

# Division 1 - General Requirements

## I - Design Standards

### 01 30 10 Ground Disturbance Standard

#### Revision Record

Ver.	Rev.	Date	Description	By	Chk'd	App'd*
1			Final Draft	CK		

\* Approval sign-off must be from proper ERAA discipline authority.



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## 1. Intent

The intent of this document is to outline the practices and procedures Edmonton Airports' will follow to ensure a safe environment for staff, tenants, contractors and public during ground disturbance activities on lands managed by Edmonton Airports.

While intended to provide direction regarding activities involving Edmonton Airports' utilities, ground disturbers must recognize the presence of other utilities on the site and follow any necessary procedures outlined by the utility owner or regulatory requirements specific to that utility.

Ground disturbance activities, for the purpose of this document, are identified under Part 32, Section 441 of the *Occupational Health and Safety Code 2009, Government of Alberta*.

The contents of this document are applicable to anyone partaking in ground disturbance activities on site, either through routine maintenance, new construction, and installation of new subsurface utilities or connection to existing subsurface utilities.

## 2. Regulatory Requirements

This document should be used in conjunction with but not limited to the following applicable acts, regulations and codes:

- Alberta Occupational Health and Safety Act
  - Alberta Occupational Health and Safety Regulation
  - Alberta Occupational Health and Safety Code
- Alberta Pipeline Act
  - Alberta Pipeline Regulation
- Canadian Labour Code, Part II
- Alberta Safety Codes Act

As well as:

- Edmonton Regional Airports Authority Ground Lease , July 24th, 1992 (and as amended)

In all instances, the latest version of the document shall prevail. The regulatory requirements noted are minimum standards, and owners of other utilities present on Airport lands may have stricter work requirements and must be consulted before working adjacent to their facilities.

## 3. Alberta One Call Registration

Edmonton Airports became a member agent of the Alberta One Call program in 2009. The program promotes public information and awareness of subsurface utilities. It acts as a public service, providing

a one point of call notification system to members for anyone who wishes to disturb the ground. The members then will mark any of their facilities free of charge for the person requesting the service.

In addition to the membership requirements placed on Edmonton Airports' when joining Alberta One Call, the following items must be undertaken regularly:

- Update any changes to legal descriptions registered with Alberta One Call as soon as the utility has been installed or removed.
- Review legal descriptions registered every 6 months to ensure they are current.
- Audit contractors hired by EA annually to ensure qualifications are valid.
- Review contact information provided to Alberta One Call for response requests and emergency notifications every 6 months.
- Review any concerns about the quality of the locators hired by Edmonton Airports as a representative for Alberta One Call responses.

#### **4. Permit Requirements**

Any excavation must have an approved Facility Alteration Permit (FAP) prior to work commencing. Information on when a FAP is required and how to apply can be found on Edmonton Airports' Corporate website, under the "Construction at EIA" heading.

[http://corporate.flyeia.com/business\\_development/construction\\_at\\_eia](http://corporate.flyeia.com/business_development/construction_at_eia)

If there is a need to excavate outside of the work area identified under the original FAP approval, the FAP must be amended or a new FAP applied for and approved prior to the additional work commencing.

Edmonton Airports' reserves the right to require the presence of a Ground Disturbance Level II supervisor on work sites deemed to have a higher risk for infrastructure damage. This may be in areas of utility congestion or when using such techniques as directional drilling (see section 11) for more information.

## 5. Definitions

**Buried Facility Owner:** The party that is responsible for managing and maintaining the sub-surface utility.

**Cadastral:** refers to legal surveys which establish or determine the rights or interests for land by using metes and bounds, survey plans, monuments and other means.

**Construction:** Design documentation has been created, the project has been awarded to a contractor and the project has begun to physically take shape.

**Contractor:** The Company hired to carry out the ground disturbance. May or may not have prime contractor responsibilities on the work site.

**Ground Disturbance:** Any activity such as trenching, excavating, digging, auguring that disturbs the ground to a depth of more than 300mm. See the Alberta Occupational Health and Safety Code 209 Explanation Guide, (Section 441) Disturbing the Ground for additional activities.

**Ground Disturber:** The person who is carrying out the activity of ground disturbance.

**Locator:** The person hired by the utility provider to use standard industry techniques to determine the location of sub-surface utilities. May be dispatched through the Alberta One Call Centre or hired privately by a member of the project team.

**Pre-planning:** One of the very first stages of a project showing very high level concepts. This stage is used to start initial design exploration including creation of scoping documents and a project delivery report. A consultant may or may not be involved in the project yet.

