

SPECIFICATIONS dated September 2014

SWIFT CURRENT RESEARCH CENTRE

CONTRACT NO. 25

DESIGN AND INSTALL IRRIGATION SYSTEM AND CONTROL VALVE

CONTENTS

SECTION 1 - GENERAL

- 1-01 Scope of the Work
- 1-02 Approximate Quantities
- 1-03 Examination of Site of Proposed Work
- 1-04 Completion of the Work
- 1-05 Materials Furnished by Canada
- 1-06 Materials Furnished by the Contractor
- 1-07 Roads, Fences, and Crop Damage
- 1-08 Use of Construction Facilities
- 1-09 Equipment, Camp, and Construction Areas
- 1-10 Site Maintenance and Cleanup
- 1-11 Regulations and Acts
- 1-12 Inspection and Tests
- 1-13 Warranty and Maintenance
- 1-14 Operation and Maintenance
- 1-15 Payment

SECTION 2 - MECHANICAL

- 2-01 General
- 2-02 Detail Requirements - Linear Irrigation Package

SECTION 3 - ELECTRICAL

- 3-01 General
- 3-02 Detail Requirements - Linear Irrigation Package

SECTION 4 - EVALUATION AND PAYMENT

- 4-01 Bid Requirements
- 4-02 Bid Evaluation
- 4-03 Testing
- 4-04 Payment

SECTION 1 - GENERAL

1-01 Scope of the Work

The work of this contract consists of the supply of all plant, labour, services, and materials, except as may be specified herein, for the design, supply and installation of a Linear Irrigation system complete with a control valve at the Swift Current Research Centre.

1-02 Approximate Quantities

The following items are the main items to be supplied and approximate quantities of each:

- | | |
|---|------------|
| 1. Design and Supply of Linear Irrigation Package | 1 Lump Sum |
|---|------------|

1-03 Examination of Site of Proposed Work

It is the responsibility of the Bidder to examine the site before submitting his Bid, to satisfy himself as to the nature and location of the work, local conditions, existing equipment, and facilities.

1-04 Completion of the Work

The contractor must complete this contract on or before May 16, 2015. Supply and installation must be completed on or before March 31, 2015.

1-05 Materials Furnished by Canada

Canada will furnish to the Contractor, without charge, all site areas, soil maps, and other data which, in the opinion of the departmental representative, are necessary for the execution of the work.

1-06 Materials Furnished by the Contractor

The Contractor shall be required to furnish all materials and supplies as specified in this contract, except such items as are specified in section 1-05. The costs of hauling, handling, and caring for all materials and supplies furnished by the contractor shall be included in the prices bid in the Price Table for the work for which the materials and hauling are required.

Materials shall meet the requirements of the specifications, or where not detailed in the specifications, shall be to the satisfaction of the departmental representative. All materials shall be new unless otherwise specified.

Schedules of piping, fittings, pipe or other materials indicating quantity and/or dimensions, which are shown in the applicable sections of the specifications, are intended only to assist the Contractor in his quantity takeoff. Quantities and dimensions shown therein are not guaranteed to be accurate and shall be checked by the Contractor prior to placing an order for such materials.

All materials provided by the Contractor shall vest in and become the property of Canada as soon as the same are delivered to the site of the works, but shall remain in the custody and at the risk of the Contractor.

1-07 Roads, Fences, and Crop Damage

Access to work shall be provided by the Contractor at his own expense. Canada assumes no responsibility for the condition and maintenance of any road or structure that may be used by the Contractor in performing the work under these specifications, or in delivering the material to the project site. For the duration of the contract, all roads damaged by the Contractor's heavy vehicle and equipment traffic shall be maintained and repaired by the Contractor to the satisfaction of the departmental representative at no additional cost to Canada.

The Contractor will be held responsible for damages to crops and shall make his own arrangements with crop owners for passage through crops, where necessary.

Canada assumes no responsibility for public safety in connection with any operations performed by the Contractor in prosecution of this contract. Public and private roads subject to interference by the work shall be kept open or suitable detours shall be provided by the Contractor. The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient red lights, danger signals and signs, and shall take all necessary precautions for the protection of the work and the safety of the public.

No allowance will be made for the cost to the Contractor of providing access roads and road detours, or of moving and replacing fences. These costs must be included in the unit prices bid on items appearing in the Price Table.

1-08 Use of Construction Facilities

Work at or in the vicinity of the site may be performed by other agencies or by other contractors during the period covered by this Contract. The Contractor shall permit full use, without charge therefor, of roads, bridges, and of any other facilities usable

jointly by the Contractor, other agencies, or other contractors, as are available for such use without additional cost to the Contractor.

