

Occupational Health and Safety

Fatality Report

Worker Electrocuted

Date of Incident: March 21, 2007

Type of Incident: Fatality

Alberta 

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Section 1.0 DATE AND TIME OF INCIDENT

1.1 March 21, 2007, at approximately 1:29 p.m.

Section 2.0 NAME & ADDRESS OF PRINCIPAL STAKEHOLDER(S)

2.1 Owner (Property)

2.1.1 City of Edmonton
9th Floor, Century Place
9803 – 102A Avenue
Edmonton, Alberta T5J 3A3

2.2 Owner (Power Installation)

2.2.1 Epcor Distribution Inc.
17th Floor
10065 - Jasper Avenue
Edmonton, Alberta T5J 3B1

2.3 Prime Contractor

2.3.1 Epcor Utilities Inc.
15th Floor
10065 – Jasper Avenue
Edmonton, Alberta T5J 3B1

2.4 Employer

2.4.1 Epcor Utilities Inc.
South Service Centre
8743 – 58 Avenue
Edmonton, Alberta T6E 5W4

2.5 Other Employer

2.5.1 Aurora Vision International Ltd.
6812 – 180 Street
Edmonton, Alberta T5T – 1Z8

Section 3.0 DESCRIPTION OF PRINCIPAL STAKEHOLDER(S)

- 3.1 The City of Edmonton was the owner of the property on which Epcor Utilities Inc.'s employees were completing power line upgrading when the fatal incident occurred. The City of Edmonton is the majority shareholder in Epcor Distribution Inc. of which Epcor Utilities Inc. is a subsidiary.
- 3.2 Epcor Distribution Inc. owns and operates 285 power distribution feeders, 4,746 circuit km of primary distribution lines and the services and facilities for more than 300,000 customers concentrated in the City of Edmonton.
- 3.3 Epcor Utilities Inc. is a subsidiary of Epcor Distribution Inc. Epcor Utilities Inc. supplies the manpower and equipment for servicing the electrical system in the City of Edmonton and other locations. Epcor Utilities Inc. has 650 employees to service the City of Edmonton.
- 3.4 Aurora Vision International Ltd. has contracts with Telus Communications Inc. (a phone service company) and Shaw Communications Inc. ETAL (a cable television company) to supply equipment and manpower for maintenance on their customer service lines. Two workers from Aurora Vision International Ltd. used a utility van-mounted bucket crane to disengage Telus Communications Inc. and Shaw Communications Inc. ETAL cable lines from the power pole to be removed. These lines were to be held up with the bucket crane while the power pole transfer took place, and then were to be reinstalled on the new power pole after it was set in place. (Attachment "A", Photographs 1, 2)

Section 4.0 LOCATION OF INCIDENT

- 4.1 In the back alley north of 51 Avenue and between 106 and 107 Streets in Edmonton, Alberta. (Attachment "A", Photograph 1)(Attachment "B", Sketch)

Section 5.0 EQUIPMENT AND MATERIAL INVOLVED

- 5.1 **Terex – Telelect Inc. Radial Arm Digger Crane**
 - 5.1.1 Commander 4050
PG Winch
Series L4000
Serial # 2031022829
Load Chart Number E04F-8496
Retracted sheave height 9.05 m (Attachment "A", Photographs 3, 4)

5.2 2003 Freightliner Truck

5.2.1 Model FL80, Extended Cab
Utility Body/Digger
Serial # [REDACTED]
Unit # E3750
License # [REDACTED]
(Attachment "A", Photograph 4)

5.3 Stanley Hydraulic Tamper

5.3.1 Model TA54
Attached to Freightliner power unit with hydraulic lines
(Attachment "A", Photographs 5, 6)(Attachment "C", Stanley Hydraulic Tamper Drawing)

5.4 Shopmade 1983 PSV Pole Trailer

5.4.1 Serial #185391
Unit # C5011
License # [REDACTED]
(Attachment "A", Photographs 7, 8)

Section 6.0 NARRATIVE DESCRIPTION OF INCIDENT

6.1 On March 21, 2007 at 8:36 a.m. a safety/planning meeting with 8 Epcor Utilities Inc. employees from the Edmonton, South Distribution Centre took place at the location where an existing 13.7 m high Power Pole was to be removed and a new Power Pole installed while the electrical power lines were still fully energized. At this same time the site supervisor had ordered a circuit reclosure to be blocked by the Control Centre Operator. This was confirmed as being successfully completed. Blocking the circuit recloser would prevent an automatic reactivation of power service if the circuit breaker shut power service off due to a power line fault.

6.2 A number of Epcor Utilities Inc. Boom Trucks with buckets for carrying personnel were set up at strategic locations at the site to facilitate a smooth completion of all the tasks associated with a Power Pole change-out.

6.3 One Boom Truck (Unit D3703) was set up with an Auxiliary Arm that had wire holders for each energized electrical Power Line of the 3-phase system. These energized Power Lines could be raised up and out of the way of the equipment to be used at the site to install the new Power Pole. Two Power Linemen would stay in the dual buckets during the whole process of removal and replacement of the Power Poles. (Attachment "A", Photograph 1)

- 6.4 Another Boom Truck (Unit D3877) set up at the location of the old Power Pole and removed all the cross-arms and hardware on this Power Pole that was to be scrapped.
- 6.5 Two workers with Aurora Vision International Ltd. dismantled the connections of the telephone and television cable from the old Power Pole to be removed, and left their Boom-Truck Bucket Crane stationary, securing the cables in the air. (Attachment "A", Photographs 1, 2)
- 6.6 The Radial Arm Digger Truck (Unit E3750) with a Pole Trailer (Unit C5011) and a new Power Pole came to the site from the Edmonton, North Distribution Centre at approximately 9:30 a.m. The site supervisor reviewed the existing Epcor Aerial Safe Work Plan with this two man crew. This crew parked away from the work area until they were required.
- 6.7 A Hydro-Vacuum Truck was brought in to evacuate the soil around the butt of the old Power Pole so as not to damage the Riser cables and conduits beside the Power Pole for the underground services. The task was completed and the Hydro-Vacuum Truck left the scene.
- 6.8 The Radial Arm Digger Crane Truck operator unloaded two full trays of gravel from the interior bed of the Freightliner Truck's Tool Box assembly on the truck frame, and stacked these onto the Pole Trailer while he was parked waiting for the Hydro-Vacuum Truck to finish and leave the alley location.
- 6.9 The operator of the Radial Arm Digger Truck and Pole Trailer parked the units in the alley in preparation for removing the old Power Pole and replacing it. The Old Power Pole was cut into pieces above the telephone and television cable junctions. The remainder of the old Power Pole was pulled out and stored on the Pole Trailer. The two Gravel Trays stored on the Pole Trailer were placed, one to the south, and one to the east of the hole for the new Power Pole. The Operator of the Radial Arm Digger Truck's Crane made a practice run to determine how the new Power Pole would be inserted into the open excavation amongst all the various electrical conduits and cables. The Power Pole was prepared with a rubber insulating sleeve around the top. The new Power Pole was installed without encountering any difficulty. (Attachment "A", Photograph 1)
- 6.10 One tray of gravel to the east of the new Power Pole was emptied into the hole surrounding the Power Pole and packed in place with the Stanley Hydraulic Tamper. One-half of the gravel in the second Gravel Tray was shovelled into the hole around the Power Pole and tamped. The Power Pole was secure enough that the Pole Claws on the end of the Radial Arm Digger Crane could be opened to let go of the Power Pole. The operator of the Radial Arm Digger Crane disengaged the Pole Claws and picked up the empty tray of gravel with the Crane Boom's winch line and swung the Crane Boom around counter-clockwise behind the Freightliner Truck. When clear of the power lines and equipment behind, the operator raised the Boom of the Radial

Arm Digger Crane to store the empty Gravel Tray and then pick up a full Gravel Tray from inside the truck bed. The operator stopped moving the Boom at this time so his assistant could climb onto the truck to assist by stopping the Gravel Tray from spinning, and then unhook the empty tray and attach the slings to pick up the full tray. The empty tray was still hanging above the truck box. (Attachment "A", Photograph 3)

- 6.11 Prior to lowering the empty Gravel Tray, the operator of the Radial Arm Digger Crane heard a loud roaring noise. He then turned to look at the site of the new Power Pole base and saw fire erupting out of the hole. (Attachment "A", Photographs 5, 6) The operator then observed Power Linemen workers near the new Power Pole dragging another worker, who had fallen, away from the fire.
- 6.12 At 1:29 p.m. on March 21, 2007 the Radial Arm Digger Crane Pole Claw was seen by one of the Power Linemen to have made contact with the east side primary 8 kV energized Power Line. (Attachment "A", Photographs 9, 10) The Power Line sparked and melted until it was severed. The north section fell to the ground and the south section snapped back and wrapped around another utility line crossing to a home on the east side of the alley. (Attachment "A", Photographs 1, 11, 12) During this period of contact to the High Voltage Power Line, the Radial Arm Digger Truck as well as the Pole Trailer and Stanley Hydraulic Tamper conducted electrical current to ground. (Attachment "A", Photographs 13 - 16) The Power Lineman that suffered electrocution had touched the Pole Trailer.
- 6.13 The co-workers of the electrocuted Power Lineman gave first aid CPR to the injured worker until the Emergency Services personnel came to the scene. The injured Power Lineman was later pronounced dead.

Section 7.0 ANALYSIS

7.1 Direct Cause

- 7.1.1 The Direct cause of the electrocution of the Power Lineman was the Radial Arm Digger Crane's open Pole Claw making contact with an 8 kV energized Power Line and energizing the Radial Arm Digger Truck and Pole Trailer at the same time as the Power Lineman touched the Pole Trailer and ground. There were distinctive arc marks on this trailer. (Attachment "A", Photographs 8, 15, 16) The Medical Examiner's photographs showed distinct electrical current entry marks and exit marks on the victim's body.

7.2 Contributing Factors

- 7.2.1 The Radial Arm Digger Crane Truck and Pole Trailer were not grounded with a dedicated ground wire and ground rod to protect the unit and surrounding area from

the electrical current due to an inadvertent Power Line strike when the unit was working among energized Power Lines. This is a practice that is used by some power utility service providers. Section 310 (2)(d) of the Occupational Health and Safety Code requires employers to provide safeguards if a worker may accidentally, or through the work process come in contact with energized electrical cables.

- 7.2.2 The Power Linemen on the ground were not using portable Rubber Ground Mats that would create an equipotential zone to protect workers from accidental electric shock hazards. (Attachment “D”, *Alberta Electrical and Communication Utility Code*, Rubber Protective Devices) Use of Rubber Ground Mats is not a common practice with Power Linemen but often used by Hydro-Vacuum Truck Operators exposing underground electrical lines.
- 7.2.3 Epcor Utilities Inc. did not ensure that a proper hazard assessment was conducted by the crew managing the project prior to starting the project or that a second hazard assessment was conducted by the Radial Arm Digger Truck Crane operator and assistant when they viewed the site with the Power Lines crossing directly above the Radial Arm Digger Truck Crane after they had positioned the truck and trailer to change-out the Power Poles.
- 7.2.4 The operator of the Radial Arm Digger Crane had changed units within the last few months and had started operating unit E3750 on December 3, 2006. This unit had a longer Crane Boom by approximately 0.46 m according to witness statements. This change in equipment made it possible for the operator to misjudge his limits of approach to the energized power line.
- 7.2.5 The Operator of the Radial Arm Digger Truck Crane disregarded the warnings on the control panels (top and front) indicating there was a danger of electrocution death from contacting an energized power line as this unit was not insulated from conducting electrical current. (Attachment “A”, Photographs 17 - 19) The operator of the Radial Arm Digger Truck Crane disregarded the safe limits of approach to energized electrical power lines allowed in the Alberta Electrical and Communication Utility Code for personnel qualified to work with energized power lines. (Attachment “E”, *Alberta Electrical and Communication Utility Code*, General Requirements for Utility Employees and Attachment “F”, *Alberta Electrical and Communication Utility Code*, Limits of Approach)
- 7.2.6 The Radial Arm Digger Truck Crane and Pole Trailer usually had a crew of 3 workers but on this occasion there was only the operator and his assistant. The third worker usually acted as a spotter to watch that the Radial Arm Digger Crane did not come within the limits of approach to the energized Power Line.
- 7.2.7 The Radial Arm Digger Truck Crane and Pole Trailer crew came from a different Power Distribution Service Centre (North Edmonton Distribution Service Centre). At the North Edmonton Distribution Service Centre the Radial Arm Digger Truck

Crane and Pole Trailer crew brought their own fill gravel in trays that were stacked inside the enclosure of the Radial Arm Digger Crane Truck box. In order to lift these Gravel Trays out, the Crane Boom would have to be angled almost straight up so the winch line could attach to the slings for hoisting the gravel trays. (Attachment "A", Photographs 3, 20) The South Distribution Service Centre used small gravel dump trucks instead of Gravel Trays that needed to be hoisted by the Radial Arm Digger Truck Crane. The South Distribution Service Centre management did not arrange for a small dump truck to supply the gravel for this site to eliminate the need for the Radial Arm Digger Truck's Crane to be used for hoisting Gravel Trays amongst energized Power Lines.

