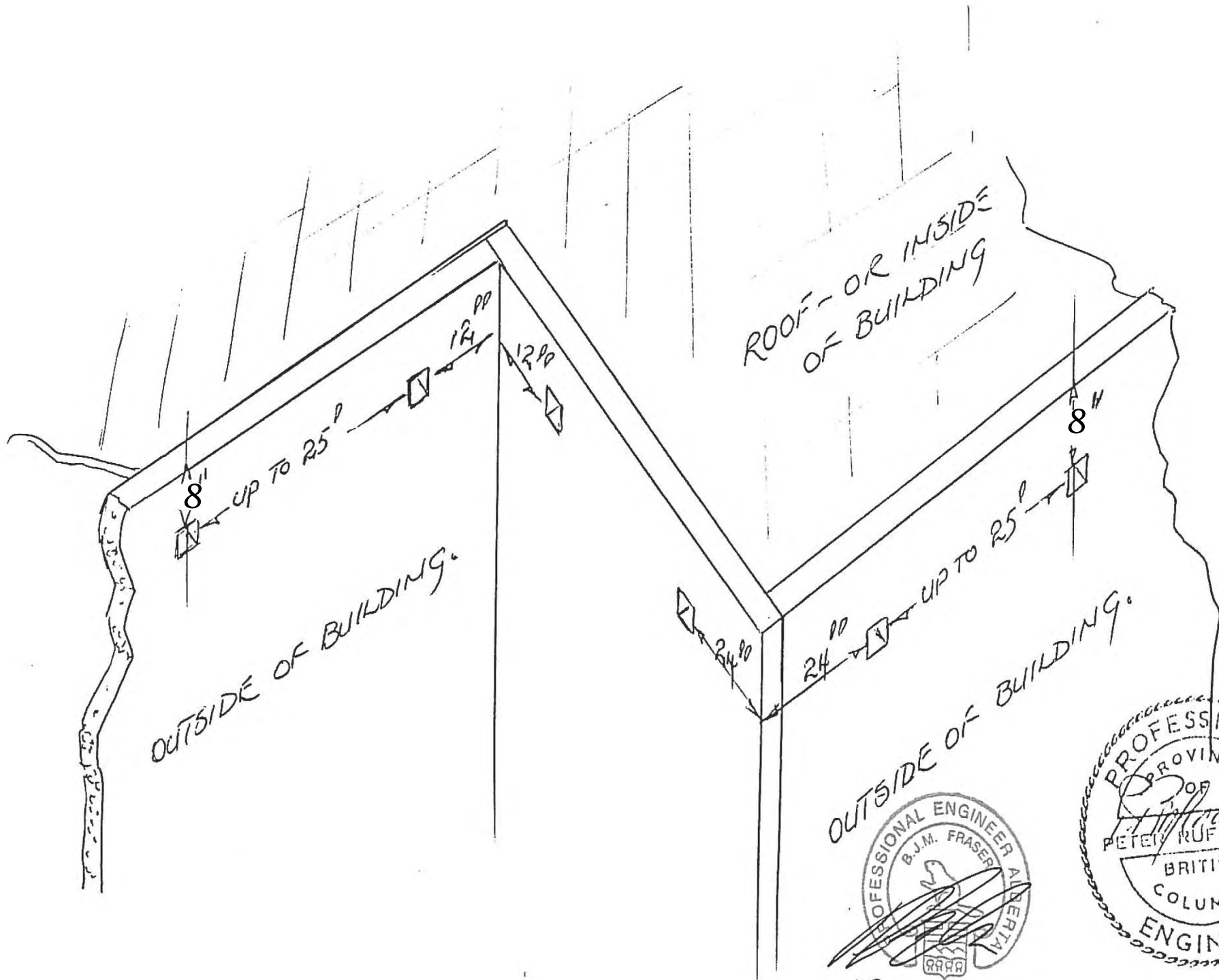
Clock Wise – Cable will drop more easily into the pass-through coils when working clockwise around the building perimeter.