The Contractor shall have a site safety management plan prior to mobilizing to site. This plan shall include provisions to ensure the safety of the public, those engaged in the work under this contract, and those employed by other agencies or contractors who may require access to the site against accident and injury. The Contractor shall post on site all necessary and applicable signs regarding safety hazards, and the required personal safety equipment. Further to the provisions of the General Conditions, the Contractor shall appoint a competent site supervisor who shall be responsible for all daily construction activities with authority over all contractors, subcontractors, and workers on site, including the implementation of the site safety management plan.

1-09 Equipment, Camp, and Construction Areas

The Contractor shall be permitted to use for storage, any land available in the vicinity of the work that is within the boundaries of land controlled by Canada, except as may be otherwise specified herein, provided that such use will not interfere with any part of the work or the work of other contractors or other agencies in the vicinity.

In the event the Contractor finds it necessary to utilize additional area, which is not owned or controlled by Canada, for the performance of the contract, The Contractor shall make all necessary arrangements for the utilization of the required area at no expense to Canada.

It is not intended that the assignment of certain construction areas shall imply that others may not have access to or perform other work in the designed areas or in other areas in which work is required under these specifications. The use of such areas by others will be limited by the departmental representative to the minimum considered consistent with efficient execution of the work under this and other contracts in force. However, the departmental representative shall be the sole judge in all matters of access and area utilization by the Contractor and others.

If private land is used by the Contractor, he shall make all necessary arrangements with the owner of the private land, and shall pay all rentals and others costs connected therein.

1-10 Site Maintenance and Clean-up

The Contractor shall confine his equipment, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the departmental representative and shall not unreasonably encumber the work area with his materials.

Clean-up shall be a continuous process from the start of the work to final acceptance of the project. The Contractor shall, at all times, and without additional instructions, keep property on which work is in progress free from accumulations of waste materials or rubbish caused by employees or by the work. Accumulations of waste materials which might constitute a fire hazard will not be permitted. Spillage from the Contractor's hauling vehicles on travelled public or private roads shall be promptly cleaned up. On completion of construction, the Contractor shall remove all temporary structures, rubbish, and waste materials resulting from his operations.

The Contractor shall dispose of all surplus excavated material, rocks and boulders at a location designated by the departmental representative. All clean-up operations shall be subject to the approval of the departmental representative.

1-11 Regulations and Acts

The Contractor shall comply with all applicable Municipal, Provincial Government and Government of Canada regulations. The Contractor shall comply with all Workers' Compensation Board Regulations as they apply to the work of this contract.

1-12 Inspection and Tests

All materials furnished and all work performed will be subject to inspection.

The Contractor shall notify the departmental representative of the suppliers from whom he proposes to obtain the material. Arrangements will be made by the departmental representative to obtain material specimens and carry out the necessary tests. The Contractor shall, at his own cost, arrange and be responsible for the safe and expeditious delivery of all required and specified specimens to a testing laboratory designated by the departmental representative.

The cost of inspection and testing will be borne by Canada, except where this contract specifies otherwise.

1-13 Warranty and Maintenance

Notwithstanding the General Conditions, the Contractor must furnish two (2) years of equipment warranty after the date of acceptance, covering the quality of material and workmanship of the equipment furnished in accordance with the original manufacturer's guarantee, and must provide free replacement of defective parts shown to have failed because of poor quality materials or poor workmanship.

The Contractor must have a service representative, fully qualified to service the irrigation package within a one hundred (100) kilometre radius of the site.

1-14 Operation and Maintenance

The Contractor must provide Canada with complete documentation on the operation and maintenance of the system. In addition to the written documentation, the Contractor shall instruct Canada's personnel in the operation and maintenance of the system. Such instructions must be sufficient in the departmental representative's opinion to properly acquaint Canada's personnel with the required procedures. The contract must not be considered substantially complete until the instruction has been provided.

1-15 Payment

No separate payment will be made for the work specified in this section. All costs incurred by the Contractor in meeting with the requirements of this section including mobilization and demobilization, must be included in the unit price bid for the items of work appearing in the Price Table.

SECTION 2 - MECHANICAL

2-01 General

The components of the irrigation system must be manufactured and finished in a thorough workmanlike manner. Workmanship must be of the highest grade throughout and in accordance with good commercial practice for this type of equipment. All dimensions/volumes shall be held as close as is consistent with good shop practice.

