

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 35 29 – Health and Safety Requirements.
- .3 Section 01 78 00 – Closeout Submittals

### **1.2 DESCRIPTION OF WORK**

- .1 This specification details how to perform the following surveys:
  - .1 In-Trench Surveys
  - .2 Under Slab Systems Surveys
  - .3 Third Party Location Service
  - .4 As-Built Topographical Survey

### **1.3 REFERENCES**

- .1 UTM, NAD 83 CSRS, Zone 22

### **1.4 SUBMITTALS**

- .1 Prepare a complete survey deliverable in an electronic format.
  - .2 Provide an electronic file on CD, or approved median, in AutoCAD (2005 format or newer) format of infrastructure locations related to each survey type within the construction area as deliverable.
  - .3 Provide an ASCII file on CD, or approved median. Include the following:
    - .1 Point Numbering
    - .2 Northing
    - .3 Easting
    - .4 Elevation
    - .5 Description
  - .4 Deliverable coordinates to be maintained in UTM, NAD 83 CSRS, Zone 22.
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- .5 Deliverable will consist of one model with various layout sheets in paperspace as required.
- .6 Produce deliverable at an appropriate scale to be legible. Legend and definitions of all symbols or lettering shall be included on the drawing.
- .7 Attribution of infrastructure will appear as text on drawings.

## **PART 2 – PRODUCTS**

Not Applicable.

## **PART 3 – EXECUTION**

### **3.1 IN-TRENCH SURVEY**

- .1 Conduct an in-trench survey to establish the accurate location of all new underground services, including but not limited to: sanitary, storm drainage, water, electrical, specialty circuits, communication, steam and fuel.
  - .2 Survey all abandoned, capped, and existing exposed services/infrastructure within the trenched area.
  - .3 Data collection points for services shall be the top center of pipe, conduit, cable or structure and will include the type of material and size.
  - .4 Data collection points of duct banks shall be the top and bottom edges of the concrete duct.
  - .5 Data collection points shall be at all bells, fittings or welds and shall not exceed 10 meters on straight runs, 2 meter arcs shall not exceed 60 cm intervals, and 3 meter arcs shall not exceed 90 cm intervals. All arcs will have a minimum of three collection points.
  - .6 Services will remain exposed until confirmation from the surveyor that the data has been collected and approved for backfill by the Department Representative.
  - .7 All surveyed services are to be marked with water base paint for inspection by Department Representative
  - .8 Surveys shall be conducted to an accuracy of 20mm and supervised by a registered Newfoundland and Labrador Land Surveyor.
  - .9 Surveys shall be referenced to UTM, NAD 83 CSRS, Zone 22.
  - .10 Survey control points for the site will be provided by Department Representative.
  - .11 Upon completion of work provide locations in accordance with Section 01 78 00 - Closeout Submittals.
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### **3.2 UNDER SLAB SYSTEMS SURVEY**

- .1 Conduct an under slab systems survey to establish the accurate location of all new underground services, including but not limited to: sanitary, storm drainage, water, electrical, specialty circuits, communication, steam and fuel.
- .2 Survey all abandoned, capped, and existing exposed services/infrastructure within the slab area.
- .3 Data collection points for services shall be the top center of pipe, conduit, cable or structure and will include the type of material and size.
- .4 Data collection points of duct banks shall be the top and bottom edges of the concrete duct.
- .5 Data collection points shall be at all bells, fittings or welds and shall not exceed 4 meters on straight runs, 1 meter arcs shall not exceed 30 cm intervals, and 2 meter arcs shall not exceed 60 cm intervals. All arcs will have a minimum of three collection points.
- .6 Data collection shall be in a continuous line mode, recording start point of service, collecting sequential points along the run, and recording the end point.
- .7 Survey building corners and any structural supports to ensure accuracy of locations when under slab systems are correlated with a design floor plan.
- .8 Services will remain exposed until confirmation from the surveyor that the data has been collected and approved for backfill by the Department Representative.
- .9 All surveyed services are to be marked with water base paint for inspection by Department Representative.
- .10 Surveys shall be conducted to an accuracy of 20mm and supervised by a registered Newfoundland and Labrador Land Surveyor.
- .11 Surveys shall be referenced to UTM, NAD 83 CSRS, Zone 22.
- .12 Survey control points for the site will be provided by Department Representative.

Upon completion of work provide locations in accordance with Section 01 78 00 - Closeout Submittals.

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### **3.3 THIRD PARTY LOCATION SERVICE**

- .1 Acquire the services of a Third Party Location Service to establish an accurate location of sub grade infrastructure within the construction area.
- .2 Prior to commencing with infrastructure locations all parties involved with the test excavation should visit the site and become acquainted with current site conditions.
- .3 Contractor shall submit a testing schedule and test hole location plan for approval by the project manager. Approval for service shut downs may be required in areas including but not limited to high voltage, fuel, or pressurized lines.
- .4 Contractor shall consult with the Project Manager regarding any changes to site conditions during the design period, any historical data relating to abandoned infrastructure and restrictions on equipment usage.
- .5 Surveys shall be conducted to an accuracy of 20mm and supervised by a registered Newfoundland and Labrador Land Surveyor.
- .6 Surveys shall be referenced to UTM, NAD 83 CSRS, Zone 22.
- .7 Survey control points for the site will be provided by Department Representative.
- .8 Restore site to original condition on completion of test excavations.
- .9 Upon completion of work provide locations in accordance with Section 01 78 00 - Closeout Submittals.

### **3.4 AS-BUILT TOPOGRAPHICAL SURVEY**

- .1 Prepare a complete as-built topographical survey to capture all topographical features within the construction area.
  - .2 Prior to commencing topographic survey, Surveyors should visit the site and become acquaint with current site conditions and receive contractors safety orientation.
  - .3 Locate all features including but not limited to: curbs, sidewalks, roadways, pads, buildings, trees, shrubs, fences, flag poles, bollards, posts, drains, swales, ditches, culverts, within the construction area.
  - .4 Locate electrical manholes, poles, transformers, switching cubicles, and specialty lights.
  - .5 Survey elevations of main floor of buildings
  - .6 Provide a complete topographical grid at a maximum 20 meter intervals and at changes in slope for the entire construction site.
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- .7 Surveys shall be conducted to an accuracy as defined below and supervised by a registered Newfoundland and Labrador Land Surveyor.
  - .1 Spot elevations on the ground to an accuracy of 50mm.
  - .2 Building floor elevations to an accuracy of 10mm.
  - .3 Spot elevations on hard surface to an accuracy of 15mm.
- .8 Surveys shall be referenced to UTM, NAD 83 CSRS, Zone 22.
- .9 Survey control points for the site will be provided by Department Representative.