Pull Tight – Life Rail protects best when the cables are very taut. Manually tension the cables with the come-along until the stanchions begin to bend in place. Tension final cable lengths enough to pull the starting -point back to a vertical position.

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OUTSIDE OF BUILDING.

ROOF - OR INSIDE OF BUILDING

OUTSIDE OF BUILDING.



Jan 9, 2009

NOTES:

FABRICATION OF POSTS, MATERIAL SPECIFICATIONS

- STEEL FOR FORMED/FABRICATED POSTS SHALL BE ACCORDING TO CSA STANDARD G4021M WITH A SPECIFIED MINIMUM YIELD STRENGTH OF 350 Mpa.
- RODS FOR WIRE ROPE THROUGH EYES SHALL BE G4021 - 300W OR A36.
- PLATES FOR TOP COVER AND THREADED WEDGE PLATE SHALL BE G4021 300W OR A36.
- THROUGH BOLT FOR WEDGE SHALL BE A307.
- ALL WELDING SHALL BE ACCORDING TO CSA W591 AND ALL OPERATORS SHALL BE QUALIFIED UNDER CSA STANDARD W47.
- POSTS SHALL BE FORMED BY MEANS OF ROLLS OF SUFFICIENT DIAMETER TO AVOID EXCESSIVE CRIPPLING AT THE BENDS.

WIRE ROPE INSTALLATION

- WIRE ROPES SHALL BE 3/8" WITH A MINIMUM BREAKING STRENGTH OF 5 TONS (10000 LBS).
- LENGTH OF WIRE ROPE SHALL BE MINIMUM 30 FEET AND MAXIMUM 300 FEET. POST SPACING SHALL BE 25 FOOT MAXIMUM.
- WIRE ROPE SHALL BE TERMINATED BY WRAPPING IT THROUGH THE THROUGH EYE AND AROUND ANCHOR POSTS. USE MINIMUM 9 1/2 INCHES OF TURNBACK. INSTALL MINIMUM THREE (3) WIRE ROPE CLIPS, TORQUED TO 30 FOOT-POUNDS OF TORQUE.
- USE MECHANICAL TENSIONING DEVICE TO TIGHTEN WIRE ROPES. MAXIMUM SAG ALLOWED IN ANY SPAN IS POST SPACING DIVIDED BY 20. THIS WILL PUT A TENSION INTO THE ROPE OF APPROXIMATELY 100 LBS.

INSTALLATION OF POSTS

- SET POSTS INTO INSERTS TO FULL DEPTH.
- TIGHTEN THROUGH BOLT WITH MINIMUM 75 FT-LB TORQUE TO ASSURE FULL WEDGING ACTION.

HARDWARE

- WORKERS SHALL WEAR FULL BODY HARNESS.
- ONLY APPROVED LANYARDS SHALL BE USED
- SHOCK ABSORBERS ARE OPTIONAL
- MAXIMUM NUMBERS OF WORKERS ATTACHED TO ONE LENGTH OF WIRE ROPE BETWEEN TERMINAL POINTS: 2

INSPECTION OF SYSTEM

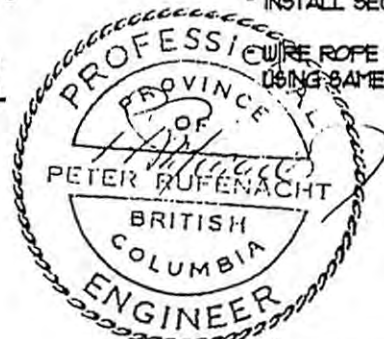
- AFTER INITIAL INSTALLATION OF THE SYSTEM AT A SPECIFIC SITE IN A SPECIFIC CONFIGURATION, THE SYSTEM SHALL BE INSPECTED BY A MANUFACTURER'S REPRESENTATIVE OR A PROFESSIONAL ENGINEER THOROUGHLY FAMILIAR WITH THE DESIGN AND LIMITATIONS OF THE LETOURNEAU LIFE-LINE.
- AFTER A FALL ARREST, ALL POSTS SHALL BE INSPECTED BY A MANUFACTURER'S REPRESENTATIVE AS WELL AS THEIR ANCHORAGE INTO THE WALL PANELS AND THE ROPE TERMINATION DETAIL. POSTS SHOWING PERMANENT DEFLECTION / DISTORTION OVER ONE (1) INCH AT THE TOP SHALL BE DISCARDED AND SENT BACK TO THE SUPPLIER.