2-02 Detail Requirements - Linear Irrigation System

- .01 The system must be equipped with a nozzle package designed with approximate flow rate 200 gallons per minute.
- .02 The linear must have an end pressure of 172 kPa (25 psi).
- .03 The total length of sprinklers must be as close to field width of 93 meters (305 feet from center of cart to edge of field) as possible. The length of the lateral must be met entirely with 2 tower spans, distance from center cart to last tower wheel approximately 70 meters (230 feet) and one overhang that correspond with plot configuration; length shall not be reached with end gun.
- .04 All metal components including nipples, fittings etc. must be hot dipped galvanized steel.
- .05 The tires must be new size 16" x 26" with tubes, semi-flotation with galvanized rims.
- .06 The outlets across the machine must be spaced to work with specified nozzle package. Extra outlets must have galvanized plug.
- .07 Nozzle Packages
 - .01 Nozzles must be Senninger I-Wobs with standard angle 9-Groove plates and nozzles must be equipped with 138 kPa (20 psi) regulators.
 - .02 Nozzles must be mounted on flexible drop tubes c/w weights with nozzles approximately 1.82 metres (6 feet) from ground level.
 - .03 Nozzles must be sized and evenly spaced at approximately the intervals specified by nozzle

Manufacturer to optimize uniformity across the entire system.

- .04 Shutoff valves required for overhang sprinklers only.
- .08 The pipe size must be minimum 100mm (4") and minimum 14 gauge.
- .09 A sand trap must be installed at the end of the linear.
- .10 A quality liquid filled pressure gauge must be installed in the lateral on the riser pipe. The gauge should have a range between 0 and 345kPa (50 psi).
- .11 The drive cart must be a four wheel drive with minimum 16" x 26" tires capable of pulling a 100mm(4") drag hose. The linear/lateral system must be capable of irrigating in forward and reverse.
- .12 Gear boxes, drives, and motors must be complete with system.
- .13 The drag hose must be 100mm (4")high density polyethylene pipe suitable for this application. Must come equipped with cables or chains for towing. Total length shall be designed to reach end of field from one hydrant located in center edge of field. Total length field approximately 333 meters. Connections from the drag hose to the linear and from the drag hose to the riser are the responsibility of the Contractor.
- .14 Linear/lateral system must be capable of pivoting at a set location without moving the travel cart; i.e. the cart must have the ability to act as a temporary pivot point.
- .15 A six foot cart/drag hookup hose with chain and ringlock ends.

SECTION 3 - ELECTRICAL

3-01 General

All electrical equipment and material of the irrigation system must be new and conform to the standards of the Canadian Standards Association.

Installation of equipment must meet the requirements of the current edition of the Canadian Electrical Code, Part 1: applicable Provincial and Municipal regulations and codes; and the current ASAE Standard for this type of application. In no instance shall the standards and recommendations established by the manufacturer be reduced by any codes or regulations referred to above. Where differences between the Canadian Codes and American Codes occur, the Canadian Code shall govern.

It is intended that the Contractor shall undertake all electrical work necessary to design and install a completely operational irrigation system and control valve. Items required under this section include, but are not limited to, the items listed under Section 3-02.

3-02 Detail Requirements - Linear Irrigation System

- .01 The system shall use a cart mounted diesel generator, with auto start control module, to supply the electrical requirements of the linear/lateral irrigation system.
- .02 The linear must have a computer control panel. Minimum features to include, programmable water application rate, low pressure and temperature shut-off.
- .03 Lightning arrester to comply with CSA Standard C233-1972 or most current standard.
- .04 Linear/lateral must be complete with tower alignment control system.
- .05 Linear/lateral must be complete with GPS tracking system and furrow guidance system or approved equivalent.
- .06 The linear must be equipped with a Nelson 800 series control valve with solenoid on/off mounted on the linear/lateral. Valve must be linked to the linear/lateral control panel for low pressure shut off and end of field shut offs c/w manufacturers recommended barricades must be included. Barricades must be placed on each end of the field either on the drag cart tower or end tower (total of

4 barricades; 2 for each field). A mechanical shut-off to stop the system in mid field must be installed.

SECTION 4 - EVALUATION AND PAYMENT

4-01 Bid Requirements

.01 Each bidder must include the following information with their bid:

.01.1 List of all materials being supplied.

.01.2 Written confirmation of service within 24 hours of Swift Current.

4-02 Bid Evaluation

Bids will be evaluated on the basis of total tendered amount.

4-03 Testing

After the irrigation system has been installed, testing and adjusting must be done by the Contractor and shall continue until the system is operating to the satisfaction of the departmental representative.

4-04 Payment

"Design and Supply of Linear Irrigation Package" will be paid for at the lump sum price bid therefor in the Price Table. Payment shall constitute full and final payment for all work specified herein.