- 7.2.8 No one was acting as a dedicated spotter for the operator of the Radial Arm Digger Truck Crane as he was lifting the boom to access the Gravel Trays in the truck enclosure. The two Power Linemen in the Bucket Truck (Unit D3703) holding up the energized lines with the insulated Auxiliary Arm, had a good horizontal line of vision, as to how close the Radial Arm Digger Crane's Pole Claws were to the energized lines. The operator of the Radial Arm Digger Crane would have had his back to the Crane Boom when operating the controls at the left side of the Radial Arm Digger Crane. (Attachment "A", Photographs 3, 17) The operator would have had to turn his head and look up to view the tip of his boom. The positioning of the Gravel Tray was a distraction. The Gravel Tray was spinning due to the installation of a new hoisting cable on the Radial Arm Digger Crane.
- 7.2.9 The energized Power Lines had only 1 rubber Line Protector each, as they were deemed too heavy for the Power Lines to carry the weight due to a weakened cross-arm on the Main Power Line junction. The rubber Line Protector was not near the area where the Radial Arm Digger Truck Crane operator was raising his boom to place the Gravel Tray. (Attachment "A", Photograph 20) In preparation for the Power Pole change-out, this cross-arm structure was not replaced with a new one so as to allow for the energized Power Lines to carry the added weight of rubber Line Protectors during the Power Pole change-out procedure. (Attachment "A", Photograph 21) Power Linemen that were interviewed also indicated that they were concerned that if they put too many rubber Line Protectors on the energized line, it may be prone to swing more in a windy situation. (Attachment "G", *Alberta Electrical and Communication Utility Code, Safety Rules and Guarding*)
- 7.2.10 The Boom Truck, unit D3703, did not lift the energized Power Lines on the insulated Auxiliary Arm as high as possible due to concern that the weakened cross-arm structure on the Main Line junction would fail. In preparation for the Power Pole change-out, this cross-arm structure was not upgraded or replaced with a new one, so as to allow for the energized Power Lines to be lifted higher during the Power Pole change-out procedure.

- 7.2.11 The Radial Arm Digger Crane did not have a Proximity Alarm to warn of being too close to energized Power Lines. The Radial Arm Digger Crane did not have a boom that was insulated from carrying electrical current. The Radial Arm Digger Crane was being operated with the Pole Claws in the extended position which would make the equipment more prone to contact the Power Line.
- 7.2.12 The Main Line junction was not aligned with the Power Poles along the alley. The Power Lines crossed the alley. If the Main Line junction had been aligned, the Power Lines would have been to one side of the alley instead of crossing the alley. This created a hazard for equipment positioned and working in the alley of contacting the energized Power Lines that crossed the alley.
- 7.2.13 The Main Line Junction Power Pole was old, and had deteriorating cross-arms that posed a hazard of failure with the procedures used for the Power Pole change-out. The Main Line junction Power Pole had not been moved to be in alignment with the alley in a project prior to the change-out of the Power Pole in the alley. A new metal pole structure had been installed in line with the alley Power Poles and between the Main Line and the first Power Pole, as a guy support for the first Power Pole along the alley. (Attachment "A", Photograph 22)
- 7.2.14 The Power Distribution Breaker for the zone being serviced did not open on first indication of fault to ground after the initial energized Power Line contact. If the breakers had opened at first indication of fault to ground, the electrocution could have been prevented. The Relays to activate the Breaker were set to open at a specified electrical current flow to ground. The information from witnesses and the Control Centre operation's recorder indicated that the fire roaring from the hole of the new Power Pole (due to the grounded Stanley Hydraulic Tamper) lasted for a considerable number of seconds until the contacted 8 kV Power Line melted and severed. The evidence from the Control Centre recorder shows that from the first indication of a line fault, to the actual time that the power was shut off manually by the Control Centre Operator, was 1 minute and 22 seconds. Review of the evidence indicates that the Phase Relay Inverse Time Over-Current setting was to activate at 720 amperes (primary). The Phase Relay Instantaneous Over-Current setting was to activate at 1224 amperes (primary). Due to the resistance of various objects to electrical current flow after the energized Power Line contact, the maximum fault to ground recorded, was a 480 amperage flow. Neither of the Relays would have activated to stop electrical current flow.
- 7.2.15 The wind had started to blow and gust in the early afternoon according to the statements of witnesses. According to the Environment Canada Weather report from the Edmonton International Airport the wind had increased from 11 km/h at 8:00 a.m. to 30-32 km/h between 1:00 and 2:00 p.m. in the afternoon. (Attachment "H" Weather Report) The wind was swaying the Power Lines.

Section 8.0 APPLICABLE LEGISLATION**8.1 Occupational Health and Safety Act, Section 2(1)(a)(i)(b)
Obligations of employers, workers, etc.**

8.1.1 Epcor Utilities Inc. did not ensure as far as reasonably practicable that everything was done to ensure the project was performed in as safe a manner as possible. Some of the areas included the assessment of the hazards of parking the Radial Arm Digger Crane Truck in the alley below the energized Power Lines, the hazards associated with the Main Power Line junction deterioration, and the type of equipment used for filling the hole in setting the new Power Pole. A proper hazard assessment was not performed.

**8.2 Occupational Health and Safety Act, Section 2(2)(a)
Obligations of employers, workers, etc.**

8.2.1 The operator of the Radial Arm Digger Truck Crane did not take reasonable care to protect the health and safety of himself and other workers by ensuring an adequate hazard assessment was completed relating to the area of the alley where his equipment was parked, and that his equipment was grounded properly before operating a Crane in close proximity to energized Power Lines.

8.2.2 The operator of the Radial Arm Digger Truck Crane did not take reasonable care to ensure safe limits of approach were followed in operating the Crane near an 8 kV energized Power Line. He did not follow the operational warnings on the equipment he was operating. He contacted the live Power Line, energizing all the equipment, which resulted in the electrocution of the worker.

**8.3 Occupational Health and Safety Code, Section 7(1)
Hazard assessment**

8.3.1 The Epcor Utilities Inc. did not properly assess the work site and identify existing and potential hazards before work began at the worksite. Epcor Utilities Inc's Aerial Safe Work Plan had a generic hazard priority list and some controls. There was no mention of the hazards associated with the Radial Arm Digger Truck Crane and Pole Trailer that would be set up to exchange Power Poles while parked under energized Power Lines.

**8.4 Occupational Health and Safety Code, Section 7(4)(a)(b)(c)
Hazard assessment**

8.4.1 Epcor Utilities Inc's management did not require the Radial Arm Digger Truck Crane operator and his assistant to conduct a separate hazard assessment for work associated with exchanging Power Poles. The original hazard assessment was not revisited when the work process changed as new equipment was added to the site.

**8.5 Occupational Health and Safety Code Section 310(2)(d)
Safeguards**

8.5.1 Epcor Utilities Inc. did not provide safeguards where a worker could accidentally, or through the work process come in contact with energized Power Lines. The Radial Arm Digger Truck was parked in such a way, that to access the Gravel Trays within the enclosure of the truck, an energized Power Line could be contacted. The Crane Boom on the Radial Arm Digger was not insulated to prevent conducting electricity.

**8.6 Occupational Health and Safety Code, Section 800(1)
Safe work practices for electric utilities and rural electrification associations**

8.6.1 Epcor Utilities Inc. did not ensure that the operator of the Radial Arm Digger Truck Crane followed the safe limits of approach for utility workers noted in Section 4 Division "E", Safe Limits of Approach and Table 4-1 in the *Alberta Electrical and Communications and Utility Code*. This section identifies 850 mm as the safe limits of approach to 8 kV energized exposed parts. The operator made direct contact with the 8 kV energized Power Line.

Section 9.0 FOLLOW-UP / ACTION TAKEN

9.1 Alberta Employment, Immigration & Industry

9.1.1 Workplace Health and Safety Compliance Investigators attended the site of the incident on March 21, 2007 and investigated the incident. Workplace Health and Safety Compliance enlisted the aid of the Alberta Municipal Affairs and Housing's Chief Electrical Inspector in determining the causes of the incident and assessing the safe work procedure that was developed (at the time of the investigation) to safely dismantle the damaged equipment, complete the installation of power service equipment and re-energize the power distribution system.

9.1.2 A verbal Stop Work Order was issued by Workplace Health and Safety Compliance pending determination of the cause of the incident and was to remain in effect until a site-specific safe work procedure was developed to clear the damaged equipment, repair the damaged equipment, and continue the installation to re-energize the power distribution lines. A specific document was required on how a similar incident was to be prevented before any Radial Arm Digger Truck Crane work was allowed to continue in similar circumstances. Orders were written to Epcor Utilities Inc. for obligations of the employer and worker, hazard assessment, inspection, repair and certification of the damaged Radial Arm Digger Truck Crane and Pole Trailer. Orders were issued for failure to follow the safe limit of approach distances to energized parts. Epcor Utilities Inc. was required to conduct their own incident investigation and prepare a report of circumstances and corrective measures, and make this report available for review. Epcor Utilities Inc. was required to provide

specific information on the recorded communication at the time of the incident and the switching orders made prior to the project. Epcor Utilities Inc. was ordered to supply maintenance documentation related to the testing of relays and circuit breakers involved with the energized power circuit involved in the incident. The settings of these circuit breakers were also requested.

9.2 Industry

9.2.1 The Edmonton Police Service secured the scene of the incident and provided personnel to ensure no equipment was disturbed and that no workers or the public would be endangered by the damaged electrical equipment while Workplace Health and Safety Compliance Investigators were investigating, and remained until the hazard was removed.

9.2.2 Epcor Utilities Inc. co-operated fully with the orders written by the Occupational Health and Safety Compliance Investigator and complied with all the orders. All information requested was supplied.

9.3 Additional Measures

9.3.1 No additional measures are required.

Section 10.0 SIGNATURES

ORIGINAL REPORT SIGNED _____
Investigator Date

ORIGINAL REPORT SIGNED _____
Investigator Date

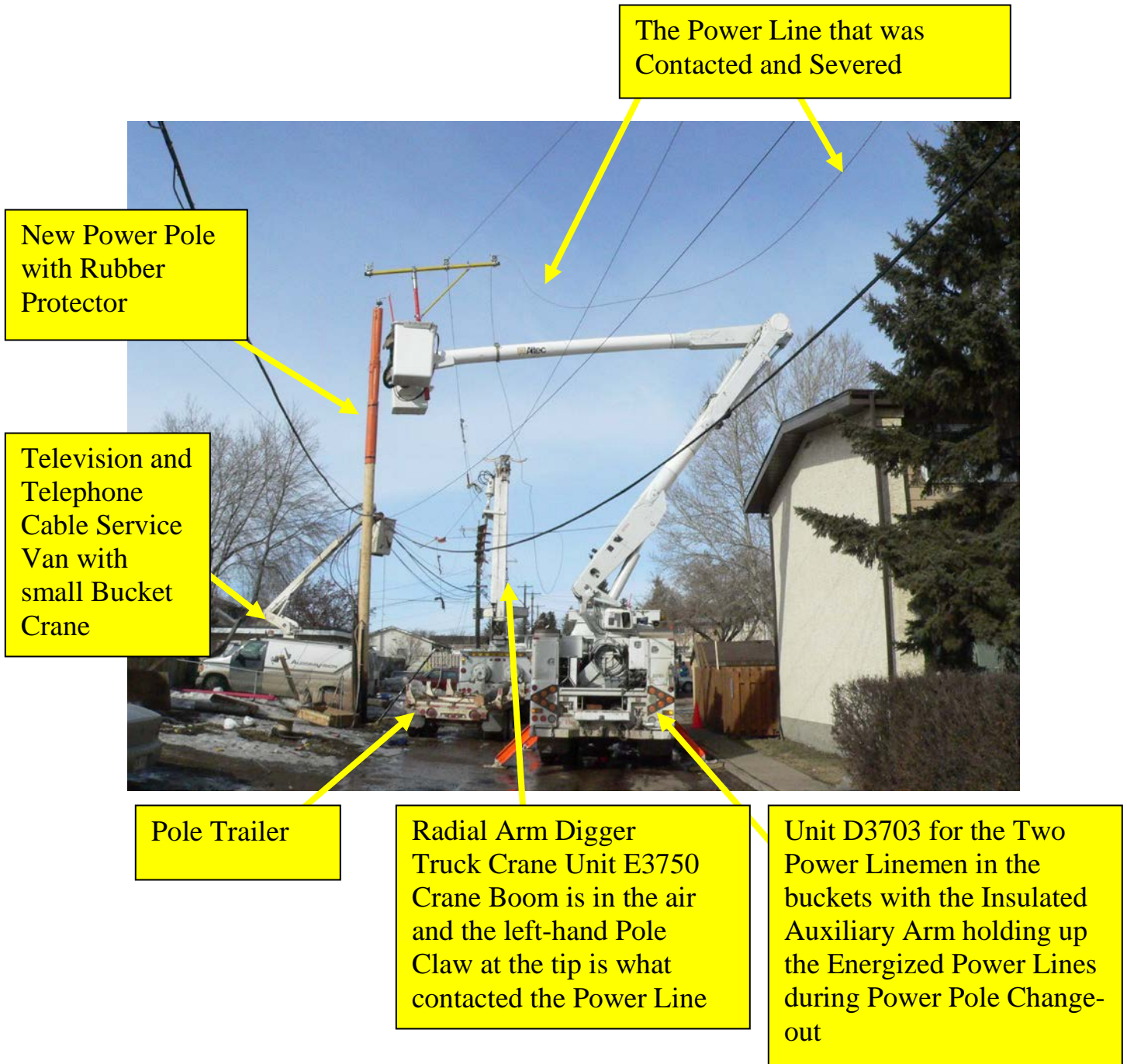
ORIGINAL REPORT SIGNED _____
Investigator Date