Jan 9, 2009

GUARD RAILS

- INSTALL SECOND WIRE ROPE AT LOWER THROUGH EYE.
- WIRE ROPE SPECIFICATION IDENTICAL TO TOP ROPE FOR FALL ARREST, USING SAME DETAILS.



| REV. | BY | DATE (M.D.Y.) | DESCRIPTION |
|------|-----|---------------|------------------------|
| C | PWR | | ISSUED FOR FABRICATION |
| B | PWR | | GENERAL REVISION |
| A | PWR | | ISSUED TO BCB |

| | | | |
|--|-------------|----------|---|
| NU-WESTTECH ENGINEERING LIMITED <small>107 COLUMBIA ST. NEW WESTPORTER, B.C. CANADA V0L 1B1 TEL: (250) 322-0027 FAX: (250) 322-0230</small> | | | |
| <h2>LETOURNEAU LIFE RAIL</h2> | | | |
| SCALE | NTS | REVISION | |
| DATE | AUGUST 1997 | OWNER | |
| DRAWN | JPL | APPROVED | |
| TILT-UP PANEL CONSTRUCTION COMBINATION GUARD RAIL AND FALL PROTECTION - GENERAL NOTES | | | REV. NO. B9764-8101 REV. C |



NU-WESTECH ENGINEERING LIMITED
462 COLUMBIA STREET,
NEW WESTMINSTER, B.C. CANADA V3L 1B1
TEL. (604) 522-0057 FAX: (604) 522-0230

May 13, 1998

Project No.: 9764

TO WHOM IT MAY CONCERN

RE: LETOURNEAU LIFE-RAIL SYSTEM

This is to confirm that Nu-Westech Engineering Limited has carried out the structural design of the fall restraint / fall arrest system.

We have further devised and witnessed drop tests to confirm results of our theoretical calculations.

We can state that the system, if properly installed, meets all relevant safety requirements of the National Building Code of Canada, and Workers' Compensation Board of British Columbia.

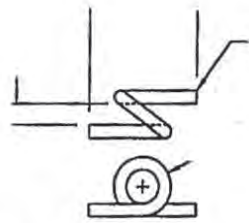
Yours Truly,
NU-WESTECH ENGINEERING LTD.

Peter Rufenacht, P.Eng.
Vice-President

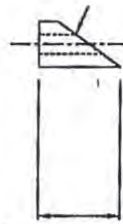
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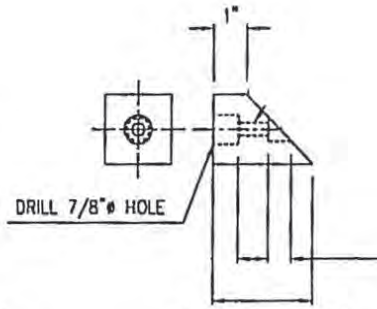




PASS THROUGH COIL
(2 REQ'D PER UNIT)