**Planning:** A very early stage in the design process. The consultant has been brought in and has started to explore the physical constraints and requirements of the project.

**Prime Contractor:** the contractor, employer or other person who has entered into an agreement with the Owner of the work site to be the Prime Contractor to ensure overall coordination of the health and safety system where required by the Alberta Occupational Health and Safety Act.

**Project Manager:** the person responsible for ensuring the project objectives of use, budget, and time (amongst other criteria) are met.

**Project Owner:** The Company / Person who will retain ownership upon completion of the project

## 6. Responsibilities

### 6.1. Buried Facilities Owner

#### 6.1.1. General

1. Participate in the Alberta One Call program, retaining good member standing by adhering to the Alberta One Call member's agreement requirements.
2. Provide accurate, up to date records of both live and abandoned facilities.
3. Audit the performance of contract locators and report on their use
4. Provide updated member submission forms to Alberta One Call as changes occur to registered utility locations.
5. Retain records of locates completed for a period of 10 years
6. Ensure utility locators have access to geo.flyeia.com and training ensuring proper usage of Edmonton Airports' GIS application as a tool for delivering utility locates at Edmonton International Airport.

#### 6.1.2. Planning Activities

1. Correct records when errors are found and provide updated information back to locator as soon as possible for use in the field.
2. Assist locator in identifying previously unknown utilities found in the field.
3. Support the locator's decision not to complete locates if the project area has not been identified with Alberta One Call, either as an original service request or an amended service request.
4. Supply historical information to facilitate easy of utility location at Edmonton International Airport through the use of the GIS.
5. Plan for and install new utilities in protected utility right of ways where ever possible.

#### 6.1.3. During Ground Disturbance/Construction

1. Participate in root cause analyses on all damage incidents.
2. Provide access to Edmonton Airports' project managers (or their representatives) to review site markings on project locates as required by the complexity of the proposed ground disturbance site.
3. Ensure that new underground utilities installed by Edmonton Airports (or their representatives) are installed following good industry practices
4. Require that accurate as-builts are created for all projects defining horizontal and vertical elevations of installed utilities.

### 6.2. Buried Facilities Owner As Ground Disturber

#### 6.2.1. General

1. Will follow the same practices as identified under the sub-heading "Contractor" (Section 6.5)

## 6.3. Locator

### 6.3.1. General

1. Be a member in good standing with the Canadian Association of Pipeline and Utility Locating Contractors (CAPULC).
2. Ensure that Staff completing locates meet the minimum competencies as specified in Canadian Locator Technician Standards as published by CAPULC.
3. Locates shall be performed in accordance with CAPULC's Locating Industry Recognized Practices
4. Respond to requests for locates within the timelines indicated in Appendix "A" of this document

### 6.3.2. Prior to Line Locating

1. Ensure on site locate staff have the appropriate equipment required to use the Geographic Information System (GIS) via a web browser, Internet Explorer V. 7 or greater. This may include items such as laptop, hand held GPS, etc.
2. Provide locate services only to the area identified under the original Alberta One Call Locate service ticket, including an appropriate search area beyond project boundaries (up to 30 meters for pipelines or as reasonable for other utilities).
3. Refuse to locate any area not indicated under original ticket until a revised ticket or new ticket has been created within the Alberta One Call system.
4. Comply with any safety requirements on site as deemed necessary by the Prime Contractor

### 6.3.3. During Line Locating:

1. Provide clearly distinguishable markings and warnings on site, using the standard colour codes identified as the 'International Colour Code' (also known as the "Uniform Colour Code") for marking buried facilities (available at [www.alberta1call.com](http://www.alberta1call.com)). See Appendix "B".
2. Indicate appropriate clearances for hand expose/hydro excavation zones in conflict areas :
  - a. 5 meters either side of a gas/pipeline utility
  - b. 2.0 meters for electrical/communication
  - c. 1.0 meters for all others.

\*Note that all clearances are minimums required by Edmonton Airports. Some utilities may be governed by provincial legislation and require clearances larger than those provided in this document. Legislation will take precedence in these instances.

3. Locator will not give depth but will warn the ground disturber if it is suspected a particular utility is deeper or shallower than might normally be expected.
4. Identify known, but un-locatable, lines within the locate area. Note "un-locatable" and utility type on service ticket.

5. Record all comments / conditions regarding locates on the completed Alberta First Call Ticket. This includes all verbal conditions or directions conveyed on site to staff responsible for the excavation.
6. Use the most current information provided by Edmonton Airports, in GIS format for Edmonton International Airport or pdf format for all other facilities.