ORIGINAL REPORT SIGNED _____
Manager Date

ORIGINAL REPORT SIGNED _____
Senior Manager, North Date

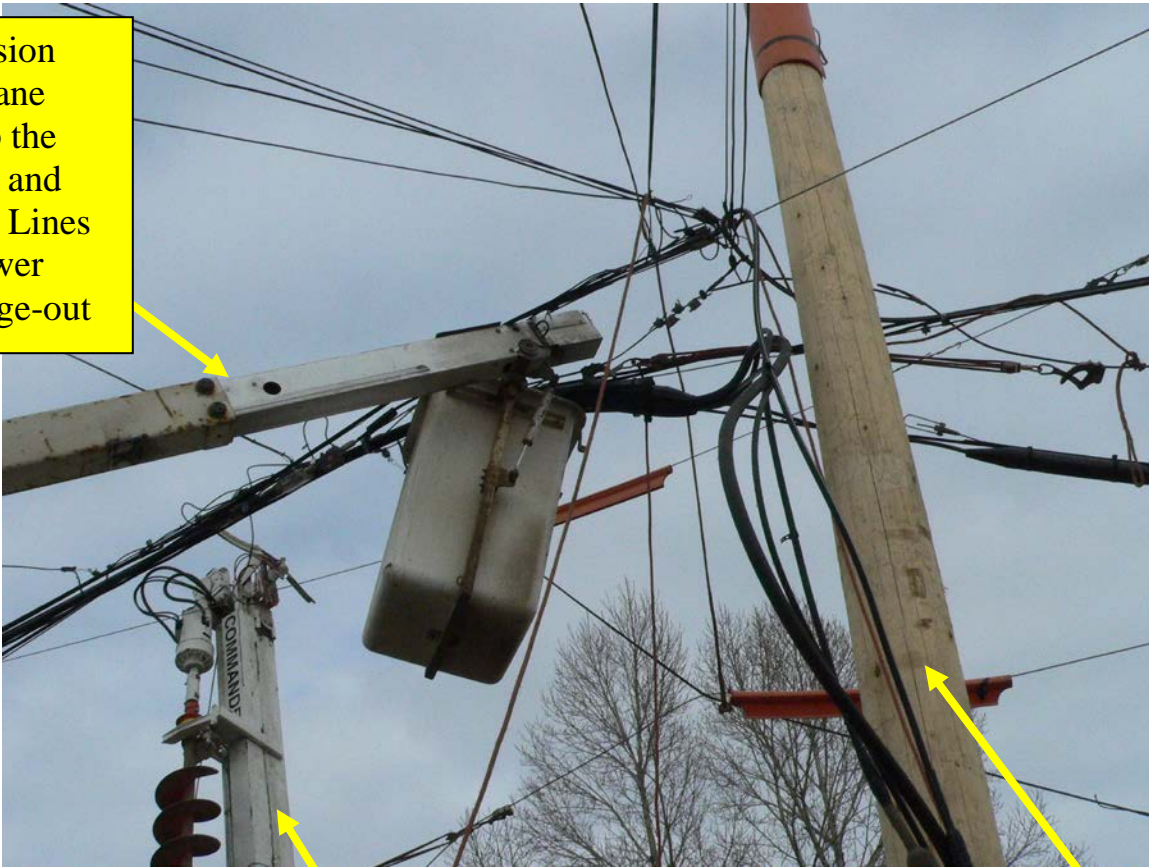
Section 11.0 ATTACHMENTS

Attachment A	Photographs
Attachment B	Sketch
Attachment C	Hydraulic Tamper Drawing
Attachment D	<i>Alberta Electrical and Communication Utility Code</i> , Rubber Protective Devices
Attachment E	<i>Alberta Electrical and Communication Utility Code</i> , General Requirements for Utility Employees
Attachment F	<i>Alberta Electrical and Communication Utility Code</i> , Limits of Approach
Attachment G	<i>Alberta Electrical and Communication Utility Code</i> , Safety Rules and Guarding
Attachment H	Weather Report



Photograph #1 Shows a view of the alley looking north from 51 Avenue between 106 and 107 Streets in Edmonton, Alberta. The Power Lines can be seen crossing the alley from the Main Line junction to the first Power Pole that is shown replaced.

Aurora Vision
Bucket Crane
holding up the
Television and
Telephone Lines
during Power
Pole Change-out



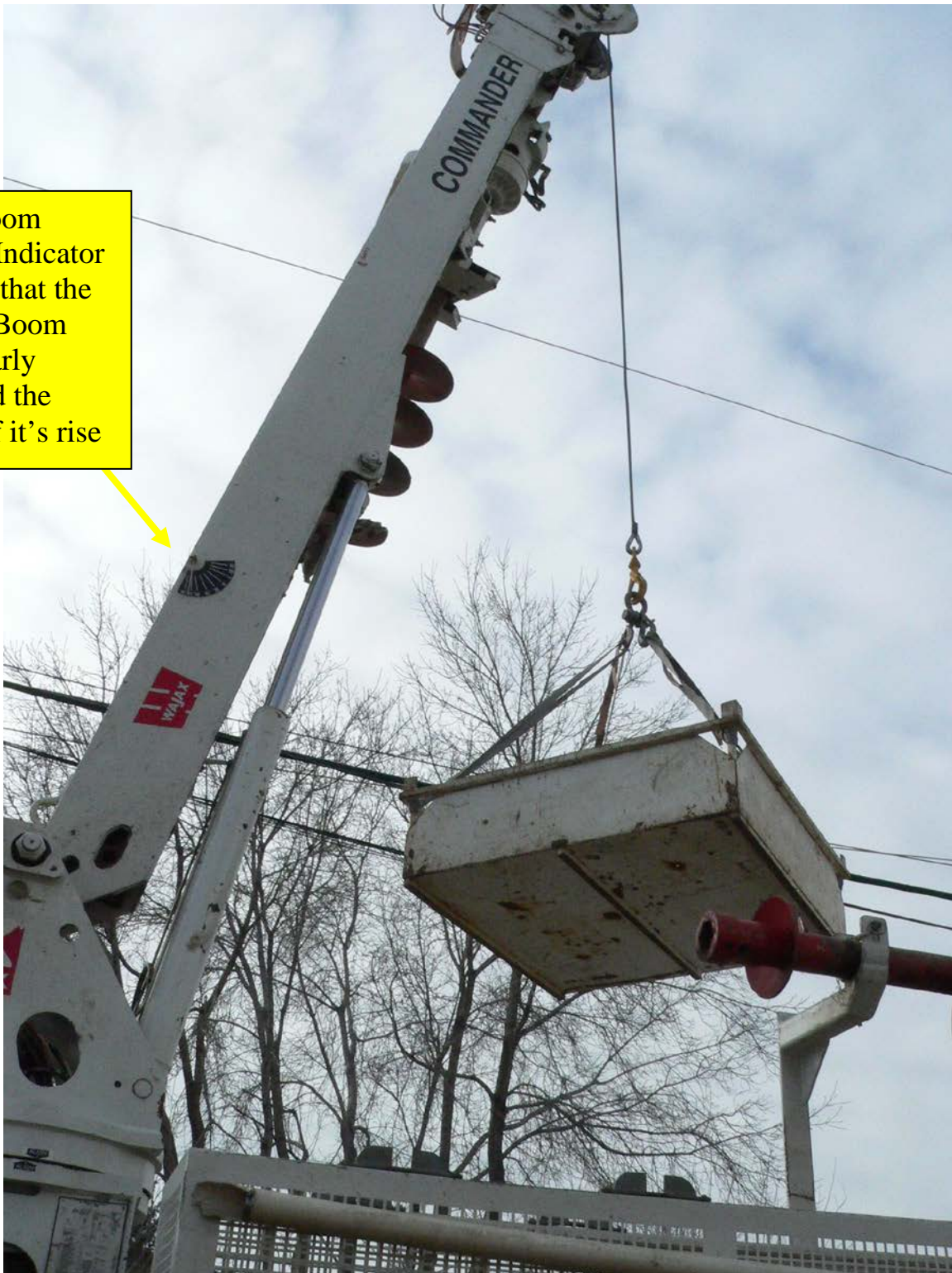
Top of the Radial
Arm Digger Crane

Looking up from
the base of the new
Power Pole

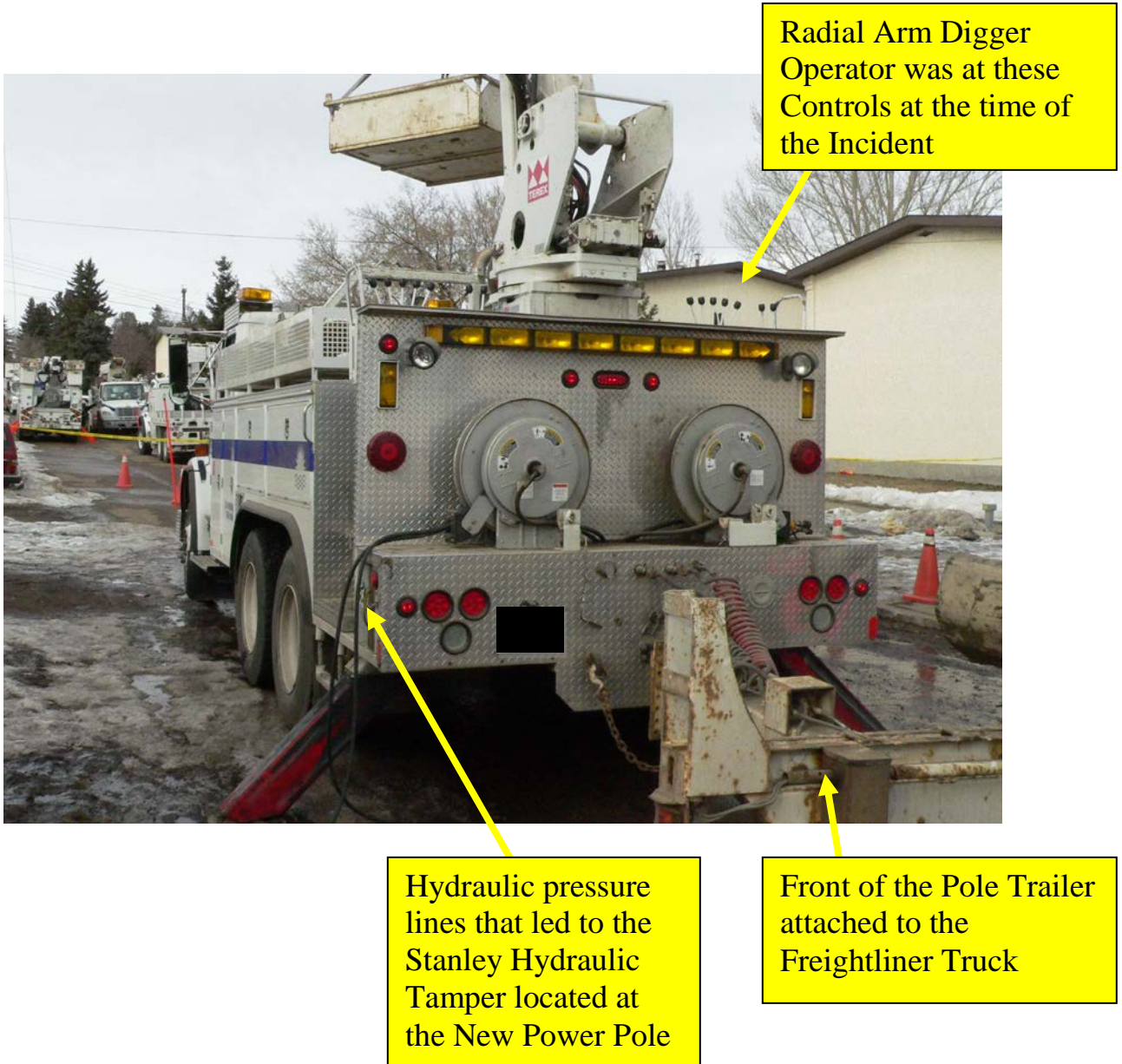
Photograph #2

Shows a closer view looking northeast up from the base of the new Power Pole that was installed. This view exemplifies the difficulty for the Power Linemen and other service personnel to complete the removal and installation of power poles with the many different services along with the Power Lines.

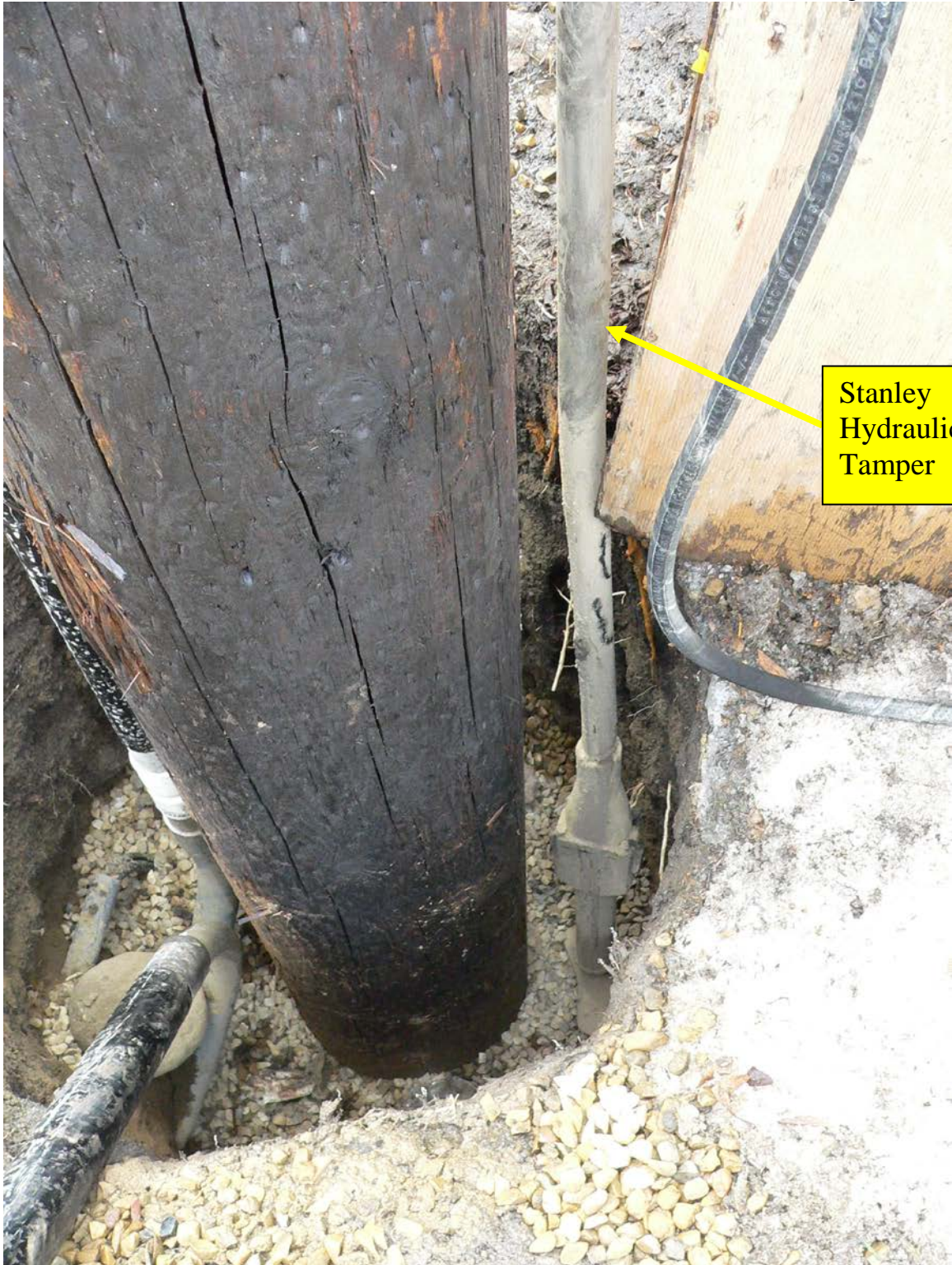
The Boom Angle Indicator Shows that the Crane Boom has nearly reached the limit of its rise



Photograph #3 Shows the position of the Radial Arm Digger Crane Boom and the empty Gravel Tray hanging in the air looking in a northwesterly direction from the passenger side of the truck. The operator would have been looking towards the rear of the truck to operate the Crane controls.