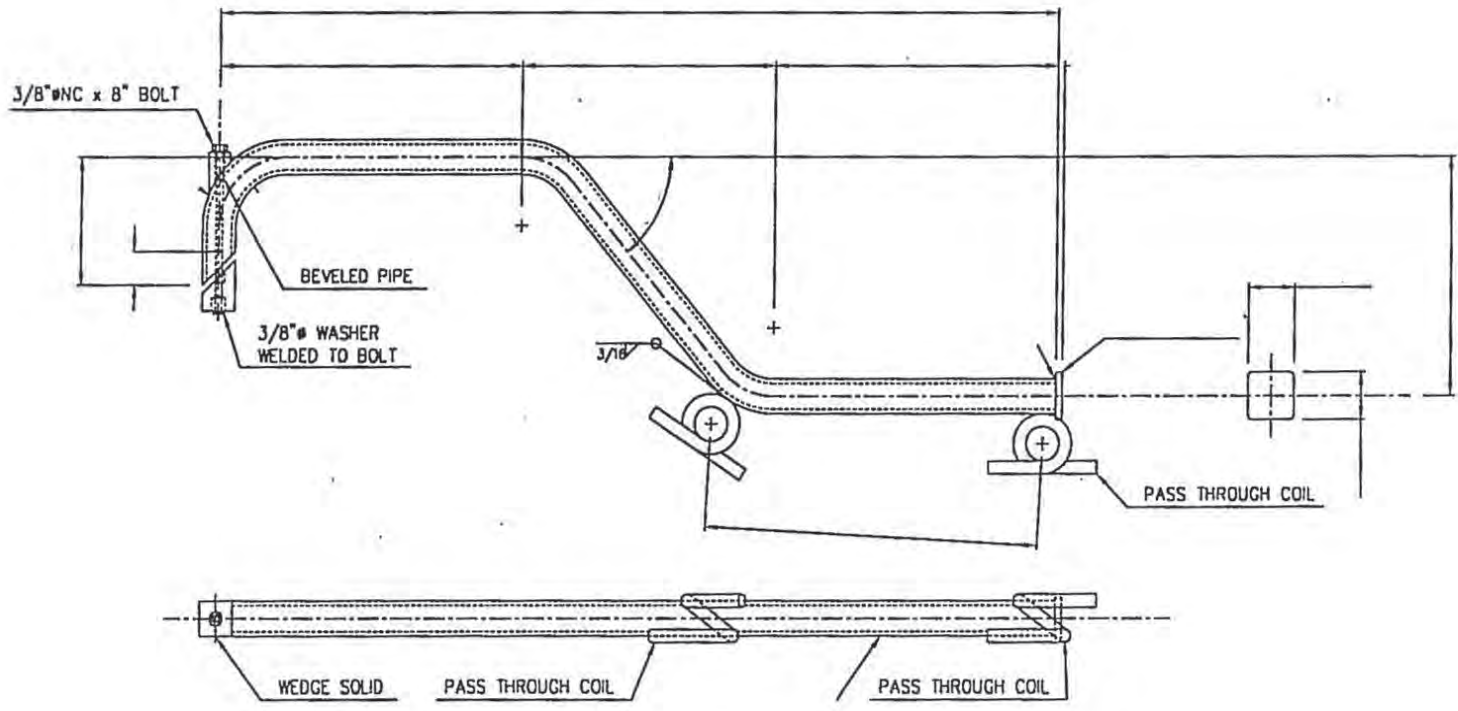
BEVELED PIPE
(ONE REQ'D PER UNIT)



WEDGE SOLID
(ONE REQ'D PER UNIT)



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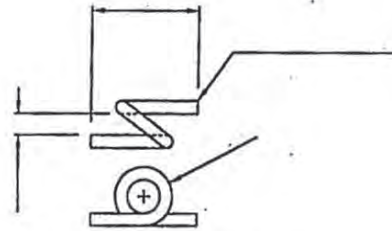