#### **6.3.4. After Line Locating**

1. Report any utilities found in the field that do not match Edmonton Airports' records to Edmonton Airports' Technical Services department and provide a drawing showing approximate location and nature of utility.
2. Retain and manage records and reports as outlined under CAPULC's *Locating Industry Recognized Practices* (Version 1 , Section 8)

### **6.4. Project Owner**

#### **6.4.1. General**

1. Working on airport lands requires a higher attention to diligence and safety over standard construction sites. Edmonton Airports' has numerous processes and procedures in place to protect the site that the Project Owner must familiarize themselves with.

#### **6.4.2. Pre-planning**

1. Allow an appropriate amount of time to assess the hazards associated with the ground disturbance and plan to minimize the risk. This may include allowing for additional funding to use non-standard means of utility locating in high risk areas.

#### **6.4.3. Planning**

1. Some projects may have an Edmonton Airports' Project Manager assigned to the work to assist the Project Owner navigate the complexities of working on airport lands. If one has been assigned to assist, contact Edmonton Airports' Projects department prior to construction, preferably early in the design stage, to receive information on the necessary procedures and requirements as the Project Owner may have to alter design or construction methods in order to meet these requirements.

### **6.5. Contractor**

#### **6.5.1. Pre-excavation/ground disturbance**

1. Conduct a hazard assessment on the proposed excavation prior to starting the ground disturbance.
2. Ensure work is being conducted based on the latest issue of the Issued for Construction drawings.
3. Contact the utility owner to have locate marks re-established should they become disturbed, destroyed or illegible.

### **6.5.2. During excavation/ground disturbance**

1. Use reasonable precautions to identify the utility and minimize risk of damage or injury when a utility has been identified as un-locatable by standard line locating methods.
2. Do not use mechanical excavation equipment within an area identified as a hand dig zone until the utility has been exposed to sight by hand digging or a non-destructive method approved by Edmonton Airports. (Refer to Occupational Health and Safety Code 2009 – Explanation Guide, Part 32, Section 448, subsection 448(1) for information on hydro excavation recommendations.)
3. All excavation equipment operators should use a spotter on the ground to minimize damage due to blind spots in the operator's area of vision.

### **6.5.3. Upon Completion of Excavation/Ground Disturbance**

1. Report any utilities found in the field that do not match Edmonton Airports' records to Edmonton Airports' Technical Services department and provide a drawing showing approximate location and nature of utility within 5 working days of discovery.
2. Remove all locate flags/stakes upon completion of work

## **7. Process**

The following activities shall be overseen by the Project Manager assigned to Edmonton Airports' project. Responsibilities for completing the various tasks may be delegated to the consultant or contractor by the Project Manager or as dictated by the party's contract with Edmonton Airports. Should Edmonton Airports' assign a Project Manager to assist with a tenant project, the Project Owner will be charged with ensuring the following requirements are met.

### **7.1.Pre-planning**

1. Place new utilities in existing transportation utility corridors (TUC) or easements wherever possible. If no easements exist, create new.
2. Ensure all preliminary lease plans, lease plans and site plans issued as proposals show easements.

### **7.2.Planning**

1. Contact Edmonton Airports for all available information on the site. This may include historical data, as-built information or issued for construction.
2. Conduct a site visit to review for visible indications of underground facilities e.g. catch basins, manhole covers, vent pipes, etc.

### **7.3.Design**

1. Overlay existing sub-surface utility information over proposed design, noting any potential conflicts. Designers should meet with Edmonton Airports' Infrastructure staff at no later than a 30% design phase to review the quality level of the existing information.

2. Data quality levels will be assessed from Levels D through Level A, as set out in the American Society of Civil Engineers “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data “ (CI/ASCE 38-02).
3. Any sub-surface facilities identified as Quality Level D or C, and have been identified by Edmonton Airports’ staff as having a potential impact to EA operations if damaged, shall warrant further subsurface utility engineering to Quality Levels B or A.
4. Information gathered in the field shall be noted on the drawings, including elevations if obtained, and survey coordinates in a system noted on the drawing. The information must then be circulated back to Edmonton Airports as part of the 60% design review for additional clarification/comment where required.
5. The 90% design files shall indicate final identification and resolution of all known utility conflicts.