Photograph #4 Shows the Freightliner Truck (with license identifier) depicting the Radial Arm Digger mounting arrangement and the perspective of where the Gravel Tray is when looking north, north-east from the rear of the unit. The operator was at the controls on the rear passenger side of the truck. The normal operating position would be facing to the rear.



Stanley
Hydraulic
Tamper

Photograph #5 Shows how the base of the new Power Pole looked from the alley side. The Power Pole is singed from the fire that erupted due to grounding of the 8 Kv Power Line. The Stanley Hydraulic Tamper in the hole was a main source of grounding from the Freightliner Truck with Radial Arm Digger Crane.

Freightliner Truck Unit E3750
with the Radial Arm Digger
Crane mounted on it



Shows one of two
Gravel Trays that were
placed near the Power
Pole excavation. This
Gravel tray is located
directly south of the
new Power Pole.

This is the location of the Gravel
Tray that was taken away by the
Radial Arm Digger Crane. This is
also the location where 3 workers
were at the time fire erupted from the
hole at the base of the Power Pole.
One of the workers exiting the scene
was electrocuted.

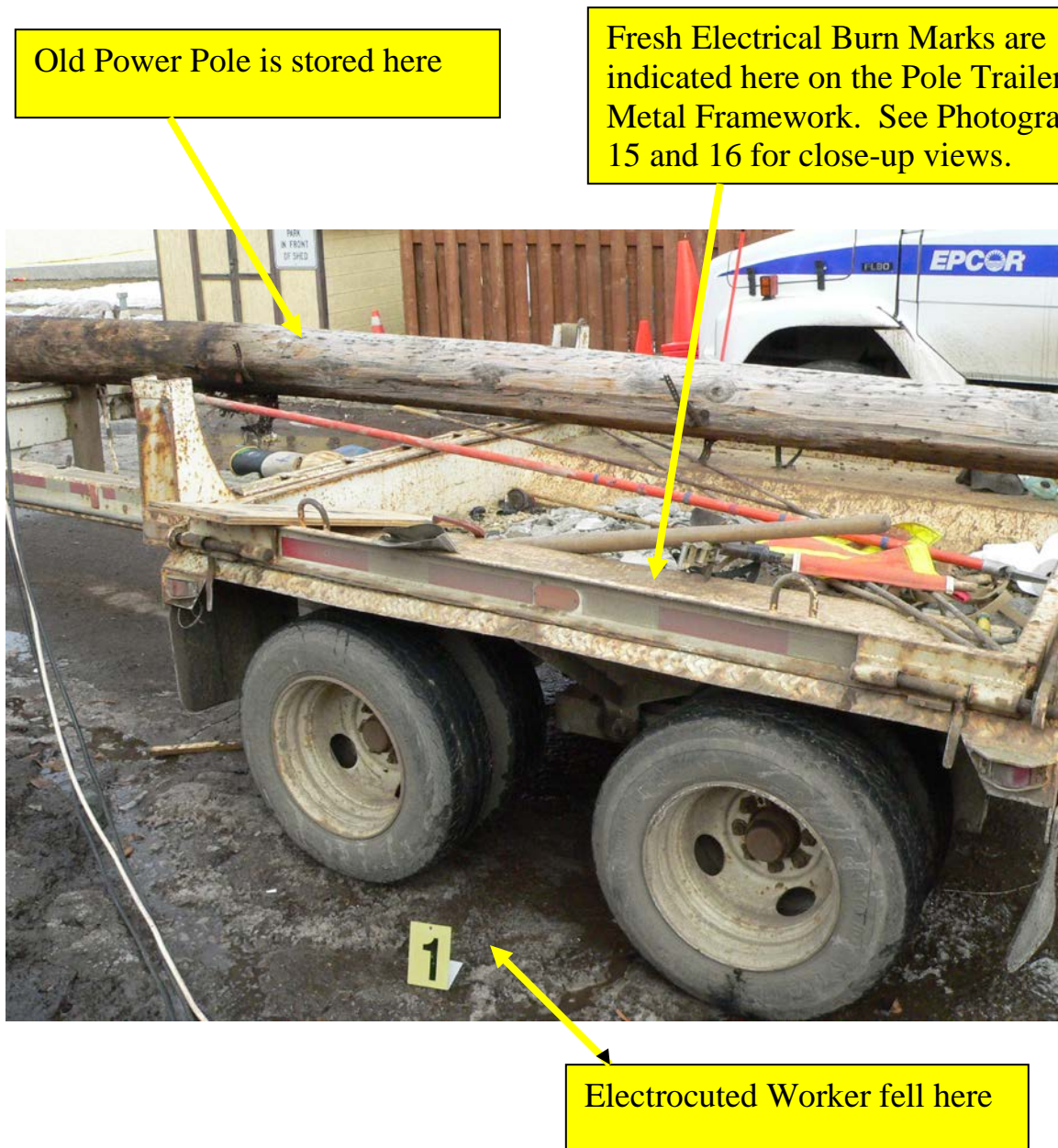
Hydraulic Hoses
leading to the
Stanley Hydraulic
Tamper

Photograph #6 Shows the base of the Power Pole from the alley, looking in a
northerly direction.



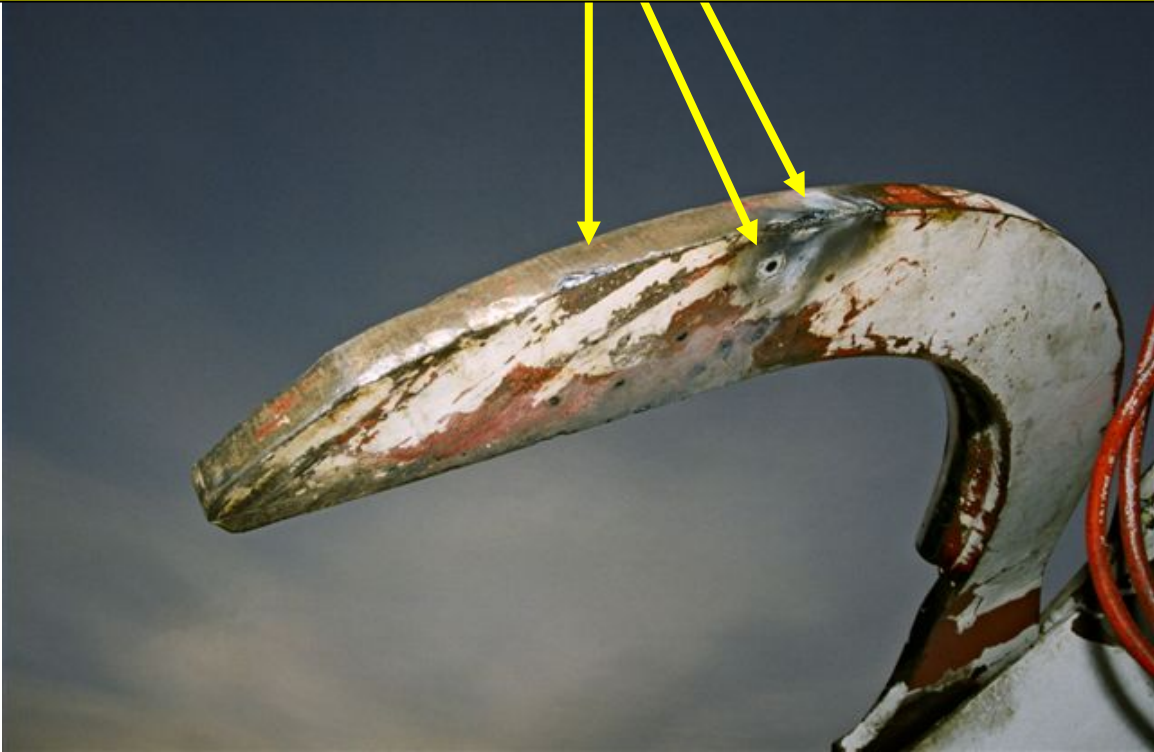
Photograph #7

Shows a view of the scene from the same location where Photograph 6 was taken, looking in a northeasterly direction. This indicates how the Freightliner Truck and Pole Trailer were attached and became an integral part of the conducting system for the electrical current dispersal once the energized Power Lines had been hit by the Radial Arm Digger Crane Pole Claw.



Photograph #8 Shows a view taken from the same position as Photographs 6 and 7, while turning in a rotation on the landscape. The number 1 marker indicates where the electrocuted worker fell to the ground beside the driver's side of the Pole Trailer wheels.

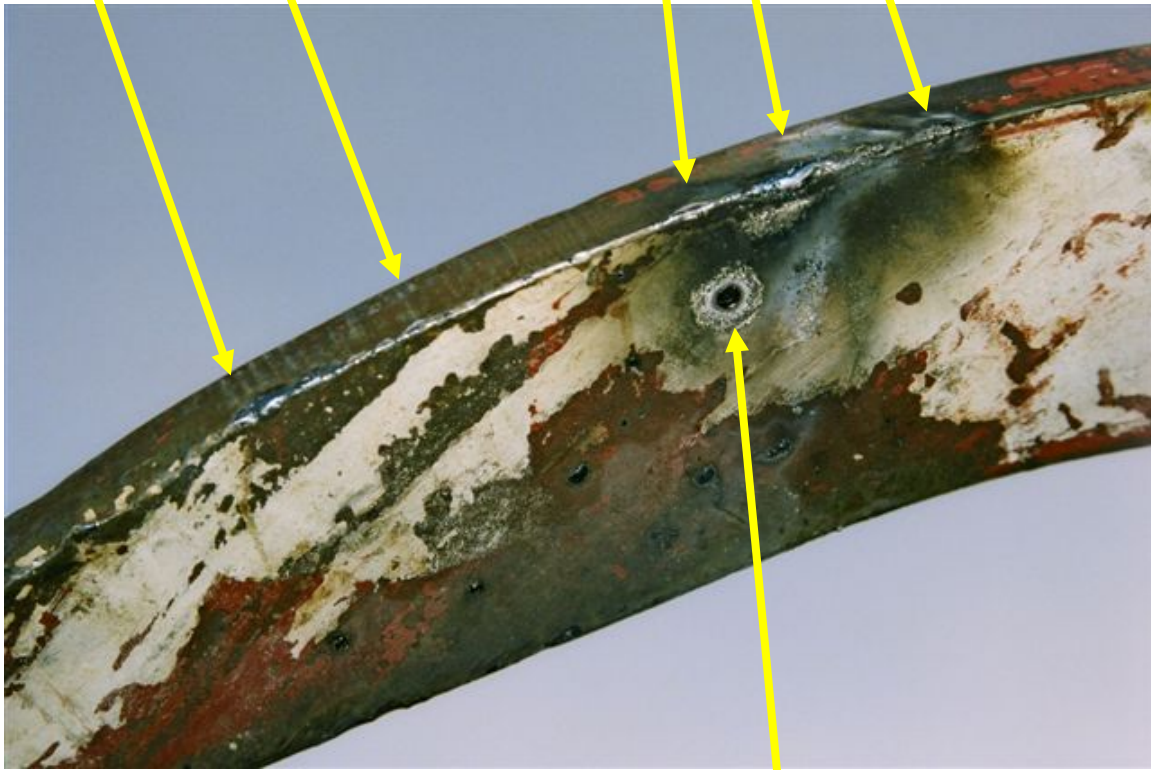
Fresh Electrical Burn and Melting Marks on this outer side Rim of the Pole Claw



Photograph #9 Shows the electrical arc marks and melting on the left, driver's side, bottom, of the Pole Claw that is located at the top of the Radial Arm Digger Crane Boom. This is one of the areas that made contact with the 8 Kv energized Power Line. See Photograph 10 for a close-up view of the arc marks.