SPECIFICATIONS

FOR MATERIAL
SPECIFICATIONS SEE
DRAWING B 9764-S-101



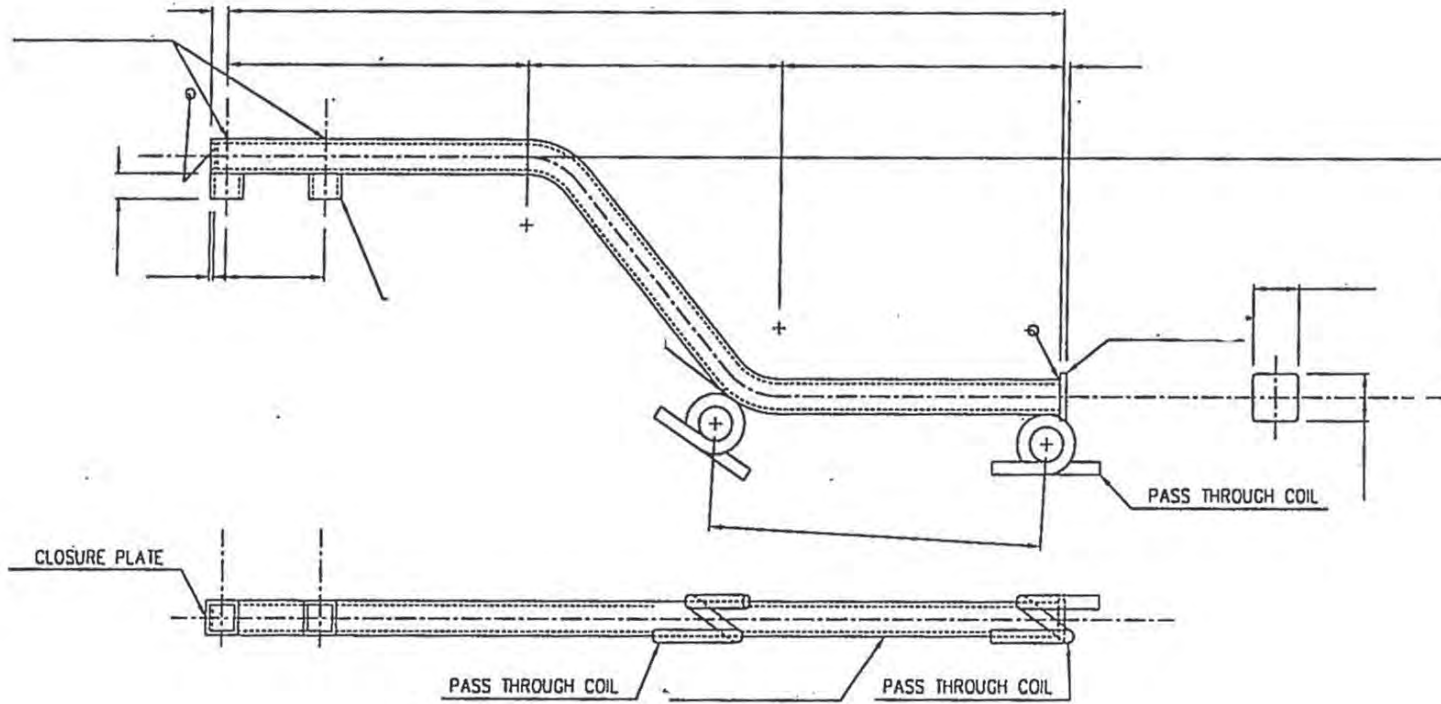
| | | | | |
|----------------------------|---------------------------------|----------------------|--------------|------------------|
| PROJECT: LIFE RAIL | DRAWN BY: T.J.V. | DATE: NOV 5/99 | SCALE NTS | TOLER ± 1/16 |
| CUSTOMER: LIFE RAIL LTD | DWG NAME: STANDARD LIFE RAIL | APPROVED BY: Y.T. | DATE: | DWG NO.: SK-2 |
| | | | | REV. 0 |



PASS THROUGH COIL
(2 REQ'D PER UNIT)