#### **7.4.Pre-Bid**

1. Any project requiring excavation will have a mandatory site pre-bid site visit. At this time, the contractor will be briefed on the utilities in the area by the Project Manager and advised of Edmonton Airports’ excavation protocol. At this time, the contractors will be advised by the Project Manager if they are required to have a Ground Disturbance Level II Supervisor on site for any proposed directional drilling or high risk excavation.

#### **7.5.Construction**

1. Ground disturbance shall not occur without the contractor having completed utility locates by using the Alberta One Call System. Edmonton Airports will require a copy of all completed Alberta One Call locate sheets to be submitted to the Technical Services department. Any work found proceeding prior to the submission being made may be shut down until proof for locate completion has been submitted. Due to the number of utility providers on EA’s sites, there may be more than one locate sheet provided to the contractor.
2. Clearly identify the area of excavation with white paint markings/stakes/flags prior to the locators coming on site.
3. The contractor is responsible for following all conditions and instructions provided by the utility locator. As there are several public and private utilities on site, it is important to note that there may be a need to meet with more than one locate operator.
4. Site meetings must be held prior to any excavation taking place. At that point, the contractor and the Project Manager will review the markings made by the locators against the design drawings.  
A pre-activity meeting must be held to review information and create a strategy for mitigating any perceived risks.
5. Prior to subsurface utilities being covered up the following is to occur:
  1. Vertical and horizontal elevations are to be captured by and recorded on redline drawings for key locations as follows:

- All facility items that are assigned unique reference numbers on facility maps and records.
  - Repair points
  - Buried service drops: Service stubs
  - Laterals
  - Bends: changes of direction, arcs
  - Depth changes/ lateral deflection
  - Fiber optic facilities with no metallic conductor
  - Conduit stubs
  - Encasement ends: conduit ends of horizontally directional drilled facilities
  - Manhole covers
  - Water crossings
  - Major road crossings
  - Utility crossings: locations where the cable crosses over or under other utilities.
  - Non-metallic facilities
  - Other items of value or interest
  - Maintenance holes and chambers/valve chambers including extents
  - Valves, tees and plugs
2. Appropriate utility locating mechanisms (RFID tags, trace tape, etc.) must be installed and verified by the Project Manager (or appointed representative) as being installed.
  3. Any discrepancies between the drawings and the markings must be resolved prior to excavation beginning. A risk assessment will be conducted. Any historical information verbally provided by Edmonton Airports' staff must be recorded either through meeting minutes or as part of the risk assessment documentation. The nature of the information and person providing it must be included.
  4. Any deviations from drawings are to be recorded on the redline drawings and transposed into as-built documents for future information. See Edmonton Airports' Standards for Redline Submission (Appendix E) for more information.
  5. Redline information including survey items as identified in 7.5.5.1 are to be transposed on to the final record drawings.

## 8. Installation of Underground Utilities

- 8.1. Trace tape/wires shall be added on all non-metallic facilities. Inspection by a designated Edmonton Airports' representative must occur prior to the utility be covered to ensure installation of locate mechanism.
- 8.2. Survey requirements – all utilities shall be surveyed for vertical and horizontal elevations at key locations identified in **7.5.5.1** prior to being covered. The resulting information shall be added to the redline drawings, noting the survey coordinate system the information has been captured in. See **Appendix E** for redline submission requirements. Appropriate survey tolerances as noted in **Appendix F (Positional Accuracy of Records)** are to be noted on the drawings for each utility installed.

- 8.3. RFID locate equipment (by 3M) - 3M RFID Marker System. RFID markers are to be programmed with the following information :
- utility owner,
  - product within the pipe,
  - size of pipe,
  - material.
- 8.4. Signage – all non-metallic utilities located outside of right of ways registered with Edmonton Airports shall be field marked above ground with signage indicating the position of the utility and owner. See **Appendix C** for a sample.

## 9. Utility Hits or Near Misses

All instances of utility hits or near misses shall be reported to the contractor having Prime Contractor responsibilities on the construction site. If Prime Contractor has not been designated, then the report will be made to the Owner if Prime Contractor has not been designated. A follow up investigation shall occur as outlined in the Prime Contractor's (or Owner as required) safety program.

In the case a utility should be hit or a near miss occurs, a copy of the incident investigation shall be provided to Technical Services as well as a description of the changes that will be put in place to allow construction to continue and ensure a similar instance does not occur again. Use the form found on [fap.flyeia.com](http://fap.flyeia.com) in order to make the submission.

## 10. Training

Due to the large number of both small and large scale civil projects on airport lands, any EA staff involved in excavation on a regular basis must have a basic level of safety training with a focus on ground disturbance practices.