A Second Tracking Burn Mark with a Deposit of Metal Welded to the Pole Claw

A Tracking, High Temperature Burn Mark with a deposit of Metal Welded to the Pole Claw



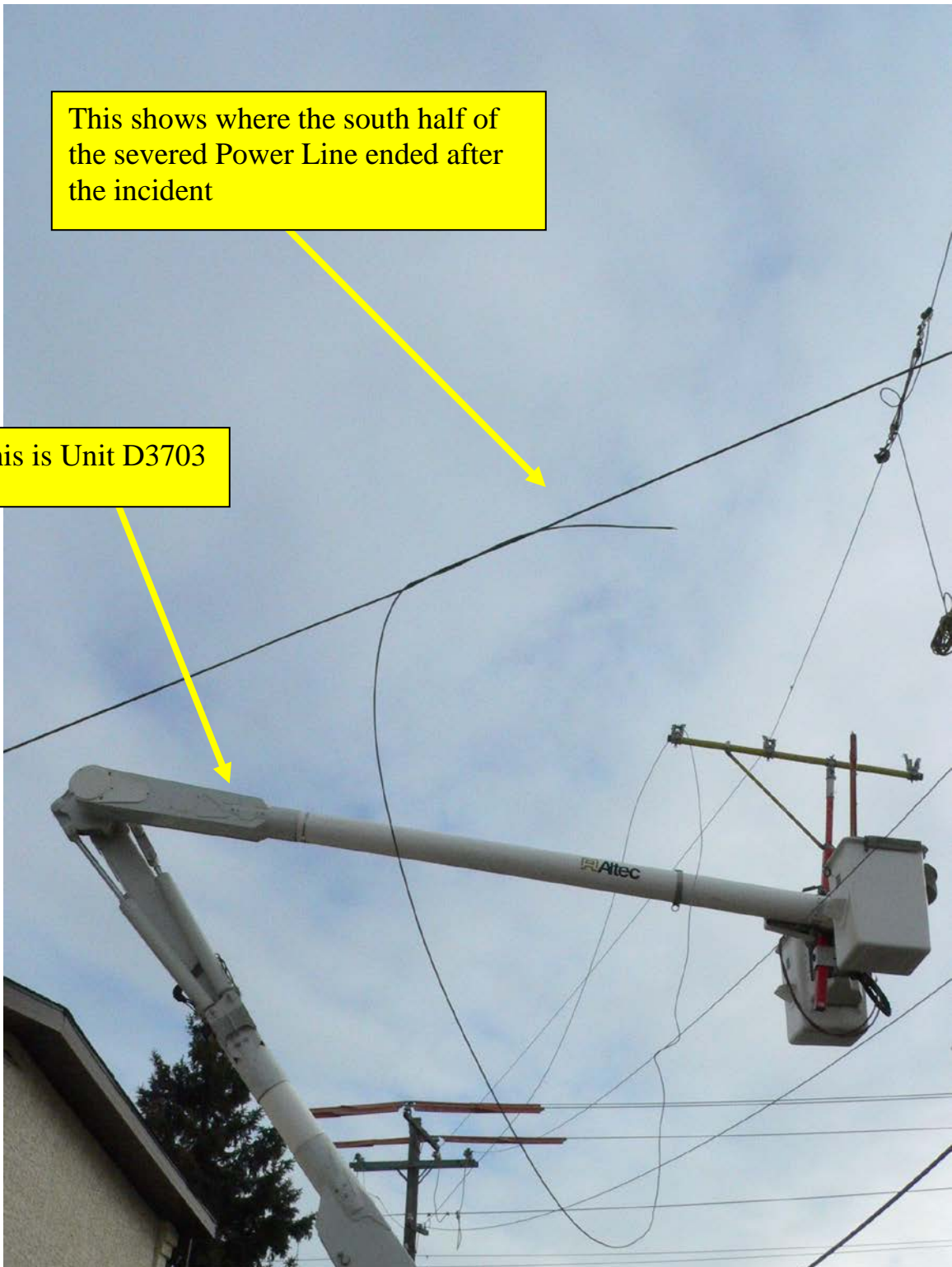
Fresh Electrical Arc Depression in the Steel

Photograph #10 Shows a closer view of the Pole Claw depicted in Photograph 9.



North half of the Bare Metal
Electrical Power Line lying
on the ground

Photograph #11 Shows the severed end of the Power Line between the front of the Radial Arm Digger Truck and the second pole in the alley going north. This line ended up on the ground after being severed.



This shows where the south half of the severed Power Line ended after the incident

This is Unit D3703

Photograph #12 Shows the south half of the Power Line after it was severed. This photograph is taken looking south from the alley towards 51 Avenue. The electrical Power Line severed end wrapped around a utility line traversing the alley to the east side dwellings.



Electrical Arcing indicated by the blackened rubber on the Freightliner Truck Tire. Unit E 3750

Photograph #13 Shows how the electrical current from the Power Line contact by the Pole Claw, traveled through the Radial Arm Digger Truck frame and into the ground through the driver's side rear tires.



Burned Rubber
Coating indicated

Hydraulic Hoses are
melted into the ice from the
heat of High Voltage
Electrical Current flow

Photograph #14 Shows a closer view of how the heat from the high-voltage electrical current following the hydraulic hoses (also shown in photograph 6) burned the rubber coating and melted the hose into the ice.



Fresh Electrical arc marks under the top lip of the channel-iron frame of the Pole Trailer. See Photograph 8 for orientation of where this area is located on the Pole Trailer.

Photograph #15 Shows where the Power Lineman contacted the Pole Trailer and was electrocuted from the current of the 8 Kv Power Line that was contacted by the Radial Arm Digger Crane's Pole Claw.



Fresh Electrical arcing marks where the Power Lineman touched the top edge of the Pole Trailer and was electrocuted

Photograph #16 Shows the top of the channel-iron frame of the Pole Trailer that the worker was touching when the Radial Arm Digger Crane Pole Claw contacted the high voltage Power Line and conducted electrical current through it.



Photograph #17 Shows a view from the Radial Arm Digger left side control panel for the Crane. This is taken looking south and off the left side of the Radial Arm Digger Truck frame. The operator would have been facing the rear and the boom of the Crane was elevated and behind him. See the next two photographs for a closer view of the warnings related to the precautions around electrical hazards.

A closer view of Warning Posters on the Operator Control Panel for the Radial Arm Digger Crane

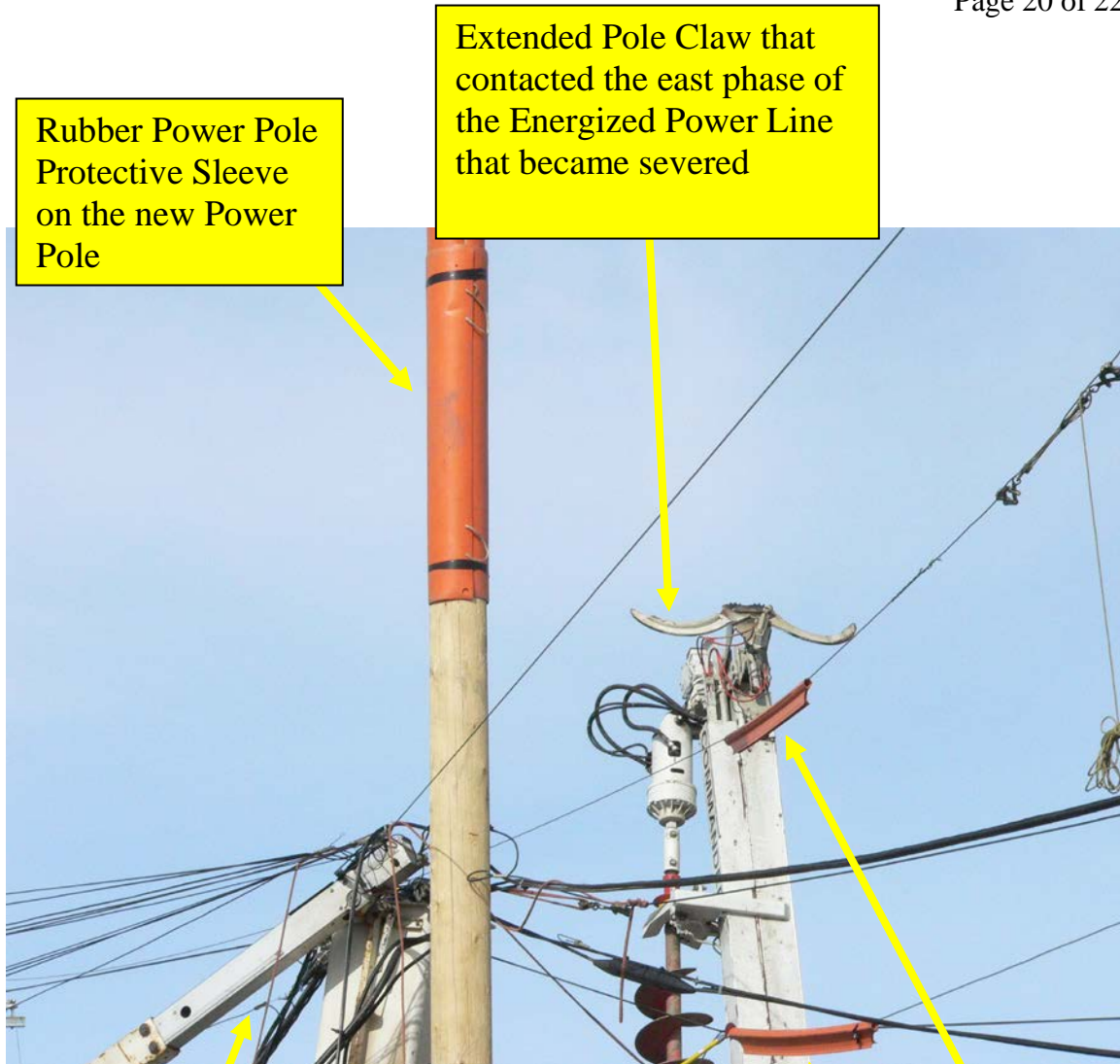


Photograph #18 Shows a close-up of the warning posters on the front side facing the operator at the control panel where the Radial Arm Digger Truck operator was located during the time of the incident.

Electrocution Hazard
Warnings on the top side
of the Operators Control
Panel



Photograph #19 Shows a view looking down directly onto the warning posters on the left-side control panel for the Radial Arm Digger Crane.



Rubber Power Pole Protective Sleeve on the new Power Pole

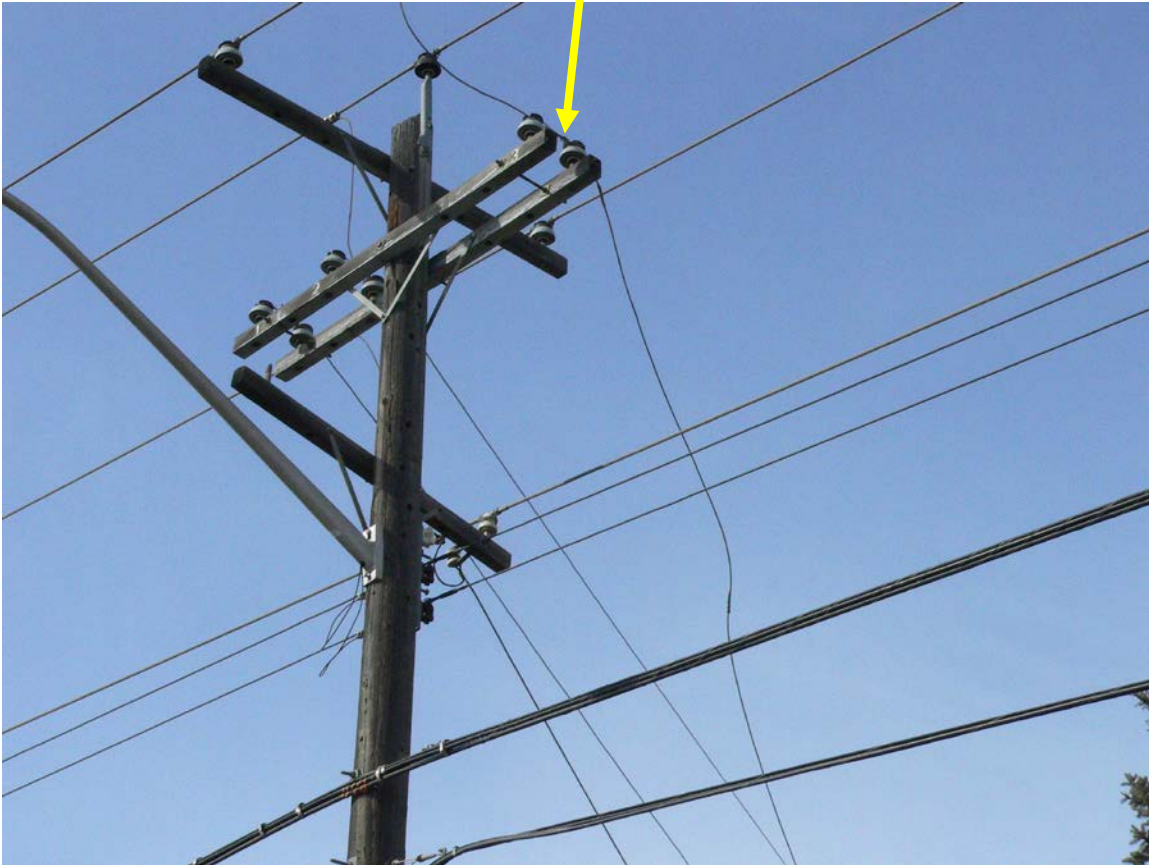
Extended Pole Claw that contacted the east phase of the Energized Power Line that became severed

Aurora Vision Van Crane and Bucket holding up the Telephone and Television and other Cables

Shows one single Rubber Power Line Protector remaining on each of the two Power Lines of the three phases that were energized on this project

Photograph #20 Shows the proximity of the Radial Arm Digger Crane's Boom and Pole Claws to the rubber Power Line Protectors on the two lines that remain in the air after the incident.