Jan 9, 2009



SPECIFICATIONS

FOR MATERIAL SPECIFICATIONS SEE DRAWING B 9764-S-101



PROJECT:
LIFE RAIL

CUSTOMER:
LIFE RAIL LTD

DWG NAME:
BOLT-ON LIFE RAIL

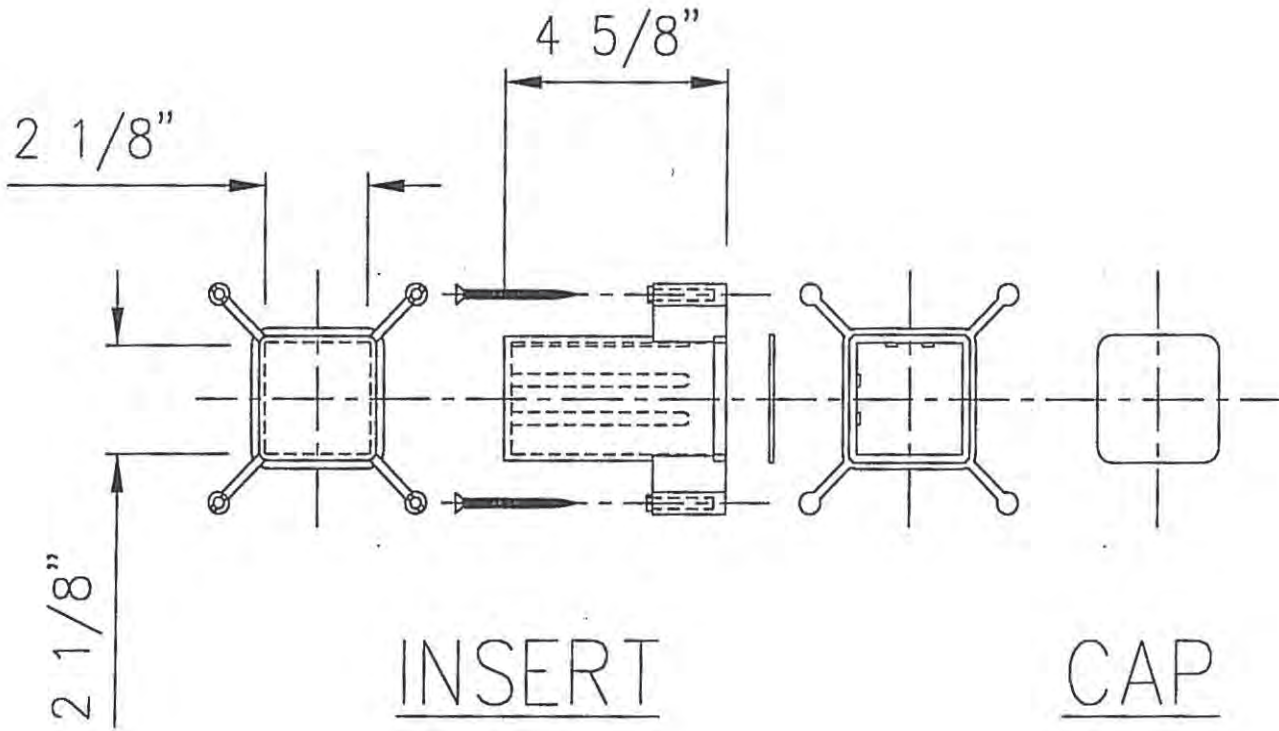
DRAWN BY:
T.J.V.

APPROVED BY:
Y.T.

DATE:
NOV 5/99

DATE:

| SCALE | TOLER |
|----------|--------|
| NTS | ± 1/16 |
| DWG NO.: | REV. |
| SK-7 | 0 |



SPECIFICATIONS

1/8" THK PVC



| | | | | | |
|----------------------------|---|----------------------|-------|------------------|-----------|
| PROJECT: LIFE RAIL | DRAWN BY: T.J.V. | DATE: NOV 5/99 | SCALE | TOLER | |
| | | | NTS | ± 1/16 | |
| CUSTOMER: LIFE RAIL LTD | DWG NAME: LIFE RAIL POST SM PLASTIC INSERT | APPROVED BY: Y.T. | DATE: | DWG NO.: SK-5 | REV. 0 |