**All staff** members regularly involved in ground disturbance must take and pass one of two courses (or approved substitute). Certification must be maintained as long as the employee is in a position that requires being involved in ground disturbance.

1. Safe Trenching, Excavation and Ground Disturbance – developed by the [Alberta Construction Safety Association](#) or
2. Ground Disturbance Level 1 – developed by the [Alberta Damage Prevention Council](#).
3. On-line at [e-compliance.ca](http://e-compliance.ca)

The following positions have been identified as requiring this training:

- Project Managers (all)
- Plumbers
- Electricians
- Field Maintenance (permanent staff) inc. superintendents

- Technical Services' staff

All EA staff members supervising large scale civil activities must have the equivalent of the Ground Disturbance Level 2 training (developed by the [Alberta Damage Prevention Council](#)) and maintain the training while supervising ground disturbance is part of this/her regular activities.

This training is available through companies such as the Safety Training Centre (<http://www.safetytrainingcentre.com>) or on-line through e-compliance.ca

The following positions have been identified as requiring Ground Disturbance Level 2 training are:

- Project Managers – those that deal with large civil works.

All permanent staff as of January 1, 2012 must obtain the level of training as identified above before the end of the year 2014. Any new staff member brought on after this time will have 6 months from when the date of passing his/her probationary period to complete the required training. Certification must be renewed upon expiry and for the duration of holding the position.

## 11. Directional Drilling

Edmonton Airports' reserves the right to require the presence of a Ground Disturbance Level II supervisor present on work sites when directional drilling.

All directional drilling will require the applicant to provide stamped, engineered drawings including cross sections of the drill path. A work plan providing risk mitigation and contingency planning will need to be provided to Edmonton Airports in areas deemed high risk prior to approval for work being given.

## 12. Miscellaneous

### 12.1. Contract Language

The requirement for as-builts/record documents shall be provided in all Edmonton Airports' contracts that effect airport infrastructure. If a consultant is not directing the work, the responsibility for providing as-builts shall fall to the contractor or construction manager directing the work (depending on the situation).

### 12.2. Contractor/ Consultant Evaluation

Contractors and consultants may be evaluated prior to being hired to ensure they have the proper training for carrying out ground disturbance activities where required by the nature of the project they have been hired to work on. The Contractor pre-qualification program is one tool that will be used when a Prime Contractor is being chosen. For instances other than pre-qualification, the Project Manager will determine if the project requires excavation, and request that the parties provide documentation describing their excavation/ground disturbance program.

When construction has been completed, an evaluation of the contractor/consultant performance should be conducted as part of the Contractor feedback form used at to see if procedures had been followed. This will be used as a reference for future hiring as well as a check to ensure procedures and processes are still relevant or problematic. Contracts and Procurement will be reviewing the assessment process in 2012 and will include excavation/ground disturbance practices as one of the criteria for evaluation.

### **12.3. Data Submissions**

See item 8.2. Edmonton Airports' reserves the right to ask for data in active work sites prior to the redline submission at substantial completion if warranted that constructive activity in the area requires use of the information prior to this milestone. Edmonton Airports' may audit contractors redlines during the course of the project to ensure the data is being collected to the required standard.

### **12.4. Data Collection**

All utility locations collected as Quality Level A or B information shall be collected using good survey practice, and within accepted survey tolerances for data collection defined under both provincial legislation and the Alberta Land Surveyors Manual.

### **12.5. Data Input**

Edmonton Airports will input utility information into the GIS utility application upon receipt of surveyed information. The GIS application is considered to be the most up to date source of site utility information. Information will be incorporated into the CAD record base at quarterly scheduled intervals for use in design.

Information will be noted for two distinct qualities - data quality as outlined in *ASCE 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*, with Quality Level D being the lowest quality of data and Quality Level A being the most precise level of data. The utilities will also be given an accuracy level of 1 through 4, 5 or 0 as outlined in *CSA Standard CSA S250-11 Mapping of Underground Utility Infrastructure*.

Edmonton Airports' utility information is compiled from information supplied by others. While procedures have been put in place to ensure quality information has been gathered and distributed, Edmonton Airports' will not guarantee or warrant information provided by others.