Wooden cross-arms with insulators
that are the junction from the Main
Power Line Pole on 51 Avenue



Photograph #21 Shows a view of the Main Power Line Junction to the three-phase Power Lines leading into the alley north of 51 Avenue. This indicates that they are well aged, wooden, and may have allowed the insulators to break loose if the Power Lines were lifted too high by the D3703 Boom Truck with the Auxiliary Arm.

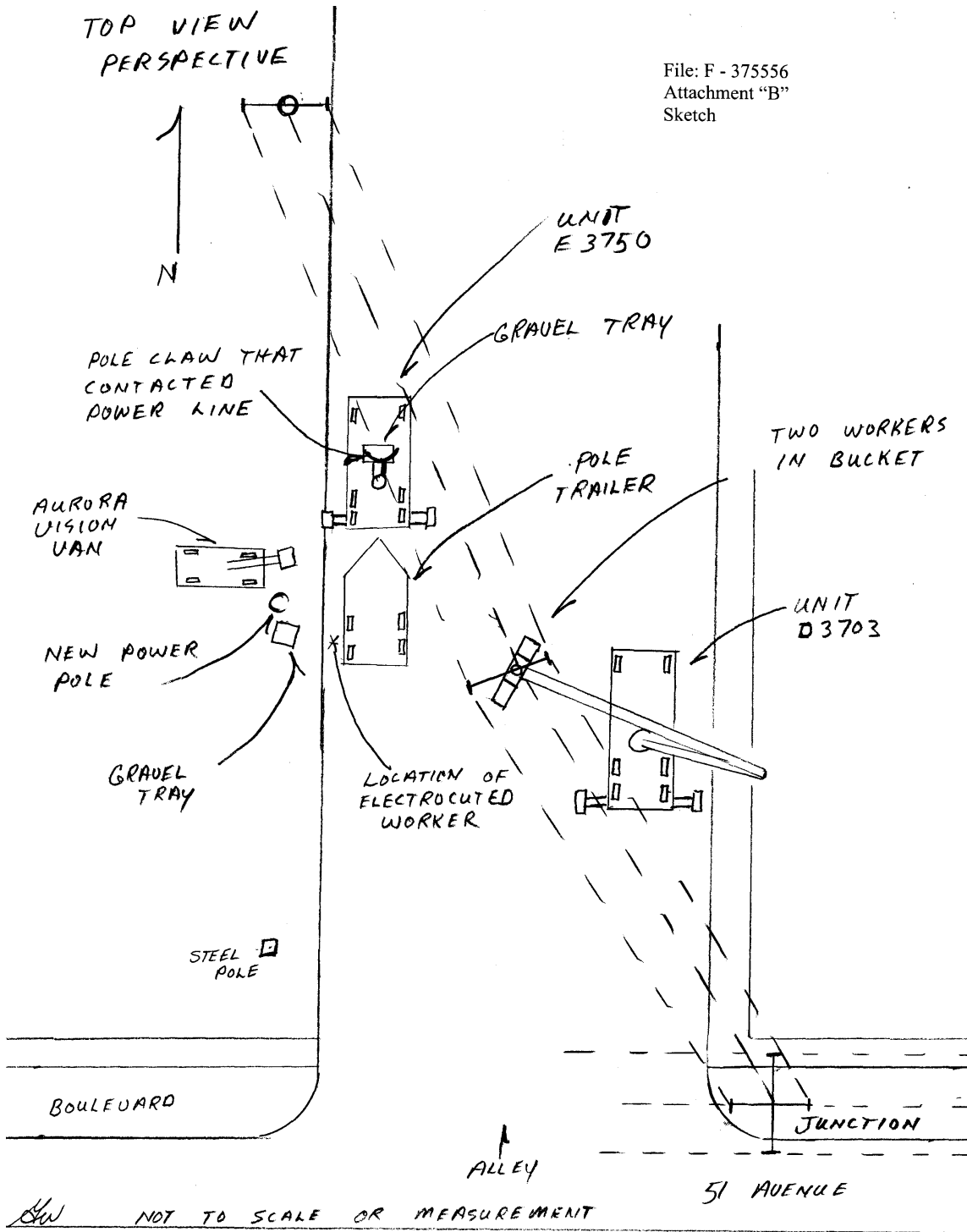


This is the Metal Support Pole that was installed as a part of the project to give stability to the Power Poles along the alley. This Metal Pole is in line with the Power Poles along the alley.

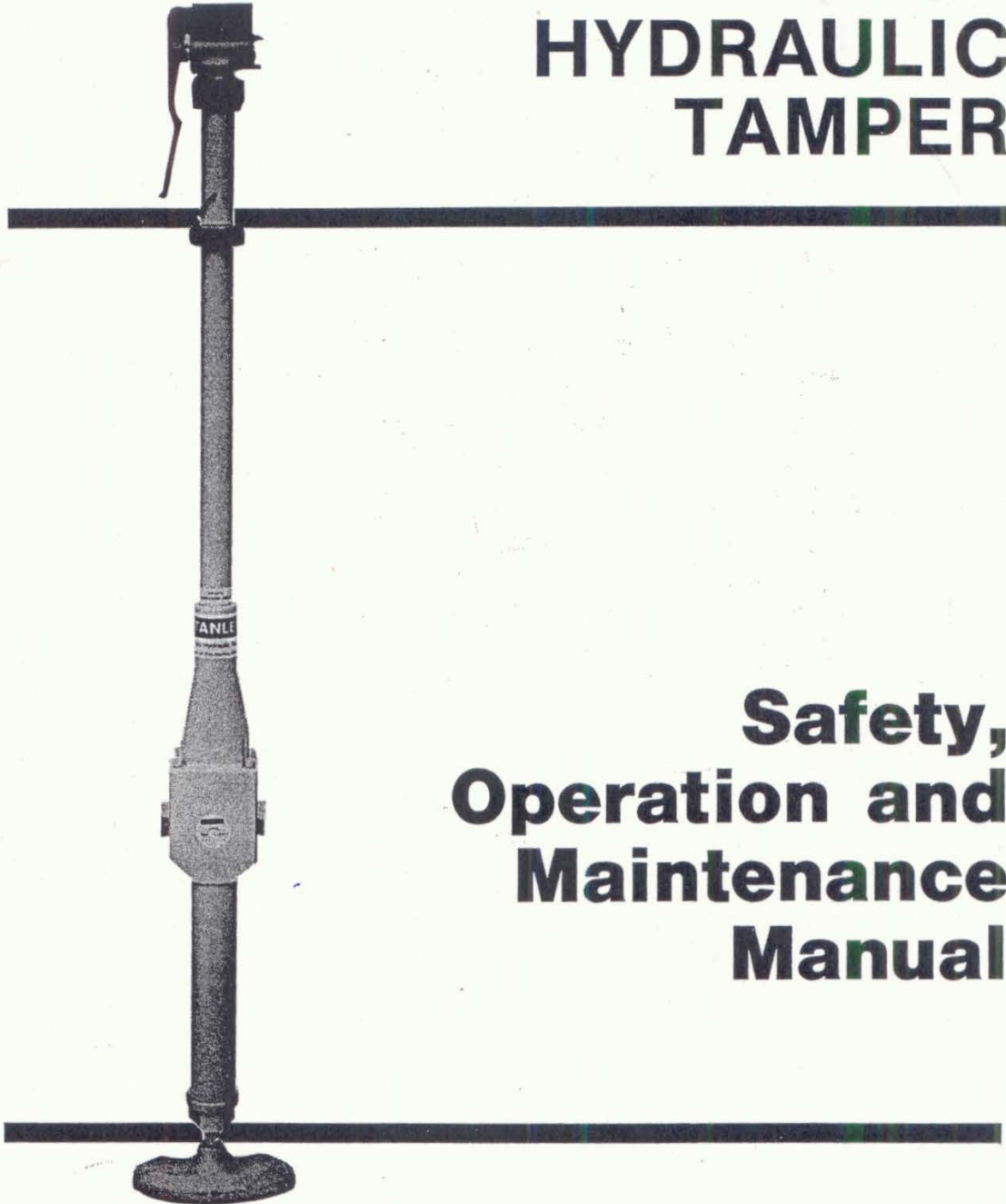
Photograph #22 Shows a view from 51 Avenue looking northwest depicting how the Power Lines from the Main Line Junction were held up by the Auxiliary Arm on Unit D3703. Also shown in this view is the Metal Support Pole installed in line with the alley Power Poles.

TOP VIEW
PERSPECTIVE

File: F - 375556
Attachment "B"
Sketch



TA54 HYDRAULIC TAMPER

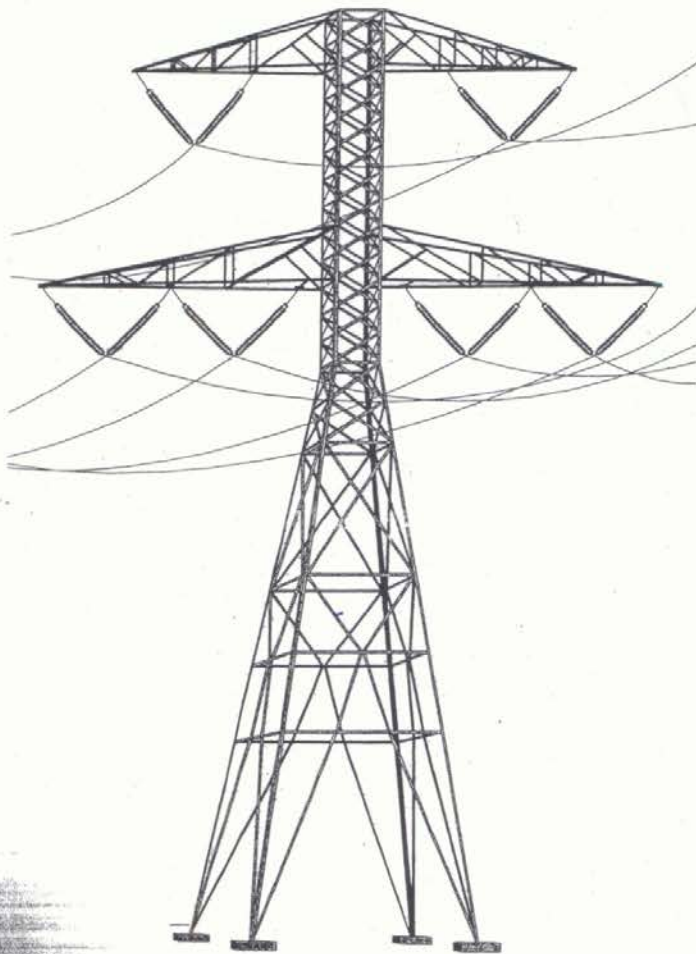


Safety, Operation and Maintenance Manual

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- (2) If a pole, wooden structure or tree will not safely sustain a utility employee's weight, the pole, wooden structure or tree shall be supported before it is climbed.
- (3) A utility employee shall, in accordance with procedures established by the employer, ensure that elevated portions of structures used for support will safely sustain the utility employees' weight.
- (4) A utility employee shall ensure that:
 - (a) forces or tensions on a pole or structure are not changed in a manner that could result in failure of the pole or structure, and
 - (b) additional support is provided if there is danger that changes in forces or tensions could result in pole or structure failure.

4-044 Climbing Spurs. A utility employee shall ensure that:

- (a) climbing spurs are used in accordance with the requirements of Division C; and
- (b) climbing spurs are not worn for work where they are not required.

4-046 Carrying Tools. A utility employee shall carry and handle tools and equipment in a manner that will prevent inadvertent contact with energized electrical equipment.

DIVISION C - Protective Devices and Equipment

4-048 Standards. Protective devices or equipment required by this code shall be manufactured, maintained, inspected and tested according to acceptable recognized industry standards.

Note: The industry recognizes that approved equipment is often unavailable or impracticable to obtain. It is for this reason that equipment designed and manufactured to other recognized standards may be acceptable.

It is important that owners and users follow the maintenance, inspection and testing requirements of the standard to which the equipment was manufactured as well as any manufacturer's requirements.

Some common industry recognized standards are:

- lanyards and life lines - CSA Z259.2-M1979, *Fall-Arresting Devices, Personnel Lowering Devices and Life Lines*;
- safety belts and safety straps - CSA Z259.3-M1978, *Lineman's Body Belt and Lineman's Safety Strap*;
- climbing spurs - CSA Z259.10-M1990, *Linemen's Pole Climbers and Attachments*;
- rubber gloves and mitts - CSA Z259.4-M1979, *Rubber Insulating Gloves and Mitts and ASTM F 496-96, Standard Specification for the In-Service Care of Insulating Gloves and Sleeves*;
- rubber sleeves - CSA Z259.5-M1979, *Rubber Insulating Sleeves and ASTM F 496-96, Standard Specification for the In-Service Care of Insulating Gloves and Sleeves*;
- rubber blankets - CSA Z259.6-M1981, *Rubber Insulating Blankets and ASTM F 479-95, Standard Specification for In-Service Care of Insulating Blankets*;
- rubber line hose - CSA Z259.7-M1981, *Rubber Insulating Line Hose and ASTM F 478-92, Standard Specification for In-Service Care of Insulating Line Hose and Covers*;
- rubber covers - CSA Z259.8-M1981, *Rubber Insulating Covers and ASTM F 478-92, Standard Specification for In-Service Care of Insulating Line Hose and Covers*;
- rubber matting - ASTM D178-93, *Standard Specification for Rubber Insulating Matting*;
- leather protectors - ASTM F 696-91, *Standard Specification for Leather Protectors for Rubber Insulating Gloves and Mittens*;
- live line tools - ASTM F 711-89, *Standard Specification for Fiberglass - Reinforced Plastic (FRP) Rod and Tube used in Live Line Tools*;
- aerial devices - CSA C225-M88, *Vehicle-Mounted Aerial Devices*,
- warning and regulatory signs and operational tags - CSA CAN3-Z321-96, *Signs and Symbols for the Occupational Environment*.