See Appendix F for detailed information on data quality levels

## **13. Reference Materials**

- 13.1. American Society of Civil Engineers, *ASCE 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*
- 13.2. Alberta Damage Prevention Council, (Version 3.2, 16 September 2009), *The Damage Prevention Process In Alberta*

- 13.3. Canadian Association of Pipelines and Utility Locating Contractors, (Version 1.0, June 2007) *Locating Industry Recognized Practices*
- 13.4. Canadian Standards Association, (S250-11 September 2011), *Mapping of Underground Utility Infrastructure*
- 13.5. U.S. Department of Transportation – Office of Pipeline Safety (August 1999), *Common Ground – study of One Call systems and Damage Prevention Best Practices.*
- 13.6. Enform (IRP Volume 17 – 2009) *Ground Disturbance and Damage Prevention – An Industry Recommended Practice for the Canadian Oil and Gas Industry.*

## Appendix “A” – Alberta One Call Requirements

### SCHEDULE “A”

#### SERVICE SPECIFICATION

##### **A1.00 FUNCTION**

- A1.01 The Supplier shall receive requests from Excavators to have the locations of Underground Facilities marked by the User.
- A1.02 The Supplier shall transmit these requests to the User or, at the option and request of the User, to the User's authorized agent.
- A1.03 The Supplier shall voice record all incoming calls and maintain various files and records of all Locate Requests from Excavators and all Notifications to the User.

##### **A2.00 COMMUNICATION SYSTEM**

- A2.01 The Supplier shall transmit Notifications to the User by data communication to the User's facsimile machine unless the User chooses the printer option described in paragraph A2.02 hereof.
- A2.02 To accommodate a high volume of Notifications or preprinted multi-part locate slips, the User may choose to receive Notifications by data communication from the Supplier, to a printer, in which case the User shall purchase a printer, at cost, from the Supplier. In the event the User's printer requires maintenance, the Supplier shall provide, at no charge to the User, a replacement printer while the User's printer is being repaired.
- A2.03 The Supplier, at his sole discretion, may introduce other methods of communicating Notifications to the User to improve efficiency and to take advantage of technological advances.
- A2.04 In the situation where the transmission of Notifications from the Supplier to the User requires a Standard Single Telephone Line, the costs of the installation, operation and maintenance of such line shall be borne by the User.
- A2.05 Any costs incurred in the relocation of the lines defined in paragraph A2.04 hereof within the User's premises, after initial installation, shall be borne by the User.

##### **A3.00 OPERATION**

- A3.01 The Supplier shall provide the Service Monday through Friday exclusive of the following holidays; New Year's Day, Family Day, Good Friday, Victoria Day, Canada Day, August Civic Holiday, Labour Day, Thanksgiving Day, Remembrance Day, Christmas Day and Boxing Day and any other civic, provincial or federal holiday declared from time to time. The Supplier shall provide the Service between the hours of 0600 and 1800 during the months of March through November and between the hours of 0800 and 1600 during the months of December through February.

## Appendix “A” – Alberta One Call Requirements (cont.d)

- A3.02 Between the hours of 1800 and 0600 or 1600 and 0800, as the case may be, on weekends and on holidays as defined in paragraph A3.01 hereof, the Supplier shall provide service through a paging system to process Emergency Locate Requests only.
- A3.03 With respect to Locate Requests which will require less than one (1) hour of the User's time to mark his Underground Facilities and for which less than two (2) full working days notice is given, the Excavator shall be given the following message: "Our members require a minimum of two full working days notice."
- A3.04 With respect to Locate Requests which will require more than one (1) hour of the User's time to mark his Underground Facilities and for which less than five (5) full working days notice is given, the Excavator shall be given the following message: "Our members may require a minimum of five full working days notice."
- A3.05 The Supplier shall not accept Locate Requests in the situation where the Excavator will not be commencing excavation within ten (10) working days of the date of request except in the case where it is specified at the time the Locate Request is placed that the marking of locations of buried plant is required for planning or design purposes only.
- A3.06 Any advice received by the Supplier that an Underground Facility has been damaged shall be transmitted, immediately on its receipt, to the User at the number supplied by the User for this purpose.
- A3.07 Each Excavator's Identification Number, which shall be his contact telephone number, shall be stored to permit his future identification, maintain information relative to his identity and reduce the length of time of future Locate Request calls.
- A3.08 Each Locate Request shall be assigned a Ticket Number, which shall be given to the Excavator for future reference.
- A3.09 Each Notification shall be assigned a Ticket Number and be transmitted to appropriate Destination Codes. This Ticket Number shall be the same as that in paragraph A3.08 hereof.
- A3.10 The Destination Code shall be acknowledged electronically by the User's printer or facsimile machine, if he has one, at the time of each transmission.
- A3.11 At the conclusion of each regular working day, a list of all Ticket Numbers transmitted to each Destination Code during that day shall be transmitted to that Destination Code to allow the User to verify that all Notifications for the preceding twenty-four (24) hour period were in fact received.
- A3.12 At the end of each month, a summary of all Ticket Numbers transmitted to each Distribution Code during that month shall be transmitted to that Destination Code.
- A3.13 Emergency Locate Requests shall be transmitted by the Supplier to the User immediately upon completion of the preparation of the Notification by the Supplier.
- A3.14 Priority Locate Requests shall be transmitted by the Supplier to the User within fifteen (15) minutes of the completion of the preparation of the Notification by the Supplier.
- A3.15 Routine Locate Requests shall be transmitted by the Supplier to the User within two (2) hours of the completion of the preparation of the Notification by the Supplier.

## Appendix “A” – Alberta One Call Requirements (cont.d)

### A4.00 DATA BASE AND DATA

- A4.01 The Supplier shall create and maintain a Data Base to contain the Data supplied by the User.
- A4.02 The Data Base shall be a grid system based on legal land descriptions with a quarter section being the smallest defined area of land.
- A4.03 The Supplier, at his sole discretion, may put in place other grid systems to accommodate population centres or congested quarter sections and to take advantage of technological advances.
- A4.04 The User shall provide Data to the Supplier in a format acceptable to the Supplier. The Data shall indicate in which areas of the appropriate Data Bases the User has Underground Facilities.
- A4.05 The Data provided by the User shall include all the known Underground Facilities situated throughout the province of Alberta that are owned, operated or under the control of the User and/or its parent, subsidiaries, affiliates and related companies.
- A4.06 Within fourteen (14) days of receipt of the Data described in paragraph A4.04 hereof, the Supplier shall enter the Data into the appropriate Data Bases and return a printout from the System of the User's Data to the User for verification.
- A4.07 On receipt of the printout described in paragraphs A4.05 hereof, the User shall carefully check the Data, make any required changes, additions or deletions to the Data and verify the accuracy of the Data in a form acceptable to the Supplier. The User shall return such verification of Data within fourteen (14) days of receipt of any request for same from the Supplier.
- A4.08 In December of each year, the Supplier shall contact the User if the User has not updated his Data in the preceding six (6) months and request that the User update his Data.
- A4.09 The User is encouraged to update and/or verify his Data at least annually.
- A4.10 The Supplier assumes no responsibility for the accuracy of Data supplied by the User and shall retain copies of all documents provided by the User for a minimum of seven (7) years for future reference should a dispute arise concerning the accuracy of the Data.

### A5.00 RECORDS

- A5.01 The Supplier shall voice record all Locate Requests and store such recordings for a minimum period of three (3) years.
- A5.02 The Supplier shall retain and store, for a minimum of seven (7) years, a record of all Notifications.

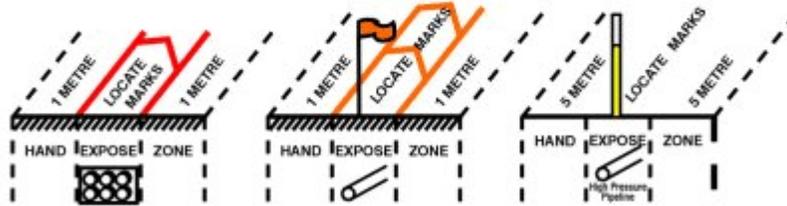
### A6.00 GENERAL

- A6.01 The Supplier assumes no responsibility for the locating or marking of Underground Facilities. The only undertaking of the Supplier is to ensure that the User is notified of a proposed ground disturbance and of the name of and a contact phone number for the Excavator.

## Appendix “B” – International Colour Code for Marking Buried Facilities

### INTERNATIONAL COLOUR CODE FOR MARKING BURIED FACILITIES

	<b>WHITE</b> - Proposed Excavation
	<b>PINK</b> - Temporary Survey Markings
	<b>RED</b> - Electric Power Lines, Cable Conduit and Lighting Cables
	<b>YELLOW</b> - Gas, Oil, Petroleum and Gaseous Materials
	<b>ORANGE</b> - Telephone, Cable TV, Communication, Alarm and Signal Lines
	<b>BLUE</b> - Potable Water
	<b>GREEN</b> - Sanitary Sewers, Storm Sewers and Drain Lines
	<b>PURPLE</b> - Reclaimed Water, Irrigation and Slurry Lines



FACILITIES MUST BE HAND EXPOSED AND VISIBLE BEFORE MECHANICAL EQUIPMENT IS USED WITHIN THE HAND EXPOSE ZONE.