8-016 Supporting Surfaces Above Live Parts

- (1) The supporting surfaces above live parts shall be without openings.
- (2) Toe boards at least 150 mm high shall be provided at all edges and the lower edge shall be flush with the platform.

8-018 Exits

- (1) Each room or space and each working space about equipment shall have a suitable means of exit which shall be kept clear of all obstructions.
- (2) Where the size of the room or space or the arrangement of cables and equipment is such that one means of exit may be cut off, two or more exits shall be provided and located to best serve the intended purpose.
- (3) Where doors are kept locked, panic hardware shall be provided to permit easy exit.

8-020 Dimensions of Working Space Near Live Parts on Switchboards Indoors. The horizontal dimensions of the working space in front of live parts operating at a maximum potential of 750 V shall be not less than the following:

- (a) for parts on one side of more than 150 V to ground, and no live or grounded parts on the other side of the working space, 0.9 m; and
- (b) for parts on one side of more than 150 V to ground, and live or grounded parts of the other, 1.2 m; and
- (c) for parts on one side of less than 150 V to ground, and no live or grounded parts on the other, a minimum of 0.75 m; and
- (d) for parts on one side of less than 150 V to ground, and live or grounded parts on the other, 0.9 m.

8-022 Working Space Near Electrical Equipment

- (1) Adequate and readily accessible working space with secure footing shall be maintained about all electrical parts or equipment which require adjustment or examination while in service and the space back of the board shall be kept clear and shall not be used for storage.
- (2) Where necessary, steps and handrails shall be installed on or about large machines to afford ready access to live parts which must be examined or adjusted during operation.
- (3) Where possible, a minimum working space 0.9 m wide by 2.2 m high shall be provided outside the guard zone.
- (4) In cases of voltages up to 15-kV phase to phase:
 - (a) where it is necessary for employees to bring their bodies or any material or tools handled within the guard zone of unguarded live parts, suitable protective equipment such as rubber gloves, rubber sleeves, insulated tools, portable rubber mats, insulated stools, rubber blankets, insulated fuse pullers, testing and grounding devices, switch sticks, insulated bucket or platform trucks and the like shall be provided; and
 - (b) equipment shall be periodically inspected or tested and kept in a safe condition; and
 - (c) protective equipment shall be suitable for the voltage involved.

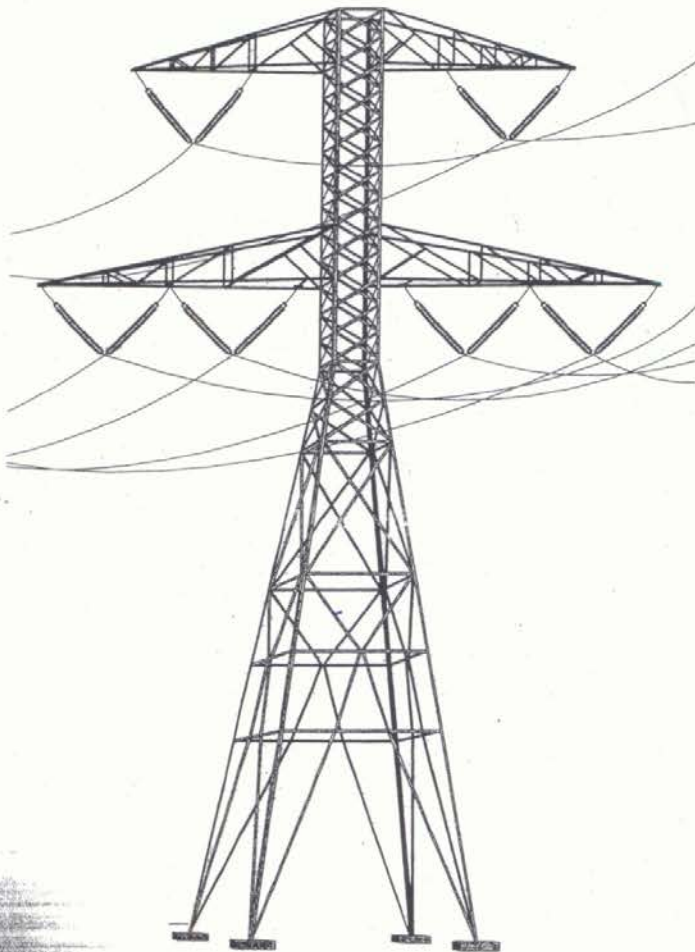
NOTE: See also requirements of Section 4 (Safety Rules).

- (5) In cases of voltages over 15 kV phase to phase, hand contact work using acceptable methods and equipment on lines or equipment carrying more than 15 kV phase to phase may only be performed where special permission is granted and where that permission is granted:

- (a) suitable protective equipment such as testing and grounding devices, switch sticks, fuse pullers, special insulated tools and insulated bucket or platform trucks shall be provided, periodically inspected or tested and kept in safe condition; and
- (b) the equipment shall provide an ample margin of safety, and shall have a voltage rating suitable for use on the circuit involved.

NOTE: See also Requirements of Section 4 (Safety Rules).

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DIVISION B - General Requirements for Utility Employees

4-030 Duties. A utility employee shall:

- (a) become familiar with the safety rules; and
- (b) comply with the safety rules; and
- (c) comply with the operating procedures established by the employer; and
- (d) comply with procedures covering the application of protective grounding established by the employer; and
- (e) warn persons seen in danger near electrical equipment or lines; and
- (f) heed and obey warnings and signs issued or used in accordance with the requirements of this Code.

4-032 Instruction

- (1) A utility employee shall not perform work on or near energized electrical equipment unless the utility employee is properly qualified.
- (2) If a utility employee is in doubt with regard to performing work assigned, the utility employee shall request instructions from the utility employee in charge.

4-034 Authorized Entry. A utility employee shall not enter areas where there is exposed energized electrical equipment unless the utility employee is authorized by the employer.

4-036 Hazard Report. A utility employee shall:

- (a) report as soon as reasonably possible to the proper authority any conditions of electrical equipment or lines that constitute a hazard; and
- (b) guard any hazardous conditions until the condition is made safe; and
- (c) where reasonably possible and in accordance with the safety rules, take steps to eliminate the hazardous condition.

4-038 Equipment. A utility employee shall:

- (a) only use tools or devices that are suited to the work to be performed; and
- (b) use protective devices and equipment required by the safety rules; and
- (c) ensure that the required protective devices and equipment are used in accordance with the safety rules.

4-040 Clothing

- (1) A utility employee working on or near energized electrical equipment shall wear:
 - (a) clothing next to the skin made of non-melting natural fibres, such as wool or cotton or of other acceptable fire retardant material; and
 - (b) other clothing made with at least 65 % natural fibres; and
 - (c) no metallic articles in contact with the skin; and
 - (d) approved industrial protective headgear; and
 - (e) a long sleeved garment with the garment sleeves rolled down.
- (1) Subrule (1)(c) does not apply to conductive clothing, eyeglasses or hearing protection acceptable to the owner/operator of the utility.

4-042 Climbing

- (1) Before attempting to climb a pole, wooden structure or tree a utility employee shall, in accordance with procedures established by the employer, determine that the pole, wooden structure or tree will safely sustain the utility employee's weight.

- (2) If a pole, wooden structure or tree will not safely sustain a utility employee's weight, the pole, wooden structure or tree shall be supported before it is climbed.
- (3) A utility employee shall, in accordance with procedures established by the employer, ensure that elevated portions of structures used for support will safely sustain the utility employees' weight.
- (4) A utility employee shall ensure that:
 - (a) forces or tensions on a pole or structure are not changed in a manner that could result in failure of the pole or structure, and
 - (b) additional support is provided if there is danger that changes in forces or tensions could result in pole or structure failure.

4-044 Climbing Spurs. A utility employee shall ensure that:

- (a) climbing spurs are used in accordance with the requirements of Division C; and
- (b) climbing spurs are not worn for work where they are not required.

4-046 Carrying Tools. A utility employee shall carry and handle tools and equipment in a manner that will prevent inadvertent contact with energized electrical equipment.

DIVISION C - Protective Devices and Equipment

4-048 Standards. Protective devices or equipment required by this code shall be manufactured, maintained, inspected and tested according to acceptable recognized industry standards.

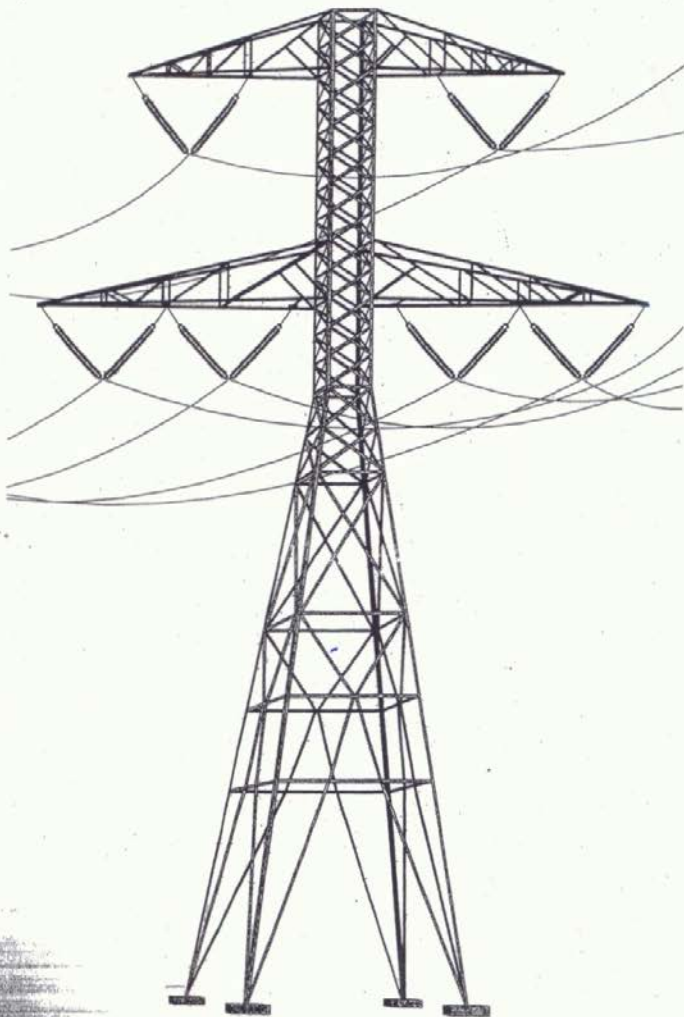
Note: The industry recognizes that approved equipment is often unavailable or impracticable to obtain. It is for this reason that equipment designed and manufactured to other recognized standards may be acceptable.

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Some common industry recognized standards are:

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- rubber sleeves - CSA Z259.5-M1979, Rubber Insulating Sleeves and ASTM F 496-96, Standard Specification for the In-Service Care of Insulating Gloves and Sleeves;
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- rubber covers - CSA Z259.8-M1981, Rubber Insulating Covers and ASTM F 478-92, Standard Specification for In-Service Care of Insulating Line Hose and Covers;
- rubber matting - ASTM D178-93, Standard Specification for Rubber Insulating Matting;
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- aerial devices - CSA C225-M88, Vehicle-Mounted Aerial Devices,
- warning and regulatory signs and operational tags - CSA CAN3-Z321-96, Signs and Symbols for the Occupational Environment.

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4-122 Contact with Equipment Below 750 V. A utility employee shall not contact isolated electrical equipment or lines normally operated at voltages below 750 V between conductors until potential testing or grounding, or both, indicate that it is safe to contact the isolated electrical equipment or lines.

4-124 Work on Equipment in Joint Use. A utility employee working on communication equipment or lines in joint use with electrical equipment or lines shall:

- (a) consider the electrical equipment or lines as being energized; and
- (b) prior to contacting non-current carrying parts of the electrical equipment or lines required to perform the work, test the non-current carrying parts for hazardous potentials; and
- (c) prior to working on the communication equipment or lines, test the equipment or lines for hazardous potentials.

4-126 Communication Lines, Cables. A utility employee stringing or removing communication lines or cables shall:

- (a) maintain the limit of approach distance required by Rule 4-130 between the communication lines or cables and energized electrical equipment or lines; and
- (b) prevent the communication lines or cables from contacting overhead electrical lines; and
- (c) not string communication lines or cables above overhead electrical equipment or lines.

4-128 Overhead Lines in Joint Use. A utility employee working on overhead communication lines in joint use with electrical utility equipment or lines shall avoid unnecessary contact with grounded parts of the electrical utility equipment or lines.

DIVISION E - Limits of Approach

4-130 General Application

- (1) Subject to Subrule (4), where electrical equipment or lines are operated at voltages less than the design voltage of the equipment or lines, the operating voltage may be used by utility employees to establish the safe limit of approach distance, and the design voltage shall be used for approach criteria by all other workers.
- (2) Subject to Subrule (4), the limit of approach distance for electrical equipment or lines operating at voltages between 750 V and 4.16 kV between conductors shall be the same as the limit of approach distance required for 4.16 kV systems.
- (3) Subject to Subrule (4), where the operating voltage of electrical equipment or lines exceeds the maximum operating voltage level specified in the safety rules the limit of approach distance for the next higher nominal voltage level shall be used.
- (4) Subrules (1), (2) and (3) do not apply where an employer has calculated a limit of approach distance for electrical equipment or lines, based on the operating voltage and insulating level of the equipment or lines.

4-132 Utility Employee Distances

- (1) Subject to Subrule (2), a utility employee shall not approach or allow conducting objects or equipment to approach exposed energized electrical equipment or lines closer than the limit of approach distances to exposed energized parts specified in Table 4-1, Column 4.
- (2) Subrule (1) does not apply where:
 - (a) the utility employee is in the continual presence of and under the direction of a qualified utility employee; or
 - (b) the energized parts are guarded in accordance with Section 8.
- (3) Subject to Subrule (4), if utility employees are not trained to work on energized electrical equipment or communication equipment in joint use the limit of approach distance to normally exposed energized electrical equipment or lines operating at voltages below 750 V between conductors shall be 800 mm.

TABLES

TABLE 2-1 ~ Safe Limits of Approach Distances from Overhead Power Lines for Persons and Equipment
 (See Rules 2-012 & 4-134)

Operating voltage of overhead power line between phase conductors	Safe limit of approach distance for persons and equipment
0 - 750 V insulated or polyethylene covered conductors (1)	0.3 m
0 - 750 V bare, uninsulated	1.0 m
Above 750 V insulated conductors (1)(2)	1.0 m
.75 kV - 40 kV	3.0 m
69 kV, 72 kV	3.5 m
138 kV, 144 kV	4.0 m
230 kV, 260 kV	5.0 m
500 kV	7.0 m

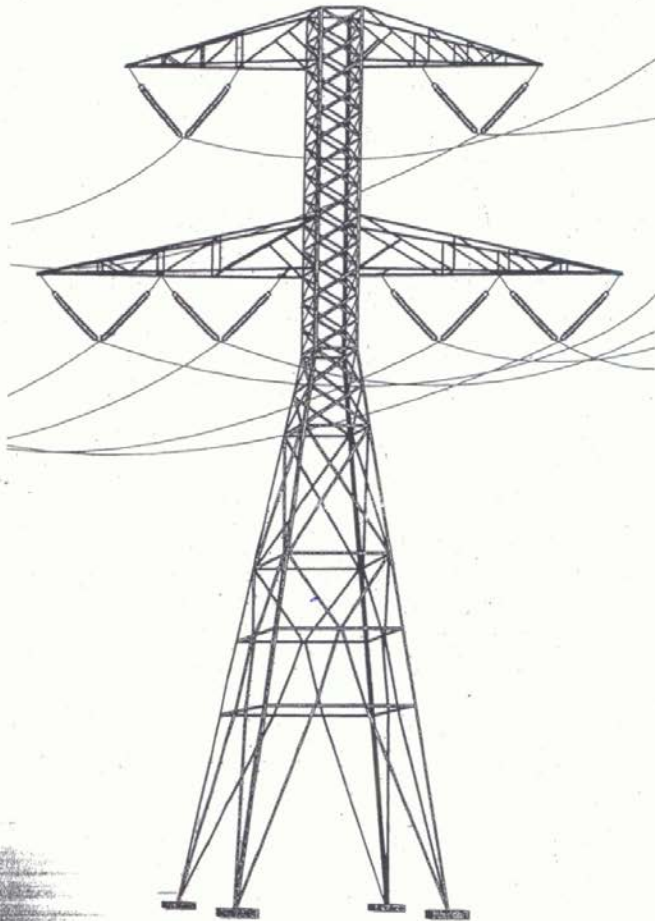
Notes: (1) Conductors must be insulated or covered throughout their entire length to comply with these groups.
 (2) Conductors must be manufactured to rated and tested insulation levels.

TABLE 4-1 ~ Limit of Approach Distances in Millimetres for Utility Employees
 (See Rule 4-132)

Voltage Levels			Utility employees
Nominal voltage to ground	Nominal voltage phase to phase	Maximum operating V phase to phase	Limit of approach to exposed energized parts
kV	kV	kV	mm
Column 1	Column 2	Column 3	Column 4(1)
0.6 (DC only)			800
0.3 - 2.4	0.6 - 4.16	4.58	800
8	13.8	15.18	850
14.4	25	27.5	950
19.9	34.5	37.95	1050
	69, 72	79.2	1350
	138, 144	158.4	1650
	230, 260	285	2150
	500	550	3450

Note: (1) Limit of approach distances in Column 4 have been calculated using IEEE minimum tool distances plus 750 mm safety factor, rounded to the nearest 50 mm.

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SECTION 4 - SAFETY RULES

4-000 Scope. This Section applies to the operation of and work on or near electrical and communication utility systems covered by this Code.

4-002 Duties

- (1) For the purpose of applying the safety rules, an employer is responsible for establishing the knowledge and ability levels of the utility employees, qualified utility employees, utility tree trimmers and utility tree workers that are employed by the employer.
- (2) A requirement in the safety rules that applies to a utility employee shall also apply to a qualified utility employee unless the safety rules specify a different requirement for the qualified utility employee.
- (3) A qualified utility employee shall comply with all of the requirements for a utility employee in the safety rules unless a provision in the safety rules allows the qualified utility employee to perform work in a different manner.
- (4) A utility tree trimmer shall comply with the requirements for a utility employee in the safety rules insofar as the requirements affect tree work near power lines.
- (5) A utility tree worker shall comply with the requirements for a utility employee in the safety rules insofar as the requirements affect tree work near power lines.

4-004 Interpretation of Rules. If there is a difference of opinion regarding the application or interpretation of these safety rules the inspection authority having jurisdiction shall be consulted for a final decision.

DIVISION A - General Requirements for Employers

4-006 Duties. An employer shall:

- (a) ensure that a copy of the safety rules are available to each utility employee; and
- (b) ensure that each utility employee has received instruction in the application of the safety rules; and
- (c) take reasonable steps to ensure that each utility employee complies with the requirements of the safety rules; and
- (d) ensure that each utility employee is qualified to perform work in accordance with the safety rules and in accordance with the utility employee's ability.

4-008 Instruction. An employer shall ensure that all utility employees are instructed regarding the condition of all electrical equipment or lines at locations where work must be done.

4-010 Visitors. If workers, visitors or employees unfamiliar with electrical hazards are permitted by an employer to enter normally restricted areas where there is exposed energized electrical equipment the employer shall ensure that the workers, visitors or employees are continuously supervised by a qualified utility employee or a person, authorized by the employer, who is capable of ensuring their safety.

4-012 Employee in Charge

- (1) If more than one utility employee is required to work on or near the same electrical equipment or line at any one location the employer shall ensure that one of the utility employees is designated as the utility employee in charge.
- (2) An employer shall ensure that the utility employee in charge of work instructs all workers under the utility employees control regarding the work they are to perform.

- 4-014 Work Area.** An employer shall ensure that work area protection is provided and used for work areas where energized electrical equipment has been exposed that could be inadvertently contacted.
- 4-016 Coordination.** An employer shall:
- (a) assign an operator-in-charge to co-ordinate the control of the electrical operation of the electrical utility system or portion of the system where more than one operator-in-charge may be required; and
 - (b) provide switching diagrams or equivalent devices, showing the arrangement, location and status of electrical equipment and lines for the operator-in-charge; and
 - (c) assign qualified utility employees in charge of work to control work performed on electrical equipment or lines; and
 - (d) provide switching diagrams, showing the arrangement and location of electrical equipment and lines for qualified utility employees performing work where reference to the diagrams is required; and
 - (e) provide operating procedures outlining the operation, isolation and maintenance of electrical equipment and lines; and
 - (f) provide procedures outlining the application and use of protective grounding that ensures that utility employees working on isolated and grounded electrical equipment or lines are not subjected to hazardous potentials; and
 - (g) ensure that switching diagrams or equivalent devices, operating procedures and procedures outlining the application and use of protective grounding are kept up-to-date at all times.
- 4-018 Fires Extinguishers.** An employer shall ensure that:
- (a) fire extinguishing equipment provided for use on or in close proximity to energized electrical equipment shall be in accordance with the requirements of the current Alberta Fire Code, and
 - (b) utility employees are instructed to use only approved extinguishing equipment on or in close proximity to energized electrical equipment in accordance with the requirements of the current Alberta Fire Code.
- 4-020 Equipment Supply.** If this Code requires that protective devices and equipment be used or applied, an employer shall ensure that all the protective devices and equipment necessary to comply with this Code is available.
- 4-022 Training and Space.** An employer shall ensure that:
- (a) utility employees required to use protective devices and equipment are trained in the proper care and use of the devices and equipment; and
 - (b) working space is provided where live line tools are required to operate or handle electrical equipment in confined spaces.
- 4-024 Identification.** An employer shall ensure that electrical equipment and lines are identified in accordance with the requirements of this Code to facilitate switching procedures and work on the equipment or lines.
- 4-026 Rescue Training.** An employer shall ensure that utility employees required to work on or near energized electrical equipment or lines are instructed in rescue and resuscitation practices.
- 4-028 Prohibited Equipment.** An employer shall ensure that the following equipment is not used near energized electrical equipment:
- (a) metal measuring tapes, ropes, tapes, hand lines, or similar equipment constructed of metal, or with metal strands in the fabric; and
 - (b) portable metal ladders or wooden ladders reinforced longitudinally with metal.



Hourly Data Report for March 21, 2007

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Notes on Data Quality.

EDMONTON INT'L A ALBERTA

Latitude: 53° 19' N **Longitude:** 113° 34' W **Elevation:** 723.30 m
Climate ID: 3012205 **WMO ID:** 71123 **TC ID:** YEG

Hourly Data Report for March 21, 2007										
Time	Temp °C	Dew Point Ten °C	Rel Hum %	Wind Di 10's deg	Wind Sp km/h	Visibilit km	Stn Pres kPa	Hmd:	Wind Chi	Weather
00:00	-5.8	-7.2	90	27	20	24.1	92.34		-13	Mainly Clea
01:00	-4.1	-8.6	71	28	17	24.1	92.44		-10	Mostly Clou
02:00	-6.8	-10.3	76	27	17	24.1	92.53		-13	Cloudy
03:00	-6.4	-11.9	65	28	11	24.1	92.60		-11	Mostly Clou
04:00	-7.9	-12.7	68	31	9	24.1	92.67			Cloudy
05:00	-10.6	-14.0	76	28	7	24.1	92.71			Mainly Clea
06:00	-11.7	-14.8	78	23	6	24.1	92.75			Mainly Clea
07:00	-13.9	-16.7	79	22	7	24.1	92.77			Mainly Clea
08:00	-12.6	-15.6	78	22	11	24.1	92.79		-19	Clear
09:00	-8.3	-13.0	69	21	11	24.1	92.76		-14	Mainly Clea
10:00	-5.5	-11.1	65	23	13	24.1	92.72		-11	Mainly Clea
11:00	-2.6	-8.2	65	20	13	24.1	92.66		-7	Mainly Clea
12:00	-1.0	-6.4	67	20	22	24.1	92.58		-7	Mostly Clou
13:00	-0.5	-6.9	62	19	30	24.1	92.43		-7	Cloudy
14:00	-0.6	-6.2	66	20	32	24.1	92.38		-7	Cloudy
15:00	0.4	-5.4	65	20	26	24.1	92.28			Mostly Clou
16:00	0.7	-4.4	69	20	22	24.1	92.25			Mostly Clou
17:00	0.8	-4.9	66	20	24	24.1	92.18			Mostly Clou
18:00	0.6	-4.3	70	20	24	24.1	92.10			Cloudy
19:00	-0.2	-4.4	73	20	19	24.1	92.05		-5	Cloudy
20:00	-0.4	-3.9	77	20	19	24.1	92.01		-6	Cloudy
21:00	-0.1	-3.1	80	20	17	24.1	91.90		-5	Mostly Clou
22:00	0.0	-2.4	84	21	9	24.1	91.87			Cloudy
23:00	0.0	-1.9	87	32	6	24.1	92.02			Cloudy

Legend
M = Missing
E = Estimated
NA = Not Available

Navigation Options
Canada Map
Alberta Map
Customized Search
Nearby Stations with Data
1971-2000 Climate Normals
Almanac Page (March 21)

EPCOR AERIAL SAFE WORK PLAN

DATE: MARCH 21, 07 SECTION: AERIAL SOUTH UNITS: G3877
3703
 LOCATION: 1PN 51 AVE 1/2 E 107 ST E3750
V9258
 CCT #: T S14 M _____ B _____ BLK AT: 08:36 RES AT: _____ S/O #: 736

Employee in Charge: [REDACTED]	Emergency Roles & Plan Reviewed:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Crew Members: [REDACTED]	Vehicle Pre-Flight Check:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Task: <u>SAME HOLE</u>	First Call Reviewed: n/a	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
First Aid Attendant: <u>ALL CREW MEMBERS</u>	First Call Ticket # <u>7048093</u>	
Safe Work Plan Co-ordinator: [REDACTED]	Communication Check:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
System S/O #:	Appropriate PPE:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
	O.S.C.A.M. #	

APPARATUS: ENERGIZED Y N ISOLATED Y N GROUNDED Y N

HAZARD PRIORITY	CONTROLS
Falling from height:	USE OF FALL ARREST
Falling objects:	NO WORKING IN HOT ZONE
Slips and trips:	ICY ; SNOW COVERED GROUND (WATCH YOUR STEP)
Structure condition:	OLD ; NEW
Climbing obstructions:	NONE
Rigging and hoisting:	HANDLINE ; BUCKET ROPE
Induction / Backfeed:	USE OF RUBBER COVER UP
Equipment conditions:	OK
Traffic conditions:	OK WORKING BACK LANE
Vehicle stability:	RIGGER ; PADS
Weather conditions:	SUNNY
Pedestrian control:	USE OF SAFETY CONES AROUND JOB SITE

JOB SPECIFICS / SAFE WORK PLAN UPDATE

* HYDRO VAC
TEL.
* WATCHING OUT FOR PEDESTRIANS

Significant Environmental Aspects	Controls
Potential release of contaminants to the environment	<u>SPILL KIT ON TRUCK.</u>
Potential release of gases and associated by-products	
Loss of natural resources	
Generation of EMF	<u>HYDRO VAC EAR PROTECTION</u>
Wildlife Protection	
Generation of noise	
Historical Resources Act - Rosedale Graveyard	