**1-800-242-3447**

PLEASE PROVIDE AT LEAST  
2 FULL WORKING DAY'S NOTICE



## Appendix “C” – Sample of Above Ground Utility Marking Signage

Font: Clearview Hwy.  
Line widths - 20 pt  
Telephone and web text - lower case  
EIA logo - solid black  
RED - to match Pantone 186.  
Finished Size - 9.875” x 7.875”



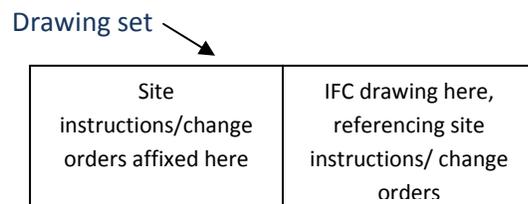
7.875" x 9.875"  
0.063" aluminum (white)  
Graphics / text carried forward from provided sample then adjusted to accommodate bolts & washers

Right sample content reduced to 90% to allow room for Valve / Locate  
Valve / Location - Font: clearviewHwy-5-W

## Appendix “D” – Reserved

## Appendix “E” – Redline Submission Requirements

- Copies kept on site and updated daily
- IFC drawings to be marked up with “as constructed” information, noting any change order or site instructions on the drawing by number and bubble indicating area affected by the change.
- Symbols used during the mark up process must be consistent with any issued in the drawing legend. Any new symbols are to be added to the legend, and then incorporated into the final drawing by the Consultant preparing the final record drawing submission.
- Copies of the site instruction/change order to be affixed to the back of the previous drawing, facing the drawing it is being referenced on. See below for example of the drawing set:



- Redlines will be scanned in colour and delivered to Edmonton Airports at substantial completion, before the files are sent to the consultant for final record drawing preparation. Any redlines delivered to other consultants prior to substantial completion must also have an electronic copy sent to Edmonton Airports (e.g. drawing issue for commissioning).
- File naming should follow the standard naming conventions as outlined in the Edmonton Airports’ CADD Standards (latest edition). The sheet containing the site instructions/change orders should be designated by adding <SI> to the end of the file name. E.g. IFC sheet A-401.pdf and the site instructions sheet A-401-SI.pdf
- Any schedule that is re-issued during the course of construction must be added to the record drawings. Schedules must be kept in sync with any redline mark-ups that occur to the IFC drawings.
- Drawing cover sheet to be amended to reflect drawings issued to date including additions of new drawings or removal of drawings from the IFC package.
- Any information captured as part of underground utility work is to be transposed onto the record information. This included survey coordinates and horizontal elevations.
- Redlines may be subject to an unscheduled audit review by Edmonton Airports or their representative over the schedule of the project,

## Appendix “F” – Data Quality

Any underground utility data will be identified by the two following criteria.

### Positional Accuracy of Records:

Accuracy Level	Description	Reference
1	Accurate within $\pm 25$ mm in the x, y, and z coordinates, and referenced to an accepted geodetic datum with a 95% confidence level.	Absolute
2	Accurate within $\pm 100$ mm in the x, y, and z coordinates, and referenced to an accepted geodetic datum with a 95% confidence level.	Absolute
3	Accurate within $\pm 300$ mm in the x, y, and z coordinates, and referenced to an acceptable geodetic datum or topographical and cadastral features with a 95% confidence level.	Absolute or relative
4	Accurate within $\pm 1000$ mm in the x, y, and z coordinates, and referenced to an acceptable geodetic datum or topographical and cadastral features with a 95% confidence level.	Absolute or relative
5	Surveyed, but accuracy unknown	Absolute or relative
0	No information available	N/A

### Data Quality Levels\*:

Data Quality Level	Description
A	Precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of sub-surface utilities, usually at a specific point. Minimally intrusive excavation equipment is typically used to minimize the potential for utility damage. A precise horizontal and vertical location as well as other utility attributes is shown on plan documents. Accuracy is typically set to 15mm vertical and to applicable horizontal survey and mapping accuracy as defined or expected by the map owner.
B	Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities. Quality level B data should be reproducible by surface geophysics

	at any point of their depictions. This information is surveyed to applicable tolerances defined by the project and reduced onto plan documents.
<b>C</b>	Information obtained through the survey and plotting visible above ground utility features and by using professional judgement in correlating this information to quality level D information.
<b>D</b>	Information derived from existing records or oral recollections

\*reproduced from the American Society of Civil Engineers (2003) CI/ASCE 38-02 *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*.